



FCC Radio Test Report

FCC ID : SL6-MOD001
Equipment : BEEKS BLE Module
Brand Name : HID
Model Name : MOD001
Applicant : HID Global Corporation
611 Center Ridge Drive Austin TX 78753
United States Of America
Manufacturer : HID Global Corporation
611 Center Ridge Drive Austin TX 78753
United States Of America
Standard : 47 CFR FCC Part 15.247

The product was received on Jan. 25, 2021, and testing was started from Nov. 03, 2021 and completed on Nov. 11, 2021. We, SPORTON INTERNATIONAL INC. Hsinhua Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2013 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. Hsinhua Laboratory, the test report shall not be reproduced except in full.

Approved by: Allen Lin

SPORTON INTERNATIONAL INC. Hsinhua Laboratory

No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333411, Taiwan (R.O.C.)



Table of Contents

HISTORY OF THIS TEST REPORT3

SUMMARY OF TEST RESULT4

1 GENERAL DESCRIPTION5

1.1 Information.....5

1.2 Testing Applied Standards7

1.3 Testing Location Information7

1.4 Measurement Uncertainty7

2 TEST CONFIGURATION OF EUT.....8

2.1 Test Channel Mode8

2.2 The Worst Case Measurement Configuration9

2.3 Support Equipment.....10

2.4 Test Setup Diagram11

3 TRANSMITTER TEST RESULT13

3.1 AC Power-line Conducted Emissions13

3.2 DTS Bandwidth.....21

3.3 Maximum Conducted Output Power28

3.4 Power Spectral Density31

3.5 Emissions in Non-restricted Frequency Bands38

3.6 Emissions in Restricted Frequency Bands.....45

4 TEST EQUIPMENT AND CALIBRATION DATA.....69

APPENDIX A. TEST PHOTOS

PHOTOGRAPHS OF EUT V01



Summary of Test Result

FCC Regulations Requirements Test Standard: 47 CFR FCC Part 15				
Test Method: ANSI C63.10-2013				
Report Clause	Ref.Std. Clause	Test Items	Result (PASS/FAIL)	Remark
1.1.2	15.203	Antenna Requirement	PASS	-
3.1	15.207	AC Power-line Conducted Emissions	PASS	-
3.2	15.247(a)	DTS Bandwidth	PASS	-
3.3	15.247(b)	Maximum Conducted Output Power	PASS	-
3.4	15.247(e)	Power Spectral Density	PASS	-
3.5	15.247(d)	Emissions in Non-restricted Frequency Bands	PASS	-
3.6	15.247(d)	Emissions in Restricted Frequency Bands	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:
None

Reviewed by: Sam Tsai

Report Producer: Ann Hou



1 General Description

1.1 Information

1.1.1 RF General Information

Frequency Range (MHz)	Bluetooth Mode	Ch. Frequency (MHz)	Channel Number
2400-2483.5	LE	2402-2480	0-39 [40]

Band	Mode	Channel Spacing (MHz)	Nant
2.4-2.4835GHz	BT-LE(1Mbps)	2.0	1TX

Note:
 ♦ Bluetooth LE uses a GFSK (1Mbps) modulation.

1.1.2 Antenna Information

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	HID	MOD001	PCB Antenna	N/A	0.3
2	TAOGLAS	WCM.01.0111	Button Antenna	I-PEX	0.89

Note 1: The EUT has two antennas.

For BT function:

For IEEE 802.15.1 Bluetooth mode (1TX/1RX)

Ant. 1 (port 1) and Ant. 2 (port 2) could transmit/receive.

1.1.3 EUT Information

Operational Condition	
EUT Power Type	From Test Fixture
EUT Function	<input checked="" type="checkbox"/> Point-to-multipoint <input type="checkbox"/> Point-to-point
Type of EUT	
<input checked="" type="checkbox"/>	Stand-alone
<input type="checkbox"/>	Combined (EUT where the radio part is fully integrated within another device)
	Combined Equipment - Brand Name / Model No.: ...
<input type="checkbox"/>	Plug-in radio (EUT intended for a variety of host systems)
	Host System - Brand Name / Model No.: ...
<input type="checkbox"/>	Other:



1.1.4 Mode Test Duty Cycle

PCB Antenna

Mode	DC	DCF(dB)	T(s)	VBW(Hz) $\geq 1/T$
BT-LE(1Mbps)	0.666	1.77	415.313u	3k

Note. If DC < 0.98, the DCF was added while measuring Output power and PSD.

Button Antenna

Mode	DC	DCF(dB)	T(s)	VBW(Hz) $\geq 1/T$
BT-LE(1Mbps)	0.665	1.77	415.313u	3k

Note. If DC < 0.98, the DCF was added while measuring Output power and PSD.



1.2 Testing Applied Standards

Test Standard	47 CFR FCC Part 15
Test Method	ANSI C63.10-2013

Note: The following reference test guidance is not within the scope of accreditation of TAF:

- ♦ KDB 558074 D01 v05r02
- ♦ KDB 414788 D01 v01r01

1.3 Testing Location Information

Test Lab. : Sporton International Inc. Hsinhua Laboratory				
<input checked="" type="checkbox"/>	Hsinhua (TAF: 3785)	ADD: No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333411, Taiwan (R.O.C.)		
		TEL: 886-3-327-3456	FAX: 886-3-327-0973	
Test site Designation No. TW3785 with FCC.				
Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
AC Conduction	CO04-HY	Edward Wang	21.5~22.0°C / 50~54%	11/Nov/2021
RF Conducted	TH06-HY	Alan Chien	20.1~26.9°C / 50~60%	09/Nov/2021
<input checked="" type="checkbox"/>	Wen 33rd.St. (TAF: 3785)	ADD: No.14-1, Ln. 19, Wen 33rd St., Guishan Dist., Taoyuan City 333010, Taiwan (R.O.C.)		
		TEL: 886-3-318-0787	FAX: 886-3-318-0287	
Test site Designation No. TW0008 with FCC.				
Radiated	03CH09-HY	Daniel Hsu	23.4~24°C / 60~63%	03/Nov/2021~04/Nov/2021

1.4 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2))

Test Items	Uncertainty	Remark
Conducted Emission (150kHz ~ 30MHz)	0.9 dB	Confidence levels of 95%
Radiated Emission (9kHz ~ 30MHz)	2.4 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	3.7 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	3.6 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	3.5 dB	Confidence levels of 95%
Conducted Emission	1.0 dB	Confidence levels of 95%
Temperature	0.41 °C	Confidence levels of 95%
Humidity	3.4 %	Confidence levels of 95%



2 Test Configuration of EUT

2.1 Test Channel Mode

The EUT is an engineering test sample loaded with RF testing firmware specifically designed to support the RF TX/RX measurement in different aspects.

The following software was used for testing and to monitor EUT performance.





Software	Description
nRFgo Studio v1.21.2.10	To set BLE into DTM mode

Mode	Power Setting
BT-LE(1Mbps)	-
2402MHz	Default
2440MHz	Default
2480MHz	Default

2.2 The Worst Case Measurement Configuration

The Worst Case Mode for Following Conformance Tests	
Tests Item	AC power-line conducted emissions
Condition	AC power-line conducted measurement for line and neutral Test Voltage: 120Vac / 60Hz
Operating Mode	CTX
1	Test fixture; PCB Antenna
2	Test fixture; Button Antenna

The Worst Case Mode for Following Conformance Tests	
Tests Item	DTS Bandwidth Maximum Conducted Output Power Power Spectral Density Emissions in Non-restricted Frequency Bands
Test Condition	Conducted measurement at transmit chains

The Worst Case Mode for Following Conformance Tests			
Tests Item	Emissions in Restricted Frequency Bands		
Test Condition	Radiated measurement If EUT consist of multiple antenna assembly (multiple antenna are used in EUT regardless of spatial multiplexing MIMO configuration), the radiated test should be performed with highest antenna gain of each antenna type.		
Operating Mode < 1GHz	CTX		
1	Test fixture; PCB Antenna		
2	Test fixture; Button Antenna		
Operating Mode > 1GHz	CTX		
Orthogonal Planes of EUT (Button Antenna)	Z Plane		
			
Orthogonal Planes of EUT (PCB Antenna)	X Plane	Y Plane	Z Plane
			
Worst Planes of EUT			V



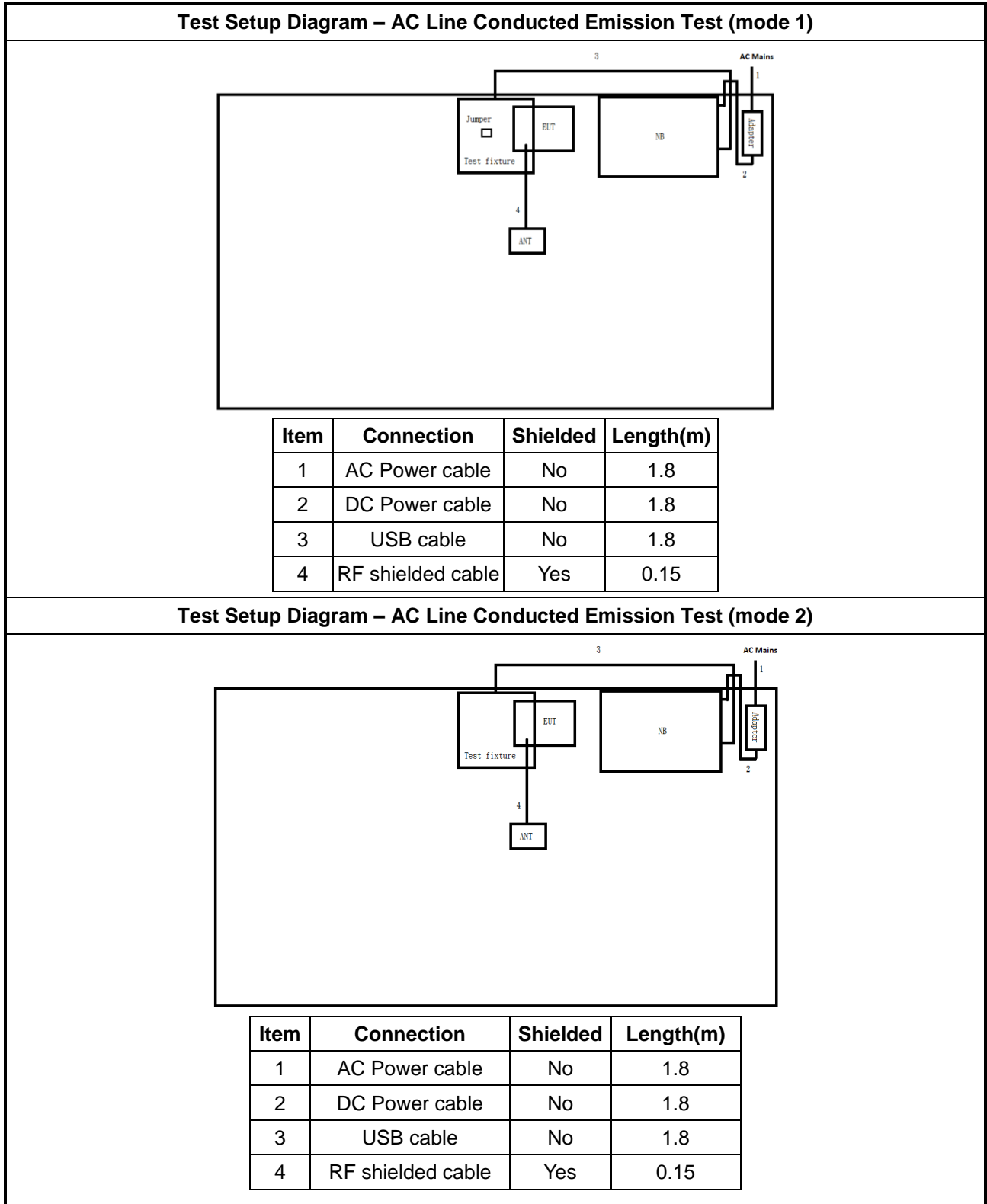
2.3 Support Equipment

Support Equipment – AC Conduction					
No.	Equipment	Brand Name	Model Name	FCC ID	Remark
1	Notebook	HP	HSTNN-Q85C	-	-
2	Adapter for Notebook	HP	PPP012L-E	-	-
3	RF shielded cable	PulseLarsen Antennas	W9006M	-	Provided by Customer
4	USB cable	HS	E337631	-	-
5	Test fixture	FTDI	UM232H-B	-	Provided by Customer
6	Jumper connect	NorComp	810-002-SP2L001	-	Provided by Customer

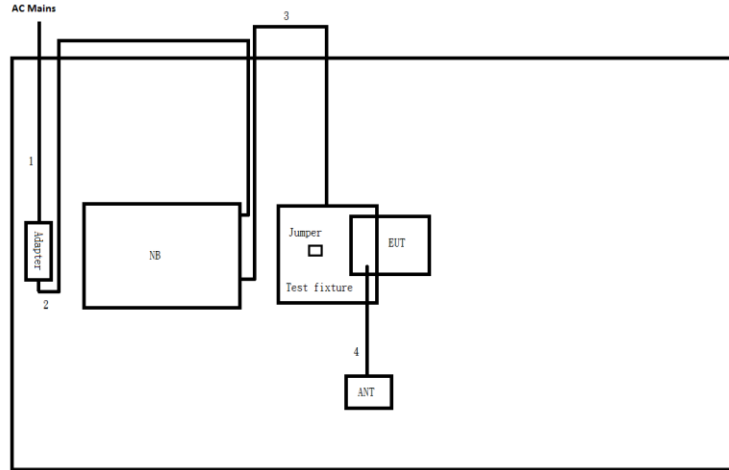
Support Equipment – Conducted					
No.	Equipment	Brand Name	Model Name	FCC ID	Remark
1	Notebook	DELL	E5410	-	-
2	Adapter for Notebook	DELL	HA65NM130	-	-
3	USB cable	HS	E337631	-	-
4	Test fixture	FTDI	UM232H-B	-	Provided by Customer
5	Jumper connect	NorComp	810-002-SP2L001	-	Provided by Customer

Support Equipment – Radiated					
No.	Equipment	Brand Name	Model Name	FCC ID	Remark
1	Notebook	HP	HSTNN-Q85C	-	-
2	Adapter for Notebook	HP	PPP012L-E	-	-
3	RF shielded cable	PulseLarsen Antennas	W9006M	-	Provided by Customer
4	USB cable	HS	E337631	-	-
5	Test fixture	FTDI	UM232H-B	-	Provided by Customer
6	Jumper connect	NorComp	810-002-SP2L001	-	Provided by Customer

2.4 Test Setup Diagram

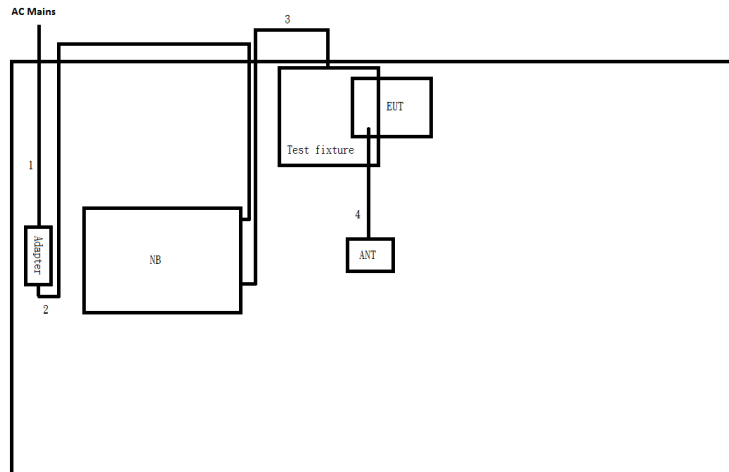


Test Setup Diagram - Radiated Test (mode 1)



Item	Connection	Shielded	Length(m)
1	AC Power cable	No	1.8
2	DC Power cable	No	1.8
3	USB cable	No	1.8
4	RF shielded cable	Yes	0.15

Test Setup Diagram - Radiated Test (mode 2)



Item	Connection	Shielded	Length(m)
1	AC Power cable	No	1.8
2	DC Power cable	No	1.5
3	USB cable	No	1.8
4	RF shielded cable	Yes	0.15

3 Transmitter Test Result

3.1 AC Power-line Conducted Emissions

3.1.1 AC Power-line Conducted Emissions Limit

Spec	Item	AC Power-line Conducted Emissions Limit			Applicable
		Frequency Emission (MHz)	Quasi-Peak	Average	
47 CFR FCC Part 15	15.207	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 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.1.3 Test Procedures

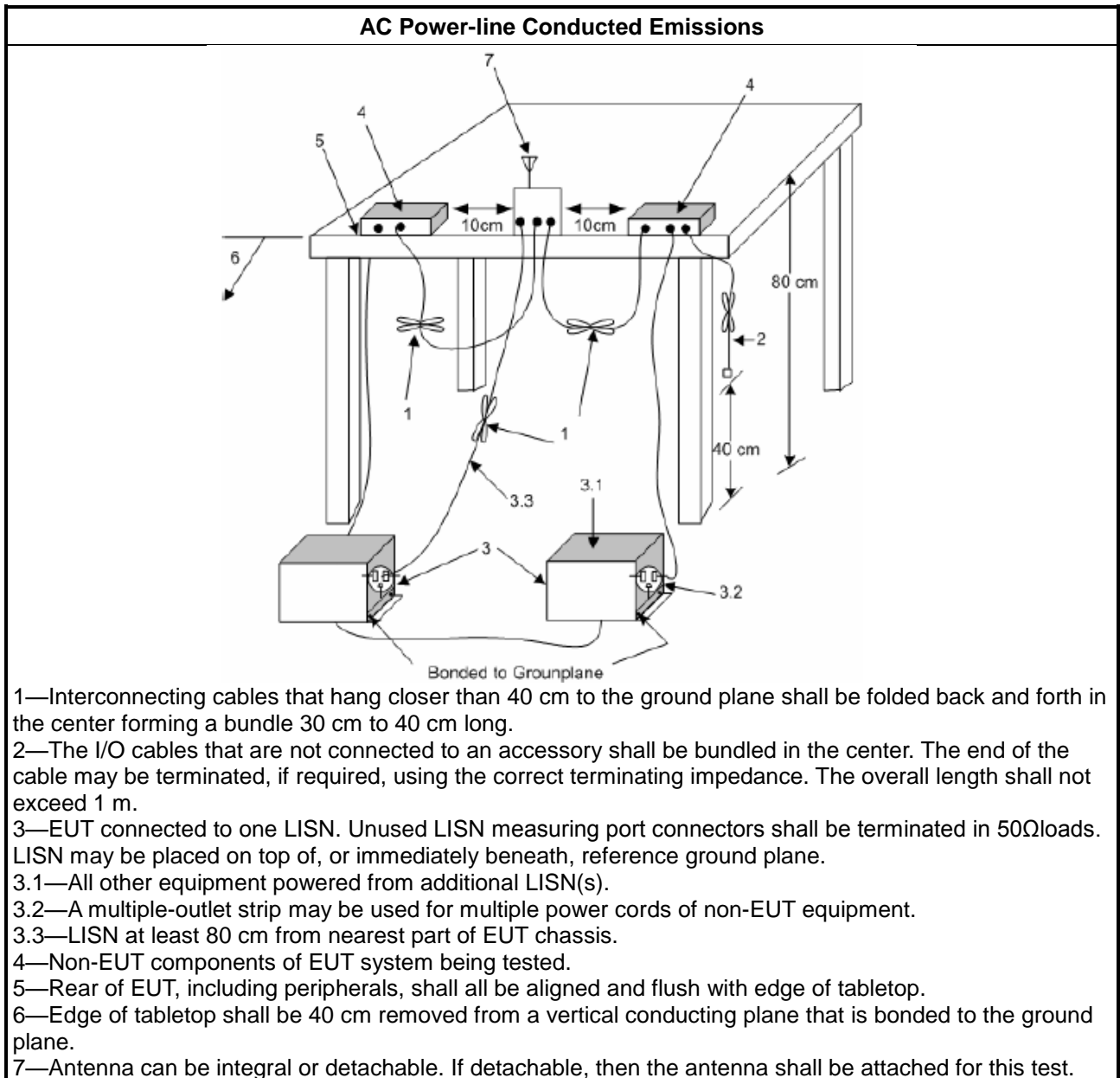
Test Method
<ul style="list-style-type: none"> ▪ Refer as ANSI C63.10-2013, clause 6.2 foray power-line conducted emissions.

3.1.4 Measurement Results Calculation

The measured Level is calculated using:

Corrected Reading: Raw(Read Level) + LISN(LISN Factor) + CL(Cable Loss) + AT(Attenuator).

3.1.5 Test Setup





3.1.6 Test Result of AC Power-line Conducted Emissions

PCB Antenna Summary

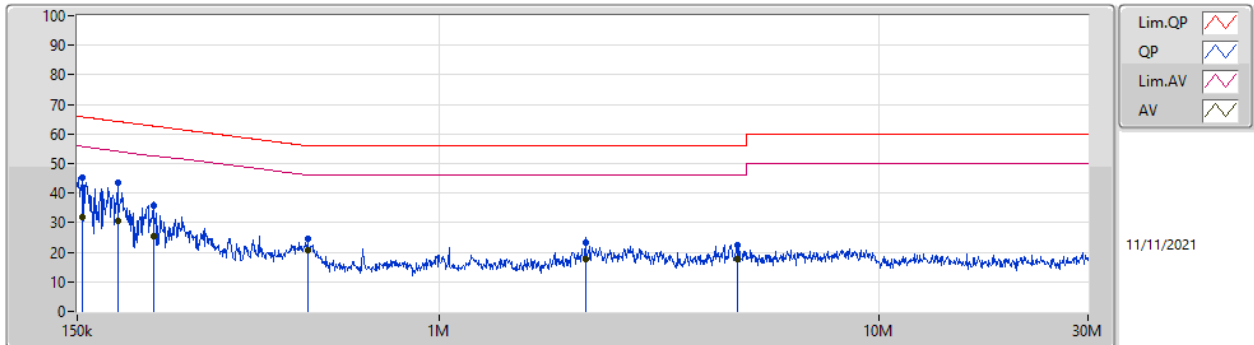
Mode	Result	Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition
Mode 1	Pass	QP	150k	48.97	66.00	-17.03	Neutral

Mode Configure

Mode	Result	Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition	Comments
Mode 1	Pass	QP	154.251k	45.36	65.77	-20.41	Line	-
Mode 1	Pass	AV	154.251k	32.02	55.77	-23.75	Line	-
Mode 1	Pass	QP	185.344k	43.66	64.24	-20.58	Line	-
Mode 1	Pass	AV	185.344k	30.63	54.24	-23.61	Line	-
Mode 1	Pass	QP	223.595k	35.97	62.69	-26.72	Line	-
Mode 1	Pass	AV	223.595k	25.30	52.69	-27.39	Line	-
Mode 1	Pass	QP	502.813k	24.49	56.00	-31.51	Line	-
Mode 1	Pass	AV	502.813k	20.79	46.00	-25.21	Line	-
Mode 1	Pass	QP	2.15M	23.44	56.00	-32.56	Line	-
Mode 1	Pass	AV	2.15M	17.85	46.00	-28.15	Line	-
Mode 1	Pass	QP	4.778M	22.30	56.00	-33.70	Line	-
Mode 1	Pass	AV	4.778M	17.63	46.00	-28.37	Line	-
Mode 1	Pass	QP	150k	48.97	66.00	-17.03	Neutral	-
Mode 1	Pass	AV	150k	34.63	56.00	-21.37	Neutral	-
Mode 1	Pass	QP	183.137k	43.87	64.34	-20.47	Neutral	-
Mode 1	Pass	AV	183.137k	30.68	54.34	-23.66	Neutral	-
Mode 1	Pass	QP	221.817k	37.35	62.75	-25.40	Neutral	-
Mode 1	Pass	AV	221.817k	25.59	52.75	-27.16	Neutral	-
Mode 1	Pass	QP	494.848k	25.85	56.10	-30.25	Neutral	-
Mode 1	Pass	AV	494.848k	21.46	46.10	-24.64	Neutral	-
Mode 1	Pass	QP	2.167M	22.67	56.00	-33.33	Neutral	-
Mode 1	Pass	AV	2.167M	17.25	46.00	-28.75	Neutral	-
Mode 1	Pass	QP	4.464M	20.08	56.00	-35.92	Neutral	-
Mode 1	Pass	AV	4.464M	16.19	46.00	-29.81	Neutral	-



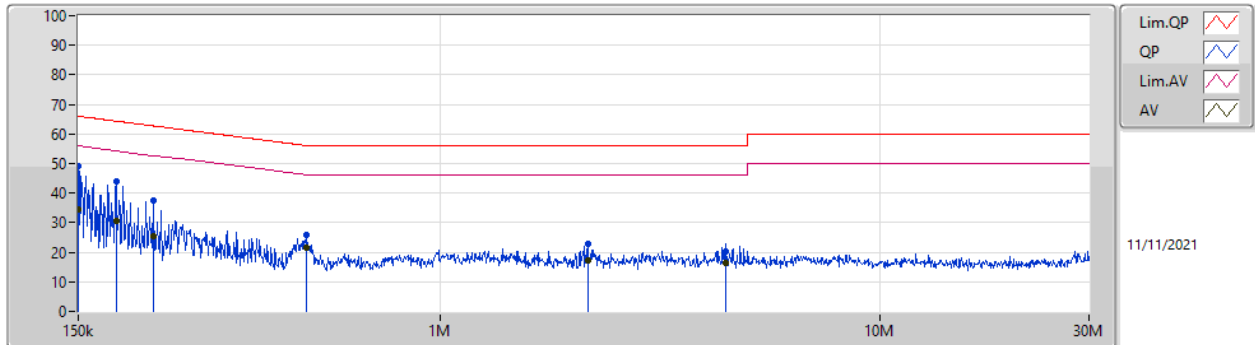
Conducted Emissions at Powerline_Mode 1



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)
QP	154.251k	45.36	65.77	-20.41	19.62	Line	-	25.74	9.69	0.04	9.89
AV	154.251k	32.02	55.77	-23.75	19.62	Line	-	12.40	9.69	0.04	9.89
QP	185.344k	43.66	64.24	-20.58	19.61	Line	-	24.05	9.68	0.04	9.89
AV	185.344k	30.63	54.24	-23.61	19.61	Line	-	11.02	9.68	0.04	9.89
QP	223.595k	35.97	62.69	-26.72	19.61	Line	-	16.36	9.68	0.04	9.89
AV	223.595k	25.30	52.69	-27.39	19.61	Line	-	5.69	9.68	0.04	9.89
QP	502.813k	24.49	56.00	-31.51	19.62	Line	-	4.87	9.67	0.06	9.89
AV	502.813k	20.79	46.00	-25.21	19.62	Line	-	1.17	9.67	0.06	9.89
QP	2.15M	23.44	56.00	-32.56	19.67	Line	-	3.77	9.69	0.10	9.88
AV	2.15M	17.85	46.00	-28.15	19.67	Line	-	-1.82	9.69	0.10	9.88
QP	4.778M	22.30	56.00	-33.70	19.76	Line	-	2.54	9.72	0.15	9.89
AV	4.778M	17.63	46.00	-28.37	19.76	Line	-	-2.13	9.72	0.15	9.89



Conducted Emissions at Powerline_Mode 1



Lim.QP
 QP
 Lim.AV
 AV

11/11/2021

Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)
QP	150k	48.97	66.00	-17.03	19.62	Neutral	-	29.35	9.69	0.04	9.89
AV	150k	34.63	56.00	-21.37	19.62	Neutral	-	15.01	9.69	0.04	9.89
QP	183.137k	43.87	64.34	-20.47	19.61	Neutral	-	24.26	9.68	0.04	9.89
AV	183.137k	30.68	54.34	-23.66	19.61	Neutral	-	11.07	9.68	0.04	9.89
QP	221.817k	37.35	62.75	-25.40	19.61	Neutral	-	17.74	9.68	0.04	9.89
AV	221.817k	25.59	52.75	-27.16	19.61	Neutral	-	5.98	9.68	0.04	9.89
QP	494.848k	25.85	56.10	-30.25	19.62	Neutral	-	6.23	9.67	0.06	9.89
AV	494.848k	21.46	46.10	-24.64	19.62	Neutral	-	1.84	9.67	0.06	9.89
QP	2.167M	22.67	56.00	-33.33	19.66	Neutral	-	3.01	9.68	0.10	9.88
AV	2.167M	17.25	46.00	-28.75	19.66	Neutral	-	-2.41	9.68	0.10	9.88
QP	4.464M	20.08	56.00	-35.92	19.75	Neutral	-	0.33	9.71	0.15	9.89
AV	4.464M	16.19	46.00	-29.81	19.75	Neutral	-	-3.56	9.71	0.15	9.89



Button Antenna
Summary

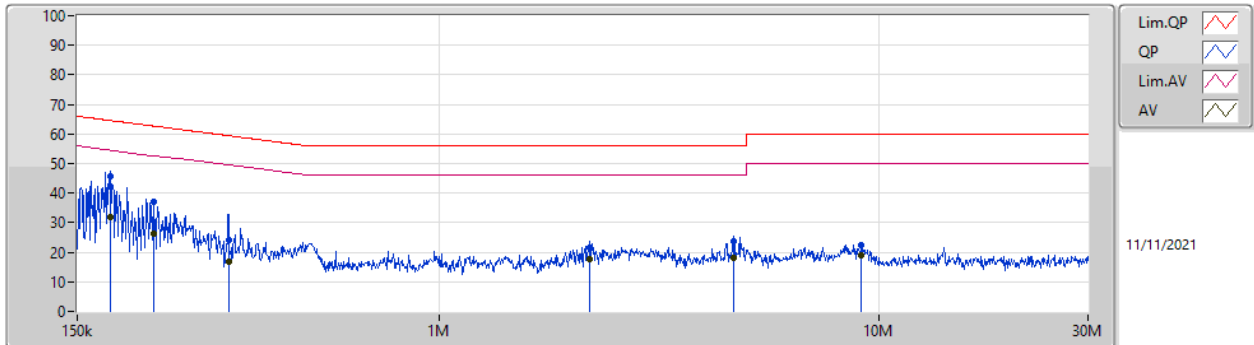
Mode	Result	Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition
Mode 1	Pass	QP	175.269k	47.93	64.70	-16.77	Neutral

Mode Configure

Mode	Result	Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition	Comments
Mode 1	Pass	QP	178.091k	45.76	64.57	-18.81	Line	-
Mode 1	Pass	AV	178.091k	31.84	54.57	-22.73	Line	-
Mode 1	Pass	QP	223.595k	37.28	62.69	-25.41	Line	-
Mode 1	Pass	AV	223.595k	26.32	52.69	-26.37	Line	-
Mode 1	Pass	QP	331.971k	24.21	59.40	-35.19	Line	-
Mode 1	Pass	AV	331.971k	16.86	49.40	-32.54	Line	-
Mode 1	Pass	QP	2.194M	21.52	56.00	-34.48	Line	-
Mode 1	Pass	AV	2.194M	17.69	46.00	-28.31	Line	-
Mode 1	Pass	QP	4.683M	23.80	56.00	-32.20	Line	-
Mode 1	Pass	AV	4.683M	18.30	46.00	-27.70	Line	-
Mode 1	Pass	QP	9.158M	22.29	60.00	-37.71	Line	-
Mode 1	Pass	AV	9.158M	18.90	50.00	-31.10	Line	-
Mode 1	Pass	QP	153.636k	48.48	65.81	-17.33	Neutral	-
Mode 1	Pass	AV	153.636k	30.07	55.81	-25.74	Neutral	-
Mode 1	Pass	QP	175.269k	47.93	64.70	-16.77	Neutral	-
Mode 1	Pass	AV	175.269k	33.80	54.70	-20.90	Neutral	-
Mode 1	Pass	QP	219.176k	37.73	62.85	-25.12	Neutral	-
Mode 1	Pass	AV	219.176k	26.08	52.85	-26.77	Neutral	-
Mode 1	Pass	QP	481.211k	24.87	56.33	-31.46	Neutral	-
Mode 1	Pass	AV	481.211k	20.44	46.33	-25.89	Neutral	-
Mode 1	Pass	QP	2.091M	22.04	56.00	-33.96	Neutral	-
Mode 1	Pass	AV	2.091M	17.34	46.00	-28.66	Neutral	-
Mode 1	Pass	QP	4.855M	20.73	56.00	-35.27	Neutral	-
Mode 1	Pass	AV	4.855M	16.44	46.00	-29.56	Neutral	-



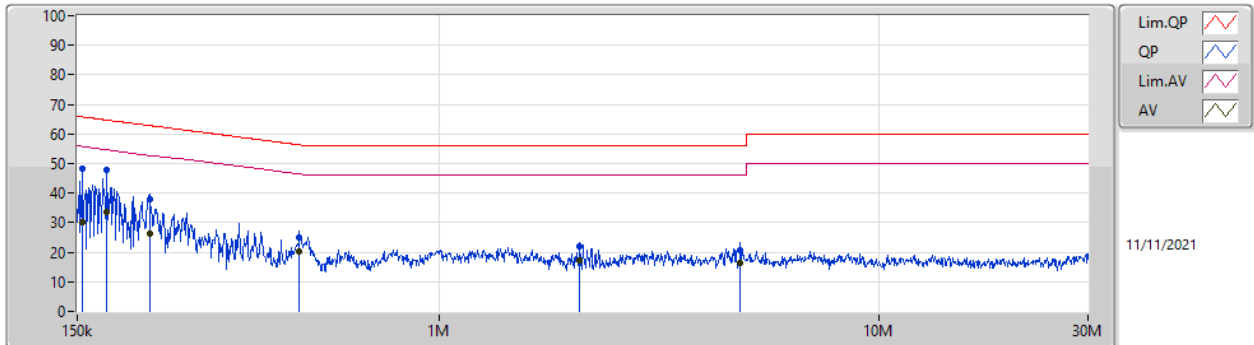
Conducted Emissions at Powerline_Mode 1



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)
QP	178.091k	45.76	64.57	-18.81	19.61	Line	-	26.15	9.68	0.04	9.89
AV	178.091k	31.84	54.57	-22.73	19.61	Line	-	12.23	9.68	0.04	9.89
QP	223.595k	37.28	62.69	-25.41	19.61	Line	-	17.67	9.68	0.04	9.89
AV	223.595k	26.32	52.69	-26.37	19.61	Line	-	6.71	9.68	0.04	9.89
QP	331.971k	24.21	59.40	-35.19	19.61	Line	-	4.60	9.67	0.05	9.89
AV	331.971k	16.86	49.40	-32.54	19.61	Line	-	-2.75	9.67	0.05	9.89
QP	2.194M	21.52	56.00	-34.48	19.68	Line	-	1.84	9.69	0.11	9.88
AV	2.194M	17.69	46.00	-28.31	19.68	Line	-	-1.99	9.69	0.11	9.88
QP	4.683M	23.80	56.00	-32.20	19.76	Line	-	4.04	9.72	0.15	9.89
AV	4.683M	18.30	46.00	-27.70	19.76	Line	-	-1.46	9.72	0.15	9.89
QP	9.158M	22.29	60.00	-37.71	19.86	Line	-	2.43	9.78	0.19	9.89
AV	9.158M	18.90	50.00	-31.10	19.86	Line	-	-0.96	9.78	0.19	9.89



Conducted Emissions at Powerline_Mode 1



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)
QP	153.636k	48.48	65.81	-17.33	19.62	Neutral	-	28.86	9.69	0.04	9.89
AV	153.636k	30.07	55.81	-25.74	19.62	Neutral	-	10.45	9.69	0.04	9.89
QP	175.269k	47.93	64.70	-16.77	19.61	Neutral	-	28.32	9.68	0.04	9.89
AV	175.269k	33.80	54.70	-20.90	19.61	Neutral	-	14.19	9.68	0.04	9.89
QP	219.176k	37.73	62.85	-25.12	19.61	Neutral	-	18.12	9.68	0.04	9.89
AV	219.176k	26.08	52.85	-26.77	19.61	Neutral	-	6.47	9.68	0.04	9.89
QP	481.211k	24.87	56.33	-31.46	19.62	Neutral	-	5.25	9.67	0.06	9.89
AV	481.211k	20.44	46.33	-25.89	19.62	Neutral	-	0.82	9.67	0.06	9.89
QP	2.091M	22.04	56.00	-33.96	19.66	Neutral	-	2.38	9.68	0.10	9.88
AV	2.091M	17.34	46.00	-28.66	19.66	Neutral	-	-2.32	9.68	0.10	9.88
QP	4.855M	20.73	56.00	-35.27	19.77	Neutral	-	0.96	9.73	0.15	9.89
AV	4.855M	16.44	46.00	-29.56	19.77	Neutral	-	-3.33	9.73	0.15	9.89

3.2 DTS Bandwidth

3.2.1 6dB Bandwidth Limit

Spec	Item	6dB Bandwidth Limit	Applicable
		Systems using digital modulation techniques:	
47 CFR FCC Part 15	15.247(a)	6 dB bandwidth \geq 500 kHz.	<input checked="" type="checkbox"/>

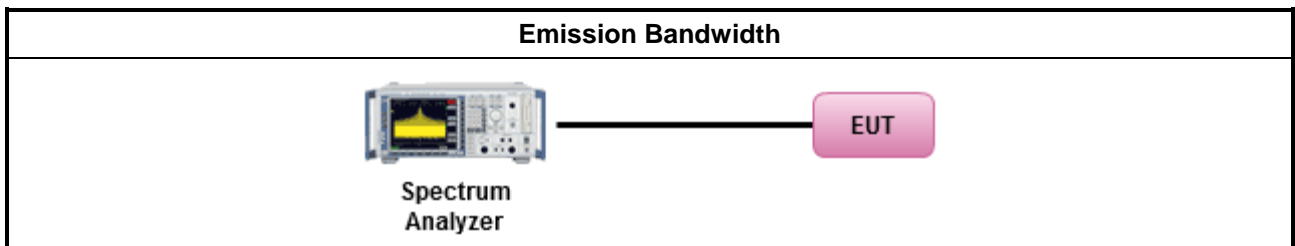
3.2.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.2.3 Test Procedures

Test Method	
<ul style="list-style-type: none"> For the emission bandwidth shall be measured using one of the options below: 	
<input checked="" type="checkbox"/>	Refer as KDB 558074, clause 8.2 (11.8 of ANSI C63.10) DTS bandwidth measurement.
<input type="checkbox"/>	Refer as RSS-Gen, clause 6.7 for for occupied bandwidth testing.
<input type="checkbox"/>	Refer as ANSI C63.10, clause 6.9.3 for occupied bandwidth testing.

3.2.4 Test Setup





3.2.5 Test Result of Emission Bandwidth

PCB Antenna Summary

Mode	Max-N dB (Hz)	Max-OBW (Hz)	ITU-Code	Min-N dB (Hz)	Min-OBW (Hz)
2.4-2.4835GHz	-	-	-	-	-
BT-LE(1Mbps)	702.5k	1.032M	1M03F1D	671.25k	1.012M

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)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	500k	671.25k	1.012M
2440MHz	Pass	500k	682.5k	1.026M
2480MHz	Pass	500k	702.5k	1.032M

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

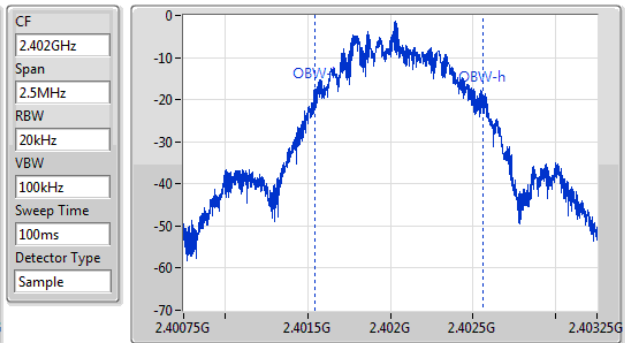
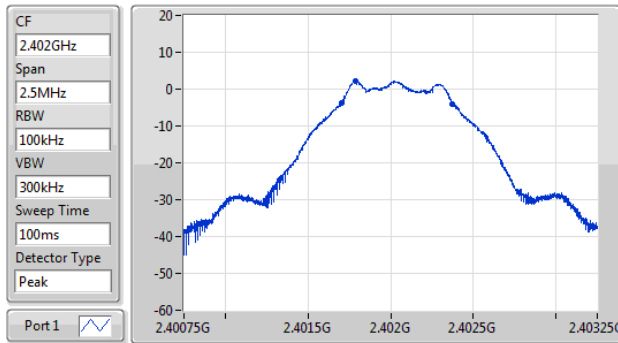


BT-LE(1Mbps)

EBW-DTS

2402MHz

09/11/2021



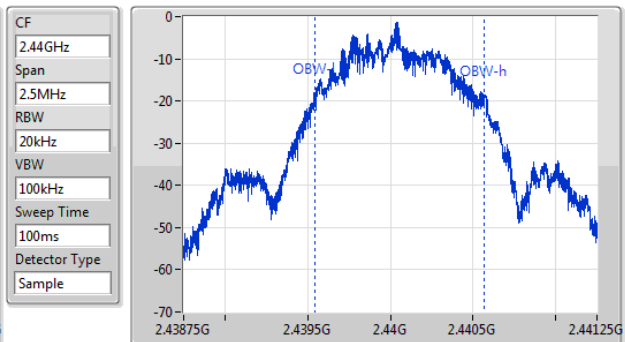
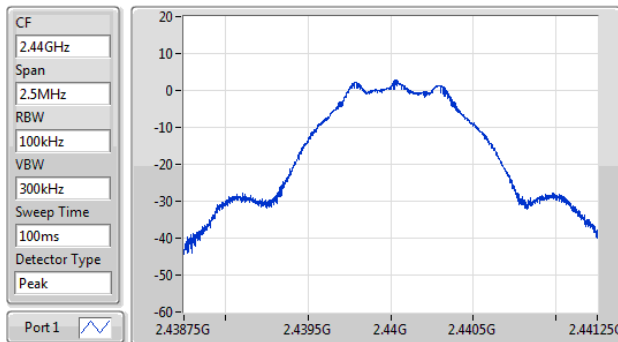
6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
671.25k	2.401703G	2.402374G	1.012M	2.401545G	2.402557G	500k	1

BT-LE(1Mbps)

EBW-DTS

2440MHz

09/11/2021

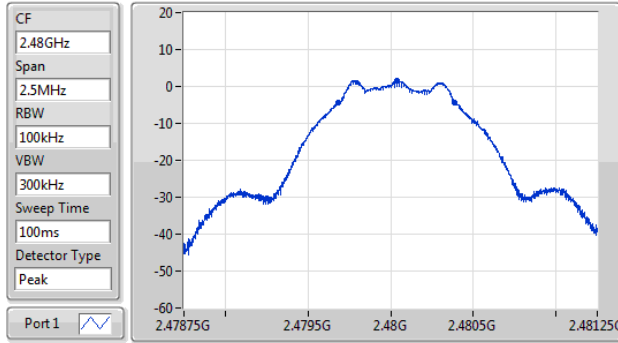


6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
682.5k	2.439696G	2.440379G	1.026M	2.439541G	2.440567G	500k	1



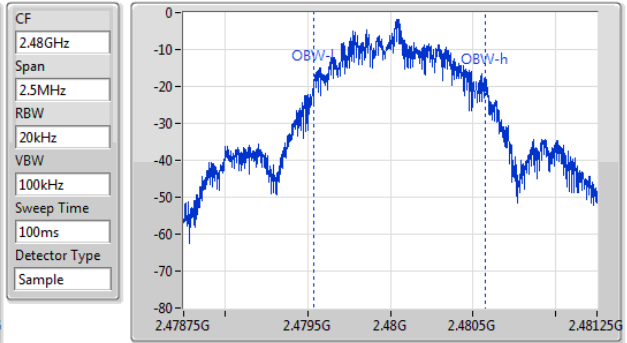
BT-LE(1Mbps)

2480MHz



EBW-DTS

09/11/2021



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
702.5k	2.479686G	2.480389G	1.032M	2.47954G	2.480572G	500k	1



**Button Antenna
Summary**

Mode	Max-N dB (Hz)	Max-OBW (Hz)	ITU-Code	Min-N dB (Hz)	Min-OBW (Hz)
2.4-2.4835GHz	-	-	-	-	-
BT-LE(1Mbps)	693.75k	1.029M	1M03F1D	676.25k	1.024M

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)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	500k	676.25k	1.024M
2440MHz	Pass	500k	686.25k	1.027M
2480MHz	Pass	500k	693.75k	1.029M

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

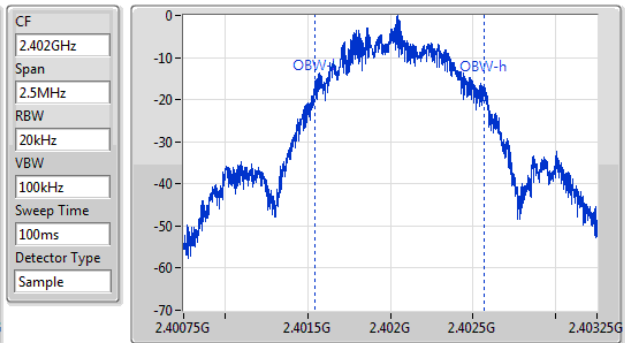
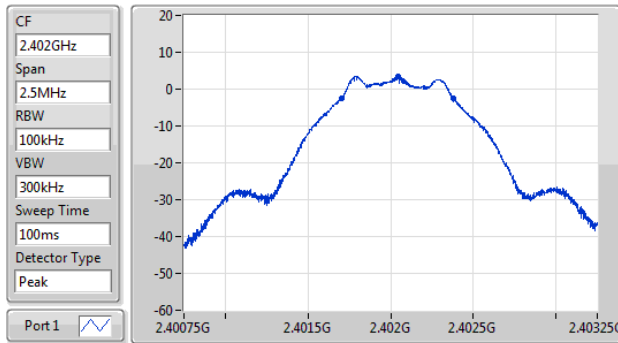


BT-LE(1Mbps)

EBW-DTS

2402MHz

09/11/2021



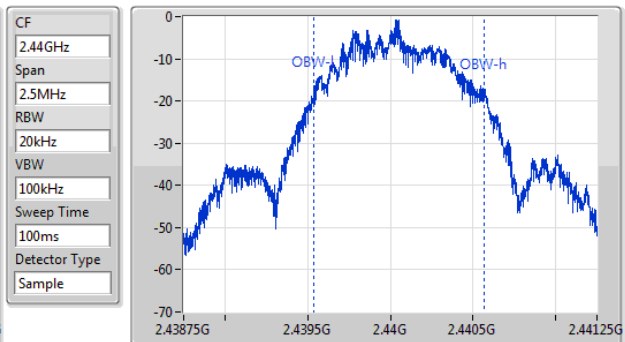
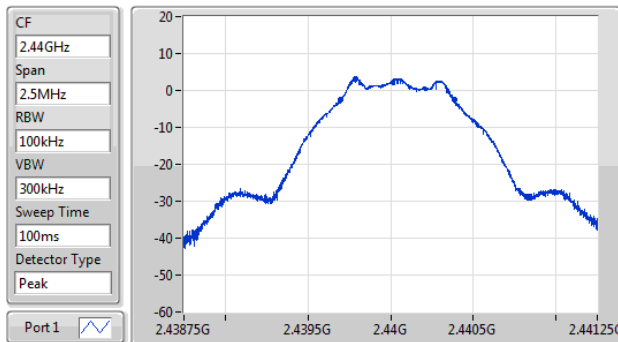
6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
676.25k	2.401701G	2.402378G	1.024M	2.401541G	2.402566G	500k	1

BT-LE(1Mbps)

EBW-DTS

2440MHz

09/11/2021

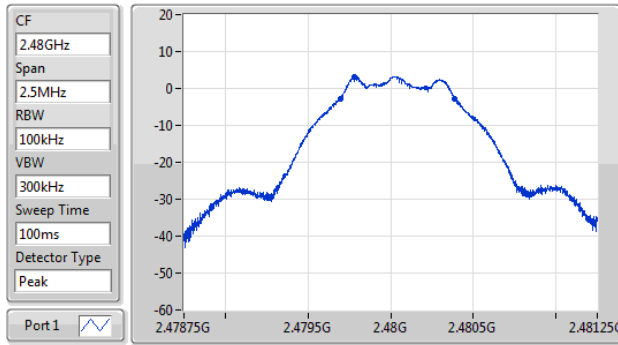


6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
686.25k	2.439698G	2.440384G	1.027M	2.43954G	2.440567G	500k	1



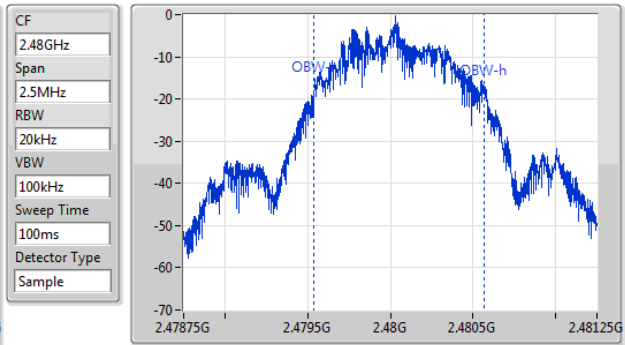
BT-LE(1Mbps)

2480MHz



EBW-DTS

09/11/2021



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
693.75k	2.479694G	2.480388G	1.029M	2.47954G	2.48057G	500k	1

3.3 Maximum Conducted Output Power

3.3.1 Maximum Conducted Output Power Limit

Spec	Item	Maximum Conducted Output Power Limit	Applicable
47 CFR FCC Part 15	15.247(b)	<ul style="list-style-type: none"> ▪ If $G_{TX} \leq 6$ dBi, then $P_{Out} \leq 30$ dBm (1 W) 	☒
		<ul style="list-style-type: none"> ▪ Point-to-multipoint systems (P2M): If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)$ dBm 	
		<ul style="list-style-type: none"> ▪ Point-to-point systems (P2P): If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3$ dBm 	
		<ul style="list-style-type: none"> ▪ Smart antenna system (SAS): 	
		<ul style="list-style-type: none"> - Single beam: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3$ dBm 	
		<ul style="list-style-type: none"> - Overlap beam: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3$ dBm 	
		<ul style="list-style-type: none"> - Aggregate power on all beams: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3 + 8$ dB dBm 	
Spec	Item	e.i.r.p. Power Limit:	Applicable
47 CFR FCC Part 15	15.247(b)	<ul style="list-style-type: none"> ▪ 2400-2483.5 MHz Band 	☒
		<ul style="list-style-type: none"> ▪ Point-to-multipoint systems (P2M): $P_{eirp} \leq 36$ dBm (4 W) 	
		<ul style="list-style-type: none"> ▪ Point-to-point systems (P2P): $P_{eirp} \leq \text{MAX}(36, [P_{Out} + G_{TX}])$ dBm 	
		<ul style="list-style-type: none"> ▪ Smart antenna system (SAS) 	
		<ul style="list-style-type: none"> - Single beam: $P_{eirp} \leq \text{MAX}(36, P_{Out} + G_{TX})$ dBm 	
		<ul style="list-style-type: none"> - Overlap beam: $P_{eirp} \leq \text{MAX}(36, P_{Out} + G_{TX})$ dBm 	
		<ul style="list-style-type: none"> - Aggregate power on all beams: $P_{eirp} \leq \text{MAX}(36, [P_{Out} + G_{TX} + 8])$ dBm 	
P_{Out} = maximum peak conducted output power or maximum conducted output power in dBm, G_{TX} = the maximum transmitting antenna directional gain in dBi.			

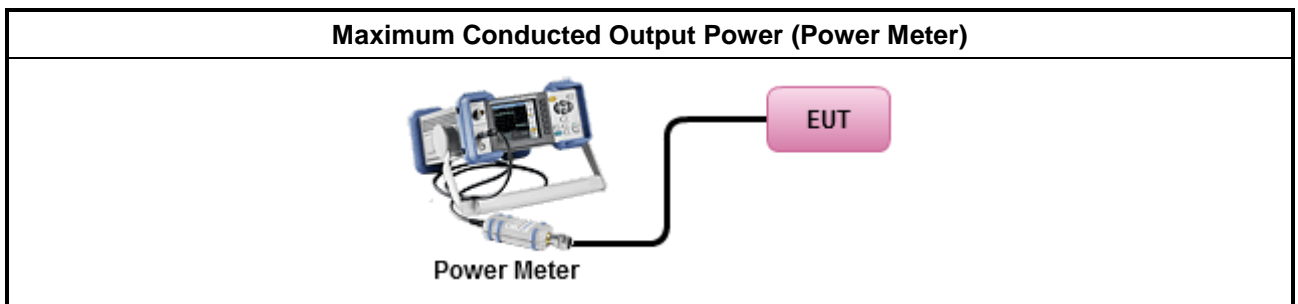
3.3.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.3.3 Test Procedures

Test Method	
<ul style="list-style-type: none"> ▪ Maximum Peak Conducted Output Power 	
<input type="checkbox"/>	Refer as KDB 558074, clause 8.3.1.1 (11.9.1.1 of ANSI C63.10) RBW ≥ EBW method.
<input type="checkbox"/>	Refer as KDB 558074, clause 8.3.1.2 (11.9.1.2 of ANSI C63.10) integrated band power method.
<input type="checkbox"/>	Refer as KDB 558074, clause 8.3.1.3 (11.9.1.3 of ANSI C63.10) peak power meter.
<ul style="list-style-type: none"> ▪ Maximum Average Conducted Output Power 	
<input type="checkbox"/>	Refer as KDB 558074, clause 8.3.2.2 (11.9.2.2 of ANSI C63.10) using a spectrum analyzer.
<input checked="" type="checkbox"/>	Refer as KDB 558074, clause 8.3.2.3 (11.9.2.3 of ANSI C63.10) using a power meter.
<ul style="list-style-type: none"> ▪ For conducted measurement. 	
<ul style="list-style-type: none"> ▪ If the EUT supports multiple transmit chains using options given below: Refer as KDB 662911, In-band power measurements. Using the measure-and-sum approach, measured all transmit ports individually. Sum the power (in linear power units e.g., mW) of all ports for each individual sample and save them. 	
<ul style="list-style-type: none"> ▪ If multiple transmit chains, EIRP calculation could be following as methods: $P_{total} = P_1 + P_2 + \dots + P_n$ (calculated in linear unit [mW] and transfer to log unit [dBm]) $EIRP_{total} = P_{total} + DG$ 	

3.3.4 Test Setup





3.3.5 Test Result of Maximum Conducted Output Power

PCB Antenna Summary

Mode	Power (dBm)	Power (W)
2.4-2.4835GHz	-	-
BT-LE(1Mbps)	3.14	0.00206

Result

Mode	Result	Gain (dBi)	Power (dBm)	Power Limit (dBm)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	0.30	3.14	30.00
2440MHz	Pass	0.30	3.09	30.00
2480MHz	Pass	0.30	3.04	30.00

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

Button Antenna Summary

Mode	Power (dBm)	Power (W)
2.4-2.4835GHz	-	-
BT-LE(1Mbps)	3.94	0.00248

Result

Mode	Result	Gain (dBi)	Power (dBm)	Power Limit (dBm)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	0.89	3.94	30.00
2440MHz	Pass	0.89	3.81	30.00
2480MHz	Pass	0.89	3.76	30.00

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

3.4 Power Spectral Density

3.4.1 Power Spectral Density Limit

Spec	Item	Power Spectral Density Limit	Applicable
47 CFR FCC Part 15	15.247(e)	Power Spectral Density (PSD) ≤ 8 dBm/3kHz	<input checked="" type="checkbox"/>

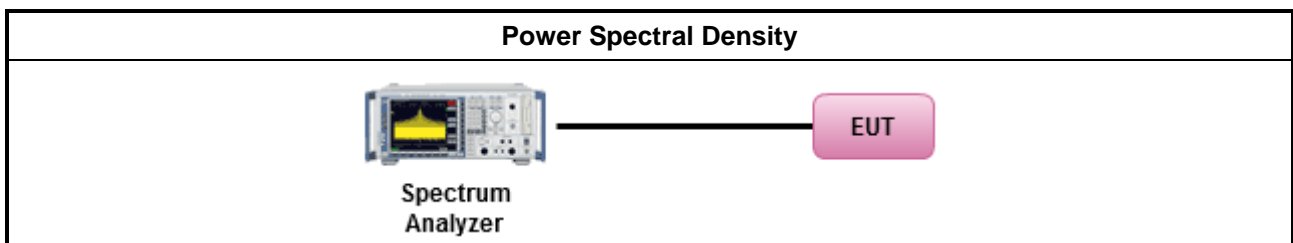
3.4.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.4.3 Test Procedures

Test Method	
	<ul style="list-style-type: none"> ▪ Peak power spectral density procedures that the same method as used to determine the conducted output power. If maximum peak conducted output power was measured to demonstrate compliance to the output power limit, then the peak PSD procedure below (Method PKPSD) shall be used. If maximum conducted output power was measured to demonstrate compliance to the output power limit, then one of the average PSD procedures shall be used, as applicable based on the following criteria (the peak PSD procedure is also an acceptable option).
<input checked="" type="checkbox"/>	Refer as KDB 558074, clause 8.4 (11.10 of ANSI C63.10) Max. PSD.
	<ul style="list-style-type: none"> ▪ For conducted measurement.
	<ul style="list-style-type: none"> ▪ If The EUT supports multiple transmit chains using options given below:
	<ul style="list-style-type: none"> ▪ Measure and sum the spectra across the outputs. Refer as KDB 662911, In-band power spectral density (PSD). Sample all transmit ports simultaneously using a spectrum analyzer for each transmit port. Where the trace bin-by-bin of each transmit port summing can be performed. (i.e., in the first spectral bin of output 1 is summed with that in the first spectral bin of output 2 and that from the first spectral bin of output 3, and so on up to the NTX output to obtain the value for the first frequency bin of the summed spectrum.). Add up the amplitude (power) values for the different transmit chains and use this as the new data trace.

3.4.4 Test Setup





3.4.5 Test Result of Power Spectral Density

PCB Antenna Summary

Mode	PD (dBm/RBW)
2.4-2.4835GHz	-
BT-LE(1Mbps)	-11.90

RBW = 3kHz;

Result

Mode	Result	Gain (dBi)	PD (dBm/RBW)	PD Limit (dBm/RBW)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	0.30	-11.90	8.00
2440MHz	Pass	0.30	-12.81	8.00
2480MHz	Pass	0.30	-14.50	8.00

DG = Directional Gain; RBW = 3kHz;

PD = trace bin-by-bin of each transmits port summing can be performed maximum power density; Port X = Port X Power Density;

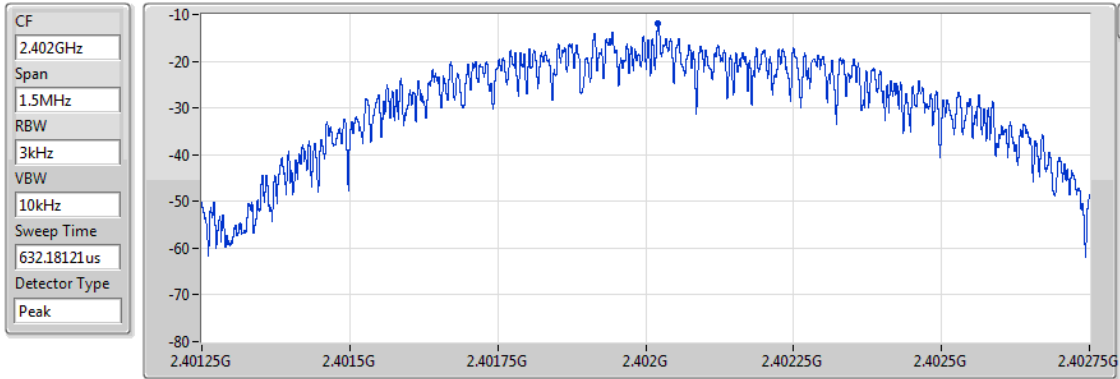


BT-LE(1Mbps)

PSD

2402MHz

09/11/2021



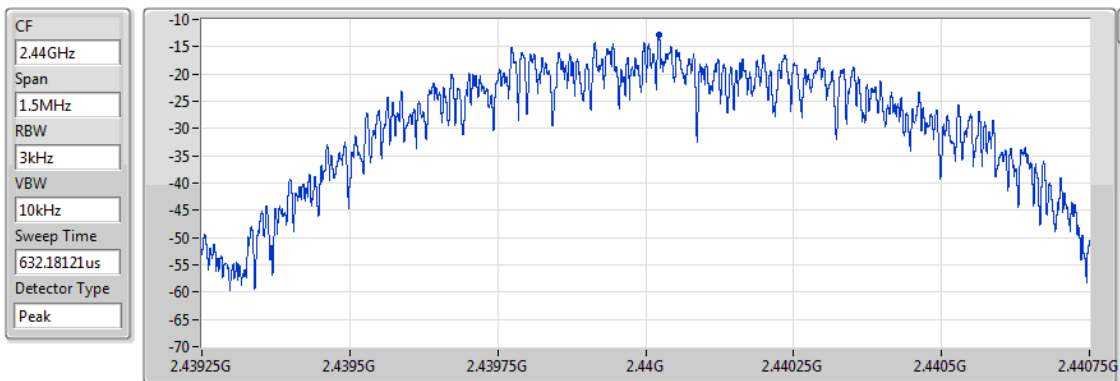
Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-11.90	-11.90	-11.90

BT-LE(1Mbps)

PSD

2440MHz

09/11/2021



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-12.81	-12.81	-12.81

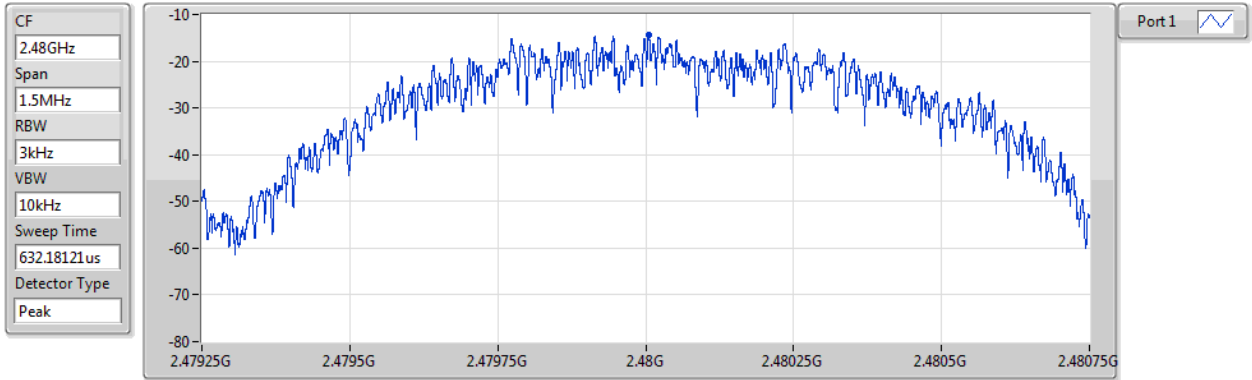


BT-LE(1Mbps)

2480MHz

PSD

09/11/2021



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-14.50	-14.50	-14.50



Button Antenna
Summary

Mode	PD (dBm/RBW)
2.4-2.4835GHz	-
BT-LE(1Mbps)	-12.03

RBW = 3kHz;

Result

Mode	Result	Gain (dBi)	PD (dBm/RBW)	PD Limit (dBm/RBW)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	0.89	-12.22	8.00
2440MHz	Pass	0.89	-12.03	8.00
2480MHz	Pass	0.89	-12.42	8.00

DG = Directional Gain; RBW = 3kHz;

PD = trace bin-by-bin of each transmits port summing can be performed maximum power density; Port X = Port X Power Density;

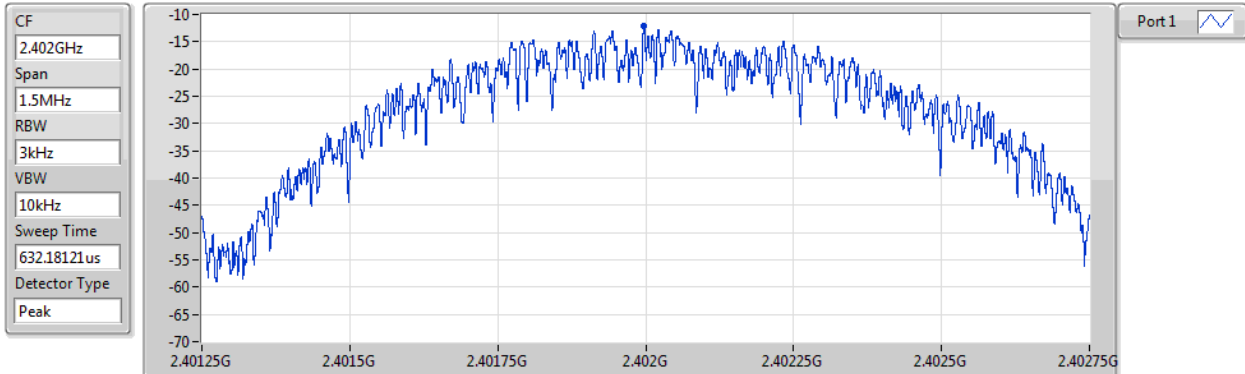


BT-LE(1Mbps)

PSD

2402MHz

09/11/2021

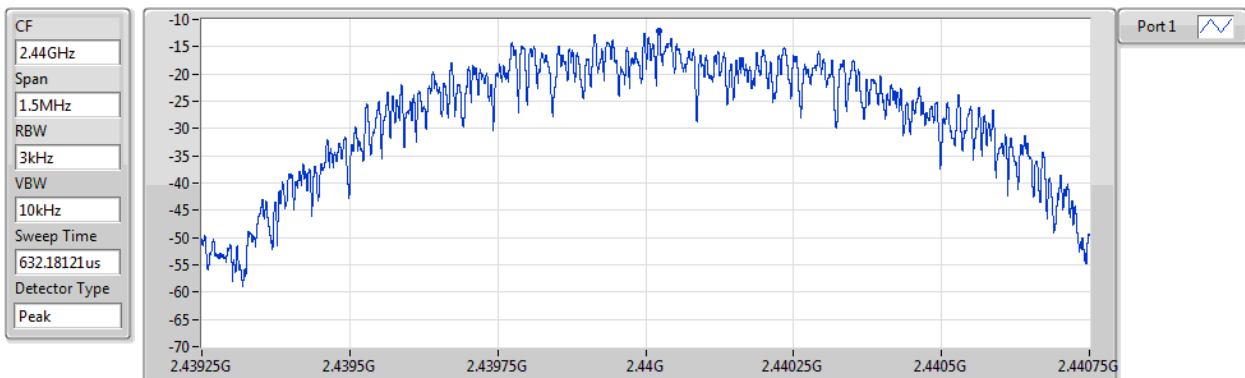


BT-LE(1Mbps)

PSD

2440MHz

09/11/2021



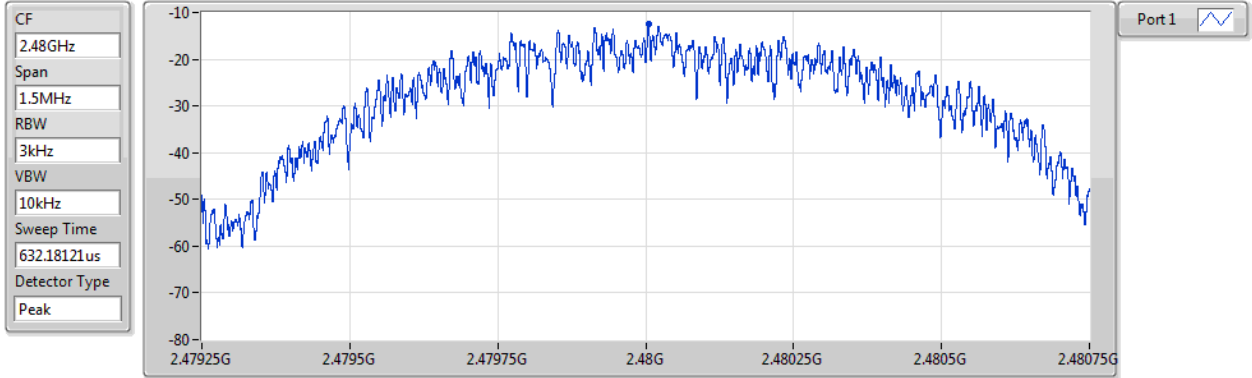


BT-LE(1Mbps)

2480MHz

PSD

09/11/2021



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-12.42	-12.42	-12.42

3.5 Emissions in Non-restricted Frequency Bands

3.5.1 Emissions in Non-restricted Frequency Bands Limit

Spec	Item	Un-restricted Band Emissions Limit		Applicable
		RF output power procedure	Limit (dB)	
47 CFR FCC Part 15	15.247(d)	Peak output power procedure	20	<input type="checkbox"/>
		Average output power procedure	30	<input checked="" type="checkbox"/>

Note 1: If the peak output power procedure is used to measure the fundamental emission power to demonstrate compliance to requirements, then the peak conducted output power measured within any 100 kHz outside the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum measured in-band peak level.

Note 2: If the average output power procedure is used to measure the fundamental emission power to demonstrate compliance to requirements, then the power in any 100 kHz outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum measured in-band average level.

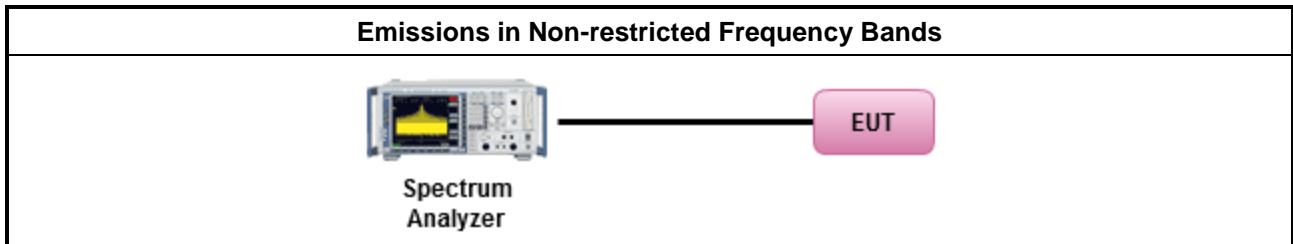
3.5.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.5.3 Test Procedures

Test Method
<ul style="list-style-type: none"> Refer as KDB 558074, clause 8.5 (11.11 of ANSI C63.10) for non-restricted frequency bands.

3.5.4 Test Setup





3.5.5 Test Result of Emissions in Non-restricted Frequency Bands

PCB Antenna Summary

Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	2.40175G	2.05	-27.95	2.11915G	-55.80	2.39963G	-42.37	2.4G	-45.35	2.49521G	-53.13	17.62396G	-43.50	1

Result

Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	2.40175G	2.05	-27.95	2.11915G	-55.80	2.39963G	-42.37	2.4G	-45.35	2.49521G	-53.13	17.62396G	-43.50	1
2440MHz	Pass	2.40175G	2.05	-27.95	833.7M	-56.37	2.3916G	-53.98	2.4835G	-56.70	2.50152G	-53.82	24.74973G	-43.43	1
2480MHz	Pass	2.40175G	2.05	-27.95	2.12356G	-56.14	2.39474G	-54.92	2.4835G	-48.88	2.48354G	-48.37	23.35494G	-42.59	1

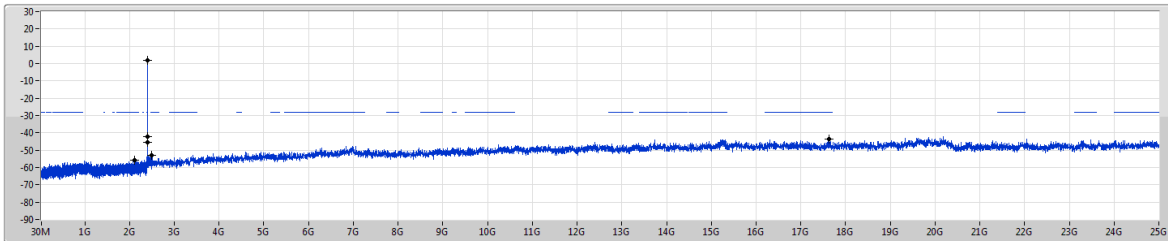


BT-LE(1Mbps)

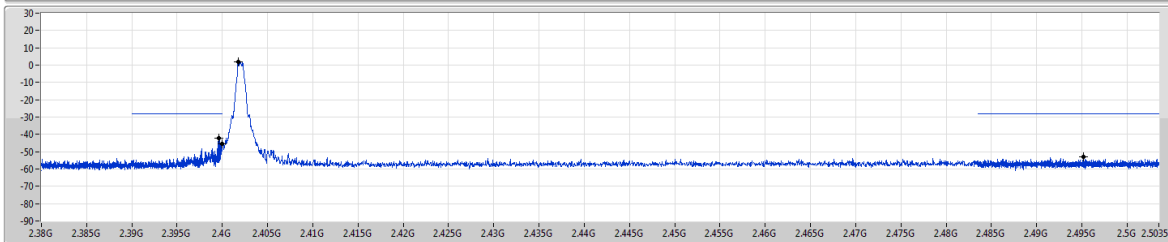
CSEndB-DTS

2402MHz

09/11/2021



Port 1



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

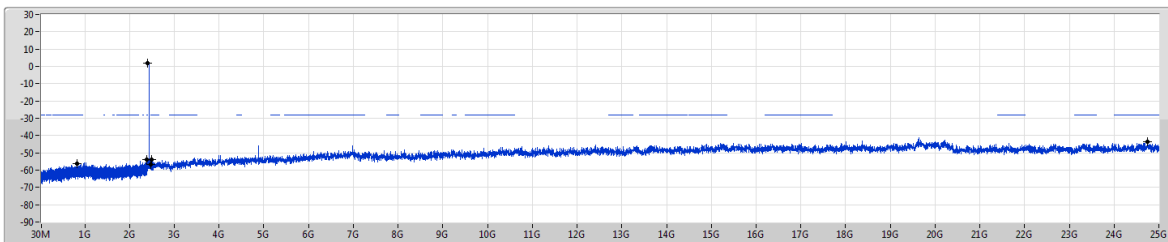
Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.40175G	2.05	-27.95	2.11915G	-55.80	2.39963G	-42.37	2.4G	-45.35	2.49521G	-53.13	17.62396G	-43.50	1

BT-LE(1Mbps)

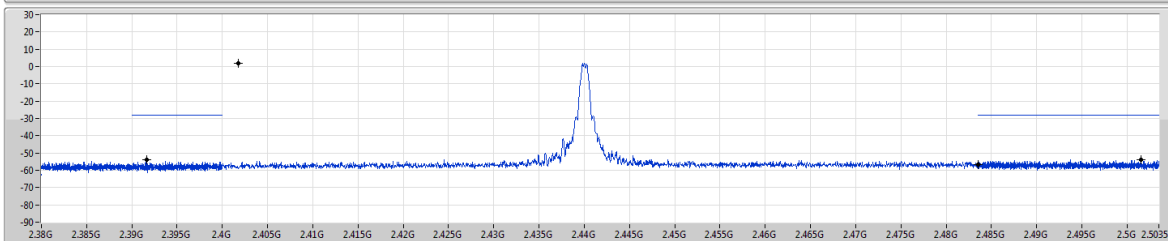
CSEndB-DTS

2440MHz

09/11/2021

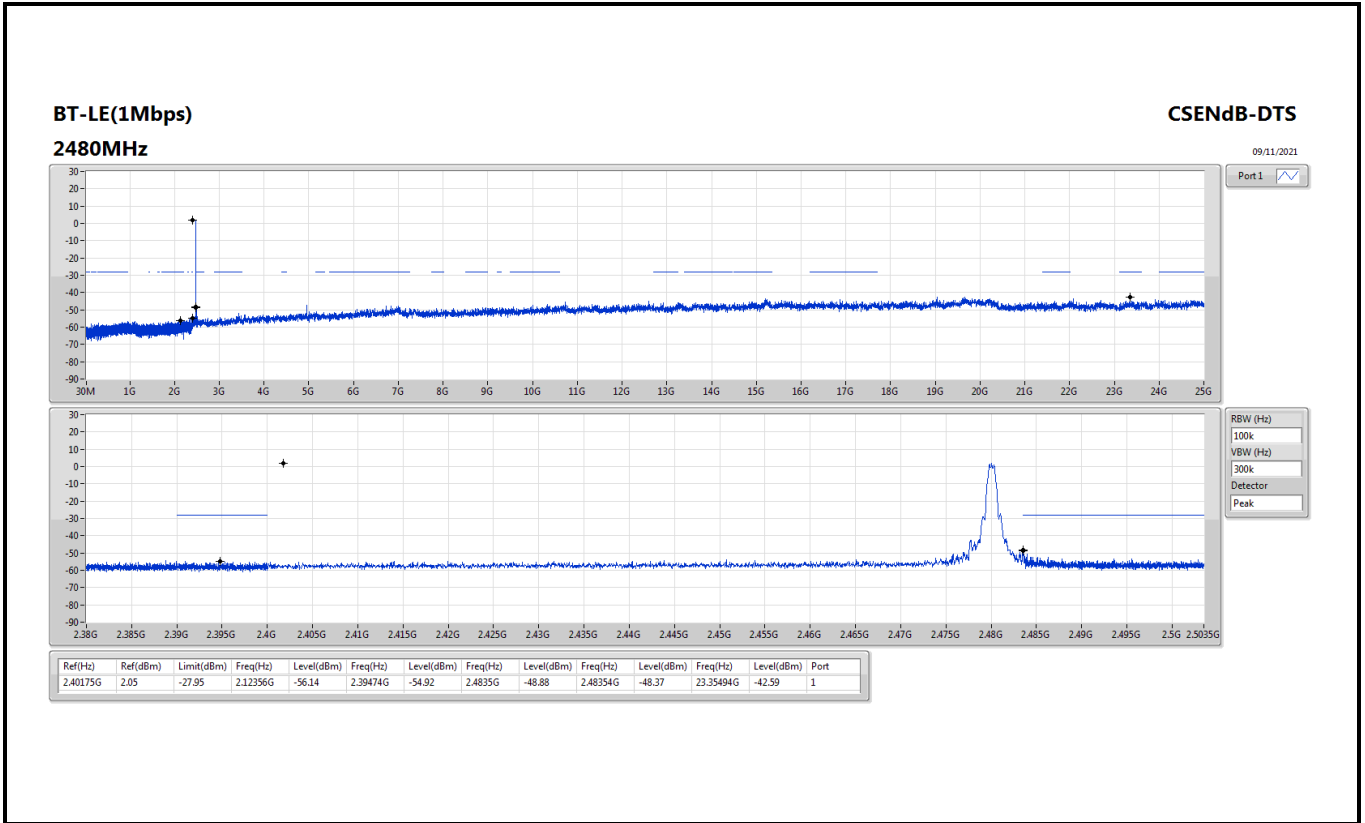


Port 1



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)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.40175G	2.05	-27.95	833.7M	-56.37	2.3916G	-53.98	2.4835G	-56.70	2.50152G	-53.82	24.74973G	-43.43	1





Button Antenna Summary

Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	2.40175G	3.33	-26.67	2.14735G	-54.37	2.39975G	-41.00	2.4G	-44.63	2.48735G	-52.51	15.23933G	-43.14	1

Result

Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	2.40175G	3.33	-26.67	2.14735G	-54.37	2.39975G	-41.00	2.4G	-44.63	2.48735G	-52.51	15.23933G	-43.14	1
2440MHz	Pass	2.40175G	3.33	-26.67	2.14118G	-55.64	2.39922G	-53.60	2.4835G	-56.45	2.48808G	-53.13	15.21402G	-43.00	1
2480MHz	Pass	2.40175G	3.33	-26.67	2.13061G	-55.07	2.39524G	-54.00	2.4835G	-48.86	2.48352G	-47.94	23.43087G	-42.93	1

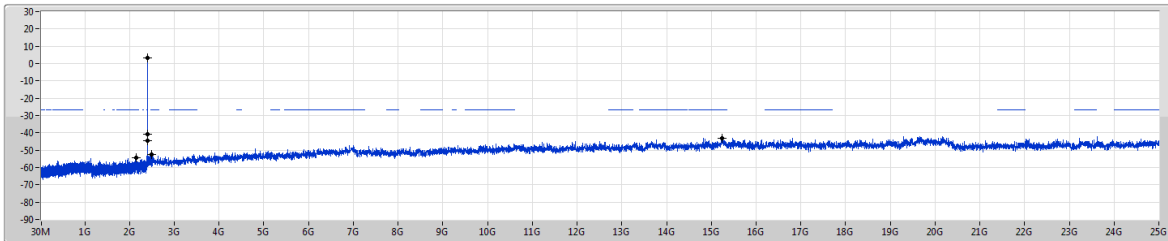


BT-LE(1Mbps)

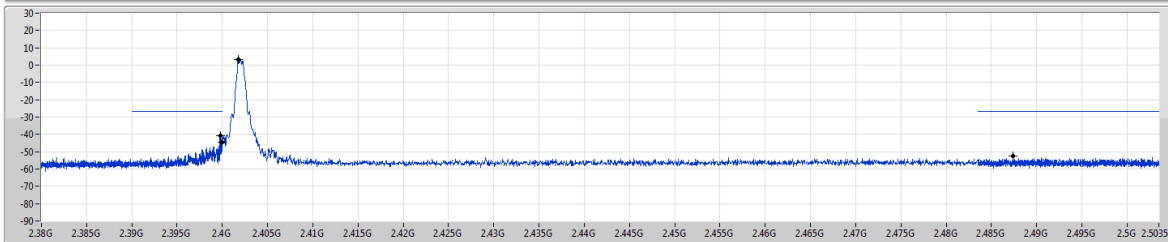
CSEndB-DTS

2402MHz

09/11/2021



Port 1



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

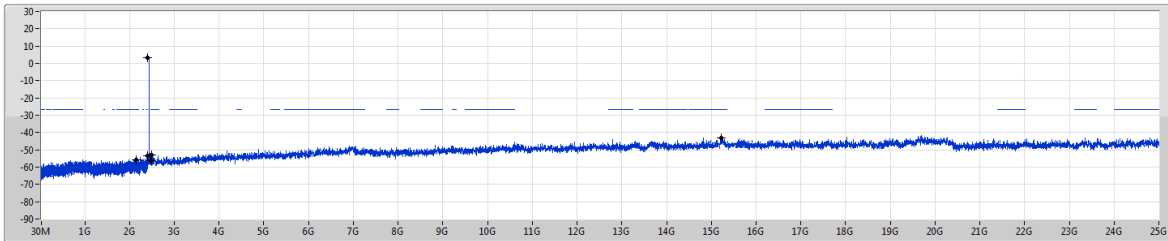
Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.40175G	3.33	-26.67	2.14735G	-54.37	2.39975G	-41.00	2.4G	-44.63	2.48735G	-52.51	15.23933G	-43.14	1

BT-LE(1Mbps)

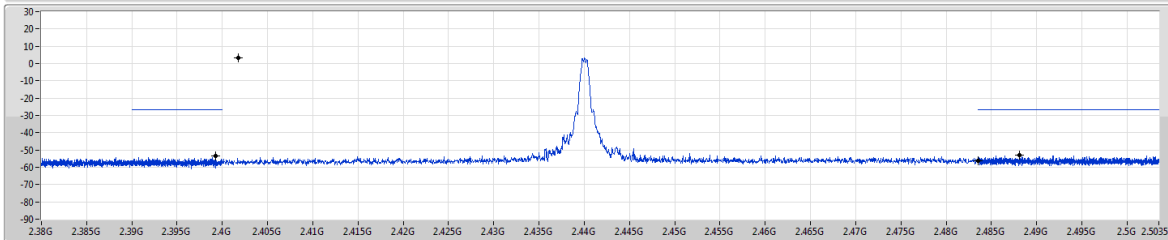
CSEndB-DTS

2440MHz

09/11/2021

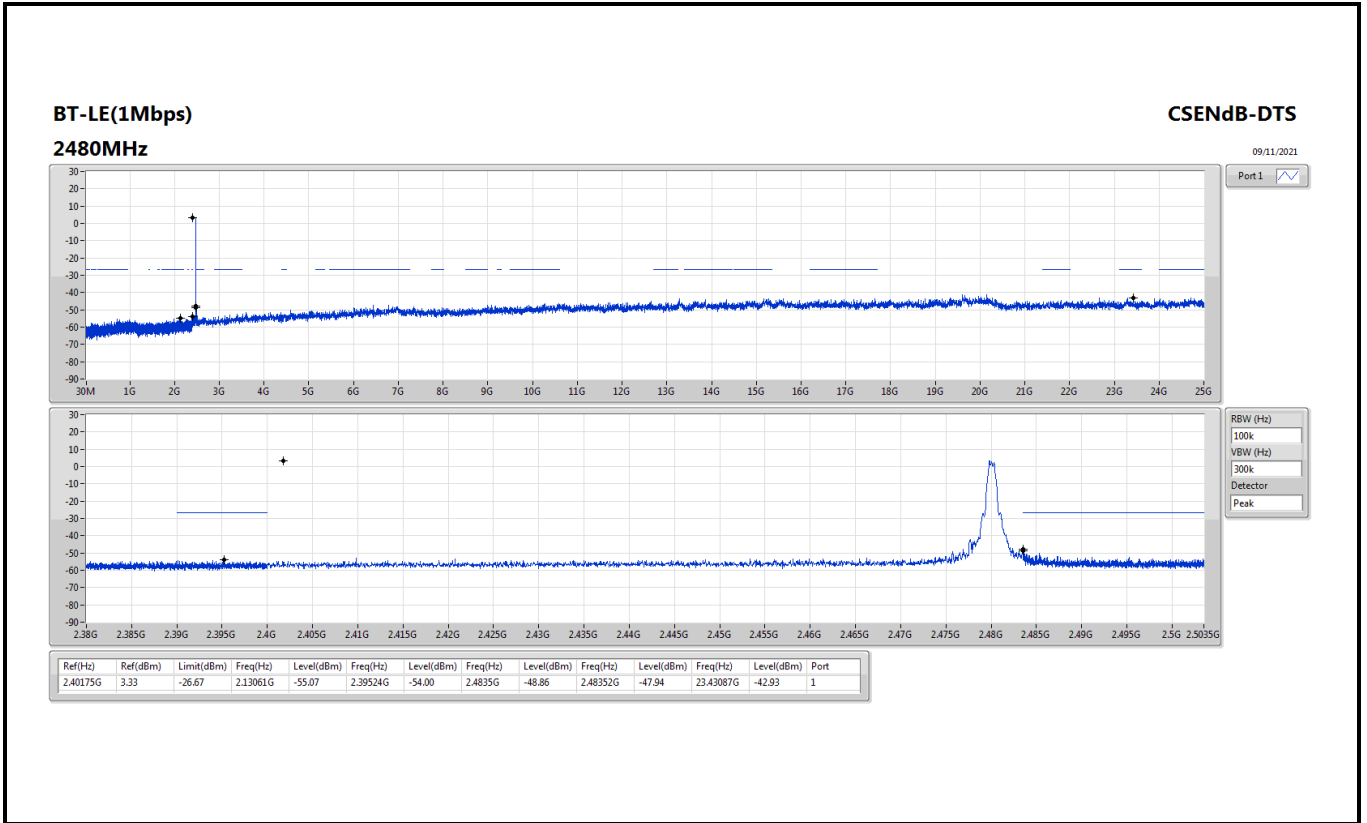


Port 1



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)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.40175G	3.33	-26.67	2.14118G	-55.64	2.39922G	-53.60	2.4835G	-56.45	2.48808G	-53.13	15.21402G	-43.00	1





3.6 Emissions in Restricted Frequency Bands

3.6.1 Emissions in Restricted Frequency Bands Limit

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: Test distance for frequencies at or above 30 MHz, measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).

Note 2: Test distance for frequencies at below 30 MHz, measurements may be performed at a distance closer than the EUT limit distance; however, an attempt should be made to avoid making measurements in the near field. When performing measurements below 30 MHz at a closer distance than the limit distance, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two or more distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB / decade). The test report shall specify the extrapolation method used to determine compliance of the EUT.

Note 3: Using the distance of 1m during the test for above 18 GHz, and the test value to correct for the distance factor at 3m.

3.6.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.



3.6.3 Test Procedures

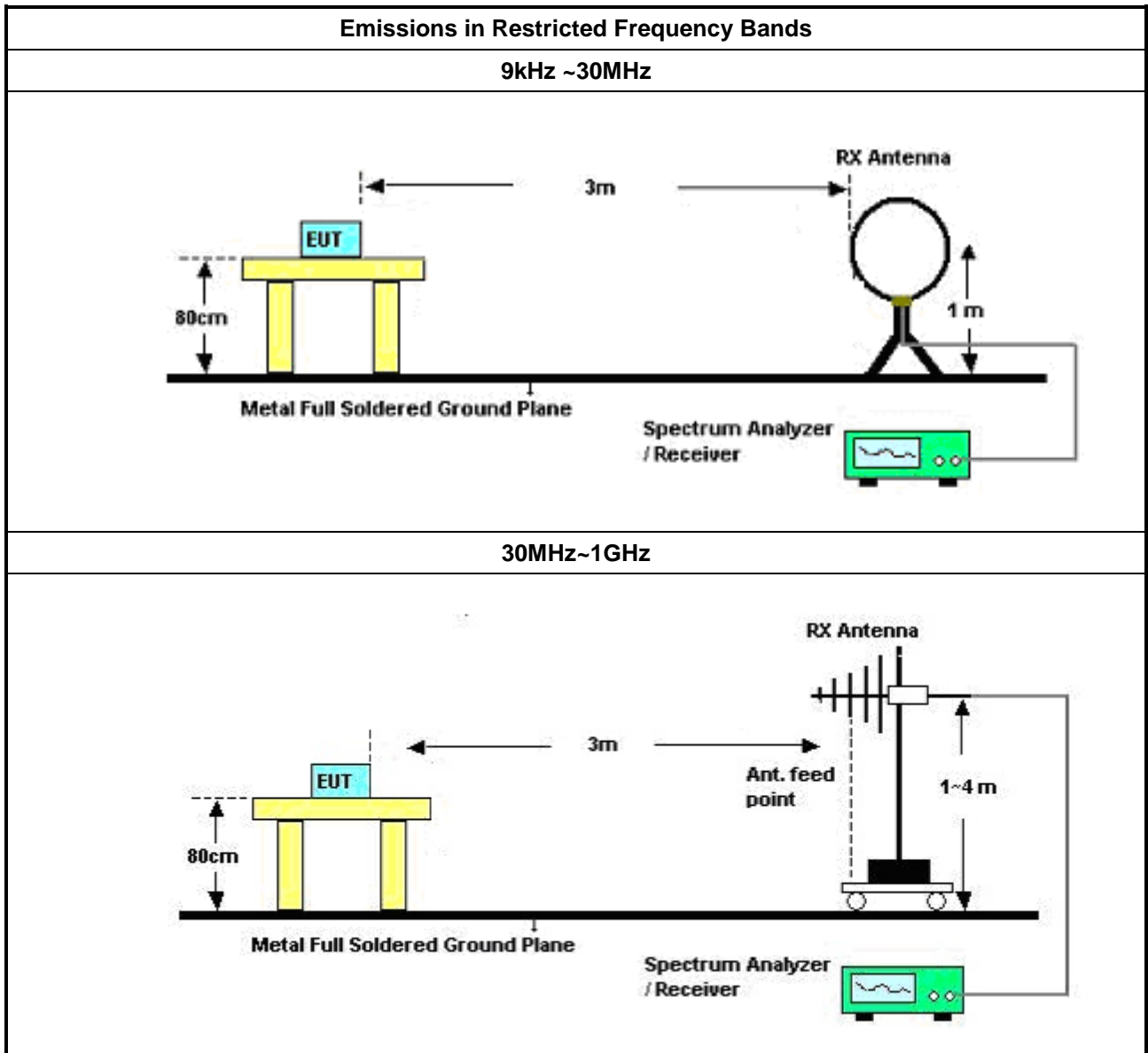
Test Method	
	<ul style="list-style-type: none"> The average emission levels shall be measured in [duty cycle ≥ 98 or duty factor].
	<ul style="list-style-type: none"> Refer as ANSI C63.10, clause 6.10.3 band-edge testing shall be performed at the lowest frequency channel and highest frequency channel within the allowed operating band.
	<ul style="list-style-type: none"> For the transmitter unwanted emissions shall be measured using following options below: <ul style="list-style-type: none"> Refer as KDB 558074, clause 8.6 (11.12 of ANSI C63.10) for restricted frequency bands.
	<ul style="list-style-type: none"> For the transmitter band-edge emissions shall be measured using following options below: <ul style="list-style-type: none"> Refer as KDB 558074 clause 8.7.1, When the performing peak or average radiated measurements, emissions within 2 MHz of the authorized band edge may be measured using the marker-delta method described below. Refer as KDB 558074, clause 8.7.2 (6.10.6 of ANSI C63.10) for marker-delta method for band-edge measurements. Refer as KDB 558074, clause 8.7.3 for narrower resolution bandwidth (100kHz) using the band power and summing the spectral levels.
	<ul style="list-style-type: none"> Use the following spectrum analyzer settings: <ul style="list-style-type: none"> Set RBW=100 kHz for f < 1 GHz; VBW=3 * RBW; Sweep = auto; Detector function = peak; Trace = max hold. Set RBW = 1 MHz, VBW= 3MHz for f ≥ 1 GHz for peak measurement. For average measurement, refer as 1.1.4.
	<ul style="list-style-type: none"> KDB 414788 Open-Field Test Sites and Chamber Correlation Justification. <ul style="list-style-type: none"> Based on FCC 15.31(f)(2): measurements may be performed at a distance closer than that specified in regulations; however, an attempt should be made to avoid making measurements in the near field. Open-field site and chamber correlation testing had been performed and chamber measured test result is the worst case test result.

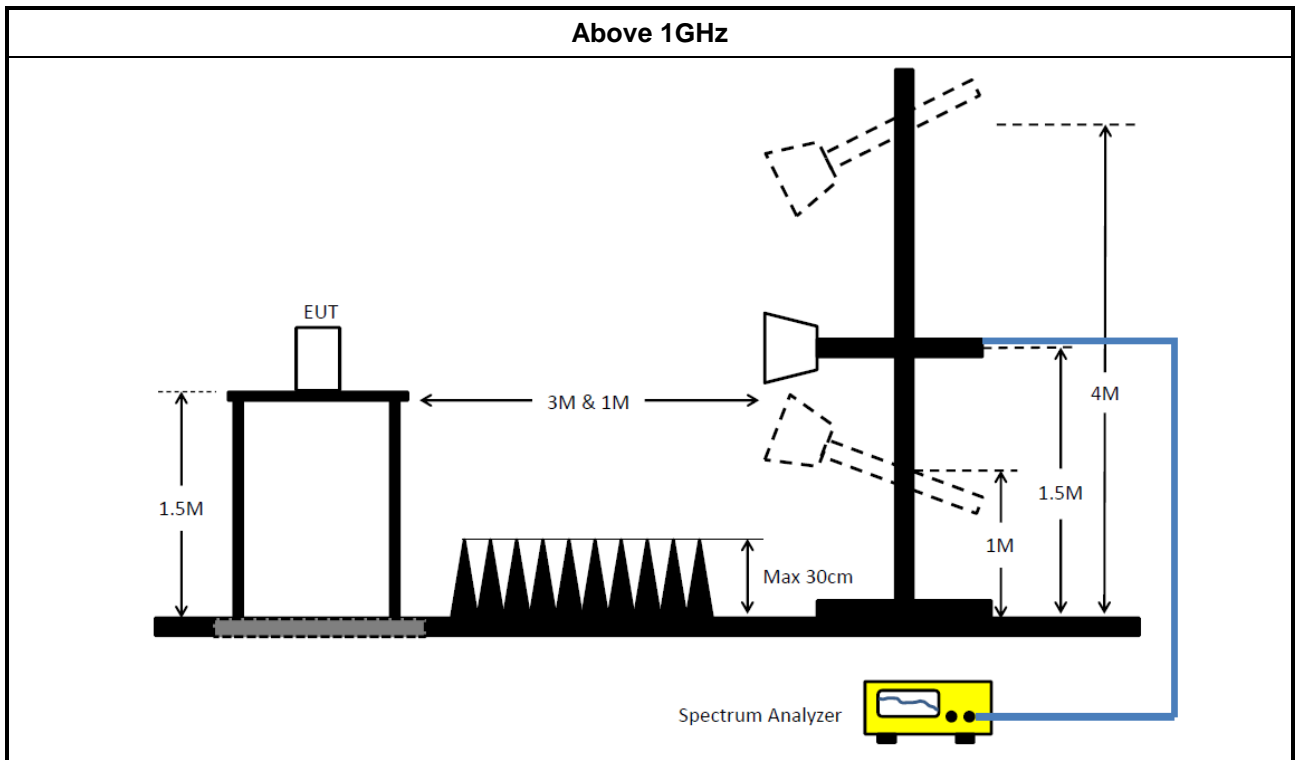
3.6.4 Measurement Results Calculation

The measured Level is calculated using:

Corrected Reading: Raw(Read Level) + AF(Antenna Factor) + CL(Cable Loss) - PA(Preamplifier Factor)

3.6.5 Test Setup





3.6.6 Test Result of Emissions in Restricted Frequency Bands (Below 30MHz)

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.



3.6.7 Test Result of Emissions in Restricted Frequency Bands below 1G

PCB Antenna 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	-	-	-	-	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	QP	720M	44.40	46.00	-1.60	3	Horizontal	298	1.00	-

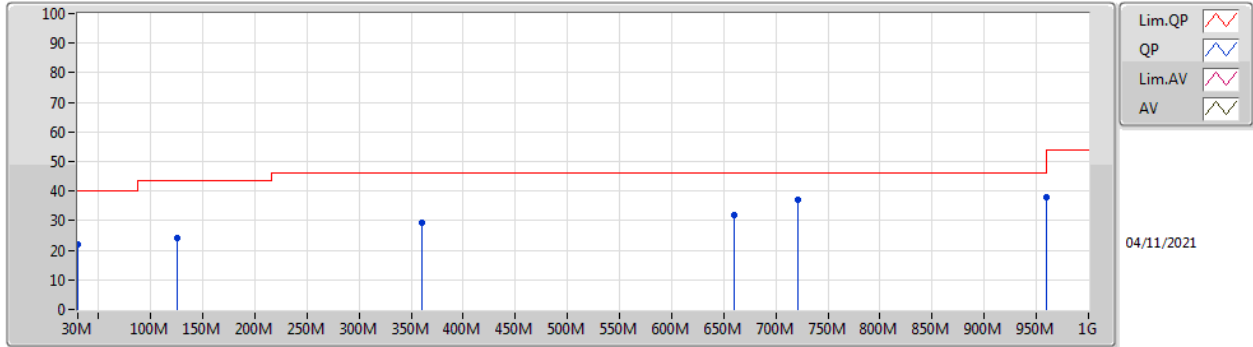
Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-
2440MHz	Pass	PK	30M	22.13	40.00	-17.87	3	Vertical	360	1.00	-
2440MHz	Pass	PK	125.06M	24.04	43.50	-19.46	3	Vertical	360	1.00	-
2440MHz	Pass	PK	359.8M	29.40	46.00	-16.60	3	Vertical	360	1.00	-
2440MHz	Pass	PK	660.5M	31.83	46.00	-14.17	3	Vertical	360	1.00	-
2440MHz	Pass	PK	720.64M	36.96	46.00	-9.04	3	Vertical	360	1.00	-
2440MHz	Pass	PK	960M	37.76	46.00	-8.24	3	Vertical	360	1.00	-
2440MHz	Pass	PK	30M	20.77	40.00	-19.23	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	239.52M	32.45	46.00	-13.55	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	359.8M	40.38	46.00	-5.62	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	660.5M	39.11	46.00	-6.89	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	960M	39.71	46.00	-6.29	3	Horizontal	0	1.00	-
2440MHz	Pass	QP	720M	44.40	46.00	-1.60	3	Horizontal	298	1.00	-



BT-LE(1Mbps)

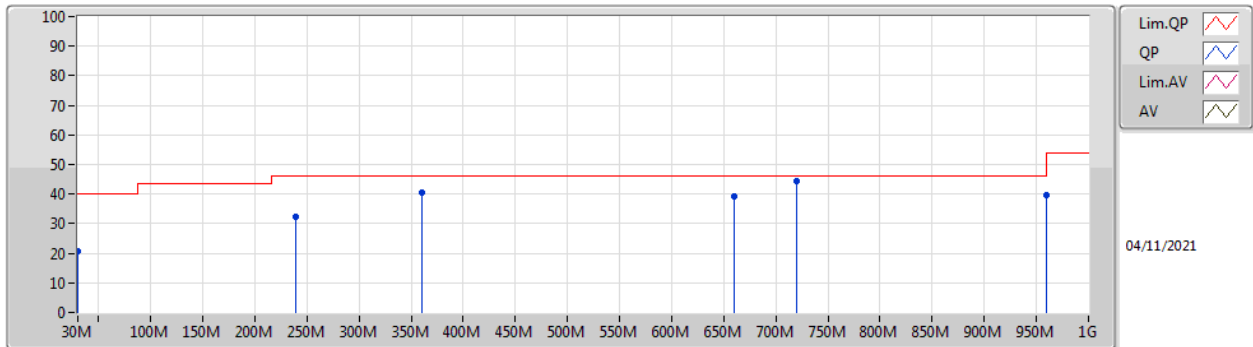
2440MHz_Test fixture



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
PK	30M	22.13	40.00	-17.87	-12.86	3	Vertical	360	1.00	-	34.99	23.73	0.56	37.15
PK	125.06M	24.04	43.50	-19.46	-18.75	3	Vertical	360	1.00	-	42.79	16.76	1.10	36.61
PK	359.8M	29.40	46.00	-16.60	-14.83	3	Vertical	360	1.00	-	44.23	19.91	1.80	36.54
PK	660.5M	31.83	46.00	-14.17	-9.06	3	Vertical	360	1.00	-	40.89	25.57	2.63	37.26
PK	720.64M	36.96	46.00	-9.04	-8.38	3	Vertical	360	1.00	-	45.34	26.31	2.73	37.42
PK	960M	37.76	46.00	-8.24	-4.19	3	Vertical	360	1.00	-	41.95	30.17	3.11	37.47

BT-LE(1Mbps)

2440MHz_Test fixture



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
PK	30M	20.77	40.00	-19.23	-12.86	3	Horizontal	0	1.00	-	33.63	23.73	0.56	37.15
PK	239.52M	32.45	46.00	-13.55	-18.55	3	Horizontal	0	1.00	-	51.00	16.35	1.46	36.36
PK	359.8M	40.38	46.00	-5.62	-14.83	3	Horizontal	0	1.00	-	55.21	19.91	1.80	36.54
PK	660.5M	39.11	46.00	-6.89	-9.06	3	Horizontal	0	1.00	-	48.17	25.57	2.63	37.26
PK	960M	39.71	46.00	-6.29	-4.19	3	Horizontal	0	1.00	-	43.90	30.17	3.11	37.47
QP	720M	44.40	46.00	-1.60	-8.43	3	Horizontal	298	1.00	-	52.83	26.27	2.72	37.42



Button Antenna
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	-	-	-	-	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	QP	720.01M	44.74	46.00	-1.26	3	Horizontal	213	1.00	-

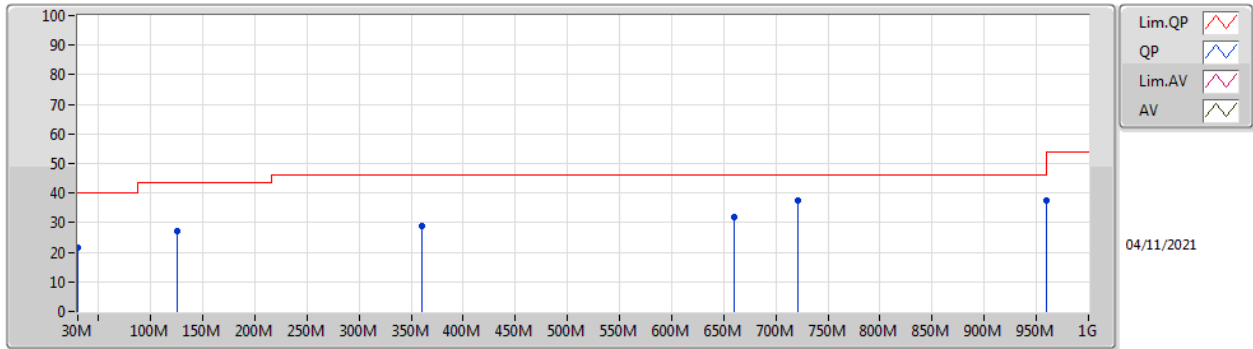
Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-
2440MHz	Pass	PK	30M	21.71	40.00	-18.29	3	Vertical	0	1.00	-
2440MHz	Pass	PK	125.06M	27.32	43.50	-16.18	3	Vertical	0	1.00	-
2440MHz	Pass	PK	359.8M	28.99	46.00	-17.01	3	Vertical	0	1.00	-
2440MHz	Pass	PK	660.5M	32.03	46.00	-13.97	3	Vertical	0	1.00	-
2440MHz	Pass	PK	720.64M	37.42	46.00	-8.58	3	Vertical	0	1.00	-
2440MHz	Pass	PK	960M	37.66	46.00	-8.34	3	Vertical	0	1.00	-
2440MHz	Pass	PK	30M	21.17	40.00	-18.83	3	Horizontal	360	1.00	-
2440MHz	Pass	PK	239.52M	30.66	46.00	-15.34	3	Horizontal	360	1.00	-
2440MHz	Pass	PK	359.8M	40.07	46.00	-5.93	3	Horizontal	360	1.00	-
2440MHz	Pass	PK	660.5M	38.91	46.00	-7.09	3	Horizontal	360	1.00	-
2440MHz	Pass	PK	960M	40.95	46.00	-5.05	3	Horizontal	360	1.00	-
2440MHz	Pass	QP	720.01M	44.74	46.00	-1.26	3	Horizontal	213	1.00	-



BT-LE(1Mbps)

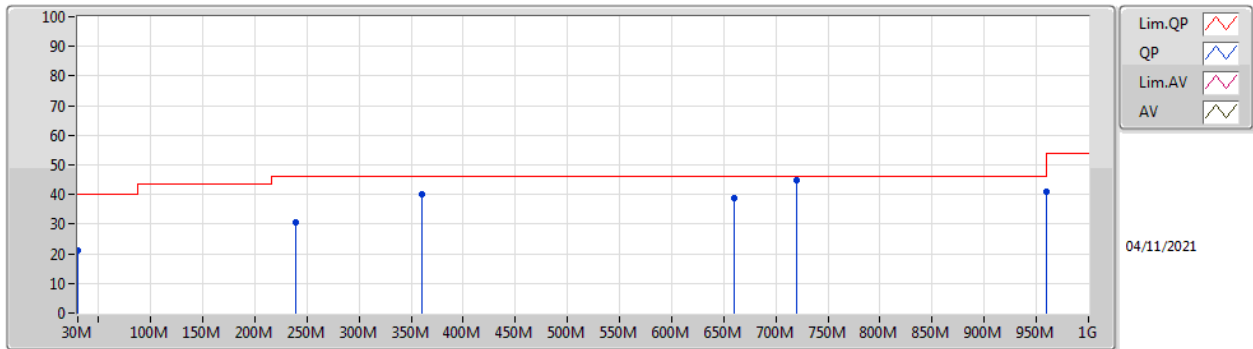
2440MHz_Test fixture



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
PK	30M	21.71	40.00	-18.29	-12.86	3	Vertical	0	1.00	-	34.57	23.73	0.56	37.15
PK	125.06M	27.32	43.50	-16.18	-18.75	3	Vertical	0	1.00	-	46.07	16.76	1.10	36.61
PK	359.8M	28.99	46.00	-17.01	-14.83	3	Vertical	0	1.00	-	43.82	19.91	1.80	36.54
PK	660.5M	32.03	46.00	-13.97	-9.06	3	Vertical	0	1.00	-	41.09	25.57	2.63	37.26
PK	720.64M	37.42	46.00	-8.58	-8.38	3	Vertical	0	1.00	-	45.80	26.31	2.73	37.42
PK	960M	37.66	46.00	-8.34	-4.19	3	Vertical	0	1.00	-	41.85	30.17	3.11	37.47

BT-LE(1Mbps)

2440MHz_Test fixture



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
PK	30M	21.17	40.00	-18.83	-12.86	3	Horizontal	360	1.00	-	34.03	23.73	0.56	37.15
PK	239.52M	30.66	46.00	-15.34	-18.55	3	Horizontal	360	1.00	-	49.21	16.35	1.46	36.36
PK	359.8M	40.07	46.00	-5.93	-14.83	3	Horizontal	360	1.00	-	54.90	19.91	1.80	36.54
PK	660.5M	38.91	46.00	-7.09	-9.06	3	Horizontal	360	1.00	-	47.97	25.57	2.63	37.26
PK	960M	40.95	46.00	-5.05	-4.19	3	Horizontal	360	1.00	-	45.14	30.17	3.11	37.47
QP	720.01M	44.74	46.00	-1.26	-8.43	3	Horizontal	213	1.00	-	53.37	26.27	2.72	37.42



3.6.8 Test Result of Emissions in Restricted Frequency Bands above 1G

PCB Antenna
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	-	-	-	-	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	AV	4.80413G	49.56	54.00	-4.44	3	Horizontal	172	1.10	-

Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	AV	2.371G	45.80	54.00	-8.20	3	Vertical	124	1.50	-
2402MHz	Pass	AV	2.402G	94.27	Inf	-Inf	3	Vertical	124	1.50	-
2402MHz	Pass	PK	2.3608G	57.68	74.00	-16.32	3	Vertical	124	1.50	-
2402MHz	Pass	PK	2.4018G	95.24	Inf	-Inf	3	Vertical	124	1.50	-
2402MHz	Pass	AV	2.3634G	45.68	54.00	-8.32	3	Horizontal	205	1.50	-
2402MHz	Pass	AV	2.402G	100.36	Inf	-Inf	3	Horizontal	205	1.50	-
2402MHz	Pass	PK	2.388G	58.23	74.00	-15.77	3	Horizontal	205	1.50	-
2402MHz	Pass	PK	2.4018G	101.30	Inf	-Inf	3	Horizontal	205	1.50	-
2402MHz	Pass	AV	4.80414G	43.59	54.00	-10.41	3	Vertical	82	1.06	-
2402MHz	Pass	PK	4.80362G	51.50	74.00	-22.50	3	Vertical	82	1.06	-
2402MHz	Pass	AV	4.80413G	49.56	54.00	-4.44	3	Horizontal	172	1.10	-
2402MHz	Pass	PK	4.80409G	55.99	74.00	-18.01	3	Horizontal	172	1.10	-
2440MHz	Pass	AV	2.3464G	45.76	54.00	-8.24	3	Vertical	326	1.50	-
2440MHz	Pass	AV	2.44G	91.03	Inf	-Inf	3	Vertical	326	1.50	-
2440MHz	Pass	AV	2.4868G	45.68	54.00	-8.32	3	Vertical	326	1.50	-
2440MHz	Pass	PK	2.3508G	57.96	74.00	-16.04	3	Vertical	326	1.50	-
2440MHz	Pass	PK	2.4396G	91.98	Inf	-Inf	3	Vertical	326	1.50	-
2440MHz	Pass	PK	2.496G	56.81	74.00	-17.19	3	Vertical	326	1.50	-
2440MHz	Pass	AV	2.3504G	45.65	54.00	-8.35	3	Horizontal	259	1.50	-
2440MHz	Pass	AV	2.44G	99.87	Inf	-Inf	3	Horizontal	259	1.50	-
2440MHz	Pass	AV	2.4864G	45.78	54.00	-8.22	3	Horizontal	259	1.50	-
2440MHz	Pass	PK	2.3648G	58.08	74.00	-15.92	3	Horizontal	259	1.50	-
2440MHz	Pass	PK	2.4404G	100.82	Inf	-Inf	3	Horizontal	259	1.50	-
2440MHz	Pass	PK	2.4892G	57.54	74.00	-16.46	3	Horizontal	259	1.50	-
2440MHz	Pass	AV	4.88012G	42.42	54.00	-11.58	3	Vertical	101	1.13	-
2440MHz	Pass	AV	7.3194G	46.27	54.00	-7.73	3	Vertical	187	1.02	-
2440MHz	Pass	PK	4.87941G	50.45	74.00	-23.55	3	Vertical	101	1.13	-
2440MHz	Pass	PK	7.31945G	55.66	74.00	-18.34	3	Vertical	187	1.02	-
2440MHz	Pass	AV	4.88013G	47.60	54.00	-6.40	3	Horizontal	173	1.05	-
2440MHz	Pass	AV	7.31953G	44.06	54.00	-9.94	3	Horizontal	42	1.03	-
2440MHz	Pass	PK	4.87955G	53.88	74.00	-20.12	3	Horizontal	173	1.05	-
2440MHz	Pass	PK	7.32061G	54.62	74.00	-19.38	3	Horizontal	42	1.03	-
2480MHz	Pass	PK	2.4798G	94.09	Inf	-Inf	3	Vertical	224	1.17	-
2480MHz	Pass	AV	2.48G	93.09	Inf	-Inf	3	Vertical	224	1.17	-
2480MHz	Pass	PK	2.4842G	59.16	74.00	-14.84	3	Vertical	224	1.17	-
2480MHz	Pass	AV	2.485G	45.77	54.00	-8.23	3	Vertical	224	1.17	-
2480MHz	Pass	AV	2.48G	99.66	Inf	-Inf	3	Horizontal	235	1.35	-
2480MHz	Pass	AV	2.4835G	46.44	54.00	-7.56	3	Horizontal	235	1.35	-

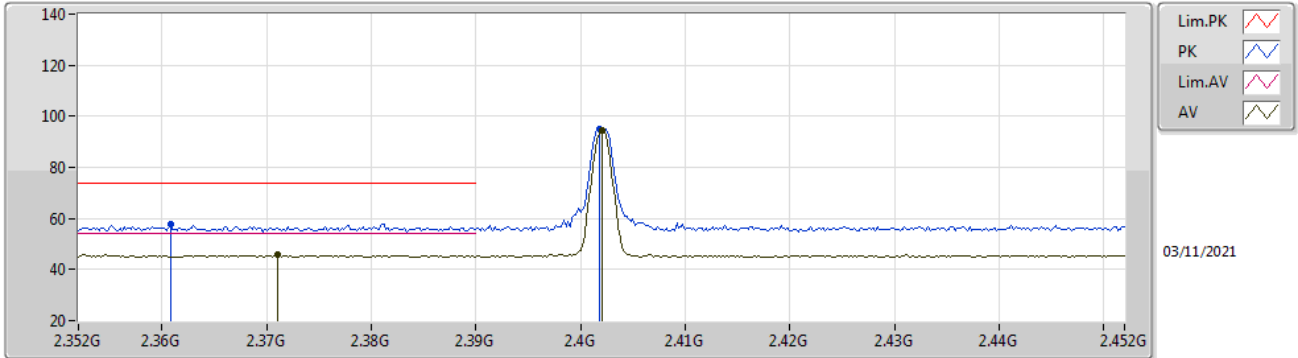


Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2480MHz	Pass	PK	2.4798G	100.63	Inf	-Inf	3	Horizontal	235	1.35	-
2480MHz	Pass	PK	2.4835G	62.48	74.00	-11.52	3	Horizontal	235	1.35	-
2480MHz	Pass	AV	4.96001G	41.98	54.00	-12.02	3	Vertical	87	1.09	-
2480MHz	Pass	AV	7.43943G	43.20	54.00	-10.80	3	Vertical	191	2.93	-
2480MHz	Pass	PK	4.95962G	50.58	74.00	-23.42	3	Vertical	87	1.09	-
2480MHz	Pass	PK	7.4394G	53.83	74.00	-20.17	3	Vertical	191	2.93	-
2480MHz	Pass	AV	4.96018G	47.40	54.00	-6.60	3	Horizontal	173	1.04	-
2480MHz	Pass	AV	7.43936G	42.19	54.00	-11.81	3	Horizontal	42	1.02	-
2480MHz	Pass	PK	4.95958G	54.07	74.00	-19.93	3	Horizontal	173	1.04	-
2480MHz	Pass	PK	7.43928G	53.80	74.00	-20.20	3	Horizontal	42	1.02	-



BT-LE(1Mbps)

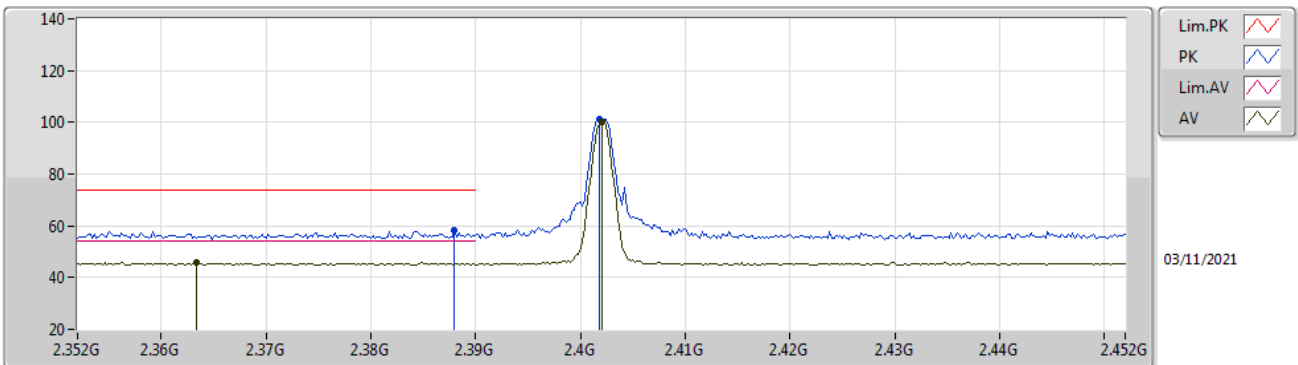
2402MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.371G	45.80	54.00	-8.20	32.27	3	Vertical	124	1.50	-	13.53	27.72	4.55	-
AV	2.402G	94.27	Inf	-Inf	32.18	3	Vertical	124	1.50	-	62.09	27.60	4.58	-
PK	2.3608G	57.68	74.00	-16.32	32.30	3	Vertical	124	1.50	-	25.38	27.76	4.54	-
PK	2.4018G	95.24	Inf	-Inf	32.18	3	Vertical	124	1.50	-	63.06	27.60	4.58	-

BT-LE(1Mbps)

2402MHz_TX

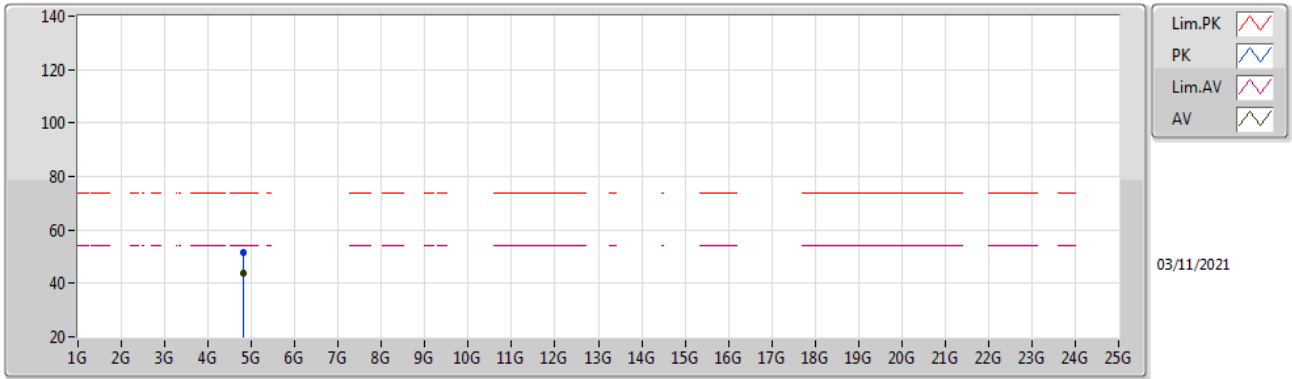


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.3634G	45.68	54.00	-8.32	32.30	3	Horizontal	205	1.50	-	13.38	27.75	4.55	-
AV	2.402G	100.36	Inf	-Inf	32.18	3	Horizontal	205	1.50	-	68.18	27.60	4.58	-
PK	2.388G	58.23	74.00	-15.77	32.22	3	Horizontal	205	1.50	-	26.01	27.65	4.57	-
PK	2.4018G	101.30	Inf	-Inf	32.18	3	Horizontal	205	1.50	-	69.12	27.60	4.58	-



BT-LE(1Mbps)

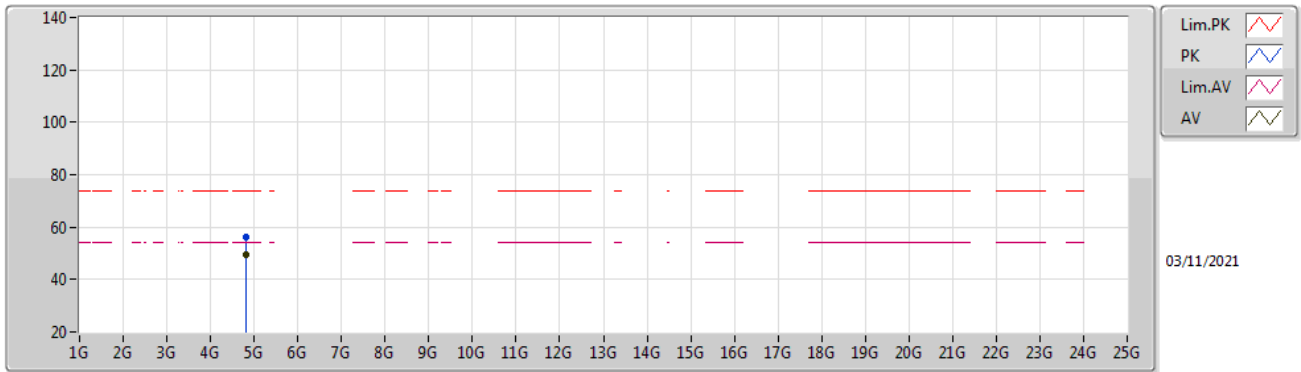
2402MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.80414G	43.59	54.00	-10.41	2.95	3	Vertical	82	1.06	-	40.64	31.10	6.66	34.81
PK	4.80362G	51.50	74.00	-22.50	2.95	3	Vertical	82	1.06	-	48.55	31.10	6.66	34.81

BT-LE(1Mbps)

2402MHz_TX

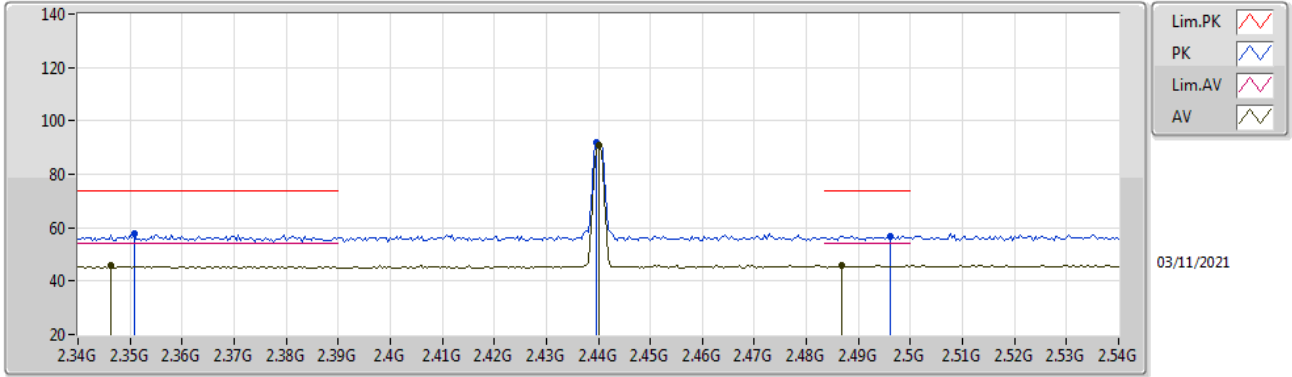


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.80413G	49.56	54.00	-4.44	2.95	3	Horizontal	172	1.10	-	46.61	31.10	6.66	34.81
PK	4.80409G	55.99	74.00	-18.01	2.95	3	Horizontal	172	1.10	-	53.04	31.10	6.66	34.81



BT-LE(1Mbps)

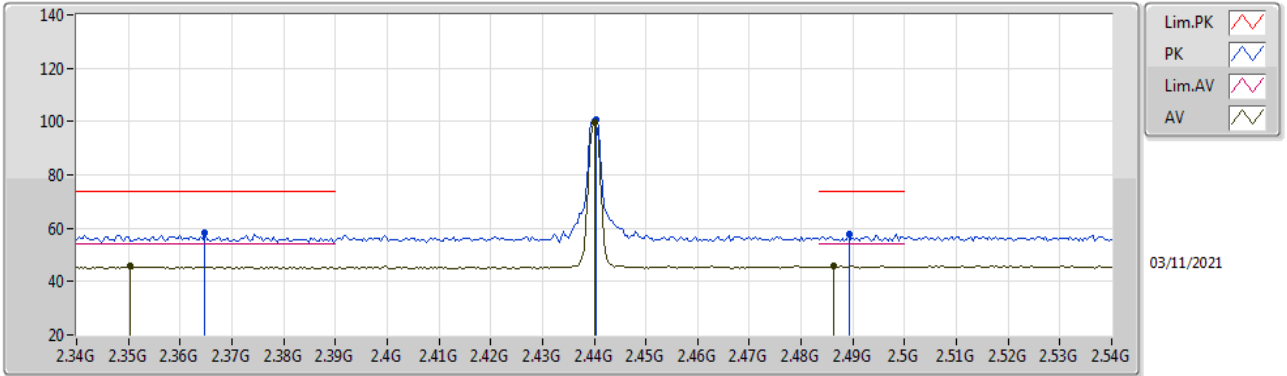
2440MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.3464G	45.76	54.00	-8.24	32.33	3	Vertical	326	1.50	-	13.43	27.80	4.53	-
AV	2.44G	91.03	Inf	-Inf	32.12	3	Vertical	326	1.50	-	58.91	27.52	4.60	-
AV	2.4868G	45.68	54.00	-8.32	32.11	3	Vertical	326	1.50	-	13.57	27.50	4.61	-
PK	2.3508G	57.96	74.00	-16.04	32.33	3	Vertical	326	1.50	-	25.63	27.80	4.53	-
PK	2.4396G	91.98	Inf	-Inf	32.12	3	Vertical	326	1.50	-	59.86	27.52	4.60	-
PK	2.496G	56.81	74.00	-17.19	32.12	3	Vertical	326	1.50	-	24.69	27.50	4.62	-

BT-LE(1Mbps)

2440MHz_TX

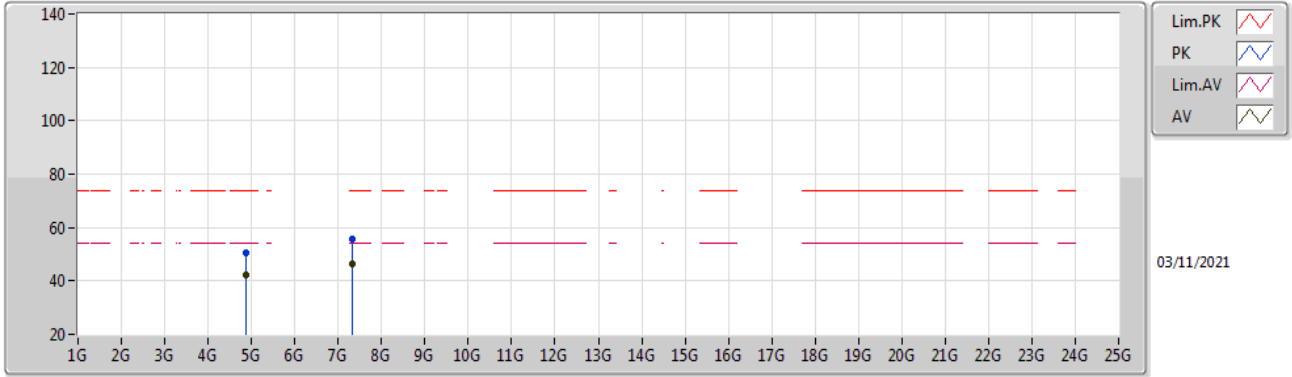


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.3504G	45.65	54.00	-8.35	32.33	3	Horizontal	259	1.50	-	13.32	27.80	4.53	-
AV	2.44G	99.87	Inf	-Inf	32.12	3	Horizontal	259	1.50	-	67.75	27.52	4.60	-
AV	2.4864G	45.78	54.00	-8.22	32.11	3	Horizontal	259	1.50	-	13.67	27.50	4.61	-
PK	2.3648G	58.08	74.00	-15.92	32.29	3	Horizontal	259	1.50	-	25.79	27.74	4.55	-
PK	2.4404G	100.82	Inf	-Inf	32.12	3	Horizontal	259	1.50	-	68.70	27.52	4.60	-
PK	2.4892G	57.54	74.00	-16.46	32.12	3	Horizontal	259	1.50	-	25.42	27.50	4.62	-



BT-LE(1Mbps)

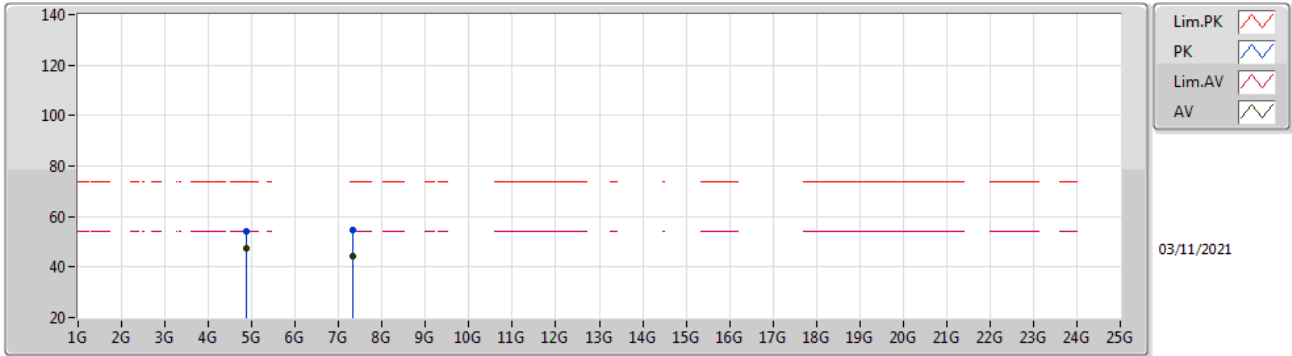
2440MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.88012G	42.42	54.00	-11.58	3.03	3	Vertical	101	1.13	-	39.39	31.10	6.72	34.79
AV	7.3194G	46.27	54.00	-7.73	9.41	3	Vertical	187	1.02	-	36.86	36.36	7.87	34.82
PK	4.87941G	50.45	74.00	-23.55	3.03	3	Vertical	101	1.13	-	47.42	31.10	6.72	34.79
PK	7.31945G	55.66	74.00	-18.34	9.41	3	Vertical	187	1.02	-	46.25	36.36	7.87	34.82

BT-LE(1Mbps)

2440MHz_TX

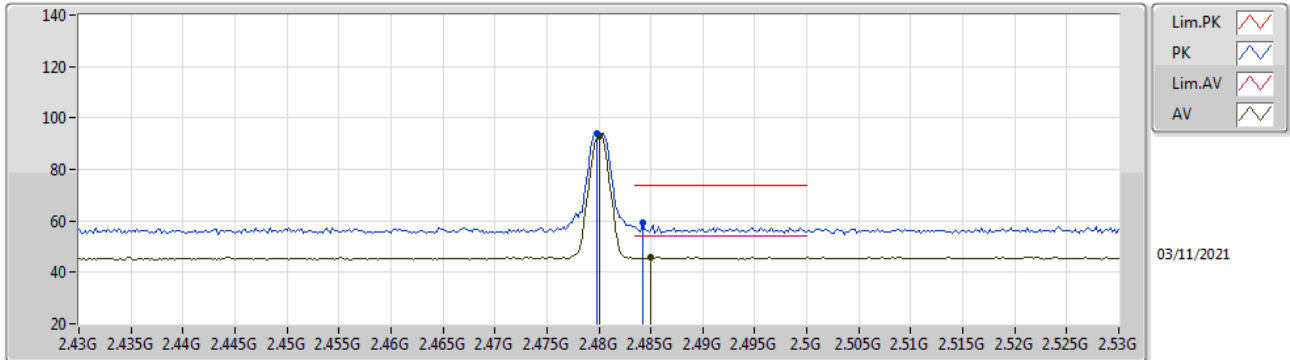


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.88013G	47.60	54.00	-6.40	3.03	3	Horizontal	173	1.05	-	44.57	31.10	6.72	34.79
AV	7.31953G	44.06	54.00	-9.94	9.41	3	Horizontal	42	1.03	-	34.65	36.36	7.87	34.82
PK	4.87955G	53.88	74.00	-20.12	3.03	3	Horizontal	173	1.05	-	50.85	31.10	6.72	34.79
PK	7.32061G	54.62	74.00	-19.38	9.41	3	Horizontal	42	1.03	-	45.21	36.36	7.87	34.82



BT-LE(1Mbps)

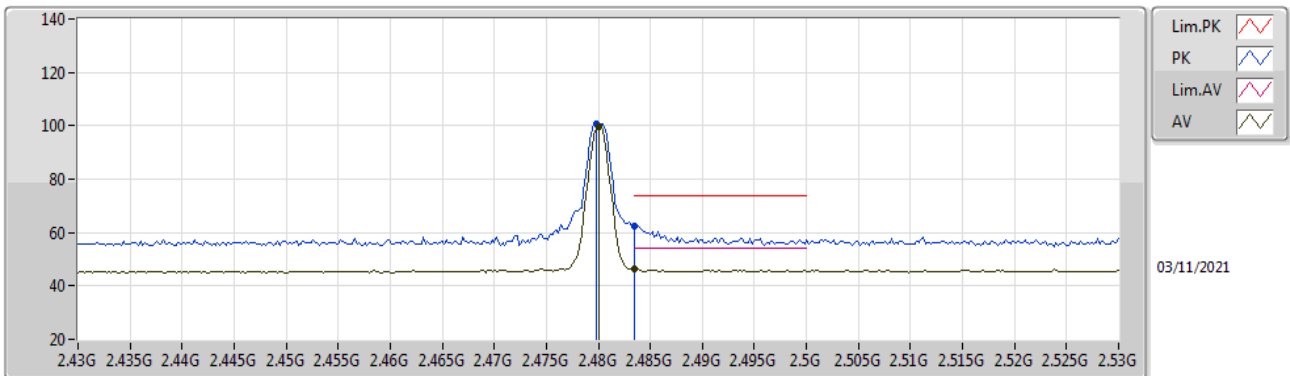
2480MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
PK	2.4798G	94.09	Inf	-Inf	32.11	3	Vertical	224	1.17	-	61.98	27.50	4.61	-
AV	2.48G	93.09	Inf	-Inf	32.11	3	Vertical	224	1.17	-	60.98	27.50	4.61	-
PK	2.4842G	59.16	74.00	-14.84	32.11	3	Vertical	224	1.17	-	27.05	27.50	4.61	-
AV	2.485G	45.77	54.00	-8.23	32.11	3	Vertical	224	1.17	-	13.66	27.50	4.61	-

BT-LE(1Mbps)

2480MHz_TX

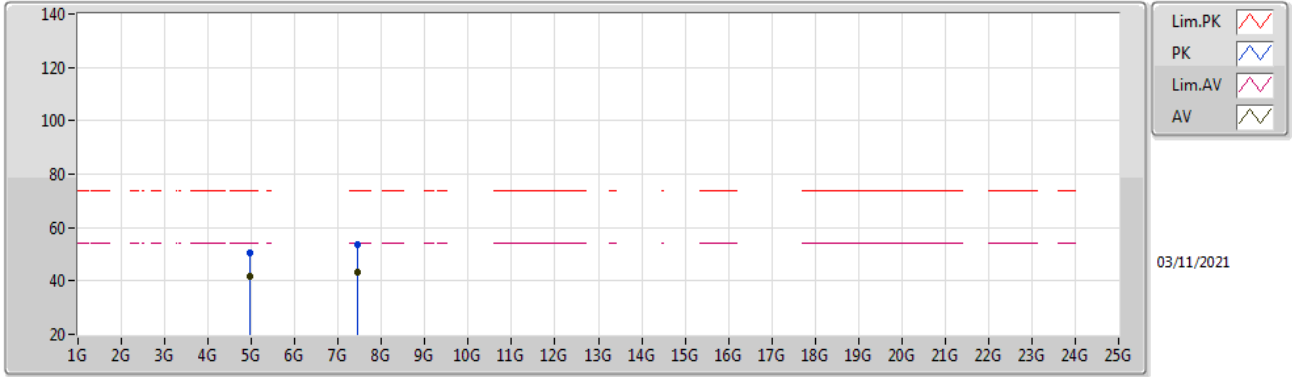


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.48G	99.66	Inf	-Inf	32.11	3	Horizontal	235	1.35	-	67.55	27.50	4.61	-
AV	2.4835G	46.44	54.00	-7.56	32.11	3	Horizontal	235	1.35	-	14.33	27.50	4.61	-
PK	2.4798G	100.63	Inf	-Inf	32.11	3	Horizontal	235	1.35	-	68.52	27.50	4.61	-
PK	2.4835G	62.48	74.00	-11.52	32.11	3	Horizontal	235	1.35	-	30.37	27.50	4.61	-



BT-LE(1Mbps)

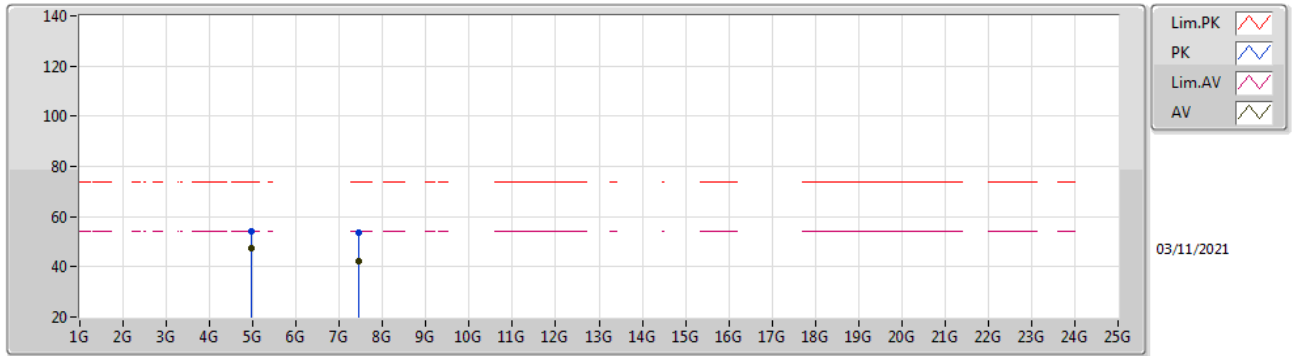
2480MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.96001G	41.98	54.00	-12.02	3.35	3	Vertical	87	1.09	-	38.63	31.34	6.78	34.77
AV	7.43943G	43.20	54.00	-10.80	9.49	3	Vertical	191	2.93	-	33.71	36.28	8.05	34.84
PK	4.95962G	50.58	74.00	-23.42	3.35	3	Vertical	87	1.09	-	47.23	31.34	6.78	34.77
PK	7.4394G	53.83	74.00	-20.17	9.49	3	Vertical	191	2.93	-	44.34	36.28	8.05	34.84

BT-LE(1Mbps)

2480MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.96018G	47.40	54.00	-6.60	3.35	3	Horizontal	173	1.04	-	44.05	31.34	6.78	34.77
AV	7.43936G	42.19	54.00	-11.81	9.49	3	Horizontal	42	1.02	-	32.70	36.28	8.05	34.84
PK	4.95958G	54.07	74.00	-19.93	3.35	3	Horizontal	173	1.04	-	50.72	31.34	6.78	34.77
PK	7.43928G	53.80	74.00	-20.20	9.49	3	Horizontal	42	1.02	-	44.31	36.28	8.05	34.84



Button Antenna
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	-	-	-	-	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	AV	2.3894G	46.16	54.00	-7.84	3	Horizontal	131	1.50	-

Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	AV	2.368G	45.60	54.00	-8.40	3	Vertical	230	1.09	-
2402MHz	Pass	AV	2.402G	92.41	Inf	-Inf	3	Vertical	230	1.09	-
2402MHz	Pass	PK	2.3828G	58.53	74.00	-15.47	3	Vertical	230	1.09	-
2402MHz	Pass	PK	2.4018G	93.37	Inf	-Inf	3	Vertical	230	1.09	-
2402MHz	Pass	AV	2.3894G	46.16	54.00	-7.84	3	Horizontal	131	1.50	-
2402MHz	Pass	AV	2.402G	96.59	Inf	-Inf	3	Horizontal	131	1.50	-
2402MHz	Pass	PK	2.352G	57.47	74.00	-16.53	3	Horizontal	131	1.50	-
2402MHz	Pass	PK	2.4018G	97.51	Inf	-Inf	3	Horizontal	131	1.50	-
2402MHz	Pass	AV	4.80395G	39.52	54.00	-14.48	3	Vertical	175	2.77	-
2402MHz	Pass	PK	4.80357G	49.66	74.00	-24.34	3	Vertical	175	2.77	-
2402MHz	Pass	AV	4.80412G	41.08	54.00	-12.92	3	Horizontal	30	2.76	-
2402MHz	Pass	PK	4.8036G	50.08	74.00	-23.92	3	Horizontal	30	2.76	-
2440MHz	Pass	AV	2.3508G	45.58	54.00	-8.42	3	Vertical	234	1.12	-
2440MHz	Pass	AV	2.44G	89.08	Inf	-Inf	3	Vertical	234	1.12	-
2440MHz	Pass	AV	2.4912G	45.89	54.00	-8.11	3	Vertical	234	1.12	-
2440MHz	Pass	PK	2.3836G	57.86	74.00	-16.14	3	Vertical	234	1.12	-
2440MHz	Pass	PK	2.4396G	90.11	Inf	-Inf	3	Vertical	234	1.12	-
2440MHz	Pass	PK	2.4848G	56.99	74.00	-17.01	3	Vertical	234	1.12	-
2440MHz	Pass	AV	2.3492G	45.66	54.00	-8.34	3	Horizontal	54	1.32	-
2440MHz	Pass	AV	2.44G	97.32	Inf	-Inf	3	Horizontal	54	1.32	-
2440MHz	Pass	AV	2.4872G	45.72	54.00	-8.28	3	Horizontal	54	1.32	-
2440MHz	Pass	PK	2.344G	56.99	74.00	-17.01	3	Horizontal	54	1.32	-
2440MHz	Pass	PK	2.4404G	98.30	Inf	-Inf	3	Horizontal	54	1.32	-
2440MHz	Pass	PK	2.4896G	57.48	74.00	-16.52	3	Horizontal	54	1.32	-
2440MHz	Pass	AV	4.88034G	37.10	54.00	-16.90	3	Vertical	171	2.34	-
2440MHz	Pass	AV	7.31952G	46.11	54.00	-7.89	3	Vertical	180	2.90	-
2440MHz	Pass	PK	4.87997G	47.46	74.00	-26.54	3	Vertical	171	2.34	-
2440MHz	Pass	PK	7.32095G	55.53	74.00	-18.47	3	Vertical	180	2.90	-
2440MHz	Pass	AV	4.88013G	38.41	54.00	-15.59	3	Horizontal	29	2.71	-
2440MHz	Pass	AV	7.31944G	43.96	54.00	-10.04	3	Horizontal	259	2.48	-
2440MHz	Pass	PK	4.88002G	47.75	74.00	-26.25	3	Horizontal	29	2.71	-
2440MHz	Pass	PK	7.32006G	54.26	74.00	-19.74	3	Horizontal	259	2.48	-
2480MHz	Pass	AV	2.48G	87.64	Inf	-Inf	3	Vertical	234	1.08	-
2480MHz	Pass	AV	2.4952G	45.89	54.00	-8.11	3	Vertical	234	1.08	-
2480MHz	Pass	PK	2.4802G	88.72	Inf	-Inf	3	Vertical	234	1.08	-
2480MHz	Pass	PK	2.4874G	57.08	74.00	-16.92	3	Vertical	234	1.08	-
2480MHz	Pass	AV	2.48G	95.44	Inf	-Inf	3	Horizontal	50	1.13	-
2480MHz	Pass	AV	2.4835G	46.06	54.00	-7.94	3	Horizontal	50	1.13	-
2480MHz	Pass	PK	2.4804G	96.44	Inf	-Inf	3	Horizontal	50	1.13	-

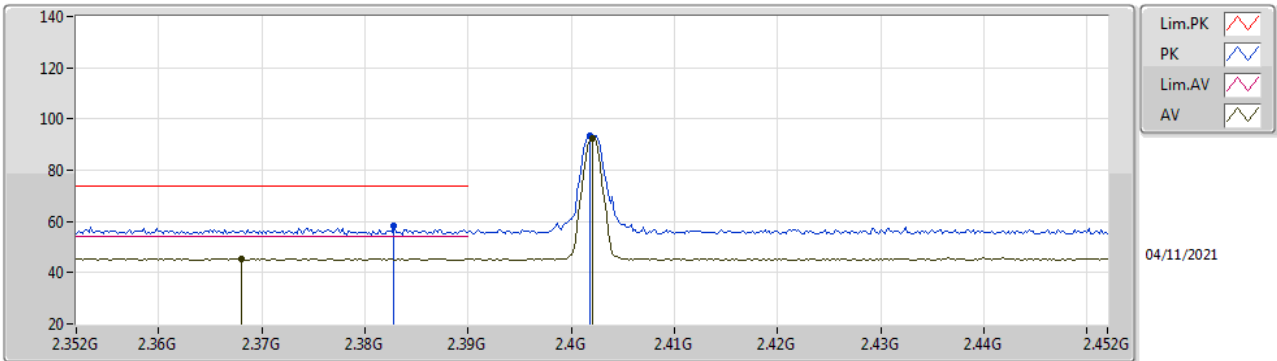


Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2480MHz	Pass	PK	2.4836G	59.30	74.00	-14.70	3	Horizontal	50	1.13	-
2480MHz	Pass	AV	4.9601G	39.48	54.00	-14.52	3	Vertical	290	1.14	-
2480MHz	Pass	AV	7.43959G	44.64	54.00	-9.36	3	Vertical	179	2.92	-
2480MHz	Pass	PK	4.95991G	49.54	74.00	-24.46	3	Vertical	290	1.14	-
2480MHz	Pass	PK	7.43936G	54.65	74.00	-19.35	3	Vertical	179	2.92	-
2480MHz	Pass	AV	4.96022G	40.47	54.00	-13.53	3	Horizontal	30	1.00	-
2480MHz	Pass	AV	7.43926G	42.08	54.00	-11.92	3	Horizontal	266	1.00	-
2480MHz	Pass	PK	4.9599G	49.67	74.00	-24.33	3	Horizontal	30	1.00	-
2480MHz	Pass	PK	7.4395G	52.92	74.00	-21.08	3	Horizontal	266	1.00	-



BT-LE(1Mbps)

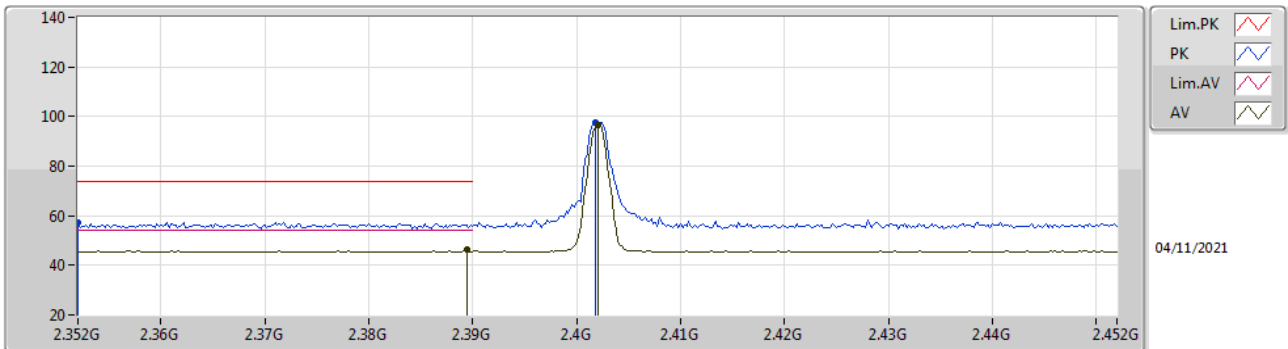
2402MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.368G	45.60	54.00	-8.40	32.28	3	Vertical	230	1.09	-	13.32	27.73	4.55	-
AV	2.402G	92.41	Inf	-Inf	32.18	3	Vertical	230	1.09	-	60.23	27.60	4.58	-
PK	2.3828G	58.53	74.00	-15.47	32.23	3	Vertical	230	1.09	-	26.30	27.67	4.56	-
PK	2.4018G	93.37	Inf	-Inf	32.18	3	Vertical	230	1.09	-	61.19	27.60	4.58	-

BT-LE(1Mbps)

2402MHz_TX

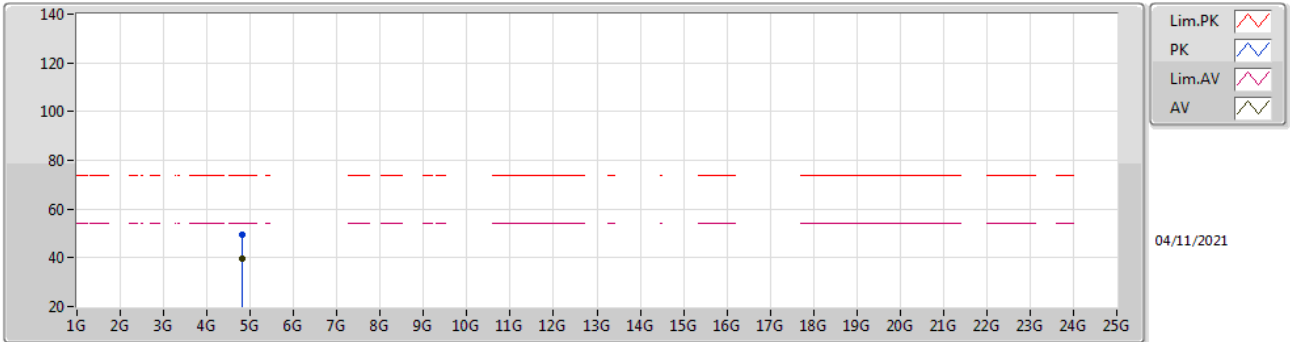


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.3894G	46.16	54.00	-7.84	32.21	3	Horizontal	131	1.50	-	13.95	27.64	4.57	-
AV	2.402G	96.59	Inf	-Inf	32.18	3	Horizontal	131	1.50	-	64.41	27.60	4.58	-
PK	2.352G	57.47	74.00	-16.53	32.32	3	Horizontal	131	1.50	-	25.15	27.79	4.53	-
PK	2.4018G	97.51	Inf	-Inf	32.18	3	Horizontal	131	1.50	-	65.33	27.60	4.58	-



BT-LE(1Mbps)

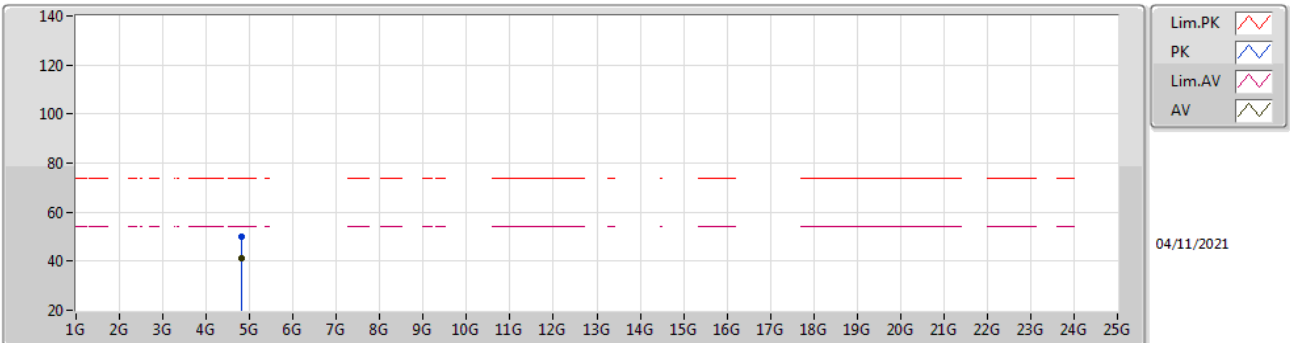
2402MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.80395G	39.52	54.00	-14.48	2.95	3	Vertical	175	2.77	-	36.57	31.10	6.66	34.81
PK	4.80357G	49.66	74.00	-24.34	2.95	3	Vertical	175	2.77	-	46.71	31.10	6.66	34.81

BT-LE(1Mbps)

2402MHz_TX

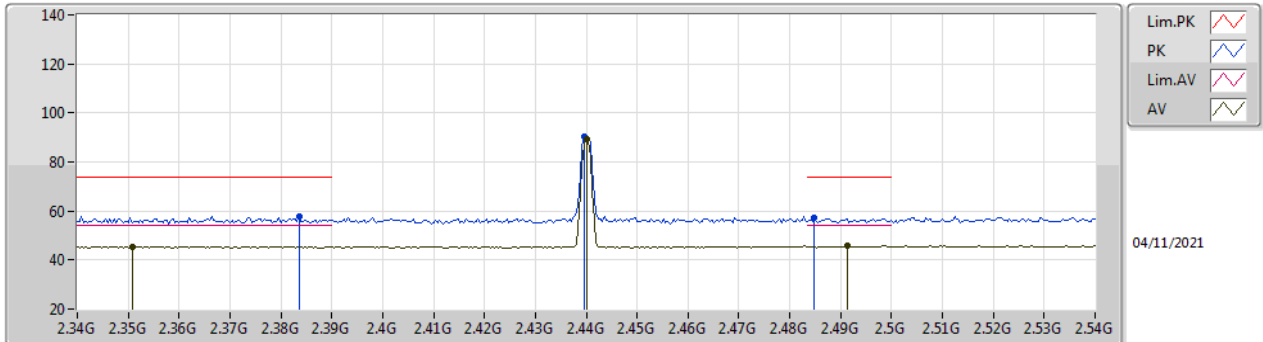


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.80412G	41.08	54.00	-12.92	2.95	3	Horizontal	30	2.76	-	38.13	31.10	6.66	34.81
PK	4.8036G	50.08	74.00	-23.92	2.95	3	Horizontal	30	2.76	-	47.13	31.10	6.66	34.81



BT-LE(1Mbps)

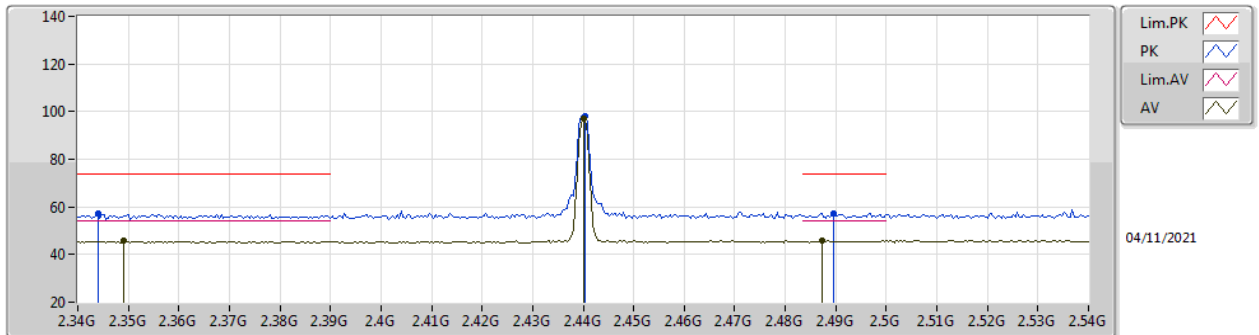
2440MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.3508G	45.58	54.00	-8.42	32.33	3	Vertical	234	1.12	-	13.25	27.80	4.53	-
AV	2.44G	89.08	Inf	-Inf	32.12	3	Vertical	234	1.12	-	56.96	27.52	4.60	-
AV	2.4912G	45.89	54.00	-8.11	32.12	3	Vertical	234	1.12	-	13.77	27.50	4.62	-
PK	2.3836G	57.86	74.00	-16.14	32.23	3	Vertical	234	1.12	-	25.63	27.67	4.56	-
PK	2.4396G	90.11	Inf	-Inf	32.12	3	Vertical	234	1.12	-	57.99	27.52	4.60	-
PK	2.4848G	56.99	74.00	-17.01	32.11	3	Vertical	234	1.12	-	24.88	27.50	4.61	-

BT-LE(1Mbps)

2440MHz_TX

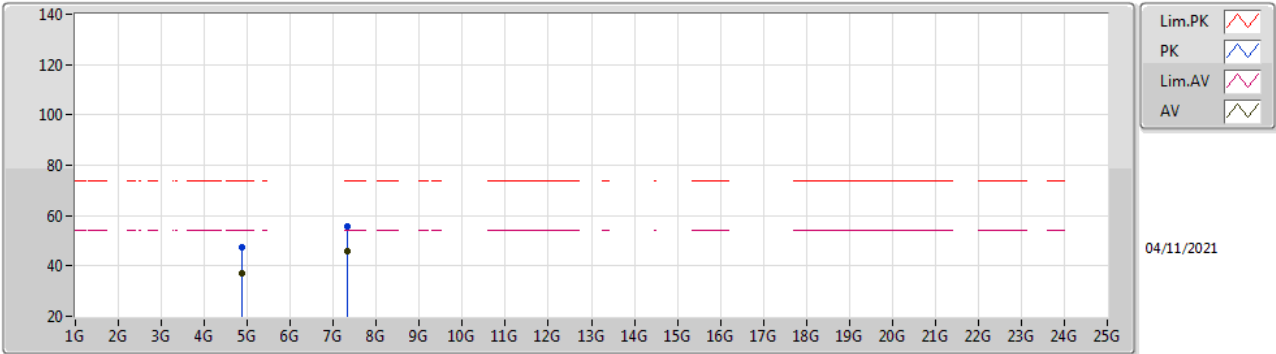


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.3492G	45.66	54.00	-8.34	32.33	3	Horizontal	54	1.32	-	13.33	27.80	4.53	-
AV	2.44G	97.32	Inf	-Inf	32.12	3	Horizontal	54	1.32	-	65.20	27.52	4.60	-
AV	2.4872G	45.72	54.00	-8.28	32.11	3	Horizontal	54	1.32	-	13.61	27.50	4.61	-
PK	2.344G	56.99	74.00	-17.01	32.33	3	Horizontal	54	1.32	-	24.66	27.80	4.53	-
PK	2.4404G	98.30	Inf	-Inf	32.12	3	Horizontal	54	1.32	-	66.18	27.52	4.60	-
PK	2.4896G	57.48	74.00	-16.52	32.12	3	Horizontal	54	1.32	-	25.36	27.50	4.62	-



BT-LE(1Mbps)

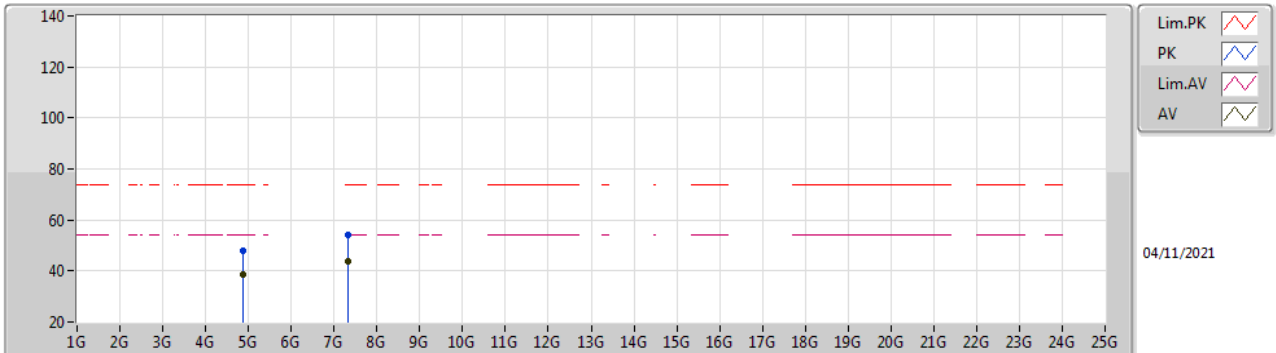
2440MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.88034G	37.10	54.00	-16.90	3.03	3	Vertical	171	2.34	-	34.07	31.10	6.72	34.79
AV	7.31952G	46.11	54.00	-7.89	9.41	3	Vertical	180	2.90	-	36.70	36.36	7.87	34.82
PK	4.87997G	47.46	74.00	-26.54	3.03	3	Vertical	171	2.34	-	44.43	31.10	6.72	34.79
PK	7.32095G	55.53	74.00	-18.47	9.42	3	Vertical	180	2.90	-	46.11	36.36	7.88	34.82

BT-LE(1Mbps)

2440MHz_TX

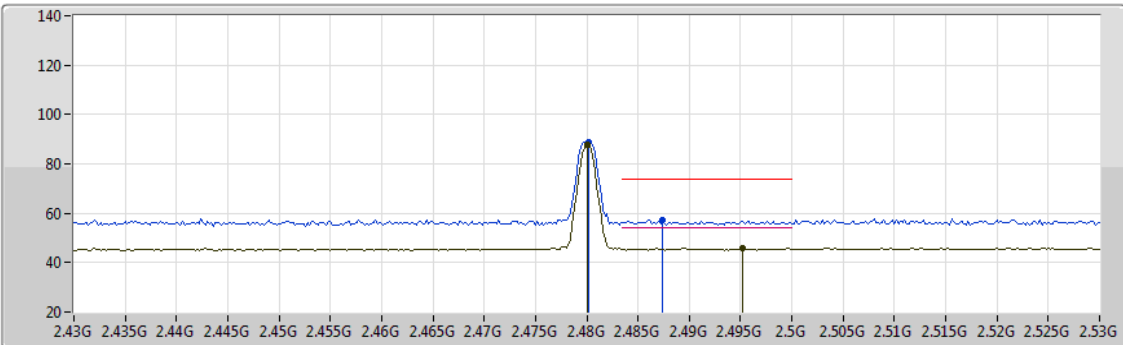


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.88013G	38.41	54.00	-15.59	3.03	3	Horizontal	29	2.71	-	35.38	31.10	6.72	34.79
AV	7.31944G	43.96	54.00	-10.04	9.41	3	Horizontal	259	2.48	-	34.55	36.36	7.87	34.82
PK	4.88002G	47.75	74.00	-26.25	3.03	3	Horizontal	29	2.71	-	44.72	31.10	6.72	34.79
PK	7.32006G	54.26	74.00	-19.74	9.41	3	Horizontal	259	2.48	-	44.85	36.36	7.87	34.82



BT-LE(1Mbps)

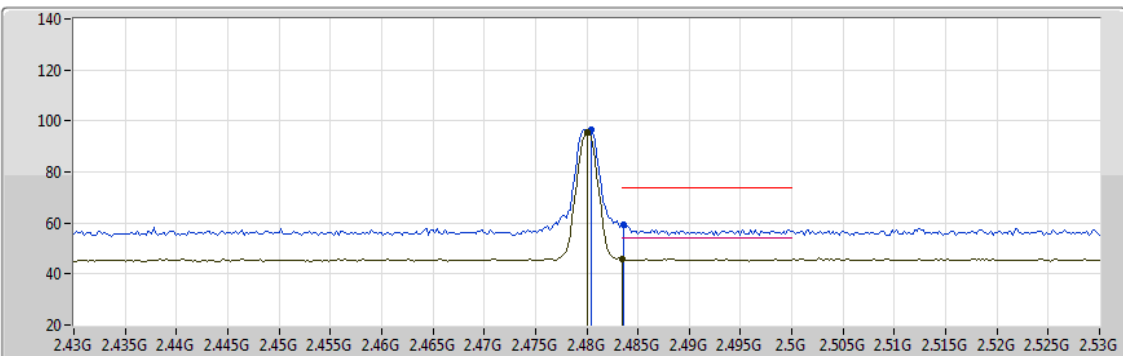
2480MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.48G	87.64	Inf	-Inf	32.11	3	Vertical	234	1.08	-	55.53	27.50	4.61	-
AV	2.4952G	45.89	54.00	-8.11	32.12	3	Vertical	234	1.08	-	13.77	27.50	4.62	-
PK	2.4802G	88.72	Inf	-Inf	32.11	3	Vertical	234	1.08	-	56.61	27.50	4.61	-
PK	2.4874G	57.08	74.00	-16.92	32.11	3	Vertical	234	1.08	-	24.97	27.50	4.61	-

BT-LE(1Mbps)

2480MHz_TX

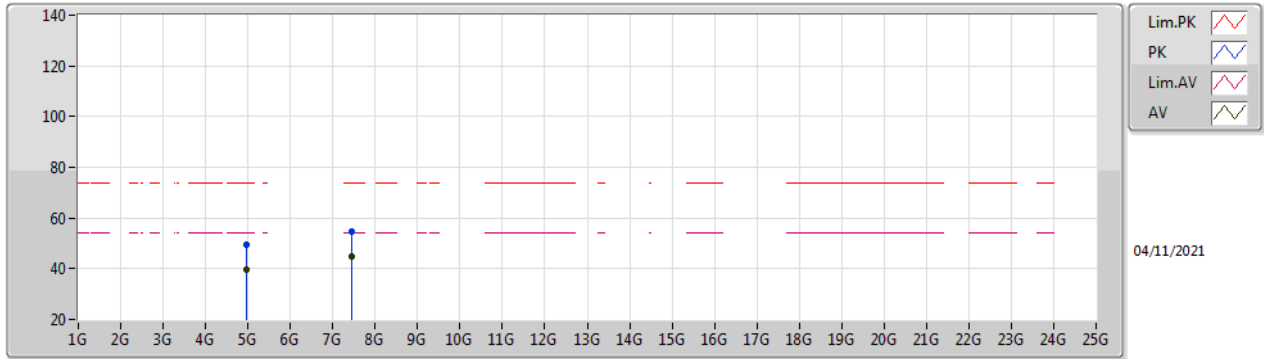


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.48G	95.44	Inf	-Inf	32.11	3	Horizontal	50	1.13	-	63.33	27.50	4.61	-
AV	2.4835G	46.06	54.00	-7.94	32.11	3	Horizontal	50	1.13	-	13.95	27.50	4.61	-
PK	2.4804G	96.44	Inf	-Inf	32.11	3	Horizontal	50	1.13	-	64.33	27.50	4.61	-
PK	2.4836G	59.30	74.00	-14.70	32.11	3	Horizontal	50	1.13	-	27.19	27.50	4.61	-



BT-LE(1Mbps)

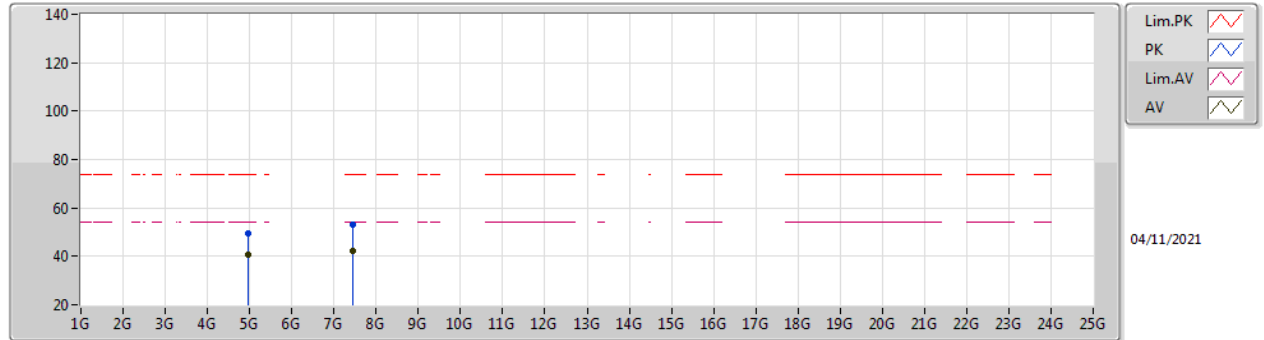
2480MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.9601G	39.48	54.00	-14.52	3.35	3	Vertical	290	1.14	-	36.13	31.34	6.78	34.77
AV	7.43959G	44.64	54.00	-9.36	9.50	3	Vertical	179	2.92	-	35.14	36.28	8.06	34.84
PK	4.95991G	49.54	74.00	-24.46	3.35	3	Vertical	290	1.14	-	46.19	31.34	6.78	34.77
PK	7.43936G	54.65	74.00	-19.35	9.49	3	Vertical	179	2.92	-	45.16	36.28	8.05	34.84

BT-LE(1Mbps)

2480MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.96022G	40.47	54.00	-13.53	3.35	3	Horizontal	30	1.00	-	37.12	31.34	6.78	34.77
AV	7.43926G	42.08	54.00	-11.92	9.49	3	Horizontal	266	1.00	-	32.59	36.28	8.05	34.84
PK	4.9599G	49.67	74.00	-24.33	3.35	3	Horizontal	30	1.00	-	46.32	31.34	6.78	34.77
PK	7.4395G	52.92	74.00	-21.08	9.49	3	Horizontal	266	1.00	-	43.43	36.28	8.05	34.84



4 Test Equipment and Calibration Data

Instrument for AC Conduction

Instrument	Manufacturer /Brand	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
EMI Test Receiver	R&S	ESR3	102051	9kHz ~ 3.6GHz	21/May/2021	20/May/2022
LISN	R&S	ENV216	100003	9kHz ~ 30MHz	15/Dec/2020	14/Dec/2021
RF Cable 5m	TITAN	TITAN	CO04-cable-01	0.1MHz~200MHz	03/Mar/2021	02/Mar/2022
Impuls Begrenzer Pulse Limiter	SCHWARZBECK	VTSD 9561-F	9561-F041	9kHz ~ 30MHz	15/Sep/2021	14/Sep/2022

Instrument for Conducted Test

Instrument	Manufacturer /Brand	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
Signal Analyzer	R&S	FSV 40	101029	10Hz~40GHz	20/Oct/2021	19/Oct/2022
SMB100A Signal Generator	R&S	SMB100A03	181147	100kHz~40GHz	21/Oct/2021	20/Oct/2022
Pulse Sensor	Anritsu	MA2411B	1027452	300MHz~40GHz	25/Mar/2021	24/Mar/2022
Power Meter	Anritsu	ML2495A	1124009	300MHz~40GHz	25/Mar/2021	24/Mar/2022

Instrument for Radiated Test

Instrument	Manufacturer /Brand	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
3m Semi Anechoic Chamber	TDK	SAC-3M	03CH09-HY	30MHz~1GHz 3m	26/Mar/2021	25/Mar/2022
3m Semi Anechoic Chamber	TDK	SAC-3M	03CH09-HY	1GHz~18GHz 3m	18/Mar/2021	17/Mar/2022
EXA Signal Analyzer	KEYSIGHT	N9010A	MY54200885	10Hz~44GHz	13/Aug/2021	12/Aug/2022
Amplifier	EMC	EMC9135	980232	9kHz~1GHz	12/Apr/2021	11/Apr/2022
Microwave Preamplifier	Agilent	8449B	3008A02096	1GHz~26.5GHz	23/Jul/2021	22/Jul/2022
Bilog Antenna & 5dB Attenuator	TESEQ & MTJ	CBL6111D&MT J6102-05	35418 & 3	30MHz~1GHz	04/Sep/2021	03/Sep/2022
Double Ridged Guide Horn Antenna	SCHWARZBECK	BBHA 9120 D	BBHA9120 D 1534	1GHz~18GHz	18/May/2021	17/May/2022
RF Cable-low	Jye Bao	RG142	CB031+324530/4	9kHz~30MHz	30/Aug/2021	29/Aug/2022
RF Cable-low	Jye Bao	RG142	CB031+324530/4	30MHz~1GHz	09/Feb/2021	08/Feb/2022
RF CABLE 5m+3m+1m	HUBER+SUHNER	SUCOFLEX104	CB009	1GHz~40GHz	13/Aug/2021	12/Aug/2022
Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA 9170221	18GHz~40GHz	11/Mar/2021	10/Mar/2022
Microwave Premplifier	EMC INSTRUMENTS	EM18G40G	060604	18GHz ~ 40GHz	09/Mar/2021	08/Mar/2022
Loop Antenna	TESEQ	HLA 6120	31244	9kHz~30MHz	16/Mar/2021	15/Mar/2022
EMI Test Receiver	R&S	ESR3	102052	9kHz~3.6GHz	19/Apr/2021	18/Apr/2022