FCC TEST REPORT

FCC ID: QOBZBN6302

Product	:	Zigbee 3.0 Slim Door/Window Sensor Open-Close
Model Name	:	ZBN6302
Additional Models	:	84169
Brand	:	JascoPro
Report No.	:	PTC26060921605E-FC01
Prepared for		
JASCO PRODUCTS COMPANY		
10 E Memorial Road, Building B, Oklahoma City, OK 73114, USA		
Prepared by		
Precise Testing & Certification Co., Ltd		
Building 1, No. 6, Tongxin Road, Dongcheng Street, Dongguan, Guangdong, China		

1 TEST RESULT CERTIFICATION

Applicant's name	:	JASCO PRODUCTS COMPANY
Address	:	10 E Memorial Road, Building B, Oklahoma City, OK 73114, USA
Manufacture's name	:	Ultra Tech Industries Company Limited
Address	:	NON SAO INDUSTRIAL CLUSTER, TAN DINH COMMUNE, Bac Ninh Province，VIETNAM
Product name	:	Zigbee 3.0 Slim Door/Window Sensor Open-Close
Model name	:	ZBN6302
Additional Models	:	84169
Standards	:	FCC CFR47 Part 15 Section 15.247
Test procedure	:	ANSI C63.10-2020
Test Date	:	June 29, 2026 to August 04, 2026
Date of Issue	:	August 04, 2026
Test Result	:	Pass

This device described above has been tested by PTC, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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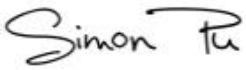
Test Engineer:

Jack zhou / Engineer

Technical Manager:



Simon Pu / Manager

Contents

2 Test Summary

Test Items	Test Requirement	Result
Conduct Emission	15.207	N/A.
Radiated Spurious Emissions	15.205(a) 15.209 15.247(d)	PASS
Conducted Spurious Emission	15.247(d)	PASS
Band edge	15.247(d) 15.205(a)	PASS
6dB Bandwidth	15.247(a)(2)	PASS
Maximum Peak Output Power	15.247(b)(3)	PASS
Power Spectral Density	15.247(e)	PASS
Antenna Requirement	15.203	PASS

2.1 Test Site

Precise Testing & Certification Co., Ltd

Address: Building 1, No. 6, Tongxin Road, Dongcheng Street, Dongguan, Guangdong, China

FCC Registration Number: 790290

A2LA Certificate No.: 4408.01

IC Registration Number: 12191A

FCC Designation Number: CN1219

3 General Information

3.1 General Description of E.U.T.

Product Name	:	Zigbee 3.0 Slim Door/Window Sensor Open-Close
Model name	:	ZBN6302
Additional Models	:	84169
Models Difference	:	These models differ only in their names.
Specification	:	Zigbee
Operating frequency	:	2405-2480MHz
Modulation	:	O-QPSK For Zigbee
Number of Channel	:	16 channels For Zigbee
Antenna installation	:	PCB antenna
Antenna Gain	:	-2.92 dBi
Power supply	:	CR2450 DC 3V
Hardware Version	:	N/A
Software Version	:	N/A

3.2 Channel List

The EUT has been tested under its typical operating condition. Pre-defined engineering program for regulatory testing used to control the EUT for staying in continuous transmitting. Only the worst case data were reported.

The EUT has been associated with peripherals pursuant to ANSI C63.10-2020 and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: radiation (9 KHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower).

The details of test channels and bandwidth were for RF conductive measurement.

Channel List:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2405	6	2435	12	2465
1	2410	7	2440	13	2470
2	2415	8	2445	14	2475
3	2420	9	2450	15	2480
4	2425	10	2455		
5	2430	11	2460		
Note: Fc = 2 405 + 5 (k - 11) in MHz, for k = 11, 12, …, 26.					

Test Frequency and channel for Zigbee:

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2405	7	2440	15	2480

4 Equipment During Test

4.1 Equipments List

RF Conducted Test

Name of Equipment	Manufacturer	Model	Serial No.	Characteristics	Last Calibration	Calibration Interval
MXG Signal Analyzer	Agilent	N9020A	SER MY5111038	10Hz-26.5GHz	Aug.14, 2025	1 Year
Coaxial Cable	CDS	79254	46107086	10Hz-30GHz	Aug.14, 2025	1 Year
Power Meter	Anritsu	ML2495A	0949003	300MHz-40GHz	Aug.14, 2025	1 Year
Power Sensor	Anritsu	MA2411B	0917017	300MHz-40GHz	Aug.14, 2025	1 Year
DC power Supply	Agilent	E3642A	MY52420017	0-8V,5A/0-20 ,2.5A	Aug.14, 2025	1 Year
Test S/W	Tonscend	JS1120-3	/	/	/	/
6dB Attenuation	/	DC-3GHz	/	0.09MHz-3GHz	Aug.14, 2025	1 Year

Remark: The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.

Radiated Emissions

Name of Equipment	Manufacturer	Model	Serial No.	Characteristics	Last Calibration	Calibration Interval
EMI Test Receiver	Rohde&Schwarz	ESPI7	101671	9KHz-7GHz	Aug.14, 2025	1 Year
Loop Antenna	Schwarzbeck	FMZB 1519	192	9 KHz -30MHz	Nov.27, 2025	1 Year
Bilog Antenna	SCHWARZBECK	VULB9160	9160-3355	25MHz-2GHz	Sep.09, 2025	1 Year
Preamplifier (low frequency)	SCHWARZBECK	BBV 9475	9745-0013	9KHz-1GHz	Mar.21, 2026	1 Year
Cable	IMRO	AK-9515E(9m)	Cable-L	9KHz-3GHz	Aug.14, 2025	1 Year
Spectrum	Rohde&Schwarz	FSV40	6625-01-588-55	9KHz-40GHz	Aug.14,	1 Year

Analyzer			15		2025	
Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-1246	1GHz-18GHz	Dec.11, 2025	1 Year
Power Amplifier	ZHINAN	ZN3380C	15002	1GHz-26.5GHz	Aug.14, 2025	1 Year
Horn Antenna	SCHWARZBECK	BBHA 9170	9170-1066	15GHz-40GHz	Jun. 24, 2025	1 Year
Horn Antenna	SCHWARZBECK	BBHA 9170	9170-1066	15GHz-40GHz	Jun. 11, 2026	1 Year
Amplifier	SCHWARZBECK	BBV 9721	9721-205	18GHz-40GHz	Jun. 23, 2025	1 Year
Amplifier	SCHWARZBECK	BBV 9721	9721-205	18GHz-40GHz	Jun. 08, 2026	1 Year
Cable	H+S	CBL-26	N/A	1GHz-26.5GHz	Aug.14, 2025	1 Year
RF Cable	R&S	R204	R21X	1GHz-40GHz	Aug.14, 2025	1 Year
Test S/W	Tonscend	TS+	/	/	/	/

Conducted Emissions

Name of Equipment	Manufacturer	Model	Serial No.	Characteristics	Calibration Date	Calibration Interval
EMI Test Receiver	Rohde&Schwarz	ESCI3	101417	9KHz-3GHz	Aug.14, 2025	1 Year
Artificial Mains Network	Rohde&Schwarz	ENV216	102453	9KHz-300MHz	Oct.29, 2025	1 Year
Artificial Mains Network	Rohde&Schwarz	ENV216	101342	9KHz-300MHz	Oct.29, 2025	1 Year
Limiter	R&S	ESH3-Z2	0357.8810.54-102808-NB	0Hz-30MHz	Aug.14, 2025	1 Year

RF Switch	DIAMOND ANTENNA	CX-210	/	0.09MHz-6GHz	Mar. 21,2026	1 Year
Test S/W	Tonscend	JS32-CE	/	/	/	/

4.2 Measurement Uncertainty

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

Parameter	**Uncertainty**
RF output power, conducted	±1.0dB
Power Spectral Density, conducted	±2.2dB
Radio Frequency	± 1 x 10^{-6}
Bandwidth	± 1.5 x 10^{-6}
Time	±2%
Duty Cycle	±2%
Temperature	±1°C
Humidity	±5%
DC and low frequency voltages	±3%
Conducted Emissions (150kHz~30MHz)	±3.64dB
Radiated Emission(9kHz~30MHz)	±3.15dB
Radiated Emission(30MHz~1GHz)	±5.03dB
Radiated Emission(1GHz~25GHz)	±4.74dB

4.3 Description of Support Units

Equipment	Model No.	Series No.
N/A	N/A	N/A

5 Conducted Emission

Test Requirement	:	FCC CFR 47 Part 15 Section 15.207
Test Method	:	ANSI C63.10-2020
Test Result	:	PASS
Frequency Range	:	150kHz to 30MHz
Class/Severity	:	Class B

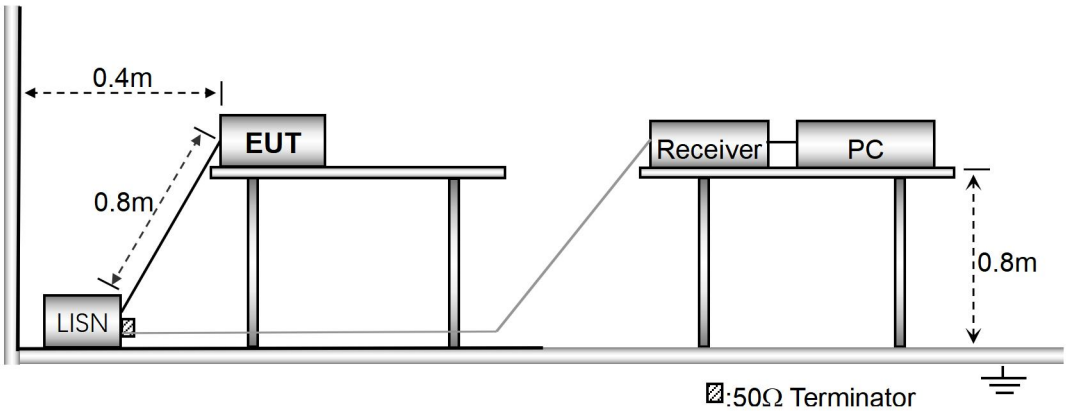
5.1 E.U.T. Operation

Operating Environment :

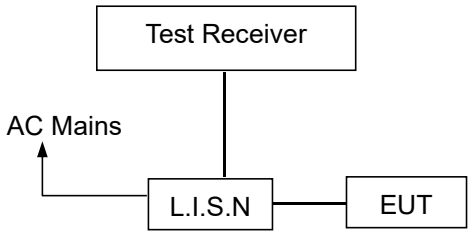
Temperature	:	25.5 °C
Humidity	:	51 % RH
Atmospheric Pressure	:	101.2kPa

5.2 EUT Setup

The conducted emission tests were performed using the setup accordance with the ANSI C63.10-2020.



5.3 Test SET-UP (Block Diagram of Configuration)



5.4 Measurement Procedure

1. Place the EUT on a non-conductive tabletop at a height of 80 cm. A vertical conductive shielding wall is located 40 cm behind the EUT.
2. The excess length of the power cord between the EUT and the LISN receptaele (or ac power receptaclewhere a liSN cannot he used), or an adapter or extension cord connected to and measured with the LISNshall be folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.
3. EUT shall be placed at a distanee of 80 cm from the LISN (or power receptacle where a LISN cannot be used) and connected thereto by a powerlead or appropriate connection no more than 1 m long.
4. The equipment shall be arranged and installed in compliance with the standards, and operated in a manner that maximizes its emission characteristics in normal applications, with the six highest points on the waveform recorded.

5.5 Conducted Emission Limit

Conducted Emission

Frequency(MHz)	Quasi-peak	Average
0.15-0.5	66-56	56-46
0.5-5.0	56	46
5.0-30.0	60	50

Note:

1. The lower limit shall apply at the transition frequencies
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

5.6 Measurement Receiver Parameters:

Receiver Parameters	Setting
Start Frequency	150kHz
Stop Frequency	30MHz
IF Bandwidth	9 kHz

5.7 Conducted Emission Test Result

N/A.

Remark:This device does not have a port connected to the AC power supply.

6 Radiated Spurious Emissions

Test Requirement : FCC CFR47 Part 15 Section 15.209 & 15.247

Test Method : ANSI C63.10-2020

Test Result : PASS

Measurement Distance : 3m

Limit : See the follow table

Frequency (MHz)	Field Strength		Field Strength Limit at 3m Measurement Dist	
	uV/m	Distance (m)	uV/m	dBuV/m
0.009 ~ 0.490	2400/F(kHz)	300	10000 * 2400/F(kHz)	$20\log^{(2400/F(kHz))}$ + 80
0.490 ~ 1.705	24000/F(kHz)	30	100 * 24000/F(kHz)	$20\log^{(24000/F(kHz))}$ + 40
1.705 ~ 30	30	30	100 * 30	$20\log^{(30)}$ + 40
30 ~ 88	100	3	100	$20\log^{(100)}$
88 ~ 216	150	3	150	$20\log^{(150)}$
216 ~ 960	200	3	200	$20\log^{(200)}$
Above 960	500	3	500	$20\log^{(500)}$

6.1 EUT Operation

Operating Environment :

Temperature : 23.5 °C

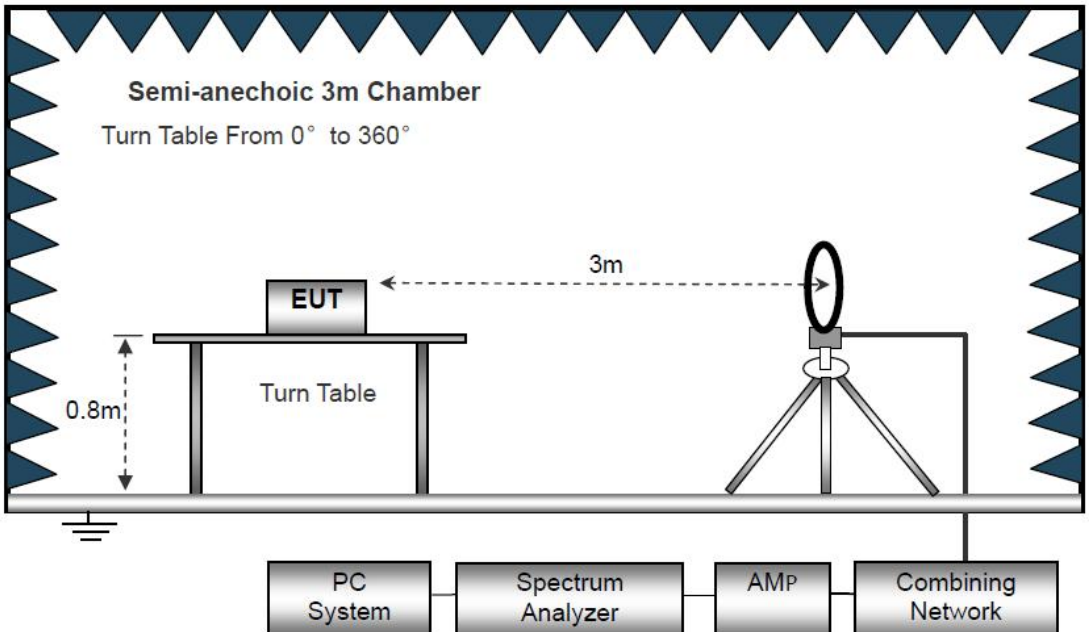
Humidity : 51.1 % RH

Atmospheric Pressure : 101.2kPa

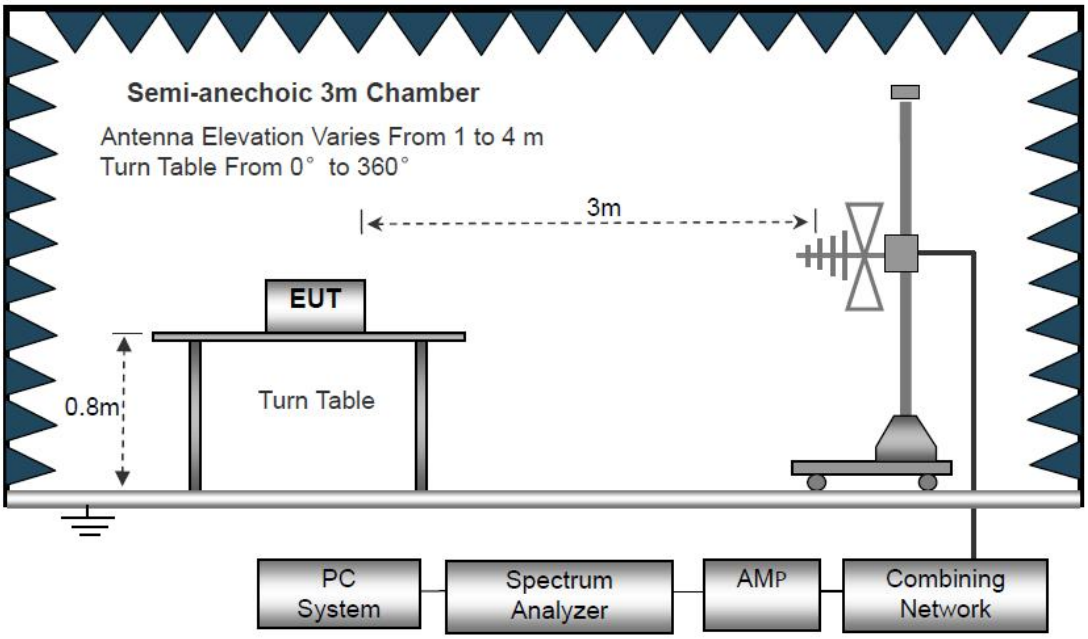
6.2 Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site

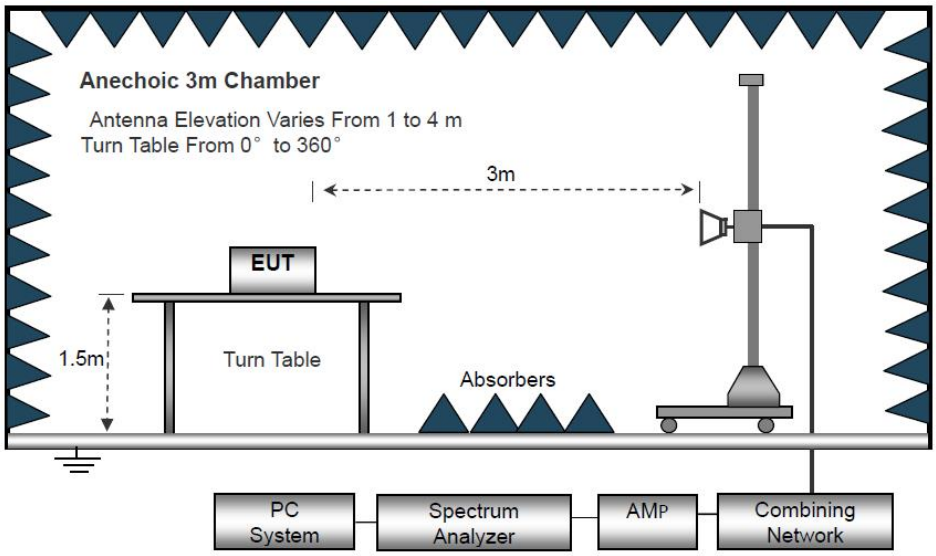
The test setup for emission measurement below 30MHz



The test setup for emission measurement from 30 MHz to 1 GHz.



The test setup for emission measurement above 1 GHz



6.3 Spectrum Analyzer Setup

	Frequency	Detector	RBW	VBW	Remark
Receiver Setup	Below 30MHz	--	10kHz	10kHz	--
	30MHz ~ 1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak Value
	Above 1GHz	Peak	1MHz	3MHz	Peak Value
		RMS	1MHz	3MHz	Average Value

6.4 Test Procedure

1. The testing follows the guidelines in Spurious Radiated Emissions of ANSI C63.10-2020.

2. Below 1000MHz, The EUT was placed on a turn table which is 0.8m above ground plane. And above 1000MHz, The EUT was placed on a styrofoam table which is 1.5m above ground plane.

3. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.

4. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (From 1m to 4m) and turntable (from 0 degree to 360 degree) 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 to comply with the guidelines.

5. Set to the maximum power setting and enable the EUT transmit continuously.

6. Final measurement (Above 1GHz): The frequency range will be divided into different sub ranges depending of the frequency range of the used horn antenna. The EMI Receiver set to peak and average mode and a resolution bandwidth of 1MHz. The measurement will be performed in horizontal and vertical polarization of the measuring antenna and while rotating the EUT in its vertical axis in the range of 0 degree to 360 degree in order to have the antenna inside the cone of radiation.

7. Test Procedure of measurement (For Above 1GHz):

1) Monitor the frequency range at horizontal polarization and move the antenna over all sides of the EUT(if necessary move the EUT to another orthogonal axis).

2) Change the antenna polarization and repeat 1) with vertical polarization.

3) Make a hardcopy of the spectrum.

4) Measure the frequency of the detected emissions with a lower span and resolution bandwidth to increase the accuracy and note the frequency value.

5) Change the analyser mode to Clear/ Write and found the cone of emission.

6) Rotate and move the EUT, so that the measuring distance can be enlarged to 3m and the antenna will be still inside the cone of emission.

7) Measure the level of the detected frequency with the correct resolution bandwidth, with the antenna polarization and azimuth and the peak and average detector, which causes the maximum emission.

8) Repeat steps 1) to 7) for the next antenna spot if the EUT is larger than the antenna beamwidth.

8. The radiation measurements are tested under 3-axes(X,Y,Z) position(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand), After pre-test, It was found that the worse radiation emission was get at the X position. So the data shown was the X position only.

For Average Measurement:

VBW=10Hz, 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.

Band	Duty Cycle(%)	T(μs)	1/T(KHz)	Average Correction Factor	VBW Setting
2405-2480	100	-	-	0	10Hz

6.5 Summary of Test Results

Test Frequency: 9KHz-30MHz

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV/m)	Limit 3m (dBuV/m)	Over Limit (dB)
--	--	--	--	>20

Note:

The amplitude of spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.

Distance extrapolation factor =40log(Specific distance/ test distance)(dB);

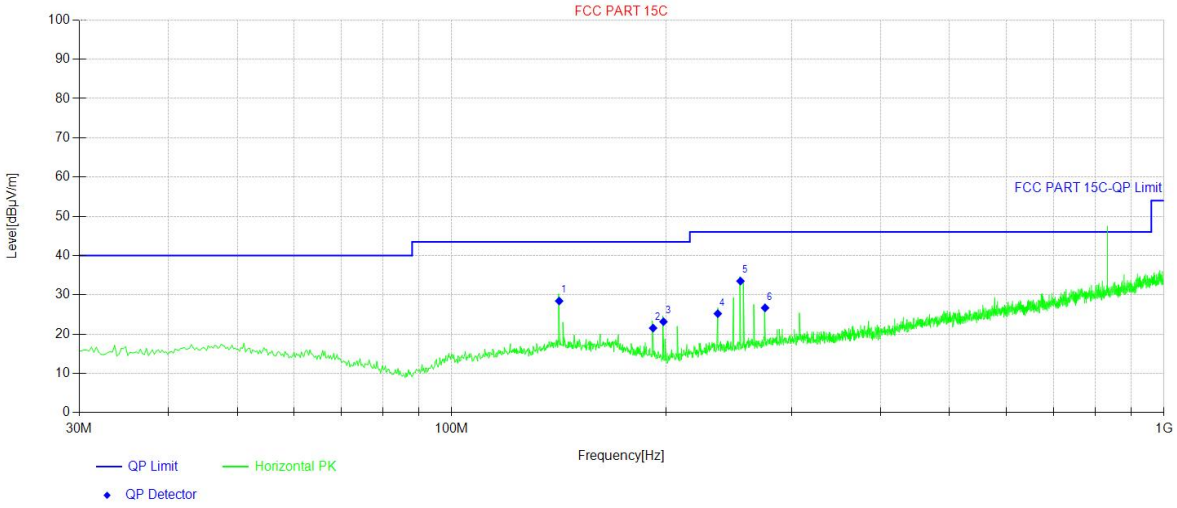
Limit line=Specific limits(dBuV) + distance extrapolation factor.

Test Frequency: 30MHz ~ 1GHz

Pass.

Please refer to the following test plots for the worst test mode (O-QPSK (CH00: 2405MHz)).

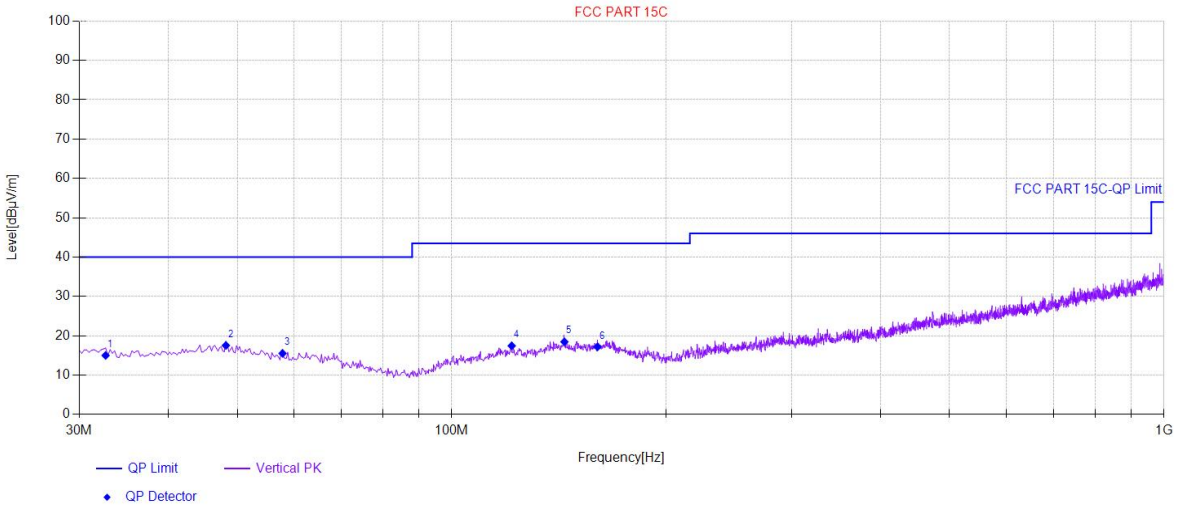
Antenna Polarization: Horizontal O-QPSK(CH00: 2405MHz)



Final Data List[QP]								
NO.	Freq. [MHz]	QP Reading [dBµV/m]	Factor [dB]	QP Value [dBµV/m]	QP Limit [dBµV/m]	QP Margin [dB]	Polarity	Verdict
1	141.55	36.89	-8.46	28.43	43.50	15.07	Horizontal	PASS
2	191.75	32.01	-10.47	21.54	43.50	21.96	Horizontal	PASS
3	198.30	33.97	-10.80	23.17	43.50	20.33	Horizontal	PASS
4	236.37	33.84	-8.63	25.21	46.00	20.79	Horizontal	PASS
5	254.31	41.55	-8.04	33.51	46.00	12.49	Horizontal	PASS
6	275.41	33.82	-7.14	26.68	46.00	19.32	Horizontal	PASS

Remark:Emission Level=Reading+Cable Loss+ANT Factor-AMP Factor

Antenna Polarization: Vertical O-QPSK(CH00: 2405MHz)



Final Data List[QP]								
NO.	Freq. [MHz]	QP Reading [dBµV/m]	Factor [dB]	QP Value [dBµV/m]	QP Limit [dBµV/m]	QP Margin [dB]	Polarity	Verdict
1	32.67	25.3	-10.30	15.00	40.00	25.00	Vertical	PASS
2	48.19	27.32	-9.78	17.54	40.00	22.46	Vertical	PASS
3	57.89	26.1	-10.58	15.52	40.00	24.48	Vertical	PASS
4	121.42	27.28	-9.83	17.45	43.50	26.05	Vertical	PASS
5	143.98	26.74	-8.27	18.47	43.50	25.03	Vertical	PASS
6	160.22	25.06	-7.87	17.19	43.50	26.31	Vertical	PASS

Remark:Emission Level=Reading+Cable Loss+ANT Factor-AMP Factor

Test Frequency 1GHz-25GHz:

Test Mode: CH00 O-QPSK				Test channel:Low Channel (2405MHz)				
Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.
4810	44.93	34.04	6.58	34.09	51.46	74	-22.54	V
7215	42.08	37.11	7.73	34.5	52.42	74	-21.58	V
9620	38.72	39.31	9.23	34.79	52.47	74	-21.53	V
4810	46.33	34.04	6.58	34.09	52.86	74	-21.14	H
7215	37.12	37.11	7.73	34.5	47.46	74	-26.54	H
9620	40.39	39.31	9.23	34.79	54.14	74	-19.86	H
Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.
4810	32.69	34.04	6.58	34.09	39.22	54	-14.78	V
7215	28.85	37.11	7.73	34.5	39.19	54	-14.81	V
9620	25.38	39.31	9.23	34.79	39.13	54	-14.87	V
4810	34.45	34.04	6.58	34.09	40.98	54	-13.02	H
7215	27.59	37.11	7.73	34.5	37.93	54	-16.07	H
9620	24.32	39.31	9.23	34.79	38.07	54	-15.93	H

Test Mode: CH07 O-QPSK				Test channel:Middle Channel (2440MHz)				
Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.
4880	42.59	34.38	6.69	34.09	49.57	74	-24.43	V
7320	39.59	37.22	7.78	34.53	50.06	74	-23.94	V
9760	33.64	39.46	9.35	34.8	47.65	74	-26.35	V
4880	40.76	34.38	6.69	34.09	47.74	74	-26.26	H
7320	38.23	37.22	7.78	34.53	48.70	74	-25.30	H
9760	37.92	39.46	9.35	34.8	51.93	74	-22.07	H
Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.
4880	32.27	34.38	6.69	34.09	39.25	54	-14.75	V
7320	26.85	37.22	7.78	34.53	37.32	54	-16.68	V
9760	24.08	39.46	9.35	34.8	38.09	54	-15.91	V
4880	32.88	34.38	6.69	34.09	39.86	54	-14.14	H
7320	28.00	37.22	7.78	34.53	38.47	54	-15.53	H
9760	26.20	39.46	9.35	34.8	40.21	54	-13.79	H

Test Mode: CH15 O-QPSK				Test channel:High Channel (2480MHz)				
Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.
4960	43.01	34.72	6.79	34.09	50.43	74	-23.57	V
7440	40.02	37.34	7.82	34.57	50.61	74	-23.39	V
9920	33.94	39.62	9.46	34.81	48.21	74	-25.79	V
4960	40.83	34.72	6.79	34.09	48.25	74	-25.75	H
7440	37.56	37.34	7.82	34.57	48.15	74	-25.85	H
9920	36.94	39.62	9.46	34.81	51.21	74	-22.79	H
Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.
4960	34.38	34.72	6.79	34.09	41.80	54	-12.20	V
7440	28.55	37.34	7.82	34.57	39.14	54	-14.86	V
9920	26.23	39.62	9.46	34.81	40.50	54	-13.50	V
4960	32.24	34.72	6.79	34.09	39.66	54	-14.34	H
7440	26.52	37.34	7.82	34.57	37.11	54	-16.89	H
9920	25.83	39.62	9.46	34.81	40.10	54	-13.90	H

Note: 1. The testing has been conformed to 10*2480MHz=24800MHz.

2. All other emissions more than 30dB below the limit.

3. Factor = Antenna Factor + Cable Loss – Pre-amplifier.
Emission Level = Reading + Factor
Margin=Emission Level-Limit

Spurious Emission in Restricted Band 2310-2390MHz and 2483.5-2500MHz

Test Mode: Low Channel 2405MHz									
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over (dB)	Polarity H/V	Test Value
2310	53.52	28.67	6.72	37.26	51.65	74	-22.35	H	Peak
2390	54.07	28.08	6.81	37.12	51.84	74	-22.16	H	Peak
2310	32.84	28.67	6.72	37.26	30.97	54	-23.03	H	Average
2390	34.53	28.08	6.81	37.12	32.30	54	-21.70	H	Average
2310	57.16	28.67	6.72	37.26	55.29	74	-18.71	V	Peak
2390	56.90	28.08	6.81	37.12	54.67	74	-19.33	V	Peak
2310	36.12	28.67	6.72	37.26	34.25	54	-19.75	V	Average
2390	35.22	28.08	6.81	37.12	32.99	54	-21.01	V	Average

Test Mode: High Channel 2480MHz									
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over (dB)	Polarity H/V	Test Value
2483.5	54.35	27.38	6.15	36.29	51.59	74	-22.41	H	Peak
2500	53.12	27.43	6.68	36.79	50.44	74	-23.56	H	Peak
2483.5	36.29	27.38	6.15	36.29	33.53	54	-20.47	H	Average
2500	34.83	27.43	6.68	36.79	32.15	54	-21.85	H	Average
2483.5	54.36	27.38	6.15	36.29	51.60	74	-22.40	V	Peak
2500	53.19	27.43	6.68	36.79	50.51	74	-23.49	V	Peak
2483.5	35.97	27.38	6.15	36.29	33.21	54	-20.79	V	Average
2500	36.31	27.43	6.68	36.79	33.63	54	-20.37	V	Average

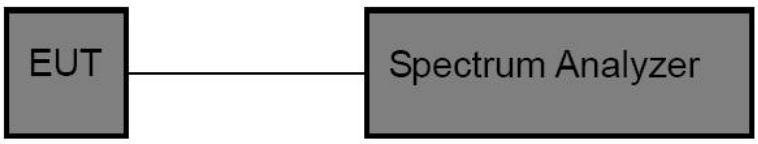
7 Conduct Band Edge And Spurious Emissions Measurement

Test Requirement	:	Section 15.247(d) In addition, radiated emissions which fall in the restricted bands. as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).
Test Method	:	ANSI C63.10-2020
Test Limit	:	Regulation 15.247 (d),In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. 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)).

7.1 Test Procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: RBW = 100kHz, VBW = 300kHz, Sweep = auto
Detector function = peak, Trace = max hold

7.2 Test Setup



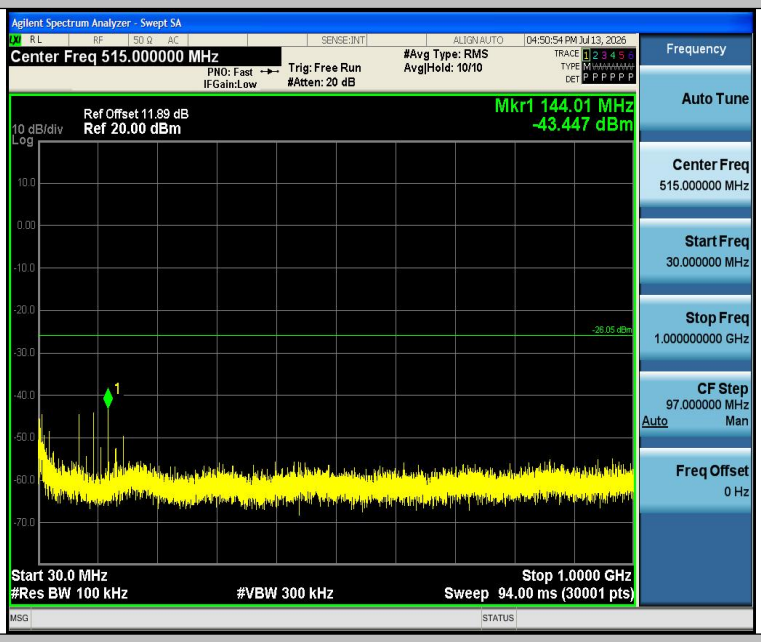
7.3 Test Result

TestMode	Antenna	Frequency[MHz]	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
ZIGB	Ant1	2405	0~Reference	-6.05	-6.05	---	PASS
ZIGB	Ant1	2405	30~1000	-6.05	-43.45	≤-26.05	PASS
ZIGB	Ant1	2405	1000~26500	-6.05	-36.37	≤-26.05	PASS
ZIGB	Ant1	2440	0~Reference	-5.25	-5.25	---	PASS
ZIGB	Ant1	2440	30~1000	-5.25	-44	≤-25.25	PASS
ZIGB	Ant1	2440	1000~26500	-5.25	-26.52	≤-25.25	PASS
ZIGB	Ant1	2480	0~Reference	-0.08	-0.08	---	PASS
ZIGB	Ant1	2480	30~1000	-0.08	-54.95	≤-20.08	PASS
ZIGB	Ant1	2480	1000~26500	-0.08	-42.85	≤-20.08	PASS

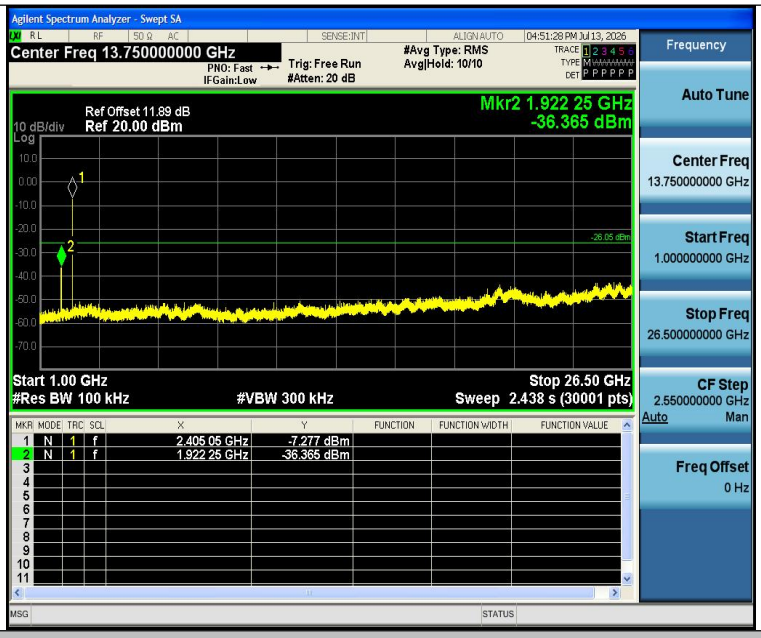
Test Graphs：

ZIGB-Ant1-2405-0~Reference-PASS

ZIGB-Ant1-2405-30~1000-PASS

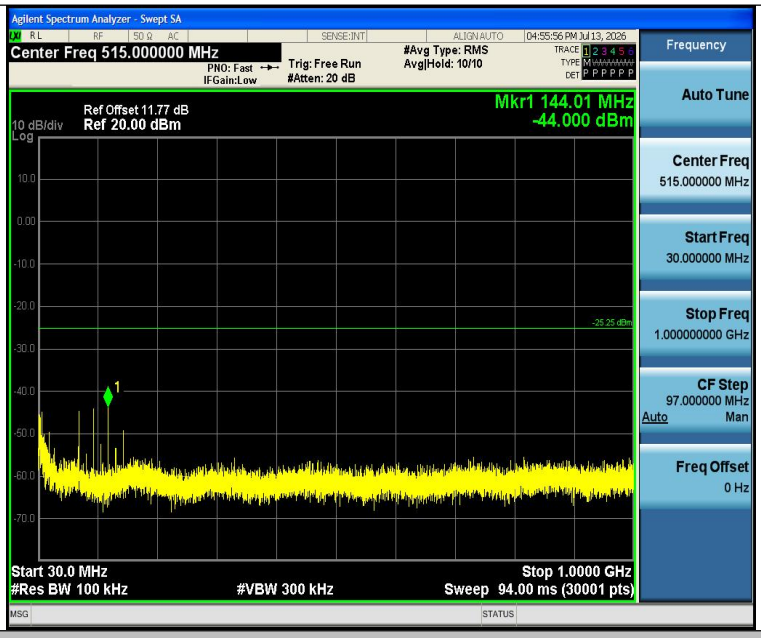


ZIGB-Ant1-2405-1000~26500-PASS

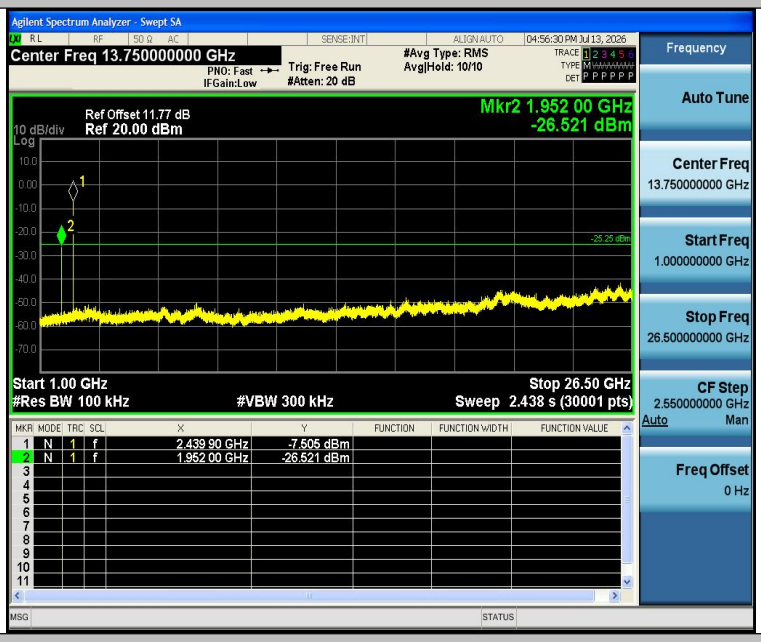


ZIGB-Ant1-2440-0~Reference-PASS

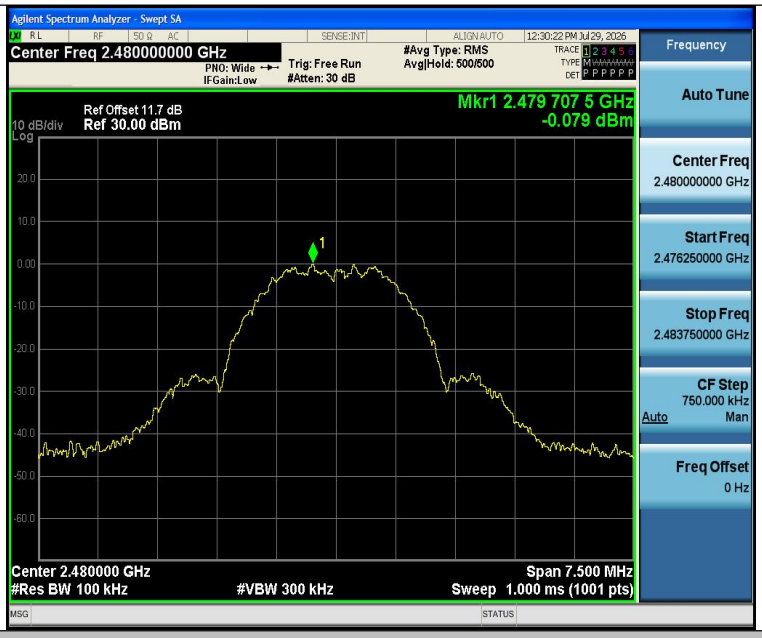
ZIGB-Ant1-2440-30~1000-PASS



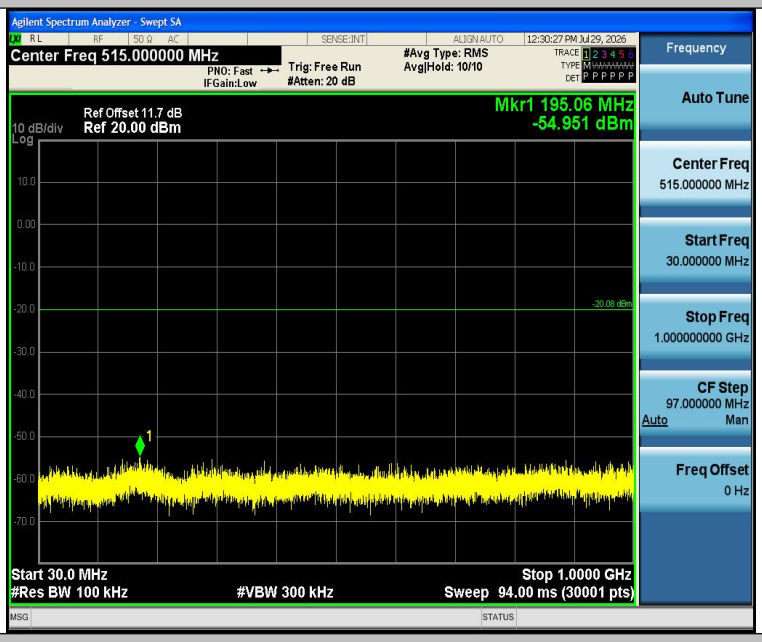
ZIGB-Ant1-2440-1000~26500-PASS



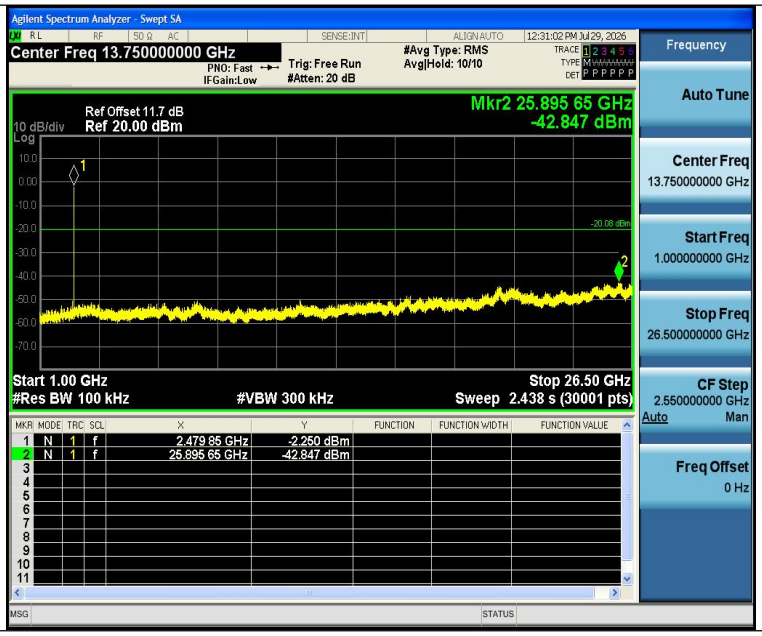
ZIGB-Ant1-2480-0~Reference-PASS



ZIGB-Ant1-2480-30~1000-PASS



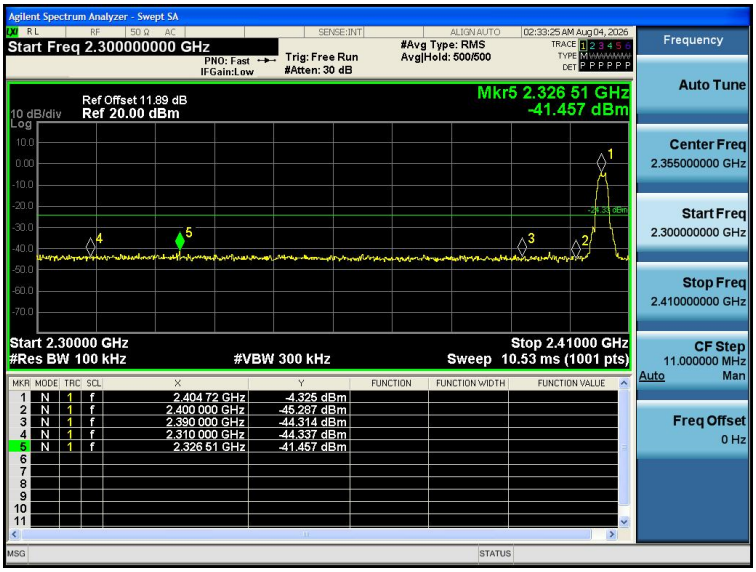
ZIGB-Ant1-2480-1000~26500-PASS


Agilent Spectrum Analyzer - Swept SA
Center Freq 13.750000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
#Avg Type: RMS
Avg|Hold: 10/10
12:31:02 PM Jul 29, 2026
Ref Offset 11.7 dB
10 dB/div
Log
Ref 20.00 dBm
Mkr2 25.895 65 GHz
-42.847 dBm
-20.00 dBm
Start 1.00 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 26.50 GHz
Sweep 2.438 s (30001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N 1 f 2.479 85 GHz -2.250 dBm
2 N 1 f 25.895 65 GHz -42.847 dBm
Frequency
Auto Tune
Center Freq
13.750000000 GHz
Start Freq
1.000000000 GHz
Stop Freq
26.500000000 GHz
CF Step
2.550000000 GHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS

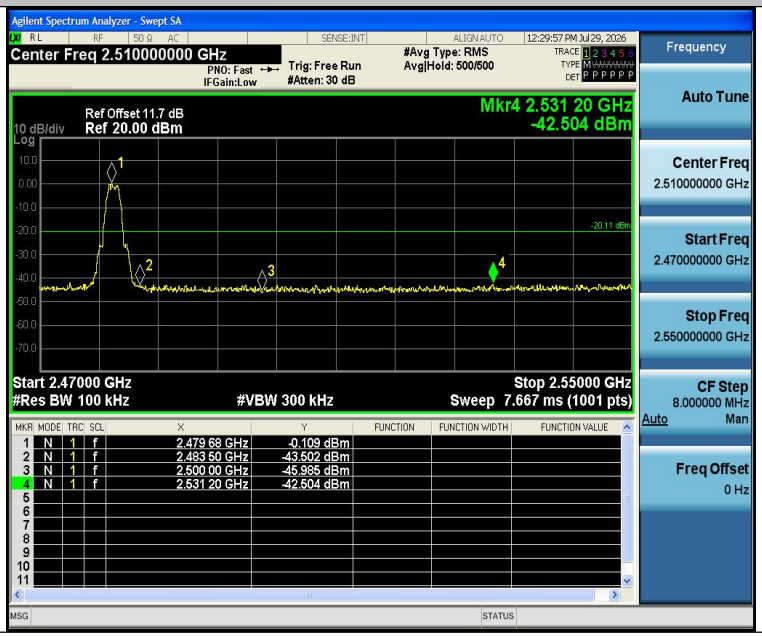
Band edge:

TestMode	Antenna	ChName	Frequency[MHz]	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
ZIGB	Ant1	Low	2405	-4.33	-41.46	≤-24.33	PASS
ZIGB	Ant1	High	2480	-0.11	-42.50	≤-20.11	PASS

ZIGB-Ant1-2405-PASS



ZIGB-Ant1-2480-PASS



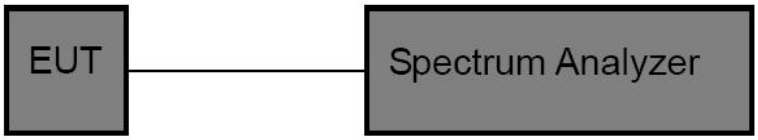
8 6dB Bandwidth Measurement

Test Requirement	:	FCC CFR47 Part 15 Section 15.247
Test Method	:	ANSI C63.10-2020
Test Limit		Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

Test Procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: RBW = 100kHz, VBW = 300kHz

Test Setup



Test Result

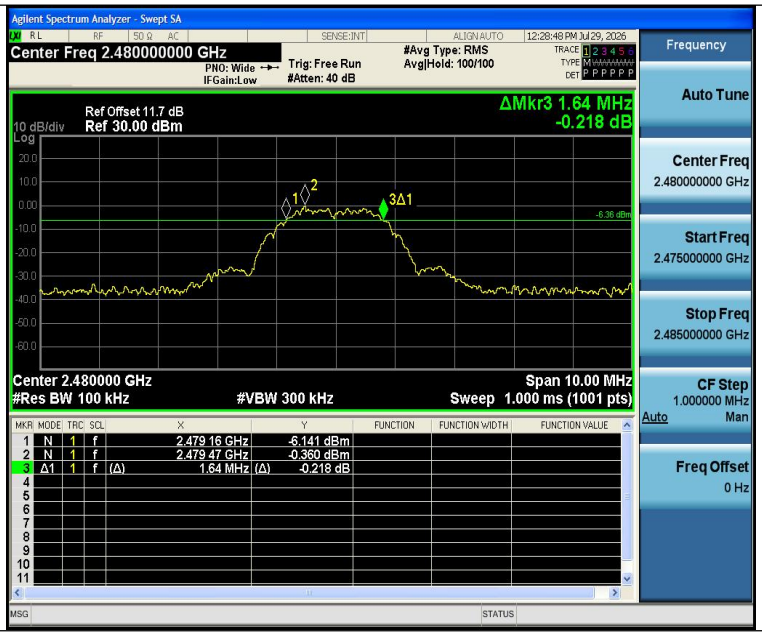
TestMode	Antenna	Frequency[MHz]	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
ZIGB	Ant1	2405	1.770	2404.110	2405.880	0.5	PASS
ZIGB	Ant1	2440	1.640	2439.150	2440.790	0.5	PASS
ZIGB	Ant1	2480	1.640	2479.160	2480.800	0.5	PASS

Test Graphs:

ZIGB-Ant1-2405-PASS

ZIGB-Ant1-2440-PASS

ZIGB-Ant1-2480-PASS


Agilent Spectrum Analyzer - Swept SA
Center Freq 2.480000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 40 dB
#Avg Type: RMS
Avg|Hold: 100/100
12:28:48 PM Jul 29, 2026
Ref Offset 11.7 dB
10 dB/div
Log
Ref 30.00 dBm
ΔMkr3 1.64 MHz
-0.218 dB
Center 2.480000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 10.00 MHz
Sweep 1.000 ms (1001 pts)
1 N 1 f 2.479 16 GHz -6.141 dBm
2 N 1 f 2.479 47 GHz -0.360 dBm
3 Δ1 1 f (Δ) 1.64 MHz (Δ) -0.218 dB
Frequency
Auto Tune
Center Freq
2.480000000 GHz
Start Freq
2.475000000 GHz
Stop Freq
2.485000000 GHz
CF Step
1.000000 MHz
Auto
Man
Freq Offset
0 Hz

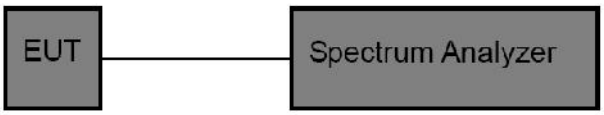
9 Maximum Peak Output Power

Test Requirement	:	FCC CFR47 Part 15 Section 15.247
Test Method	:	ANSI C63.10-2020
Test Limit	:	Regulation 15.247 (b)(3), For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power.

9.1 Test Procedure

1. 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.
2. Set to the maximum power setting and enable the EUT transmit continuously.
3. Measure the conducted output power and record the results in the test report.

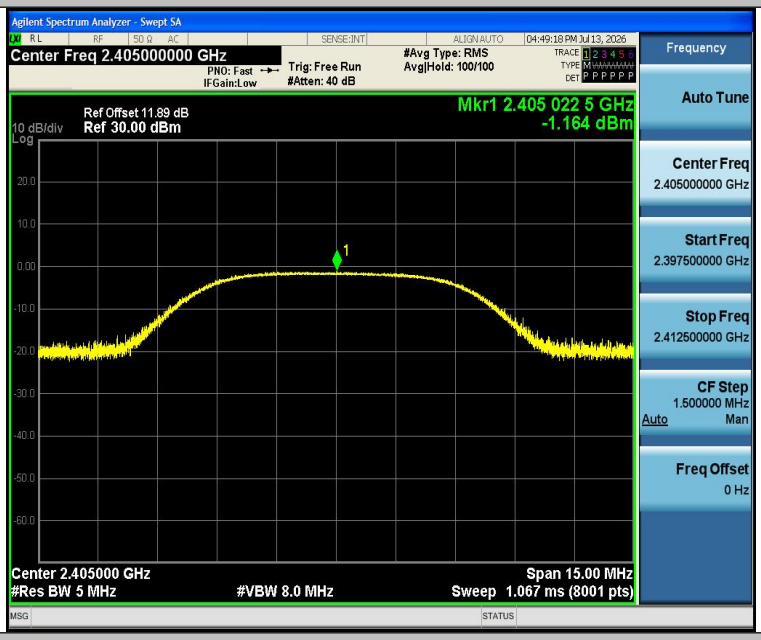
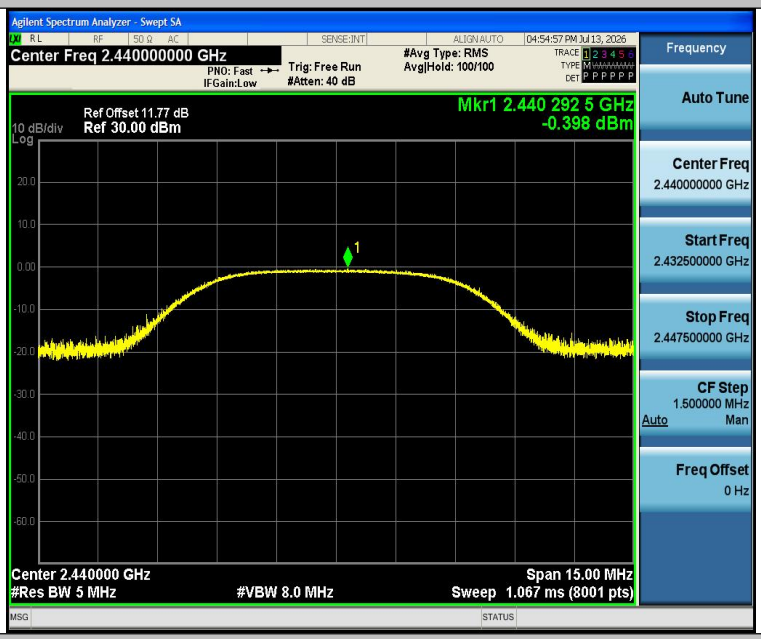
9.2Test Setup

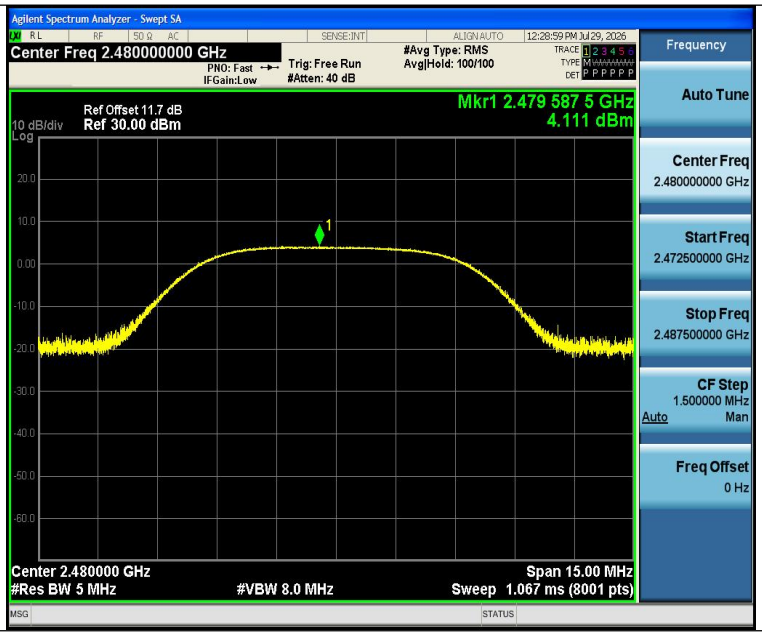


9.3 Test Result

TestMode	Antenna	Frequency[MHz]	Result[dBm]	Limit[dBm]	Verdict
ZIGB	Ant1	2405	-1.16	≤30	PASS
ZIGB	Ant1	2440	-0.4	≤30	PASS
ZIGB	Ant1	2480	4.11	≤30	PASS

Test Graphs:

ZIGB-Ant1-2405-PASS

ZIGB-Ant1-2440-PASS

ZIGB-Ant1-2480-PASS


Agilent Spectrum Analyzer - Swept SA
Center Freq 2.480000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 40 dB
#Avg Type: RMS
Avg|Hold: 100/100
12:28:59 PM Jul 29, 2026
Ref Offset 11.7 dB
10 dB/div
Log
Ref 30.00 dBm
Mkr1 2.479 587 5 GHz
4.111 dBm
Center 2.480000 GHz
#Res BW 5 MHz
#VBW 8.0 MHz
Span 15.00 MHz
Sweep 1.067 ms (8001 pts)
Frequency
Auto Tune
Center Freq
2.480000000 GHz
Start Freq
2.472500000 GHz
Stop Freq
2.487500000 GHz
CF Step
1.500000 MHz
Auto
Man
Freq Offset
0 Hz

10 Power Spectral density

Test Requirement	:	FCC CFR47 Part 15 Section 15.247
Test Method	:	ANSI C63.10-2020
Test Limit	:	Regulation 15.247(f) The power spectral density conducted from the intentional radiator to the antenna due to the digital modulation operation of the hybrid system, with the frequency hopping operation turned off, shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

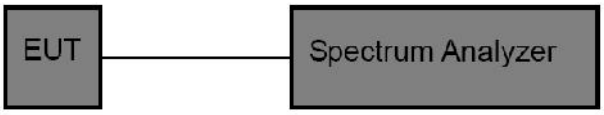
10.1 Test Procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.

2. Set the spectrum analyzer: RBW = 3kHz. VBW = 10kHz , Span = 1.5 times the DTS channel bandwidth(6 dB bandwidth). Sweep = auto; Detector Function = Peak. Trace = Max hold.

3. Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. The limit is specified in one of the subparagraphs of this Section Submit this plot.

10.2 Test Setup



10.3 Test Result

TestMode	Antenna	Frequency[MHz]	Result[dBm/3-100kHz]	Limit[dBm/3kHz]	Verdict
ZIGB	Ant1	2405	-17.49	≤8.00	PASS
ZIGB	Ant1	2440	-16.69	≤8.00	PASS
ZIGB	Ant1	2480	-11.53	≤8.00	PASS

Test Graphs:

ZIGB-Ant1-2405-PASS

ZIGB-Ant1-2440-PASS

ZIGB-Ant1-2480-PASS


Agilent Spectrum Analyzer - Swept SA
Center Freq 2.480000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 30 dB
#Avg Type: RMS
Avg|Hold: 100/100
12:29:45 PM Jul 29, 2026
Ref Offset 11.7 dB
10 dB/div
Log
Ref 20.00 dBm
Mkr1 2.480 394 21 GHz
-11.530 dBm
Center 2.480000 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 3.280 MHz
Sweep 346.0 ms (30000 pts)
Frequency
Auto Tune
Center Freq
2.480000000 GHz
Start Freq
2.478360000 GHz
Stop Freq
2.481640000 GHz
CF Step
328.000 kHz
Auto
Man
Freq Offset
0 Hz

11 Antenna Application

11.1 Antenna Requirement

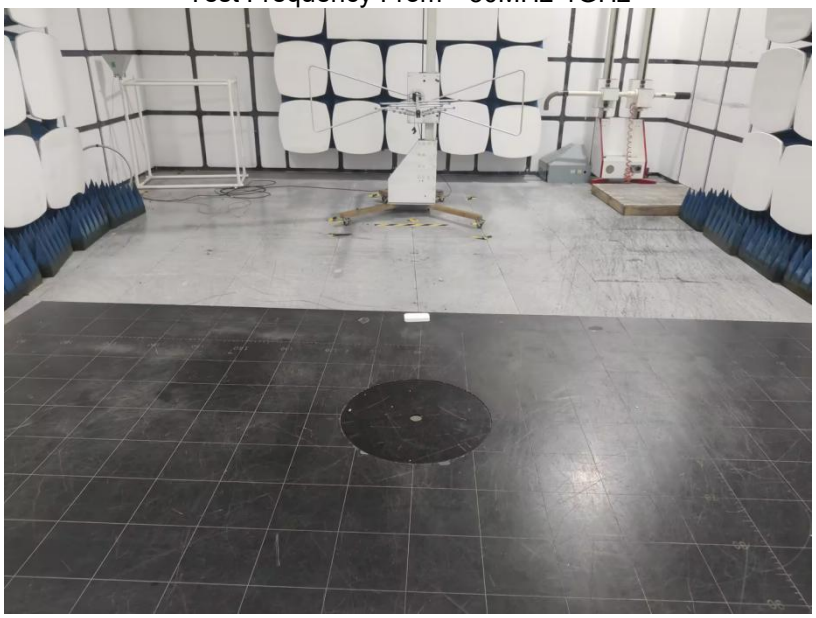
For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

11.2 Result

The EUT'S antenna, permanent attached antenna, is internal PCB antenna. The antenna's gain is -2.92 dBi and meets the requirement.

12 Test Setup

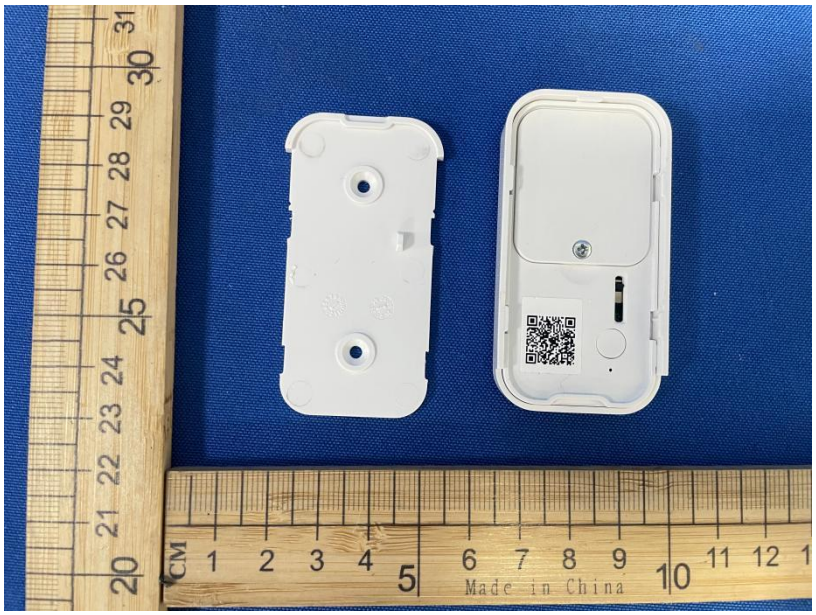
Radiated Spurious Emissions
Test Frequency From 30MHz-1GHz



Test frequency from Above 1GHz

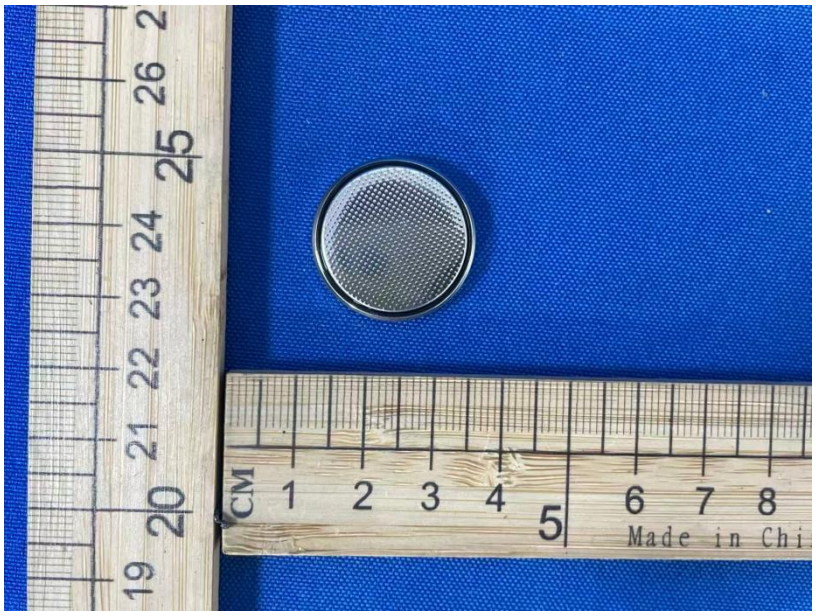
13 EUT Photos


1cm

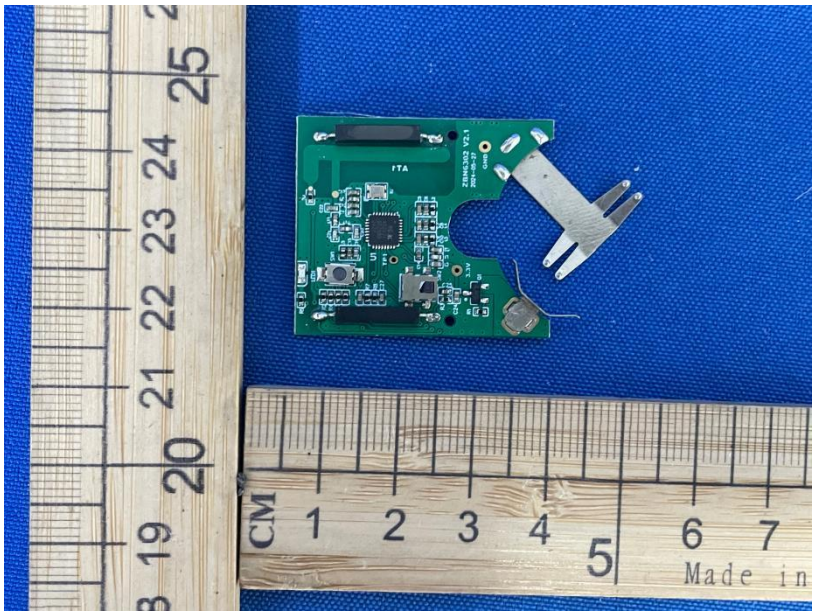

Made in China

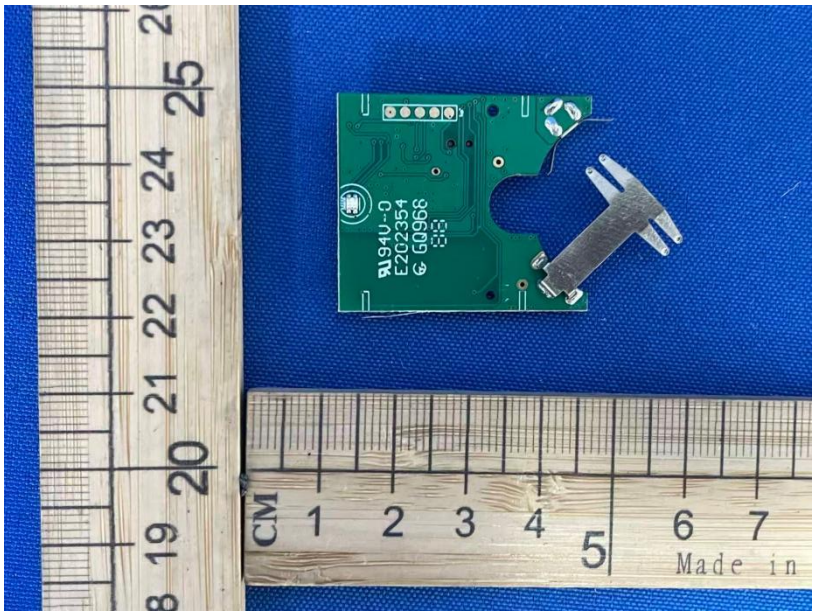

CM
Made in China


PKCELL
LITHIUM CELL
3V
CR2450
CM
Made in Ch


CM
Made in Chi


CM
Made in China


CM
1
2
3
4
5
6
7
Made in


CM
1
2
3
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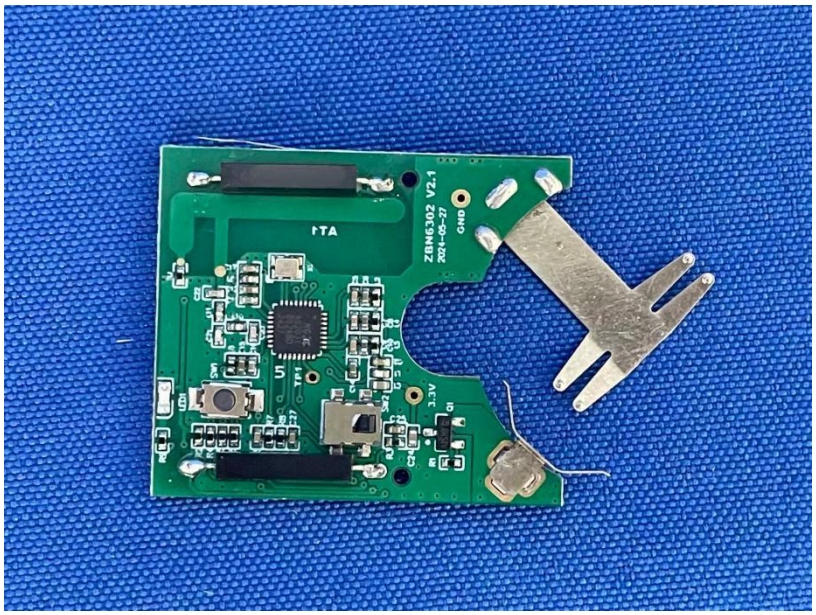
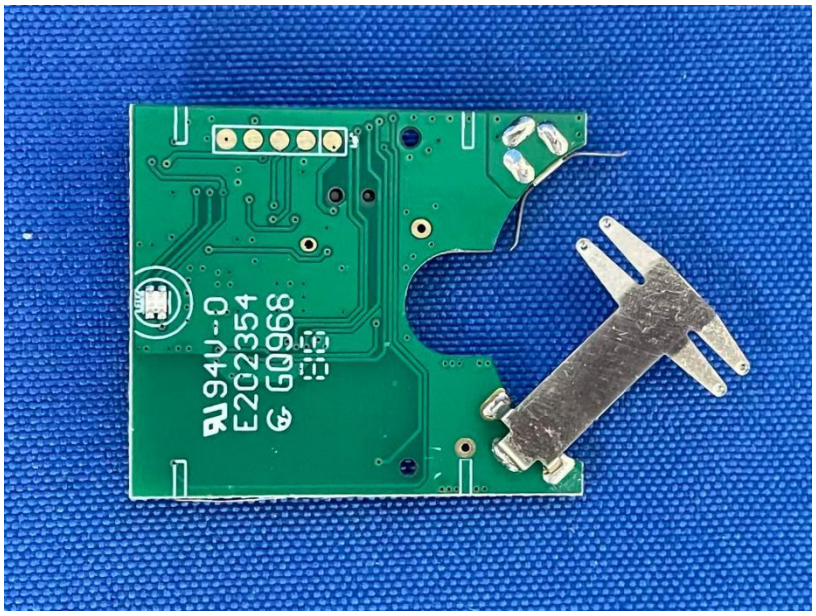
5
6
7
Made in





******THE END REPORT******