

FCC Test Report

FCC ID : W8J-7212
Equipment : DCS Digital Control Solution
Brand Name : Steinel
Model Name : 110077337
Applicant : Steinel GmbH
Dieselstrasse 80-84, 33442 Herzebrock-Clarholz,
Germany
Manufacturer : Steinel Solutions AG
Allmeindstrasse 10, 8840 Einsiedeln, Switzerland
Standard : 47 CFR FCC Part 15.247

The product was received on May 11, 2020, and testing was started from May 11, 2020 and completed on May 13, 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 report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

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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PHOTOGRAPHS OF EUT V01



History of this test report

Report No.	Version	Description	Issued Date
FR052925AL	01	Initial issue of report	Jul. 02, 2020



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: 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

Note:

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

1.1.2 Antenna Information

Ant.	Port	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	1	Johanson	-	Chip Antenna	N/A	0.5

Note 1: The EUT has one antenna.

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

1.1.4 Mode Test Duty Cycle

Mode	DC	DCF(dB)	T(s)	VBW(Hz) ≥ 1/T
BT-LE(1Mbps)	0.175	7.57	109.375u	10k

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		
<input checked="" type="checkbox"/>	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.		
<input type="checkbox"/>	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.		
<input type="checkbox"/>	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	22.2~24.5°C / 62~64%	13/May/2020
RF Conducted	TH07-HY	Justin	21.3~24.1°C / 50~56%	12/May/2020
Radiated	03CH03-HY	Jeff	22.4~25.2°C / 53~61%	11/May/2020~12/May/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	QCOM_V1.6
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Mode	Power Setting
BT-LE(1Mbps)	-
2402MHz	8dBm
2440MHz	4dBm
2480MHz	4dBm

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	Switching Power supply mode

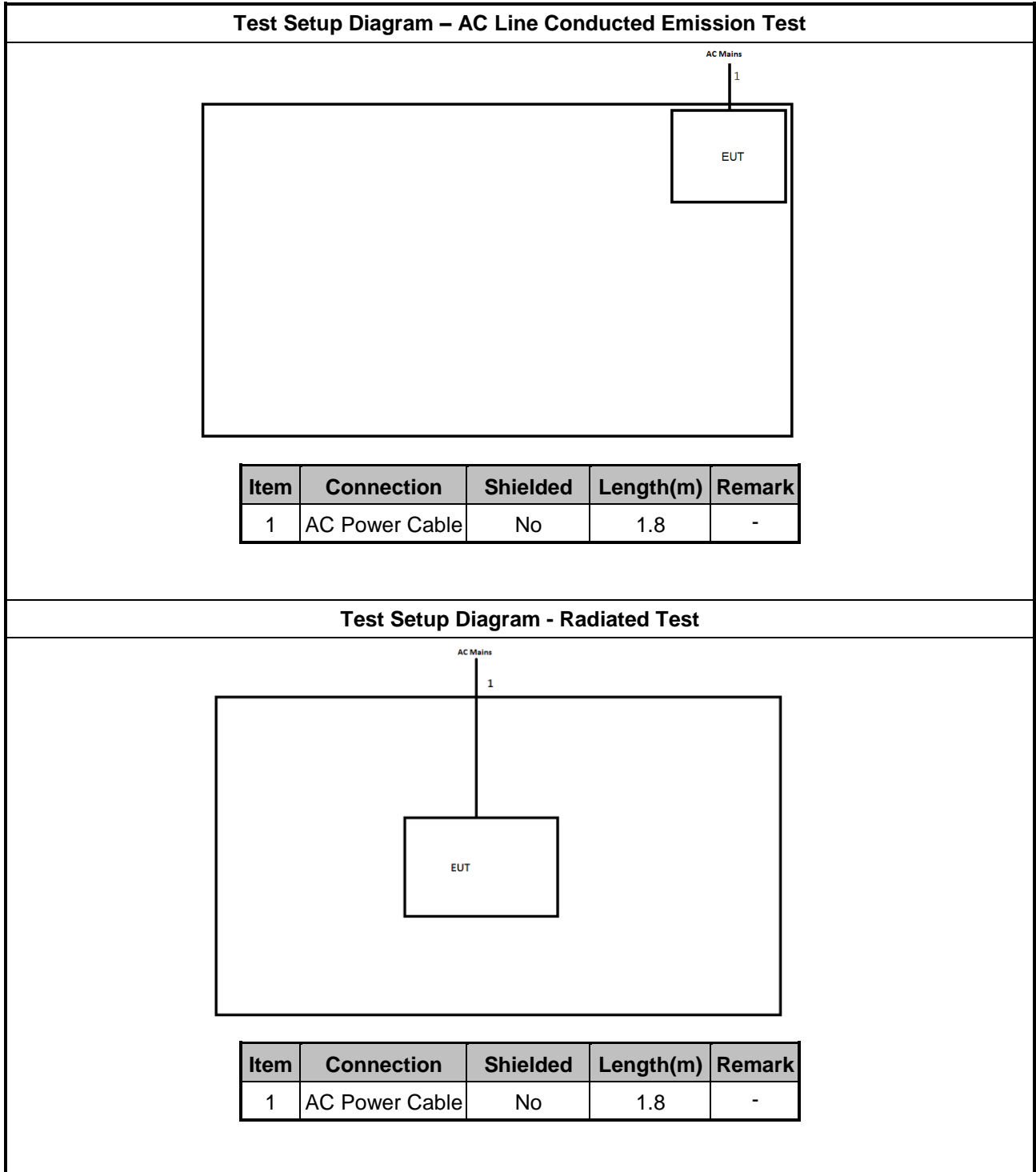
The Worst Case Mode for Following Conformance Tests	
Tests Item	DTS Bandwidth Maximum Conducted Output Power Power Spectral Density Emissions in Non-restricted Frequency Bands
Test Condition	Conducted measurement at transmit chains

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	Switching Power supply mode		
Operating Mode > 1GHz	CTX		
Orthogonal Planes of EUT	X Plane	Y Plane	Z Plane
			
Worst Planes of EUT	V		

2.4 Support Equipment

Support Equipment – Conducted					
No.	Equipment	Brand Name	Model Name	FCC ID	Remark
1	Notebook	DELL	PP13S	-	-
2	Adapter for NB	DELL	AA90PM111	-	-
3	Fixture	Sporton	Sporton	-	-
4	AC Power Cable	Power sync	MPCQKH0100	-	-

2.5 Test Setup Diagram



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.

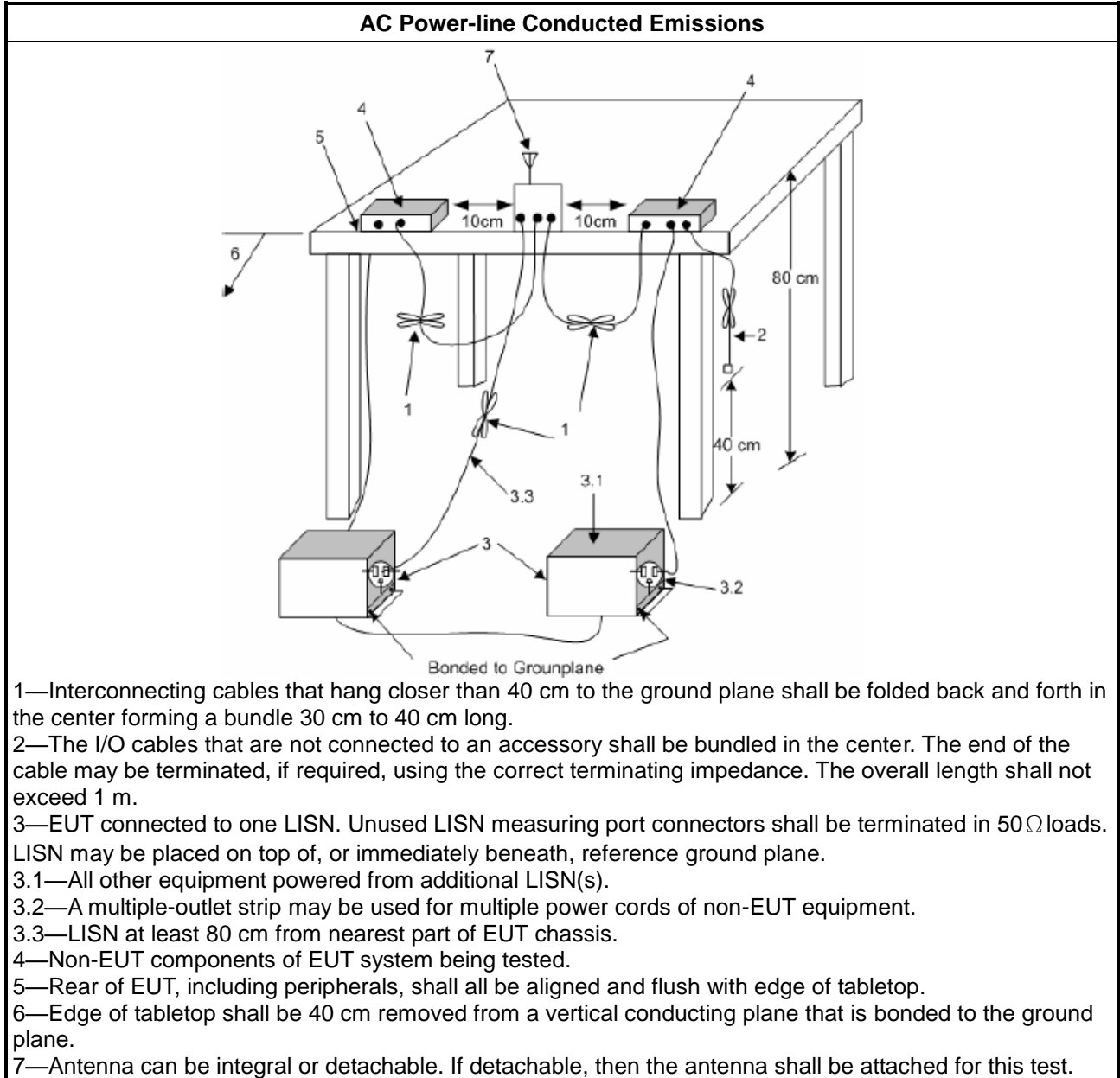
3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

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

3.1.4 Test Setup



3.1.5 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:
<ul style="list-style-type: none"> ▪ 6 dB bandwidth \geq 500 kHz.

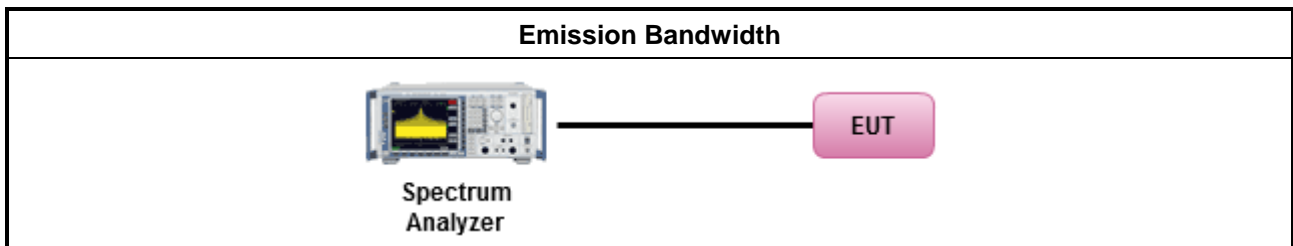
3.2.2 Measuring Instruments

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

3.2.3 Test Procedures

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

3.2.4 Test Setup



3.2.5 Test Result of Emission Bandwidth

Refer as Appendix B

3.3 Maximum Conducted Output Power

3.3.1 Maximum Conducted Output Power Limit

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

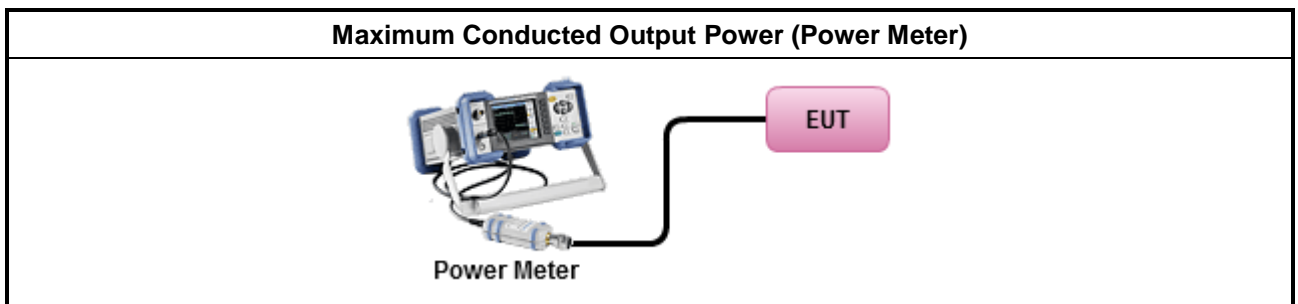
3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

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

3.3.4 Test Setup



3.3.5 Test Result of Maximum Conducted Output Power

Refer as Appendix C

3.4 Power Spectral Density

3.4.1 Power Spectral Density Limit

Power Spectral Density Limit
<ul style="list-style-type: none"> ▪ Power Spectral Density (PSD) ≤ 8 dBm/3kHz

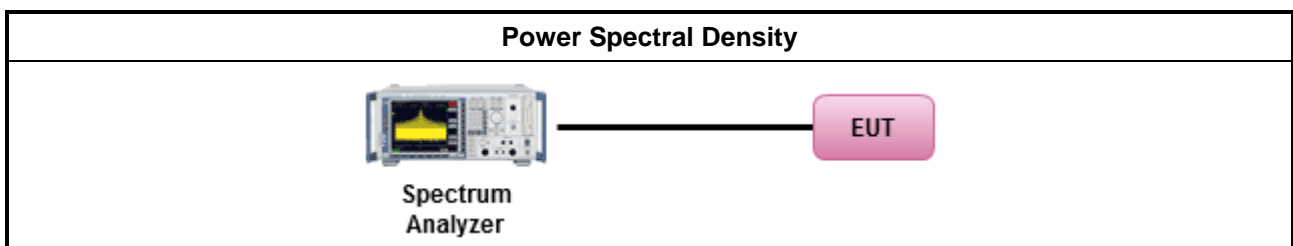
3.4.2 Measuring Instruments

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

3.4.3 Test Procedures

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

3.4.4 Test Setup



3.4.5 Test Result of Power Spectral Density

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.

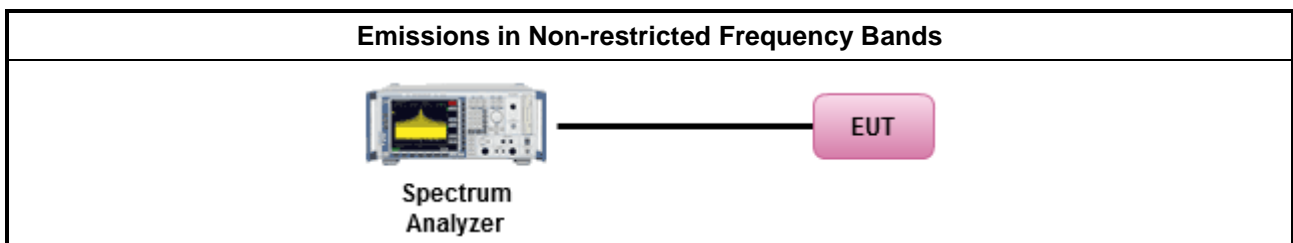
3.5.2 Measuring Instruments

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

3.5.3 Test Procedures

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

3.5.4 Test Setup



3.5.5 Test Result of Emissions in Non-restricted Frequency Bands

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.

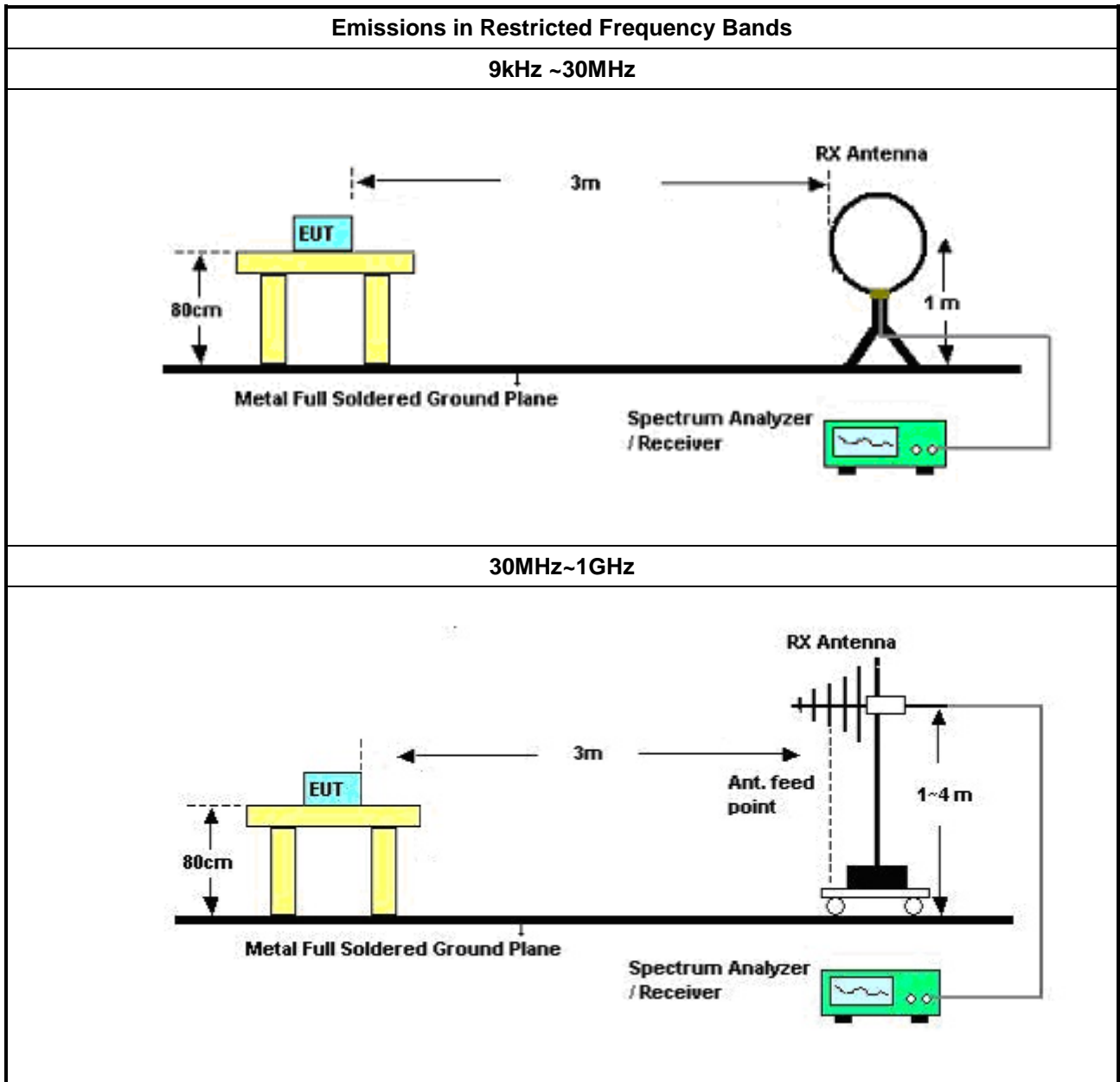
3.6.2 Measuring Instruments

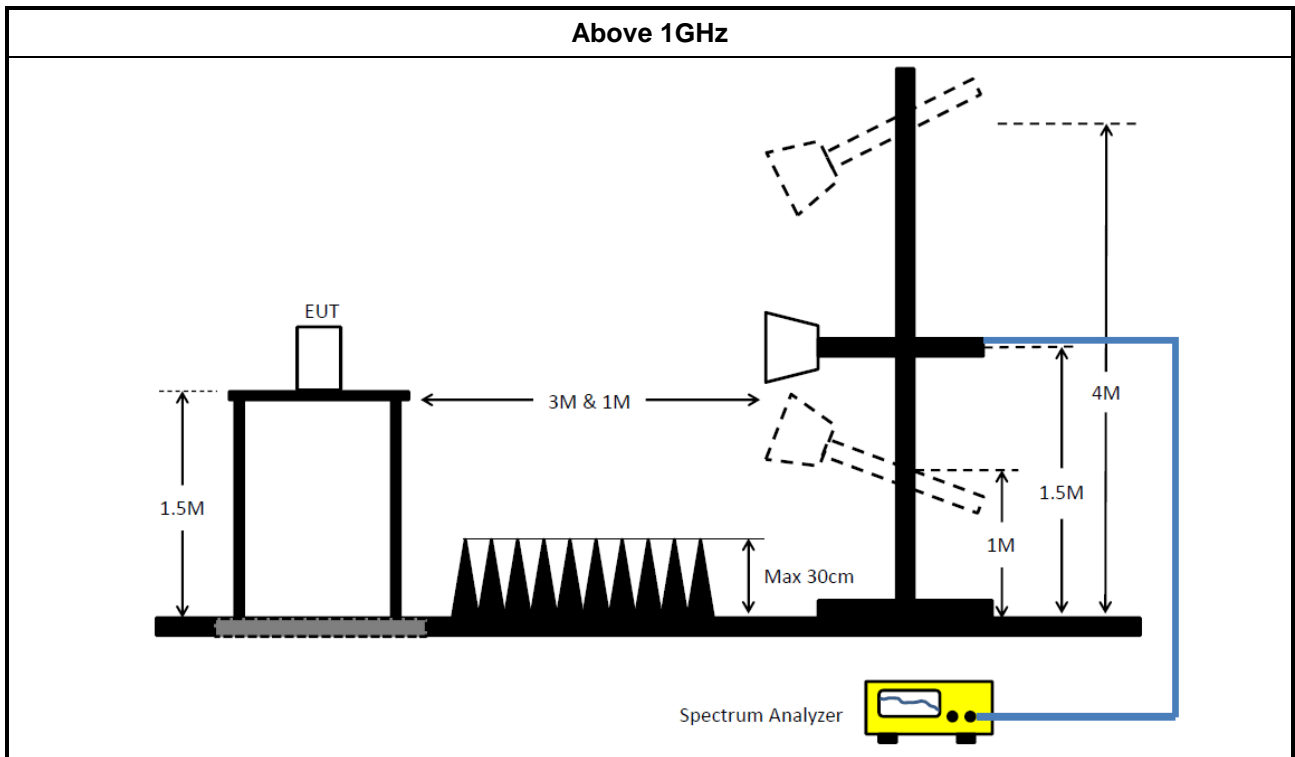
Refer a test equipment and calibration data table in this test report.

3.6.3 Test Procedures

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

3.6.4 Test Setup





3.6.5 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.

3.6.6 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
EMC Receiver	R&S	ESR3	102051	9kHz ~ 3.6GHz	28/May/2019	27/May/2020
LISN	R&S	ENV216	101295	9kHz ~ 30MHz	05/Nov/2019	04/Nov/2020
RF Cable-CON	MTJ	RG142	CB002-CO	9kHz ~ 200MHz	23/Sep/2019	22/Sep/2020
AC POWER	APC	AFC-11005G	F310050055	47Hz ~ 63Hz 5 ~ 300V	NCR	NCR
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
Spectrum Analyzer	R&S	FSV 40	101013	10Hz ~ 40GHz	19/Mar/2020	18/Mar/2021
Pulse Power Sensor	Anritsu	MA2411B	0917017	300MHz ~ 40GHz	17/Feb/2020	16/Feb/2021
Power Meter	Anritsu	ML2495A	0949003	300MHz ~ 40GHz	17/Feb/2020	16/Feb/2021
SMB100A Signal Generator	R&S	SMB100A03	181147	100kHz ~ 40GHz	12/Nov/2018	11/Nov/2020



Instrument for Radiated Test

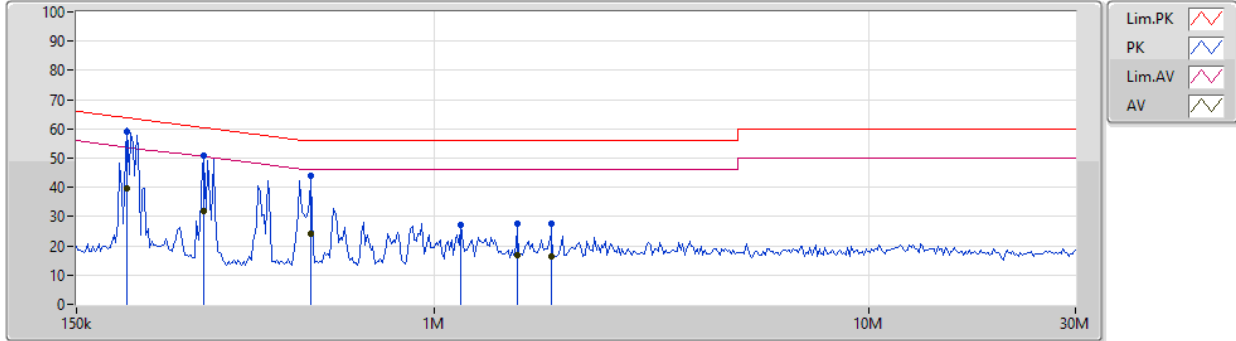
Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30MHz ~ 1GHz 3m	30/Aug/2019	29/Aug/2020
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	1GHz ~ 18GHz 3m	30/Aug/2019	29/Aug/2020
Amplifier	HP	8447D	2944A08033	10kHz ~ 1.3GHz	14/Apr/2020	13/Apr/2021
EMC Receiver	R&S	ESR3	102051	9kHz ~ 3.6GHz	28/May/2019	27/May/2020
Bilog Antenna & 6dB Attenuator	SCHAFFNER / EMCI	CBL6112B / N-6-05	22237 / AT-N-0603	30MHz ~ 1GHz	19/Apr/2020	18/Apr/2021
Microwave System Preamp	KEYSIGHT	83017A	MY53270196	1GHz ~ 26.5GHz	09/Sep/2019	08/Sep/2020
Signal Analyzer	R&S	FSV40	101500	10Hz ~ 40GHz	15/Aug/2019	14/Aug/2020
RF Cable-R03m	Jye Bao	RG142	CB021	9kHz ~ 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
Double Ridged Guide Horn Antenna	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1531	1GHz ~ 18GHz	26/Mar/2020	25/Mar/2021
Loop Antenna	TESEQ	HLA 6120	31244	9kHz ~ 30MHz	16/Mar/2020	15/Mar/2021



AC Power-line Conducted Emissions Result

Operating Mode	1	Power Phase	Neutral
Operating Function	Switching Power supply mode		

13/05/2020



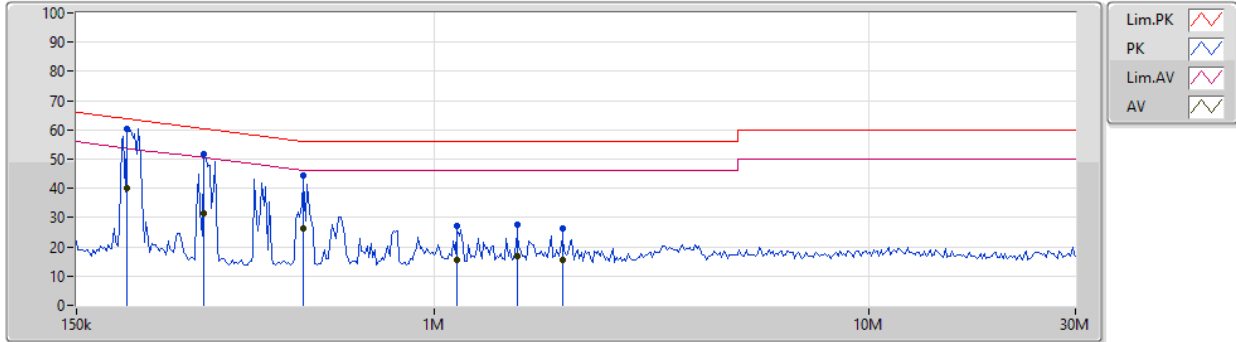
Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)
QP	196.231k	59.16	63.76	-4.60	19.62	Neutral	"Worst"	39.54	9.64	0.11	9.87
AV	196.231k	39.60	53.76	-14.16	19.62	Neutral	-	19.98	9.64	0.11	9.87
QP	295.083k	50.99	60.38	-9.39	19.62	Neutral	-	31.37	9.63	0.12	9.87
AV	295.083k	32.02	50.38	-18.36	19.62	Neutral	-	12.40	9.63	0.12	9.87
QP	520.311k	44.04	56.00	-11.96	19.63	Neutral	-	24.41	9.63	0.13	9.87
AV	520.311k	24.35	46.00	-21.65	19.63	Neutral	-	4.72	9.63	0.13	9.87
QP	1.153M	27.19	56.00	-28.81	19.63	Neutral	-	7.56	9.63	0.12	9.88
AV	1.153M	27.00	46.00	-19.00	19.63	Neutral	-	7.37	9.63	0.12	9.88
QP	1.555M	27.72	56.00	-28.28	19.64	Neutral	-	8.08	9.64	0.13	9.87
AV	1.555M	16.66	46.00	-29.34	19.64	Neutral	-	-2.98	9.64	0.13	9.87
QP	1.86M	27.43	56.00	-28.57	19.66	Neutral	-	7.77	9.65	0.14	9.87
AV	1.86M	16.46	46.00	-29.54	19.66	Neutral	-	-3.20	9.65	0.14	9.87



AC Power-line Conducted Emissions Result

Operating Mode	1	Power Phase	Line
Operating Function	Switching Power supply mode		

13/05/2020



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)
QP	196.231k	60.29	63.76	-3.47	19.63	Line	"Worst"	40.66	9.65	0.11	9.87
AV	196.231k	40.17	53.76	-13.59	19.63	Line	-	20.54	9.65	0.11	9.87
QP	295.083k	51.93	60.38	-8.45	19.63	Line	-	32.30	9.64	0.12	9.87
AV	295.083k	31.34	50.38	-19.04	19.63	Line	-	11.71	9.64	0.12	9.87
QP	500k	44.32	56.00	-11.68	19.64	Line	-	24.68	9.64	0.13	9.87
AV	500k	26.38	46.00	-19.62	19.64	Line	-	6.74	9.64	0.13	9.87
QP	1.131M	27.14	56.00	-28.86	19.64	Line	-	7.50	9.64	0.12	9.88
AV	1.131M	15.45	46.00	-30.55	19.64	Line	-	-4.19	9.64	0.12	9.88
QP	1.555M	27.41	56.00	-28.59	19.65	Line	-	7.76	9.65	0.13	9.87
AV	1.555M	16.85	46.00	-29.15	19.65	Line	-	-2.80	9.65	0.13	9.87
QP	1.974M	26.09	56.00	-29.91	19.67	Line	-	6.42	9.65	0.15	9.87
AV	1.974M	15.67	46.00	-30.33	19.67	Line	-	-4.00	9.65	0.15	9.87



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)	687.5k	1.028M	1M03F1D	685k	1.025M

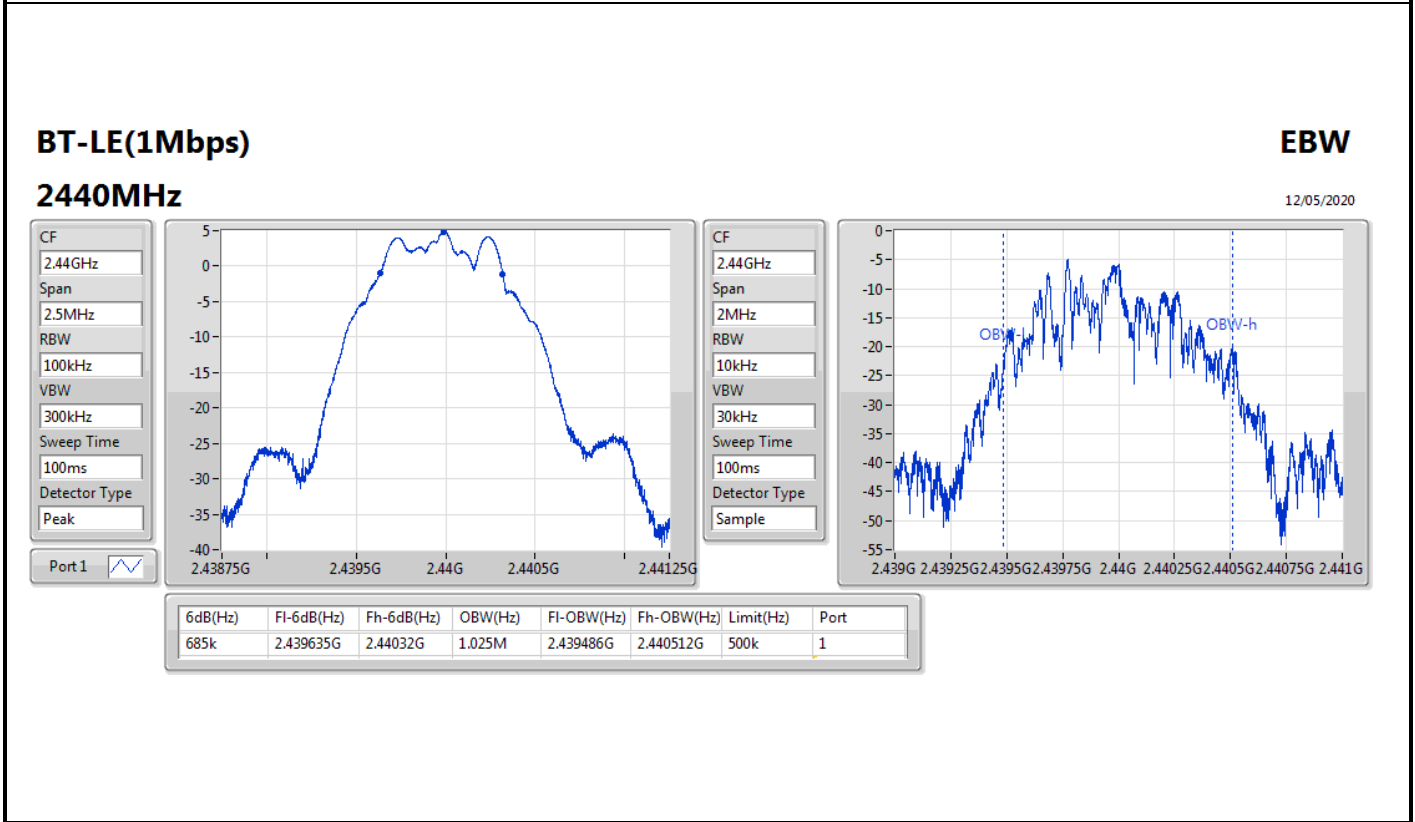
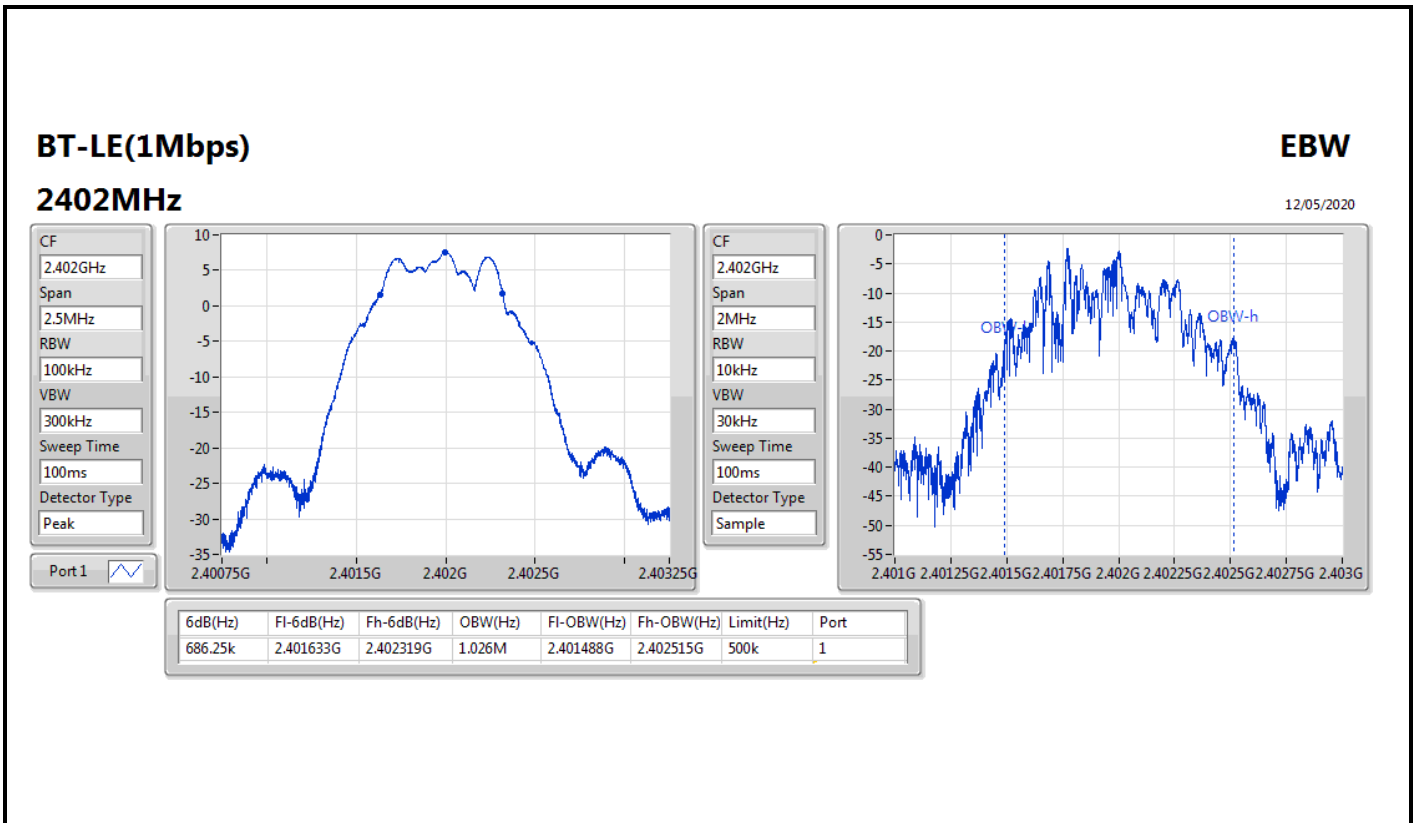
Max-N dB = Maximum 6dB down bandwidth; **Max-OBW** = Maximum 99% occupied bandwidth;
Min-N dB = Minimum 6dB down bandwidth; **Min-OBW** = Minimum 99% occupied bandwidth;

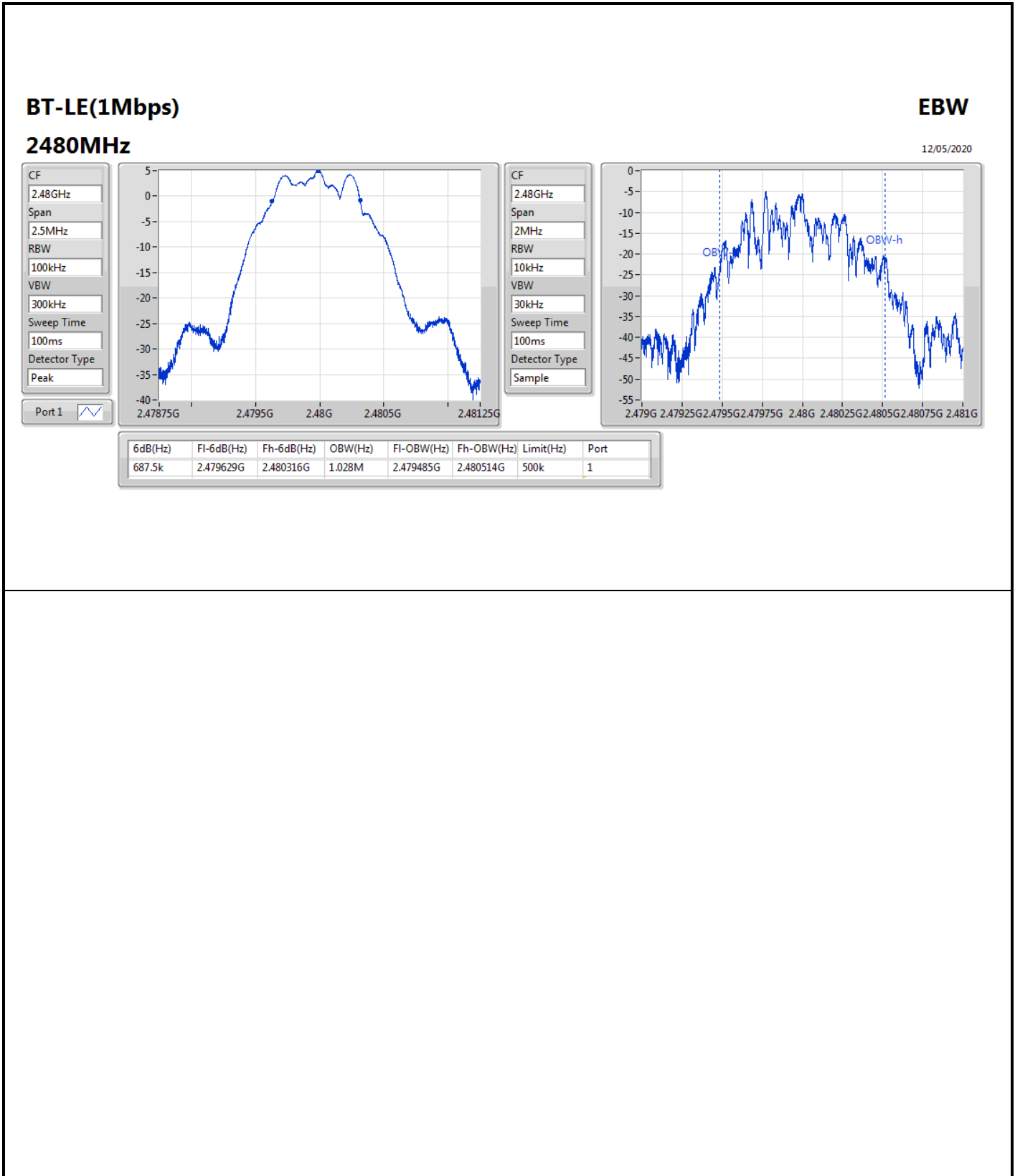


Result

Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
BT-LE(1Mbps)	-	-	-	-
2402MHz_TnomVnom	Pass	500k	686.25k	1.026M
2440MHz_TnomVnom	Pass	500k	685k	1.025M
2480MHz_TnomVnom	Pass	500k	687.5k	1.028M

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







Summary

Mode	Power (dBm)	Power (W)
2.4-2.4835GHz	-	-
BT-LE(1Mbps)	7.31	0.00538



Result

Mode	Result	Gain (dBi)	Power (dBm)	Power Limit (dBm)
BT-LE(1Mbps)	-	-	-	-
2402MHz_TnomVnom	Pass	0.50	7.31	30.00
2440MHz_TnomVnom	Pass	0.50	4.48	30.00
2480MHz_TnomVnom	Pass	0.50	4.67	30.00

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



Summary

Mode	PD (dBm/RBW)
2.4-2.4835GHz	-
BT-LE(1Mbps)	-9.76

RBW=3 kHz.

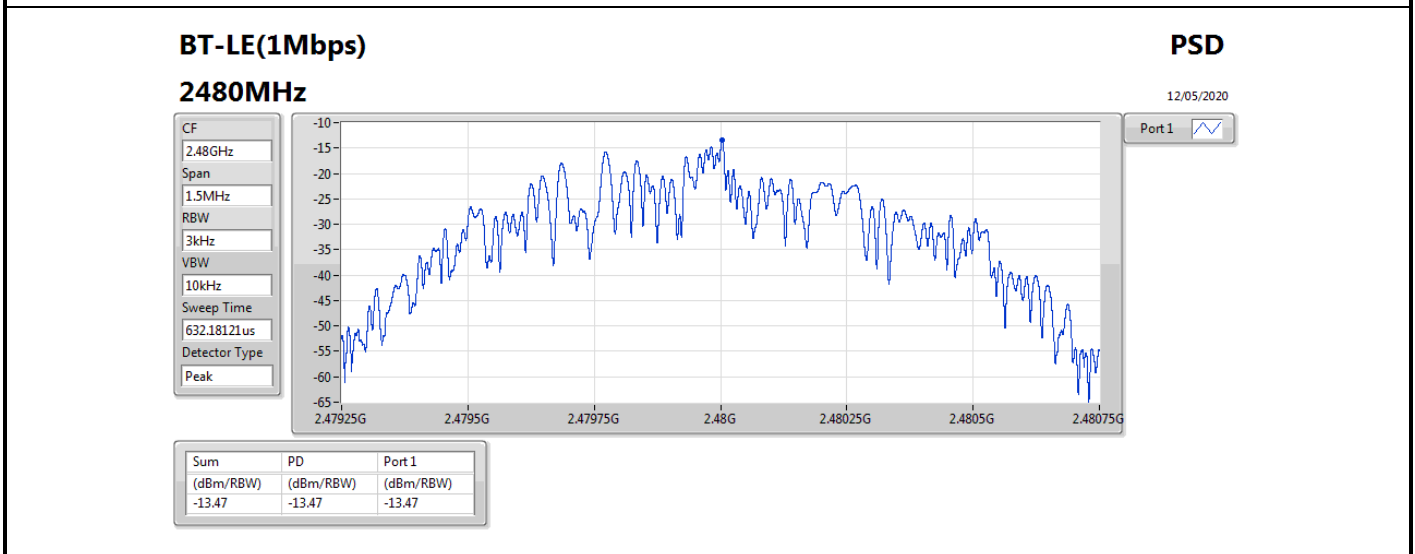
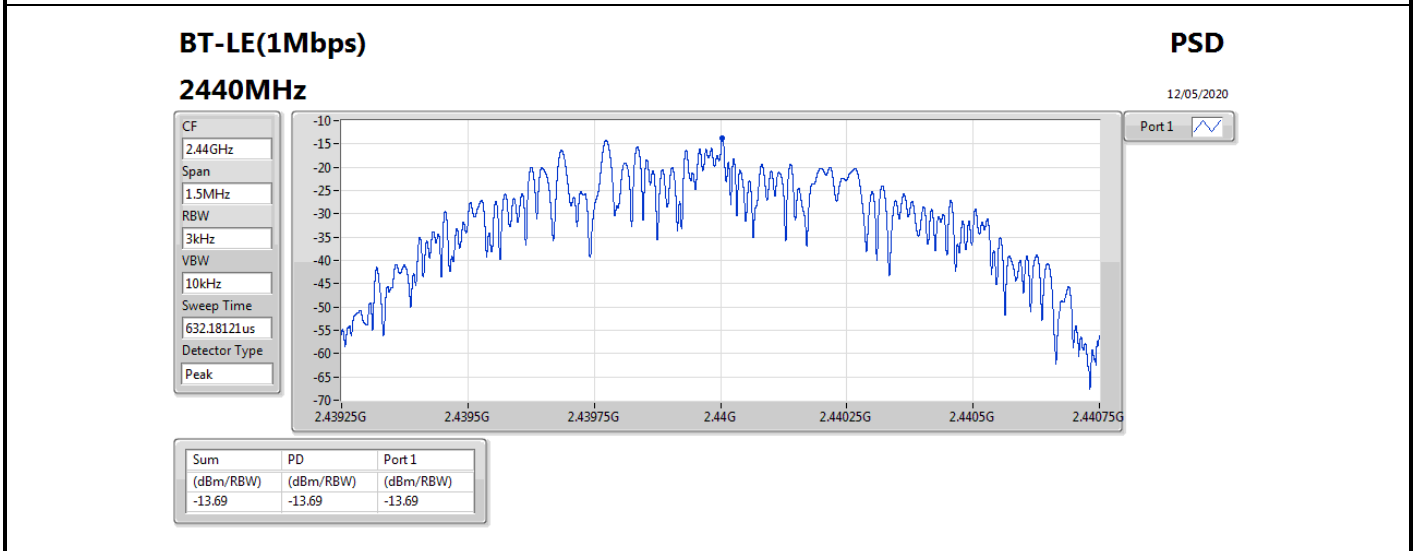
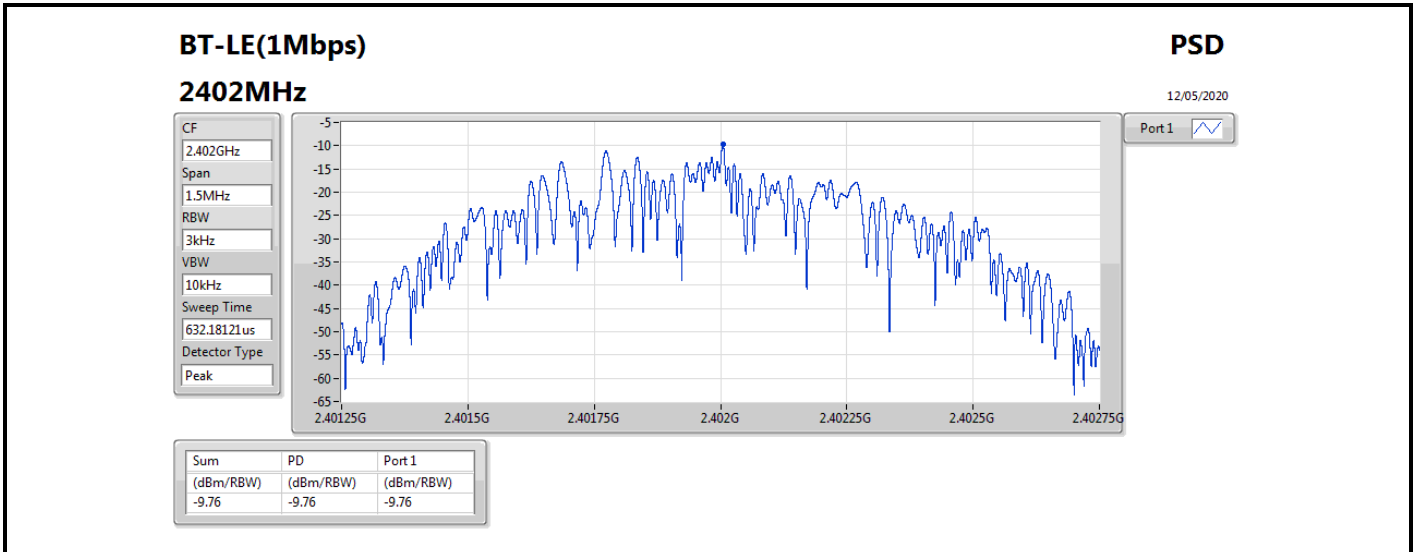


Result

Mode	Result	Gain (dBi)	PD (dBm/RBW)	PD Limit (dBm/RBW)
BT-LE(1Mbps)	-	-	-	-
2402MHz_TnomVnom	Pass	0.50	-9.76	8.00
2440MHz_TnomVnom	Pass	0.50	-13.69	8.00
2480MHz_TnomVnom	Pass	0.50	-13.47	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;





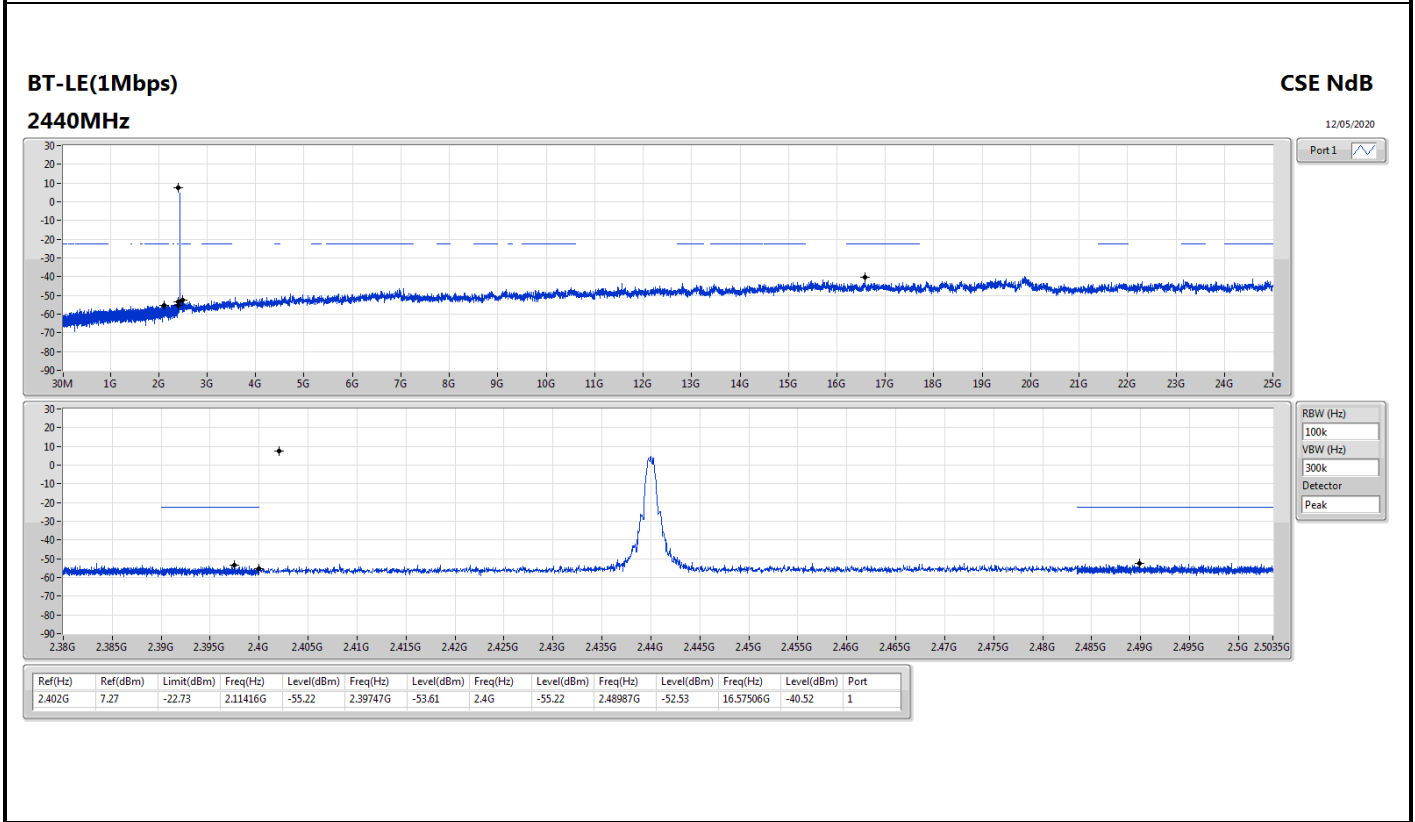
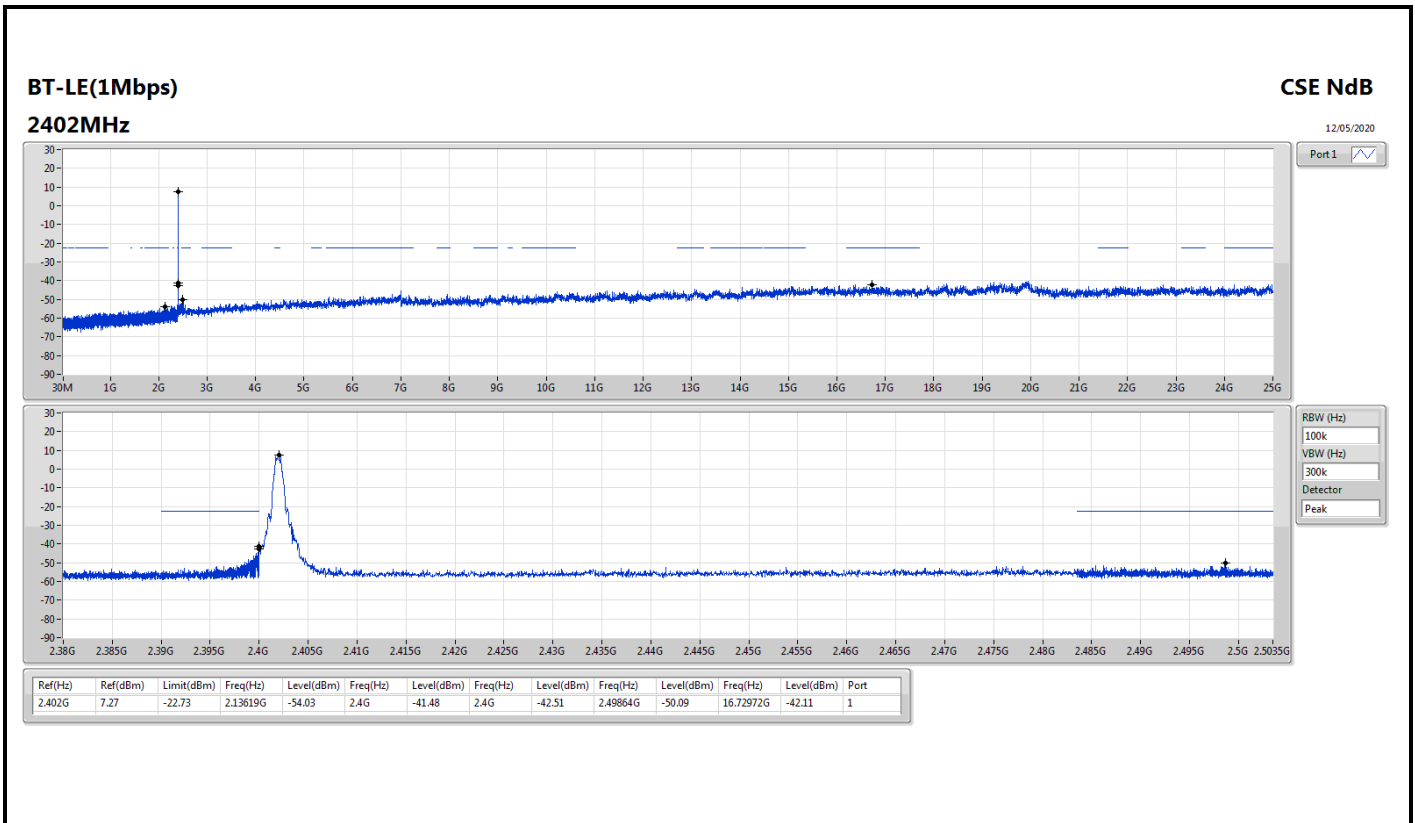
Summary

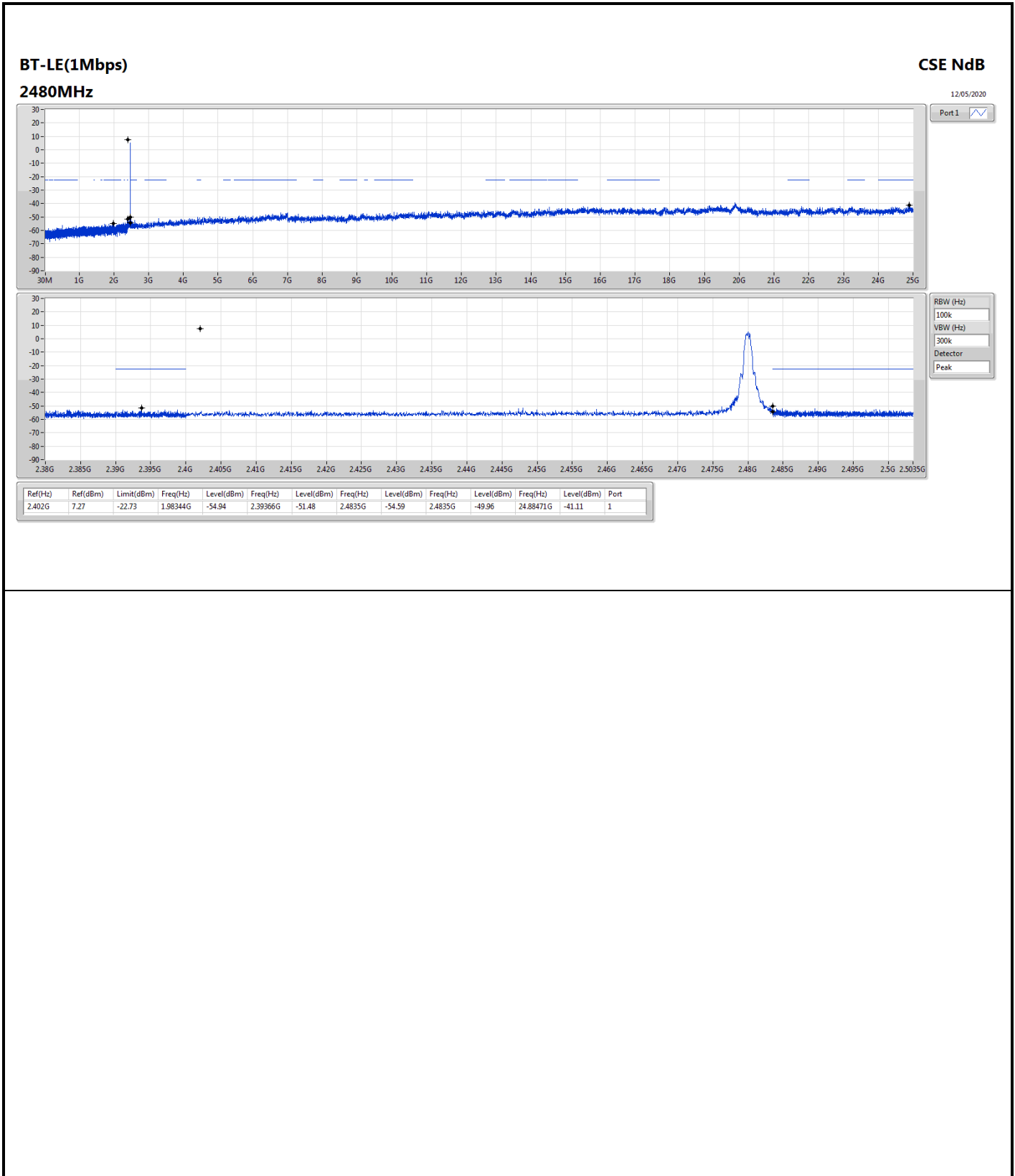
Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	2.402G	7.27	-22.73	2.13619G	-54.03	2.4G	-41.48	2.4G	-42.51	2.49864G	-50.09	16.72972G	-42.11	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_TnomVnom	Pass	2.402G	7.27	-22.73	2.13619G	-54.03	2.4G	-41.48	2.4G	-42.51	2.49864G	-50.09	16.72972G	-42.11	1
2440MHz_TnomVnom	Pass	2.402G	7.27	-22.73	2.11416G	-55.22	2.39747G	-53.61	2.4G	-55.22	2.48987G	-52.53	16.57506G	-40.52	1
2480MHz_TnomVnom	Pass	2.402G	7.27	-22.73	1.98344G	-54.94	2.39366G	-51.48	2.4835G	-54.59	2.4835G	-49.96	24.88471G	-41.11	1







Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	QP	474.26M	44.09	46.00	-1.91	3	Vertical	118	1.03	-



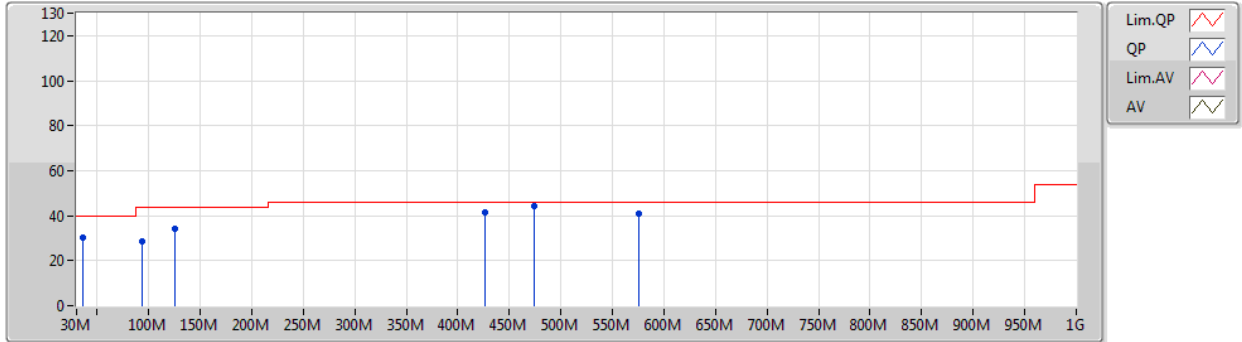
Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-
2440MHz	Pass	PK	35.82M	30.53	40.00	-9.47	3	Vertical	360	1.00	-
2440MHz	Pass	PK	94.02M	28.46	43.50	-15.04	3	Vertical	360	1.00	-
2440MHz	Pass	PK	125.06M	34.43	43.50	-9.07	3	Vertical	360	1.00	-
2440MHz	Pass	PK	425.76M	41.41	46.00	-4.59	3	Vertical	360	1.00	-
2440MHz	Pass	PK	575.14M	40.63	46.00	-5.37	3	Vertical	360	1.00	-
2440MHz	Pass	QP	474.26M	44.09	46.00	-1.91	3	Vertical	118	1.03	-
2440MHz	Pass	PK	30M	23.27	40.00	-16.73	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	224M	33.29	46.00	-12.71	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	274.44M	37.75	46.00	-8.25	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	474.26M	41.21	46.00	-4.79	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	575.14M	40.13	46.00	-5.87	3	Horizontal	0	1.00	-
2440MHz	Pass	QP	324.88M	43.35	46.00	-2.65	3	Horizontal	16	1.00	-

BT-LE(1Mbps)

12/05/2020

2440MHz_Switching Power Supply

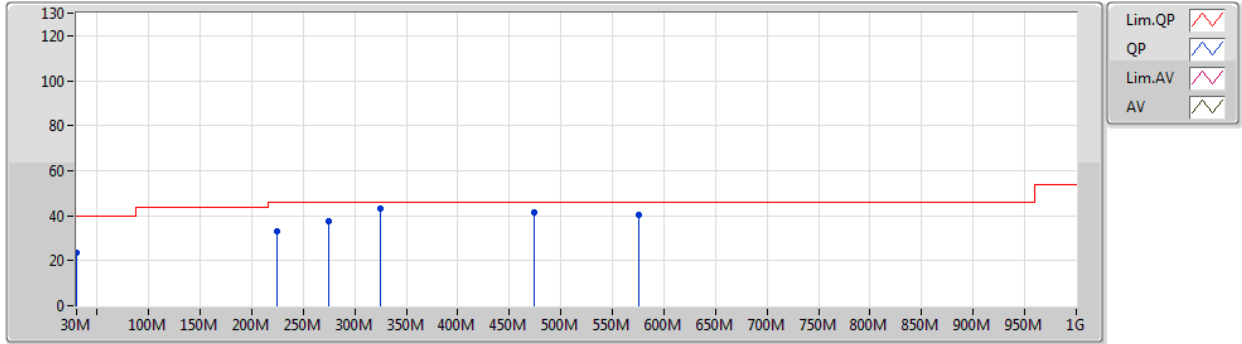


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
PK	35.82M	30.53	40.00	-9.47	-6.64	3	Vertical	360	1.00	-	37.17	19.99	0.92	27.55
PK	94.02M	28.46	43.50	-15.04	-10.92	3	Vertical	360	1.00	-	39.38	14.89	1.58	27.39
PK	125.06M	34.43	43.50	-9.07	-8.28	3	Vertical	360	1.00	-	42.71	17.16	1.83	27.27
PK	425.76M	41.41	46.00	-4.59	-2.32	3	Vertical	360	1.00	-	43.73	21.81	3.35	27.48
PK	575.14M	40.63	46.00	-5.37	-0.40	3	Vertical	360	1.00	-	41.03	23.61	4.00	28.01
QP	474.26M	44.09	46.00	-1.91	-1.69	3	Vertical	118	1.03	-	45.78	22.50	3.55	27.74

BT-LE(1Mbps)

12/05/2020

2440MHz_Switching Power Supply



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	23.27	40.00	-16.73	-3.35	3	Horizontal	0	1.00	-	26.62	23.33	0.90	27.58
PK	224M	33.29	46.00	-12.71	-9.85	3	Horizontal	0	1.00	-	43.14	14.53	2.44	26.82
PK	274.44M	37.75	46.00	-8.25	-6.00	3	Horizontal	0	1.00	-	43.75	17.93	2.75	26.68
PK	474.26M	41.21	46.00	-4.79	-1.69	3	Horizontal	0	1.00	-	42.90	22.50	3.55	27.74
PK	575.14M	40.13	46.00	-5.87	-0.40	3	Horizontal	0	1.00	-	40.53	23.61	4.00	28.01
QP	324.88M	43.35	46.00	-2.65	-5.02	3	Horizontal	16	1.00	-	48.37	18.77	3.00	26.79



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	7.43922G	49.94	54.00	-4.06	3	Horizontal	338	1.01	-



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	2.3698G	40.24	54.00	-13.76	3	Vertical	90	1.82	-
2402MHz	Pass	AV	2.402G	96.13	Inf	-Inf	3	Vertical	90	1.82	-
2402MHz	Pass	PK	2.3528G	51.34	74.00	-22.66	3	Vertical	90	1.82	-
2402MHz	Pass	PK	2.402G	98.39	Inf	-Inf	3	Vertical	90	1.82	-
2402MHz	Pass	AV	2.3694G	40.24	54.00	-13.76	3	Horizontal	36	1.26	-
2402MHz	Pass	AV	2.402G	95.95	Inf	-Inf	3	Horizontal	36	1.26	-
2402MHz	Pass	PK	2.3576G	52.26	74.00	-21.74	3	Horizontal	36	1.26	-
2402MHz	Pass	PK	2.4018G	98.21	Inf	-Inf	3	Horizontal	36	1.26	-
2402MHz	Pass	AV	4.80348G	37.92	54.00	-16.08	3	Vertical	154	1.12	-
2402MHz	Pass	PK	4.80442G	48.24	74.00	-25.76	3	Vertical	154	1.12	-
2402MHz	Pass	AV	4.8035G	41.18	54.00	-12.82	3	Horizontal	17	1.09	-
2402MHz	Pass	PK	4.80394G	50.02	74.00	-23.98	3	Horizontal	17	1.09	-
2440MHz	Pass	AV	2.3672G	40.31	54.00	-13.69	3	Vertical	67	1.75	-
2440MHz	Pass	AV	2.44G	90.62	Inf	-Inf	3	Vertical	67	1.75	-
2440MHz	Pass	AV	2.4924G	39.99	54.00	-14.01	3	Vertical	67	1.75	-
2440MHz	Pass	PK	2.3568G	51.80	74.00	-22.20	3	Vertical	67	1.75	-
2440MHz	Pass	PK	2.44G	92.88	Inf	-Inf	3	Vertical	67	1.75	-
2440MHz	Pass	PK	2.4864G	51.09	74.00	-22.91	3	Vertical	67	1.75	-
2440MHz	Pass	AV	2.344G	40.42	54.00	-13.58	3	Horizontal	40	1.11	-
2440MHz	Pass	AV	2.44G	91.64	Inf	-Inf	3	Horizontal	40	1.11	-
2440MHz	Pass	AV	2.4912G	39.99	54.00	-14.01	3	Horizontal	40	1.11	-
2440MHz	Pass	PK	2.3444G	51.59	74.00	-22.41	3	Horizontal	40	1.11	-
2440MHz	Pass	PK	2.4396G	93.92	Inf	-Inf	3	Horizontal	40	1.11	-
2440MHz	Pass	PK	2.4944G	50.59	74.00	-23.41	3	Horizontal	40	1.11	-
2440MHz	Pass	AV	4.87946G	37.01	54.00	-16.99	3	Vertical	2	1.50	-
2440MHz	Pass	AV	7.31916G	45.47	54.00	-8.53	3	Vertical	327	1.19	-
2440MHz	Pass	PK	4.86986G	47.07	74.00	-26.93	3	Vertical	2	1.50	-
2440MHz	Pass	PK	7.32078G	54.33	74.00	-19.67	3	Vertical	327	1.19	-
2440MHz	Pass	AV	4.87958G	40.17	54.00	-13.83	3	Horizontal	65	1.04	-
2440MHz	Pass	AV	7.31922G	49.72	54.00	-4.28	3	Horizontal	348	1.06	-
2440MHz	Pass	PK	4.8794G	48.93	74.00	-25.07	3	Horizontal	65	1.04	-
2440MHz	Pass	PK	7.32006G	57.79	74.00	-16.21	3	Horizontal	348	1.06	-
2480MHz	Pass	AV	2.48G	90.22	Inf	-Inf	3	Vertical	73	1.48	-
2480MHz	Pass	AV	2.4836G	40.38	54.00	-13.62	3	Vertical	73	1.48	-
2480MHz	Pass	PK	2.4798G	92.48	Inf	-Inf	3	Vertical	73	1.48	-
2480MHz	Pass	PK	2.4835G	51.68	74.00	-22.32	3	Vertical	73	1.48	-
2480MHz	Pass	AV	2.4798G	90.82	Inf	-Inf	3	Horizontal	42	1.15	-
2480MHz	Pass	AV	2.5G	40.07	54.00	-13.93	3	Horizontal	42	1.15	-
2480MHz	Pass	PK	2.4796G	93.13	Inf	-Inf	3	Horizontal	42	1.15	-
2480MHz	Pass	PK	2.4838G	52.29	74.00	-21.71	3	Horizontal	42	1.15	-
2480MHz	Pass	AV	4.95943G	38.67	54.00	-15.33	3	Vertical	12	1.02	-
2480MHz	Pass	AV	7.43917G	43.32	54.00	-10.68	3	Vertical	4	1.51	-
2480MHz	Pass	PK	4.95988G	48.88	74.00	-25.12	3	Vertical	12	1.02	-
2480MHz	Pass	PK	7.43911G	53.85	74.00	-20.15	3	Vertical	4	1.51	-
2480MHz	Pass	AV	4.95949G	40.05	54.00	-13.95	3	Horizontal	13	1.08	-
2480MHz	Pass	AV	7.43922G	49.94	54.00	-4.06	3	Horizontal	338	1.01	-
2480MHz	Pass	PK	4.95952G	49.73	74.00	-24.27	3	Horizontal	13	1.08	-

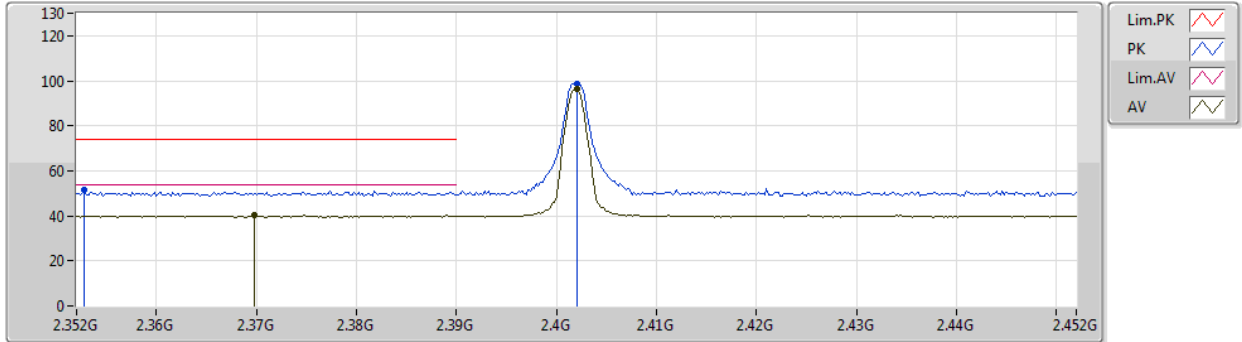


Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2480MHz	Pass	PK	7.44072G	58.02	74.00	-15.98	3	Horizontal	338	1.01	-

BT-LE(1Mbps)

11/05/2020

2402MHz_TX

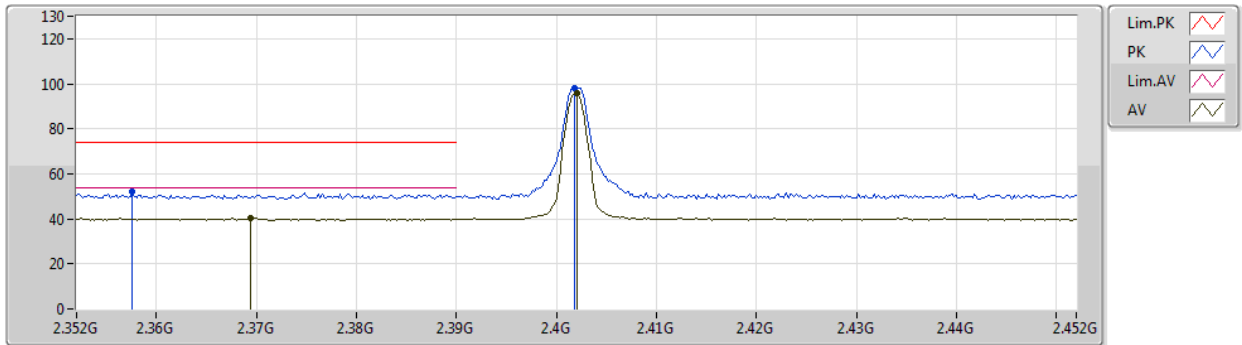


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.3698G	40.24	54.00	-13.76	2.67	3	Vertical	90	1.82	-	37.57	27.66	5.25	30.24
AV	2.402G	96.13	Inf	-Inf	2.68	3	Vertical	90	1.82	-	93.45	27.60	5.30	30.22
PK	2.3528G	51.34	74.00	-22.66	2.67	3	Vertical	90	1.82	-	48.67	27.69	5.23	30.25
PK	2.402G	98.39	Inf	-Inf	2.68	3	Vertical	90	1.82	-	95.71	27.60	5.30	30.22

BT-LE(1Mbps)

11/05/2020

2402MHz_TX



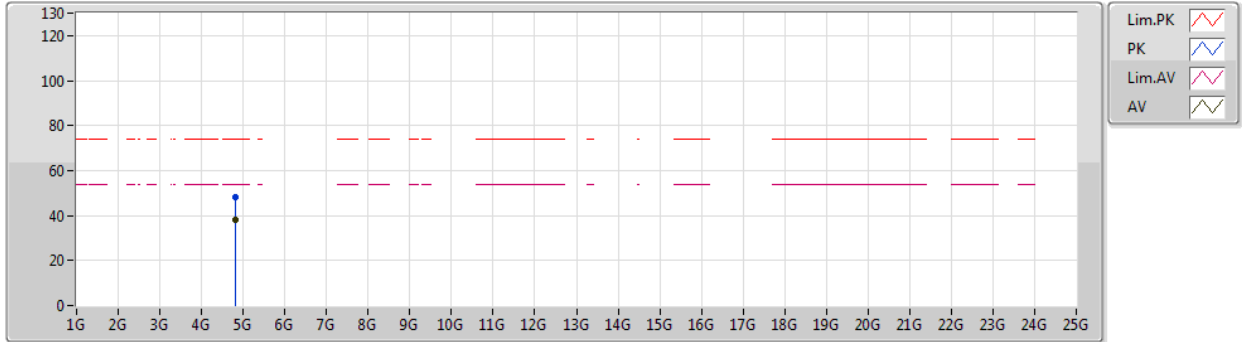
Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.3694G	40.24	54.00	-13.76	2.67	3	Horizontal	36	1.26	-	37.57	27.66	5.25	30.24
AV	2.402G	95.95	Inf	-Inf	2.68	3	Horizontal	36	1.26	-	93.27	27.60	5.30	30.22
PK	2.3576G	52.26	74.00	-21.74	2.67	3	Horizontal	36	1.26	-	49.59	27.68	5.24	30.25
PK	2.4018G	98.21	Inf	-Inf	2.68	3	Horizontal	36	1.26	-	95.53	27.60	5.30	30.22



BT-LE(1Mbps)

11/05/2020

2402MHz_TX

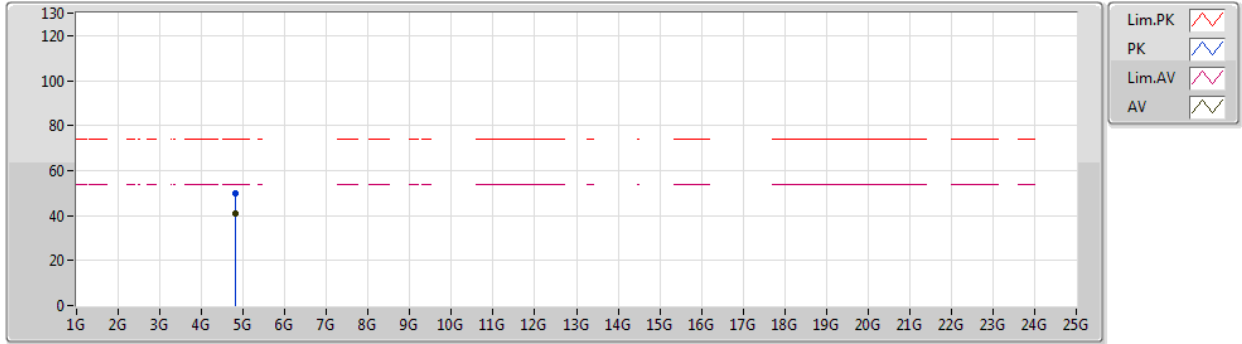


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.80348G	37.92	54.00	-16.08	8.79	3	Vertical	154	1.12	-	29.13	31.10	7.10	29.41
PK	4.80442G	48.24	74.00	-25.76	8.79	3	Vertical	154	1.12	-	39.45	31.10	7.10	29.41

BT-LE(1Mbps)

11/05/2020

2402MHz_TX

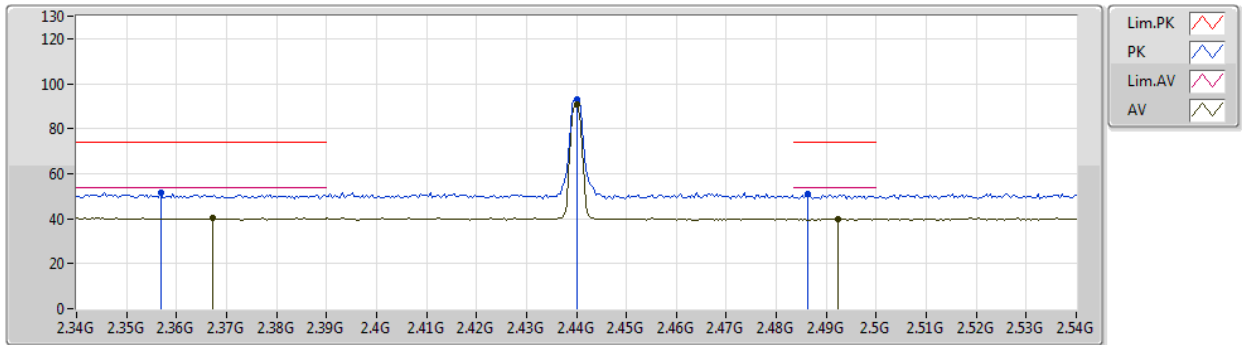


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.8035G	41.18	54.00	-12.82	8.79	3	Horizontal	17	1.09	-	32.39	31.10	7.10	29.41
PK	4.80394G	50.02	74.00	-23.98	8.79	3	Horizontal	17	1.09	-	41.23	31.10	7.10	29.41

BT-LE(1Mbps)

11/05/2020

2440MHz_TX



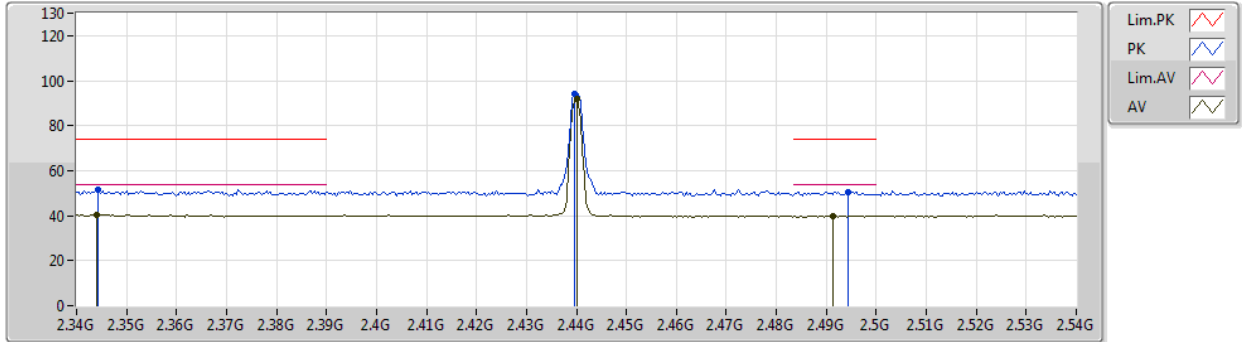
Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.3672G	40.31	54.00	-13.69	2.68	3	Vertical	67	1.75	-	37.63	27.67	5.25	30.24
AV	2.44G	90.62	Inf	-Inf	2.66	3	Vertical	67	1.75	-	87.96	27.52	5.34	30.20
AV	2.4924G	39.99	54.00	-14.01	2.64	3	Vertical	67	1.75	-	37.35	27.42	5.39	30.17
PK	2.3568G	51.80	74.00	-22.20	2.68	3	Vertical	67	1.75	-	49.12	27.69	5.24	30.25
PK	2.44G	92.88	Inf	-Inf	2.66	3	Vertical	67	1.75	-	90.22	27.52	5.34	30.20
PK	2.4864G	51.09	74.00	-22.91	2.64	3	Vertical	67	1.75	-	48.45	27.43	5.39	30.18



BT-LE(1Mbps)

11/05/2020

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	2.344G	40.42	54.00	-13.58	2.69	3	Horizontal	40	1.11	-	37.73	27.72	5.22	30.25
AV	2.44G	91.64	Inf	-Inf	2.66	3	Horizontal	40	1.11	-	88.98	27.52	5.34	30.20
AV	2.4912G	39.99	54.00	-14.01	2.64	3	Horizontal	40	1.11	-	37.35	27.42	5.39	30.17
PK	2.3444G	51.59	74.00	-22.41	2.69	3	Horizontal	40	1.11	-	48.90	27.72	5.22	30.25
PK	2.4396G	93.92	Inf	-Inf	2.66	3	Horizontal	40	1.11	-	91.26	27.52	5.34	30.20
PK	2.4944G	50.59	74.00	-23.41	2.63	3	Horizontal	40	1.11	-	47.96	27.41	5.39	30.17

Remark :

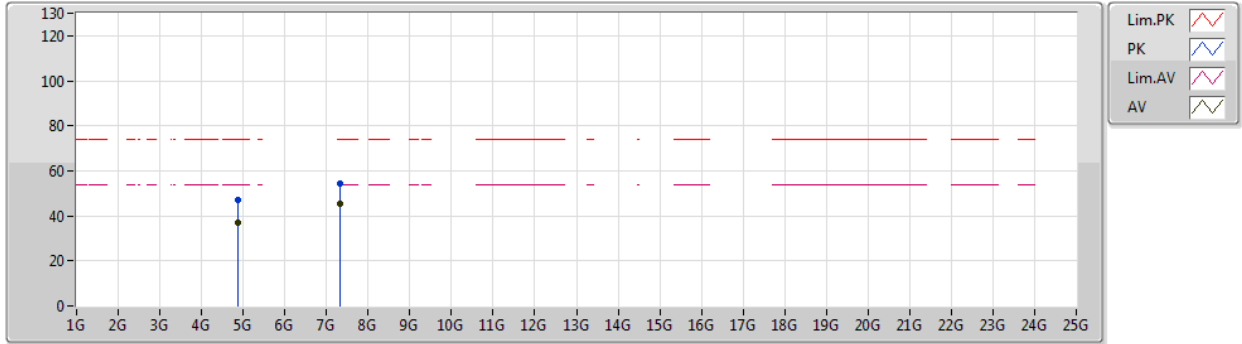
Level (dBuV/m) = Raw(Read Level) + AF(Antenna Factor) + CL(Cable Loss) - PA(Preamp Factor)

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BT-LE(1Mbps)

11/05/2020

2440MHz_TX

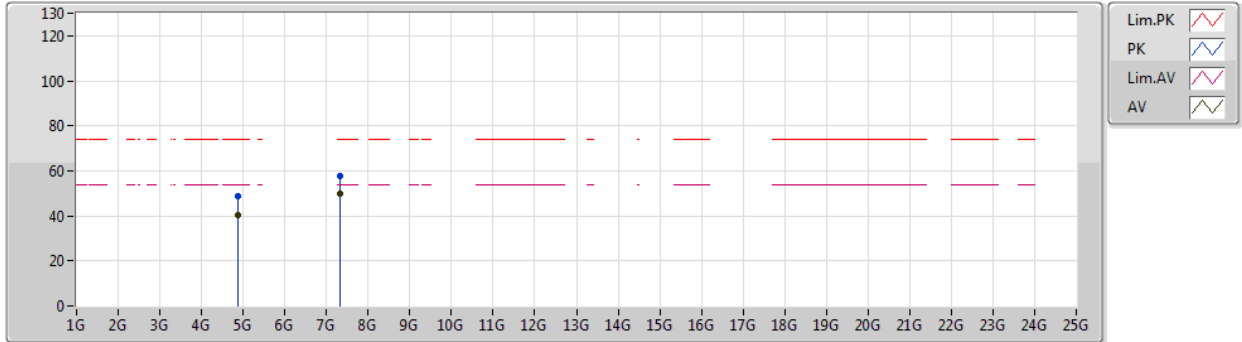


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.87946G	37.01	54.00	-16.99	8.86	3	Vertical	2	1.50	-	28.15	31.10	7.14	29.38
AV	7.31916G	45.47	54.00	-8.53	14.28	3	Vertical	327	1.19	-	31.19	36.34	8.30	30.36
PK	4.86986G	47.07	74.00	-26.93	8.85	3	Vertical	2	1.50	-	38.22	31.10	7.13	29.38
PK	7.32078G	54.33	74.00	-19.67	14.27	3	Vertical	327	1.19	-	40.06	36.34	8.30	30.37

BT-LE(1Mbps)

11/05/2020

2440MHz_TX

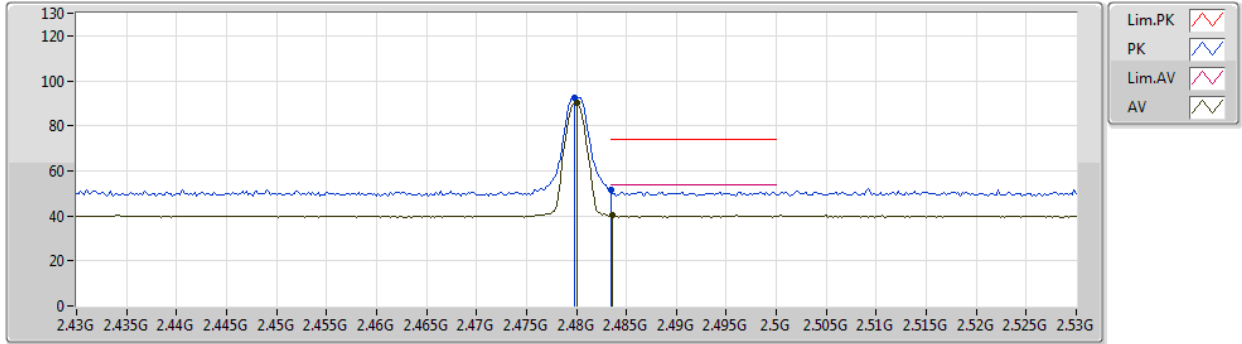


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.87958G	40.17	54.00	-13.83	8.86	3	Horizontal	65	1.04	-	31.31	31.10	7.14	29.38
AV	7.31922G	49.72	54.00	-4.28	14.28	3	Horizontal	348	1.06	-	35.44	36.34	8.30	30.36
PK	4.8794G	48.93	74.00	-25.07	8.86	3	Horizontal	65	1.04	-	40.07	31.10	7.14	29.38
PK	7.32006G	57.79	74.00	-16.21	14.27	3	Horizontal	348	1.06	-	43.52	36.34	8.30	30.37

BT-LE(1Mbps)

11/05/2020

2480MHz_TX

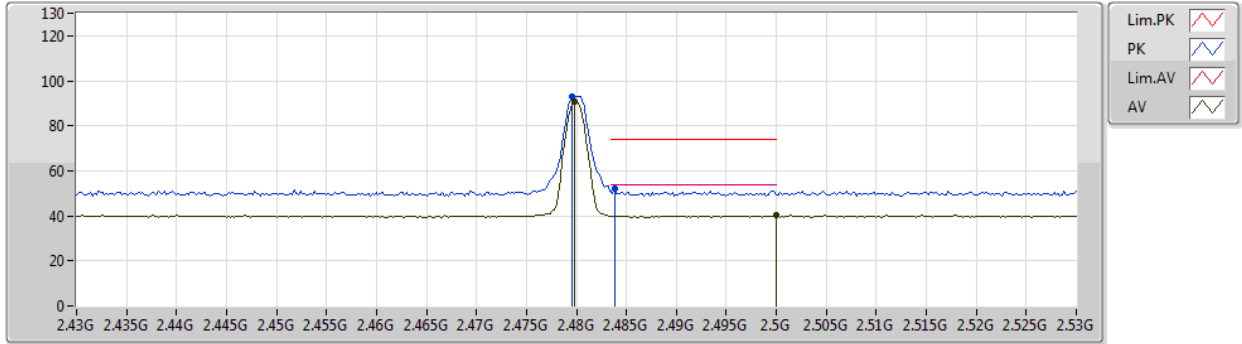


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.48G	90.22	Inf	-Inf	2.64	3	Vertical	73	1.48	-	87.58	27.44	5.38	30.18
AV	2.4836G	40.38	54.00	-13.62	2.63	3	Vertical	73	1.48	-	37.75	27.43	5.38	30.18
PK	2.4798G	92.48	Inf	-Inf	2.64	3	Vertical	73	1.48	-	89.84	27.44	5.38	30.18
PK	2.4835G	51.68	74.00	-22.32	2.63	3	Vertical	73	1.48	-	49.05	27.43	5.38	30.18

BT-LE(1Mbps)

11/05/2020

2480MHz_TX

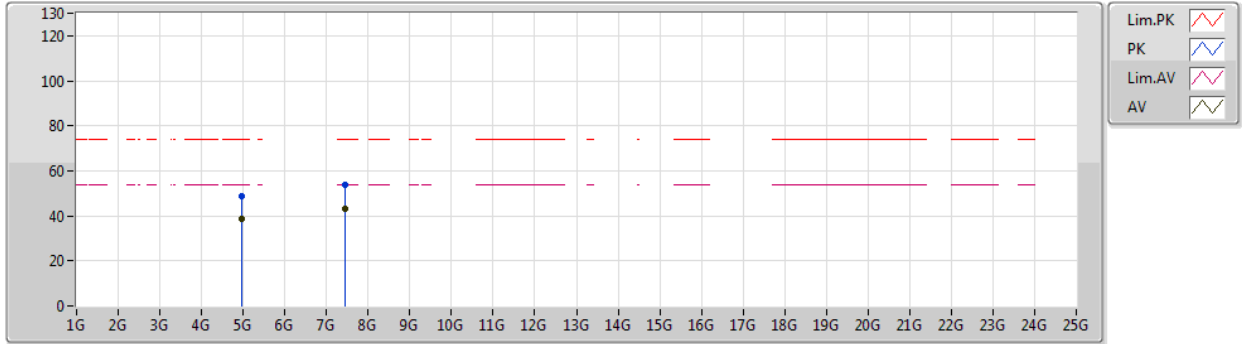


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.4798G	90.82	Inf	-Inf	2.64	3	Horizontal	42	1.15	-	88.18	27.44	5.38	30.18
AV	2.5G	40.07	54.00	-13.93	2.63	3	Horizontal	42	1.15	-	37.44	27.40	5.40	30.17
PK	2.4796G	93.13	Inf	-Inf	2.64	3	Horizontal	42	1.15	-	90.49	27.44	5.38	30.18
PK	2.4838G	52.29	74.00	-21.71	2.63	3	Horizontal	42	1.15	-	49.66	27.43	5.38	30.18

BT-LE(1Mbps)

11/05/2020

2480MHz_TX

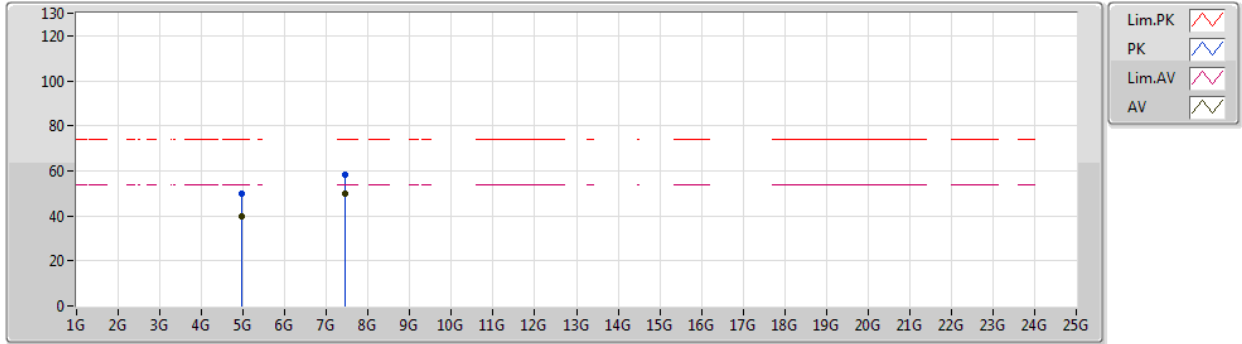


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.95943G	38.67	54.00	-15.33	9.04	3	Vertical	12	1.02	-	29.63	31.20	7.18	29.34
AV	7.43917G	43.32	54.00	-10.68	14.09	3	Vertical	4	1.51	-	29.23	36.24	8.32	30.47
PK	4.95988G	48.88	74.00	-25.12	9.04	3	Vertical	12	1.02	-	39.84	31.20	7.18	29.34
PK	7.43911G	53.85	74.00	-20.15	14.08	3	Vertical	4	1.51	-	39.77	36.23	8.32	30.47

BT-LE(1Mbps)

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2480MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.95949G	40.05	54.00	-13.95	9.04	3	Horizontal	13	1.08	-	31.01	31.20	7.18	29.34
AV	7.43922G	49.94	54.00	-4.06	14.09	3	Horizontal	338	1.01	-	35.85	36.24	8.32	30.47
PK	4.95952G	49.73	74.00	-24.27	9.04	3	Horizontal	13	1.08	-	40.69	31.20	7.18	29.34
PK	7.44072G	58.02	74.00	-15.98	14.09	3	Horizontal	338	1.01	-	43.93	36.24	8.32	30.47