FCC RF Test Report

APPLICANT	:	Espressif Systems (Shanghai) Co.,Ltd.
EQUIPMENT	:	2.4GHz &5GHz Wifi&BLE&Zigbee module
BRAND NAME	:	ESPRESSIF
MODEL NAME	:	ESP32-C5-WROOM-1U
FCC ID	:	2AC7Z-ESPC5WROOMU
STANDARD	:	47 CFR Part 15 Subpart C §15.247
CLASSIFICATION	:	(DTS) Digital Transmission System
TEST DATE(S)	:	Dec. 11, 2024 ~ Dec. 23, 2024

We, Sporton International Inc. (Kunshan), would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. (Kunshan), the test report shall not be reproduced except in full.

Jason Jia

Approved by: Jason Jia

ACCREDITED
Cert #5145.02

Sporton International Inc. (Kunshan)
No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China

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APPENDIX C. RADIATED SPURIOUS EMISSION

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR4N0707C	Rev. 01	Initial issue of report	Mar. 04, 2025

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(2)	6dB Bandwidth	≥ 0.5MHz	Pass	-
3.1	-	99% Bandwidth	-	Pass	-
3.2	15.247(b)(3)	Output Power	≤ 30dBm	Pass	-
3.3	15.247(e)	Power Spectral Density	≤ 8dBm/3kHz	Pass	-
3.4	15.247(d)	Conducted Band Edges and Spurious Emission	≤ 20dBc	Pass	-
3.5	15.247(d)	Radiated Band Edges and Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 2.34 dB at 2483.50 MHz
3.6	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 9.11 dB at 0.187 MHz
3.7	15.203 & 15.247(b)	Antenna Requirement	N/A	Pass	-

Conformity Assessment Condition:

1. The test results (PASS/FAIL) with all measurement uncertainty excluded are presented against the regulation limits or in accordance with the requirements stipulated by the applicant/manufacturer who shall bear all the risks of non-compliance that may potentially occur if measurement uncertainty is taken into account.
2. The measurement uncertainty please refer to each test result in the section “Measurement Uncertainty”

Disclaimer:

The product specifications of the EUT presented in the test report that may affect the test assessments are declared by the manufacturer who shall take full responsibility for the authenticity.

1 General Description

1.1 Applicant

Espressif Systems (Shanghai) Co.,Ltd.
Suite 204, Block 2, 690 Bibo Road, Zhang Jiang Hi-Tech Park, Shanghai, China

1.2 Manufacturer

Espressif Systems (Shanghai) Co.,Ltd.
Suite 204, Block 2, 690 Bibo Road, Zhang Jiang Hi-Tech Park, Shanghai, China

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	2.4GHz &5GHz Wifi&BLE&Zigbee module
Brand Name	ESPRESSIF
Model Name	ESP32-C5-WROOM-1U
FCC ID	2AC7Z-ESPC5WROOMU
SN Code	Conducted: 6055F9FAA8E0 Conduction: 6055F9FAA88C Radiation: 6055F9FAA8C4
HW Version	V1
SW Version	v1.1.3.4
EUT Stage	Identical Prototype

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.4 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx/Rx Frequency Range	2405 MHz ~ 2480 MHz
Number of Channels	16
Channel Spacing	5 MHz
Carrier Frequency of Each Channel	2405 MHz, 2410MHz, …, 2480MHz
Maximum Output Power to Antenna	Zigbee : 20.64 dBm (0.1159 W) Thread : 20.56 dBm (0.1138 W)
99% Occupied Bandwidth	Zigbee : 1.988MHz
Antenna Type / Gain	External PCB antenna with gain 3.86 dBi
Type of Modulation	O-QPSK

Remark: For Zigbee & Thread mode, the whole testing has assessed Zigbee mode by referring to the higher conducted power.

1.5 Modification of EUT

No modifications are made to the EUT during all test items.

1.6 Testing Location

Sporton International Inc. (Kunshan) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.02.

Test Firm	Sporton International Inc. (Kunshan)		
Test Site Location	No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China TEL : +86-512-57900158		
Test Site No.	**Sporton Site No.**	**FCC Designation No.**	**FCC Test Firm Registration No.**
	CO01-KS 03CH08-KS TH01-KS	CN1257	314309

1.7 Test Software

Item	Site	Manufacturer	Name	Version
1.	03CH08-KS	AUDIX	E3	210616
2.	CO01-KS	AUDIX	E3	6.2009-8-24
3.	TH01-KS	Tonscend	JS1120-3 test system China_210602	3.3.10

1.8 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- 47 CFR Part 15 Subpart C §15.247
- FCC KDB 558074 D01 15.247 Meas Guidance v05
- ANSI C63.10-2013

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

2 Test Configuration of Equipment Under Test

2.1 Carrier Frequency Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
2400-2483.5 MHz	11	2405	19	2445
	12	2410	20	2450
	13	2415	21	2455
	14	2420	22	2460
	15	2425	23	2465
	16	2430	24	2470
	17	2435	25	2475
	18	2440	26	2480

2.2 Test Mode

a. The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conduction (150 kHz to 30 MHz), radiation (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). Pre-scanned tests, X, Y, Z in three orthogonal panels to determine the final configuration (X plane as worst plane) from all possible combinations.

b. AC power line Conducted Emission was tested under maximum output power.

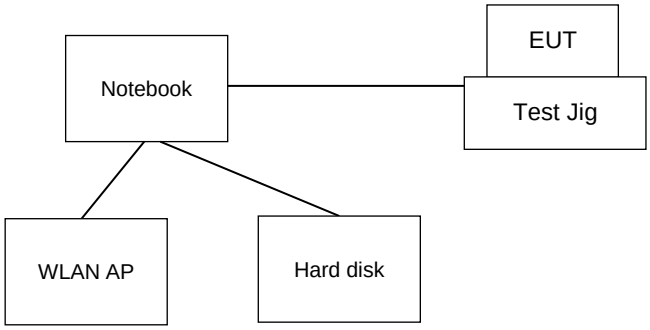
The following summary table is showing all test modes to demonstrate in compliance with the standard.

Summary table of Test Cases	
Test Item	**Data Rate / Modulation**
	250kbps / Zigbee, Thread
Conducted TCs	Mode 1: Zigbee Tx CH11_2405 MHz Mode 2: Zigbee Tx CH18_2440 MHz Mode 3: Zigbee Tx CH25_2475 MHz Mode 4: Zigbee Tx CH26_2480 MHz Mode 5: Thread Tx CH11_2405 MHz Mode 6: Thread Tx CH18_2440 MHz Mode 7: Thread Tx CH25_2475 MHz Mode 8: Thread Tx CH26_2480 MHz
Radiated TCs	Mode 1: Zigbee Tx CH11_2405 MHz Mode 2: Zigbee Tx CH18_2440 MHz Mode 3: Zigbee Tx CH25_2475 MHz Mode 4: Zigbee Tx CH26_2480 MHz

AC Conducted Emission	Mode 1: Thread TX + Charging from Notebook Mode 2: Zigbee TX + Charging from Notebook
Remark: The worst case of conducted emission is mode 2; only the test data of it was reported.	

2.3 Connection Diagram of Test System

AC Conducted Emission:



This example is connection diagram of EUT test configurations.

. For detail, please refer to test mode configuration and setup photographs for each test item.

Radiated Emission:

This example is connection diagram of EUT test configurations.

. For detail, please refer to test mode configuration and setup photographs for each test item.

2.4 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Notebook	Lenovo	G480	QDS-BRCM1050I	N/A	Shielded cable DC O/P 1.8m, Unshielded AC I/P cable 1.8m
2.	WLAN AP	D-link	DIR-655	KA21R655B1	N/A	Unshielded,1.8m
3.	Hard disk	N/A	N/A	N/A	N/A	N/A
4.	Test Jig	N/A	N/A	N/A	N/A	N/A

2.5 EUT Operation Test Setup

For ZigBee function, the engineering test program was provided and enabled to make EUT continuous transmit.

2.6 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

Example :

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset = RF cable loss + attenuator factor.

Following shows an offset computation example with cable loss 1.91 dB and 20dB attenuator.

Offset(dB) = RF cable loss(dB) + attenuator factor(dB).

= 1.91 + 20 = 21.91 (dB)

3 Test Result

3.1 6dB and 99% Bandwidth Measurement

3.1.1 Limit of 6dB and 99% Bandwidth

The minimum 6 dB bandwidth shall be at least 500 kHz.

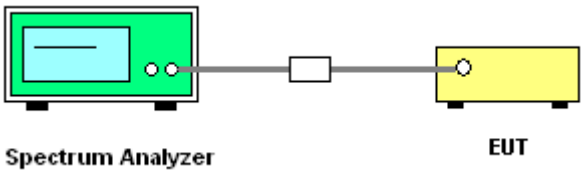
3.1.2 Measuring Instruments

The section 4.0 of List of Measuring Equipment of this test report is used for test.

3.1.3 Test Procedures

1. The testing follows ANSI C63.10-2013 clause 11.8
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6 dB bandwidth must be greater than 500 kHz.
5. For 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) is set 1% to 5% of the 99% OBW and the VBW is set to 3 times of the RBW.
6. Measure and record the results in the test report.

3.1.4 Test Setup



3.1.5 Test Result of 6dB and 99% Occupied Bandwidth

Test data refer to Appendix A.

3.2 Output Power Measurement

3.2.1 Limit of Peak Output Power

For systems using digital modulation in the 2400-2483.5MHz, the limit for peak output power is 30dBm. If transmitting antenna of directional gain greater than 6dBi is used, the peak output power from the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the antenna exceeds 6 dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

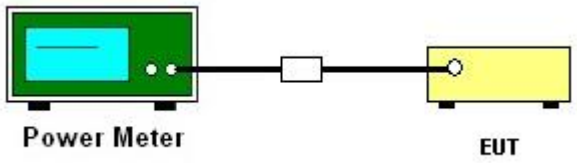
3.2.2 Measuring Instruments

The section 4.0 of List of Measuring Equipment of this test report is used for test.

3.2.3 Test Procedures

1. The testing follows the Measurement Procedure of ANSI C63.10-2013 clause 11.9.1.3 PKPM1 Peak power meter or ANSI C63.10-2013 clause 11.9.2.3.1 Method AVGPM method.
2. The RF output of EUT was connected to the power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Measure the conducted output power and record the results in the test report.

3.2.4 Test Setup



3.2.5 Test Result of Peak Output Power

Test data refers to Appendix A.

3.2.6 Test Result of Average Output Power (Reporting Only)

Test data refers to Appendix A.

3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

The peak power spectral density shall not be greater than 8dBm in any 3kHz band at any time interval of continuous transmission.

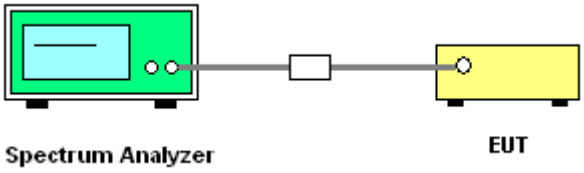
3.3.2 Measuring Instruments

The section 4.0 of List of Measuring Equipment of this test report is used for test.

3.3.3 Test Procedures

1. The testing follows Measurement Procedure of ANSI C63.10-2013 clause 11.10.2 Method PKPSD.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 3 kHz. Video bandwidth VBW = 10 kHz In order to make an accurate measurement, set the span to 1.5 times DTS Channel Bandwidth. (6dB BW)
5. Detector = peak, Sweep time = auto couple, Trace mode = max hold, Allow trace to fully stabilize. Use the peak marker function to determine the maximum power level.
6. Measure and record the results in the test report.
7. The Measured power density (dBm)/ 100kHz is a reference level and used as 20dBc down limit line for Conducted Band Edges and Conducted Spurious Emission.

3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

Test data refers to Appendix A.

3.4 Conducted Band Edges and Spurious Emission Measurement

3.4.1 Limit of Conducted Band Edges and Spurious Emission

All harmonics/spurious must be at least 20 dB down from the highest emission level within the authorized band.

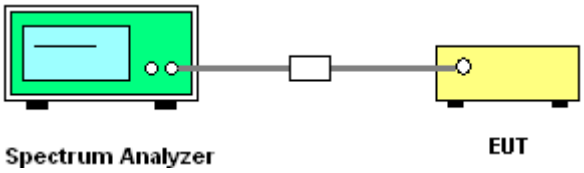
3.4.2 Measuring Instruments

The section 4.0 of List of Measuring Equipment of this test report is used for test.

3.4.3 Test Procedure

1. The testing follows ANSI C63.10-2013 clause 11.13
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Set RBW = 100 kHz, VBW=300 kHz, Peak Detector. Unwanted Emissions measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz when maximum peak conducted output power procedure is used. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.
5. Measure and record the results in the test report.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

3.4.4 Test Setup



3.4.5 Test Result of Conducted Band Edges Plots

Test data refers to Appendix A.

3.4.6 Test Result of Conducted Spurious Emission Plots

Test data refers to Appendix A.

3.5 Spurious Emission Measurement in the Restricted Band

3.5.1 Limit of Spurious Emission Measurement in the Restricted Band

Emissions which fall in the restricted bands must also comply with the limits as below.

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

3.5.2 Measuring Instruments

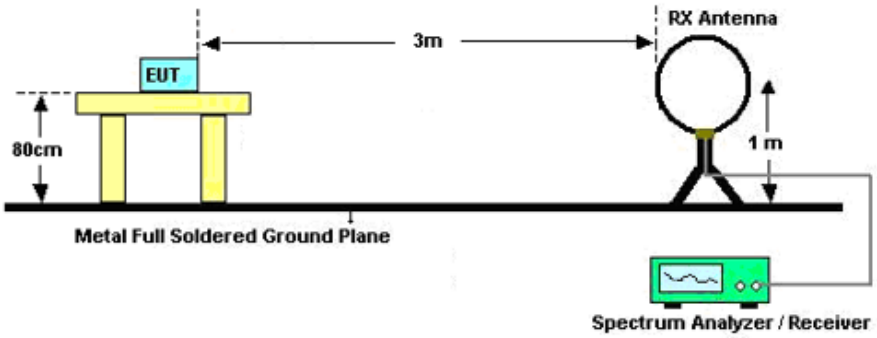
The section 4.0 of List of Measuring Equipment of this test report is used for test.

3.5.3 Test Procedures

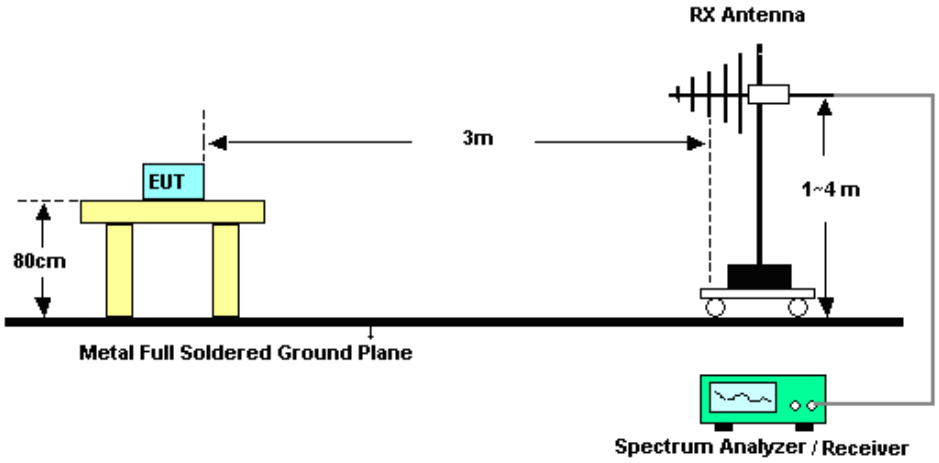
1. The testing follows ANSI C63.10-2013 clause 11.11 & 11.12
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.
3. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
6. For conducted spurious emission measurement in the restricted band, the RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
7. For measurement below 1GHz, if the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
8. Use the following spectrum analyzer settings:
   (1) Span shall wide enough to fully capture the emission being measured;
   (2) Set RBW=100 kHz for f < 1 GHz; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold;
   (3) Set RBW = 1 MHz, VBW= 3MHz for f ≥ 1 GHz for peak measurement.
   For average measurement:
   - VBW = 10 Hz, when duty cycle is no less than 98 percent.
   - VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

3.5.4 Test Setup

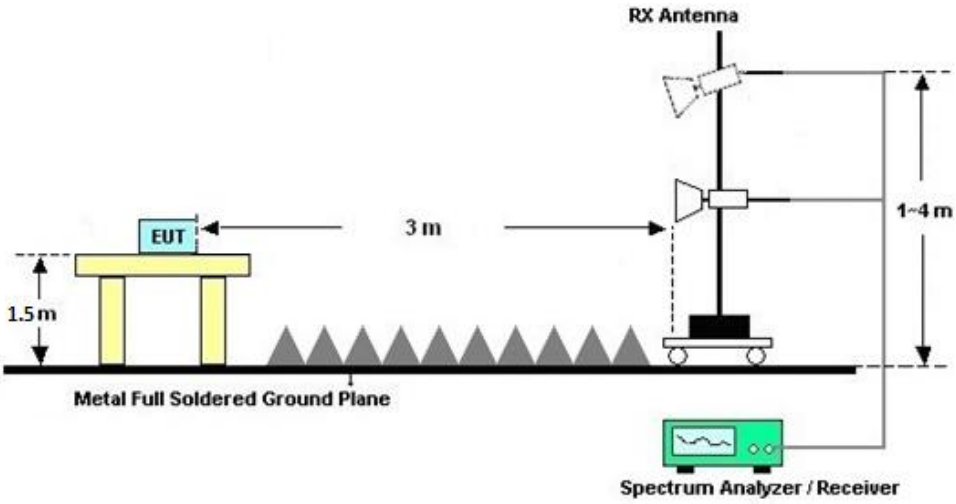
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



3.5.5 Test Results of Radiated Spurious Emissions (9 kHz ~ 30 MHz)

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.

3.5.6 Test Results of Radiated Spurious at Band Edges

Please refer to Appendix C.

3.5.7 Test Result of Cabinet Radiated Spurious Emission (30MHz ~ 10th Harmonic or 40GHz, whichever is lower)

Please refer to Appendix C.

3.5.8 Duty Cycle

Please refer to Appendix D.

3.6 AC Conducted Emission Measurement

3.6.1 Limit of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

Frequency of emission (MHz)	Conducted limit (dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

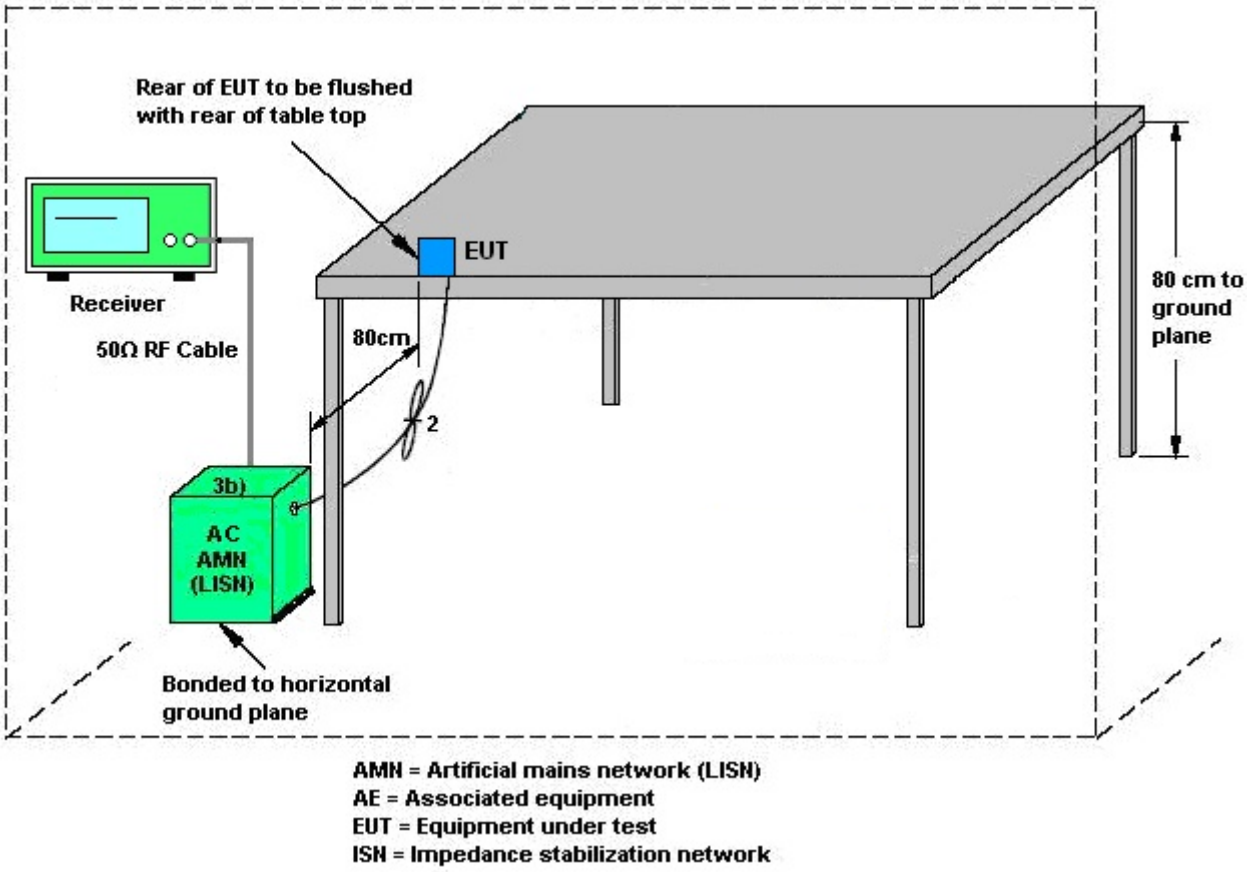
3.6.2 Measuring Instruments

The section 4.0 of List of Measuring Equipment of this test report is used for test.

3.6.3 Test Procedures

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth (IF Bandwidth = 9kHz) with Maximum Hold Mode. Then measurement is also conducted by Average Detector and Quasi-Peak Detector Function respectively.

3.6.4 Test Setup



3.6.5 Test Result of AC Conducted Emission

Please refer to Appendix B.

3.7 Antenna Requirements

3.7.1 Standard Applicable

If directional gain of transmitting antennas is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi. 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 rule.

3.7.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.7.3 Antenna Gain

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
EMI Receiver	R&S	ESCI7	100768	9kHz~7GHz;	Apr. 18, 2024	Dec. 15, 2024	Apr. 17, 2025	Conduction (CO01-KS)
AC LISN (for auxiliary equipment)	MessTec	AN3016	060103	9kHz~30MHz	Aug. 20, 2024	Dec. 15, 2024	Aug. 19, 2025	Conduction (CO01-KS)
AC LISN	MessTec	AN3016	060105	9kHz~30MHz	Apr. 18, 2024	Dec. 15, 2024	Apr. 17, 2025	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP000000811	AC 0V~300V, 45Hz~1000Hz	Oct. 09, 2024	Dec. 15, 2024	Oct. 08, 2025	Conduction (CO01-KS)
EMI Test Receiver	Keysight	N9038A	MY57290151	3Hz~8.5GHz;Max 30dBm	Jul. 04, 2024	Dec. 11, 2024	Jul. 03, 2025	Radiation (03CH08-KS)
EXA Spectrum Analyzer	Keysight	N9010B	MY57441079	10Hz-44GHz	Oct. 09, 2024	Dec. 11, 2024	Oct. 08, 2025	Radiation (03CH08-KS)
Loop Antenna	R&S	HFH2-Z2E	101125	9kHz~30MHz	Sep. 08, 2024	Dec. 11, 2024	Sep. 07, 2025	Radiation (03CH08-KS)
Bilog Antenna	TESEQ	CBL 6111D	59915	30MHz-1GHz	Aug. 18, 2024	Dec. 11, 2024	Aug.17, 2025	Radiation (03CH08-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	00240138	1GHz~18GHz	Jul. 06, 2024	Dec. 11, 2024	Jul. 05, 2025	Radiation (03CH08-KS)
high gain Amplifier	EM	EM01G18GA	060890	1Ghz-18Ghz	Jul. 23, 2024	Dec. 11, 2024	Jul. 22, 2025	Radiation (03CH08-KS)
SHF-EHF Horn	Com-power	AH-840	101116	18GHz~40GHz	Oct. 22, 2024	Dec. 11, 2024	Oct. 21, 2025	Radiation (03CH08-KS)
Amplifier	SONOMA	310N	380826	9KHz-1GHz	Jul. 03, 2024	Dec. 11, 2024	Jul. 02, 2025	Radiation (03CH08-KS)
Amplifier	Keysight	83017A	MY53270417	500MHz~26.5GHz	Oct. 09, 2024	Dec. 11, 2024	Oct. 08, 2025	Radiation (03CH08-KS)
Amplifier	EM	EM18G40GGA	060737	18~40GHz	Jan. 03, 2024	Dec. 11, 2024	Jan. 02, 2025	Radiation (03CH08-KS)
AC Power Source	Chroma	61601	616010002473	N/A	NCR	Dec. 11, 2024	NCR	Radiation (03CH08-KS)
Turn Table	EM	EM 1000-T	N/A	0~360 degree	NCR	Dec. 11, 2024	NCR	Radiation (03CH08-KS)
Antenna Mast	EM	EM 1000-A	N/A	1 m~4 m	NCR	Dec. 11, 2024	NCR	Radiation (03CH08-KS)
Spectrum Analyzer	R&S	FSV40	101040	10Hz~40GHz	Oct. 10, 2024	Dec. 23, 2024	Oct. 09, 2025	Conducted (TH01-KS)
Pulse Power Senor	Anritsu	MA2411B	0917070	300MHz~40GHz	Jan. 02, 2024	Dec. 23, 2024	Jan. 01, 2025	Conducted (TH01-KS)
Power Meter	Anritsu	ML2495A	1005002	50MHz Bandwidth	Jan. 02, 2024	Dec. 23, 2024	Jan. 01, 2025	Conducted (TH01-KS)

NCR: No Calibration Required

5 Measurement Uncertainty

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI 63.10-2013. All the measurement uncertainty value were shown with a coverage K=2 to indicate 95% level of confidence. The measurement data show herein meets or exceeds the CISPR measurement uncertainty values specified in CISPR 16-4-2 and can be compared directly to specified limit to determine compliance.

Uncertainty of Conducted Measurement

Conducted Spurious Emission & Bandedge	**±2.22 dB**
Occupied Channel Bandwidth	**±0.1%**
Conducted Power	**±0.50 dB**
Conducted Power Spectral Density	**±0.90 dB**
Frequency	**±0.04 Hz**

Uncertainty of AC Conducted Emission Measurement (0.15 MHz ~ 30 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**2.84 dB**

Uncertainty of Radiated Emission Measurement (9 KHz ~ 30 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**3.30 dB**

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**6.04 dB**

Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**5.26 dB**

Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**5.40 dB**

---------- THE END ----------

Appendix A. Conducted Test Results

Ambient Condition: 25 ℃, 45 %RH	
Test Date: 2024.12.23	**Test Engineer:** Zhang Zhizheng

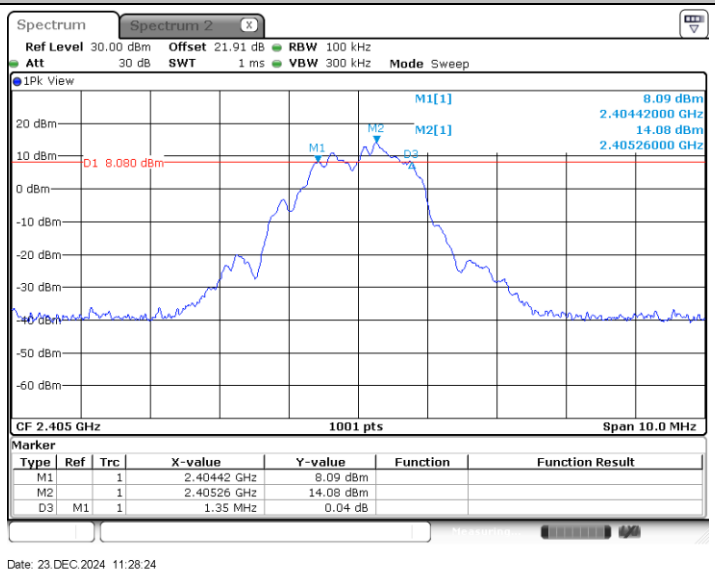
DTS Bandwidth

Test Result

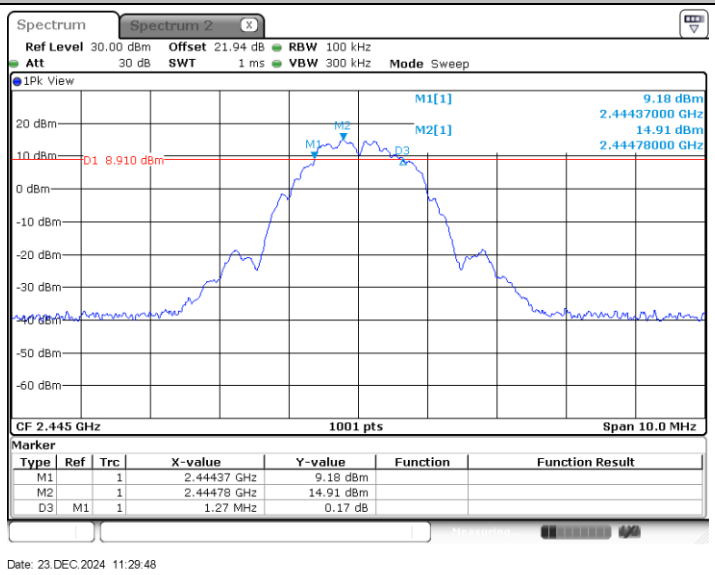
TestMode	Antenna	Frequency[MHz]	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
ZIGBEE	Ant1	2405	1.35	2404.42	2405.77	0.5	PASS
		2445	1.27	2444.37	2445.64	0.5	PASS
		2475	1.40	2474.33	2475.73	0.5	PASS
		2480	1.27	2479.37	2480.64	0.5	PASS

Test Graphs

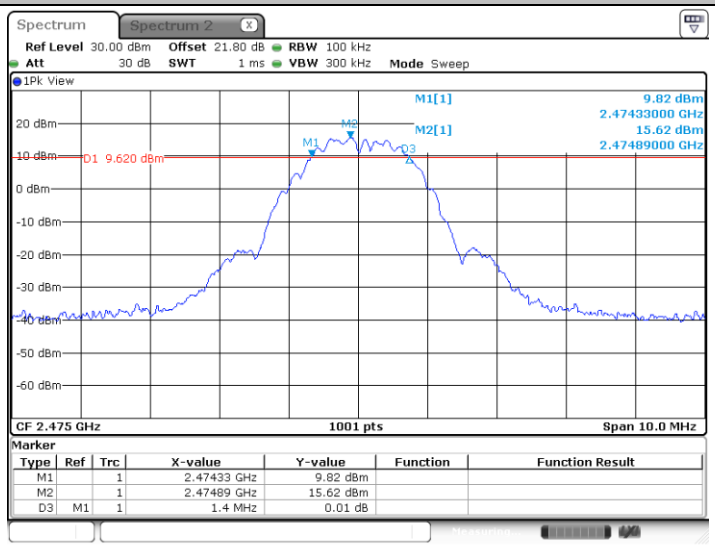
ZIGBEE_Ant1_2405



ZIGBEE_Ant1_2445

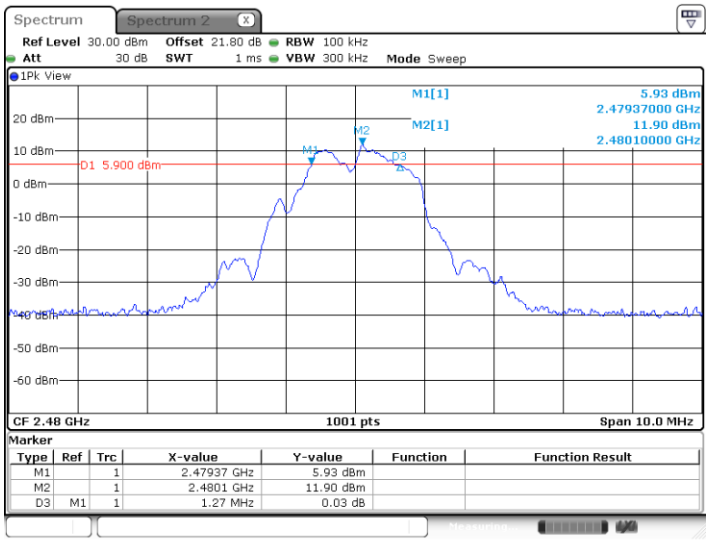


ZIGBEE_Ant1_2475



Date: 23.DEC.2024 11:31:05

ZIGBEE_Ant1_2480



Date: 23.DEC.2024 11:32:33

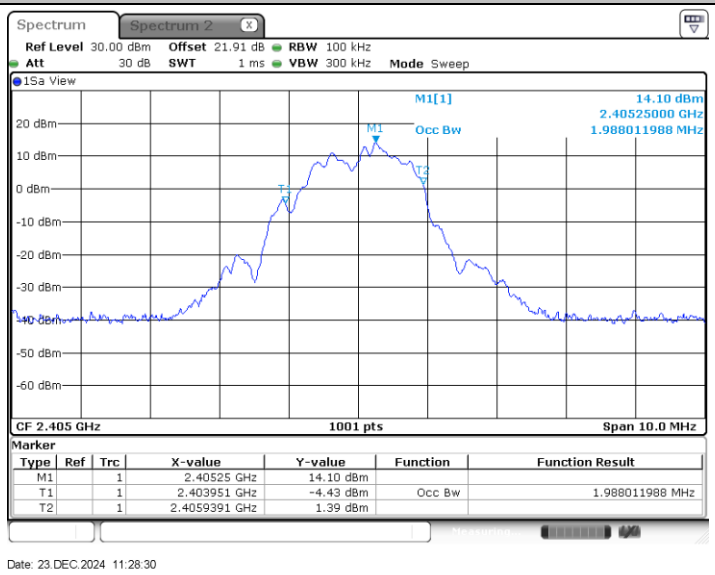
Occupied Channel Bandwidth

Test Result

TestMode	Antenna	Frequency[MHz]	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
ZIGBEE	Ant1	2405	1.988	2403.9510	2405.9391	---	---
		2445	1.948	2444.0110	2445.9590	---	---
		2475	1.978	2474.0010	2475.9790	---	---
		2480	1.978	2478.9610	2480.9391	---	---

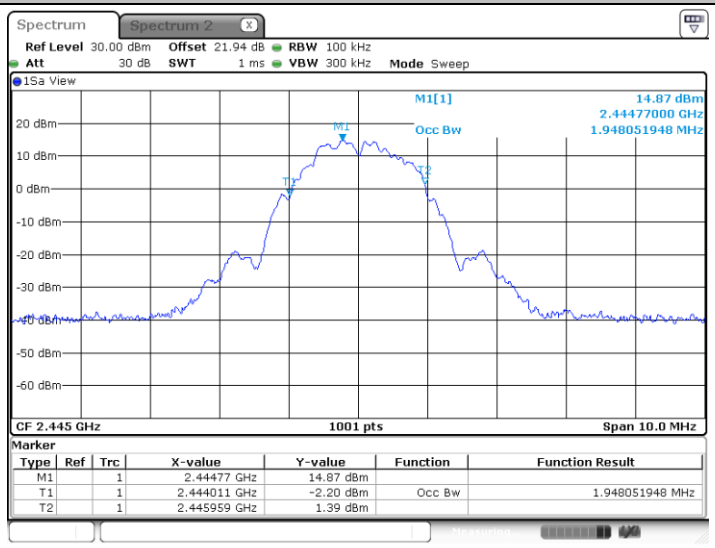
Test Graphs

ZIGBEE_Ant1_2405



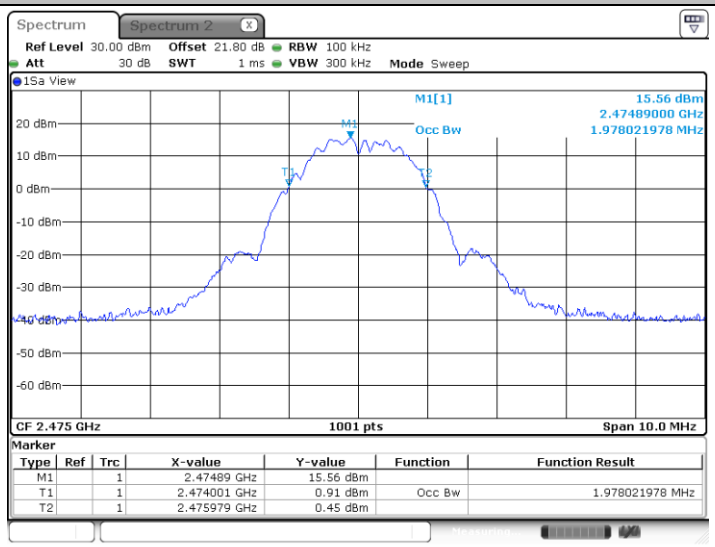
Date: 23.DEC.2024 11:28:30

ZIGBEE_Ant1_2445



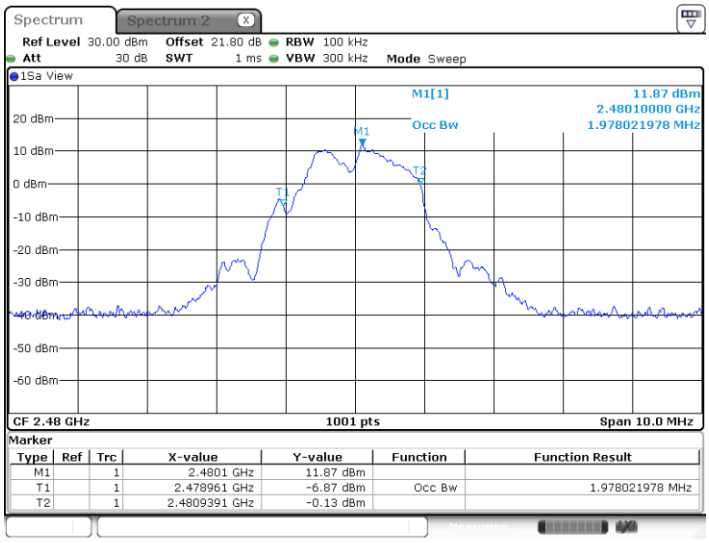
Date: 23.DEC.2024 11:29:54

ZIGBEE_Ant1_2475



Date: 23.DEC.2024 11:31:10

ZIGBEE_Ant1_2480



Date: 23.DEC.2024 11:32:39

Maximum conducted output power

Test Result Peak

TestMode	Antenna	CH.	Peak Conducted Power (dBm)	Conducted Power Limit	DG (dBi)	EIRP Power (dBm)	EIRP Power Limit	Pass/Fail
ZIGBEEee	Ant1	11	17.87	30.00	3.86	21.73	36.00	Pass
		18	19.15	30.00	3.86	23.01	36.00	Pass
		25	20.64	30.00	3.86	24.50	36.00	Pass
		26	15.95	30.00	3.86	19.81	36.00	Pass
Thread	Ant1	11	17.78	30.00	3.86	21.64	36.00	Pass
		18	19.07	30.00	3.86	22.93	36.00	Pass
		25	20.56	30.00	3.86	24.42	36.00	Pass
		26	15.86	30.00	3.86	19.72	36.00	Pass

Test Result Average

TestMode	Antenna	CH.	Duty Factor (dB)	Average Conducted Power (dBm)	Setting
ZIGBEEee	Ant1	11	0.00	17.59	15.00
		18	0.00	18.86	15.00
		25	0.00	20.36	15.00
		26	0.00	15.66	13.00
Thread	Ant1	11	0.00	17.48	15.00
		18	0.00	18.82	15.00
		25	0.00	20.27	15.00
		26	0.00	15.55	13.00

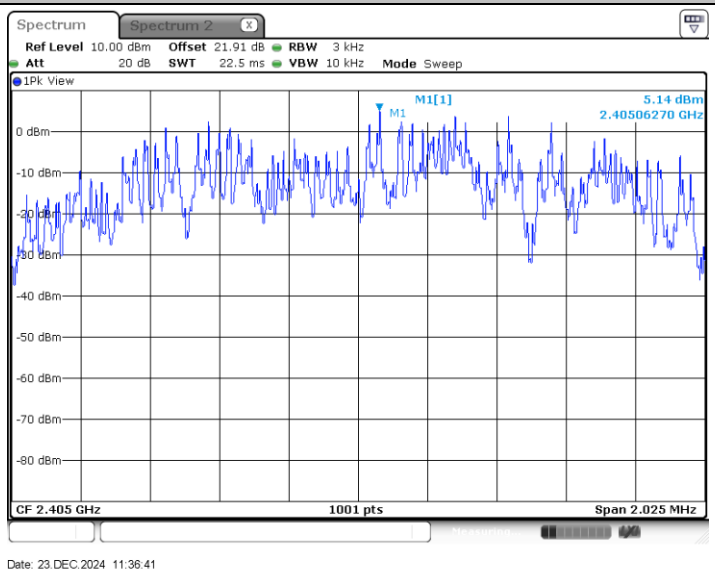
Maximum power spectral density

Test Result

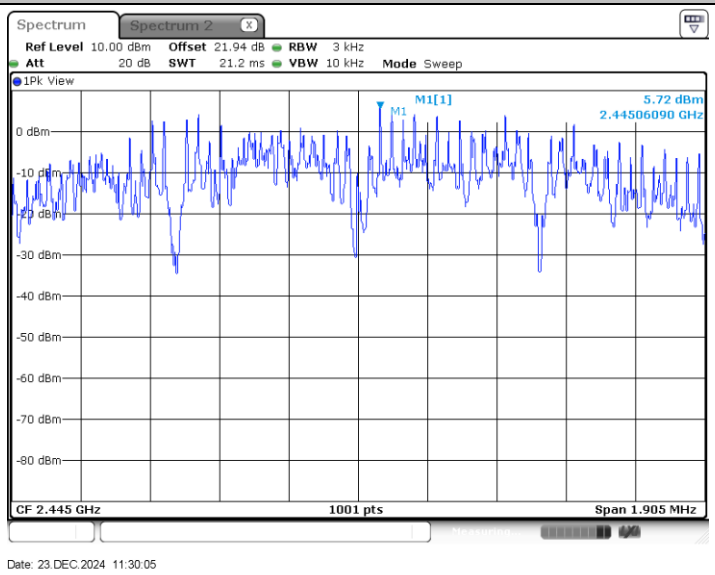
TestMode	Antenna	Frequency[MHz]	Result[dBm/3-100kHz]	Limit[dBm/3kHz]	Verdict
ZIGBEE	Ant1	2405	5.14	≤8.00	PASS
		2445	5.72	≤8.00	PASS
		2475	6.6	≤8.00	PASS
		2480	3.76	≤8.00	PASS

Test Graphs

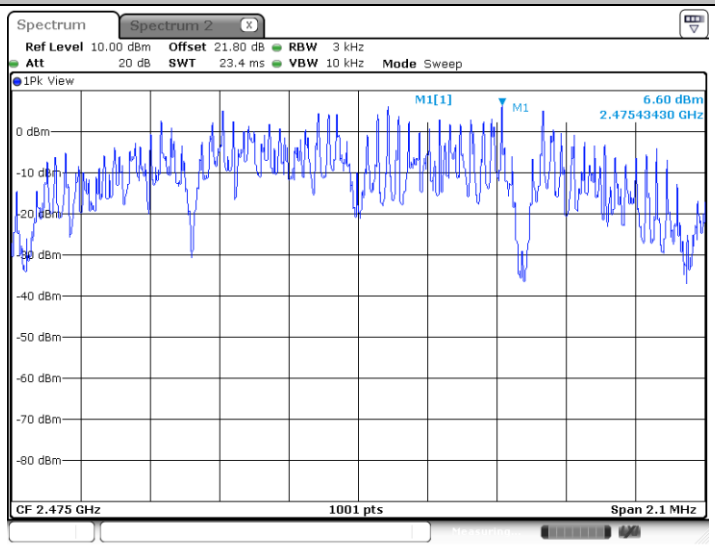
ZIGBEE_Ant1_2405



ZIGBEE_Ant1_2445

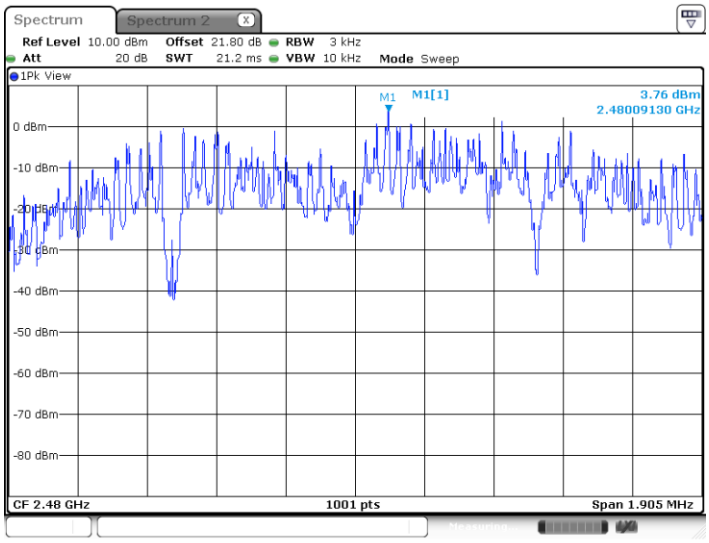


ZIGBEE_Ant1_2475



Date: 23.DEC.2024 11:31:21

ZIGBEE_Ant1_2480



Date: 23.DEC.2024 11:32:50

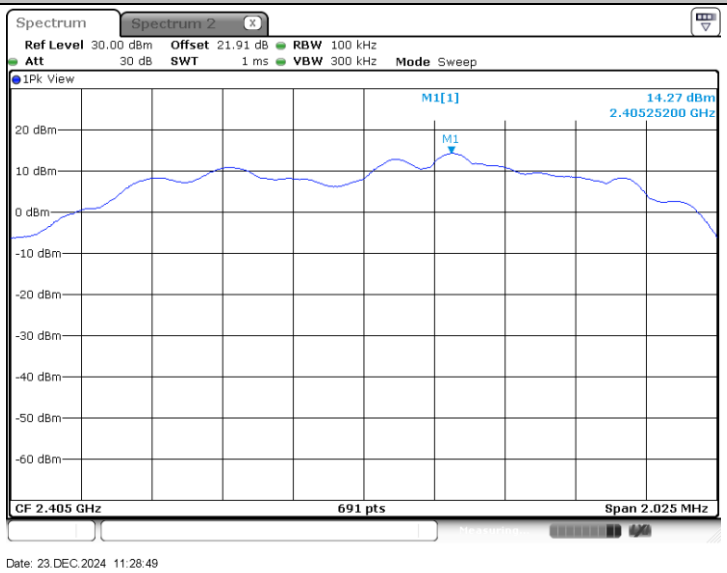
Reference level measurement

Test Result

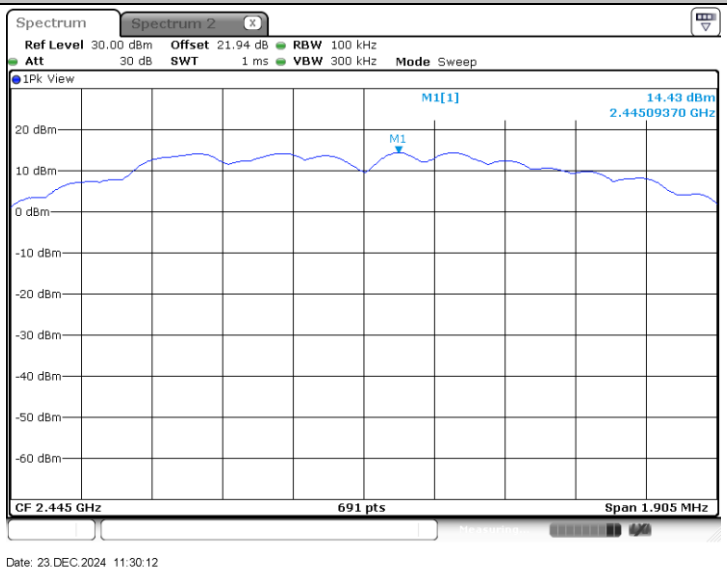
TestMode	Antenna	Freq(MHz)	Max.Point[MHz]	Result[dBm/100KHz]
ZIGBEE	Ant1	2405	2405.25	14.27
		2445	2445.10	14.43
		2475	2474.90	15.17
		2480	2480.10	11.83

Test Graphs

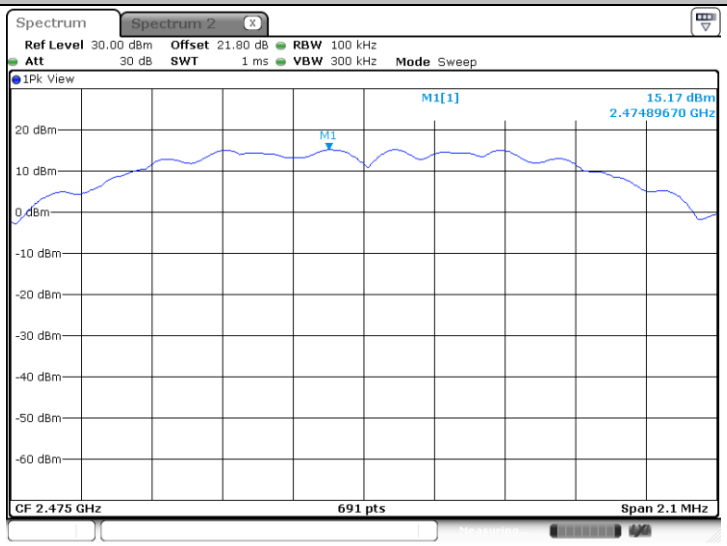
ZIGBEE_Ant1_2405



ZIGBEE_Ant1_2445

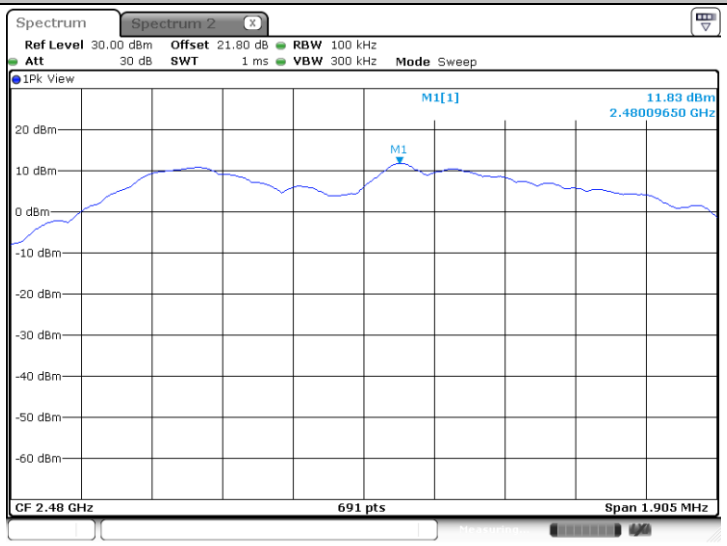


ZIGBEE_Ant1_2475



Date: 23.DEC.2024 11:31:29

ZIGBEE_Ant1_2480



Date: 23.DEC.2024 11:32:57

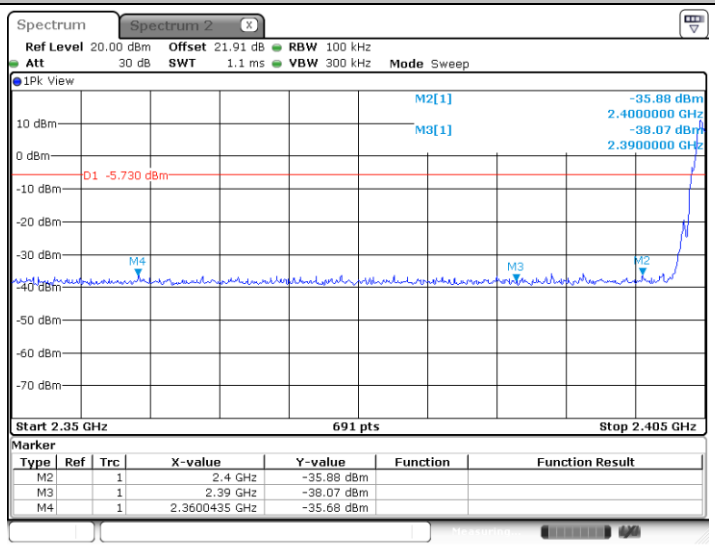
Band edge measurements

Test Result

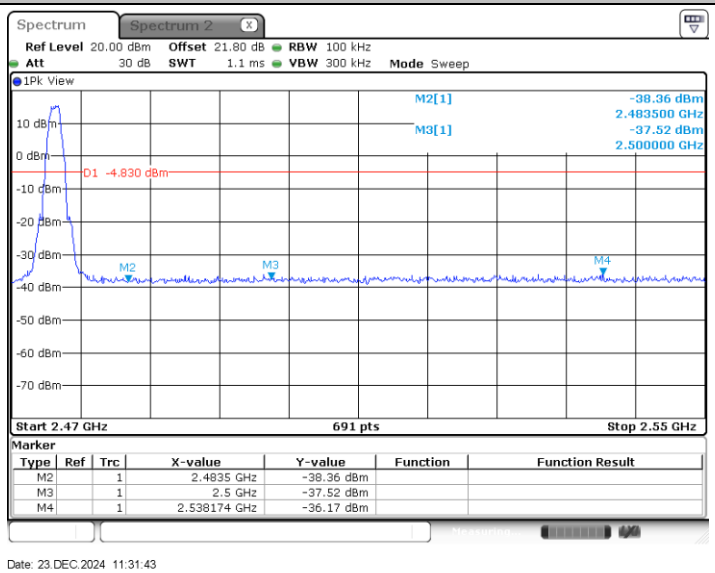
TestMode	Antenna	ChName	Frequency[MHz]	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
ZIGBEE	Ant1	Low	2405	14.27	-35.68	≤-5.73	PASS
		High	2475	15.17	-36.17	≤-4.83	PASS
			2480	11.83	-36.12	≤-8.17	PASS

Test Graphs

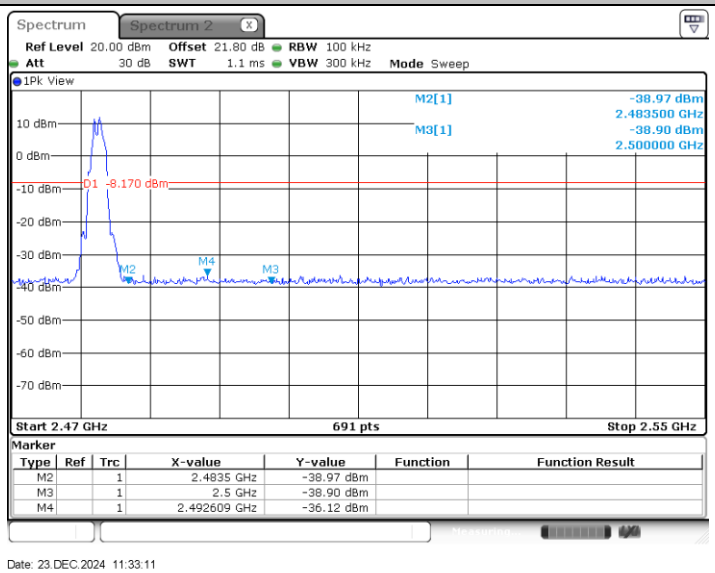
ZIGBEE_Ant1_Low_2405



ZIGBEE_Ant1_High_2475



ZIGBEE_Ant1_High_2480



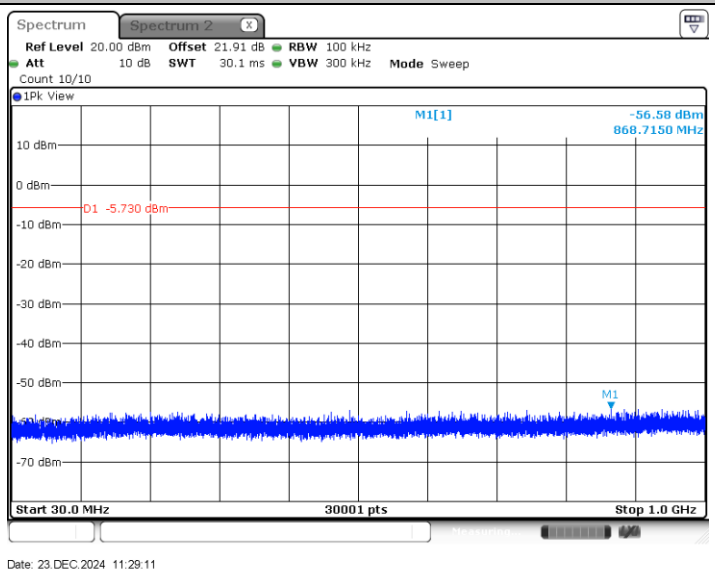
Conducted Spurious Emission

Test Result

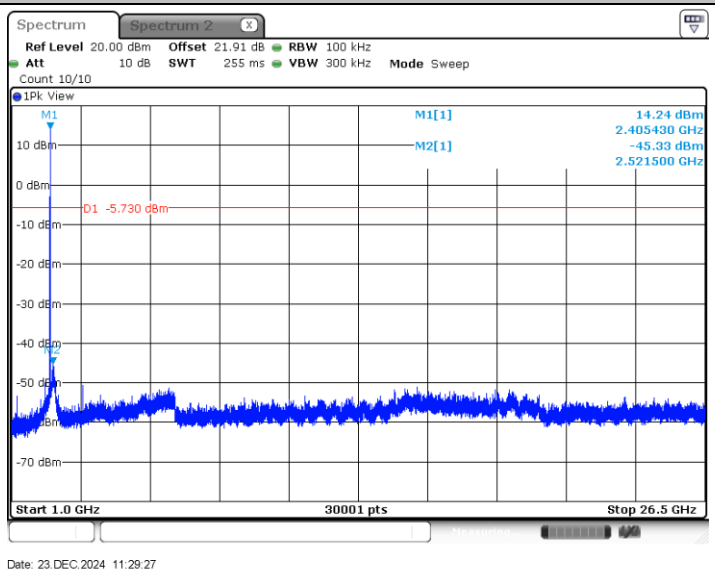
TestMode	Antenna	Frequency[MHz]	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
ZIGBEE	Ant1	2405	30~1000	14.27	-56.58	≤-5.73	PASS
			1000~26500	14.27	-45.33	≤-5.73	PASS
		2445	30~1000	14.43	-55.1	≤-5.57	PASS
			1000~26500	14.43	-46.7	≤-5.57	PASS
		2475	30~1000	15.17	-56.62	≤-4.83	PASS
			1000~26500	15.17	-46.81	≤-4.83	PASS
		2480	30~1000	11.83	-55.97	≤-8.17	PASS
			1000~26500	11.83	-51.28	≤-8.17	PASS

Test Graphs

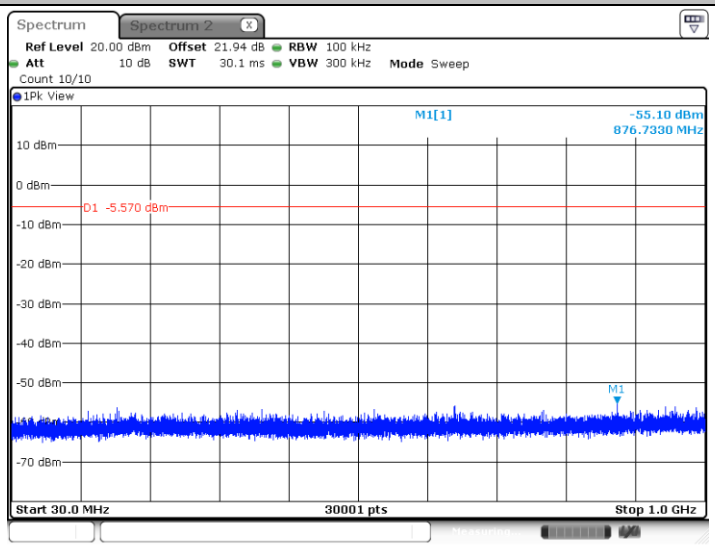
ZIGBEE_Ant1_2405_30~1000



ZIGBEE_Ant1_2405_1000~26500

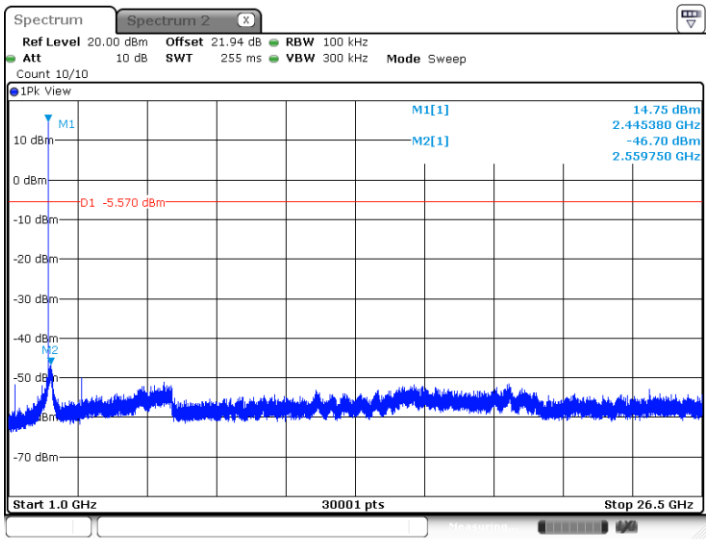


ZIGBEE_Ant1_2445_30~1000



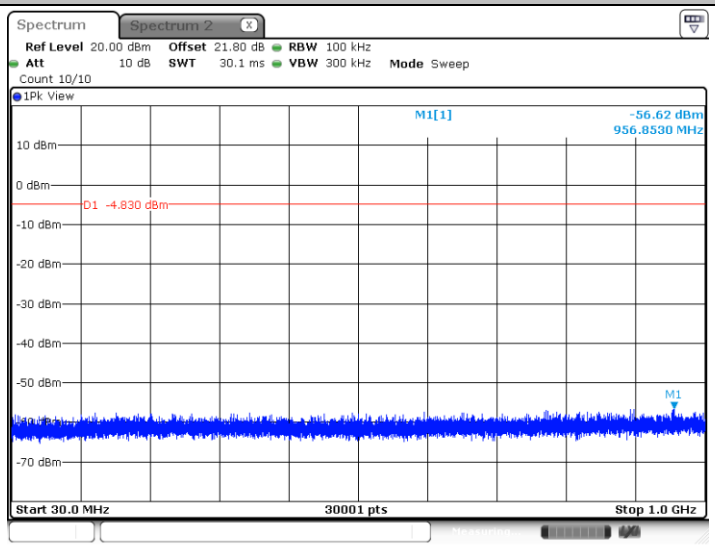
Date: 23.DEC.2024 11:30:18

ZIGBEE_Ant1_2445_1000~26500



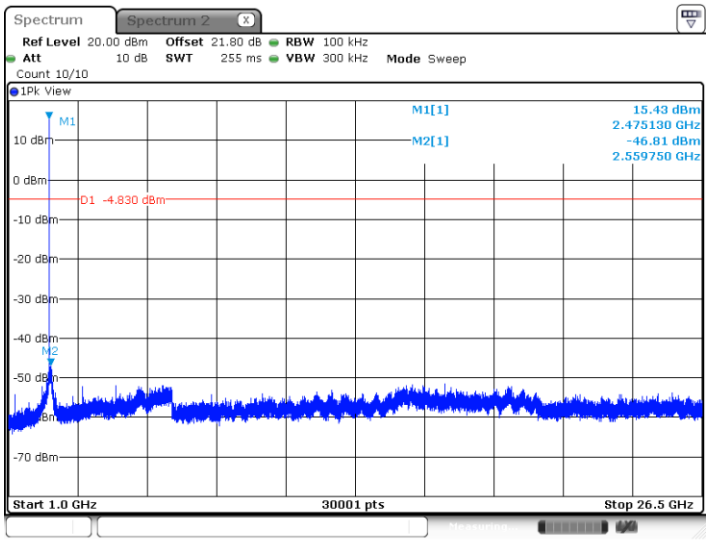
Date: 23.DEC.2024 11:30:35

ZIGBEE_Ant1_2475_30~1000



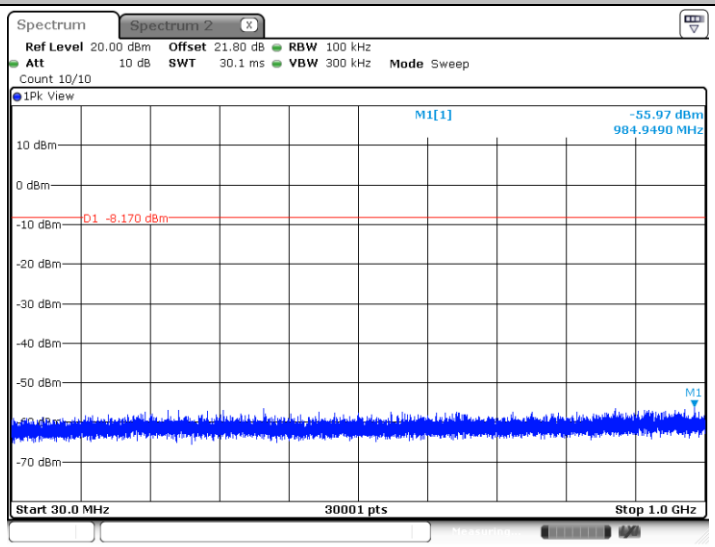
Date: 23.DEC.2024 11:31:50

ZIGBEE_Ant1_2475_1000~26500



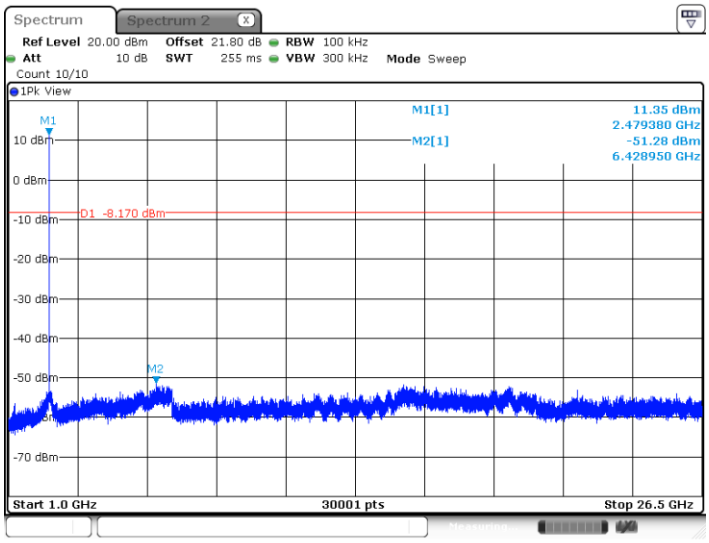
Date: 23.DEC.2024 11:32:07

ZIGBEE_Ant1_2480_30~1000



Date: 23.DEC.2024 11:33:18

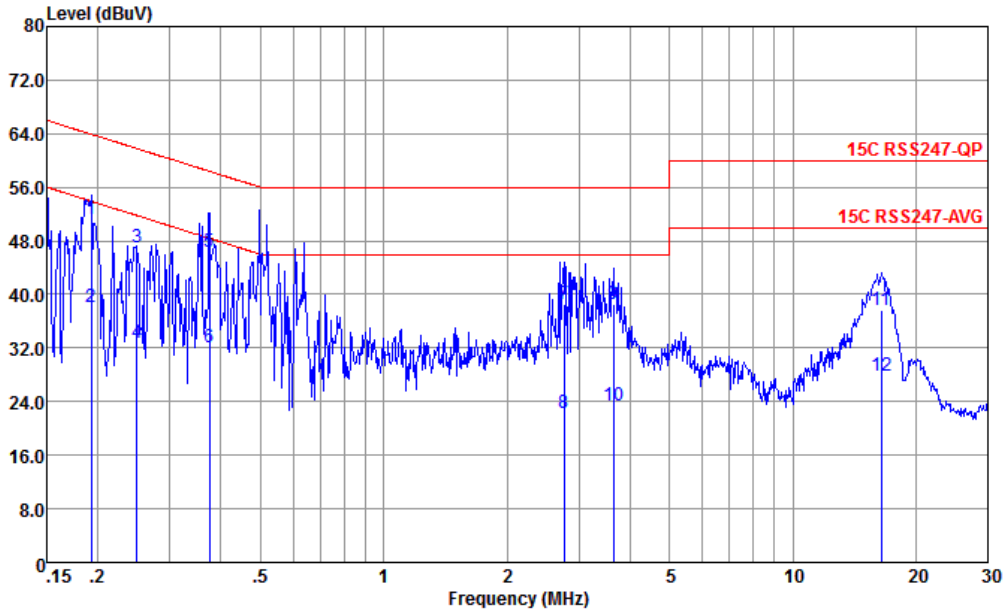
ZIGBEE_Ant1_2480_1000~26500



Date: 23.DEC.2024 11:33:35

Appendix B. AC Conducted Emission Test Results

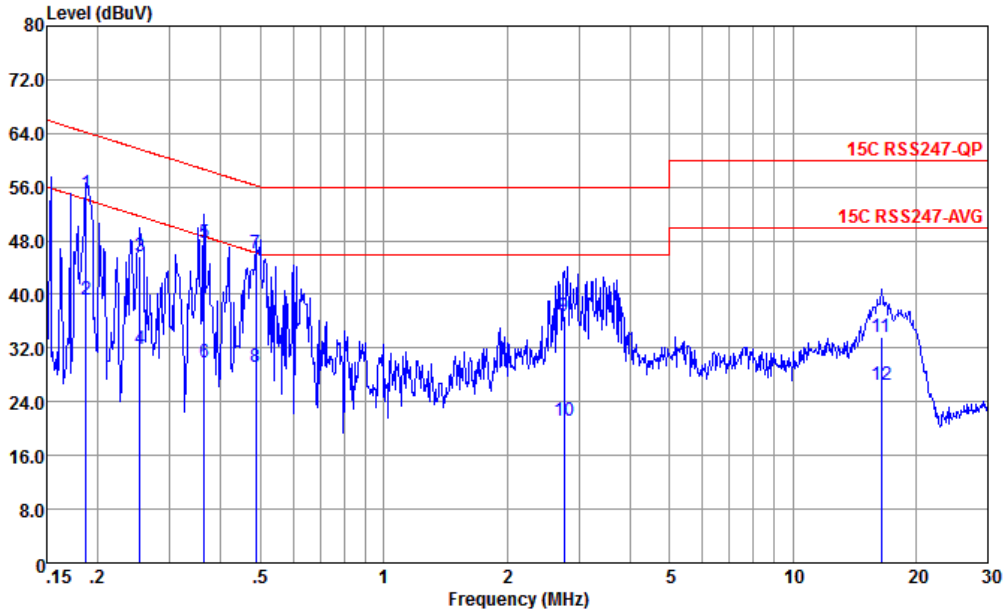
Test Engineer :	Amos Zhang	**Temperature :**	25.3~26.2℃
		Relative Humidity :	38~40%
Test Voltage :	120Vac / 60Hz	**Phase :**	Line
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Site : CO01-KS
Condition : 15C RSS247-QP LISN-060105-L 2024 LINE

		Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
		MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1		0.192	51.30	-12.63	63.93	40.81	0.08	10.41	QP
2		0.192	38.00	-15.93	53.93	27.51	0.08	10.41	Average
3		0.249	46.95	-14.83	61.78	36.49	0.09	10.37	QP
4		0.249	32.65	-19.13	51.78	22.19	0.09	10.37	Average
5	*	0.375	46.39	-12.00	58.39	36.10	0.00	10.29	QP
6		0.375	32.09	-16.30	48.39	21.80	0.00	10.29	Average
7		2.765	38.50	-17.50	56.00	28.60	-0.17	10.07	QP
8		2.765	22.20	-23.80	46.00	12.30	-0.17	10.07	Average
9		3.642	38.48	-17.52	56.00	28.59	-0.18	10.07	QP
10		3.642	23.48	-22.52	46.00	13.59	-0.18	10.07	Average
11		16.486	37.59	-22.41	60.00	26.60	-0.26	11.25	QP
12		16.486	27.79	-22.21	50.00	16.80	-0.26	11.25	Average

Test Engineer :	Amos Zhang	**Temperature :**	25.3~26.2℃
		Relative Humidity :	38~40%
Test Voltage :	120Vac / 60Hz	**Phase :**	Neutral
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Site : CO01-KS
Condition : 15C RSS247-QP LISN-060105-N 2024 NEUTRAL

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1 *	0.187	55.04	-9.11	64.15	44.50	0.13	10.41	QP
2	0.187	39.14	-15.01	54.15	28.60	0.13	10.41	Average
3	0.253	45.65	-15.99	61.64	35.30	-0.02	10.37	QP
4	0.253	31.85	-19.79	51.64	21.50	-0.02	10.37	Average
5	0.363	47.77	-10.88	58.65	37.60	-0.13	10.30	QP
6	0.363	29.77	-18.88	48.65	19.60	-0.13	10.30	Average
7	0.486	46.18	-10.05	56.23	36.10	-0.15	10.23	QP
8	0.486	29.28	-16.95	46.23	19.20	-0.15	10.23	Average
9	2.765	36.77	-19.23	56.00	26.91	-0.21	10.07	QP
10	2.765	21.17	-24.83	46.00	11.31	-0.21	10.07	Average
11	16.486	33.62	-26.38	60.00	22.60	-0.23	11.25	QP
12	16.486	26.62	-23.38	50.00	15.60	-0.23	11.25	Average

Note:

1. Level(dBμV) = Read Level(dBμV) + LISN Factor(dB) + Cable Loss(dB)
2. Over Limit(dB) = Level(dBμV) – Limit Line(dBμV)

Appendix C. Radiated Spurious Emission

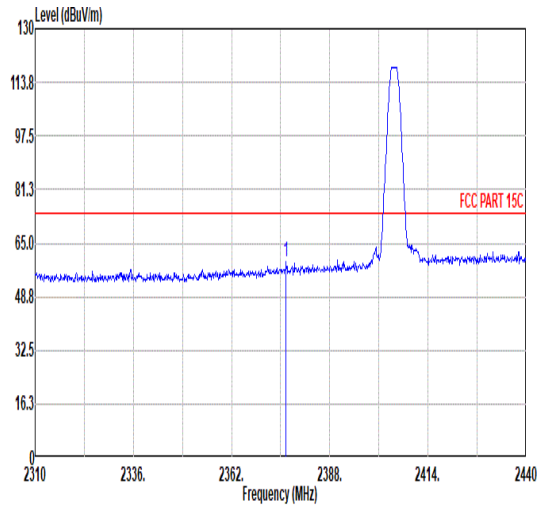
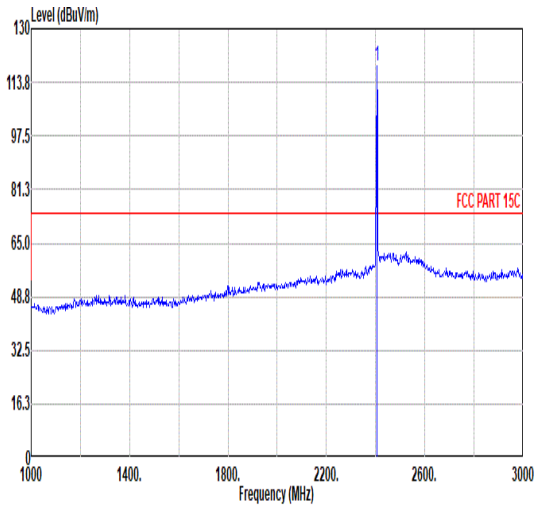
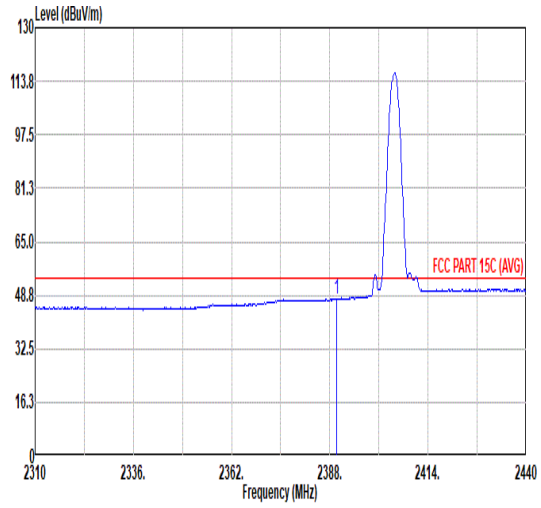
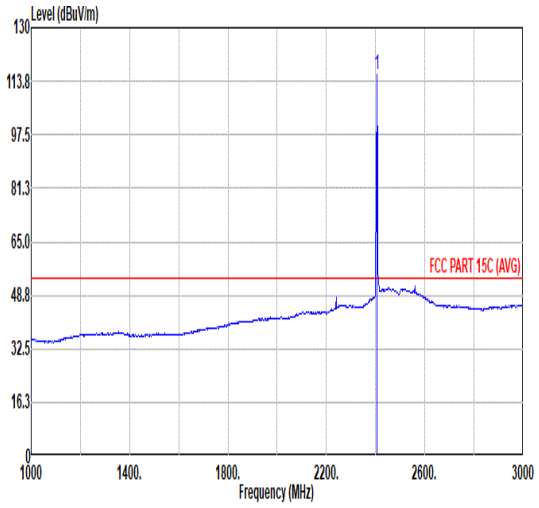
Test Engineer :	Koi Ji	**Relative Humidity :**	51~53%
		Temperature :	21.2~22.5℃

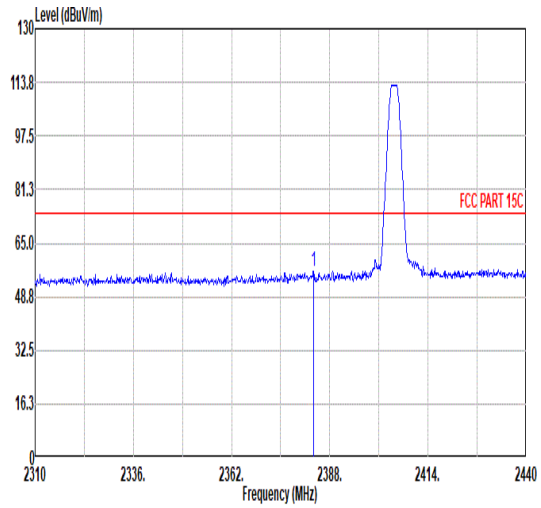
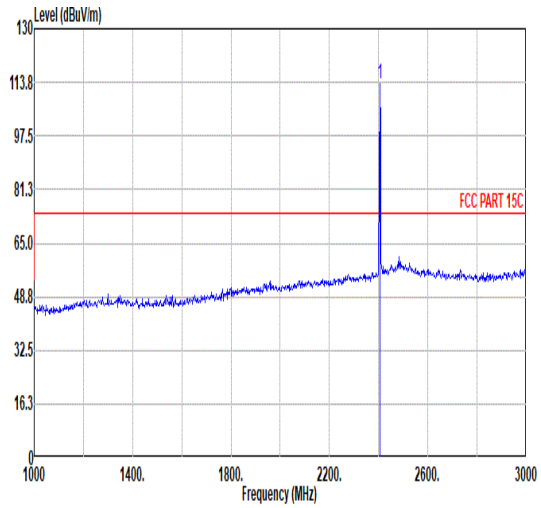
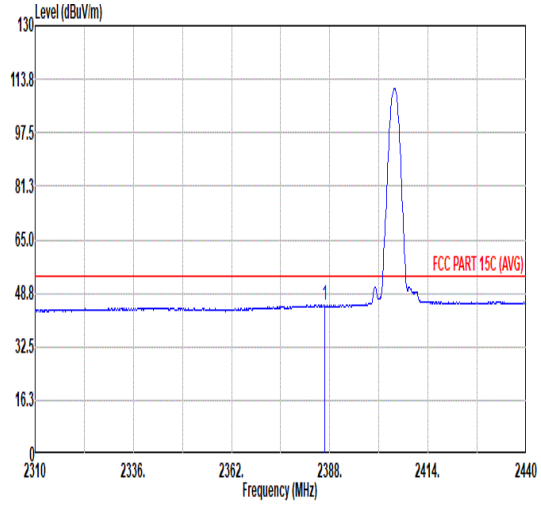
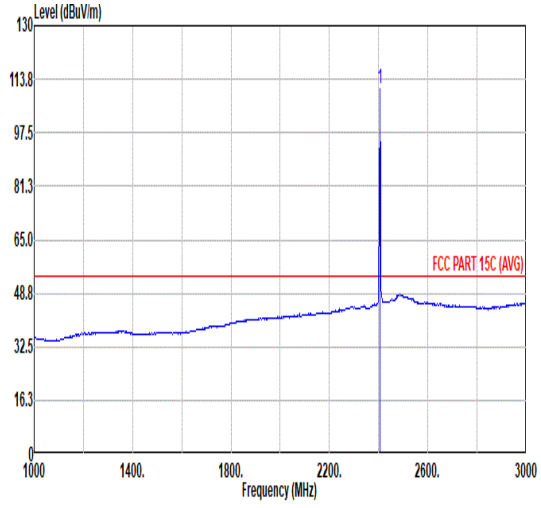
Radiated Spurious Emission Test Modes

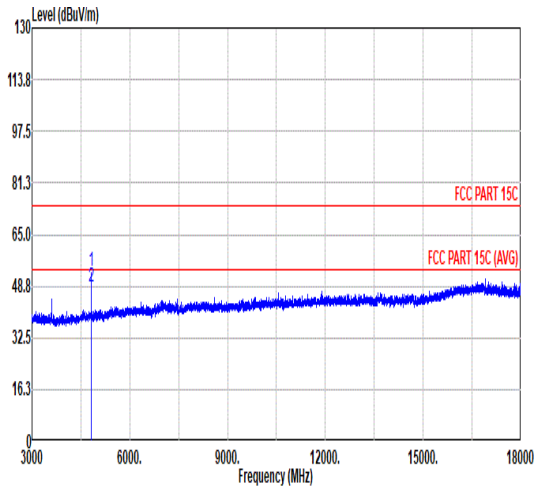
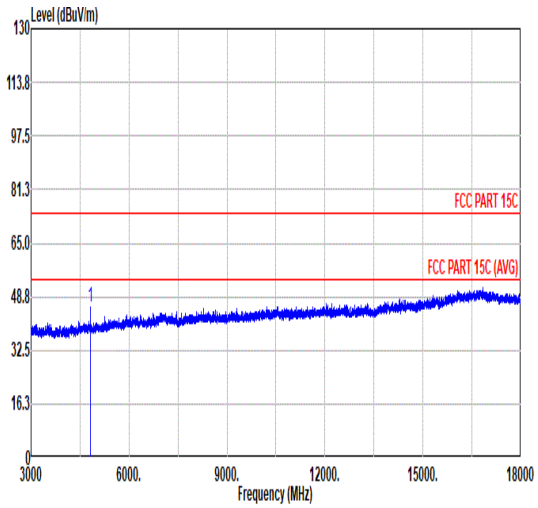
Mode	Band (MHz)	Modulation	Channel	Frequency	Data Rate	RU	Remark
Mode 1	2400-2483.5	Zigbee	11	2405	250Kbps	-	-
Mode 2	2400-2483.5	Zigbee	18	2440	250Kbps	-	-
Mode 3	2400-2483.5	Zigbee	26	2480	250Kbps	-	-
Mode 4	2400-2483.5	Zigbee	25	2475	250Kbps	-	-

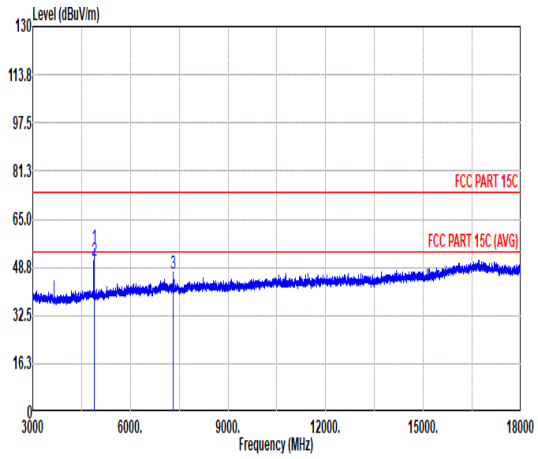
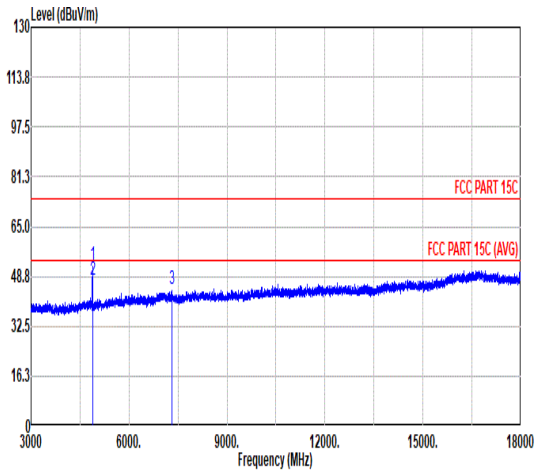
Summary of each worse mode

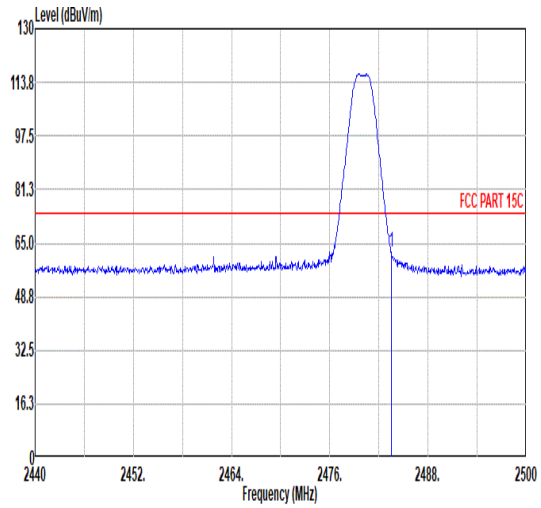
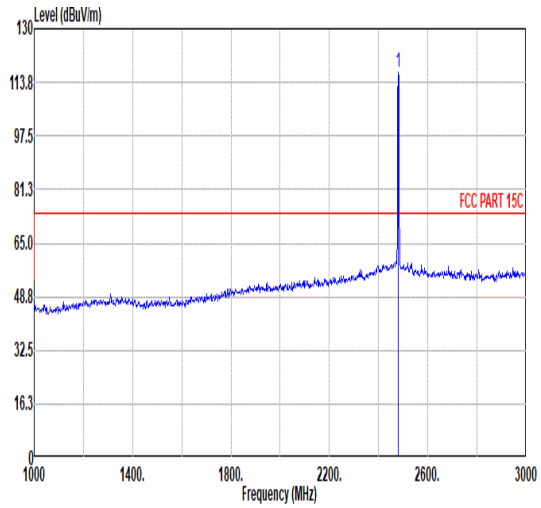
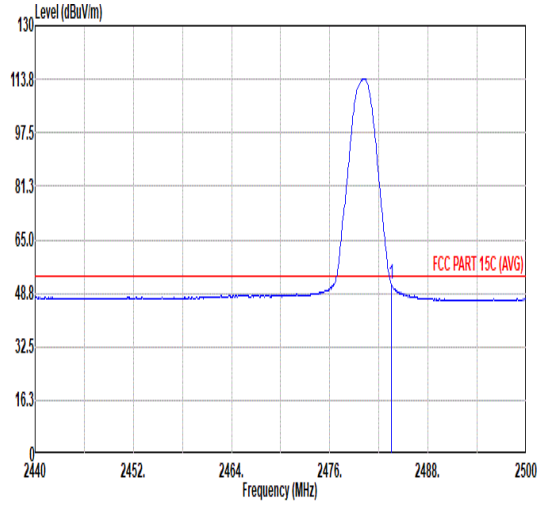
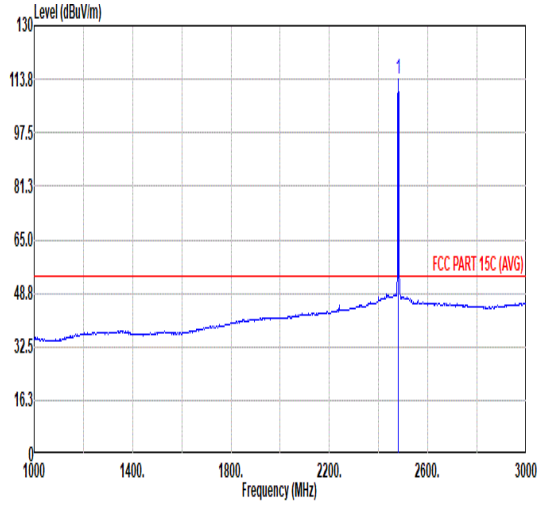
Mode	Modulation	Ch.	Freq. (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol.	Peak Avg.	Result	Remark
1	Zigbee	11	2389.82	47.69	54.00	-6.31	H	AVERAGE	Pass	Band Edge
1	Zigbee	11	4810.00	48.43	54.00	-5.57	H	AVERAGE	Pass	Harmonic
2	Zigbee	18	-	-	-	-	-	-	-	Band Edge
2	Zigbee	18	4880.00	50.91	54.00	-3.09	H	AVERAGE	Pass	Harmonic
3	Zigbee	26	2483.50	51.66	54.00	-2.34	H	AVERAGE	Pass	Band Edge
3	Zigbee	26	4960.00	47.61	54.00	-6.39	H	AVERAGE	Pass	Harmonic
4	Zigbee	25	2483.92	49.18	54.00	-4.82	H	AVERAGE	Pass	Band Edge
4	Zigbee	25	4950.00	50.23	54.00	-3.77	H	AVERAGE	Pass	Harmonic

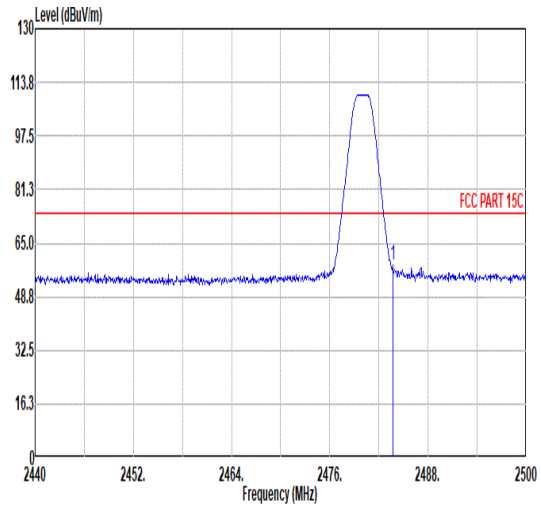
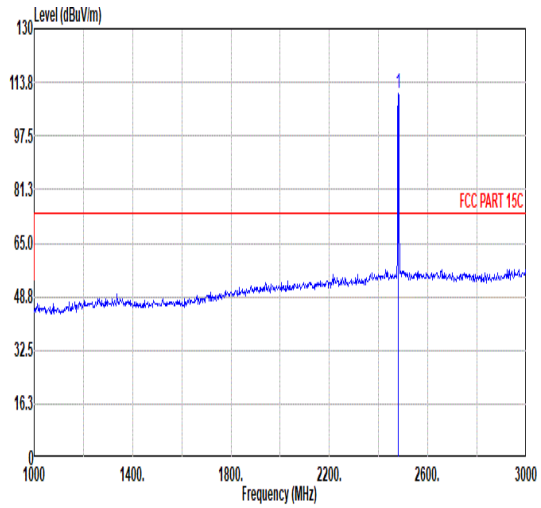
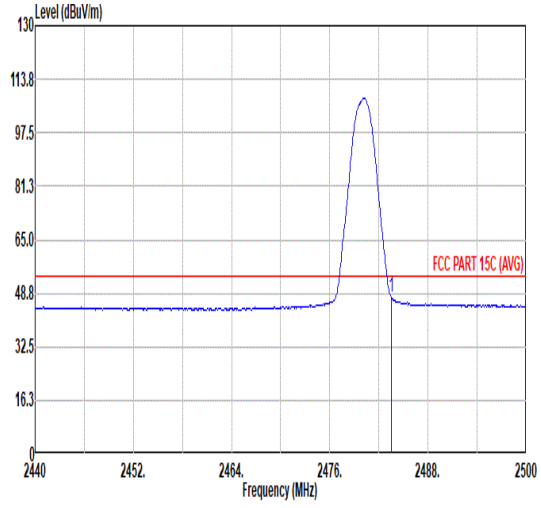
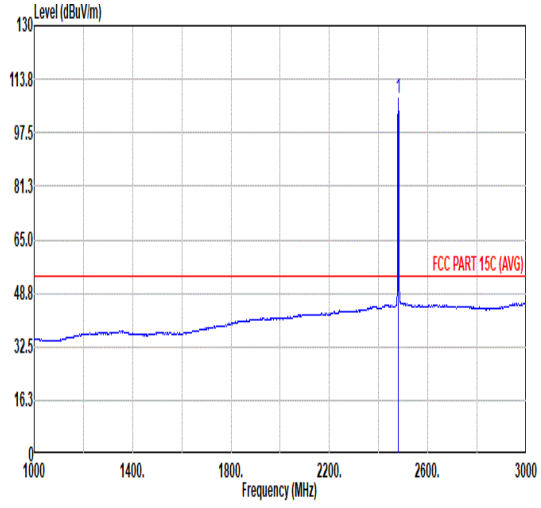
Mode	1	
	Band Edge	
	2400-2483.5_Zigbee_CH11_2405MHz	
Pol.	Horizontal	Fundamental
Peak	 Freq Level Limit Line Margin Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 2376.43 59.28 74.00 -14.72 43.88 32.06 8.03 30.69 6.00 300 154 PEAK	 Freq Level Limit Line Margin Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 2405.00 118.53 ------ ------ 102.92 32.21 8.08 30.68 6.00 300 154 PEAK
Avg	 Freq Level Limit Line Margin Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 2389.82 47.69 54.00 -6.31 32.19 32.14 8.05 30.69 6.00 300 154 AVERAGE	 Freq Level Limit Line Margin Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 2405.00 116.01 ------ ------ 100.40 32.21 8.08 30.68 6.00 300 154 AVERAGE

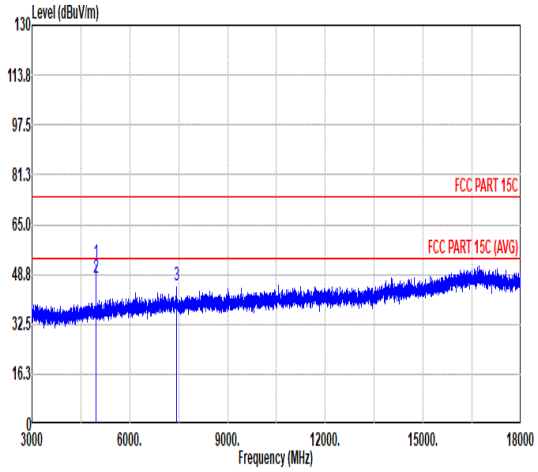
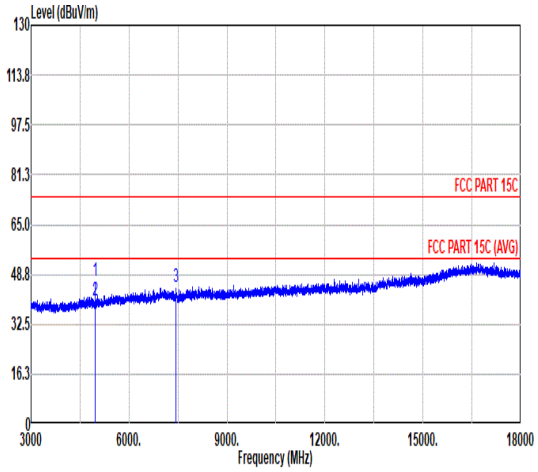
Mode	1	
	Band Edge	
	2400-2483.5_Zigbee_CH11_2405MHz	
Pol.	Vertical	Fundamental
Peak	 Freq Level Limit Line Margin Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 2383.71 56.65 74.00 -17.35 41.20 32.10 8.04 30.69 6.00 321 267 PEAK	 Freq Level Limit Line Margin Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 2405.00 113.27 ------ ------ 97.66 32.21 8.08 30.68 6.00 321 267 PEAK
Avg	 Freq Level Limit Line Margin Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 2386.57 45.18 54.00 -8.82 29.70 32.12 8.05 30.69 6.00 321 267 AVERAGE	 Freq Level Limit Line Margin Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 2405.00 110.74 ------ ------ 95.13 32.21 8.08 30.68 6.00 321 267 AVERAGE

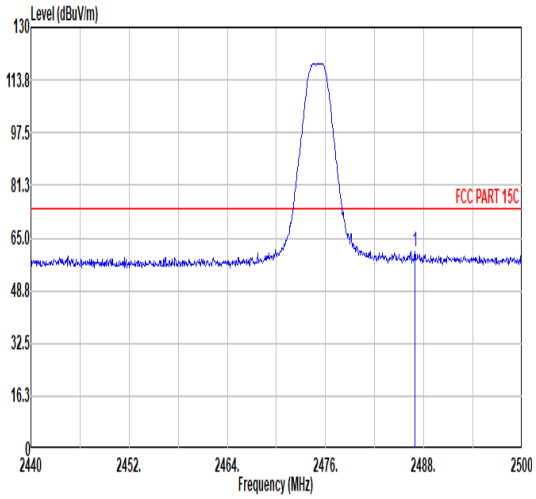
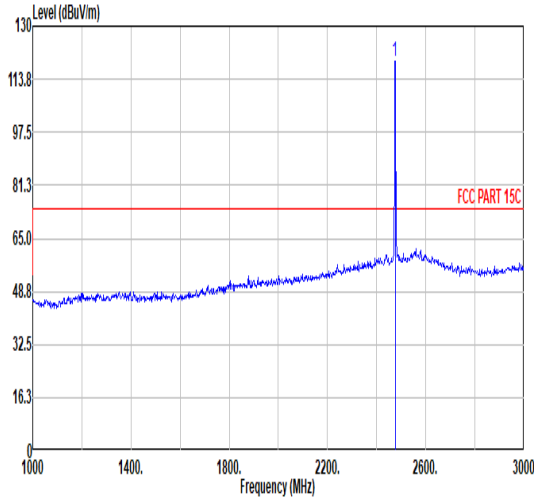
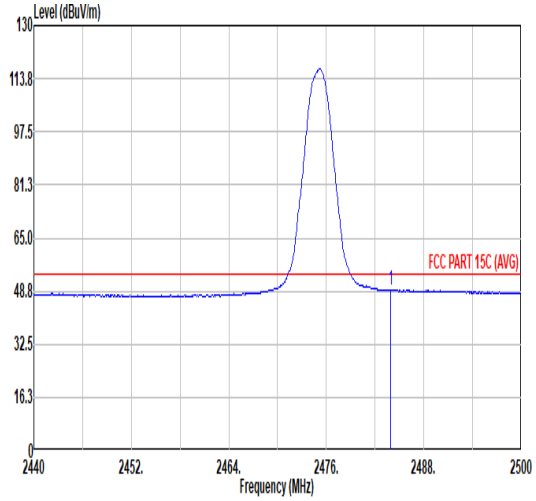
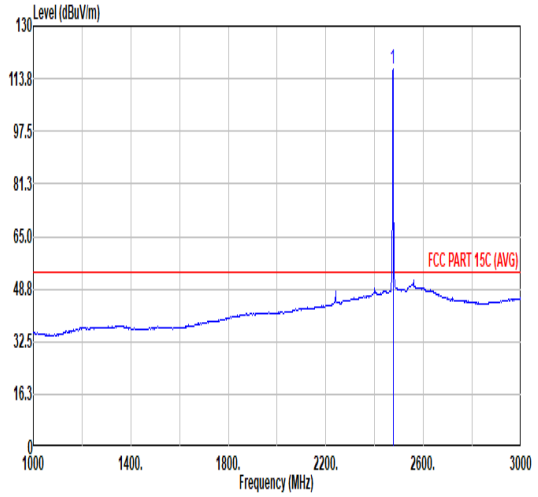
Mode	1	
	Harmonic	
	2400-2483.5_Zigbee_CH11_2405MHz	
Pol.	Horizontal	Vertical
Peak Avg	 Freq Level Limit Line Margin Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 4810.00 53.27 74.00 -20.73 68.88 34.12 11.55 61.28 0.00 100 122 PEAK 2 4810.00 48.43 54.00 -5.57 64.04 34.12 11.55 61.28 0.00 100 122 AVERAGE	 Freq Level Limit Line Margin Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 4810.00 45.78 74.00 -28.22 61.39 34.12 11.55 61.28 0.00 -- -- PEAK

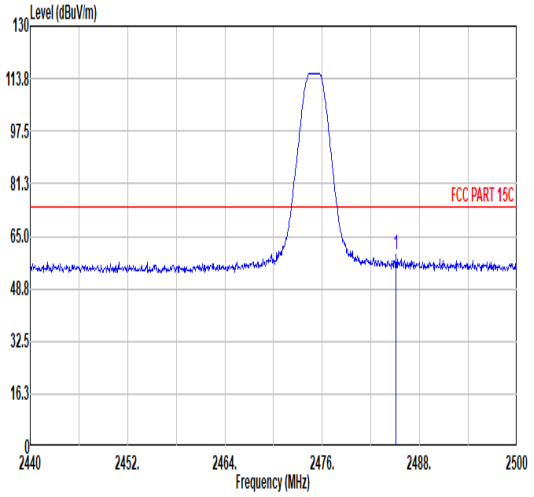
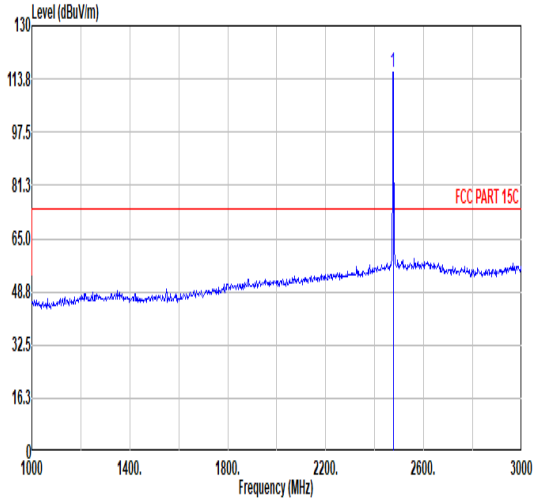
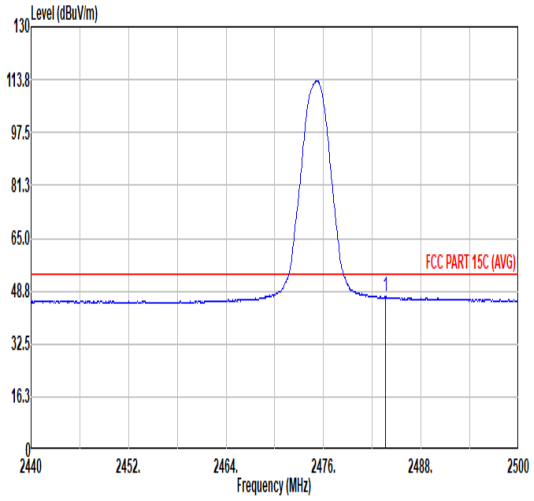
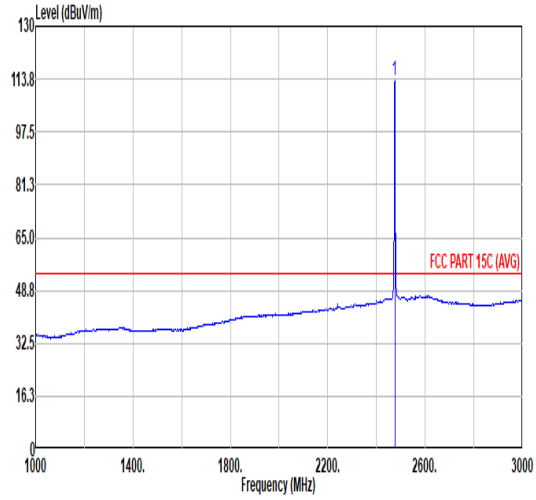
Mode	2	
	Harmonic	
	2400-2483.5_Zigbee_CH18_2440MHz	
Pol.	Horizontal	Vertical
Peak Avg	 Freq Level Limit Line Margin Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 4880.00 55.20 74.00 -18.80 70.59 34.14 11.69 61.22 0.00 100 86 PEAK 2 4880.00 50.91 54.00 -3.09 66.30 34.14 11.69 61.22 0.00 100 86 AVERAGE 3 7320.00 46.44 74.00 -27.56 56.94 35.76 14.49 60.75 0.00 100 86 PEAK 4 7320.00 38.84 54.00 -15.16 49.34 35.76 14.49 60.75 0.00 100 86 AVERAGE	 Freq Level Limit Line Margin Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 4880.00 52.40 74.00 -21.60 67.79 34.14 11.69 61.22 0.00 390 178 PEAK 2 4880.00 47.61 54.00 -6.39 63.00 34.14 11.69 61.22 0.00 390 178 AVERAGE 3 7320.00 44.86 74.00 -29.14 55.36 35.76 14.49 60.75 0.00 -- -- PEAK

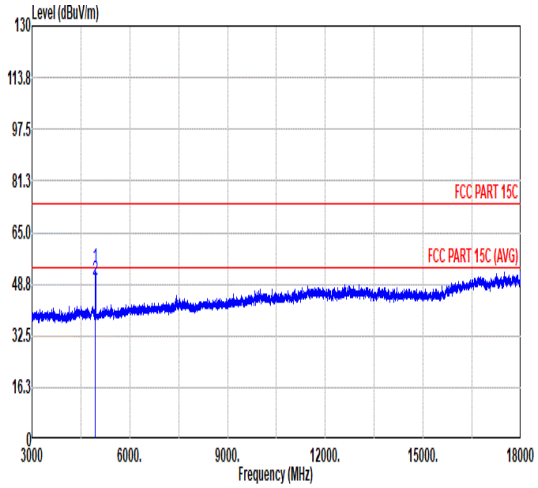
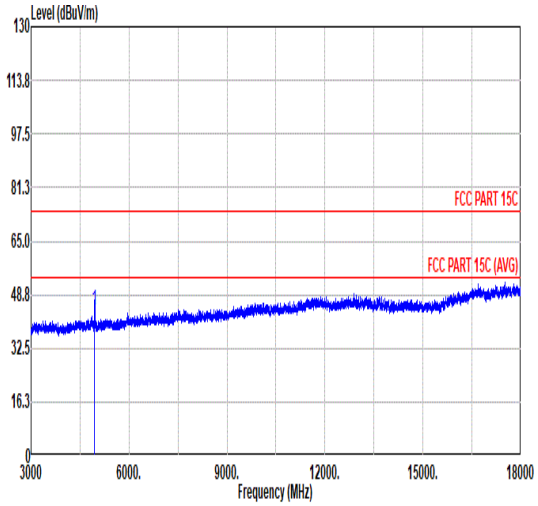
Mode	3	
	Band Edge	
	2400-2483.5_Zigbee_CH26_2480MHz	
Pol.	Horizontal	Fundamental
Peak	 Freq Level Limit Line Margin Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 2483.50 62.27 74.00 -11.73 46.32 32.37 8.23 30.65 6.00 114 164 PEAK	 Freq Level Limit Line Margin Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 2400.00 116.54 ------ ------ 100.61 32.36 8.23 30.66 6.00 114 164 PEAK
Avg	 Freq Level Limit Line Margin Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 2483.50 51.66 54.00 -2.34 35.71 32.37 8.23 30.65 6.00 114 164 AVERAGE	 Freq Level Limit Line Margin Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 2400.00 113.96 ------ ------ 98.03 32.36 8.23 30.66 6.00 114 164 AVERAGE

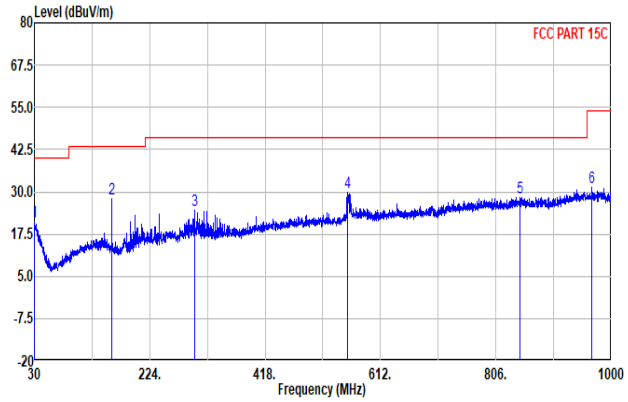
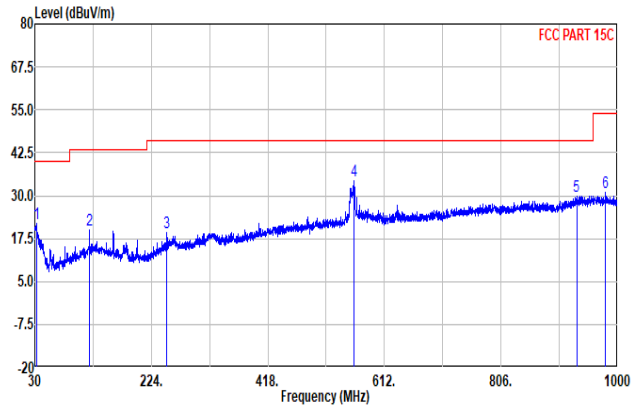
Mode	3	
	Band Edge	
	2400-2483.5_Zigbee_CH26_2480MHz	
Pol.	Vertical	Fundamental
Peak	 Freq Level Limit Line Margin Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 2483.68 58.44 74.00 -15.56 42.49 32.37 8.23 30.65 6.00 400 248 PEAK	 Freq Level Limit Line Margin Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 2400.00 110.37 ------ ------ 94.44 32.36 8.23 30.66 6.00 400 248 PEAK
Avg	 Freq Level Limit Line Margin Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 2483.50 47.62 54.00 -6.38 31.67 32.37 8.23 30.65 6.00 400 248 AVERAGE	 Freq Level Limit Line Margin Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 2400.00 107.86 ------ ------ 91.93 32.36 8.23 30.66 6.00 400 248 AVERAGE

Mode	3	
	Harmonic	
	2400-2483.5_Zigbee_CH26_2480MHz	
Pol.	Horizontal	Vertical
Peak Avg	 Freq Level Limit Line Margin Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 4960.00 52.45 74.00 -21.55 67.82 33.94 11.85 61.16 0.00 100 84 PEAK 2 4960.00 47.61 54.00 -6.39 62.98 33.94 11.85 61.16 0.00 100 84 AVERAGE 3 7440.00 45.00 74.00 -29.00 55.59 35.80 14.63 61.02 0.00 -- -- PEAK	 Freq Level Limit Line Margin Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 4960.00 46.44 74.00 -27.56 61.81 33.94 11.85 61.16 0.00 300 0 PEAK 2 4960.00 40.02 54.00 -13.98 55.39 33.94 11.85 61.16 0.00 300 0 AVERAGE 3 7440.00 44.55 74.00 -29.45 55.14 35.80 14.63 61.02 0.00 -- -- PEAK

Mode	4	
	Band Edge	
	2400-2483.5_Zigbee _CH25_2480MHz	
Pol.	Horizontal	Fundamental
Peak	 Freq Level Limit Line Margin Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 2486.92 60.70 74.00 -13.30 44.74 32.37 8.24 30.65 6.00 157 41 PEAK	 Freq Level Limit Line Margin Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 2475.00 119.18 ------ ------ 103.27 32.35 8.22 30.66 6.00 157 41 PEAK
Avg	 Freq Level Limit Line Margin Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 2483.92 49.18 54.00 -4.82 33.23 32.37 8.23 30.65 6.00 157 41 AVERAGE	 Freq Level Limit Line Margin Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 2475.00 116.63 ------ ------ 100.72 32.35 8.22 30.66 6.00 157 41 AVERAGE

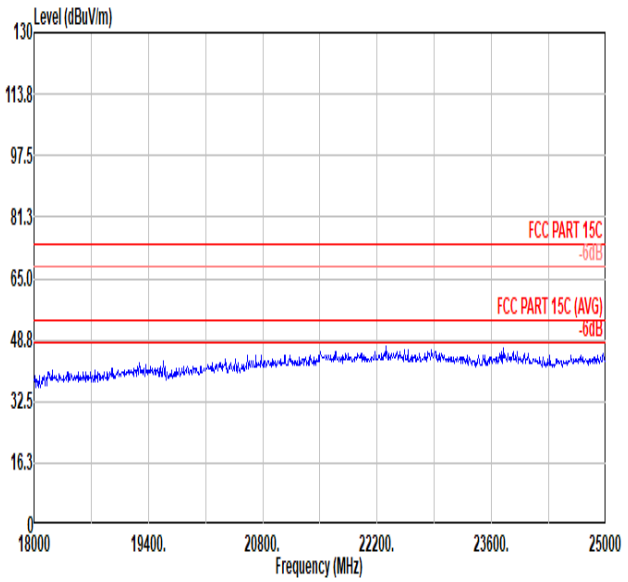
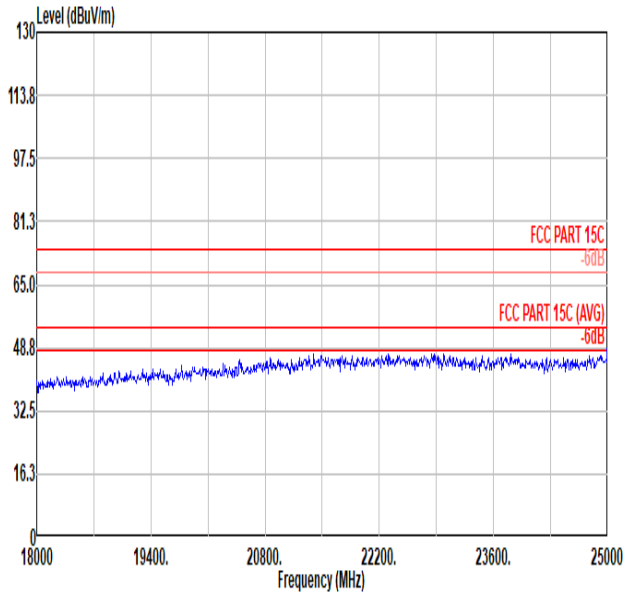
Mode	4	
	Band Edge	
	2400-2483.5_Zigbee _CH25_2480MHz	
Pol.	Vertical	Fundamental
Peak	 Freq Level Limit Line Margin Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 2485.12 59.23 74.00 -14.77 43.27 32.37 8.24 30.65 6.00 322 79 PEAK	 Freq Level Limit Line Margin Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 2475.00 115.90 ------ ------ 99.99 32.35 8.22 30.66 6.00 322 79 PEAK
Avg	 Freq Level Limit Line Margin Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 2483.62 46.98 54.00 -7.02 31.03 32.37 8.23 30.65 6.00 322 79 AVERAGE	 Freq Level Limit Line Margin Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 2475.00 113.35 ------ ------ 97.44 32.35 8.22 30.66 6.00 322 79 AVERAGE

Mode	4	
	Harmonic	
	2400-2483.5_Zigbee _CH25_MHz	
Pol.	Horizontal	Vertical
Peak Avg	 Freq Level Limit Line Margin Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 4950.00 53.97 74.00 -20.03 73.84 33.90 11.83 65.60 0.00 100 304 PEAK 2 4950.00 50.23 54.00 -3.77 70.10 33.90 11.83 65.60 0.00 100 304 AVERAGE	 Freq Level Limit Line Margin Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 4950.00 44.08 74.00 -29.92 63.95 33.90 11.83 65.60 0.00 -- -- PEAK

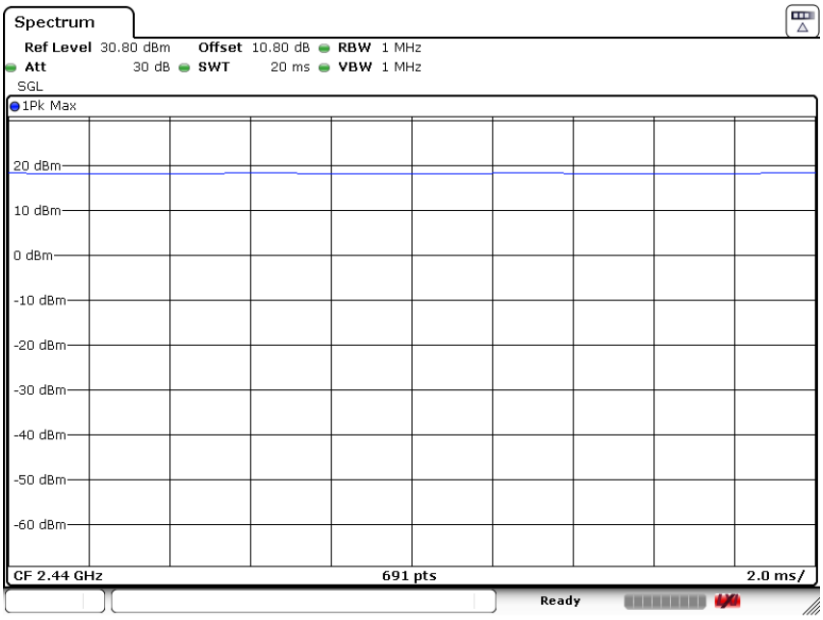
Mode	3	
	LF	
	2400-2483.5_Zigbee_CH26_2480MHz	
Pol.	Horizontal	Vertical
Peak		

	Freq	Level	Limit Line	Over Limit	Read Level	Ant Factor	Cable Loss	Preamp Factor	Aux Factor	APos	TPos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	dB	cm	deg	
1	30.24	21.23	40.00	-18.77	28.70	24.98	0.36	32.81	0.00	--	--	Peak
2	159.98	27.80	43.50	-15.70	42.57	16.68	1.27	32.72	0.00	--	--	Peak
3	298.93	24.67	46.00	-21.33	36.39	19.30	1.81	32.83	0.00	--	--	Peak
4	555.98	29.79	46.00	-16.21	34.48	26.09	2.45	33.23	0.00	--	--	Peak
5	846.50	28.41	46.00	-17.59	28.85	29.14	3.03	32.61	0.00	--	--	Peak
6	967.75	31.16	54.00	-22.84	28.67	30.70	3.26	31.47	0.00	--	--	Peak

	Freq	Level	Limit Line	Over Limit	Read Level	Ant Factor	Cable Loss	Preamp Factor	Aux Factor	APos	TPos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	dB	cm	deg	
1	32.91	21.88	40.00	-18.12	30.78	23.53	0.36	32.79	0.00	--	--	Peak
2	121.18	19.90	43.50	-23.60	33.88	17.63	1.06	32.67	0.00	--	--	Peak
3	249.95	19.35	46.00	-26.65	32.11	18.48	1.65	32.89	0.00	--	--	Peak
4	561.80	34.26	46.00	-11.74	38.67	26.37	2.46	33.24	0.00	--	--	Peak
5	931.86	29.63	46.00	-16.37	28.06	30.30	3.18	31.91	0.00	--	--	Peak
6	979.15	30.80	54.00	-23.20	28.17	30.69	3.30	31.36	0.00	--	--	Peak

Emission above 18GHz		
Peak		

Appendix D. Duty Cycle Plots

Mode	Duty Cycle(%)	T(ms)	1/T(kHz)	VBW Setting
Zigbee	100	-	-	10Hz

Zigbee mode