FCC RADIO TEST REPORT

FCC ID	:	**SWX-UAPFLEXHD**
EQUIPMENT	:	**UniFi FLEXHD**
Brand Name	:	**UBIQUITI**
Model Name	:	**UAP-FlexHD**
Applicant/ Manufacturer	:	**Ubiquiti Networks, Inc. 685 Third Avenue, 27th Floor New York, New York 10017 USA**
Standard	:	**47 CFR FCC Part 15.249**

The product was received on Dec. 25, 2018, and testing was started from Apr. 24, 2019 and completed on May 20, 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 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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HISTORY OF THIS TEST REPORT

Report No.	Version	Description	Issued Date
FR7O2609-06AL	01	Initial issue of report	May 31, 2019

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	15.215(c)	Emission Bandwidth	PASS	-
3.3	15.249(a)	Fundamental Emissions	PASS	-
3.4	15.249(a)/(d)	Transmitter Radiated Unwanted Emissions	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: Jackson Tsai

Report Producer: Michelle Tsai

1 General Description

1.1 Information

1.1.1 RF General Information

RF General Information			
Frequency Range (MHz)	**Bluetooth Mode**	**Ch. Frequency (MHz)**	**Channel Number**
2400-2483.5	LE	2402-2480	0-39 [40]
Note 1: Field strength performed average level at 3m.			

1.1.2 Antenna Information

Ant.	Port	Brand	Model Name	Antenna Type	Connector
1	1	-	-	internal antenna	i-Pex
2	2	-	-	internal antenna	i-Pex
3	3	-	-	internal antenna	i-Pex
4	4	-	-	internal antenna	i-Pex
5	1	-	-	internal antenna	fixed on board

Ant.	Port	Gain (dBi)		
		2.4G	**BT**	**5G**
1	1	1.6	-	4.0
2	2			
3	3	-	-	4.0
4	4			
5	1	-	1.6	-

Note 1: The EUT has four antennas.

For 2.4GHz function:

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

Ant. 1 and Ant. 2 can be used as transmitting/receiving antenna.

For BT function:

For Bluetooth mode (1TX/1RX)

Only Ant. 5 can be used as transmitting/receiving antenna.

For 5GHz function:

For IEEE 802.11a/n/ac mode (4TX/4RX):

Ant. 1 & Ant. 2 & Ant. 3 and Ant. 4 can be used as transmitting/receiving antenna.

1.1.3 EUT Information

Operational Condition	
EUT Power Type	From PoE
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 Test Signal Duty Cycle

Operated Mode for Worst Duty Cycle	
☐	Operated normally mode for worst duty cycle
☒	Operated test mode for worst duty cycle
Test Signal Duty Cycle (x)	
☒	100%

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 15.249
- ANSI C63.10-2013

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.			

Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
RF Conducted	TH06-HY	Gary Wang	23.1~26.6°C / 61~69%	10/May/2019
Radiated	03CH03-HY	Jeff Lin	23.6~24.2°C / 51.2~52.1%	24/Apr/2019~20/May/2019
AC Conduction	CO01-HY	Jeff Lin	22.2~25.8°C / 52.2~57.1%	09/May/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)	3.54 dB	Confidence levels of 95%
Radiated Emission (9kHz ~ 30MHz)	1.6 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	4.3 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	3.9 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	3.5 dB	Confidence levels of 95%
Conducted Emission	1.3 dB	Confidence levels of 95%
Temperature	0.7 ℃	Confidence levels of 95%
Humidity	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	DoC

2.3 The Worst Case Modulation Configuration

Modulation Used for Conformance Testing	
Test Mode	**Field Strength (dBuV/m at 3 m)**
Bluetooth 4.0 LE	91.37

2.4 Test Channel Frequencies Configuration

Test Channel Frequencies Configuration	
Test Mode	**Test Channel Frequencies (MHz)**
Bluetooth 4.0 LE	2402-2480

2.5 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	Operating Mode Description
1	PoE Mode

The Worst Case Mode for Following Conformance Tests	
Tests Item	Emission Bandwidth, Fundamental Emissions, Radiated Unwanted Emissions
Test Condition	Radiated measurement
User Position	☐ EUT will be placed in fixed position.
	☒ EUT will be placed in mobile position and operating multiple positions.
	☐ EUT will be a hand-held or body-worn battery-powered devices and operating multiple positions.
Operating Mode	☒ 1. PoE Mode
Operating Mode > 1GHz	CTX
Orthogonal Planes of EUT	**Y Plane**
	

2.6 Support Equipment

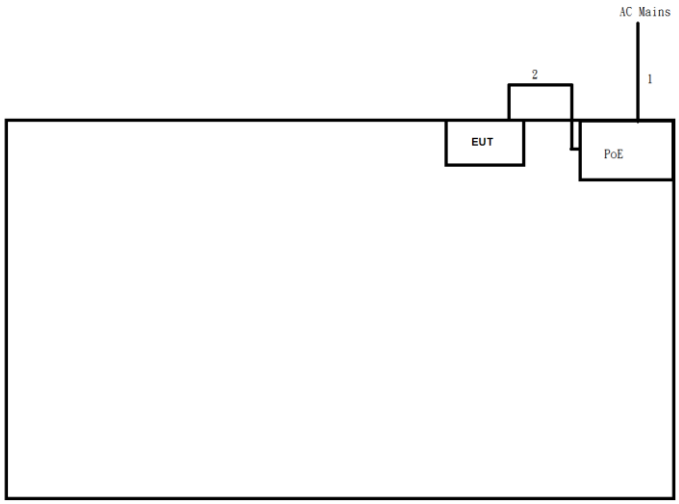
Support Equipment – AC Conduction				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
1	PoE	UBIQUITI	GP-H480-050G	-

Support Equipment – Radiated Emission				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
1	PoE (Remote)	UBIQUITI	GP-H480-050G	-

Support Equipment – RF Conducted				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
A	Notebook	DELL	E5410	DoC
B	Adapter for NB	DELL	HA65NM130	DoC

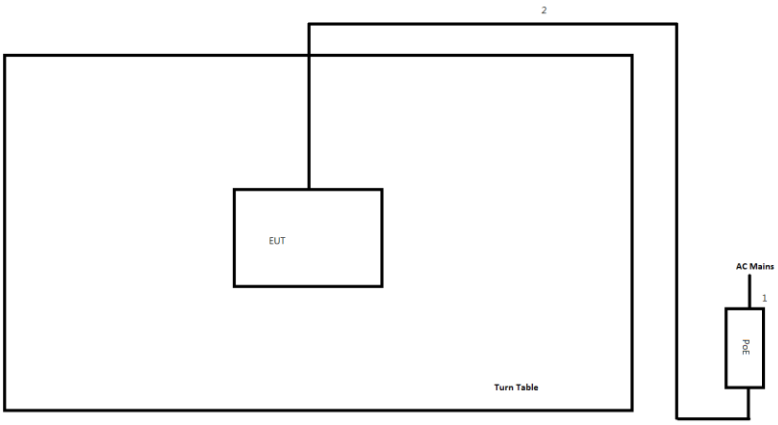
2.7 Test Setup Diagram

Test Setup Diagram – AC Line Conducted Emission Test



Item	Connection	Shielded	Length(m)	Remark
1	AC Power line	No	1.0	-
2	LAN cable	No	0.8	-

Test Setup Diagram - Radiated Test



Item	Connection	Shielded	Length(m)	Remark
1	AC Power line	No	1.5	-
2	Lan cable	No	10.0	-

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

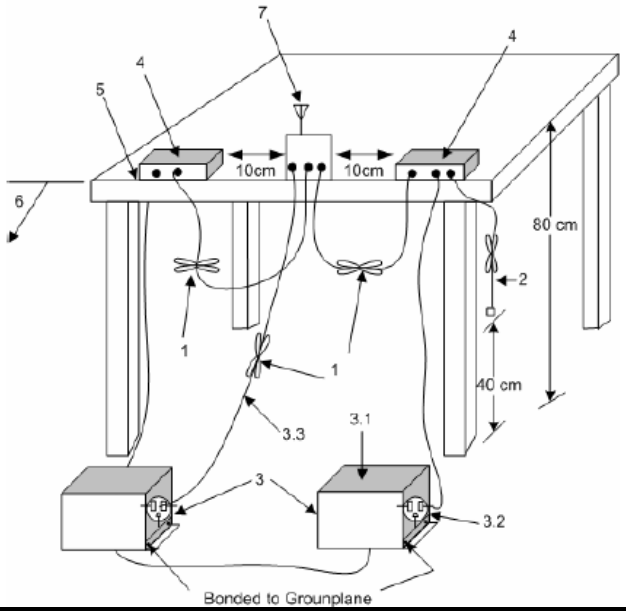
Refer a test equipment and calibration data table in this test report.

3.1.3 Test Procedures

Test Method
☒ Refer as ANSI C63.10-2013, clause 6.2 for AC power-line conducted emissions.

3.1.4 Test Setup

AC Power-line Conducted Emissions



3.1.5 Test Result of AC Power-line Conducted Emissions

Refer as Appendix A

3.2 Emission Bandwidth

3.2.1 Emission Bandwidth Limit

Emission Bandwidth Limit
☒ Emission bandwidth falls completely within authorized band.

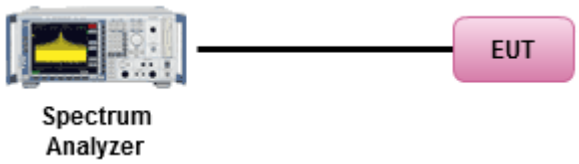
3.2.2 Measuring Instruments

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

3.2.3 Test Procedures

Test Method
☒ Refer as ANSI C63.10, clause 6.9.3 for occupied bandwidth testing.
☐ Refer as RSS-Gen, clause 6.7 for for occupied bandwidth testing.

3.2.4 Test Setup

Emission Bandwidth


3.2.5 Test Result of Emission Bandwidth

Refer as Appendix B

3.3 Fundamental Emissions

3.3.1 Fundamental Emissions Limit

Fundamental Emissions E-Field Strength Limit (3m)	
☐	902-928 MHz Band: 94 dBuV/m (quasi peak)
☒	2400-2483.5 MHz Band: 94 dBuV/m (average)
☐	5725-5875 MHz Band: 94 dBuV/m (average)

3.3.2 Measuring Instruments

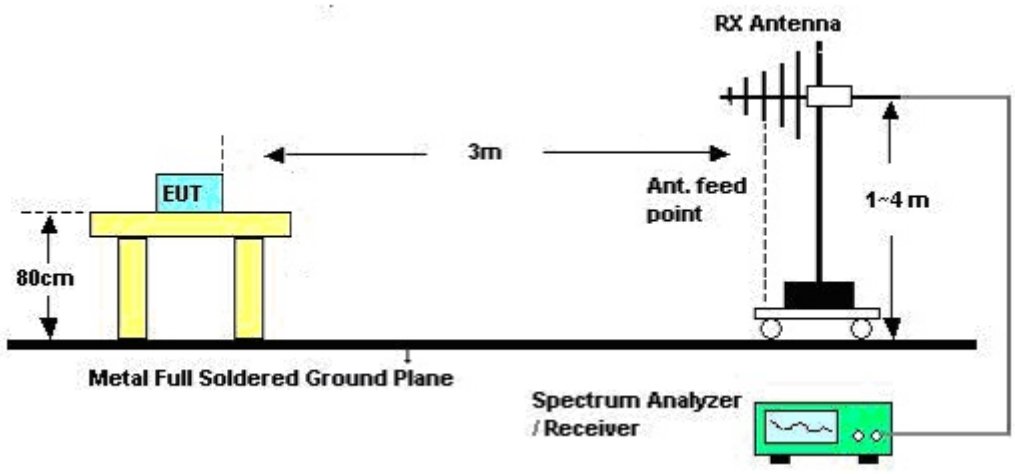
Refer a test equipment and calibration data table in this test report.

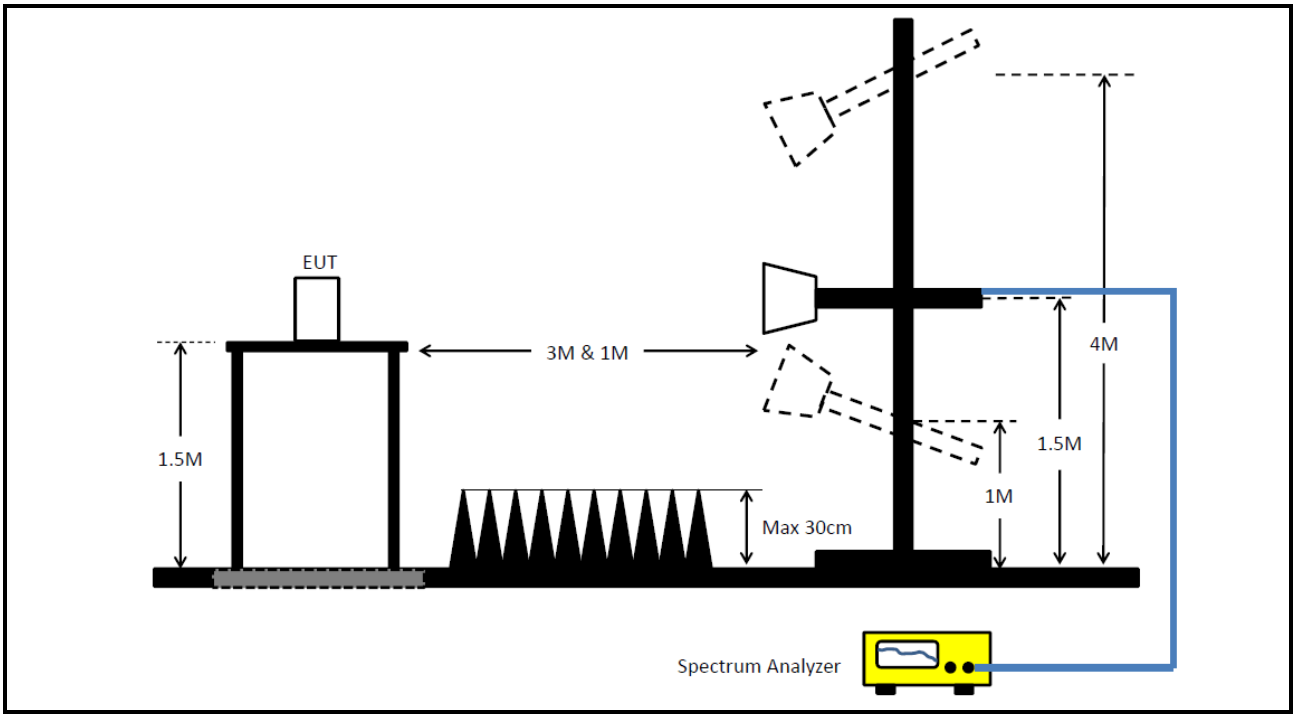
3.3.3 Test Procedures

☒	The average emission levels shall be measured in [duty cycle ≥ 100 or by duty cycle correction factor].	
☒	For the transmitter emissions shall be measured using following options below:	
	☒	Refer as ANSI C63.10, clause 4.1.4.2.3 (Reduced VBW) – Duty cycle ≥ 100%.
	☐	Refer as ANSI C63.10, clause 4.1.4.2.4 average value of pulsed emissions. Adjusted by a "duty cycle correction factor", derived from 20log (dwell time/100 ms). Average emission = peak emission + 20 log (duty cycle).
	☒	Refer as ANSI C63.10, clause 4.1.4.2.1 measurement procedure quasi-peak limit.
	☒	Refer as ANSI C63.10, clause 4.1.4.2.2 measurement procedure peak limit.
☒	Refer as ANSI C63.10, clause 6.5 for radiated emissions 30 MHz to 1 GHz and test distance is 3m.	
☒	Refer as ANSI C63.10, clause 6.6 for radiated emissions above 1 GHz and test distance is 3m.	

3.3.4 Test Setup

Fundamental Emissions





3.3.5 Test Result of Fundamental Emissions

Refer as Appendix C

3.4 Transmitter Radiated Unwanted Emissions

3.4.1 Transmitter Radiated Unwanted Emissions Limit

Transmitter Radiated Unwanted Emissions Limit
Harmonics:
☒ 54 dBuV/m (average)
Other Unwanted Emissions:
☒ 50 dB below the level of the fundamental or Part 15.209, whichever is the lesser attenuation.

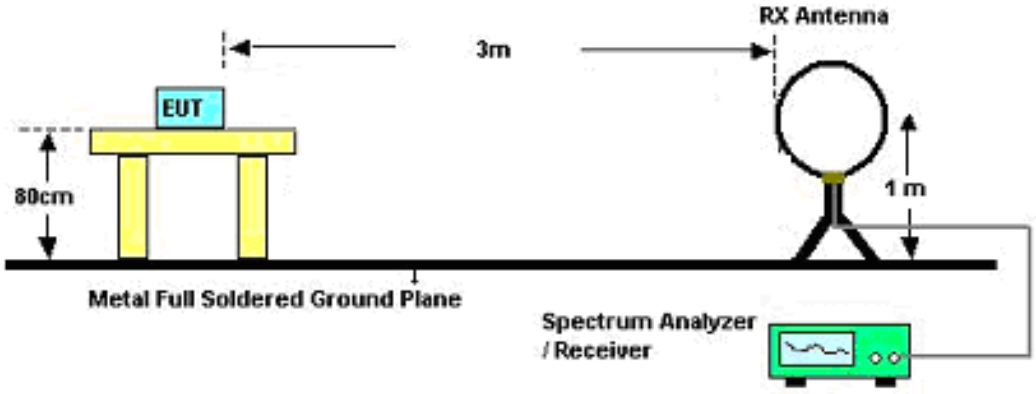
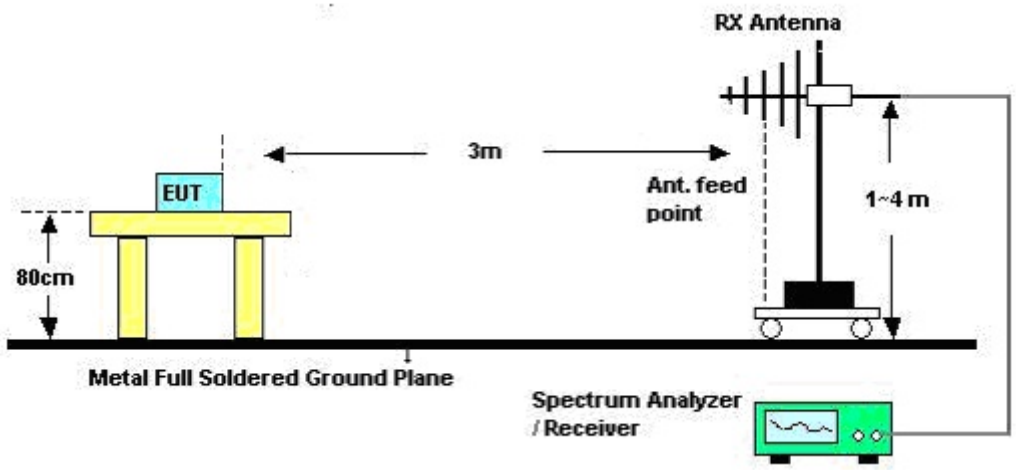
3.4.2 Measuring Instruments

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

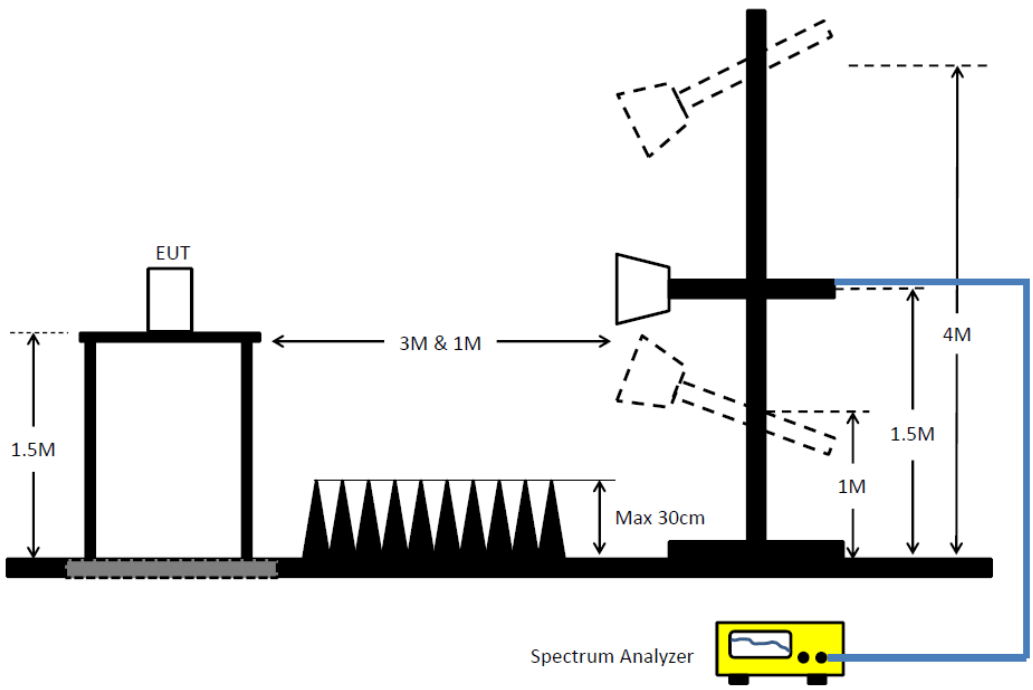
3.4.3 Test Procedures

Test Method – General Information	
☒	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).
☒	The average emission levels shall be measured in [duty cycle ≥ 98 or duty factor].
☒	Refer as ANSI C63.10, clause 6.10.3 bandedge 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 ANSI C63.10, clause 4.1.4.2.3 (Reduced VBW) – Duty cycle ≥ 100%.
☐	Refer as ANSI C63.10, clause 4.1.4.2.4 average value of pulsed emissions. Adjusted by a “duty cycle correction factor”, derived from 20log (dwell time/100 ms). Average emission = peak emission + 20 log (duty cycle).
☐	Refer as ANSI C63.10, clause 4.1.4.2.1 measurement procedure quasi-peak limit.
☒	Refer as ANSI C63.10, clause 4.1.4.2.2 measurement procedure peak limit.
☒	For the transmitter bandedge emissions shall be measured using following options below:
☒	Refer as ANSI C63.10, clause 6.10 for band-edge testing.
☐	Refer as ANSI C63.10, clause 6.10.6 for marker-delta method for band-edge measurements.
☒	For radiated measurement.
☒	Refer as ANSI C63.10, clause 6.4 for radiated emissions below 30 MHz and test distance is 3m.
☒	Refer as ANSI C63.10, clause 6.5 for radiated emissions 30 MHz to 1 GHz and test distance is 3m.
☒	Refer as ANSI C63.10, clause 6.6 for radiated emissions above 1 GHz and test distance is 3m.
☒	The any unwanted emissions level shall not exceed the fundamental emission level.
☒	All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported.

3.4.4 Test Setup

Emissions in Restricted Frequency Bands
9kHz ~30MHz

30MHz~1GHz


Above 1GHz



3.4.5 Transmitter Radiated Unwanted Emissions (Below 30MHz)

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

3.4.6 Transmitter Radiated Unwanted Emissions (Below 1GHz)

Refer as Appendix C

3.5 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	ENV 216	101274	9kHz ~ 30MHz	12/Jun/2018	11/Jun/2019
RF Cable-CON	MTJ	RG142	CB001-CO	9kHz ~ 30MHz	17/Sep/2018	16/Sep/2019
AC POWER	APC	AFC-11003G	F308010045	47Hz~63Hz 5~300V	NCR	NCR
Impuls Begrenzer Pulse Limiter	SCHWARZBECK	VTSD 9561F	9495	9kHz ~ 30MHz	11/Oct/2018	10/Oct/2019

NCR : Non-Calibration Require

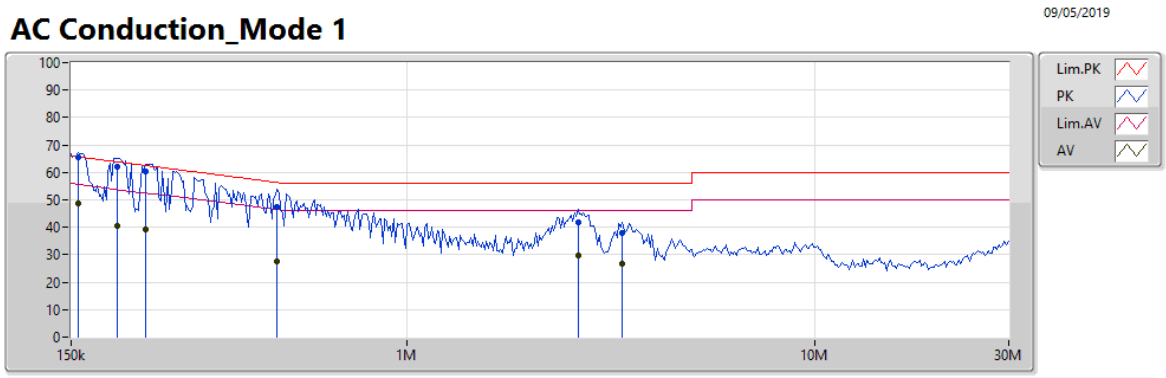
Instrument for Radiated Test

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/Oct/2018	29/Oct/2019
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	1GHz ~ 18GHz 3m	30/Oct/2018	29/Oct/2019
Amplifier	HP	8447D	2944A08033	10kHz ~ 1.3GHz	22/Apr/2019	21/Apr/2020
EMI Test Receiver	R&S	ESR3	102052	9kHz ~ 3.6GHz	09/Apr/2019	08/Apr/2020
Bilog Antenna with 5dB Pad	ETS	3142B & MTJ6102-05	00022055	26 MHz - 3 GHz	19/Nov/2018	18/Nov/2019
Microwave System Preamplifier	KEYSIGHT	83017A	MY53270196	1GHz ~ 26.5GHz	05/Sep/2018	04/Sep/2019
Signal Analyzer	R&S	FSV40	101500	10Hz ~ 40GHz	18/Jul/2018	17/Jul/2019
RF Cable-R03m	Jye Bao	RG142	CB021	9kHz ~ 1GHz	22/Mar/2019	21/Mar/2020
RF Cable-high	SUHNER	SUCOFLEX 106	MY34918/4	1GHz ~ 40GHz	21/Mar/2019	20/Mar/2020
RF Cable-high	SUHNER	SUCOFLEX104	MY34918/4	1GHz ~ 40GHz	19/Jan/2019	18/Jan/2020
Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170339	18GHz ~ 40GHz	19/Apr/ 2019	18/Apr/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
Loop Antenna	TESEQ	HLA 6120	31244	9kHz ~ 30MHz	15/Mar/2019	14/Mar/2020

Instrument for Conducted Test

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
Spectrum Analyzer	R&S	FSV 40	101500	10Hz~40GHz	18/Jul/2018	17/Jul/2019

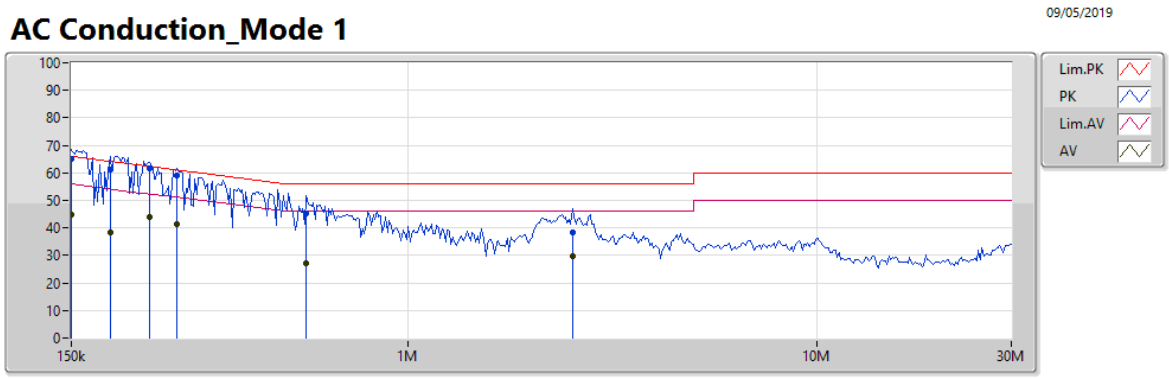
AC Power-line Conducted Emissions Result			
Operating Mode	1	**Power Phase**	Neutral
Operating Function	PoE Mode		



Type	Freq	Level	Limit	Margin	Factor	Condition	Comment	Raw	LISN	CL	AT
	(Hz)	(dBuV)	(dBuV)	(dB)	(dB)			(dBuV)	(dB)	(dB)	(dB)
QP	156.091k	65.61	65.67	-0.06	19.52	Neutral	"Worst"	46.09	9.65	0.01	9.86
AV	156.091k	48.73	55.67	-6.94	19.52	Neutral	-	29.21	9.65	0.01	9.86
QP	194.288k	61.86	63.86	-2.00	19.51	Neutral	-	42.35	9.64	0.01	9.86
AV	194.288k	40.46	53.86	-13.40	19.51	Neutral	-	20.95	9.64	0.01	9.86
QP	227.818k	60.52	62.52	-2.00	19.51	Neutral	-	41.01	9.64	0.01	9.86
AV	227.818k	39.39	52.52	-13.13	19.51	Neutral	-	19.88	9.64	0.01	9.86
QP	480.498k	47.31	56.33	-9.02	19.51	Neutral	-	27.80	9.64	0.01	9.86
AV	480.498k	27.65	46.33	-18.68	19.51	Neutral	-	8.14	9.64	0.01	9.86
QP	2.634M	41.60	56.00	-14.40	19.56	Neutral	-	22.04	9.65	0.04	9.87
AV	2.634M	29.55	46.00	-16.45	19.56	Neutral	-	9.99	9.65	0.04	9.87
QP	3.378M	37.82	56.00	-18.18	19.58	Neutral	-	18.24	9.66	0.04	9.88
AV	3.378M	26.85	46.00	-19.15	19.58	Neutral	-	7.27	9.66	0.04	9.88

Note 1: ">20dB" means emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: "N/F" means Nothing Found emissions (No emissions were detected.)

AC Power-line Conducted Emissions Result			
Operating Mode	1	**Power Phase**	Line
Operating Function	PoE Mode		



Type	Freq	Level	Limit	Margin	Factor	Condition	Comment	Raw	LISN	CL	AT
	(Hz)	(dBuV)	(dBuV)	(dB)	(dB)			(dBuV)	(dB)	(dB)	(dB)
QP	150k	64.93	66.00	-1.07	19.48	Line	-	45.45	9.61	0.01	9.86
AV	150k	44.84	56.00	-11.16	19.48	Line	-	25.36	9.61	0.01	9.86
QP	186.707k	61.35	64.18	-2.83	19.48	Line	-	41.87	9.61	0.01	9.86
AV	186.707k	38.45	54.18	-15.73	19.48	Line	-	18.97	9.61	0.01	9.86
QP	232.398k	61.61	62.37	-0.76	19.48	Line	"Worst"	42.13	9.61	0.01	9.86
AV	232.398k	44.04	52.37	-8.33	19.48	Line	-	24.56	9.61	0.01	9.86
QP	272.505k	58.88	61.05	-2.17	19.48	Line	-	39.40	9.61	0.01	9.86
AV	272.505k	41.45	51.05	-9.60	19.48	Line	-	21.97	9.61	0.01	9.86
QP	563.422k	45.29	56.00	-10.71	19.48	Line	-	25.81	9.61	0.01	9.86
AV	563.422k	27.33	46.00	-18.67	19.48	Line	-	7.85	9.61	0.01	9.86
QP	2.531M	38.54	56.00	-17.46	19.53	Line	-	19.01	9.62	0.04	9.87
AV	2.531M	29.72	46.00	-16.28	19.53	Line	-	10.19	9.62	0.04	9.87

Note 1: ">20dB" means emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: "N/F" means Nothing Found emissions (No emissions were detected.)

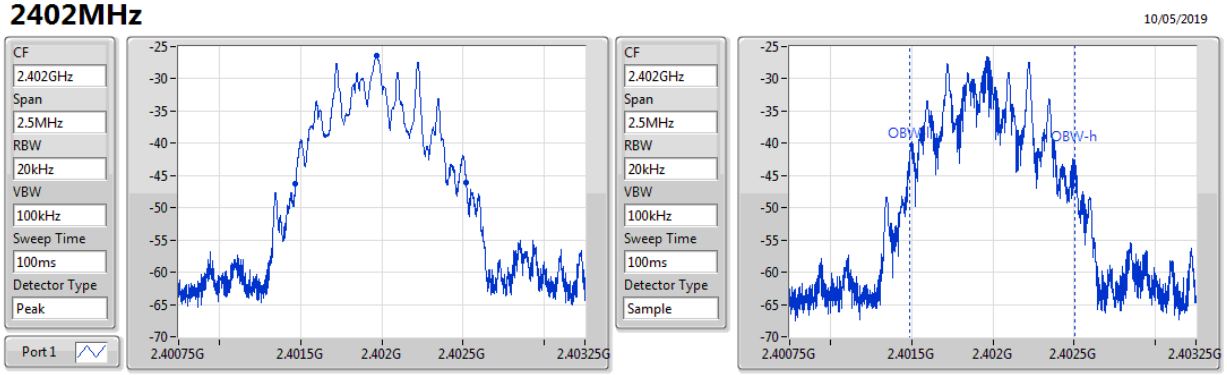
Summary

Emission Bandwidth Result					
Bluetooth Mode	**Frequency (MHz)**	**20dB Bandwidth (MHz)**	**99% Bandwidth (MHz)**	**F_L at 20dB BW (MHz)**	**F_H at 20dB BW (MHz)**
LE	2402.00	1.0490	1.0160	2401.4700	-
LE	2440.00	1.0510	1.0040	-	-
LE	2480.00	1.0510	1.0110	-	2480.5140
Limit		**N/A**	**N/A**	**2402**	**2483.5**
Result		**Complied**			

Emission Bandwidth Plots

BT-LE(1Mbps) **EBW**

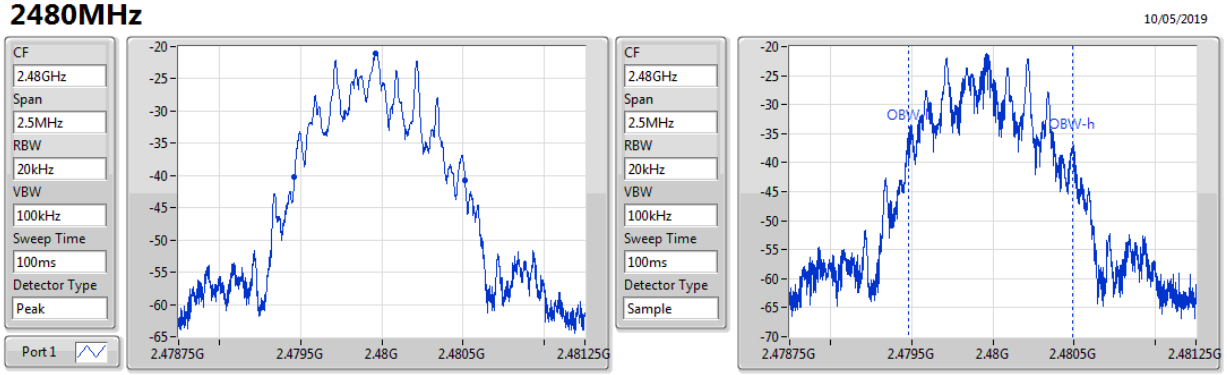
2402MHz



20dB(Hz)	Fl-20dB(Hz)	Fh-20dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
1.049M	2.40147G	2.402519G	1.016M	2.401488G	2.402503G	500k	1

BT-LE(1Mbps) **EBW**

2480MHz



20dB(Hz)	Fl-20dB(Hz)	Fh-20dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
1.051M	2.479463G	2.480514G	1.011M	2.479478G	2.480489G	500k	1

Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	QP	614.08M	40.73	46.00	-5.27	-10.03	3	Vertical	121	1.00	-

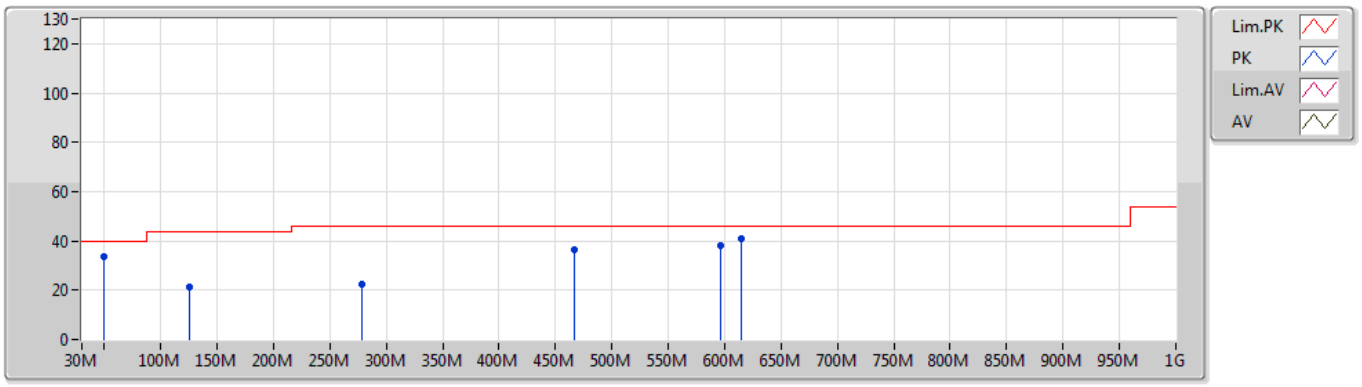
Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-	-
2440MHz	Pass	PK	49.4M	33.83	40.00	-6.17	-22.99	3	Vertical	360	1.00	-
2440MHz	Pass	PK	125.06M	21.04	43.50	-22.46	-19.00	3	Vertical	360	1.00	-
2440MHz	Pass	PK	278.32M	22.55	46.00	-23.45	-16.95	3	Vertical	360	1.00	-
2440MHz	Pass	PK	466.5M	36.29	46.00	-9.71	-12.32	3	Vertical	360	1.00	-
2440MHz	Pass	QP	596.24M	37.85	46.00	-8.15	-10.46	3	Vertical	132	1.00	-
2440MHz	Pass	QP	614.08M	40.73	46.00	-5.27	-10.03	3	Vertical	121	1.00	-
2440MHz	Pass	PK	49.4M	23.15	40.00	-16.85	-22.99	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	128.94M	24.14	43.50	-19.36	-18.96	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	305.48M	26.74	46.00	-19.26	-16.58	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	412.18M	30.54	46.00	-15.46	-13.36	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	485.9M	32.12	46.00	-13.88	-12.02	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	613.94M	39.01	46.00	-6.99	-10.03	3	Horizontal	0	1.00	-

BT-LE(1Mbps)

2440MHz_PoE

08/05/2019

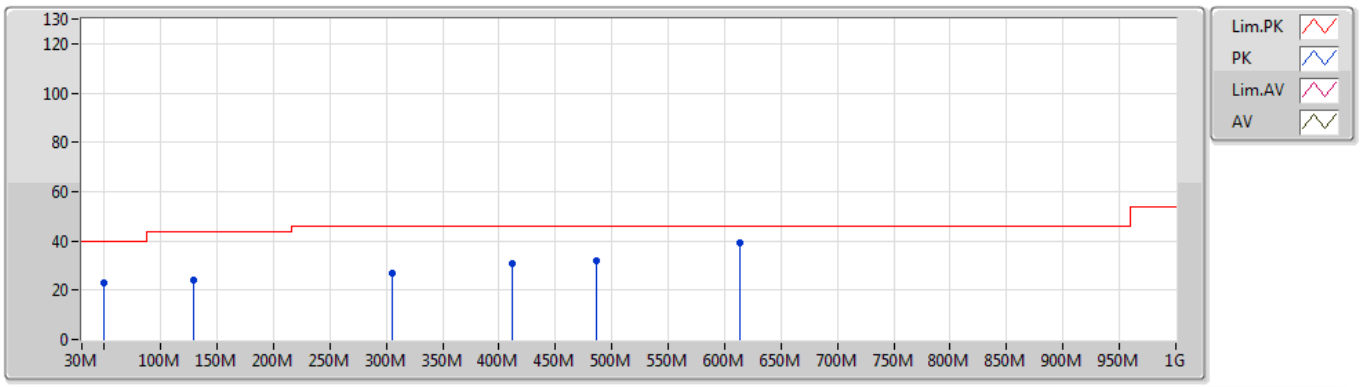


Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	49.4M	33.83	40.00	-6.17	-22.99	3	Vertical	360	1.00	-
PK	125.06M	21.04	43.50	-22.46	-19.00	3	Vertical	360	1.00	-
PK	278.32M	22.55	46.00	-23.45	-16.95	3	Vertical	360	1.00	-
PK	466.5M	36.29	46.00	-9.71	-12.32	3	Vertical	360	1.00	-
QP	596.24M	37.85	46.00	-8.15	-10.46	3	Vertical	132	1.00	-
QP	614.08M	40.73	46.00	-5.27	-10.03	3	Vertical	121	1.00	-

BT-LE(1Mbps)

2440MHz_PoE

08/05/2019



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	49.4M	23.15	40.00	-16.85	-22.99	3	Horizontal	0	1.00	-
PK	128.94M	24.14	43.50	-19.36	-18.96	3	Horizontal	0	1.00	-
PK	305.48M	26.74	46.00	-19.26	-16.58	3	Horizontal	0	1.00	-
PK	412.18M	30.54	46.00	-15.46	-13.36	3	Horizontal	0	1.00	-
PK	485.9M	32.12	46.00	-13.88	-12.02	3	Horizontal	0	1.00	-
PK	613.94M	39.01	46.00	-6.99	-10.03	3	Horizontal	0	1.00	-

Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	AV	2.442G	91.37	94.00	-2.63	31.15	3	Vertical	164	2.23	-

Result

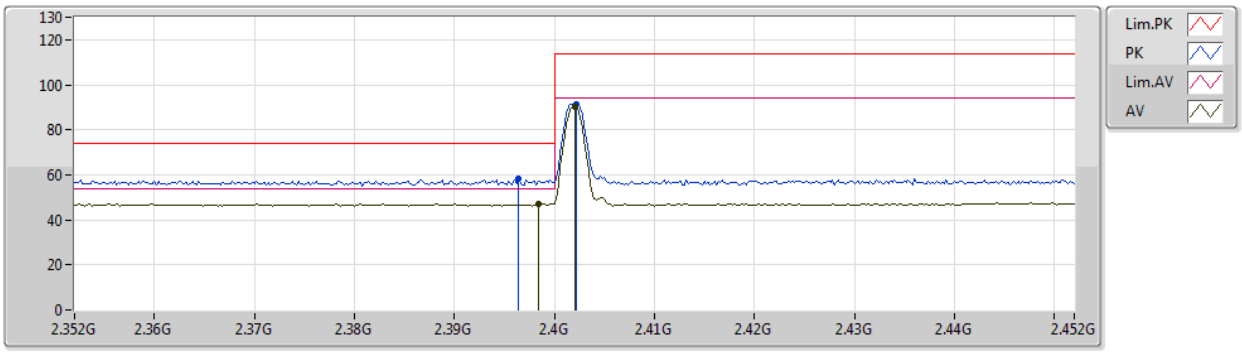
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-	-
2402MHz_TX	Pass	AV	2.3984G	47.20	54.00	-6.80	30.99	3	Vertical	158	2.61	-
2402MHz_TX	Pass	AV	2.402G	90.16	94.00	-3.84	31.00	3	Vertical	158	2.61	-
2402MHz_TX	Pass	PK	2.3964G	58.35	74.00	-15.65	30.98	3	Vertical	158	2.61	-
2402MHz_TX	Pass	PK	2.4022G	91.55	114.00	-22.45	31.00	3	Vertical	158	2.61	-
2402MHz_TX	Pass	AV	2.3536G	47.15	54.00	-6.85	30.83	3	Horizontal	212	2.46	-
2402MHz_TX	Pass	AV	2.402G	88.47	94.00	-5.53	31.00	3	Horizontal	212	2.46	-
2402MHz_TX	Pass	PK	2.389G	57.75	74.00	-16.25	30.95	3	Horizontal	212	2.46	-
2402MHz_TX	Pass	PK	2.4022G	89.89	114.00	-24.11	31.00	3	Horizontal	212	2.46	-
2402MHz_TX	Pass	AV	4.80454G	33.79	54.00	-20.21	1.62	3	Vertical	360	2.04	-
2402MHz_TX	Pass	PK	4.8028G	44.61	74.00	-29.39	1.62	3	Vertical	360	2.04	-
2402MHz_TX	Pass	AV	4.80346G	34.39	54.00	-19.61	1.62	3	Horizontal	19	2.13	-
2402MHz_TX	Pass	PK	4.80442G	45.21	74.00	-28.79	1.62	3	Horizontal	19	2.13	-
2442MHz_TX	Pass	AV	2.3912G	46.91	54.00	-7.09	30.96	3	Vertical	164	2.23	-
2442MHz_TX	Pass	AV	2.442G	91.37	94.00	-2.63	31.15	3	Vertical	164	2.23	-
2442MHz_TX	Pass	AV	2.4852G	47.91	54.00	-6.09	31.31	3	Vertical	164	2.23	-
2442MHz_TX	Pass	PK	2.3852G	57.88	74.00	-16.12	30.94	3	Vertical	164	2.23	-
2442MHz_TX	Pass	PK	2.4416G	92.68	114.00	-21.32	31.15	3	Vertical	164	2.23	-
2442MHz_TX	Pass	PK	2.4844G	58.43	74.00	-15.57	31.31	3	Vertical	164	2.23	-
2442MHz_TX	Pass	AV	2.3984G	46.95	54.00	-7.05	30.99	3	Horizontal	271	2.35	-
2442MHz_TX	Pass	AV	2.442G	90.78	94.00	-3.22	31.15	3	Horizontal	271	2.35	-
2442MHz_TX	Pass	AV	2.4948G	47.95	54.00	-6.05	31.35	3	Horizontal	271	2.35	-
2442MHz_TX	Pass	PK	2.3436G	57.67	74.00	-16.33	30.79	3	Horizontal	271	2.35	-
2442MHz_TX	Pass	PK	2.4416G	92.37	114.00	-21.63	31.15	3	Horizontal	271	2.35	-
2442MHz_TX	Pass	PK	2.4852G	59.00	74.00	-15.00	31.31	3	Horizontal	271	2.35	-
2442MHz_TX	Pass	AV	4.88442G	35.44	54.00	-18.56	1.82	3	Vertical	184	1.84	-
2442MHz_TX	Pass	AV	7.31544G	39.56	54.00	-14.44	7.49	3	Vertical	72	1.50	-
2442MHz_TX	Pass	PK	4.88454G	45.82	74.00	-28.18	1.82	3	Vertical	184	1.84	-
2442MHz_TX	Pass	PK	7.31664G	50.36	74.00	-23.64	7.49	3	Vertical	72	1.50	-
2442MHz_TX	Pass	AV	4.88346G	35.62	54.00	-18.38	1.82	3	Horizontal	302	1.77	-
2442MHz_TX	Pass	AV	7.32072G	39.44	54.00	-14.56	7.50	3	Horizontal	25	1.06	-
2442MHz_TX	Pass	PK	4.8834G	45.76	74.00	-28.24	1.82	3	Horizontal	302	1.77	-
2442MHz_TX	Pass	PK	7.33836G	50.07	74.00	-23.93	7.54	3	Horizontal	25	1.06	-
2480MHz_TX	Pass	AV	2.48G	89.83	94.00	-4.17	31.28	3	Vertical	161	2.78	-
2480MHz_TX	Pass	AV	2.4994G	47.71	54.00	-6.29	31.36	3	Vertical	161	2.78	-
2480MHz_TX	Pass	PK	2.4798G	91.24	114.00	-22.76	31.28	3	Vertical	161	2.78	-
2480MHz_TX	Pass	PK	2.4918G	58.52	74.00	-15.48	31.33	3	Vertical	161	2.78	-
2480MHz_TX	Pass	AV	2.48G	88.16	94.00	-5.84	31.28	3	Horizontal	268	2.78	-
2480MHz_TX	Pass	AV	2.4962G	47.70	54.00	-6.30	31.35	3	Horizontal	268	2.78	-
2480MHz_TX	Pass	PK	2.4796G	89.59	114.00	-24.41	31.28	3	Horizontal	268	2.78	-
2480MHz_TX	Pass	PK	2.4998G	59.05	74.00	-14.95	31.36	3	Horizontal	268	2.78	-
2480MHz_TX	Pass	AV	4.96024G	33.95	54.00	-20.05	2.02	3	Vertical	359	1.23	-
2480MHz_TX	Pass	AV	7.43766G	39.27	54.00	-14.73	7.80	3	Vertical	209	2.23	-
2480MHz_TX	Pass	PK	4.97296G	44.49	74.00	-29.51	2.05	3	Vertical	359	1.23	-
2480MHz_TX	Pass	PK	7.44612G	50.53	74.00	-23.47	7.82	3	Vertical	209	2.23	-
2480MHz_TX	Pass	AV	4.95952G	35.99	54.00	-18.01	2.02	3	Horizontal	26	1.50	-
2480MHz_TX	Pass	AV	7.4502G	39.32	54.00	-14.68	7.82	3	Horizontal	191	1.77	-
2480MHz_TX	Pass	PK	4.9594G	46.06	74.00	-27.94	2.02	3	Horizontal	26	1.50	-

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2480MHz_TX	Pass	PK	7.45422G	50.10	74.00	-23.90	7.83	3	Horizontal	191	1.77	-

BT-LE(1Mbps)

2402MHz_TX

10/05/2019

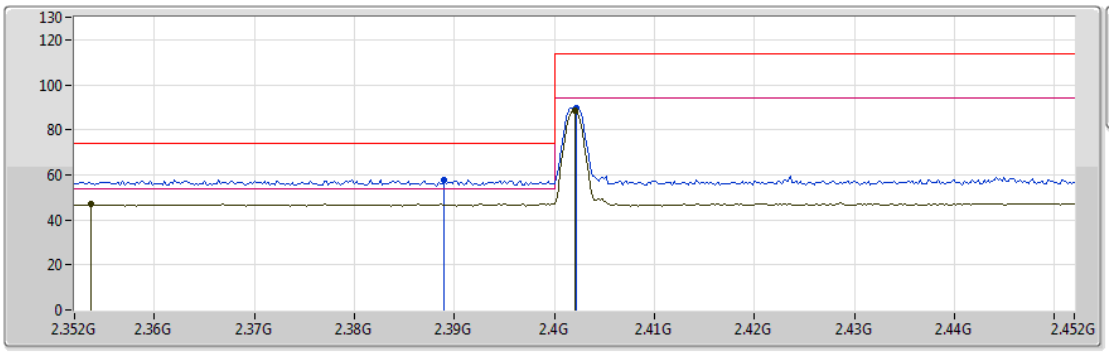


Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
AV	2.3984G	47.20	54.00	-6.80	30.99	3	Vertical	158	2.61	-
AV	2.402G	90.16	94.00	-3.84	31.00	3	Vertical	158	2.61	-
PK	2.3964G	58.35	74.00	-15.65	30.98	3	Vertical	158	2.61	-
PK	2.4022G	91.55	114.00	-22.45	31.00	3	Vertical	158	2.61	-

BT-LE(1Mbps)

2402MHz_TX

10/05/2019

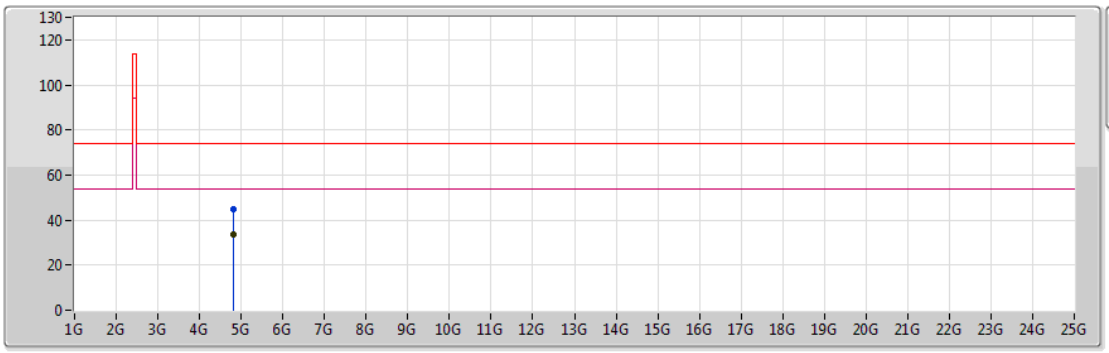


Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
AV	2.3536G	47.15	54.00	-6.85	30.83	3	Horizontal	212	2.46	-
AV	2.402G	88.47	94.00	-5.53	31.00	3	Horizontal	212	2.46	-
PK	2.389G	57.75	74.00	-16.25	30.95	3	Horizontal	212	2.46	-
PK	2.4022G	89.89	114.00	-24.11	31.00	3	Horizontal	212	2.46	-

BT-LE(1Mbps)

2402MHz_TX

10/05/2019

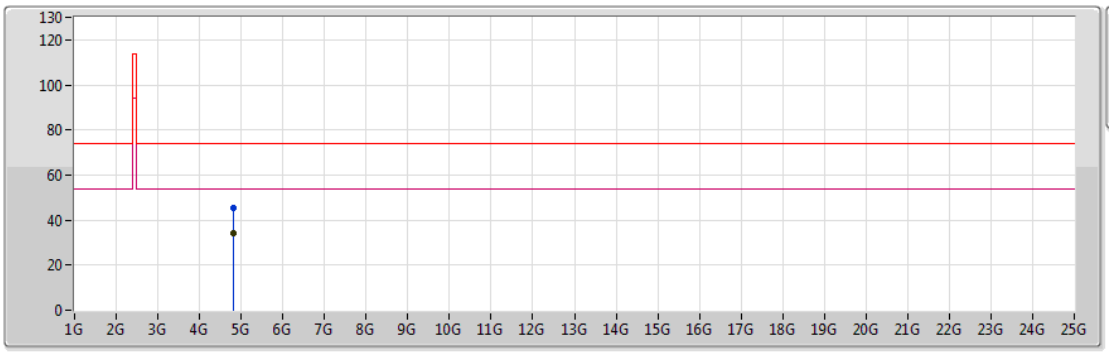


Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
AV	4.80454G	33.79	54.00	-20.21	1.62	3	Vertical	360	2.04	-
PK	4.8028G	44.61	74.00	-29.39	1.62	3	Vertical	360	2.04	-

BT-LE(1Mbps)

2402MHz_TX

10/05/2019

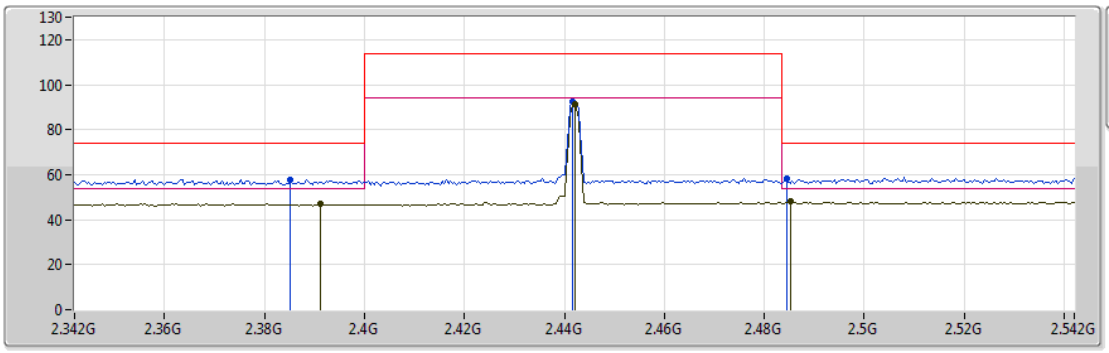


Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
AV	4.80346G	34.39	54.00	-19.61	1.62	3	Horizontal	19	2.13	-
PK	4.80442G	45.21	74.00	-28.79	1.62	3	Horizontal	19	2.13	-

BT-LE(1Mbps)

2442MHz_TX

10/05/2019

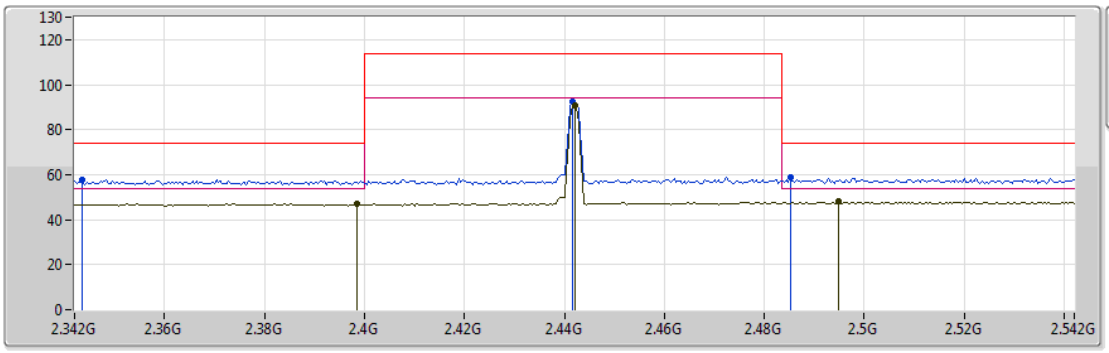


Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
AV	2.3912G	46.91	54.00	-7.09	30.96	3	Vertical	164	2.23	-
AV	2.442G	91.37	94.00	-2.63	31.15	3	Vertical	164	2.23	-
AV	2.4852G	47.91	54.00	-6.09	31.31	3	Vertical	164	2.23	-
PK	2.3852G	57.88	74.00	-16.12	30.94	3	Vertical	164	2.23	-
PK	2.4416G	92.68	114.00	-21.32	31.15	3	Vertical	164	2.23	-
PK	2.4844G	58.43	74.00	-15.57	31.31	3	Vertical	164	2.23	-

BT-LE(1Mbps)

2442MHz_TX

10/05/2019

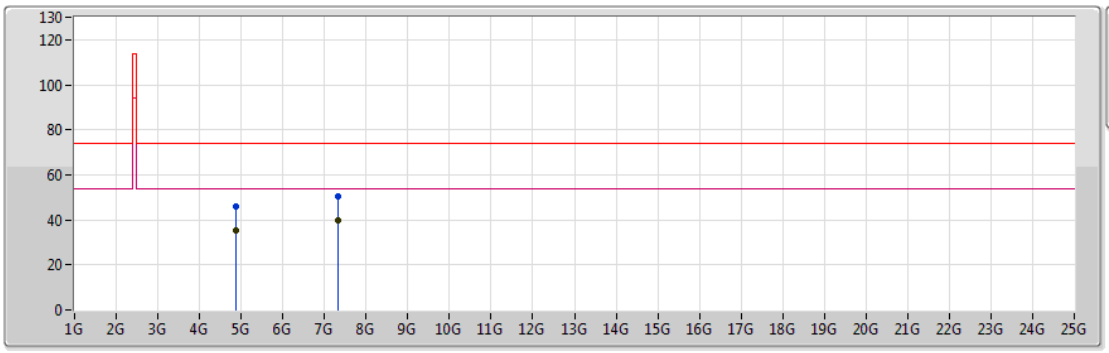


Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
AV	2.3984G	46.95	54.00	-7.05	30.99	3	Horizontal	271	2.35	-
AV	2.442G	90.78	94.00	-3.22	31.15	3	Horizontal	271	2.35	-
AV	2.4948G	47.95	54.00	-6.05	31.35	3	Horizontal	271	2.35	-
PK	2.3436G	57.67	74.00	-16.33	30.79	3	Horizontal	271	2.35	-
PK	2.4416G	92.37	114.00	-21.63	31.15	3	Horizontal	271	2.35	-
PK	2.4852G	59.00	74.00	-15.00	31.31	3	Horizontal	271	2.35	-

BT-LE(1Mbps)

2442MHz_TX

10/05/2019

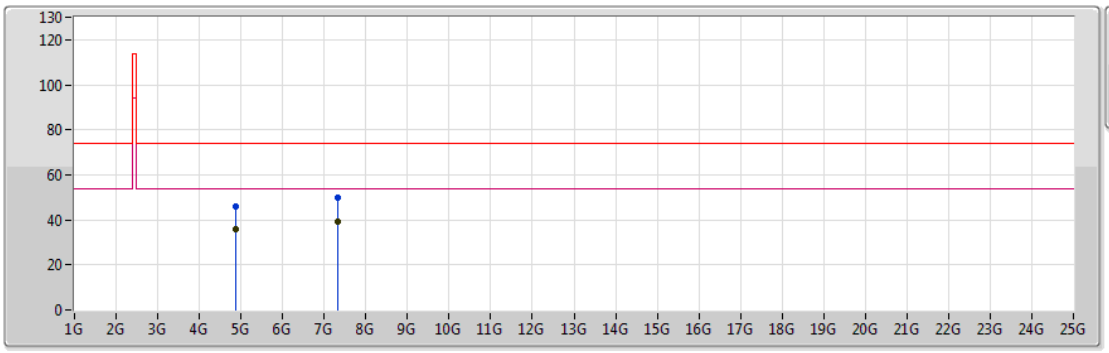


Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
AV	4.88442G	35.44	54.00	-18.56	1.82	3	Vertical	184	1.84	-
AV	7.31544G	39.56	54.00	-14.44	7.49	3	Vertical	72	1.50	-
PK	4.88454G	45.82	74.00	-28.18	1.82	3	Vertical	184	1.84	-
PK	7.31664G	50.36	74.00	-23.64	7.49	3	Vertical	72	1.50	-

BT-LE(1Mbps)

2442MHz_TX

10/05/2019

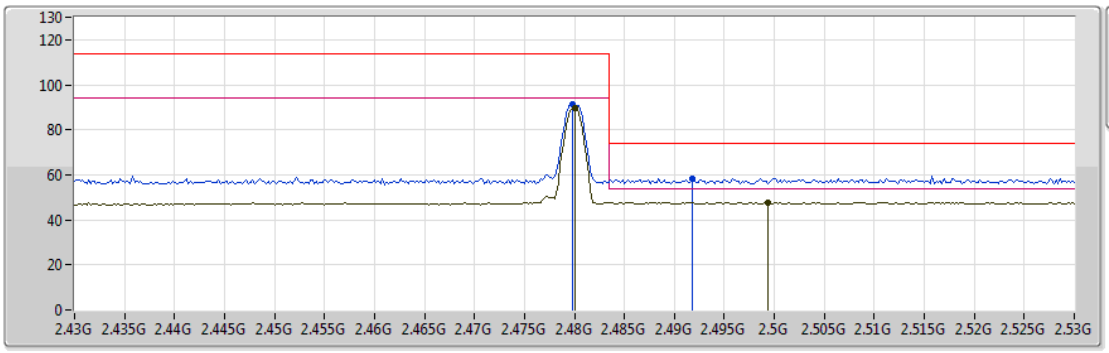


Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
AV	4.88346G	35.62	54.00	-18.38	1.82	3	Horizontal	302	1.77	-
AV	7.32072G	39.44	54.00	-14.56	7.50	3	Horizontal	25	1.06	-
PK	4.8834G	45.76	74.00	-28.24	1.82	3	Horizontal	302	1.77	-
PK	7.33836G	50.07	74.00	-23.93	7.54	3	Horizontal	25	1.06	-

BT-LE(1Mbps)

2480MHz_TX

10/05/2019

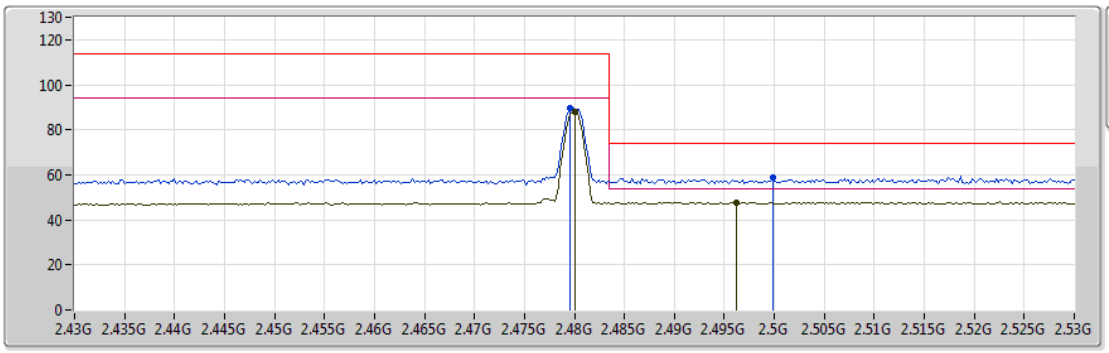


Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
AV	2.48G	89.83	94.00	-4.17	31.28	3	Vertical	161	2.78	-
AV	2.4994G	47.71	54.00	-6.29	31.36	3	Vertical	161	2.78	-
PK	2.4798G	91.24	114.00	-22.76	31.28	3	Vertical	161	2.78	-
PK	2.4918G	58.52	74.00	-15.48	31.33	3	Vertical	161	2.78	-

BT-LE(1Mbps)

2480MHz_TX

10/05/2019

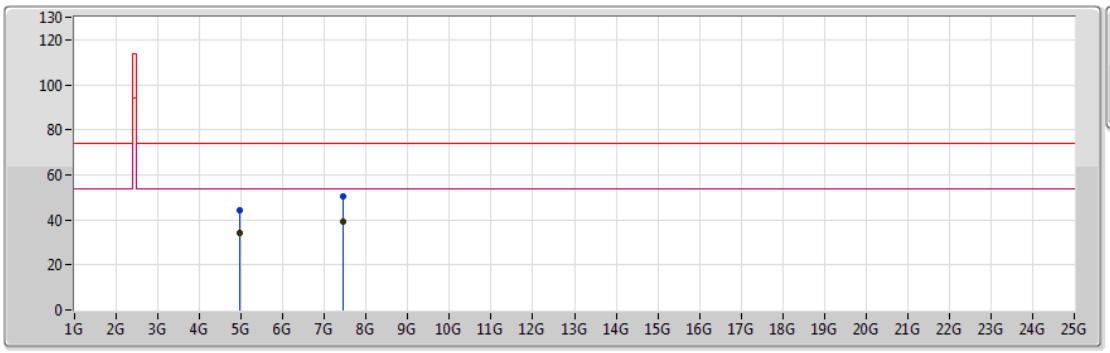


Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
AV	2.48G	88.16	94.00	-5.84	31.28	3	Horizontal	268	2.78	-
AV	2.4962G	47.70	54.00	-6.30	31.35	3	Horizontal	268	2.78	-
PK	2.4796G	89.59	114.00	-24.41	31.28	3	Horizontal	268	2.78	-
PK	2.4998G	59.05	74.00	-14.95	31.36	3	Horizontal	268	2.78	-

BT-LE(1Mbps)

2480MHz_TX

10/05/2019

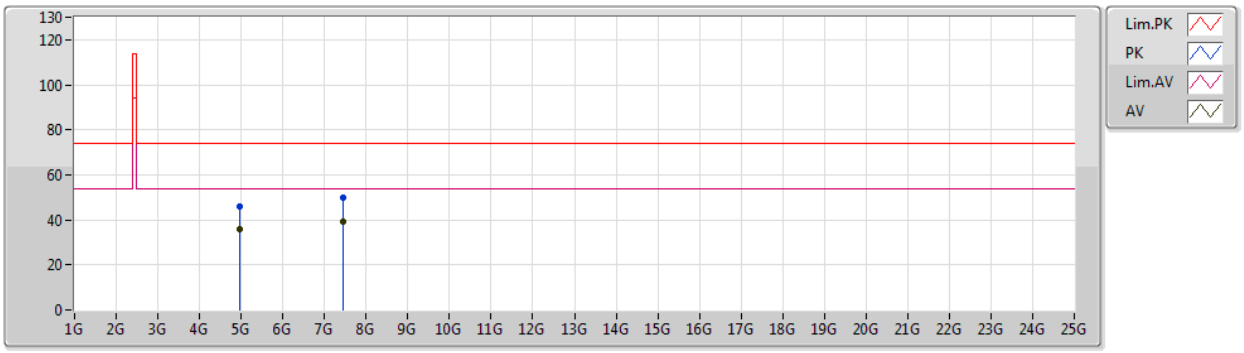


Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
AV	4.96024G	33.95	54.00	-20.05	2.02	3	Vertical	359	1.23	-
AV	7.43766G	39.27	54.00	-14.73	7.80	3	Vertical	209	2.23	-
PK	4.97296G	44.49	74.00	-29.51	2.05	3	Vertical	359	1.23	-
PK	7.44612G	50.53	74.00	-23.47	7.82	3	Vertical	209	2.23	-

BT-LE(1Mbps)

2480MHz_TX

10/05/2019



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
AV	4.95952G	35.99	54.00	-18.01	2.02	3	Horizontal	26	1.50	-
AV	7.4502G	39.32	54.00	-14.68	7.82	3	Horizontal	191	1.77	-
PK	4.9594G	46.06	74.00	-27.94	2.02	3	Horizontal	26	1.50	-
PK	7.45422G	50.10	74.00	-23.90	7.83	3	Horizontal	191	1.77	-