FCC Test Report

FCC ID	:	**Q9DAPEX017**
Equipment	:	**Wireless Access Point**
Brand Name	:	**aruba、Hewlett Packard Enterprise**
Model Name	:	**APEX017**
Applicant	:	**Hewlett Packard Enterprise Company 3333 Scott Blvd Santa Clara, CA. 94089**
Manufacturer	:	**Hewlett Packard Enterprise Company 3333 Scott Blvd Santa Clara, CA. 94089**
Standard	:	**47 CFR FCC Part 15.247**

The product was received on May 27, 2019, and testing was started from May 29, 2019 and completed on Jun. 17, 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.

Allen Lin

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
FR952258AL	01	Initial issue of report	Jul. 24, 2019
FR952258AL	02	1. Update address of Applicant and Manufacturer 2. Update Antenna Information	Aug. 05, 2019

Summary of Test Result

Report Clause	Ref. Std. Clause	Test Items	Result (PASS/FAIL)	Remark
1.1.2	15.203	Antenna Requirement	PASS	FCC 15.203
3.1	15.207	AC Power-line Conducted Emissions	PASS	FCC 15.207
3.2	15.247(a)	DTS Bandwidth	PASS	≥500kHz
3.3	15.247(b)	Maximum Conducted Output Power	PASS	Power [dBm]:30
3.4	15.247(e)	Power Spectral Density	PASS	PSD [dBm/3kHz]:8
3.5	15.247(d)	Emissions in Non-restricted Frequency Bands	PASS	Non-Restricted Bands:>30 dBc
3.6	15.247(d)	Emissions in Restricted Frequency Bands	PASS	Restricted Bands: FCC 15.209

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: Ann Hou

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 for DSSS.
- BWch is the nominal channel bandwidth.
- TX is the abbreviation of Transmits.

1.1.2 Antenna Information

Ant.	Brand	Model Name	Antenna Type	Connector
1	HPE	ANT-17	Dipole Antenna	I-PEX
2	HPE	ANT-17	Dipole Antenna	I-PEX
3	HPE	ANT-17	Dipole Antenna	I-PEX
4	HPE	ANT-17	Dipole Antenna	I-PEX

Ant.	Port	Gain (dBi)				
		2.4G		5G		BT
		Vertical polarized	Horizontal polarized	Vertical polarized	Horizontal polarized	
1	1	-	1.8	-	3.5	-
2	2	1.8	-	-	-	-
3	3	-	-	3.5	-	-
4	4	-	-	-	-	2.7

Ant.	Port	Elevation angle above 30 degrees Gain (dBi)	
		5G	
		Vertical polarized	Horizontal polarized
1	1	-	0.9
2	2	-	-
3	3	0.9	-
4	4	-	-

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.

Cross-polarized antenna combination is Ant.1 with Ant.2.

For 5GHz function:

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

Ant. 1 (port 1) and Ant. 3 (port 3) could transmit/receive simultaneously.

Cross-polarized antenna combination is Ant.1 with Ant.3.

For BT function:

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

Ant. 4 (port 4) could transmit/receive simultaneously.

1.1.3 EUT Information

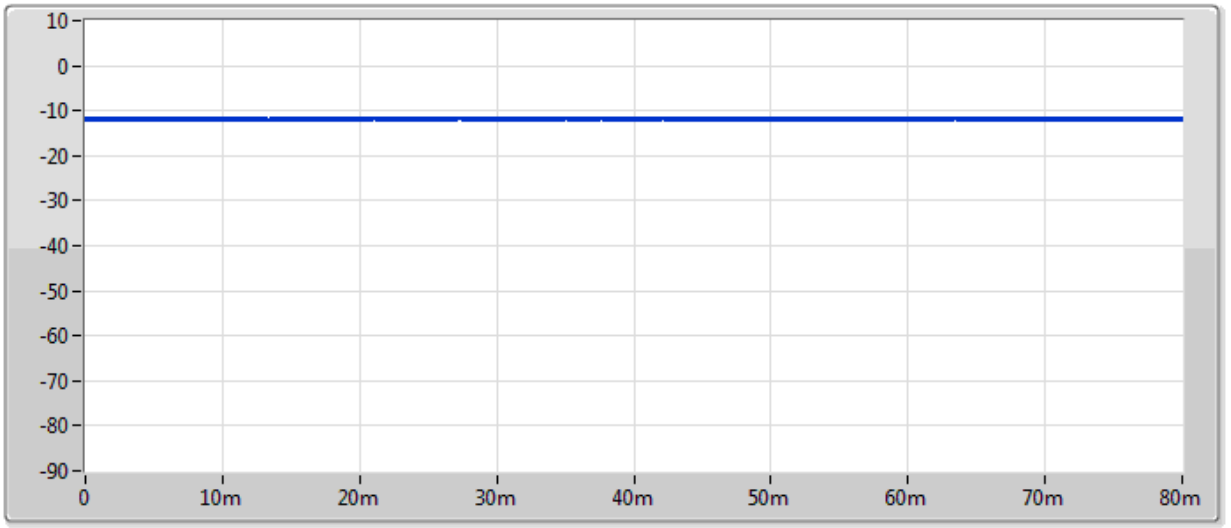
Identify EUT				
Software version	R6201.1.0.3.009			
Operational Condition				
EUT Power Type	From PoE			
EUT Function	☒	Point-to-multipoint	☐	Point-to-point
Type of EUT				
☒	Stand-alone			
☐	Combined (EUT where the radio part is fully integrated within another device)			
	Combined Equipment - Brand 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) ≥ 1/T
BT-LE(1Mbps)	1	0	n/a (DC>=0.98)	n/a (DC>=0.98)

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

BT-LE(1Mbps)



CF	RBW	VBW	Sweep Time	Total Sample	Sample Time	TX Time	DC
2.402GHz	1MHz	3MHz	80ms	32001	2.5us	80ms	1

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

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
AC Conduction	CO01-HY	Edward	22.5~26°C / 58.3~63.1%	01/Jun/2019
RF Conducted	TH01-HY	Andy	20.3~22°C / 59~63%	31/May/2019~13/Jun/2019
Radiated	03CH03-HY	Andy	23.2~24.1°C / 51.2~62.4%	29/May/2019~17/Jun/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 °C	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	DoS

Mode	Power Setting
BT-LE(1Mbps)	-
2402MHz	03
2440MHz	03
2480MHz	03

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	Continuous Transmits
1	PoE 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	Continuous Transmits		
1	PoE mode		
Operating Mode > 1GHz	Continuous Transmits		
Orthogonal Planes of EUT	**X Plane**	**Y Plane**	**Z Plane**
Worst Planes of EUT	V		

The Worst Case Mode for Following Conformance Tests	
Tests Item	Simultaneous Transmission Analysis
Test Condition	Radiated measurement
Operating Mode	Normal link
1	Bluetooth+WLAN 2.4GHz+WLAN 5GHz
Refer to Sporton Test Report No.: Appendix G for Radiated Emission Co-location	
Operating Mode	Continuous Transmits
2	Bluetooth+WLAN 2.4GHz+WLAN 5GHz
Refer to Sporton Test Report No.: FA952258 for Co-location RF Exposure Evaluation.	

2.4 Support Equipment

Support Equipment – AC Conduction				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
1	PoE	PowerDsine	PD-3501G/AC	N/A

Note: Support equipment No.1 was provided by customer.

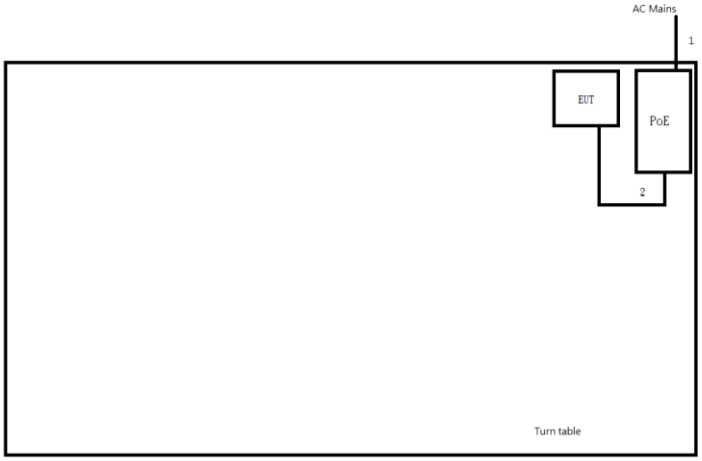
Support Equipment – RF Conducted				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
1	Notebook	DELL	E5410	DoC
2	Adapter for Notebook	DELL	HA65NM130	DoC
3	AC Power Source	GW	APS-9102	N/A

Support Equipment – Radiated Emission				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
1	PoE	PowerDsine	PD-3501G/AC	N/A

Note: Support equipment No.1 was provided by customer.

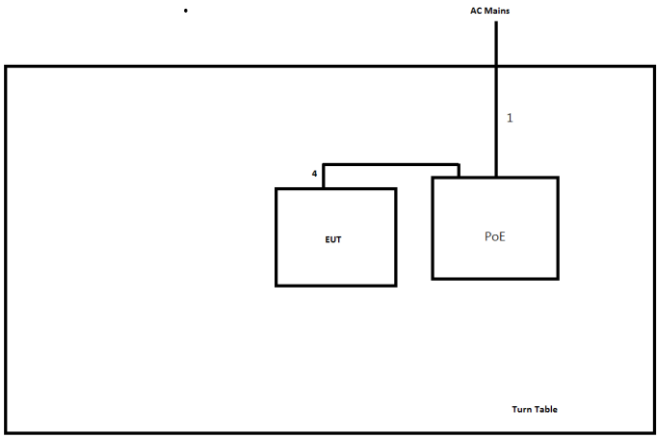
2.5 Test Setup Diagram

Test Setup Diagram – AC Line Conducted Emission Test



Item	Connection	Shielded	Length
1	AC Power line	No	1.5m
2	Lan Cable	No	1.0m

Test Setup Diagram - Radiated Test



Item	Connection	Shielded	Length
1	AC Power line	No	1.5m
2	Lan Cable	No	1.0m

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

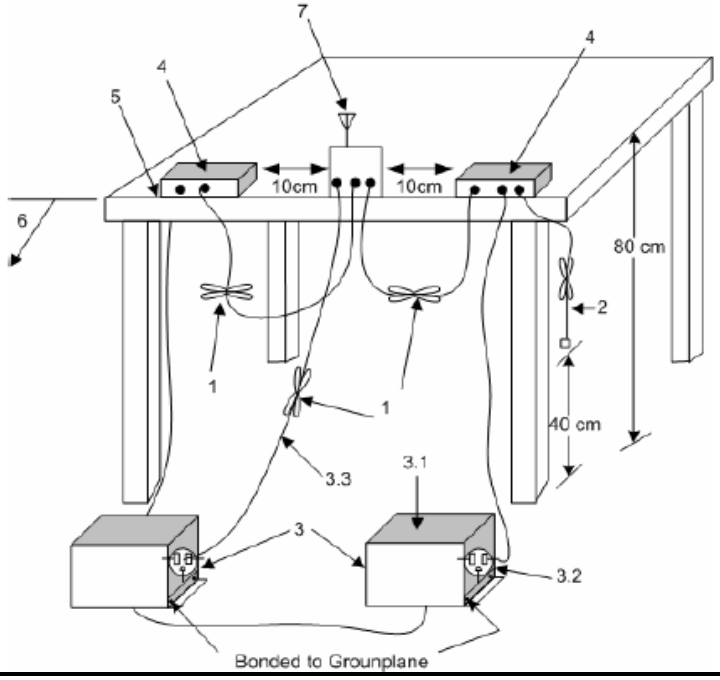
Refer a test equipment and calibration data table in this test report.

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

AC Power-line Conducted Emissions



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 ≥ 500 kHz.

3.2.2 Measuring Instruments

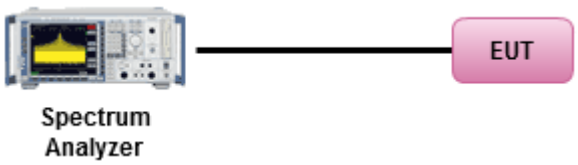
Refer a test equipment and calibration data table in this test report.

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 for occupied bandwidth testing.
	☐ Refer as ANSI C63.10, clause 6.9.3 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 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): $P_{eirp} \leq MAX(36, [P_{Out} + G_{TX}])$ dBm	
	▪ Smart antenna system (SAS)	
		- Single beam: $P_{eirp} \leq MAX(36, P_{Out} + G_{TX})$ dBm
		- Overlap beam: $P_{eirp} \leq MAX(36, P_{Out} + G_{TX})$ dBm
		- Aggregate power on all beams: $P_{eirp} \leq MAX(36, [P_{Out} + G_{TX} + 8])$ 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: $P_{total} = P_1 + P_2 + \ldots + P_n$ (calculated in linear unit [mW] and transfer to log unit [dBm]) $EIRP_{total} = P_{total} + DG$

3.3.4 Test Setup

Maximum Conducted Output Power (Power Meter)

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

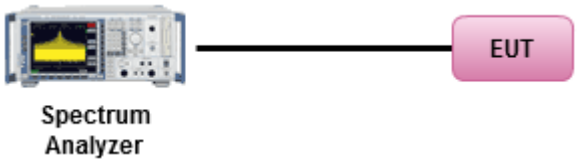
3.4.2 Measuring Instruments

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) Method PKPSD.	
▪ 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

Power Spectral Density


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

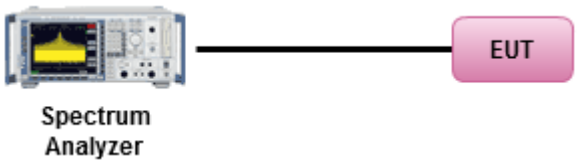
Refer a test equipment and calibration data table in this test report.

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

Emissions in Non-restricted Frequency Bands



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 below30 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.

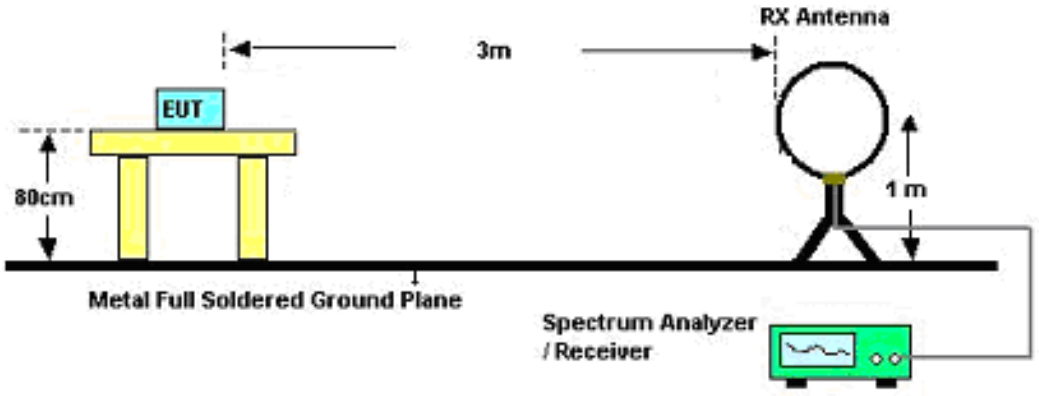
3.6.3 Test Procedures

Test Method	
▪ The average emission levels shall be measured in [duty cycle ≥ 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 (i.e., 1 MHz).
▪ 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 ≥ 1 GHz for peak measurement. For average measurement, refer as 1.1.4.

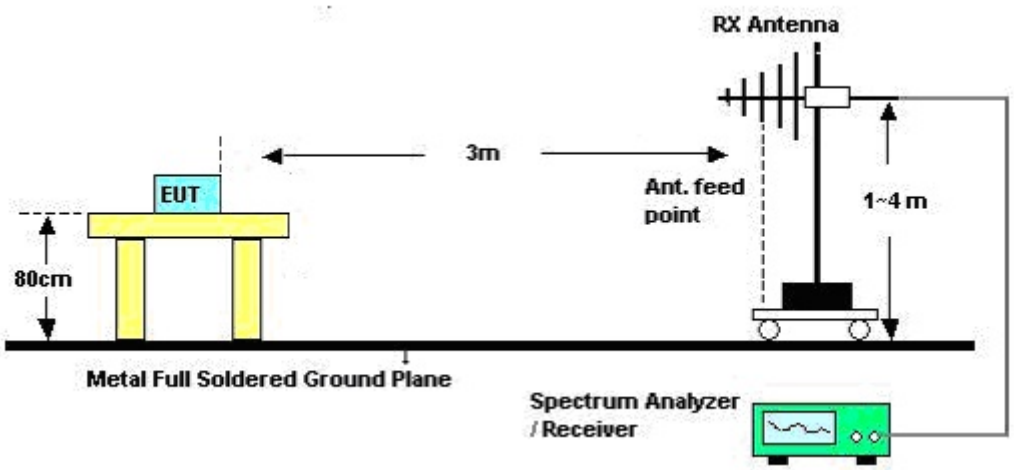
3.6.4 Test Setup

Emissions in Restricted Frequency Bands

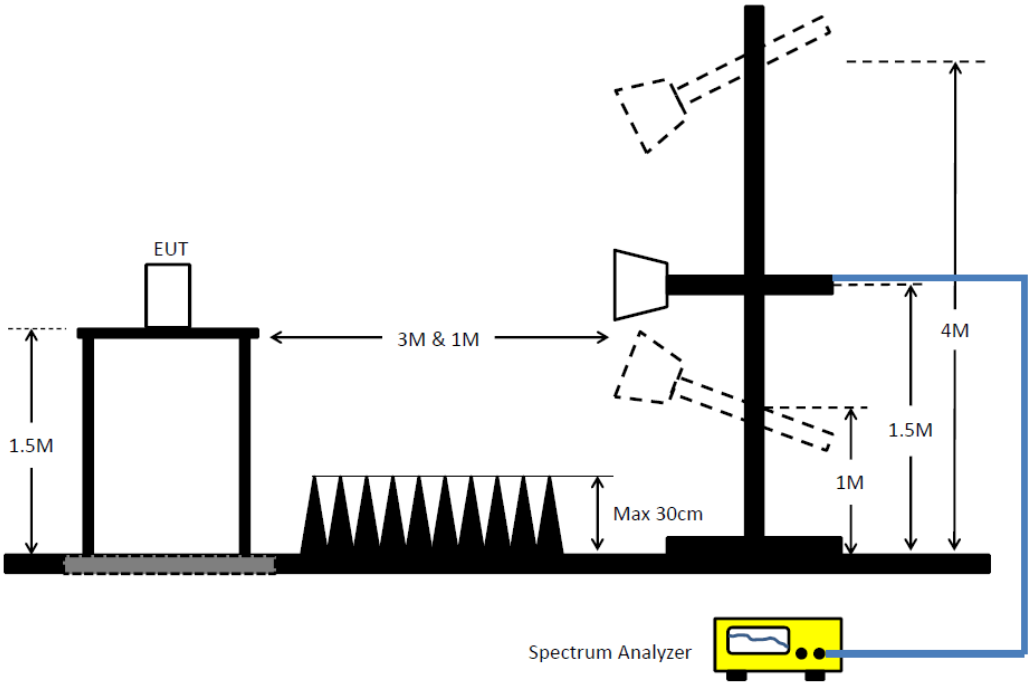
9kHz ~30MHz



30MHz~1GHz



Above 1GHz



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	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

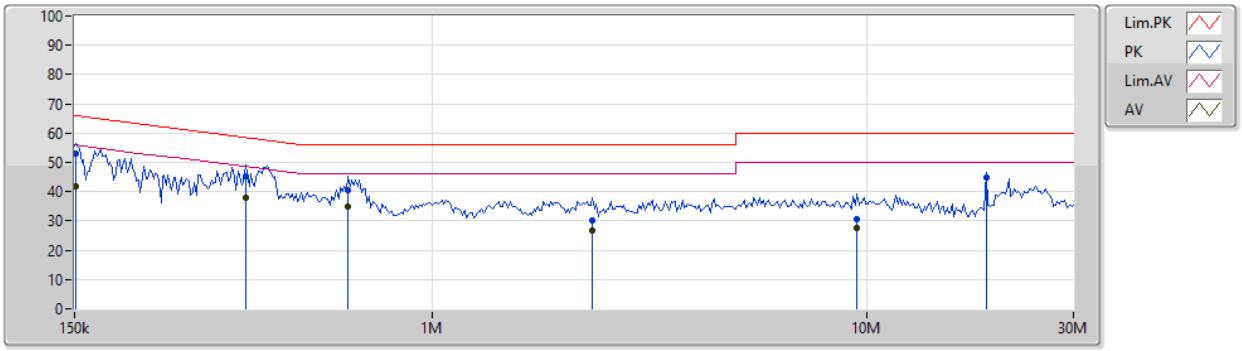
Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30MHz ~ 1GHz 3m	30/Oct/2018	29/Oct/2019
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	1GHz ~ 18GHz 3m	30/Oct/2018	29/Oct/2019
Amplifier	IFI	SCCXL150	03CH03-HY	10KHz ~ 100MHz	14/Sep/2017	13/Sep/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 6m	HUBER+SUHNER	SUOFLEX 104	SN 805801/4	1GHz ~ 40GHz	21/Mar/2019	20/Mar/2020
RF CABLE 7m	HUBER+SUHNER	SUOFLEX 104	SN 805805/4	1GHz ~ 40GHz	01/May/2019	30/Apr/2020
Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA 9170221	15GHz ~ 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
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	101013	10Hz~40GHz	13/Mar/2019	12/Mar/2020
Power Sensor	Anritsu	MA2411B	1339407	300MHz ~ 40GHz	17/Nov/2018	16/Nov/2019
Power Meter	Anritsu	ML2495A	1517010	300MHz ~ 40GHz	17/Nov/2018	16/Nov/2019
Cable 0.2m	HUBER	MY10710/4	RF Cable - 01	30MHz ~18G	21/Mar/2019	20/Mar/2020
Cable 0.2m	HUBER	MY10711/4	RF Cable - 02	30MHz ~18G	21/Mar/2019	20/Mar/2020
Cable 0.5m	HUBER	MY39470/4	RF Cable - 29	30MHz ~18G	21/Mar/2019	20/Mar/2020
SMB100A Signal Generator	R&S	SMB100A03	181147	100kHz~40GHz	12/Nov/2018	10/Nov/2020

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

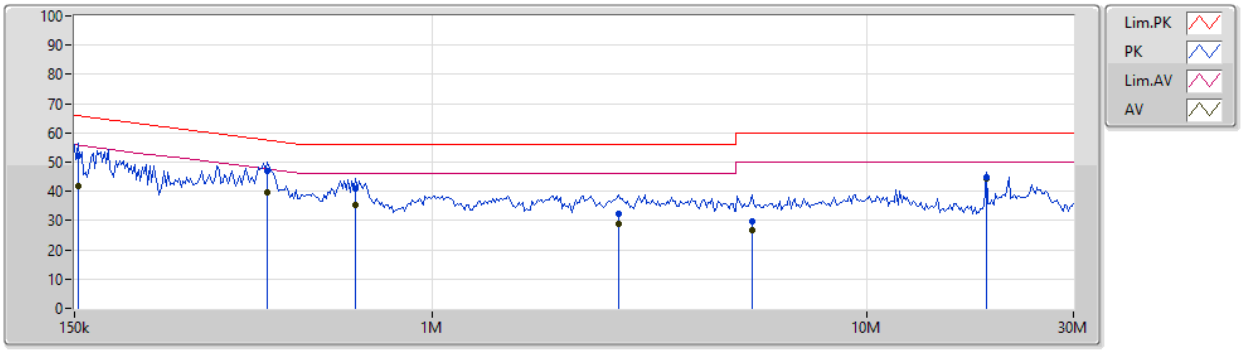
01/06/2019



Type	Freq	Level	Limit	Margin	Factor	Condition	Comment	Raw	LISN	CL	AT
	(Hz)	(dBuV)	(dBuV)	(dB)	(dB)			(dBuV)	(dB)	(dB)	(dB)
QP	151.5k	53.04	65.92	-12.88	19.52	Neutral	-	33.52	9.65	0.01	9.86
AV	151.5k	41.98	55.92	-13.94	19.52	Neutral	-	22.46	9.65	0.01	9.86
QP	370.968k	45.39	58.49	-13.10	19.51	Neutral	-	25.88	9.64	0.01	9.86
AV	370.968k	37.98	48.49	-10.51	19.51	Neutral	-	18.47	9.64	0.01	9.86
QP	641.227k	40.64	56.00	-15.36	19.51	Neutral	-	21.13	9.64	0.01	9.86
AV	641.227k	34.75	46.00	-11.25	19.51	Neutral	-	15.24	9.64	0.01	9.86
QP	2.338M	30.11	56.00	-25.89	19.56	Neutral	-	10.55	9.65	0.04	9.87
AV	2.338M	26.79	46.00	-19.21	19.56	Neutral	-	7.23	9.65	0.04	9.87
QP	9.508M	30.51	60.00	-29.49	19.68	Neutral	-	10.83	9.71	0.07	9.90
AV	9.508M	27.66	50.00	-22.34	19.68	Neutral	-	7.98	9.71	0.07	9.90
QP	18.892M	44.93	60.00	-15.07	19.77	Neutral	-	25.16	9.71	0.11	9.95
AV	18.892M	44.73	50.00	-5.27	19.77	Neutral	"Worst"	24.96	9.71	0.11	9.95

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

01/06/2019



Type	Freq	Level	Limit	Margin	Factor	Condition	Comment	Raw	LISN	CL	AT
	(Hz)	(dBuV)	(dBuV)	(dB)	(dB)			(dBuV)	(dB)	(dB)	(dB)
QP	153.015k	52.28	65.83	-13.55	19.48	Line	-	32.80	9.61	0.01	9.86
AV	153.015k	41.76	55.83	-14.07	19.48	Line	-	22.28	9.61	0.01	9.86
QP	418.016k	47.02	57.49	-10.47	19.48	Line	-	27.54	9.61	0.01	9.86
AV	418.016k	39.53	47.49	-7.96	19.48	Line	-	20.05	9.61	0.01	9.86
QP	667.263k	41.08	56.00	-14.92	19.48	Line	-	21.60	9.61	0.01	9.86
AV	667.263k	35.29	46.00	-10.71	19.48	Line	-	15.81	9.61	0.01	9.86
QP	2.687M	32.50	56.00	-23.50	19.53	Line	-	12.97	9.62	0.04	9.87
AV	2.687M	28.94	46.00	-17.06	19.53	Line	-	9.41	9.62	0.04	9.87
QP	5.446M	29.68	60.00	-30.32	19.57	Line	-	10.11	9.64	0.05	9.88
AV	5.446M	26.73	50.00	-23.27	19.57	Line	-	7.16	9.64	0.05	9.88
QP	18.892M	44.77	60.00	-15.23	19.69	Line	-	25.08	9.63	0.11	9.95
AV	18.892M	44.33	50.00	-5.67	19.69	Line	"Worst"	24.64	9.63	0.11	9.95

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	1.059M	1M06F1D	676.25k	1.056M

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

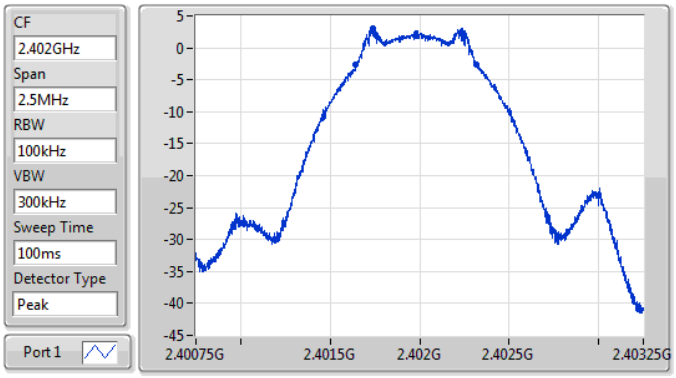
Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
BT-LE(1Mbps)	-	-	-	-
2402MHz_TnomVnom	Pass	500k	676.25k	1.059M
2440MHz_TnomVnom	Pass	500k	687.5k	1.057M
2480MHz_TnomVnom	Pass	500k	682.5k	1.056M

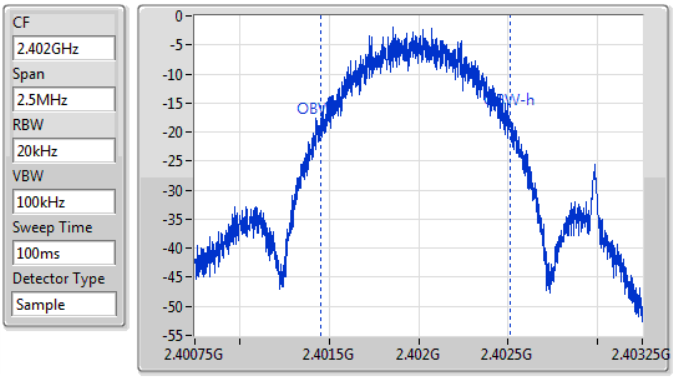
Port X-N dB = Port **X** 6dB down bandwidth; **Port X-OBW** = Port **X** 99% occupied bandwidth;

BT-LE(1Mbps) EBW

2402MHz

31/05/2019



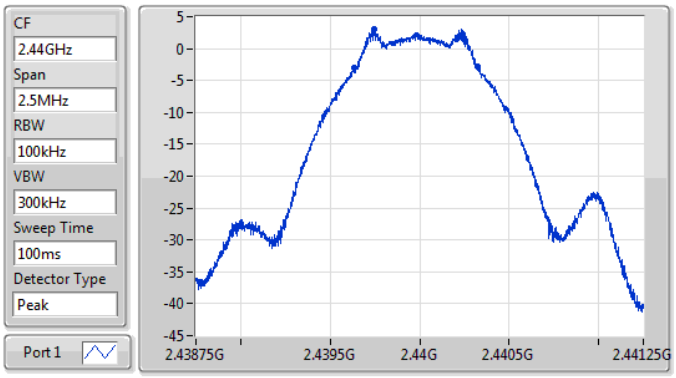


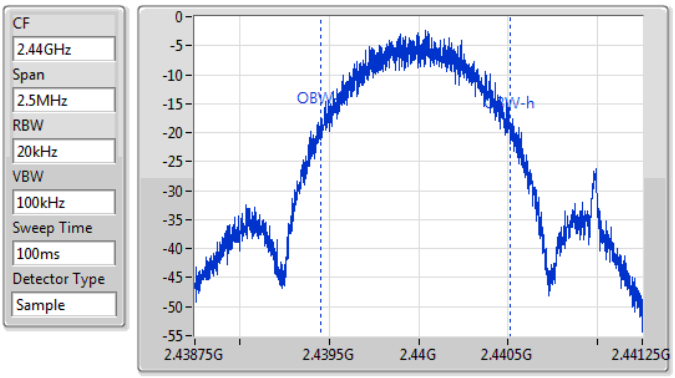
6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
676.25k	2.401644G	2.40232G	1.059M	2.401454G	2.402513G	500k	1

BT-LE(1Mbps) EBW

2440MHz

31/05/2019



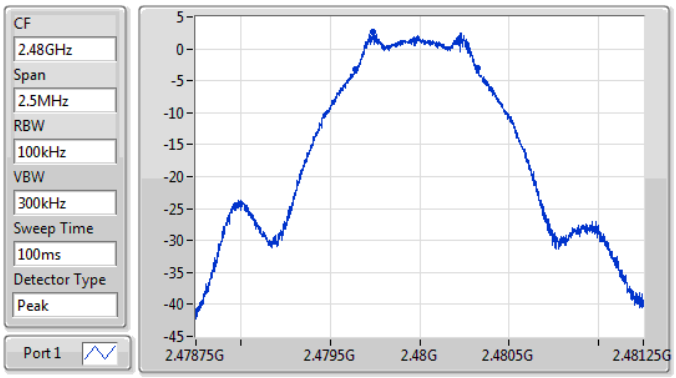


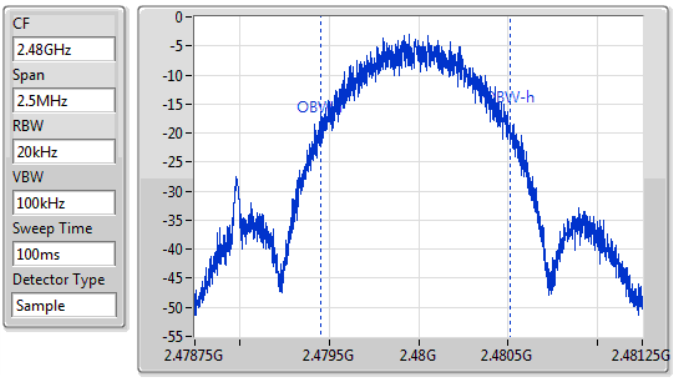
6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
687.5k	2.439638G	2.440325G	1.057M	2.439457G	2.440513G	500k	1

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

2480MHz

31/05/2019





6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
682.5k	2.479641G	2.480324G	1.056M	2.479453G	2.480508G	500k	1

Summary

Mode	Power (dBm)	Power (W)
2.4-2.4835GHz	-	-
BT-LE(1Mbps)	2.99	0.00199

Result

Mode	Result	Gain (dBi)	Power (dBm)	Power Limit (dBm)
BT-LE(1Mbps)	-	-	-	-
2402MHz_TnomVnom	Pass	2.70	2.99	30.00
2440MHz_TnomVnom	Pass	2.70	2.79	30.00
2480MHz_TnomVnom	Pass	2.70	2.49	30.00

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

Summary

Mode	PD (dBm/RBW)
2.4-2.4835GHz	-
BT-LE(1Mbps)	-9.26

RBW=3 kHz.

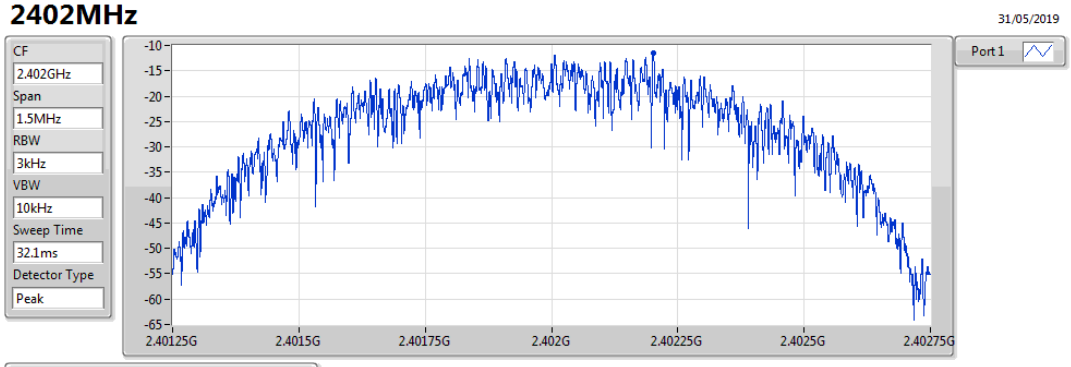
Result

Mode	Result	Gain (dBi)	PD (dBm/RBW)	PD Limit (dBm/RBW)
BT-LE(1Mbps)	-	-	-	-
2402MHz_TnomVnom	Pass	2.70	-11.49	8.00
2440MHz_TnomVnom	Pass	2.70	-10.86	8.00
2480MHz_TnomVnom	Pass	2.70	-9.26	8.00

DG = Directional Gain; RBW=3 kHz;
PD = trace bin-by-bin of each transmits port summing can be performed maximum power density; **Port X** = Port X power density;

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

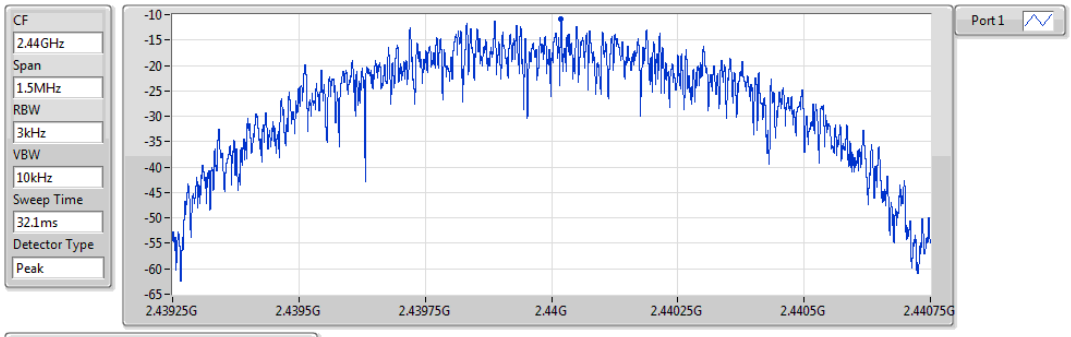
2402MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-11.49	-11.49	-11.49

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

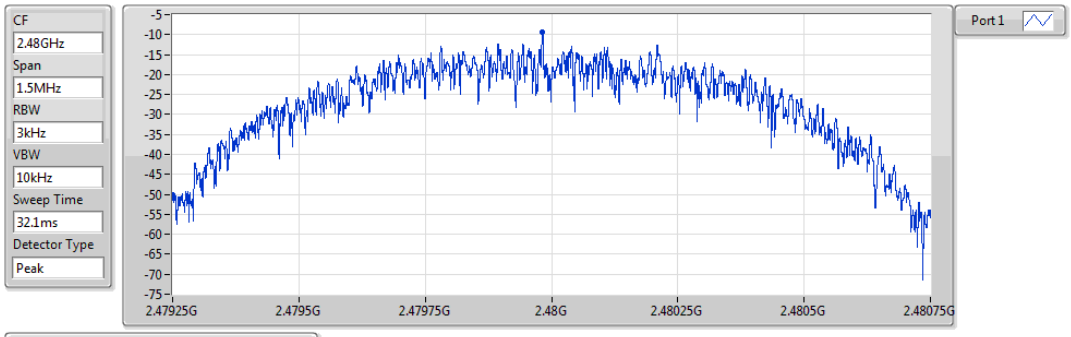
2440MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-10.86	-10.86	-10.86

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

2480MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-9.26	-9.26	-9.26

Summary

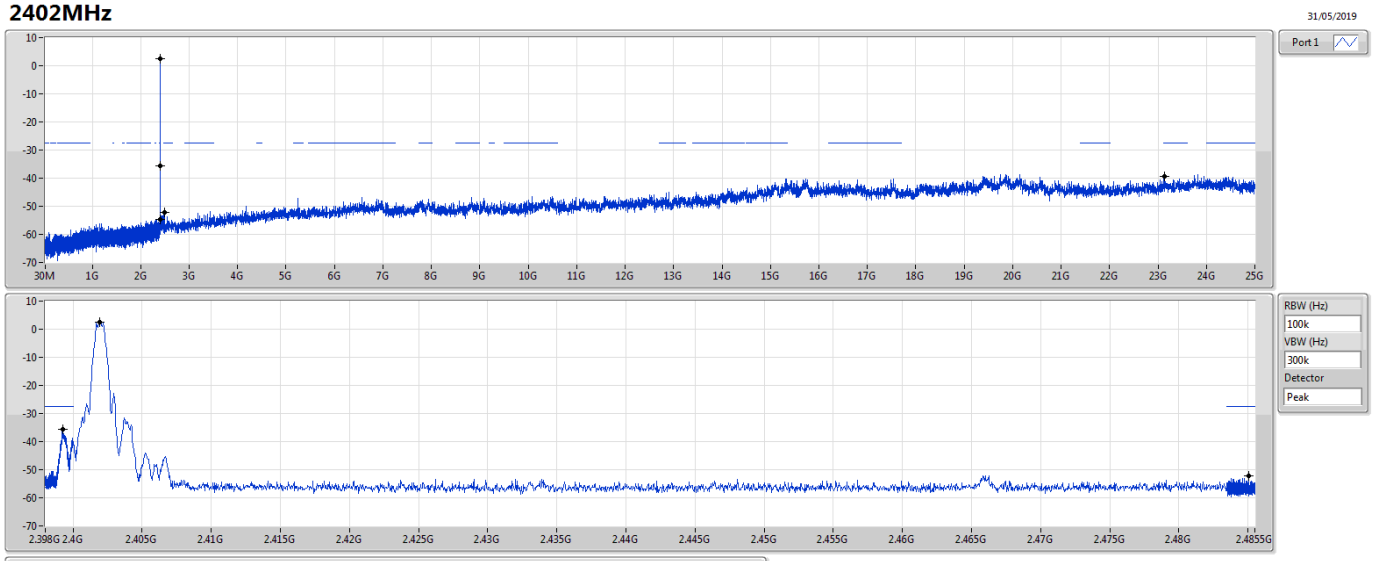
Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	2.40196G	2.62	-27.38	2.39652G	-54.71	2.39925G	-35.65	2.48507G	-52.17	23.13693G	-39.42	1

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_TnomVnom	Pass	2.40196G	2.62	-27.38	2.39652G	-54.71	2.39925G	-35.65	2.48507G	-52.17	23.13693G	-39.42	1
2440MHz_TnomVnom	Pass	2.40196G	2.62	-27.38	2.12746G	-55.00	2.39847G	-54.01	2.48354G	-52.86	24.45965G	-39.03	1
2480MHz_TnomVnom	Pass	2.40196G	2.62	-27.38	2.07743G	-55.01	2.39997G	-53.86	2.48523G	-49.94	24.06565G	-39.20	1

BT-LE(1Mbps) **CSE NdB**

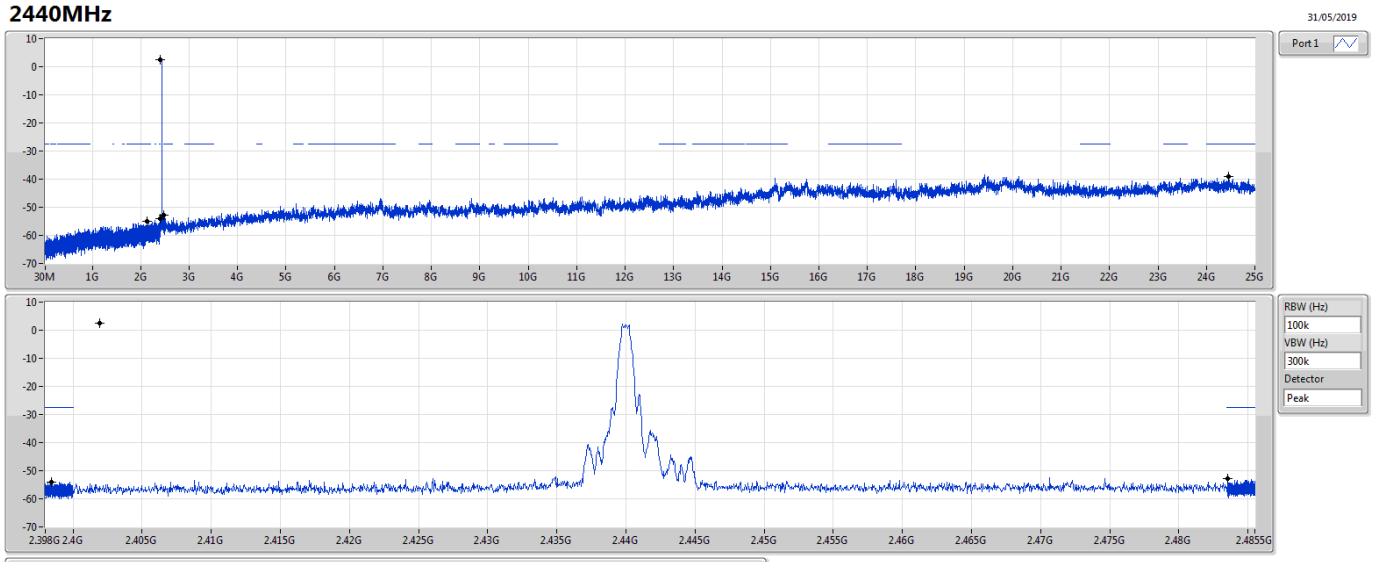
2402MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.40196G	2.62	-27.38	2.39652G	-54.71	2.39925G	-35.65	2.48507G	-52.17	23.13693G	-39.42	1

BT-LE(1Mbps) **CSE NdB**

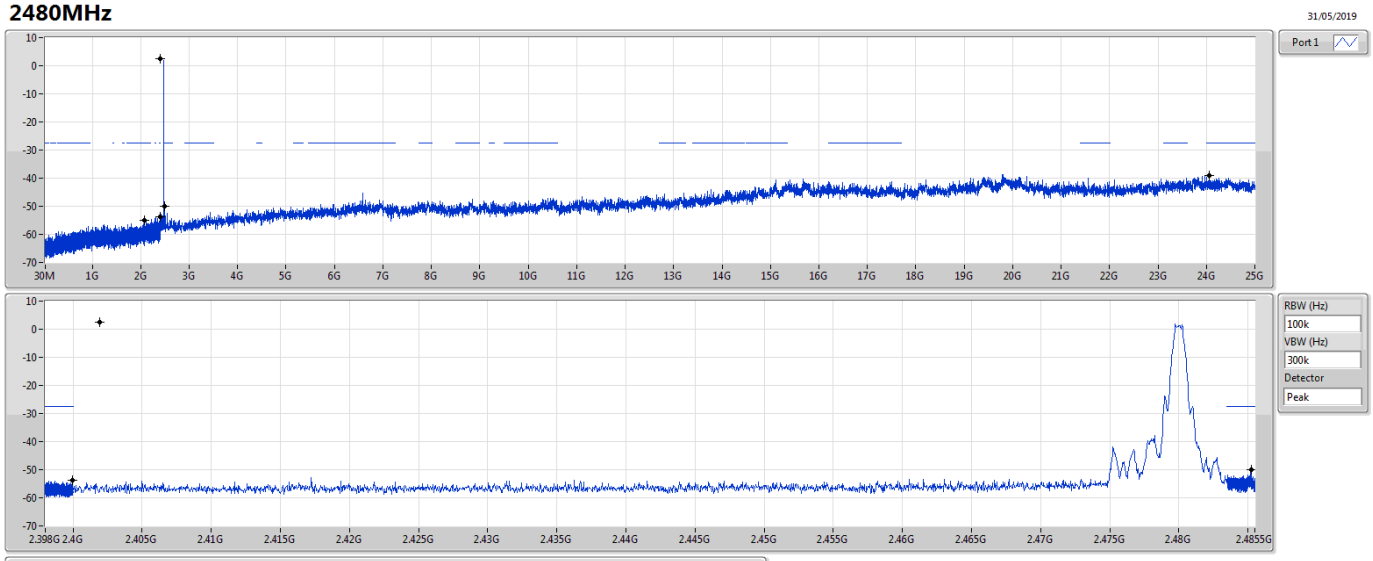
2440MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.40196G	2.62	-27.38	2.12746G	-55.00	2.39847G	-54.01	2.48354G	-52.86	24.45965G	-39.03	1

BT-LE(1Mbps) **CSE NdB**

2480MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.40196G	2.62	-27.38	2.07743G	-55.01	2.39997G	-53.86	2.48523G	-49.94	24.06565G	-39.20	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	PK	55.22M	32.98	40.00	-7.02	-25.00	-	Vertical	360	1.00	-

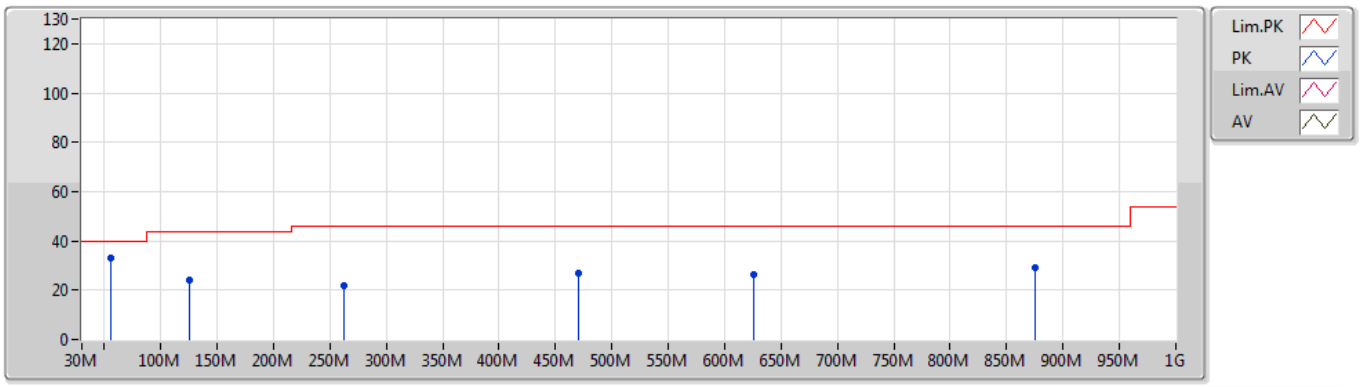
Result

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	55.22M	32.98	40.00	-7.02	-25.00	-	Vertical	360	1.00	-
2440MHz	Pass	PK	125.06M	24.08	43.50	-19.42	-19.00	-	Vertical	360	1.00	-
2440MHz	Pass	PK	262.8M	21.86	46.00	-24.14	-15.81	-	Vertical	360	1.00	-
2440MHz	Pass	PK	470.38M	26.80	46.00	-19.20	-12.25	-	Vertical	360	1.00	-
2440MHz	Pass	PK	625.58M	26.48	46.00	-19.52	-9.73	-	Vertical	360	1.00	-
2440MHz	Pass	PK	875.84M	29.04	46.00	-16.96	-6.62	-	Vertical	360	1.00	-
2440MHz	Pass	PK	59.1M	19.34	40.00	-20.66	-25.39	-	Horizontal	0	1.00	-
2440MHz	Pass	PK	123.12M	22.88	43.50	-20.62	-19.03	-	Horizontal	0	1.00	-
2440MHz	Pass	PK	185.2M	18.73	43.50	-24.77	-21.26	-	Horizontal	0	1.00	-
2440MHz	Pass	PK	262.8M	21.24	46.00	-24.76	-15.81	-	Horizontal	0	1.00	-
2440MHz	Pass	PK	474.26M	31.86	46.00	-14.14	-12.19	-	Horizontal	0	1.00	-
2440MHz	Pass	PK	875.84M	29.62	46.00	-16.38	-6.62	-	Horizontal	0	1.00	-

BT-LE(1Mbps)

2440MHz_PoE

31/05/2019

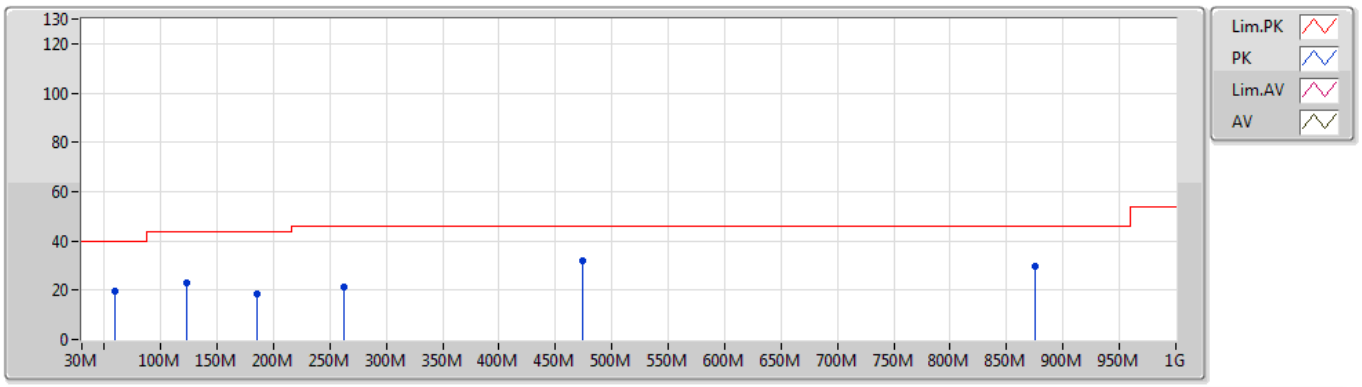


Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	55.22M	32.98	40.00	-7.02	-25.00	-	Vertical	360	1.00	-
PK	125.06M	24.08	43.50	-19.42	-19.00	-	Vertical	360	1.00	-
PK	262.8M	21.86	46.00	-24.14	-15.81	-	Vertical	360	1.00	-
PK	470.38M	26.80	46.00	-19.20	-12.25	-	Vertical	360	1.00	-
PK	625.58M	26.48	46.00	-19.52	-9.73	-	Vertical	360	1.00	-
PK	875.84M	29.04	46.00	-16.96	-6.62	-	Vertical	360	1.00	-

BT-LE(1Mbps)

2440MHz_PoE

31/05/2019



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	59.1M	19.34	40.00	-20.66	-25.39	-	Horizontal	0	1.00	-
PK	123.12M	22.88	43.50	-20.62	-19.03	-	Horizontal	0	1.00	-
PK	185.2M	18.73	43.50	-24.77	-21.26	-	Horizontal	0	1.00	-
PK	262.8M	21.24	46.00	-24.76	-15.81	-	Horizontal	0	1.00	-
PK	474.26M	31.86	46.00	-14.14	-12.19	-	Horizontal	0	1.00	-
PK	875.84M	29.62	46.00	-16.38	-6.62	-	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	2.4835G	51.76	54.00	-2.24	31.51	3	Horizontal	48	1.04	-

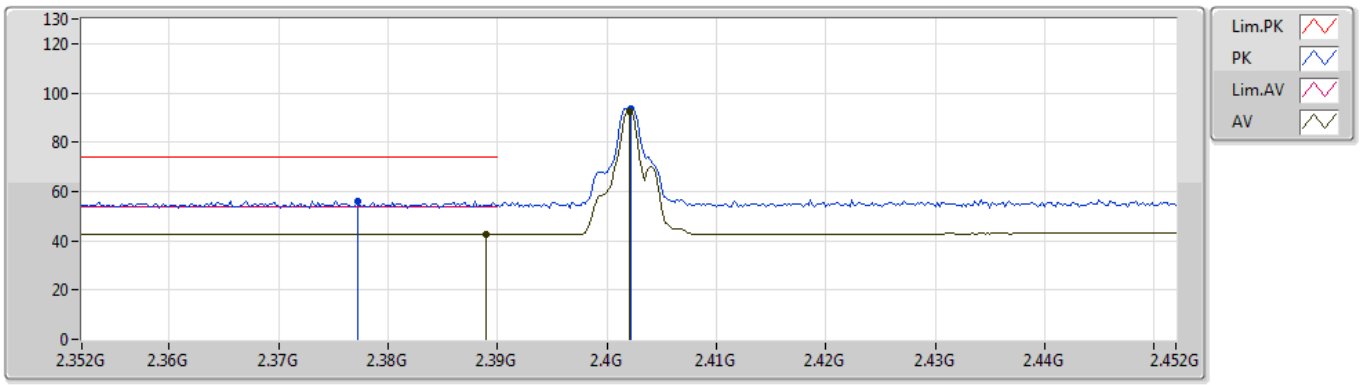
Result

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	Pass	AV	2.389G	42.53	54.00	-11.47	31.11	3	Vertical	271	1.01	-
2402MHz	Pass	AV	2.402G	92.53	Inf	-Inf	31.17	3	Vertical	271	1.01	-
2402MHz	Pass	PK	2.3772G	56.12	74.00	-17.88	31.06	3	Vertical	271	1.01	-
2402MHz	Pass	PK	2.4022G	93.58	Inf	-Inf	31.17	3	Vertical	271	1.01	-
2402MHz	Pass	AV	2.3898G	42.58	54.00	-11.42	31.11	3	Horizontal	48	1.76	-
2402MHz	Pass	AV	2.402G	97.54	Inf	-Inf	31.17	3	Horizontal	48	1.76	-
2402MHz	Pass	PK	2.3726G	56.70	74.00	-17.30	31.03	3	Horizontal	48	1.76	-
2402MHz	Pass	PK	2.4022G	98.52	Inf	-Inf	31.17	3	Horizontal	48	1.76	-
2402MHz	Pass	AV	4.80151G	32.81	54.00	-21.19	7.91	3	Vertical	161	1.50	-
2402MHz	Pass	PK	4.80261G	46.43	74.00	-27.57	7.91	3	Vertical	161	1.50	-
2402MHz	Pass	AV	4.8015G	32.76	54.00	-21.24	7.91	3	Horizontal	5	1.50	-
2402MHz	Pass	PK	4.80304G	46.79	74.00	-27.21	7.91	3	Horizontal	5	1.50	-
2440MHz	Pass	AV	2.3808G	42.52	54.00	-11.48	31.08	3	Vertical	271	1.50	-
2440MHz	Pass	AV	2.44G	92.37	Inf	-Inf	31.32	3	Vertical	271	1.50	-
2440MHz	Pass	AV	2.4984G	43.43	54.00	-10.57	31.58	3	Vertical	271	1.50	-
2440MHz	Pass	PK	2.3812G	56.68	74.00	-17.32	31.08	3	Vertical	271	1.50	-
2440MHz	Pass	PK	2.4404G	93.36	Inf	-Inf	31.32	3	Vertical	271	1.50	-
2440MHz	Pass	PK	2.4972G	56.83	74.00	-17.17	31.57	3	Vertical	271	1.50	-
2440MHz	Pass	AV	2.376G	42.61	54.00	-11.39	31.05	3	Horizontal	49	1.02	-
2440MHz	Pass	AV	2.44G	97.34	Inf	-Inf	31.32	3	Horizontal	49	1.02	-
2440MHz	Pass	AV	2.4968G	43.42	54.00	-10.58	31.57	3	Horizontal	49	1.02	-
2440MHz	Pass	PK	2.3428G	56.49	74.00	-17.51	30.91	3	Horizontal	49	1.02	-
2440MHz	Pass	PK	2.4404G	98.34	Inf	-Inf	31.32	3	Horizontal	49	1.02	-
2440MHz	Pass	PK	2.4884G	57.23	74.00	-16.77	31.53	3	Horizontal	49	1.02	-
2440MHz	Pass	AV	4.87778G	32.27	54.00	-21.73	8.10	3	Vertical	295	1.50	-
2440MHz	Pass	PK	4.87854G	46.23	74.00	-27.77	8.11	3	Vertical	295	1.50	-
2440MHz	Pass	AV	4.87752G	32.21	54.00	-21.79	8.10	3	Horizontal	82	1.50	-
2440MHz	Pass	PK	4.87775G	46.14	74.00	-27.86	8.10	3	Horizontal	82	1.50	-
2480MHz	Pass	AV	2.48G	93.07	Inf	-Inf	31.49	3	Vertical	276	1.00	-
2480MHz	Pass	AV	2.4835G	48.26	54.00	-5.74	31.51	3	Vertical	276	1.00	-
2480MHz	Pass	PK	2.4798G	94.09	Inf	-Inf	31.49	3	Vertical	276	1.00	-
2480MHz	Pass	PK	2.4835G	59.48	74.00	-14.52	31.51	3	Vertical	276	1.00	-
2480MHz	Pass	AV	2.48G	98.32	Inf	-Inf	31.49	3	Horizontal	48	1.04	-
2480MHz	Pass	AV	2.4835G	51.76	54.00	-2.24	31.51	3	Horizontal	48	1.04	-
2480MHz	Pass	PK	2.4798G	99.32	Inf	-Inf	31.49	3	Horizontal	48	1.04	-
2480MHz	Pass	PK	2.4835G	61.17	74.00	-12.83	31.51	3	Horizontal	48	1.04	-
2480MHz	Pass	AV	4.9604G	32.30	54.00	-21.70	7.96	3	Vertical	3	1.50	-
2480MHz	Pass	PK	4.95932G	45.90	74.00	-28.10	7.95	3	Vertical	3	1.50	-
2480MHz	Pass	AV	4.96023G	33.01	54.00	-20.99	7.96	3	Horizontal	298	1.00	-
2480MHz	Pass	PK	4.95971G	46.28	74.00	-27.72	7.96	3	Horizontal	298	1.00	-

BT-LE(1Mbps)

2402MHz_TX

30/05/2019

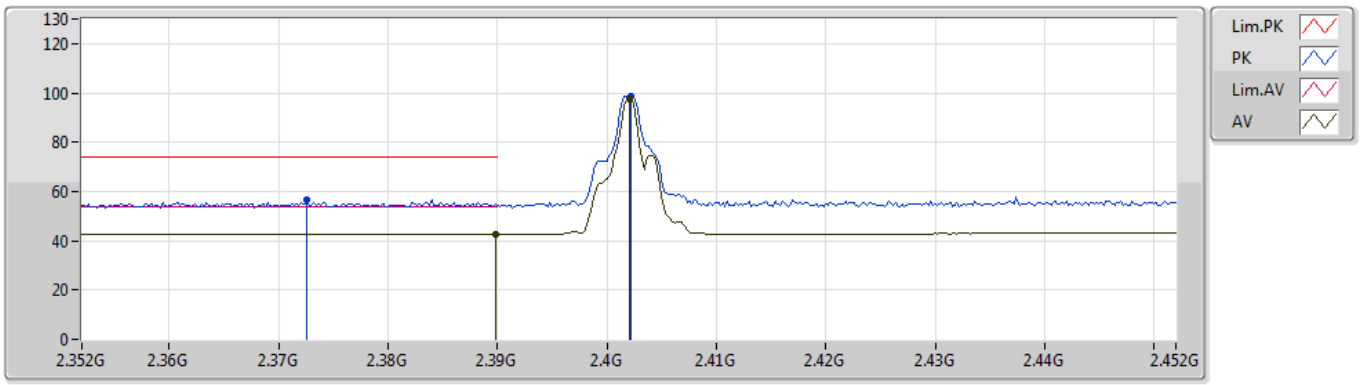


Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
AV	2.389G	42.53	54.00	-11.47	31.11	3	Vertical	271	1.01	-
AV	2.402G	92.53	Inf	-Inf	31.17	3	Vertical	271	1.01	-
PK	2.3772G	56.12	74.00	-17.88	31.06	3	Vertical	271	1.01	-
PK	2.4022G	93.58	Inf	-Inf	31.17	3	Vertical	271	1.01	-

BT-LE(1Mbps)

2402MHz_TX

30/05/2019

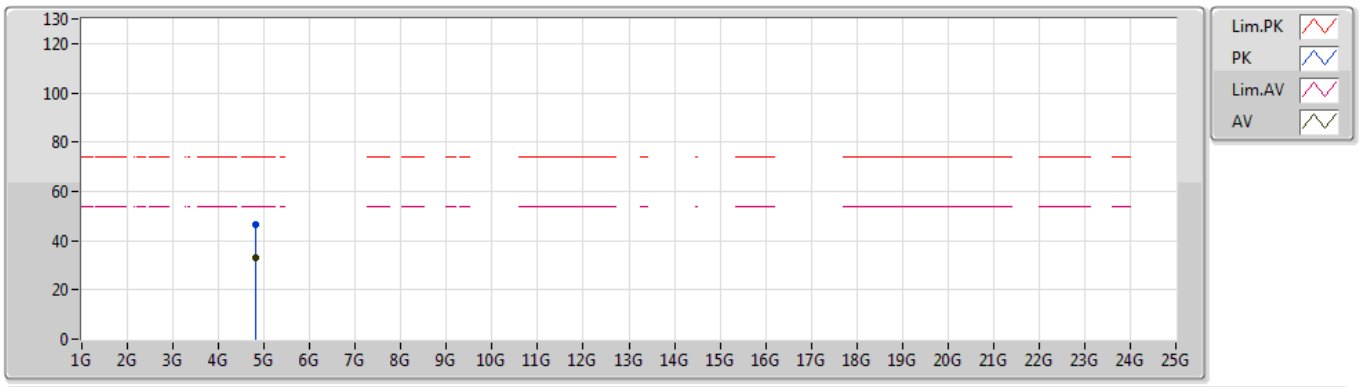


Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
AV	2.3898G	42.58	54.00	-11.42	31.11	3	Horizontal	48	1.76	-
AV	2.402G	97.54	Inf	-Inf	31.17	3	Horizontal	48	1.76	-
PK	2.3726G	56.70	74.00	-17.30	31.03	3	Horizontal	48	1.76	-
PK	2.4022G	98.52	Inf	-Inf	31.17	3	Horizontal	48	1.76	-

BT-LE(1Mbps)

2402MHz_TX

30/05/2019

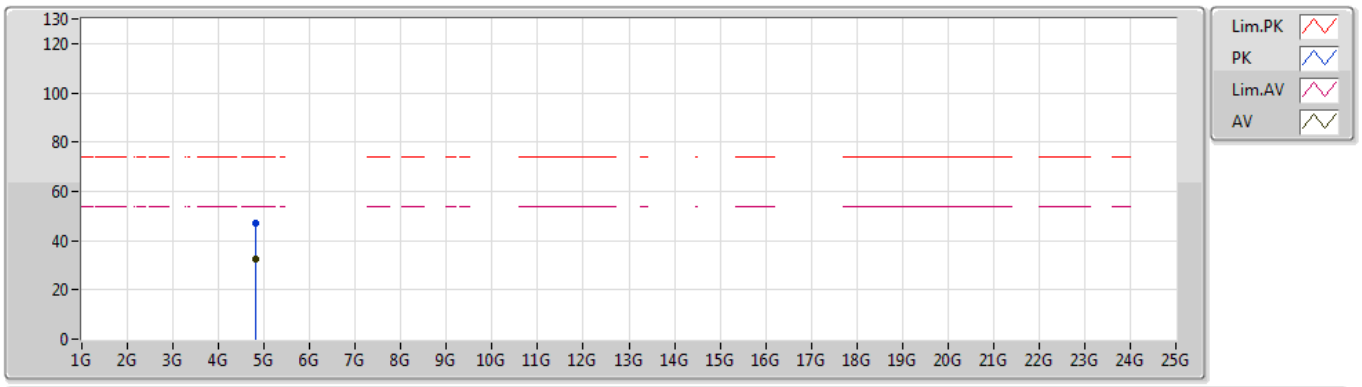


Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
AV	4.80151G	32.81	54.00	-21.19	7.91	3	Vertical	161	1.50	-
PK	4.80261G	46.43	74.00	-27.57	7.91	3	Vertical	161	1.50	-

BT-LE(1Mbps)

2402MHz_TX

30/05/2019

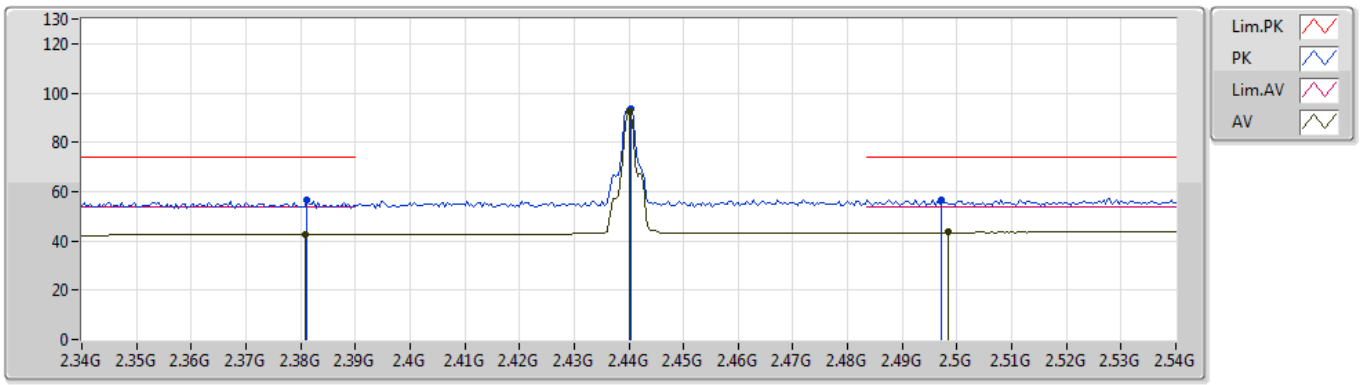


Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
AV	4.8015G	32.76	54.00	-21.24	7.91	3	Horizontal	5	1.50	-
PK	4.80304G	46.79	74.00	-27.21	7.91	3	Horizontal	5	1.50	-

BT-LE(1Mbps)

2440MHz_TX

30/05/2019

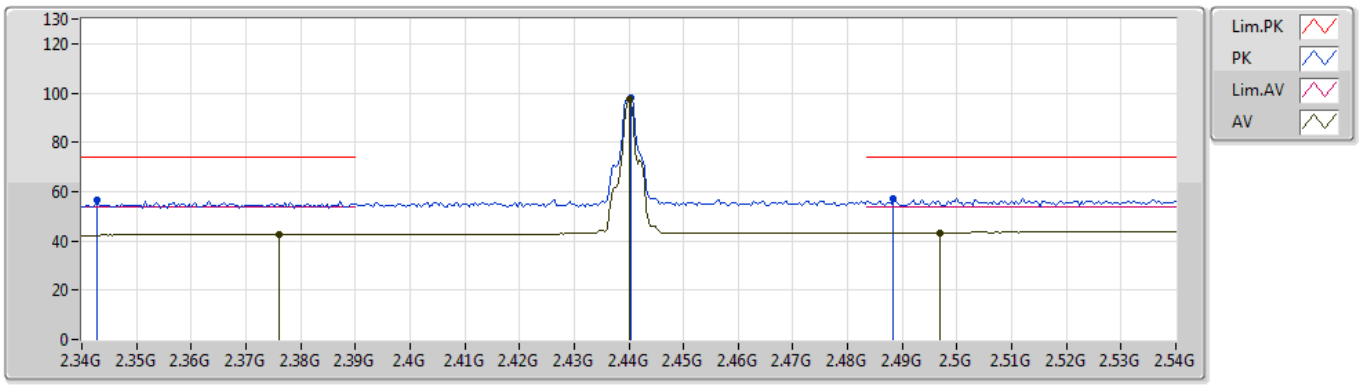


Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
AV	2.3808G	42.52	54.00	-11.48	31.08	3	Vertical	271	1.50	-
AV	2.44G	92.37	Inf	-Inf	31.32	3	Vertical	271	1.50	-
AV	2.4984G	43.43	54.00	-10.57	31.58	3	Vertical	271	1.50	-
PK	2.3812G	56.68	74.00	-17.32	31.08	3	Vertical	271	1.50	-
PK	2.4404G	93.36	Inf	-Inf	31.32	3	Vertical	271	1.50	-
PK	2.4972G	56.83	74.00	-17.17	31.57	3	Vertical	271	1.50	-

BT-LE(1Mbps)

2440MHz_TX

30/05/2019

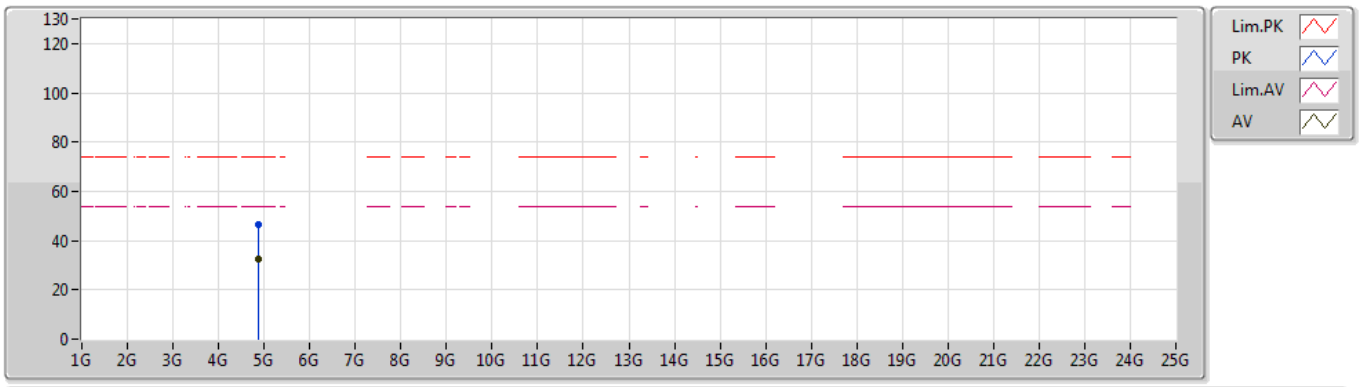


Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
AV	2.376G	42.61	54.00	-11.39	31.05	3	Horizontal	49	1.02	-
AV	2.44G	97.34	Inf	-Inf	31.32	3	Horizontal	49	1.02	-
AV	2.4968G	43.42	54.00	-10.58	31.57	3	Horizontal	49	1.02	-
PK	2.3428G	56.49	74.00	-17.51	30.91	3	Horizontal	49	1.02	-
PK	2.4404G	98.34	Inf	-Inf	31.32	3	Horizontal	49	1.02	-
PK	2.4884G	57.23	74.00	-16.77	31.53	3	Horizontal	49	1.02	-

BT-LE(1Mbps)

2440MHz_TX

30/05/2019

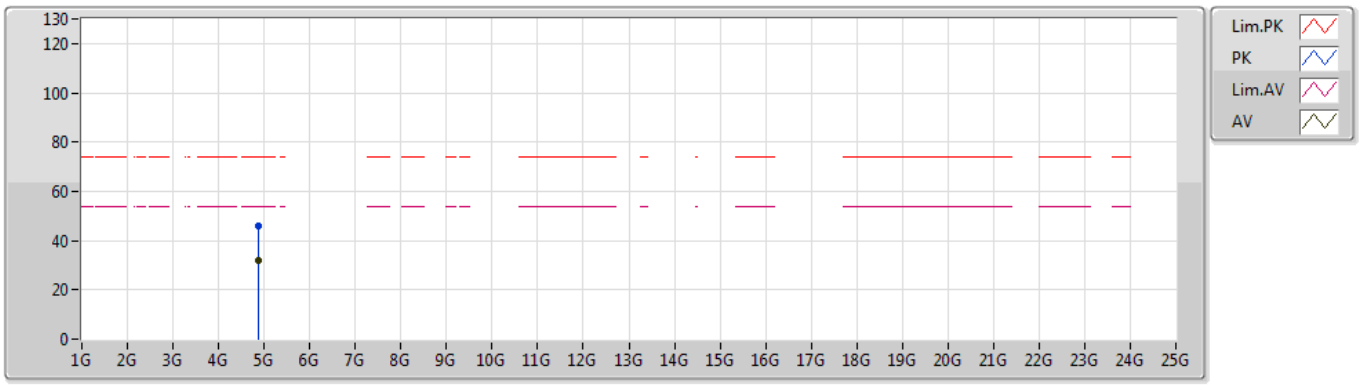


Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
AV	4.87778G	32.27	54.00	-21.73	8.10	3	Vertical	295	1.50	-
PK	4.87854G	46.23	74.00	-27.77	8.11	3	Vertical	295	1.50	-

BT-LE(1Mbps)

2440MHz_TX

30/05/2019

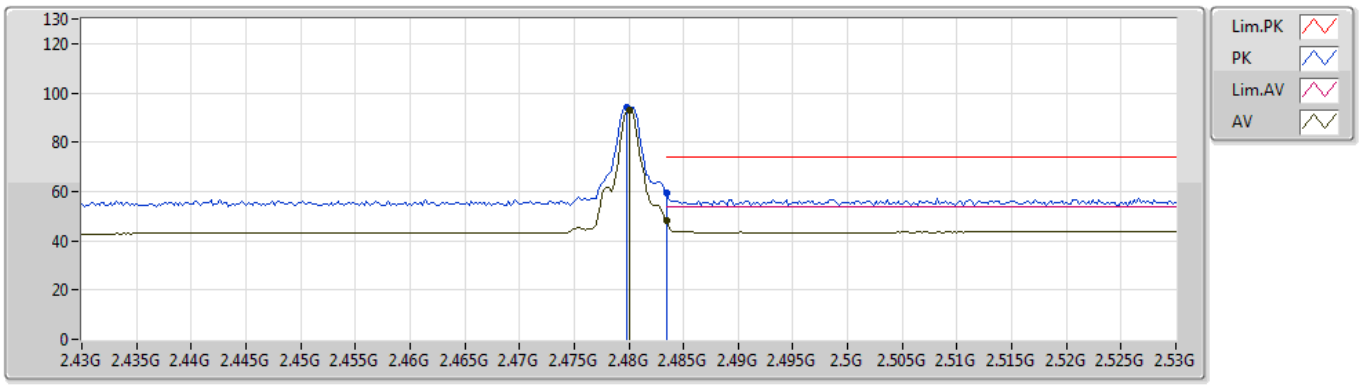


Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
AV	4.87752G	32.21	54.00	-21.79	8.10	3	Horizontal	82	1.50	-
PK	4.87775G	46.14	74.00	-27.86	8.10	3	Horizontal	82	1.50	-

BT-LE(1Mbps)

2480MHz_TX

30/05/2019

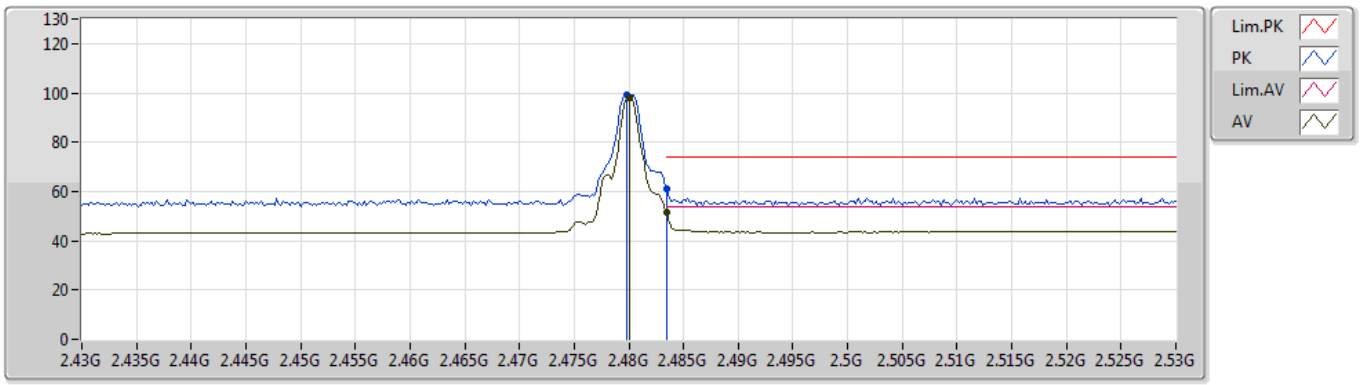


Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
AV	2.48G	93.07	Inf	-Inf	31.49	3	Vertical	276	1.00	-
AV	2.4835G	48.26	54.00	-5.74	31.51	3	Vertical	276	1.00	-
PK	2.4798G	94.09	Inf	-Inf	31.49	3	Vertical	276	1.00	-
PK	2.4835G	59.48	74.00	-14.52	31.51	3	Vertical	276	1.00	-

BT-LE(1Mbps)

2480MHz_TX

30/05/2019

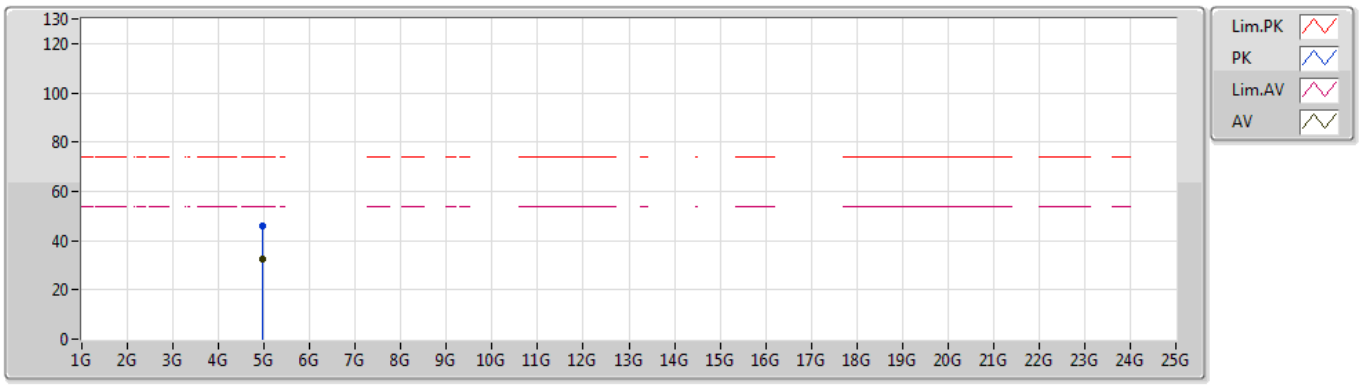


Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
AV	2.48G	98.32	Inf	-Inf	31.49	3	Horizontal	48	1.04	-
AV	2.4835G	51.76	54.00	-2.24	31.51	3	Horizontal	48	1.04	-
PK	2.4798G	99.32	Inf	-Inf	31.49	3	Horizontal	48	1.04	-
PK	2.4835G	61.17	74.00	-12.83	31.51	3	Horizontal	48	1.04	-

BT-LE(1Mbps)

2480MHz_TX

30/05/2019

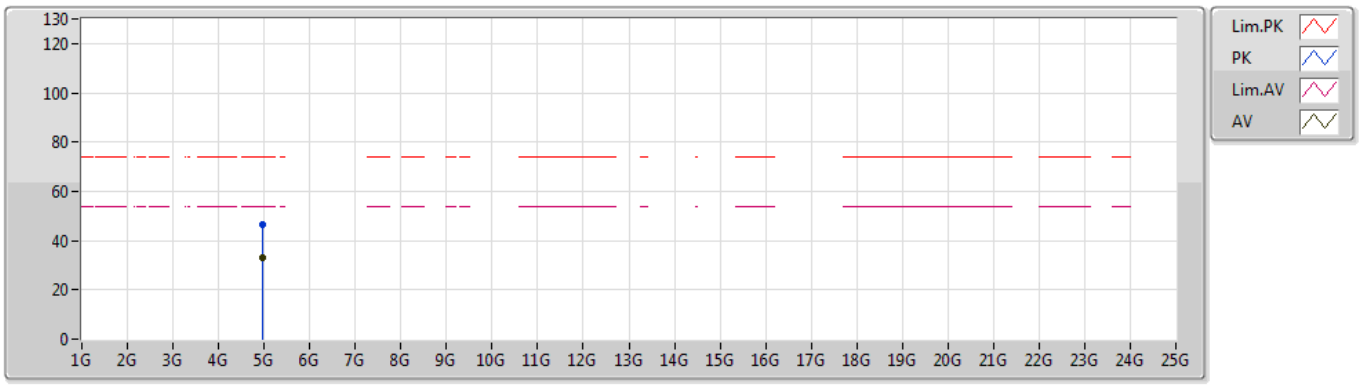


Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
AV	4.9604G	32.30	54.00	-21.70	7.96	3	Vertical	3	1.50	-
PK	4.95932G	45.90	74.00	-28.10	7.95	3	Vertical	3	1.50	-

BT-LE(1Mbps)

2480MHz_TX

30/05/2019



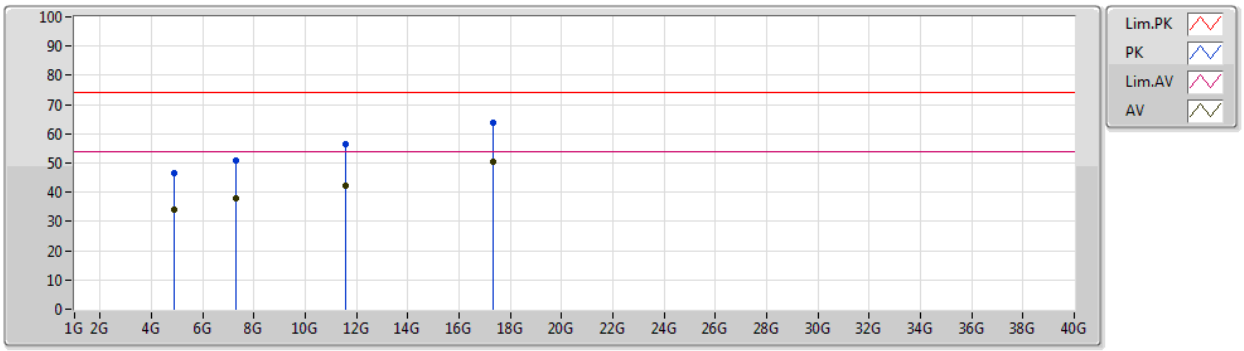
Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
AV	4.96023G	33.01	54.00	-20.99	7.96	3	Horizontal	298	1.00	-
PK	4.95971G	46.28	74.00	-27.72	7.96	3	Horizontal	298	1.00	-

Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Condition
Mode 1	Pass	AV	17.325G	50.82	54.00	-3.18	20.02	Horizontal

Radiation-above 1GHz_Mode 1

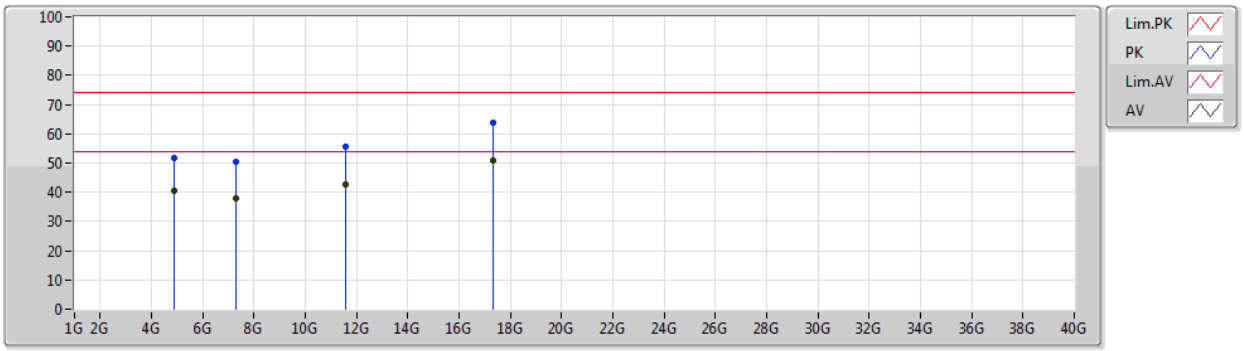
19/07/2019



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	4.874G	34.10	54.00	-19.90	1.79	3	Vertical	5	1.48	-	32.31	31.27	5.36	34.84
AV	7.311G	37.83	54.00	-16.17	8.01	3	Vertical	336	1.50	-	29.82	36.49	6.61	35.09
AV	11.55001G	42.34	54.00	-11.66	13.17	3	Vertical	317	1.50	-	29.17	39.58	8.36	34.77
AV	17.32499G	50.23	54.00	-3.77	20.01	3	Vertical	138	1.50	-	30.22	43.57	10.68	34.24
PK	4.87559G	46.47	74.00	-27.53	1.81	3	Vertical	5	1.48	-	44.66	31.28	5.36	34.83
PK	7.311G	51.07	74.00	-22.93	8.01	3	Vertical	336	1.50	-	43.06	36.49	6.61	35.09
PK	11.55001G	56.32	74.00	-17.68	13.17	3	Vertical	317	1.50	-	43.15	39.58	8.36	34.77
PK	17.32501G	63.87	74.00	-10.13	20.02	3	Vertical	138	1.50	-	43.85	43.58	10.68	34.24

Radiation-above 1GHz_Mode 1

19/07/2019



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	4.87391G	40.54	54.00	-13.46	1.79	3	Horizontal	47	1.74	-	38.75	31.27	5.36	34.84
AV	7.31128G	37.77	54.00	-16.23	8.01	3	Horizontal	297	2.71	-	29.76	36.49	6.61	35.09
AV	11.55G	42.87	54.00	-11.13	13.17	3	Horizontal	354	1.21	-	29.70	39.58	8.36	34.77
AV	17.325G	50.82	54.00	-3.18	20.02	3	Horizontal	6	2.98	-	30.80	43.58	10.68	34.24
PK	4.87391G	51.63	74.00	-22.37	1.79	3	Horizontal	47	1.74	-	49.84	31.27	5.36	34.84
PK	7.31146G	50.52	74.00	-23.48	8.01	3	Horizontal	297	2.71	-	42.51	36.49	6.61	35.09
PK	11.55G	55.76	74.00	-18.24	13.18	3	Horizontal	354	1.21	-	42.58	39.59	8.36	34.77
PK	17.32501G	63.89	74.00	-10.11	20.02	3	Horizontal	6	2.98	-	43.87	43.58	10.68	34.24