FCC Test Report

FCC ID	:	**TTUBEOPLAYH4G2**
Equipment	:	**Bluetooth Headphone**
Brand Name	:	**Bang & Olufsen**
Model Name	:	**Beoplay H4 2nd Gen**
Applicant/ Manufacturer	:	**Bang & Olufsen A/S Bang og Olufsen Allé 1, 7600 Struer, Denmark**
Standard	:	**47 CFR FCC Part 15.247**

The product was received on Aug. 07, 2019, and testing was started from Aug. 12, 2019 and completed on Aug. 26, 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
FR971118AL	01	Initial issue of report	Sep. 05, 2019
FR971118AL	02	Update Information of 1.1.1 Section. This report is the latest version replacing for the report issued on Sep. 05, 2019	Sep. 10, 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: Kate Lo

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.
- The EUT Bluetooth version is v4.2 and it can be downward compatibility.

1.1.2 Antenna Information

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	Sage Elephant Tech co., Ltd	S306300001000-A	Chip Antenna	N/A	0.69

For BT function:

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

Ant. 1 could transmit/receive simultaneously.

1.1.3 EUT Information

Operational Condition				
EUT Power Type	From host system (NB)			
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)	0.659	1.81	412.5u	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

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	CO04-HY	Lego	24.2~25.3°C / 63.1~67.2%	15/Aug/2019
RF Conducted	TH06-HY	Gary	23.5~25.6°C / 65~68%	12/Aug/2019~ 26/Aug/2019
Radiated	03CH03-HY	Justin	20.9~24.5°C / 50.1~55.6%	13/Aug/2019~ 15/Aug/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 Version	InstallBlueSuite_2_5_8_667

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

2.3 The Worst Case Measurement Configuration

The Worst Case Mode for Following Conformance Tests	
Tests Item	AC power-line conducted emissions
Condition	AC power-line conducted measurement for line and neutral
Operating Mode	CTX
1	USB 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	USB mode		
Operating Mode > 1GHz	CTX		
Orthogonal Planes of EUT	**X Plane**	**Y Plane**	**Z Plane**
			
Worst Planes of EUT		V	

2.4 Accessories and Support Equipment

Accessories				
Battery	**Brand Name**	Synergy	**Model Name**	AHB622540PMT-04
	Power Rating	3.7Vdc, 600mAh	**Type**	Lithium-ion Polymer Battery Pack
USB Cable	**Brand Name**	Bang & Olufsen	**Model Name**	4021XW01850ZAU
	Signal Line	1.25 meter, D-shielded cable, w/o ferrite core		
Audio Cable	**Brand Name**	Bang & Olufsen	**Model Name**	4021XW01852ZAS
	Signal Line	1.25 meter, non-shielded cable, w/o ferrite core		

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

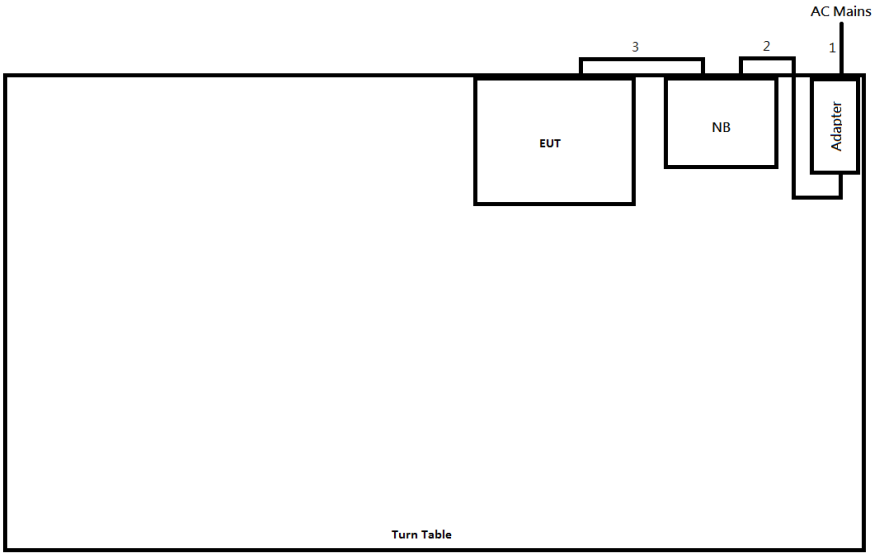
Support Equipment – RF Conducted				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
1	Notebook	DELL	E5410	DoC
2	Adapter for NB	DELL	HA65NM130	DoC
3	Fixture	-	-	-

Note: Support equipment No.3 was provided by customer.

Support Equipment –AC Conduction and Radiated Emission				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
1	Notebook	DELL	E4300	-
2	Adapter for NB	DELL	AA90PM111	-
3	Mouse(USB)	DEXIN	17C06227	-
4	IPod	APPLE	YM719D8YVQ5	-
5	Earphone	APPLE	-	-

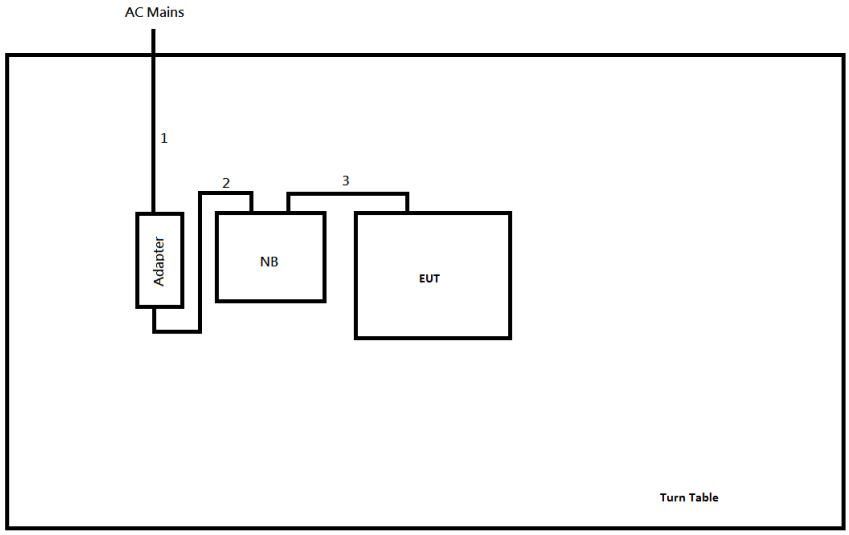
2.5 Test Setup Diagram

Test Setup Diagram – AC Line Conducted Emission Test



Item	Connection	Shielded	Length(m)	Remark
1	Power Cable	No	1.8	-
2	DC Power Cable	No	1.0	-
3	USB Cable	Yes	1.25	-

Test Setup Diagram - Radiated Test



Item	Connection	Shielded	Length(m)	Remark
1	Power Cable	No	1.8	-
2	DC Power Cable	No	1.0	-
3	USB Cable	Yes	1.25	-

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

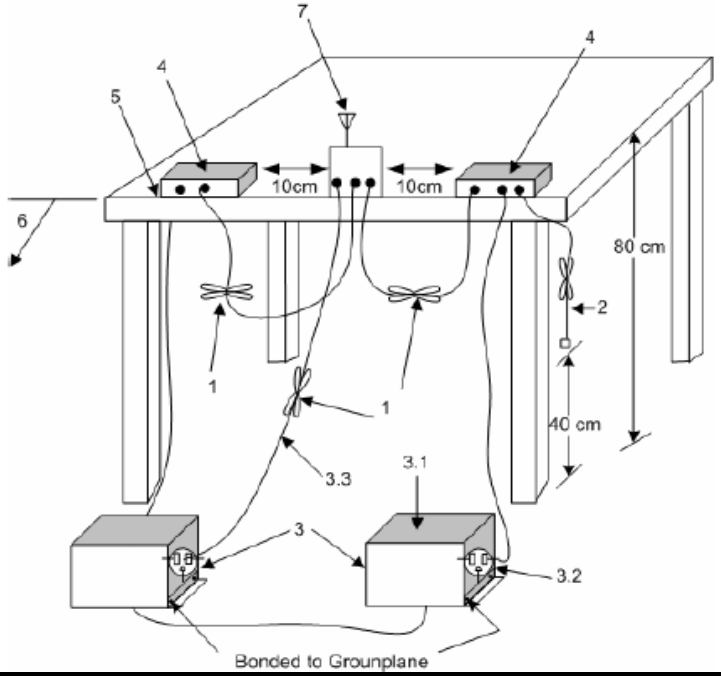
Refer a test equipment and calibration data table in this test report.

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.

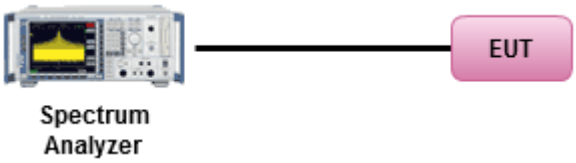
3.2.2 Measuring Instruments

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 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} ≤ 6 dBi, then P_{Out} ≤ 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 + 8dB dBm
e.i.r.p. Power Limit:		
▪ 2400-2483.5 MHz Band		
	▪ Point-to-multipoint systems (P2M): P_{eirp} ≤ 36 dBm (4 W)	
	▪ Point-to-point systems (P2P): P_{eirp} ≤ MAX(36, [P_{Out} + G_{TX}]) dBm	
	▪ Smart antenna system (SAS)	
		- Single beam: P_{eirp} ≤ MAX(36, P_{Out} + G_{TX}) dBm
		- Overlap beam: P_{eirp} ≤ MAX(36, P_{Out} + G_{TX}) dBm
		- Aggregate power on all beams: P_{eirp} ≤ 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

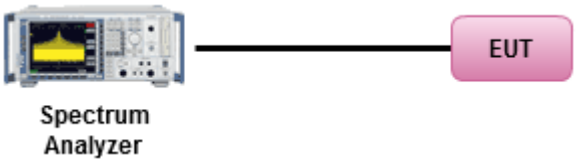
3.4.2 Measuring Instruments

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.	

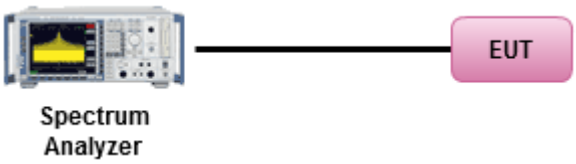
3.5.2 Measuring Instruments

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.

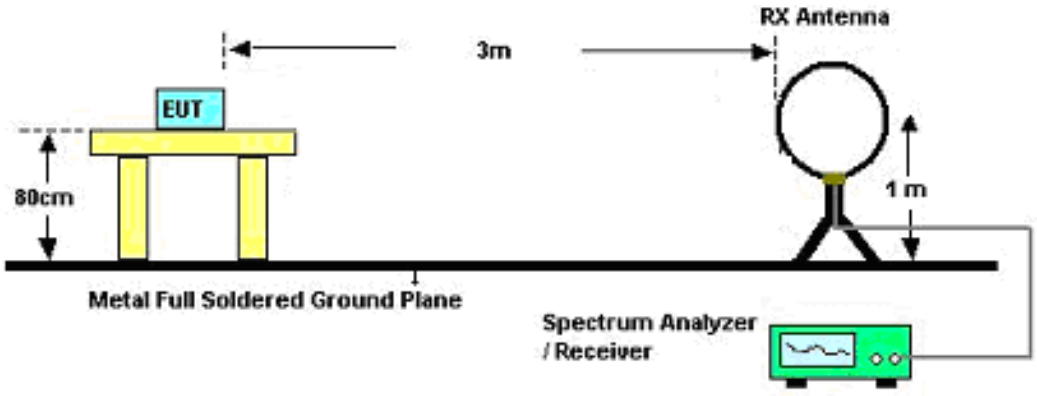
3.6.2 Measuring Instruments

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

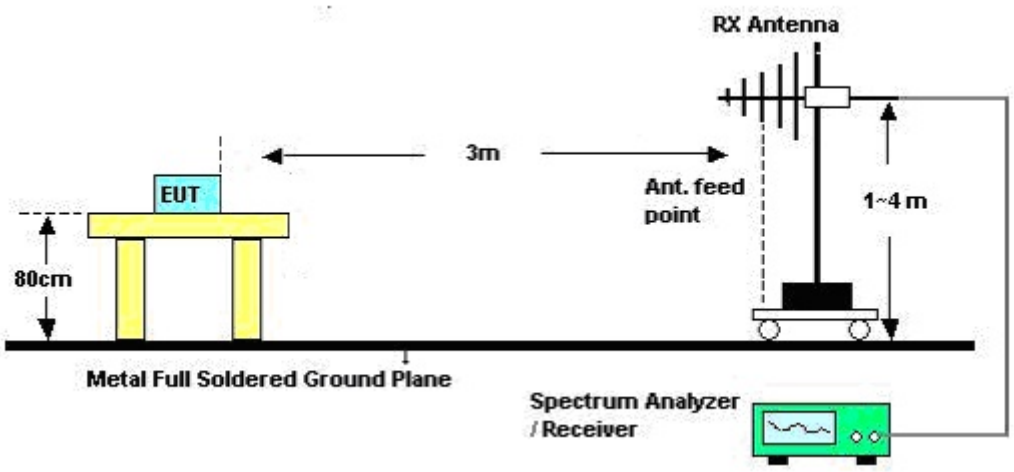
3.6.3 Test Procedures

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.
▪ 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.

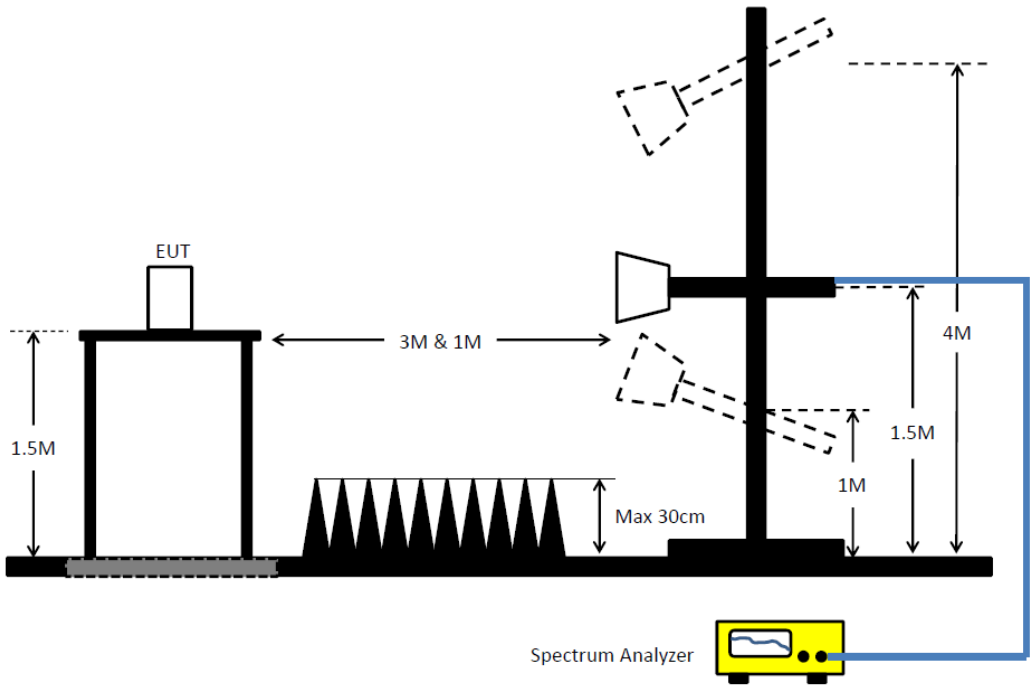
3.6.4 Test Setup

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	ENV216	101295	9kHz~30MHz	08/Nov/2018	07/Nov/2019
RF Cable-CON	MTJ	RG142	CB002-CO	9kHz~200MHz	17/Sep/2018	16/Sep/2019
AC POWER	APC	AFC-11005G	F310050055	47Hz~63Hz 5~300V	NCR	NCR
Impuls Begrenzer Pulse Limiter	SCHWARZBECK	VTSD 9561-F	9561-F041	9kHz~30 MHz	12/Oct/2018	11/Oct/2019

NCR : Non-Calibration Require

Instrument for Conducted Test

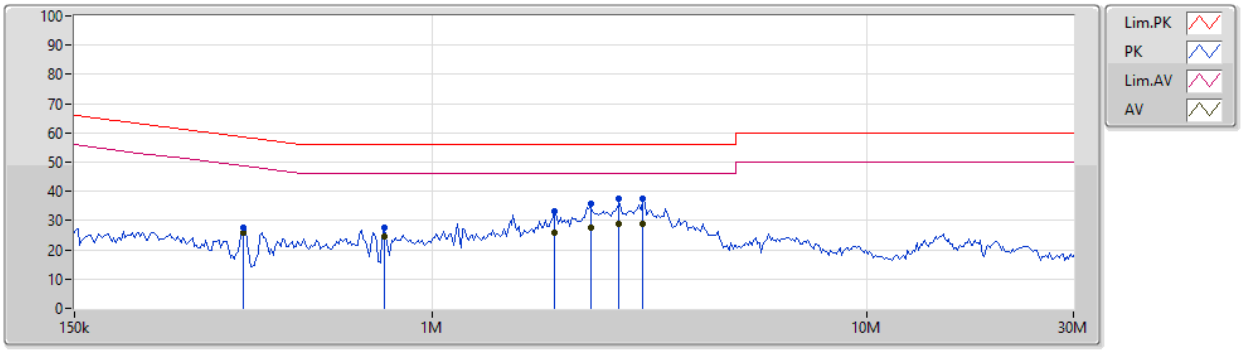
Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
Spectrum Analyzer	R&S	FSV 40	101013	10Hz~40GHz	13/Mar/2019	12/Mar/2020
Power Sensor	Anritsu	MA2411B	1339407	300MHz~40GHz	17/Nov/2018	16/Nov/2019
Power Meter	Anritsu	ML2495A	1517010	300MHz~40GHz	17/Nov/2018	16/Nov/2019
Cable 0.2m	HUBER	MY10710/4	RF Cable - 01	30MHz~18G	10/Jan/2019	09/Jan/2020
Cable 0.2m	HUBER	MY10711/4	RF Cable - 02	30MHz~18G	10/Jan/2019	09/Jan/2020
Cable 0.5m	HUBER	MY39470/4	RF Cable - 29	30MHz~18G	10/Jan/2019	09/Jan/2020
CABLE 1.5m	HUBER	MY33066/4	RF Cable - 30	1~18GHz	10/Jan/2019	09/Jan/2020
SMB100A Signal Generator	R&S	SMB100A03	181147	100kHz~40GHz	12/Nov/2018	10/Nov/2020

Instrument for Radiated Test

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30MHz~1GHz 3m	30/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	26MHz~3GHz	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	101013	10Hz~40GHz	13/Mar/2019	12/Mar/2020
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	HUBER+SUHNER	SUOFLEX 104	802378/4	1GHz~18GHz	04/Jul/2019	03/Jul/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

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

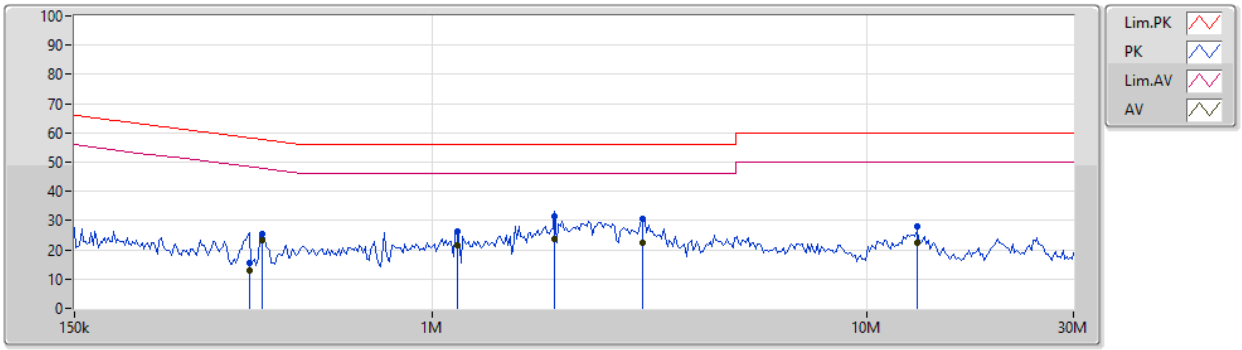
15/08/2019



Type	Freq	Level	Limit	Margin	Factor	Condition	Comment	Raw	LISN	CL	AT
	(Hz)	(dBuV)	(dBuV)	(dB)	(dB)			(dBuV)	(dB)	(dB)	(dB)
QP	367.295k	27.60	58.56	-30.96	19.48	Neutral	-	8.12	9.59	0.01	9.88
AV	367.295k	25.67	48.56	-22.89	19.48	Neutral	-	6.19	9.59	0.01	9.88
QP	774.672k	27.61	56.00	-28.39	19.49	Neutral	-	8.12	9.59	0.02	9.88
AV	774.672k	24.44	46.00	-21.56	19.49	Neutral	-	4.95	9.59	0.02	9.88
QP	1.916M	33.22	56.00	-22.78	19.53	Neutral	-	13.69	9.61	0.03	9.89
AV	1.916M	25.83	46.00	-20.17	19.53	Neutral	-	6.30	9.61	0.03	9.89
QP	2.315M	35.94	56.00	-20.06	19.54	Neutral	-	16.40	9.61	0.04	9.89
AV	2.315M	27.76	46.00	-18.24	19.54	Neutral	-	8.22	9.61	0.04	9.89
QP	3.058M	37.30	56.00	-18.70	19.54	Neutral	-	17.76	9.61	0.04	9.89
AV	3.058M	28.75	46.00	-17.25	19.54	Neutral	-	9.21	9.61	0.04	9.89
QP	2.687M	37.61	56.00	-18.39	19.54	Neutral	-	18.07	9.61	0.04	9.89
AV	2.687M	28.94	46.00	-17.06	19.54	Neutral	"Worst"	9.40	9.61	0.04	9.89

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

15/08/2019



Type	Freq	Level	Limit	Margin	Factor	Condition	Comment	Raw	LISN	CL	AT
	(Hz)	(dBuV)	(dBuV)	(dB)	(dB)			(dBuV)	(dB)	(dB)	(dB)
QP	378.424k	15.45	58.31	-42.86	19.48	Line	-	-4.03	9.59	0.01	9.88
AV	378.424k	12.85	48.31	-35.46	19.48	Line	-	-6.63	9.59	0.01	9.88
QP	405.722k	25.58	57.74	-32.16	19.48	Line	-	6.10	9.59	0.01	9.88
AV	405.722k	23.43	47.74	-24.31	19.48	Line	-	3.95	9.59	0.01	9.88
QP	1.142M	26.44	56.00	-29.56	19.50	Line	-	6.94	9.60	0.02	9.88
AV	1.142M	21.35	46.00	-24.65	19.50	Line	-	1.85	9.60	0.02	9.88
QP	1.916M	31.38	56.00	-24.62	19.54	Line	-	11.84	9.62	0.03	9.89
AV	1.916M	23.92	46.00	-22.08	19.54	Line	"Worst"	4.38	9.62	0.03	9.89
QP	3.058M	30.54	56.00	-25.46	19.56	Line	-	10.98	9.63	0.04	9.89
AV	3.058M	22.51	46.00	-23.49	19.56	Line	-	2.95	9.63	0.04	9.89
QP	13.073M	27.83	60.00	-32.17	19.63	Line	-	8.20	9.65	0.08	9.90
AV	13.073M	22.53	50.00	-27.47	19.63	Line	-	2.90	9.65	0.08	9.90

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)	692.5k	1.026M	1M03F1D	683.75k	1.019M

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

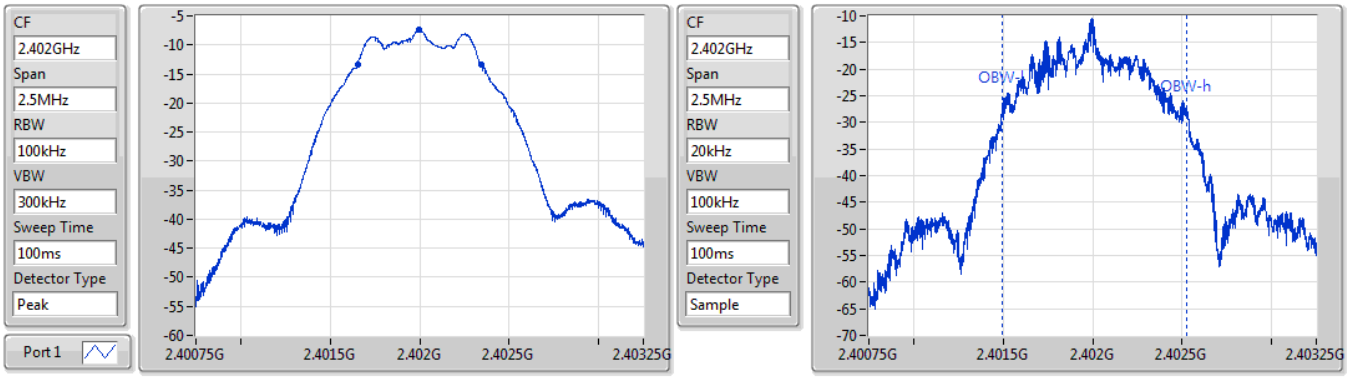
Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	500k	692.5k	1.026M
2440MHz	Pass	500k	687.5k	1.019M
2480MHz	Pass	500k	683.75k	1.019M

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

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

2402MHz

12/08/2019

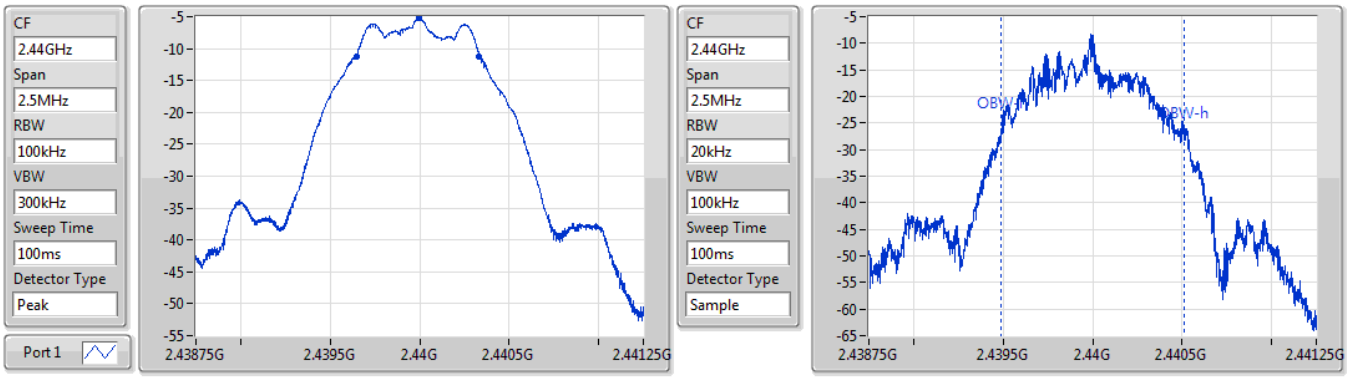


6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
692.5k	2.401653G	2.402345G	1.026M	2.401498G	2.402523G	500k	1

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

2440MHz

12/08/2019

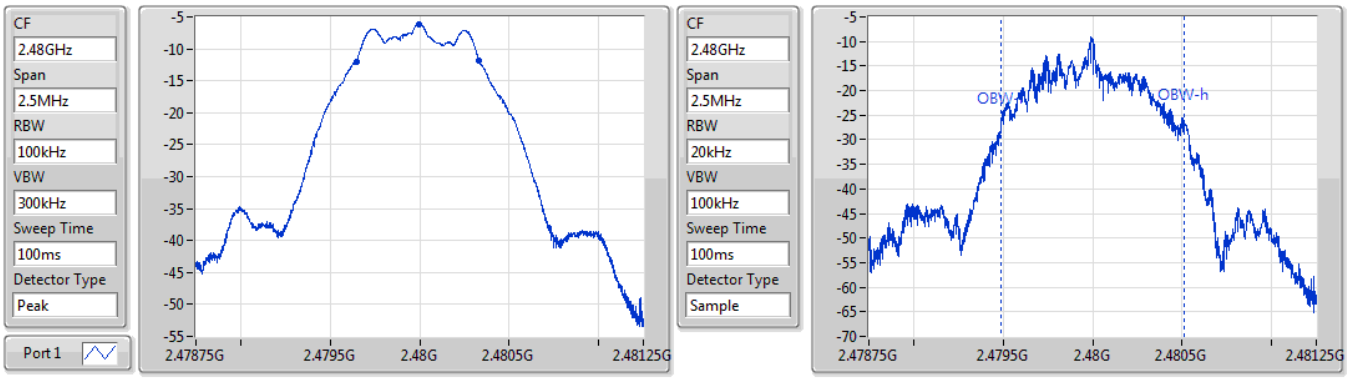


6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
687.5k	2.439645G	2.440333G	1.019M	2.43949G	2.44051G	500k	1

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

2480MHz

12/08/2019



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
683.75k	2.479646G	2.48033G	1.019M	2.47949G	2.48051G	500k	1

Summary

Mode	Power (dBm)	Power (W)
2.4-2.4835GHz	-	-
BT-LE(1Mbps)	-6.55	0.00022

Result

Mode	Result	Gain (dBi)	Power (dBm)	Power Limit (dBm)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	0.69	-8.43	30.00
2440MHz	Pass	0.69	-6.55	30.00
2480MHz	Pass	0.69	-7.29	30.00

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

Summary

Mode	PD (dBm/RBW)
2.4-2.4835GHz	-
BT-LE(1Mbps)	-21.51

RBW=3 kHz.

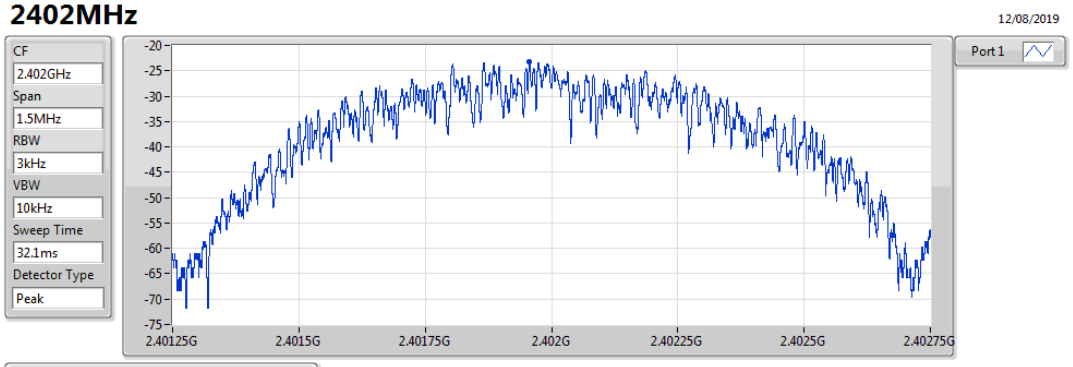
Result

Mode	Result	Gain (dBi)	PD (dBm/RBW)	PD Limit (dBm/RBW)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	0.69	-23.23	8.00
2440MHz	Pass	0.69	-21.51	8.00
2480MHz	Pass	0.69	-22.06	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**

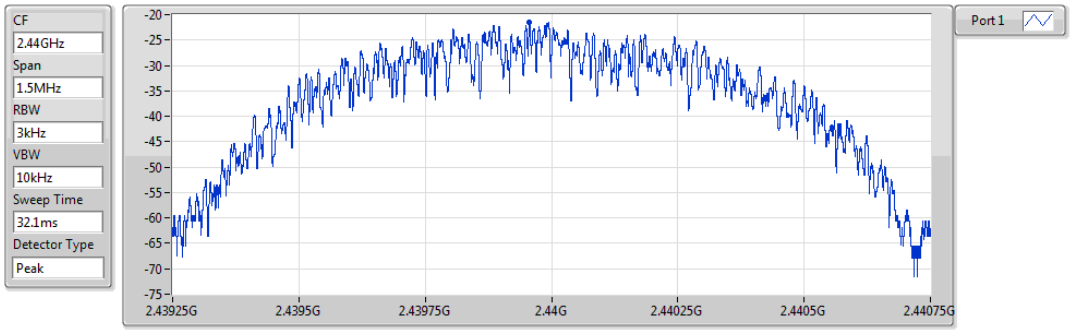
2402MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-23.23	-23.23	-23.23

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

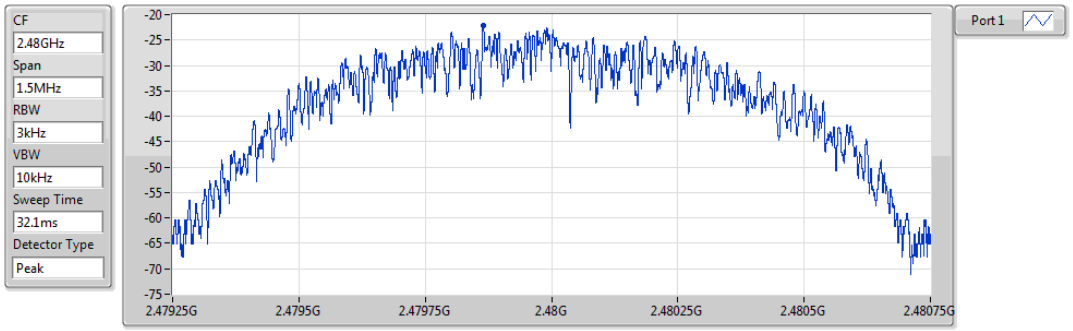
2440MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-21.51	-21.51	-21.51

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

2480MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-22.06	-22.06	-22.06

Summary

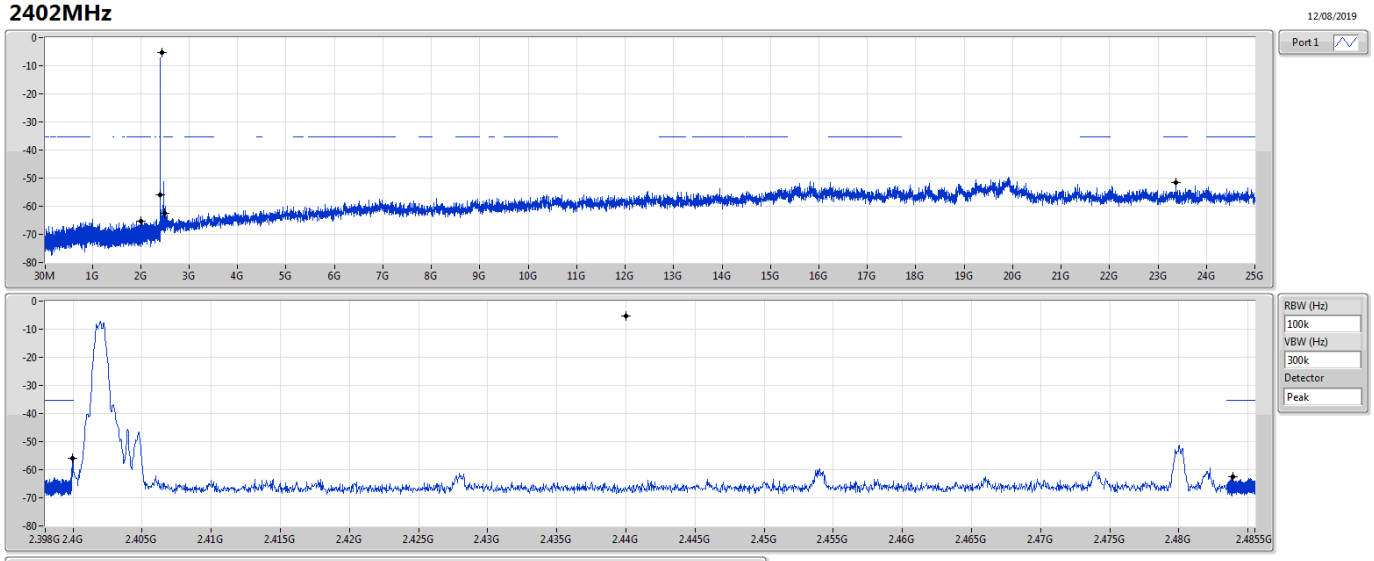
Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	2.44G	-5.22	-35.22	2.00787G	-65.29	2.39999G	-55.89	2.48392G	-62.60	23.37333G	-51.59	1

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	2.44G	-5.22	-35.22	2.00787G	-65.29	2.39999G	-55.89	2.48392G	-62.60	23.37333G	-51.59	1
2440MHz	Pass	2.44G	-5.22	-35.22	1.7471G	-65.44	2.39819G	-63.16	2.48376G	-62.52	21.70725G	-52.19	1
2480MHz	Pass	2.44G	-5.22	-35.22	2.01853G	-64.96	2.39984G	-61.80	2.48402G	-61.64	17.64339G	-52.28	1

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

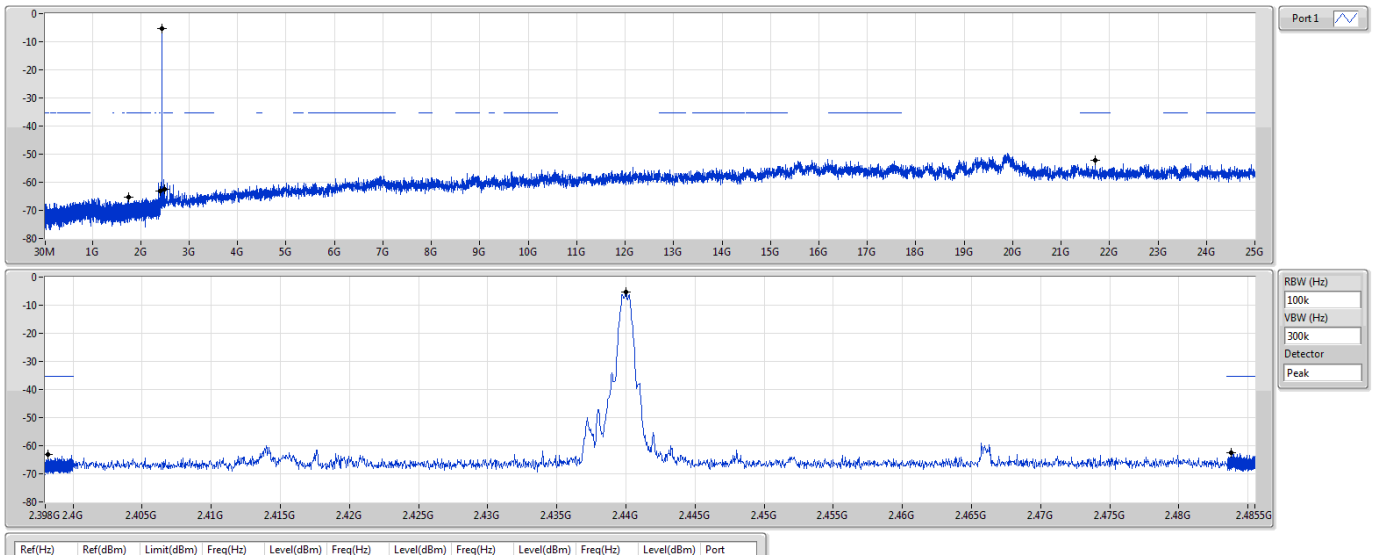
2402MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.44G	-5.22	-35.22	2.00787G	-65.29	2.39999G	-55.89	2.48392G	-62.60	23.37333G	-51.59	1

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

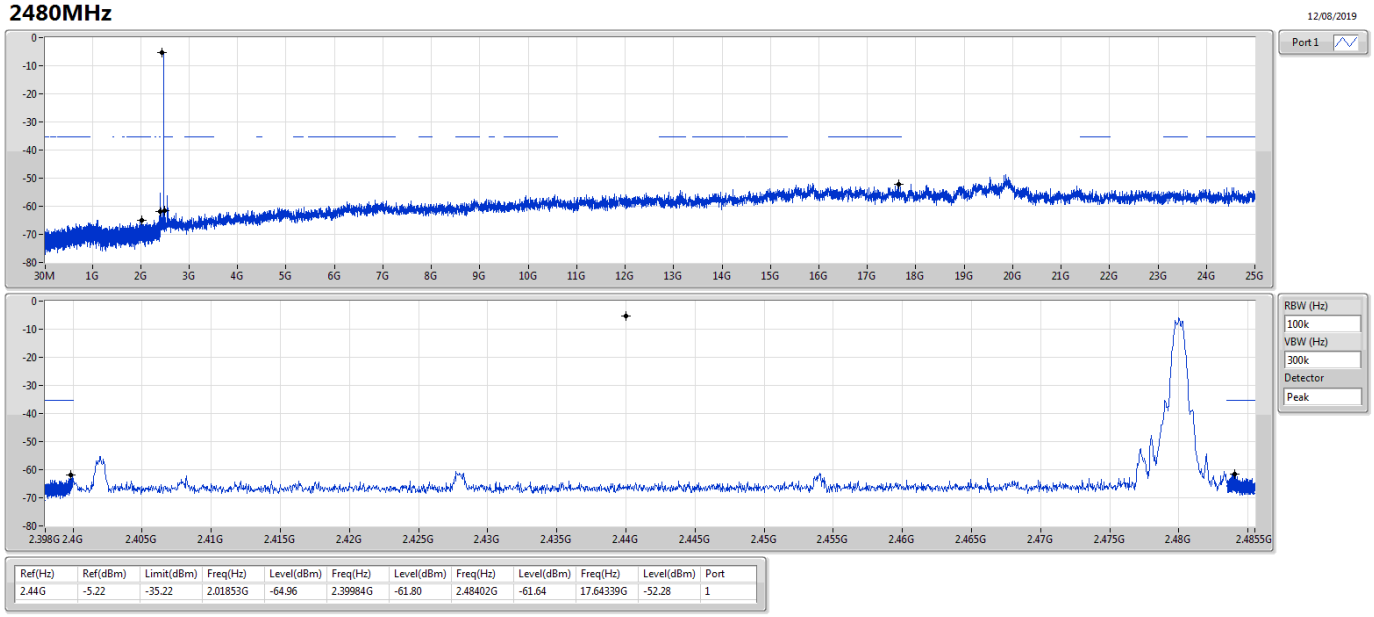
2440MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.44G	-5.22	-35.22	1.7471G	-65.44	2.39819G	-63.16	2.48376G	-62.52	21.70725G	-52.19	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
2.44G	-5.22	-35.22	2.01853G	-64.96	2.39984G	-61.80	2.48402G	-61.64	17.64339G	-52.28	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	404.42M	42.46	46.00	-3.54	3	Horizontal	0	1.00	-

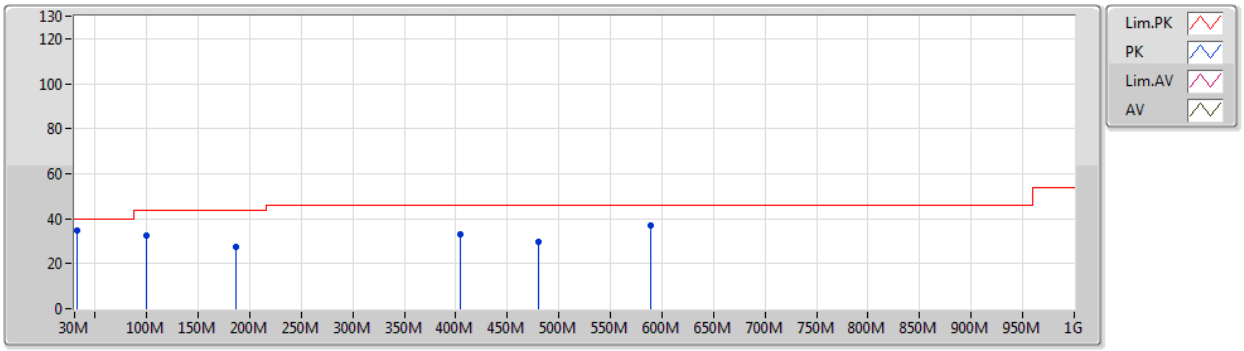
Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-
2440MHz_USB	Pass	PK	31.94M	35.02	40.00	-4.98	3	Vertical	360	1.00	-
2440MHz_USB	Pass	PK	99.84M	32.58	43.50	-10.92	3	Vertical	360	1.00	-
2440MHz_USB	Pass	PK	187.14M	27.49	43.50	-16.01	3	Vertical	360	1.00	-
2440MHz_USB	Pass	PK	404.42M	33.24	46.00	-12.76	3	Vertical	360	1.00	-
2440MHz_USB	Pass	PK	480.08M	29.88	46.00	-16.12	3	Vertical	360	1.00	-
2440MHz_USB	Pass	PK	588.72M	37.10	46.00	-8.90	3	Vertical	360	1.00	-
2440MHz_USB	Pass	PK	99.84M	30.15	43.50	-13.35	3	Horizontal	0	1.00	-
2440MHz_USB	Pass	PK	187.14M	38.20	43.50	-5.30	3	Horizontal	0	1.00	-
2440MHz_USB	Pass	PK	253.1M	40.51	46.00	-5.49	3	Horizontal	0	1.00	-
2440MHz_USB	Pass	PK	404.42M	42.46	46.00	-3.54	3	Horizontal	0	1.00	-
2440MHz_USB	Pass	PK	474.26M	30.99	46.00	-15.01	3	Horizontal	0	1.00	-
2440MHz_USB	Pass	PK	619.76M	32.57	46.00	-13.43	3	Horizontal	0	1.00	-

BT-LE(1Mbps)

2440MHz_USB

15/08/2019

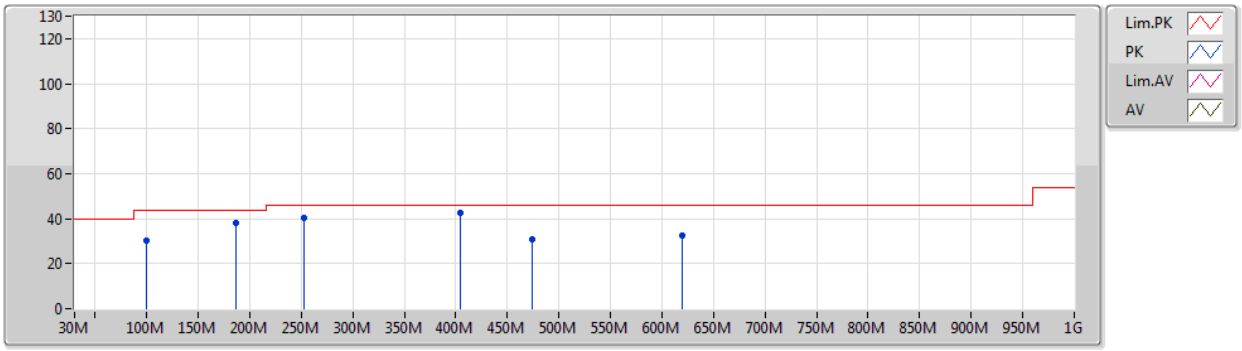


Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	31.94M	35.02	40.00	-4.98	38.38	3	Vertical	360	1.00	-	23.37	0.83	27.56
PK	99.84M	32.58	43.50	-10.92	42.53	3	Vertical	360	1.00	-	15.89	1.52	27.36
PK	187.14M	27.49	43.50	-16.01	37.48	3	Vertical	360	1.00	-	14.83	2.14	26.96
PK	404.42M	33.24	46.00	-12.76	35.35	3	Vertical	360	1.00	-	21.99	3.20	27.30
PK	480.08M	29.88	46.00	-16.12	30.40	3	Vertical	360	1.00	-	23.66	3.52	27.70
PK	588.72M	37.10	46.00	-8.90	35.50	3	Vertical	360	1.00	-	25.53	4.01	27.94

BT-LE(1Mbps)

2440MHz_USB

15/08/2019



Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
PK	99.84M	30.15	43.50	-13.35	40.10	3	Horizontal	0	1.00	-	15.89	1.52	27.36
PK	187.14M	38.20	43.50	-5.30	48.19	3	Horizontal	0	1.00	-	14.83	2.14	26.96
PK	253.1M	40.51	46.00	-5.49	45.78	3	Horizontal	0	1.00	-	18.99	2.50	26.76
PK	404.42M	42.46	46.00	-3.54	44.57	3	Horizontal	0	1.00	-	21.99	3.20	27.30
PK	474.26M	30.99	46.00	-15.01	31.59	3	Horizontal	0	1.00	-	23.57	3.50	27.67
PK	619.76M	32.57	46.00	-13.43	30.21	3	Horizontal	0	1.00	-	26.18	4.12	27.94

Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	AV	4.87988G	49.64	54.00	-4.36	3	Horizontal	140	2.27	-

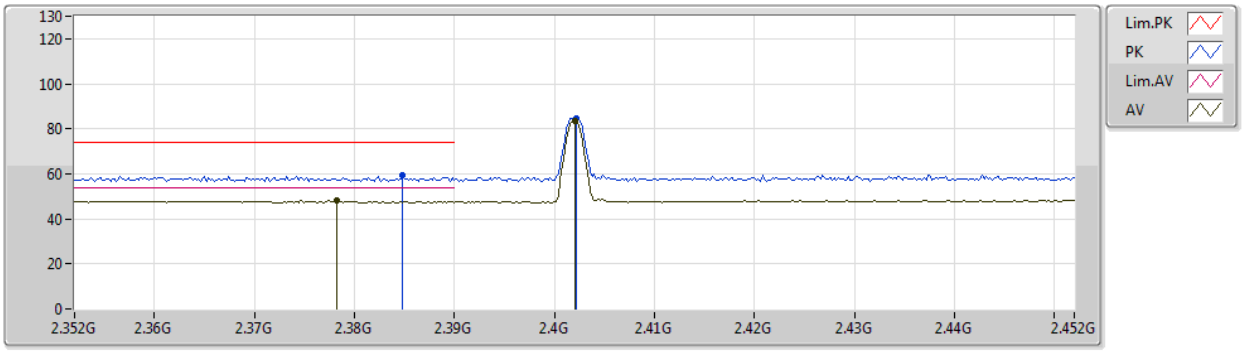
Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-
2402MHz_TX	Pass	AV	2.3782G	48.22	54.00	-5.78	3	Vertical	124	1.52	-
2402MHz_TX	Pass	AV	2.402G	83.61	Inf	-Inf	3	Vertical	124	1.52	-
2402MHz_TX	Pass	PK	2.3848G	59.12	74.00	-14.88	3	Vertical	124	1.52	-
2402MHz_TX	Pass	PK	2.4022G	84.88	Inf	-Inf	3	Vertical	124	1.52	-
2402MHz_TX	Pass	AV	2.358G	48.09	54.00	-5.91	3	Horizontal	32	2.18	-
2402MHz_TX	Pass	AV	2.402G	81.79	Inf	-Inf	3	Horizontal	32	2.18	-
2402MHz_TX	Pass	PK	2.3536G	59.67	74.00	-14.33	3	Horizontal	32	2.18	-
2402MHz_TX	Pass	PK	2.4022G	83.06	Inf	-Inf	3	Horizontal	32	2.18	-
2402MHz_TX	Pass	AV	4.804G	41.19	54.00	-12.81	3	Vertical	235	1.50	-
2402MHz_TX	Pass	PK	4.80412G	48.87	74.00	-25.13	3	Vertical	235	1.50	-
2402MHz_TX	Pass	AV	4.804G	49.20	54.00	-4.80	3	Horizontal	129	2.21	-
2402MHz_TX	Pass	PK	4.8046G	54.46	74.00	-19.54	3	Horizontal	129	2.21	-
2440MHz_TX	Pass	AV	2.3408G	48.20	54.00	-5.80	3	Vertical	123	1.69	-
2440MHz_TX	Pass	AV	2.44G	87.26	Inf	-Inf	3	Vertical	123	1.69	-
2440MHz_TX	Pass	AV	2.4996G	48.37	54.00	-5.63	3	Vertical	123	1.69	-
2440MHz_TX	Pass	PK	2.3708G	59.53	74.00	-14.47	3	Vertical	123	1.69	-
2440MHz_TX	Pass	PK	2.4396G	88.46	Inf	-Inf	3	Vertical	123	1.69	-
2440MHz_TX	Pass	PK	2.4948G	59.79	74.00	-14.21	3	Vertical	123	1.69	-
2440MHz_TX	Pass	AV	2.3896G	48.20	54.00	-5.80	3	Horizontal	37	2.28	-
2440MHz_TX	Pass	AV	2.44G	84.87	Inf	-Inf	3	Horizontal	37	2.28	-
2440MHz_TX	Pass	AV	2.4972G	48.37	54.00	-5.63	3	Horizontal	37	2.28	-
2440MHz_TX	Pass	PK	2.3664G	59.12	74.00	-14.88	3	Horizontal	37	2.28	-
2440MHz_TX	Pass	PK	2.4396G	86.01	Inf	-Inf	3	Horizontal	37	2.28	-
2440MHz_TX	Pass	PK	2.4856G	59.27	74.00	-14.73	3	Horizontal	37	2.28	-
2440MHz_TX	Pass	AV	4.87964G	43.46	54.00	-10.54	3	Vertical	231	1.14	-
2440MHz_TX	Pass	PK	4.87964G	50.54	74.00	-23.46	3	Vertical	231	1.14	-
2440MHz_TX	Pass	AV	4.87988G	49.64	54.00	-4.36	3	Horizontal	140	2.27	-
2440MHz_TX	Pass	PK	4.87958G	54.91	74.00	-19.09	3	Horizontal	140	2.27	-
2480MHz_TX	Pass	AV	2.48G	85.25	Inf	-Inf	3	Vertical	178	1.72	-
2480MHz_TX	Pass	AV	2.4998G	48.37	54.00	-5.63	3	Vertical	178	1.72	-
2480MHz_TX	Pass	PK	2.4798G	86.54	Inf	-Inf	3	Vertical	178	1.72	-
2480MHz_TX	Pass	PK	2.4962G	60.14	74.00	-13.86	3	Vertical	178	1.72	-
2480MHz_TX	Pass	AV	2.48G	82.06	Inf	-Inf	3	Horizontal	5	1.06	-
2480MHz_TX	Pass	AV	2.4908G	48.56	54.00	-5.44	3	Horizontal	5	1.06	-
2480MHz_TX	Pass	PK	2.4798G	83.35	Inf	-Inf	3	Horizontal	5	1.06	-
2480MHz_TX	Pass	PK	2.4902G	59.88	74.00	-14.12	3	Horizontal	5	1.06	-
2480MHz_TX	Pass	AV	4.96006G	42.70	54.00	-11.30	3	Vertical	232	1.91	-
2480MHz_TX	Pass	PK	4.95964G	50.36	74.00	-23.64	3	Vertical	232	1.91	-
2480MHz_TX	Pass	AV	4.95982G	48.15	54.00	-5.85	3	Horizontal	138	2.15	-
2480MHz_TX	Pass	PK	4.95952G	53.75	74.00	-20.25	3	Horizontal	138	2.15	-

BT-LE(1Mbps)

2402MHz_TX

14/08/2019

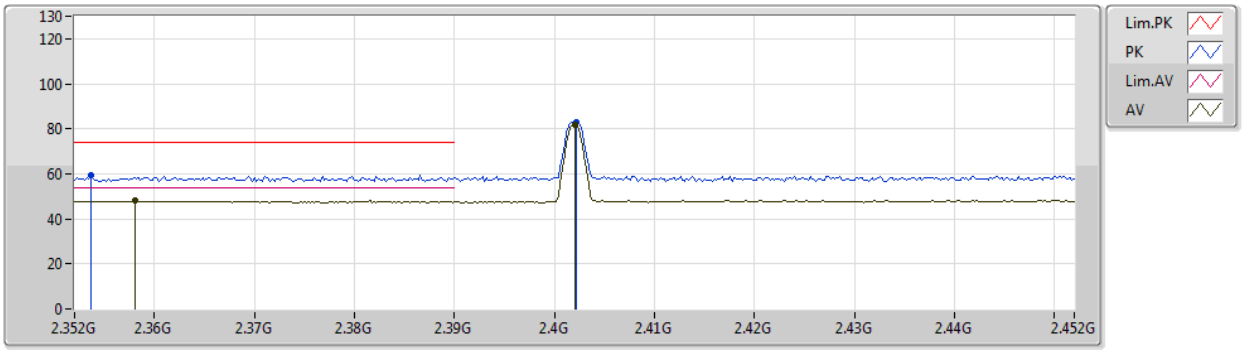


Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
AV	2.3782G	48.22	54.00	-5.78	16.64	3	Vertical	124	1.52	-	27.59	3.99	-
AV	2.402G	83.61	Inf	-Inf	52.10	3	Vertical	124	1.52	-	27.50	4.01	-
PK	2.3848G	59.12	74.00	-14.88	27.57	3	Vertical	124	1.52	-	27.56	3.99	-
PK	2.4022G	84.88	Inf	-Inf	53.37	3	Vertical	124	1.52	-	27.50	4.01	-

BT-LE(1Mbps)

2402MHz_TX

14/08/2019

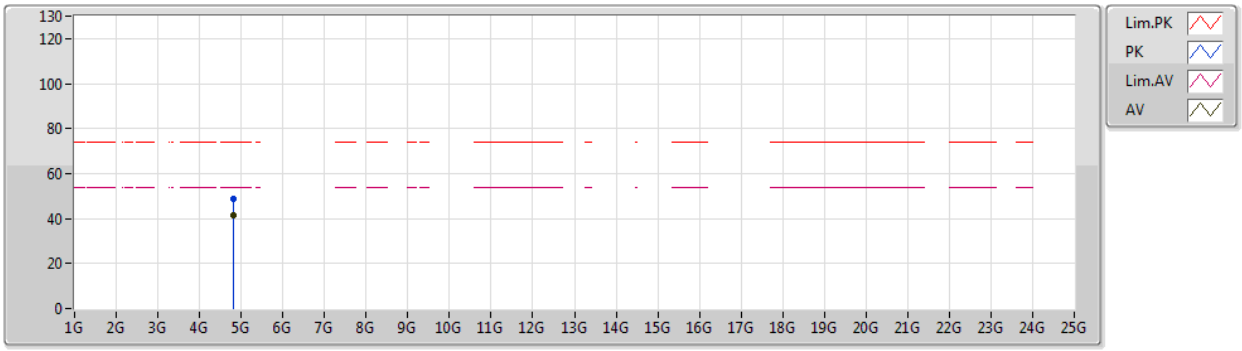


Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
AV	2.358G	48.09	54.00	-5.91	16.45	3	Horizontal	32	2.18	-	27.67	3.97	-
AV	2.402G	81.79	Inf	-Inf	50.28	3	Horizontal	32	2.18	-	27.50	4.01	-
PK	2.3536G	59.67	74.00	-14.33	28.02	3	Horizontal	32	2.18	-	27.69	3.96	-
PK	2.4022G	83.06	Inf	-Inf	51.55	3	Horizontal	32	2.18	-	27.50	4.01	-

BT-LE(1Mbps)

2402MHz_TX

14/08/2019

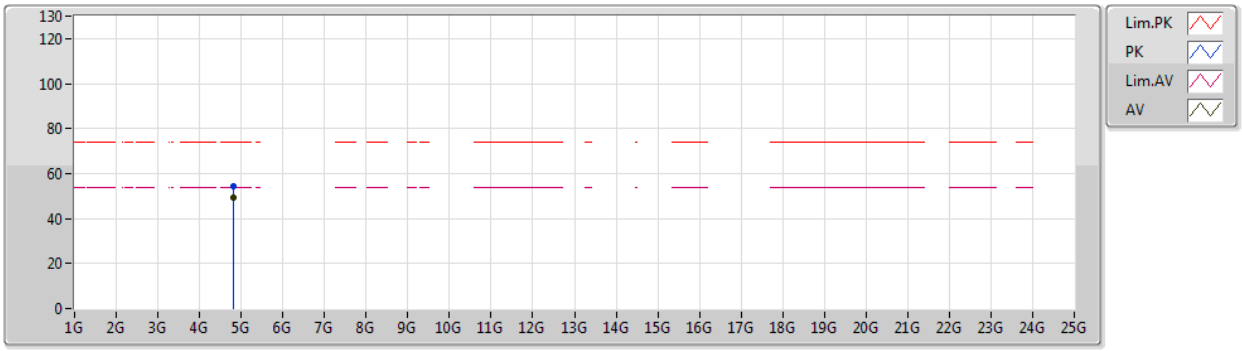


Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
AV	4.804G	41.19	54.00	-12.81	34.09	3	Vertical	235	1.50	-	31.10	5.78	29.78
PK	4.80412G	48.87	74.00	-25.13	41.77	3	Vertical	235	1.50	-	31.10	5.78	29.78

BT-LE(1Mbps)

2402MHz_TX

14/08/2019

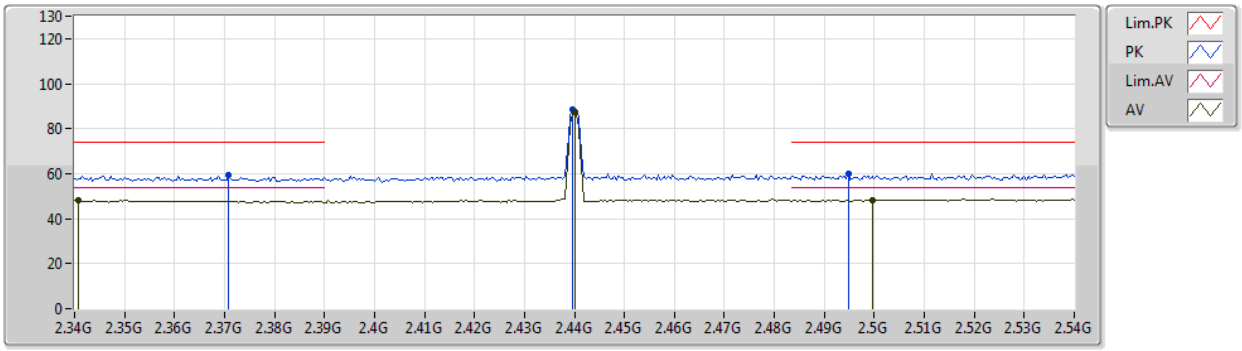


Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
AV	4.804G	49.20	54.00	-4.80	42.10	3	Horizontal	129	2.21	-	31.10	5.78	29.78
PK	4.8046G	54.46	74.00	-19.54	47.36	3	Horizontal	129	2.21	-	31.10	5.78	29.78

BT-LE(1Mbps)

2440MHz_TX

14/08/2019

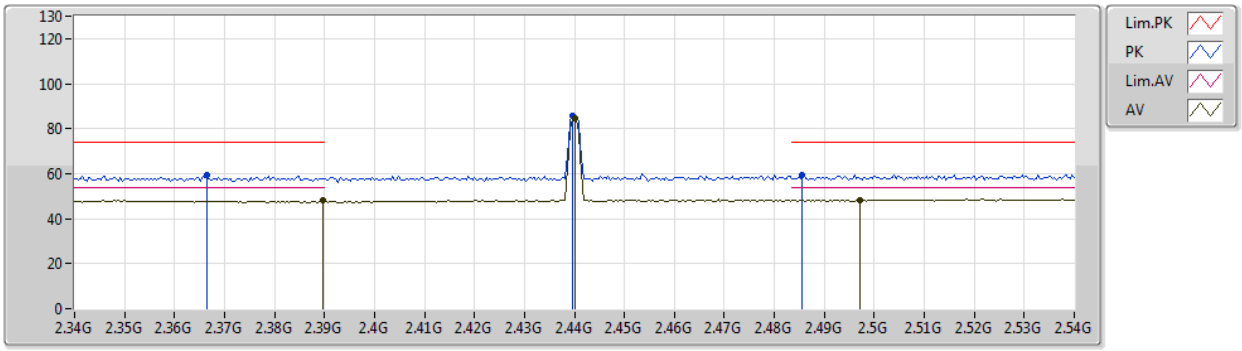


Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
AV	2.3408G	48.20	54.00	-5.80	16.51	3	Vertical	123	1.69	-	27.74	3.95	-
AV	2.44G	87.26	Inf	-Inf	55.80	3	Vertical	123	1.69	-	27.42	4.04	-
AV	2.4996G	48.37	54.00	-5.63	16.97	3	Vertical	123	1.69	-	27.30	4.10	-
PK	2.3708G	59.53	74.00	-14.47	27.93	3	Vertical	123	1.69	-	27.62	3.98	-
PK	2.4396G	88.46	Inf	-Inf	57.00	3	Vertical	123	1.69	-	27.42	4.04	-
PK	2.4948G	59.79	74.00	-14.21	28.38	3	Vertical	123	1.69	-	27.31	4.10	-

BT-LE(1Mbps)

2440MHz_TX

14/08/2019

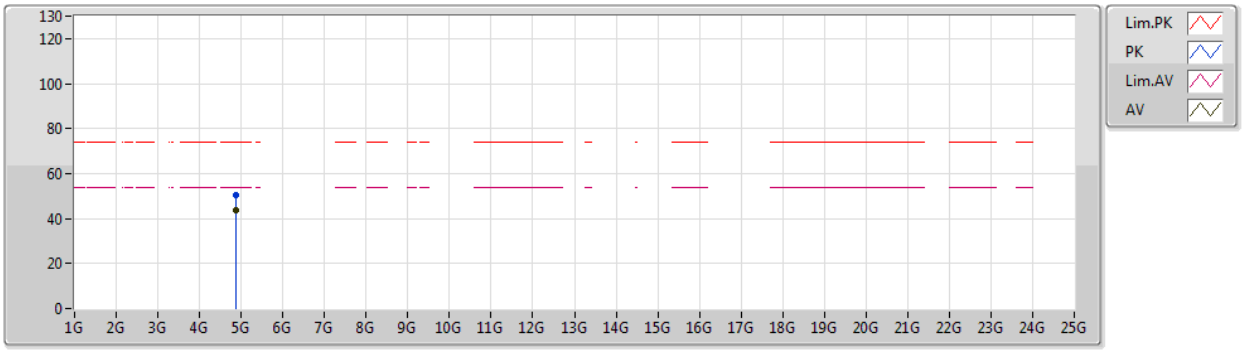


Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
AV	2.3896G	48.20	54.00	-5.80	16.66	3	Horizontal	37	2.28	-	27.54	4.00	-
AV	2.44G	84.87	Inf	-Inf	53.41	3	Horizontal	37	2.28	-	27.42	4.04	-
AV	2.4972G	48.37	54.00	-5.63	16.96	3	Horizontal	37	2.28	-	27.31	4.10	-
PK	2.3664G	59.12	74.00	-14.88	27.52	3	Horizontal	37	2.28	-	27.63	3.97	-
PK	2.4396G	86.01	Inf	-Inf	54.55	3	Horizontal	37	2.28	-	27.42	4.04	-
PK	2.4856G	59.27	74.00	-14.73	27.85	3	Horizontal	37	2.28	-	27.33	4.09	-

BT-LE(1Mbps)

2440MHz_TX

14/08/2019

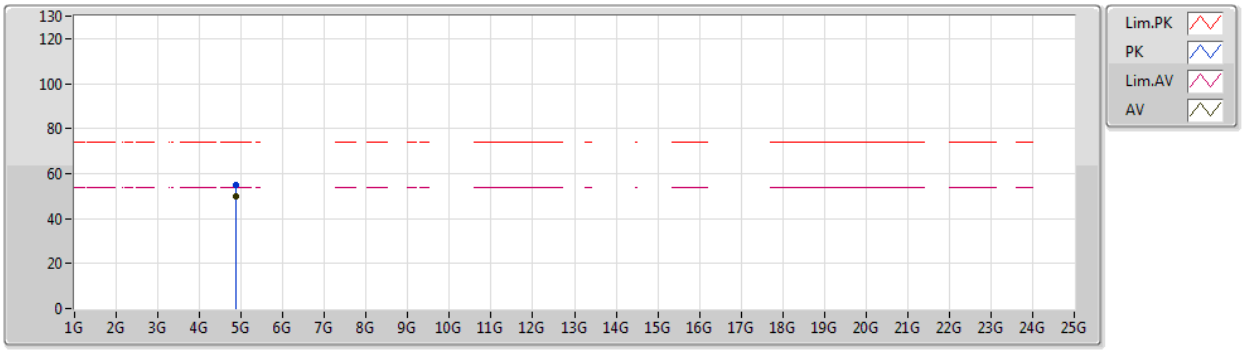


Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
AV	4.87964G	43.46	54.00	-10.54	36.22	3	Vertical	231	1.14	-	31.18	5.83	29.77
PK	4.87964G	50.54	74.00	-23.46	43.30	3	Vertical	231	1.14	-	31.18	5.83	29.77

BT-LE(1Mbps)

2440MHz_TX

14/08/2019

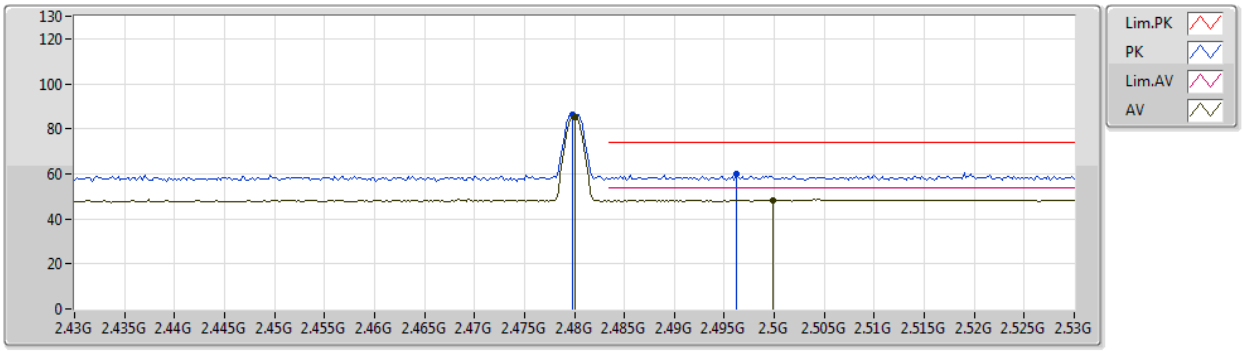


Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
AV	4.87988G	49.64	54.00	-4.36	42.40	3	Horizontal	140	2.27	-	31.18	5.83	29.77
PK	4.87958G	54.91	74.00	-19.09	47.67	3	Horizontal	140	2.27	-	31.18	5.83	29.77

BT-LE(1Mbps)

2480MHz_TX

14/08/2019

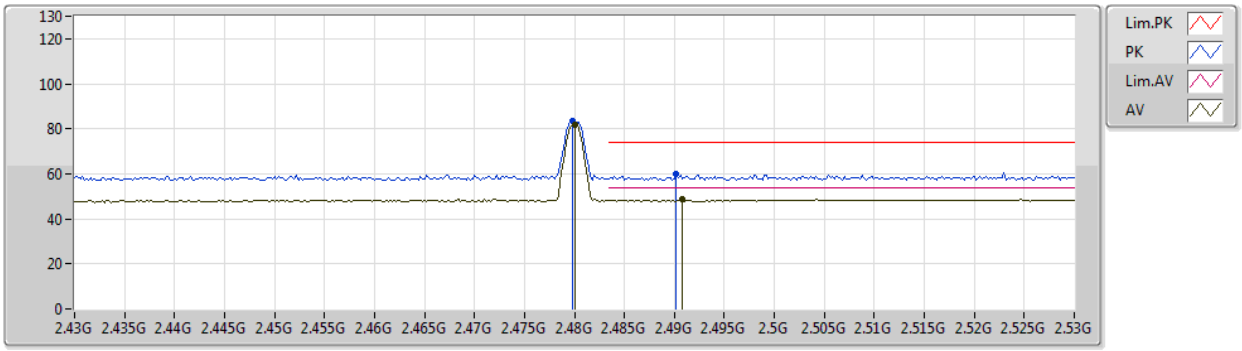


Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
AV	2.48G	85.25	Inf	-Inf	53.83	3	Vertical	178	1.72	-	27.34	4.08	-
AV	2.4998G	48.37	54.00	-5.63	16.97	3	Vertical	178	1.72	-	27.30	4.10	-
PK	2.4798G	86.54	Inf	-Inf	55.12	3	Vertical	178	1.72	-	27.34	4.08	-
PK	2.4962G	60.14	74.00	-13.86	28.73	3	Vertical	178	1.72	-	27.31	4.10	-

BT-LE(1Mbps)

2480MHz_TX

14/08/2019

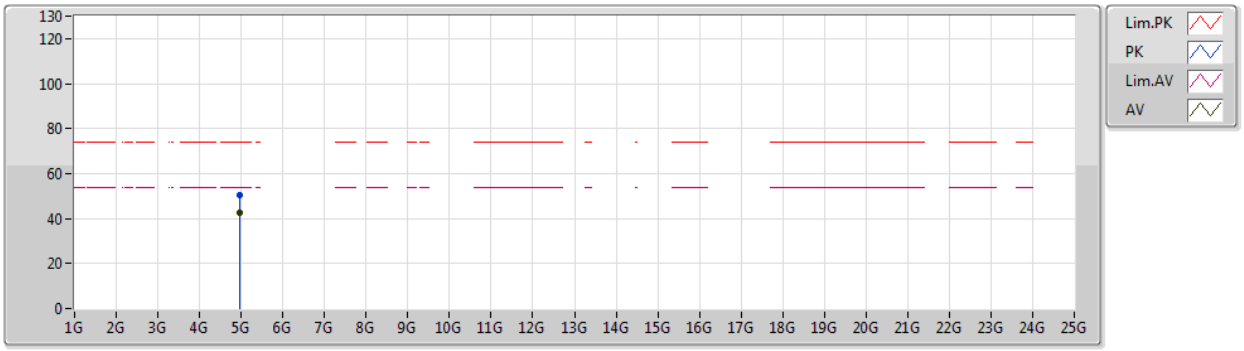


Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
AV	2.48G	82.06	Inf	-Inf	50.64	3	Horizontal	5	1.06	-	27.34	4.08	-
AV	2.4908G	48.56	54.00	-5.44	17.15	3	Horizontal	5	1.06	-	27.32	4.09	-
PK	2.4798G	83.35	Inf	-Inf	51.93	3	Horizontal	5	1.06	-	27.34	4.08	-
PK	2.4902G	59.88	74.00	-14.12	28.47	3	Horizontal	5	1.06	-	27.32	4.09	-

BT-LE(1Mbps)

2480MHz_TX

14/08/2019

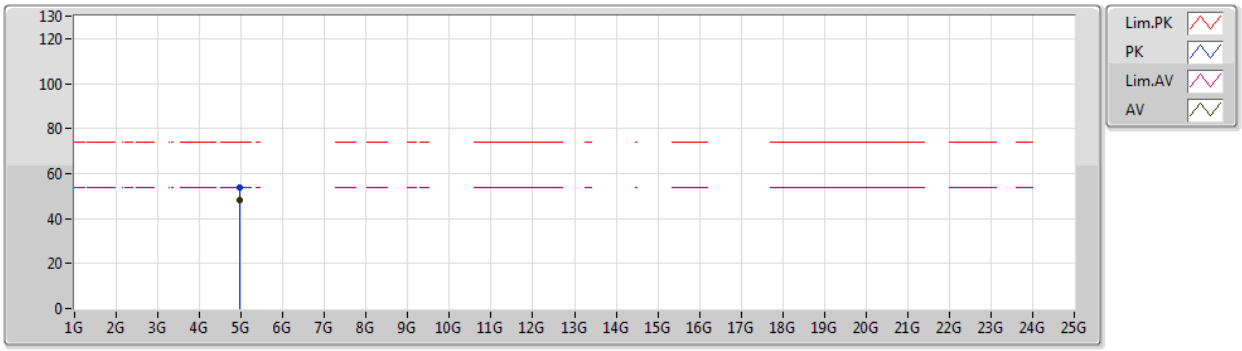


Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
AV	4.96006G	42.70	54.00	-11.30	35.19	3	Vertical	232	1.91	-	31.38	5.89	29.76
PK	4.95964G	50.36	74.00	-23.64	42.85	3	Vertical	232	1.91	-	31.38	5.89	29.76

BT-LE(1Mbps)

2480MHz_TX

14/08/2019



Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB)	(dB)	(dB)
AV	4.95982G	48.15	54.00	-5.85	40.64	3	Horizontal	138	2.15	-	31.38	5.89	29.76
PK	4.95952G	53.75	74.00	-20.25	46.24	3	Horizontal	138	2.15	-	31.38	5.89	29.76