

FCC Test Report

FCC ID : YL6VDB770
Equipment : Video Doorbell
Brand Name : Alarm.com
Model Name : ADC-VDB770
Applicant : Alarm.com Incorporated
8281 Greensboro Drive Suite 100 , Tysons, VA 22102 , USA
Manufacturer 1 : Chicony Electronics (Dong Guan) Co.,Ltd.
San Zhong Guan Li Qu, Qingxi Town, Dongguan City
Guangdong 523651 China
Manufacturer 2 : Chicony Electronics (Thailand) Co.,Ltd.
82 Moo 4 T. Takham A. Bangpakong, Chachoengsao 24130
Standard : 47 CFR FCC Part 15.247

The product was received on Jul. 30, 2019, and testing was started from Aug. 08, 2019 and completed on Dec. 13, 2019. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2013 and shown compliance with the applicable technical standards.

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



Approved by: Allen Lin

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory

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

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History of this test report

[illegible]

Summary of Test Result

Report Clause	Ref.Std. Clause	Test Items	Result (PASS/FAIL)	Remark
1.1.2	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.	Brand	Model Name	Antenna Type	Connector
1	Weison	-	dipole	I-PEX
2	Weison	-	dipole	I-PEX

Ant.	Port	Gain (dBi)					
		2.4G	5G				BT
			U-NII-1	U-NII-2A	U-NII-2C	U-NII-3	
1	1	0.86	1.48	1.11	1.90	1.90	0.86
2	2	1.76	1.60	1.83	1.98	1.50	-

Note 1: The EUT has two antennas.

For 2.4GHz function:

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

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

For BT function:

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

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

For 5GHz function:

For IEEE 802.11 a/n/ac mode (2TX/2RX)

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

1.1.3 EUT Information

Operational Condition			
EUT Power Type	From Transformer		
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)	0.628	2.02	392.188u	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
- ♦ 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	22.3~26.2°C / 51.8~70.1%	23/Sep/2019
RF Conducted	TH07-HY	Alan	23.5~25.6C / 65~69%	08/Aug/2019~12/Dec/2019
Radiated	03CH09-HY	Edward	21.2~22.7°C / 56.2~61.2%	06/Aug/2019~13/Dec/2019
	03CH03-HY	Jeff	21.0~23.8°C / 49~68%	06/Aug/2019~13/Dec/2019

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	CMD
---------------	-----

Mode	PowerSetting
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	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

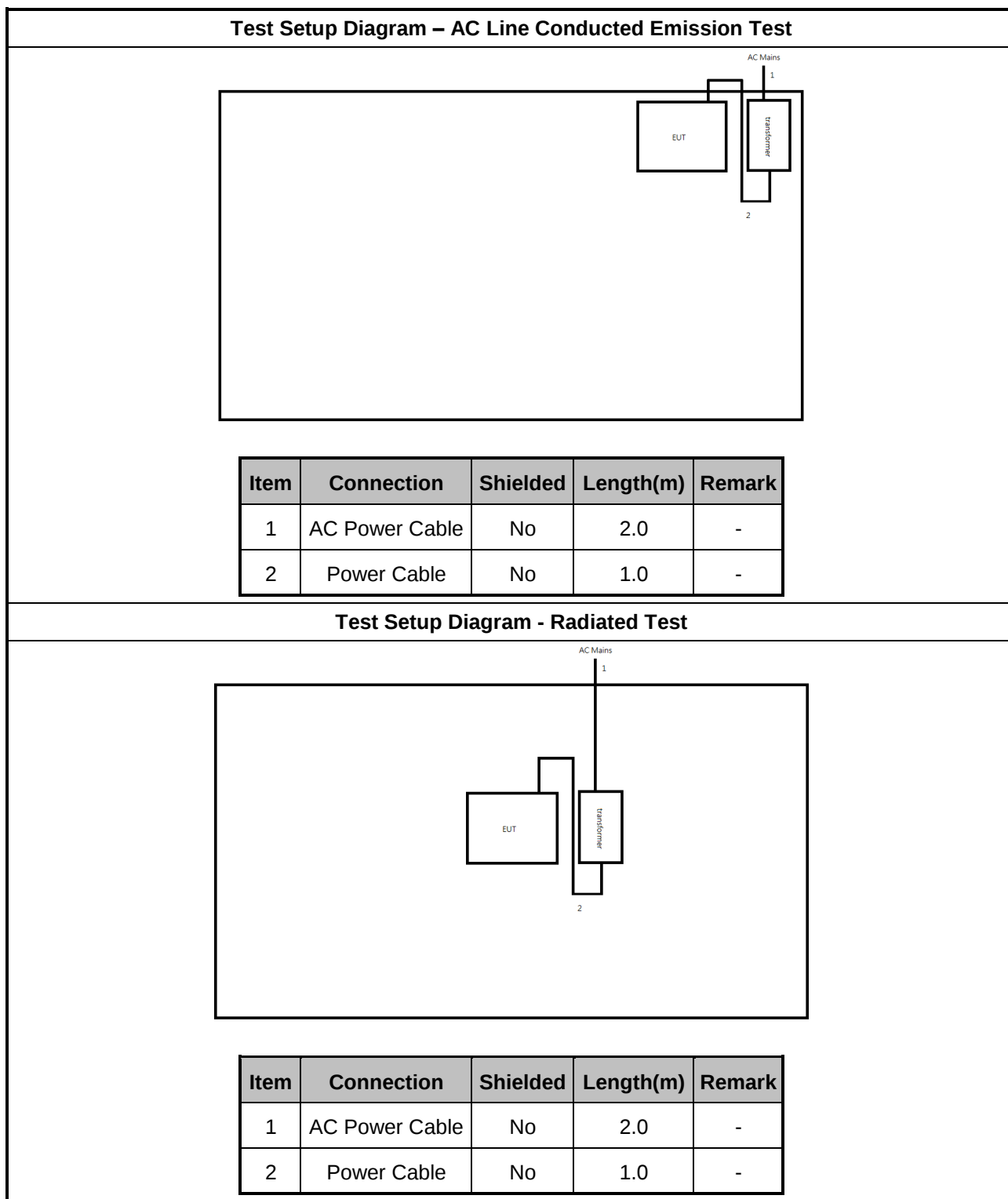
2.4 Support Equipment

Support Equipment – AC Conduction / Radiated					
No.	Equipment	Brand Name	Model Name	FCC ID	Remark
1	Power Cable	Volex	V1625	-	Note 1
2	Transformer	TRIAD	VPL24-11000 C	-	-
3	AC Power Cable	-	-	-	Note 1

Note 1 : No.1, 3 was provided by customer.

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

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.		

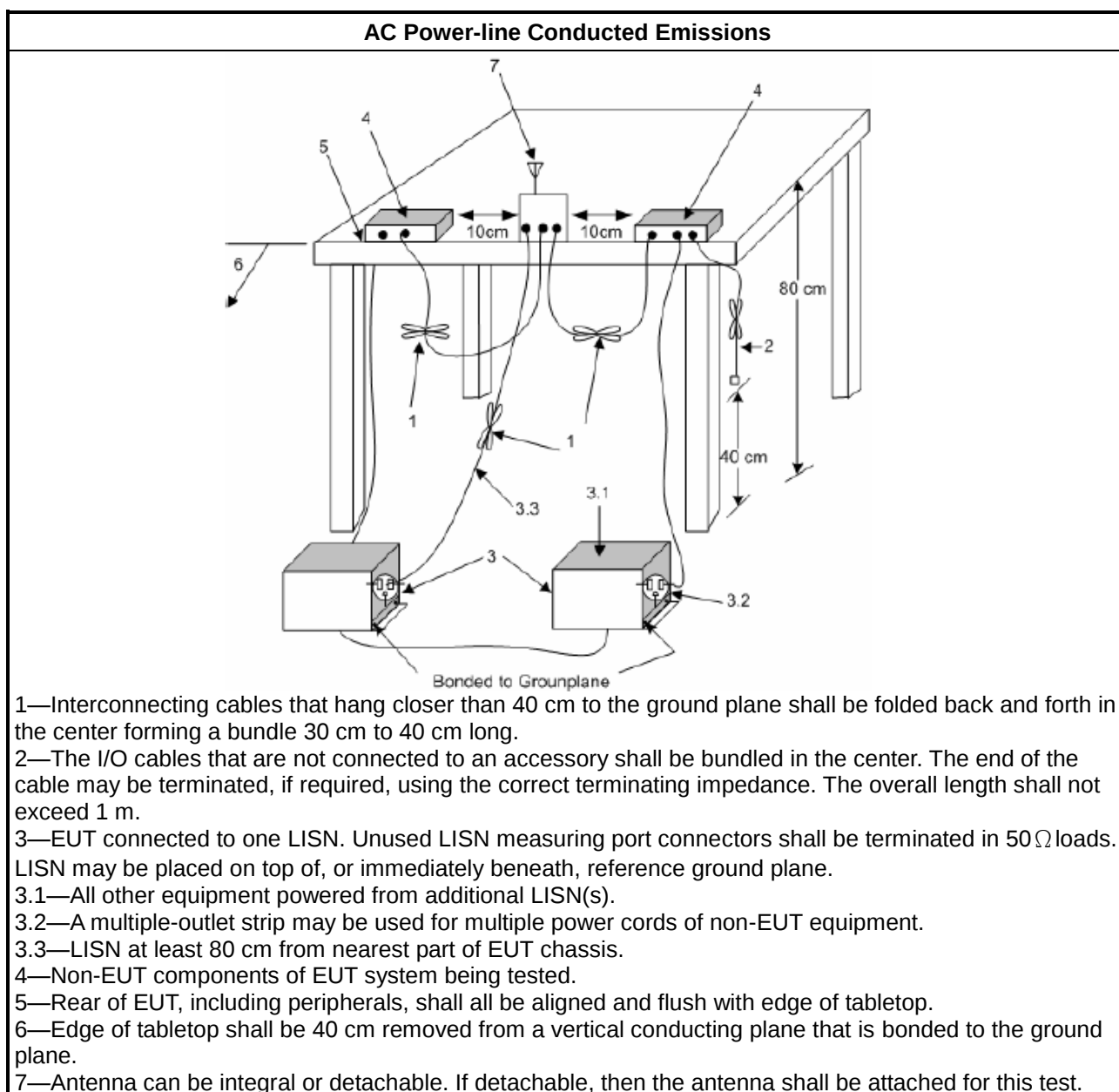
3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

Test Method
▪ 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:	
▪	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.	

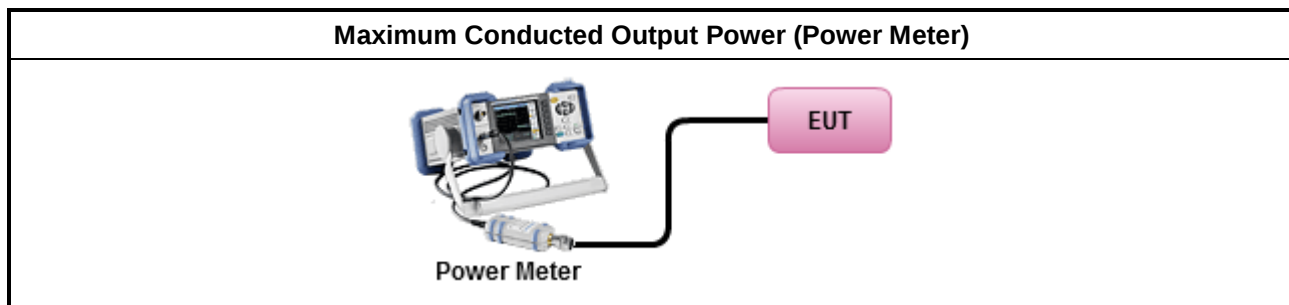
3.3.2 Measuring Instruments

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.	

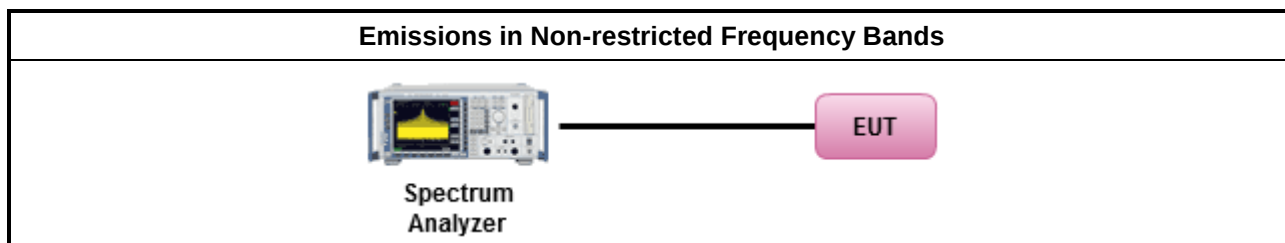
3.5.2 Measuring Instruments

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.

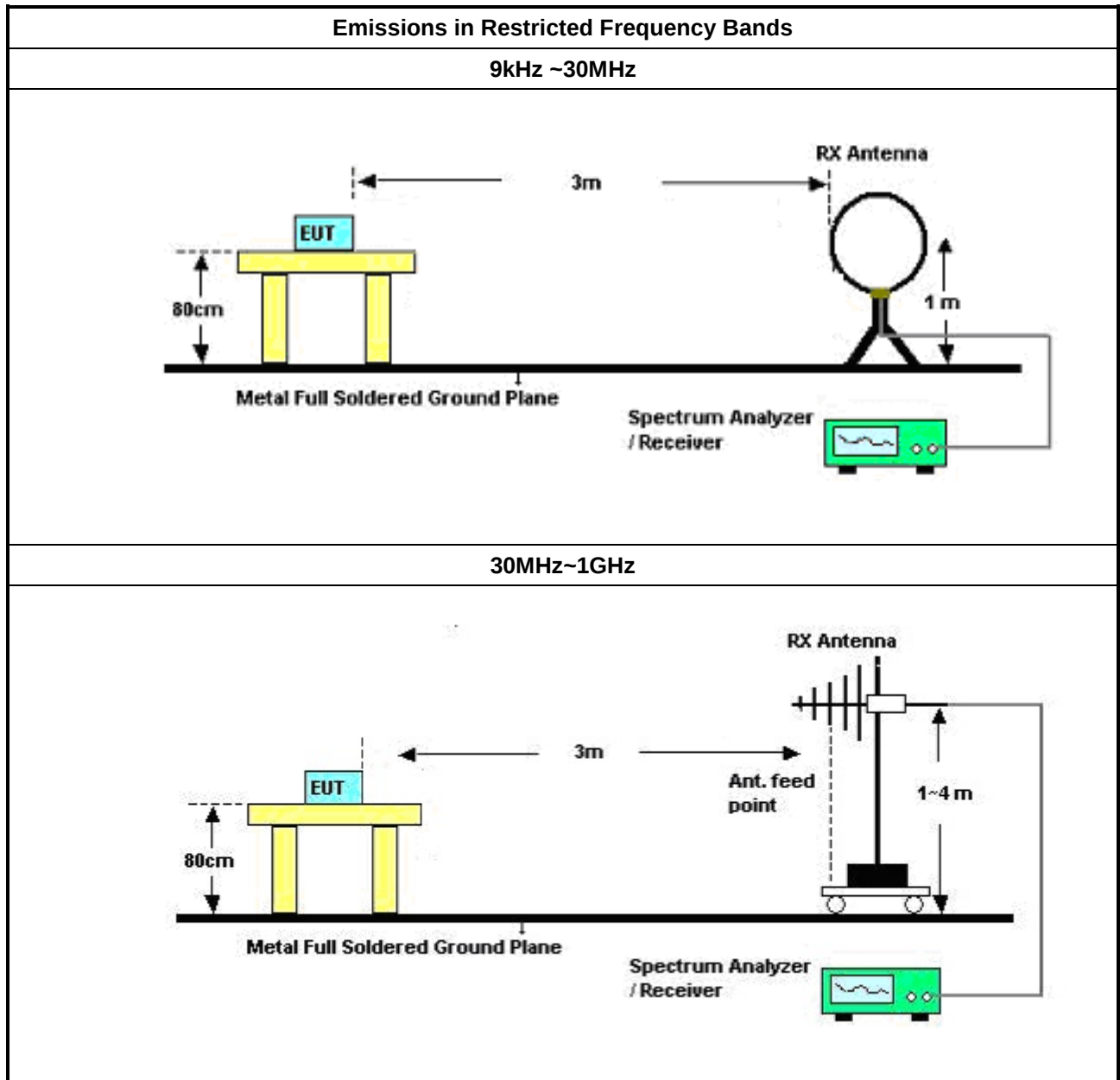
3.6.2 Measuring Instruments

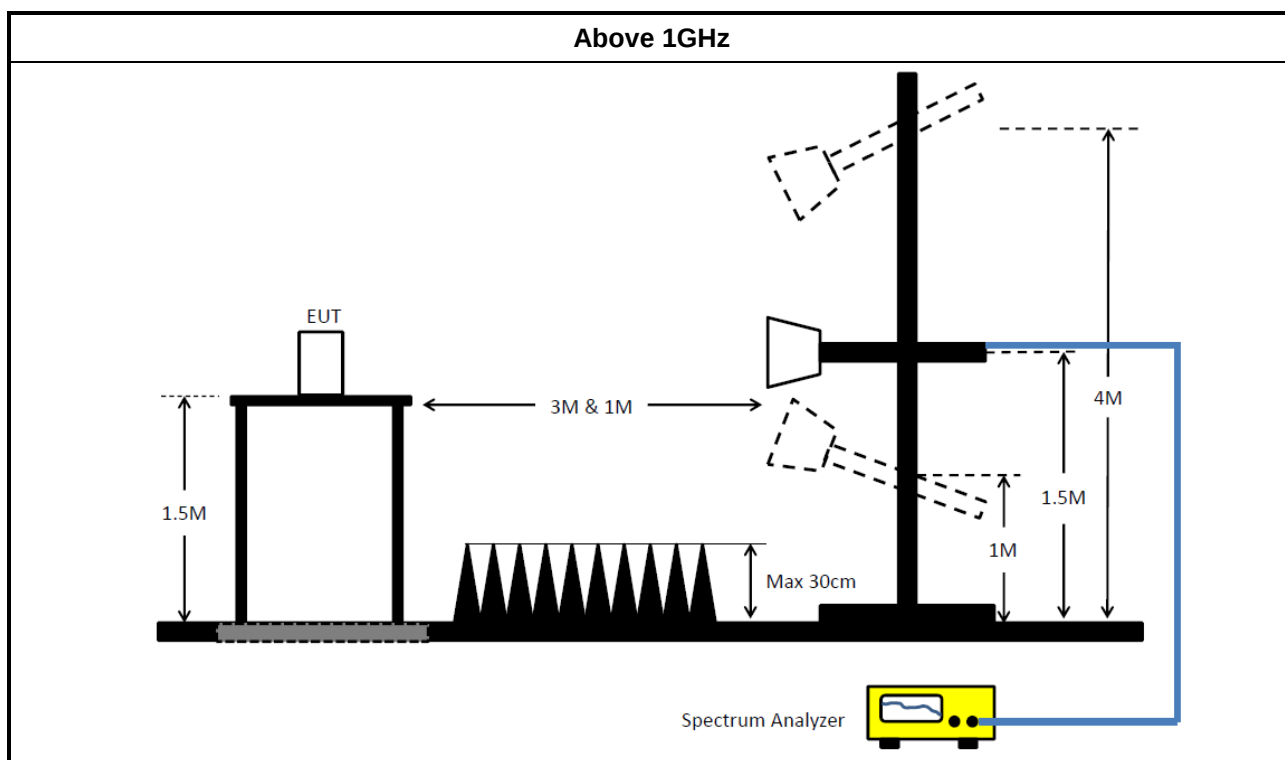
Refer a test equipment and calibration data table in this test report.

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 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	102052	9kHz ~ 3.6GHz	09/Apr/2019	08/Apr/2020
LISN	R&S	ENV216	101295	9kHz ~ 30MHz	08/Nov/2018	07/Nov/2019
RF Cable-CON	MTJ	RG142	CB002-CO	9kHz ~ 200MHz	12/Sep/2019	11/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	12/Oct/2018	11/Oct/2019

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	13/Mar/2019	12/Mar/2020
Pulse Power Sensor	Anritsu	MA2411B	1027452	300MHz ~ 40GHz	14/Mar/2019	13/Mar/2020
Power Meter	Anritsu	ML2495A	1124009	300MHz ~ 40GHz	14/Mar/2019	13/Mar/2020
SMB100A Signal Generator	R&S	SMB100A03	181147	100kHz ~ 40GHz	12/Nov/2018	10/Nov/2020

Instrument for Radiated Test (03CH09-HY)

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
3m Semi Anechoic Chamber	TDK	SAC-3M	03CH09-HY	30MHz ~ 1GHz	22/Apr/2019	21/Apr/2020
3m Semi Anechoic Chamber	TDK	SAC-3M	03CH09-HY	1GHz ~ 18GHz	13/Jun/2019	12/Jun/2020
Microwave System Premplifier	Agilent	8449B	3008A02326	1GHz ~ 26.5GHz	15/Jul/2019	14/Jul/2020
Amplifier	EMC	EMC9135	980232	9KHz~1GHz	09/Apr/2019	08/Apr/2020
EMI Test Receiver	R&S	ESR3	102052	9kHz ~ 3.6GHz	09/Apr/2019	08/Apr/2020
EXA Signal Analyser	KEYSIGHT	N9010A	MY54200882	10Hz ~ 44GHz	26/Jul/2019	25/Jul/2020
Bilog Antenna & 5dB Attenuator	TESEQ & MTJ	CBL6111D & MTJ6102-05	35418 / 3	30MHz~1GHz	04/Oct/2018	03/Oct/2019
Double Ridged Guide Horn Antenna	SCHWARZBECK	BBHA 9120 D	BBHA9120 D 1534	1GHz~18GHz	22/May/2019	21/May/2020
Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170221	18GHz~40GHz	22/May/2019	21/May/2020
Preamplifier	MITEQ	TTA1840-35-HG	1864481	18GHz ~ 40GHz	05/Aug/2019	04/Aug/2020
Loop Antenna	TESEQ	HLA 6120	31244	9k-30MHz	15/Mar/2019	14/Mar/2020
LF-CABLE-20190 218	Jye Bao	RG142	CB028	9kHz ~ 1GHz	18/Feb/2019	17/Feb/2020
RF Cable-high	HUBER+SUHNER	SUCOFLEX104	SN 556626/4 + 17173/4	1GHz ~ 40GHz	03/Jul/2019	02/Jul/2020

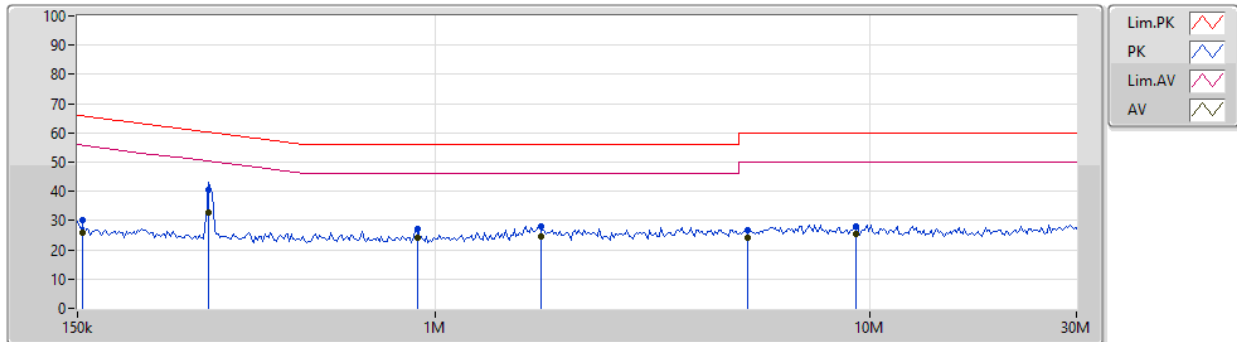
Instrument for Radiated Test (03CH03-HY)

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/2018	29/Aug/2019
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	1GHz ~ 18GHz 3m	31/Oct/2018	30/Oct/2019
Amplifier	HP	8447D	2944A08033	10kHz ~ 1.3GHz	22/Apr/2019	21/Apr/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
Microwave System Preamplifier	KEYSIGHT	83017A	MY53270196	1GHz ~ 26.5GHz	05/Sep/2018	04/Sep/2019
Microwave System Preamplifier	KEYSIGHT	83017A	MY53270196	1GHz ~ 26.5GHz	09/Sep/2019	08/Sep/2020
Signal Analyzer	R&S	FSV40	101515	10Hz ~ 40GHz	19/Dec/2018	18/Dec/2019
Signal Analyzer	R&S	FSV40	101500	10Hz ~ 40GHz	15/Aug/2019	14/Aug/2020
RF CABLE 6m	HUBER+SUHNER	SUOFLEX 104	SN 805801/4	1GHz ~ 40GHz	21/Mar/2019	20/Mar/2020
RF CABLE 5m	HUBER+SUHNER	SUOFLEX 104	SN 804300/4	1GHz ~ 40GHz	17/Jun/2019	16/Jun/2020
Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA 9170221	18GHz~40GHz	22/Mar/2019	21/Mar/2020
Double Ridged Guide Horn Antenna	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1531	1GHz ~ 18GHz	09/Mar/ 2019	08/Mar/2020
Preamplifier	MITEQ	TTA1840-35-HG	1864481	18GHz~40GHz	24/Aug/2018	23/Aug/2019
Preamplifier	MITEQ	TTA1840-35-HG	1864481	18GHz~40GHz	05/Aug/2019	04/Aug/2020
Loop Antenna	TESEQ	HLA 6120	31244	9kHz ~ 30MHz	15/Mar/2019	14/Mar/2020

AC Power-line Conducted Emissions Result

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

23/09/2019



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)			
QP	154.545k	30.16	65.75	-35.59	19.48	Neutral	-	10.68	9.60	0.01	9.87			
AV	154.545k	25.68	55.75	-30.07	19.48	Neutral	-	6.20	9.60	0.01	9.87			
QP	301.015k	40.56	60.21	-19.65	19.48	Neutral	-	21.08	9.59	0.01	9.88			
AV	301.015k	32.58	50.21	-17.63	19.48	Neutral	"Worst"	13.10	9.59	0.01	9.88			
QP	908.364k	27.21	56.00	-28.79	19.49	Neutral	-	7.72	9.59	0.02	9.88			
AV	908.364k	23.96	46.00	-22.04	19.49	Neutral	-	4.47	9.59	0.02	9.88			
QP	1.752M	27.86	56.00	-28.14	19.53	Neutral	-	8.33	9.61	0.03	9.89			
AV	1.752M	24.44	46.00	-21.56	19.53	Neutral	-	4.91	9.61	0.03	9.89			
QP	5.234M	26.54	60.00	-33.46	19.57	Neutral	-	6.97	9.63	0.05	9.89			
AV	5.234M	24.27	50.00	-25.73	19.57	Neutral	-	4.70	9.63	0.05	9.89			
QP	9.321M	27.94	60.00	-32.06	19.63	Neutral	-	8.31	9.67	0.07	9.89			
AV	9.321M	25.34	50.00	-24.66	19.63	Neutral	-	5.71	9.67	0.07	9.89			

AC Power-line Conducted Emissions Result

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

23/09/2019



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)			
QP	150k	34.15	66.00	-31.85	19.48	Line	-	14.67	9.60	0.01	9.87			
AV	150k	27.50	56.00	-28.50	19.48	Line	-	8.02	9.60	0.01	9.87			
QP	301.015k	40.42	60.21	-19.79	19.48	Line	-	20.94	9.59	0.01	9.88			
AV	301.015k	32.34	50.21	-17.87	19.48	Line	"Worst"	12.86	9.59	0.01	9.88			
QP	908.364k	27.13	56.00	-28.87	19.50	Line	-	7.63	9.60	0.02	9.88			
AV	908.364k	23.80	46.00	-22.20	19.50	Line	-	4.30	9.60	0.02	9.88			
QP	1.734M	24.49	56.00	-31.51	19.54	Line	-	4.95	9.62	0.03	9.89			
AV	1.734M	22.65	46.00	-23.35	19.54	Line	-	3.11	9.62	0.03	9.89			
QP	2.608M	24.51	56.00	-31.49	19.55	Line	-	4.96	9.62	0.04	9.89			
AV	2.608M	22.86	46.00	-23.14	19.55	Line	-	3.31	9.62	0.04	9.89			
QP	9.321M	28.32	60.00	-31.68	19.63	Line	-	8.69	9.67	0.07	9.89			
AV	9.321M	25.72	50.00	-24.28	19.63	Line	-	6.09	9.67	0.07	9.89			



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)	706.25k	1.057M	1M06F1D	703.75k	1.051M

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

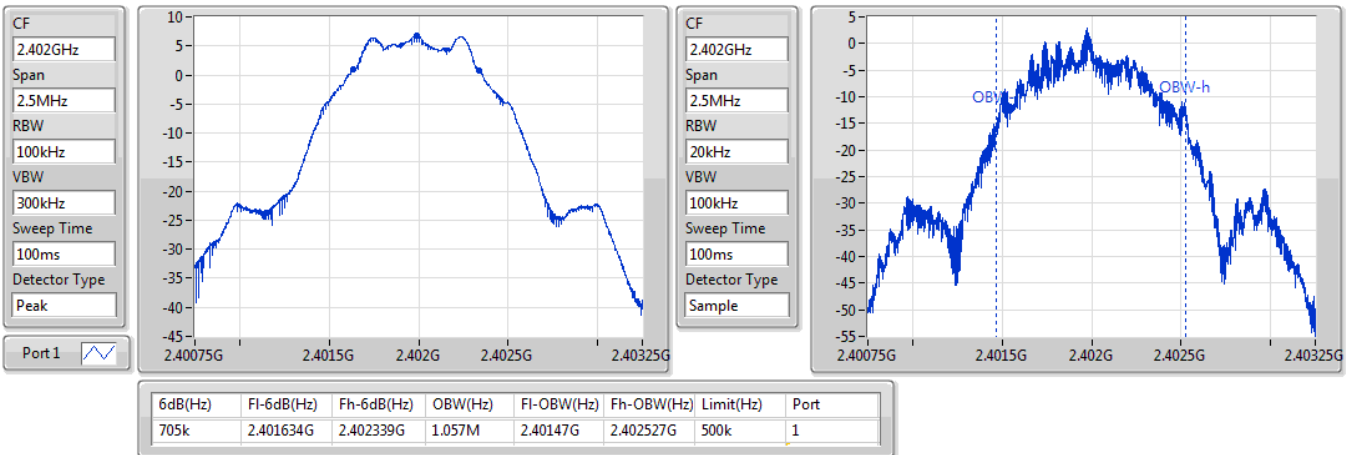
Result

Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	500k	705k	1.057M
2440MHz	Pass	500k	703.75k	1.051M
2480MHz	Pass	500k	706.25k	1.053M

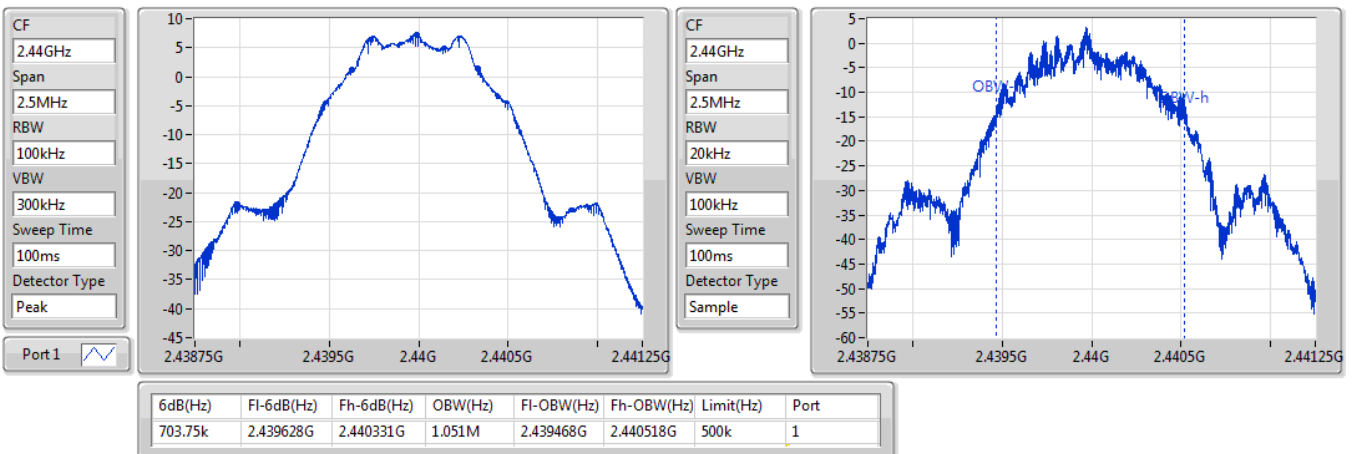
Port X-N dB = Port X 6dB down bandwidth; **Port X-OBW** = Port X 99% occupied bandwidth;

BT-LE(1Mbps)
2402MHz

19/08/2019


BT-LE(1Mbps)
2440MHz

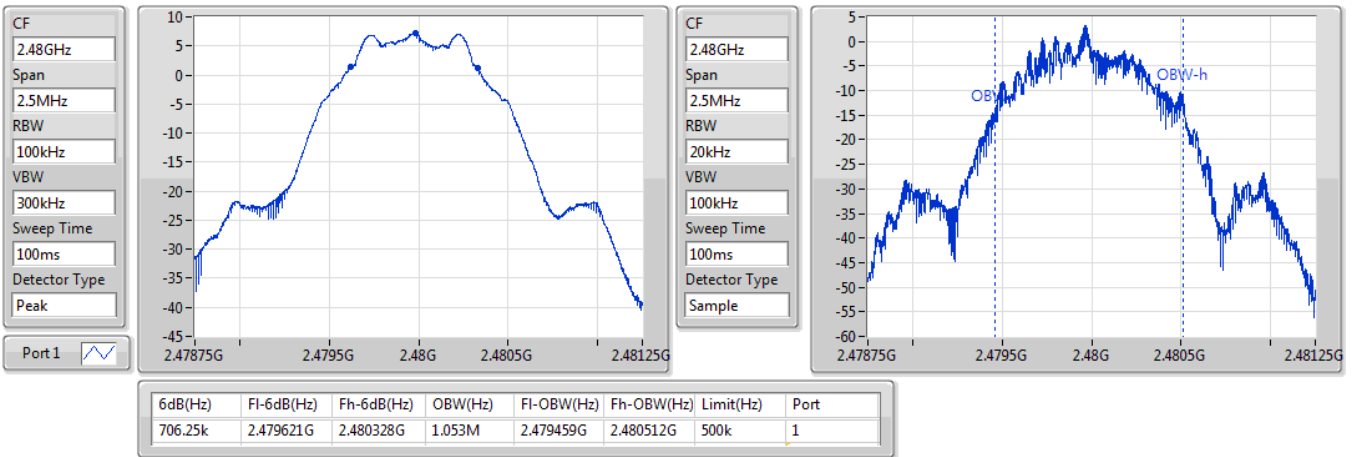
19/08/2019



BT-LE(1Mbps)

2480MHz

19/08/2019





Summary

Mode	Power (dBm)	Power (W)
2.4-2.4835GHz	-	-
BT-LE(1Mbps)	7.66	0.00583



Average Power-DTS

Appendix C

Result

Mode	Result	Gain (dBi)	Power (dBm)	Power Limit (dBm)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	0.86	7.18	30.00
2440MHz	Pass	0.86	7.27	30.00
2480MHz	Pass	0.86	7.66	30.00

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



Summary

Mode	PD (dBm/RBW)
2.4-2.4835GHz	-
BT-LE(1Mbps)	-7.01

RBW=3 kHz.



Result

Mode	Result	Gain (dBi)	PD (dBm/RBW)	PD Limit (dBm/RBW)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	0.86	-7.14	8.00
2440MHz	Pass	0.86	-7.32	8.00
2480MHz	Pass	0.86	-7.01	8.00

DG = Directional Gain; RBW=3 kHz;

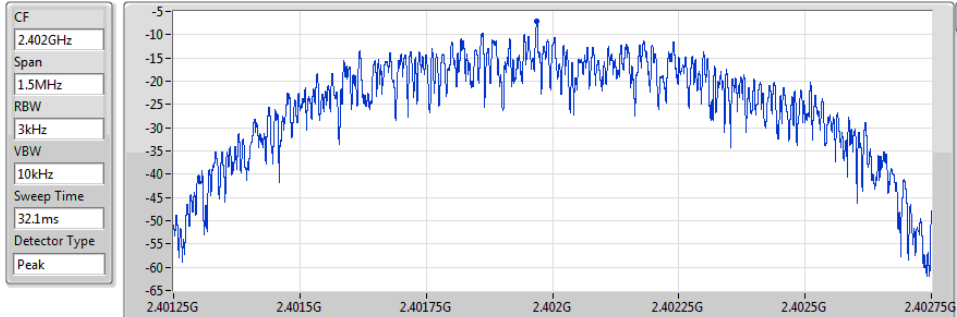
PD = trace bin-by-bin of each transmits port summing can be performed maximum power density; **Port X** = Port X power density;

BT-LE(1Mbps)

PSD

2402MHz

19/08/2019



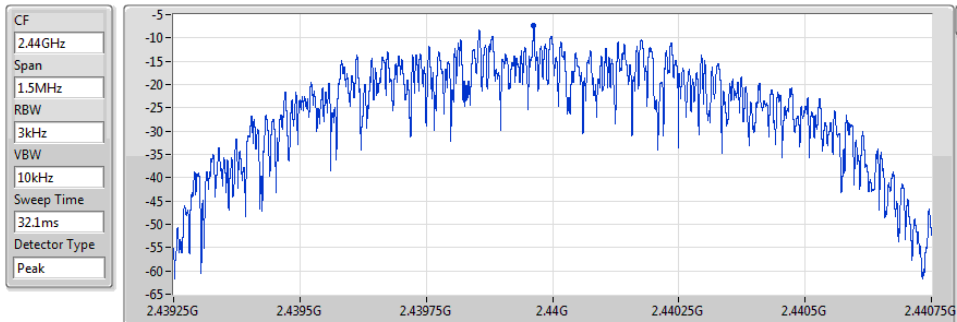
Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-7.14	-7.14	-7.14

BT-LE(1Mbps)

PSD

2440MHz

19/08/2019



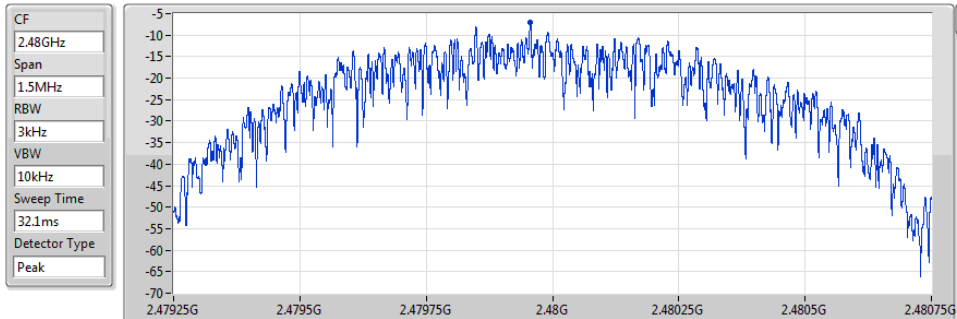
Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-7.32	-7.32	-7.32

BT-LE(1Mbps)

PSD

2480MHz

19/08/2019



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-7.01	-7.01	-7.01



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)	Port
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	2.47999G	7.20	-22.80	1.82228G	-54.49	2.39825G	-53.40	2.48472G	-53.01	23.40428G	-37.67	1

Result

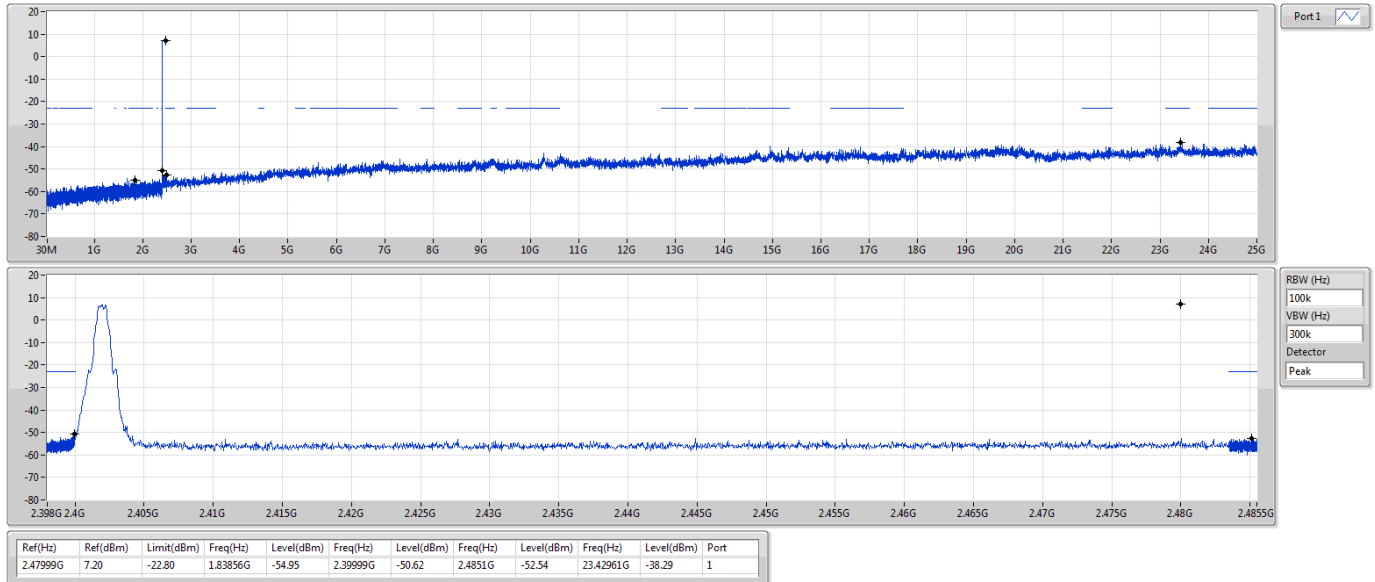
Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	2.47999G	7.20	-22.80	1.83856G	-54.95	2.39999G	-50.62	2.4851G	-52.54	23.42961G	-38.29	1
2440MHz	Pass	2.47999G	7.20	-22.80	1.82228G	-54.49	2.39825G	-53.40	2.48472G	-53.01	23.40428G	-37.67	1
2480MHz	Pass	2.47999G	7.20	-22.80	2.30624G	-53.57	2.39814G	-53.69	2.48362G	-51.34	24.39774G	-38.44	1

BT-LE(1Mbps)

2402MHz

CSE NdB

19/08/2019

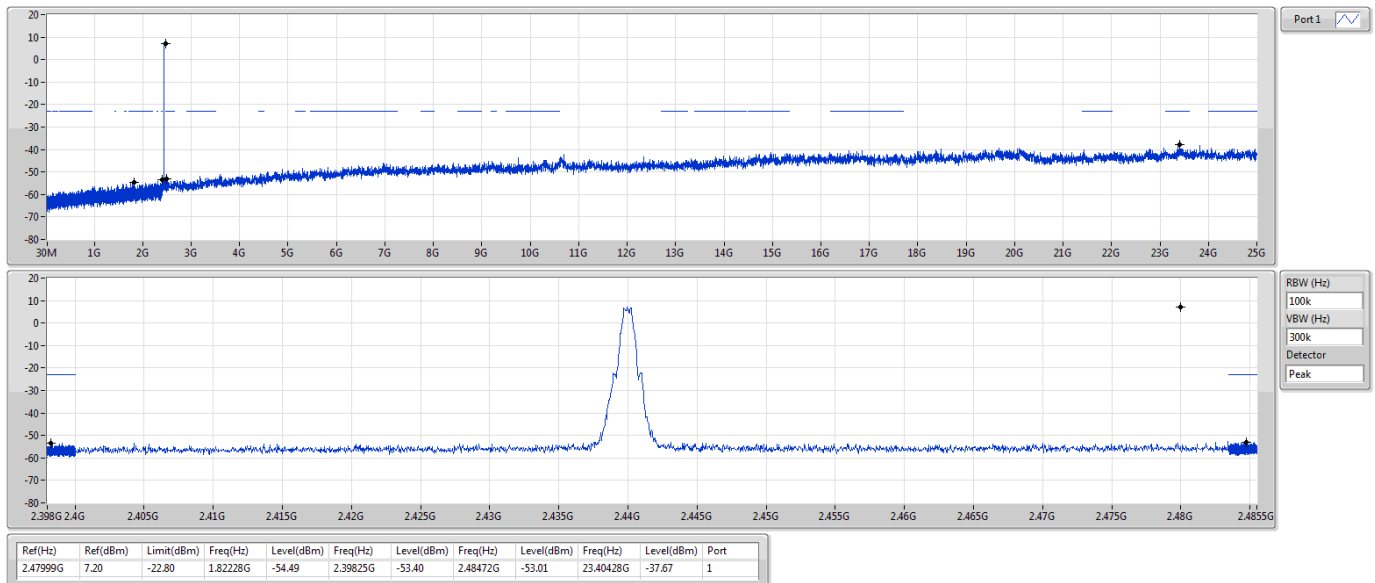


BT-LE(1Mbps)

2440MHz

CSE NdB

19/08/2019



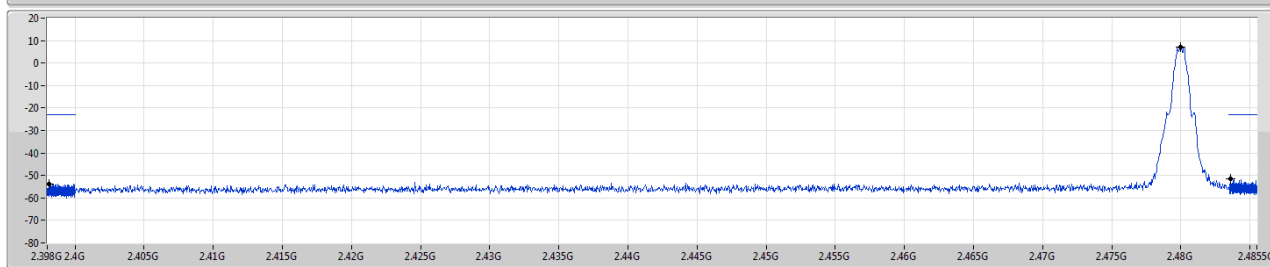
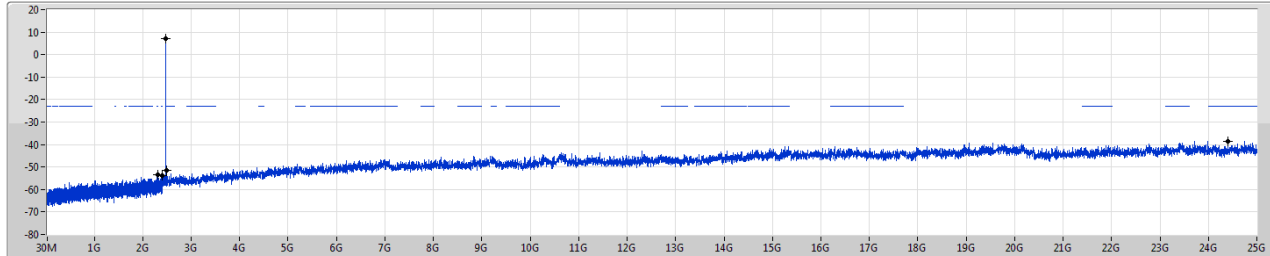
BT-LE(1Mbps)

2480MHz

CSE NdB

19/08/2019

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)	Port
2.47999G	7.20	-22.80	2.30624G	-53.57	2.39814G	-53.69	2.48362G	-51.34	2.439774G	-38.44	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	PK	455.95M	41.50	46.00	-4.50	3	Horizontal	0	1.00	-

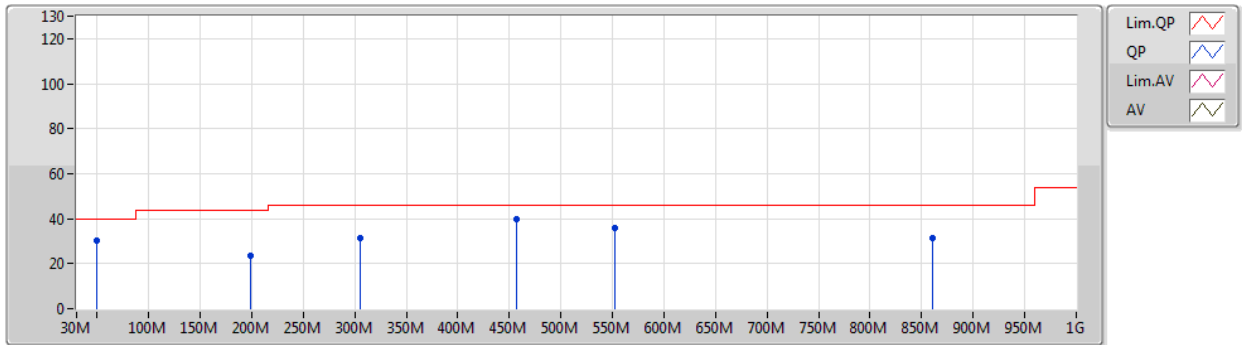
Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-
2440MHz	Pass	PK	49.4M	30.42	40.00	-9.58	3	Vertical	360	1.00	-
2440MHz	Pass	PK	198.78M	23.75	43.50	-19.75	3	Vertical	360	1.00	-
2440MHz	Pass	PK	305.48M	31.36	46.00	-14.64	3	Vertical	360	1.00	-
2440MHz	Pass	PK	456.8M	39.60	46.00	-6.40	3	Vertical	360	1.00	-
2440MHz	Pass	PK	551.86M	35.72	46.00	-10.28	3	Vertical	360	1.00	-
2440MHz	Pass	PK	860.32M	31.19	46.00	-14.81	3	Vertical	360	1.00	-
2440MHz	Pass	PK	42.55M	23.63	40.00	-16.37	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	97.15M	26.34	43.50	-17.16	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	309.7M	40.99	46.00	-5.01	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	455.95M	41.50	46.00	-4.50	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	551.5M	38.66	46.00	-7.34	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	910.3M	38.86	46.00	-7.14	3	Horizontal	0	1.00	-

BT-LE(1Mbps)

2440MHz_AC

26/09/2019

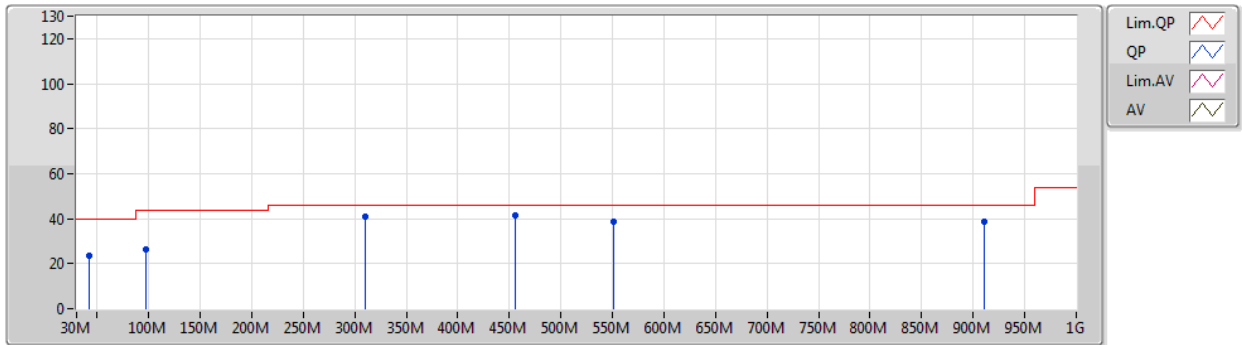


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
PK	49.4M	30.42	40.00	-9.58	-22.93	3	Vertical	360	1.00	-	53.35	13.64	0.58	37.15
PK	198.78M	23.75	43.50	-19.75	-21.30	3	Vertical	360	1.00	-	45.05	14.00	1.18	36.48
PK	305.48M	31.36	46.00	-14.64	-16.78	3	Vertical	360	1.00	-	48.14	18.30	1.46	36.54
PK	456.8M	39.60	46.00	-6.40	-12.91	3	Vertical	360	1.00	-	52.51	22.14	1.84	36.89
PK	551.86M	35.72	46.00	-10.28	-11.10	3	Vertical	360	1.00	-	46.82	24.20	2.02	37.32
PK	860.32M	31.19	46.00	-14.81	-6.94	3	Vertical	360	1.00	-	38.13	28.29	2.51	37.74

BT-LE(1Mbps)

2440MHz_AC

26/09/2019



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	42.55M	23.63	40.00	-16.37	-19.17	3	Horizontal	0	1.00	-	42.80	17.47	0.55	37.19
PK	97.15M	26.34	43.50	-17.16	-21.19	3	Horizontal	0	1.00	-	47.53	14.80	0.80	36.79
PK	309.7M	40.99	46.00	-5.01	-16.78	3	Horizontal	0	1.00	-	57.77	18.30	1.47	36.55
PK	455.95M	41.50	46.00	-4.50	-12.93	3	Horizontal	0	1.00	-	54.43	22.12	1.84	36.89
PK	551.5M	38.66	46.00	-7.34	-11.16	3	Horizontal	0	1.00	-	49.82	24.14	2.02	37.32
PK	910.3M	38.86	46.00	-7.14	-6.65	3	Horizontal	0	1.00	-	45.51	28.21	2.55	37.41



Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	AV	2.4835G	49.62	54.00	-4.38	3	Horizontal	113	2.34	-

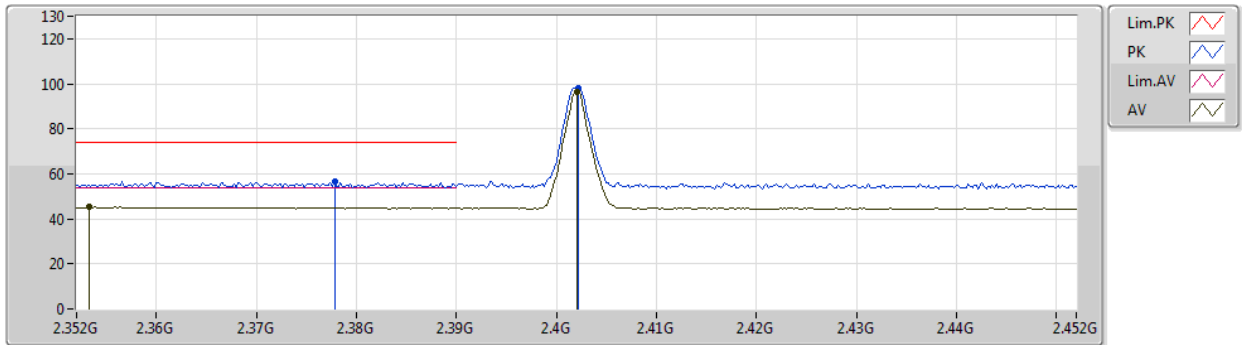
Result

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	2.3532G	45.21	54.00	-8.79	3	Vertical	286	2.08	-
2402MHz	Pass	AV	2.402G	96.58	Inf	-Inf	3	Vertical	286	2.08	-
2402MHz	Pass	PK	2.3778G	56.84	74.00	-17.16	3	Vertical	286	2.08	-
2402MHz	Pass	PK	2.4022G	98.02	Inf	-Inf	3	Vertical	286	2.08	-
2402MHz	Pass	AV	2.3538G	45.12	54.00	-8.88	3	Horizontal	124	2.19	-
2402MHz	Pass	AV	2.402G	102.01	Inf	-Inf	3	Horizontal	124	2.19	-
2402MHz	Pass	PK	2.3562G	56.53	74.00	-17.47	3	Horizontal	124	2.19	-
2402MHz	Pass	PK	2.4022G	103.54	Inf	-Inf	3	Horizontal	124	2.19	-
2402MHz	Pass	AV	4.7911G	33.23	54.00	-20.77	3	Vertical	5	1.50	-
2402MHz	Pass	PK	4.80724G	45.71	74.00	-28.29	3	Vertical	5	1.50	-
2402MHz	Pass	AV	4.79032G	33.44	54.00	-20.56	3	Horizontal	360	1.50	-
2402MHz	Pass	PK	4.80232G	45.63	74.00	-28.37	3	Horizontal	360	1.50	-
2440MHz	Pass	AV	2.3656G	45.31	54.00	-8.69	3	Vertical	305	3.00	-
2440MHz	Pass	AV	2.44G	97.61	Inf	-Inf	3	Vertical	305	3.00	-
2440MHz	Pass	AV	2.49G	44.88	54.00	-9.12	3	Vertical	305	3.00	-
2440MHz	Pass	PK	2.3456G	56.34	74.00	-17.66	3	Vertical	305	3.00	-
2440MHz	Pass	PK	2.4404G	99.11	Inf	-Inf	3	Vertical	305	3.00	-
2440MHz	Pass	PK	2.4876G	54.98	74.00	-19.02	3	Vertical	305	3.00	-
2440MHz	Pass	AV	2.3432G	45.46	54.00	-8.54	3	Horizontal	127	2.15	-
2440MHz	Pass	AV	2.44G	101.44	Inf	-Inf	3	Horizontal	127	2.15	-
2440MHz	Pass	AV	2.4924G	44.70	54.00	-9.30	3	Horizontal	127	2.15	-
2440MHz	Pass	PK	2.3548G	56.95	74.00	-17.05	3	Horizontal	127	2.15	-
2440MHz	Pass	PK	2.4404G	102.96	Inf	-Inf	3	Horizontal	127	2.15	-
2440MHz	Pass	PK	2.4972G	55.68	74.00	-18.32	3	Horizontal	127	2.15	-
2440MHz	Pass	AV	4.88726G	33.00	54.00	-21.00	3	Vertical	360	1.50	-
2440MHz	Pass	PK	4.89092G	46.25	74.00	-27.75	3	Vertical	360	1.50	-
2440MHz	Pass	AV	4.87502G	33.42	54.00	-20.58	3	Horizontal	145	1.03	-
2440MHz	Pass	PK	4.87802G	45.41	74.00	-28.59	3	Horizontal	145	1.03	-
2480MHz	Pass	AV	2.48G	98.11	Inf	-Inf	3	Vertical	290	2.39	-
2480MHz	Pass	AV	2.4835G	47.14	54.00	-6.86	3	Vertical	290	2.39	-
2480MHz	Pass	PK	2.4802G	99.56	Inf	-Inf	3	Vertical	290	2.39	-
2480MHz	Pass	PK	2.4835G	55.89	74.00	-18.11	3	Vertical	290	2.39	-
2480MHz	Pass	AV	2.48G	101.89	Inf	-Inf	3	Horizontal	113	2.34	-
2480MHz	Pass	AV	2.4835G	49.62	54.00	-4.38	3	Horizontal	113	2.34	-
2480MHz	Pass	PK	2.4798G	103.34	Inf	-Inf	3	Horizontal	113	2.34	-
2480MHz	Pass	PK	2.4835G	57.57	74.00	-16.43	3	Horizontal	113	2.34	-
2480MHz	Pass	AV	4.97404G	33.38	54.00	-20.62	3	Vertical	231	1.50	-
2480MHz	Pass	PK	4.95814G	45.15	74.00	-28.85	3	Vertical	231	1.50	-
2480MHz	Pass	AV	4.9696G	33.43	54.00	-20.57	3	Horizontal	0	1.50	-
2480MHz	Pass	PK	4.94776G	45.83	74.00	-28.17	3	Horizontal	0	1.50	-

BT-LE(1Mbps)

2402MHz_TX

20/08/2019

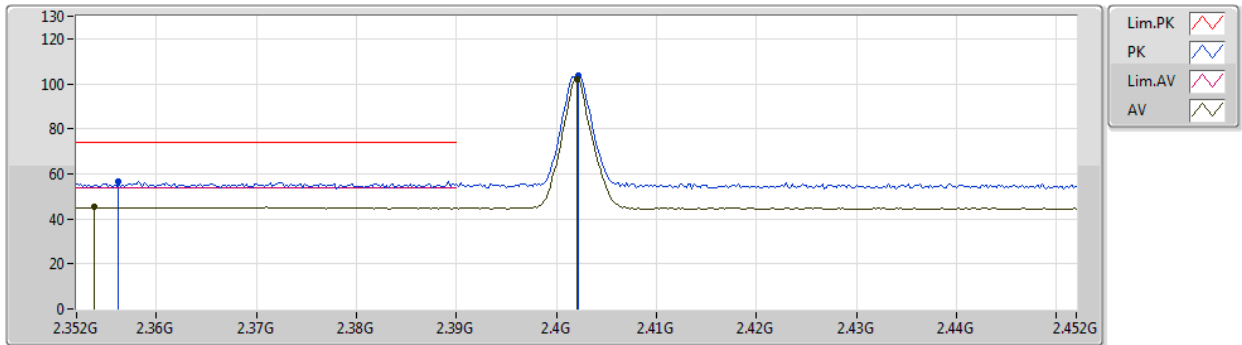


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.3532G	45.21	54.00	-8.79	31.68	3	Vertical	286	2.08	-	13.53	27.69	3.99	-
AV	2.402G	96.58	Inf	-Inf	31.56	3	Vertical	286	2.08	-	65.02	27.50	4.06	-
PK	2.3778G	56.84	74.00	-17.16	31.62	3	Vertical	286	2.08	-	25.22	27.59	4.03	-
PK	2.4022G	98.02	Inf	-Inf	31.56	3	Vertical	286	2.08	-	66.46	27.50	4.06	-

BT-LE(1Mbps)

2402MHz_TX

20/08/2019

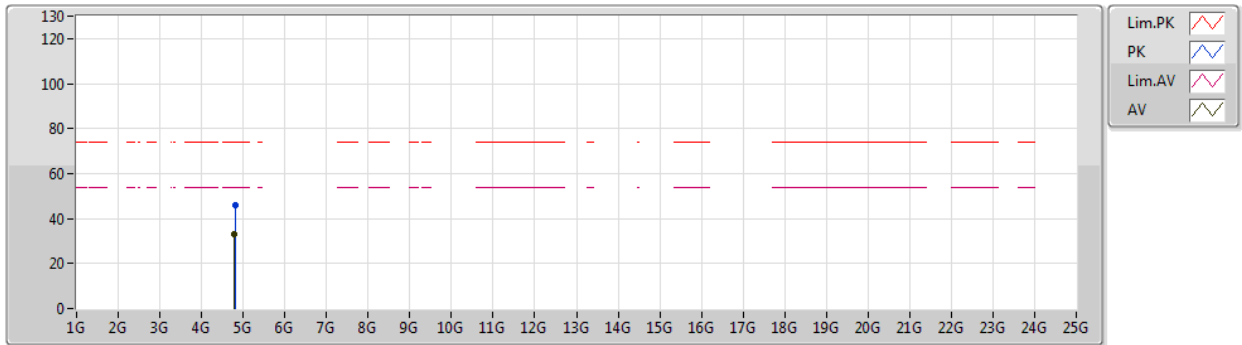


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.3538G	45.12	54.00	-8.88	31.67	3	Horizontal	124	2.19	-	13.45	27.68	3.99	-
AV	2.402G	102.01	Inf	-Inf	31.56	3	Horizontal	124	2.19	-	70.45	27.50	4.06	-
PK	2.3562G	56.53	74.00	-17.47	31.67	3	Horizontal	124	2.19	-	24.86	27.68	3.99	-
PK	2.4022G	103.54	Inf	-Inf	31.56	3	Horizontal	124	2.19	-	71.98	27.50	4.06	-

BT-LE(1Mbps)

20/08/2019

2402MHz_TX

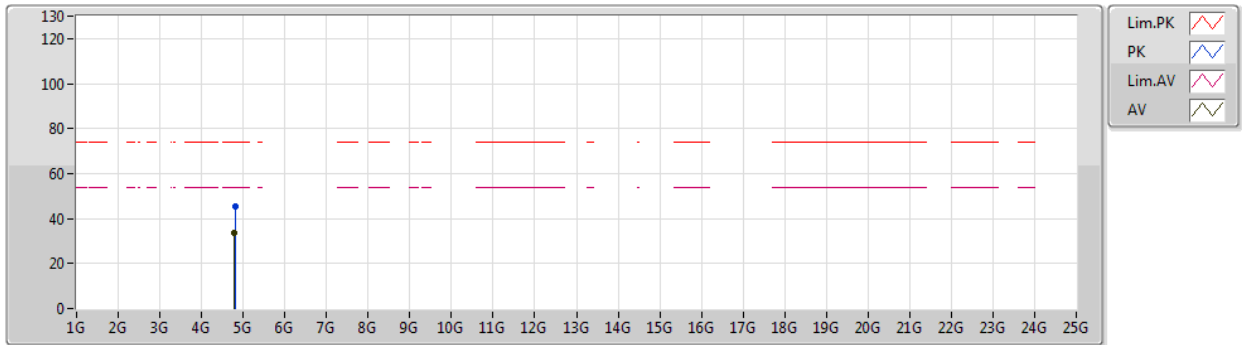


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.7911G	33.23	54.00	-20.77	7.08	3	Vertical	5	1.50	-	26.15	31.12	5.74	29.78
PK	4.80724G	45.71	74.00	-28.29	7.10	3	Vertical	5	1.50	-	38.61	31.13	5.75	29.78

BT-LE(1Mbps)

20/08/2019

2402MHz_TX

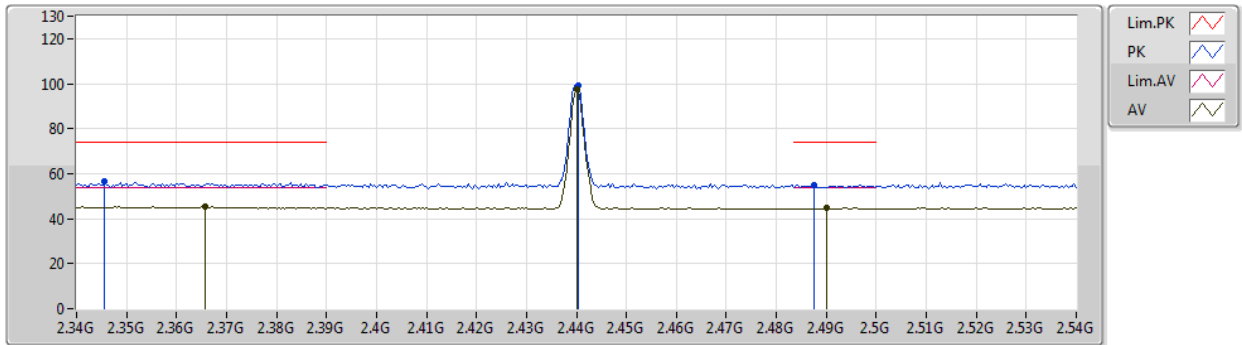


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.79032G	33.44	54.00	-20.56	7.08	3	Horizontal	360	1.50	-	26.36	31.12	5.74	29.78
PK	4.80232G	45.63	74.00	-28.37	7.07	3	Horizontal	360	1.50	-	38.56	31.11	5.74	29.78

BT-LE(1Mbps)

2440MHz_TX

20/08/2019

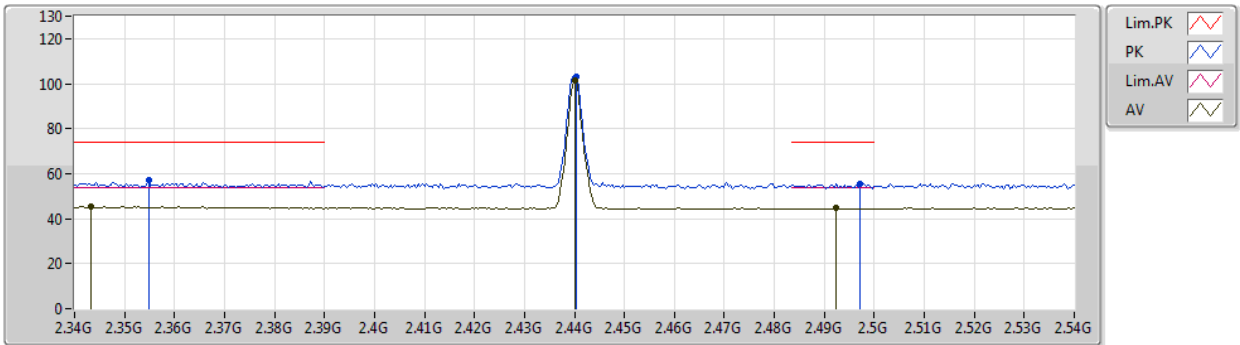


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.3656G	45.31	54.00	-8.69	31.65	3	Vertical	305	3.00	-	13.66	27.64	4.01	-
AV	2.44G	97.61	Inf	-Inf	31.50	3	Vertical	305	3.00	-	66.11	27.42	4.08	-
AV	2.49G	44.88	54.00	-9.12	31.42	3	Vertical	305	3.00	-	13.46	27.32	4.10	-
PK	2.3456G	56.34	74.00	-17.66	31.70	3	Vertical	305	3.00	-	24.64	27.72	3.98	-
PK	2.4404G	99.11	Inf	-Inf	31.50	3	Vertical	305	3.00	-	67.61	27.42	4.08	-
PK	2.4876G	54.98	74.00	-19.02	31.42	3	Vertical	305	3.00	-	23.56	27.32	4.10	-

BT-LE(1Mbps)

2440MHz_TX

20/08/2019

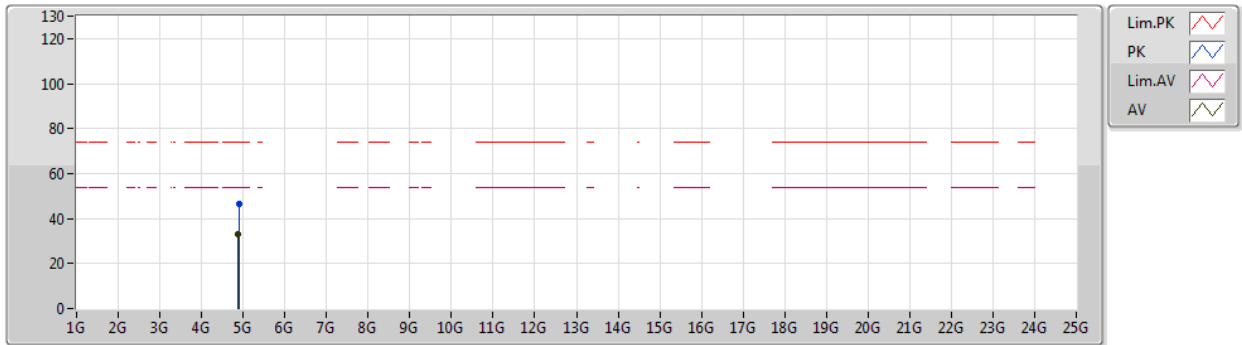


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.3432G	45.46	54.00	-8.54	31.70	3	Horizontal	127	2.15	-	13.76	27.73	3.97	-
AV	2.44G	101.44	Inf	-Inf	31.50	3	Horizontal	127	2.15	-	69.94	27.42	4.08	-
AV	2.4924G	44.70	54.00	-9.30	31.42	3	Horizontal	127	2.15	-	13.28	27.32	4.10	-
PK	2.3548G	56.95	74.00	-17.05	31.67	3	Horizontal	127	2.15	-	25.28	27.68	3.99	-
PK	2.4404G	102.96	Inf	-Inf	31.50	3	Horizontal	127	2.15	-	71.46	27.42	4.08	-
PK	2.4972G	55.68	74.00	-18.32	31.41	3	Horizontal	127	2.15	-	24.27	27.31	4.10	-

BT-LE(1Mbps)

20/08/2019

2440MHz_TX

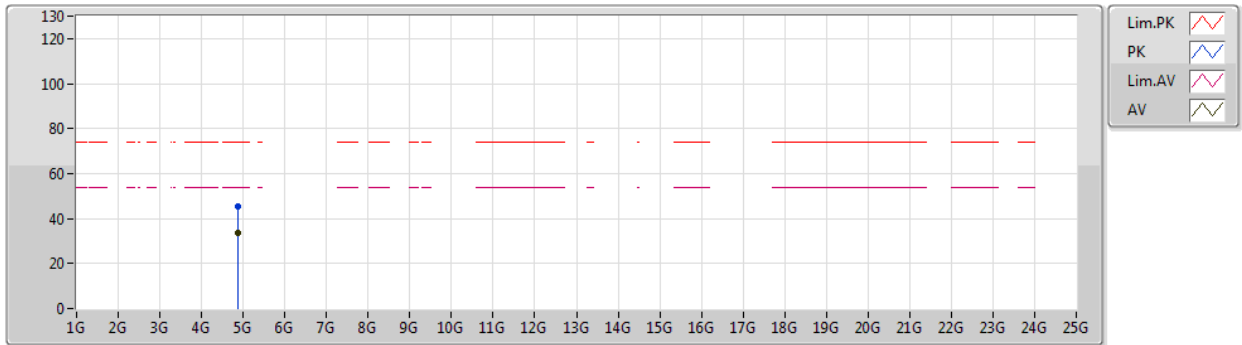


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.88726G	33.00	54.00	-21.00	7.27	3	Vertical	360	1.50	-	25.73	31.23	5.81	29.77
PK	4.89092G	46.25	74.00	-27.75	7.26	3	Vertical	360	1.50	-	38.99	31.22	5.81	29.77

BT-LE(1Mbps)

20/08/2019

2440MHz_TX

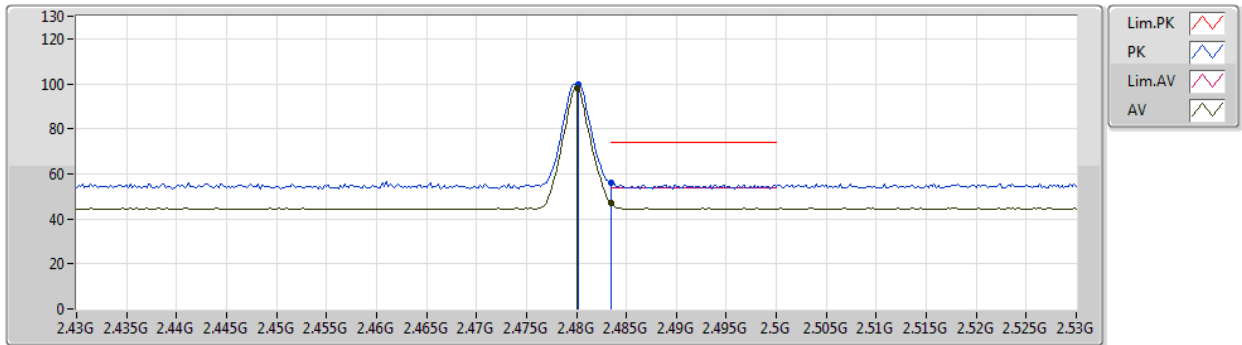


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.87502G	33.42	54.00	-20.58	7.28	3	Horizontal	145	1.03	-	26.14	31.25	5.80	29.77
PK	4.87802G	45.41	74.00	-28.59	7.27	3	Horizontal	145	1.03	-	38.14	31.24	5.80	29.77

BT-LE(1Mbps)

2480MHz_TX

20/08/2019

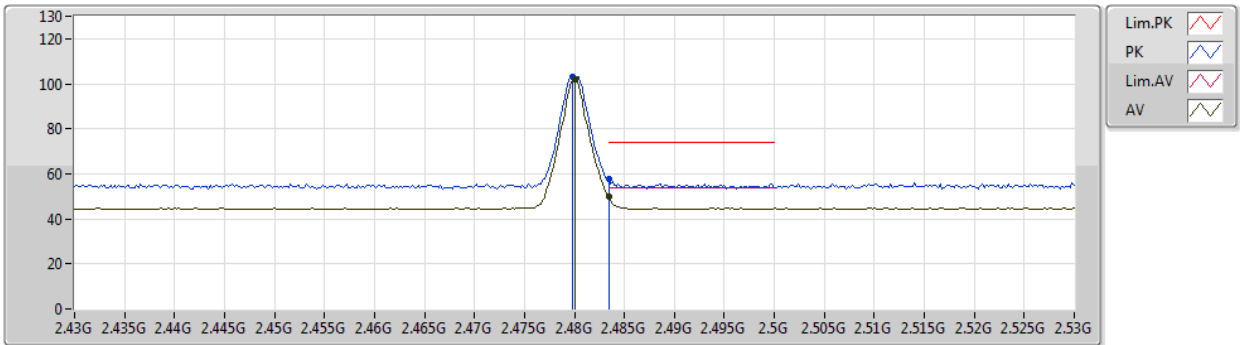


Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	2.48G	98.11	Inf	-Inf	31.44	3	Vertical	290	2.39	-	66.67	27.34	4.10	-
AV	2.4835G	47.14	54.00	-6.86	31.43	3	Vertical	290	2.39	-	15.71	27.33	4.10	-
PK	2.4802G	99.56	Inf	-Inf	31.44	3	Vertical	290	2.39	-	68.12	27.34	4.10	-
PK	2.4835G	55.89	74.00	-18.11	31.43	3	Vertical	290	2.39	-	24.46	27.33	4.10	-

BT-LE(1Mbps)

2480MHz_TX

20/08/2019

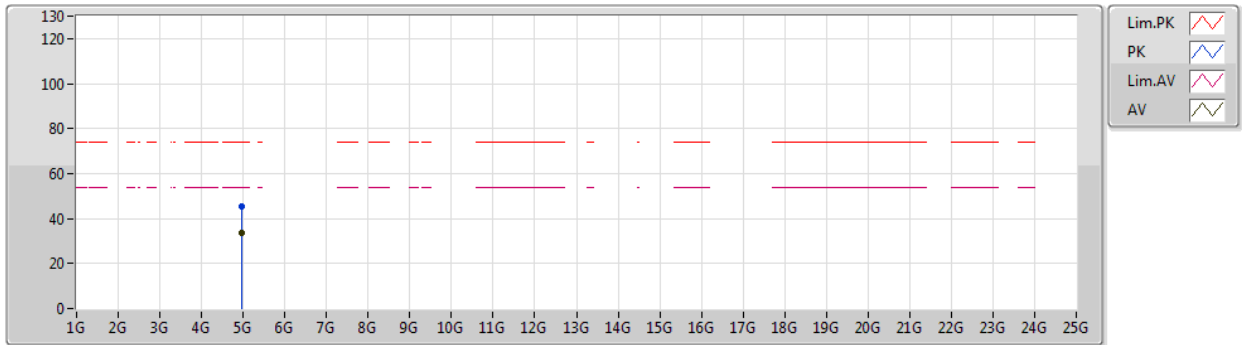


Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	2.48G	101.89	Inf	-Inf	31.44	3	Horizontal	113	2.34	-	70.45	27.34	4.10	-
AV	2.4835G	49.62	54.00	-4.38	31.43	3	Horizontal	113	2.34	-	18.19	27.33	4.10	-
PK	2.4798G	103.34	Inf	-Inf	31.44	3	Horizontal	113	2.34	-	71.90	27.34	4.10	-
PK	2.4835G	57.57	74.00	-16.43	31.43	3	Horizontal	113	2.34	-	26.14	27.33	4.10	-

BT-LE(1Mbps)

2480MHz_TX

20/08/2019

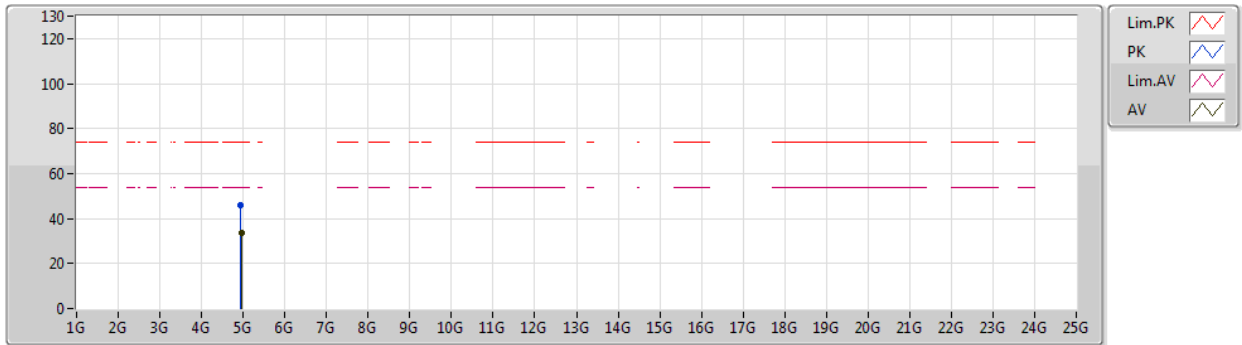


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.97404G	33.38	54.00	-20.62	7.52	3	Vertical	231	1.50	-	25.86	31.40	5.88	29.76
PK	4.95814G	45.15	74.00	-28.85	7.44	3	Vertical	231	1.50	-	37.71	31.33	5.87	29.76

BT-LE(1Mbps)

2480MHz_TX

20/08/2019



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	4.9696G	33.43	54.00	-20.57	7.50	3	Horizontal	0	1.50	-	25.93	31.38	5.88	29.76
PK	4.94776G	45.83	74.00	-28.17	7.39	3	Horizontal	0	1.50	-	38.44	31.30	5.86	29.77