ISED Test Report

IC	:	**3147A-BL5340**
Equipment	:	**BT5.2 BLE module (with passive NFC - 13.56MHz & 802.15.4)**
Model No.	:	**BL5340**
Brand Name	:	**Laird Connectivity**
Applicant	:	**Laird Connectivity, Inc.**
Address	:	**W66N220 Commerce Court, Cedarburg, WI 53012 United States Of America**
Manufacturer	:	**Laird Connectivity, Inc.**
Address	:	**W66N220 Commerce Court, Cedarburg, Wisconsin 53012, USA**
Standard	:	**RSS-247 Issue 2 February 2017**
Received Date	:	**Jan. 27, 2021**
Tested Date	:	**Feb. 05 ~ Mar. 12, 2021**

We, International Certification Corp., would like to declare that the tested sample has been evaluated and in compliance with the requirement of the above standards. The test results contained in this report refer exclusively to the product. It may be duplicated completely for legal use with the approval of the applicant. It shall not be reproduced except in full without the written approval of our laboratory.

Reviewed by:

Along Chen

Along Chen / Assistant Manager

Approved by:

Gary Chang

Gary Chang / Manager

Testing Laboratory 2732

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Release Record

Report No.	Version	Description	Issued Date
CR112703	Rev. 01	Initial issue	May 13, 2021

Summary of Test Results

IC Rules	Test Items	Measured	Result
RSS-Gen Section 8.8	Conducted Emissions	[dBuV]: 0.549MHz 24.33 (Margin -21.67dB) - AV	Pass
RSS-247 Section 5.5 RSS-Gen Section 8.9	Radiated Emissions	[dBuV/m at 3m]: 160.95MHz 39.61 (Margin -3.89dB) - PK	Pass
RSS-247 Section 5.4 (d)	Maximum Output Power	Max Power [dBm]: 3.21	Pass
RSS-247 Section 5.2 (a)	6dB Bandwidth	Meet the requirement of limit	Pass
RSS-247 Section 5.2 (b)	Power Spectral Density	Meet the requirement of limit	Pass
N/A	Antenna Requirement	Meet the requirement of limit	Pass

Declaration of Conformity:
The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.
Comments and Explanations:
The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

1 General Description

1.1 Information

1.1.1 Specification of the Equipment under Test (EUT)

RF General Information				
Frequency Range (MHz)	**Mode**	**Ch. Frequency (MHz)**	**Channel Number**	**Data Rate**
2400~2483.5	802.15.4	2405~2480	11-26 [16]	250kbps
Note 1: 802.15.4 uses DSSS-OQPSK modulation.				

1.1.2 Antenna Details

Ant. No.	Brand	Model	Type	Connector	2400-2500MHz	2400-2480MHz	Remarks
					Gain (dBi)		
1	Laird	NanoBlue	PCB Dipole	IPEX MHF4	2	---	External
2	Laird	FlexPIFA	PCB Dipole	IPEX MHF4	---	2	External
3	Mag.Layers	EDA-8709-2G4C1-B27-CY	Dipole	IPEX MHF4	2	---	External
4	Laird	mFlexPIFA	PIFA	IPEX MHF4	---	2	External
5	Laird	BL5340 onboard printed PCB Trace antenna	Printed PCB	---	1.49	---	Internal
6	Laird	Laird NFC	spiral	---	---	---	External

1.1.3 Power Supply Type of Equipment under Test (EUT)

Power Supply Type	1.8 Vdc / 3.3Vdc / 5Vdc from host

1.1.4 Accessories

N/A

1.1.5 Test Sample Information

Serial Number of Test Sample	Radiated Emission: 00003 AC Power Line Conducted Emission: 00001 Antenna Port Conducted: 00003

1.1.6 Channel List

Channel No.	Frequency (MHz)
11	2405
12	2410
13	2415
14	2420
15	2425
16	2430
17	2435
18	2440
19	2445
20	2450
21	2455
22	2460
23	2465
24	2470
25	2475
26	2480

1.1.7 Test Tool and Duty Cycle

Test Tool	Tera Term, V 4.74	
Duty Cycle and Duty Factor	**Duty Cycle (%)**	**Duty Factor (dB)**
	100	0

1.1.8 Power Index of Test Tool

Internal antenna, Lower power

Modulation Mode	Test Frequency (MHz)	Power Index
OQPSK	2405	-40
OQPSK	2440	-40
OQPSK	2475	-40
OQPSK	2480	-40

Internal antenna, high power

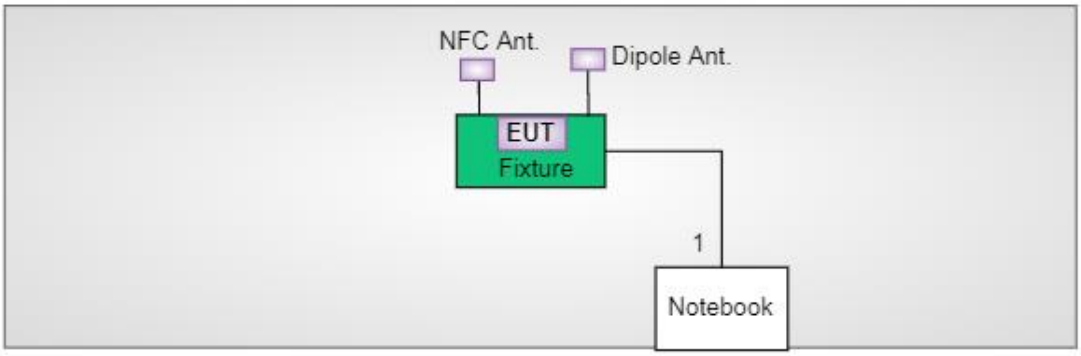
Modulation Mode	Test Frequency (MHz)	Power Index
OQPSK	2405	0
OQPSK	2440	0
OQPSK	2475	0
OQPSK	2480	-8

1.2 Local Support Equipment List

Support Equipment List					
No.	**Equipment**	**Brand**	**Model**	**FCC ID**	**Remarks**
1	Notebook	DELL	Latitude 5400	DoC	---
2	50Ω terminator	---	---	---	---
3	Fixture	---	---	---	Provided by applicant.

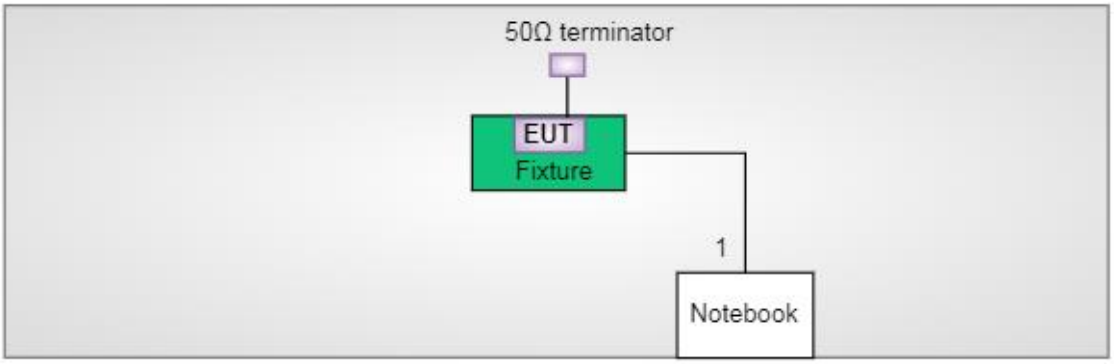
1.3 Test Setup Chart

Test Setup Diagram – conducted emission



No.	Signal cable / Length (m)
1	USB, 0.5m shielded.

Test Setup Diagram – radiated emission



No.	Signal cable / Length (m)
1	USB, 0.5m shielded.

1.4 The Equipment List

Test Item	Conducted Emission				
Test Site	Conduction room 1 / (CO01-WS)				
Tested Date	Feb. 05, 2021				
Instrument	**Brand**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Receiver	R&S	ESR3	101657	Feb. 14, 2020	Feb. 13, 2021
LISN	R&S	ENV216	101579	Mar. 12, 2020	Mar. 11, 2021
RF Cable-CON	Woken	CFD200-NL	CFD200-NL-001	Oct. 21, 2020	Oct. 20, 2021
Measurement Software	AUDIX	e3	6.120210k	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

Test Item	Radiated Emission				
Test Site	966 chamber1 / (03CH01-WS)				
Tested Date	Mar. 03 ~ Mar. 04, 2021				
Instrument	**Brand**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Spectrum Analyzer	R&S	FSV40	101498	Dec. 04, 2020	Dec. 03, 2021
Receiver	R&S	ESR3	101658	Feb. 08, 2021	Feb. 07, 2022
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-522	Jul. 10, 2020	Jul. 09, 2021
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1096	Dec. 11, 2020	Dec. 10, 2021
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170517	Nov. 06, 2020	Nov. 05, 2021
Loop Antenna	R&S	HFH2-Z2	100330	Nov. 17, 2020	Nov. 16, 2021
Loop Antenna Cable	KOAX KABEL	101354-BW	101354-BW	Oct. 06, 2020	Oct. 05, 2021
Preamplifier	EMC	EMC02325	980225	Jul. 03, 2020	Jul. 02, 2021
Preamplifier	Agilent	83017A	MY39501308	Sep. 26, 2020	Sep. 25, 2021
Preamplifier	EMC	EMC184045B	980192	Jul. 21, 2020	Jul. 20, 2021
RF Cable	EMC	EMC104-SM-SM-8000	181106	Oct. 06, 2020	Oct. 05, 2021
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16019/4	Oct. 06, 2020	Oct. 05, 2021
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16014/4	Oct. 06, 2020	Oct. 05, 2021
LF cable 1M	EMC	EMCCFD400-NM-NM-1000	160502	Oct. 06, 2020	Oct. 05, 2021
LF cable 3M	Woken	CFD400NL-LW	CFD400NL-001	Oct. 06, 2020	Oct. 05, 2021
LF cable 11M	EMC	EMCCFD400-NW-NW-11000	200801	Oct. 06, 2020	Oct. 05, 2021
Measurement Software	AUDIX	e3	6.120210g	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

Test Item	RF Conducted				
Test Site	(TH01-WS)				
Tested Date	Mar. 12, 2021				
Instrument	**Brand**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Spectrum Analyzer	R&S	FSV40	101063	Apr. 30, 2020	Apr. 29, 2021
Power Meter	Anritsu	ML2495A	1241002	Nov. 04, 2020	Nov. 03, 2021
Power Sensor	Anritsu	MA2411B	1207366	Nov. 04, 2020	Nov. 03, 2021
DC POWER SOURCE	GW INSTEK	GPC-6030D	GES855395	Nov. 09, 2020	Nov. 08, 2021
Measurement Software	Sporton	Sporton_1	1.3.30	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

1.5 Test Standards

RSS-247 Issue 2 February 2017
RSS-Gen Issue 5 February 2021 Amendment 2
ANSI C63.10-2013

1.6 Reference Guidance

FCC KDB 558074 D01 15.247 Meas Guidance v05r02

1.7 Deviation from Test Standard and Measurement Procedure

None

1.8 Measurement Uncertainty

The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2)).

Measurement Uncertainty	
Parameters	**Uncertainty**
Bandwidth	±34.130 Hz
Conducted power	±0.808 dB
Power density	±0.583 dB
Conducted emission	±2.715 dB
AC conducted emission	±2.92 dB
Radiated emission ≤ 1GHz	±3.41 dB
Radiated emission > 1GHz	±4.59 dB

2 Test Configuration

2.1 Testing Facility

Test Laboratory	International Certification Corp.
Test Site	CO01-WS, 03CH01-WS, TH01-WS
Address of Test Site	No. 3-1, Lane 6, Wen San 3rd St., Kwei Shan District, Tao Yuan City 333, Taiwan, R.O.C.

- FCC Designation No.: TW2732
- FCC site registration No.: 181692
- ISED#: 10807A
- CAB identifier: TW2732

2.2 The Worst Test Modes and Channel Details

Test item	Modulation Mode	Test Frequency (MHz)	Data Rate	Test Configuration
Conducted Emissions	OQPSK	2405	250kbps	3
Radiated Emissions ≤1GHz	OQPSK	2405	250kbps	1, 2 Note4
Radiated Emissions >1GHz	OQPSK	2405 / 2440 / 2475 / 2480	250kbps	1, 2 Note4
Maximum Output Power 6dB bandwidth Power spectral density	OQPSK	2405 / 2440 / 2475 / 2480	250kbps	1, 2 Note4

NOTE:

1. The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement – X, Y, and Z-plane. The **X-plane** result was found as the worst case and was shown in this report.
2. The EUT supports three DC voltage options, DC 1.8V, DC 3.3V & DC 5V. Three options were assessed and DC 3.3V was found to be the worst case and was selected for the final test.
3. Test configurations are listed as below:
   1) Configuration 1: Internal antenna, Lower power
   2) Configuration 2: Internal antenna, high power
   3) Configuration 3: External antenna, high power
4. The 50Ω terminators are connected to antenna port of EUT for radiated emission measurement.

3 Transmitter Test Results

3.1 Conducted Emissions

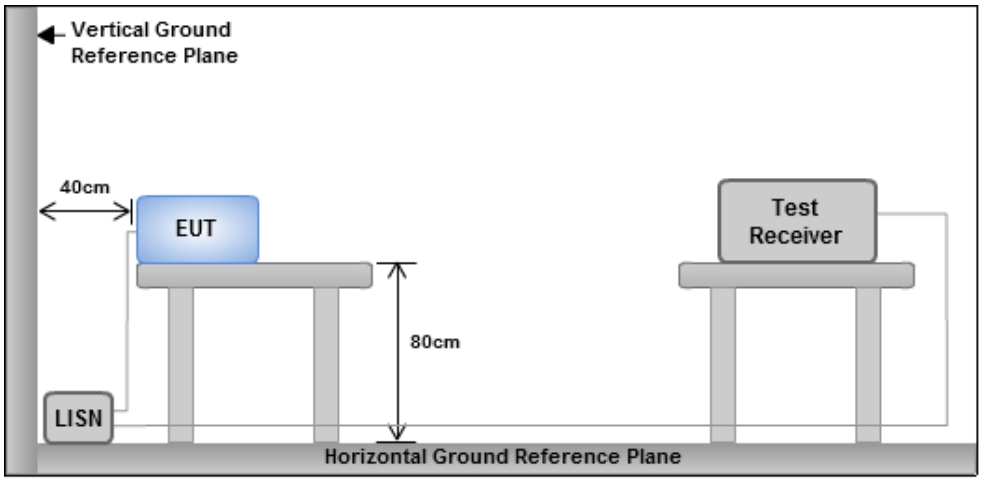
3.1.1 Limit of Conducted Emissions

Conducted Emissions Limit		
Frequency Emission (MHz)	**Quasi-Peak**	**Average**
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50
Note 1: * Decreases with the logarithm of the frequency.		

3.1.2 Test Procedures

1. The device is placed on a test table, raised 80 cm above the reference ground plane. The vertical conducting plane is located 40 cm to the rear of the device.
2. The device is connected to line impedance stabilization network (LISN) and other accessories are connected to other LISN. Measured levels of AC power line conducted emission are across the 50 Ω LISN port.
3. AC conducted emission measurements is made over frequency range from 150 kHz to 30 MHz.
4. This measurement was performed with AC 120V / 60Hz.

3.1.3 Test Setup



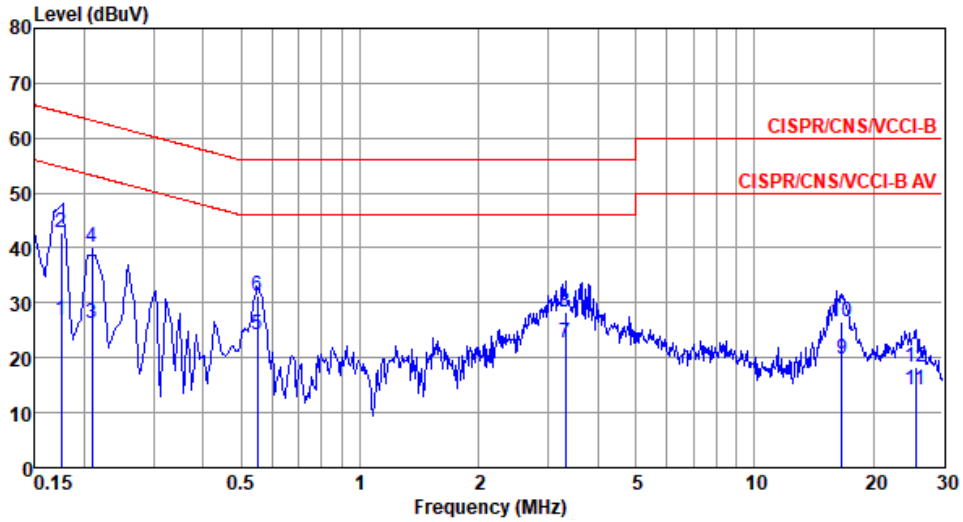
Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

External antenna, high power

3.1.4 Test Result of Conducted Emissions

Modulation	OQPSK	**Test Freq. (MHz)**	2405
Power Phase	Line		

Test by : Alex Tsai Temperature: 20°C Humidity: 60%

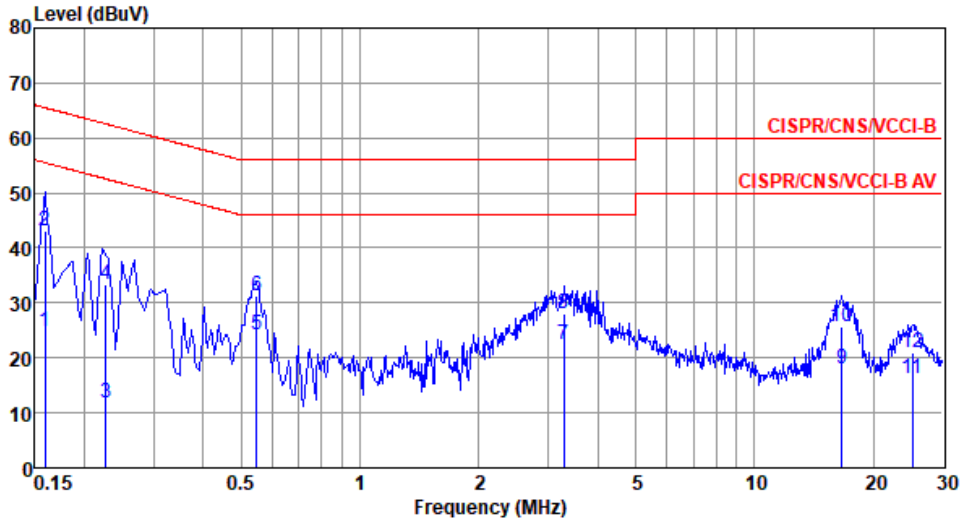


	Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	Factor dB	Cable loss dB	Remark
1	0.175	26.90	54.72	-27.82	17.21	9.63	0.06	Average
2	0.175	42.71	64.72	-22.01	33.02	9.63	0.06	QP
3	0.209	26.26	53.23	-26.97	16.57	9.63	0.06	Average
4	0.209	40.24	63.23	-22.99	30.55	9.63	0.06	QP
5*	0.549	24.33	46.00	-21.67	14.61	9.63	0.09	Average
6	0.549	31.24	56.00	-24.76	21.52	9.63	0.09	QP
7	3.310	22.69	46.00	-23.31	12.78	9.65	0.26	Average
8	3.310	28.33	56.00	-27.67	18.42	9.65	0.26	QP
9	16.661	19.69	50.00	-30.31	9.35	9.71	0.63	Average
10	16.661	26.62	60.00	-33.38	16.28	9.71	0.63	QP
11	25.591	14.13	50.00	-35.87	3.76	9.66	0.71	Average
12	25.591	18.17	60.00	-41.83	7.80	9.66	0.71	QP

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

Modulation	OQPSK	Test Freq. (MHz)	2405
Power Phase	Neutral		

Test by : Alex Tsai Temperature: 20°C Humidity: 60%



	Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	Factor dB	Cable loss dB	Remark
1	0.159	24.72	55.52	-30.80	15.01	9.66	0.05	Average
2	0.159	43.14	65.52	-22.38	33.43	9.66	0.05	QP
3	0.227	11.66	52.57	-40.91	1.95	9.65	0.06	Average
4	0.227	33.30	62.57	-29.27	23.59	9.65	0.06	QP
5*	0.546	24.30	46.00	-21.70	14.56	9.65	0.09	Average
6	0.546	31.17	56.00	-24.83	21.43	9.65	0.09	QP
7	3.293	22.57	46.00	-23.43	12.64	9.67	0.26	Average
8	3.293	28.12	56.00	-27.88	18.19	9.67	0.26	QP
9	16.661	17.99	50.00	-32.01	7.55	9.81	0.63	Average
10	16.661	25.63	60.00	-34.37	15.19	9.81	0.63	QP
11	25.188	16.30	50.00	-33.70	5.80	9.80	0.70	Average
12	25.188	20.82	60.00	-39.18	10.32	9.80	0.70	QP

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

3.2 6dB and Occupied Bandwidth

3.2.1 Limit of 6dB Bandwidth

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

3.2.2 Test Procedures

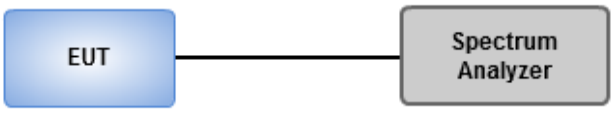
6dB Bandwidth

1. Set resolution bandwidth (RBW) = 1% to 5% of the anticipated emission, Video bandwidth = 3x the RBW.
2. Detector = Peak, Trace mode = max hold.
3. Sweep = auto couple, Allow the trace to stabilize.
4. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 6dB relative to the maximum level measured in the fundamental emission.

Occupied Bandwidth

1. Set resolution bandwidth (RBW) = 1 MHz, Video bandwidth = 3 MHz.
2. Detector = Sample, Trace mode = max hold.
3 Sweep = auto couple, Allow the trace to stabilize.
4. Use the OBW measurement function of spectrum analyzer to measure the occupied bandwidth.

3.2.3 Test Setup



3.2.4 Test Result of 6dB and Occupied Bandwidth

Ambient Condition	24°C / 63%	**Tested By**	Aska Huang

Internal antenna, Lower power

Summary

Mode	Max-N dB (Hz)	Max-OBW (Hz)	ITU-Code	Min-N dB (Hz)	Min-OBW (Hz)
2.4-2.4835GHz	-	-	-	-	-
802.15.4	1.558M	2.406M	2M41D1D	1.467M	2.37M

Max-N dB = Maximum 6dB down bandwidth; **Max-OBW** = Maximum 99% occupied bandwidth;
Min-N dB = Minimum 6dB down bandwidth; **Min-OBW** = Minimum 99% occupied bandwidth;

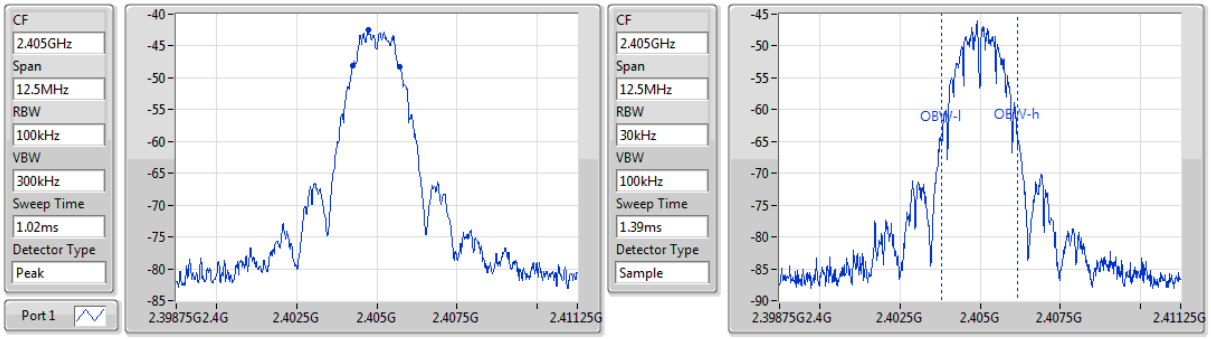
Result

Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
802.15.4	-	-	-	-
2405MHz	Pass	500k	1.486M	2.37M
2440MHz	Pass	500k	1.54M	2.37M
2475MHz	Pass	500k	1.467M	2.388M
2480MHz	Pass	500k	1.558M	2.406M

Port X-N dB = Port **X** 6dB down bandwidth; **Port X-OBW** = Port **X** 99% occupied bandwidth;

802.15.4 **EBW**

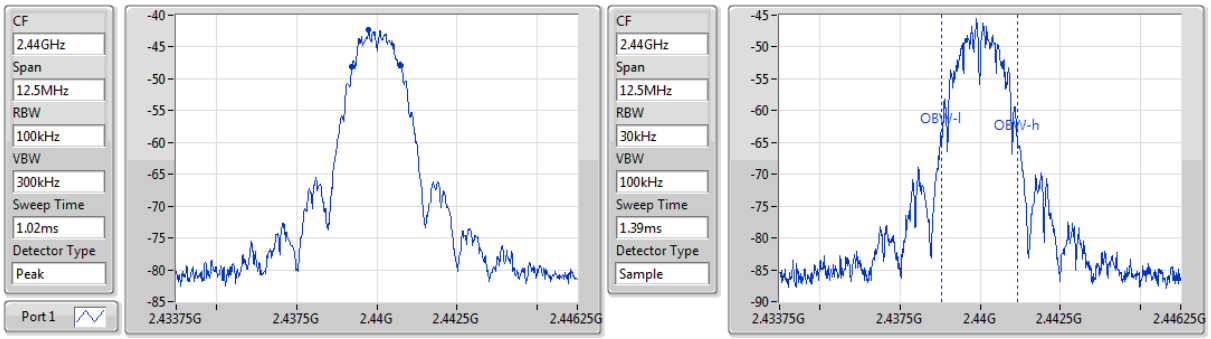
2405MHz



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
1.486M	2.404239G	2.405725G	2.37M	2.403788G	2.406158G	500k	1

802.15.4 **EBW**

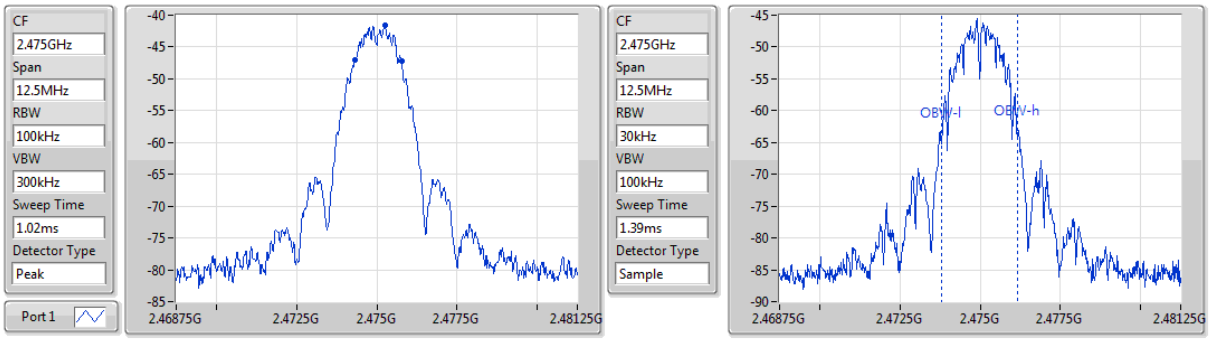
2440MHz



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
1.54M	2.439221G	2.440761G	2.37M	2.438806G	2.441176G	500k	1

802.15.4 **EBW**

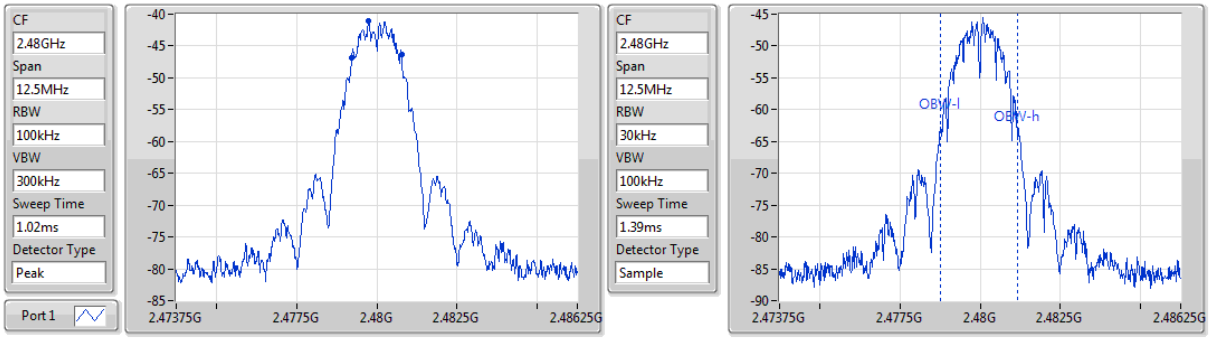
2475MHz



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
1.467M	2.474312G	2.475779G	2.388M	2.473788G	2.476176G	500k	1

802.15.4 **EBW**

2480MHz



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
1.558M	2.479221G	2.480779G	2.406M	2.47877G	2.481176G	500k	1

Internal antenna, high power

Summary

Mode	Max-N dB (Hz)	Max-OBW (Hz)	ITU-Code	Min-N dB (Hz)	Min-OBW (Hz)
2.4-2.4835GHz	-	-	-	-	-
802.15.4	1.558M	2.37M	2M37D1D	1.522M	2.297M

Max-N dB = Maximum 6dB down bandwidth; **Max-OBW** = Maximum 99% occupied bandwidth;
Min-N dB = Minimum 6dB down bandwidth; **Min-OBW** = Minimum 99% occupied bandwidth;

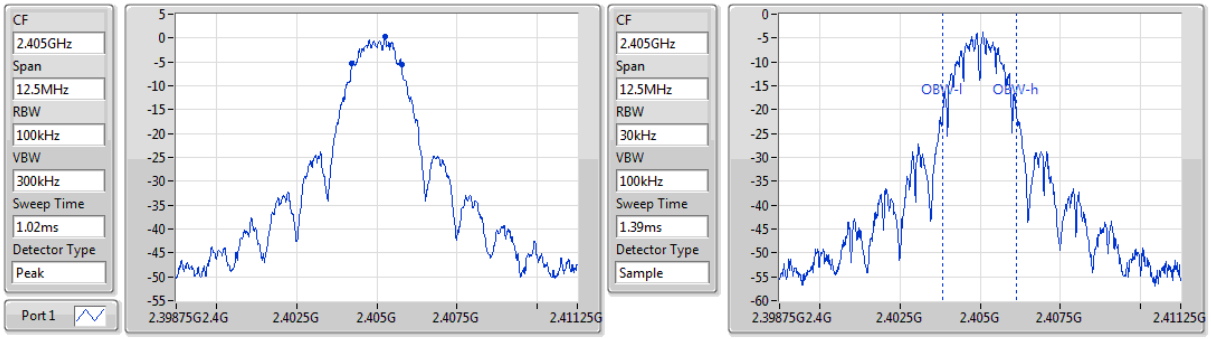
Result

Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
802.15.4	-	-	-	-
2405MHz	Pass	500k	1.558M	2.297M
2440MHz	Pass	500k	1.54M	2.315M
2475MHz	Pass	500k	1.522M	2.334M
2480MHz	Pass	500k	1.558M	2.37M

Port X-N dB = Port **X** 6dB down bandwidth; **Port X-OBW** = Port **X** 99% occupied bandwidth;

802.15.4 **EBW**

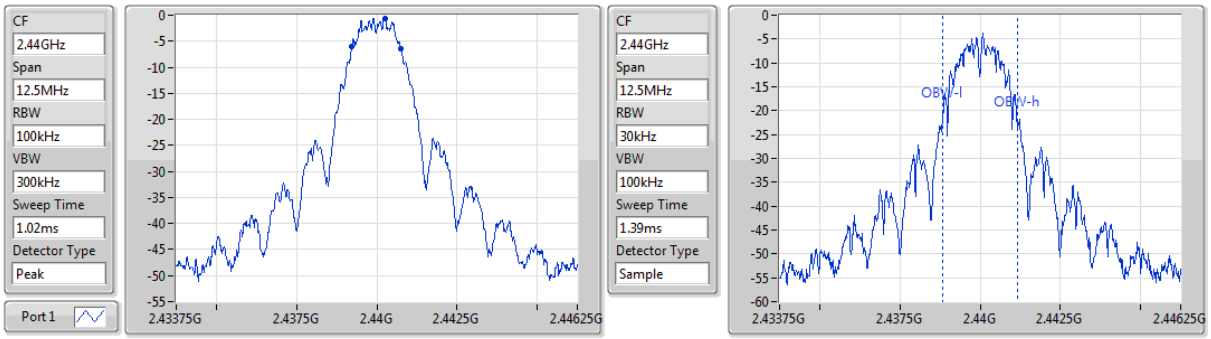
2405MHz



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
1.558M	2.404221G	2.405779G	2.297M	2.403842G	2.40614G	500k	1

802.15.4 **EBW**

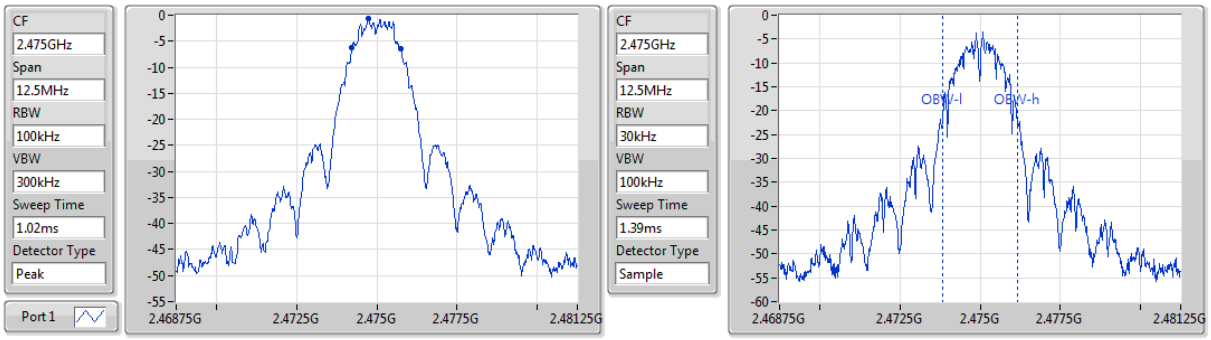
2440MHz



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
1.54M	2.439221G	2.440761G	2.315M	2.438842G	2.441158G	500k	1

802.15.4 **EBW**

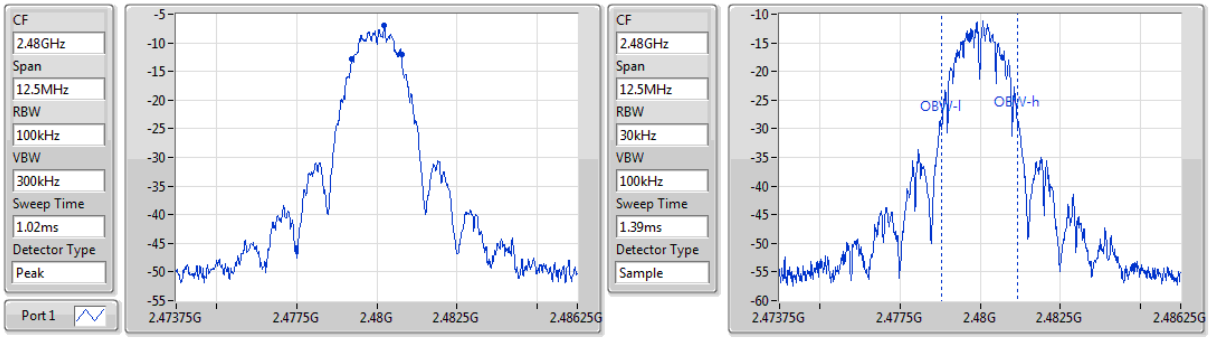
2475MHz



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
1.522M	2.474221G	2.475743G	2.334M	2.473824G	2.476158G	500k	1

802.15.4 **EBW**

2480MHz



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
1.558M	2.479221G	2.480779G	2.37M	2.478788G	2.481158G	500k	1

3.3 RF Output Power

3.3.1 Limit of RF Output Power

Conducted power shall not exceed 1Watt.

Antenna gain <= 6dBi, no any corresponding reduction is in output power limit.

3.3.2 Test Procedures

A broadband RF power meter is used for output power measurement. The video bandwidth of power meter is greater than DTS bandwidth of EUT. If duty cycle of test signal is not 100 %, trigger and gating function of power meter will be enabled to capture transmission burst for measuring output power.

3.3.3 Test Setup

3.3.4 Test Result of Maximum Output Power

Ambient Condition	24°C / 63%	Tested By	Aska Huang

Internal antenna, Lower power

Summary of Peak Conducted Output Power

Mode	Total Power (dBm)	Total Power (W)
2.4-2.4835GHz	-	-
802.15.4	-37.03	0.0000002

Result

Mode	Result	DG (dBi)	Port 1 (dBm)	Total Power (dBm)	Power Limit (dBm)	EIRP (dBm)	EIRP Limit (dBm)
802.15.4	-	-	-	-	-	-	-
2405MHz	Pass	2.00	-37.26	-37.26	30.00	-35.26	36.00
2440MHz	Pass	2.00	-37.09	-37.09	30.00	-35.09	36.00
2475MHz	Pass	2.00	-37.13	-37.13	30.00	-35.13	36.00
2480MHz	Pass	2.00	-37.03	-37.03	30.00	-35.03	36.00

DG = Directional Gain; **Port X** = Port X output power

Summary of Conducted (Average) Output Power

Mode	Total Power (dBm)	Total Power (W)
2.4-2.4835GHz	-	-
802.15.4	-38.43	0.0000001

Result

Mode	Result	DG (dBi)	Port 1 (dBm)	Total Power (dBm)	Power Limit (dBm)	EIRP (dBm)	EIRP Limit (dBm)
802.15.4	-	-	-	-	-	-	-
2405MHz	Pass	2.00	-38.67	-38.67	-	-36.67	-
2440MHz	Pass	2.00	-38.49	-38.49	-	-36.49	-
2475MHz	Pass	2.00	-38.43	-38.43	-	-36.43	-
2480MHz	Pass	2.00	-38.43	-38.43	-	-36.43	-

DG = Directional Gain; **Port X** = Port X output power

Note : Conducted average output power is for reference only

Internal antenna, high power

Summary of Peak Conducted Output Power

Mode	Total Power (dBm)	Total Power (W)
2.4-2.4835GHz	-	-
802.15.4	3.21	0.00209

Result

Mode	Result	DG (dBi)	Port 1 (dBm)	Total Power (dBm)	Power Limit (dBm)	EIRP (dBm)	EIRP Limit (dBm)
802.15.4	-	-	-	-	-	-	-
2405MHz	Pass	2.00	3.21	3.21	30.00	5.21	36.00
2440MHz	Pass	2.00	3.12	3.12	30.00	5.12	36.00
2475MHz	Pass	2.00	2.97	2.97	30.00	4.97	36.00
2480MHz	Pass	2.00	-3.42	-3.42	30.00	-1.42	36.00

DG = Directional Gain; **Port X** = Port X output power

Summary of Conducted (Average) Output Power

Mode	Total Power (dBm)	Total Power (W)
2.4-2.4835GHz	-	-
802.15.4	3.12	0.00205

Result

Mode	Result	DG (dBi)	Port 1 (dBm)	Total Power (dBm)	Power Limit (dBm)	EIRP (dBm)	EIRP Limit (dBm)
802.15.4	-	-	-	-	-	-	-
2405MHz	Pass	2.00	3.12	3.12	-	5.12	-
2440MHz	Pass	2.00	3.02	3.02	-	5.02	-
2475MHz	Pass	2.00	2.88	2.88	-	4.88	-
2480MHz	Pass	2.00	-3.98	-3.98	-	-1.98	-

DG = Directional Gain; **Port X** = Port X output power

Note : Conducted average output power is for reference only

3.4 Power Spectral Density

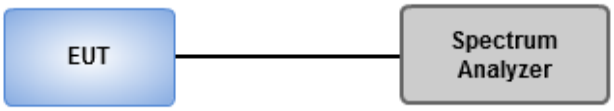
3.4.1 Limit of Power Spectral Density

Power spectral density shall not be greater than 8 dBm in any 3 kHz band.

3.4.2 Test Procedures

1. Set the RBW = 3 kHz, VBW = 10 kHz.
2. Detector = Peak, Sweep time = auto couple.
3. Trace mode = max hold, allow trace to fully stabilize.
4. Use the peak marker function to determine the maximum amplitude level.

3.4.3 Test Setup



3.4.4 Test Result of Power Spectral Density

Ambient Condition	24°C / 63%	Tested By	Aska Huang

Internal antenna, Lower power

Summary

Mode	PD (dBm/3kHz)
2.4-2.4835GHz	-
802.15.4	-51.90

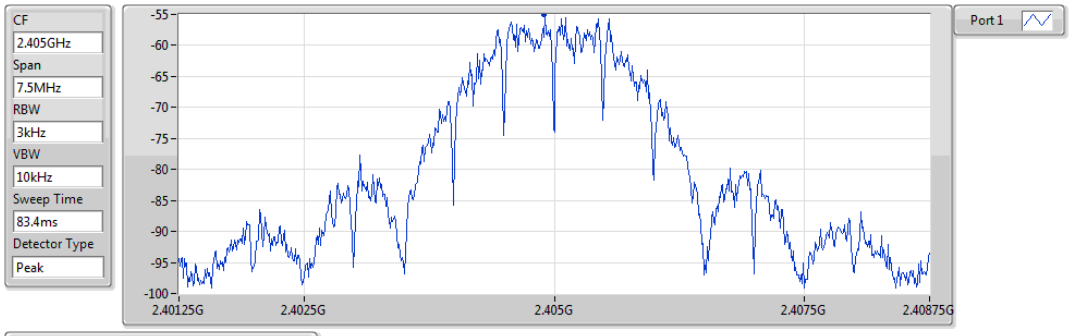
Result

Mode	Result	DG (dBi)	Port 1 (dBm/3kHz)	PD (dBm/3kHz)	PD Limit (dBm/3kHz)
802.15.4	-	-	-	-	-
2405MHz	Pass	2.00	-55.07	-55.07	8.00
2440MHz	Pass	2.00	-54.03	-54.03	8.00
2475MHz	Pass	2.00	-51.90	-51.90	8.00
2480MHz	Pass	2.00	-53.31	-53.31	8.00

DG = Directional Gain;
PD =Maximum power density; **Port X** = Port X power density;

802.15.4 **PSD**

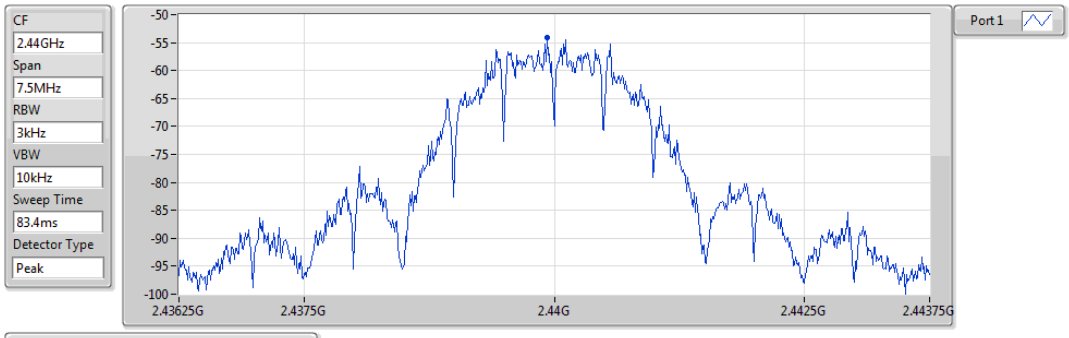
2405MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-55.07	-55.07	-55.07

802.15.4 **PSD**

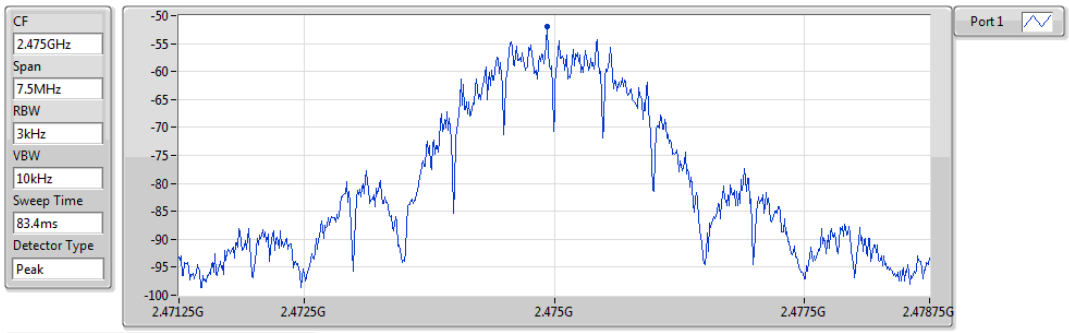
2440MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-54.03	-54.03	-54.03

802.15.4 **PSD**

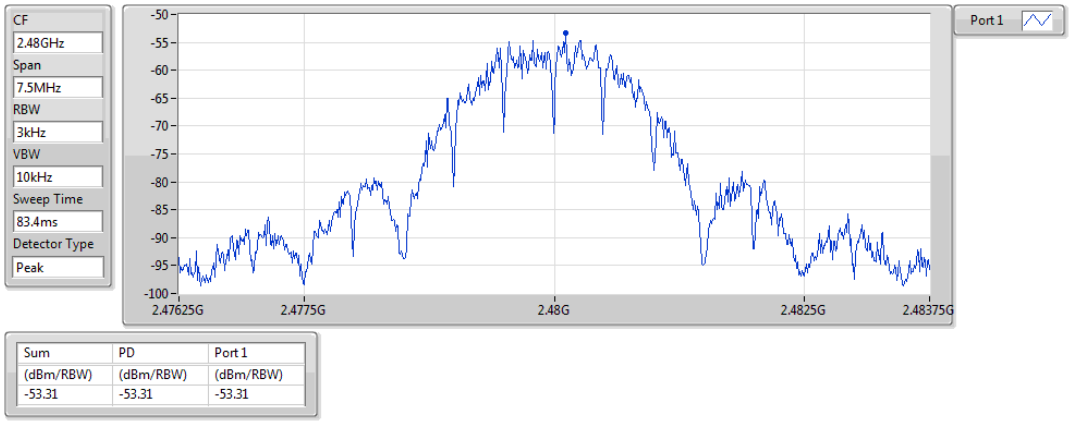
2475MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-51.90	-51.90	-51.90

802.15.4 **PSD**

2480MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-53.31	-53.31	-53.31

Internal antenna, high power

Summary

Mode	PD (dBm/3kHz)
2.4-2.4835GHz	-
802.15.4	-12.03

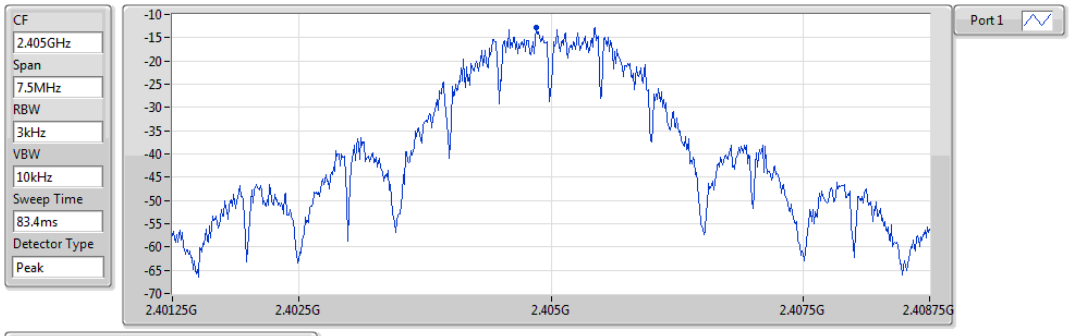
Result

Mode	Result	DG (dBi)	Port 1 (dBm/3kHz)	PD (dBm/3kHz)	PD Limit (dBm/3kHz)
802.15.4	-	-	-	-	-
2405MHz	Pass	2.00	-12.75	-12.75	8.00
2440MHz	Pass	2.00	-13.48	-13.48	8.00
2475MHz	Pass	2.00	-12.03	-12.03	8.00
2480MHz	Pass	2.00	-19.24	-19.24	8.00

DG = Directional Gain;
PD = trace bin-by-bin of each transmits port summing can be performed maximum power density; **Port X** = Port X power density;

802.15.4 **PSD**

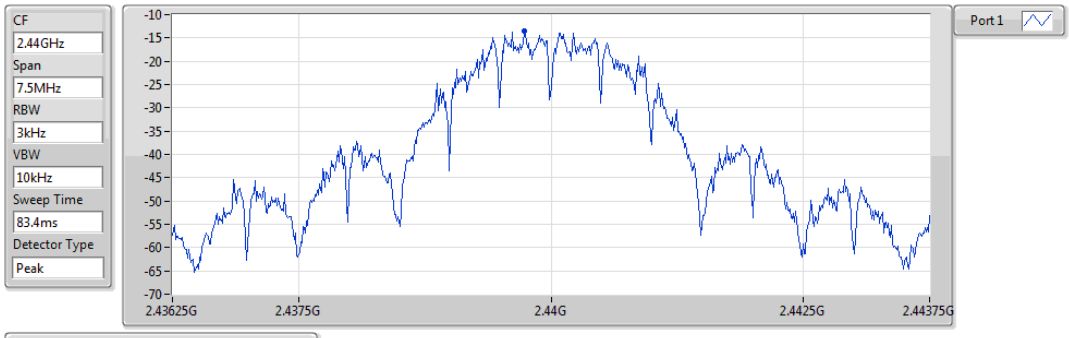
2405MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-12.75	-12.75	-12.75

802.15.4 **PSD**

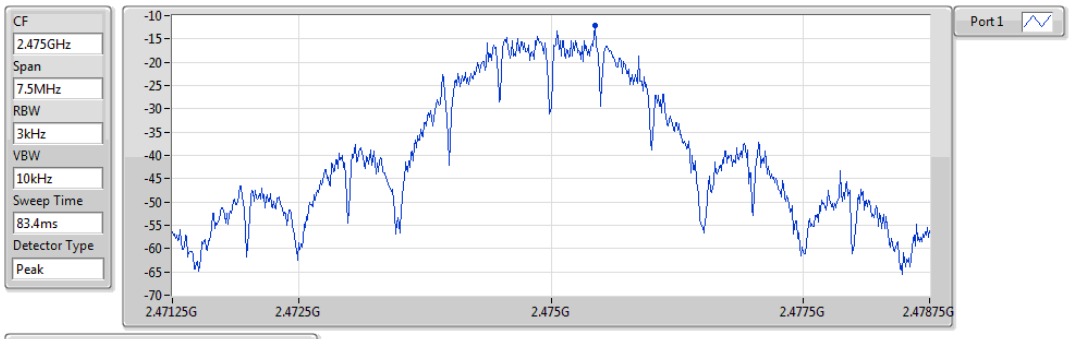
2440MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-13.48	-13.48	-13.48

802.15.4 **PSD**

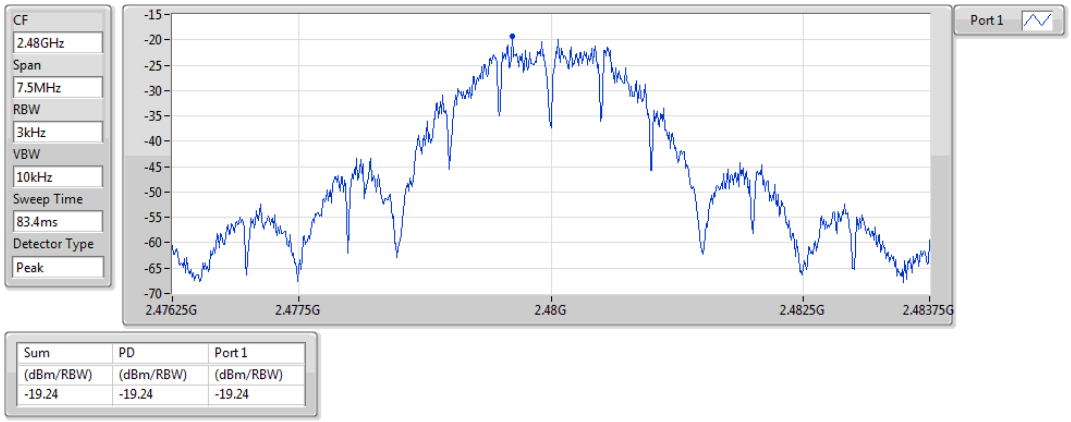
2475MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-12.03	-12.03	-12.03

802.15.4 **PSD**

2480MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-19.24	-19.24	-19.24

3.5 Unwanted Emissions into Restricted Frequency Bands

3.5.1 Limit of Unwanted Emissions into Restricted Frequency Bands

Restricted Band Emissions Limit			
Frequency Range (MHz)	**Field Strength (uV/m)**	**Field Strength (dBuV/m)**	**Measure Distance (m)**
0.009~0.490	2400/F(kHz)	48.5 - 13.8	300
0.490~1.705	24000/F(kHz)	33.8 - 23	30
1.705~30.0	30	29	30
30~88	100	40	3
88~216	150	43.5	3
216~960	200	46	3
Above 960	500	54	3

Note 1:
Qusai-Peak value is measured for frequency below 1GHz except for 9–90 kHz, 110–490 kHz frequency band. Peak and average value are measured for frequency above 1GHz. The limit on average radio frequency emission is as above table. The limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit
Note 2:
Measurements may be performed at a distance other than what is specified provided. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor as below, Frequency at or above 30 MHz: 20 dB/decade Frequency below 30 MHz: 40 dB/decade.

3.5.2 Test Procedures

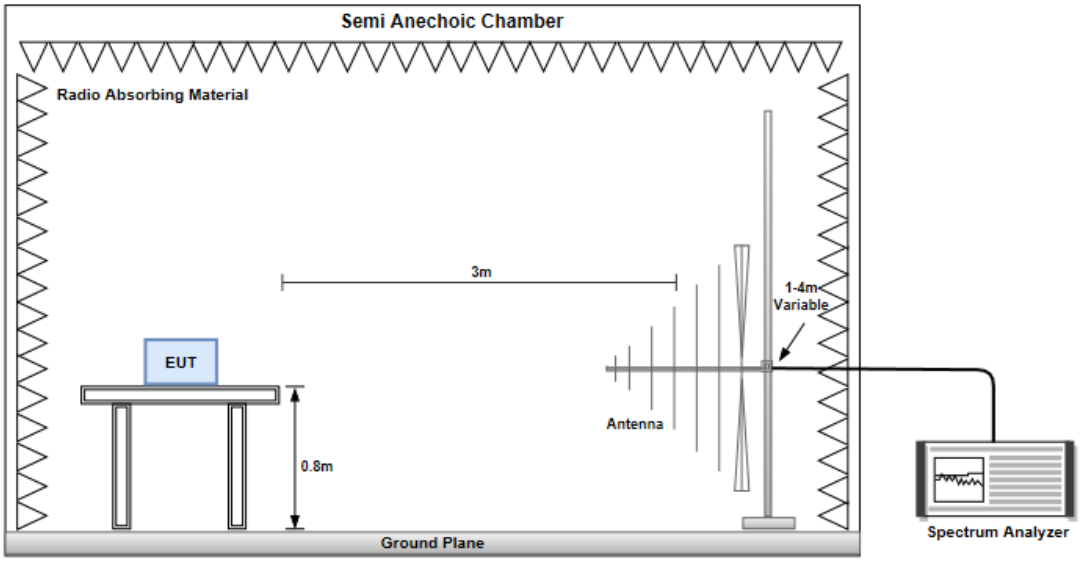
1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission frequency. The EUT is placed at test table. For emissions testing at or below 1 GHz, the table height is 80 cm above the reference ground plane. For emission measurements above 1 GHz, the table height is 1.5 m
2. Measurement is made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna is varied in height (1m ~ 4m) above the reference ground plane to obtain the maximum signal strength. Distance between EUT and antenna is 3 m.
3. This investigation is performed with the EUT rotated 360°, the antenna height scanned between 1 m and 4 m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations.

Note:

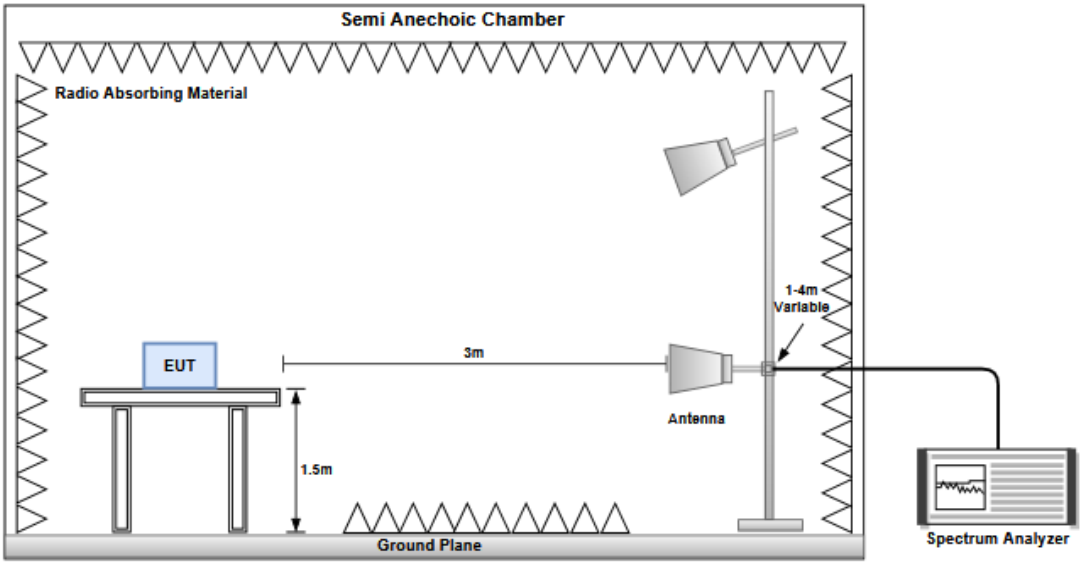
1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission below 1GHz.
2. RBW=1MHz, VBW=3MHz and Peak detector is for peak measured value of radiated emission above 1GHz.
3. RBW=1MHz, VBW=1/T and Peak detector is for average measured value of radiated emission above 1GHz.

3.5.3 Test Setup

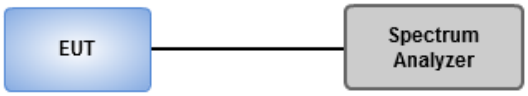
Radiated Emissions below 1 GHz



Radiated Emissions above 1 GHz



Transmitter Conducted Unwanted Emissions (30MHz~40GHz)

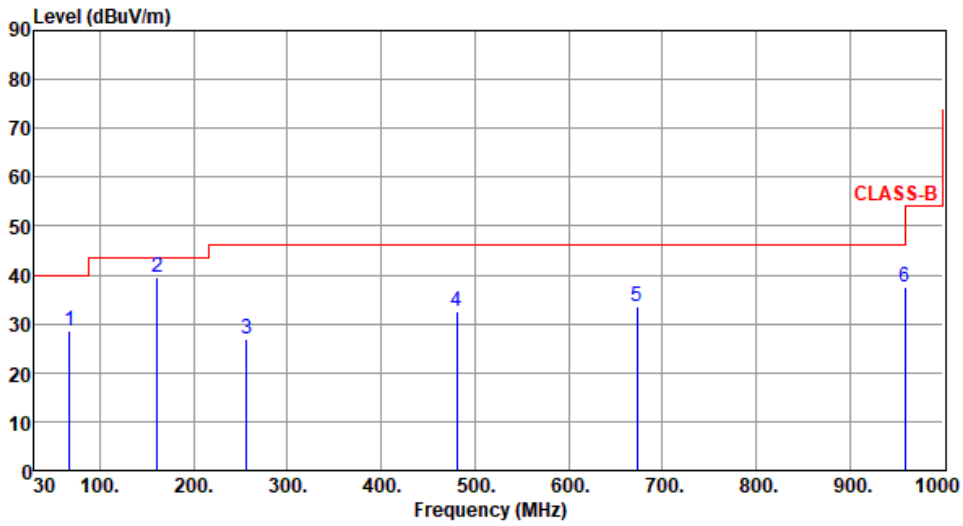


Internal antenna, Lower power

3.5.4 Transmitter Radiated Unwanted Emissions (Below 1GHz)

Modulation	OQPSK	**Test Freq. (MHz)**	2405
Polarization	Horizontal		

Test By :Roger Lu Temperature(℃):23 Humidity(%):68

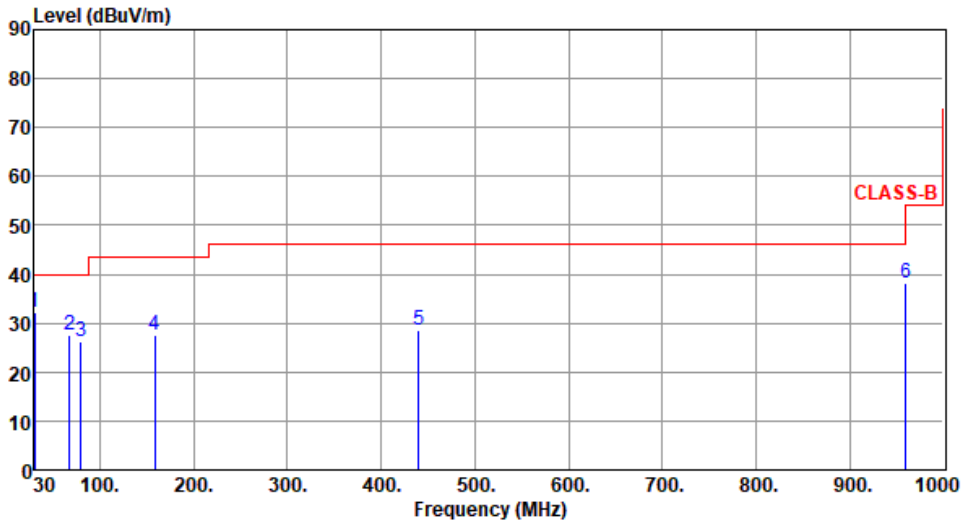


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	67.58	28.41	40.00	-11.59	38.59	-10.18	Peak	---	---
2	161.18	39.45	43.50	-4.05	48.38	-8.93	Peak	---	---
3	256.58	26.87	46.00	-19.13	36.76	-9.89	Peak	---	---
4	480.48	32.59	46.00	-13.41	36.24	-3.65	Peak	---	---
5	673.05	33.54	46.00	-12.46	33.81	-0.27	Peak	---	---
6	959.02	37.64	46.00	-8.36	32.88	4.76	Peak	---	---

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).
Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Modulation	OQPSK	Test Freq. (MHz)	2405
Polarization	Vertical		

Test By :Roger Lu Temperature(℃):23 Humidity(%):68



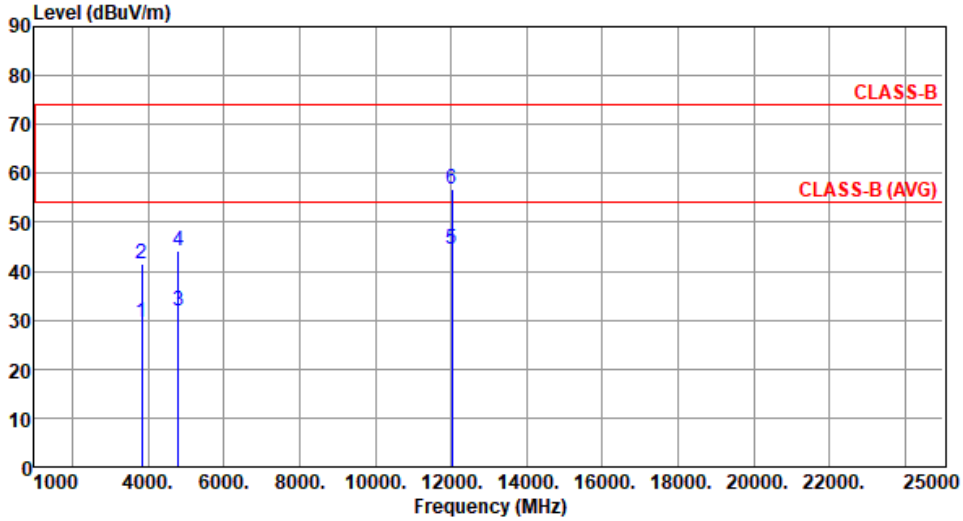
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	30.28	32.29	40.00	-7.71	41.85	-9.56	Peak	---	---
2	67.61	27.54	40.00	-12.46	37.72	-10.18	Peak	---	---
3	79.58	26.18	40.00	-13.82	39.35	-13.17	Peak	---	---
4	158.26	27.58	43.50	-15.92	36.48	-8.90	Peak	---	---
5	440.15	28.64	46.00	-17.36	33.21	-4.57	Peak	---	---
6	959.58	38.06	46.00	-7.94	33.29	4.77	Peak	---	---

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).
Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

3.5.5 Transmitter Radiated Unwanted Emissions (Above 1GHz)

Modulation	OQPSK	**Test Freq. (MHz)**	2405
Polarization	Horizontal		

Test By :Roger Lu Temperature(℃):24 Humidity(%):61

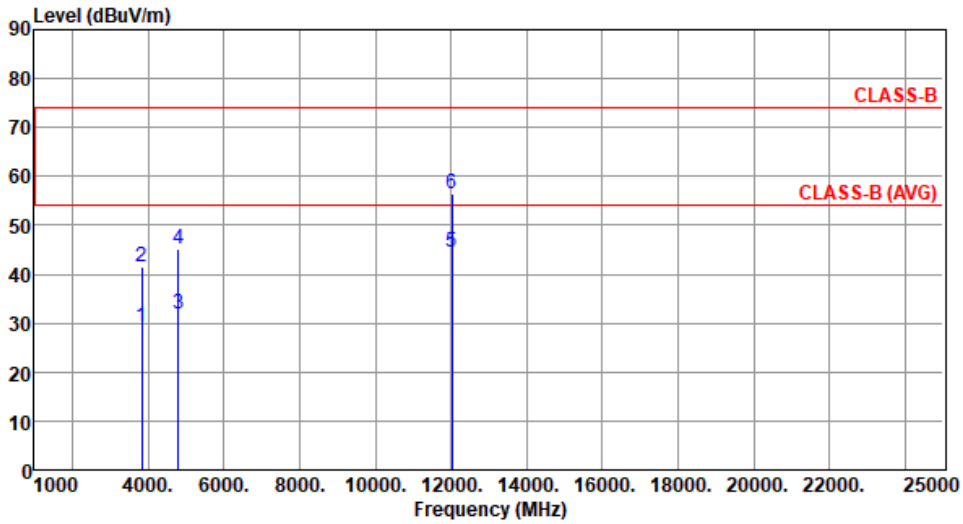


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	3840.00	29.51	54.00	-24.49	28.65	0.86	Average	100	65
2	3840.00	41.44	74.00	-32.56	40.58	0.86	Peak	100	65
3	4810.00	31.81	54.00	-22.19	28.32	3.49	Average	100	50
4	4810.00	44.17	74.00	-29.83	40.68	3.49	Peak	100	50
5	12025.00	44.58	54.00	-9.42	30.29	14.29	Average	100	40
6	12025.00	56.75	74.00	-17.25	42.46	14.29	Peak	100	40

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Modulation	OQPSK	Test Freq. (MHz)	2405
Polarization	Vertical		

Test By :Roger Lu Temperature(℃):24 Humidity(%):61

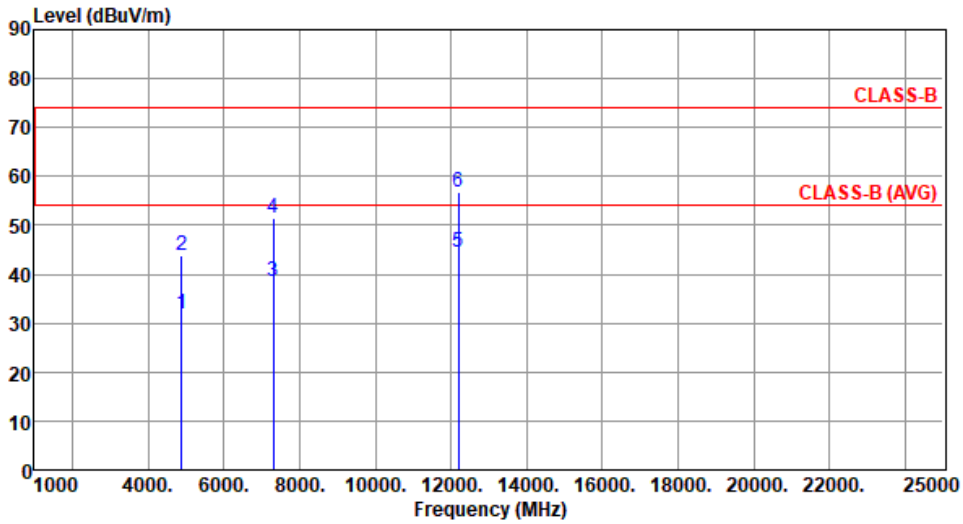


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	3840.00	29.35	54.00	-24.65	28.49	0.86	Average	100	192
2	3840.00	41.44	74.00	-32.56	40.58	0.86	Peak	100	192
3	4810.00	31.95	54.00	-22.05	28.46	3.49	Average	100	30
4	4810.00	45.07	74.00	-28.93	41.58	3.49	Peak	100	30
5	12025.00	44.55	54.00	-9.45	30.26	14.29	Average	100	40
6	12025.00	56.60	74.00	-17.40	42.31	14.29	Peak	100	40

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Modulation	OQPSK	Test Freq. (MHz)	2440
Polarization	Horizontal		

Test By :Roger Lu Temperature(℃):24 Humidity(%):61

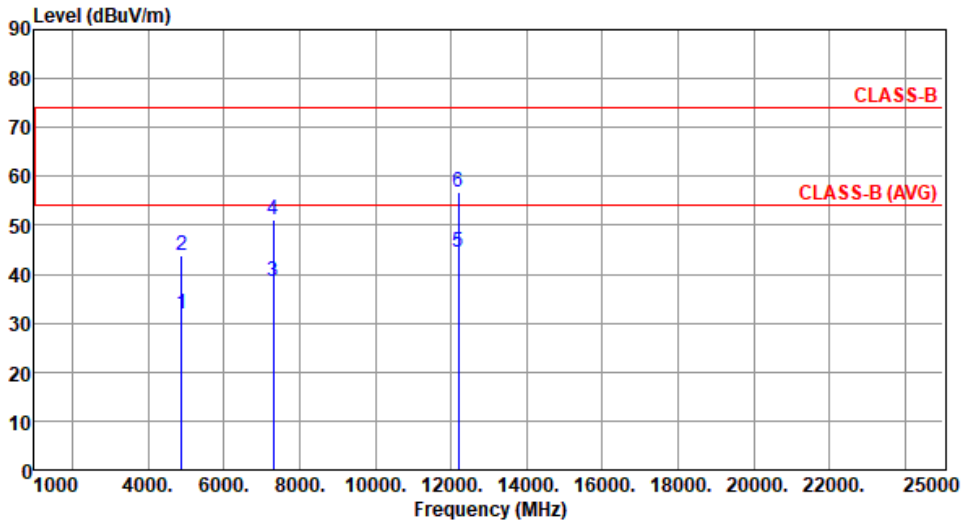


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	4880.00	31.81	54.00	-22.19	28.34	3.47	Average	100	20
2	4880.00	43.95	74.00	-30.05	40.48	3.47	Peak	100	20
3	7320.00	38.50	54.00	-15.50	29.48	9.02	Average	100	50
4	7320.00	51.49	74.00	-22.51	42.47	9.02	Peak	100	50
5	12200.00	44.65	54.00	-9.35	30.28	14.37	Average	100	30
6	12200.00	56.74	74.00	-17.26	42.37	14.37	Peak	100	30

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Modulation	OQPSK	Test Freq. (MHz)	2440
Polarization	Vertical		

Test By :Roger Lu Temperature(℃):24 Humidity(%):61

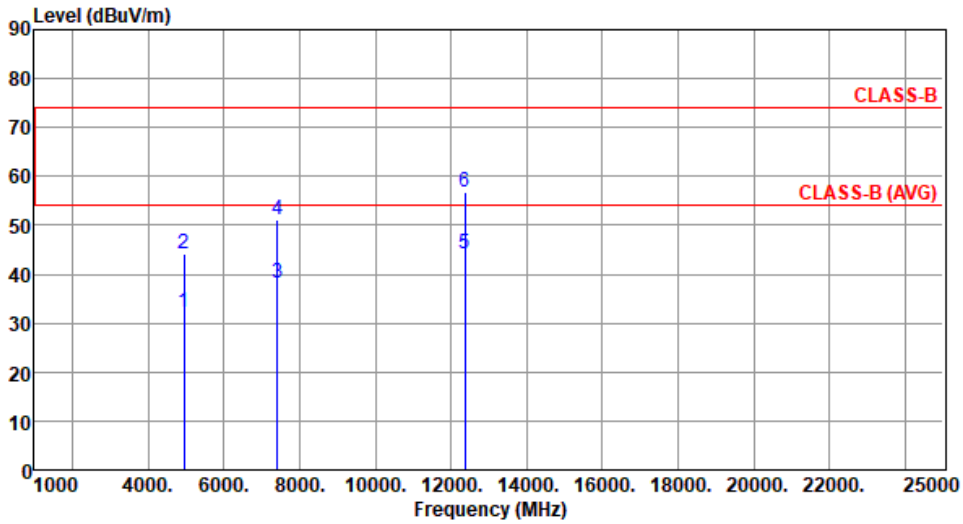


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	4880.00	31.92	54.00	-22.08	28.45	3.47	Average	100	50
2	4880.00	43.93	74.00	-30.07	40.46	3.47	Peak	100	50
3	7320.00	38.46	54.00	-15.54	29.44	9.02	Average	100	20
4	7320.00	51.23	74.00	-22.77	42.21	9.02	Peak	100	20
5	12200.00	44.48	54.00	-9.52	30.11	14.37	Average	100	30
6	12200.00	56.83	74.00	-17.17	42.46	14.37	Peak	100	30

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Modulation	OQPSK	Test Freq. (MHz)	2475
Polarization	Horizontal		

Test By :Roger Lu Temperature(℃):24 Humidity(%):61

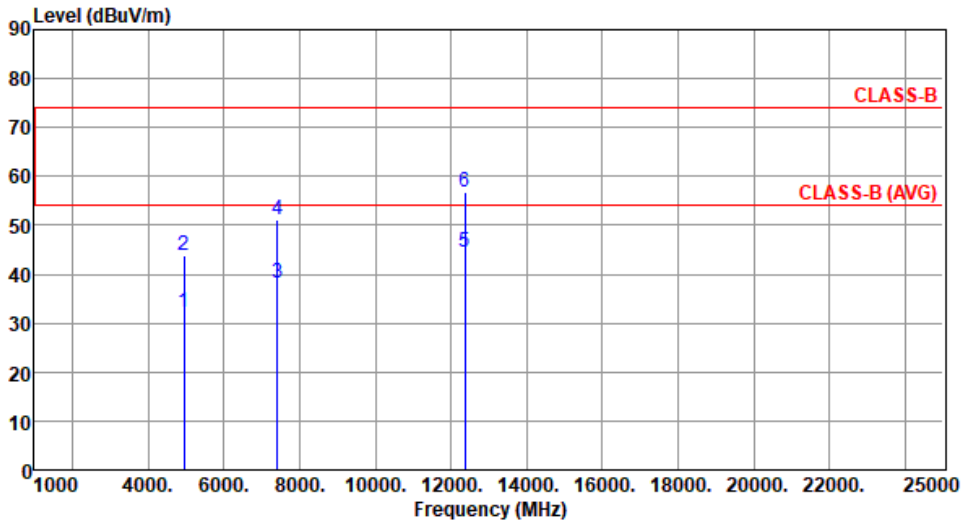


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	4950.00	32.16	54.00	-21.84	28.54	3.62	Average	100	100
2	4950.00	44.29	74.00	-29.71	40.67	3.62	Peak	100	100
3	7425.00	38.28	54.00	-15.72	29.32	8.96	Average	100	30
4	7425.00	51.15	74.00	-22.85	42.19	8.96	Peak	100	30
5	12375.00	44.31	54.00	-9.69	30.19	14.12	Average	100	40
6	12375.00	56.76	74.00	-17.24	42.64	14.12	Peak	100	40

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Modulation	OQPSK	Test Freq. (MHz)	2475
Polarization	Vertical		

Test By :Roger Lu Temperature(℃):24 Humidity(%):61

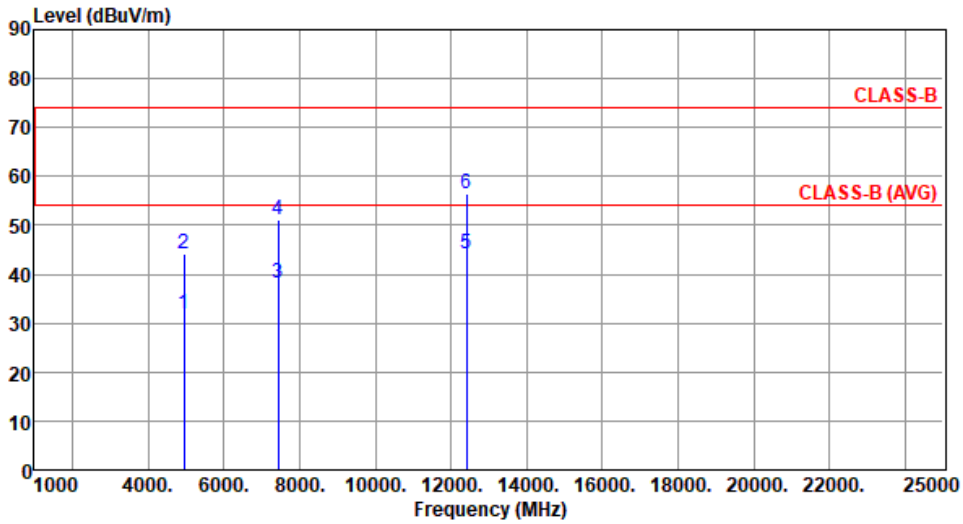


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	4950.00	32.08	54.00	-21.92	28.46	3.62	Average	100	80
2	4950.00	43.99	74.00	-30.01	40.37	3.62	Peak	100	80
3	7425.00	38.30	54.00	-15.70	29.34	8.96	Average	100	20
4	7425.00	51.12	74.00	-22.88	42.16	8.96	Peak	100	20
5	12375.00	44.40	54.00	-9.60	30.28	14.12	Average	100	30
6	12375.00	56.67	74.00	-17.33	42.55	14.12	Peak	100	30

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Modulation	OQPSK	Test Freq. (MHz)	2480
Polarization	Horizontal		

Test By :Roger Lu Temperature(℃):24 Humidity(%):61

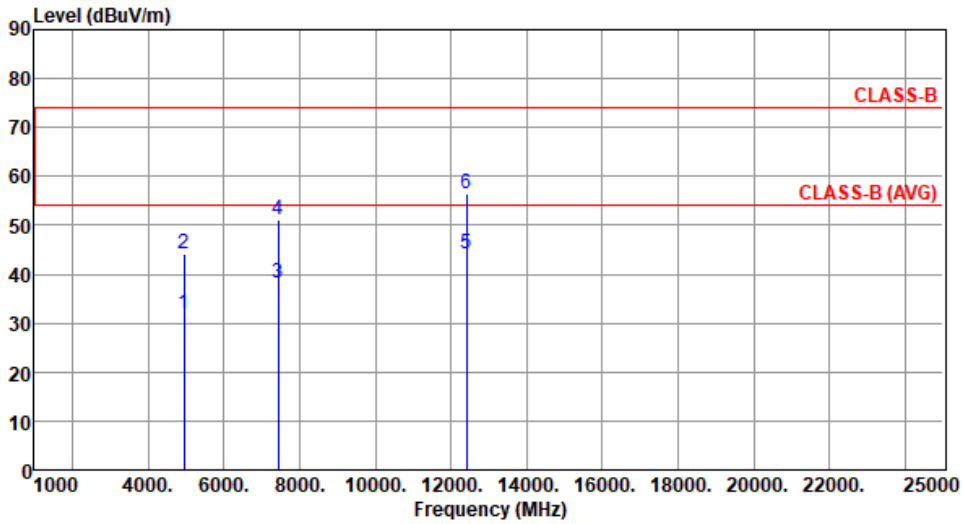


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	4960.00	31.99	54.00	-22.01	28.31	3.68	Average	100	50
2	4960.00	44.14	74.00	-29.86	40.46	3.68	Peak	100	50
3	7440.00	38.31	54.00	-15.69	29.33	8.98	Average	100	100
4	7440.00	51.29	74.00	-22.71	42.31	8.98	Peak	100	100
5	12400.00	44.23	54.00	-9.77	30.16	14.07	Average	100	90
6	12400.00	56.56	74.00	-17.44	42.49	14.07	Peak	100	90

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Modulation	OQPSK	Test Freq. (MHz)	2480
Polarization	Vertical		

Test By :Roger Lu Temperature(℃):24 Humidity(%):61



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	4960.00	31.96	54.00	-22.04	28.28	3.68	Average	100	50
2	4960.00	44.13	74.00	-29.87	40.45	3.68	Peak	100	50
3	7440.00	38.26	54.00	-15.74	29.28	8.98	Average	100	25
4	7440.00	51.15	74.00	-22.85	42.17	8.98	Peak	100	25
5	12400.00	44.25	54.00	-9.75	30.18	14.07	Average	100	40
6	12400.00	56.54	74.00	-17.46	42.47	14.07	Peak	100	40

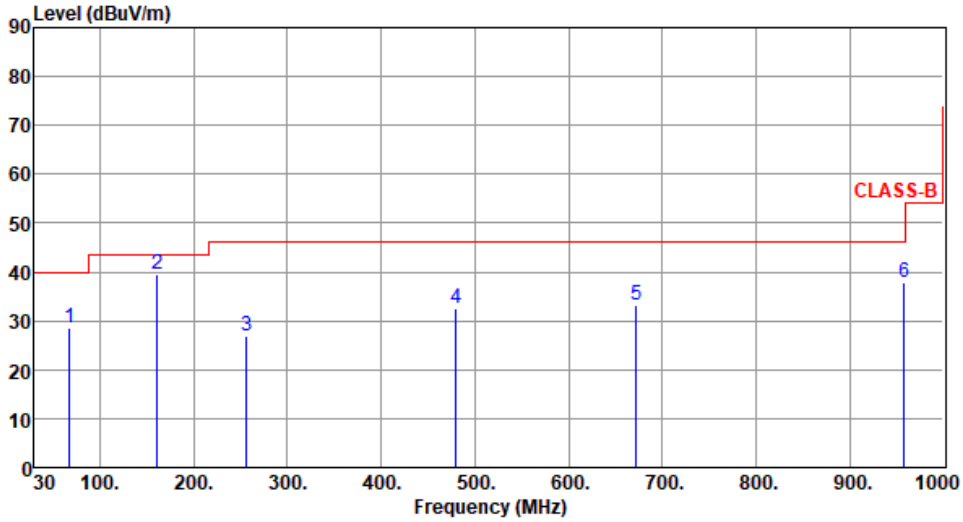
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Internal antenna, high power

3.5.6 Transmitter Radiated Unwanted Emissions (Below 1GHz)

Modulation	OQPSK	**Test Freq. (MHz)**	2405
Polarization	Horizontal		

Test By :Roger Lu Temperature(℃):23 Humidity(%):68

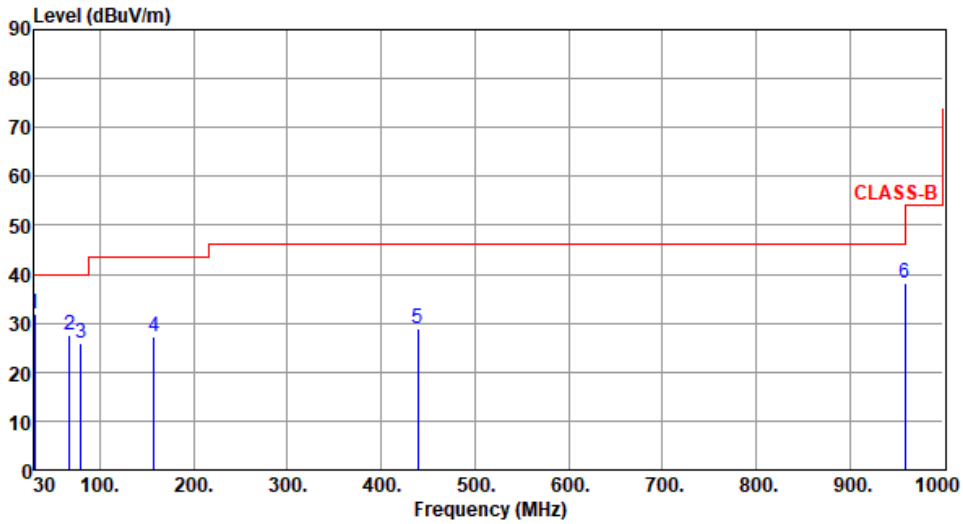


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	67.83	28.54	40.00	-11.46	38.70	-10.16	Peak	---	---
2	160.95	39.61	43.50	-3.89	48.53	-8.92	Peak	---	---
3	256.01	26.77	46.00	-19.23	36.67	-9.90	Peak	---	---
4	480.08	32.40	46.00	-13.60	36.05	-3.65	Peak	---	---
5	672.14	33.26	46.00	-12.74	33.50	-0.24	Peak	---	---
6	958.29	37.90	46.00	-8.10	33.14	4.76	Peak	---	---

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).
Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Modulation	OQPSK	Test Freq. (MHz)	2405
Polarization	Vertical		

Test By :Roger Lu Temperature(℃):23 Humidity(%):68



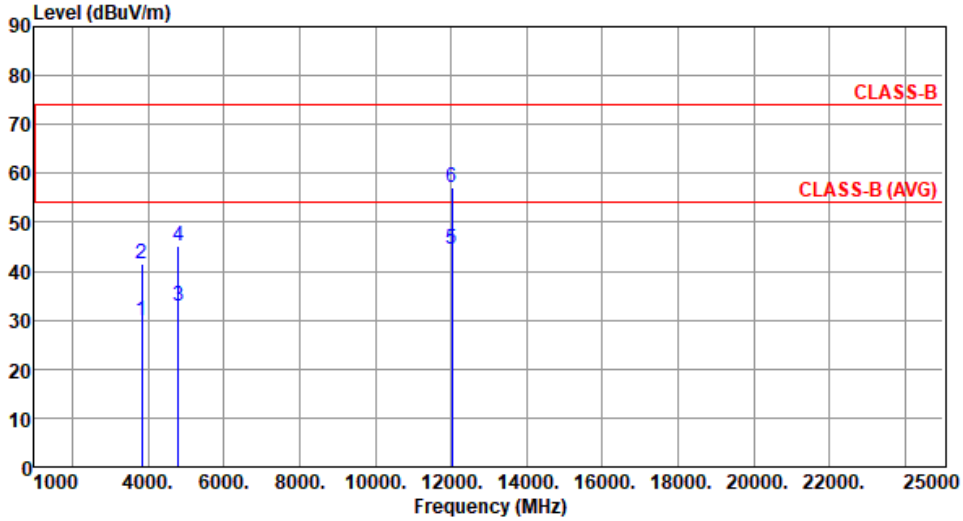
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	30.00	32.04	40.00	-7.96	41.52	-9.48	Peak	---	---
2	67.83	27.71	40.00	-12.29	37.87	-10.16	Peak	---	---
3	79.47	25.91	40.00	-14.09	39.05	-13.14	Peak	---	---
4	158.04	27.13	43.50	-16.37	36.06	-8.93	Peak	---	---
5	439.34	28.88	46.00	-17.12	33.46	-4.58	Peak	---	---
6	959.26	38.30	46.00	-7.70	33.54	4.76	Peak	---	---

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).
Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

3.5.7 Transmitter Radiated Unwanted Emissions (Above 1GHz)

Modulation	OQPSK	**Test Freq. (MHz)**	2405
Polarization	Horizontal		

Test By :Roger Lu Temperature(℃):24 Humidity(%):61

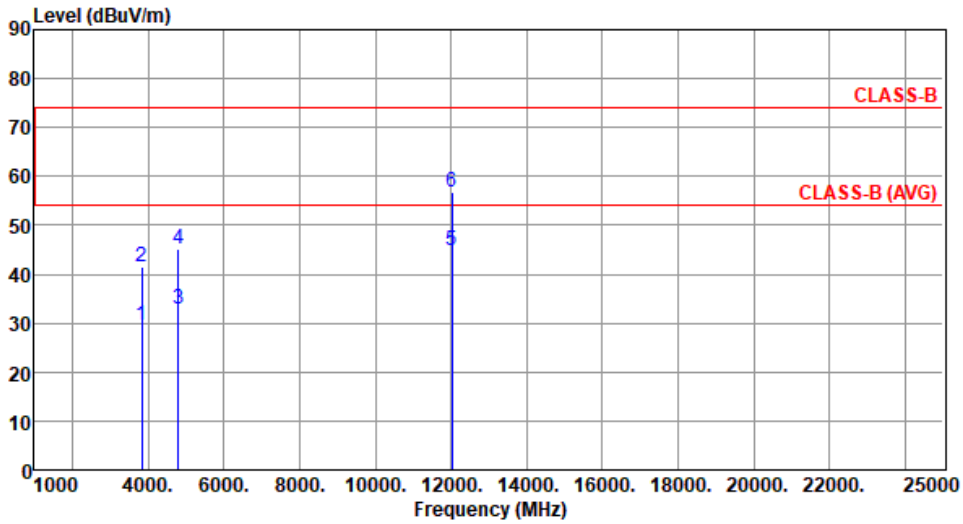


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	3840.00	29.73	54.00	-24.27	28.87	0.86	Average	100	70
2	3840.00	41.66	74.00	-32.34	40.80	0.86	Peak	100	70
3	4810.00	32.80	54.00	-21.20	29.31	3.49	Average	100	245
4	4810.00	45.14	74.00	-28.86	41.65	3.49	Peak	100	245
5	12025.00	44.44	54.00	-9.56	30.15	14.29	Average	100	60
6	12025.00	56.98	74.00	-17.02	42.69	14.29	Peak	100	60

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Modulation	OQPSK	Test Freq. (MHz)	2405
Polarization	Vertical		

Test By :Roger Lu Temperature(℃):24 Humidity(%):61

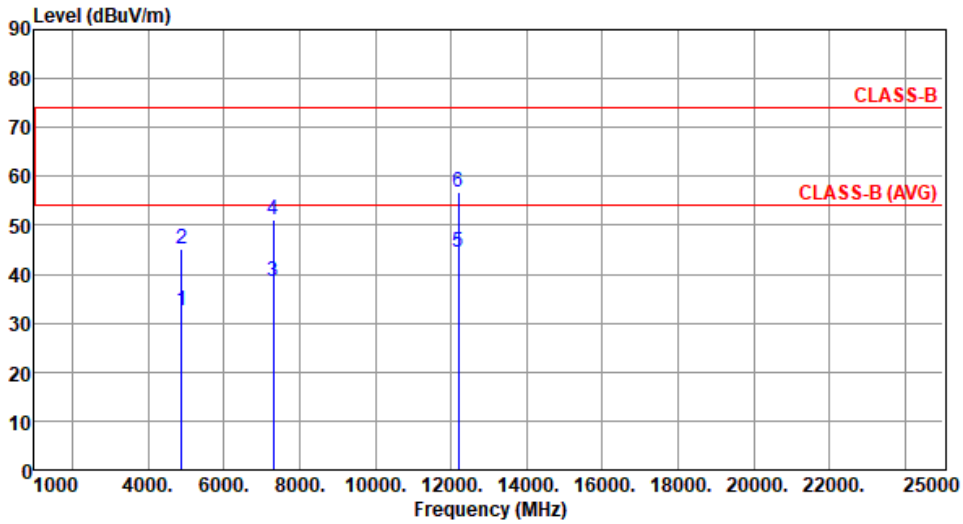


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	3840.00	29.61	54.00	-24.39	28.75	0.86	Average	100	191
2	3840.00	41.51	74.00	-32.49	40.65	0.86	Peak	100	191
3	4810.00	32.84	54.00	-21.16	29.35	3.49	Average	100	248
4	4810.00	45.14	74.00	-28.86	41.65	3.49	Peak	100	248
5	12025.00	44.74	54.00	-9.26	30.45	14.29	Average	100	60
6	12025.00	56.78	74.00	-17.22	42.49	14.29	Peak	100	60

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Modulation	OQPSK	Test Freq. (MHz)	2440
Polarization	Horizontal		

Test By :Roger Lu Temperature(℃):24 Humidity(%):61

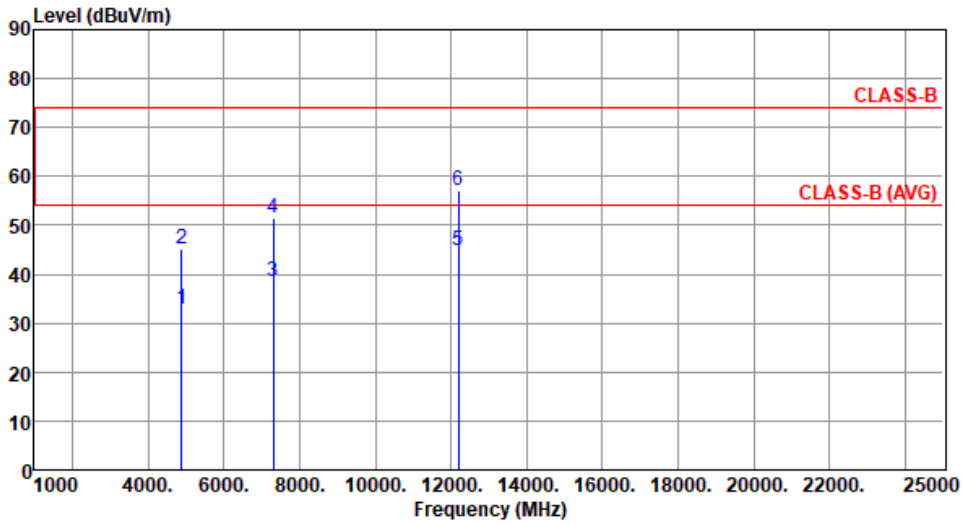


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	4880.00	32.67	54.00	-21.33	29.20	3.47	Average	100	238
2	4880.00	45.07	74.00	-28.93	41.60	3.47	Peak	100	238
3	7320.00	38.57	54.00	-15.43	29.55	9.02	Average	100	60
4	7320.00	51.21	74.00	-22.79	42.19	9.02	Peak	100	60
5	12200.00	44.52	54.00	-9.48	30.15	14.37	Average	100	30
6	12200.00	56.86	74.00	-17.14	42.49	14.37	Peak	100	30

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Modulation	OQPSK	Test Freq. (MHz)	2440
Polarization	Vertical		

Test By :Roger Lu Temperature(℃):24 Humidity(%):61

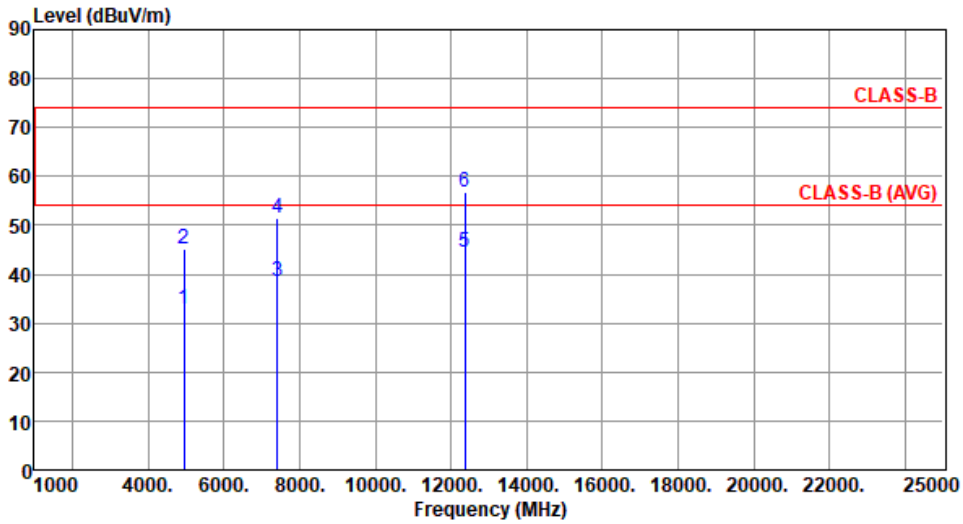


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	4880.00	32.75	54.00	-21.25	29.28	3.47	Average	100	249
2	4880.00	45.18	74.00	-28.82	41.71	3.47	Peak	100	249
3	7320.00	38.67	54.00	-15.33	29.65	9.02	Average	100	50
4	7320.00	51.33	74.00	-22.67	42.31	9.02	Peak	100	50
5	12200.00	44.76	54.00	-9.24	30.39	14.37	Average	100	40
6	12200.00	56.96	74.00	-17.04	42.59	14.37	Peak	100	40

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Modulation	OQPSK	Test Freq. (MHz)	2475
Polarization	Horizontal		

Test By :Roger Lu Temperature(℃):24 Humidity(%):61

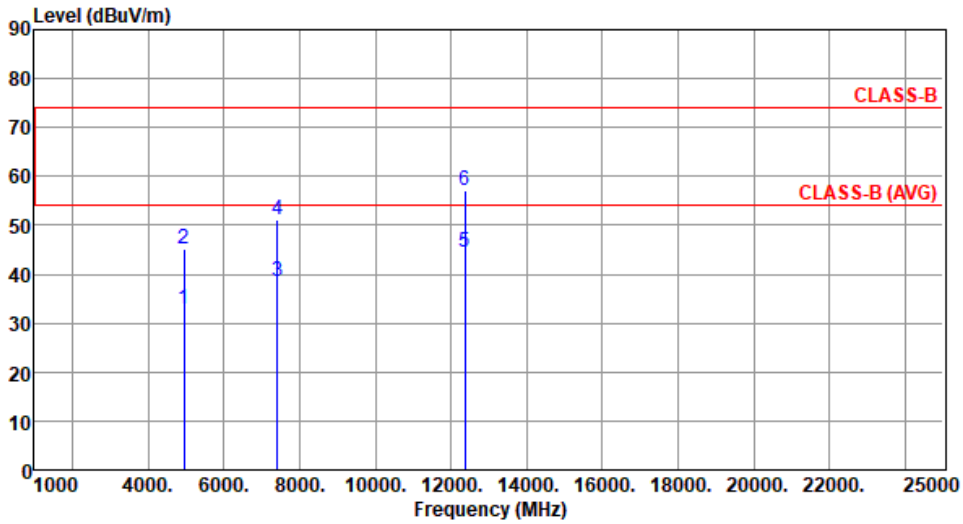


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	4950.00	32.78	54.00	-21.22	29.16	3.62	Average	100	241
2	4950.00	45.20	74.00	-28.80	41.58	3.62	Peak	100	241
3	7425.00	38.43	54.00	-15.57	29.47	8.96	Average	100	55
4	7425.00	51.35	74.00	-22.65	42.39	8.96	Peak	100	55
5	12375.00	44.44	54.00	-9.56	30.32	14.12	Average	100	25
6	12375.00	56.88	74.00	-17.12	42.76	14.12	Peak	100	25

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Modulation	OQPSK	Test Freq. (MHz)	2475
Polarization	Vertical		

Test By :Roger Lu Temperature(℃):24 Humidity(%):61

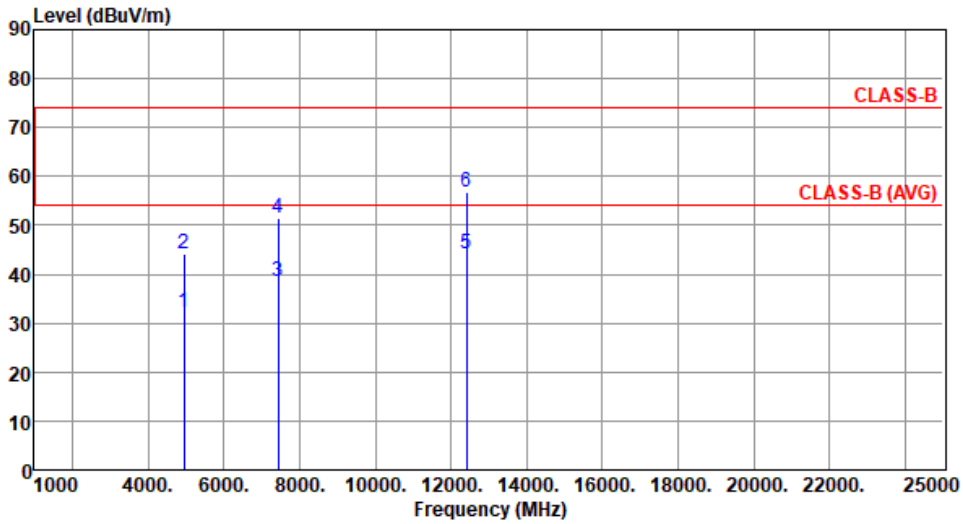


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	4950.00	32.76	54.00	-21.24	29.14	3.62	Average	100	240
2	4950.00	45.10	74.00	-28.90	41.48	3.62	Peak	100	240
3	7425.00	38.45	54.00	-15.55	29.49	8.96	Average	100	100
4	7425.00	51.13	74.00	-22.87	42.17	8.96	Peak	100	100
5	12375.00	44.42	54.00	-9.58	30.30	14.12	Average	100	50
6	12375.00	56.99	74.00	-17.01	42.87	14.12	Peak	100	50

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Modulation	OQPSK	Test Freq. (MHz)	2480
Polarization	Horizontal		

Test By :Roger Lu Temperature(℃):24 Humidity(%):61

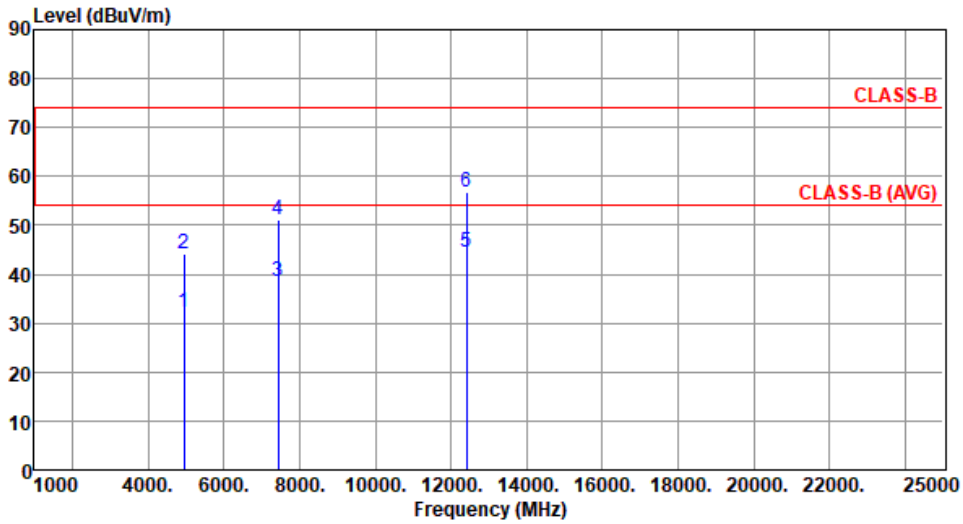


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	4960.00	32.13	54.00	-21.87	28.45	3.68	Average	100	200
2	4960.00	44.27	74.00	-29.73	40.59	3.68	Peak	100	200
3	7440.00	38.44	54.00	-15.56	29.46	8.98	Average	100	20
4	7440.00	51.43	74.00	-22.57	42.45	8.98	Peak	100	20
5	12400.00	44.30	54.00	-9.70	30.23	14.07	Average	100	40
6	12400.00	56.63	74.00	-17.37	42.56	14.07	Peak	100	40

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Modulation	OQPSK	Test Freq. (MHz)	2480
Polarization	Vertical		

Test By :Roger Lu Temperature(℃):24 Humidity(%):61



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	4960.00	32.12	54.00	-21.88	28.44	3.68	Average	100	80
2	4960.00	44.32	74.00	-29.68	40.64	3.68	Peak	100	80
3	7440.00	38.45	54.00	-15.55	29.47	8.98	Average	100	30
4	7440.00	51.29	74.00	-22.71	42.31	8.98	Peak	100	30
5	12400.00	44.41	54.00	-9.59	30.34	14.07	Average	100	60
6	12400.00	56.66	74.00	-17.34	42.59	14.07	Peak	100	60

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Internal antenna, Lower power

3.5.8 Transmitter Conducted Unwanted Emissions (30MHz ~ 1GHz)

Ambient Condition	24°C / 63%	**Tested By**	Aska Huang

Summary

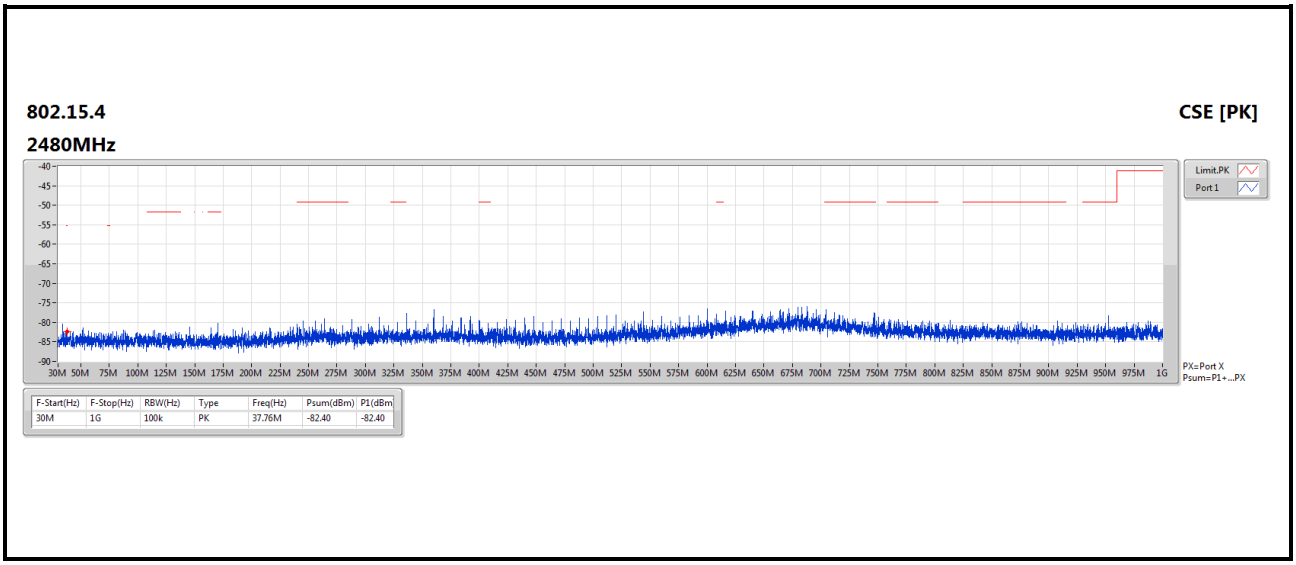
Mode	Result	F-Start (Hz)	F-Stop (Hz)	Type	Freq (Hz)	DG (dBi)	P1 (dBm)	Psum (dBm)	GRF (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-
802.15.4	Pass	30M	1G	PK	37.76M	2.00	-82.40	-82.40	4.7	-75.70	-55.20	-20.50

DG = Directional Gain;
PX=Port X; **Psum**=P1+.P2+..PX

Result

Mode	Result	F-Start (Hz)	F-Stop (Hz)	Type	Freq (Hz)	DG (dBi)	P1 (dBm)	Psum (dBm)	GRF (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
802.15.4	-	-	-	-	-	-	-	-	-	-	-	-
2480MHz	Pass	30M	1G	PK	37.76M	2.00	-82.40	-82.40	4.7	-75.70	-55.20	-20.50

DG = Directional Gain;
PX=Port X; **Psum**=P1+.P2+..PX



3.5.9 Transmitter Conducted Unwanted Emissions (1GHz ~ 3.1GHz)

Ambient Condition	24°C / 63%	Tested By	Aska Huang

Summary

Mode	Result	F-Start (Hz)	F-Stop (Hz)	Type	Freq (Hz)	DG (dBi)	P1 (dBm)	Psum (dBm)	EIRP (dBm)	Limit (dBm)	Margin (dB)
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-
802.15.4	Pass	1G	2.31G	AV	2.15395G	2.00	-72.36	-72.36	-70.36	-41.20	-29.16

DG = Directional Gain;
PX=Port X; **Psum**=P1+.P2+..PX

Result

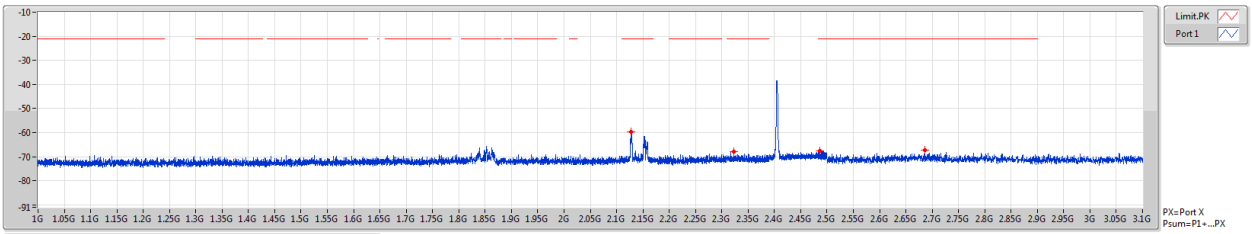
Mode	Result	F-Start (Hz)	F-Stop (Hz)	Type	Freq (Hz)	DG (dBi)	P1 (dBm)	Psum (dBm)	EIRP (dBm)	Limit (dBm)	Margin (dB)
802.15.4	-	-	-	-	-	-	-	-	-	-	-
2405MHz	Pass	1G	2.31G	AV	2.15395G	2.00	-72.36	-72.36	-70.36	-41.20	-29.16
2405MHz	Pass	2.31G	2.39G	AV	2.31858G	2.00	-80.00	-80.00	-78.00	-41.20	-36.80
2405MHz	Pass	2.4835G	2.5G	AV	2.49732G	2.00	-79.69	-79.69	-77.69	-41.20	-36.49
2405MHz	Pass	2.5G	3.1G	AV	2.6887G	2.00	-78.62	-78.62	-76.62	-41.20	-35.42
2405MHz	Pass	1G	2.31G	PK	2.12791G	2.00	-59.71	-59.71	-57.71	-21.20	-36.51
2405MHz	Pass	2.31G	2.39G	PK	2.32275G	2.00	-67.95	-67.95	-65.95	-21.20	-44.75
2405MHz	Pass	2.4835G	2.5G	PK	2.48575G	2.00	-67.63	-67.63	-65.63	-21.20	-44.43
2405MHz	Pass	2.5G	3.1G	PK	2.6857G	2.00	-67.39	-67.39	-65.39	-21.20	-44.19
2440MHz	Pass	1G	2.31G	AV	2.12807G	2.00	-74.36	-74.36	-72.36	-41.20	-31.16
2440MHz	Pass	2.31G	2.39G	AV	2.34536G	2.00	-80.18	-80.18	-78.18	-41.20	-36.98
2440MHz	Pass	2.4835G	2.5G	AV	2.494G	2.00	-79.70	-79.70	-77.70	-41.20	-36.50
2440MHz	Pass	2.5G	3.1G	AV	2.6803G	2.00	-78.59	-78.59	-76.59	-41.20	-35.39
2440MHz	Pass	1G	2.31G	PK	2.12807G	2.00	-59.32	-59.32	-57.32	-21.20	-36.12
2440MHz	Pass	2.31G	2.39G	PK	2.32809G	2.00	-67.75	-67.75	-65.75	-21.20	-44.55
2440MHz	Pass	2.4835G	2.5G	PK	2.49548G	2.00	-67.55	-67.55	-65.55	-21.20	-44.35
2440MHz	Pass	2.5G	3.1G	PK	2.716G	2.00	-67.72	-67.72	-65.72	-21.20	-44.52
2475MHz	Pass	1G	2.31G	AV	2.15247G	2.00	-73.19	-73.19	-71.19	-41.20	-29.99
2475MHz	Pass	2.31G	2.39G	AV	2.34571G	2.00	-80.18	-80.18	-78.18	-41.20	-36.98
2475MHz	Pass	2.4835G	2.5G	AV	2.49703G	2.00	-79.69	-79.69	-77.69	-41.20	-36.49
2475MHz	Pass	2.5G	3.1G	AV	2.6938G	2.00	-78.65	-78.65	-76.65	-41.20	-35.45
2475MHz	Pass	1G	2.31G	PK	2.12807G	2.00	-58.82	-58.82	-56.82	-21.20	-35.62
2475MHz	Pass	2.31G	2.39G	PK	2.32577G	2.00	-67.96	-67.96	-65.96	-21.20	-44.76
2475MHz	Pass	2.4835G	2.5G	PK	2.49823G	2.00	-67.66	-67.66	-65.66	-21.20	-44.46
2475MHz	Pass	2.5G	3.1G	PK	2.8489G	2.00	-67.93	-67.93	-65.93	-21.20	-44.73

Mode	Result	F-Start (Hz)	F-Stop (Hz)	Type	Freq (Hz)	DG (dBi)	P1 (dBm)	Psum (dBm)	EIRP (dBm)	Limit (dBm)	Margin (dB)
2480MHz	Pass	1G	2.31G	AV	2.15215G	2.00	-73.63	-73.63	-71.63	-41.20	-30.43
2480MHz	Pass	2.31G	2.39G	AV	2.31417G	2.00	-79.98	-79.98	-77.98	-41.20	-36.78
2480MHz	Pass	2.4835G	2.5G	AV	2.48352G	2.00	-76.87	-76.87	-74.87	-41.20	-33.67
2480MHz	Pass	2.5G	3.1G	AV	2.6893G	2.00	-78.62	-78.62	-76.62	-41.20	-35.42
2480MHz	Pass	1G	2.31G	PK	2.12873G	2.00	-61.08	-61.08	-59.08	-21.20	-37.88
2480MHz	Pass	2.31G	2.39G	PK	2.35151G	2.00	-68.44	-68.44	-66.44	-21.20	-45.24
2480MHz	Pass	2.4835G	2.5G	PK	2.48355G	2.00	-65.79	-65.79	-63.79	-21.20	-42.59
2480MHz	Pass	2.5G	3.1G	PK	2.8339G	2.00	-67.83	-67.83	-65.83	-21.20	-44.63

DG = Directional Gain;
PX=Port X; **Psum**=P1

802.15.4 **CSE [PK]**

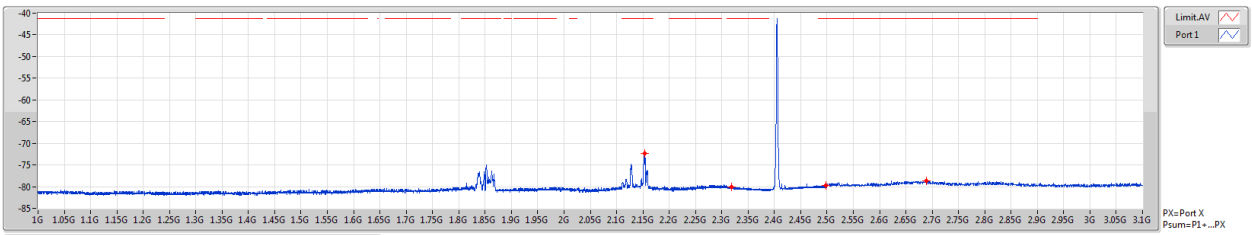
2405MHz



F-Start(Hz)	F-Stop(Hz)	RBW(Hz)	Type	Freq(Hz)	Psum(dBm)	P1(dBm
1G	2.31G	1M	PK	2.12791G	-59.71	-59.71
2.31G	2.39G	1M	PK	2.32275G	-67.95	-67.95
2.4835G	2.5G	1M	PK	2.48575G	-67.63	-67.63
2.5G	3.1G	1M	PK	2.6857G	-67.39	-67.39

802.15.4 **CSE [AV]**

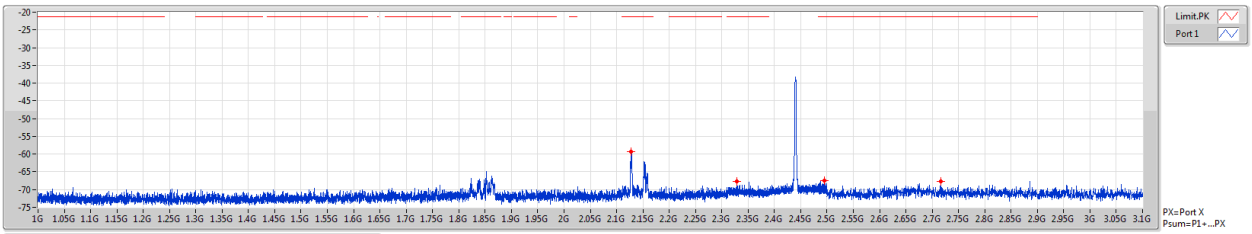
2405MHz



F-Start(Hz)	F-Stop(Hz)	RBW(Hz)	Type	Freq(Hz)	Psum(dBm)	P1(dBm
1G	2.31G	1M	AV	2.15395G	-72.36	-72.36
2.31G	2.39G	1M	AV	2.31858G	-80.00	-80.00
2.4835G	2.5G	1M	AV	2.49732G	-79.69	-79.69
2.5G	3.1G	1M	AV	2.6887G	-78.62	-78.62

802.15.4 **CSE [PK]**

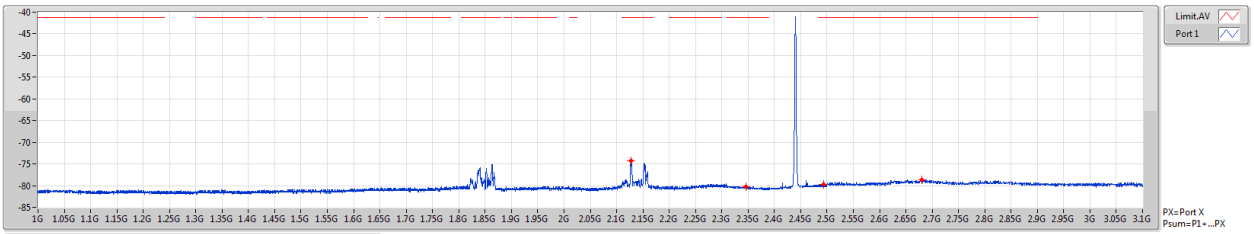
2440MHz



F-Start(Hz)	F-Stop(Hz)	RBW(Hz)	Type	Freq(Hz)	Psum(dBm)	P1(dBm
1G	2.31G	1M	PK	2.12807G	-59.32	-59.32
2.31G	2.39G	1M	PK	2.32809G	-67.75	-67.75
2.4835G	2.5G	1M	PK	2.49548G	-67.55	-67.55
2.5G	3.1G	1M	PK	2.716G	-67.72	-67.72

802.15.4 **CSE [AV]**

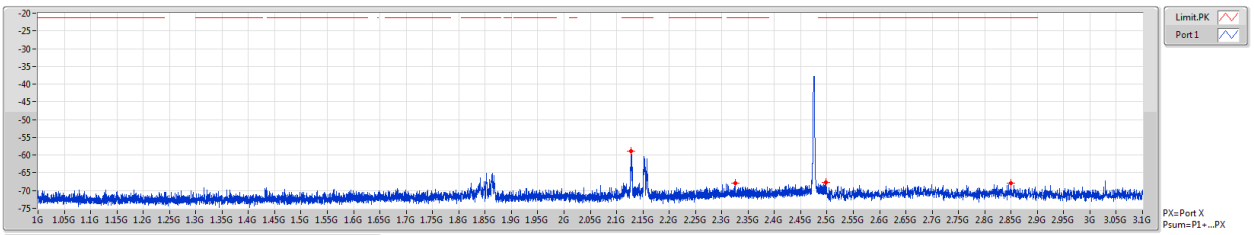
2440MHz



F-Start(Hz)	F-Stop(Hz)	RBW(Hz)	Type	Freq(Hz)	Psum(dBm)	P1(dBm
1G	2.31G	1M	AV	2.12807G	-74.36	-74.36
2.31G	2.39G	1M	AV	2.34536G	-80.18	-80.18
2.4835G	2.5G	1M	AV	2.494G	-79.70	-79.70
2.5G	3.1G	1M	AV	2.6803G	-78.59	-78.59

802.15.4 **CSE [PK]**

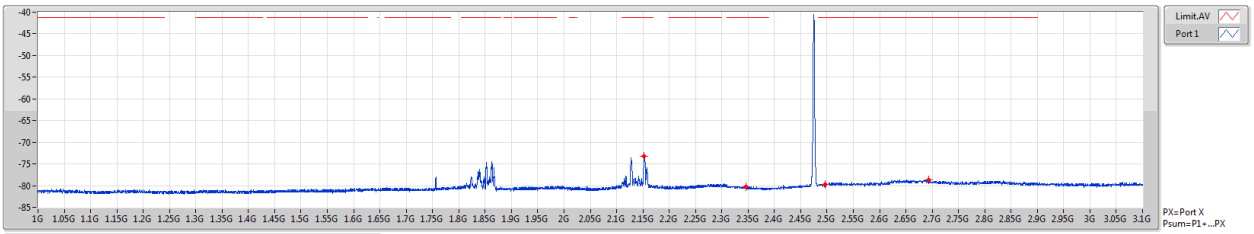
2475MHz



F-Start(Hz)	F-Stop(Hz)	RBW(Hz)	Type	Freq(Hz)	Psum(dBm)	P1(dBm
1G	2.31G	1M	PK	2.12807G	-58.82	-58.82
2.31G	2.39G	1M	PK	2.32577G	-67.96	-67.96
2.4835G	2.5G	1M	PK	2.49823G	-67.66	-67.66
2.5G	3.1G	1M	PK	2.8489G	-67.93	-67.93

802.15.4 **CSE [AV]**

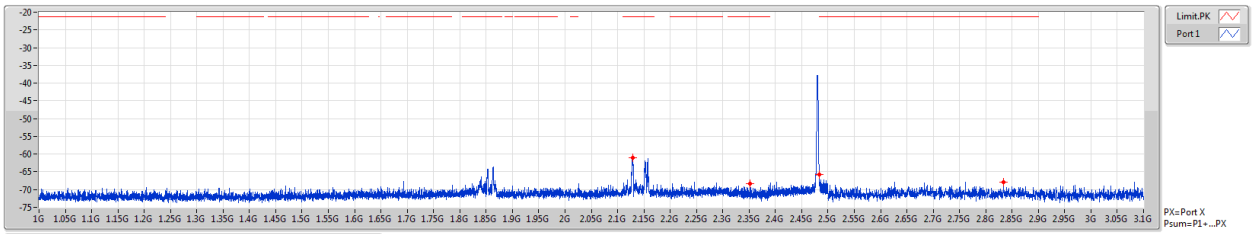
2475MHz



F-Start(Hz)	F-Stop(Hz)	RBW(Hz)	Type	Freq(Hz)	Psum(dBm)	P1(dBm
1G	2.31G	1M	AV	2.15247G	-73.19	-73.19
2.31G	2.39G	1M	AV	2.34571G	-80.18	-80.18
2.4835G	2.5G	1M	AV	2.49703G	-79.69	-79.69
2.5G	3.1G	1M	AV	2.6938G	-78.65	-78.65

802.15.4 **CSE [PK]**

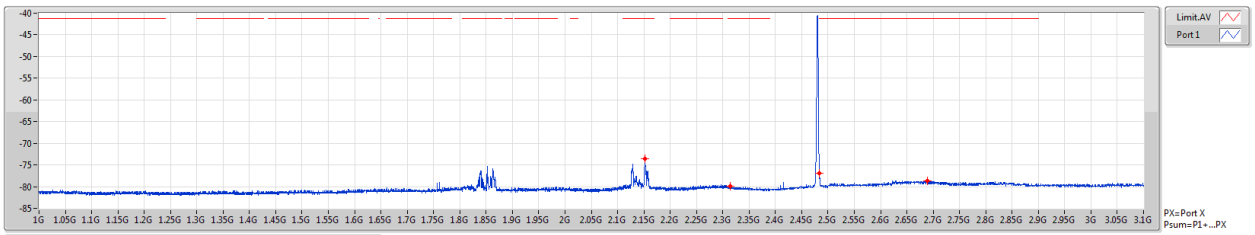
2480MHz



F-Start(Hz)	F-Stop(Hz)	RBW(Hz)	Type	Freq(Hz)	Psum(dBm)	P1(dBm
1G	2.31G	1M	PK	2.12873G	-61.08	-61.08
2.31G	2.39G	1M	PK	2.35151G	-68.44	-68.44
2.4835G	2.5G	1M	PK	2.48355G	-65.79	-65.79
2.5G	3.1G	1M	PK	2.8339G	-67.83	-67.83

802.15.4 **CSE [AV]**

2480MHz



F-Start(Hz)	F-Stop(Hz)	RBW(Hz)	Type	Freq(Hz)	Psum(dBm)	P1(dBm
1G	2.31G	1M	AV	2.15215G	-73.63	-73.63
2.31G	2.39G	1M	AV	2.31417G	-79.98	-79.98
2.4835G	2.5G	1M	AV	2.48352G	-76.87	-76.87
2.5G	3.1G	1M	AV	2.6893G	-78.62	-78.62

3.5.10 Transmitter Conducted Unwanted Emissions (3.1GHz ~ 25GHz)

Ambient Condition	24°C / 63%	Tested By	Aska Huang

Summary

Mode	Result	F-Start (Hz)	F-Stop (Hz)	Type	Freq (Hz)	DG (dBi)	P1 (dBm)	Psum (dBm)	EIRP (dBm)	Limit (dBm)	Margin (dB)
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-
802.15.4	Pass	8G	25G	AV	20.12738G	2.00	-67.64	-67.64	-65.64	-41.20	-24.44

DG = Directional Gain;
PX=Port X; **Psum**=P1+.P2+..PX

Result

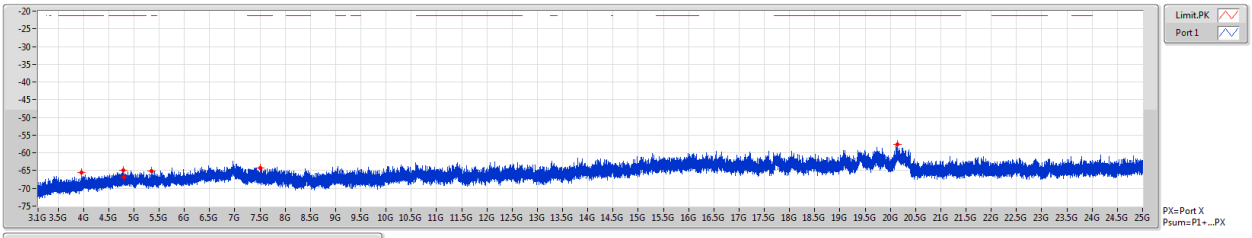
Mode	Result	F-Start (Hz)	F-Stop (Hz)	Type	Freq (Hz)	DG (dBi)	P1 (dBm)	Psum (dBm)	EIRP (dBm)	Limit (dBm)	Margin (dB)
802.15.4	-	-	-	-	-	-	-	-	-	-	-
2405MHz	Pass	3.1G	4G	AV	3.99303G	2.00	-77.36	-77.36	-75.36	-41.20	-34.16
2405MHz	Pass	4G	5G	AV	4.8085G	2.00	-76.83	-76.83	-74.83	-41.20	-33.63
2405MHz	Pass	4G	5G	AV	4.9345G	2.00	-76.65	-76.65	-74.65	-41.20	-33.45
2405MHz	Pass	5G	7G	AV	5.101G	2.00	-75.93	-75.93	-73.93	-41.20	-32.73
2405MHz	Pass	7G	8G	AV	7.39825G	2.00	-74.56	-74.56	-72.56	-41.20	-31.36
2405MHz	Pass	8G	25G	AV	20.12738G	2.00	-67.64	-67.64	-65.64	-41.20	-24.44
2405MHz	Pass	3.1G	4G	PK	3.96738G	2.00	-65.48	-65.48	-63.48	-21.20	-42.28
2405MHz	Pass	4G	5G	PK	4.792G	2.00	-64.90	-64.90	-62.90	-21.20	-41.70
2405MHz	Pass	4G	5G	PK	4.80825G	2.00	-66.87	-66.87	-64.87	-21.20	-43.67
2405MHz	Pass	5G	7G	PK	5.351G	2.00	-65.18	-65.18	-63.18	-21.20	-41.98
2405MHz	Pass	7G	8G	PK	7.504G	2.00	-64.19	-64.19	-62.19	-21.20	-40.99
2405MHz	Pass	8G	25G	PK	20.13588G	2.00	-57.55	-57.55	-55.55	-21.20	-34.35
2440MHz	Pass	3.1G	4G	AV	3.99955G	2.00	-77.54	-77.54	-75.54	-41.20	-34.34
2440MHz	Pass	4G	5G	AV	4.8805G	2.00	-76.85	-76.85	-74.85	-41.20	-33.65
2440MHz	Pass	4G	5G	AV	4.9385G	2.00	-76.65	-76.65	-74.65	-41.20	-33.45
2440MHz	Pass	5G	7G	AV	5.104G	2.00	-75.93	-75.93	-73.93	-41.20	-32.73
2440MHz	Pass	7G	8G	AV	7.399G	2.00	-74.55	-74.55	-72.55	-41.20	-31.35
2440MHz	Pass	8G	25G	AV	20.14066G	2.00	-67.91	-67.91	-65.91	-41.20	-24.71
2440MHz	Pass	3.1G	4G	PK	3.87265G	2.00	-66.69	-66.69	-64.69	-21.20	-43.49
2440MHz	Pass	4G	5G	PK	4.5635G	2.00	-65.05	-65.05	-63.05	-21.20	-41.85
2440MHz	Pass	4G	5G	PK	4.87875G	2.00	-66.74	-66.74	-64.74	-21.20	-43.54
2440MHz	Pass	5G	7G	PK	5.217G	2.00	-63.63	-63.63	-61.63	-21.20	-40.43
2440MHz	Pass	7G	8G	PK	7.401G	2.00	-63.73	-63.73	-61.73	-21.20	-40.53
2440MHz	Pass	8G	25G	PK	20.16988G	2.00	-58.01	-58.01	-56.01	-21.20	-34.81

Mode	Result	F-Start (Hz)	F-Stop (Hz)	Type	Freq (Hz)	DG (dBi)	P1 (dBm)	Psum (dBm)	EIRP (dBm)	Limit (dBm)	Margin (dB)
2475MHz	Pass	3.1G	4G	AV	3.98628G	2.00	-77.64	-77.64	-75.64	-41.20	-34.44
2475MHz	Pass	4G	5G	AV	4.943G	2.00	-76.66	-76.66	-74.66	-41.20	-33.46
2475MHz	Pass	4G	5G	AV	4.951G	2.00	-76.69	-76.69	-74.69	-41.20	-33.49
2475MHz	Pass	5G	7G	AV	5.104G	2.00	-75.93	-75.93	-73.93	-41.20	-32.73
2475MHz	Pass	7G	8G	AV	7.40275G	2.00	-74.55	-74.55	-72.55	-41.20	-31.35
2475MHz	Pass	8G	25G	AV	20.15234G	2.00	-67.67	-67.67	-65.67	-41.20	-24.47
2475MHz	Pass	3.1G	4G	PK	3.76105G	2.00	-65.94	-65.94	-63.94	-21.20	-42.74
2475MHz	Pass	4G	5G	PK	4.6345G	2.00	-64.25	-64.25	-62.25	-21.20	-41.05
2475MHz	Pass	4G	5G	PK	4.95125G	2.00	-66.17	-66.17	-64.17	-21.20	-42.97
2475MHz	Pass	5G	7G	PK	5.19G	2.00	-65.04	-65.04	-63.04	-21.20	-41.84
2475MHz	Pass	7G	8G	PK	7.4135G	2.00	-64.09	-64.09	-62.09	-21.20	-40.89
2475MHz	Pass	8G	25G	PK	20.22459G	2.00	-57.71	-57.71	-55.71	-21.20	-34.51
2480MHz	Pass	3.1G	4G	AV	3.97908G	2.00	-77.46	-77.46	-75.46	-41.20	-34.26
2480MHz	Pass	4G	5G	AV	4.93675G	2.00	-76.65	-76.65	-74.65	-41.20	-33.45
2480MHz	Pass	4G	5G	AV	4.96175G	2.00	-76.80	-76.80	-74.80	-41.20	-33.60
2480MHz	Pass	5G	7G	AV	5.1015G	2.00	-75.93	-75.93	-73.93	-41.20	-32.73
2480MHz	Pass	7G	8G	AV	7.39925G	2.00	-74.55	-74.55	-72.55	-41.20	-31.35
2480MHz	Pass	8G	25G	AV	20.15341G	2.00	-67.81	-67.81	-65.81	-41.20	-24.61
2480MHz	Pass	3.1G	4G	PK	3.61368G	2.00	-66.54	-66.54	-64.54	-21.20	-43.34
2480MHz	Pass	4G	5G	PK	4.93125G	2.00	-65.17	-65.17	-63.17	-21.20	-41.97
2480MHz	Pass	4G	5G	PK	4.959G	2.00	-67.03	-67.03	-65.03	-21.20	-43.83
2480MHz	Pass	5G	7G	PK	5.095G	2.00	-64.96	-64.96	-62.96	-21.20	-41.76
2480MHz	Pass	7G	8G	PK	7.3105G	2.00	-63.31	-63.31	-61.31	-21.20	-40.11
2480MHz	Pass	8G	25G	PK	20.16881G	2.00	-58.33	-58.33	-56.33	-21.20	-35.13

DG = Directional Gain;
PX=Port X; **Psum**=P1

802.15.4 **CSE [PK]**

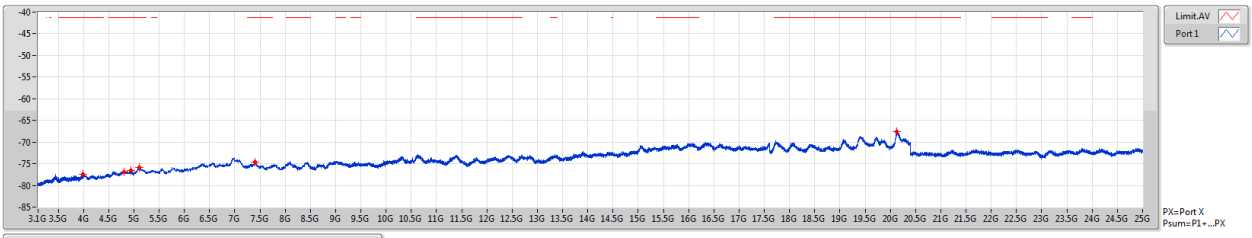
2405MHz



F-Start(Hz)	F-Stop(Hz)	RBW(Hz)	Type	Freq(Hz)	Psum(dBm)	P1(dBm
3.1G	4G	1M	PK	3.96738G	-65.48	-65.48
4G	5G	1M	PK	4.792G	-64.90	-64.90
4G	5G	1M	PK	4.80825G	-66.87	-66.87
5G	7G	1M	PK	5.351G	-65.18	-65.18
7G	8G	1M	PK	7.504G	-64.19	-64.19
8G	25G	1M	PK	20.13588G	-57.55	-57.55

802.15.4 **CSE [AV]**

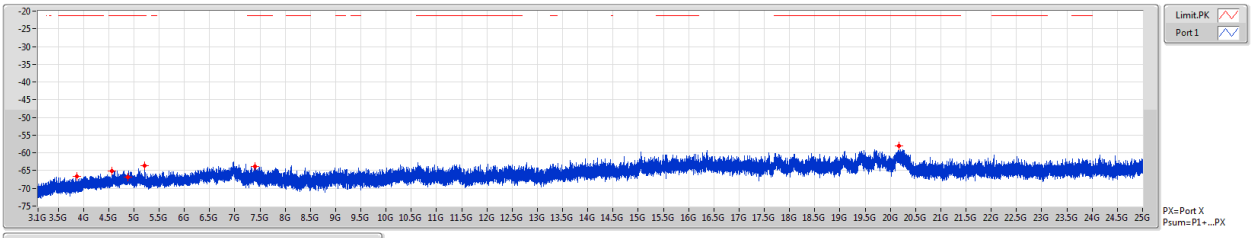
2405MHz



F-Start(Hz)	F-Stop(Hz)	RBW(Hz)	Type	Freq(Hz)	Psum(dBm)	P1(dBm
3.1G	4G	1M	AV	3.99303G	-77.36	-77.36
4G	5G	1M	AV	4.8085G	-76.83	-76.83
4G	5G	1M	AV	4.9345G	-76.65	-76.65
5G	7G	1M	AV	5.101G	-75.93	-75.93
7G	8G	1M	AV	7.39825G	-74.56	-74.56
8G	25G	1M	AV	20.12738G	-67.64	-67.64

802.15.4 **CSE [PK]**

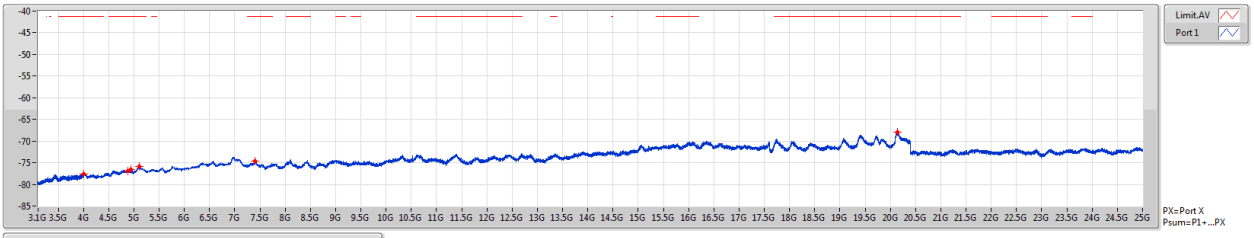
2440MHz



F-Start(Hz)	F-Stop(Hz)	RBW(Hz)	Type	Freq(Hz)	Psum(dBm)	P1(dBm
3.1G	4G	1M	PK	3.87265G	-66.69	-66.69
4G	5G	1M	PK	4.5635G	-65.05	-65.05
4G	5G	1M	PK	4.87875G	-66.74	-66.74
5G	7G	1M	PK	5.217G	-63.63	-63.63
7G	8G	1M	PK	7.401G	-63.73	-63.73
8G	25G	1M	PK	20.16988G	-58.01	-58.01

802.15.4 **CSE [AV]**

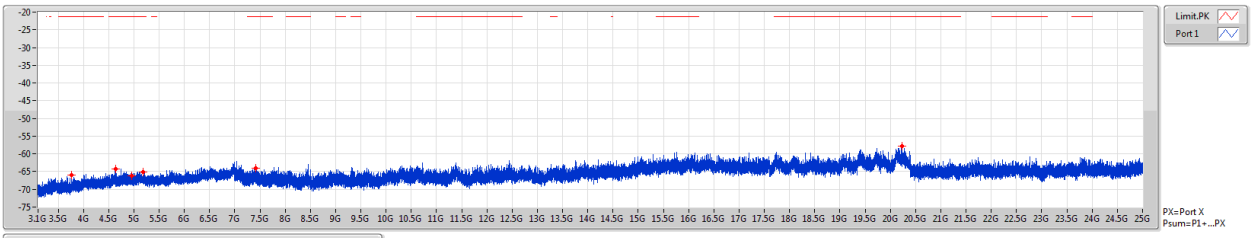
2440MHz



F-Start(Hz)	F-Stop(Hz)	RBW(Hz)	Type	Freq(Hz)	Psum(dBm)	P1(dBm
3.1G	4G	1M	AV	3.99955G	-77.54	-77.54
4G	5G	1M	AV	4.8805G	-76.85	-76.85
4G	5G	1M	AV	4.9385G	-76.65	-76.65
5G	7G	1M	AV	5.104G	-75.93	-75.93
7G	8G	1M	AV	7.399G	-74.55	-74.55
8G	25G	1M	AV	20.14066G	-67.91	-67.91

802.15.4 **CSE [PK]**

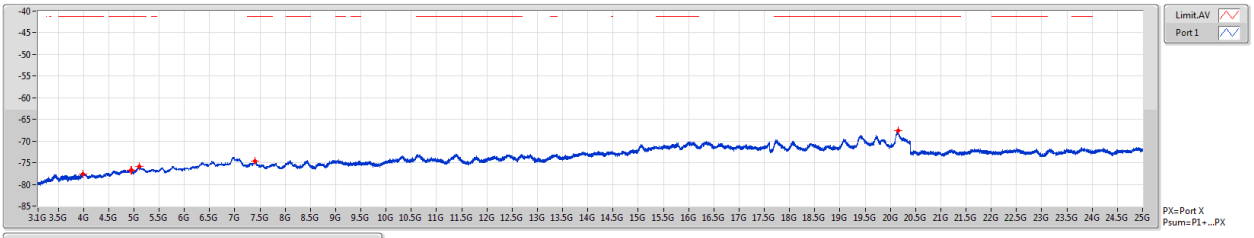
2475MHz



F-Start(Hz)	F-Stop(Hz)	RBW(Hz)	Type	Freq(Hz)	Psum(dBm)	P1(dBm
3.1G	4G	1M	PK	3.76105G	-65.94	-65.94
4G	5G	1M	PK	4.6345G	-64.25	-64.25
4G	5G	1M	PK	4.95125G	-66.17	-66.17
5G	7G	1M	PK	5.19G	-65.04	-65.04
7G	8G	1M	PK	7.4135G	-64.09	-64.09
8G	25G	1M	PK	20.22459G	-57.71	-57.71

802.15.4 **CSE [AV]**

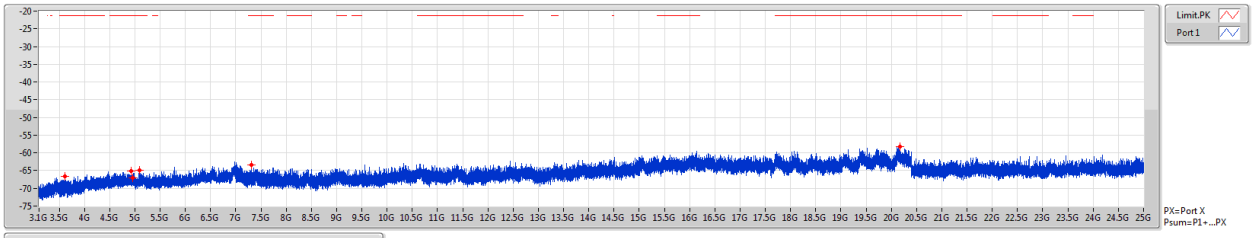
2475MHz



F-Start(Hz)	F-Stop(Hz)	RBW(Hz)	Type	Freq(Hz)	Psum(dBm)	P1(dBm
3.1G	4G	1M	AV	3.98628G	-77.64	-77.64
4G	5G	1M	AV	4.943G	-76.66	-76.66
4G	5G	1M	AV	4.951G	-76.69	-76.69
5G	7G	1M	AV	5.104G	-75.93	-75.93
7G	8G	1M	AV	7.40275G	-74.55	-74.55
8G	25G	1M	AV	20.15234G	-67.67	-67.67

802.15.4 **CSE [PK]**

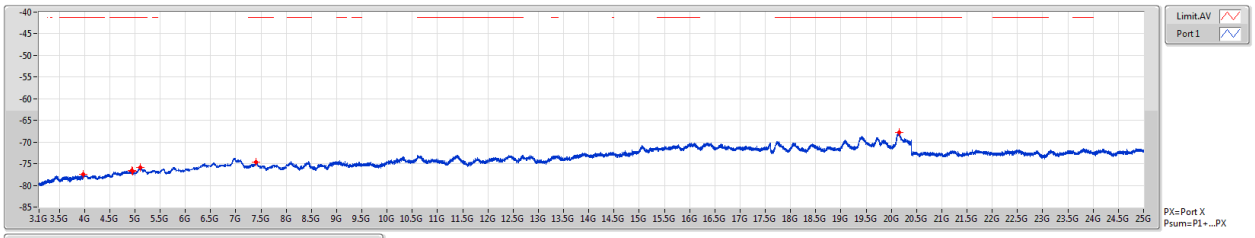
2480MHz



F-Start(Hz)	F-Stop(Hz)	RBW(Hz)	Type	Freq(Hz)	Psum(dBm)	P1(dBm
3.1G	4G	1M	PK	3.61368G	-66.54	-66.54
4G	5G	1M	PK	4.93125G	-65.17	-65.17
4G	5G	1M	PK	4.959G	-67.03	-67.03
5G	7G	1M	PK	5.095G	-64.96	-64.96
7G	8G	1M	PK	7.3105G	-63.31	-63.31
8G	25G	1M	PK	20.16881G	-58.33	-58.33

802.15.4 **CSE [AV]**

2480MHz



F-Start(Hz)	F-Stop(Hz)	RBW(Hz)	Type	Freq(Hz)	Psum(dBm)	P1(dBm
3.1G	4G	1M	AV	3.97908G	-77.46	-77.46
4G	5G	1M	AV	4.93675G	-76.65	-76.65
4G	5G	1M	AV	4.96175G	-76.80	-76.80
5G	7G	1M	AV	5.1015G	-75.93	-75.93
7G	8G	1M	AV	7.39925G	-74.55	-74.55
8G	25G	1M	AV	20.15341G	-67.81	-67.81

Internal antenna, high power

3.5.11 Transmitter Conducted Unwanted Emissions (30MHz ~ 1GHz)

Ambient Condition	24°C / 63%	**Tested By**	Aska Huang

Summary

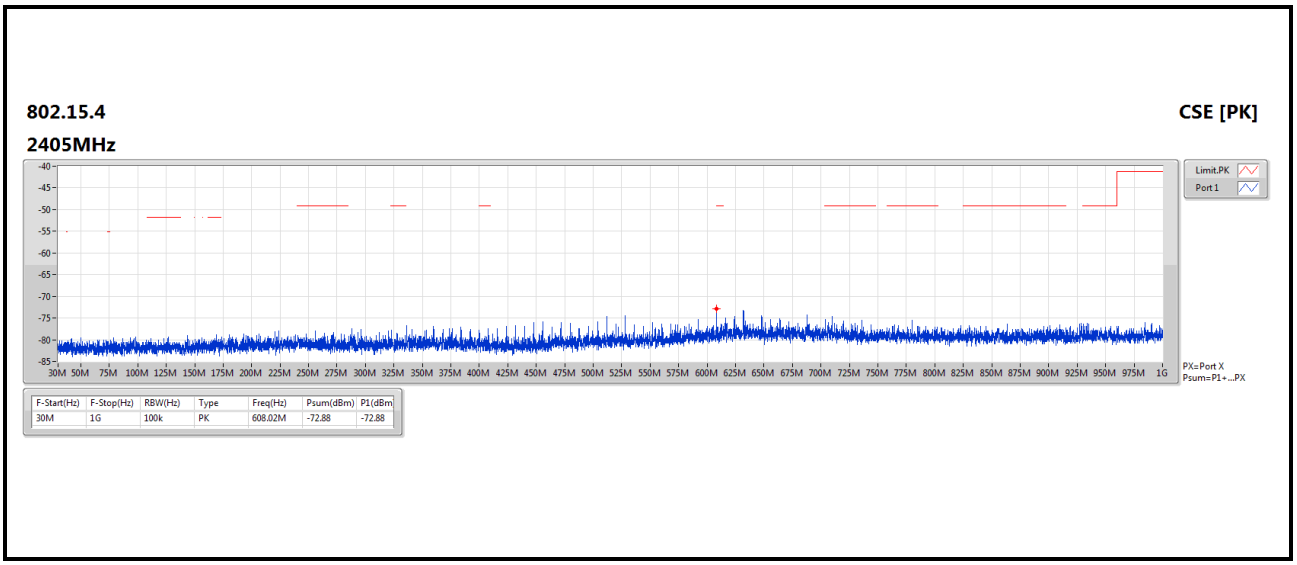
Mode	Result	F-Start (Hz)	F-Stop (Hz)	Type	Freq (Hz)	DG (dBi)	P1 (dBm)	Psum (dBm)	GRF (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-
802.15.4	Pass	30M	1G	PK	608.02 M	2.00	-72.88	-72.88	4.7	-66.18	-49.20	-16.98

DG = Directional Gain;
PX=Port X; **Psum**=P1+.P2+..PX

Result

Mode	Result	F-Start (Hz)	F-Stop (Hz)	Type	Freq (Hz)	DG (dBi)	P1 (dBm)	Psum (dBm)	GRF (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
802.15.4	-	-	-	-	-	-	-	-	-	-	-	-
2405MHz	Pass	30M	1G	PK	608.02 M	2.00	-72.88	-72.88	4.7	-66.18	-49.20	-16.98

DG = Directional Gain;
PX=Port X; **Psum**=P1+.P2+..PX



Transmitter Conducted Unwanted Emissions (1GHz ~ 3.1GHz)

Ambient Condition	24°C / 63%	Tested By	Aska Huang

Summary

Mode	Result	F-Start (Hz)	F-Stop (Hz)	Type	Freq (Hz)	DG (dBi)	P1 (dBm)	Psum (dBm)	EIRP (dBm)	Limit (dBm)	Margin (dB)
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-
802.15.4	Pass	2.4835 G	2.5G	AV	2.4835G	2.00	-45.69	-45.69	-43.69	-41.20	-2.49

DG = Directional Gain;
PX=Port X; **Psum**=P1+.P2+..PX

Result

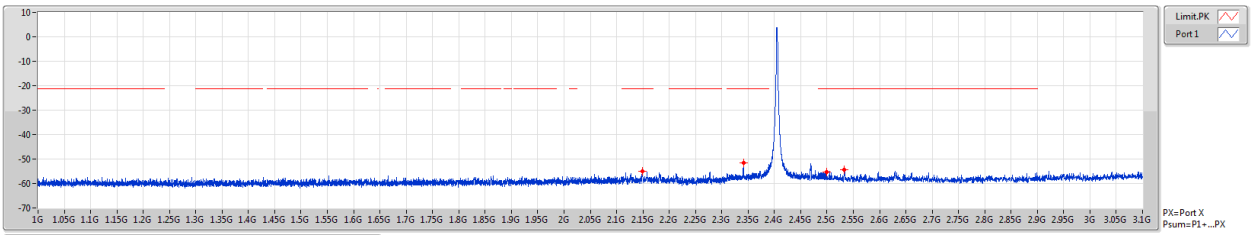
Mode	Result	F-Start (Hz)	F-Stop (Hz)	Type	Freq (Hz)	DG (dBi)	P1 (dBm)	Psum (dBm)	EIRP (dBm)	Limit (dBm)	Margin (dB)
802.15.4	-	-	-	-	-	-	-	-	-	-	-
2405MHz	Pass	1G	2.31G	AV	2.27725G	2.00	-64.16	-64.16	-62.16	-41.20	-20.96
2405MHz	Pass	2.31G	2.39G	AV	2.39G	2.00	-64.95	-64.95	-62.95	-41.20	-21.75
2405MHz	Pass	2.4835G	2.5G	AV	2.49323G	2.00	-67.38	-67.38	-65.38	-41.20	-24.18
2405MHz	Pass	2.5G	3.1G	AV	2.533G	2.00	-63.91	-63.91	-61.91	-41.20	-20.71
2405MHz	Pass	1G	2.31G	PK	2.14936G	2.00	-55.00	-55.00	-53.00	-21.20	-31.80
2405MHz	Pass	2.31G	2.39G	PK	2.34107G	2.00	-51.42	-51.42	-49.42	-21.20	-28.22
2405MHz	Pass	2.4835G	2.5G	PK	2.49916G	2.00	-55.22	-55.22	-53.22	-21.20	-32.02
2405MHz	Pass	2.5G	3.1G	PK	2.5333G	2.00	-54.53	-54.53	-52.53	-21.20	-31.33
2440MHz	Pass	1G	2.31G	AV	2.21617G	2.00	-64.75	-64.75	-62.75	-41.20	-21.55
2440MHz	Pass	2.31G	2.39G	AV	2.31209G	2.00	-65.32	-65.32	-63.32	-41.20	-22.12
2440MHz	Pass	2.4835G	2.5G	AV	2.4879G	2.00	-67.12	-67.12	-65.12	-41.20	-23.92
2440MHz	Pass	2.5G	3.1G	AV	2.6959G	2.00	-64.18	-64.18	-62.18	-41.20	-20.98
2440MHz	Pass	1G	2.31G	PK	2.21601G	2.00	-55.80	-55.80	-53.80	-21.20	-32.60
2440MHz	Pass	2.31G	2.39G	PK	2.37597G	2.00	-51.05	-51.05	-49.05	-21.20	-27.85
2440MHz	Pass	2.4835G	2.5G	PK	2.48776G	2.00	-54.85	-54.85	-52.85	-21.20	-31.65
2440MHz	Pass	2.5G	3.1G	PK	2.6326G	2.00	-55.14	-55.14	-53.14	-21.20	-31.94
2475MHz	Pass	1G	2.31G	AV	2.21928G	2.00	-64.67	-64.67	-62.67	-41.20	-21.47
2475MHz	Pass	2.31G	2.39G	AV	2.3471G	2.00	-64.48	-64.48	-62.48	-41.20	-21.28
2475MHz	Pass	2.4835G	2.5G	AV	2.4835G	2.00	-58.45	-58.45	-56.45	-41.20	-15.25
2475MHz	Pass	2.5G	3.1G	AV	2.6032G	2.00	-64.94	-64.94	-62.94	-41.20	-21.74
2475MHz	Pass	1G	2.31G	PK	2.21912G	2.00	-55.84	-55.84	-53.84	-21.20	-32.64
2475MHz	Pass	2.31G	2.39G	PK	2.34687G	2.00	-55.30	-55.30	-53.30	-21.20	-32.10
2475MHz	Pass	2.4835G	2.5G	PK	2.48362G	2.00	-46.30	-46.30	-44.30	-21.20	-23.10
2475MHz	Pass	2.5G	3.1G	PK	2.5396G	2.00	-54.00	-54.00	-52.00	-21.20	-30.80

Mode	Result	F-Start (Hz)	F-Stop (Hz)	Type	Freq (Hz)	DG (dBi)	P1 (dBm)	Psum (dBm)	EIRP (dBm)	Limit (dBm)	Margin (dB)
2480MHz	Pass	1G	2.31G	AV	2.12644G	2.00	-66.28	-66.28	-64.28	-41.20	-23.08
2480MHz	Pass	2.31G	2.39G	AV	2.35197G	2.00	-67.63	-67.63	-65.63	-41.20	-24.43
2480MHz	Pass	2.4835G	2.5G	AV	2.4835G	2.00	-45.69	-45.69	-43.69	-41.20	-2.49
2480MHz	Pass	2.5G	3.1G	AV	2.608G	2.00	-66.95	-66.95	-64.95	-41.20	-23.75
2480MHz	Pass	1G	2.31G	PK	2.1266G	2.00	-55.68	-55.68	-53.68	-21.20	-32.48
2480MHz	Pass	2.31G	2.39G	PK	2.36623G	2.00	-55.86	-55.86	-53.86	-21.20	-32.66
2480MHz	Pass	2.4835G	2.5G	PK	2.48352G	2.00	-36.06	-36.06	-34.06	-21.20	-12.86
2480MHz	Pass	2.5G	3.1G	PK	2.8903G	2.00	-55.72	-55.72	-53.72	-21.20	-32.52

DG = Directional Gain;
PX=Port X; **Psum**=P1

802.15.4 **CSE [PK]**

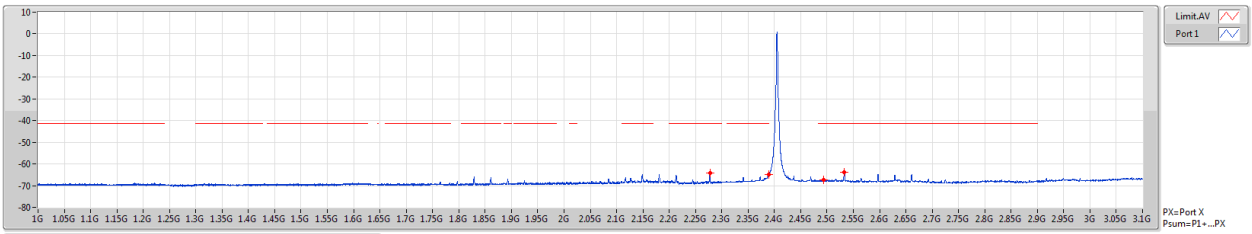
2405MHz



F-Start(Hz)	F-Stop(Hz)	RBW(Hz)	Type	Freq(Hz)	Psum(dBm)	P1(dBm
1G	2.31G	1M	PK	2.14936G	-55.00	-55.00
2.31G	2.39G	1M	PK	2.34107G	-51.42	-51.42
2.4835G	2.5G	1M	PK	2.49916G	-55.22	-55.22
2.5G	3.1G	1M	PK	2.5333G	-54.53	-54.53

802.15.4 **CSE [AV]**

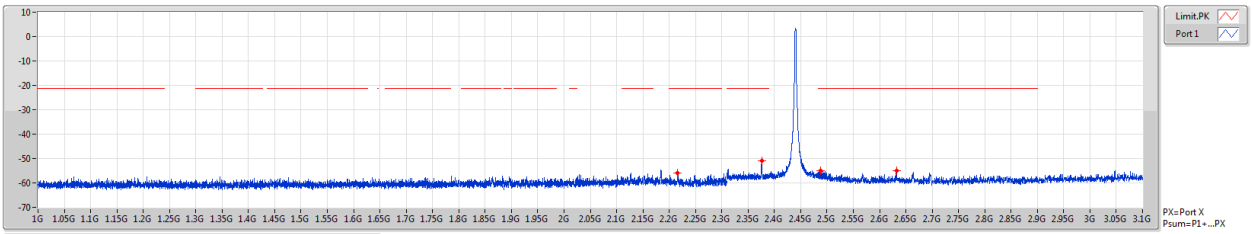
2405MHz



F-Start(Hz)	F-Stop(Hz)	RBW(Hz)	Type	Freq(Hz)	Psum(dBm)	P1(dBm
1G	2.31G	1M	AV	2.27725G	-64.16	-64.16
2.31G	2.39G	1M	AV	2.39G	-64.95	-64.95
2.4835G	2.5G	1M	AV	2.49323G	-67.38	-67.38
2.5G	3.1G	1M	AV	2.533G	-63.91	-63.91

802.15.4 **CSE [PK]**

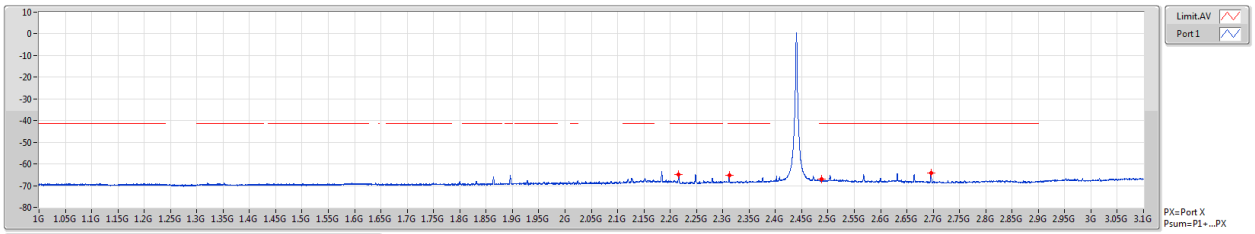
2440MHz



F-Start(Hz)	F-Stop(Hz)	RBW(Hz)	Type	Freq(Hz)	Psum(dBm)	P1(dBm
1G	2.31G	1M	PK	2.21601G	-55.80	-55.80
2.31G	2.39G	1M	PK	2.37597G	-51.05	-51.05
2.4835G	2.5G	1M	PK	2.48776G	-54.85	-54.85
2.5G	3.1G	1M	PK	2.6326G	-55.14	-55.14

802.15.4 **CSE [AV]**

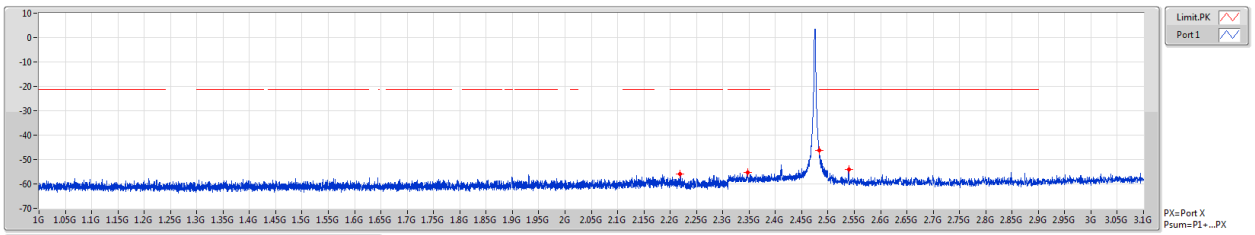
2440MHz



F-Start(Hz)	F-Stop(Hz)	RBW(Hz)	Type	Freq(Hz)	Psum(dBm)	P1(dBm
1G	2.31G	1M	AV	2.21617G	-64.75	-64.75
2.31G	2.39G	1M	AV	2.31209G	-65.32	-65.32
2.4835G	2.5G	1M	AV	2.4879G	-67.12	-67.12
2.5G	3.1G	1M	AV	2.6959G	-64.18	-64.18

802.15.4 **CSE [PK]**

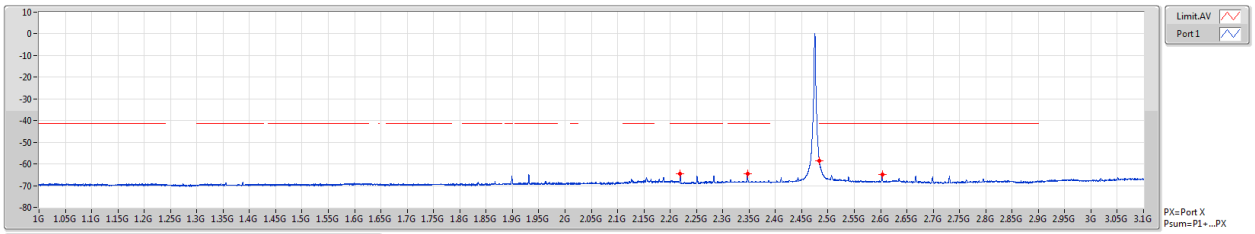
2475MHz



F-Start(Hz)	F-Stop(Hz)	RBW(Hz)	Type	Freq(Hz)	Psum(dBm)	P1(dBm
1G	2.31G	1M	PK	2.21912G	-55.84	-55.84
2.31G	2.39G	1M	PK	2.34687G	-55.30	-55.30
2.4835G	2.5G	1M	PK	2.48362G	-46.30	-46.30
2.5G	3.1G	1M	PK	2.5396G	-54.00	-54.00

802.15.4 **CSE [AV]**

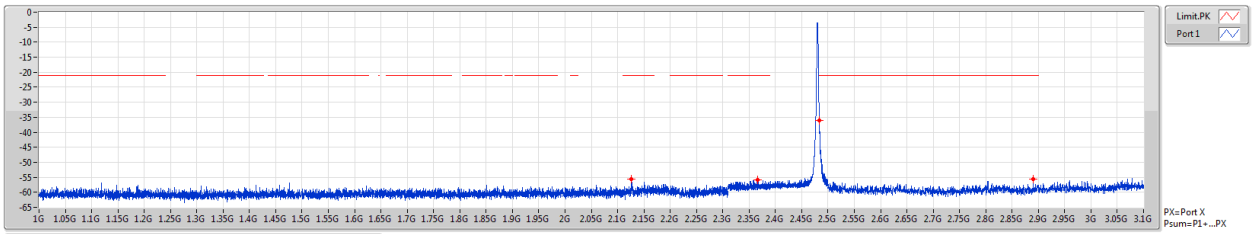
2475MHz



F-Start(Hz)	F-Stop(Hz)	RBW(Hz)	Type	Freq(Hz)	Psum(dBm)	P1(dBm
1G	2.31G	1M	AV	2.21928G	-64.67	-64.67
2.31G	2.39G	1M	AV	2.3471G	-64.48	-64.48
2.4835G	2.5G	1M	AV	2.4835G	-58.45	-58.45
2.5G	3.1G	1M	AV	2.6032G	-64.94	-64.94

802.15.4 **CSE [PK]**

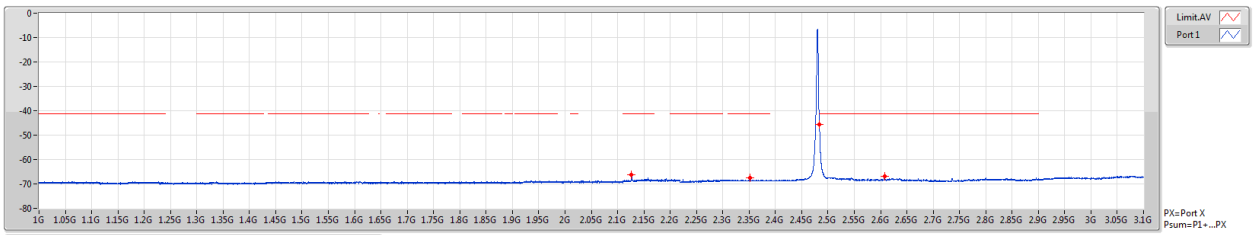
2480MHz



F-Start(Hz)	F-Stop(Hz)	RBW(Hz)	Type	Freq(Hz)	Psum(dBm)	P1(dBm
1G	2.31G	1M	PK	2.1266G	-55.68	-55.68
2.31G	2.39G	1M	PK	2.36623G	-55.86	-55.86
2.4835G	2.5G	1M	PK	2.48352G	-36.06	-36.06
2.5G	3.1G	1M	PK	2.8903G	-55.72	-55.72

802.15.4 **CSE [AV]**

2480MHz



F-Start(Hz)	F-Stop(Hz)	RBW(Hz)	Type	Freq(Hz)	Psum(dBm)	P1(dBm
1G	2.31G	1M	AV	2.12644G	-66.28	-66.28
2.31G	2.39G	1M	AV	2.35197G	-67.63	-67.63
2.4835G	2.5G	1M	AV	2.4835G	-45.69	-45.69
2.5G	3.1G	1M	AV	2.608G	-66.95	-66.95

3.5.12 Transmitter Conducted Unwanted Emissions (3.1GHz ~ 25GHz)

Ambient Condition	24°C / 63%	Tested By	Aska Huang

Summary

Mode	Result	F-Start (Hz)	F-Stop (Hz)	Type	Freq (Hz)	DG (dBi)	P1 (dBm)	Psum (dBm)	EIRP (dBm)	Limit (dBm)	Margin (dB)
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-
802.15.4	Pass	4G	5G	AV	4.809G	2.00	-51.18	-51.18	-49.18	-41.20	-7.98

DG = Directional Gain;
PX=Port X; **Psum**=P1+.P2+..PX

Result

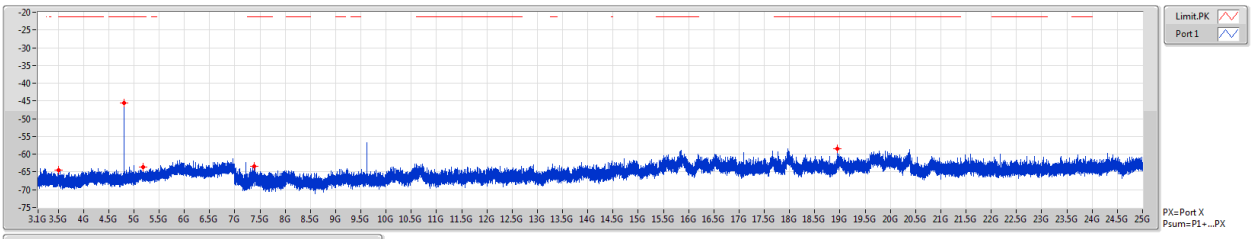
Mode	Result	F-Start (Hz)	F-Stop (Hz)	Type	Freq (Hz)	DG (dBi)	P1 (dBm)	Psum (dBm)	EIRP (dBm)	Limit (dBm)	Margin (dB)
802.15.4	-	-	-	-	-	-	-	-	-	-	-
2405MHz	Pass	3.1G	4G	AV	3.35245G	2.00	-75.87	-75.87	-73.87	-41.20	-32.67
2405MHz	Pass	4G	5G	AV	4.809G	2.00	-51.18	-51.18	-49.18	-41.20	-7.98
2405MHz	Pass	5G	7G	AV	5.413G	2.00	-75.23	-75.23	-73.23	-41.20	-32.03
2405MHz	Pass	7G	8G	AV	7.393G	2.00	-74.98	-74.98	-72.98	-41.20	-31.78
2405MHz	Pass	8G	25G	AV	20.39406G	2.00	-69.05	-69.05	-67.05	-41.20	-25.85
2405MHz	Pass	3.1G	4G	PK	3.50275G	2.00	-64.57	-64.57	-62.57	-21.20	-41.37
2405MHz	Pass	4G	5G	PK	4.80925G	2.00	-45.62	-45.62	-43.62	-21.20	-22.42
2405MHz	Pass	5G	7G	PK	5.178G	2.00	-63.58	-63.58	-61.58	-21.20	-40.38
2405MHz	Pass	7G	8G	PK	7.38075G	2.00	-63.37	-63.37	-61.37	-21.20	-40.17
2405MHz	Pass	8G	25G	PK	18.95491G	2.00	-58.51	-58.51	-56.51	-21.20	-35.31
2440MHz	Pass	3.1G	4G	AV	3.35605G	2.00	-75.87	-75.87	-73.87	-41.20	-32.67
2440MHz	Pass	4G	5G	AV	4.881G	2.00	-53.16	-53.16	-51.16	-41.20	-9.96
2440MHz	Pass	5G	7G	AV	5.133G	2.00	-75.22	-75.22	-73.22	-41.20	-32.02
2440MHz	Pass	7G	8G	AV	7.32125G	2.00	-69.57	-69.57	-67.57	-41.20	-26.37
2440MHz	Pass	8G	25G	AV	20.39778G	2.00	-69.18	-69.18	-67.18	-41.20	-25.98
2440MHz	Pass	3.1G	4G	PK	3.97885G	2.00	-64.79	-64.79	-62.79	-21.20	-41.59
2440MHz	Pass	4G	5G	PK	4.87925G	2.00	-47.17	-47.17	-45.17	-21.20	-23.97
2440MHz	Pass	5G	7G	PK	5.3635G	2.00	-63.61	-63.61	-61.61	-21.20	-40.41
2440MHz	Pass	7G	8G	PK	7.3215G	2.00	-61.58	-61.58	-59.58	-21.20	-38.38
2440MHz	Pass	8G	25G	PK	19.798G	2.00	-57.26	-57.26	-55.26	-21.20	-34.06
2475MHz	Pass	3.1G	4G	AV	3.35628G	2.00	-75.87	-75.87	-73.87	-41.20	-32.67
2475MHz	Pass	4G	5G	AV	4.951G	2.00	-55.16	-55.16	-53.16	-41.20	-11.96
2475MHz	Pass	5G	7G	AV	5.401G	2.00	-75.49	-75.49	-73.49	-41.20	-32.29
2475MHz	Pass	7G	8G	AV	7.42625G	2.00	-68.64	-68.64	-66.64	-41.20	-25.44

Mode	Result	F-Start (Hz)	F-Stop (Hz)	Type	Freq (Hz)	DG (dBi)	P1 (dBm)	Psum (dBm)	EIRP (dBm)	Limit (dBm)	Margin (dB)
2475MHz	Pass	8G	25G	AV	20.39991G	2.00	-69.01	-69.01	-67.01	-41.20	-25.81
2475MHz	Pass	3.1G	4G	PK	3.62875G	2.00	-64.34	-64.34	-62.34	-21.20	-41.14
2475MHz	Pass	4G	5G	PK	4.94925G	2.00	-49.06	-49.06	-47.06	-21.20	-25.86
2475MHz	Pass	5G	7G	PK	5.378G	2.00	-62.33	-62.33	-60.33	-21.20	-39.13
2475MHz	Pass	7G	8G	PK	7.42375G	2.00	-59.69	-59.69	-57.69	-21.20	-36.49
2475MHz	Pass	8G	25G	PK	19.73638G	2.00	-58.71	-58.71	-56.71	-21.20	-35.51
2480MHz	Pass	3.1G	4G	AV	3.34683G	2.00	-75.89	-75.89	-73.89	-41.20	-32.69
2480MHz	Pass	4G	5G	AV	4.961G	2.00	-70.14	-70.14	-68.14	-41.20	-26.94
2480MHz	Pass	5G	7G	AV	5.4015G	2.00	-75.49	-75.49	-73.49	-41.20	-32.29
2480MHz	Pass	7G	8G	AV	7.4385G	2.00	-74.73	-74.73	-72.73	-41.20	-31.53
2480MHz	Pass	8G	25G	AV	20.39513G	2.00	-69.04	-69.04	-67.04	-41.20	-25.84
2480MHz	Pass	3.1G	4G	PK	3.35403G	2.00	-64.78	-64.78	-62.78	-21.20	-41.58
2480MHz	Pass	4G	5G	PK	4.959G	2.00	-61.19	-61.19	-59.19	-21.20	-37.99
2480MHz	Pass	5G	7G	PK	5.433G	2.00	-63.20	-63.20	-61.20	-21.20	-40.00
2480MHz	Pass	7G	8G	PK	7.3025G	2.00	-63.79	-63.79	-61.79	-21.20	-40.59
2480MHz	Pass	8G	25G	PK	19.70184G	2.00	-58.35	-58.35	-56.35	-21.20	-35.15

DG = Directional Gain;
PX=Port X; **Psum**=P1

802.15.4 **CSE [PK]**

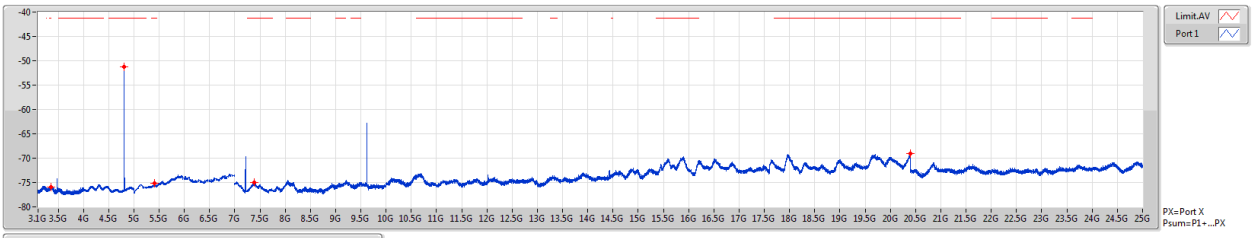
2405MHz



F-Start(Hz)	F-Stop(Hz)	RBW(Hz)	Type	Freq(Hz)	Psum(dBm)	P1(dBm
3.1G	4G	1M	PK	3.50275G	-64.57	-64.57
4G	5G	1M	PK	4.80925G	-45.62	-45.62
5G	7G	1M	PK	5.178G	-63.58	-63.58
7G	8G	1M	PK	7.38075G	-63.37	-63.37
8G	25G	1M	PK	18.95491G	-58.51	-58.51

802.15.4 **CSE [AV]**

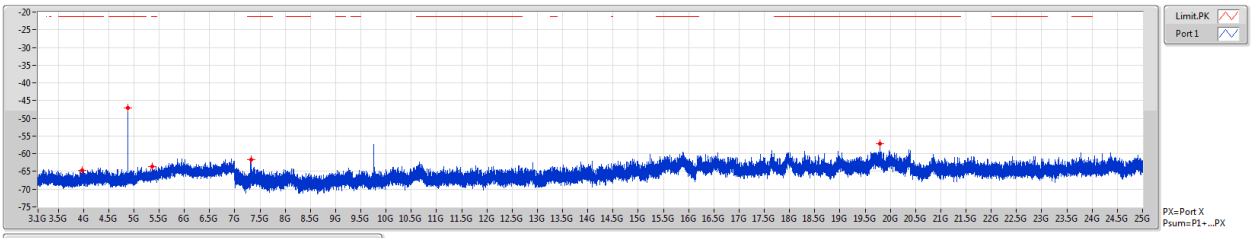
2405MHz



F-Start(Hz)	F-Stop(Hz)	RBW(Hz)	Type	Freq(Hz)	Psum(dBm)	P1(dBm
3.1G	4G	1M	AV	3.35245G	-75.87	-75.87
4G	5G	1M	AV	4.809G	-51.18	-51.18
5G	7G	1M	AV	5.413G	-75.23	-75.23
7G	8G	1M	AV	7.393G	-74.98	-74.98
8G	25G	1M	AV	20.39406G	-69.05	-69.05

802.15.4 **CSE [PK]**

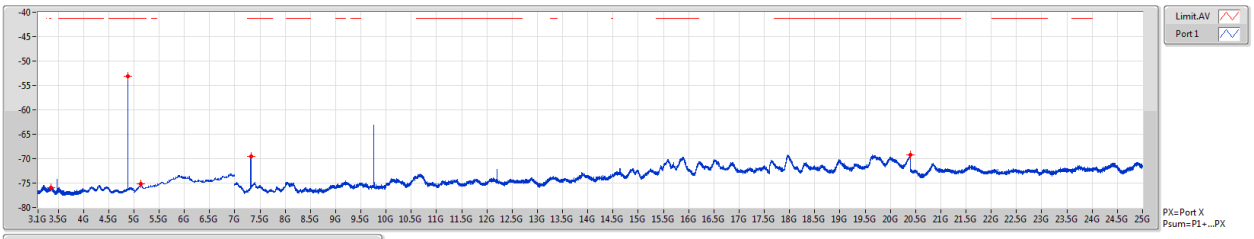
2440MHz



F-Start(Hz)	F-Stop(Hz)	RBW(Hz)	Type	Freq(Hz)	Psum(dBm)	P1(dBm
3.1G	4G	1M	PK	3.97885G	-64.79	-64.79
4G	5G	1M	PK	4.87925G	-47.17	-47.17
5G	7G	1M	PK	5.3635G	-63.61	-63.61
7G	8G	1M	PK	7.3215G	-61.58	-61.58
8G	25G	1M	PK	19.798G	-57.26	-57.26

802.15.4 **CSE [AV]**

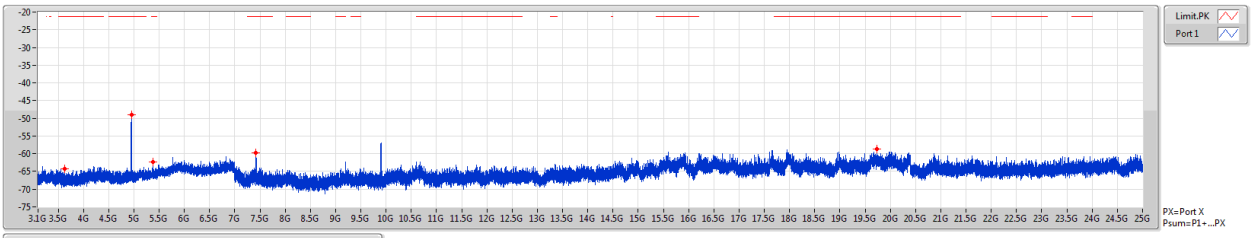
2440MHz



F-Start(Hz)	F-Stop(Hz)	RBW(Hz)	Type	Freq(Hz)	Psum(dBm)	P1(dBm
3.1G	4G	1M	AV	3.35605G	-75.87	-75.87
4G	5G	1M	AV	4.881G	-53.16	-53.16
5G	7G	1M	AV	5.133G	-75.22	-75.22
7G	8G	1M	AV	7.32125G	-69.57	-69.57
8G	25G	1M	AV	20.39778G	-69.18	-69.18

802.15.4 **CSE [PK]**

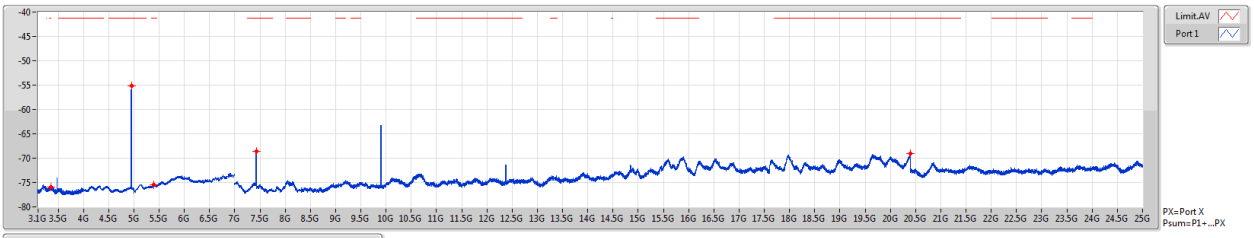
2475MHz



F-Start(Hz)	F-Stop(Hz)	RBW(Hz)	Type	Freq(Hz)	Psum(dBm)	P1(dBm
3.1G	4G	1M	PK	3.62875G	-64.34	-64.34
4G	5G	1M	PK	4.94925G	-49.06	-49.06
5G	7G	1M	PK	5.378G	-62.33	-62.33
7G	8G	1M	PK	7.42375G	-59.69	-59.69
8G	25G	1M	PK	19.73638G	-58.71	-58.71

802.15.4 **CSE [AV]**

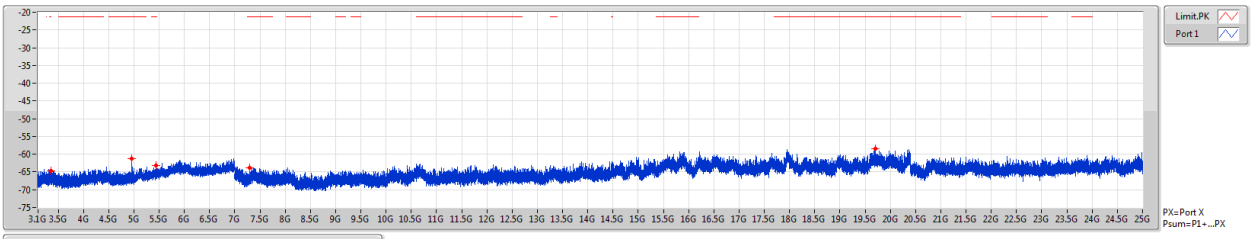
2475MHz



F-Start(Hz)	F-Stop(Hz)	RBW(Hz)	Type	Freq(Hz)	Psum(dBm)	P1(dBm
3.1G	4G	1M	AV	3.35628G	-75.87	-75.87
4G	5G	1M	AV	4.951G	-55.16	-55.16
5G	7G	1M	AV	5.401G	-75.49	-75.49
7G	8G	1M	AV	7.42625G	-68.64	-68.64
8G	25G	1M	AV	20.39991G	-69.01	-69.01

802.15.4 **CSE [PK]**

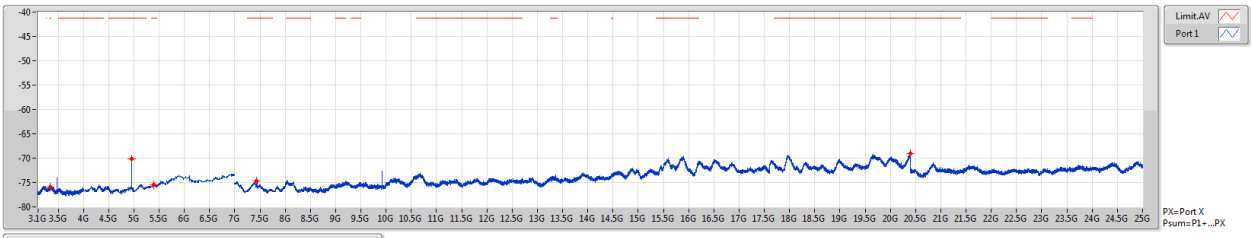
2480MHz



F-Start(Hz)	F-Stop(Hz)	RBW(Hz)	Type	Freq(Hz)	Psum(dBm)	P1(dBm)
3.1G	4G	1M	PK	3.35403G	-64.78	-64.78
4G	5G	1M	PK	4.959G	-61.19	-61.19
5G	7G	1M	PK	5.433G	-63.20	-63.20
7G	8G	1M	PK	7.3025G	-63.79	-63.79
8G	25G	1M	PK	19.70184G	-58.35	-58.35

802.15.4 **CSE [AV]**

2480MHz



F-Start(Hz)	F-Stop(Hz)	RBW(Hz)	Type	Freq(Hz)	Psum(dBm)	P1(dBm)
3.1G	4G	1M	AV	3.34683G	-75.89	-75.89
4G	5G	1M	AV	4.961G	-70.14	-70.14
5G	7G	1M	AV	5.4015G	-75.49	-75.49
7G	8G	1M	AV	7.4385G	-74.73	-74.73
8G	25G	1M	AV	20.39513G	-69.04	-69.04

3.6 Emissions in Non-Restricted Frequency Bands

3.6.1 Emissions in Non-Restricted Frequency Bands Limit

Peak power 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.

3.6.2 Test Procedures

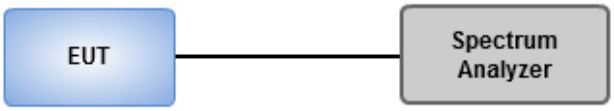
Reference level measurement

1. Set RBW=100kHz, VBW = 300kHz , Detector = Peak, Sweep time = Auto
2. Trace = max hold , Allow Trace to fully stabilize
3. Use the peak marker function to determine the maximum PSD level

Emission level measurement

1. Set RBW=100kHz, VBW = 300kHz , Detector = Peak, Sweep time = Auto
2. Trace = max hold , Allow Trace to fully stabilize
3. Scan Frequency range is up to 25GHz
4. Use the peak marker function to determine the maximum amplitude level

3.6.3 Test Setup



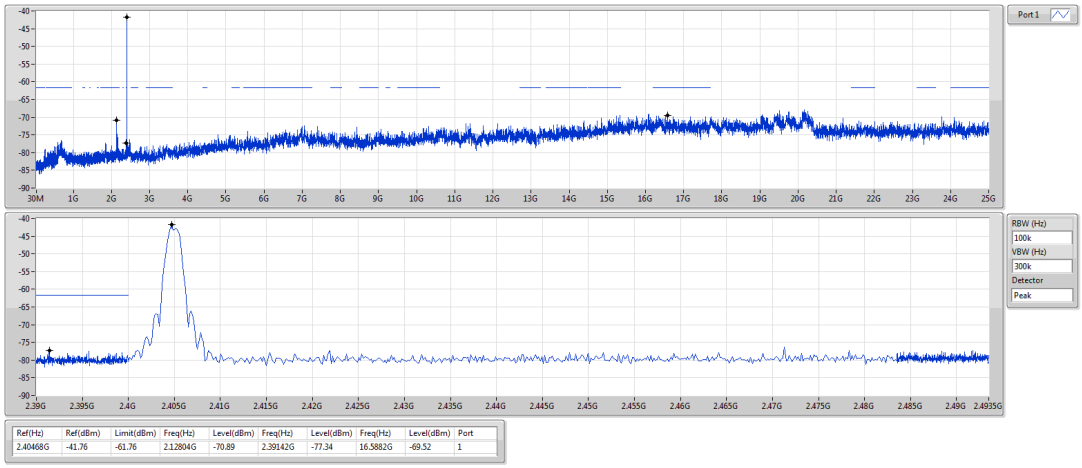
3.6.4 Unwanted Emissions into Non-Restricted Frequency Bands

Ambient Condition	24°C / 63%	Tested By	Aska Huang

Internal antenna, Lower power

802.15.4 **CSE NdB**

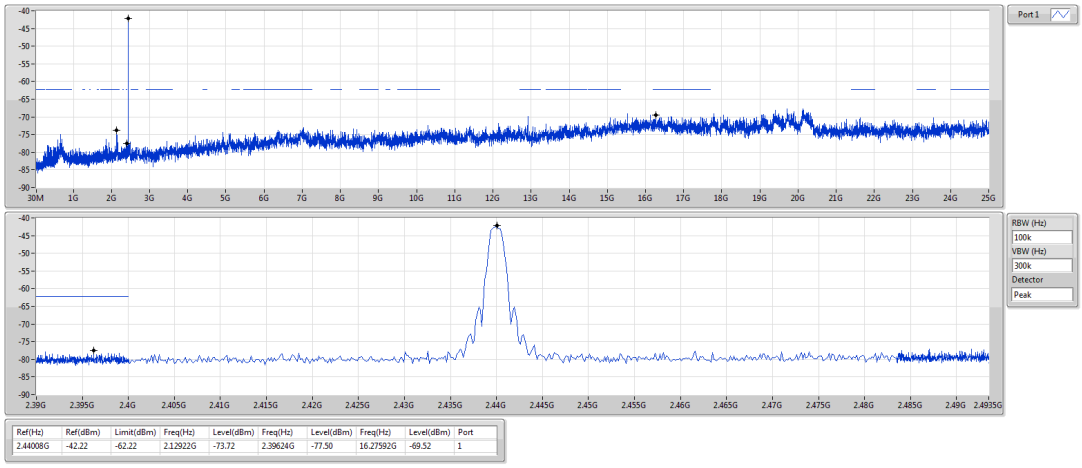
2405MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.40468G	-41.76	-61.76	2.12804G	-70.89	2.39142G	-77.34	16.5882G	-69.52	1

802.15.4 **CSE NdB**

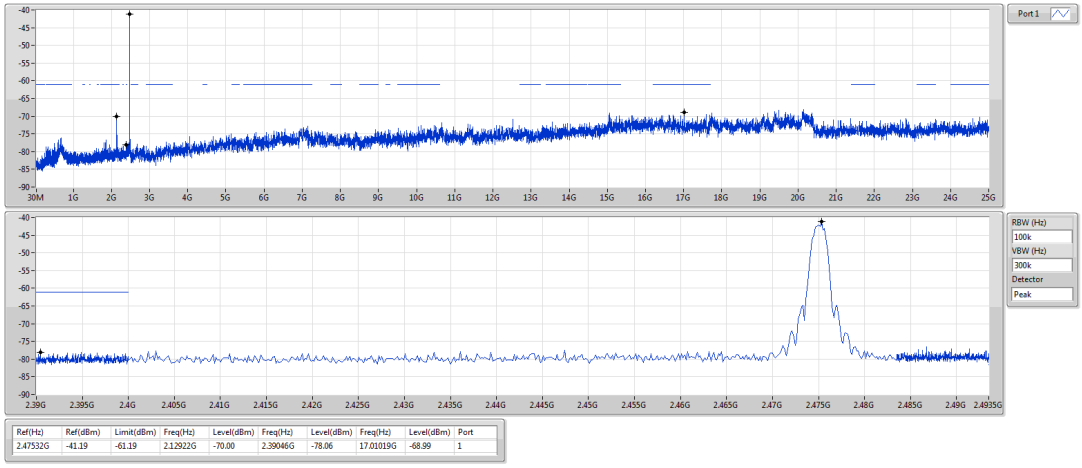
2440MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.44008G	-42.22	-62.22	2.12922G	-73.72	2.39624G	-77.50	16.27592G	-69.52	1

802.15.4 **CSE NdB**

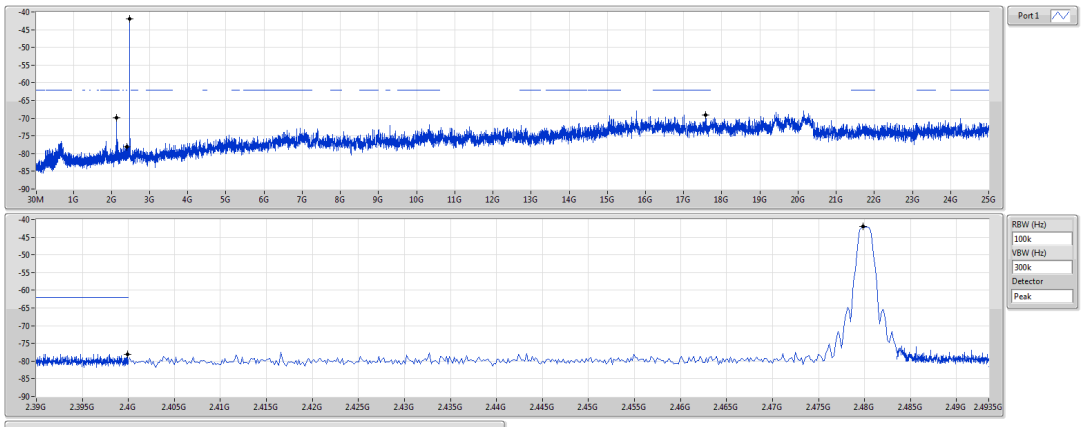
2475MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.47532G	-41.19	-61.19	2.12922G	-70.00	2.39046G	-78.06	17.01019G	-68.99	1

802.15.4 **CSE NdB**

2480MHz

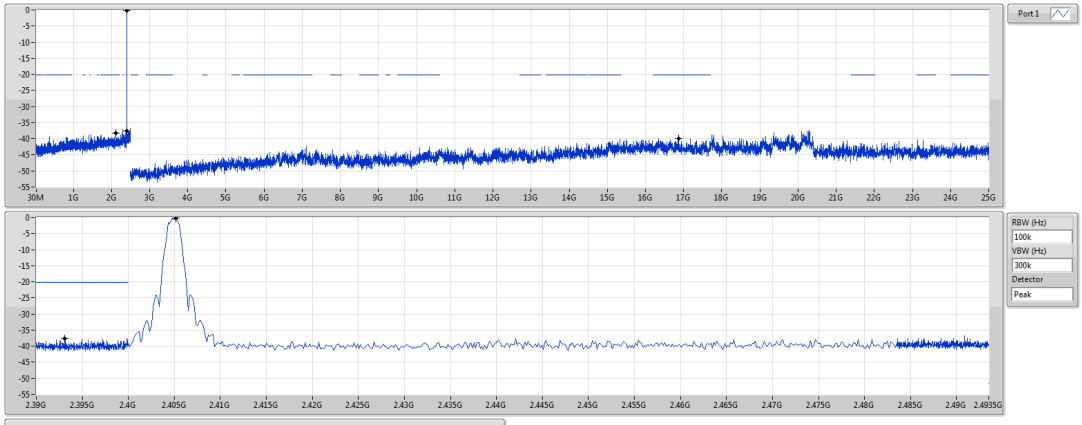


Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.47983G	-42.03	-62.03	2.12922G	-69.90	2.3999G	-78.02	17.56723G	-69.01	1

Internal antenna, high power

802.15.4 **CSE NdB**

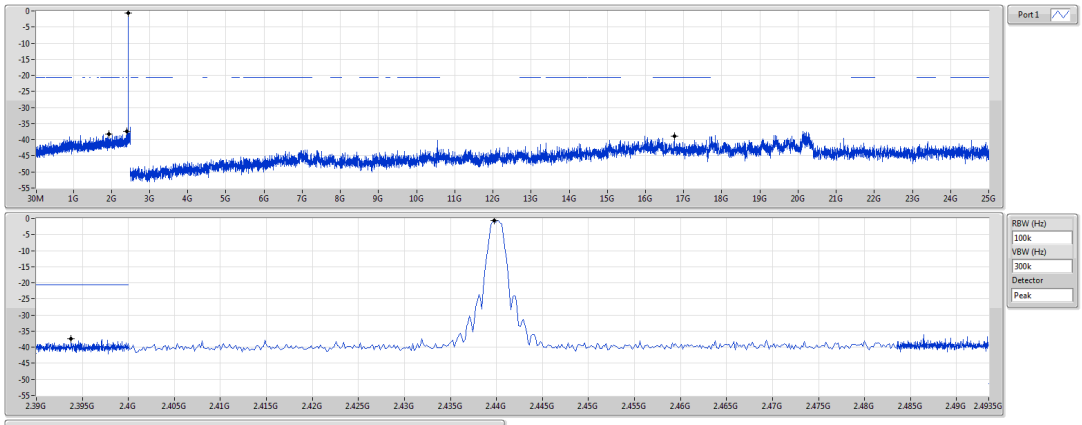
2405MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.40518G	-0.27	-20.27	2.1186G	-38.14	2.3931G	-37.68	16.86671G	-39.96	1

802.15.4 **CSE NdB**

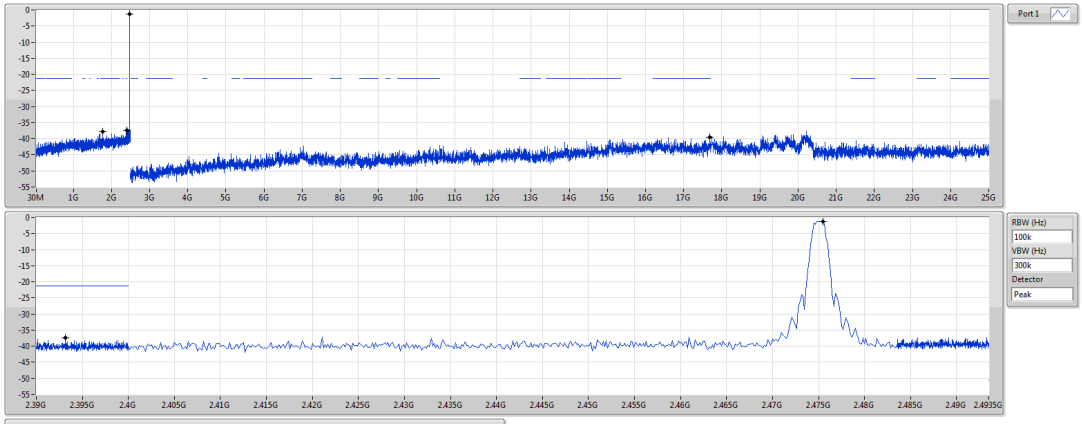
2440MHz



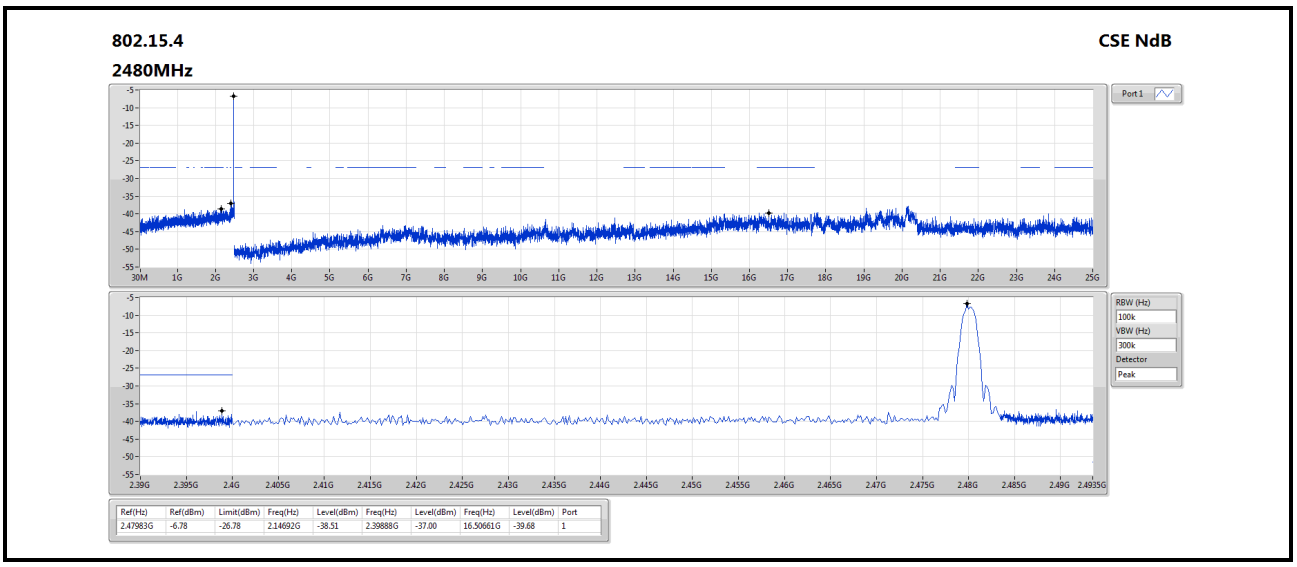
Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.43975G	-0.65	-20.65	1.93334G	-38.33	2.39374G	-37.35	16.75699G	-38.87	1

802.15.4 **CSE NdB**

2475MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.47548G	-1.21	-21.21	1.76106G	-37.86	2.39318G	-37.34	17.67976G	-39.50	1


802.15.4
CSE NdB
2480MHz
Port1
RBW (Hz)
100k
VBW (Hz)
300k
Detector
Peak
Ref(Hz) Ref(dBm) Limit(dBm) Freq(Hz) Level(dBm) Freq(Hz) Level(dBm) Freq(Hz) Level(dBm) Port
2.47983G -6.78 -26.78 2.14692G -38.51 2.39888G -37.00 16.50661G -39.68 1

4 Test laboratory information

Established in 2012, ICC provides foremost EMC & RF Testing and advisory consultation services by our skilled engineers and technicians. Our services employ a wide variety of advanced edge test equipment and one of the widest certification extents in the business.

International Certification Corp (EMC and Wireless Communication Laboratory), it is our definitive objective is to institute long term, trust-based associations with our clients. The expectation we set up with our clients is based on outstanding service, practical expertise and devotion to a certified value structure. Our passion is to grant our clients with best EMC / RF services by oriented knowledgeable and accommodating staff.

Our Test sites are located at Linkou District and Kwei Shan District. Location map can be found on our website http://www.icertifi.com.tw.

Linkou	**Kwei Shan**	**Kwei Shan Site II**
Tel: 886-2-2601-1640	Tel: 886-3-271-8666	Tel: 886-3-271-8640
No. 30-2, Ding Fwu Tsuen, Lin Kou District, New Taipei City, Taiwan, R.O.C.	No. 3-1, Lane 6, Wen San 3rd St., Kwei Shan District, Tao Yuan City 333, Taiwan, R.O.C.	No. 14-1, Lane 19, Wen San 3rd St., Kwei Shan District, Tao Yuan City 333, Taiwan, R.O.C.

If you have any suggestion, please feel free to contact us as below information.

Tel: 886-3-271-8666
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