

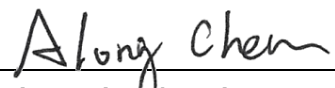
FCC Test Report

FCC ID : SQG-BL54H20
Equipment : Multi-core Bluetooth LE + 802.15.4 + NFC module
Model No. : BL54H20
Brand Name : Ezurio
Applicant : Ezurio LLC
Address : W66N220 Commerce Court, Cedarburg, WI 53012 United States Of America
Standard : 47 CFR FCC Part 15.247
Received Date : Nov. 12, 2024
Tested Date : Nov. 12 ~ Nov. 18, 2024

We, International Certification Corporation, 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 shall not be reproduced except in full without the written approval of our laboratory.

Reviewed by:

Approved by:


Along Chen / Assistant Manager

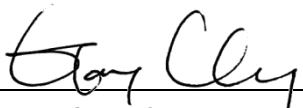

Gary Chang / Manager

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Release Record

Report No.	Version	Description	Issued Date
FR4N1402	Rev. 01	Initial issue	Jan. 09, 2025

Summary of Test Results

FCC Rules	Test Items	Measured	Result
15.207	AC Power Line Conducted Emission	[dBuV]: 24.922MHz 25.33 (Margin -24.67dB) - AV	Pass
15.247(d) 15.209	Unwanted Emissions	[dBuV/m at 3m]: 7.425GHz 45.64 (Margin -8.36dB) - AV	Pass
15.247(b)(3)	Conducted Output Power	Max Power [dBm]: 7.12	Pass
15.247(a)(2)	6dB Bandwidth	Meet the requirement of limit	Pass
15.247(e)	Power Spectral Density	Meet the requirement of limit	Pass
15.203	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: RF output power specifies that Maximum Peak Conducted Output Power.				
Note 2: 802.15.4 uses DSSS-OQPSK modulation.				

1.1.2 Antenna Details

External Antenna list for BL54H20 MHF4 module variant (453-00198)

Ant. No.	Manufacturer	Model	Part Number	Type	Connector	2400-2500 (MHz)	2400-2480 (MHz)
1	Ezurio	NanoBlue	EBL2400A1-10MH4L	PCB Dipole	IPEX MHF4	2 dBi	-
2	Ezurio	FlexPIFA	001-0022	FlexPIFA	IPEX MHF4L	-	2 dBi
3	Mag.Layers	EDA-8709-2G4C1-B27-CY	0600-00057	Dipole	IPEX MHF4	2.32 dBi	-
4	Ezurio	mFlexPIFA	EFA2400A3S-10MH4L	FlexPIFA	IPEX MHF4L	-	2 dBi
5	Ezurio	iFlexPIFA Mini Series	EFG2401A3S-10MH4L	i-FlexPIFA	IPEX MHF4L	-	2 dBi
6	Ezurio	Ezurio NFC	0600-00061	Coiled Inductor	FFC/FPC Connector	-	-

Integrated Antenna BL54H20 Chip antenna module variant (453-00197)

Ant. No.	Manufacturer	Model	Part Number	Type	Connector	2400-2500 (MHz)
1	Ignion	NANO mXTEND	NN02-101	Chip loop	N/A	2.4dBi
2	Ezurio	Ezurio NFC	0600-00061	Coiled Inductor	FFC/FPC Connector	-

Note: The antennas with highest gain was chosen for final test

1.1.3 Configuration of Equipment under Test (EUT)

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

Note: Three input voltage (1.8 / 3.3 / 5Vdc) had been covered during the pretest, and found that 5Vdc was the worst case and was selected for final test.

1.1.4 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

1.1.5 Test Tool and Duty Cycle

Test Tool	PuTTY, Version: 0.60	
Duty Cycle and Duty Factor	Duty Cycle Of Test Signal (%)	Duty Factor (dB)
	100.00%	0

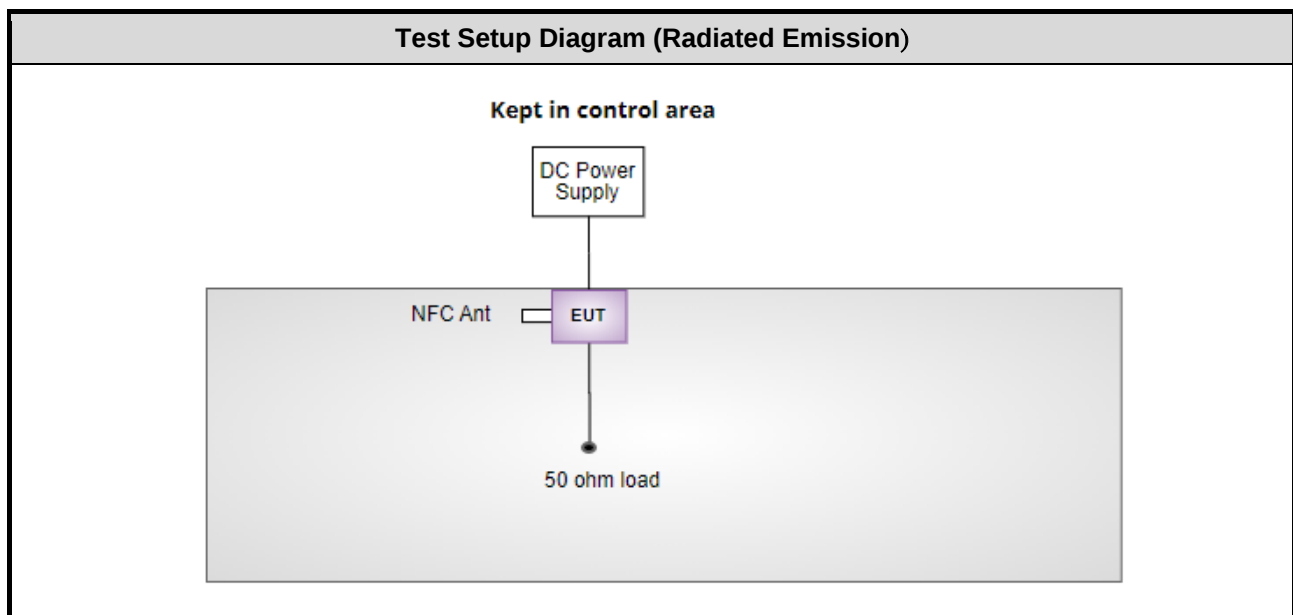
1.1.6 Power Index of Test Tool

Modulation Mode	Test Frequency (MHz)	Power Index
OQPSK	2405	pos7dBm
OQPSK	2440	pos7dBm
OQPSK	2475	pos7dBm
OQPSK	2480	neg8dBm

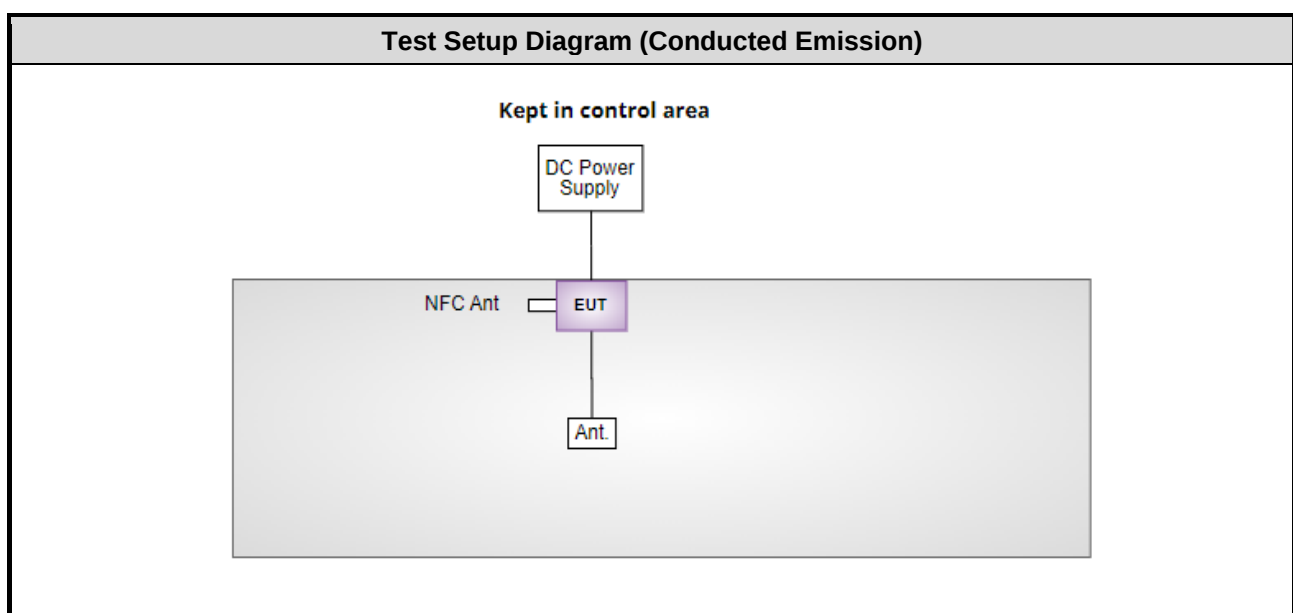
1.2 Local Support Equipment List

Support Equipment List					
No.	Equipment	Brand	Model	FCC ID	Remarks
1	DC Power Supply	GWINSTEK	GPC-60300	---	---
2	50 ohm load	Woken	WTER-18S2	---	---

1.3 Test Setup Chart



Note: The support Laptop and USB cable were disconnected from EUT and was removed from test table after sending command from Laptop to control EUT to transmit continuously.



Note: The support Laptop and USB cable were disconnected from EUT and was removed from test table after sending command from Laptop to control EUT to transmit continuously.

1.4 The Equipment List

Test Item	Conducted Emission				
Test Site	Conduction room 1 / (CO01-WS)				
Tested Date	Nov. 18, 2024				
Instrument	Brand	Model No.	Serial No.	Calibration Date	Calibration Until
Receiver	R&S	ESR3	101658	Feb. 23, 2024	Feb. 22, 2025
LISN	R&S	ENV216	101579	May 09, 2024	May 08, 2025
LISN (Support Unit)	SCHWARZBECK	Schwarzbeck 8127	8127667	Jan. 10, 2024	Jan. 09, 2025
DC POWER SOURCE	GW INSTRON	GPC-6030D	GES855395	Nov. 06, 2024	Nov. 05, 2025
50 ohm terminal	NA	50	01	Jun. 19, 2024	Jun. 18, 2025
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 chamber3 / (03CH03-WS)				
Tested Date	Nov. 12 ~ Nov. 15, 2024				
Instrument	Brand	Model No.	Serial No.	Calibration Date	Calibration Until
Receiver	R&S	ESR3	101657	Mar. 05, 2024	Mar. 04, 2025
Spectrum Analyzer	R&S	FSV40	101498	Nov. 12, 2024	Nov. 11, 2025
Loop Antenna	R&S	HFH2-Z2	100330	Nov. 05, 2024	Nov. 04, 2025
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-522	Aug. 09, 2024	Aug. 08, 2025
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1096	Nov. 27, 2023	Nov. 26, 2024
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170508	Dec. 28, 2023	Dec. 27, 2024
Preamplifier	EMC	EMC02325	980225	Jun. 17, 2024	Jun. 16, 2025
Preamplifier	EMC	EMC118A45SE	980898	Jul. 05, 2024	Jul. 04, 2025
Preamplifier	EMC	EMC184045SE	980903	Jul. 30, 2024	Jul. 29, 2025
Loop Antenna Cable	KOAX KABEL	101354-BW	101354-BW	Oct. 02, 2024	Oct. 01, 2025
LF cable 3M	Woken	CFD400NL-LW	CFD400NL-001	Oct. 02, 2024	Oct. 01, 2025
LF cable 11M	EMC	EMCCFD400-NW-N W-11000	200801	Oct. 02, 2024	Oct. 01, 2025
LF cable 1M	EMC	EMCCFD400-NM-N M-1000	160502	Oct. 02, 2024	Oct. 01, 2025
RF Cable	EMC	EMC104-35M-35M-8000	210920	Oct. 02, 2024	Oct. 01, 2025
RF Cable	EMC	EMC104-35M-35M-3000	210922	Oct. 02, 2024	Oct. 01, 2025
Attenuator	Pasternack	PE7005-10	10-1	Oct. 02, 2024	Oct. 01, 2025
HIGHPASS FILTER 3.1-18G	WHK	WHK3.1/18G-10SS	39	Oct. 02, 2024	Oct. 01, 2025
Measurement Software	Sporton	SENSE-15247_FS	V5. 11	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

Test Item	RF Conducted				
Test Site	(TH01-WS)				
Tested Date	Nov. 15, 2024				
Instrument	Brand	Model No.	Serial No.	Calibration Date	Calibration Until
Spectrum Analyzer	R&S	FSV40	101910	Apr. 18, 2024	Apr. 17, 2025
Power Meter	Anritsu	ML2495A	1241002	Nov. 21, 2023	Nov. 20, 2024
Power Sensor	Anritsu	MA2411B	1207366	Nov. 21, 2023	Nov. 20, 2024
Attenuator	Pasternack	PE7005-10	10-2	Oct. 04, 2024	Oct. 03, 2025
Measurement Software	Sporton	SENSE-15247_FS	V5.11	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

1.5 Test Standards

47 CFR FCC Part 15.247

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
Unwanted Emission ≤ 1GHz	±3.41 dB
Unwanted Emission > 1GHz	±4.59 dB

2 Test Configuration

2.1 Testing Facility

Test Laboratory	International Certification Corporation
Test Site	CO01-WS, 03CH01-WS, TH01-WS
Address of Test Site	No.3-1, Lane 6, Wen San 3rd St., Kwei Shan Dist., Tao Yuan City 33381, Taiwan (R.O.C.)

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

2.2 The Worst Test Modes and Channel Details

Test item	Mode	Test Frequency (MHz)	Conducted / Radiated measurement	Data Rate	Test Configuration
AC Power Line Conducted Emission	OQPSK	2405	Conducted	250kbps	---
Unwanted Emissions $\leq$ 1GHz	OQPSK	2405	Conducted	250kbps	---
			Radiated		
Unwanted Emissions $>$ 1GHz	OQPSK	2405 / 2440 / 2475 / 2480	Conducted	250kbps	---
			Radiated		
Conducted Output Power 6dB bandwidth Power spectral density	OQPSK	2405 / 2440 / 2475 / 2480	Conducted	250kbps	

NOTE:

1. The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement – X, Y, and Z-plane. The **Z-plane** results were found as the worst case and were shown in this report.
2. The 50 Ω terminator is connected to antenna port of EUT for radiated emission measurement.

3 Transmitter Test Results

3.1 6dB and Occupied Bandwidth

3.1.1 Limit of 6dB Bandwidth

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

3.1.2 Test Procedures

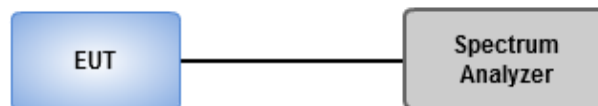
6dB Bandwidth

1. Set resolution bandwidth (RBW) = 100 kHz, Video bandwidth = 300 kHz.
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% ~ 5 % of OBW, Video bandwidth = 3 x RBW
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.

3.1.3 Test Setup



3.1.4 Test Results

Ambient Condition	22°C / 66%	Tested By	Roger Lu
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Refer to Appendix A.

3.2 Conducted Output Power

3.2.1 Limit of Conducted Output Power

Conducted power shall not exceed 1Watt.

Antenna gain $\leq 6\text{dBi}$, no any corresponding reduction is in output power limit.

Antenna gain $> 6\text{dBi}$

Non Fixed, point to point operations.

The conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dB

Fixed, point to point operations

Systems operating in the 2400–2483.5 MHz band that are used exclusively for fixed, point-to-point Operations, maximum peak output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

3.2.2 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.

3.2.3 Test Setup



3.2.4 Test Results

Ambient Condition	22°C / 66%	Tested By	Roger Lu
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Refer to Appendix B.

3.3 Power Spectral Density

3.3.1 Limit of Power Spectral Density

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

3.3.2 Test Procedures

Peak PSD

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.

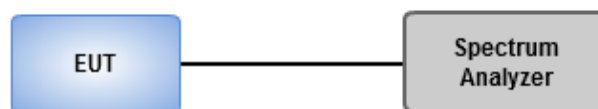
Average PSD, duty cycle $\geq 98\%$

1. Set the RBW = 3 kHz, VBW = 10 kHz.
2. Detector = RMS, Sweep time = auto couple.
3. Sweep time = auto couple.
4. Employ trace averaging (RMS) mode over a minimum of 100 traces.
5. Use the peak marker function to determine the maximum amplitude level.

Average PSD, duty cycle $< 98\%$

1. Set the RBW = 3 kHz, VBW = 10 kHz
2. Detector = RMS, Sweep time = auto couple.
3. Sweep time = auto couple.
4. Employ trace averaging (RMS) mode over a minimum of 100 traces.
5. Use the peak marker function to determine the maximum amplitude level.
6. Add $10 \log (1/x)$, where x is the duty cycle.

3.3.3 Test Setup



3.3.4 Test Results

Ambient Condition	22°C / 66%	Tested By	Roger Lu
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Refer to Appendix C.

3.4 Unwanted Emissions into Restricted Frequency Bands

3.4.1 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:
Quasi-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.

3.4.2 Test Procedures

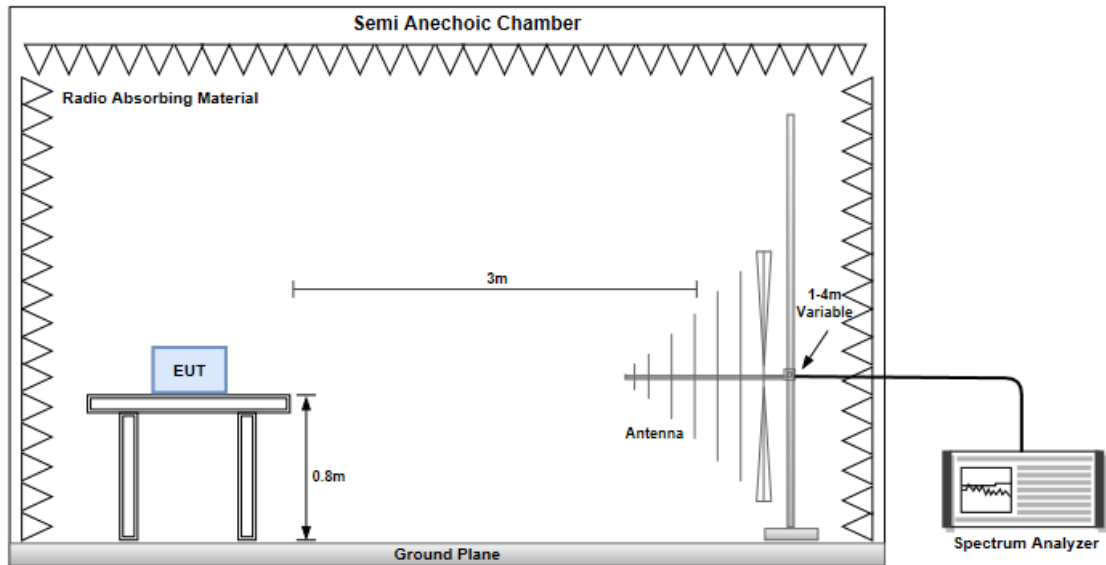
1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission 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:

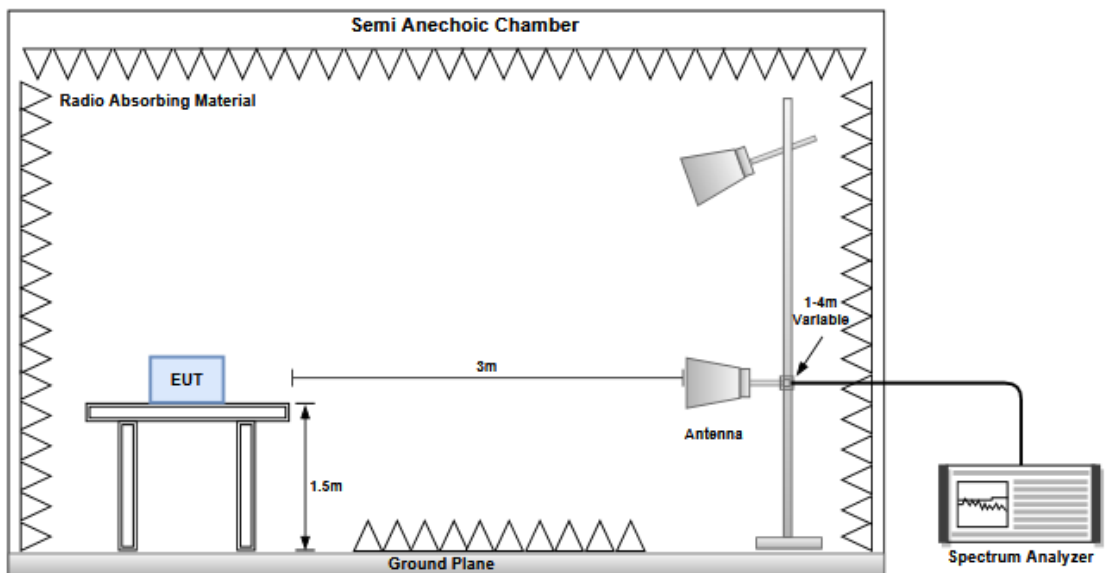
1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission below 1GHz.
2. RBW=1MHz, VBW=3MHz and Peak detector is for peak measured value of radiated emission above 1GHz.
3. RBW=1MHz, VBW=1/T and Peak detector is for average measured value of radiated emission above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

3.4.3 Test Setup

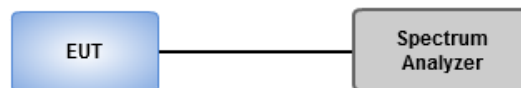
Radiated Emissions below 1 GHz



Radiated Emissions above 1 GHz



Transmitter Conducted Unwanted Emissions (30MHz~40GHz)



3.4.4 Test Results

Refer to Appendix D.

3.5 Emissions in Non-Restricted Frequency Bands

3.5.1 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.

3.5.2 Test Procedures

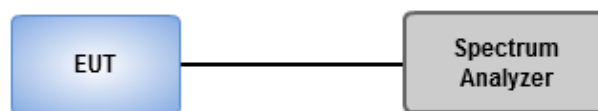
Reference level measurement

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

3.5.3 Test Setup



3.5.4 Test Results

Ambient Condition	22°C / 66%	Tested By	Roger Lu
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Refer to Appendix E.

3.6 AC Power Line Conducted Emissions

3.6.1 Limit of AC Power Line Conducted Emissions

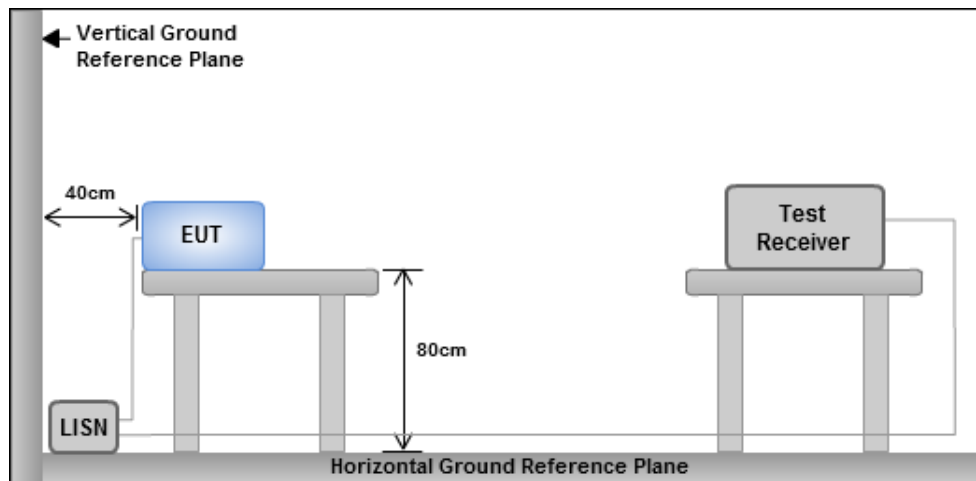
Conducted Emissions Limit		
Frequency Emission (MHz)	Quasi-Peak	Average
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50

Note 1: * Decreases with the logarithm of the frequency.

3.6.2 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.

3.6.3 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

3.6.4 Test Results

Refer to Appendix F.

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 Corporation (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

Tel: 886-2-2601-1640

No.30-2, Ding Fwu Tsuen, Lin Kou
District, New Taipei City, Taiwan
(R.O.C.)

Kwei Shan

Tel: 886-3-271-8666

No.3-1, Lane 6, Wen San 3rd
St., Kwei Shan Dist., Tao Yuan
City 33381, Taiwan (R.O.C.)
No.2-1, Lane 6, Wen San 3rd
St., Kwei Shan Dist., Tao Yuan
City 33381, Taiwan (R.O.C.)

Kwei Shan Site II

Tel: 886-3-271-8640

No.14-1, Lane 19, Wen San 3rd
St., Kwei Shan Dist., Tao Yuan
City 33381, Taiwan (R.O.C.)

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

Tel: 886-3-271-8666

Fax: 886-3-318-0345

Email: ICC_Service@icertifi.com.tw

==END==

**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	1.6M	2.418M	2M42D1D	1.569M	2.38M

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

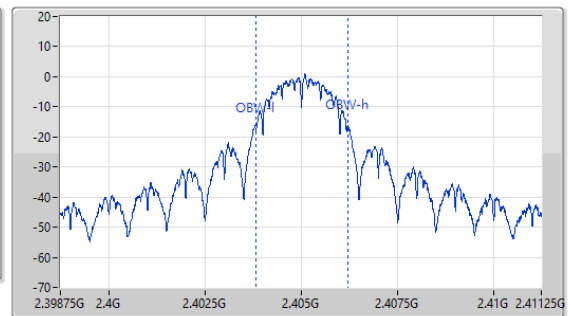
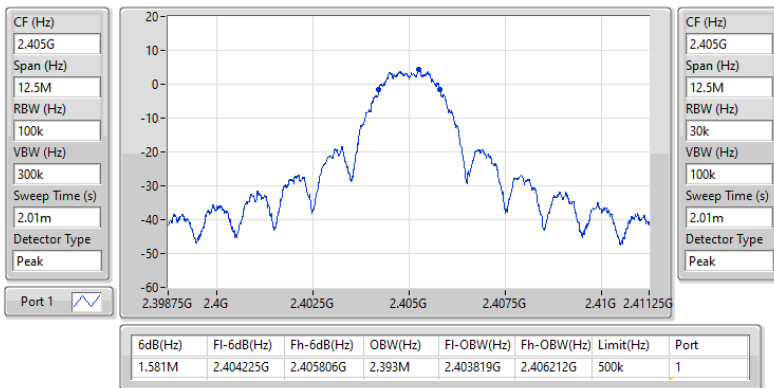
Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
802.15.4	-	-	-	-
2405MHz	Pass	500k	1.581M	2.393M
2440MHz	Pass	500k	1.6M	2.386M
2475MHz	Pass	500k	1.569M	2.38M
2480MHz	Pass	500k	1.569M	2.418M

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

2.4-2.4835GHz_802.15.4

EBW-DTS

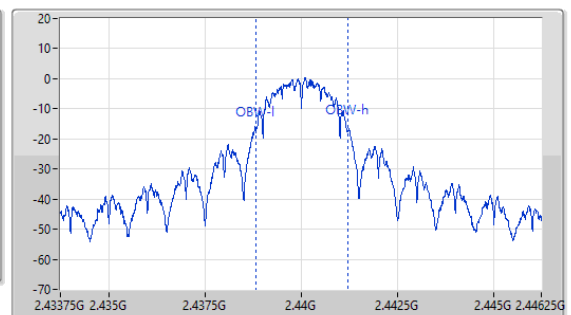
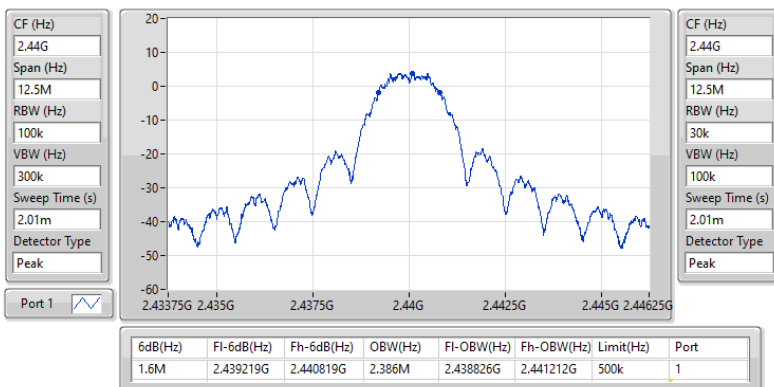
2405MHz



2.4-2.4835GHz_802.15.4

EBW-DTS

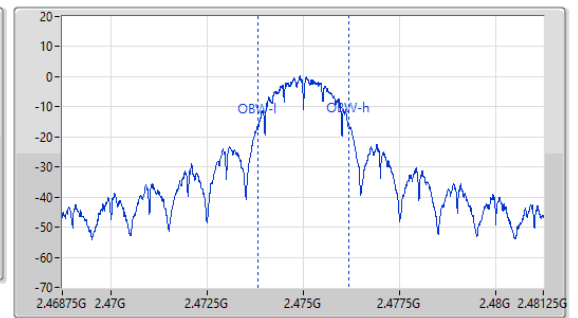
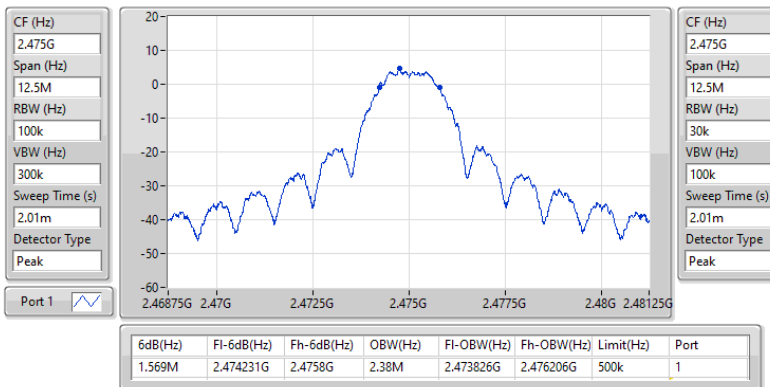
2440MHz



2.4-2.4835GHz_802.15.4

EBW-DTS

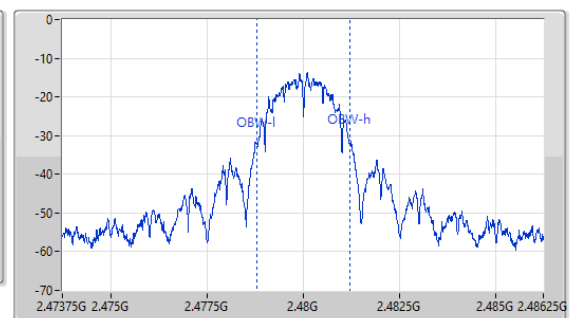
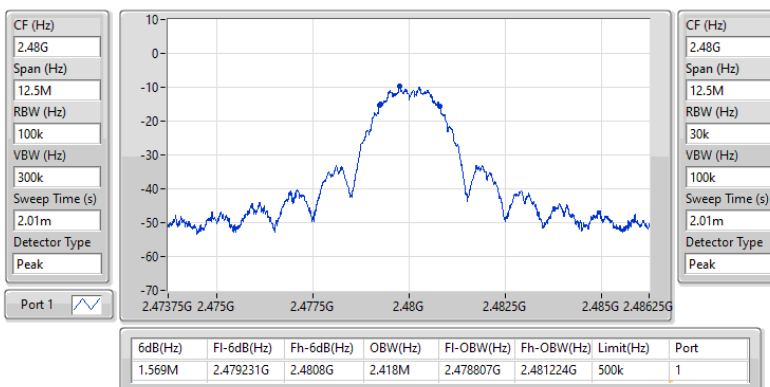
2475MHz



2.4-2.4835GHz_802.15.4

EBW-DTS

2480MHz



**Summary**

Mode	Total Power (dBm)	Total Power (W)
2.4-2.4835GHz	-	-
802.15.4	7.12	0.00515

Result

Mode	Result	Antenna Gain (dBi)	Total Power (dBm)	Power Limit (dBm)	EIRP (dBm)	EIRP Limit (dBm)
802.15.4	-	-	-	-	-	-
2405MHz	Pass	2.40	7.12	30.00	9.52	36.00
2440MHz	Pass	2.40	6.99	30.00	9.39	36.00
2475MHz	Pass	2.40	6.93	30.00	9.33	36.00
2480MHz	Pass	2.40	-7.28	30.00	-4.88	36.00



Conducted Output Power (Average)

Appendix B

Summary

Mode	Total Power (dBm)	Total Power (W)
2.4-2.4835GHz	-	-
802.15.4	6.98	0.00499

Result

Mode	Result	Antenna Gain (dBi)	Total Power (dBm)	Power Limit (dBm)	EIRP (dBm)	EIRP Limit (dBm)
802.15.4	-	-	-	-	-	-
2405MHz	Pass	2.40	6.98	-	9.38	-
2440MHz	Pass	2.40	6.87	-	9.27	-
2475MHz	Pass	2.40	6.81	-	9.21	-
2480MHz	Pass	2.40	-7.42	-	-5.02	-

Note: Average power is for reference only.

**Summary**

Mode	PD (dBm/3kHz)
2.4-2.4835GHz	-
802.15.4	-7.20

Result

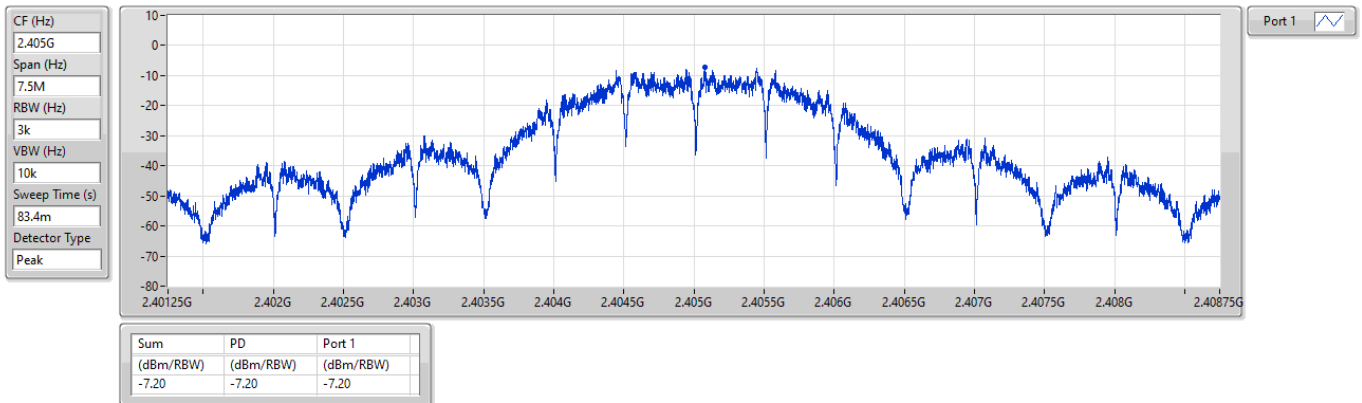
Mode	Result	Antenna Gain (dBi)	Power Density (dBm/3kHz)	Power Density Limit (dBm/3kHz)
802.15.4	-	-	-	-
2405MHz	Pass	2.40	-7.20	8.00
2440MHz	Pass	2.40	-7.59	8.00
2475MHz	Pass	2.40	-7.24	8.00
2480MHz	Pass	2.40	-20.82	8.00



2.4-2.4835GHz_802.15.4

PSD

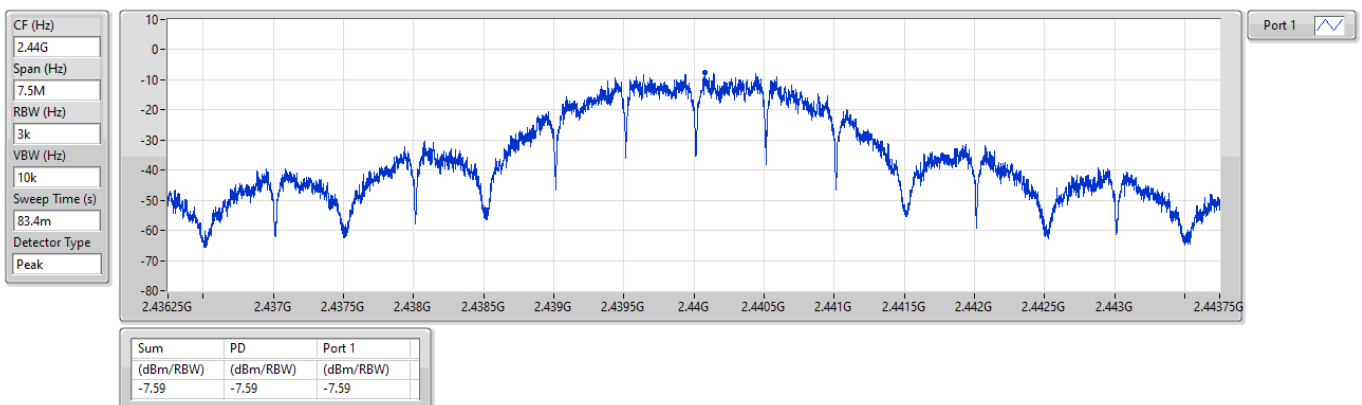
2405MHz



2.4-2.4835GHz_802.15.4

PSD

2440MHz



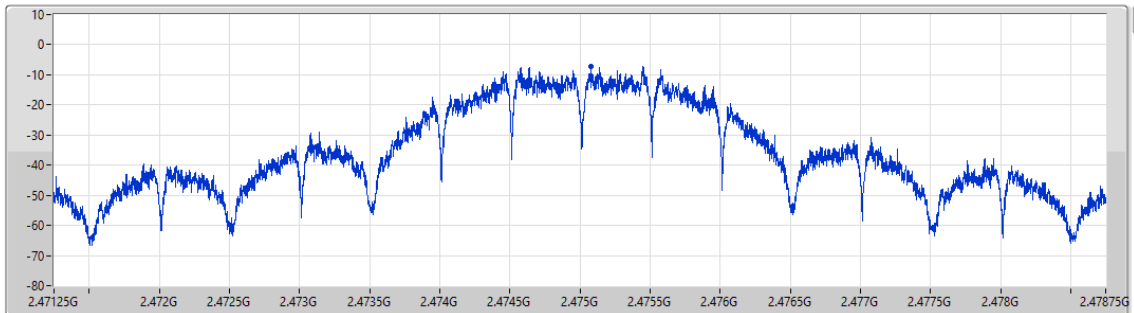


2.4-2.4835GHz_802.15.4

PSD

2475MHz

CF (Hz)
2.475G
Span (Hz)
7.5M
RBW (Hz)
3k
VBW (Hz)
10k
Sweep Time (s)
83.4m
Detector Type
Peak



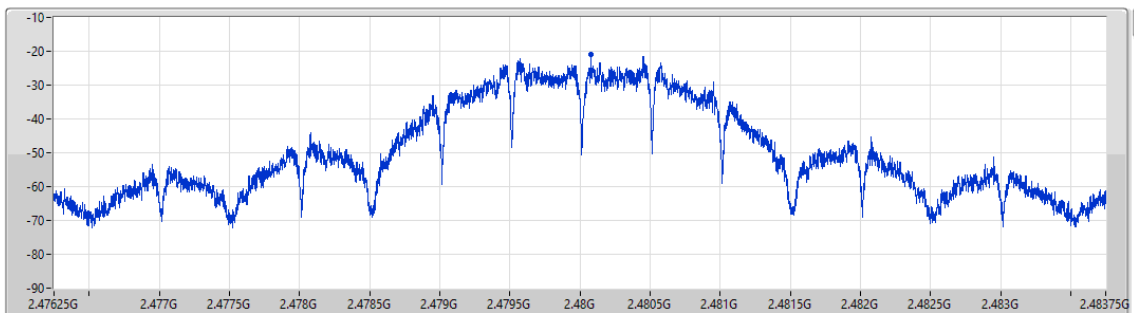
Sum	PD	Port 1
(dBm/Hz)	(dBm/Hz)	(dBm/Hz)
-7.24	-7.24	-7.24

2.4-2.4835GHz_802.15.4

PSD

2480MHz

CF (Hz)
2.48G
Span (Hz)
7.5M
RBW (Hz)
3k
VBW (Hz)
10k
Sweep Time (s)
83.4m
Detector Type
Peak



Sum	PD	Port 1
(dBm/Hz)	(dBm/Hz)	(dBm/Hz)
-20.82	-20.82	-20.82



Unwanted Conducted Emissions into Restricted Frequency Bands

AppendixD.1

Summary

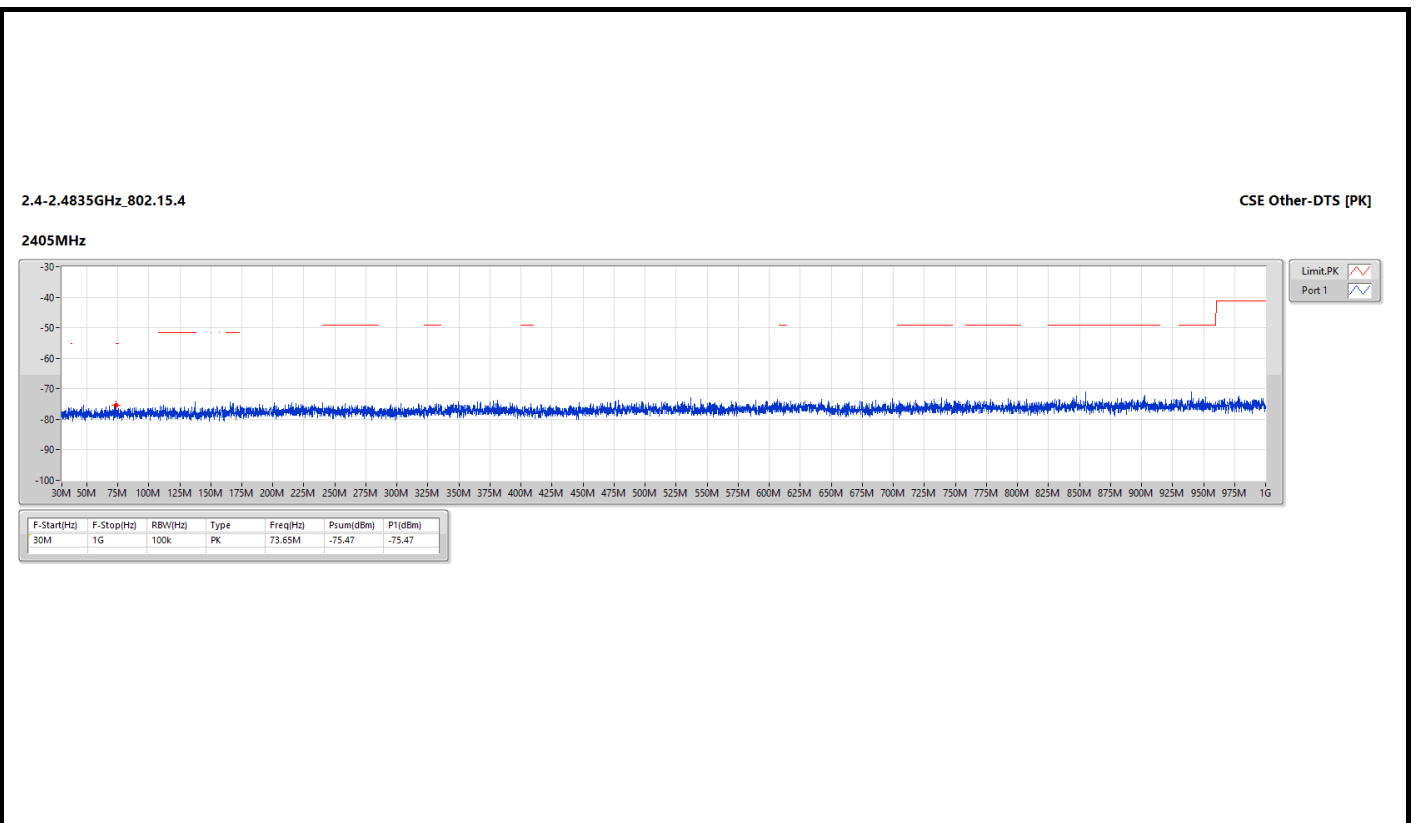
Mode	Result	F-Start (Hz)	F-Stop (Hz)	Type	Freq (Hz)	DG (dBi)	Psum (dBm)	GRF (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-
802.15.4	Pass	30M	1G	PK	73.65M	2.40	-75.47	4.7	-68.37	-55.20	-13.17

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

Result

Mode	Result	F-Start (Hz)	F-Stop (Hz)	Type	Freq (Hz)	DG (dBi)	Psum (dBm)	GRF (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
802.15.4	-	-	-	-	-	-	-	-	-	-	-
2405MHz	Pass	30M	1G	PK	73.65M	2.40	-75.47	4.7	-68.37	-55.20	-13.17

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





Summary

Mode	Result	F-Start (Hz)	F-Stop (Hz)	Type	Freq (Hz)	DG (dBi)	Psum (dBm)	EIRP (dBm)	Limit (dBm)	Margin (dB)
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-
802.15.4	Pass	2.4835G	2.5G	AV	2.4835G	2.40	-46.94	-44.54	-41.20	-3.34

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



Unwanted Conducted Emissions into Restricted Frequency Bands

Appendix D.2

Result

Mode	Result	F-Start (Hz)	F-Stop (Hz)	Type	Freq (Hz)	DG (dBi)	Psum (dBm)	EIRP (dBm)	Limit (dBm)	Margin (dB)
802.15.4	-	-	-	-	-	-	-	-	-	-
2405MHz	Pass	1G	2.31G	AV	2.21322G	2.40	-66.32	-63.92	-41.20	-22.72
2405MHz	Pass	2.31G	2.39G	AV	2.39G	2.40	-55.12	-52.72	-41.20	-11.52
2405MHz	Pass	2.4835G	2.5G	AV	2.49915G	2.40	-66.70	-64.30	-41.20	-23.10
2405MHz	Pass	2.5G	3.1G	AV	2.8864G	2.40	-65.26	-62.86	-41.20	-21.66
2405MHz	Pass	1G	2.31G	PK	1.92814G	2.40	-57.08	-54.68	-21.20	-33.48
2405MHz	Pass	2.31G	2.39G	PK	2.38984G	2.40	-45.07	-42.67	-21.20	-21.47
2405MHz	Pass	2.4835G	2.5G	PK	2.48697G	2.40	-54.41	-52.01	-21.20	-30.81
2405MHz	Pass	2.5G	3.1G	PK	2.5552G	2.40	-55.34	-52.94	-21.20	-31.74
2440MHz	Pass	1G	2.31G	AV	2.2147G	2.40	-66.32	-63.92	-41.20	-22.72
2440MHz	Pass	2.31G	2.39G	AV	2.3442G	2.40	-66.40	-64.00	-41.20	-22.80
2440MHz	Pass	2.4835G	2.5G	AV	2.48399G	2.40	-65.72	-63.32	-41.20	-22.12
2440MHz	Pass	2.5G	3.1G	AV	2.8888G	2.40	-65.26	-62.86	-41.20	-21.66
2440MHz	Pass	1G	2.31G	PK	2.20062G	2.40	-55.98	-53.58	-21.20	-32.38
2440MHz	Pass	2.31G	2.39G	PK	2.35952G	2.40	-55.07	-52.67	-21.20	-31.47
2440MHz	Pass	2.4835G	2.5G	PK	2.48723G	2.40	-54.08	-51.68	-21.20	-30.48
2440MHz	Pass	2.5G	3.1G	PK	2.8972G	2.40	-53.96	-51.56	-21.20	-30.36
2475MHz	Pass	1G	2.31G	AV	2.21322G	2.40	-66.04	-63.64	-41.20	-22.44
2475MHz	Pass	2.31G	2.39G	AV	2.37968G	2.40	-66.50	-64.10	-41.20	-22.90
2475MHz	Pass	2.4835G	2.5G	AV	2.48391G	2.40	-47.44	-45.04	-41.20	-3.84
2475MHz	Pass	2.5G	3.1G	AV	2.5069G	2.40	-59.34	-56.94	-41.20	-15.74
2475MHz	Pass	1G	2.31G	PK	1.86067G	2.40	-56.24	-53.84	-21.20	-32.64
2475MHz	Pass	2.31G	2.39G	PK	2.37864G	2.40	-55.13	-52.73	-21.20	-31.53
2475MHz	Pass	2.4835G	2.5G	PK	2.48358G	2.40	-36.11	-33.71	-21.20	-12.51
2475MHz	Pass	2.5G	3.1G	PK	2.506G	2.40	-53.91	-51.51	-21.20	-30.31
2480MHz	Pass	1G	2.31G	AV	2.21339G	2.40	-66.60	-64.20	-41.20	-23.00
2480MHz	Pass	2.31G	2.39G	AV	2.38776G	2.40	-67.32	-64.92	-41.20	-23.72
2480MHz	Pass	2.4835G	2.5G	AV	2.4835G	2.40	-46.94	-44.54	-41.20	-3.34
2480MHz	Pass	2.5G	3.1G	AV	2.87935G	2.40	-65.54	-63.14	-41.20	-21.94
2480MHz	Pass	1G	2.31G	PK	1.10022G	2.40	-57.64	-55.24	-21.20	-34.04
2480MHz	Pass	2.31G	2.39G	PK	2.36776G	2.40	-55.78	-53.38	-21.20	-32.18
2480MHz	Pass	2.4835G	2.5G	PK	2.48357G	2.40	-38.32	-35.92	-21.20	-14.72
2480MHz	Pass	2.5G	3.1G	PK	2.5744G	2.40	-54.78	-52.38	-21.20	-31.18

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



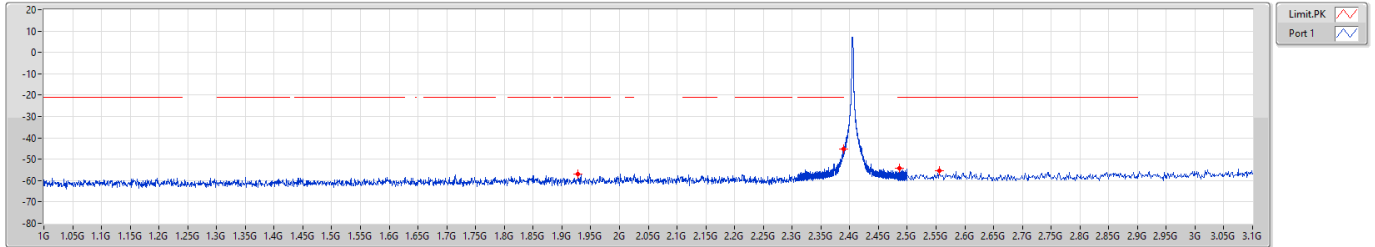
Unwanted Conducted Emissions into Restricted Frequency Bands

Appendix D.2

2.4-2.4835GHz_802.15.4

CSE Bandedge-DTS [PK]

2405MHz

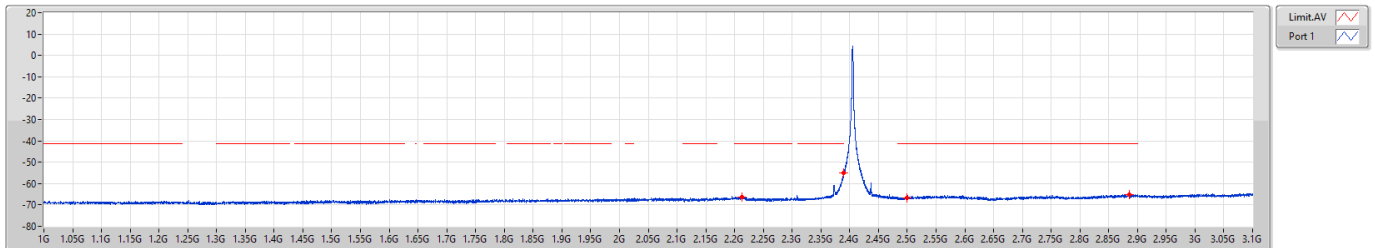


F-Start(Hz)	F-Stop(Hz)	RBW(Hz)	Type	Freq(Hz)	Psum(dBm)	P1(dBm)
1G	2.31G	1M	PK	1.92814G	-57.08	-57.08
2.31G	2.39G	1M	PK	2.38984G	-45.07	-45.07
2.4835G	2.5G	1M	PK	2.48697G	-54.41	-54.41
2.5G	3.1G	1M	PK	2.5552G	-55.34	-55.34

2.4-2.4835GHz_802.15.4

CSE Bandedge-DTS [AV]

2405MHz



F-Start(Hz)	F-Stop(Hz)	RBW(Hz)	Type	Freq(Hz)	Psum(dBm)	P1(dBm)
1G	2.31G	1M	AV	2.21322G	-66.32	-66.32
2.31G	2.39G	1M	AV	2.39G	-55.12	-55.12
2.4835G	2.5G	1M	AV	2.49915G	-66.70	-66.70
2.5G	3.1G	1M	AV	2.8864G	-65.26	-65.26



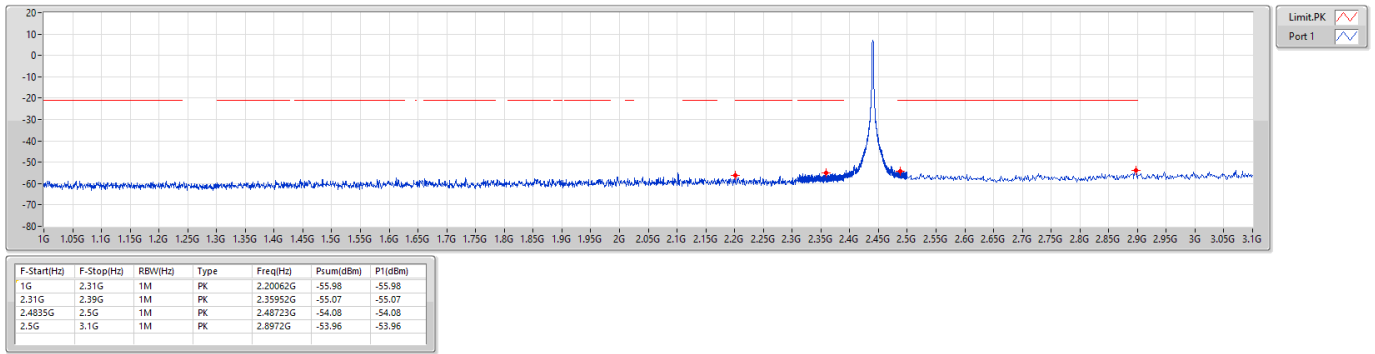
Unwanted Conducted Emissions into Restricted Frequency Bands

Appendix D.2

2.4-2.4835GHz_802.15.4

CSE Bandedge-DTS [PK]

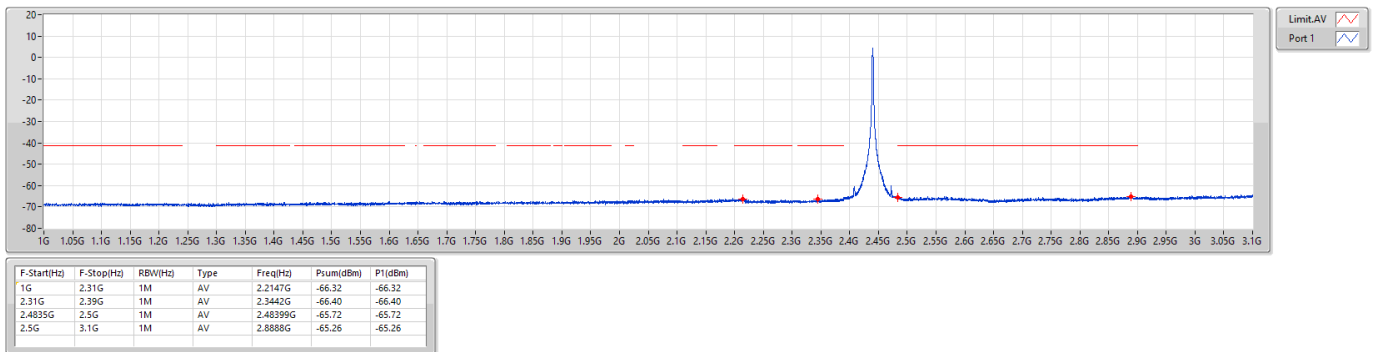
2440MHz



2.4-2.4835GHz_802.15.4

CSE Bandedge-DTS [AV]

2440MHz





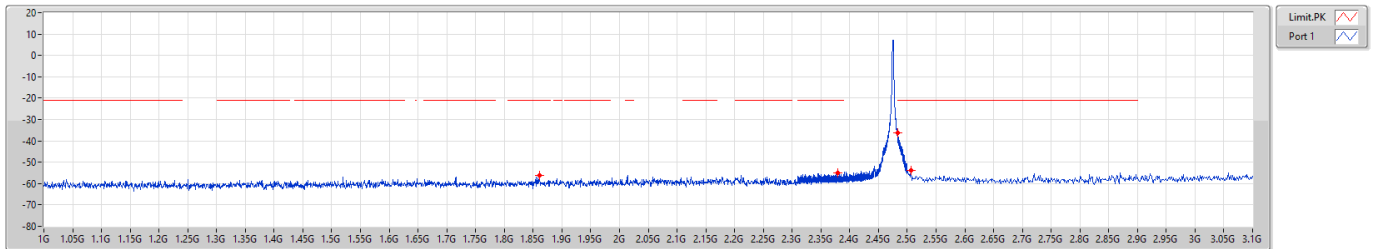
Unwanted Conducted Emissions into Restricted Frequency Bands

Appendix D.2

2.4-2.4835GHz_802.15.4

CSE Bandedge-DTS [PK]

2475MHz

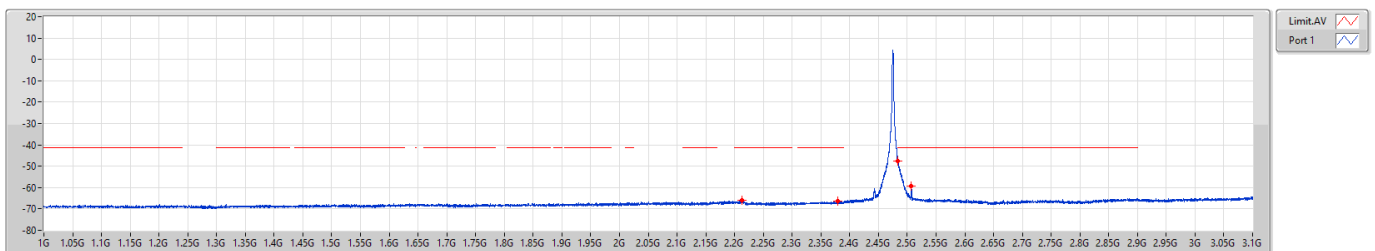


F-Start(Hz)	F-Stop(Hz)	RBW(Hz)	Type	Freq(Hz)	Psum(dBm)	P1(dBm)
1G	2.31G	1M	PK	1.86067G	-56.24	-56.24
2.31G	2.39G	1M	PK	2.37864G	-55.13	-55.13
2.4835G	2.5G	1M	PK	2.48358G	-36.11	-36.11
2.5G	3.1G	1M	PK	2.506G	-53.91	-53.91

2.4-2.4835GHz_802.15.4

CSE Bandedge-DTS [AV]

2475MHz



F-Start(Hz)	F-Stop(Hz)	RBW(Hz)	Type	Freq(Hz)	Psum(dBm)	P1(dBm)
1G	2.31G	1M	AV	2.21322G	-66.04	-66.04
2.31G	2.39G	1M	AV	2.37968G	-66.50	-66.50
2.4835G	2.5G	1M	AV	2.48391G	-47.44	-47.44
2.5G	3.1G	1M	AV	2.5069G	-59.34	-59.34



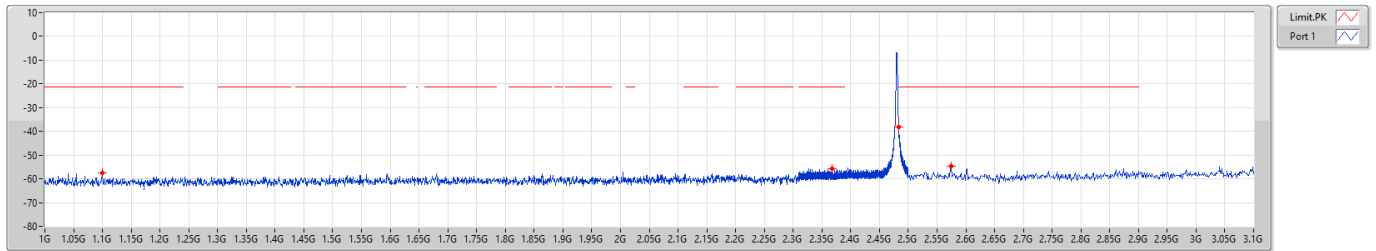
Unwanted Conducted Emissions into Restricted Frequency Bands

Appendix D.2

2.4-2.4835GHz_802.15.4

CSE Bandedge-DTS [PK]

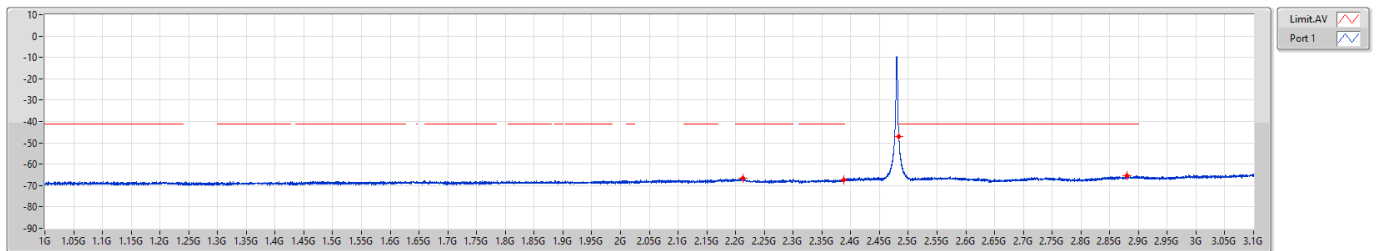
2480MHz



2.4-2.4835GHz_802.15.4

CSE Bandedge-DTS [AV]

2480MHz





Summary

Mode	Result	F-Start (Hz)	F-Stop (Hz)	Type	Freq (Hz)	DG (dBi)	Psum (dBm)	EIRP (dBm)	Limit (dBm)	Margin (dB)
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-
802.15.4	Pass	8G	25G	AV	19.24391G	2.40	-56.41	-54.01	-41.20	-12.81

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

Result

Mode	Result	F-Start (Hz)	F-Stop (Hz)	Type	Freq (Hz)	DG (dBi)	Psum (dBm)	EIRP (dBm)	Limit (dBm)	Margin (dB)
802.15.4	-	-	-	-	-	-	-	-	-	-
2405MHz	Pass	3.1G	4G	AV	3.26515G	2.40	-73.75	-71.35	-41.20	-30.15
2405MHz	Pass	4G	5G	AV	4.811G	2.40	-62.00	-59.60	-41.20	-18.40
2405MHz	Pass	5G	7G	AV	5.2115G	2.40	-72.94	-70.54	-41.20	-29.34
2405MHz	Pass	7G	8G	AV	7.73975G	2.40	-72.31	-69.91	-41.20	-28.71
2405MHz	Pass	8G	25G	AV	19.24391G	2.40	-56.41	-54.01	-41.20	-12.81
2405MHz	Pass	3.1G	4G	PK	3.26313G	2.40	-63.57	-61.17	-21.20	-39.97
2405MHz	Pass	4G	5G	PK	4.8095G	2.40	-55.96	-53.56	-21.20	-32.36
2405MHz	Pass	5G	7G	PK	5.388G	2.40	-62.67	-60.27	-21.20	-39.07
2405MHz	Pass	7G	8G	PK	7.37G	2.40	-63.01	-60.61	-21.20	-39.41
2405MHz	Pass	8G	25G	PK	19.23647G	2.40	-49.23	-46.83	-21.20	-25.63
2440MHz	Pass	3.1G	4G	AV	3.2647G	2.40	-73.21	-70.81	-41.20	-29.61
2440MHz	Pass	4G	5G	AV	4.881G	2.40	-63.91	-61.51	-41.20	-20.31
2440MHz	Pass	5G	7G	AV	5.238G	2.40	-73.10	-70.70	-41.20	-29.50
2440MHz	Pass	7G	8G	AV	7.70125G	2.40	-72.41	-70.01	-41.20	-28.81
2440MHz	Pass	8G	25G	AV	19.51644G	2.40	-59.27	-56.87	-41.20	-15.67
2440MHz	Pass	3.1G	4G	PK	3.3367G	2.40	-63.63	-61.23	-21.20	-40.03
2440MHz	Pass	4G	5G	PK	4.87925G	2.40	-57.35	-54.95	-21.20	-33.75
2440MHz	Pass	5G	7G	PK	5.4465G	2.40	-63.38	-60.98	-21.20	-39.78
2440MHz	Pass	7G	8G	PK	7.7415G	2.40	-62.55	-60.15	-21.20	-38.95
2440MHz	Pass	8G	25G	PK	19.51644G	2.40	-50.68	-48.28	-21.20	-27.08
2475MHz	Pass	3.1G	4G	AV	3.26583G	2.40	-73.73	-71.33	-41.20	-30.13
2475MHz	Pass	4G	5G	AV	4.94925G	2.40	-63.98	-61.58	-41.20	-20.38
2475MHz	Pass	5G	7G	AV	5.24G	2.40	-73.09	-70.69	-41.20	-29.49
2475MHz	Pass	7G	8G	AV	7.739G	2.40	-72.49	-70.09	-41.20	-28.89
2475MHz	Pass	8G	25G	AV	19.80438G	2.40	-63.75	-61.35	-41.20	-20.15
2475MHz	Pass	3.1G	4G	PK	3.26583G	2.40	-63.60	-61.20	-21.20	-40.00
2475MHz	Pass	4G	5G	PK	4.94925G	2.40	-57.09	-54.69	-21.20	-33.49
2475MHz	Pass	5G	7G	PK	5.2245G	2.40	-63.10	-60.70	-21.20	-39.50
2475MHz	Pass	7G	8G	PK	7.62575G	2.40	-63.43	-61.03	-21.20	-39.83
2475MHz	Pass	8G	25G	PK	19.79588G	2.40	-54.89	-52.49	-21.20	-31.29
2480MHz	Pass	3.1G	4G	AV	3.26695G	2.40	-73.73	-71.33	-41.20	-30.13
2480MHz	Pass	4G	5G	AV	4.96325G	2.40	-73.72	-71.32	-41.20	-30.12
2480MHz	Pass	4G	5G	AV	4.972G	2.40	-73.11	-70.71	-41.20	-29.51
2480MHz	Pass	5G	7G	AV	5.392G	2.40	-72.92	-70.52	-41.20	-29.32
2480MHz	Pass	7G	8G	AV	7.73175G	2.40	-72.24	-69.84	-41.20	-28.64
2480MHz	Pass	8G	25G	AV	19.09356G	2.40	-65.16	-62.76	-41.20	-21.56
2480MHz	Pass	3.1G	4G	PK	3.84993G	2.40	-63.31	-60.91	-21.20	-39.71
2480MHz	Pass	4G	5G	PK	4.8045G	2.40	-62.88	-60.48	-21.20	-39.28
2480MHz	Pass	4G	5G	PK	4.9595G	2.40	-64.62	-62.22	-21.20	-41.02
2480MHz	Pass	5G	7G	PK	5.3985G	2.40	-62.66	-60.26	-21.20	-39.06
2480MHz	Pass	7G	8G	PK	7.7415G	2.40	-62.51	-60.11	-21.20	-38.91



Unwanted Conducted Emissions into Restricted Frequency Bands

AppendixD.3

Mode	Result	F-Start (Hz)	F-Stop (Hz)	Type	Freq (Hz)	DG (dBi)	Psum (dBm)	EIRP (dBm)	Limit (dBm)	Margin (dB)
2480MHz	Pass	8G	25G	PK	18.09428G	2.40	-55.49	-53.09	-21.20	-31.89

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



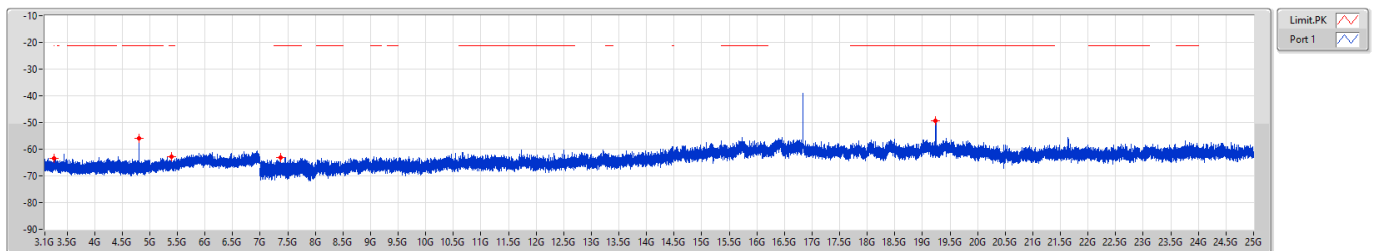
Unwanted Conducted Emissions into Restricted Frequency Bands

AppendixD.3

2.4-2.4835GHz_802.15.4

CSE-DTS [PK]

2405MHz

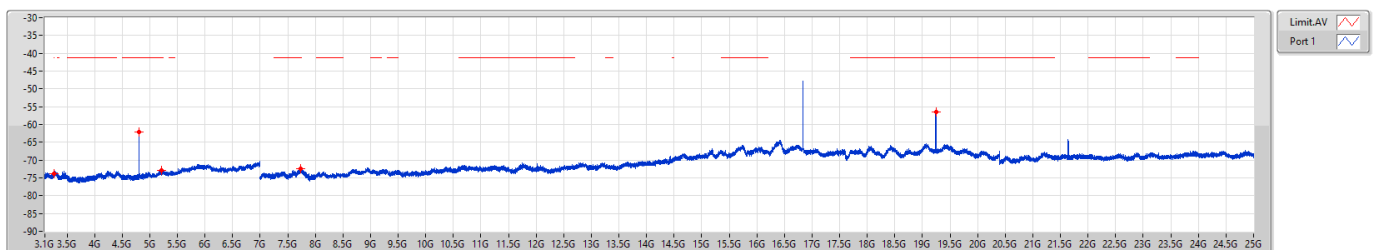


F.Start(Hz)	F.Stop(Hz)	RBW(Hz)	Type	Freq(Hz)	Prum(dBm)	P1(dBm)
3.1G	4G	1M	PK	3.26313G	-63.57	-63.57
4G	5G	1M	PK	4.8095G	-55.96	-55.96
5G	7G	1M	PK	5.388G	-62.67	-62.67
7G	8G	1M	PK	7.37G	-63.01	-63.01
8G	25G	1M	PK	19.23647G	-49.23	-49.23

2.4-2.4835GHz_802.15.4

CSE-DTS [AV]

2405MHz



F.Start(Hz)	F.Stop(Hz)	RBW(Hz)	Type	Freq(Hz)	Prum(dBm)	P1(dBm)
3.1G	4G	1M	AV	3.26515G	-73.75	-73.75
4G	5G	1M	AV	4.811G	-62.00	-62.00
5G	7G	1M	AV	5.2115G	-72.94	-72.94
7G	8G	1M	AV	7.73975G	-72.31	-72.31
8G	25G	1M	AV	19.24391G	-56.41	-56.41



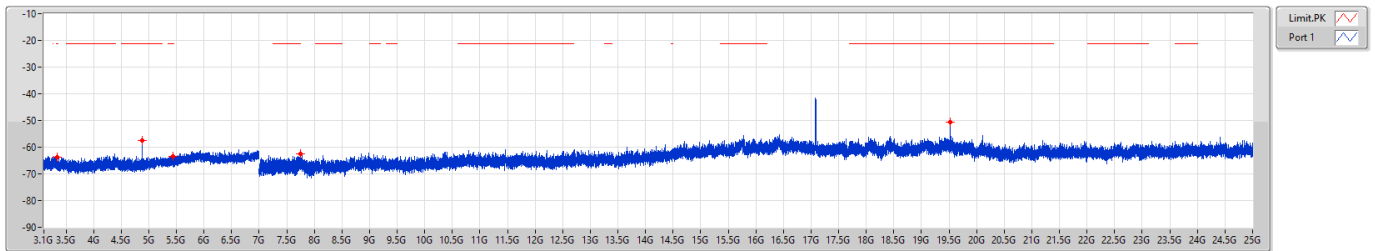
Unwanted Conducted Emissions into Restricted Frequency Bands

AppendixD.3

2.4-2.4835GHz_802.15.4

CSE-DTS [PK]

2440MHz

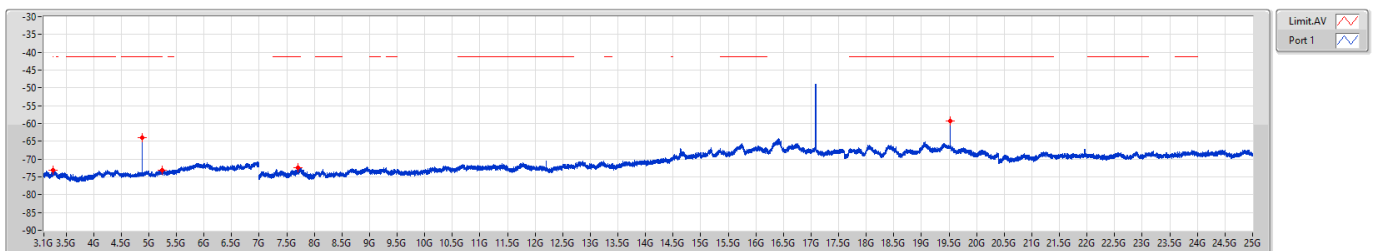


F-Start(Hz)	F-Stop(Hz)	RBW(Hz)	Type	Freq(Hz)	Psum(dBm)	P1(dBm)
3.1G	4G	1M	PK	3.3367G	-63.63	-63.63
4G	5G	1M	PK	4.87925G	-57.35	-57.35
5G	7G	1M	PK	5.4465G	-63.38	-63.38
7G	8G	1M	PK	7.7415G	-62.55	-62.55
8G	25G	1M	PK	19.51644G	-50.68	-50.68

2.4-2.4835GHz_802.15.4

CSE-DTS [AV]

2440MHz



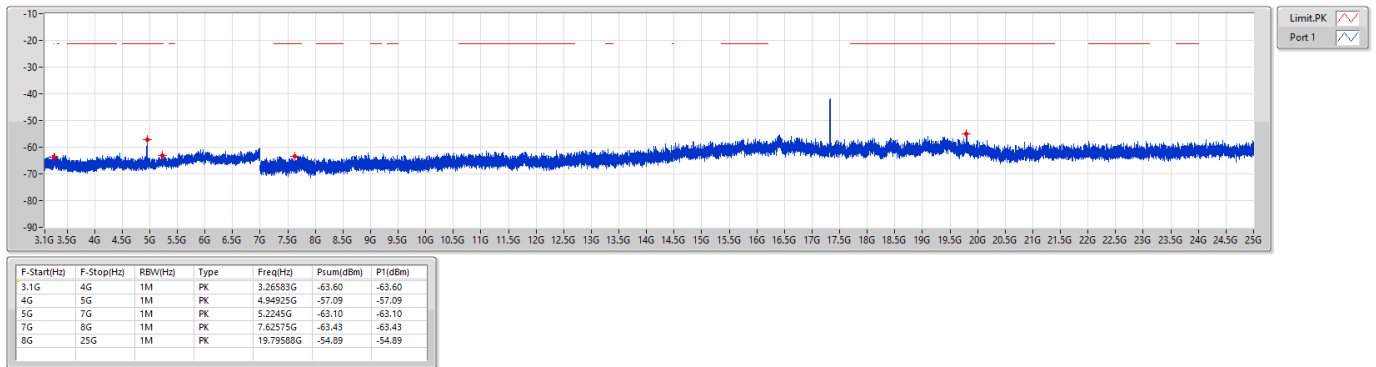
F-Start(Hz)	F-Stop(Hz)	RBW(Hz)	Type	Freq(Hz)	Psum(dBm)	P1(dBm)
3.1G	4G	1M	AV	3.2647G	-73.21	-73.21
4G	5G	1M	AV	4.881G	-63.91	-63.91
5G	7G	1M	AV	5.238G	-73.10	-73.10
7G	8G	1M	AV	7.70125G	-72.41	-72.41
8G	25G	1M	AV	19.51644G	-59.27	-59.27



2.4-2.4835GHz_802.15.4

CSE-DTS [PK]

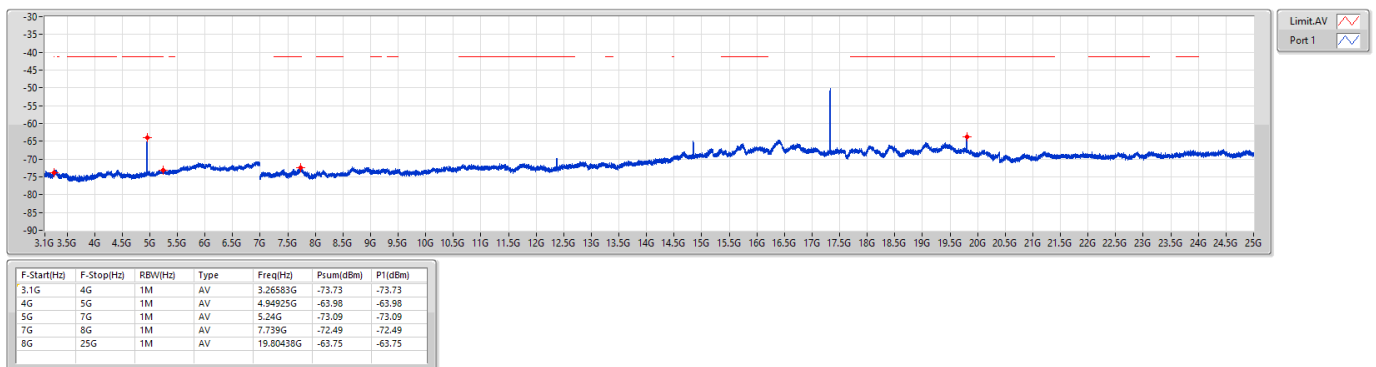
2475MHz



2.4-2.4835GHz_802.15.4

CSE-DTS [AV]

2475MHz





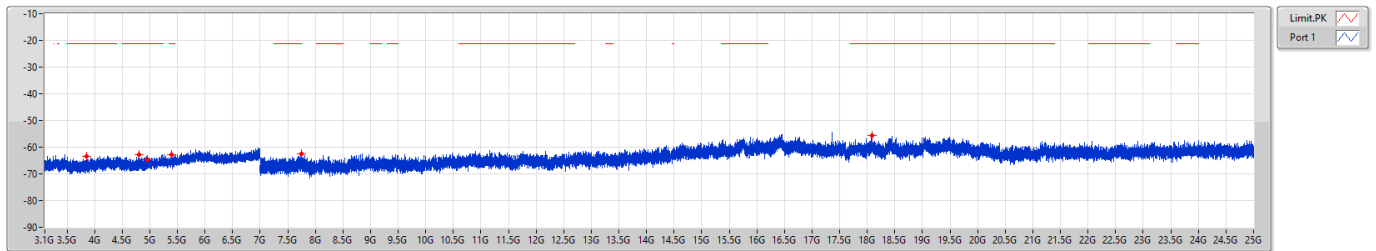
Unwanted Conducted Emissions into Restricted Frequency Bands

AppendixD.3

2.4-2.4835GHz_802.15.4

CSE-DTS [PK]

2480MHz

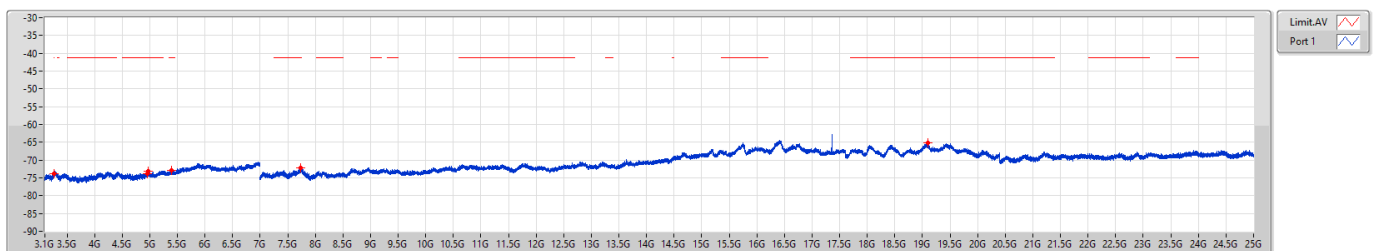


F.Start(Hz)	F.Stop(Hz)	RBW(Hz)	Type	Freq(Hz)	Psrm(dBm)	P1(dBm)
3.1G	4G	1M	PK	3.84993G	-63.31	-63.31
4G	5G	1M	PK	4.8045G	-62.88	-62.88
4G	5G	1M	PK	4.9595G	-64.62	-64.62
5G	7G	1M	PK	5.3985G	-62.66	-62.66
7G	8G	1M	PK	7.7415G	-62.51	-62.51
8G	25G	1M	PK	18.09428G	-55.49	-55.49

2.4-2.4835GHz_802.15.4

CSE-DTS [AV]

2480MHz



F.Start(Hz)	F.Stop(Hz)	RBW(Hz)	Type	Freq(Hz)	Psrm(dBm)	P1(dBm)
3.1G	4G	1M	AV	3.26695G	-73.73	-73.73
4G	5G	1M	AV	4.96325G	-73.72	-73.72
4G	5G	1M	AV	4.972G	-73.11	-73.11
5G	7G	1M	AV	5.392G	-72.92	-72.92
7G	8G	1M	AV	7.73175G	-72.24	-72.24
8G	25G	1M	AV	19.09356G	-65.16	-65.16



Summary

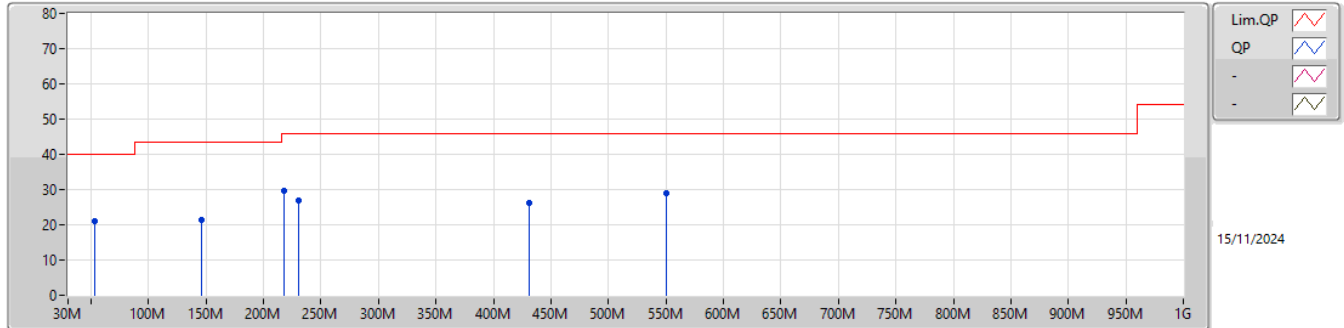
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Condition
Mode 1	Pass	PK	32.3M	28.31	40.00	-11.69	Vertical



Unwanted Radiated Emissions into Restricted Frequency Bands Below 1GHz

Appendix D.4

Mode 1



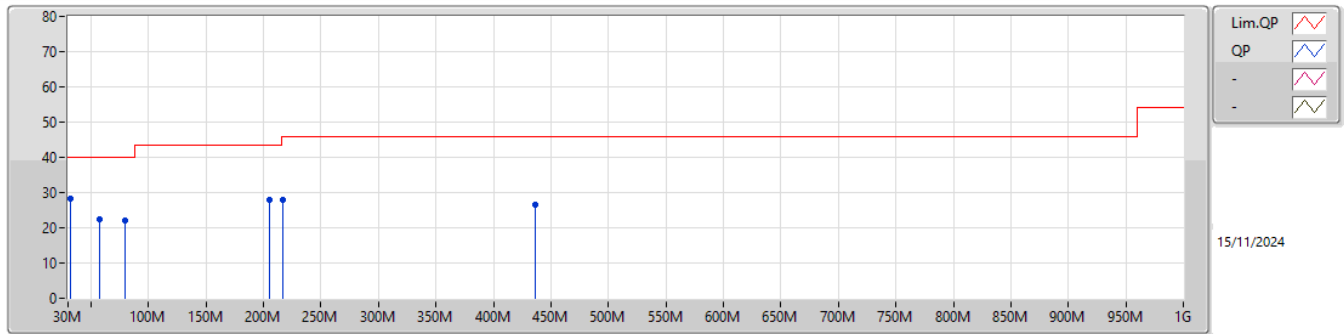
Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB/m)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB/m)	CL (dB)	PA (dB)		
PK	52.7M	21.16	40.00	-18.84	-8.24	3	Horizontal	0	0.00	-	29.40	19.17	0.73	28.14		
PK	145.9M	21.41	43.50	-22.09	-8.87	3	Horizontal	0	0.00	-	30.28	18.19	1.19	28.25		
PK	217.6M	29.65	46.00	-16.35	-11.70	3	Horizontal	0	0.00	-	41.35	15.10	1.47	28.27		
PK	230.6M	26.77	46.00	-19.23	-11.45	3	Horizontal	0	0.00	-	38.22	15.30	1.51	28.26		
PK	431.2M	26.05	46.00	-19.95	-4.68	3	Horizontal	0	0.00	-	30.73	21.55	1.95	28.18		
PK	550.4M	28.98	46.00	-17.02	-2.44	3	Horizontal	0	0.00	-	31.42	23.51	2.24	28.19		



Unwanted Radiated Emissions into Restricted Frequency Bands Below 1GHz

Appendix D.4

Mode 1



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB/m)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB/m)	CL (dB)	PA (dB)		
PK	32.3M	28.31	40.00	-11.69	-9.74	3	Vertical	0	0.00	-	38.05	17.81	0.54	28.09		
PK	57.9M	22.57	40.00	-17.43	-8.75	3	Vertical	0	0.00	-	31.32	18.63	0.77	28.15		
PK	80M	21.99	40.00	-18.01	-13.46	3	Vertical	0	0.00	-	35.45	13.80	0.93	28.19		
PK	205.1M	27.83	43.50	-15.67	-11.65	3	Vertical	0	0.00	-	39.48	15.20	1.43	28.28		
PK	217M	27.91	46.00	-18.09	-11.71	3	Vertical	0	0.00	-	39.62	15.10	1.46	28.27		
PK	436.8M	26.40	46.00	-19.60	-4.48	3	Vertical	0	0.00	-	30.88	21.74	1.96	28.18		



**Unwanted Radiated Emissions into Restricted Frequency
Bands Above 1GHz**

Appendix D.5

Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-
802.15.4	Pass	AV	7.425G	45.64	54.00	-8.36	3	Horizontal	359	2.48	-

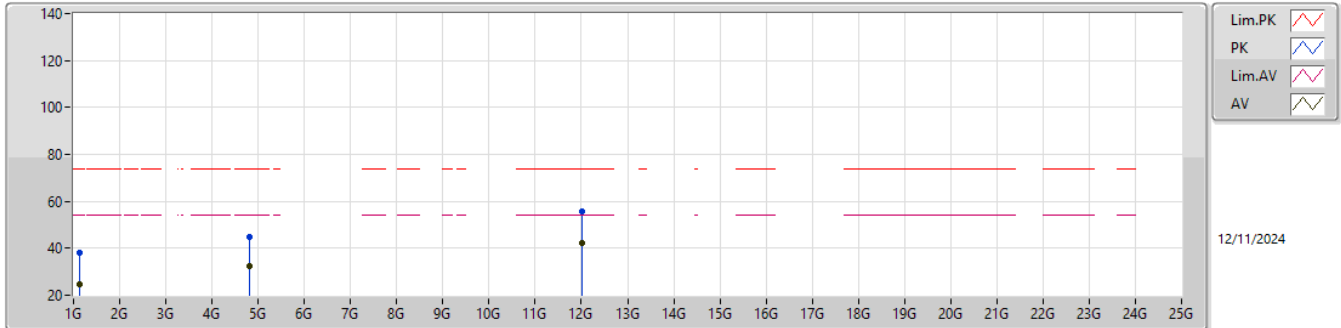


Unwanted Radiated Emissions into Restricted Frequency Bands Above 1GHz

Appendix D.5

2.4-2.4835GHz_802.15.4

2405MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB/m)	CL (dB)	PA (dB)			
AV	1.119G	24.56	54.00	-29.44	32.03	3	Horizontal	36	1.00	-	25.29	3.11	35.87			
PK	1.119G	38.19	74.00	-35.81	45.66	3	Horizontal	36	1.00	-	25.29	3.11	35.87			
AV	4.81G	32.54	54.00	-21.46	33.09	3	Horizontal	342	1.88	-	31.28	6.69	38.52			
PK	4.81G	44.68	74.00	-29.32	45.23	3	Horizontal	342	1.88	-	31.28	6.69	38.52			
AV	12.025G	42.35	54.00	-11.65	35.79	3	Horizontal	18	1.00	-	39.20	10.24	42.88			
PK	12.025G	55.69	74.00	-18.31	49.13	3	Horizontal	18	1.00	-	39.20	10.24	42.88			

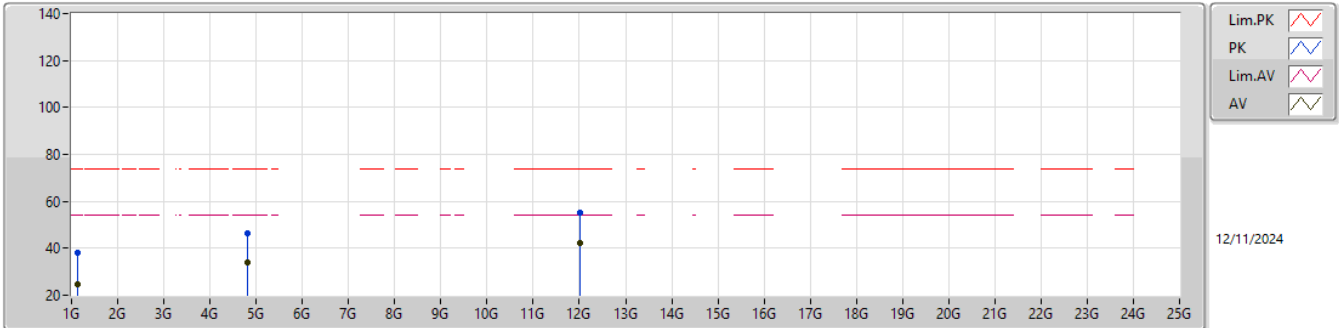


Unwanted Radiated Emissions into Restricted Frequency Bands Above 1GHz

Appendix D.5

2.4-2.4835GHz_802.15.4

2405MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB/m)	CL (dB)	PA (dB)			
AV	1.119G	24.61	54.00	-29.39	32.08	3	Vertical	39	1.00	-	25.29	3.11	35.87			
PK	1.119G	38.32	74.00	-35.68	45.79	3	Vertical	39	1.00	-	25.29	3.11	35.87			
AV	4.81G	33.81	54.00	-20.19	34.36	3	Vertical	46	1.00	-	31.28	6.69	38.52			
PK	4.81G	46.24	74.00	-27.76	46.79	3	Vertical	46	1.00	-	31.28	6.69	38.52			
AV	12.025G	42.09	54.00	-11.91	35.53	3	Vertical	58	1.00	-	39.20	10.24	42.88			
PK	12.025G	55.41	74.00	-18.59	48.85	3	Vertical	58	1.00	-	39.20	10.24	42.88			

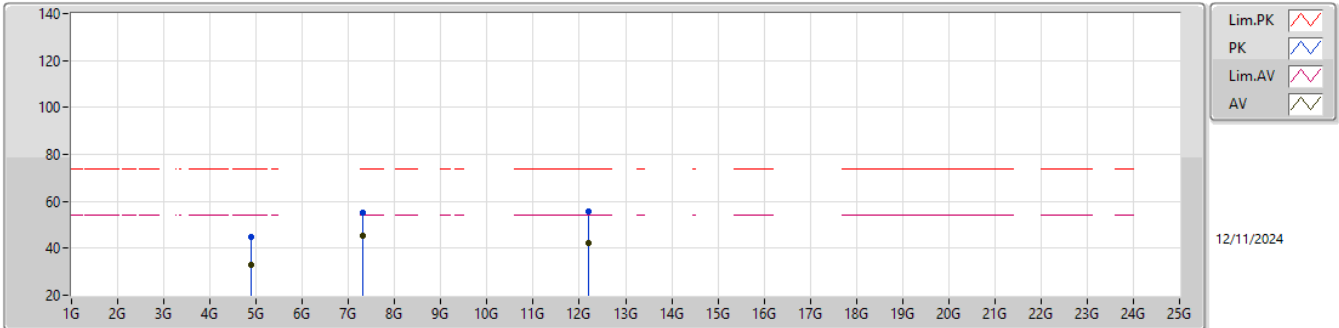


Unwanted Radiated Emissions into Restricted Frequency Bands Above 1GHz

Appendix D.5

2.4-2.4835GHz_802.15.4

2440MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB/m)	CL (dB)	PA (dB)			
AV	4.88G	32.74	54.00	-21.26	33.40	3	Horizontal	179	1.00	-	31.14	6.77	38.57			
PK	4.88G	44.96	74.00	-29.04	45.62	3	Horizontal	179	1.00	-	31.14	6.77	38.57			
AV	7.32G	45.52	54.00	-8.48	40.12	3	Horizontal	344	2.36	-	36.16	8.63	39.39			
PK	7.32G	55.36	74.00	-18.64	49.96	3	Horizontal	344	2.36	-	36.16	8.63	39.39			
AV	12.2G	42.45	54.00	-11.55	35.36	3	Horizontal	41	1.00	-	39.50	10.27	42.68			
PK	12.2G	55.81	74.00	-18.19	48.72	3	Horizontal	41	1.00	-	39.50	10.27	42.68			

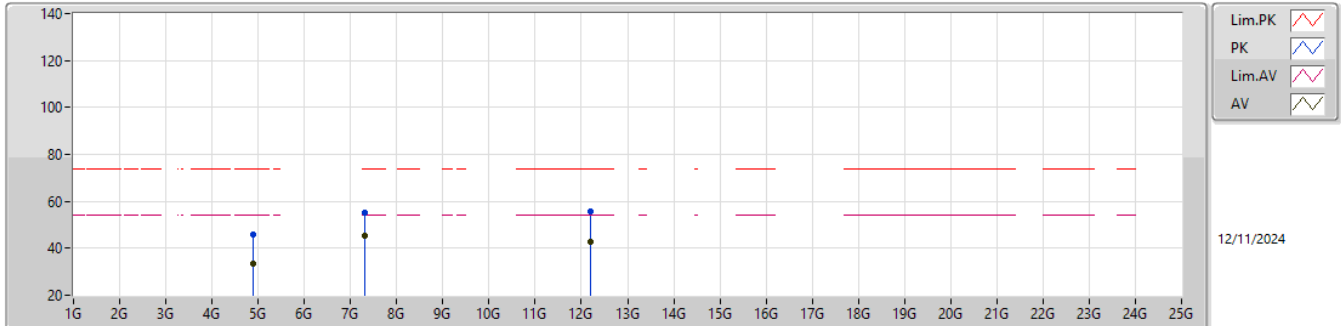


Unwanted Radiated Emissions into Restricted Frequency Bands Above 1GHz

Appendix D.5

2.4-2.4835GHz_802.15.4

2440MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB/m)	CL (dB)	PA (dB)			
AV	4.88G	33.42	54.00	-20.58	34.08	3	Vertical	52	1.00	-	31.14	6.77	38.57			
PK	4.88G	46.08	74.00	-27.92	46.74	3	Vertical	52	1.00	-	31.14	6.77	38.57			
AV	7.32G	45.34	54.00	-8.66	39.94	3	Vertical	336	1.00	-	36.16	8.63	39.39			
PK	7.32G	55.26	74.00	-18.74	49.86	3	Vertical	336	1.00	-	36.16	8.63	39.39			
AV	12.2G	42.59	54.00	-11.41	35.50	3	Vertical	28	1.00	-	39.50	10.27	42.68			
PK	12.2G	55.84	74.00	-18.16	48.75	3	Vertical	28	1.00	-	39.50	10.27	42.68			

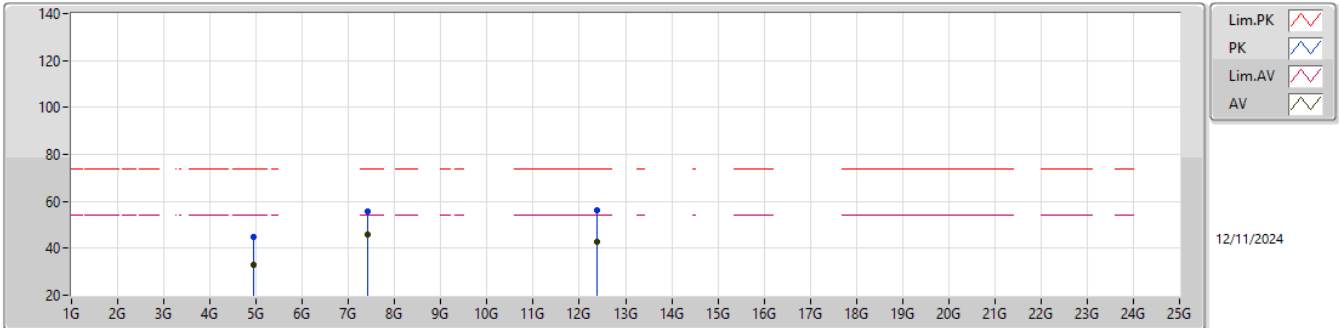


Unwanted Radiated Emissions into Restricted Frequency Bands Above 1GHz

Appendix D.5

2.4-2.4835GHz_802.15.4

2475MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB/m)	CL (dB)	PA (dB)			
AV	4.95G	32.81	54.00	-21.19	33.28	3	Horizontal	166	1.00	-	31.30	6.85	38.62			
PK	4.95G	45.06	74.00	-28.94	45.53	3	Horizontal	166	1.00	-	31.30	6.85	38.62			
AV	7.425G	45.64	54.00	-8.36	40.26	3	Horizontal	359	2.48	-	36.25	8.66	39.53			
PK	7.425G	55.48	74.00	-18.52	50.10	3	Horizontal	359	2.48	-	36.25	8.66	39.53			
AV	12.375G	42.51	54.00	-11.49	35.83	3	Horizontal	24	1.00	-	38.85	10.31	42.48			
PK	12.375G	55.96	74.00	-18.04	49.28	3	Horizontal	24	1.00	-	38.85	10.31	42.48			

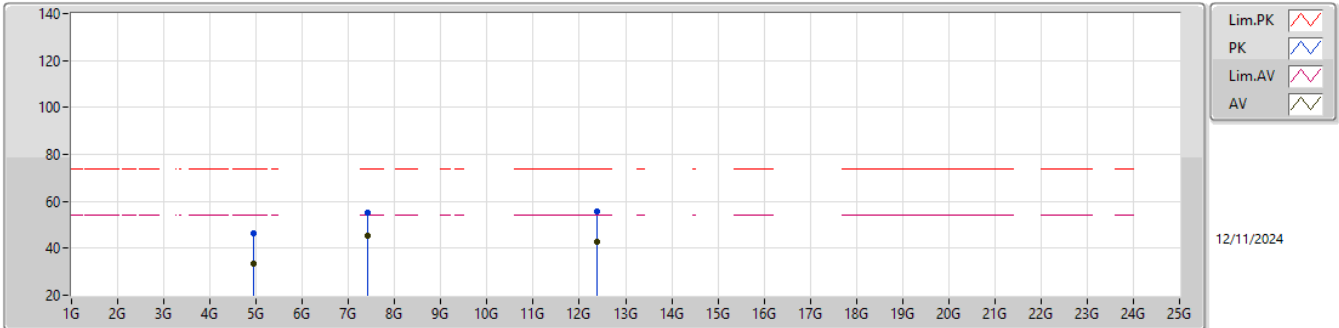


Unwanted Radiated Emissions into Restricted Frequency Bands Above 1GHz

Appendix D.5

2.4-2.4835GHz_802.15.4

2475MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB/m)	CL (dB)	PA (dB)			
AV	4.95G	33.56	54.00	-20.44	34.03	3	Vertical	61	1.00	-	31.30	6.85	38.62			
PK	4.95G	46.24	74.00	-27.76	46.71	3	Vertical	61	1.00	-	31.30	6.85	38.62			
AV	7.425G	45.48	54.00	-8.52	40.10	3	Vertical	324	1.00	-	36.25	8.66	39.53			
PK	7.425G	55.39	74.00	-18.61	50.01	3	Vertical	324	1.00	-	36.25	8.66	39.53			
AV	12.375G	42.61	54.00	-11.39	35.93	3	Vertical	39	1.00	-	38.85	10.31	42.48			
PK	12.375G	55.93	74.00	-18.07	49.25	3	Vertical	39	1.00	-	38.85	10.31	42.48			

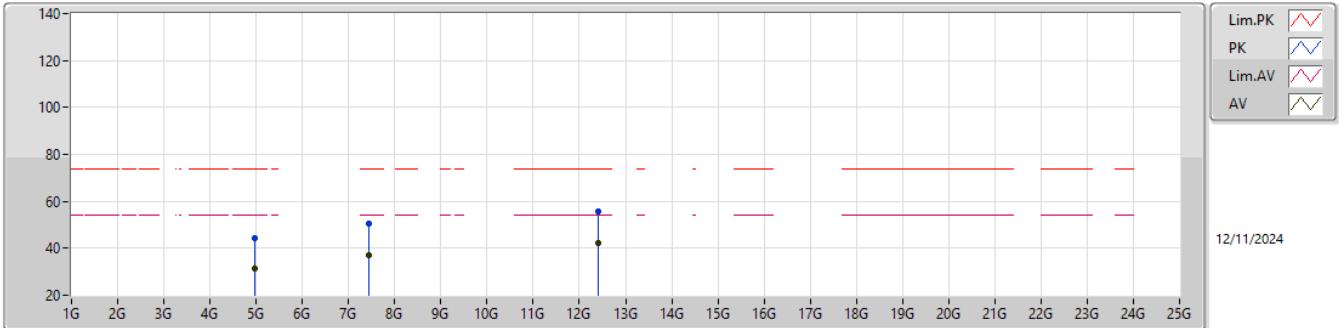


Unwanted Radiated Emissions into Restricted Frequency Bands Above 1GHz

Appendix D.5

2.4-2.4835GHz_802.15.4

2480MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB/m)	CL (dB)	PA (dB)			
AV	4.96G	31.20	54.00	-22.80	31.60	3	Horizontal	181	1.00	-	31.36	6.86	38.62			
PK	4.96G	44.29	74.00	-29.71	44.69	3	Horizontal	181	1.00	-	31.36	6.86	38.62			
AV	7.44G	37.28	54.00	-16.72	31.82	3	Horizontal	25	1.00	-	36.34	8.66	39.54			
PK	7.44G	50.60	74.00	-23.40	45.14	3	Horizontal	25	1.00	-	36.34	8.66	39.54			
AV	12.4G	42.28	54.00	-11.72	35.71	3	Horizontal	42	1.00	-	38.70	10.32	42.45			
PK	12.4G	55.64	74.00	-18.36	49.07	3	Horizontal	42	1.00	-	38.70	10.32	42.45			

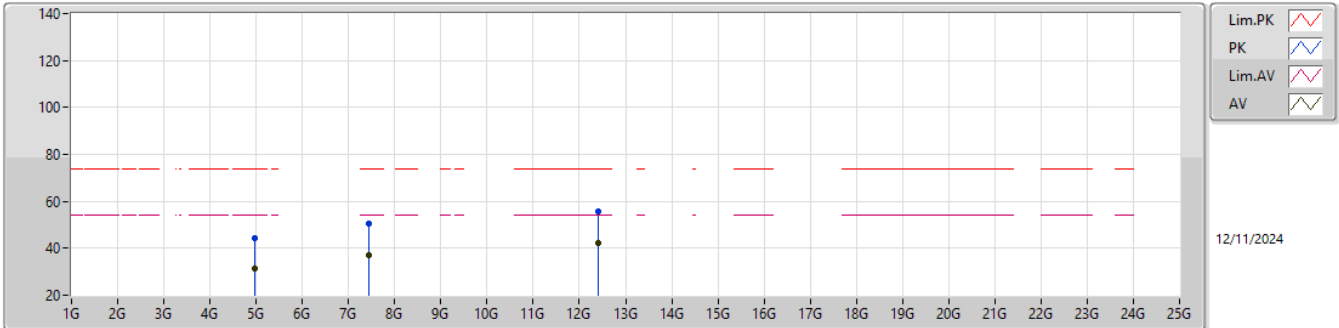


Unwanted Radiated Emissions into Restricted Frequency Bands Above 1GHz

Appendix D.5

2.4-2.4835GHz_802.15.4

2480MHz_TX



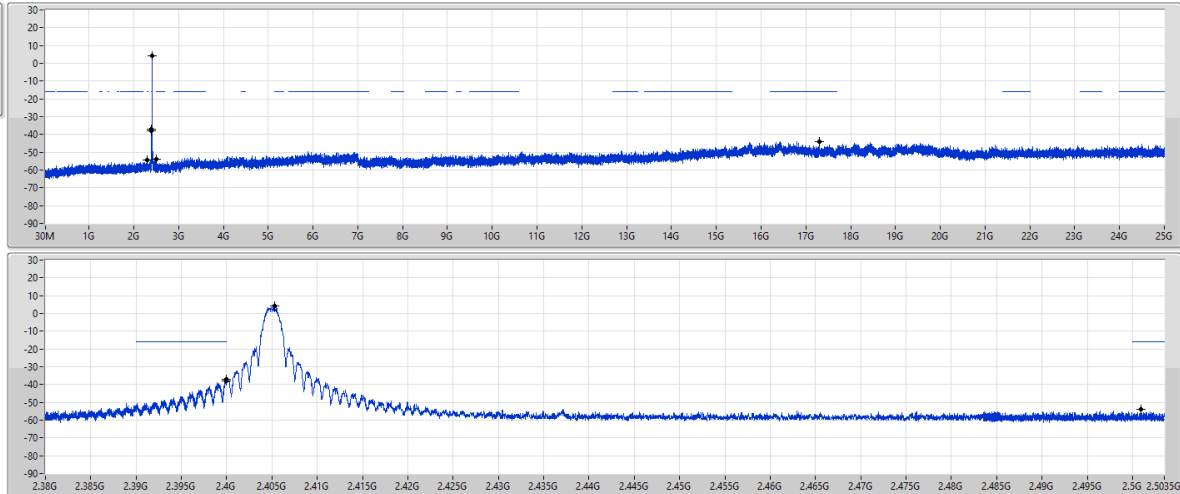
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AV	4.96G	31.35	54.00	-22.65	31.75	3	Vertical	39	1.00	-	31.36	6.86	38.62			
PK	4.96G	44.34	74.00	-29.66	44.74	3	Vertical	39	1.00	-	31.36	6.86	38.62			
AV	7.44G	37.15	54.00	-16.85	31.69	3	Vertical	24	1.00	-	36.34	8.66	39.54			
PK	7.44G	50.52	74.00	-23.48	45.06	3	Vertical	24	1.00	-	36.34	8.66	39.54			
AV	12.4G	42.39	54.00	-11.61	35.82	3	Vertical	11	1.00	-	38.70	10.32	42.45			
PK	12.4G	55.74	74.00	-18.26	49.17	3	Vertical	11	1.00	-	38.70	10.32	42.45			

2.4-2.4835GHz_802.15.4

CSEndB-DTS

2405MHz

RBW (Hz)
100k
VBW (Hz)
300k
Detector
Peak



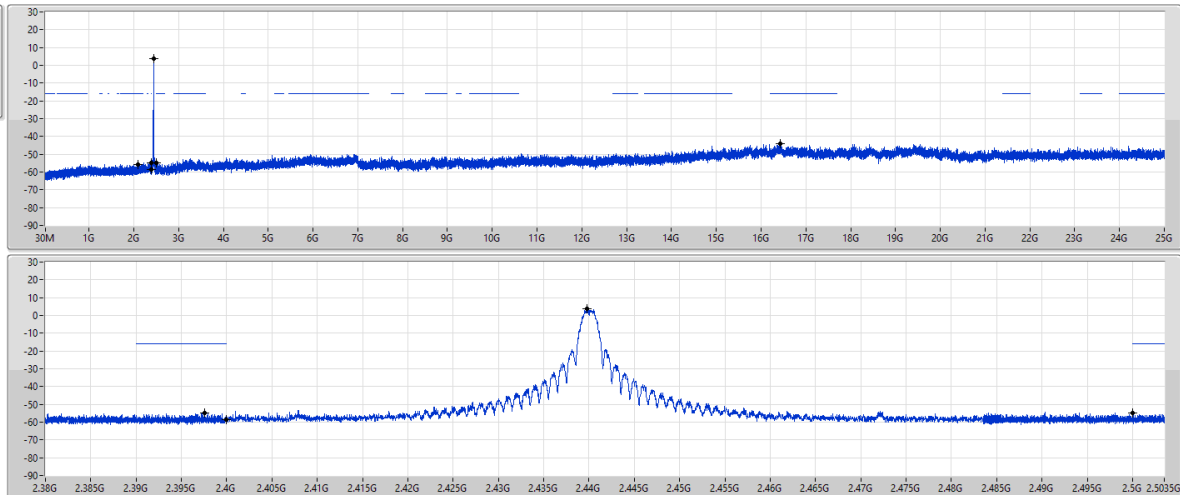
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2.40525G	4.02	-15.98	2.30128G	-54.48	2.39993G	-36.81	2.4G	-37.87	2.5009G	-54.04	17.29354G	-44.11	1

2.4-2.4835GHz_802.15.4

CSEndB-DTS

2440MHz

RBW (Hz)
100k
VBW (Hz)
300k
Detector
Peak



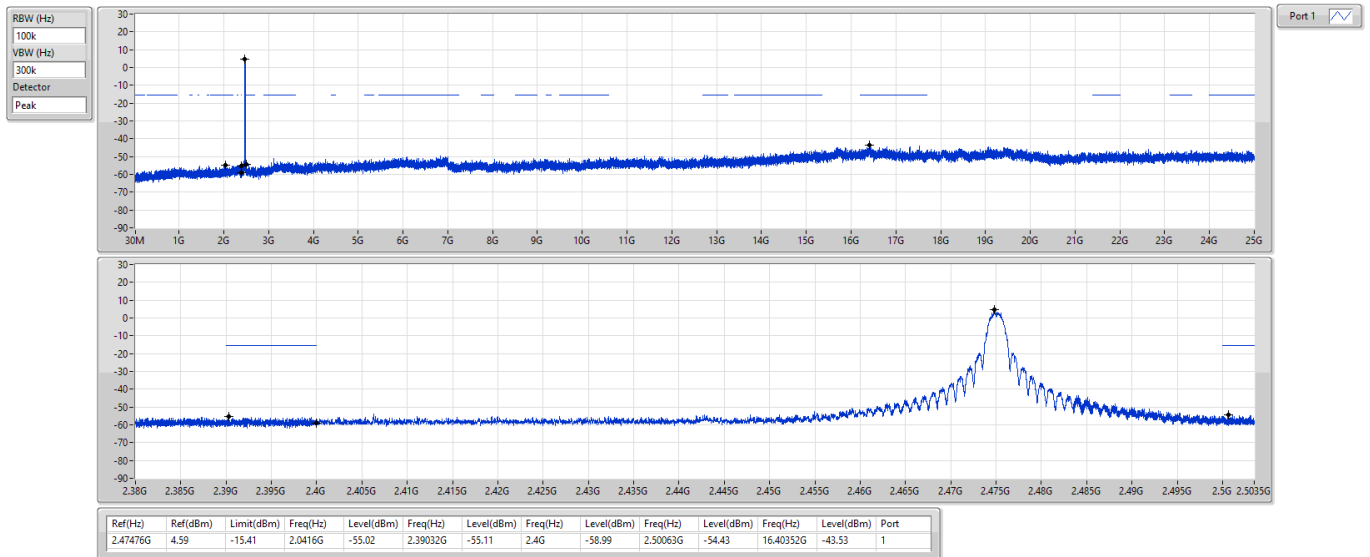
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2.43976G	3.87	-16.13	2.09477G	-55.73	2.3976G	-55.07	2.4G	-58.64	2.50005G	-55.05	16.4211G	-44.13	1



2.4-2.4835GHz_802.15.4

CSEndB-DTS

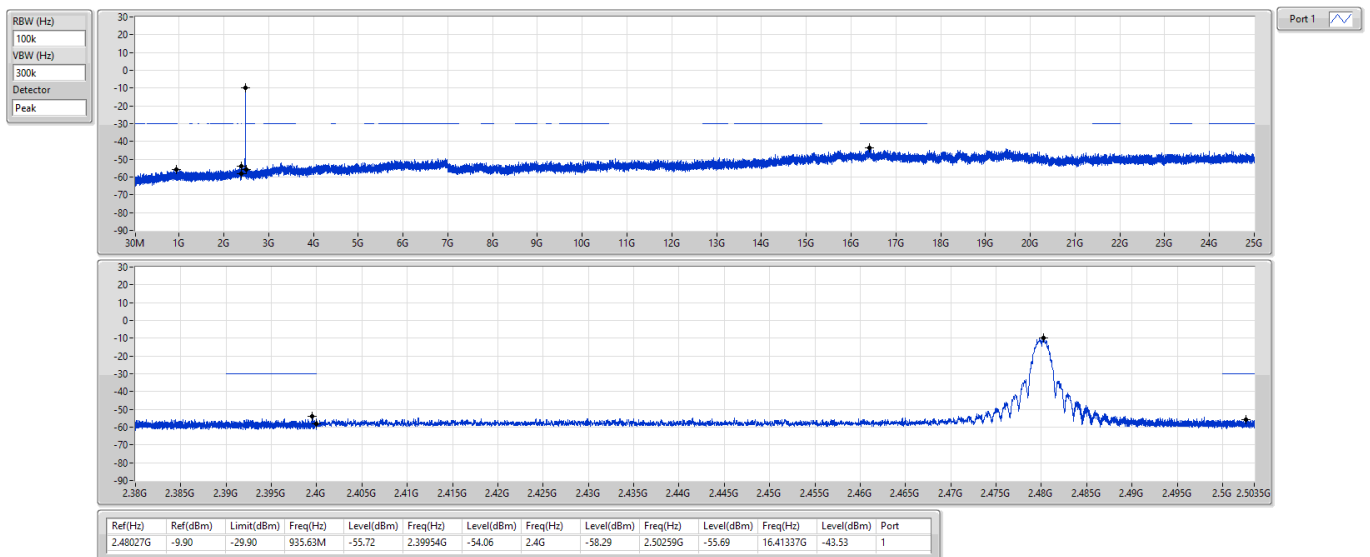
2475MHz



2.4-2.4835GHz_802.15.4

CSEndB-DTS

2480MHz



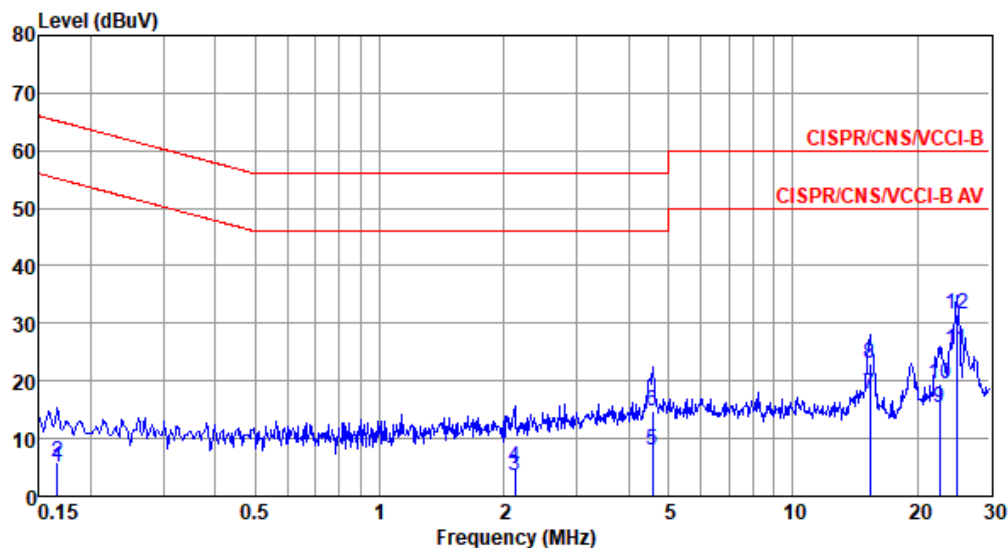


Modulation	OQPSK	Test Freq. (MHz)	2405
Power Phase	Line		

Test by : Brad Wu

Temperature: 22°C

Humidity: 63%



	Freq	Level	Limit	Over	Read	Factor	Cable	Aux	
	MHz	dBuV	Line	Limit	Level	dB	loss	dB	Remark
			dBuV	dB	dBuV		dB		
1	0.166	5.03	55.16	-50.13	-4.70	9.65	0.08	0.00	Average
2	0.166	6.04	65.16	-59.12	-3.69	9.65	0.08	0.00	QP
3	2.121	3.52	46.00	-42.48	-6.31	9.66	0.17	0.00	Average
4	2.121	4.97	56.00	-51.03	-4.86	9.66	0.17	0.00	QP
5	4.574	7.82	46.00	-38.18	-2.09	9.68	0.23	0.00	Average
6	4.574	14.70	56.00	-41.30	4.79	9.68	0.23	0.00	QP
7	15.388	17.63	50.00	-32.37	7.49	9.69	0.45	0.00	Average
8	15.388	23.06	60.00	-36.94	12.92	9.69	0.45	0.00	QP
9	22.655	15.23	50.00	-34.77	4.96	9.67	0.60	0.00	Average
10	22.655	19.40	60.00	-40.60	9.13	9.67	0.60	0.00	QP
11*	24.922	25.25	50.00	-24.75	14.96	9.66	0.63	0.00	Average
12	24.922	31.57	60.00	-28.43	21.28	9.66	0.63	0.00	QP

Note 1: Level (dBUV) = Read Level (dBUV) + LISN Factor (dB) + Cable Loss (dB) + Aux (dB).

2: Over Limit (dB) = Level (dBUV) - Limit Line (dBUV).

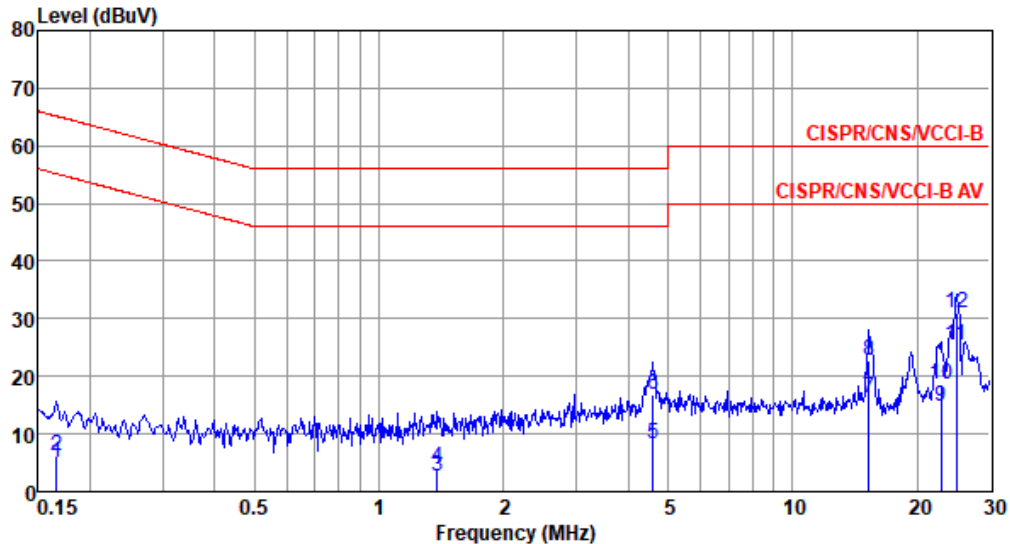


Modulation	OQPSK	Test Freq. (MHz)	2405
Power Phase	Neutral		

Test by : Brad Wu

Temperature: 22°C

Humidity: 63%



	Freq	Level	Limit	Over	Read	Factor	Cable	Aux	
	MHz	dBuV	Line	Limit	Level	dB	loss	dB	Remark
			dBuV	dB	dBuV		dB		
1	0.166	4.98	55.16	-50.18	-4.76	9.66	0.08	0.00	Average
2	0.166	6.13	65.16	-59.03	-3.61	9.66	0.08	0.00	QP
3	1.381	2.79	46.00	-43.21	-6.99	9.65	0.13	0.00	Average
4	1.381	4.24	56.00	-51.76	-5.54	9.65	0.13	0.00	QP
5	4.598	8.13	46.00	-37.87	-1.79	9.69	0.23	0.00	Average
6	4.598	16.90	56.00	-39.10	6.98	9.69	0.23	0.00	QP
7	15.307	16.30	50.00	-33.70	6.05	9.80	0.45	0.00	Average
8	15.307	22.68	60.00	-37.32	12.43	9.80	0.45	0.00	QP
9	22.896	14.73	50.00	-35.27	4.28	9.84	0.61	0.00	Average
10	22.896	18.66	60.00	-41.34	8.21	9.84	0.61	0.00	QP
11*	24.922	25.33	50.00	-24.67	14.85	9.85	0.63	0.00	Average
12	24.922	31.09	60.00	-28.91	20.61	9.85	0.63	0.00	QP

Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB) + Aux (dB).

2: Over Limit (dB) = Level (dBuV) - Limit Line (dBuV).