

NCC Test Report

Equipment : Wifi and BT Module
Brand Name : realme
Model Name : WB7638G-LT
Applicant : 薩摩亞商新茂環球有限公司台灣分公司
臺北市內湖區新湖一路 133 號 6 樓
Manufacturer : Realme Chongqing Mobile Telecommunications Corp., Ltd.
No.178 Yulong Avenue, Yufengshan, Yubei District,
Chongqing , China.
Standard : LP0002 Section 3.10 (2018-01-10)

The product was received on Jul. 15, 2020, and testing was started from Aug. 07, 2020 and completed on Sep. 04, 2020. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications 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. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.



Approved by: Allen Lin

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory

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

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History of this test report

[illegible]

Summary of Test Result

Report Clause	Ref.Std. Clause	Test Items	Result (PASS/FAIL)	Remark
1.1.2	3.10.1.4	Antenna Requirement	PASS	-
3.1	2.3	AC Power-line Conducted Emissions	PASS	-
3.2	3.10.1.6	DTS Bandwidth	PASS	-
3.3	3.10.1.2	Maximum Conducted Output Power	PASS	-
3.4	3.10.1.6	Power Spectral Density	PASS	-
3.5	3.10.1.5	Emissions in Non-restricted Frequency Bands	PASS	-
3.6	3.10.1.5	Emissions in Restricted Frequency Bands	PASS	-
3.7	2.11	Receiver Radiated Unwanted Emissions	PASS	-
3.8	5.20	Maximum Permissible Exposure	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: Yunha Liou

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	BWch (MHz)	Nant
2.4-2.4835GHz	BT-LE(1Mbps)	1.0	1TX
2.4-2.4835GHz	BT-LE(2Mbps)	2.0	1TX

Note:

- Bluetooth LE uses a GFSK (1Mbps/2Mbps) modulation.
- BWch is the nominal channel bandwidth.

1.1.2 Antenna Information

Ant.	Brand	Model Name	Antenna Type	Connector
1	博安通	ADM320G37B1\$ADM320G37A1\$ADM320G37C1	PIFA	I-PEX
2	博安通	ADM320G37B1\$ADM320G37A1\$ADM320G37C1	PIFA	I-PEX

Ant.	Port	Gain (dBi)	
		2.4G	BT
1	1	2.25	-
2	2	-	2.25

Note 1: The EUT has two antennas.

For 2.4GHz function:

For IEEE 802.11 b/g/n mode (2TX/2RX)

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

For BT function:

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

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

1.1.3 EUT Information

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

1.1.4 Mode Test Duty Cycle

Mode	DC	DCF(dB)	T(s)	VBW(Hz) $\geq$ 1/T
BT-LE(1Mbps)	0.85	0.71	2.124m	1k
BT-LE(2Mbps)	0.539	2.68	1.068m	1k

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

1.2 Testing Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ LP0002 (2018-01-10)
- ♦ ANSI C63.10-2013
- ♦ ANSI C63.4-2014

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

Testing Location					
☒	HWA YA	ADD	: No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)		
		TEL	: 886-3-327-3456	FAX	: 886-3-327-0973
☐	JHUBEI	ADD	: No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County, Taiwan (R.O.C.)		
		TEL	: 886-3-656-9065	FAX	: 886-3-656-9085
☐	Wen Shan	ADD	: No.14-1, Ln. 19, Wen 33rd St., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)		
		TEL	: 886-3-318-0787	FAX	: 886-3-318-0287

Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
AC Conduction	CO01-HY	Edward	23.6~24.9°C / 52~58%	04/Sep/2020
RF Conducted	TH06-HY	Alan	20.1~26.9°C / 50~60%	10/Aug/2020
Radiated	03CH03-HY	Edward	22.5~26.1°C / 55~63%	07/Aug/2020~ 02/Sep/2020

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 Condition

RF Conducted	Abbreviation	Remark
TnomVnom	Tnom	20°C
-	Vnom	110V

2.2 Test Channel Mode

Test Software Version	WVN_Combo_Tool Ver 2.1749.00
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Mode	Power Setting
BT-LE(1Mbps)	-
2402MHz	default
2440MHz	default
2480MHz	default
BT-LE(2Mbps)	-
2402MHz	default
2440MHz	default
2480MHz	default

2.3 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
Operating Mode	CTX/CRX
1	Test fixture mode; TX
2	Test fixture mode; RX

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 Receiver Radiated Spurious Emissions
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/CRX
1	Test fixture mode
Operating Mode > 1GHz	CTX/CRX
Orthogonal Planes of EUT	Z Plane
	

2.4 Support Equipment

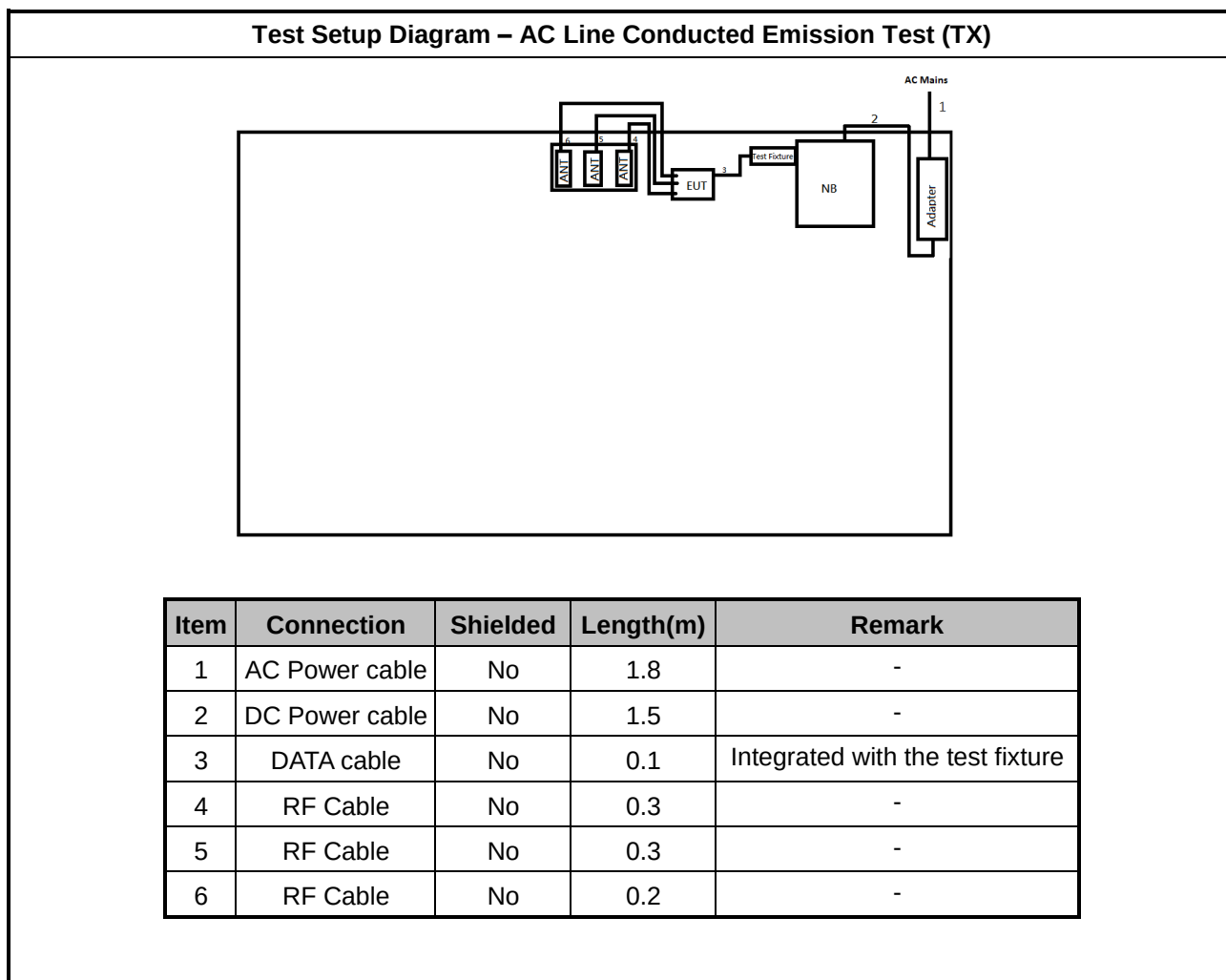
Support Equipment – AC Conduction / Radiated					
No.	Equipment	Brand Name	Model Name	FCC ID	Remark
1	Notebook	DELL	P06G	-	-
2	Adapter for NB	DELL	AA90PM111	-	-
3	AC Power Cable for NB	Power sync	PW-GPC180-3	-	-
4	iPod	Apple	A1199	-	-
5	30-pin to USB Original Cable	Apple	MA591GC	-	-
6	Earphone	Apple	MD827FEA	-	-
7	Test Fixture	AI-Link	5VTO3V3	-	Note 1

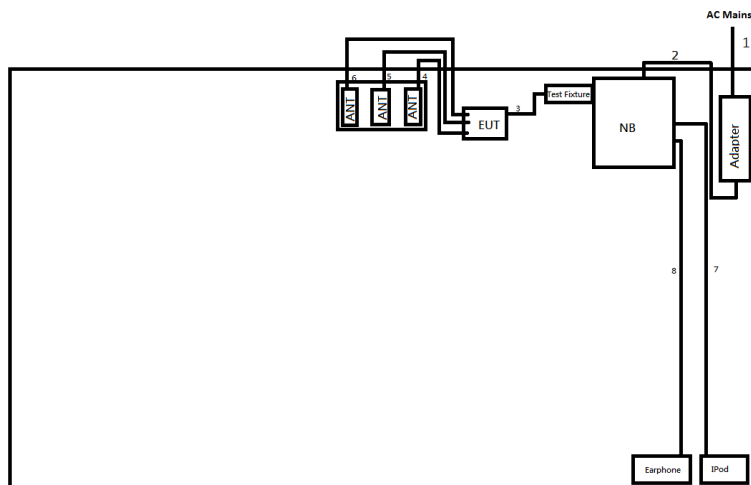
Note: No.7 was provided by customer. The applicant has signed the recognizance that the equipment will not be sold with the accessory.

Support Equipment – Conducted					
No.	Equipment	Brand Name	Model Name	FCC ID	Remark
1	Notebook	DELL	E5410	-	-
2	Adapter for NB	DELL	HA65NM130	-	-
3	Test Fixture	AI-Link	5VTO3V3	-	Note 1

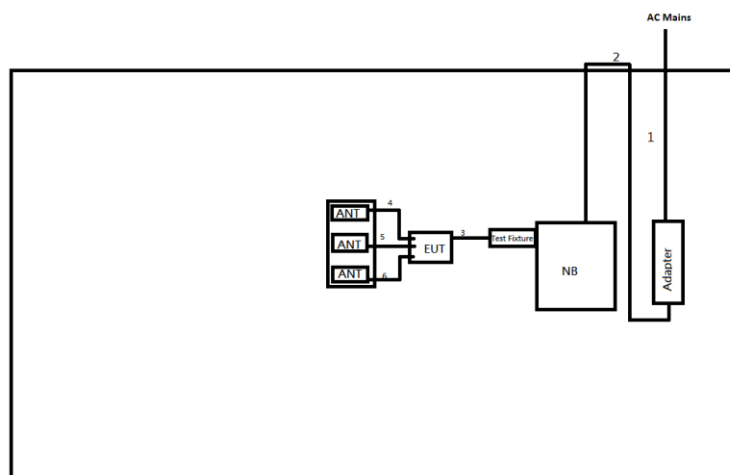
Note: No.3 was provided by customer. The applicant has signed the recognizance that the equipment will not be sold with the accessory.

2.5 Test Setup Diagram

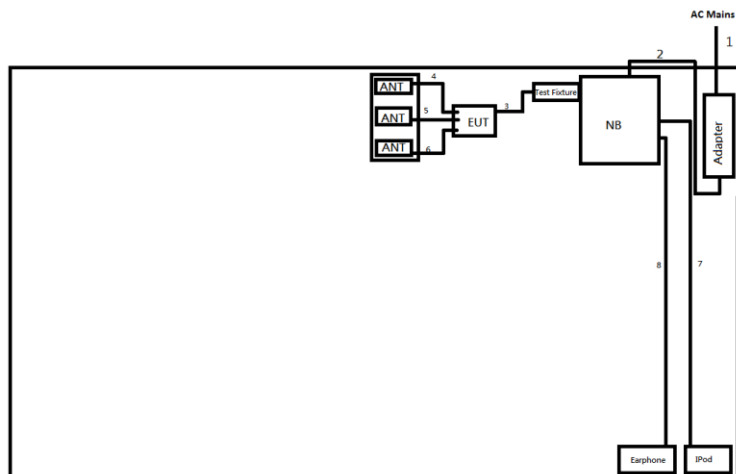


Test Setup Diagram – AC Line Conducted Emission Test (RX)


Item	Connection	Shielded	Length(m)	Remark
1	AC Power cable	No	1.8	
2	DC Power cable	No	1.5	
3	DATA cable	No	0.1	Integrated with the test fixture
4	RF Cable	No	0.3	
5	RF Cable	No	0.3	
6	RF Cable	No	0.2	
7	30-pin to USB Original Cable	No	1.0	
8	Audio Cable	No	1.25	

Test Setup Diagram - Radiated Test (TX)


Item	Connection	Shielded	Length(m)	Remark
1	AC Power cable	No	1.8	-
2	DC Power cable	No	1.5	-
3	DATA cable	No	0.1	Integrated with the test fixture
4	RF Cable	No	0.3	-
5	RF Cable	No	0.3	-
6	RF Cable	No	0.2	-

Test Setup Diagram - Radiated Test (RX)


Item	Connection	Shielded	Length(m)	Remark
1	AC Power cable	No	1.8	-
2	DC Power cable	No	1.5	-
3	DATA cable	No	0.1	Integrated with the test fixture
4	RF Cable	No	0.3	-
5	RF Cable	No	0.3	-
6	RF Cable	No	0.2	-
7	30-pin to USB Original Cable	No	1.0	-
8	Audio Cable	No	1.25	-

3 Transmitter Test Result

3.1 AC Power-line Conducted Emissions

3.1.1 AC Power-line Conducted Emissions Limit

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

3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

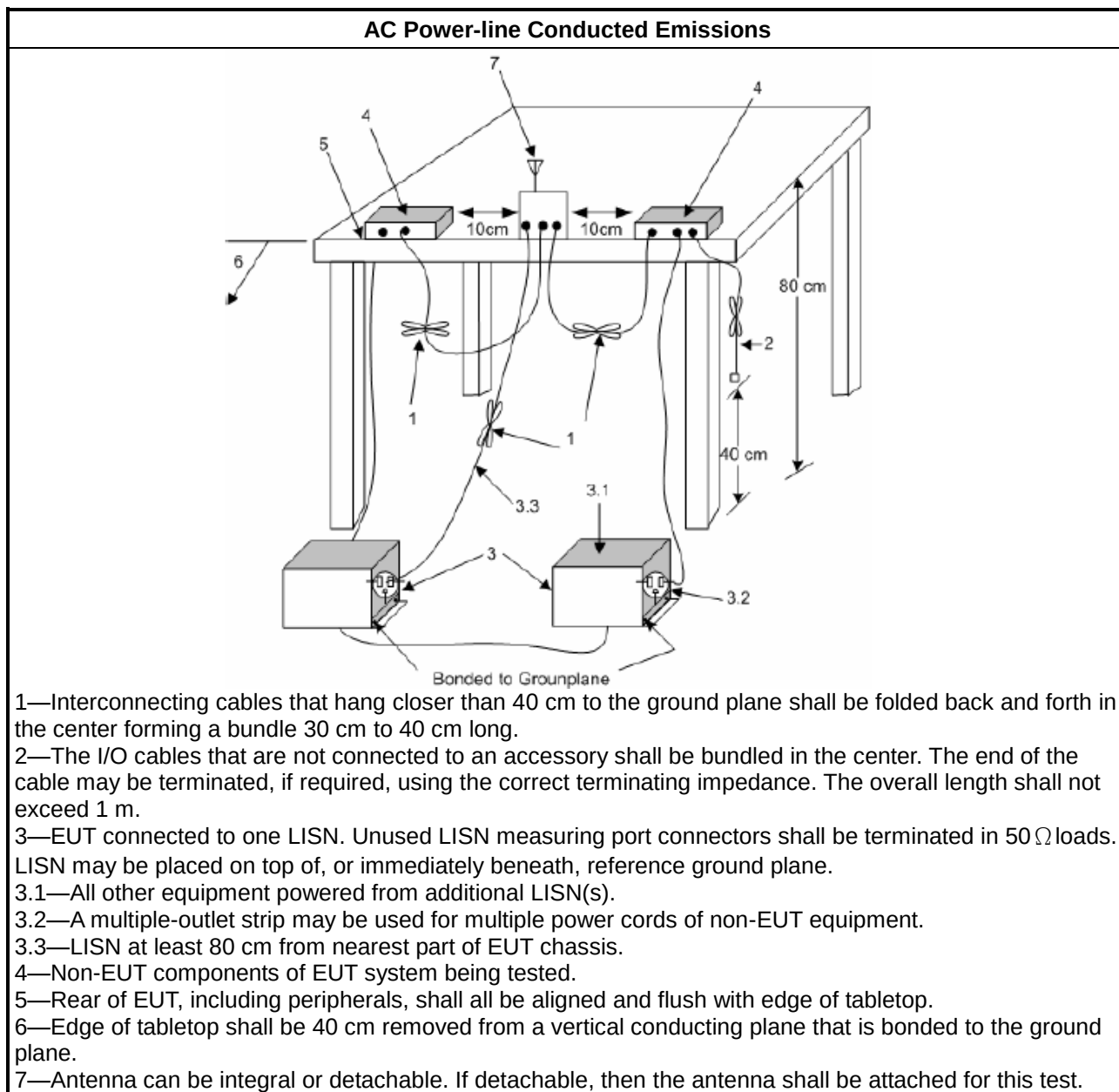
Test Method
▪ Refer as ANSI C63.10-2013, clause 6.2 foray power-line conducted emissions.

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

Refer as Appendix A

3.2 DTS Bandwidth

3.2.1 6dB Bandwidth Limit

6dB Bandwidth Limit	
Systems using digital modulation techniques:	
▪	6 dB bandwidth $\geq$ 500 kHz.

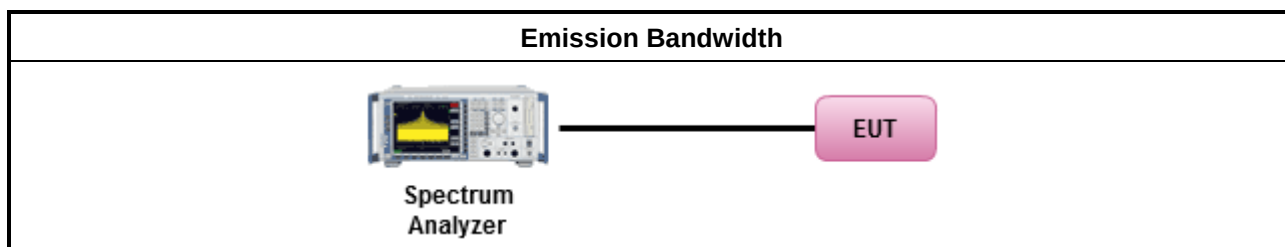
3.2.2 Measuring Instruments

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

3.2.3 Test Procedures

Test Method	
▪ For the emission bandwidth shall be measured using one of the options below:	
☒	Refer as KDB 558074, clause 8.2 (11.8 of ANSI C63.10) DTS bandwidth measurement.
☐	Refer as RSS-Gen, clause 6.7 for occupied bandwidth testing.
☐	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

Refer as Appendix B

3.3 Maximum Conducted Output Power

3.3.1 Maximum Conducted Output Power Limit

Maximum Conducted Output Power Limit	
	If $G_{TX} \leq 6$ dBi, then $P_{Out} \leq 30$ dBm (1 W)
	Point-to-multipoint systems (P2M): If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)$ dBm
	Point-to-point systems (P2P): If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3$ dBm
	Smart antenna system (SAS):
	- Single beam: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3$ dBm
	- Overlap beam: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3$ dBm
	- Aggregate power on all beams: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3 + 8$ dBm
e.i.r.p. Power Limit:	
	2400-2483.5 MHz Band
	Point-to-multipoint systems (P2M): $P_{eirp} \leq 36$ dBm (4 W)
	Point-to-point systems (P2P): $P_{eirp} \leq \text{MAX}(36, [P_{Out} + G_{TX}])$ dBm
	Smart antenna system (SAS)
	- Single beam: $P_{eirp} \leq \text{MAX}(36, P_{Out} + G_{TX})$ dBm
	- Overlap beam: $P_{eirp} \leq \text{MAX}(36, P_{Out} + G_{TX})$ dBm
	- 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.	

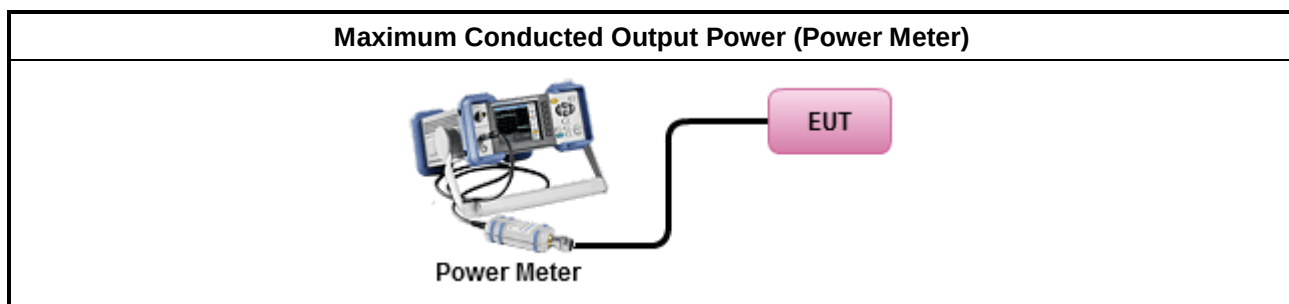
3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

Test Method	
Maximum Peak Conducted Output Power	
☐	Refer as KDB 558074, clause 8.3.1.1 (11.9.1.1 of ANSI C63.10) RBW ≥ EBW method.
☐	Refer as KDB 558074, clause 8.3.1.2 (11.9.1.2 of ANSI C63.10) integrated band power method.
☐	Refer as KDB 558074, clause 8.3.1.3 (11.9.1.3 of ANSI C63.10) peak power meter.
Maximum Average Conducted Output Power	
☐	Refer as KDB 558074, clause 8.3.2.2 (11.9.2.2 of ANSI C63.10) using a spectrum analyzer.
☒	Refer as KDB 558074, clause 8.3.2.3 (11.9.2.3 of ANSI C63.10) using a power meter.
For conducted measurement.	
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.	
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

Refer as Appendix C

3.4 Power Spectral Density

3.4.1 Power Spectral Density Limit

Power Spectral Density Limit
Power Spectral Density (PSD) ≤ 8 dBm/3kHz

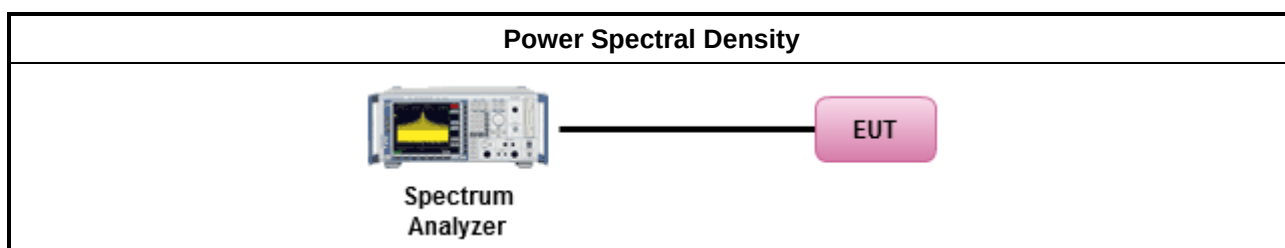
3.4.2 Measuring Instruments

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

3.4.3 Test Procedures

Test Method
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).
☒ Refer as KDB 558074, clause 8.4 (11.10 of ANSI C63.10) Max. PSD.
For conducted measurement.
If The EUT supports multiple transmit chains using options given below:
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

Refer as Appendix D

3.5 Emissions in Non-restricted Frequency Bands

3.5.1 Emissions in Non-restricted Frequency Bands Limit

Un-restricted Band Emissions Limit	
RF output power procedure	Limit (dB)
Peak output power procedure	20
Average output power procedure	30
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.	

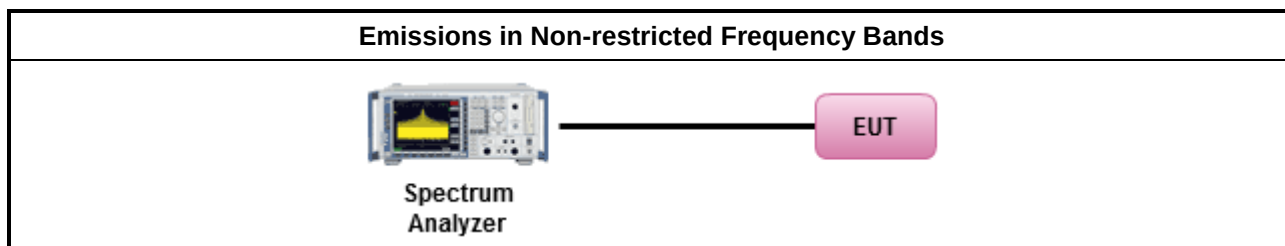
3.5.2 Measuring Instruments

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

3.5.3 Test Procedures

Test Method
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

Refer as Appendix E

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

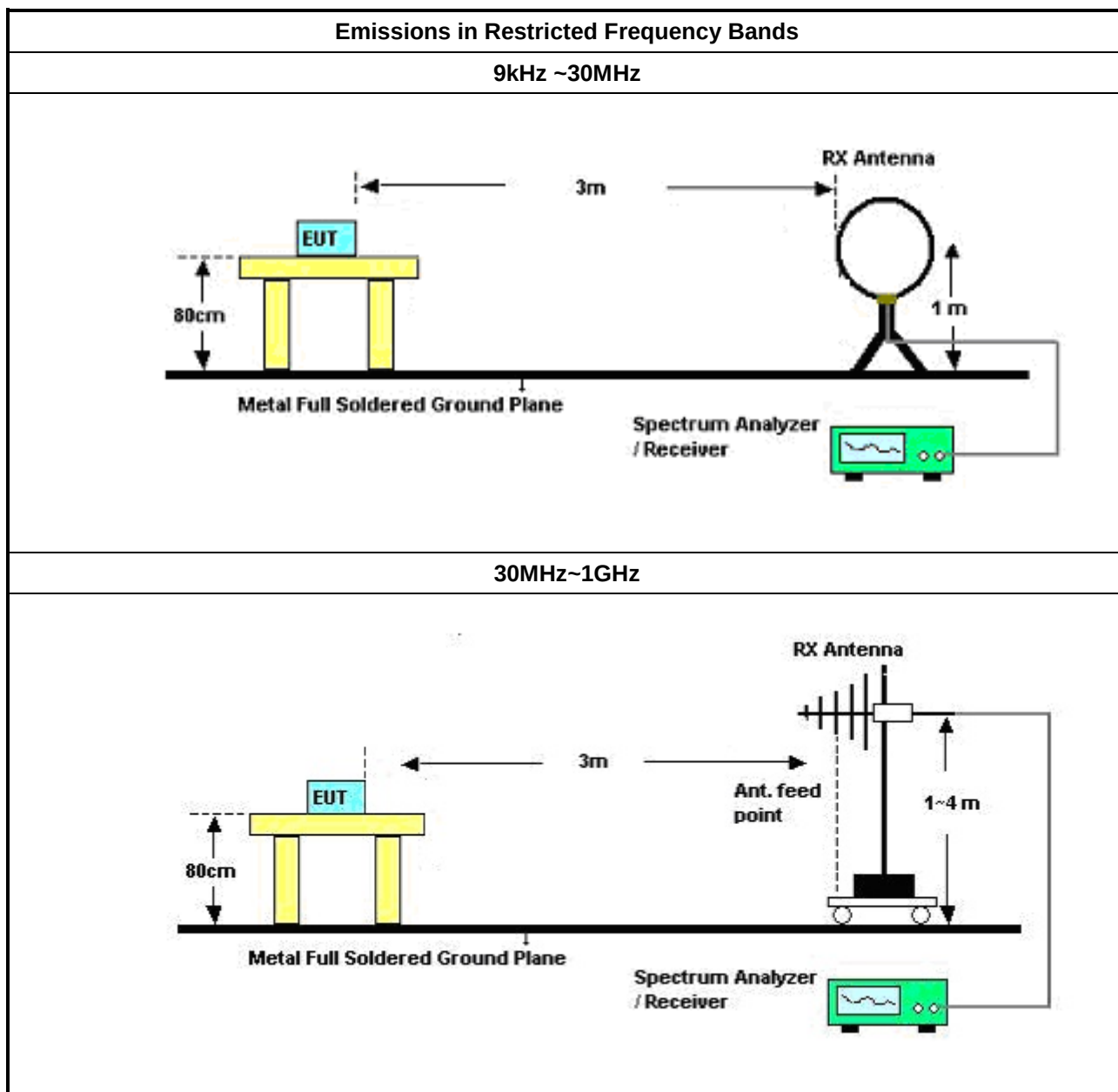
Test Method	
The average emission levels shall be measured in [duty cycle $\geq$ 98 or duty factor].	
Refer as ANSI C63.10, clause 6.10.3 band-edge testing shall be performed at the lowest frequency channel and highest frequency channel within the allowed operating band.	
For the transmitter unwanted emissions shall be measured using following options below:	
	Refer as KDB 558074, clause 8.6 (11.12 of ANSI C63.10) for restricted frequency bands.
For the transmitter band-edge emissions shall be measured using following options below:	
	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.
Use the following spectrum analyzer settings:	
	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 $f \geq 1$ GHz for peak measurement. For average measurement, refer as 1.1.4.
KDB 414788 Open-Field Test Sites and Chamber Correlation Justification.	
	Based on LP0002 5.5.2: 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.

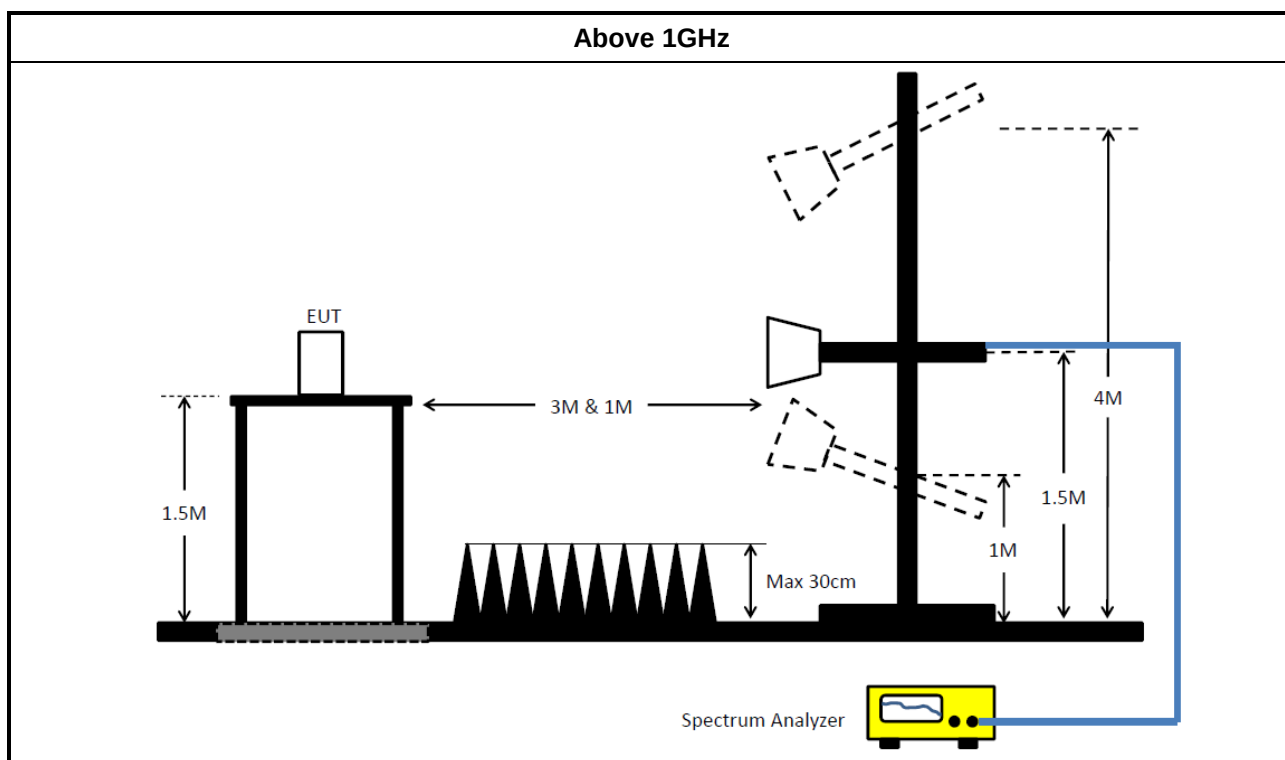
3.6.4 Measurement Results Calculation

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

Refer as Appendix F

3.7 Receiver Radiated Spurious Emissions

3.7.1 Receiver in Radiated Spurious Emissions Limit

Restricted Spurious 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.

3.7.2 Measuring Instruments

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

3.7.3 Test Procedures

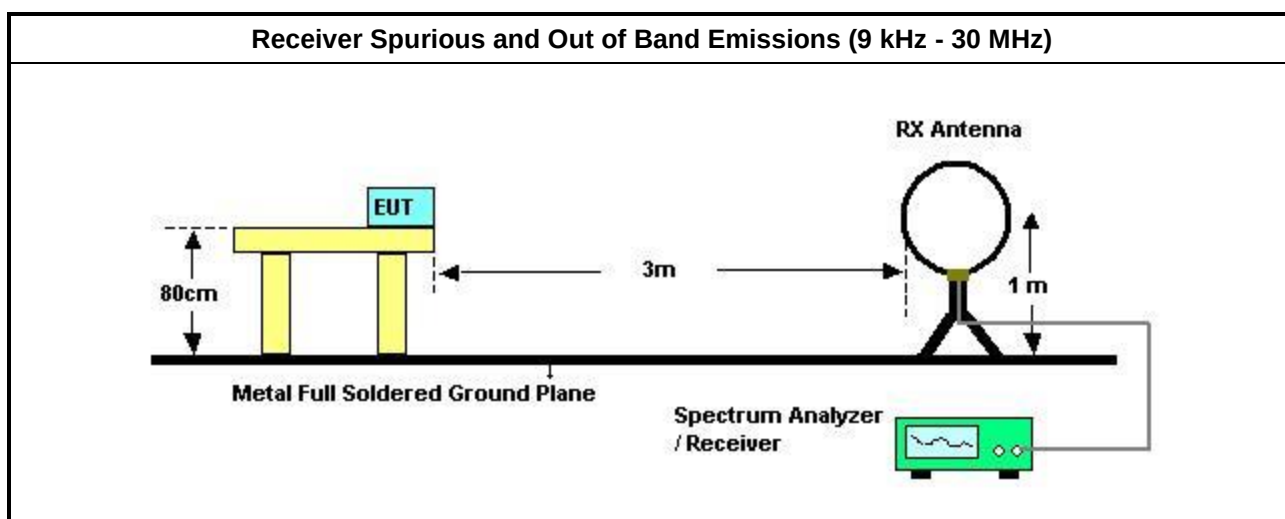
Test Method	
☒	The search for spurious emissions shall be from the lowest frequency internally generated or used in the receiver (e.g. local oscillator, intermediate or carrier frequency), or 30 MHz, whichever is higher, to at least 3 times the highest tuneable or local oscillator frequency, whichever is higher, without exceeding 40 GHz.
☒	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).
☒	For radiated measurement, refer as ANSI C63.4, clause 8.3.
☒	Refer as ANSI C63.4, clause 8.3.1.1 and 8.3.2.1 for radiated emissions from below 30 MHz.
☒	Refer as ANSI C63.4, clause 8.3.1.1 and 8.3.2.1 for radiated emissions from 30 MHz-1 GHz. For the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the QP-Limit so that the QP level does not need to be reported in addition.
☒	Refer as ANSI C63.4, clause 8.3.1.2 and 8.3.2.2 for radiated emissions from above 1 GHz. For the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.
☒	All amplitude of spurious emissions that are attenuated by more than 30 dB below the permissible value has no need to be reported.

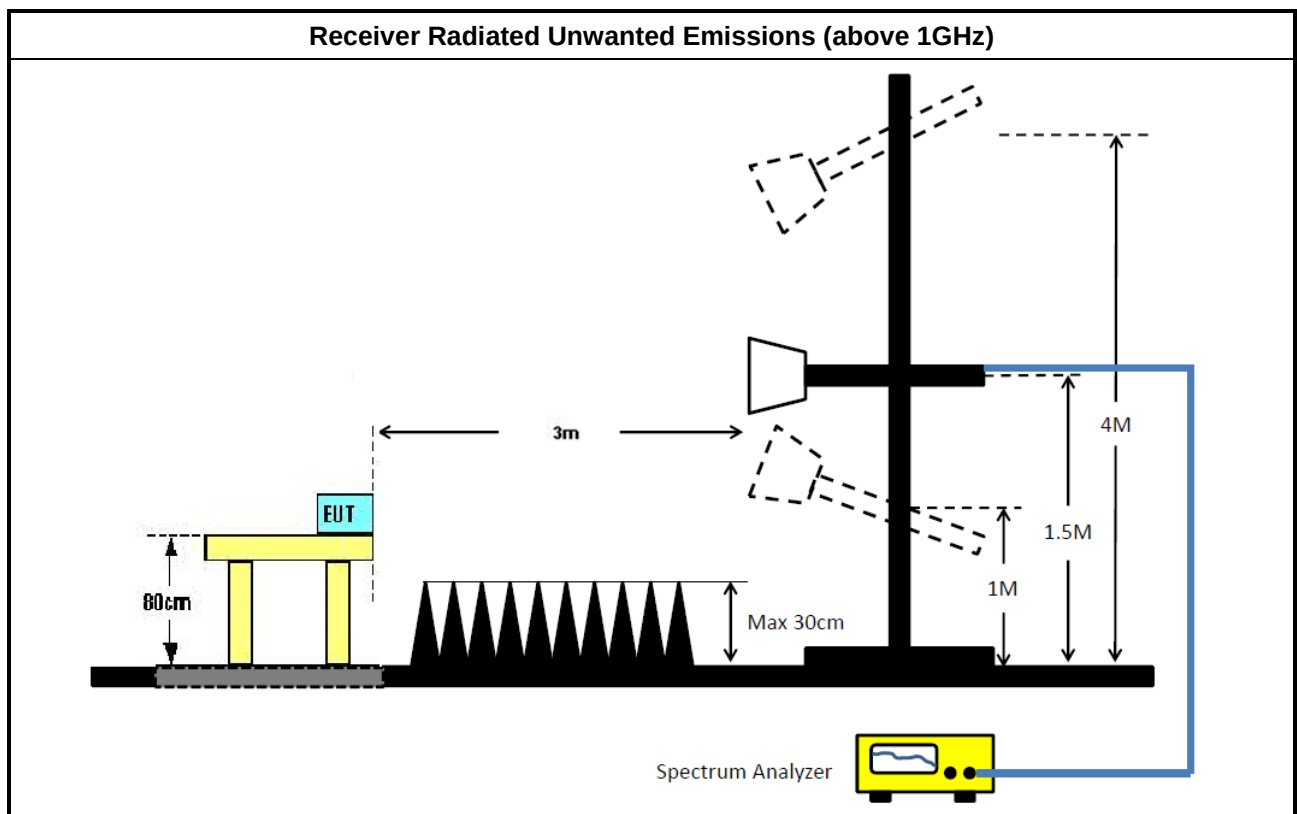
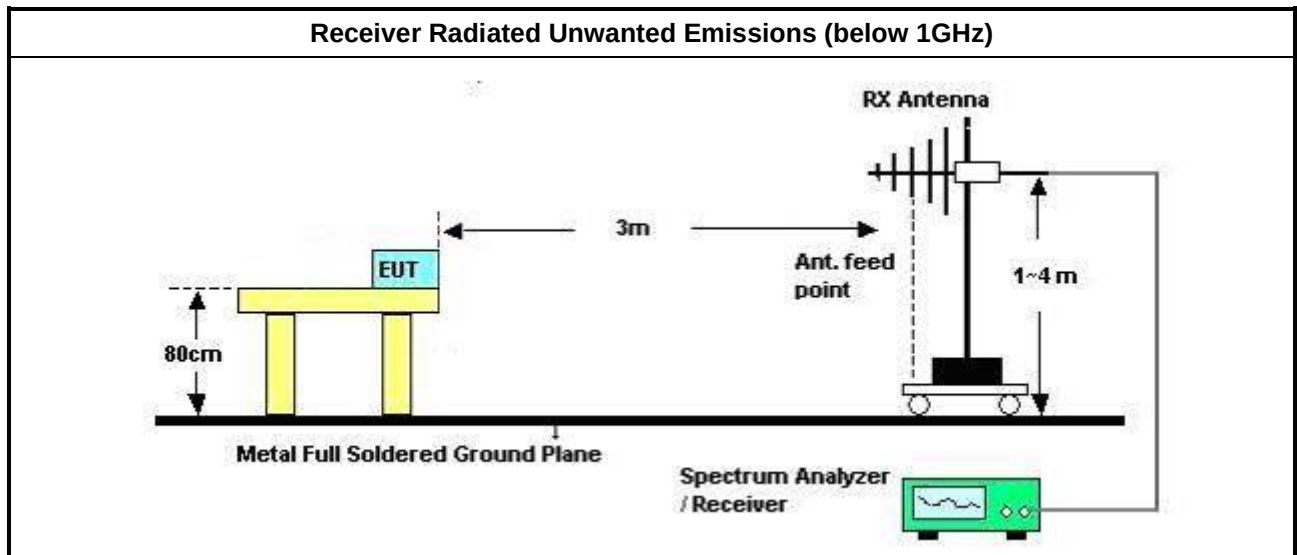
3.7.4 Measurement Results Calculation

The measured Level is calculated using:

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

3.7.5 Test Setup





3.7.6 Receiver Radiated Unwanted Emissions (Below 30MHz)

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

3.7.7 Test Result of Receiver Radiated Unwanted Emissions

Refer as Appendix G

3.8 Maximum Permissible Exposure

3.8.1 Maximum Permissible Exposure Limit

(A) Limits for Occupational / Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-3.0	614	1.63	*100	6
3-30	1842 / f	4.89 / f	*900 / f ²	6
30-300	61.4	0.163	1.0	6
300-1500	-	-	f/300	6
1500-100,000	-	-	5.0	6

(B) Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-3.0	614	1.63	*100	30
3-30	1842/f	4.89/f	*180/f ²	30
30-300	27.5	0.073	1.0	30
300-1500	-	-	f/1500	30
1500-100,000	-	-	1.0	30

Note: f = frequency in MHz ; *Plane-wave equivalent power density

3.8.2 Measuring Instruments

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

3.8.3 MPE Calculation Method

The MPE was calculated at 20 cm to show compliance with the power density limit. The following formula was used to calculate the Power Density:

$$E \text{ (V/m)} = \frac{\sqrt{30 \times P \times G}}{d} \quad \text{Power Density: } Pd \text{ (W/m}^2\text{)} = \frac{E^2}{377}$$

E = Electric field (V/m)

P = RF output power (W)

G = EUT Antenna numeric gain (numeric)

d = Separation distance between radiator and human body (m)

The formula can be changed to

$$Pd = \frac{30 \times P \times G}{377 \times d^2}$$

3.8.4 Test Result of Calculated Result and Limit

Refer as Appendix H

4 Test Equipment and Calibration Data

Instrument for AC Conduction

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
EMI Test Receiver	R&S	ESR3	102052	9kHz ~ 3.6GHz	09/Apr/2020	08/Apr/2021
Two-Line V Network (LISN)	R&S	ENV 216	101274	9kHz ~ 30MHz	10/Jun/2020	09/Jun/2021
Cable	MTJ	RG 142	CO01-cable-01	100kHz ~ 1GHz	13/Jul/2020	12/Jul/2021
Pulse Limiter	SCHWARZBECK	VTSD 9561F	9495	9kHz ~ 30MHz	24/Sep/2019	23/Sep/2020

Instrument for Conducted Test

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
Signal Analyzer	R&S	FSV 40	101029	10kHz ~ 40GHz	01/Oct/2019	30/Sep/2020
SMB100A Signal Generator	R&S	SMB100A03	181147	100kHz ~ 40GHz	12/Nov/2018	11/Nov/2020
Pulse Sensor	Anritsu	MA2411B	1027452	300MHz ~ 40GHz	18/Mar/2020	17/Mar/2021

Instrument for Radiated Test

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30MHz ~ 1GHz 3m	06/Aug/2020	05/Aug/2021
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	1GHz ~ 18GHz 3m	04/Aug/2020	03/Aug/2021
Signal Analyzer	R&S	FSV40	101500	10Hz ~ 40GHz	15/Aug/2019	14/Aug/2020
Signal Analyzer	R&S	FSP30	100793	10Hz ~ 30GHz	03/Jun/2020	02/Jun/2021
Amplifier	HP	8447D	2944A08033	10kHz ~ 1.3GHz	14/Apr/2020	13/Apr/2021
Microwave System Preamplifier	KEYSIGHT	83017A	MY53270196	1GHz ~ 26.5GHz	09/Sep/2019	08/Sep/2020
Bilog Antenna & 6dB Attenuator	SCHAFFNER / EMC	CBL6112B / N-6-05	22237 / AT-N-0603	30MHz ~ 1GHz	19/Apr/2020	18/Apr/2021
Double Ridged Guide Horn Antenna	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1531	1GHz ~ 18GHz	26/Mar/2020	25/Mar/2021
RF Cable-R03m	Jye Bao	RG142	CB021	9kHz ~ 30MHz	19/Jun/2020	18/Jun/2021
RF Cable-R03m	Jye Bao	RG142	CB021	30MHz ~ 1GHz	18/Mar/2020	17/Mar/2021
RF CABLE 5+6m	HUBER+SUHNER	SUOFLEX 104	SN 805801/4+SN 804300/4	1GHz ~ 40GHz	18/Mar/2020	17/Mar/2021
Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA 9170221	18GHz ~ 40GHz	13/Mar/2020	12/Mar/2021
Loop Antenna	TESEQ	HLA 6120	31244	9kHz ~ 30MHz	16/Mar/2020	15/Mar/2021
EMI Test Receiver	R&S	ESR3	102051	9kHz ~ 3.6GHz	29/May/2020	28/May/2021

**Summary**

Mode	Result	Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition
Mode 1	Pass	AV	1.818M	30.30	46.00	-15.70	Line
Mode 2	Pass	AV	2.05M	29.89	46.00	-16.11	Line

Mode Configure

Mode	Result	Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition	Comments
Mode 1	Pass	QP	195.997k	40.53	63.78	-23.25	Line	-
Mode 1	Pass	AV	195.997k	30.26	53.78	-23.52	Line	-
Mode 1	Pass	QP	553.37k	39.61	56.00	-16.39	Line	-
Mode 1	Pass	AV	553.37k	29.73	46.00	-16.27	Line	-
Mode 1	Pass	QP	752.508k	37.75	56.00	-18.25	Line	-
Mode 1	Pass	AV	752.508k	27.64	46.00	-18.36	Line	-
Mode 1	Pass	QP	1.818M	37.13	56.00	-18.87	Line	-
Mode 1	Pass	AV	1.818M	30.30	46.00	-15.70	Line	"Worst"
Mode 1	Pass	QP	7.592M	32.47	60.00	-27.53	Line	-
Mode 1	Pass	AV	7.592M	25.90	50.00	-24.10	Line	-
Mode 1	Pass	QP	15.512M	35.27	60.00	-24.73	Line	-
Mode 1	Pass	AV	15.512M	26.75	50.00	-23.25	Line	-
Mode 1	Pass	QP	225.388k	41.99	62.62	-20.63	Neutral	-
Mode 1	Pass	AV	225.388k	30.90	52.62	-21.72	Neutral	-
Mode 1	Pass	QP	462.379k	39.74	56.65	-16.91	Neutral	"Worst"
Mode 1	Pass	AV	462.379k	27.31	46.65	-19.34	Neutral	-
Mode 1	Pass	QP	594.596k	38.05	56.00	-17.95	Neutral	-
Mode 1	Pass	AV	594.596k	26.94	46.00	-19.06	Neutral	-
Mode 1	Pass	QP	1.431M	34.90	56.00	-21.10	Neutral	-
Mode 1	Pass	AV	1.431M	26.71	46.00	-19.29	Neutral	-
Mode 1	Pass	QP	5.787M	29.42	60.00	-30.58	Neutral	-
Mode 1	Pass	AV	5.787M	22.78	50.00	-27.22	Neutral	-
Mode 1	Pass	QP	10.574M	28.54	60.00	-31.46	Neutral	-
Mode 1	Pass	AV	10.574M	21.41	50.00	-28.59	Neutral	-
Mode 2	Pass	QP	191.358k	41.65	63.97	-22.32	Line	-
Mode 2	Pass	AV	191.358k	35.32	53.97	-18.65	Line	-
Mode 2	Pass	QP	473.588k	39.63	56.46	-16.83	Line	-
Mode 2	Pass	AV	473.588k	28.49	46.46	-17.97	Line	-
Mode 2	Pass	QP	594.596k	39.01	56.00	-16.99	Line	-
Mode 2	Pass	AV	594.596k	27.95	46.00	-18.05	Line	-
Mode 2	Pass	QP	2.05M	36.93	56.00	-19.07	Line	-
Mode 2	Pass	AV	2.05M	29.89	46.00	-16.11	Line	"Worst"
Mode 2	Pass	QP	2.971M	32.24	56.00	-23.76	Line	-
Mode 2	Pass	AV	2.971M	24.59	46.00	-21.41	Line	-
Mode 2	Pass	QP	15.45M	35.18	60.00	-24.82	Line	-
Mode 2	Pass	AV	15.45M	26.45	50.00	-23.55	Line	-
Mode 2	Pass	QP	230.851k	41.78	62.42	-20.64	Neutral	-
Mode 2	Pass	AV	230.851k	29.49	52.42	-22.93	Neutral	-
Mode 2	Pass	QP	560.037k	38.61	56.00	-17.39	Neutral	-
Mode 2	Pass	AV	560.037k	26.66	46.00	-19.34	Neutral	-
Mode 2	Pass	QP	868.81k	35.77	56.00	-20.23	Neutral	-
Mode 2	Pass	AV	868.81k	25.92	46.00	-20.08	Neutral	-
Mode 2	Pass	QP	1.923M	35.63	56.00	-20.37	Neutral	-



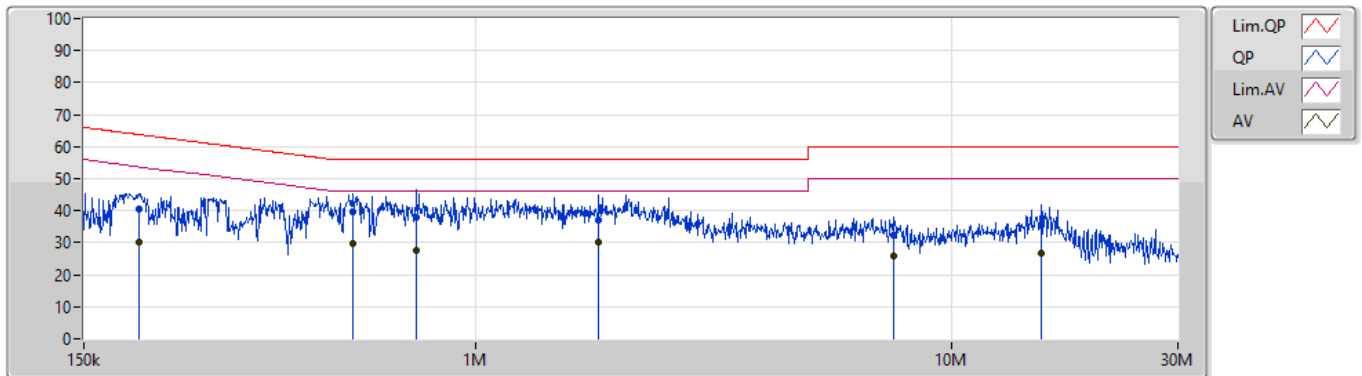
AC Power-line Conducted Emissions

Appendix A

Mode	Result	Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition	Comments
Mode 2	Pass	AV	1.923M	29.57	46.00	-16.43	Neutral	"Worst"
Mode 2	Pass	QP	2.404M	35.82	56.00	-20.18	Neutral	-
Mode 2	Pass	AV	2.404M	28.67	46.00	-17.33	Neutral	-
Mode 2	Pass	QP	11.271M	28.59	60.00	-31.41	Neutral	-
Mode 2	Pass	AV	11.271M	21.56	50.00	-28.44	Neutral	-

Conducted Emissions at Powerline_Mode 1

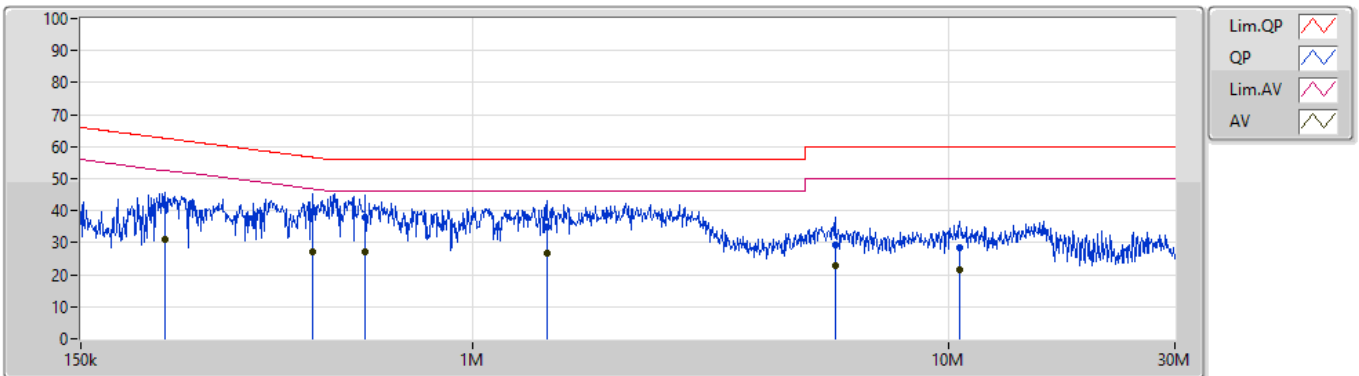
04/09/2020



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)			
QP	195.997k	40.53	63.78	-23.25	19.45	Line	-	21.08	9.67	0.02	9.76			
AV	195.997k	30.26	53.78	-23.52	19.45	Line	-	10.81	9.67	0.02	9.76			
QP	553.37k	39.61	56.00	-16.39	19.46	Line	-	20.15	9.67	0.03	9.76			
AV	553.37k	29.73	46.00	-16.27	19.46	Line	-	10.27	9.67	0.03	9.76			
QP	752.508k	37.75	56.00	-18.25	19.46	Line	-	18.29	9.67	0.04	9.75			
AV	752.508k	27.64	46.00	-18.36	19.46	Line	-	8.18	9.67	0.04	9.75			
QP	1.818M	37.13	56.00	-18.87	19.52	Line	-	17.61	9.68	0.08	9.76			
AV	1.818M	30.30	46.00	-15.70	19.52	Line	"Worst"	10.78	9.68	0.08	9.76			
QP	7.592M	32.47	60.00	-27.53	19.64	Line	-	12.83	9.71	0.17	9.76			
AV	7.592M	25.90	50.00	-24.10	19.64	Line	-	6.26	9.71	0.17	9.76			
QP	15.512M	35.27	60.00	-24.73	19.70	Line	-	15.57	9.69	0.24	9.77			
AV	15.512M	26.75	50.00	-23.25	19.70	Line	-	7.05	9.69	0.24	9.77			

Conducted Emissions at Powerline_Mode 1

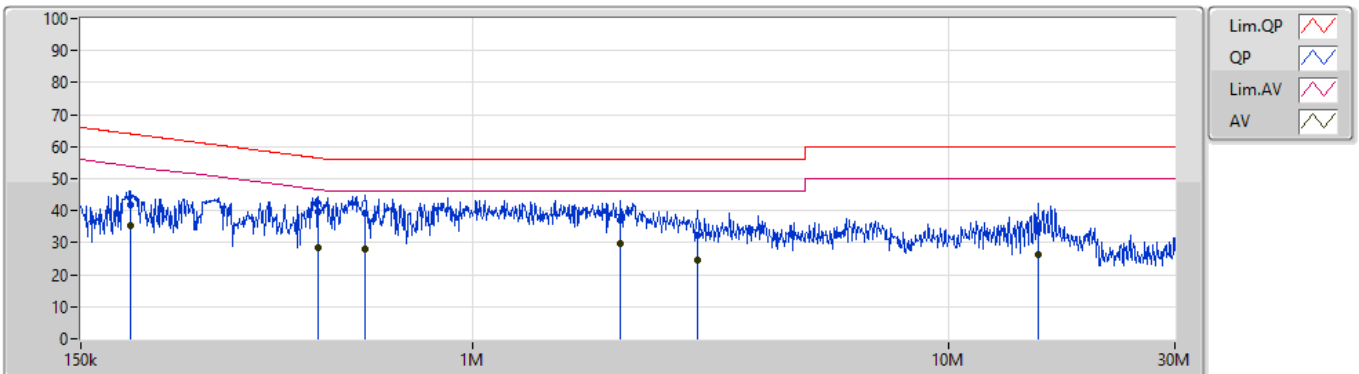
04/09/2020



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)			
QP	225.388k	41.99	62.62	-20.63	19.44	Neutral	-	22.55	9.66	0.02	9.76			
AV	225.388k	30.90	52.62	-21.72	19.44	Neutral	-	11.46	9.66	0.02	9.76			
QP	462.379k	39.74	56.65	-16.91	19.43	Neutral	"Worst"	20.31	9.65	0.02	9.76			
AV	462.379k	27.31	46.65	-19.34	19.43	Neutral	-	7.88	9.65	0.02	9.76			
QP	594.596k	38.05	56.00	-17.95	19.44	Neutral	-	18.61	9.65	0.03	9.76			
AV	594.596k	26.94	46.00	-19.06	19.44	Neutral	-	7.50	9.65	0.03	9.76			
QP	1.431M	34.90	56.00	-21.10	19.48	Neutral	-	15.42	9.66	0.07	9.75			
AV	1.431M	26.71	46.00	-19.29	19.48	Neutral	-	7.23	9.66	0.07	9.75			
QP	5.787M	29.42	60.00	-30.58	19.59	Neutral	-	9.83	9.69	0.14	9.76			
AV	5.787M	22.78	50.00	-27.22	19.59	Neutral	-	3.19	9.69	0.14	9.76			
QP	10.574M	28.54	60.00	-31.46	19.68	Neutral	-	8.86	9.72	0.20	9.76			
AV	10.574M	21.41	50.00	-28.59	19.68	Neutral	-	1.73	9.72	0.20	9.76			

Conducted Emissions at Powerline_Mode 2

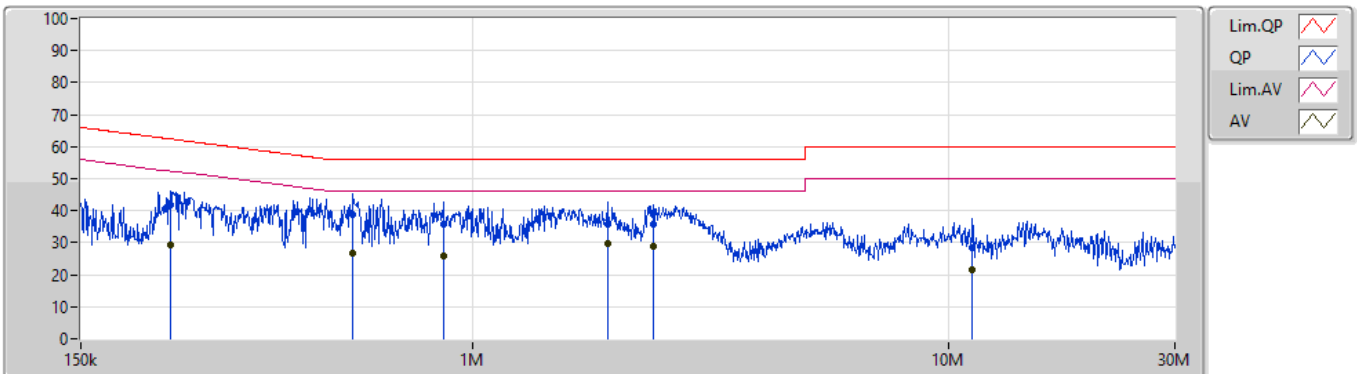
04/09/2020



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)			
QP	191.358k	41.65	63.97	-22.32	19.45	Line	-	22.20	9.67	0.02	9.76			
AV	191.358k	35.32	53.97	-18.65	19.45	Line	-	15.87	9.67	0.02	9.76			
QP	473.588k	39.63	56.46	-16.83	19.46	Line	-	20.17	9.67	0.03	9.76			
AV	473.588k	28.49	46.46	-17.97	19.46	Line	-	9.03	9.67	0.03	9.76			
QP	594.596k	39.01	56.00	-16.99	19.46	Line	-	19.55	9.67	0.03	9.76			
AV	594.596k	27.95	46.00	-18.05	19.46	Line	-	8.49	9.67	0.03	9.76			
QP	2.05M	36.93	56.00	-19.07	19.52	Line	-	17.41	9.68	0.08	9.76			
AV	2.05M	29.89	46.00	-16.11	19.52	Line	"Worst"	10.37	9.68	0.08	9.76			
QP	2.971M	32.24	56.00	-23.76	19.55	Line	-	12.69	9.69	0.10	9.76			
AV	2.971M	24.59	46.00	-21.41	19.55	Line	-	5.04	9.69	0.10	9.76			
QP	15.45M	35.18	60.00	-24.82	19.70	Line	-	15.48	9.69	0.24	9.77			
AV	15.45M	26.45	50.00	-23.55	19.70	Line	-	6.75	9.69	0.24	9.77			

Conducted Emissions at Powerline_Mode 2

04/09/2020



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)			
QP	230.851k	41.78	62.42	-20.64	19.44	Neutral	-	22.34	9.66	0.02	9.76			
AV	230.851k	29.49	52.42	-22.93	19.44	Neutral	-	10.05	9.66	0.02	9.76			
QP	560.037k	38.61	56.00	-17.39	19.44	Neutral	-	19.17	9.65	0.03	9.76			
AV	560.037k	26.66	46.00	-19.34	19.44	Neutral	-	7.22	9.65	0.03	9.76			
QP	868.81k	35.77	56.00	-20.23	19.46	Neutral	-	16.31	9.66	0.05	9.75			
AV	868.81k	25.92	46.00	-20.08	19.46	Neutral	-	6.46	9.66	0.05	9.75			
QP	1.923M	35.63	56.00	-20.37	19.50	Neutral	-	16.13	9.66	0.08	9.76			
AV	1.923M	29.57	46.00	-16.43	19.50	Neutral	"Worst"	10.07	9.66	0.08	9.76			
QP	2.404M	35.82	56.00	-20.18	19.51	Neutral	-	16.31	9.66	0.09	9.76			
AV	2.404M	28.67	46.00	-17.33	19.51	Neutral	-	9.16	9.66	0.09	9.76			
QP	11.271M	28.59	60.00	-31.41	19.68	Neutral	-	8.91	9.72	0.20	9.76			
AV	11.271M	21.56	50.00	-28.44	19.68	Neutral	-	1.88	9.72	0.20	9.76			

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)	665k	1.028M	1M03F1D	660k	1.026M
BT-LE(2Mbps)	1.235M	2.063M	2M06F1D	1.233M	2.053M

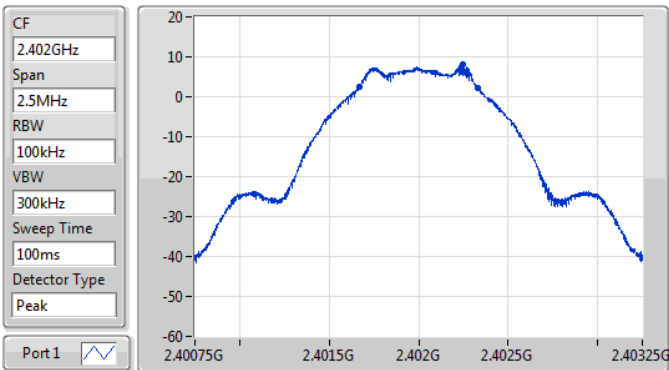
Max-N dB = Maximum 6dB down bandwidth; **Max-OBW** = Maximum 99% occupied bandwidth;

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	660k	1.026M
2440MHz	Pass	500k	665k	1.028M
2480MHz	Pass	500k	662.5k	1.026M
BT-LE(2Mbps)	-	-	-	-
2402MHz	Pass	500k	1.235M	2.055M
2440MHz	Pass	500k	1.235M	2.063M
2480MHz	Pass	500k	1.233M	2.053M

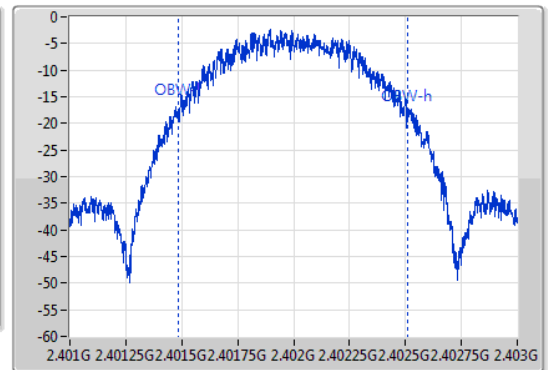
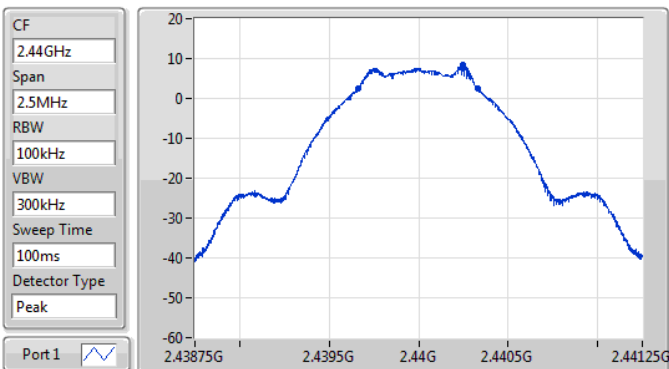
Port X-N dB = Port X 6dB down bandwidth; **Port X-OBW** = Port X 99% occupied bandwidth;

BT-LE(1Mbps)
2402MHz


6dB(Hz)	FI-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	FI-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
660k	2.401669G	2.402329G	1.026M	2.401485G	2.402512G	500k	1

EBW-DTS

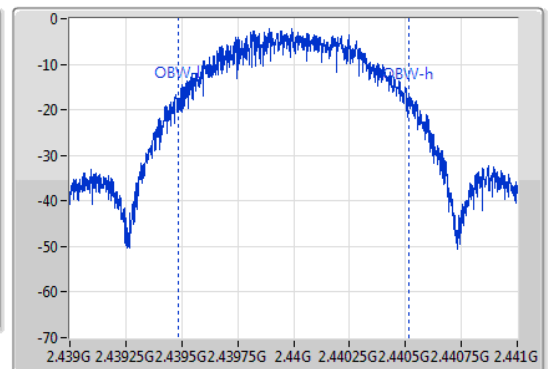
10/08/2020

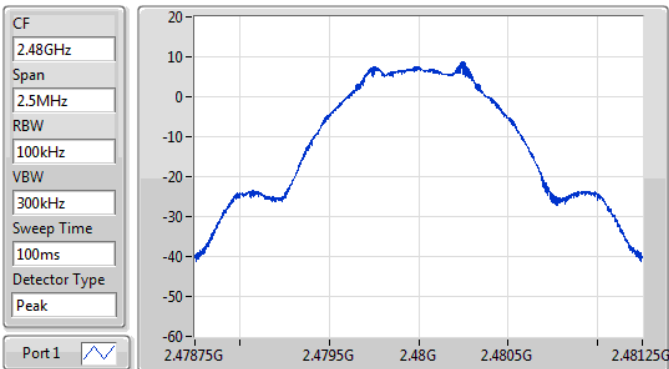

BT-LE(1Mbps)
2440MHz


6dB(Hz)	FI-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	FI-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
665k	2.439664G	2.440329G	1.028M	2.439484G	2.440513G	500k	1

EBW-DTS

10/08/2020

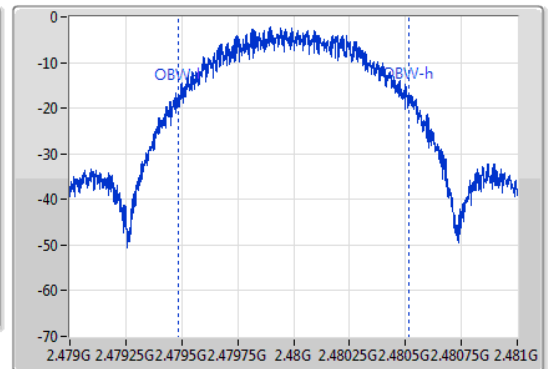
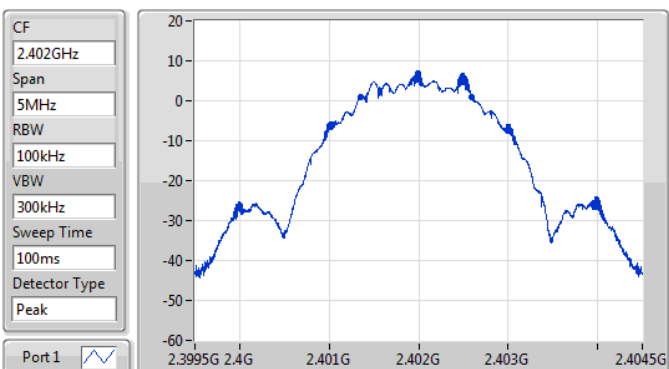


BT-LE(1Mbps)
2480MHz


6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
662.5k	2.479665G	2.480328G	1.026M	2.479486G	2.480513G	500k	1

EBW-DTS

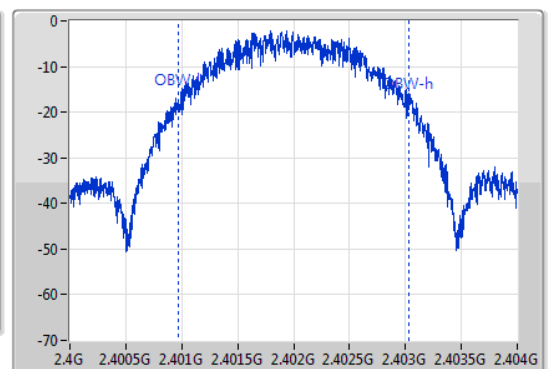
10/08/2020


BT-LE(2Mbps)
2402MHz


6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
1.235M	2.40135G	2.402585G	2.055M	2.400975G	2.403029G	500k	1

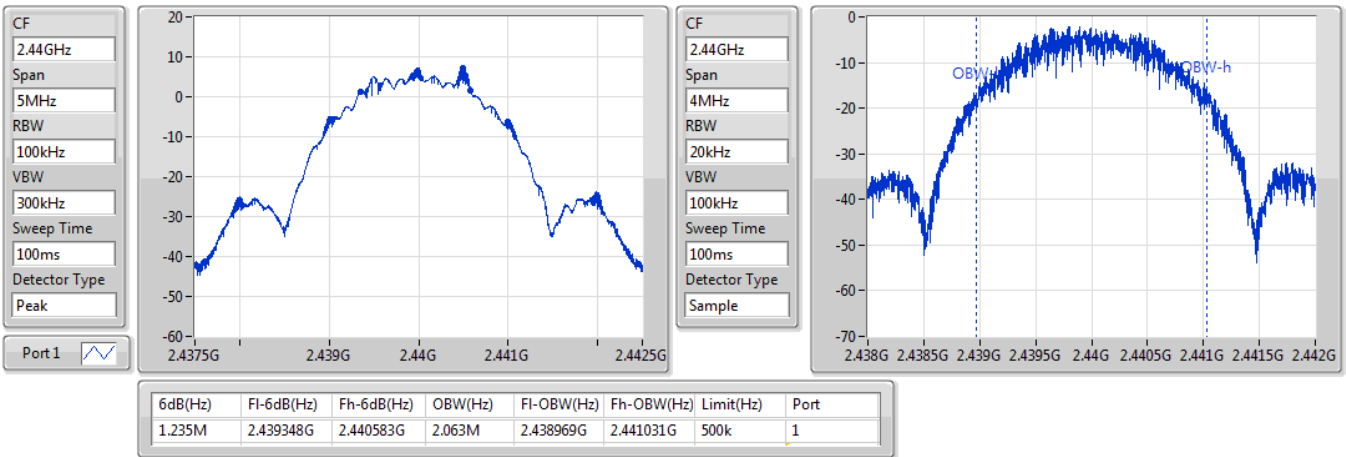
EBW-DTS

10/08/2020

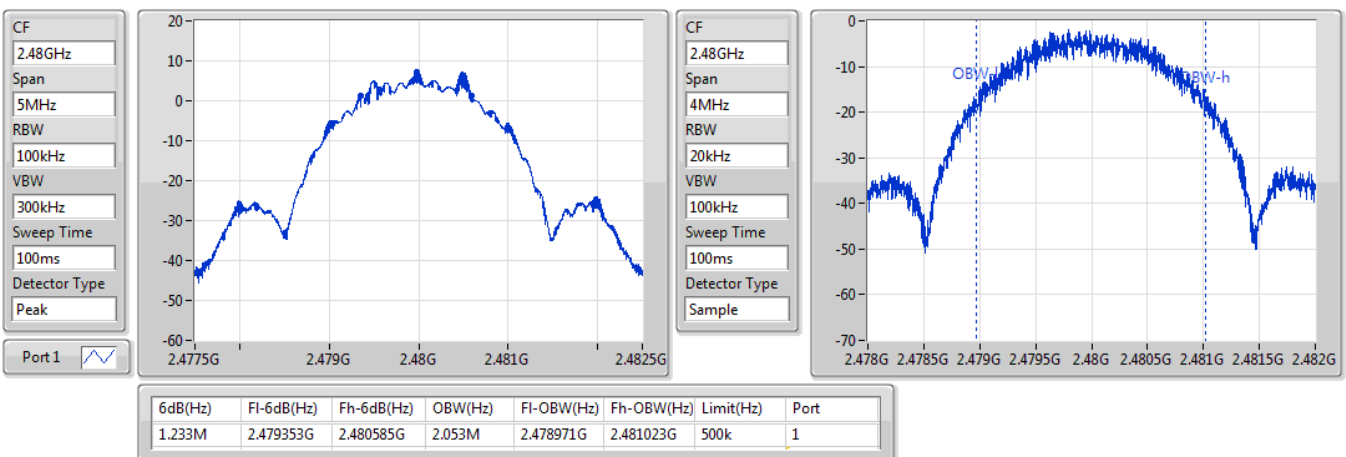


BT-LE(2Mbps)
EBW-DTS
2440MHz

10/08/2020


BT-LE(2Mbps)
EBW-DTS
2480MHz

10/08/2020





Summary

Mode	Power (dBm)	Power (W)
2.4-2.4835GHz	-	-
BT-LE(1Mbps)	8.30	0.00676
BT-LE(2Mbps)	8.23	0.00665



Result

Mode	Result	Gain (dBi)	Power (dBm)	Power Limit (dBm)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	2.25	7.98	30.00
2440MHz	Pass	2.25	8.29	30.00
2480MHz	Pass	2.25	8.30	30.00
BT-LE(2Mbps)	-	-	-	-
2402MHz	Pass	2.25	7.97	30.00
2440MHz	Pass	2.25	8.23	30.00
2480MHz	Pass	2.25	7.97	30.00

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



Summary

Mode	PD (dBm/RBW)
2.4-2.4835GHz	-
BT-LE(1Mbps)	-8.87
BT-LE(2Mbps)	-11.36

RBW=3 kHz.

Result

Mode	Result	Gain (dBi)	PD (dBm/RBW)	PD Limit (dBm/RBW)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	2.25	-8.87	8.00
2440MHz	Pass	2.25	-9.13	8.00
2480MHz	Pass	2.25	-8.91	8.00
BT-LE(2Mbps)	-	-	-	-
2402MHz	Pass	2.25	-13.92	8.00
2440MHz	Pass	2.25	-11.36	8.00
2480MHz	Pass	2.25	-13.26	8.00

DG = Directional Gain; RBW=3 kHz;

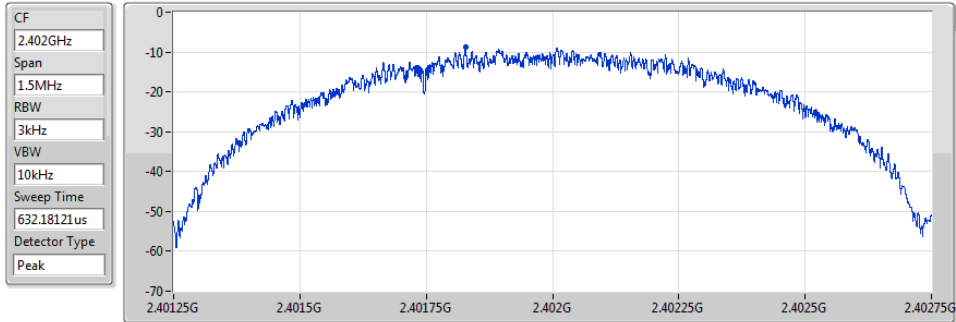
PD = trace bin-by-bin of each transmits port summing can be performed maximum power density; **Port X** = Port X power density;

BT-LE(1Mbps)

2402MHz

PSD

10/08/2020



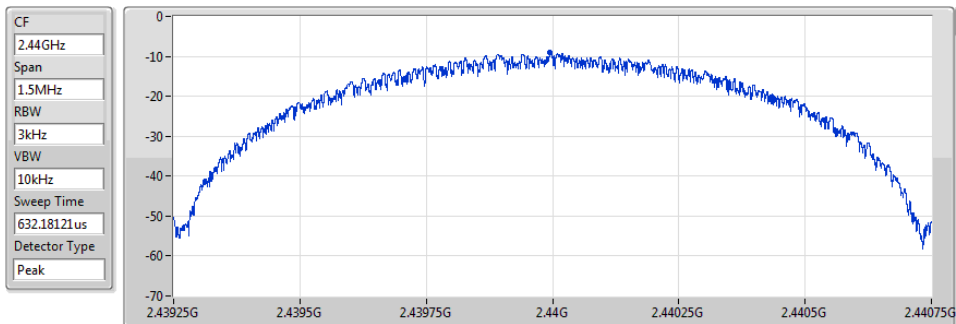
Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-8.87	-8.87	-8.87

BT-LE(1Mbps)

2440MHz

PSD

10/08/2020



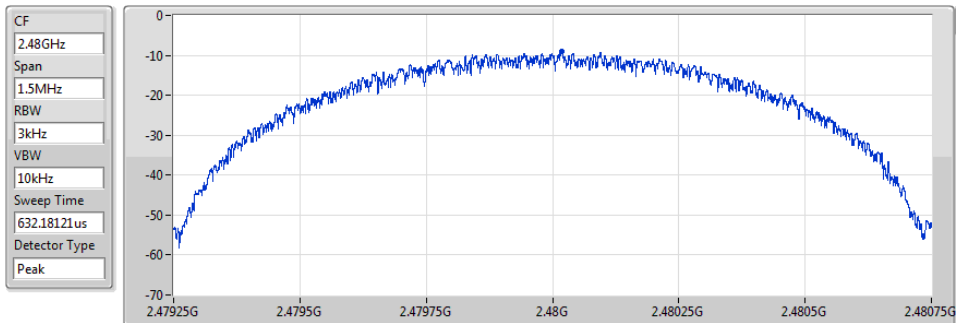
Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-9.13	-9.13	-9.13

BT-LE(1Mbps)

2480MHz

PSD

10/08/2020



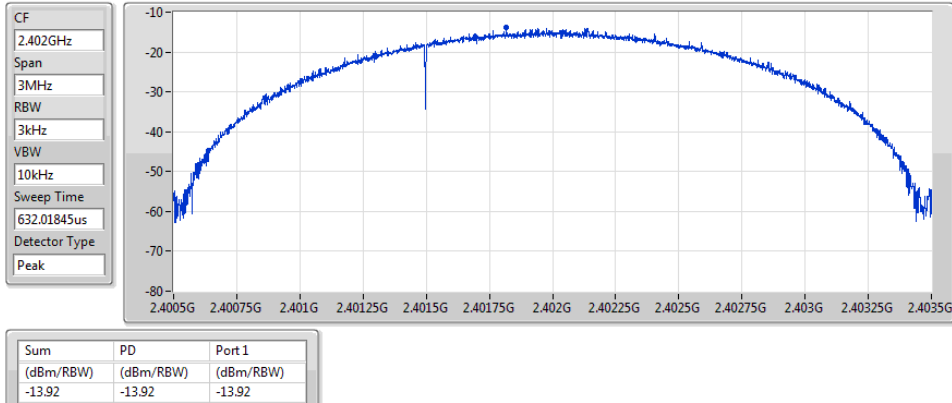
Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-8.91	-8.91	-8.91

BT-LE(2Mbps)

2402MHz

PSD

10/08/2020

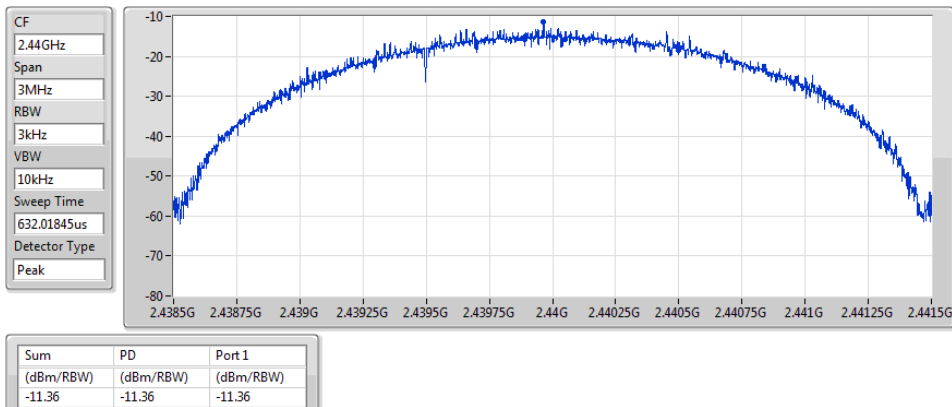


BT-LE(2Mbps)

2440MHz

PSD

10/08/2020

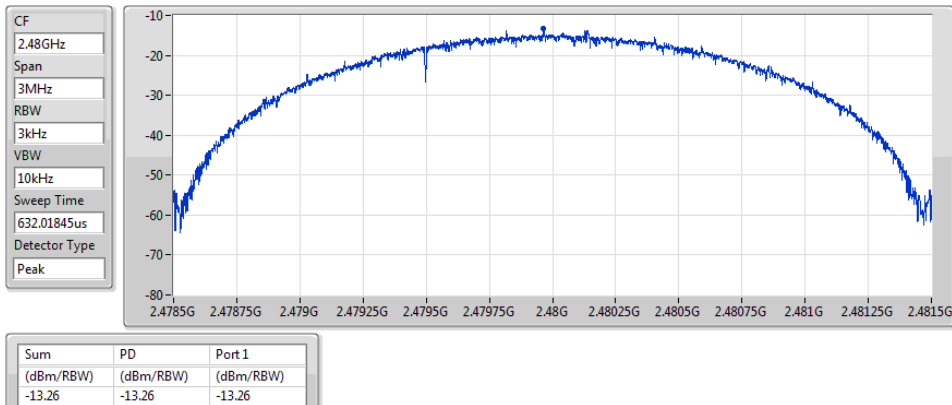


BT-LE(2Mbps)

2480MHz

PSD

10/08/2020





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	2.48024G	8.01	-21.99	2.30568G	-54.47	2.39971G	-49.40	2.4G	-49.51	2.48894G	-52.25	3.33025G	-33.08	1
BT-LE(2Mbps)	Pass	2.4405G	7.13	-22.87	1.7549G	-54.61	2.39998G	-25.61	2.4G	-28.50	2.49094G	-52.21	3.33025G	-33.05	1

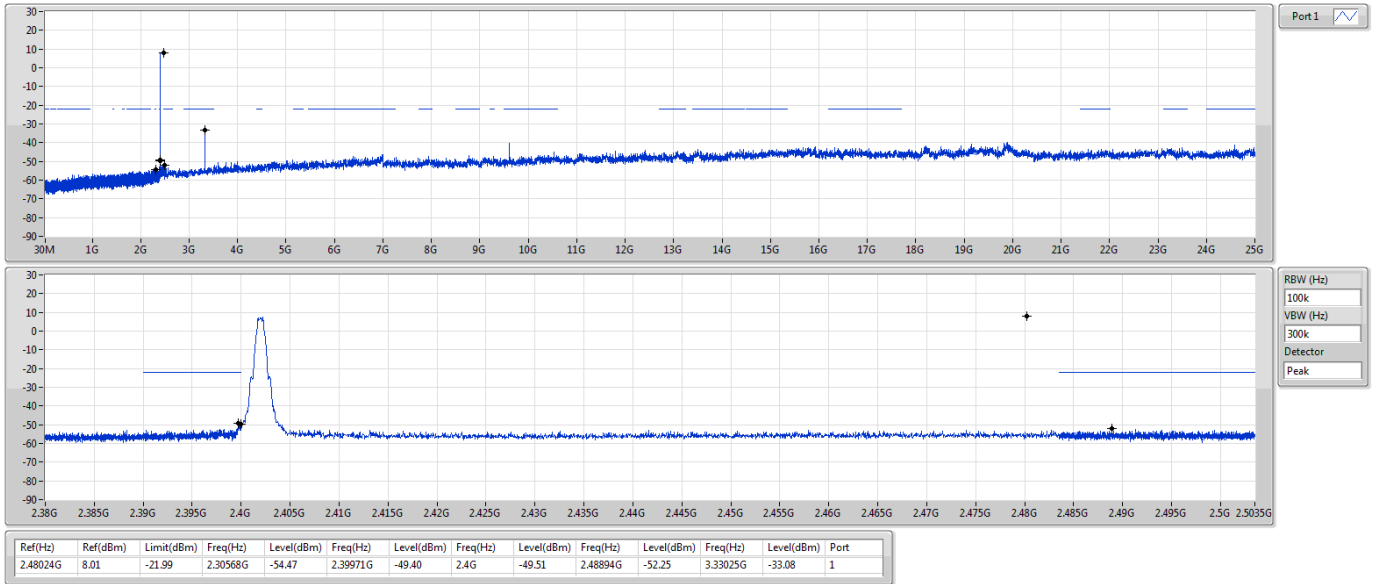
Result

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	2.48024G	8.01	-21.99	2.30568G	-54.47	2.39971G	-49.40	2.4G	-49.51	2.48894G	-52.25	3.33025G	-33.08	1
2440MHz	Pass	2.48024G	8.01	-21.99	2.1027G	-54.55	2.39968G	-53.92	2.4835G	-54.85	2.48818G	-52.42	3.33025G	-32.96	1
2480MHz	Pass	2.48024G	8.01	-21.99	2.01693G	-54.42	2.39444G	-53.07	2.4835G	-54.44	2.48423G	-51.90	3.33025G	-33.16	1
BT-LE(2Mbps)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	2.4405G	7.13	-22.87	1.7549G	-54.61	2.39998G	-25.61	2.4G	-28.50	2.49094G	-52.21	3.33025G	-33.05	1
2440MHz	Pass	2.4405G	7.13	-22.87	2.11709G	-54.16	2.39294G	-53.56	2.4835G	-54.11	2.48594G	-52.18	3.33025G	-32.91	1
2480MHz	Pass	2.4405G	7.13	-22.87	2.30833G	-54.21	2.39322G	-53.35	2.4835G	-50.96	2.48392G	-50.26	3.33025G	-33.00	1

BT-LE(1Mbps)

CSEndB-DTS

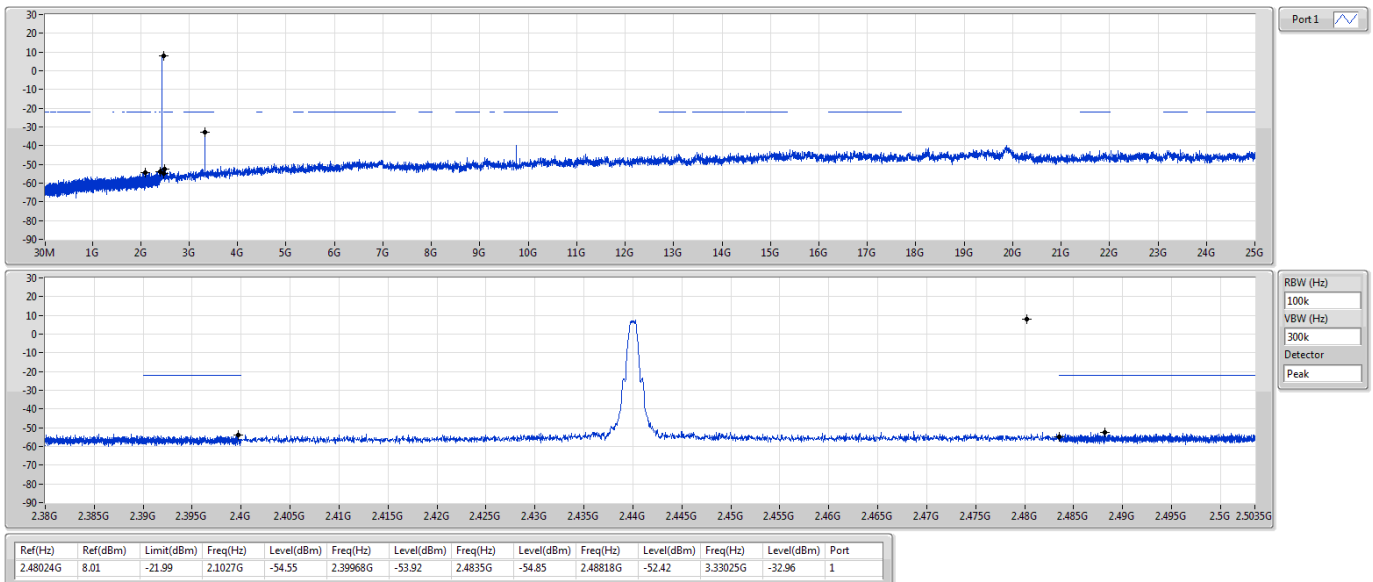
2402MHz



BT-LE(1Mbps)

CSEndB-DTS

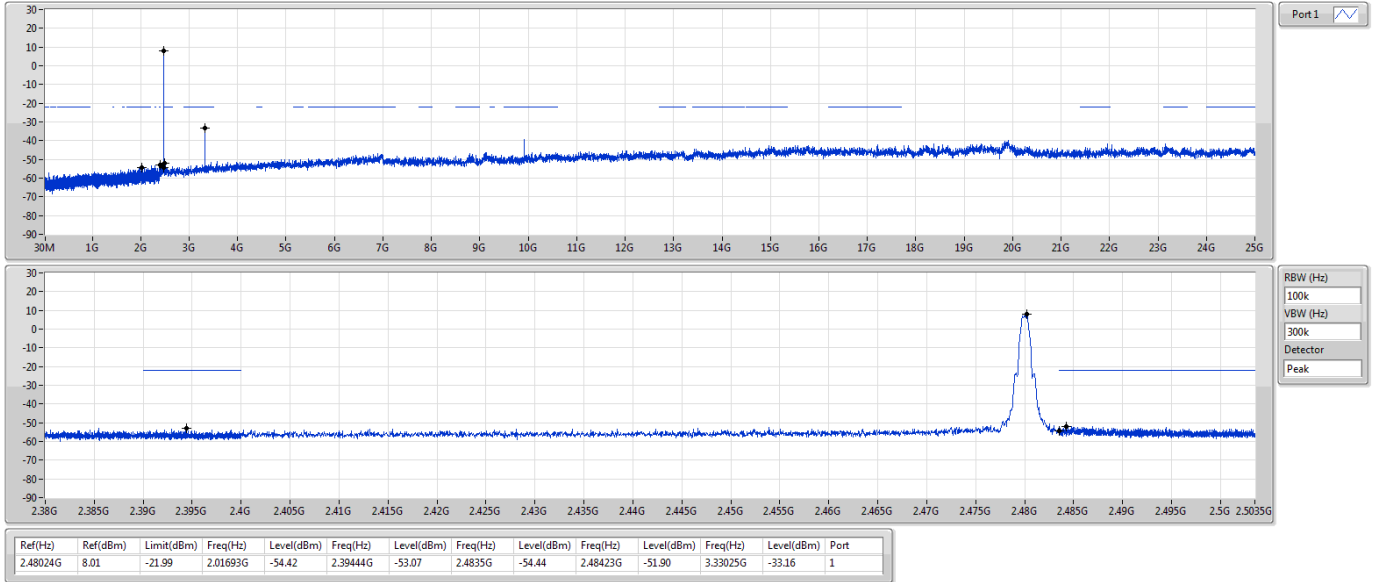
2440MHz



BT-LE(1Mbps)

CSEndB-DTS

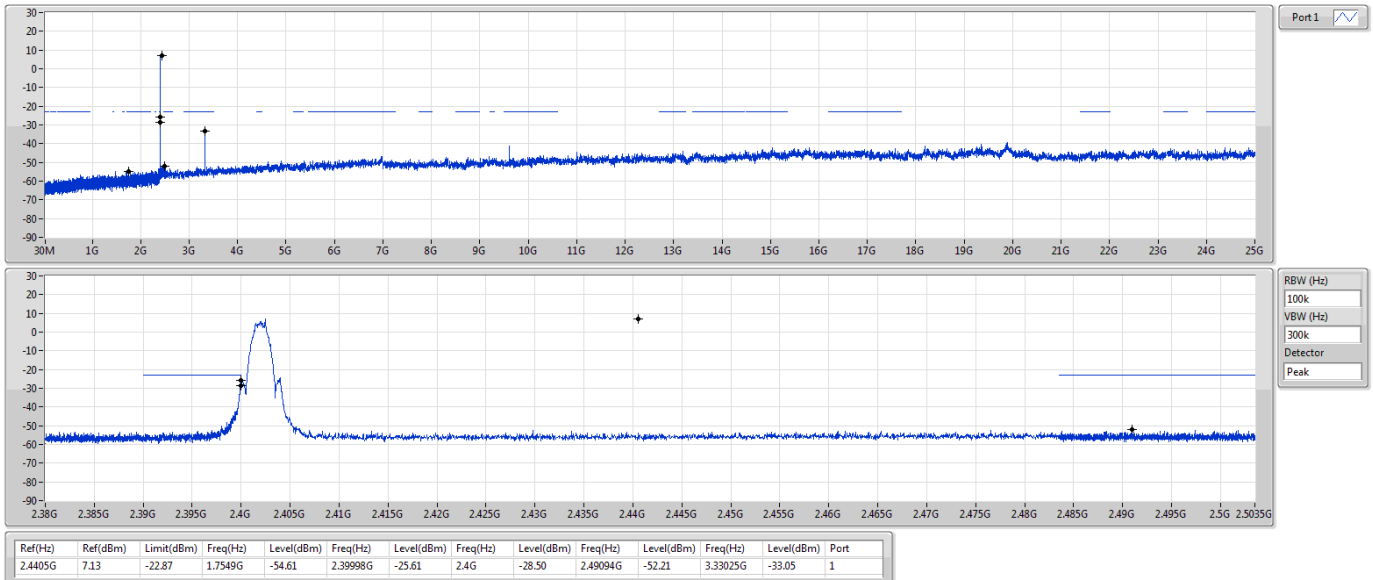
2480MHz



BT-LE(2Mbps)

CSEndB-DTS

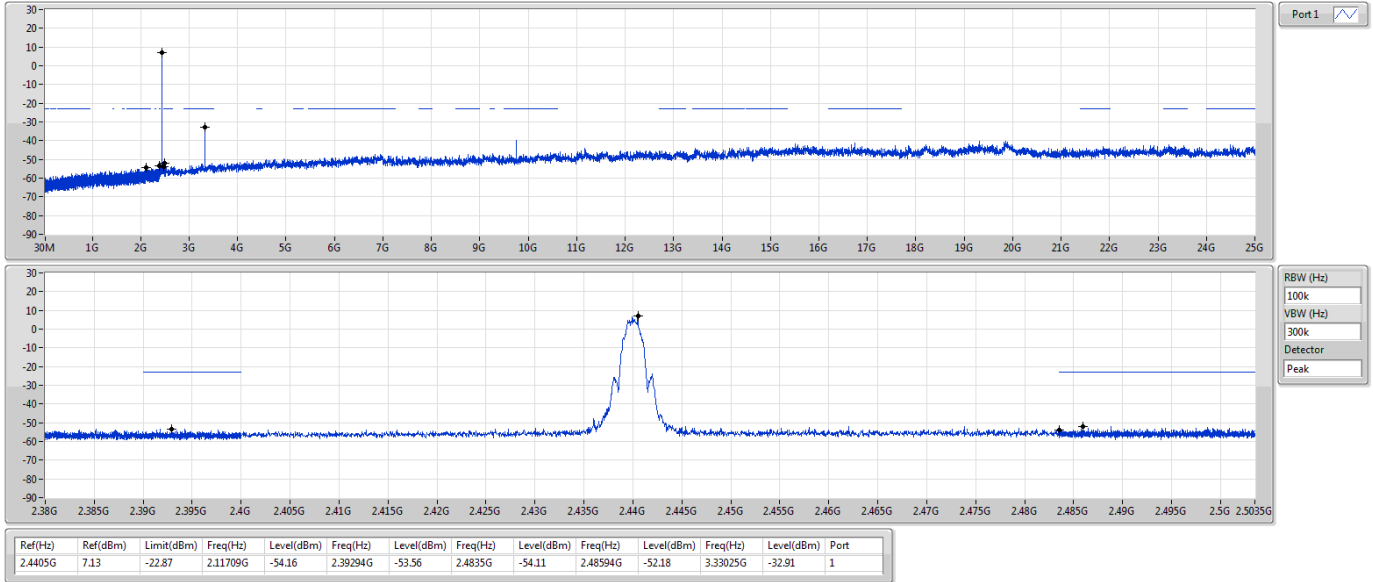
2402MHz



BT-LE(2Mbps)

CSEndB-DTS

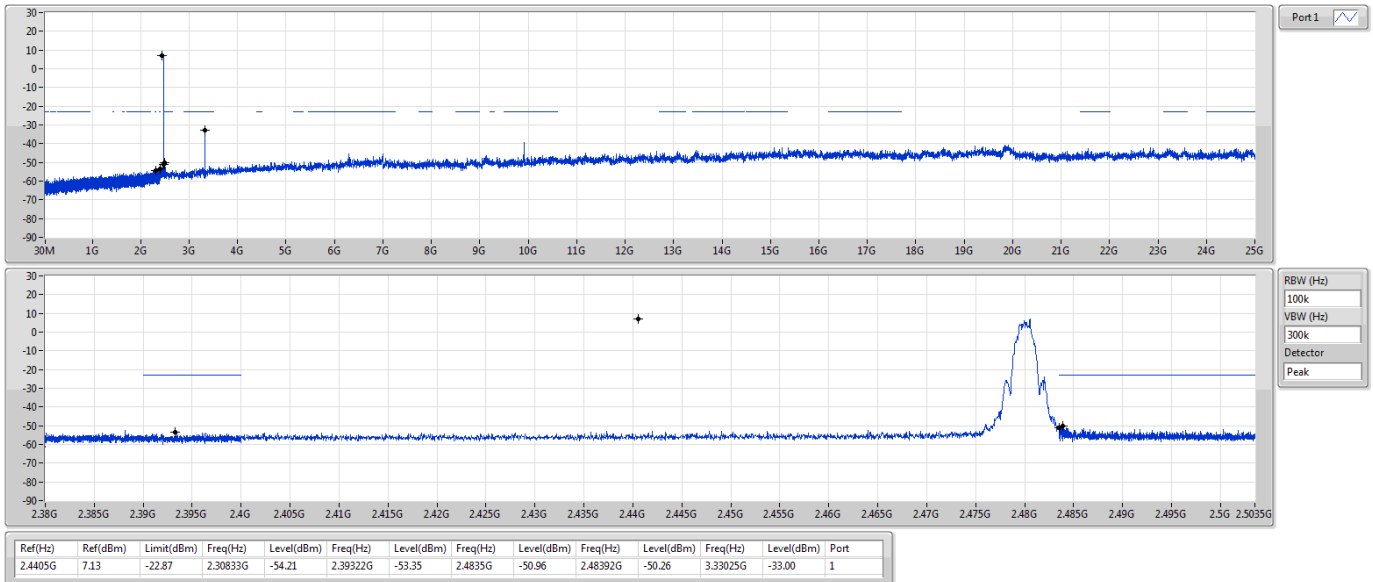
2440MHz



BT-LE(2Mbps)

CSEndB-DTS

2480MHz





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(2Mbps)	Pass	QP	144.46M	42.91	43.50	-0.59	3	Horizontal	171	1.79	-

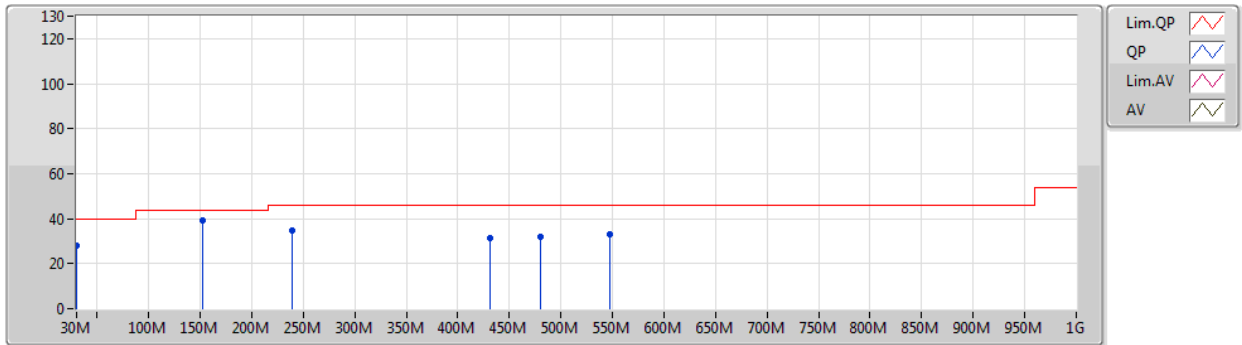
Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
BT-LE(2Mbps)	-	-	-	-	-	-	-	-	-	-	-
2440MHz	Pass	PK	30M	28.05	40.00	-11.95	3	Vertical	0	1.00	-
2440MHz	Pass	PK	152.22M	39.45	43.50	-4.05	3	Vertical	0	1.00	-
2440MHz	Pass	PK	239.52M	35.01	46.00	-10.99	3	Vertical	0	1.00	-
2440MHz	Pass	PK	431.58M	31.51	46.00	-14.49	3	Vertical	0	1.00	-
2440MHz	Pass	PK	480.08M	31.87	46.00	-14.13	3	Vertical	0	1.00	-
2440MHz	Pass	PK	547.98M	32.86	46.00	-13.14	3	Vertical	0	1.00	-
2440MHz	Pass	PK	191.02M	38.73	43.50	-4.77	3	Horizontal	360	1.00	-
2440MHz	Pass	PK	249.22M	36.36	46.00	-9.64	3	Horizontal	360	1.00	-
2440MHz	Pass	PK	336.52M	31.58	46.00	-14.42	3	Horizontal	360	1.00	-
2440MHz	Pass	PK	443.22M	40.13	46.00	-5.87	3	Horizontal	360	1.00	-
2440MHz	Pass	PK	468.44M	37.79	46.00	-8.21	3	Horizontal	360	1.00	-
2440MHz	Pass	QP	144.46M	42.91	43.50	-0.59	3	Horizontal	171	1.79	-

BT-LE(2Mbps)

2440MHz_Test Fixture

02/09/2020

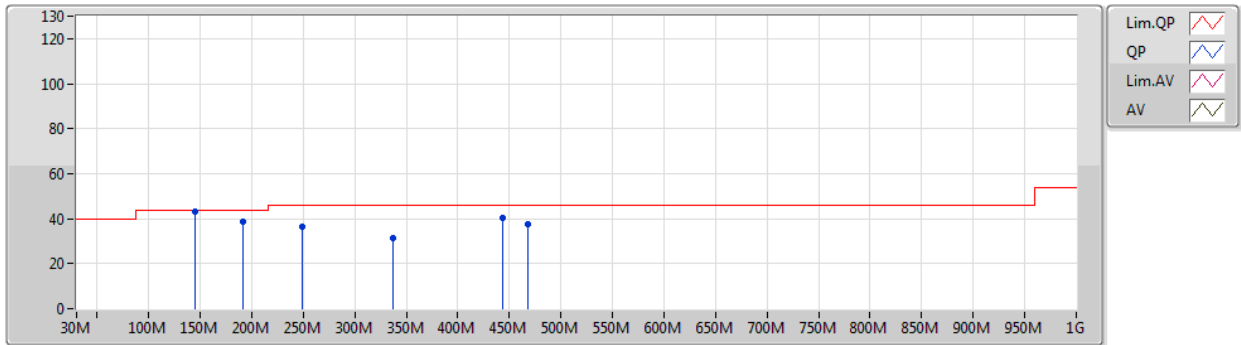


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
PK	30M	28.05	40.00	-11.95	-3.44	3	Vertical	0	1.00	-	31.49	23.33	0.81	27.58
PK	152.22M	39.45	43.50	-4.05	-10.09	3	Vertical	0	1.00	-	49.54	15.12	1.96	27.17
PK	239.52M	35.01	46.00	-10.99	-7.87	3	Vertical	0	1.00	-	42.88	16.34	2.54	26.75
PK	431.58M	31.51	46.00	-14.49	-2.36	3	Vertical	0	1.00	-	33.87	21.81	3.36	27.53
PK	480.08M	31.87	46.00	-14.13	-1.72	3	Vertical	0	1.00	-	33.59	22.45	3.58	27.75
PK	547.98M	32.86	46.00	-13.14	-0.17	3	Vertical	0	1.00	-	33.03	23.95	3.89	28.01

BT-LE(2Mbps)

2440MHz_Test Fixture

02/09/2020



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	191.02M	38.73	43.50	-4.77	-10.71	3	Horizontal	360	1.00	-	49.44	13.99	2.26	26.96
PK	249.22M	36.36	46.00	-9.64	-6.58	3	Horizontal	360	1.00	-	42.94	17.53	2.60	26.71
PK	336.52M	31.58	46.00	-14.42	-4.79	3	Horizontal	360	1.00	-	36.37	19.02	3.05	26.86
PK	443.22M	40.13	46.00	-5.87	-2.35	3	Horizontal	360	1.00	-	42.48	21.89	3.39	27.63
PK	468.44M	37.79	46.00	-8.21	-1.82	3	Horizontal	360	1.00	-	39.61	22.40	3.51	27.73
QP	144.46M	42.91	43.50	-0.59	-9.56	3	Horizontal	171	1.79	-	52.47	15.73	1.92	27.21

**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	2.4836G	49.04	54.00	-4.96	3	Horizontal	301	1.40	-
BT-LE(2Mbps)	Pass	AV	2.4835G	51.34	54.00	-2.66	3	Horizontal	303	1.40	-

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	2.3714G	48.10	54.00	-5.90	3	Vertical	209	1.06	-
2402MHz	Pass	AV	2.402G	94.37	Inf	-Inf	3	Vertical	209	1.06	-
2402MHz	Pass	PK	2.3734G	59.62	74.00	-14.38	3	Vertical	209	1.06	-
2402MHz	Pass	PK	2.4018G	95.34	Inf	-Inf	3	Vertical	209	1.06	-
2402MHz	Pass	AV	2.3898G	47.92	54.00	-6.08	3	Horizontal	301	1.25	-
2402MHz	Pass	AV	2.402G	101.41	Inf	-Inf	3	Horizontal	301	1.25	-
2402MHz	Pass	PK	2.3788G	59.42	74.00	-14.58	3	Horizontal	301	1.25	-
2402MHz	Pass	PK	2.4022G	102.32	Inf	-Inf	3	Horizontal	301	1.25	-
2402MHz	Pass	AV	4.80387G	34.94	54.00	-19.06	3	Vertical	110	1.01	-
2402MHz	Pass	PK	4.80429G	46.35	74.00	-27.65	3	Vertical	110	1.01	-
2402MHz	Pass	AV	4.80388G	36.02	54.00	-17.98	3	Horizontal	33	1.03	-
2402MHz	Pass	PK	4.804G	47.41	74.00	-26.59	3	Horizontal	33	1.03	-
2440MHz	Pass	AV	2.3408G	47.99	54.00	-6.01	3	Vertical	209	1.00	-
2440MHz	Pass	AV	2.44G	98.47	Inf	-Inf	3	Vertical	209	1.00	-
2440MHz	Pass	AV	2.4856G	48.51	54.00	-5.49	3	Vertical	209	1.00	-
2440MHz	Pass	PK	2.3484G	59.10	74.00	-14.90	3	Vertical	209	1.00	-
2440MHz	Pass	PK	2.4404G	99.41	Inf	-Inf	3	Vertical	209	1.00	-
2440MHz	Pass	PK	2.492G	60.65	74.00	-13.35	3	Vertical	209	1.00	-
2440MHz	Pass	AV	2.3424G	47.97	54.00	-6.03	3	Horizontal	299	1.26	-
2440MHz	Pass	AV	2.44G	104.43	Inf	-Inf	3	Horizontal	299	1.26	-
2440MHz	Pass	AV	2.4852G	48.51	54.00	-5.49	3	Horizontal	299	1.26	-
2440MHz	Pass	PK	2.3852G	59.95	74.00	-14.05	3	Horizontal	299	1.26	-
2440MHz	Pass	PK	2.4404G	105.31	Inf	-Inf	3	Horizontal	299	1.26	-
2440MHz	Pass	PK	2.4848G	60.08	74.00	-13.92	3	Horizontal	299	1.26	-
2440MHz	Pass	AV	4.88045G	34.52	54.00	-19.48	3	Vertical	335	1.46	-
2440MHz	Pass	PK	4.87919G	46.38	74.00	-27.62	3	Vertical	335	1.46	-
2440MHz	Pass	AV	4.88203G	34.53	54.00	-19.47	3	Horizontal	41	2.40	-
2440MHz	Pass	PK	4.87874G	46.84	74.00	-27.16	3	Horizontal	41	2.40	-
2480MHz	Pass	AV	2.48G	98.46	Inf	-Inf	3	Vertical	207	1.14	-
2480MHz	Pass	AV	2.4892G	48.78	54.00	-5.22	3	Vertical	207	1.14	-
2480MHz	Pass	PK	2.4798G	99.45	Inf	-Inf	3	Vertical	207	1.14	-
2480MHz	Pass	PK	2.496G	60.93	74.00	-13.07	3	Vertical	207	1.14	-
2480MHz	Pass	AV	2.48G	106.13	Inf	-Inf	3	Horizontal	301	1.40	-
2480MHz	Pass	AV	2.4836G	49.04	54.00	-4.96	3	Horizontal	301	1.40	-
2480MHz	Pass	PK	2.4798G	107.03	Inf	-Inf	3	Horizontal	301	1.40	-
2480MHz	Pass	PK	2.5G	60.08	74.00	-13.92	3	Horizontal	301	1.40	-
2480MHz	Pass	AV	4.95987G	34.93	54.00	-19.07	3	Vertical	2	1.44	-
2480MHz	Pass	PK	4.95813G	46.74	74.00	-27.26	3	Vertical	2	1.44	-
2480MHz	Pass	AV	4.95992G	34.79	54.00	-19.21	3	Horizontal	91	1.63	-
2480MHz	Pass	PK	4.96016G	46.79	74.00	-27.21	3	Horizontal	91	1.63	-
BT-LE(2Mbps)	-	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	AV	2.3874G	47.90	54.00	-6.10	3	Vertical	210	1.14	-
2402MHz	Pass	AV	2.402G	92.61	Inf	-Inf	3	Vertical	210	1.14	-
2402MHz	Pass	PK	2.3706G	59.97	74.00	-14.03	3	Vertical	210	1.14	-
2402MHz	Pass	PK	2.4024G	95.34	Inf	-Inf	3	Vertical	210	1.14	-
2402MHz	Pass	AV	2.3522G	48.14	54.00	-5.86	3	Horizontal	299	1.25	-
2402MHz	Pass	AV	2.402G	99.59	Inf	-Inf	3	Horizontal	299	1.25	-

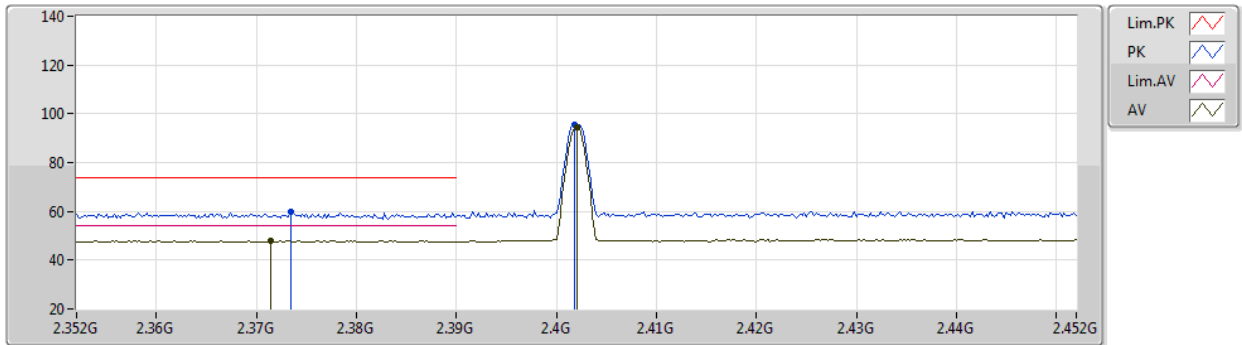


Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2402MHz	Pass	PK	2.3862G	59.96	74.00	-14.04	3	Horizontal	299	1.25	-
2402MHz	Pass	PK	2.4026G	102.19	Inf	-Inf	3	Horizontal	299	1.25	-
2402MHz	Pass	AV	4.80361G	34.28	54.00	-19.72	3	Vertical	53	1.73	-
2402MHz	Pass	PK	4.80422G	46.25	74.00	-27.75	3	Vertical	53	1.73	-
2402MHz	Pass	AV	4.80259G	34.42	54.00	-19.58	3	Horizontal	215	1.82	-
2402MHz	Pass	PK	4.80645G	46.21	74.00	-27.79	3	Horizontal	215	1.82	-
2440MHz	Pass	AV	2.3532G	48.12	54.00	-5.88	3	Vertical	210	1.01	-
2440MHz	Pass	AV	2.44G	96.83	Inf	-Inf	3	Vertical	210	1.01	-
2440MHz	Pass	AV	2.4856G	48.51	54.00	-5.49	3	Vertical	210	1.01	-
2440MHz	Pass	PK	2.3424G	59.61	74.00	-14.39	3	Vertical	210	1.01	-
2440MHz	Pass	PK	2.4404G	99.40	Inf	-Inf	3	Vertical	210	1.01	-
2440MHz	Pass	PK	2.486G	59.71	74.00	-14.29	3	Vertical	210	1.01	-
2440MHz	Pass	AV	2.3548G	48.11	54.00	-5.89	3	Horizontal	298	1.27	-
2440MHz	Pass	AV	2.44G	102.78	Inf	-Inf	3	Horizontal	298	1.27	-
2440MHz	Pass	AV	2.486G	48.51	54.00	-5.49	3	Horizontal	298	1.27	-
2440MHz	Pass	PK	2.348G	60.19	74.00	-13.81	3	Horizontal	298	1.27	-
2440MHz	Pass	PK	2.4404G	105.34	Inf	-Inf	3	Horizontal	298	1.27	-
2440MHz	Pass	PK	2.488G	60.30	74.00	-13.70	3	Horizontal	298	1.27	-
2440MHz	Pass	AV	4.87885G	34.90	54.00	-19.10	3	Vertical	256	1.50	-
2440MHz	Pass	PK	4.87981G	46.97	74.00	-27.03	3	Vertical	256	1.50	-
2440MHz	Pass	AV	4.88064G	34.66	54.00	-19.34	3	Horizontal	61	1.50	-
2440MHz	Pass	PK	4.87822G	46.34	74.00	-27.66	3	Horizontal	61	1.50	-
2480MHz	Pass	AV	2.48G	97.34	Inf	-Inf	3	Vertical	208	1.01	-
2480MHz	Pass	AV	2.4835G	49.04	54.00	-4.96	3	Vertical	208	1.01	-
2480MHz	Pass	PK	2.4796G	99.92	Inf	-Inf	3	Vertical	208	1.01	-
2480MHz	Pass	PK	2.5G	60.37	74.00	-13.63	3	Vertical	208	1.01	-
2480MHz	Pass	AV	2.48G	104.28	Inf	-Inf	3	Horizontal	303	1.40	-
2480MHz	Pass	AV	2.4835G	51.34	54.00	-2.66	3	Horizontal	303	1.40	-
2480MHz	Pass	PK	2.4796G	106.84	Inf	-Inf	3	Horizontal	303	1.40	-
2480MHz	Pass	PK	2.4835G	61.98	74.00	-12.02	3	Horizontal	303	1.40	-
2480MHz	Pass	AV	4.96G	34.93	54.00	-19.07	3	Vertical	174	2.32	-
2480MHz	Pass	PK	4.96098G	46.96	74.00	-27.04	3	Vertical	174	2.32	-
2480MHz	Pass	AV	4.95951G	34.93	54.00	-19.07	3	Horizontal	87	2.20	-
2480MHz	Pass	PK	4.96201G	46.85	74.00	-27.15	3	Horizontal	87	2.20	-

BT-LE(1Mbps)

2402MHz_TX

10/08/2020

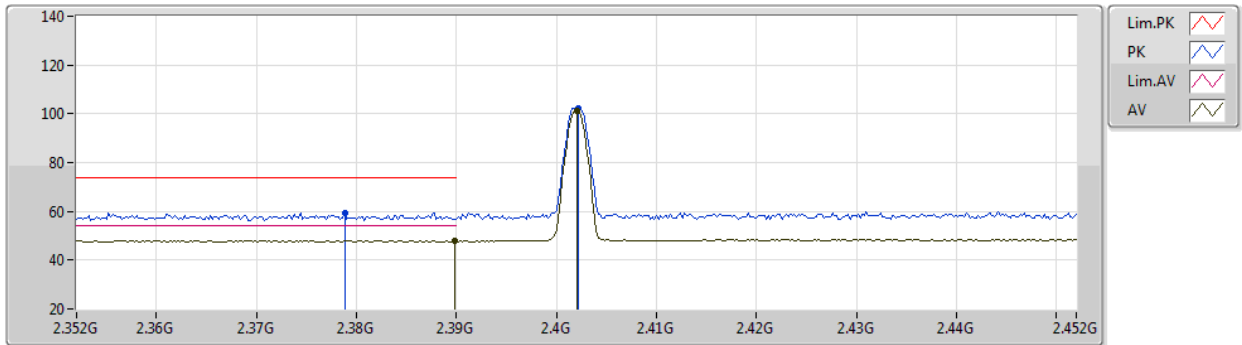


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.3714G	48.10	54.00	-5.90	31.93	3	Vertical	209	1.06	-	16.17	27.66	4.27	-
AV	2.402G	94.37	Inf	-Inf	31.90	3	Vertical	209	1.06	-	62.47	27.60	4.30	-
PK	2.3734G	59.62	74.00	-14.38	31.92	3	Vertical	209	1.06	-	27.70	27.65	4.27	-
PK	2.4018G	95.34	Inf	-Inf	31.90	3	Vertical	209	1.06	-	63.44	27.60	4.30	-

BT-LE(1Mbps)

2402MHz_TX

10/08/2020

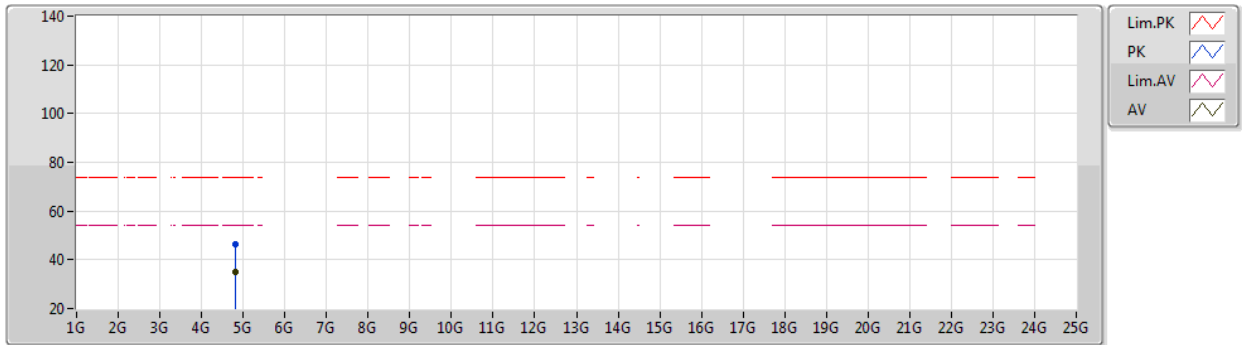


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.3898G	47.92	54.00	-6.08	31.91	3	Horizontal	301	1.25	-	16.01	27.62	4.29	-
AV	2.402G	101.41	Inf	-Inf	31.90	3	Horizontal	301	1.25	-	69.51	27.60	4.30	-
PK	2.3788G	59.42	74.00	-14.58	31.92	3	Horizontal	301	1.25	-	27.50	27.64	4.28	-
PK	2.4022G	102.32	Inf	-Inf	31.90	3	Horizontal	301	1.25	-	70.42	27.60	4.30	-

BT-LE(1Mbps)

10/08/2020

2402MHz_TX

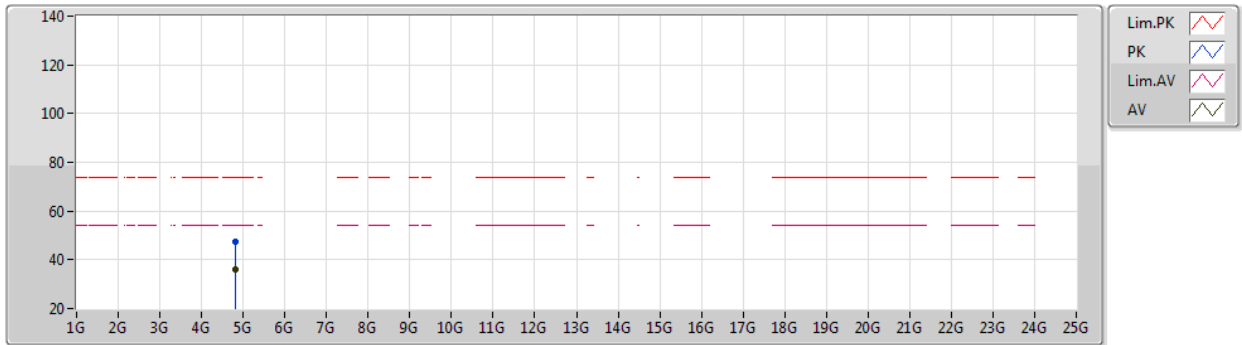


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.80387G	34.94	54.00	-19.06	8.19	3	Vertical	110	1.01	-	26.75	31.10	6.50	29.41
PK	4.80429G	46.35	74.00	-27.65	8.19	3	Vertical	110	1.01	-	38.16	31.10	6.50	29.41

BT-LE(1Mbps)

2402MHz_TX

10/08/2020

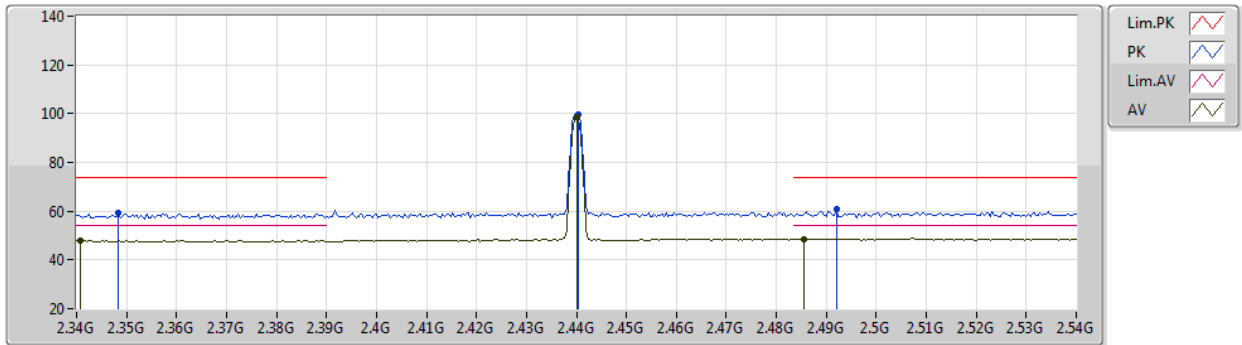


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.80388G	36.02	54.00	-17.98	8.19	3	Horizontal	33	1.03	-	27.83	31.10	6.50	29.41
PK	4.804G	47.41	74.00	-26.59	8.19	3	Horizontal	33	1.03	-	39.22	31.10	6.50	29.41

BT-LE(1Mbps)

2440MHz_TX

10/08/2020

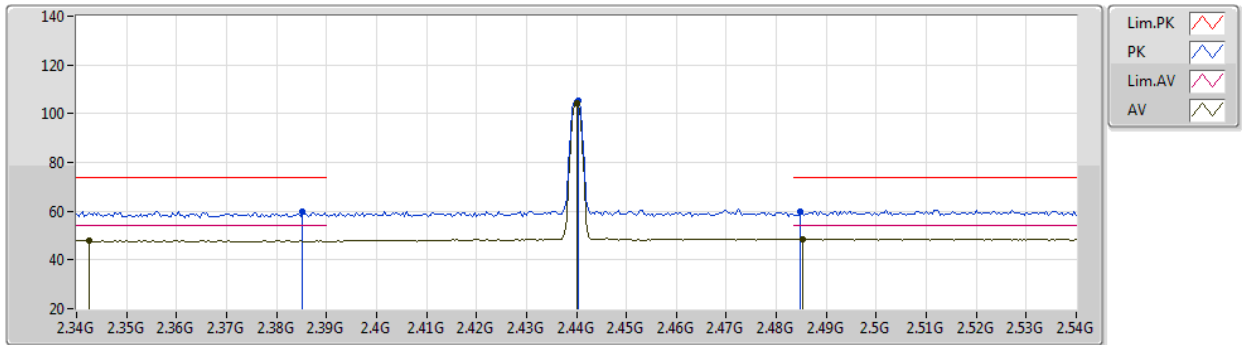


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.3408G	47.99	54.00	-6.01	31.98	3	Vertical	209	1.00	-	16.01	27.74	4.24	-
AV	2.44G	98.47	Inf	-Inf	31.86	3	Vertical	209	1.00	-	66.61	27.52	4.34	-
AV	2.4856G	48.51	54.00	-5.49	31.82	3	Vertical	209	1.00	-	16.69	27.43	4.39	-
PK	2.3484G	59.10	74.00	-14.90	31.96	3	Vertical	209	1.00	-	27.14	27.71	4.25	-
PK	2.4404G	99.41	Inf	-Inf	31.86	3	Vertical	209	1.00	-	67.55	27.52	4.34	-
PK	2.492G	60.65	74.00	-13.35	31.81	3	Vertical	209	1.00	-	28.84	27.42	4.39	-

BT-LE(1Mbps)

2440MHz_TX

10/08/2020

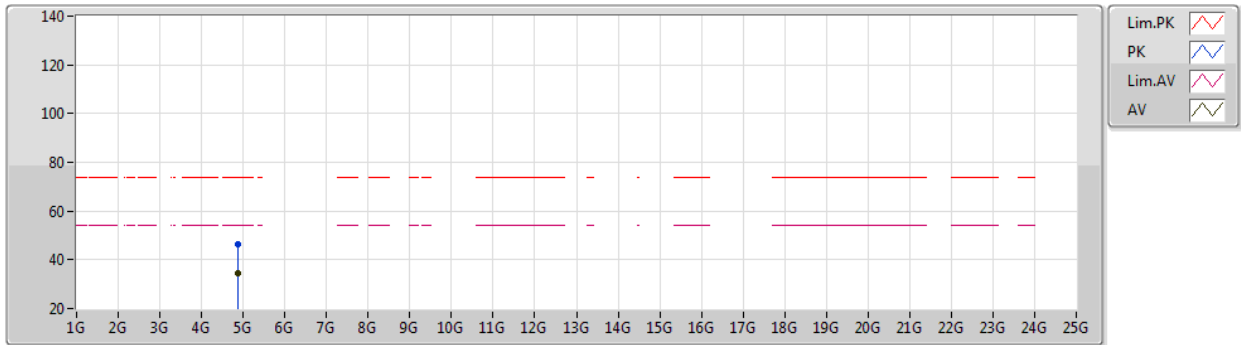


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.3424G	47.97	54.00	-6.03	31.97	3	Horizontal	299	1.26	-	16.00	27.73	4.24	-
AV	2.44G	104.43	Inf	-Inf	31.86	3	Horizontal	299	1.26	-	72.57	27.52	4.34	-
AV	2.4852G	48.51	54.00	-5.49	31.82	3	Horizontal	299	1.26	-	16.69	27.43	4.39	-
PK	2.3852G	59.95	74.00	-14.05	31.92	3	Horizontal	299	1.26	-	28.03	27.63	4.29	-
PK	2.4404G	105.31	Inf	-Inf	31.86	3	Horizontal	299	1.26	-	73.45	27.52	4.34	-
PK	2.4848G	60.08	74.00	-13.92	31.81	3	Horizontal	299	1.26	-	28.27	27.43	4.38	-

BT-LE(1Mbps)

2440MHz_TX

10/08/2020

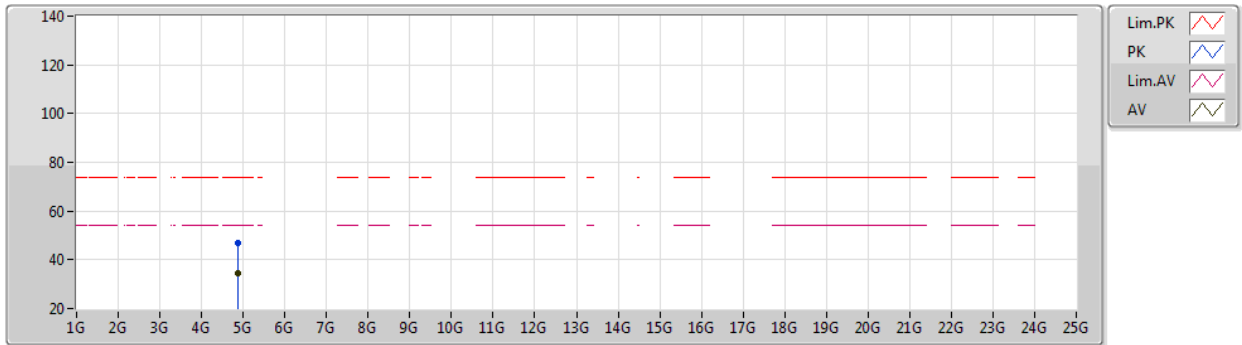


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.88045G	34.52	54.00	-19.48	8.31	3	Vertical	335	1.46	-	26.21	31.10	6.58	29.37
PK	4.87919G	46.38	74.00	-27.62	8.30	3	Vertical	335	1.46	-	38.08	31.10	6.58	29.38

BT-LE(1Mbps)

10/08/2020

2440MHz_TX

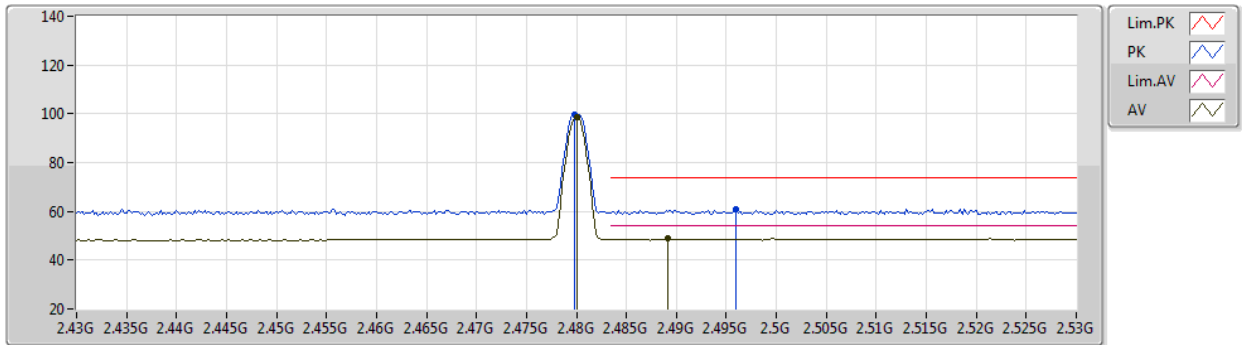


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.88203G	34.53	54.00	-19.47	8.31	3	Horizontal	41	2.40	-	26.22	31.10	6.58	29.37
PK	4.87874G	46.84	74.00	-27.16	8.30	3	Horizontal	41	2.40	-	38.54	31.10	6.58	29.38

BT-LE(1Mbps)

2480MHz_TX

10/08/2020

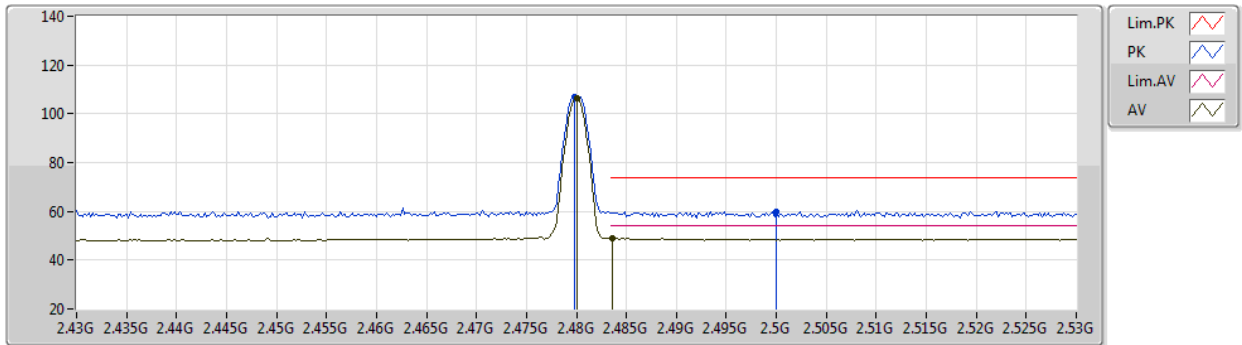


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.48G	98.46	Inf	-Inf	31.82	3	Vertical	207	1.14	-	66.64	27.44	4.38	-
AV	2.4892G	48.78	54.00	-5.22	31.81	3	Vertical	207	1.14	-	16.97	27.42	4.39	-
PK	2.4798G	99.45	Inf	-Inf	31.82	3	Vertical	207	1.14	-	67.63	27.44	4.38	-
PK	2.496G	60.93	74.00	-13.07	31.81	3	Vertical	207	1.14	-	29.12	27.41	4.40	-

BT-LE(1Mbps)

2480MHz_TX

10/08/2020

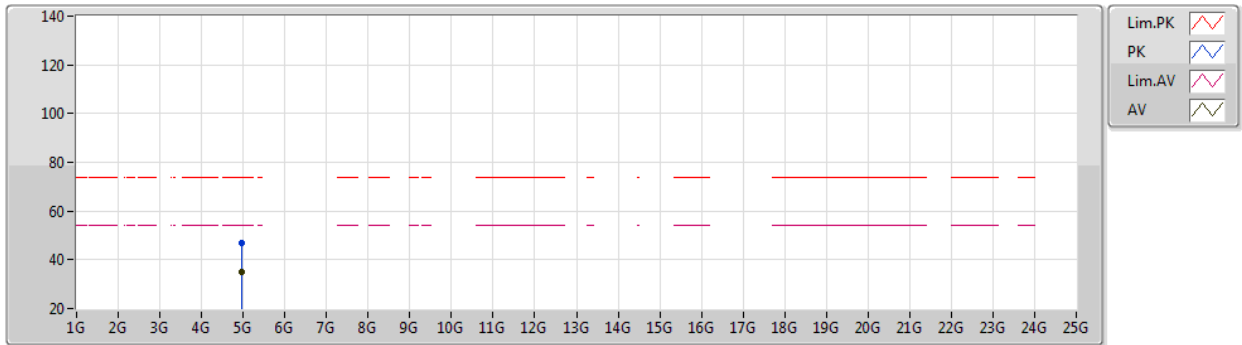


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.48G	106.13	Inf	-Inf	31.82	3	Horizontal	301	1.40	-	74.31	27.44	4.38	-
AV	2.4836G	49.04	54.00	-4.96	31.81	3	Horizontal	301	1.40	-	17.23	27.43	4.38	-
PK	2.4798G	107.03	Inf	-Inf	31.82	3	Horizontal	301	1.40	-	75.21	27.44	4.38	-
PK	2.5G	60.08	74.00	-13.92	31.80	3	Horizontal	301	1.40	-	28.28	27.40	4.40	-

BT-LE(1Mbps)

2480MHz_TX

10/08/2020

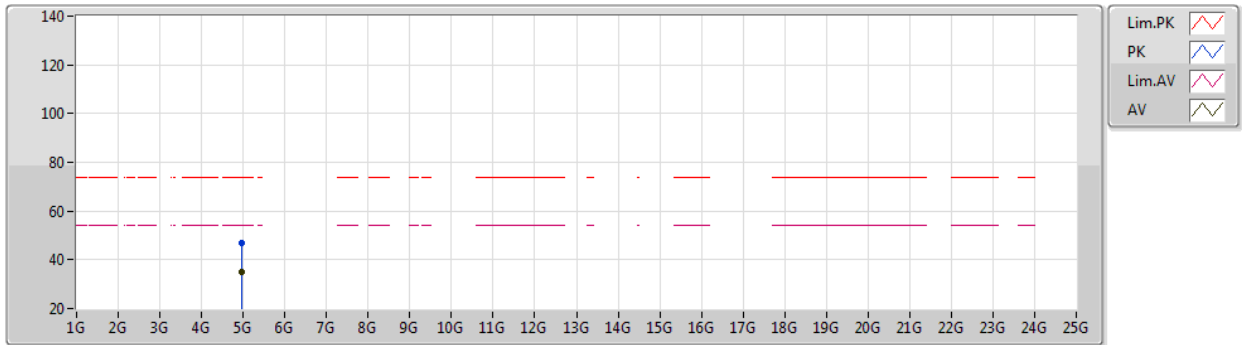


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.95987G	34.93	54.00	-19.07	8.52	3	Vertical	2	1.44	-	26.41	31.20	6.66	29.34
PK	4.95813G	46.74	74.00	-27.26	8.52	3	Vertical	2	1.44	-	38.22	31.20	6.66	29.34

BT-LE(1Mbps)

2480MHz_TX

10/08/2020

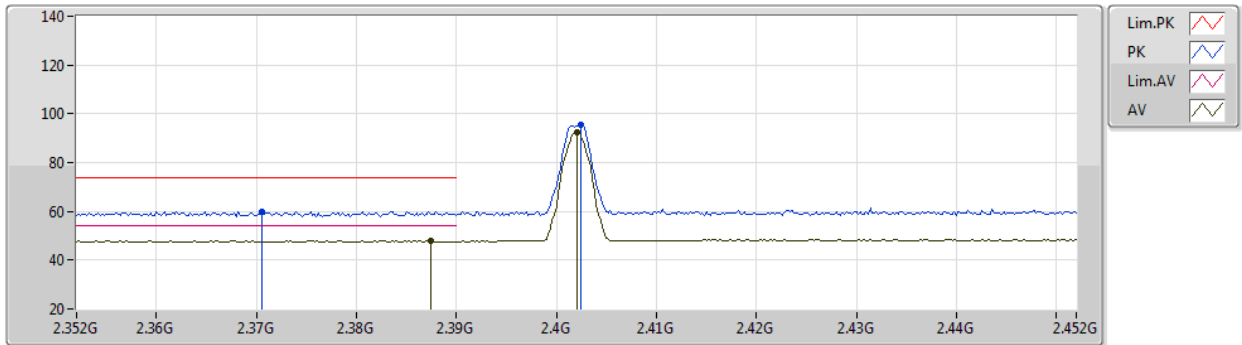


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.95992G	34.79	54.00	-19.21	8.52	3	Horizontal	91	1.63	-	26.27	31.20	6.66	29.34
PK	4.96016G	46.79	74.00	-27.21	8.52	3	Horizontal	91	1.63	-	38.27	31.20	6.66	29.34

BT-LE(2Mbps)

2402MHz_TX

10/08/2020

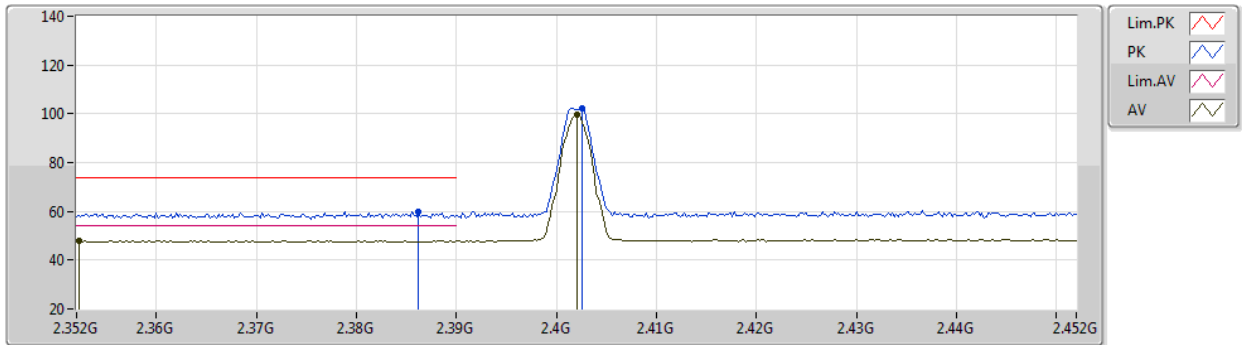


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.3874G	47.90	54.00	-6.10	31.92	3	Vertical	210	1.14	-	15.98	27.63	4.29	-
AV	2.402G	92.61	Inf	-Inf	31.90	3	Vertical	210	1.14	-	60.71	27.60	4.30	-
PK	2.3706G	59.97	74.00	-14.03	31.93	3	Vertical	210	1.14	-	28.04	27.66	4.27	-
PK	2.4024G	95.34	Inf	-Inf	31.90	3	Vertical	210	1.14	-	63.44	27.60	4.30	-

BT-LE(2Mbps)

2402MHz_TX

10/08/2020

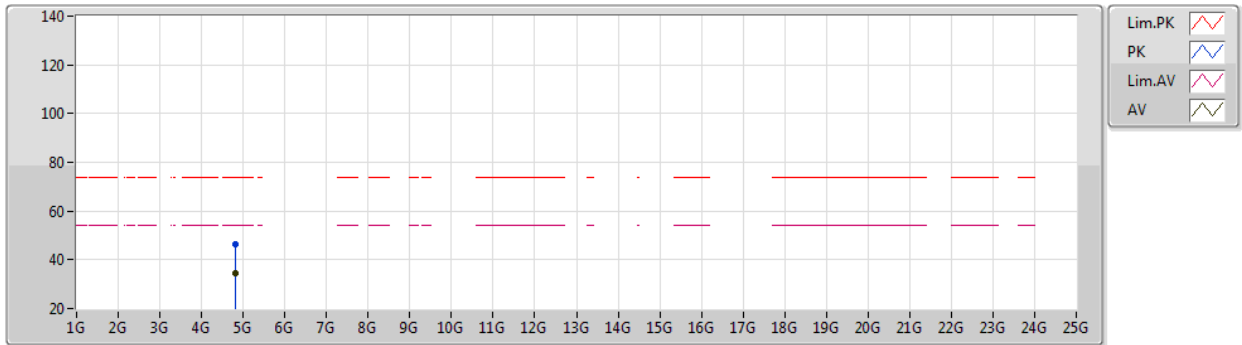


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.3522G	48.14	54.00	-5.86	31.95	3	Horizontal	299	1.25	-	16.19	27.70	4.25	-
AV	2.402G	99.59	Inf	-Inf	31.90	3	Horizontal	299	1.25	-	67.69	27.60	4.30	-
PK	2.3862G	59.96	74.00	-14.04	31.92	3	Horizontal	299	1.25	-	28.04	27.63	4.29	-
PK	2.4026G	102.19	Inf	-Inf	31.89	3	Horizontal	299	1.25	-	70.30	27.59	4.30	-

BT-LE(2Mbps)

2402MHz_TX

10/08/2020

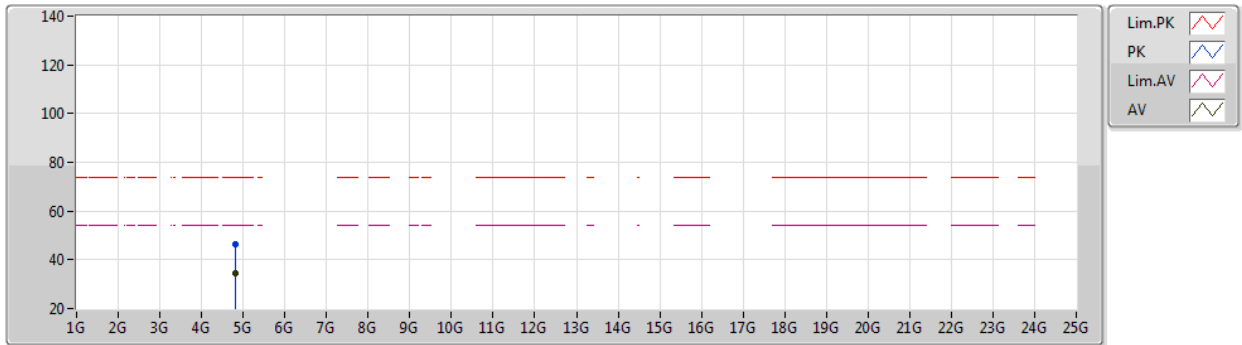


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.80361G	34.28	54.00	-19.72	8.19	3	Vertical	53	1.73	-	26.09	31.10	6.50	29.41
PK	4.80422G	46.25	74.00	-27.75	8.19	3	Vertical	53	1.73	-	38.06	31.10	6.50	29.41

BT-LE(2Mbps)

2402MHz_TX

10/08/2020

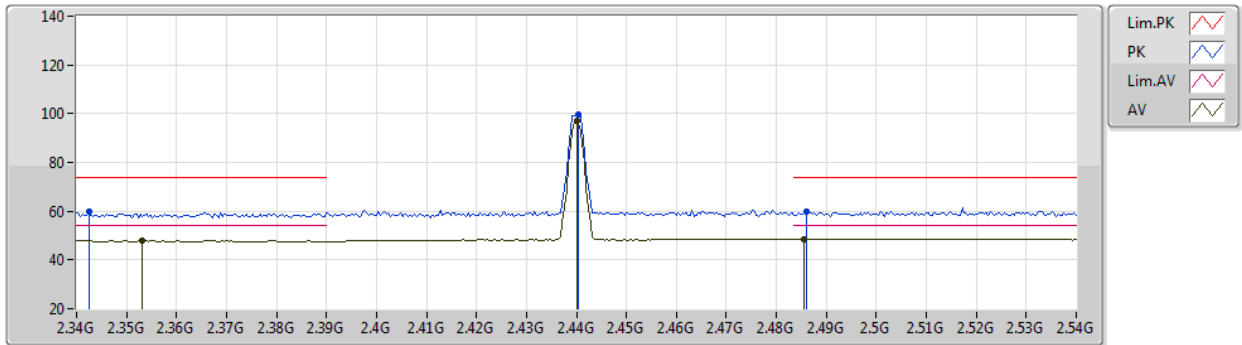


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.80259G	34.42	54.00	-19.58	8.19	3	Horizontal	215	1.82	-	26.23	31.10	6.50	29.41
PK	4.80645G	46.21	74.00	-27.79	8.20	3	Horizontal	215	1.82	-	38.01	31.10	6.51	29.41

BT-LE(2Mbps)

2440MHz_TX

10/08/2020

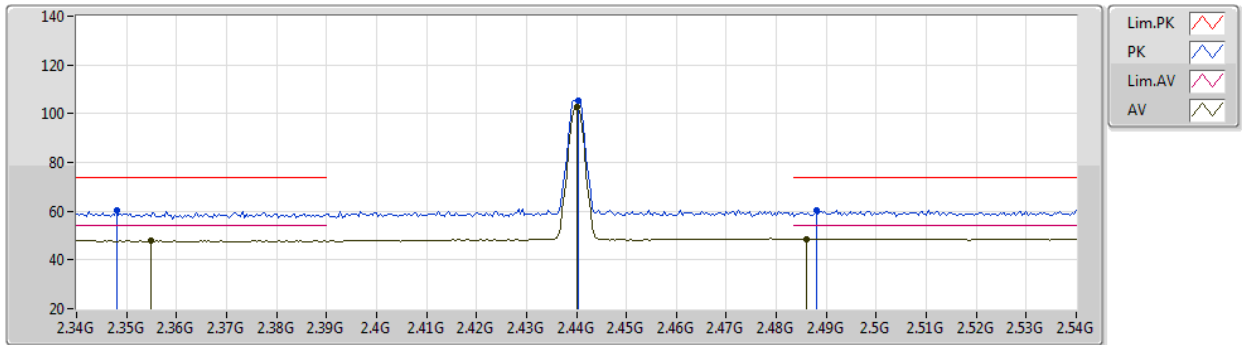


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.3532G	48.12	54.00	-5.88	31.94	3	Vertical	210	1.01	-	16.18	27.69	4.25	-
AV	2.44G	96.83	Inf	-Inf	31.86	3	Vertical	210	1.01	-	64.97	27.52	4.34	-
AV	2.4856G	48.51	54.00	-5.49	31.82	3	Vertical	210	1.01	-	16.69	27.43	4.39	-
PK	2.3424G	59.61	74.00	-14.39	31.97	3	Vertical	210	1.01	-	27.64	27.73	4.24	-
PK	2.4404G	99.40	Inf	-Inf	31.86	3	Vertical	210	1.01	-	67.54	27.52	4.34	-
PK	2.486G	59.71	74.00	-14.29	31.82	3	Vertical	210	1.01	-	27.89	27.43	4.39	-

BT-LE(2Mbps)

2440MHz_TX

10/08/2020

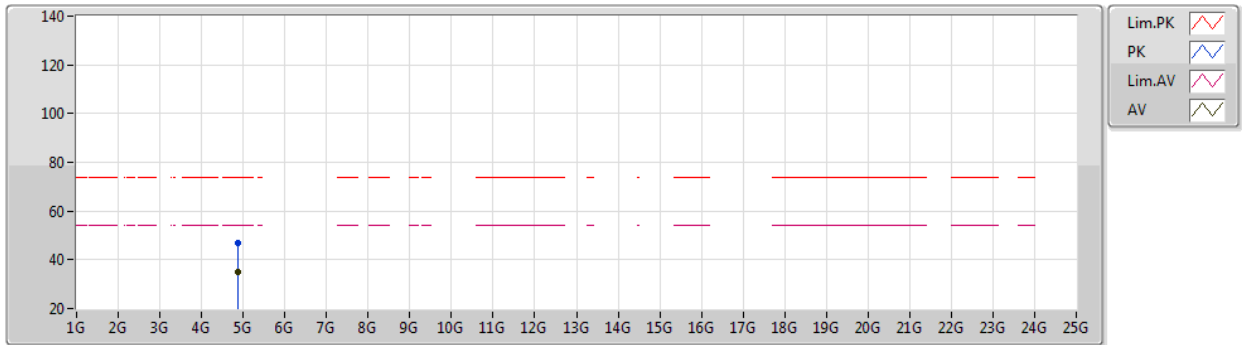


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.3548G	48.11	54.00	-5.89	31.94	3	Horizontal	298	1.27	-	16.17	27.69	4.25	-
AV	2.44G	102.78	Inf	-Inf	31.86	3	Horizontal	298	1.27	-	70.92	27.52	4.34	-
AV	2.486G	48.51	54.00	-5.49	31.82	3	Horizontal	298	1.27	-	16.69	27.43	4.39	-
PK	2.348G	60.19	74.00	-13.81	31.96	3	Horizontal	298	1.27	-	28.23	27.71	4.25	-
PK	2.4404G	105.34	Inf	-Inf	31.86	3	Horizontal	298	1.27	-	73.48	27.52	4.34	-
PK	2.488G	60.30	74.00	-13.70	31.81	3	Horizontal	298	1.27	-	28.49	27.42	4.39	-

BT-LE(2Mbps)

2440MHz_TX

10/08/2020

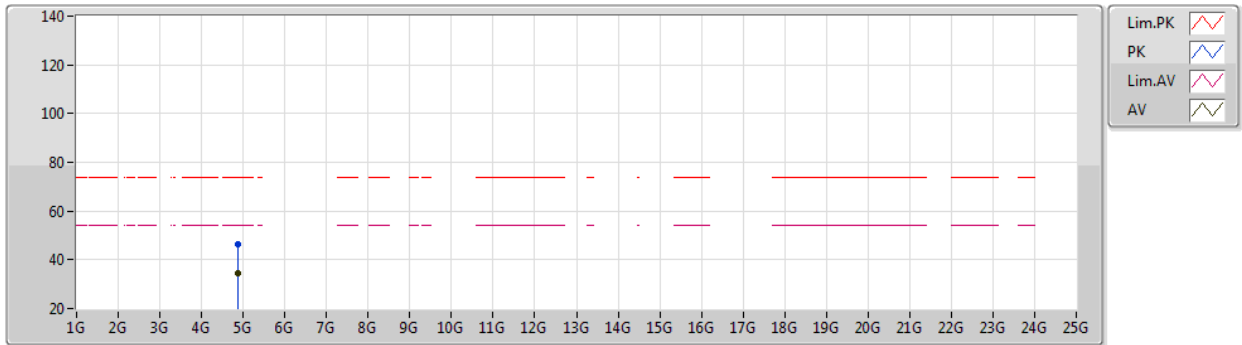


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.87885G	34.90	54.00	-19.10	8.30	3	Vertical	256	1.50	-	26.60	31.10	6.58	29.38
PK	4.87981G	46.97	74.00	-27.03	8.30	3	Vertical	256	1.50	-	38.67	31.10	6.58	29.38

BT-LE(2Mbps)

10/08/2020

2440MHz_TX

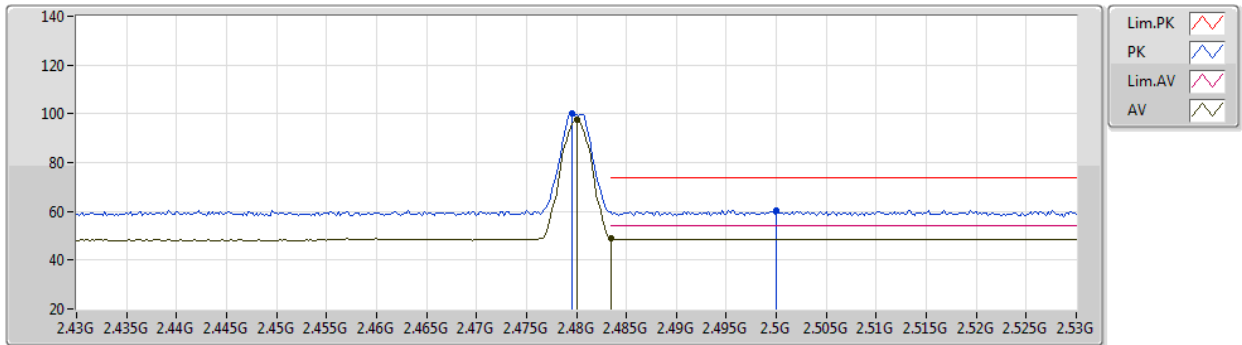


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.88064G	34.66	54.00	-19.34	8.31	3	Horizontal	61	1.50	-	26.35	31.10	6.58	29.37
PK	4.87822G	46.34	74.00	-27.66	8.30	3	Horizontal	61	1.50	-	38.04	31.10	6.58	29.38

BT-LE(2Mbps)

2480MHz_TX

10/08/2020

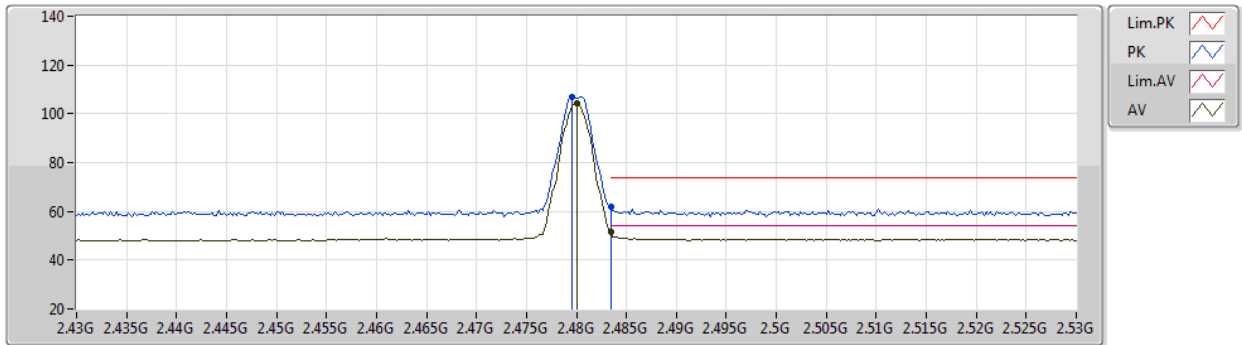


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.48G	97.34	Inf	-Inf	31.82	3	Vertical	208	1.01	-	65.52	27.44	4.38	-
AV	2.4835G	49.04	54.00	-4.96	31.81	3	Vertical	208	1.01	-	17.23	27.43	4.38	-
PK	2.4796G	99.92	Inf	-Inf	31.82	3	Vertical	208	1.01	-	68.10	27.44	4.38	-
PK	2.5G	60.37	74.00	-13.63	31.80	3	Vertical	208	1.01	-	28.57	27.40	4.40	-

BT-LE(2Mbps)

2480MHz_TX

10/08/2020

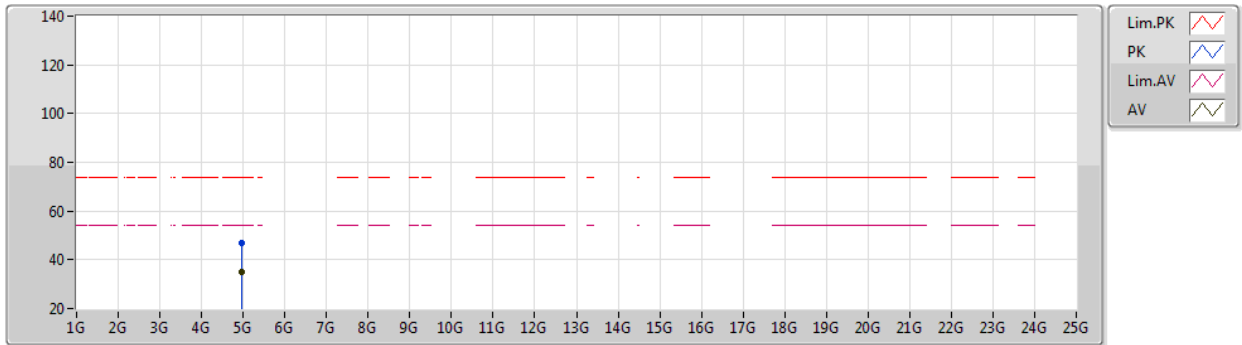


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.48G	104.28	Inf	-Inf	31.82	3	Horizontal	303	1.40	-	72.46	27.44	4.38	-
AV	2.4835G	51.34	54.00	-2.66	31.81	3	Horizontal	303	1.40	-	19.53	27.43	4.38	-
PK	2.4796G	106.84	Inf	-Inf	31.82	3	Horizontal	303	1.40	-	75.02	27.44	4.38	-
PK	2.4835G	61.98	74.00	-12.02	31.81	3	Horizontal	303	1.40	-	30.17	27.43	4.38	-

BT-LE(2Mbps)

2480MHz_TX

10/08/2020

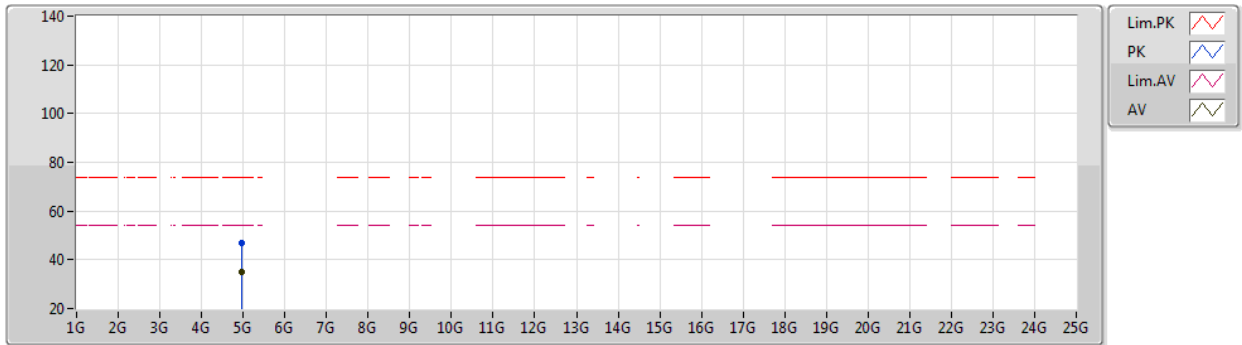


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.96G	34.93	54.00	-19.07	8.52	3	Vertical	174	2.32	-	26.41	31.20	6.66	29.34
PK	4.96098G	46.96	74.00	-27.04	8.52	3	Vertical	174	2.32	-	38.44	31.20	6.66	29.34

BT-LE(2Mbps)

2480MHz_TX

10/08/2020



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	4.95951G	34.93	54.00	-19.07	8.52	3	Horizontal	87	2.20	-	26.41	31.20	6.66	29.34
PK	4.96201G	46.85	74.00	-27.15	8.52	3	Horizontal	87	2.20	-	38.33	31.20	6.66	29.34



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(2Mbps)	Pass	QP	72.68M	38.96	40.00	-1.04	3	Horizontal	109	2.50	-

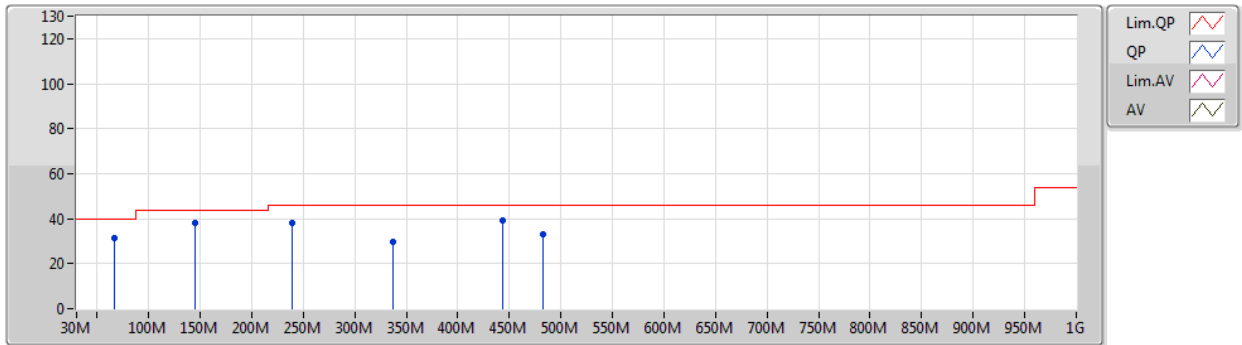
Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
BT-LE(2Mbps)	-	-	-	-	-	-	-	-	-	-	-
2440MHz	Pass	PK	66.86M	31.58	40.00	-8.42	3	Vertical	0	1.00	-
2440MHz	Pass	PK	144.46M	37.96	43.50	-5.54	3	Vertical	0	1.00	-
2440MHz	Pass	PK	239.52M	38.26	46.00	-7.74	3	Vertical	0	1.00	-
2440MHz	Pass	PK	336.52M	29.71	46.00	-16.29	3	Vertical	0	1.00	-
2440MHz	Pass	PK	443.22M	38.96	46.00	-7.04	3	Vertical	0	1.00	-
2440MHz	Pass	PK	482.02M	33.16	46.00	-12.84	3	Vertical	0	1.00	-
2440MHz	Pass	PK	253.1M	38.42	46.00	-7.58	3	Horizontal	360	1.00	-
2440MHz	Pass	PK	346.22M	32.10	46.00	-13.90	3	Horizontal	360	1.00	-
2440MHz	Pass	PK	443.22M	41.99	46.00	-4.01	3	Horizontal	360	1.00	-
2440MHz	Pass	PK	480.08M	38.05	46.00	-7.95	3	Horizontal	360	1.00	-
2440MHz	Pass	QP	72.68M	38.96	40.00	-1.04	3	Horizontal	109	2.50	-
2440MHz	Pass	QP	148.34M	41.06	43.50	-2.44	3	Horizontal	176	1.79	-

BT-LE(2Mbps)RX

2440MHz_Test Fixture

02/09/2020

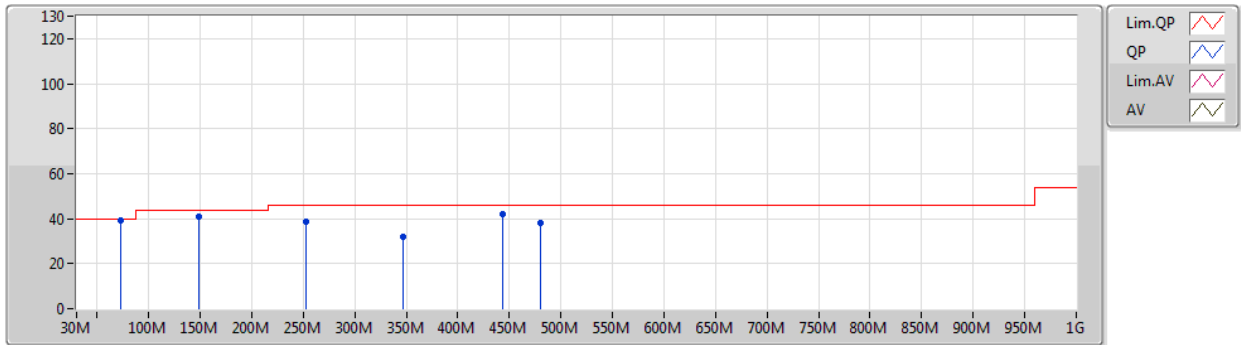


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
PK	66.86M	31.58	40.00	-8.42	-14.90	3	Vertical	0	1.00	-	46.48	11.26	1.30	27.46
PK	144.46M	37.96	43.50	-5.54	-9.56	3	Vertical	0	1.00	-	47.52	15.73	1.92	27.21
PK	239.52M	38.26	46.00	-7.74	-7.87	3	Vertical	0	1.00	-	46.13	16.34	2.54	26.75
PK	336.52M	29.71	46.00	-16.29	-4.79	3	Vertical	0	1.00	-	34.50	19.02	3.05	26.86
PK	443.22M	38.96	46.00	-7.04	-2.35	3	Vertical	0	1.00	-	41.31	21.89	3.39	27.63
PK	482.02M	33.16	46.00	-12.84	-1.69	3	Vertical	0	1.00	-	34.85	22.47	3.59	27.75

BT-LE(2Mbps)RX

2440MHz_Test Fixture

02/09/2020



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	253.1M	38.42	46.00	-7.58	-6.06	3	Horizontal	360	1.00	-	44.48	18.03	2.62	26.71
PK	346.22M	32.10	46.00	-13.90	-4.52	3	Horizontal	360	1.00	-	36.62	19.32	3.08	26.92
PK	443.22M	41.99	46.00	-4.01	-2.35	3	Horizontal	360	1.00	-	44.34	21.89	3.39	27.63
PK	480.08M	38.05	46.00	-7.95	-1.72	3	Horizontal	360	1.00	-	39.77	22.45	3.58	27.75
QP	72.68M	38.96	40.00	-1.04	-14.88	3	Horizontal	109	2.50	-	53.84	11.21	1.35	27.44
QP	148.34M	41.06	43.50	-2.44	-9.77	3	Horizontal	176	1.79	-	50.83	15.48	1.94	27.19



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(2Mbps)	Pass	AV	4.84G	33.85	54.00	-20.15	3	Vertical	0	1.00	-

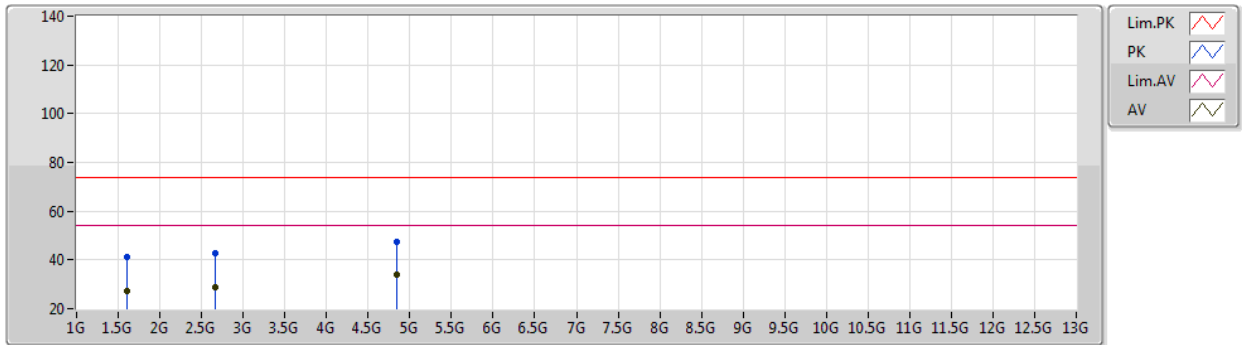
Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
BT-LE(2Mbps)	-	-	-	-	-	-	-	-	-	-	-
2440MHz	Pass	AV	1.6G	27.06	54.00	-26.94	3	Vertical	0	1.00	-
2440MHz	Pass	AV	2.672G	28.76	54.00	-25.24	3	Vertical	0	1.00	-
2440MHz	Pass	AV	4.84G	33.85	54.00	-20.15	3	Vertical	0	1.00	-
2440MHz	Pass	PK	1.6G	41.24	74.00	-32.76	3	Vertical	0	1.00	-
2440MHz	Pass	PK	2.672G	42.66	74.00	-31.34	3	Vertical	0	1.00	-
2440MHz	Pass	PK	4.84G	47.18	74.00	-26.82	3	Vertical	0	1.00	-
2440MHz	Pass	AV	1.632G	26.20	54.00	-27.80	3	Horizontal	360	1.00	-
2440MHz	Pass	AV	2.448G	28.00	54.00	-26.00	3	Horizontal	360	1.00	-
2440MHz	Pass	AV	4.68G	33.48	54.00	-20.52	3	Horizontal	360	1.00	-
2440MHz	Pass	PK	1.632G	41.13	74.00	-32.87	3	Horizontal	360	1.00	-
2440MHz	Pass	PK	2.448G	41.43	74.00	-32.57	3	Horizontal	360	1.00	-
2440MHz	Pass	PK	4.68G	45.82	74.00	-28.18	3	Horizontal	360	1.00	-

BT-LE(2Mbps)RX

2440MHz_RX

08/08/2020

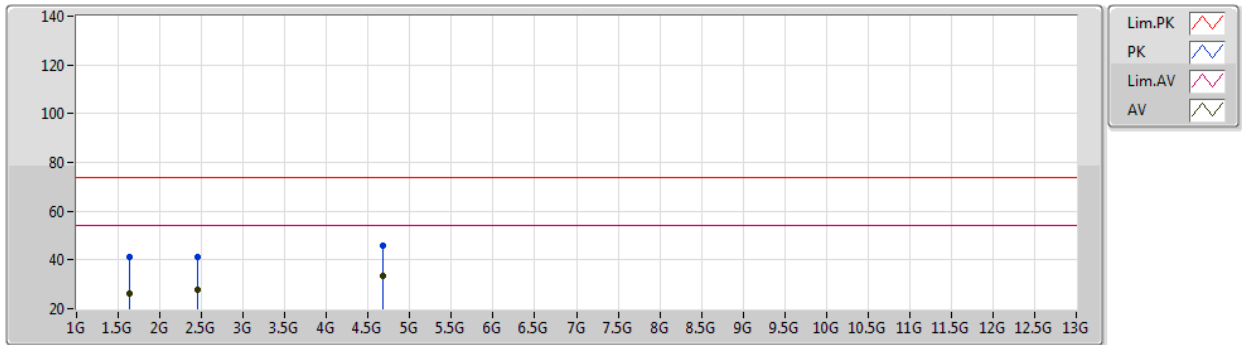


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	1.6G	27.06	54.00	-26.94	-2.29	3	Vertical	0	1.00	-	29.35	25.30	3.40	30.99
AV	2.672G	28.76	54.00	-25.24	2.31	3	Vertical	0	1.00	-	26.45	27.84	4.57	30.10
AV	4.84G	33.85	54.00	-20.15	8.25	3	Vertical	0	1.00	-	25.60	31.10	6.54	29.39
PK	1.6G	41.24	74.00	-32.76	-2.29	3	Vertical	0	1.00	-	43.53	25.30	3.40	30.99
PK	2.672G	42.66	74.00	-31.34	2.31	3	Vertical	0	1.00	-	40.35	27.84	4.57	30.10
PK	4.84G	47.18	74.00	-26.82	8.25	3	Vertical	0	1.00	-	38.93	31.10	6.54	29.39

BT-LE(2Mbps)RX

2440MHz_RX

08/08/2020



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	1.632G	26.20	54.00	-27.80	-2.33	3	Horizontal	360	1.00	-	28.53	25.17	3.45	30.95
AV	2.448G	28.00	54.00	-26.00	1.65	3	Horizontal	360	1.00	-	26.35	27.50	4.35	30.20
AV	4.68G	33.48	54.00	-20.52	7.87	3	Horizontal	360	1.00	-	25.61	30.90	6.44	29.47
PK	1.632G	41.13	74.00	-32.87	-2.33	3	Horizontal	360	1.00	-	43.46	25.17	3.45	30.95
PK	2.448G	41.43	74.00	-32.57	1.65	3	Horizontal	360	1.00	-	39.78	27.50	4.35	30.20
PK	4.68G	45.82	74.00	-28.18	7.87	3	Horizontal	360	1.00	-	37.95	30.90	6.44	29.47

**Exposure Environment: General Population / Uncontrolled Exposure****For Bluetooth**

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm ²)	S Limit (mW/cm ²)
2.4G;BT-LE	2.25	8.30	10.55	0.50	11.05	0.01274	20	0.00253	1.00000
2.4G;BT-BR	2.25	7.53	9.78	0.50	10.28	0.01067	20	0.00212	1.00000
2.4G;BT-EDR	2.25	7.97	10.22	0.50	10.72	0.01180	20	0.00235	1.00000