

TEST REPORT

Product : Zigbee PCB Module
Trade mark : ENNFU
Model/Type reference : T30P127F2.4G
Serial Number : N/A
Report Number : EED32J00192901
FCC ID : 2ANLK-T30C
Date of Issue: : Sep. 27, 2017
Test Standards : 47 CFR Part 15 Subpart C
Test result : PASS

Prepared for:

ENNFU SCIENTIFIC COMPANY LIMITED
A606, 6F, Area A, University Of Pioneer Park, No. 99, Daxue Road,
Tongshan District, Xuzhou, Jiangsu Province, P.R.China

Prepared by:

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Date:

Sep. 27, 2017

Check No.:2827583977



2 Version

Version No.	Date	Description
00	Sep. 27, 2017	Original

3 Test Summary

Test Item	Test Requirement	Test method	Result
Antenna Requirement	47 CFR Part 15, Subpart C Section 15.203/15.247 (c)	ANSI C63.10-2013	PASS
AC Power Line Conducted Emission	47 CFR Part 15, Subpart C Section 15.207	ANSI C63.10-2013	PASS
Conducted Peak Output Power	47 CFR Part 15, Subpart C Section 15.247 (b)(3)	ANSI C63.10-2013/ KDB 558074 D01v04	PASS
6dB Occupied Bandwidth	47 CFR Part 15, Subpart C Section 15.247 (a)(2)	ANSI C63.10-2013/ KDB 558074 D01v04	PASS
Power Spectral Density	47 CFR Part 15, Subpart C Section 15.247 (e)	ANSI C63.10-2013/ KDB 558074 D01v04	PASS
Band-edge for RF Conducted Emissions	47 CFR Part 15, Subpart C Section 15.247(d)	ANSI C63.10-2013/ KDB 558074 D01v04	PASS
RF Conducted Spurious Emissions	47 CFR Part 15, Subpart C Section 15.247(d)	ANSI C63.10-2013/ KDB 558074 D01v04	PASS
Radiated Spurious Emissions	47 CFR Part 15, Subpart C Section 15.205/15.209	ANSI C63.10-2013	PASS
Restricted bands around fundamental frequency (Radiated Emission)	47 CFR Part 15, Subpart C Section 15.205/15.209	ANSI C63.10-2013	PASS

Remark:

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

Tx: In this whole report Tx (or tx) means Transmitter.
 Rx: In this whole report Rx (or rx) means Receiver.
 RF: In this whole report RF means Radiated Frequency.
 CH: In this whole report CH means channel.
 Volt: In this whole report Volt means Voltage.
 Temp: In this whole report Temp means Temperature.
 Humid: In this whole report Humid means humidity.
 Press: In this whole report Press means Pressure.
 N/A: In this whole report not application.

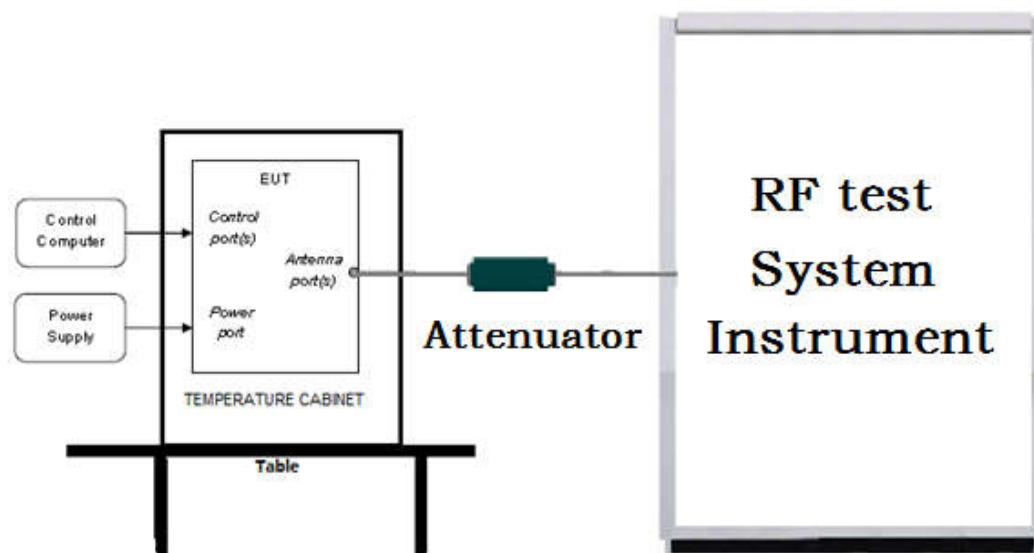
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5 Test Requirement

5.1 Test setup

5.1.1 For Conducted test setup



5.1.2 For Radiated Emissions test setup

Radiated Emissions setup:

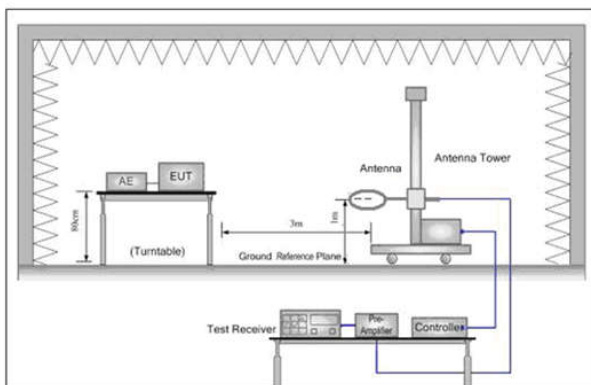


Figure 1. Below 30MHz

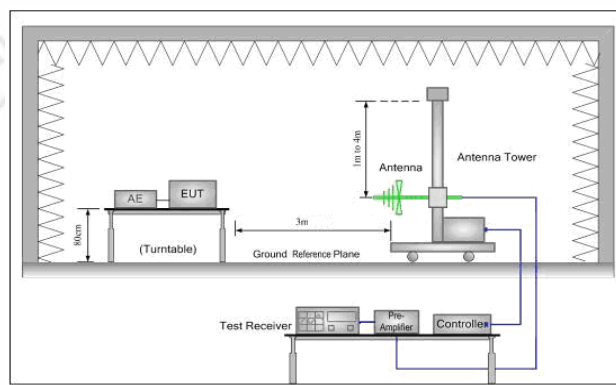


Figure 2. 30MHz to 1GHz

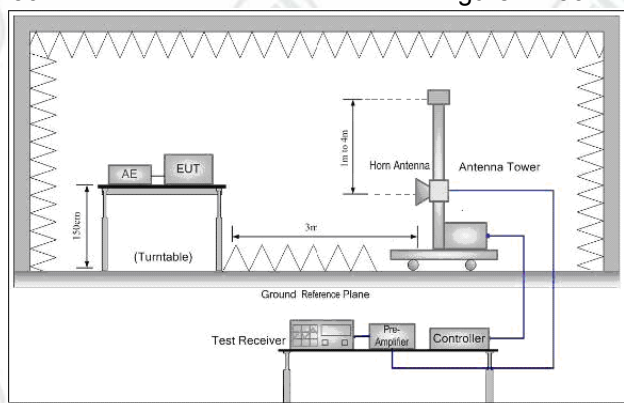
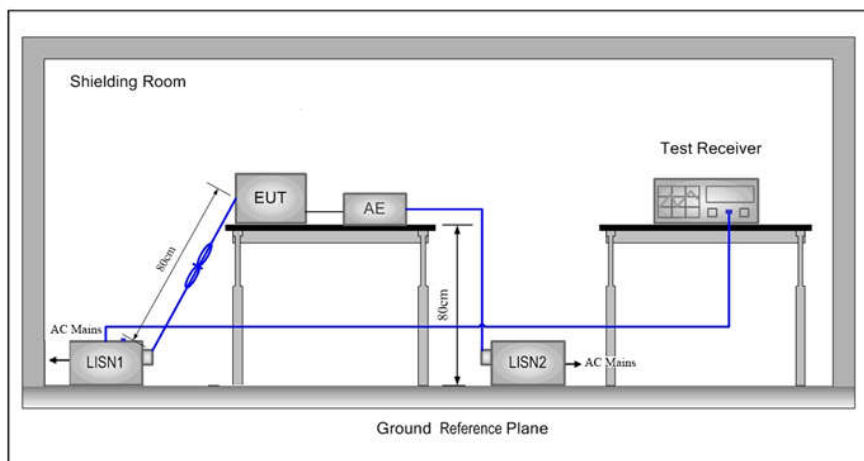


Figure 3. Above 1GHz

5.1.3 For Conducted Emissions test setup

Conducted Emissions setup



5.2 Test Environment

Operating Environment:	
Temperature:	24.8 °C
Humidity:	60 % RH
Atmospheric Pressure:	1010mbar

5.3 Test Condition

Test channel:

Test Mode	Tx/Rx	RF Channel		
		Low(L)	Middle(M)	High(H)
QPSK	2405MHz-2480MHz	Channel 1	Channel 20	Channel40
		2405MHz	2440MHz	2480MHz
Transmitting mode:	The EUT transmitted the continuous signal at the specific channel(s).			

6 General Information

6.1 Client Information

Applicant:	ENNFU SCIENTIFIC COMPANY LIMITED
Address of Applicant:	A606, 6F, Area A, University Of Pioneer Park, No. 99, Daxue Road, Tongshan District, Xuzhou, Jiangsu Province, P.R.China
Manufacturer:	ENNFU SCIENTIFIC COMPANY LIMITED
Address of Manufacturer:	A606, 6F, Area A, University Of Pioneer Park, No. 99, Daxue Road, Tongshan District, Xuzhou, Jiangsu Province, P.R.China
Factory:	ENNFU SCIENTIFIC COMPANY LIMITED
Address of Factory:	A606, 6F, Area A, University Of Pioneer Park, No. 99, Daxue Road, Tongshan District, Xuzhou, Jiangsu Province, P.R.China

6.2 General Description of EUT

Product Name:	Zigbee PCB Module
Model No.(EUT):	T30P127F2.4G
Tark mark:	ENNFU
<i>EUT Supports Radios application</i>	Zigbee
Power Supply:	DC 3.3V
Sample Received Date:	Aug. 30, 2017
Sample tested Date:	Aug. 30, 2017 to Sep. 27, 2017

6.3 Product Specification subjective to this standard

Operation Frequency:	2405MHz-2480MHz
Modulation Type:	QPSK
Number of Channel:	16
Test Power Grade:	SmartRF_Studio_7-2.6.0(manufacturer declare)
Test Software of EUT:	N/A
Antenna Type and Gain::	Modular antenna and 3dBi
Test Voltage:	DC 3.3V

Operation Frequency each of channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2405MHz	5	2425MHz	9	2445MHz	13	2465MHz
2	2410MHz	6	2430MHz	10	2450MHz	14	2470MHz
3	2415MHz	7	2435MHz	11	2455MHz	15	2475MHz
4	2420MHz	8	2440MHz	12	2460MHz	16	2480MHz

6.4 Description of Support Units

None.

6.5 Test Location

All tests were performed at:

Centre Testing International Group Co., Ltd.

Hongwei Industrial Zone, Bao'an 70 District, Shenzhen, Guangdong, China518101

Telephone: +86 (0) 755 33683668 Fax:+86 (0) 755 33683385

No tests were sub-contracted.

6.6 Deviation from Standards

None.

6.7 Abnormalities from Standard Conditions

None.

6.8 Other Information Requested by the Customer

None.

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

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

7 Equipment List

RF test system					
Equipment	Manufacturer	Model No.	Serial Number	Cal. Date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
Signal Generator	Keysight	E8257D	MY53401106	03-14-2017	03-13-2018
Spectrum Analyzer	Keysight	N9010A	MY54510339	03-14-2017	03-13-2018
Signal Generator	Keysight	N5182B	MY53051549	03-14-2017	03-13-2018
High-pass filter	Sinoscite	FL3CX03WG18 NM12-0398-002	---	01-11-2017	01-10-2018
High-pass filter	MICRO-TRONICS	SPA-F-63029-4	---	01-11-2017	01-10-2018
DC Power	Keysight	E3642A	MY54436035	03-14-2017	03-13-2018
PC-1	Lenovo	R4960d	---	04-01-2017	03-31-2018
BT&Wi-Fi Automatic control	R&S	OSP120	101374	03-14-2017	03-13-2018
RF control unit	JS Tonscend	JS0806-2	158060006	03-14-2017	03-13-2018
BT&Wi-Fi Automatic test software	JS Tonscend	JS1120-2	---	03-14-2017	03-13-2018

3M Semi/full-anechoic Chamber					
Equipment	Manufacturer	Model No.	Serial Number	Cal. date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
3M Chamber & Accessory Equipment	TDK	SAC-3	---	06-05-2016	06-05-2019
TRILOG Broadband Antenna	SCHWARZBEC K	VULB9163	9163-484	05-23-2017	05-22-2018
Microwave Preamplifier	Agilent	8449B	3008A02425	02-16-2017	02-15-2018
Horn Antenna	ETS-LINDGREN	3117	00057407	07-20-2015	07-18-2018
Loop Antenna	ETS	6502	00071730	07-30-2016	07-28-2018
Microwave Preamplifier	A.H.SYSTEMS	PAP-1840-60	6041.6042	06-30-2015	06-28-2018
Horn Antenna	A.H.SYSTEMS	SAS-574 374	---	06-30-2015	06-28-2018
Spectrum Analyzer	R&S	FSP40	100416	06-13-2017	06-12-2018
Receiver	R&S	ESCI	100435	06-14-2017	06-13-2018
Multi device Controller	maturo	NCD/070/10711 112	---	01-11-2017	01-10-2018
LISN	schwarzbeck	NNBM8125	81251547	06-13-2017	06-12-2018
LISN	schwarzbeck	NNBM8125	81251548	06-13-2017	06-12-2018
Signal Generator	Agilent	E4438C	MY45095744	03-14-2017	03-13-2018
Signal Generator	Keysight	E8257D	MY53401106	03-14-2017	03-13-2018
Temperature/ Humidity Indicator	TAYLOR	1451	1905	05-08-2017	05-07-2018
Communication test set	Agilent	E5515C	GB47050534	03-14-2017	03-13-2018
Cable line	Fulai(7M)	SF106	5219/6A	01-11-2017	01-10-2018
Cable line	Fulai(6M)	SF106	5220/6A	01-11-2017	01-10-2018
Cable line	Fulai(3M)	SF106	5216/6A	01-11-2017	01-10-2018
Cable line	Fulai(3M)	SF106	5217/6A	01-11-2017	01-10-2018
Communication test set	R&S	CMW500	152394	03-14-2017	03-13-2018
High-pass filter	Sinoscite	FL3CX03WG18 NM12-0398-002	---	01-11-2017	01-10-2018
High-pass filter	MICRO-TRONICS	SPA-F-63029-4	---	01-11-2017	01-10-2018
band rejection filter	Sinoscite	FL5CX01CA09 CL12-0395-001	---	01-11-2017	01-10-2018
band rejection filter	Sinoscite	FL5CX01CA08 CL12-0393-001	---	01-11-2017	01-10-2018
band rejection filter	Sinoscite	FL5CX02CA04 CL12-0396-002	---	01-11-2017	01-10-2018
band rejection filter	Sinoscite	FL5CX02CA03 CL12-0394-001	---	01-11-2017	01-10-2018

Conducted disturbance Test					
Equipment	Manufacturer	Model No.	Serial Number	Cal. date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
Receiver	R&S	ESCI	100009	06-14-2017	06-13-2018
Temperature/ Humidity Indicator	TAYLOR	1451	1905	05-08-2017	05-07-2018
Communication test set	Agilent	E5515C	GB47050534	03-14-2017	03-13-2018
Communication test set	R&S	CMW500	152394	03-14-2017	03-13-2018
LISN	R&S	ENV216	100098	06-13-2017	06-12-2018
LISN	schwarzbeck	NNLK8121	8121-529	06-13-2017	06-12-2018
Voltage Probe	R&S	ESH2-Z3	--	06-13-2017	06-11-2020
Current Probe	R&S	EZ17	100106	06-13-2017	06-12-2018
ISN	TESEQ GmbH	ISN T800	30297	02-23-2017	02-22-2018

8 Radio Technical Requirements Specification

Reference documents for testing:

No.	Identity	Document Title
1	FCC Part15C (2015)	Subpart C-Intentional Radiators
2	ANSI C63.10-2013	American National Standard for Testing Unlicensed Wireless Devices

Test Results List:

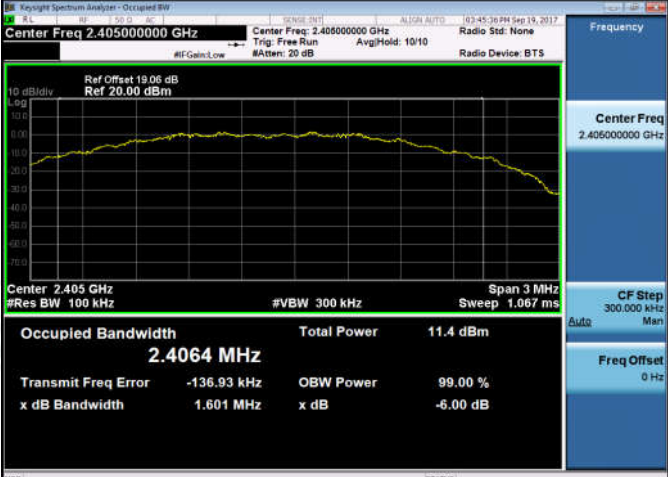
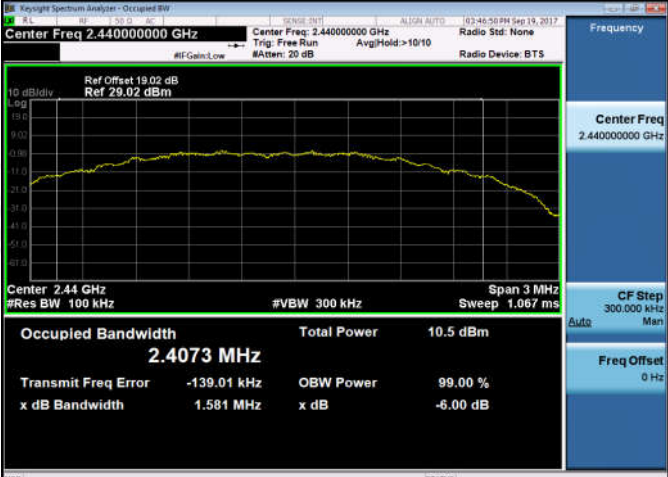
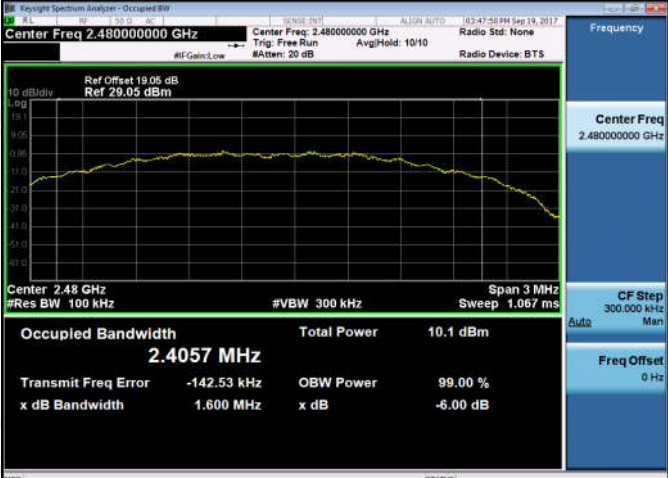
Test Requirement	Test method	Test item	Verdict	Note
Part15C Section 15.247 (a)(2)	ANSI C63.10	6dB Occupied Bandwidth	PASS	Appendix A)
Part15C Section 15.247 (b)(3)	ANSI C63.10	Conducted Peak Output Power	PASS	Appendix B)
Part15C Section 15.247(d)	ANSI C63.10	Band-edge for RF Conducted Emissions	PASS	Appendix C)
Part15C Section 15.247(d)	ANSI C63.10	RF Conducted Spurious Emissions	PASS	Appendix D)
Part15C Section 15.247 (e)	ANSI C63.10	Power Spectral Density	PASS	Appendix E)
Part15C Section 15.203/15.247 (c)	ANSI C63.10	Antenna Requirement	PASS	Appendix F)
Part15C Section 15.207	ANSI C63.10	AC Power Line Conducted Emission	PASS	Appendix G)
Part15C Section 15.205/15.209	ANSI C63.10	Restricted bands around fundamental frequency (Radiated Emission)	PASS	Appendix H)
Part15C Section 15.205/15.209	K ANSI C63.10	Radiated Spurious Emissions	PASS	Appendix I)

Appendix A): 6dB Occupied Bandwidth

Test Result

Mode	Channel	6dB Bandwidth [MHz]	99% OBW[MHz]	Verdict	Remark
Zigbee	LCH	1.601	2.4064	PASS	Peak detector
Zigbee	MCH	1.581	2.4073	PASS	
Zigbee	HCH	1.600	2.4057	PASS	

Test Graphs

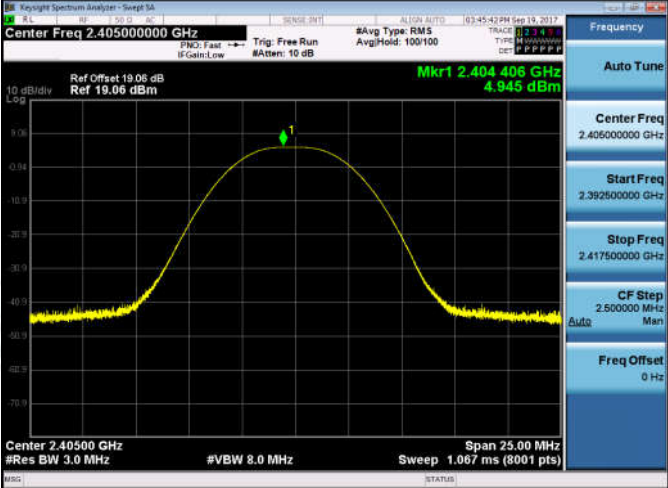
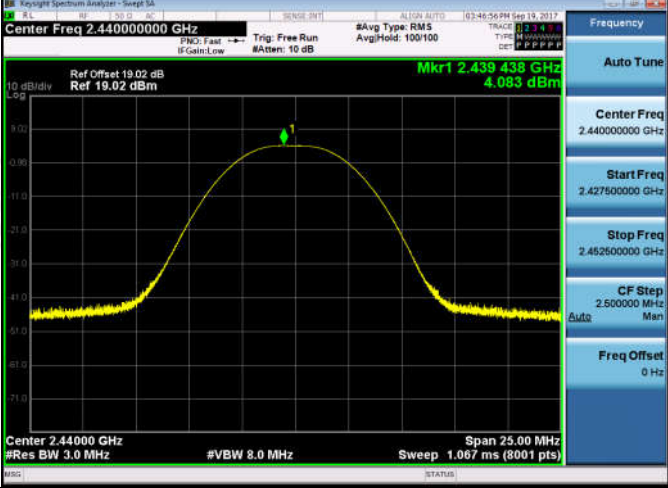
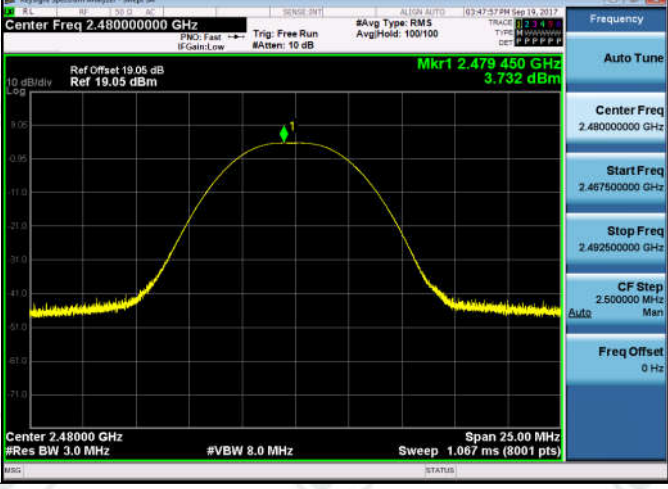
Graphs	
LCH	 Keygraph Spectrum Analyzer - Occupied BW Center Freq: 2.405000000 GHz Ref Offset: 19.06 dB Ref: 20.00 dBm Center: 2.405 GHz #Res BW: 100 kHz #VBW: 300 kHz Span: 3 MHz Sweep: 1.067 ms Occupied Bandwidth: 2.4064 MHz Total Power: 11.4 dBm Transmit Freq Error: -136.93 kHz OBW Power: 99.00 % x dB Bandwidth: 1.601 MHz x dB: -6.00 dB
MCH	 Keygraph Spectrum Analyzer - Occupied BW Center Freq: 2.440000000 GHz Ref Offset: 19.02 dB Ref: 20.02 dBm Center: 2.44 GHz #Res BW: 100 kHz #VBW: 300 kHz Span: 3 MHz Sweep: 1.067 ms Occupied Bandwidth: 2.4073 MHz Total Power: 10.5 dBm Transmit Freq Error: -139.01 kHz OBW Power: 99.00 % x dB Bandwidth: 1.581 MHz x dB: -6.00 dB
HCH	 Keygraph Spectrum Analyzer - Occupied BW Center Freq: 2.480000000 GHz Ref Offset: 19.05 dB Ref: 20.05 dBm Center: 2.48 GHz #Res BW: 100 kHz #VBW: 300 kHz Span: 3 MHz Sweep: 1.067 ms Occupied Bandwidth: 2.4057 MHz Total Power: 10.1 dBm Transmit Freq Error: -142.53 kHz OBW Power: 99.00 % x dB Bandwidth: 1.600 MHz x dB: -6.00 dB

Appendix B): Conducted Peak Output Power

Test Result

Mode	Channel	Conduct Peak Power[dBm]	Verdict
Zigbee	LCH	4.945	PASS
Zigbee	MCH	4.083	PASS
Zigbee	HCH	3.732	PASS

Test Graphs

Graphs	
LCH	 Keygraph Spectrum Analyzer - Sweep SA Center Freq 2.40500000 GHz Ref Offset 19.06 dB Ref 19.06 dBm Mkr1 2.404 406 GHz 4.945 dBm Auto Tune Center Freq 2.40500000 GHz Start Freq 2.392500000 GHz Stop Freq 2.417500000 GHz CF Step 2.500000 MHz Man Freq Offset 0 Hz Center 2.40500 GHz #Res BW 3.0 MHz #VBW 8.0 MHz Sweep 1.067 ms (8001 pts)
MCH	 Keygraph Spectrum Analyzer - Sweep SA Center Freq 2.44000000 GHz Ref Offset 19.02 dB Ref 19.02 dBm Mkr1 2.439 438 GHz 4.083 dBm Auto Tune Center Freq 2.44000000 GHz Start Freq 2.427500000 GHz Stop Freq 2.452500000 GHz CF Step 2.500000 MHz Man Freq Offset 0 Hz Center 2.44000 GHz #Res BW 3.0 MHz #VBW 8.0 MHz Sweep 1.067 ms (8001 pts)
HCH	 Keygraph Spectrum Analyzer - Sweep SA Center Freq 2.48000000 GHz Ref Offset 19.05 dB Ref 19.05 dBm Mkr1 2.479 450 GHz 3.732 dBm Auto Tune Center Freq 2.48000000 GHz Start Freq 2.467500000 GHz Stop Freq 2.492500000 GHz CF Step 2.500000 MHz Man Freq Offset 0 Hz Center 2.48000 GHz #Res BW 3.0 MHz #VBW 8.0 MHz Sweep 1.067 ms (8001 pts)

Appendix C): Band-edge for RF Conducted Emissions

Result Table

Mode	Channel	Carrier Power[dBm]	Max.Spurious Level [dBm]	Limit [dBm]	Verdict
Zigbee	LCH	0.822	-58.759	-19.18	PASS
Zigbee	HCH	0.285	-52.429	-19.72	PASS

Test Graphs

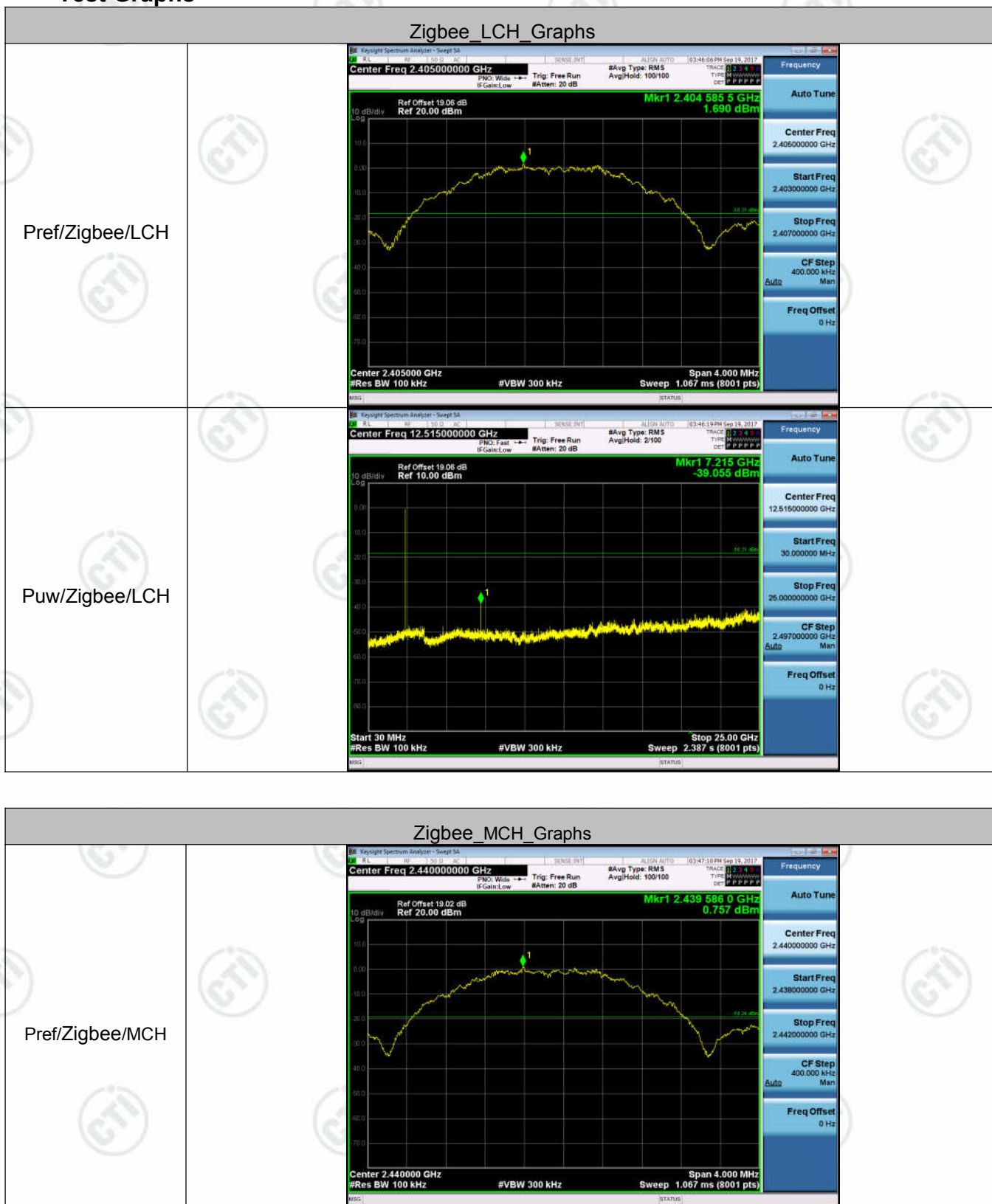


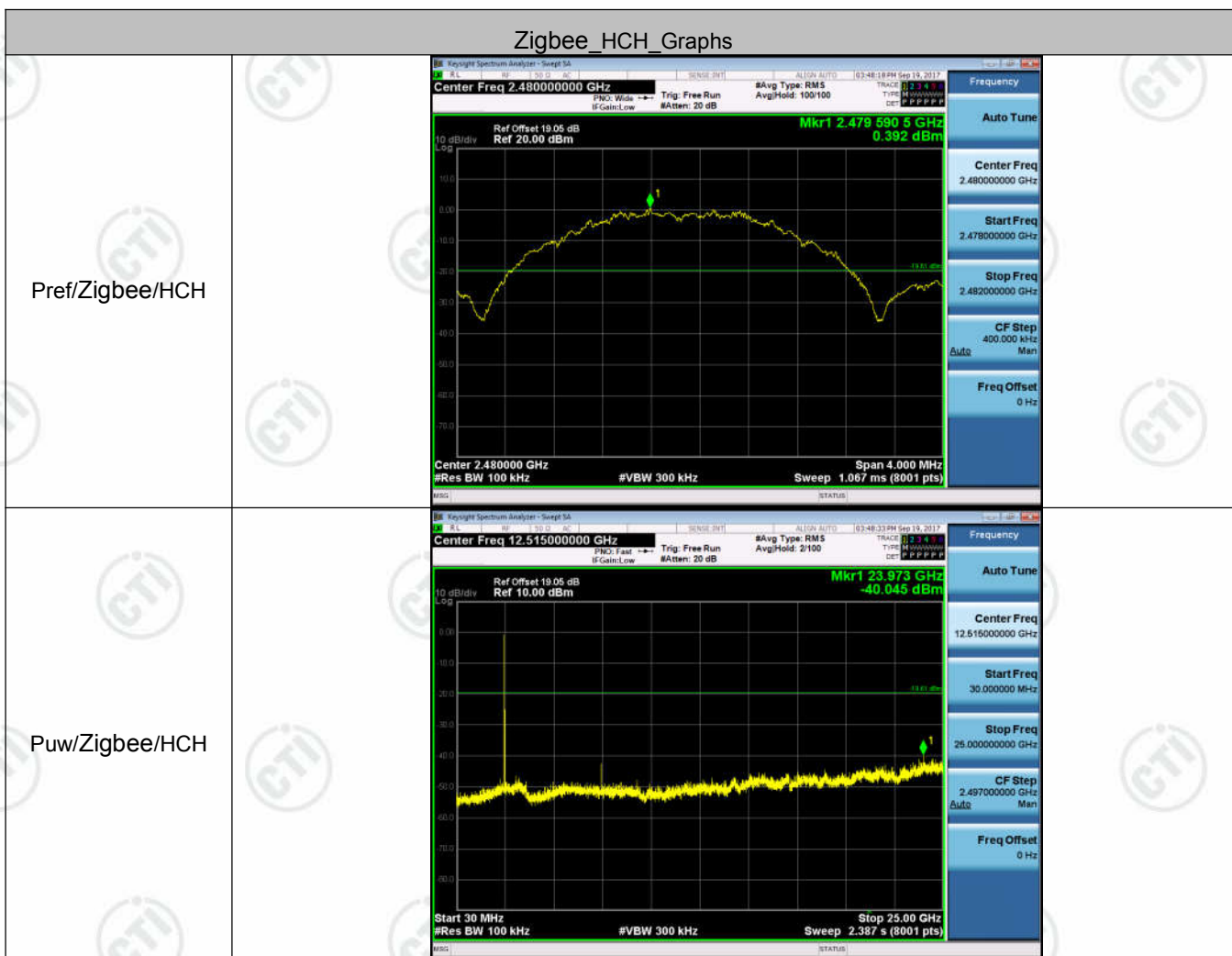
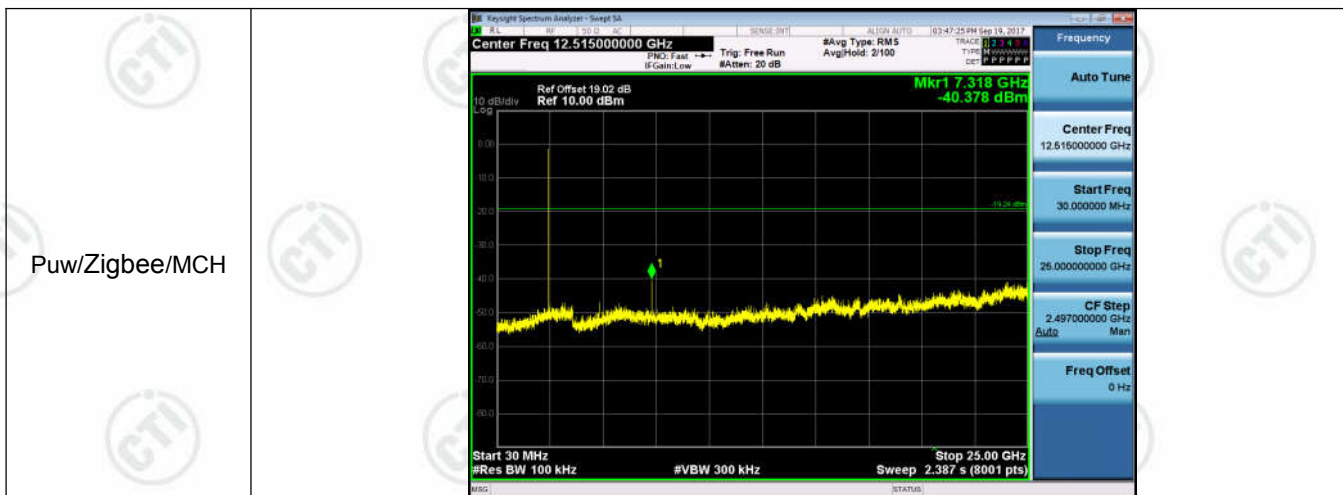
Appendix D): RF Conducted Spurious Emissions

Result Table

Mode	Channel	Pref [dBm]	Puw[dBm]	Verdict
Zigbee	LCH	1.69	<Limit	PASS
Zigbee	MCH	0.757	<Limit	PASS
Zigbee	HCH	0.392	<Limit	PASS

Test Graphs



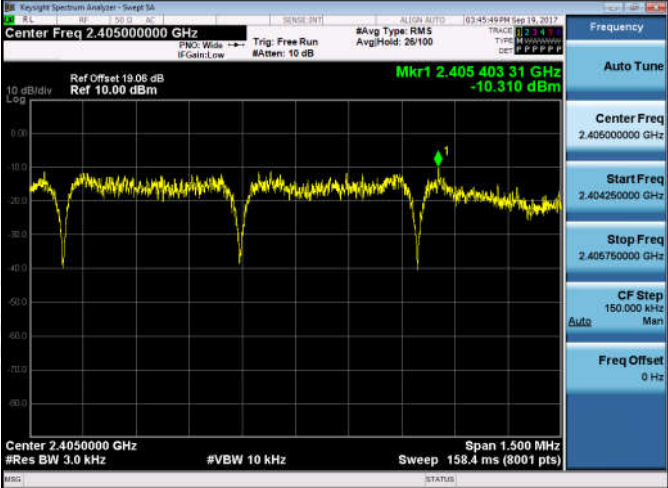
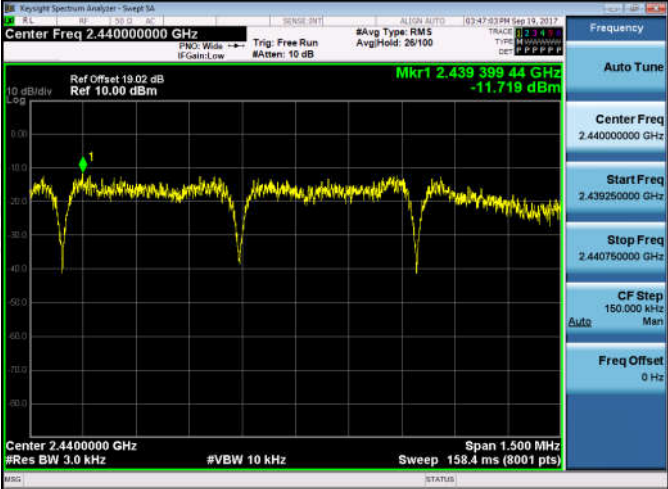
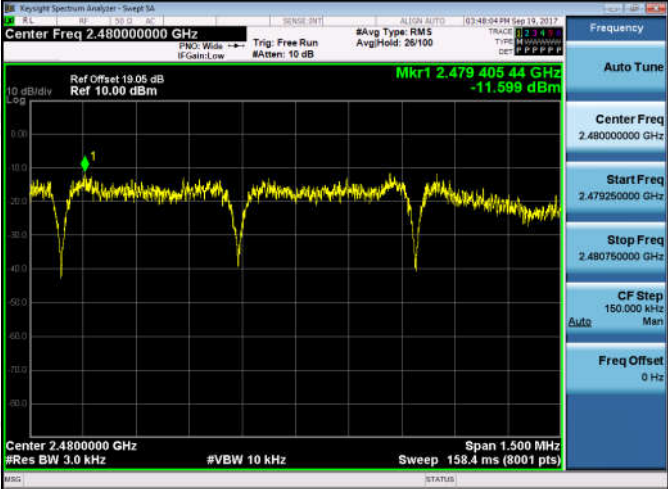


Appendix E): Power Spectral Density

Result Table

Mode	Channel	PSD [dBm/3kHz]	Limit [dBm/3kHz]	Verdict
Zigbee	LCH	-10.310	8	PASS
Zigbee	MCH	-11.719	8	PASS
Zigbee	HCH	-11.599	8	PASS

Test Graphs

Graphs	
LCH	
MCH	
HCH	

Appendix F): Antenna Requirement

15.203 requirement:

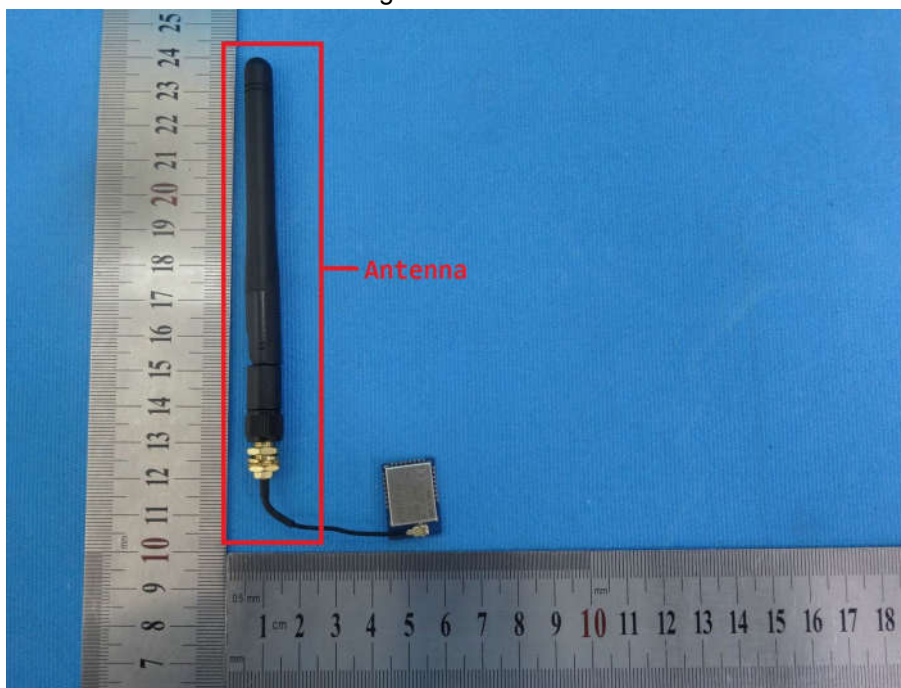
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

15.247(b) (4) requirement:

The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

EUT Antenna:

The antenna is modular antenna. The best case gain of the antenna is 3dBi.



Appendix G): AC Power Line Conducted Emission

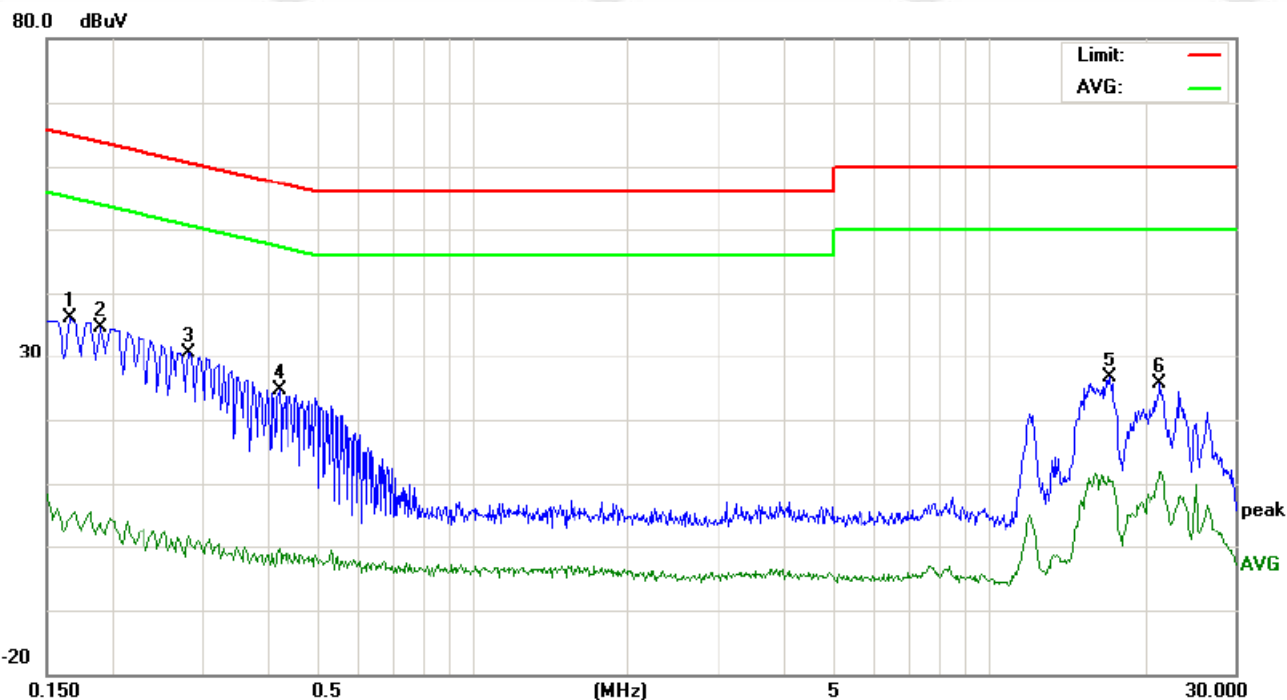
Test Procedure:	Test frequency range :150KHz-30MHz 1) The mains terminal disturbance voltage test was conducted in a shielded room. 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50Ω/50μH + 5Ω linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded. 3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2. 5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 on conducted measurement.																
Limit:	<table><tr><th rowspan="2">Frequency range (MHz)</th><th colspan="2">Limit (dBuV)</th></tr><tr><th>Quasi-peak</th><th>Average</th></tr><tr><td>0.15-0.5</td><td>66 to 56*</td><td>56 to 46*</td></tr><tr><td>0.5-5</td><td>56</td><td>46</td></tr><tr><td>5-30</td><td>60</td><td>50</td></tr></table> * The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz. NOTE : The lower limit is applicable at the transition frequency			Frequency range (MHz)	Limit (dBuV)		Quasi-peak	Average	0.15-0.5	66 to 56*	56 to 46*	0.5-5	56	46	5-30	60	50
Frequency range (MHz)	Limit (dBuV)																
	Quasi-peak	Average															
0.15-0.5	66 to 56*	56 to 46*															
0.5-5	56	46															
5-30	60	50															

Measurement Data

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

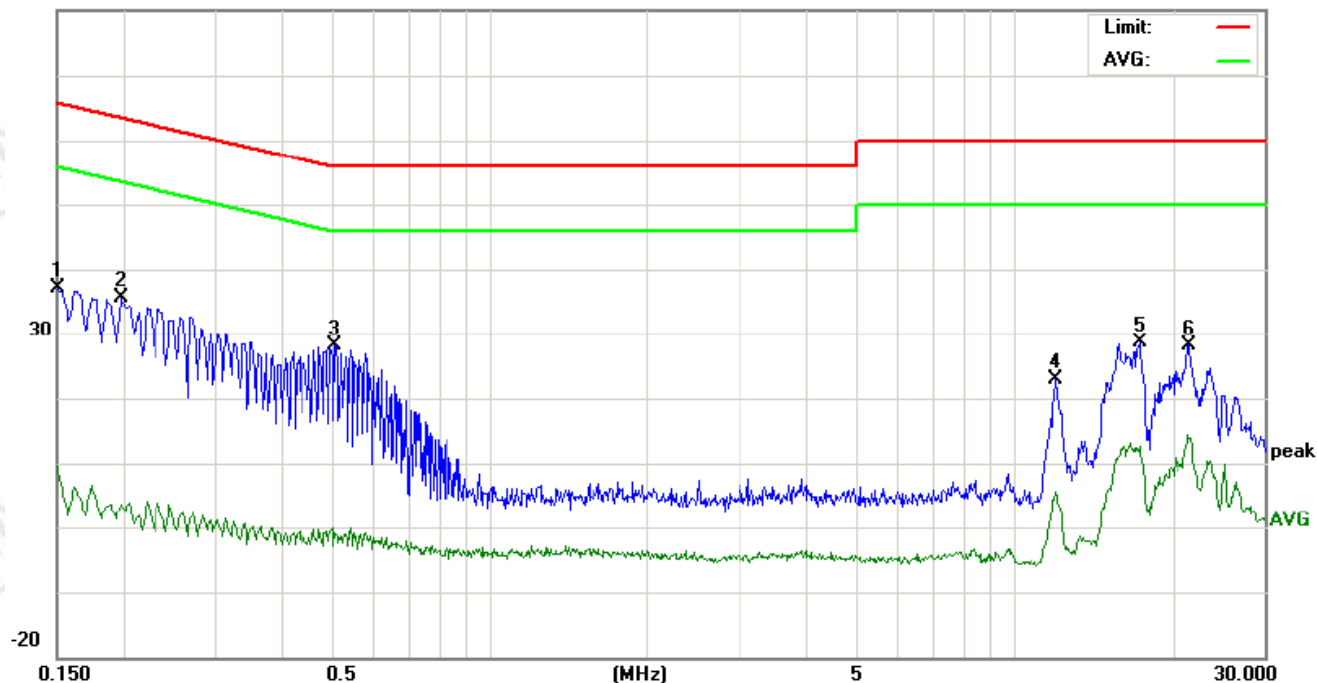
Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

Live line:



No.	Freq. MHz	Reading_Level (dBuV)			Correct Factor dB	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG		peak	QP	AVG	QP	AVG	QP	AVG		
1	0.1660	26.33	17.82	-6.71	9.75	36.08	27.57	3.04	65.15	55.15	-37.58	-52.11	P	
2	0.1900	25.02	16.56	-7.52	9.72	34.74	26.28	2.20	64.03	54.03	-37.75	-51.83	P	
3	0.2819	20.90	12.25	-10.1	9.77	30.67	22.02	-0.38	60.76	50.76	-38.74	-51.14	P	
4	0.4220	14.94	4.91	-12.5	9.74	24.68	14.65	-2.82	57.41	47.41	-42.76	-50.23	P	
5	17.1500	16.52	8.62	-0.33	10.03	26.55	18.65	9.70	60.00	50.00	-41.35	-40.30	P	
6	21.5820	15.58	8.17	0.08	10.10	25.68	18.27	10.18	60.00	50.00	-41.73	-39.82	P	

Neutral line:
80.0 dBuV



No.	Freq. MHz	Reading_Level (dBuV)			Correct Factor dB	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG		peak	QP	AVG	QP	AVG	QP	AVG		
1	0.1500	27.41	18.81	-1.86	9.77	37.18	28.58	7.91	65.99	55.99	-37.41	-48.08	P	
2	0.1980	25.84	16.70	-7.75	9.71	35.55	26.41	1.96	63.69	53.69	-37.28	-51.73	P	
3	0.5100	18.53	8.51	-12.0	9.71	28.24	18.22	-2.34	56.00	46.00	-37.78	-48.34	P	
4	12.0340	12.88	4.58	-5.21	9.88	22.76	14.46	4.67	60.00	50.00	-45.54	-45.33	P	
5	17.3460	18.56	9.59	0.22	10.03	28.59	19.62	10.25	60.00	50.00	-40.38	-39.75	P	
6	21.6460	18.14	11.60	3.51	10.10	28.24	21.70	13.61	60.00	50.00	-38.30	-36.39	P	

Notes:

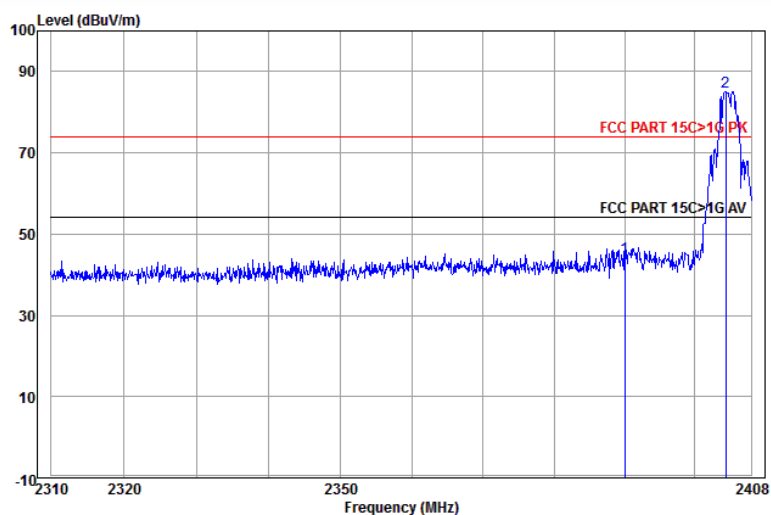
1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level = Receiver Reading + LISN Factor + Cable Loss.

Appendix H): Restricted bands around fundamental frequency (Radiated)

Receiver Setup:	Frequency	Detector	RBW	VBW	Remark
	30MHz-1GHz	Quasi-peak	120 kHz	300kHz	Quasi-peak
	Above 1GHz	Peak	1MHz	3MHz	Peak
		Peak	1MHz	10Hz	Average
Test Procedure:	Below 1GHz test procedure as below: - The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation. - The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. - The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. - For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. - The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. - Place a marker at the end of the restricted band closest to the transmit frequency to show compliance. Also measure any emissions in the restricted bands. Save the spectrum analyzer plot. Repeat for each power and modulation for lowest and highest channel Above 1GHz test procedure as below: - Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber change form table 0.8 metre to 1.5 metre(Above 18GHz the distance is 1 meter and table is 1.5 metre). . Test the EUT in the lowest channel , the Highest channel - The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is worse case. - Repeat above procedures until all frequencies measured was complete.				
Limit:	Frequency	Limit (dBuV/m @3m)		Remark	
	30MHz-88MHz	40.0		Quasi-peak Value	
	88MHz-216MHz	43.5		Quasi-peak Value	
	216MHz-960MHz	46.0		Quasi-peak Value	
	960MHz-1GHz	54.0		Quasi-peak Value	
	Above 1GHz	54.0		Average Value	
		74.0		Peak Value	

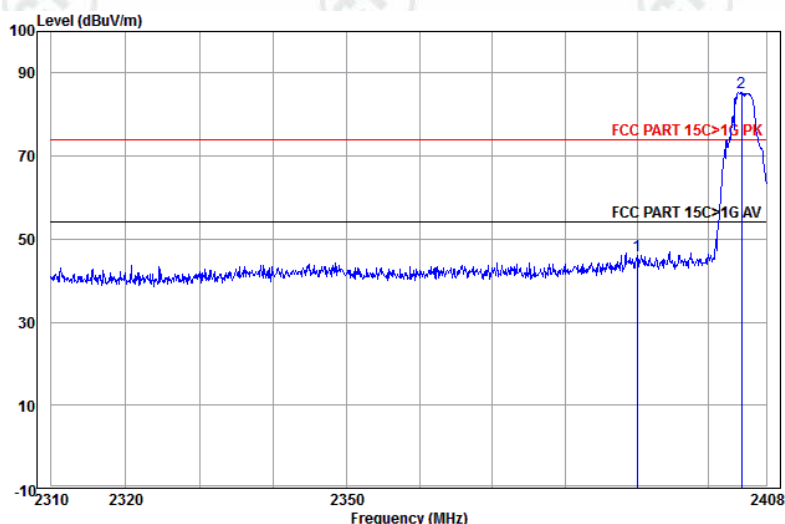
Test plot as follows:

Test mode:	QPSK		
Frequency: 2390.0MHz	Test channel: Lowest	Polarization: Horizontal	Remark: Peak



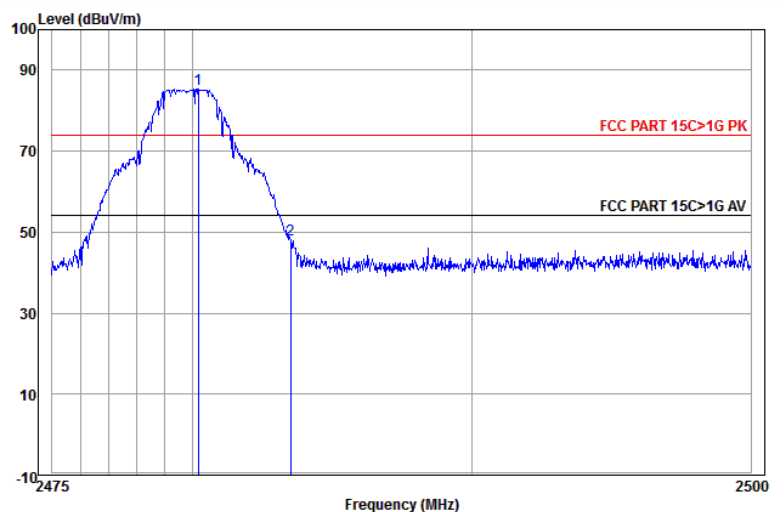
	Ant Freq	Cable Factor	Preamp Loss	Read Level	Read Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2390.000	32.53	3.07	44.03	52.57	44.14	74.00	-29.86	Horizontal Peak
2 pp	2404.401	32.56	3.08	44.05	93.45	85.04	74.00	11.04	Horizontal Peak

Test mode:	QPSK		
Frequency: 2390.0MHz	Test channel: Lowest	Polarization: Vertical	Remark: Peak



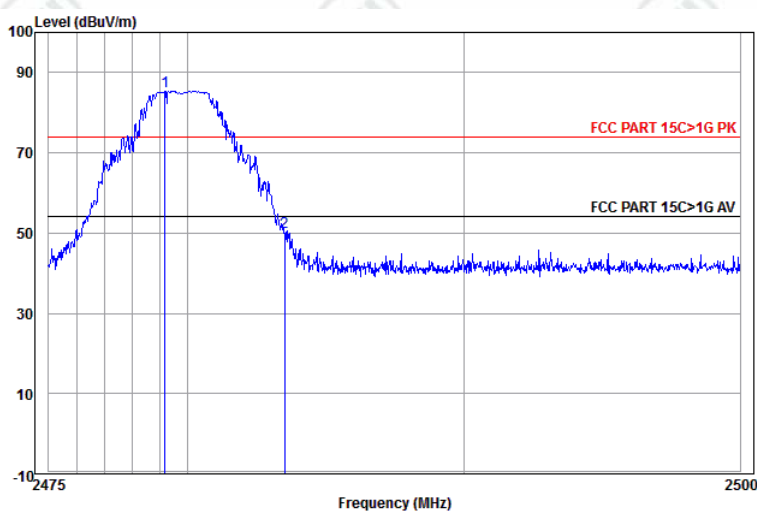
	Ant Freq	Cable Factor	Preamp Loss	Read Level	Read Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2390.000	32.53	3.07	44.03	54.49	46.06	74.00	-27.94	Vertical Peak
2 pp	2404.601	32.56	3.08	44.05	93.63	85.22	74.00	11.22	Vertical Peak

Test mode:	QPSK		
Frequency: 2483.5MHz	Test channel: Highest	Polarization: Horizontal	Remark: Peak



	Ant Freq	Cable Factor	Preamp Loss	Read Level	Limit Level	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dB	dBuV	dBuV/m	dB	
1 pp	2480.204	32.71	3.12	44.14	93.54	85.23	74.00	11.23 Horizontal Peak
2	2483.500	32.71	3.12	44.14	56.33	48.02	74.00	-25.98 Horizontal Peak

Test mode:	QPSK		
Frequency: 2483.5MHz	Test channel: Highest	Polarization: Vertical	Remark: Peak



	Ant Freq	Cable Factor	Preamp Loss	Read Level	Limit Level	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dB	dBuV	dBuV/m	dB	
1 pp	2479.182	32.71	3.12	44.14	93.69	85.38	74.00	11.38 Vertical Peak
2	2483.500	32.71	3.12	44.14	58.69	50.38	74.00	-23.62 Vertical Peak

Note:

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

Final Test Level = Receiver Reading - Correct Factor

Correct Factor = Preamplifier Factor - Antenna Factor - Cable Factor

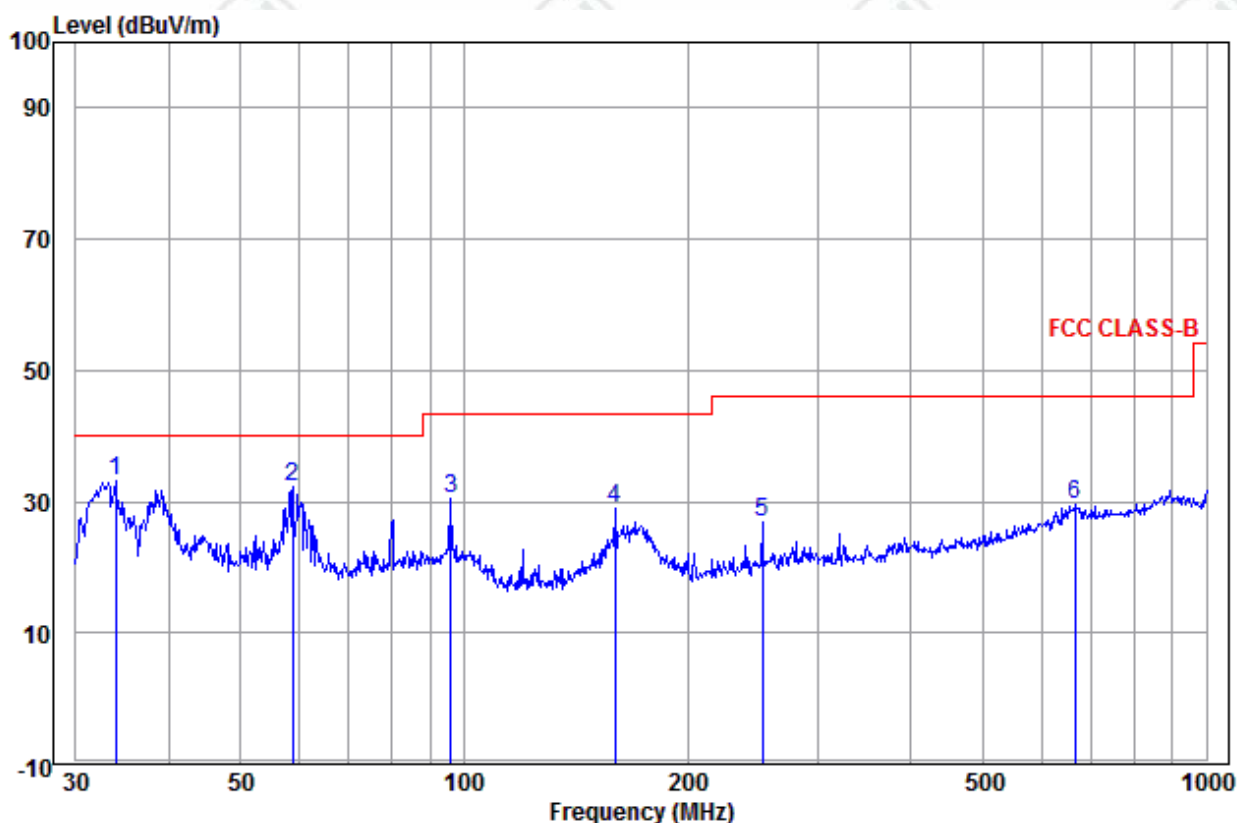
Appendix I): Radiated Spurious Emissions

Receiver Setup:	Frequency	Detector	RBW	VBW	Remark
	0.009MHz-0.090MHz	Peak	10kHz	30kHz	Peak
	0.009MHz-0.090MHz	Average	10kHz	30kHz	Average
	0.090MHz-0.110MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
	0.110MHz-0.490MHz	Peak	10kHz	30kHz	Peak
	0.110MHz-0.490MHz	Average	10kHz	30kHz	Average
	0.490MHz -30MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
	30MHz-1GHz	Quasi-peak	120 kHz	300kHz	Quasi-peak
	Above 1GHz	Peak	1MHz	3MHz	Peak
Peak		1MHz	10Hz	Average	
Test Procedure:					
Below 1GHz test procedure as below:					
a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation. b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.					
Above 1GHz test procedure as below:					
g. Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber and change form table 0.8 metre to 1.5 metre(Above 18GHz the distance is 1 meter and table is 1.5 metre). h. Test the EUT in the lowest channel ,the middle channel ,the Highest channel i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is worse case. j. Repeat above procedures until all frequencies measured was complete.					
Limit:	Frequency	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)
	0.009MHz-0.490MHz	2400/F(kHz)	-	-	300
	0.490MHz-1.705MHz	24000/F(kHz)	-	-	30
	1.705MHz-30MHz	30	-	-	30
	30MHz-88MHz	100	40.0	Quasi-peak	3
	88MHz-216MHz	150	43.5	Quasi-peak	3
	216MHz-960MHz	200	46.0	Quasi-peak	3
	960MHz-1GHz	500	54.0	Quasi-peak	3
	Above 1GHz	500	54.0	Average	3
Note: 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.					

Radiated Spurious Emissions test Data: **Radiated Emission below 1GHz**

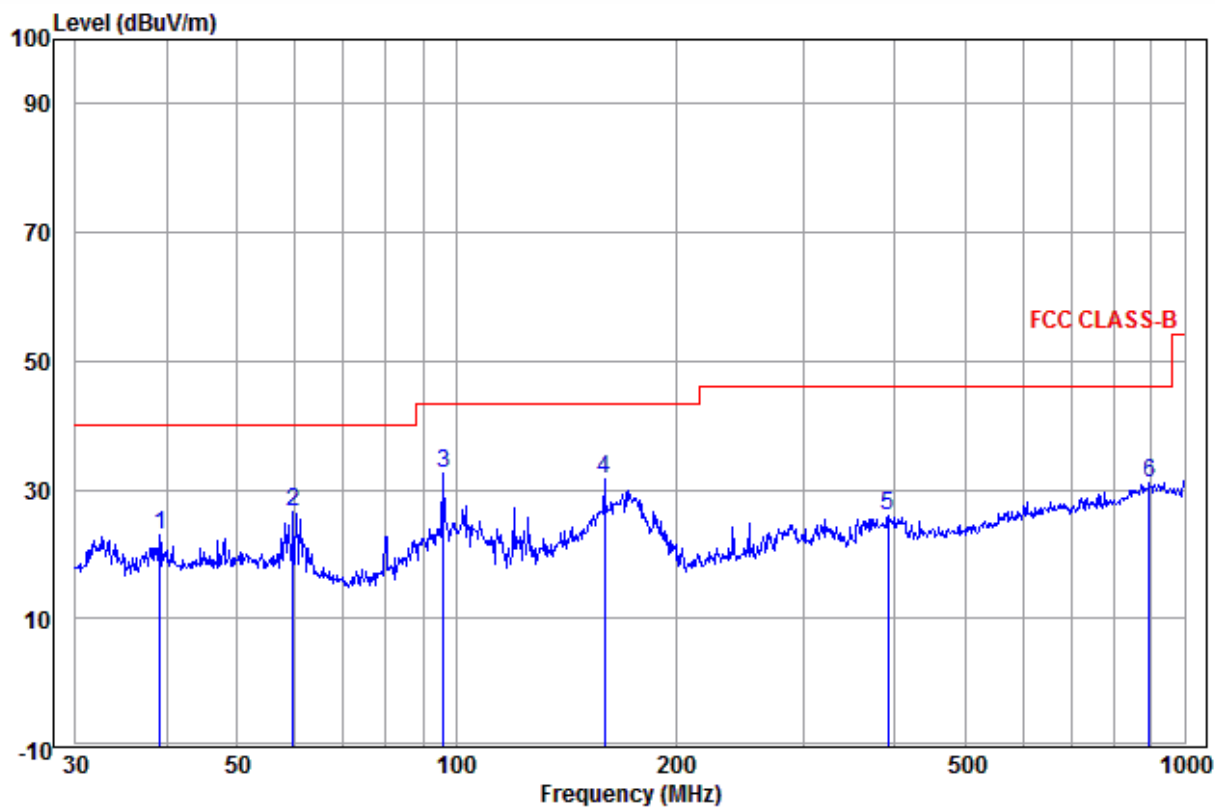
30MHz~1GHz (QP)

Test mode:	Transmitting	Vertical
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	Ant	Cable	Read	Limit	Over			
Freq	Factor	Loss	Level	Line	Limit	Pol/Phase	Remark	
MHz	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		
1 pp	33.917	12.71	0.07	20.38	33.16	40.00	-6.84	Vertical QP
2	58.819	13.26	0.20	18.92	32.38	40.00	-7.62	Vertical QP
3	96.099	11.90	0.52	18.11	30.53	43.50	-12.97	Vertical QP
4	159.784	9.39	0.72	18.86	28.97	43.50	-14.53	Vertical QP
5	252.063	12.64	1.33	12.81	26.78	46.00	-19.22	Vertical QP
6	665.804	18.96	1.89	8.79	29.64	46.00	-16.36	Vertical QP

Test mode:	Transmitting	Horizontal
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	Ant Freq	Cable Factor	Read Level	Limit Level	Over Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	39.162	13.66	0.05	9.26	22.97	40.00	-17.03	Horizontal QP
2	59.649	13.15	0.21	13.26	26.62	40.00	-13.38	Horizontal QP
3 pp	96.099	11.90	0.52	20.25	32.67	43.50	-10.83	Horizontal QP
4	159.784	9.39	0.72	21.66	31.77	43.50	-11.73	Horizontal QP
5	392.095	15.08	1.32	9.63	26.03	46.00	-19.97	Horizontal QP
6	893.857	22.00	2.49	6.71	31.20	46.00	-14.80	Horizontal QP

Transmitter Emission above 1GHz

Test mode:		QPSK		Test channel:		Lowest			
Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Read Level (dBμV)	Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Result	Antenna Polaxis
1263.883	30.38	1.96	44.29	46.23	34.28	74.00	-39.72	Pass	H
1823.477	31.43	2.66	43.66	46.69	37.12	74.00	-36.88	Pass	H
4810.000	34.70	5.99	44.60	44.44	40.53	74.00	-33.47	Pass	H
6678.987	36.25	7.27	44.57	45.41	44.36	74.00	-29.64	Pass	H
7215.000	36.42	6.96	44.78	43.58	42.18	74.00	-31.82	Pass	H
9620.000	37.90	6.99	45.57	44.13	43.45	74.00	-30.55	Pass	H
1241.562	30.32	1.93	44.33	47.37	35.29	74.00	-38.71	Pass	V
1782.177	31.37	2.62	43.70	46.64	36.93	74.00	-37.07	Pass	V
4810.000	34.70	5.99	44.60	44.46	40.55	74.00	-33.45	Pass	V
5880.782	35.81	7.32	44.51	45.44	44.06	74.00	-29.94	Pass	V
7215.000	36.42	6.96	44.78	45.78	44.38	74.00	-29.62	Pass	V
9620.000	37.90	6.99	45.57	43.76	43.08	74.00	-30.92	Pass	V

Test mode:		QPSK		Test channel:		Middle			
Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Read Level (dBμV)	Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Result	Antenna Polaxis
1192.011	30.21	1.85	44.40	47.06	34.72	74.00	-39.28	Pass	H
1659.574	31.16	2.48	43.82	47.22	37.04	74.00	-36.96	Pass	H
4880.000	34.85	6.13	44.60	45.14	41.52	74.00	-32.48	Pass	H
5850.919	35.79	7.29	44.51	45.21	43.78	74.00	-30.22	Pass	H
7320.000	36.43	6.85	44.87	43.96	42.37	74.00	-31.63	Pass	H
9760.000	38.05	7.12	45.55	42.78	42.40	74.00	-31.60	Pass	H
1296.469	30.45	2.01	44.25	47.04	35.25	74.00	-38.75	Pass	V
1541.476	30.95	2.34	43.95	47.51	36.85	74.00	-37.15	Pass	V
4880.000	34.85	6.13	44.60	44.33	40.71	74.00	-33.29	Pass	V
6445.156	36.13	7.32	44.55	45.90	44.80	74.00	-29.20	Pass	V
7320.000	36.43	6.85	44.87	50.10	48.51	74.00	-25.49	Pass	V
9760.000	38.05	7.12	45.55	43.22	42.84	74.00	-31.16	Pass	V

Test mode:		QPSK		Test channel:		Highest			
Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Read Level (dBμV)	Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Result	Antenna Polaxis
1316.422	30.49	2.04	44.22	46.59	34.90	74.00	-39.10	Pass	H
1809.605	31.41	2.65	43.67	46.19	36.58	74.00	-37.42	Pass	H
4960.000	35.02	6.29	44.60	43.78	40.49	74.00	-33.51	Pass	H
5865.832	35.80	7.31	44.51	45.82	44.42	74.00	-29.58	Pass	H
7440.000	36.45	6.73	44.97	44.55	42.76	74.00	-31.24	Pass	H
9920.000	38.22	7.26	45.52	42.92	42.88	74.00	-31.12	Pass	H
1273.572	30.40	1.97	44.28	46.73	34.82	74.00	-39.18	Pass	V
1795.839	31.39	2.63	43.69	46.58	36.91	74.00	-37.09	Pass	V
4960.000	35.02	6.29	44.60	43.07	39.78	74.00	-34.22	Pass	V
6428.771	36.12	7.33	44.54	45.55	44.46	74.00	-29.54	Pass	V
7440.000	36.45	6.73	44.97	45.06	43.27	74.00	-30.73	Pass	V
9920.000	38.22	7.26	45.52	44.05	44.01	74.00	-29.99	Pass	V

Note:

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

Final Test Level = Receiver Reading - Correct Factor

Correct Factor = Preamplifier Factor - Antenna Factor - Cable Factor

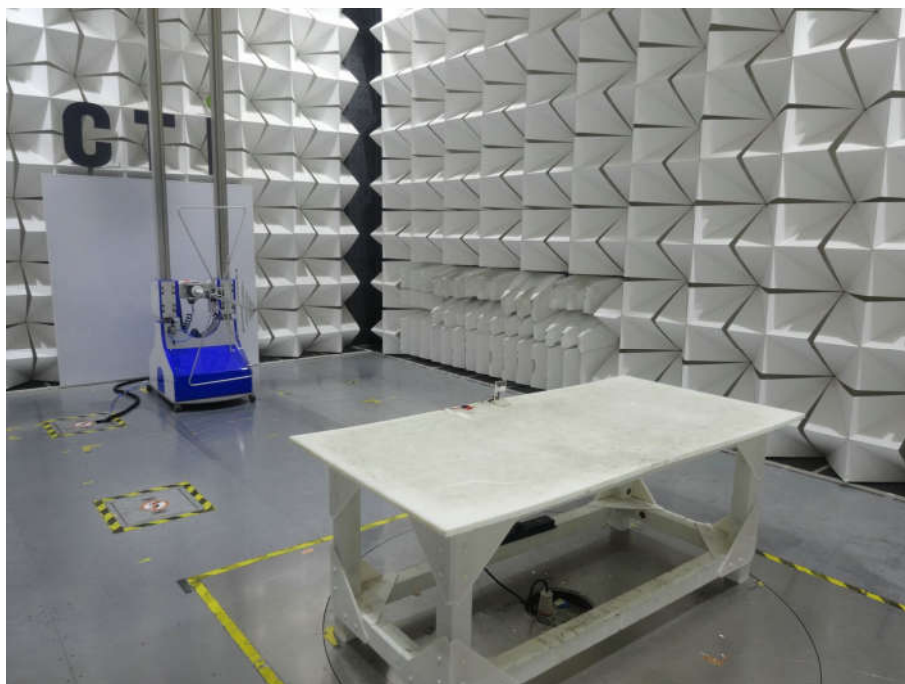
2) Scan from 9kHz to 25GHz, the disturbance above 13GHz and below 30MHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below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

PHOTOGRAPHS OF TEST SETUP

Test model No.: T30P127F2.4G



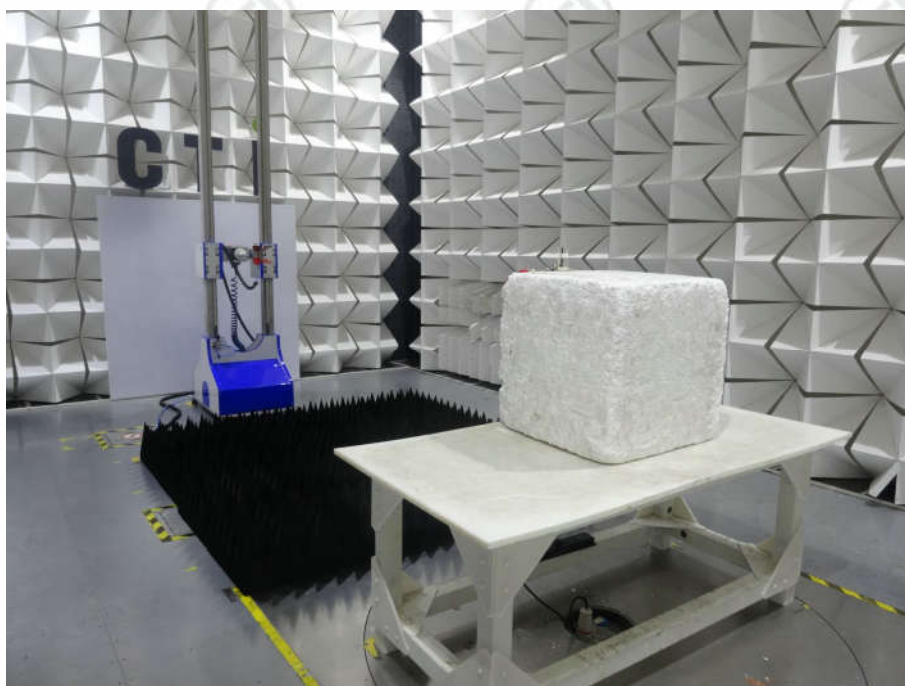
Radiated spurious emission Test Setup (9KHz-30MHz)



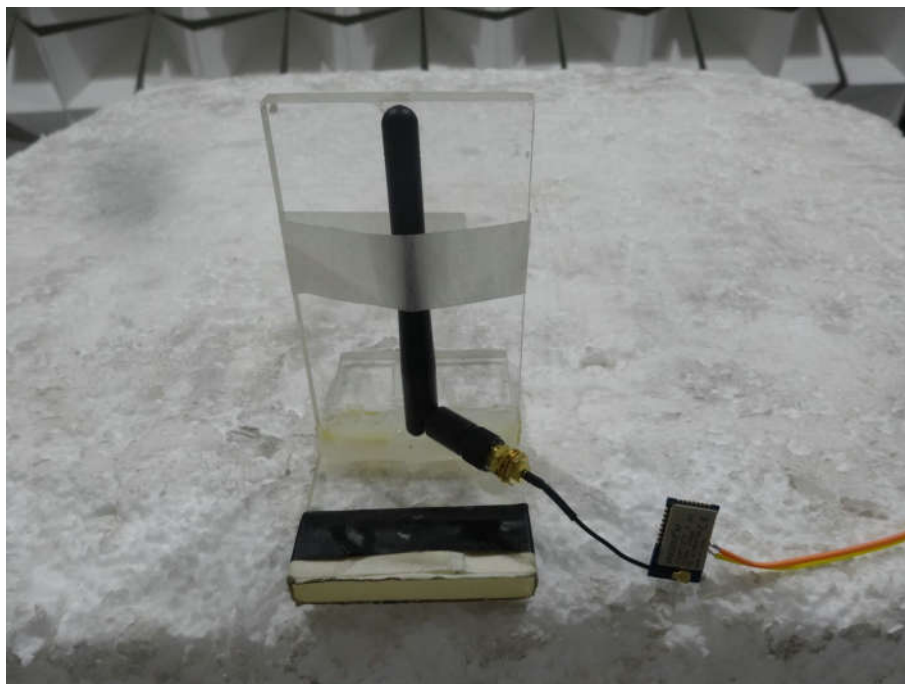
Radiated spurious emission Test Setup-1 (Below 1GHz)



Radiated spurious emission Test Setup-2 (Below 1GHz close-up)



Radiated spurious emission Test Setup-1 (Above 1GHz)



Radiated spurious emission Test Setup-2 (Above 1GHz close-up)



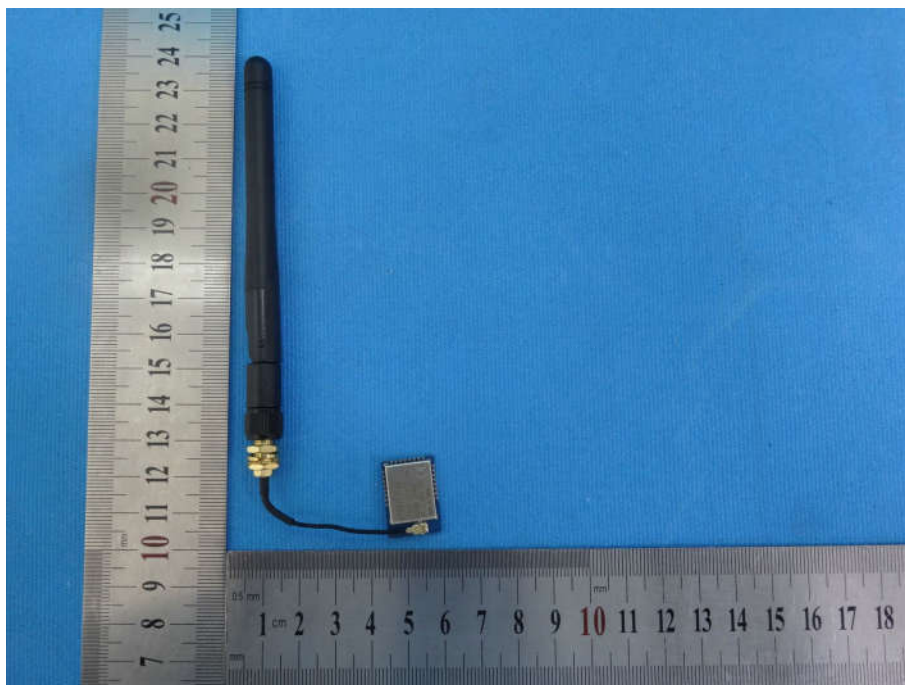
Conducted Emission Test Setup-1



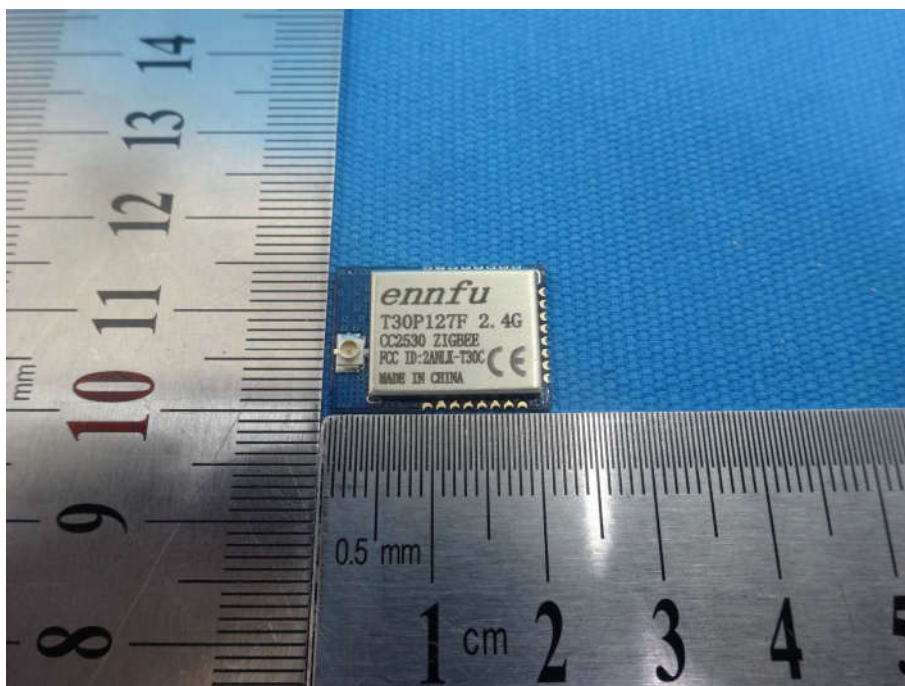
Conducted Emission Test Setup-2 (close-up)

PHOTOGRAPHS OF EUT Constructional Details

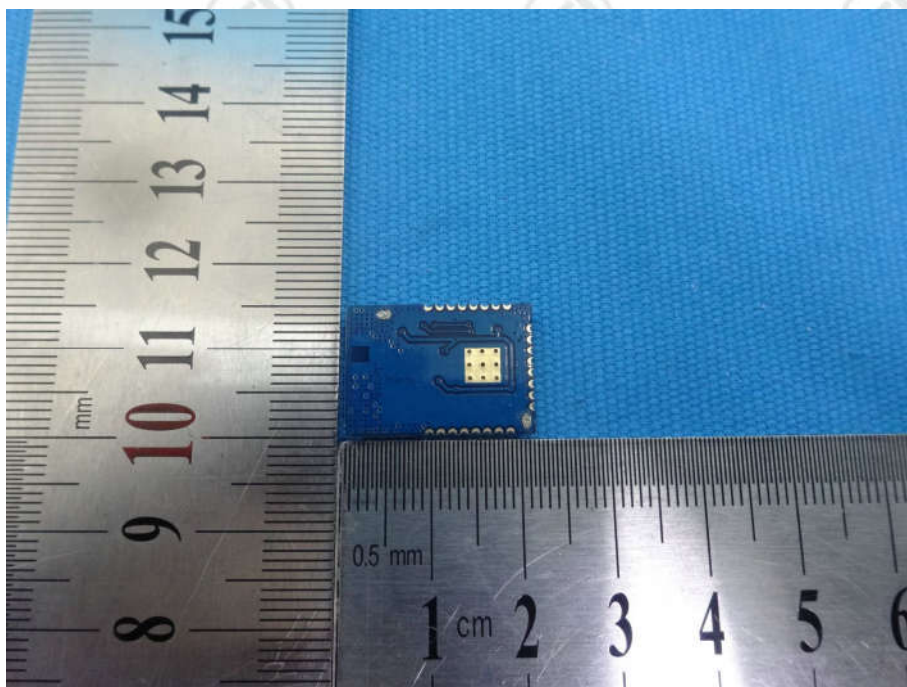
Test model No.: T30P127F2.4G



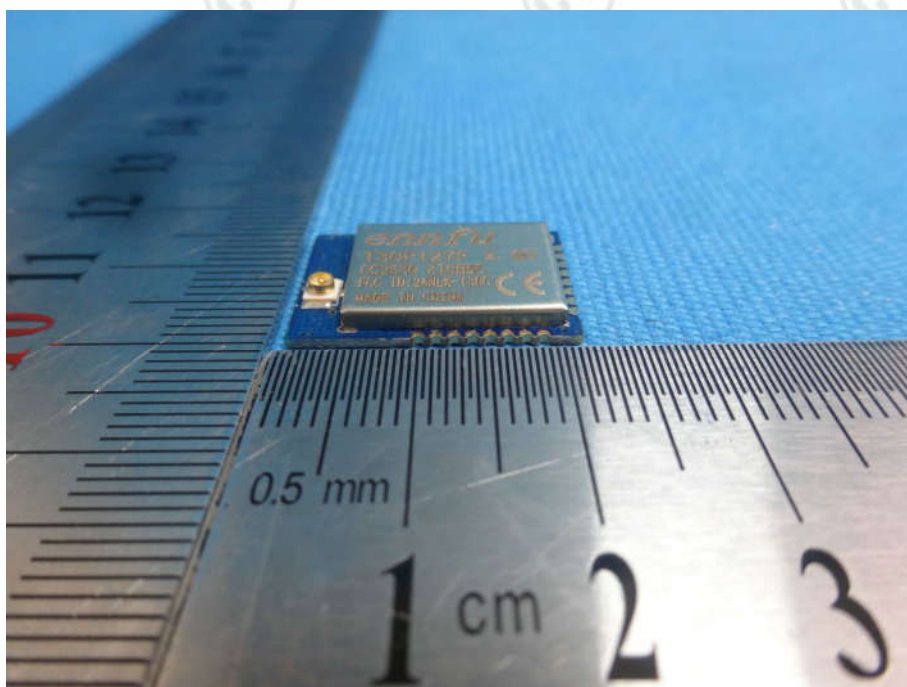
View of Product-1



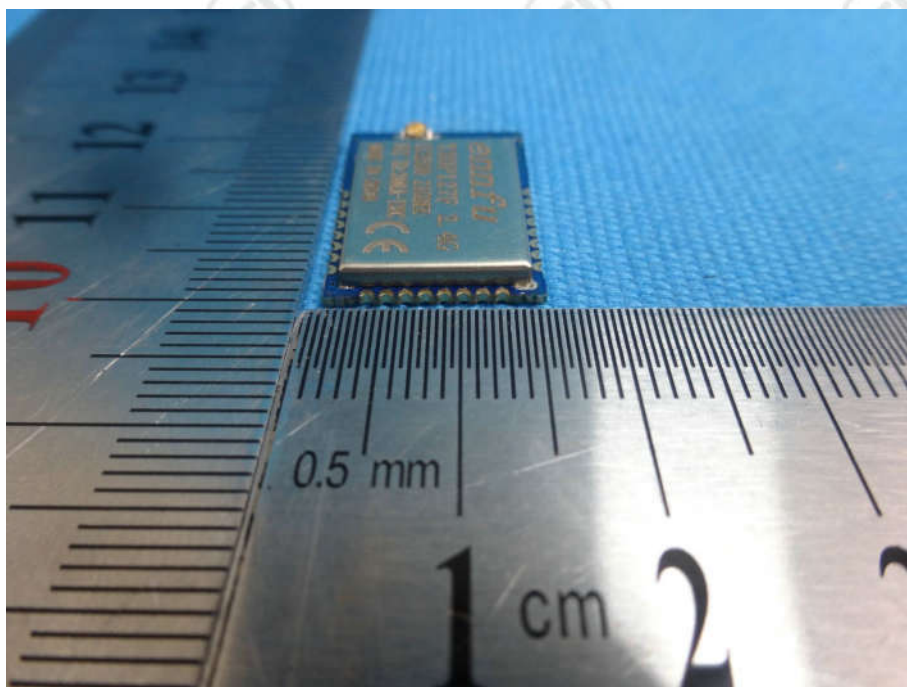
View of Product-2



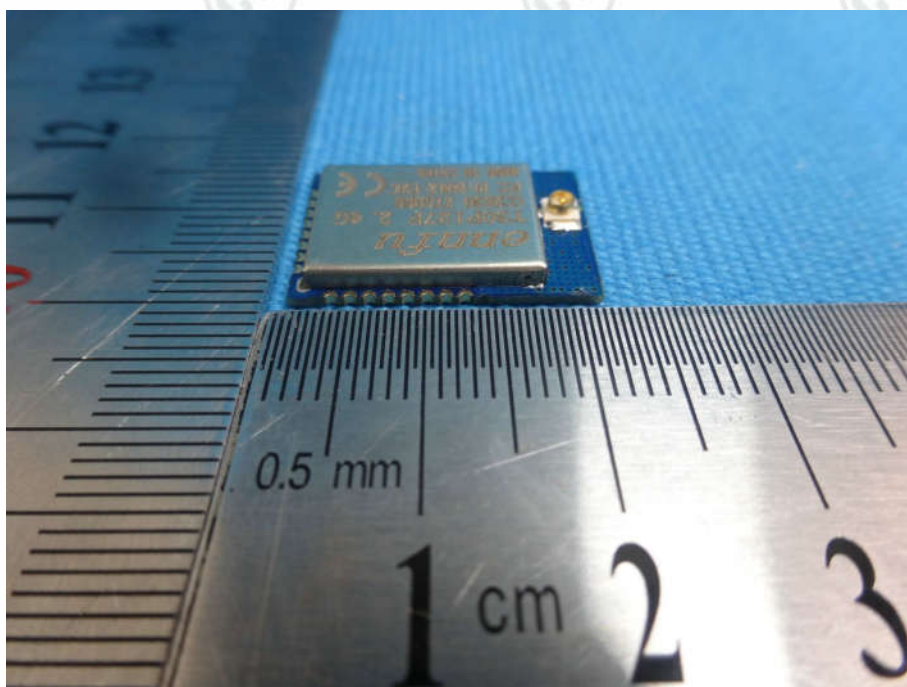
View of Product-3



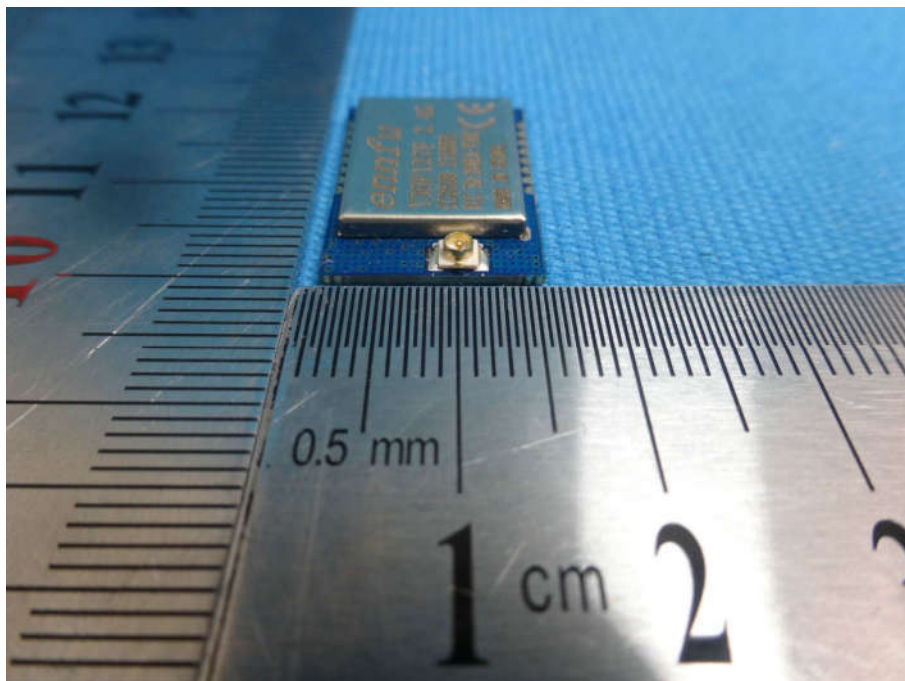
View of Product-4



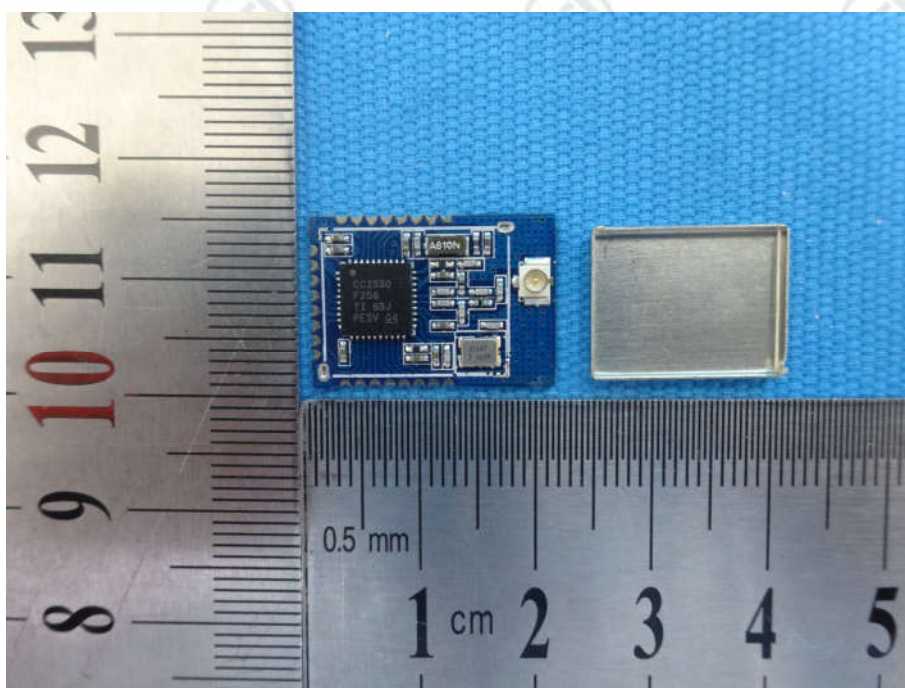
View of Product-5



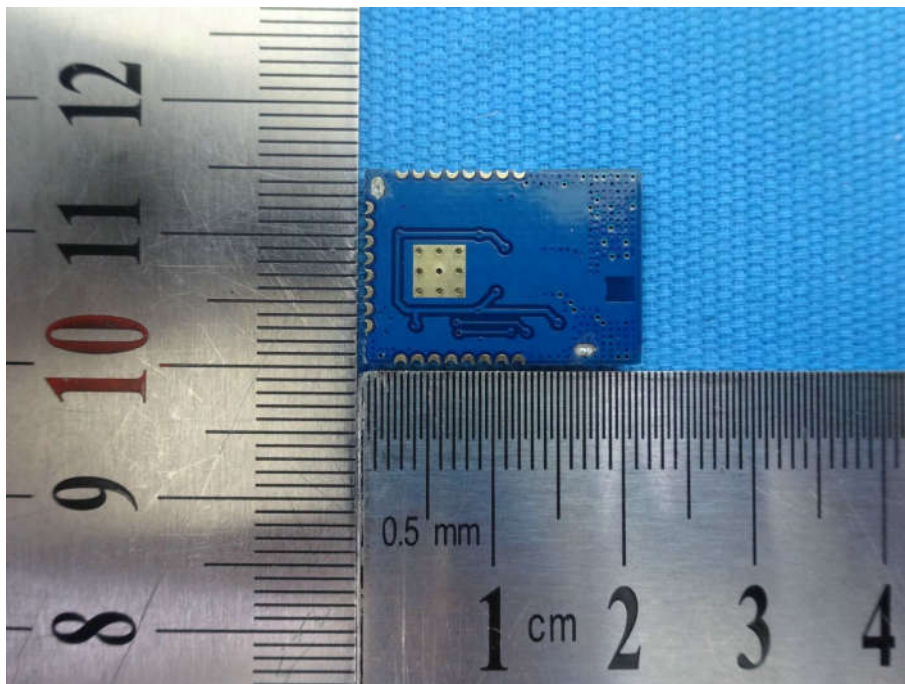
View of Product-6



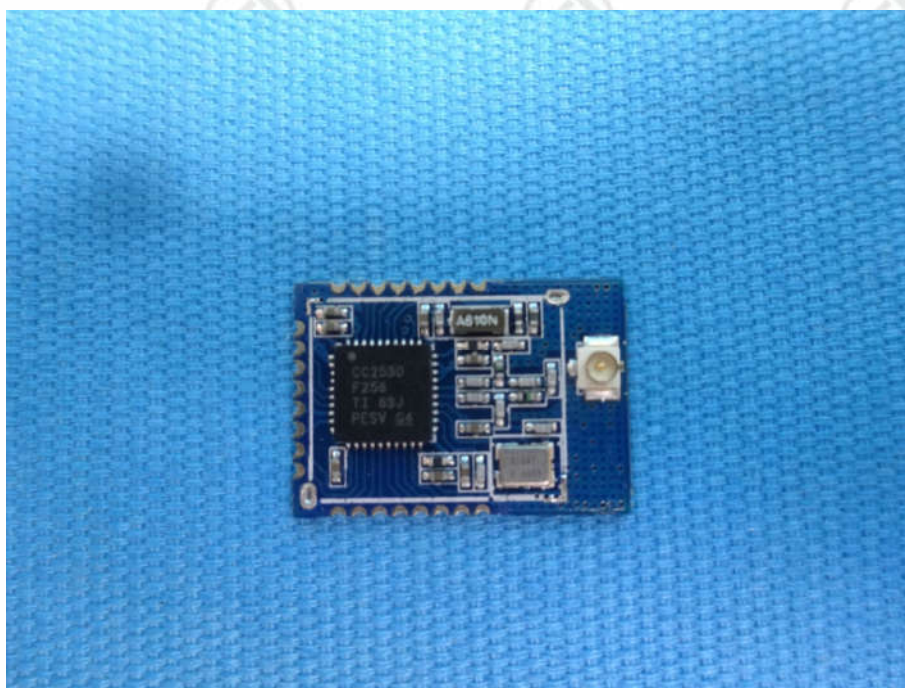
View of Product-7



View of Product-8



View of Product-9



View of Product-10

*** End of Report ***

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