



FCC Test Report

FCC ID : AUO-LABQ3
Equipment : LabQuest 3
Brand Name : Vernier
Model Name : LABQ3
Applicant : Vernier Software & Technology
13979 SW Millikan Way Beaverton, OR 97005, USA
Manufacturer : Vernier Software & Technology
13979 SW Millikan Way Beaverton, OR 97005, USA
Standard : 47 CFR FCC Part 15.247

The product was received on Aug. 19, 2020, and testing was started from Aug. 26, 2020 and completed on Sep. 15, 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.)

Table of Contents

HISTORY OF THIS TEST REPORT	3
SUMMARY OF TEST RESULT	4
1 GENERAL DESCRIPTION	5
1.1 Information.....	5
1.2 Testing Applied Standards	7
1.3 Testing Location Information	7
1.4 Measurement Uncertainty	8
2 TEST CONFIGURATION OF EUT.....	9
2.1 Test Condition	9
2.2 Test Channel Mode	9
2.3 The Worst Case Measurement Configuration.....	10
2.4 Accessories	11
2.5 Support Equipment.....	11
2.6 Test Setup Diagram	12
3 TRANSMITTER TEST RESULT	14
3.1 AC Power-line Conducted Emissions	14
3.2 DTS Bandwidth.....	16
3.3 Maximum Conducted Output Power	17
3.4 Power Spectral Density	19
3.5 Emissions in Non-restricted Frequency Bands	20
3.6 Emissions in Restricted Frequency Bands.....	21
4 TEST EQUIPMENT AND CALIBRATION DATA.....	25
APPENDIX A. TEST RESULTS OF AC POWER-LINE CONDUCTED EMISSIONS	
APPENDIX B. TEST RESULTS OF DTS BANDWIDTH	
APPENDIX C. TEST RESULTS OF MAXIMUM CONDUCTED OUTPUT POWER	
APPENDIX D. TEST RESULTS OF POWER SPECTRAL DENSITY	
APPENDIX E. TEST RESULTS OF EMISSIONS IN NON-RESTRICTED FREQUENCY BANDS	
APPENDIX F. TEST RESULTS OF EMISSIONS IN RESTRICTED FREQUENCY BANDS	
APPENDIX G. TEST PHOTOS	
PHOTOGRAPHS OF EUT V01	



History of this test report

[illegible]

Summary of Test Result

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: Jenny Yang

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

Note:

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

1.1.2 Antenna Information

Ant.	Brand	Model Name	Antenna Type	Connector
1	INPAQ	ACA-5036-A2-CC-S	Chip Antenna	N/A

Ant.	Port	Gain (dBi)	
		2.4G	BT
1	1	3	3

Note 1: The EUT has one antenna.

For 2.4GHz function:

For IEEE 802.11 b/g/n mode (1TX/1RX)

Only Ant. 1 (port 1) can be used as transmitting/receiving antenna.

For BT function:

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

Only Ant. 1 (port 1) can be used as transmitting/receiving antenna.

1.1.3 EUT Information

Operational Condition			
EUT Power Type	From AC Adapter		
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)	0.647	1.89	405u	3k

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:

- ◆ 47 CFR FCC Part 15
- ◆ ANSI C63.10-2013

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	
Test site Designation No. TW1190 with FCC.				
☐	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	
Test site Designation No. TW0006 with FCC.				
☒	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 site Designation No. TW1097 with FCC.				

Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
AC Conduction	CO04-HY	Edward Wang	23.6~24.9°C / 56~ 60%	10/Sep/2020
RF Conducted	TH01-HY	Vivi Jiang	20.1~26.9°C / 50~60%	26/Aug/2020~ 15/Sep/2020
Radiated	03CH09-HY	Lego Lin	23.2~25.1°C / 56~ 60%	07/Sep/2020~ 08/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	120V

2.2 Test Channel Mode

Test Software Version	Dos1.6
-----------------------	--------

Mode	Power Setting
BT-LE(1Mbps)	-
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
1	AC Adapter mode

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	AC Adapter mode		
Operating Mode > 1GHz	CTX		
Orthogonal Planes of EUT	X Plane	Y Plane	Z Plane
			
Worst Planes of EUT		V	

2.4 Accessories

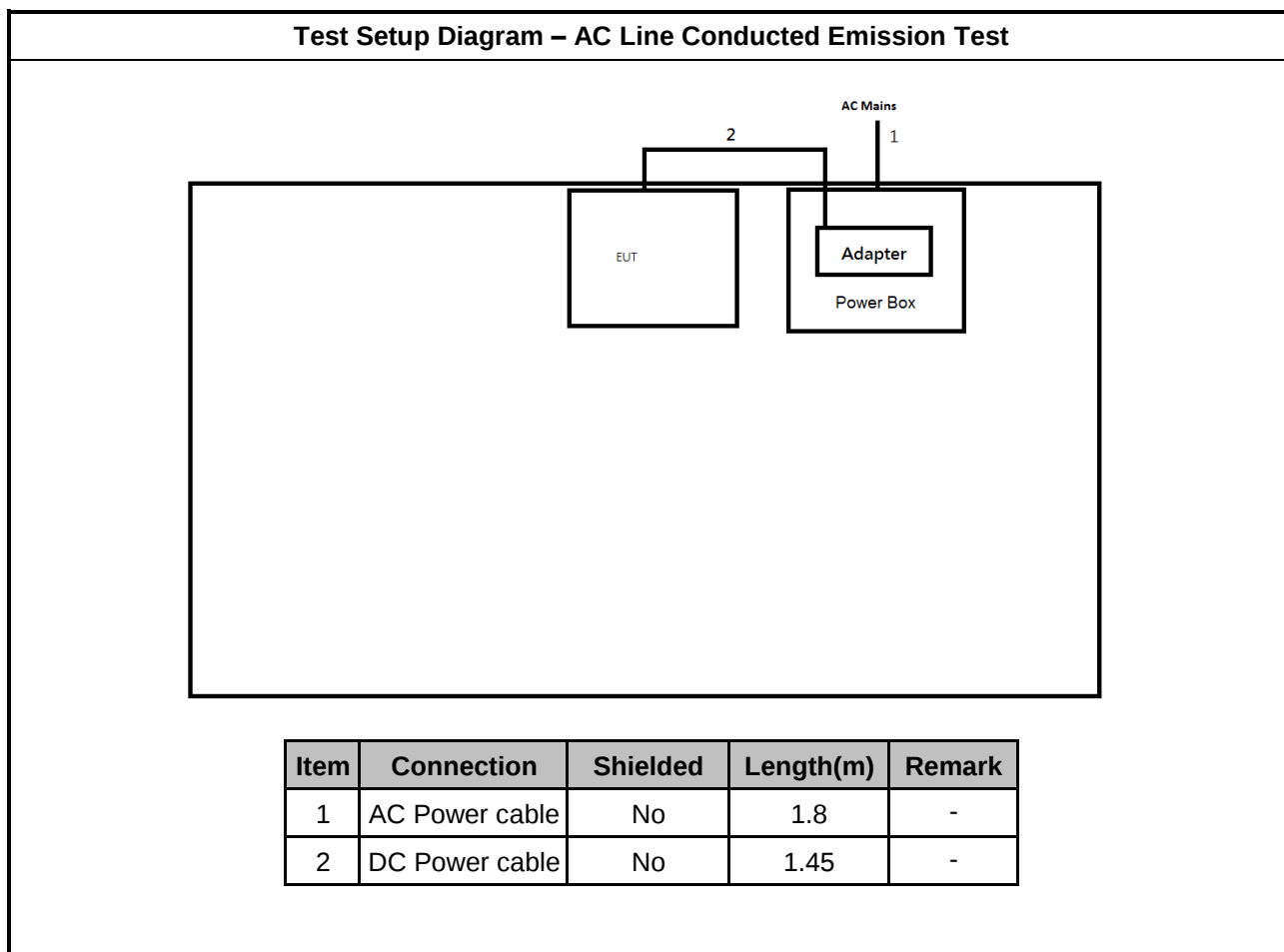
Accessories				
AC Adapter	Brand Name	N/A	Model Name	FJ-SW1260502500DN
	Manufacturer	SHENZHEN FUJIA APPLIANCE CO., LTD.	P/N	S6-052ASP
	Power Rating	I/P: 100 - 240 Vac, 0.4 A, O/P: 5Vdc, 2.5A		
	Power Cord	1.45 meter, non-shielded cable, w/o ferrite core		

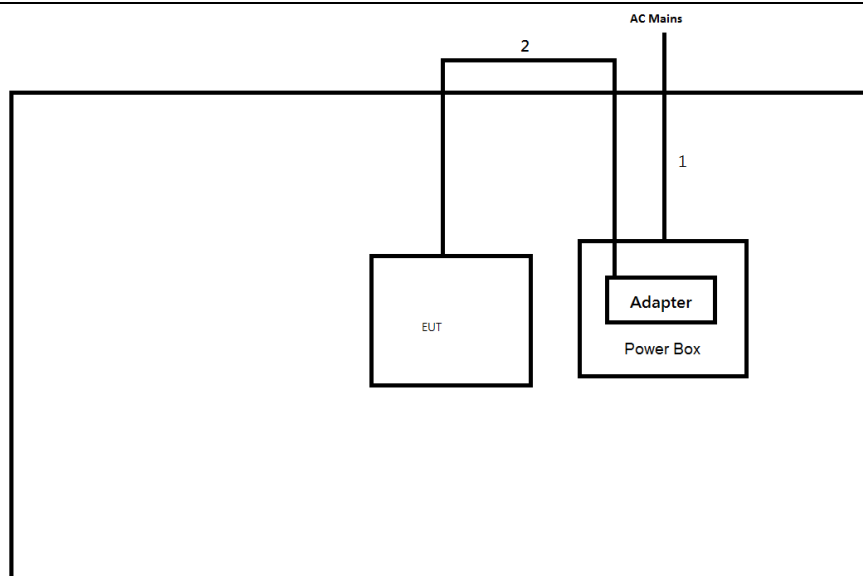
Reminder: Regarding to more detail and other information, please refer to user manual.

2.5 Support Equipment

Support Equipment – Conducted					
No.	Equipment	Brand Name	Model Name	FCC ID	Remark
1	Notebook	DELL	E5410	-	-
2	Adapter for NB	DELL	HA65NM130	-	-

2.6 Test Setup Diagram



Test Setup Diagram - Radiated Test


Item	Connection	Shielded	Length(m)	Remark
1	AC Power cable	No	1.8	-
2	DC Power cable	No	1.45	-

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).

3.2 DTS Bandwidth

3.2.1 6dB Bandwidth Limit

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

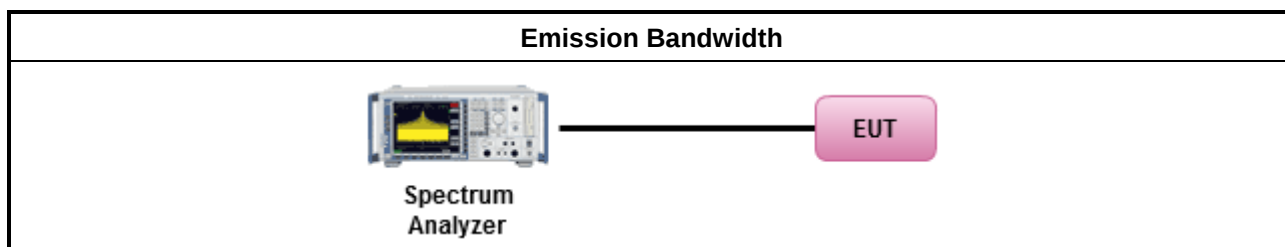
3.2.2 Measuring Instruments

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 $P_{Out} = 30 - (G_{TX} - 6)/3 + 8$ dB 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.	

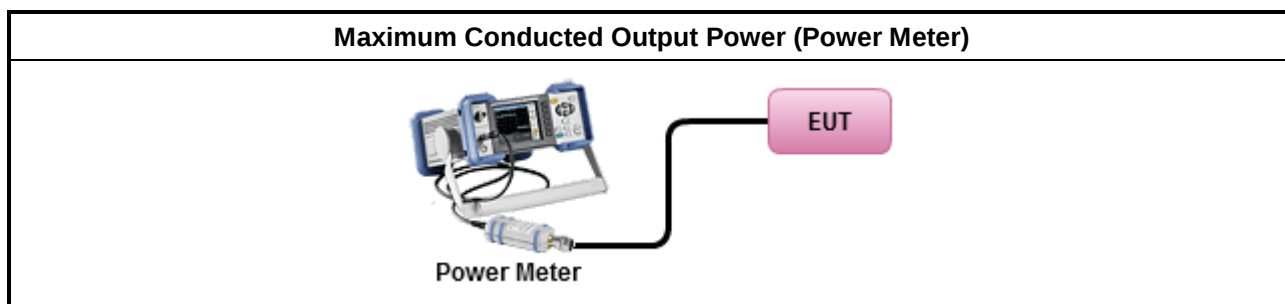
3.3.2 Measuring Instruments

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

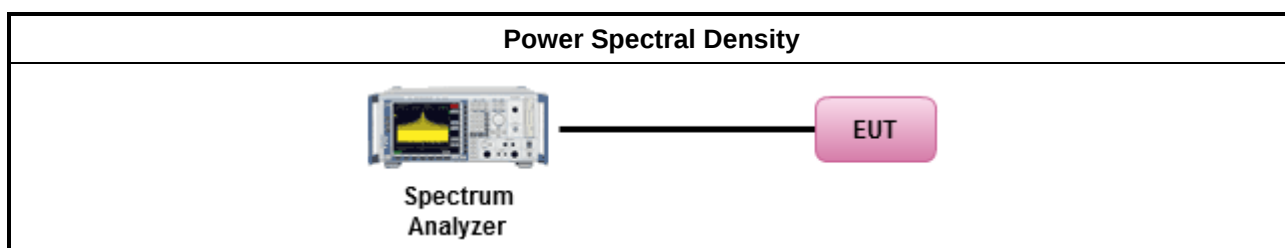
3.4.2 Measuring Instruments

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.	

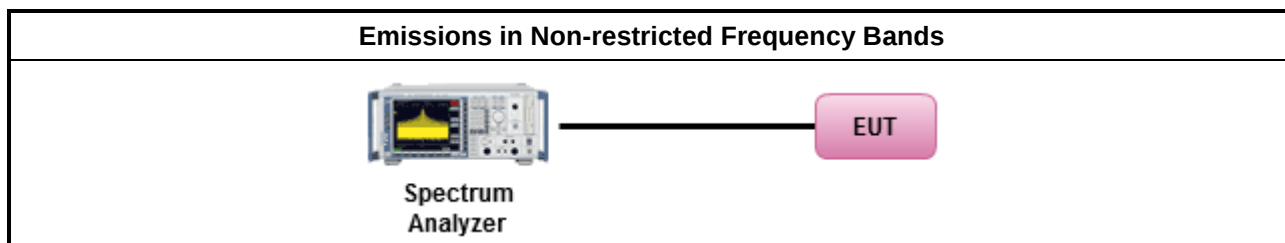
3.5.2 Measuring Instruments

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

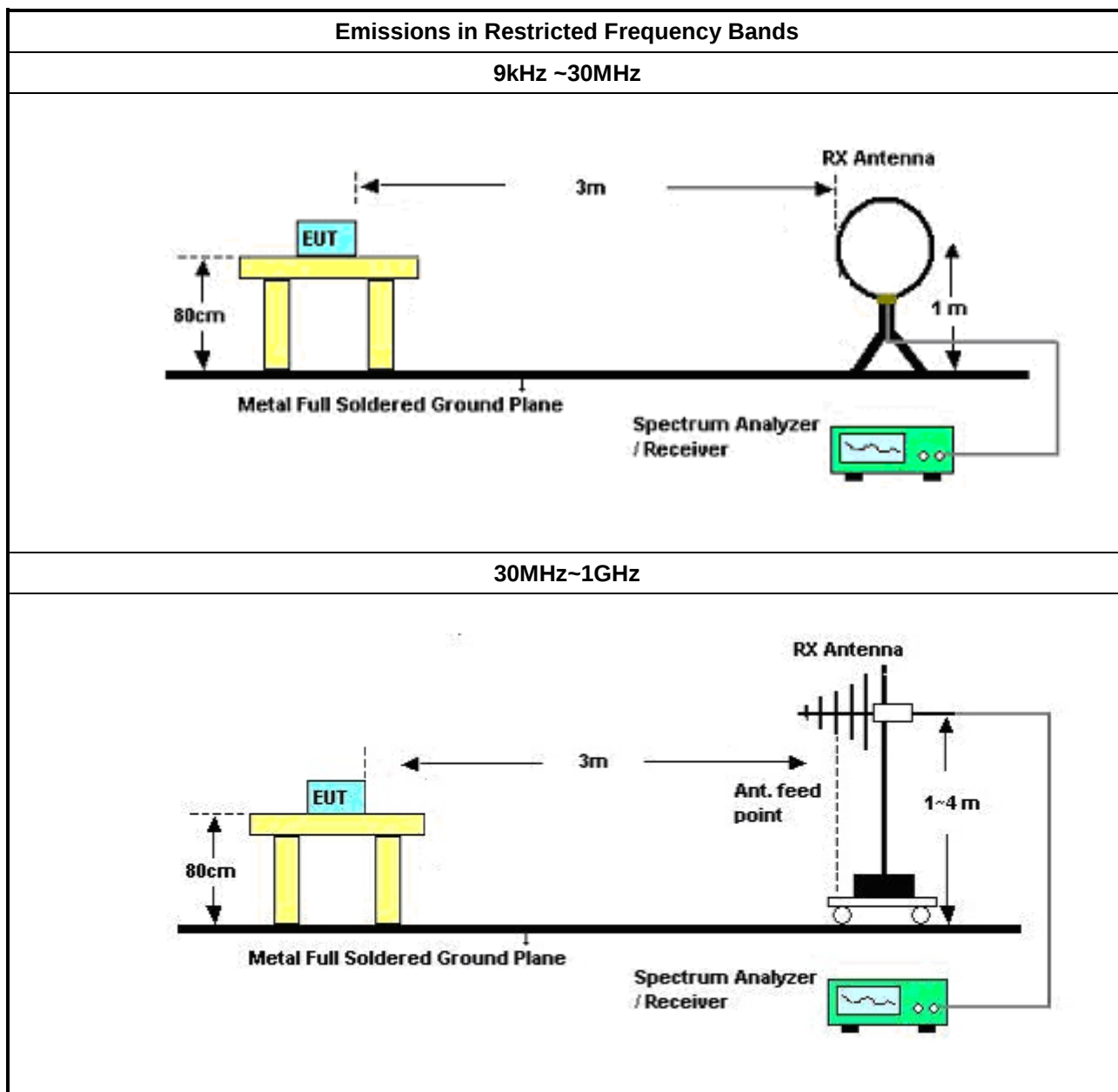
Test Method	
The average emission levels shall be measured in [duty cycle $\geq$ 98 or duty factor].	
Refer as ANSI C63.10, clause 6.10.3 band-edge testing shall be performed at the lowest frequency channel and highest frequency channel within the allowed operating band.	
For the transmitter unwanted 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 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.

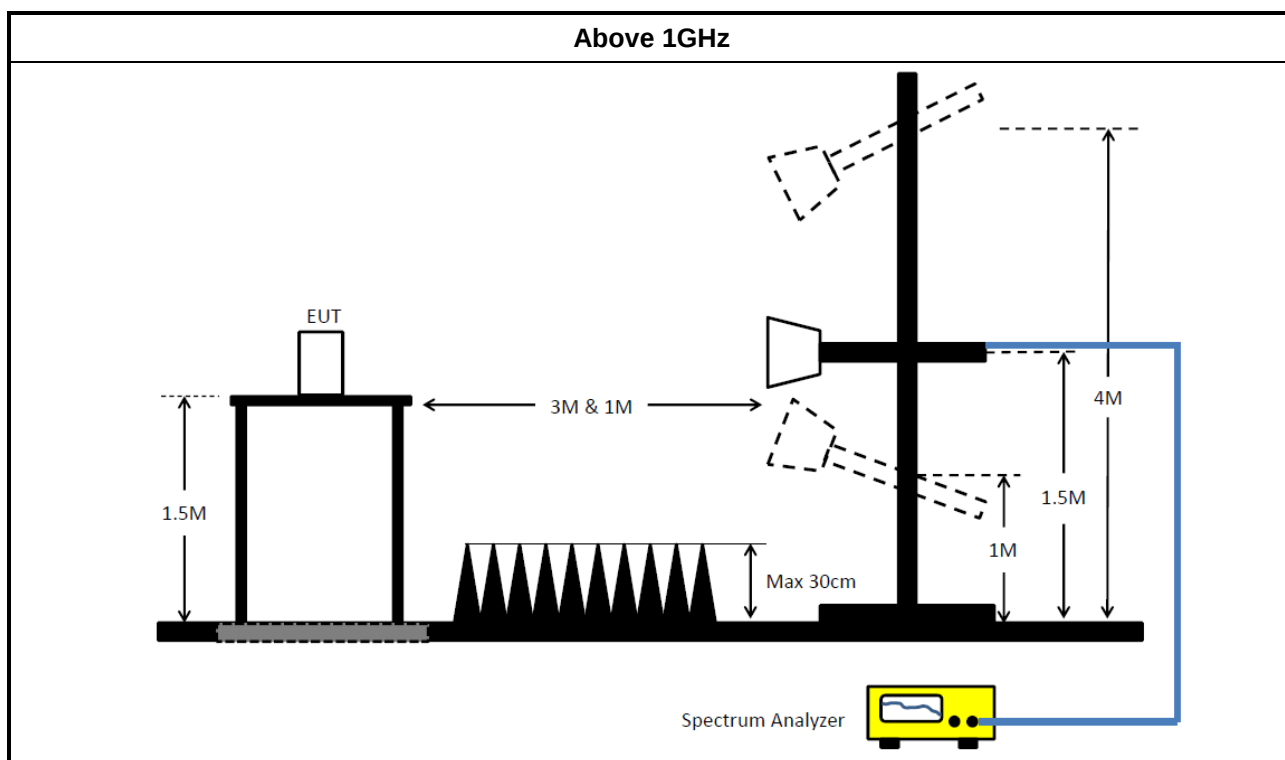
3.6.4 Measurement Results Calculation

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

Refer as Appendix F

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	102051	9kHz ~ 3.6GHz	29/May/2020	28/May/2021
LISN	R&S	ENV216	101295	9kHz ~ 30MHz	05/Nov/2019	04/Nov/2020
RF Cable-CON	MTJ	RG142	CB002-CO	9kHz ~ 200MHz	31/Aug/2020	30/Aug/2021
Impuls Begrenzer Pulse Limiter	SCHWARZBECK	VTSD 9561-F	9561-F041	9kHz ~ 30MHz	24/Sep/2019	23/Sep/2020

NCR: Non-Calibration Require

Instrument for Conducted Test

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
Signal Analyzer	R&S	FSV 40	101013	10Hz~40GHz	19/Mar/2020	18/Mar/2021
SMB100A Signal Generator	R&S	SMB100A03	181147	100kHz~40GHz	12/Nov/2018	11/Nov/2020
Pulse Sensor	Anritsu	MA2411B	917017	300MHz~40GHz	17/Feb/2020	16/Feb/2021
Power Meter	Anritsu	ML2495A	949003	300MHz~40GHz	17/Feb/2020	16/Feb/2021

Instrument for Radiated Test

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
3m Semi Anechoic Chamber	TDK	SAC-3M	03CH09-HY	30MHz~1GHz 3m	27/Mar/2020	26/Mar/2021
3m Semi Anechoic Chamber	TDK	SAC-3M	03CH09-HY	1GHz~18GHz 3m	19/Mar/2020	18/Mar/2021
EXA Signal Analyzer	KEYSIGHT	N9010A	MY54200885	10Hz~44GHz	17/Aug/2020	16/Aug/2021
Amplifier	EMC	EMC9135	980232	9kHz~1GHz	14/Apr/2020	13/Apr/2021
Microwave Preamplifier	Agilent	8449B	3008A02096	1GHz~26.5GHz	24/Jun/2020	23/Jun/2021
Bilog Antenna & 5dB Attenuator	TESEQ & MTJ	CBL6111D&MTJ6 102-05	35418 & 3	30MHz~1GHz	30/Sep/2019	29/Sep/2020
Double Ridged Guide Horn Antenna	SCHWARZBECK	BBHA 9120 D	BBHA9120 D 1534	1GHz~18GHz	28/May/2020	27/May/2021
RF Cable-low	Jye Bao	RG142	CB031+324530/4	9kHz~30MHz	03/Sep/2020	02/Sep/2021
RF Cable-low	Jye Bao	RG142	CB031+324530/4	30MHz~1GHz	12/Feb/2020	11/Feb/2021
RF Cable-R03m	HUBER+ SUHNER	SUCOFLEX104	324530/4+17173/4	1GHz~40GHz	12/Feb/2020	11/Feb/2021
Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA 9170221	18GHz~40GHz	13/Mar/2020	12/Mar/2021
Preamplifier	MITEQ	TTA1840-35-HG	1864481	18GHz~40GHz	10/Mar/2020	09/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



Conducted Emissions at Powerline

Appendix A

Summary

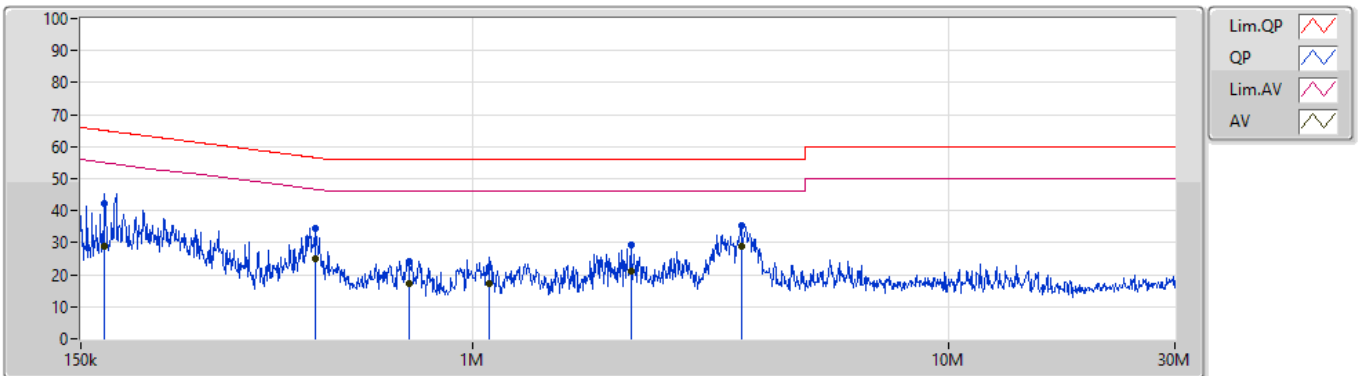
Mode	Result	Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition
Mode 1	Pass	AV	3.701M	29.49	46.00	-16.51	Neutral

Mode Configure

Mode	Result	Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition	Comments
Mode 1	Pass	QP	168.41k	42.38	65.04	-22.66	Line	-
Mode 1	Pass	AV	168.41k	28.92	55.04	-26.12	Line	-
Mode 1	Pass	QP	466.086k	34.58	56.59	-22.01	Line	-
Mode 1	Pass	AV	466.086k	24.92	46.59	-21.67	Line	-
Mode 1	Pass	QP	737.637k	24.12	56.00	-31.88	Line	-
Mode 1	Pass	AV	737.637k	17.10	46.00	-28.90	Line	-
Mode 1	Pass	QP	1.086M	22.27	56.00	-33.73	Line	-
Mode 1	Pass	AV	1.086M	17.04	46.00	-28.96	Line	-
Mode 1	Pass	QP	2.15M	29.17	56.00	-26.83	Line	-
Mode 1	Pass	AV	2.15M	21.02	46.00	-24.98	Line	-
Mode 1	Pass	QP	3.671M	35.32	56.00	-20.68	Line	-
Mode 1	Pass	AV	3.671M	29.01	46.00	-16.99	Line	"Worst"
Mode 1	Pass	QP	164.425k	42.92	65.24	-22.32	Neutral	-
Mode 1	Pass	AV	164.425k	30.17	55.24	-25.07	Neutral	-
Mode 1	Pass	QP	466.086k	33.62	56.59	-22.97	Neutral	-
Mode 1	Pass	AV	466.086k	27.71	46.59	-18.88	Neutral	-
Mode 1	Pass	QP	672.926k	23.76	56.00	-32.24	Neutral	-
Mode 1	Pass	AV	672.926k	16.42	46.00	-29.58	Neutral	-
Mode 1	Pass	QP	1.269M	23.25	56.00	-32.75	Neutral	-
Mode 1	Pass	AV	1.269M	16.59	46.00	-29.41	Neutral	-
Mode 1	Pass	QP	2.074M	27.27	56.00	-28.73	Neutral	-
Mode 1	Pass	AV	2.074M	20.46	46.00	-25.54	Neutral	-
Mode 1	Pass	QP	3.701M	35.85	56.00	-20.15	Neutral	-
Mode 1	Pass	AV	3.701M	29.49	46.00	-16.51	Neutral	"Worst"

Conducted Emissions at Powerline_Mode 1

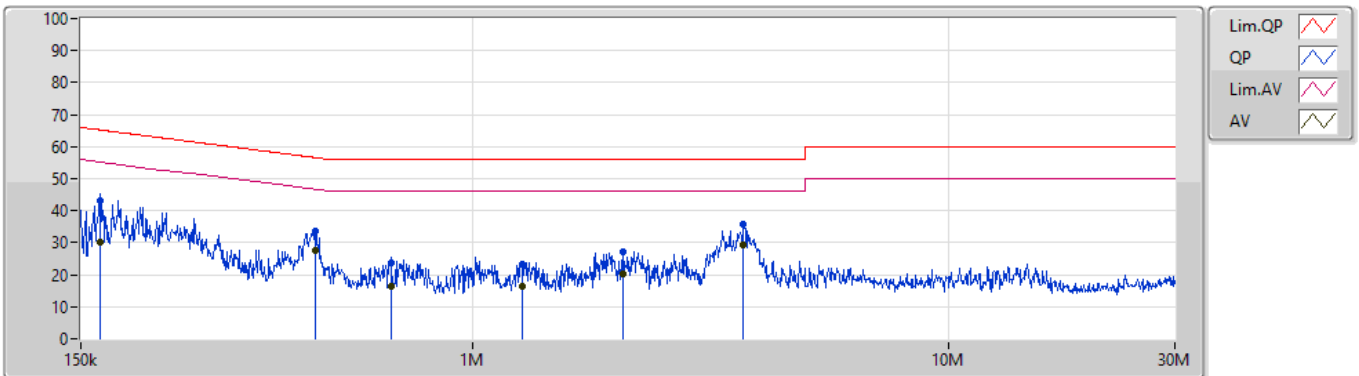
10/09/2020



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)			
QP	168.41k	42.38	65.04	-22.66	19.54	Line	-	22.84	9.66	0.01	9.87			
AV	168.41k	28.92	55.04	-26.12	19.54	Line	-	9.38	9.66	0.01	9.87			
QP	466.086k	34.58	56.59	-22.01	19.53	Line	-	15.05	9.64	0.02	9.87			
AV	466.086k	24.92	46.59	-21.67	19.53	Line	-	5.39	9.64	0.02	9.87			
QP	737.637k	24.12	56.00	-31.88	19.55	Line	-	4.57	9.64	0.04	9.87			
AV	737.637k	17.10	46.00	-28.90	19.55	Line	-	-2.45	9.64	0.04	9.87			
QP	1.086M	22.27	56.00	-33.73	19.57	Line	-	2.70	9.64	0.05	9.88			
AV	1.086M	17.04	46.00	-28.96	19.57	Line	-	-2.53	9.64	0.05	9.88			
QP	2.15M	29.17	56.00	-26.83	19.60	Line	-	9.57	9.65	0.08	9.87			
AV	2.15M	21.02	46.00	-24.98	19.60	Line	-	1.42	9.65	0.08	9.87			
QP	3.671M	35.32	56.00	-20.68	19.66	Line	-	15.66	9.66	0.12	9.88			
AV	3.671M	29.01	46.00	-16.99	19.66	Line	"Worst"	9.35	9.66	0.12	9.88			

Conducted Emissions at Powerline_Mode 1

10/09/2020



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)			
QP	164.425k	42.92	65.24	-22.32	19.53	Neutral	-	23.39	9.65	0.01	9.87			
AV	164.425k	30.17	55.24	-25.07	19.53	Neutral	-	10.64	9.65	0.01	9.87			
QP	466.086k	33.62	56.59	-22.97	19.52	Neutral	-	14.10	9.63	0.02	9.87			
AV	466.086k	27.71	46.59	-18.88	19.52	Neutral	-	8.19	9.63	0.02	9.87			
QP	672.926k	23.76	56.00	-32.24	19.54	Neutral	-	4.22	9.63	0.04	9.87			
AV	672.926k	16.42	46.00	-29.58	19.54	Neutral	-	-3.12	9.63	0.04	9.87			
QP	1.269M	23.25	56.00	-32.75	19.58	Neutral	-	3.67	9.64	0.06	9.88			
AV	1.269M	16.59	46.00	-29.41	19.58	Neutral	-	-2.99	9.64	0.06	9.88			
QP	2.074M	27.27	56.00	-28.73	19.60	Neutral	-	7.67	9.65	0.08	9.87			
AV	2.074M	20.46	46.00	-25.54	19.60	Neutral	-	0.86	9.65	0.08	9.87			
QP	3.701M	35.85	56.00	-20.15	19.66	Neutral	-	16.19	9.66	0.12	9.88			
AV	3.701M	29.49	46.00	-16.51	19.66	Neutral	"Worst"	9.83	9.66	0.12	9.88			

Summary

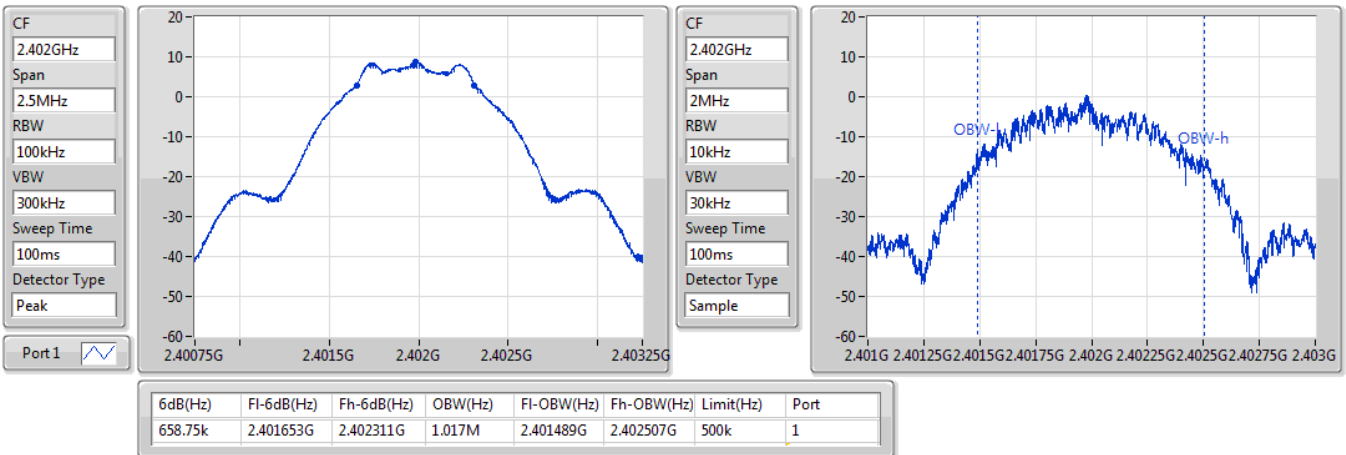
Mode	Max-N dB (Hz)	Max-OBW (Hz)	ITU-Code	Min-N dB (Hz)	Min-OBW (Hz)
2.4-2.4835GHz	-	-	-	-	-
BT-LE(1Mbps)	658.75k	1.017M	1M02F1D	653.75k	1.015M

Result

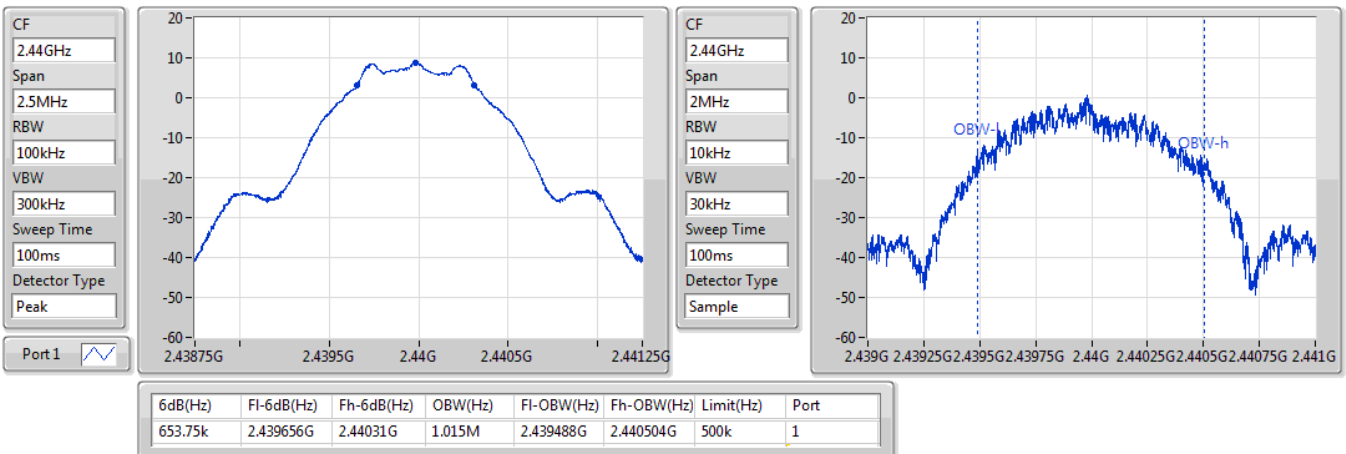
Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	500k	658.75k	1.017M
2440MHz	Pass	500k	653.75k	1.015M
2480MHz	Pass	500k	657.5k	1.017M

BT-LE(1Mbps)
2402MHz
EBW-DTS

11/09/2020

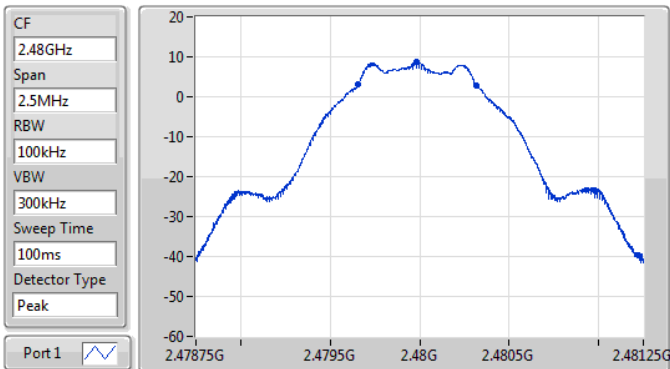

BT-LE(1Mbps)
2440MHz
EBW-DTS

11/09/2020



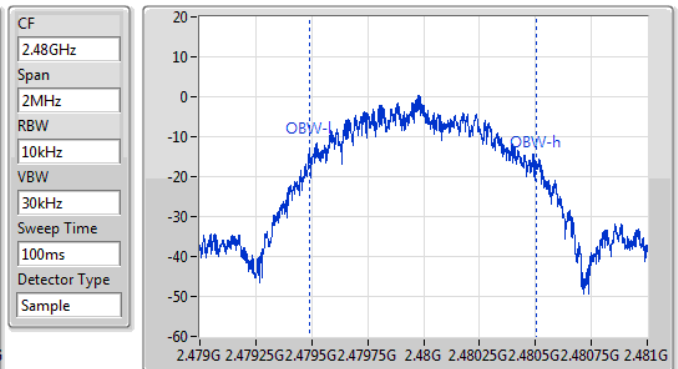
BT-LE(1Mbps)

2480MHz



EBW-DTS

11/09/2020





Summary

Mode	Power (dBm)	Power (W)
2.4-2.4835GHz	-	-
BT-LE(1Mbps)	9.88	0.00973

Result

Mode	Result	Gain (dBi)	Power (dBm)	Power Limit (dBm)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	3.00	9.88	30.00
2440MHz	Pass	3.00	9.83	30.00
2480MHz	Pass	3.00	9.87	30.00



Summary

Mode	Power (dBm)	Power (W)
2.4-2.4835GHz	-	-
BT-LE(1Mbps)	9.43	0.00877



Average Power-DTS

Appendix C.2

Result

Mode	Result	Gain (dBi)	Power (dBm)	Power Limit (dBm)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	3.00	9.41	30.00
2440MHz	Pass	3.00	9.38	30.00
2480MHz	Pass	3.00	9.43	30.00

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

Summary

Mode	PD (dBm/RBW)
2.4-2.4835GHz	-
BT-LE(1Mbps)	-6.01

Result

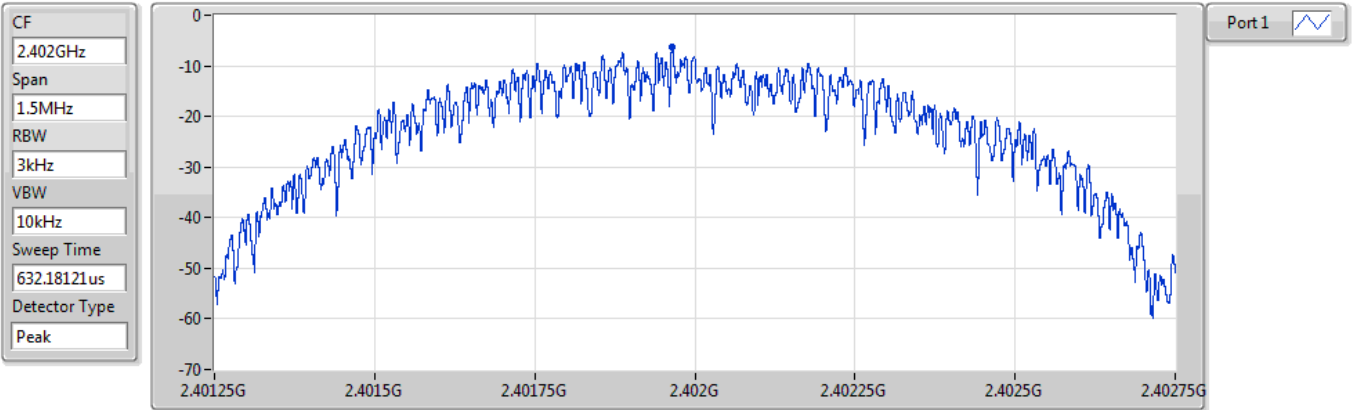
Mode	Result	Gain (dBi)	PD (dBm/RBW)	PD Limit (dBm/RBW)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	3.00	-6.20	8.00
2440MHz	Pass	3.00	-6.01	8.00
2480MHz	Pass	3.00	-6.06	8.00

BT-LE(1Mbps)

PSD

2402MHz

11/09/2020



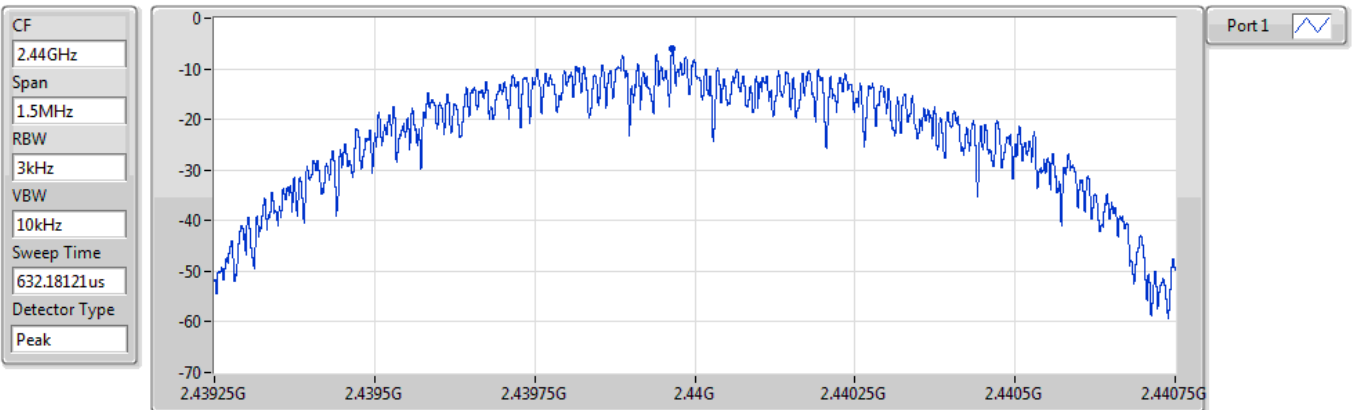
Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-6.20	-6.20	-6.20

BT-LE(1Mbps)

PSD

2440MHz

11/09/2020



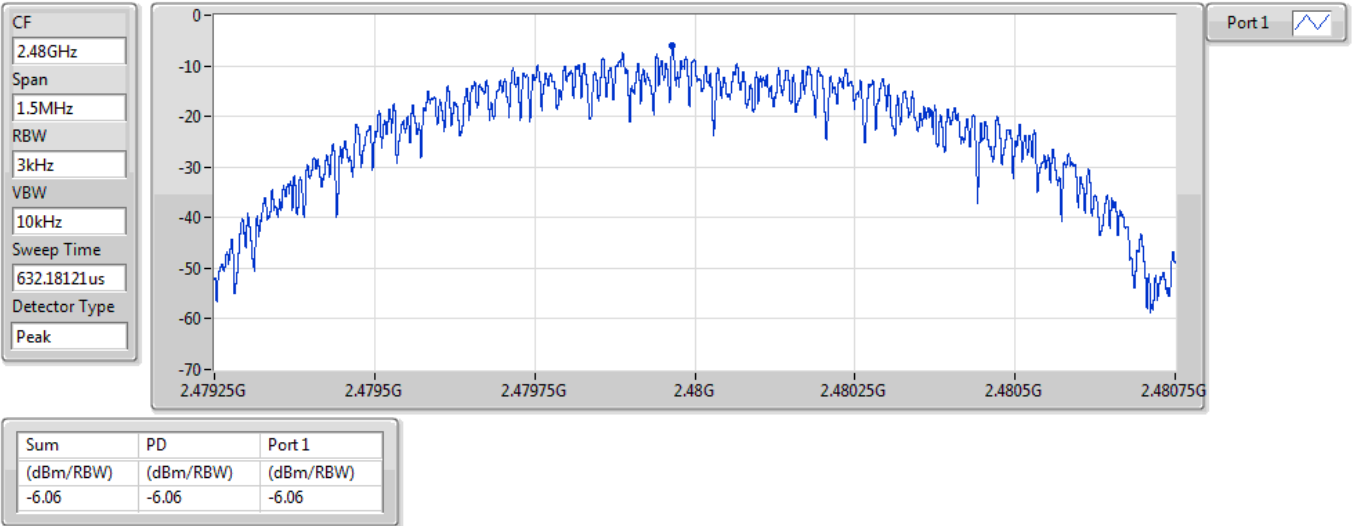
Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-6.01	-6.01	-6.01

BT-LE(1Mbps)

2480MHz

PSD

11/09/2020





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	2.47999G	8.73	-21.27	1.65326G	-55.58	2.39505G	-54.74	2.4835G	-54.84	2.48668G	-44.59	17.68301G	-41.90	1



Result

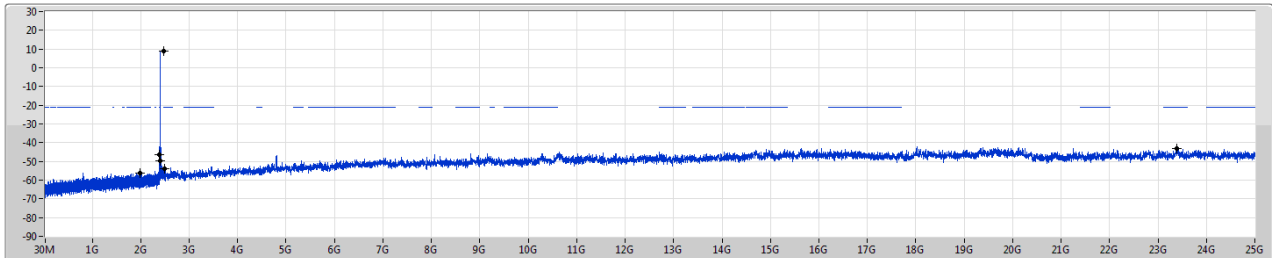
Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	2.47999G	8.73	-21.27	1.98579G	-56.37	2.39284G	-46.54	2.4G	-49.78	2.49851G	-53.71	23.38025G	-42.98	1
2440MHz	Pass	2.47999G	8.73	-21.27	2.17114G	-54.58	2.39127G	-54.58	2.4835G	-56.91	2.49056G	-52.64	24.75535G	-42.68	1
2480MHz	Pass	2.47999G	8.73	-21.27	1.65326G	-55.58	2.39505G	-54.74	2.4835G	-54.84	2.48668G	-44.59	17.68301G	-41.90	1

BT-LE(1Mbps)

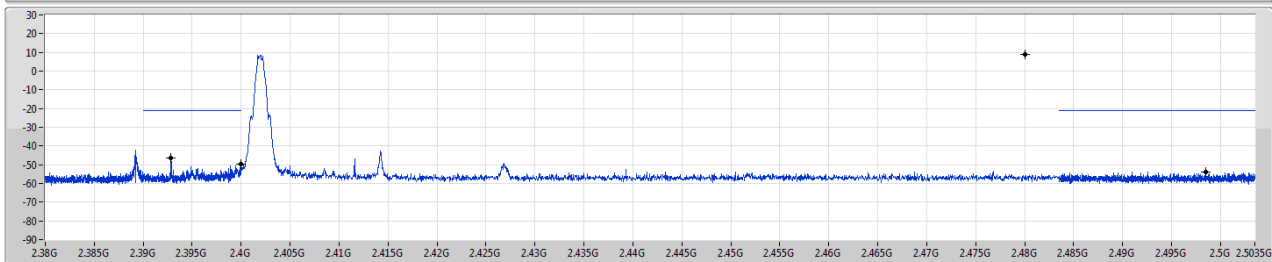
CSEndB-DTS

2402MHz

11/09/2020



Port1



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

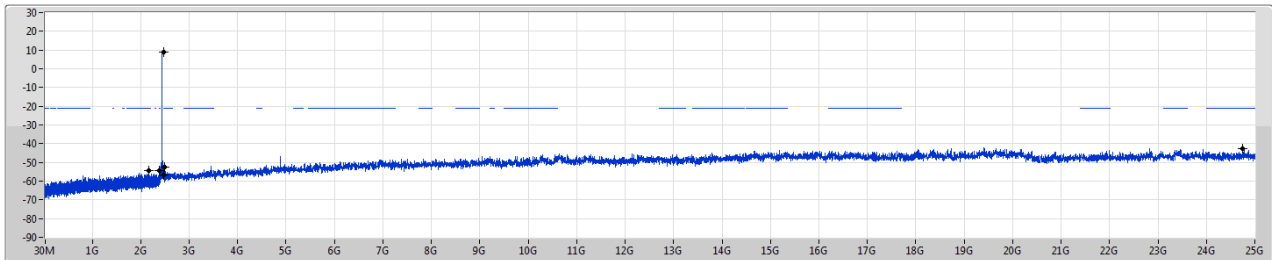
Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.47999G	8.73	-21.27	1.98579G	-56.37	2.39284G	-46.54	2.4G	-49.78	2.49851G	-53.71	2.38025G	-42.98	1

BT-LE(1Mbps)

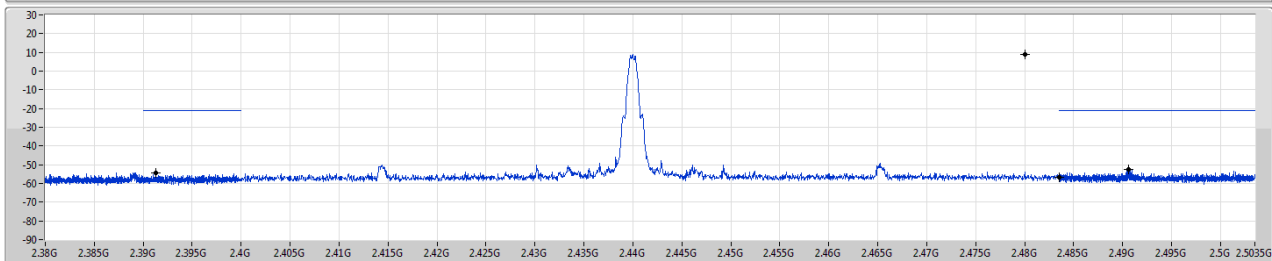
CSEndB-DTS

2440MHz

11/09/2020



Port1



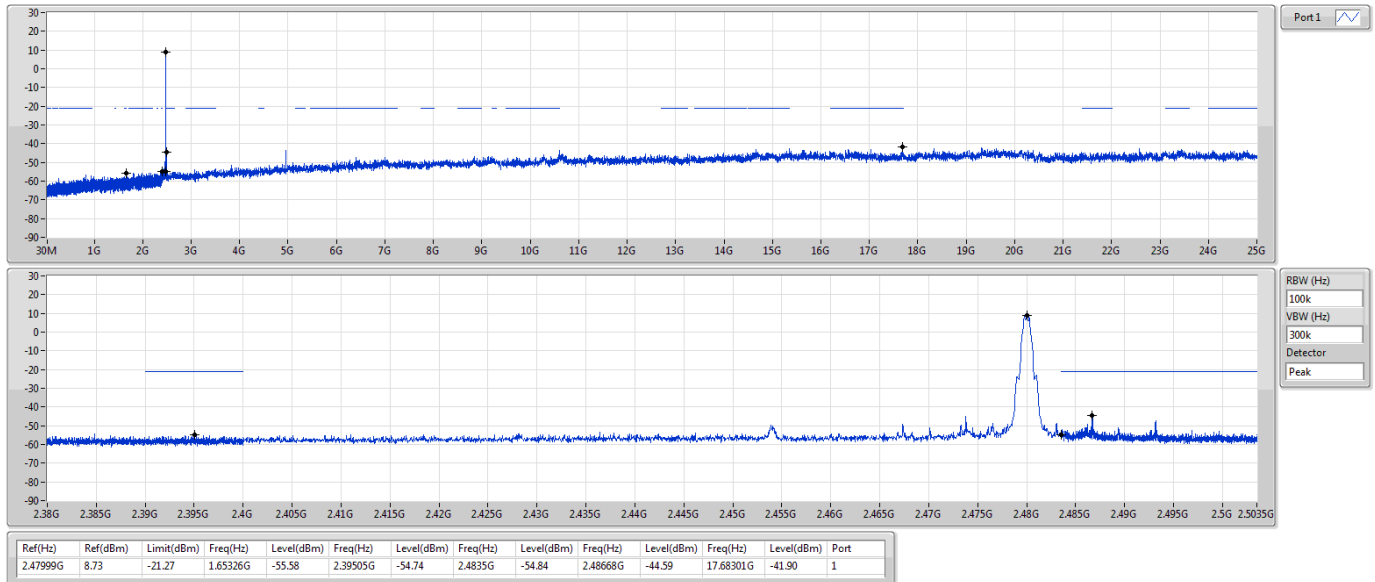
RBW (Hz)
100k
VBW (Hz)
300k
Detector
Peak

Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.47999G	8.73	-21.27	2.17114G	-54.58	2.39127G	-54.58	2.4835G	-56.91	2.49056G	-52.64	2.475535G	-42.68	1

BT-LE(1Mbps)

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(1Mbps)	Pass	PK	214.3M	40.46	43.50	-3.04	3	Vertical	0	1.00	-

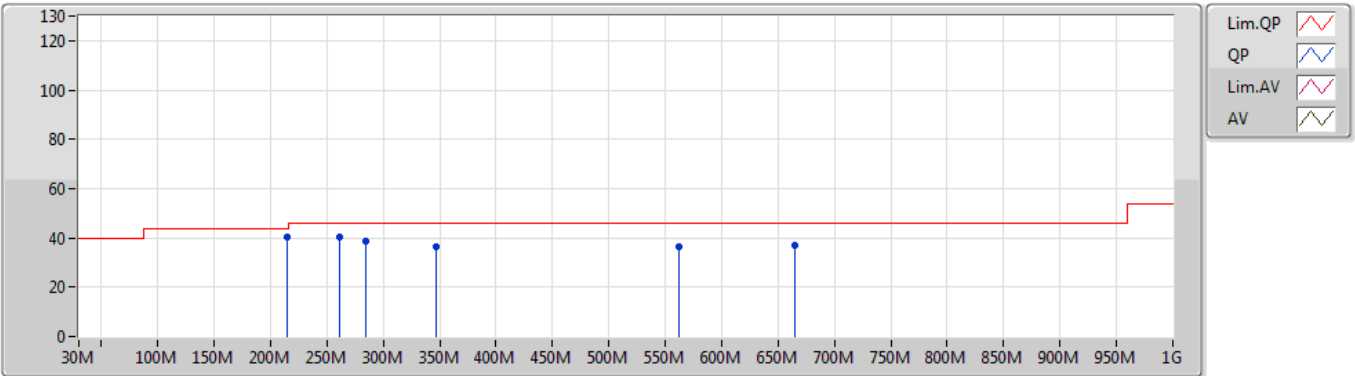
**Result**

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-
2440MHz_Adapter	Pass	PK	214.3M	40.46	43.50	-3.04	3	Vertical	0	1.00	-
2440MHz_Adapter	Pass	PK	260.86M	40.27	46.00	-5.73	3	Vertical	0	1.00	-
2440MHz_Adapter	Pass	PK	284.14M	38.80	46.00	-7.20	3	Vertical	0	1.00	-
2440MHz_Adapter	Pass	PK	346.22M	36.43	46.00	-9.57	3	Vertical	0	1.00	-
2440MHz_Adapter	Pass	PK	561.56M	36.38	46.00	-9.62	3	Vertical	0	1.00	-
2440MHz_Adapter	Pass	PK	664.38M	37.11	46.00	-8.89	3	Vertical	0	1.00	-
2440MHz_Adapter	Pass	PK	88.2M	29.83	43.50	-13.67	3	Horizontal	360	1.00	-
2440MHz_Adapter	Pass	PK	105.66M	28.03	43.50	-15.47	3	Horizontal	360	1.00	-
2440MHz_Adapter	Pass	PK	289.96M	37.90	46.00	-8.10	3	Horizontal	360	1.00	-
2440MHz_Adapter	Pass	PK	357.86M	36.42	46.00	-9.58	3	Horizontal	360	1.00	-
2440MHz_Adapter	Pass	PK	561.56M	33.24	46.00	-12.76	3	Horizontal	360	1.00	-
2440MHz_Adapter	Pass	PK	627.52M	31.89	46.00	-14.11	3	Horizontal	360	1.00	-

BT-LE(1Mbps)

08/09/2020

2440MHz_Adapter

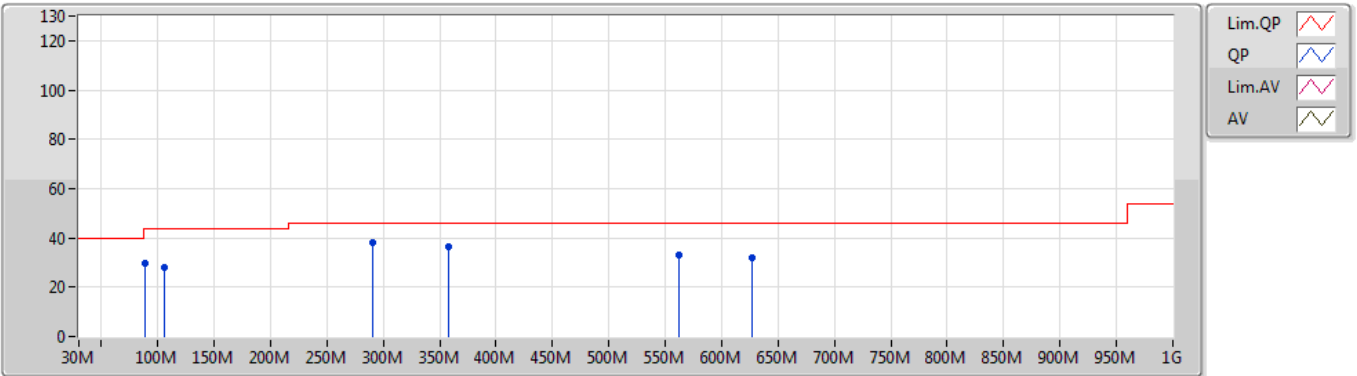


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
PK	214.3M	40.46	43.50	-3.04	-20.96	3	Vertical	0	1.00	-	61.42	14.13	1.16	36.25
PK	260.86M	40.27	46.00	-5.73	-15.93	3	Vertical	0	1.00	-	56.20	19.16	1.32	36.41
PK	284.14M	38.80	46.00	-7.20	-17.04	3	Vertical	0	1.00	-	55.84	17.97	1.37	36.38
PK	346.22M	36.43	46.00	-9.57	-15.51	3	Vertical	0	1.00	-	51.94	19.49	1.49	36.49
PK	561.56M	36.38	46.00	-9.62	-9.67	3	Vertical	0	1.00	-	46.05	25.39	2.05	37.11
PK	664.38M	37.11	46.00	-8.89	-9.32	3	Vertical	0	1.00	-	46.43	25.49	2.26	37.07

BT-LE(1Mbps)

08/09/2020

2440MHz_Adapter

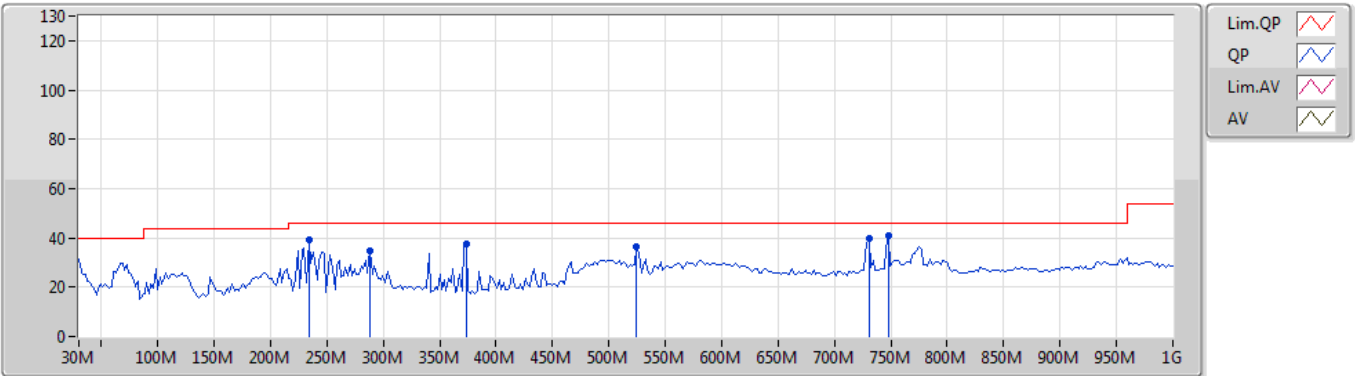


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
PK	88.2M	29.83	43.50	-13.67	-22.26	3	Horizontal	360	1.00	-	52.09	13.69	0.70	36.65
PK	105.66M	28.03	43.50	-15.47	-20.00	3	Horizontal	360	1.00	-	48.03	15.74	0.80	36.54
PK	289.96M	37.90	46.00	-8.10	-16.84	3	Horizontal	360	1.00	-	54.74	18.15	1.38	36.37
PK	357.86M	36.42	46.00	-9.58	-15.17	3	Horizontal	360	1.00	-	51.59	19.79	1.53	36.49
PK	561.56M	33.24	46.00	-12.76	-9.67	3	Horizontal	360	1.00	-	42.91	25.39	2.05	37.11
PK	627.52M	31.89	46.00	-14.11	-9.42	3	Horizontal	360	1.00	-	41.31	25.45	2.20	37.07

BT-LE(1Mbps)

08/09/2020

2440MHz_Adapter

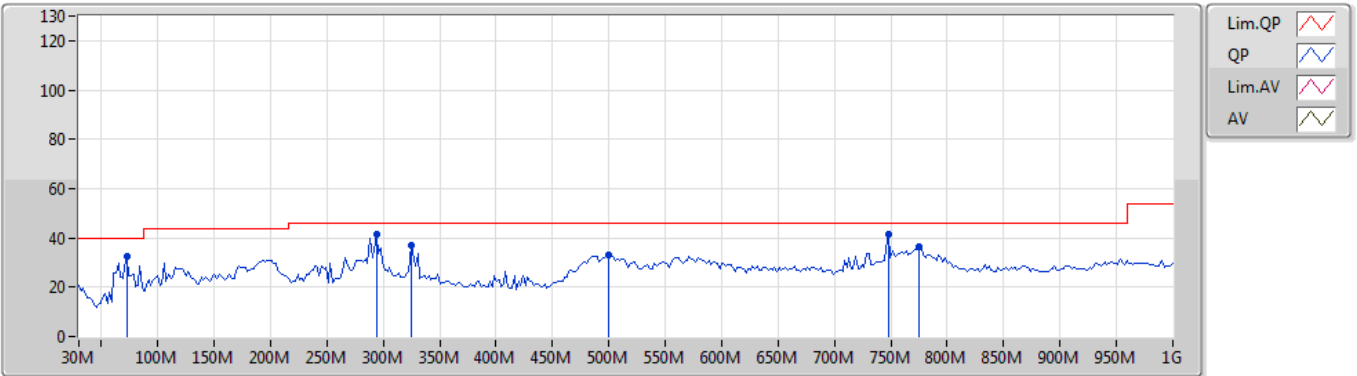


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	Raw (dBuV)	PA (dB)
PK	233.7M	39.32	46.00	-6.68	-19.39	3	Vertical	0	1.00	-	15.73	1.23	58.71	36.35
PK	288.02M	34.61	46.00	-11.39	-16.90	3	Vertical	0	1.00	-	18.09	1.38	51.51	36.37
PK	373.38M	37.38	46.00	-8.62	-14.75	3	Vertical	0	1.00	-	20.12	1.59	52.13	36.46
PK	524.7M	36.46	46.00	-9.54	-11.85	3	Vertical	0	1.00	-	23.24	1.95	48.31	37.04
PK	730.34M	39.77	46.00	-6.23	-7.91	3	Vertical	0	1.00	-	26.86	2.46	47.68	37.23
PK	747.8M	40.90	46.00	-5.10	-7.48	3	Vertical	0	1.00	-	27.22	2.50	48.38	37.20

BT-LE(1Mbps)

08/09/2020

2440MHz_Adapter



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	Raw (dBuV)	PA (dB)
PK	72.68M	32.62	40.00	-7.38	-24.66	3	Horizontal	360	1.00	-	11.52	0.65	57.28	36.83
PK	293.84M	41.22	46.00	-4.78	-16.75	3	Horizontal	360	1.00	-	18.22	1.39	57.97	36.36
PK	324.88M	36.75	46.00	-9.25	-16.17	3	Horizontal	360	1.00	-	18.80	1.45	52.92	36.42
PK	499.48M	32.98	46.00	-13.02	-11.85	3	Horizontal	360	1.00	-	23.25	1.90	44.83	37.00
PK	747.8M	41.31	46.00	-4.69	-7.48	3	Horizontal	360	1.00	-	27.22	2.50	48.79	37.20
PK	774.96M	36.20	46.00	-9.80	-7.44	3	Horizontal	360	1.00	-	27.36	2.55	43.64	37.35



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	4.96002G	50.25	54.00	-3.75	3	Horizontal	222	2.22	-

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	2.3894G	46.71	54.00	-7.29	3	Vertical	141	1.50	-
2402MHz	Pass	AV	2.402G	104.53	Inf	-Inf	3	Vertical	141	1.50	-
2402MHz	Pass	PK	2.3768G	59.39	74.00	-14.61	3	Vertical	141	1.50	-
2402MHz	Pass	PK	2.402G	105.40	Inf	-Inf	3	Vertical	141	1.50	-
2402MHz	Pass	AV	2.3734G	45.24	54.00	-8.76	3	Horizontal	193	2.73	-
2402MHz	Pass	AV	2.402G	100.11	Inf	-Inf	3	Horizontal	193	2.73	-
2402MHz	Pass	PK	2.3694G	57.56	74.00	-16.44	3	Horizontal	193	2.73	-
2402MHz	Pass	PK	2.402G	100.97	Inf	-Inf	3	Horizontal	193	2.73	-
2402MHz	Pass	AV	4.80418G	37.04	54.00	-16.96	3	Vertical	306	1.17	-
2402MHz	Pass	PK	4.80616G	48.06	74.00	-25.94	3	Vertical	306	1.17	-
2402MHz	Pass	AV	4.804G	43.75	54.00	-10.25	3	Horizontal	131	2.56	-
2402MHz	Pass	PK	4.80394G	50.70	74.00	-23.30	3	Horizontal	131	2.56	-
2440MHz	Pass	AV	2.3844G	45.34	54.00	-8.66	3	Vertical	144	1.17	-
2440MHz	Pass	AV	2.44G	106.03	Inf	-Inf	3	Vertical	144	1.17	-
2440MHz	Pass	AV	2.4956G	45.68	54.00	-8.32	3	Vertical	144	1.17	-
2440MHz	Pass	PK	2.3892G	58.65	74.00	-15.35	3	Vertical	144	1.17	-
2440MHz	Pass	PK	2.4396G	106.92	Inf	-Inf	3	Vertical	144	1.17	-
2440MHz	Pass	PK	2.4908G	57.16	74.00	-16.84	3	Vertical	144	1.17	-
2440MHz	Pass	AV	2.3528G	45.25	54.00	-8.75	3	Horizontal	193	3.00	-
2440MHz	Pass	AV	2.44G	100.65	Inf	-Inf	3	Horizontal	193	3.00	-
2440MHz	Pass	AV	2.4984G	45.62	54.00	-8.38	3	Horizontal	193	3.00	-
2440MHz	Pass	PK	2.3436G	56.93	74.00	-17.07	3	Horizontal	193	3.00	-
2440MHz	Pass	PK	2.4404G	101.51	Inf	-Inf	3	Horizontal	193	3.00	-
2440MHz	Pass	PK	2.4852G	57.63	74.00	-16.37	3	Horizontal	193	3.00	-
2440MHz	Pass	AV	4.88006G	41.59	54.00	-12.41	3	Vertical	140	1.18	-
2440MHz	Pass	AV	7.31922G	38.04	54.00	-15.96	3	Vertical	340	1.50	-
2440MHz	Pass	PK	4.87394G	49.01	74.00	-24.99	3	Vertical	140	1.18	-
2440MHz	Pass	PK	7.33092G	49.35	74.00	-24.65	3	Vertical	340	1.50	-
2440MHz	Pass	AV	4.88G	44.59	54.00	-9.41	3	Horizontal	184	2.99	-
2440MHz	Pass	AV	7.31958G	41.68	54.00	-12.32	3	Horizontal	214	1.95	-
2440MHz	Pass	PK	4.87958G	50.69	74.00	-23.31	3	Horizontal	184	2.99	-
2440MHz	Pass	PK	7.32084G	52.37	74.00	-21.63	3	Horizontal	214	1.95	-
2480MHz	Pass	AV	2.48G	106.57	Inf	-Inf	3	Vertical	146	1.25	-
2480MHz	Pass	AV	2.4836G	47.22	54.00	-6.78	3	Vertical	146	1.25	-
2480MHz	Pass	PK	2.48G	107.45	Inf	-Inf	3	Vertical	146	1.25	-
2480MHz	Pass	PK	2.4872G	58.28	74.00	-15.72	3	Vertical	146	1.25	-
2480MHz	Pass	AV	2.48G	100.40	Inf	-Inf	3	Horizontal	345	1.54	-
2480MHz	Pass	AV	2.4868G	46.06	54.00	-7.94	3	Horizontal	345	1.54	-
2480MHz	Pass	PK	2.48G	101.29	Inf	-Inf	3	Horizontal	345	1.54	-
2480MHz	Pass	PK	2.498G	57.47	74.00	-16.53	3	Horizontal	345	1.54	-
2480MHz	Pass	AV	4.96G	42.97	54.00	-11.03	3	Vertical	127	3.00	-
2480MHz	Pass	AV	7.44042G	38.84	54.00	-15.16	3	Vertical	242	1.69	-
2480MHz	Pass	PK	4.95945G	50.11	74.00	-23.89	3	Vertical	127	3.00	-
2480MHz	Pass	PK	7.43945G	51.23	74.00	-22.77	3	Vertical	242	1.69	-
2480MHz	Pass	AV	4.96002G	50.25	54.00	-3.75	3	Horizontal	222	2.22	-
2480MHz	Pass	AV	7.43931G	42.93	54.00	-11.07	3	Horizontal	223	2.22	-
2480MHz	Pass	PK	4.95954G	55.22	74.00	-18.78	3	Horizontal	222	2.22	-

Remark :

Page No. : F2 of F15

$$\text{Level (dBuV/m)} = \text{Raw(Read Level)} + \text{AF(Antenna Factor)} + \text{CL(Cable Loss)} - \text{PA(Preamp Factor)}$$



RSE TX above 1GHz

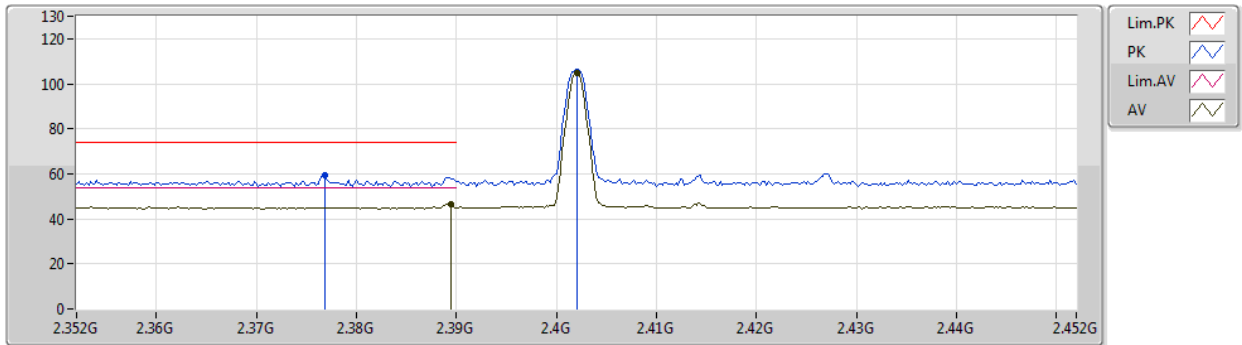
Appendix F.2

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2480MHz	Pass	PK	7.43939G	53.33	74.00	-20.67	3	Horizontal	223	2.22	-

BT-LE(1Mbps)

2402MHz_TX

31/08/2020

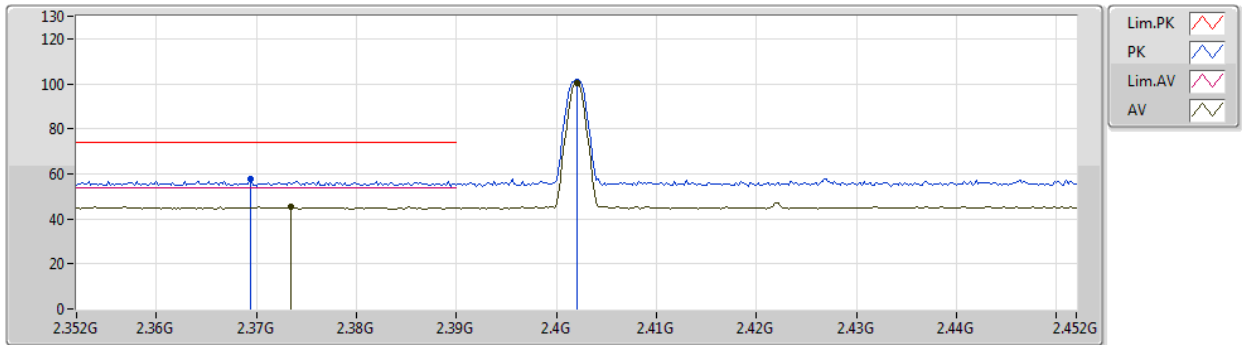


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.3894G	46.71	54.00	-7.29	31.52	3	Vertical	141	1.50	-	15.19	27.64	3.88	-
AV	2.402G	104.53	Inf	-Inf	31.50	3	Vertical	141	1.50	-	73.03	27.60	3.90	-
PK	2.3768G	59.39	74.00	-14.61	31.56	3	Vertical	141	1.50	-	27.83	27.69	3.87	-
PK	2.402G	105.40	Inf	-Inf	31.50	3	Vertical	141	1.50	-	73.90	27.60	3.90	-

BT-LE(1Mbps)

2402MHz_TX

31/08/2020

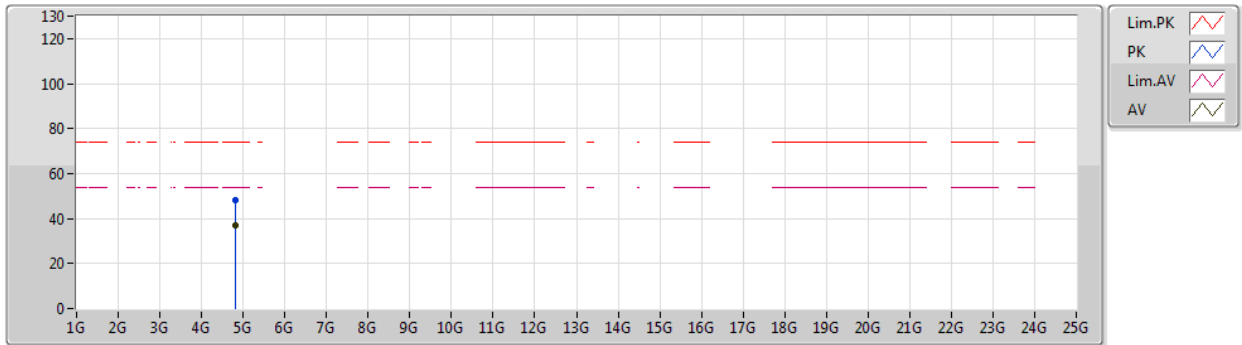


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.3734G	45.24	54.00	-8.76	31.57	3	Horizontal	193	2.73	-	13.67	27.71	3.86	-
AV	2.402G	100.11	Inf	-Inf	31.50	3	Horizontal	193	2.73	-	68.61	27.60	3.90	-
PK	2.3694G	57.56	74.00	-16.44	31.57	3	Horizontal	193	2.73	-	25.99	27.72	3.85	-
PK	2.402G	100.97	Inf	-Inf	31.50	3	Horizontal	193	2.73	-	69.47	27.60	3.90	-

BT-LE(1Mbps)

2402MHz_TX

31/08/2020

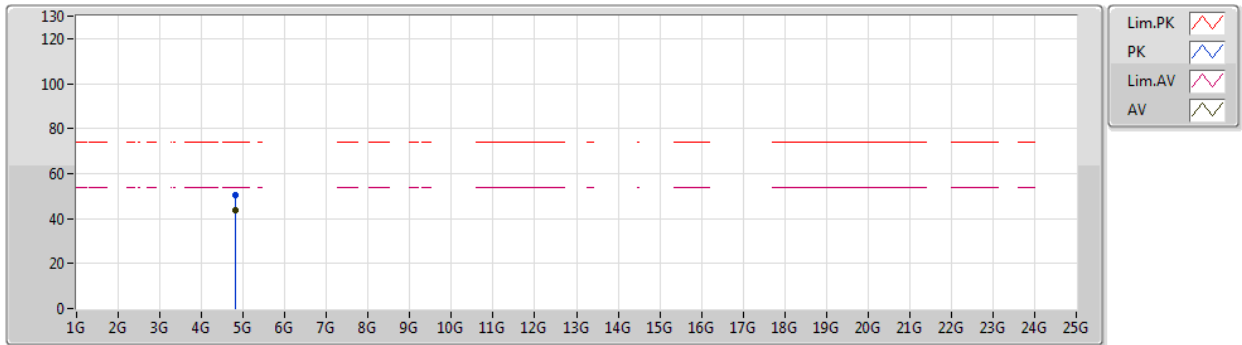


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.80418G	37.04	54.00	-16.96	1.49	3	Vertical	306	1.17	-	35.55	31.12	5.30	34.93
PK	4.80616G	48.06	74.00	-25.94	1.49	3	Vertical	306	1.17	-	46.57	31.12	5.30	34.93

BT-LE(1Mbps)

2402MHz_TX

31/08/2020

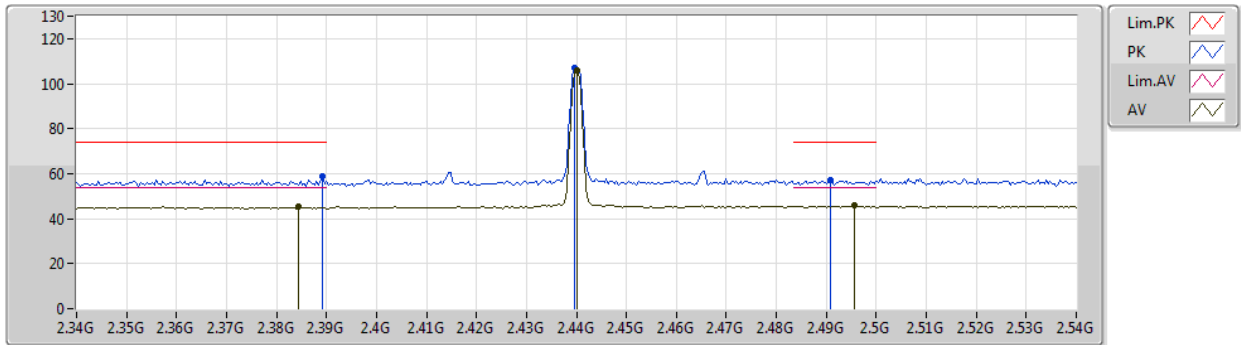


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.804G	43.75	54.00	-10.25	1.49	3	Horizontal	131	2.56	-	42.26	31.12	5.30	34.93
PK	4.80394G	50.70	74.00	-23.30	1.49	3	Horizontal	131	2.56	-	49.21	31.12	5.30	34.93

BT-LE(1Mbps)

2440MHz_TX

31/08/2020

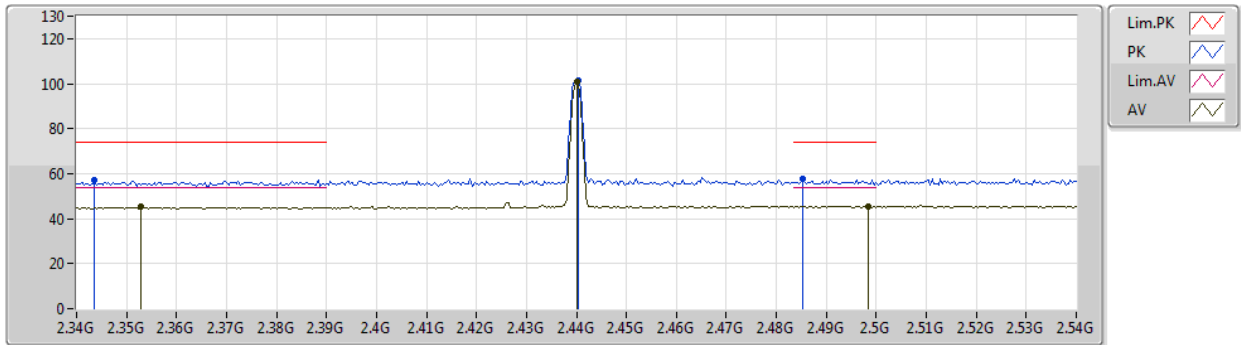


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.3844G	45.34	54.00	-8.66	31.54	3	Vertical	144	1.17	-	13.80	27.66	3.88	-
AV	2.44G	106.03	Inf	-Inf	31.56	3	Vertical	144	1.17	-	74.47	27.60	3.96	-
AV	2.4956G	45.68	54.00	-8.32	31.64	3	Vertical	144	1.17	-	14.04	27.60	4.04	-
PK	2.3892G	58.65	74.00	-15.35	31.52	3	Vertical	144	1.17	-	27.13	27.64	3.88	-
PK	2.4396G	106.92	Inf	-Inf	31.56	3	Vertical	144	1.17	-	75.36	27.60	3.96	-
PK	2.4908G	57.16	74.00	-16.84	31.64	3	Vertical	144	1.17	-	25.52	27.60	4.04	-

BT-LE(1Mbps)

2440MHz_TX

31/08/2020

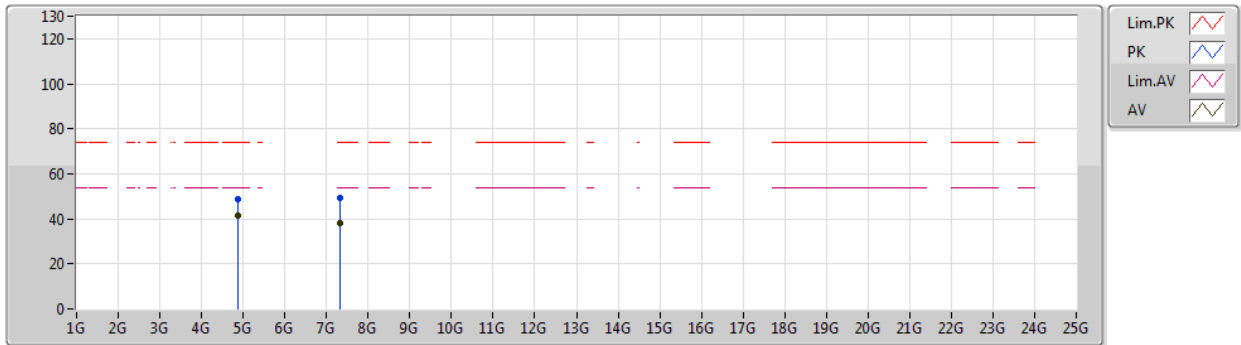


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.3528G	45.25	54.00	-8.75	31.62	3	Horizontal	193	3.00	-	13.63	27.79	3.83	-
AV	2.44G	100.65	Inf	-Inf	31.56	3	Horizontal	193	3.00	-	69.09	27.60	3.96	-
AV	2.4984G	45.62	54.00	-8.38	31.65	3	Horizontal	193	3.00	-	13.97	27.60	4.05	-
PK	2.3436G	56.93	74.00	-17.07	31.63	3	Horizontal	193	3.00	-	25.30	27.81	3.82	-
PK	2.4404G	101.51	Inf	-Inf	31.56	3	Horizontal	193	3.00	-	69.95	27.60	3.96	-
PK	2.4852G	57.63	74.00	-16.37	31.63	3	Horizontal	193	3.00	-	26.00	27.60	4.03	-

BT-LE(1Mbps)

2440MHz_TX

31/08/2020

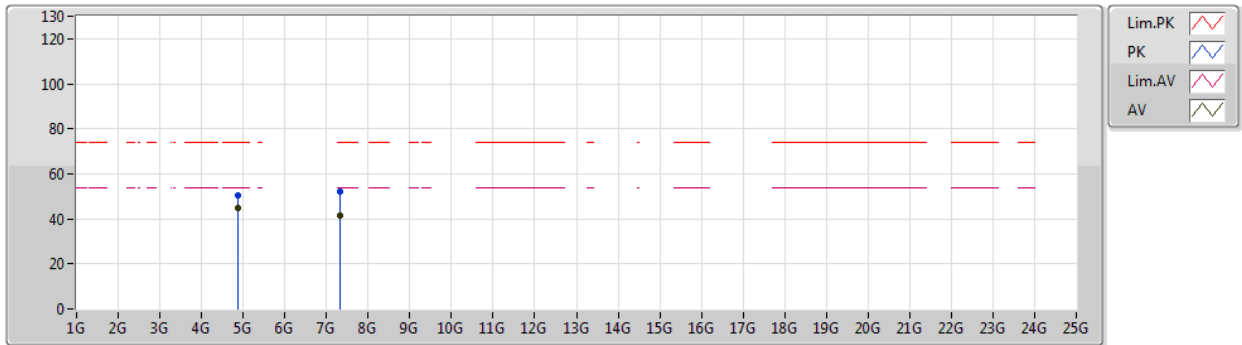


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.88006G	41.59	54.00	-12.41	1.65	3	Vertical	140	1.18	-	39.94	31.24	5.34	34.93
AV	7.31922G	38.04	54.00	-15.96	8.18	3	Vertical	340	1.50	-	29.86	36.56	6.80	35.18
PK	4.87394G	49.01	74.00	-24.99	1.66	3	Vertical	140	1.18	-	47.35	31.25	5.34	34.93
PK	7.33092G	49.35	74.00	-24.65	8.16	3	Vertical	340	1.50	-	41.19	36.54	6.80	35.18

BT-LE(1Mbps)

2440MHz_TX

31/08/2020

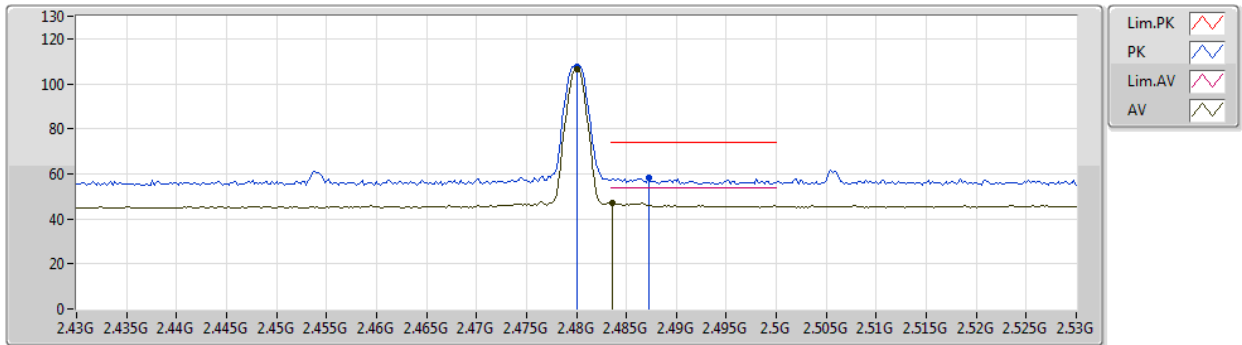


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.88G	44.59	54.00	-9.41	1.65	3	Horizontal	184	2.99	-	42.94	31.24	5.34	34.93
AV	7.31958G	41.68	54.00	-12.32	8.18	3	Horizontal	214	1.95	-	33.50	36.56	6.80	35.18
PK	4.87958G	50.69	74.00	-23.31	1.65	3	Horizontal	184	2.99	-	49.04	31.24	5.34	34.93
PK	7.32084G	52.37	74.00	-21.63	8.18	3	Horizontal	214	1.95	-	44.19	36.56	6.80	35.18

BT-LE(1Mbps)

2480MHz_TX

31/08/2020

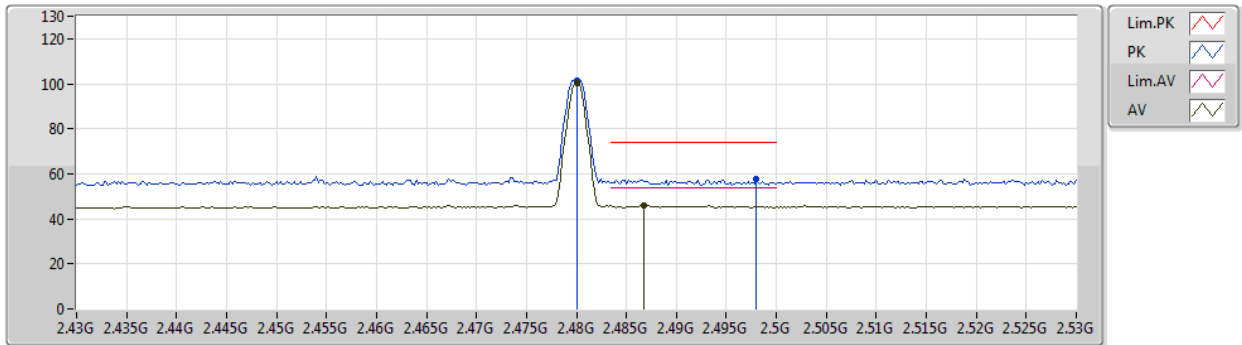


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.48G	106.57	Inf	-Inf	31.62	3	Vertical	146	1.25	-	74.95	27.60	4.02	-
AV	2.4836G	47.22	54.00	-6.78	31.63	3	Vertical	146	1.25	-	15.59	27.60	4.03	-
PK	2.48G	107.45	Inf	-Inf	31.62	3	Vertical	146	1.25	-	75.83	27.60	4.02	-
PK	2.4872G	58.28	74.00	-15.72	31.63	3	Vertical	146	1.25	-	26.65	27.60	4.03	-

BT-LE(1Mbps)

2480MHz_TX

31/08/2020

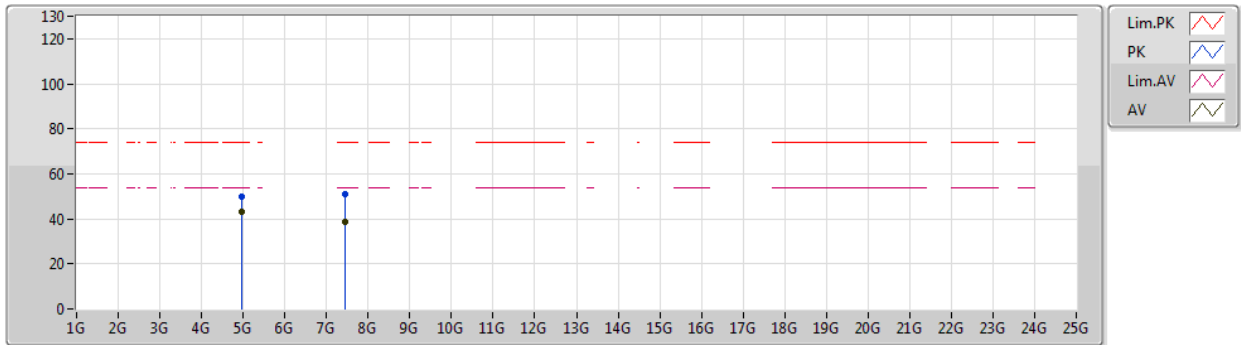


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.48G	100.40	Inf	-Inf	31.62	3	Horizontal	345	1.54	-	68.78	27.60	4.02	-
AV	2.4868G	46.06	54.00	-7.94	31.63	3	Horizontal	345	1.54	-	14.43	27.60	4.03	-
PK	2.48G	101.29	Inf	-Inf	31.62	3	Horizontal	345	1.54	-	69.67	27.60	4.02	-
PK	2.498G	57.47	74.00	-16.53	31.65	3	Horizontal	345	1.54	-	25.82	27.60	4.05	-

BT-LE(1Mbps)

2480MHz_TX

31/08/2020

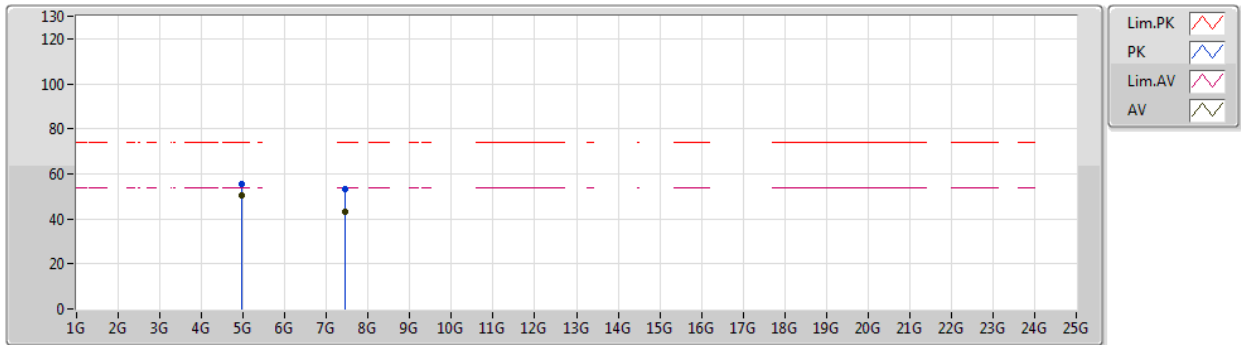


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.96G	42.97	54.00	-11.03	1.86	3	Vertical	127	3.00	-	41.11	31.42	5.38	34.94
AV	7.44042G	38.84	54.00	-15.16	8.21	3	Vertical	242	1.69	-	30.63	36.56	6.82	35.17
PK	4.95945G	50.11	74.00	-23.89	1.86	3	Vertical	127	3.00	-	48.25	31.42	5.38	34.94
PK	7.43945G	51.23	74.00	-22.77	8.21	3	Vertical	242	1.69	-	43.02	36.56	6.82	35.17

BT-LE(1Mbps)

2480MHz_TX

31/08/2020



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	4.96002G	50.25	54.00	-3.75	1.86	3	Horizontal	222	2.22	-	48.39	31.42	5.38	34.94
AV	7.43931G	42.93	54.00	-11.07	8.21	3	Horizontal	223	2.22	-	34.72	36.56	6.82	35.17
PK	4.95954G	55.22	74.00	-18.78	1.86	3	Horizontal	222	2.22	-	53.36	31.42	5.38	34.94
PK	7.43939G	53.33	74.00	-20.67	8.21	3	Horizontal	223	2.22	-	45.12	36.56	6.82	35.17