

FCC Test Report

FCC ID : SWX-UDIMAC
Equipment : UniFi DIMMER
Brand Name : UBIQUITI
Model Name : UDIM-AC
Applicant / Manufacturer : Ubiquiti Networks, Inc.
685 Third Avenue, 27th Floor New York, New York
10017 USA
Standard : 47 CFR FCC Part 15.247

The product was received on Jul. 24, 2018, and testing was started from Jul. 28, 2018 and completed on Aug. 02, 2018. 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.)

Table of Contents

HISTORY OF THIS TEST REPORT	3
SUMMARY OF TEST RESULT	4
1 GENERAL DESCRIPTION	5
1.1 Information.....	5
1.2 Testing Applied Standards	6
1.3 Testing Location Information	6
1.4 Measurement Uncertainty	6
2 TEST CONFIGURATION OF EUT.....	7
2.1 Test Condition	7
2.2 Test Channel Mode	7
2.3 The Worst Case Measurement Configuration.....	7
2.4 Support Equipment.....	8
2.5 Test Setup Diagram	9
3 TRANSMITTER TEST RESULT	10
3.1 AC Power-line Conducted Emissions	10
3.2 DTS Bandwidth.....	12
3.3 Maximum Conducted Output Power	13
3.4 Power Spectral Density	15
3.5 Emissions in Non-restricted Frequency Bands	16
3.6 Emissions in Restricted Frequency Bands.....	17
4 TEST EQUIPMENT AND CALIBRATION DATA.....	21
APPENDIX A. TEST RESULTS OF AC POWER-LINE CONDUCTED EMISSIONS	
APPENDIX B. TEST RESULTS OF DTS BANDWIDTH	
APPENDIX C. TEST RESULTS OF MAXIMUM CONDUCTED OUTPUT POWER	
APPENDIX D. TEST RESULTS OF POWER SPECTRAL DENSITY	
APPENDIX E. TEST RESULTS OF EMISSIONS IN NON-RESTRICTED FREQUENCY BANDS	
APPENDIX F. TEST RESULTS OF EMISSIONS IN RESTRICTED FREQUENCY BANDS	
APPENDIX G. TEST PHOTOS	
PHOTOGRAPHS OF EUT V01	

[illegible]

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

Reviewed by: Sam Tsai

Report Producer: Debby Hung

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.

1.1.2 Antenna Information

Ant.	Port	Brand	Model Name	Antenna Type	Connector
1	1	-	-	PCB Antenna	I-PEX

Gain(dBi)	
2.4G	BT
4	3.5

For 2.4 GHz function:

For IEEE 802.11b/g/n mode (1TX/1RX)

Only Ant. 1 (port 1) can be used as transmitting/receiving antenna.

For Bluetooth function:

For Bluetooth mode (1TX/1RX)

Only Ant. 1 (port 1) can be used as transmitting/receiving antenna.

1.1.3 EUT Information

Operational Condition	
EUT Power Type	From AC Main
EUT Function	☒ Point-to-multipoint ☐ Point-to-point
Type of EUT	
☒	Stand-alone
☐	Combined (EUT where the radio part is fully integrated within another device)
☐	Combined Equipment - Brand Name / Model No.: ...
☐	Plug-in radio (EUT intended for a variety of host systems)
☐	Host System - Brand Name / Model No.: ...
☐	Other:

1.1.4 Mode Test Duty Cycle

Mode	DC	DCF(dB)	T(s)	VBW(Hz) $\geq 1/T$
BT-LE(1Mbps)	0.607	2.168	404.375u	3k

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 v04

1.3 Testing Location Information

Testing Location				
☒	HWA YA	ADD : No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)		
		TEL : 886-3-327-3456	FAX : 886-3-327-0973	
Test site Designation No. TW1190 with FCC.				
☐	JHUBEI	ADD : No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County, Taiwan (R.O.C.)		
		TEL : 886-3-656-9065	FAX : 886-3-656-9085	
Test site Designation No. TW0006 with FCC.				

Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
RF Conducted	TH01-HY	Andy	24.6°C / 63.7%	31/Jul/2018
Radiated	03CH09-HY	Jerry	25.5°C / 55%	28/Jul/2018
AC Conduction	CO04-HY	Jeremy	20.1°C / 65%	02/Aug/2018

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)	3.6 dB	Confidence levels of 95%
Radiated Emission (9kHz ~ 30MHz)	3.0 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	08
2440MHz	08
2480MHz	04

2.3 The Worst Case Measurement Configuration

The Worst Case Mode for Following Conformance Tests	
Tests Item	AC power-line conducted emissions
Condition	AC power-line conducted measurement for line and neutral
Operating Mode	CTX
1	Switching Power Supply mode

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

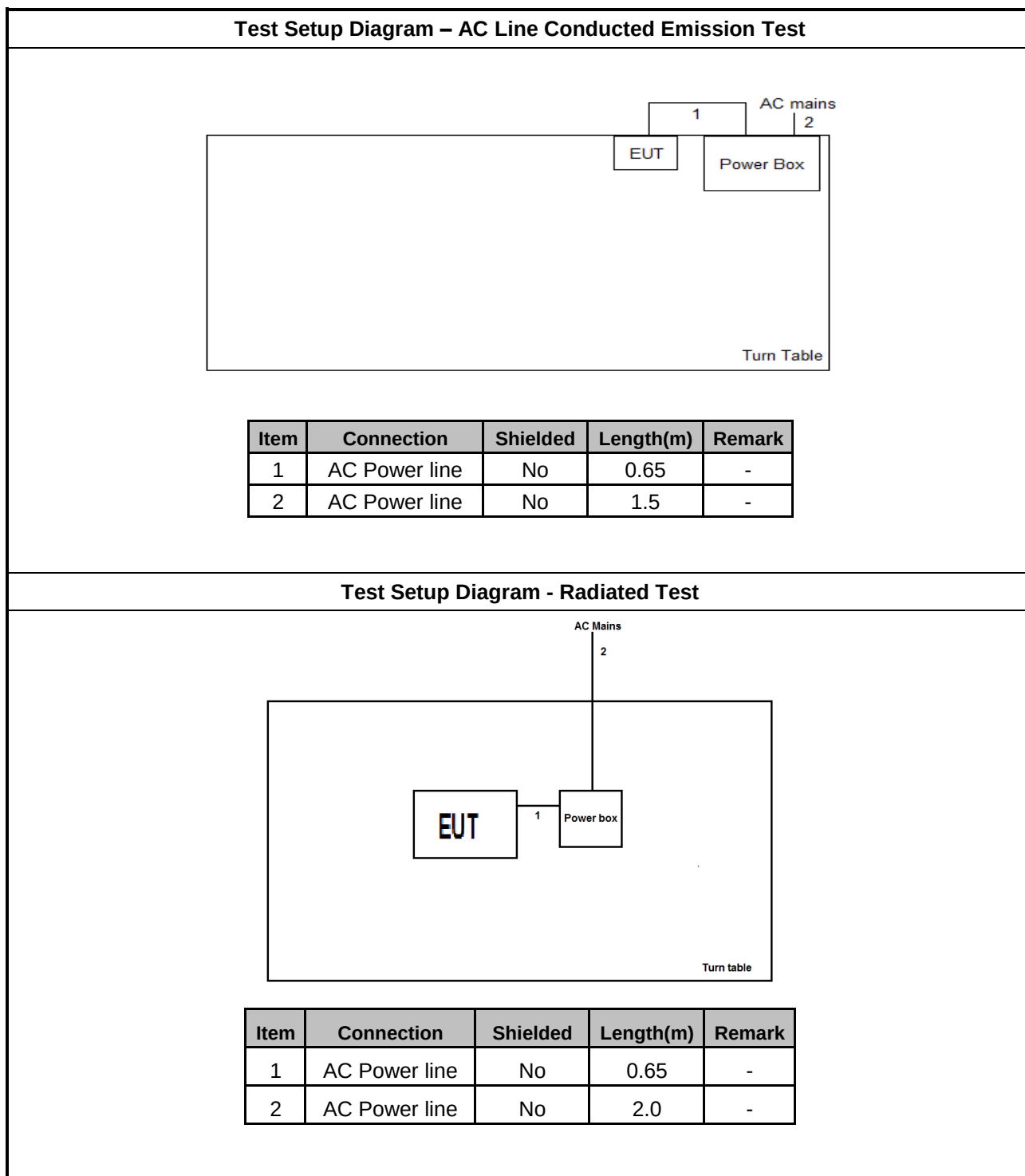
The Worst Case Mode for Following Conformance Tests			
Tests Item	Emissions in Restricted Frequency Bands		
Test Condition	Radiated measurement If EUT consist of multiple antenna assembly (multiple antenna are used in EUT regardless of spatial multiplexing MIMO configuration), the radiated test should be performed with highest antenna gain of each antenna type.		
Operating Mode < 1GHz	CTX		
1	Switching Power Supply mode		
Operating Mode > 1GHz	CTX		
Orthogonal Planes of EUT	X Plane	Y Plane	Z Plane
			
Worst Planes of EUT	V		

The Worst Case Mode for Following Conformance Tests	
Tests Item	Simultaneous Transmission Analysis
Operating Mode	CTX
1	Bluetooth+WLAN 2.4GHz
Refer to Sporton Test Report No.: FA7N0734-03 for Co-location RF Exposure Evaluation.	

2.4 Support Equipment

Support Equipment – RF Conducted				
No.	Equipment	Brand Name	Model Name	FCC ID
1	Notebook	DELL	E5410	R33002 / DOC
2	Adapter for NB	DELL	HA65NM130	R35737 / DOC
3	AC Power Source	GW	APS-9102	-

2.5 Test Setup Diagram



3 Transmitter Test Result

3.1 AC Power-line Conducted Emissions

3.1.1 AC Power-line Conducted Emissions Limit

AC Power-line Conducted Emissions Limit		
Frequency Emission (MHz)	Quasi-Peak	Average
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50

Note 1: * Decreases with the logarithm of the frequency.

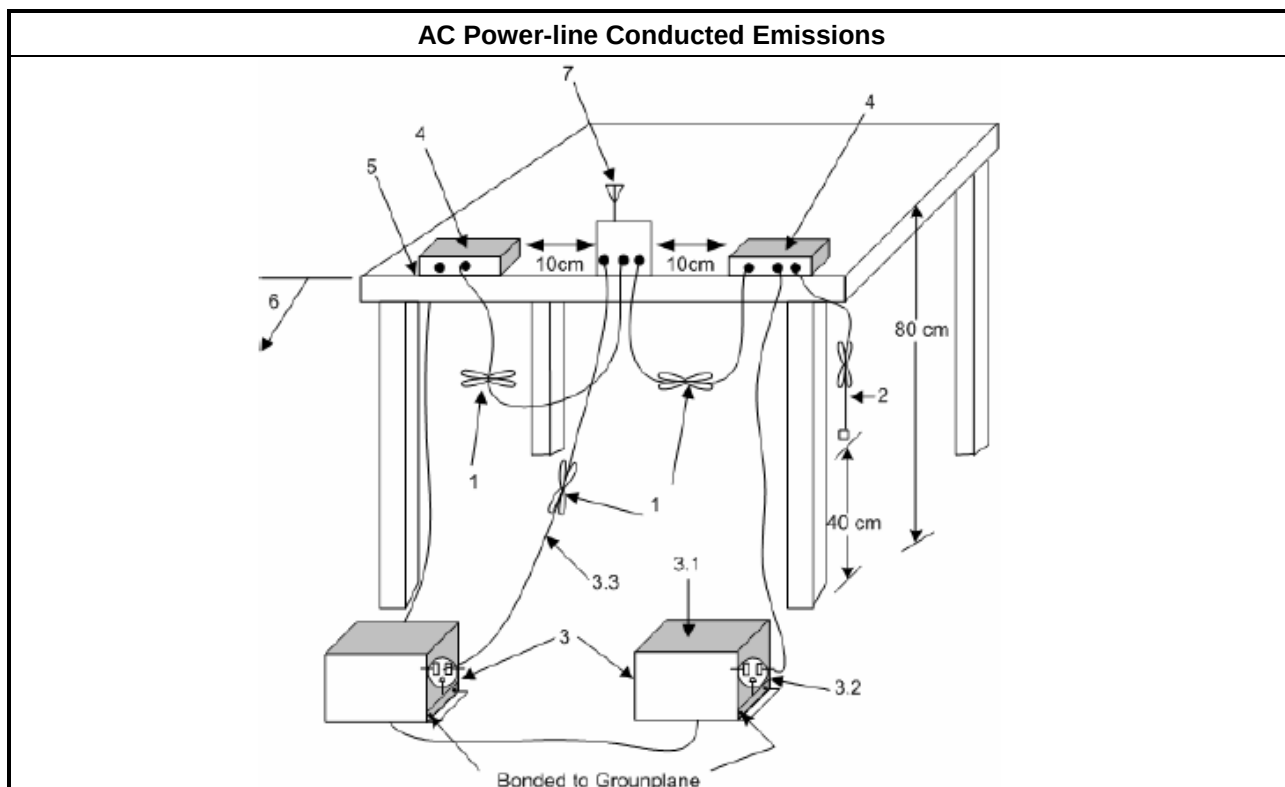
3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

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

3.1.4 Test Setup





3.1.5 Test Result of AC Power-line Conducted Emissions

Refer as Appendix A

3.2 DTS Bandwidth

3.2.1 6dB Bandwidth Limit

6dB Bandwidth Limit	
Systems using digital modulation techniques:	
▪	6 dB bandwidth $\geq$ 500 kHz.

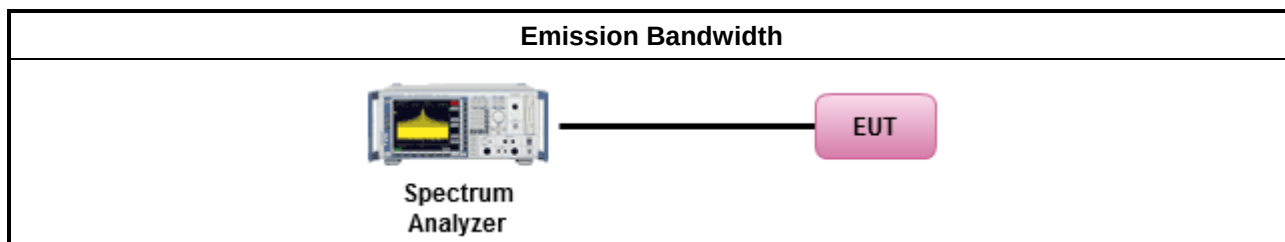
3.2.2 Measuring Instruments

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

3.2.3 Test Procedures

Test Method	
▪ For the emission bandwidth shall be measured using one of the options below:	
☒	Refer as KDB 558074, clause 8.1 Option 1 for 6 dB bandwidth measurement.
☐	Refer as KDB 558074, clause 8.2 Option 2 for 6 dB 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



3.2.5 Test Result of Emission Bandwidth

Refer as Appendix B

3.3 Maximum Conducted Output Power

3.3.1 Maximum Conducted Output Power Limit

Maximum Conducted Output Power Limit	
	If $G_{TX} \leq 6$ dBi, then $P_{Out} \leq 30$ dBm (1 W)
	Point-to-multipoint systems (P2M): If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)$ dBm
	Point-to-point systems (P2P): If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3$ dBm
	Smart antenna system (SAS):
	- Single beam: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3$ dBm
	- Overlap beam: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3$ dBm
	- Aggregate power on all beams: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)/3 + 8$ dB dBm
e.i.r.p. Power Limit:	
	2400-2483.5 MHz Band
	Point-to-multipoint systems (P2M): $P_{eirp} \leq 36$ dBm (4 W)
	Point-to-point systems (P2P): $P_{eirp} \leq \text{MAX}(36, [P_{Out} + G_{TX}])$ dBm
	Smart antenna system (SAS)
	- Single beam: $P_{eirp} \leq \text{MAX}(36, P_{Out} + G_{TX})$ dBm
	- Overlap beam: $P_{eirp} \leq \text{MAX}(36, P_{Out} + G_{TX})$ dBm
	- Aggregate power on all beams: $P_{eirp} \leq \text{MAX}(36, [P_{Out} + G_{TX} + 8])$ dBm
P_{Out} = maximum peak conducted output power or maximum conducted output power in dBm, G_{TX} = the maximum transmitting antenna directional gain in dBi.	

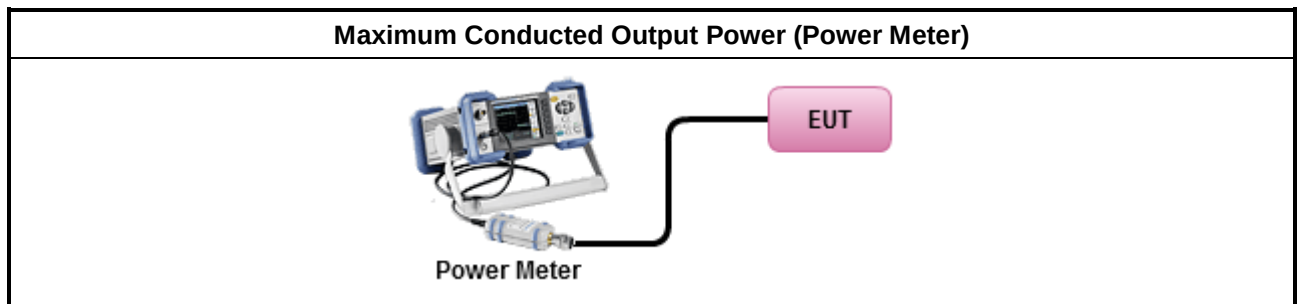
3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

Test Method	
Maximum Peak Conducted Output Power	
☐	Refer as KDB 558074, clause 9.1.1 Option 1 (RBW ≥ EBW method).
☐	Refer as KDB 558074, clause 9.1.2 Option 2 (integrated band power method)
☐	Refer as KDB 558074, clause 9.1.3 Option 3 (peak power meter for VBW ≥ DTS BW)
Maximum Average Conducted Output Power	
Duty cycle ≥ 98%	
☐	Refer as KDB 558074, clause 9.2.2.4 Method AVGSA-2 (spectral trace averaging).
Duty cycle < 98%	
☐	Refer as KDB 558074, clause 9.2.2.5 Method AVGSA-2 Alt. (slow sweep speed)
RF power meter and average over on/off periods with duty factor or gated trigger	
☒	Refer as KDB 558074, clause 9.2.3.1 Method AVGPM (using an RF average 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: $P_{\text{total}} = P_1 + P_2 + \dots + P_n$ (calculated in linear unit [mW] and transfer to log unit [dBm]) $\text{EIRP}_{\text{total}} = P_{\text{total}} + \text{DG}$	

3.3.4 Test Setup



3.3.5 Test Result of Maximum Conducted Output Power

Refer as Appendix C

3.4 Power Spectral Density

3.4.1 Power Spectral Density Limit

Power Spectral Density Limit	
▪	Power Spectral Density (PSD) ≤ 8 dBm/3kHz

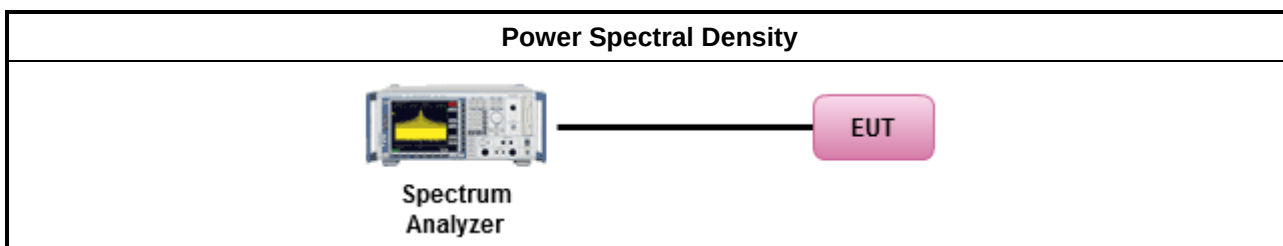
3.4.2 Measuring Instruments

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

3.4.3 Test Procedures

Test Method	
▪	Peak power spectral density procedures that the same method as used to determine the conducted output power. If maximum peak conducted output power was measured to demonstrate compliance to the output power limit, then the peak PSD procedure below (Method PKPSD) shall be used. If maximum conducted output power was measured to demonstrate compliance to the output power limit, then one of the average PSD procedures shall be used, as applicable based on the following criteria (the peak PSD procedure is also an acceptable option).
☒	Refer as KDB 558074, clause 10.2 Method PKPSD (RBW=3-100kHz; Detector=peak).
▪	For conducted measurement.
▪	If The EUT supports multiple transmit chains using options given below:
▪	Measure and sum the spectra across the outputs. Refer as KDB 662911, In-band power spectral density (PSD). Sample all transmit ports simultaneously using a spectrum analyzer for each transmit port. Where the trace bin-by-bin of each transmit port summing can be performed. (i.e., in the first spectral bin of output 1 is summed with that in the first spectral bin of output 2 and that from the first spectral bin of output 3, and so on up to the NTX output to obtain the value for the first frequency bin of the summed spectrum.). Add up the amplitude (power) values for the different transmit chains and use this as the new data trace.

3.4.4 Test Setup



3.4.5 Test Result of Power Spectral Density

Refer as Appendix D

3.5 Emissions in Non-restricted Frequency Bands

3.5.1 Emissions in Non-restricted Frequency Bands Limit

Un-restricted Band Emissions Limit	
RF output power procedure	Limit (dB)
Peak output power procedure	20
Average output power procedure	30
Note 1: If the peak output power procedure is used to measure the fundamental emission power to demonstrate compliance to requirements, then the peak conducted output power measured within any 100 kHz outside the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum measured in-band peak PSD 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 PSD level.	

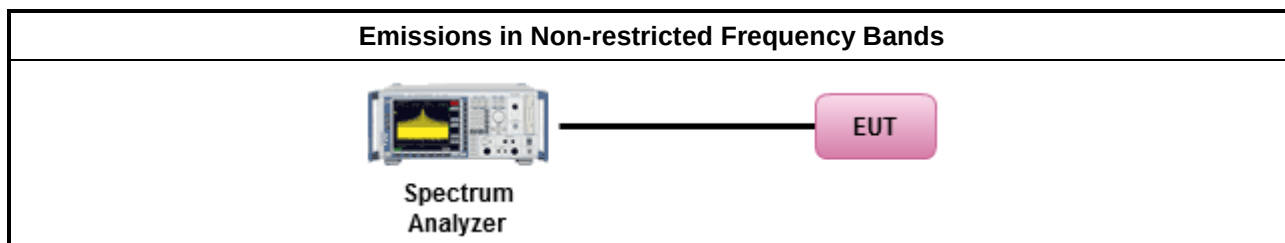
3.5.2 Measuring Instruments

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

3.5.3 Test Procedures

Test Method
Refer as KDB 558074, clause 11 for unwanted emissions into non-restricted bands.

3.5.4 Test Setup



3.5.5 Test Result of Emissions in Non-restricted Frequency Bands

Refer as Appendix E

3.6 Emissions in Restricted Frequency Bands

3.6.1 Emissions in Restricted Frequency Bands Limit

Restricted Band Emissions Limit			
Frequency Range (MHz)	Field Strength (uV/m)	Field Strength (dBuV/m)	Measure Distance (m)
0.009~0.490	2400/F(kHz)	48.5 - 13.8	300
0.490~1.705	24000/F(kHz)	33.8 - 23	30
1.705~30.0	30	29	30
30~88	100	40	3
88~216	150	43.5	3
216~960	200	46	3
Above 960	500	54	3

Note 1: Test distance for frequencies at or above 30 MHz, measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).

Note 2: Test distance for frequencies at below 30 MHz, measurements may be performed at a distance closer than the EUT limit distance; however, an attempt should be made to avoid making measurements in the near field. When performing measurements below 30 MHz at a closer distance than the limit distance, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two or more distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB / decade). The test report shall specify the extrapolation method used to determine compliance of the EUT.

Note 3: Using the distance of 1m during the test for above 18 GHz, and the test value to correct for the distance factor at 3m.

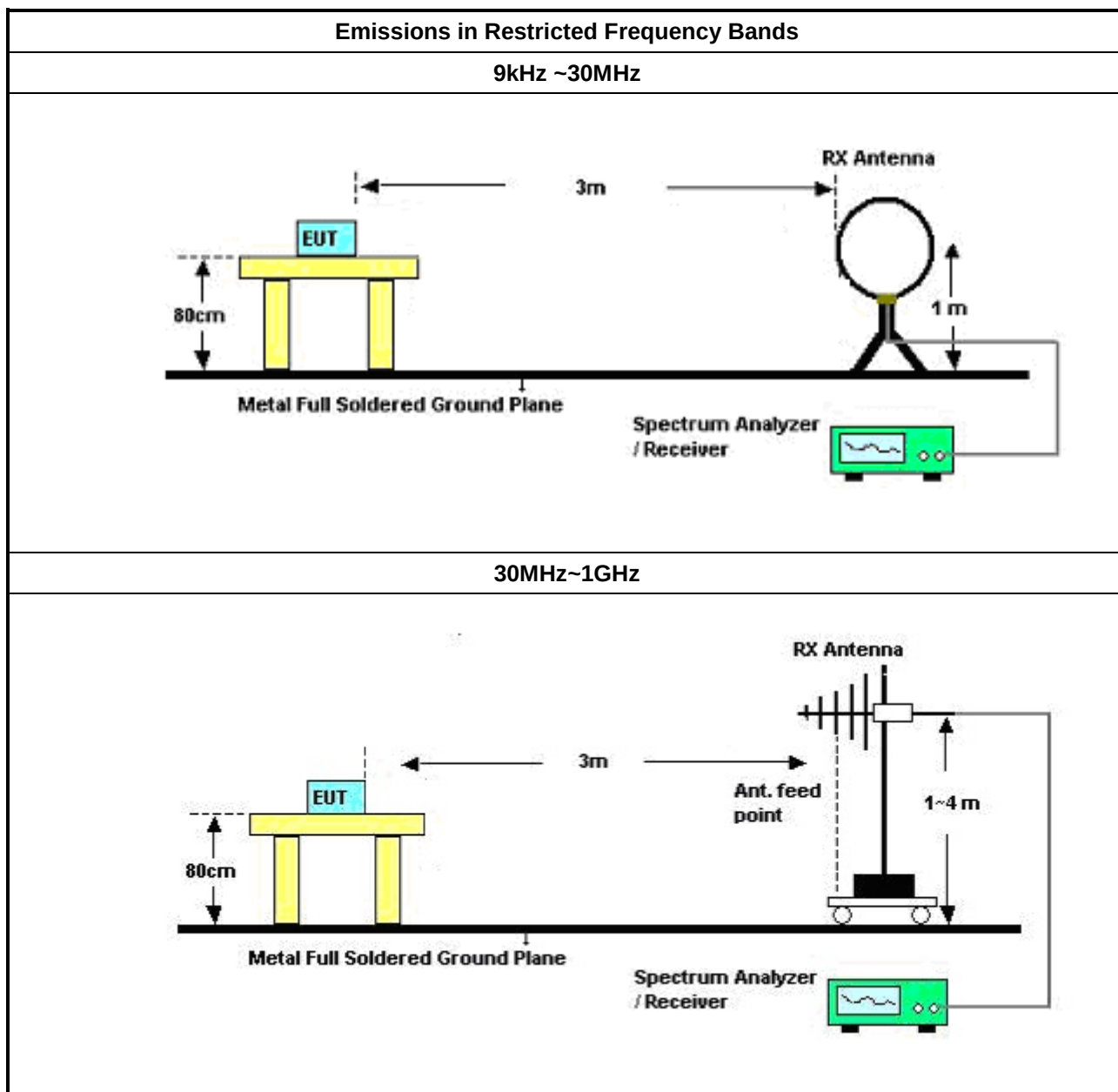
3.6.2 Measuring Instruments

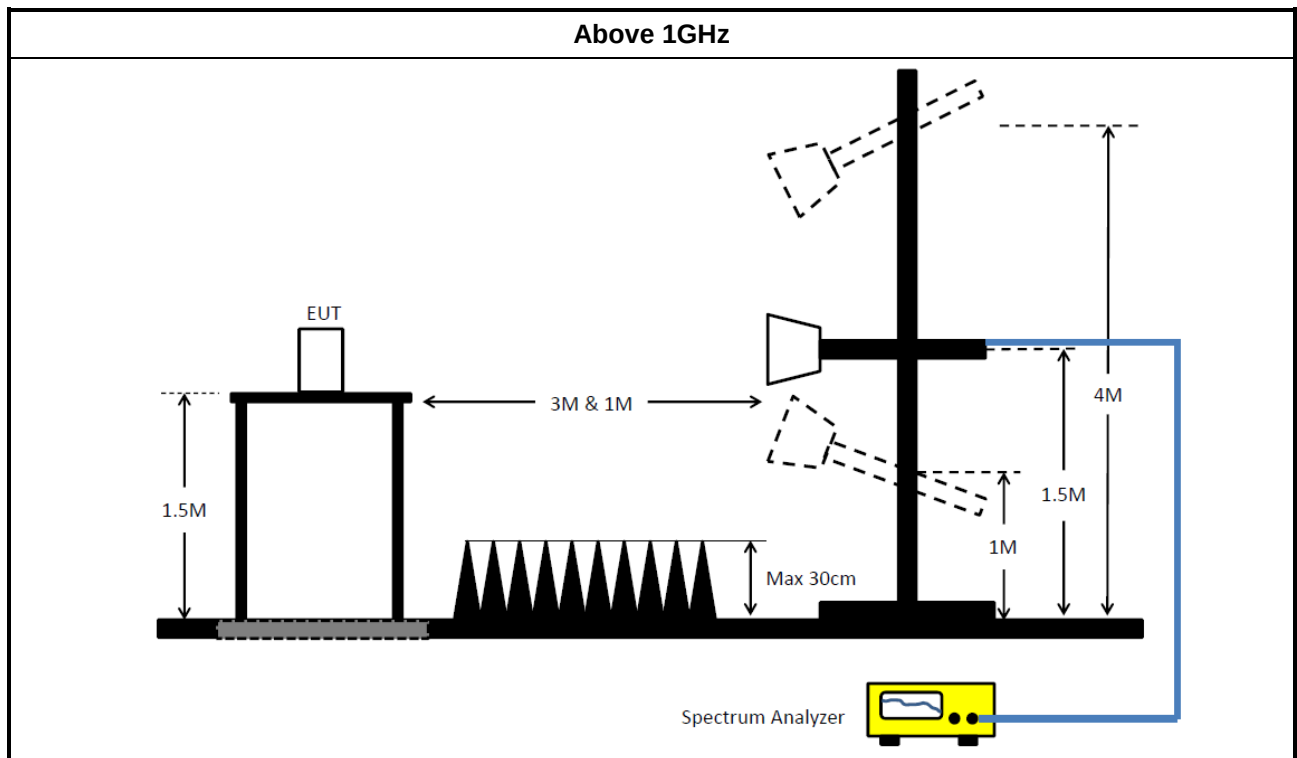
Refer a test equipment and calibration data table in this test report.

3.6.3 Test Procedures

Test Method	
The average emission levels shall be measured in [duty cycle ≥ 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 12 for unwanted emissions into restricted bands.
	☒ Refer as KDB 558074, clause 12.2.5.3 (ANSI C63.10, clause 4.1.4.2.3), Reduced VBW $\geq 1/T$.
	☒ Refer as KDB 558074, clause 12.2.4 measurement procedure peak limit.
For the transmitter band-edge emissions shall be measured using following options below:	
	Refer as KDB 558074 clause 13.1, 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 13.2 (ANSI C63.10, clause 6.10.6) for marker-delta method for band-edge measurements.
	Refer as KDB 558074, clause 13.3 for narrower resolution bandwidth (100kHz) using the band power and summing the spectral levels (i.e., 1 MHz).
For conducted and cabinet radiation measurement, refer as KDB 558074, clause 12.2.2.	
	For conducted unwanted emissions into restricted bands (absolute emission limits). Devices with multiple transmit chains using options given below: (1) Measure and sum the spectra across the outputs or (2) Measure and add 10 log(N) dB
	For KDB 662911 The methodology described here may overestimate array gain, thereby resulting in apparent failures to satisfy the out-of-band limits even if the device is actually compliant. In such cases, compliance may be demonstrated by performing radiated tests around the frequencies at which the apparent failures occurred.

3.6.4 Test Setup





3.6.5 Test Result of Emissions in Restricted Frequency Bands

Refer as Appendix F

4 Test Equipment and Calibration Data

Instrument for AC Conduction

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
EMC Receiver	R&S	ESR3	102051	9KHz ~ 3.6GHz	03/May/2018	02/May/2019
LISN	R&S	ENV216	101295	9kHz ~ 30MHz	17/Nov/2017	16/Nov/2018
RF Cable-CON	HUBER+SUHNER	RG213/U	07611832020001	9kHz ~ 30MHz	06/Oct/2017	05/Oct/2018
AC POWER	APC	AFC-11005G	F310050055	47Hz~63Hz 5~300V	NCR	NCR
Impuls Begrenzer Puls e Limiter	SCHWARZBECK	VTSD 9561-F	9561-F041	9 kHz ~ 30 MHz	12/Oct/2017	11/Oct/2018

NCR : Non-Calibration Require

Instrument for Radiated Test

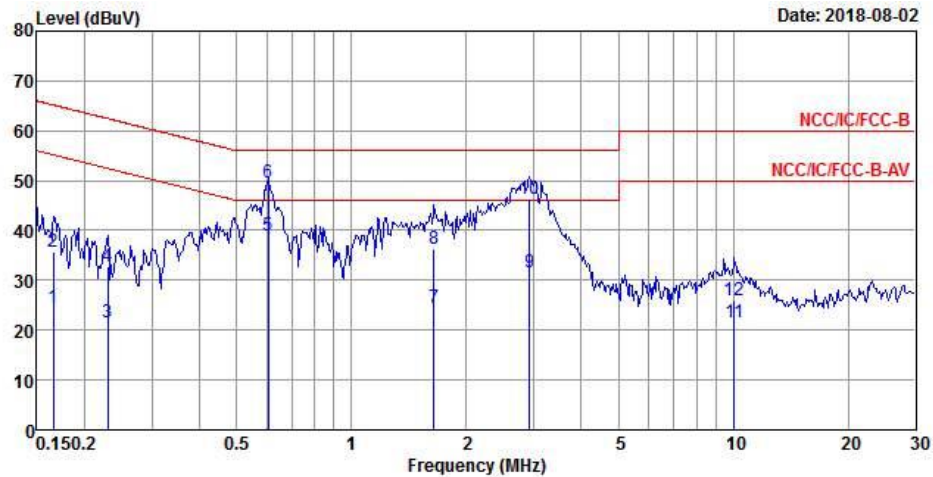
Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
3m Semi Anechoic Chamber	TDK	SAC-3M	03CH09-HY	30MHz ~ 1GHz	23/Apr/2018	22/Apr/2019
3m Semi Anechoic Chamber	TDK	SAC-3M	03CH09-HY	1GHz ~ 18GHz	14/Jun/2018	13/Jun/2019
Microwave Preamplifier	Agilent	8449B	3008A02096	1GHz ~ 26.5GHz	10/May/2018	09/May/2019
Amplifier	EMC	EMC9135	980232	9KHz~1GHz	27/Apr/2018	26/Apr/2019
EXA Signal Analyzer	KEYSIGHT	N9010A	SG56070103	10Hz ~ 44GHz	15/Dec/2016	14/Dec/2018
Bilog Antenna & 5dB Attenuator	TESEQ & MTJ	CBL6111D & MTJ6102-05	35418 / 3	30MHz~1GHz	09/Sep/2017	08/Sep/2018
Double Ridged Guide Horn Antenna	SCHWARZBECK	BBHA 9120 D	BBHA9120 D 1534	1GHz~18GHz	30/Apr/2018	29/Apr/2019
Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170614	18GHz~40GHz	09/Feb/2018	08/Feb/2019
Loop Antenna	TESEQ	HLA 6120	31244	9k-30MHz	29/Mar/2018	28/Mar/2019
RF Cable-R03m	Jye Bao	RG142	CB031	9kHz ~ 1GHz	1/Feb/2018	31/Jan/2019
RF Cable-high	HUBER+SUHNER	SUCOFLEX104	SN 556626/4 + 556627	1GHz ~ 40GHz	14/Mar/2018	13/Mar/2019

Instrument for Conducted Test

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
Spectrum Analyzer	R&S	FSV 40	101013	9kHz~40GHz	05/Feb/2018	04/Feb/2019
Power Sensor	Anritsu	MA2411B	0917017	300MHz ~ 40GHz	05/Feb/2018	04/Feb/2019
Power Meter	Anritsu	ML2495A	0949003	300MHz ~ 40GHz	05/Feb/2018	04/Feb/2019
RF Cable-0.2m	HUBER+SUHNER	SUCOFLEX_104	MY10710/4	30MHz ~ 26.5GHz	25/Aug/2017	24/Aug/2018
RF Cable-0.2m	HUBER+SUHNER	SUCOFLEX_104	MY10709/4	30MHz ~ 26.5GHz	25/Aug/2017	24/Aug/2018
RF Cable-1m	HUBER+SUHNER	SUCOFLEX_104	MY38490/4	30MHz ~ 26.5GHz	25/Aug/2017	24/Aug/2018
Signal Generator	R&S	SMR40	100116	10MHz ~ 40GHz	26/Jul/2018	25/Jul/2019

AC Power-line Conducted Emissions Result

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

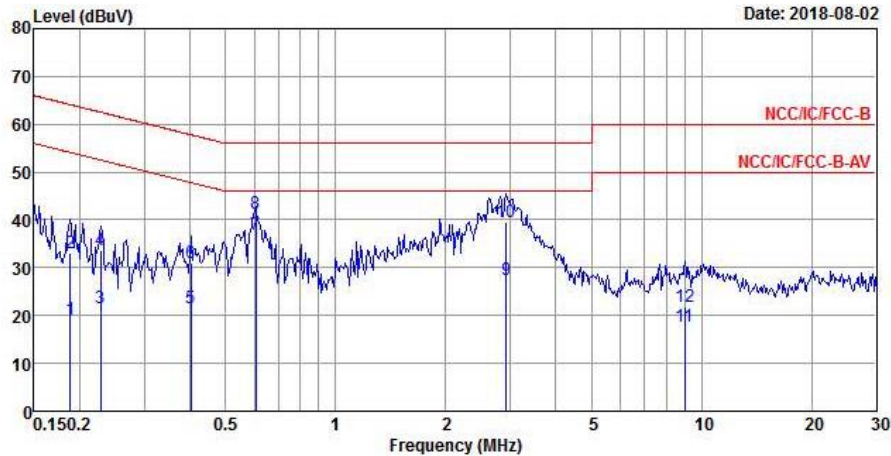


	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.17	24.47	-30.69	55.16	14.81	9.63	0.03	Average
2	0.17	35.74	-29.42	65.16	26.08	9.63	0.03	QP
3	0.23	21.68	-30.76	52.44	12.04	9.62	0.02	Average
4	0.23	32.84	-29.60	62.44	23.20	9.62	0.02	QP
5	0.60	38.89	-7.11	46.00	29.23	9.61	0.05	Average
6 MAX	0.60	49.64	-6.36	56.00	39.98	9.61	0.05	QP
7	1.64	24.64	-21.36	46.00	15.01	9.63	0.00	Average
8	1.64	36.18	-19.82	56.00	26.55	9.63	0.00	QP
9	2.93	31.59	-14.41	46.00	21.90	9.64	0.05	Average
10	2.93	46.30	-9.70	56.00	36.61	9.64	0.05	QP
11	10.07	21.51	-28.49	50.00	11.63	9.69	0.19	Average
12	10.07	25.95	-34.05	60.00	16.07	9.69	0.19	QP

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

AC Power-line Conducted Emissions Result

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



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.19	19.08	-35.03	54.11	9.45	9.62	0.01	Average
2	0.19	33.17	-30.94	64.11	23.54	9.62	0.01	QP
3	0.23	21.42	-31.10	52.52	11.78	9.62	0.02	Average
4	0.23	33.72	-28.80	62.52	24.08	9.62	0.02	QP
5	0.40	21.42	-26.39	47.81	11.71	9.61	0.10	Average
6	0.40	31.00	-26.81	57.81	21.29	9.61	0.10	QP
7 MAX	0.60	36.78	-9.22	46.00	27.11	9.61	0.06	Average
8	0.60	41.33	-14.67	56.00	31.66	9.61	0.06	QP
9	2.93	27.51	-18.49	46.00	17.83	9.63	0.05	Average
10	2.93	39.62	-16.38	56.00	29.94	9.63	0.05	QP
11	9.01	17.72	-32.28	50.00	7.87	9.66	0.19	Average
12	9.01	21.85	-38.15	60.00	12.00	9.66	0.19	QP

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

Summary

Mode	Max-N dB (Hz)	Max-OBW (Hz)	ITU-Code	Min-N dB (Hz)	Min-OBW (Hz)
2.4-2.4835GHz	-	-	-	-	-
BT-LE(1Mbps)	668.75k	1.007M	1M01F1D	646.25k	987.006k

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;

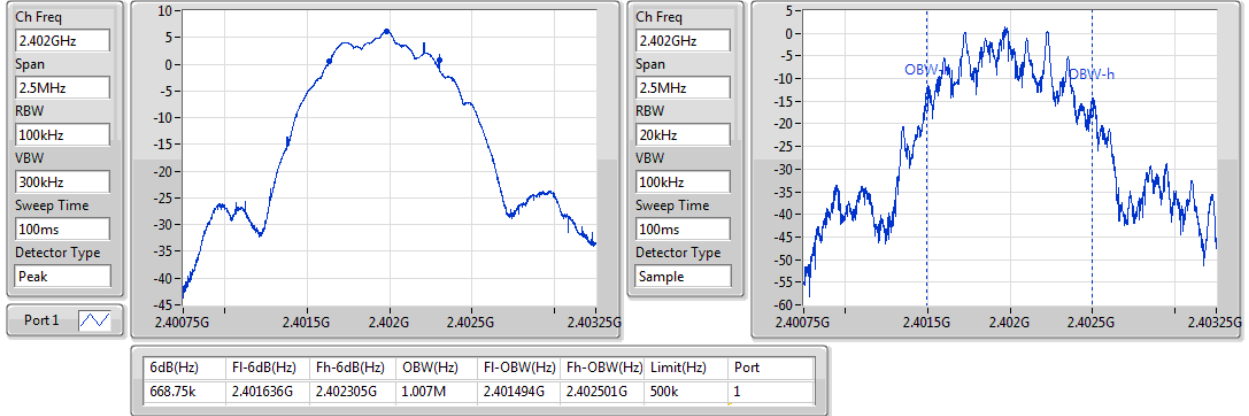
Result

Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
BT-LE(1Mbps)	-	-	-	-
2402MHz_TnomVnom	Pass	500k	668.75k	1.007M
2440MHz_TnomVnom	Pass	500k	646.25k	989.505k
2480MHz_TnomVnom	Pass	500k	647.5k	987.006k

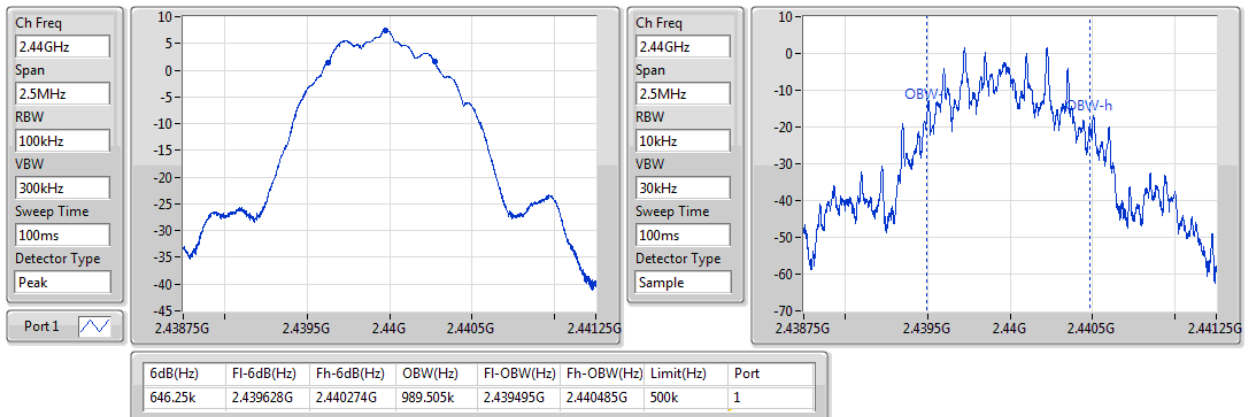
Port X-N dB = Port X 6dB down bandwidth; **Port X-OBW** = Port X 99% occupied bandwidth;

BT-LE(1Mbps)
EBW
2402MHz

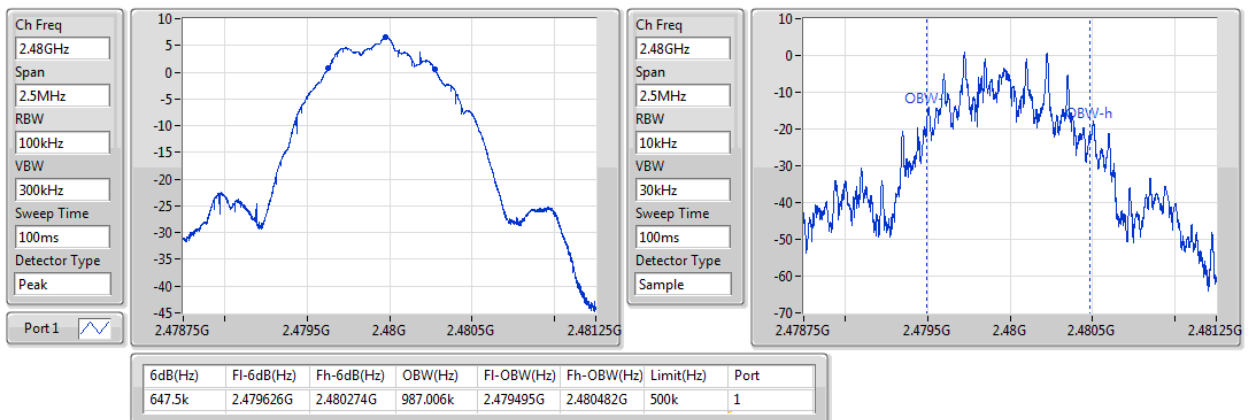
26/07/2018


BT-LE(1Mbps)
EBW
2440MHz

26/07/2018


BT-LE(1Mbps)
EBW
2480MHz

31/07/2018



**Summary**

Mode	Power	Power
	(dBm)	(W)
2.4-2.4835GHz	-	-
BT-LE(1Mbps)	6.85	0.00484

Result

Mode	Result	Gain (dBi)	Power (dBm)	Power Limit (dBm)
BT-LE(1Mbps)	-	-	-	-
2402MHz_TnomVnom	Pass	3.50	5.77	30.00
2440MHz_TnomVnom	Pass	3.50	6.85	30.00
2480MHz_TnomVnom	Pass	3.50	5.97	30.00

**Summary**

Mode	PD (dBm/RBW)
2.4-2.4835GHz	-
BT-LE(1Mbps)	-0.61

RBW=3kHz.

Result

Mode	Result	Gain (dBi)	PD (dBm/RBW)	PD Limit (dBm/RBW)
BT-LE(1Mbps)	-	-	-	-
2402MHz_TnomVnom	Pass	3.50	-1.29	8.00
2440MHz_TnomVnom	Pass	3.50	-0.61	8.00
2480MHz_TnomVnom	Pass	3.50	-2.36	8.00

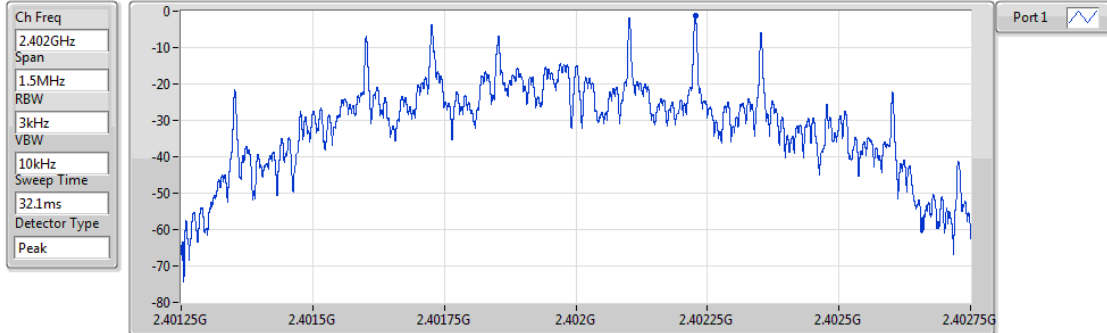
RBW=3kHz.

BT-LE(1Mbps)

PSD

2402MHz

26/07/2018



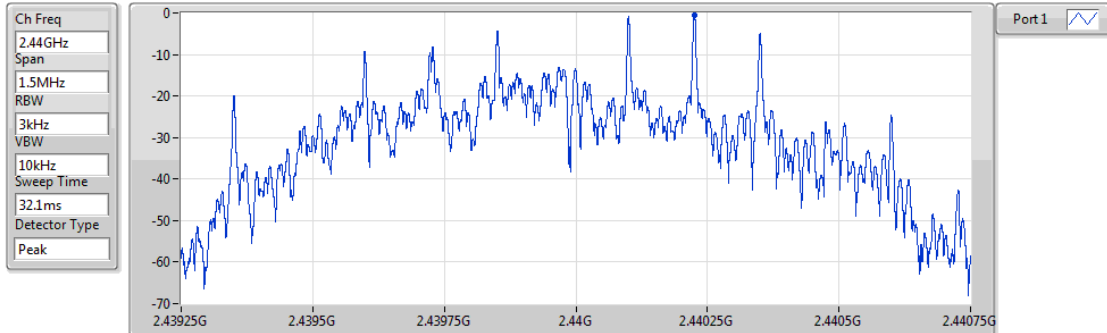
Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-1.29	-1.29	-1.29

BT-LE(1Mbps)

PSD

2440MHz

26/07/2018



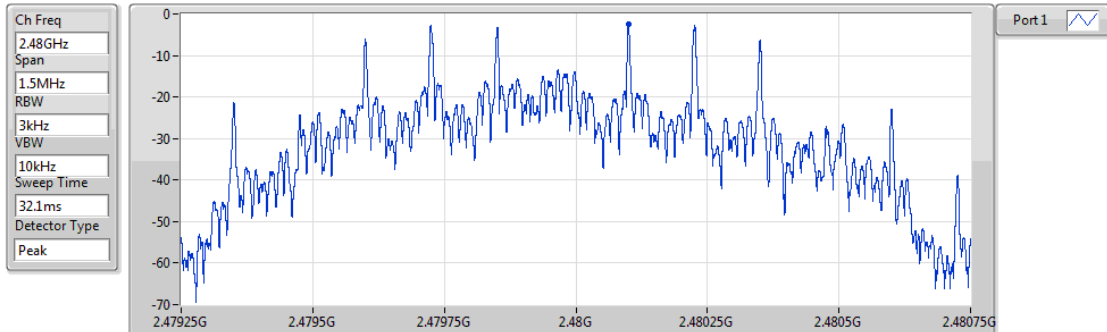
Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-0.61	-0.61	-0.61

BT-LE(1Mbps)

PSD

2480MHz

31/07/2018



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-2.36	-2.36	-2.36

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	2.439913G	7.53	-22.47	2.395632G	-61.27	2.399976G	-39.48	2.483912G	-62.71	7.205102G	-38.94	1

Result

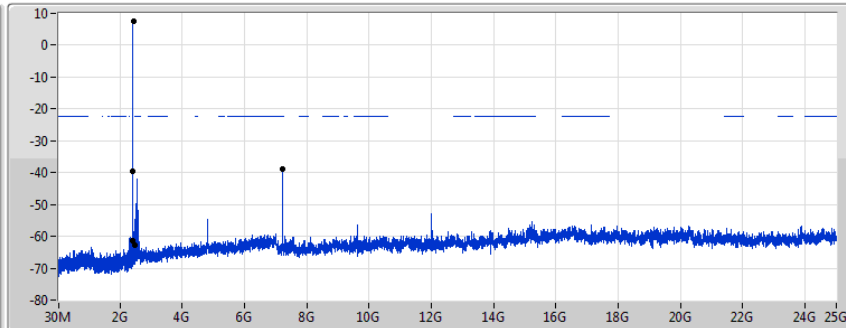
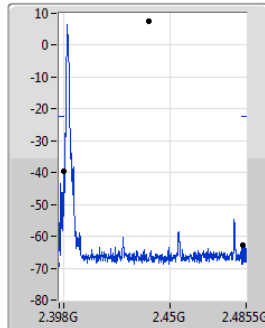
Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-	-	-
2402MHz_TnomVnom	Pass	2.439913G	7.53	-22.47	2.395632G	-61.27	2.399976G	-39.48	2.483912G	-62.71	7.205102G	-38.94	1
2440MHz_TnomVnom	Pass	2.439913G	7.53	-22.47	876.56M	-64.14	2.399988G	-39.89	2.483724G	-57.86	2.569929G	-45.09	1
2480MHz_TnomVnom	Pass	2.439913G	7.53	-22.47	848.144M	-64.42	2.399684G	-61.74	2.483516G	-59.14	2.60933G	-49.16	1

BT-LE(1Mbps)

CSE NdB

2402MHz

31/07/2018



Port1 

RBW 100kHz VSW 300kHz
Detector Type Peak

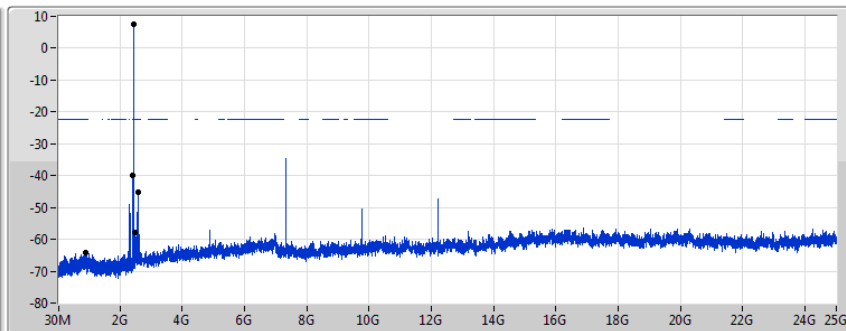
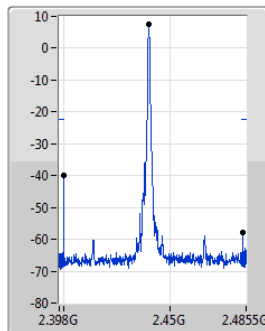
Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.439913G	7.53	-22.47	2.395632G	-61.27	2.399976G	-39.48	2.483912G	-62.71	7.205102G	-38.94	1

BT-LE(1Mbps)

CSE NdB

2440MHz

31/07/2018



Port1 

RBW 100kHz VSW 300kHz
Detector Type Peak

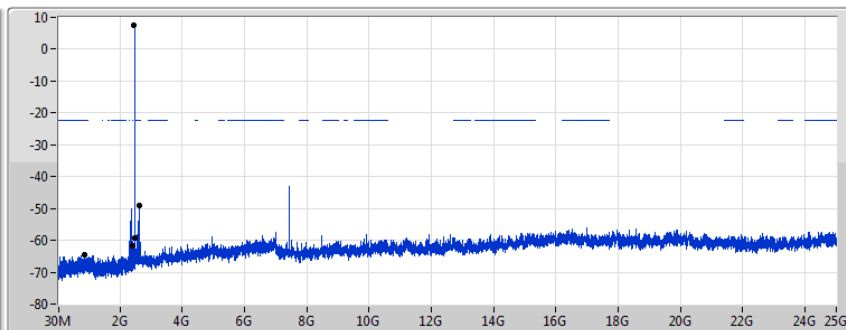
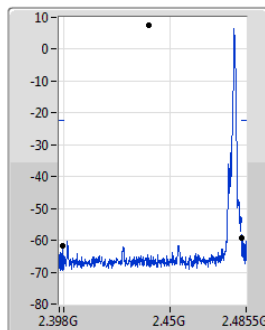
Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.439913G	7.53	-22.47	876.56M	-64.14	2.399988G	-39.89	2.483724G	-57.86	2.569929G	-45.09	1

BT-LE(1Mbps)

CSE NdB

2480MHz

31/07/2018



Port1 

RBW 100kHz VSW 300kHz
Detector Type Peak

Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.439913G	7.53	-22.47	848.144M	-64.42	2.399684G	-61.74	2.483516G	-59.14	2.60933G	-49.16	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	47.46M	31.73	40.00	-8.27	-22.21	3	Vertical	360	1.00	-

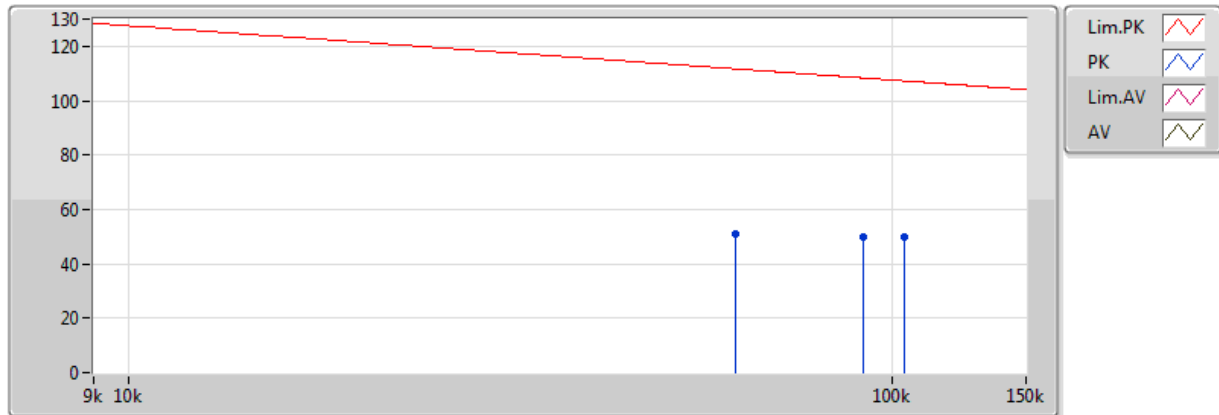
Result

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	62.3k	50.81	111.71	-60.90	21.07	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	91.77k	49.76	108.33	-58.57	20.84	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	103.89k	49.73	107.25	-57.52	20.78	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	12.389M	44.09	69.50	-25.41	22.38	3	Horizontal	360	1.00	-
2440MHz	Pass	PK	16.418M	41.91	69.50	-27.59	22.84	3	Horizontal	360	1.00	-
2440MHz	Pass	PK	24M	42.34	69.50	-27.16	23.47	3	Horizontal	360	1.00	-
2440MHz	Pass	PK	47.46M	31.73	40.00	-8.27	-22.21	3	Vertical	360	1.00	-
2440MHz	Pass	PK	163.86M	29.74	43.50	-13.76	-20.25	3	Vertical	360	1.00	-
2440MHz	Pass	PK	245.34M	24.88	46.00	-21.12	-17.84	3	Vertical	360	1.00	-
2440MHz	Pass	PK	392.78M	30.93	46.00	-15.07	-14.29	3	Vertical	360	1.00	-
2440MHz	Pass	PK	487.84M	36.53	46.00	-9.47	-12.27	3	Vertical	360	1.00	-
2440MHz	Pass	PK	586.78M	35.32	46.00	-10.68	-10.97	3	Vertical	360	1.00	-
2440MHz	Pass	PK	113.42M	24.23	43.50	-19.27	-19.75	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	163.86M	24.82	43.50	-18.68	-20.25	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	293.84M	33.95	46.00	-12.05	-16.80	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	392.78M	31.88	46.00	-14.12	-14.29	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	439.34M	29.24	46.00	-16.76	-13.05	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	784.66M	31.14	46.00	-14.86	-8.10	3	Horizontal	0	1.00	-

BT-LE(1Mbps)

2440MHz_Switch Power Supply

23/08/2018

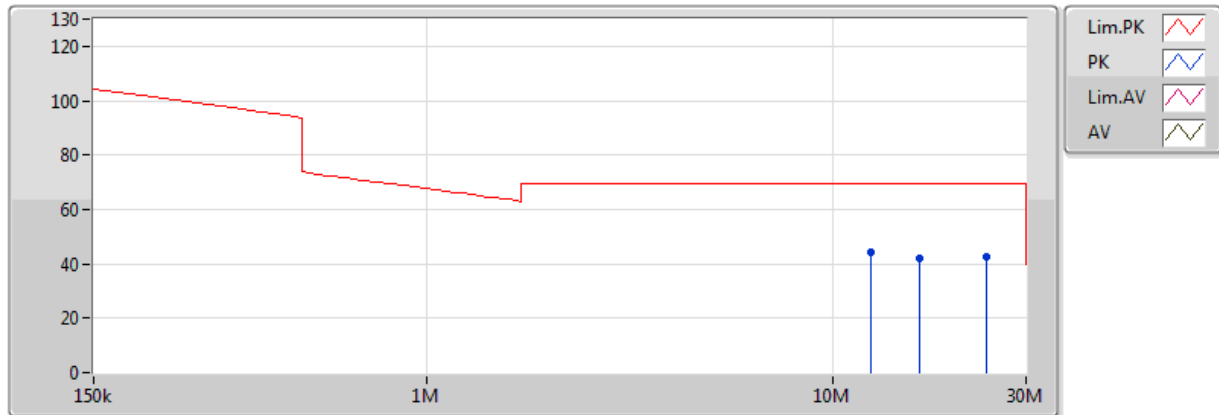


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
PK	62.3k	50.81	111.71	-60.90	21.07	3	Horizontal	0	1.00	-
PK	91.77k	49.76	108.33	-58.57	20.84	3	Horizontal	0	1.00	-
PK	103.89k	49.73	107.25	-57.52	20.78	3	Horizontal	0	1.00	-

BT-LE(1Mbps)

2440MHz_Switch Power Supply

23/08/2018

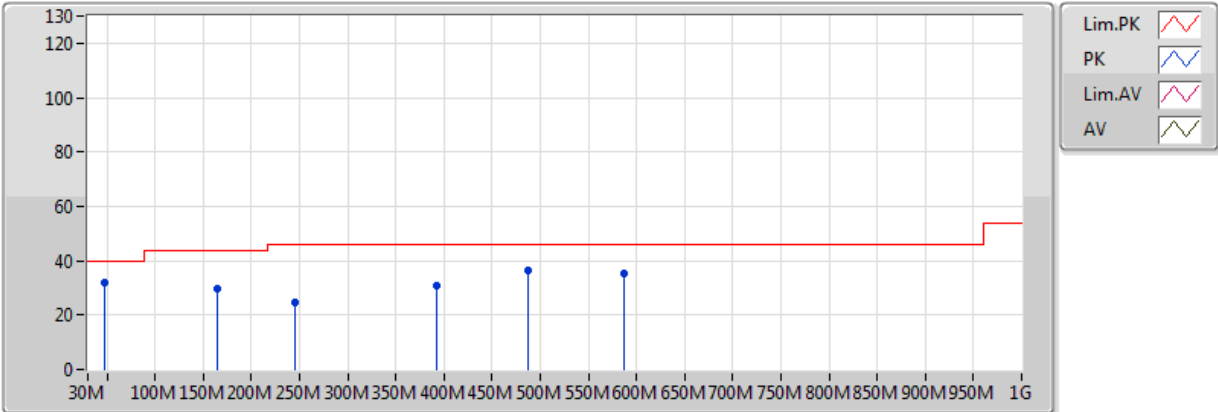


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
PK	12.389M	44.09	69.50	-25.41	22.38	3	Horizontal	360	1.00	-
PK	16.418M	41.91	69.50	-27.59	22.84	3	Horizontal	360	1.00	-
PK	24M	42.34	69.50	-27.16	23.47	3	Horizontal	360	1.00	-

BT-LE(1Mbps)

2440MHz_Switch Power Supply

27/07/2018

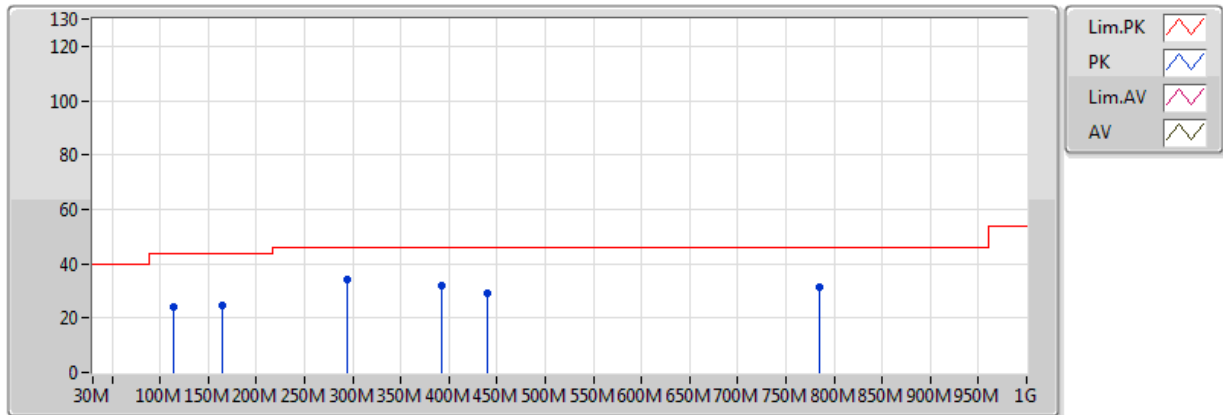


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
PK	47.46M	31.73	40.00	-8.27	-22.21	3	Vertical	360	1.00	-
PK	163.86M	29.74	43.50	-13.76	-20.25	3	Vertical	360	1.00	-
PK	245.34M	24.88	46.00	-21.12	-17.84	3	Vertical	360	1.00	-
PK	392.78M	30.93	46.00	-15.07	-14.29	3	Vertical	360	1.00	-
PK	487.84M	36.53	46.00	-9.47	-12.27	3	Vertical	360	1.00	-
PK	586.78M	35.32	46.00	-10.68	-10.97	3	Vertical	360	1.00	-

BT-LE(1Mbps)

2440MHz_Switch Power Supply

27/07/2018



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
PK	113.42M	24.23	43.50	-19.27	-19.75	3	Horizontal	0	1.00	-
PK	163.86M	24.82	43.50	-18.68	-20.25	3	Horizontal	0	1.00	-
PK	293.84M	33.95	46.00	-12.05	-16.80	3	Horizontal	0	1.00	-
PK	392.78M	31.88	46.00	-14.12	-14.29	3	Horizontal	0	1.00	-
PK	439.34M	29.24	46.00	-16.76	-13.05	3	Horizontal	0	1.00	-
PK	784.66M	31.14	46.00	-14.86	-8.10	3	Horizontal	0	1.00	-



Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	AV	2.483502G	49.09	54.00	-4.91	31.11	3	Vertical	74	1.10	-

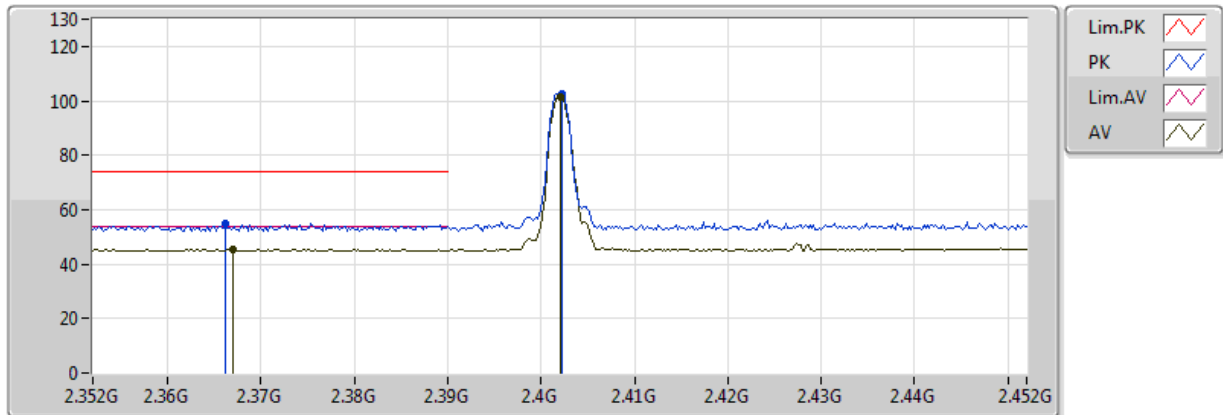
Result

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	2.367G	45.45	54.00	-8.55	30.70	3	Vertical	126	1.22	-
2402MHz	Pass	AV	2.402G	101.51	Inf	-Inf	30.82	3	Vertical	126	1.22	-
2402MHz	Pass	PK	2.3662G	55.03	74.00	-18.97	30.70	3	Vertical	126	1.22	-
2402MHz	Pass	PK	2.4022G	102.58	Inf	-Inf	30.82	3	Vertical	126	1.22	-
2402MHz	Pass	AV	2.366G	45.58	54.00	-8.42	30.69	3	Horizontal	47	1.49	-
2402MHz	Pass	AV	2.402G	98.49	Inf	-Inf	30.82	3	Horizontal	47	1.49	-
2402MHz	Pass	PK	2.3834G	54.96	74.00	-19.04	30.75	3	Horizontal	47	1.49	-
2402MHz	Pass	PK	2.4022G	99.58	Inf	-Inf	30.82	3	Horizontal	47	1.49	-
2402MHz	Pass	AV	4.80436G	35.93	54.00	-18.07	2.08	3	Vertical	1	1.03	-
2402MHz	Pass	PK	4.80436G	44.80	74.00	-29.20	2.08	3	Vertical	1	1.03	-
2402MHz	Pass	AV	4.80352G	36.17	54.00	-17.83	2.08	3	Horizontal	318	1.15	-
2402MHz	Pass	PK	4.8049G	43.81	74.00	-30.19	2.08	3	Horizontal	318	1.15	-
2440MHz	Pass	PK	2.3776G	55.43	74.00	-18.57	30.73	3	Vertical	66	1.20	-
2440MHz	Pass	AV	2.3616G	45.61	54.00	-8.39	30.67	3	Vertical	66	1.20	-
2440MHz	Pass	PK	2.4396G	105.00	Inf	-Inf	30.95	3	Vertical	66	1.20	-
2440MHz	Pass	AV	2.44G	104.02	Inf	-Inf	30.95	3	Vertical	66	1.20	-
2440MHz	Pass	PK	2.4924G	54.91	74.00	-19.09	31.14	3	Vertical	66	1.20	-
2440MHz	Pass	AV	2.492G	46.18	54.00	-7.82	31.14	3	Vertical	66	1.20	-
2440MHz	Pass	AV	2.3752G	45.84	54.00	-8.16	30.72	3	Horizontal	34	2.28	-
2440MHz	Pass	AV	2.44G	102.43	Inf	-Inf	30.95	3	Horizontal	34	2.28	-
2440MHz	Pass	AV	2.4988G	46.01	54.00	-7.99	31.17	3	Horizontal	34	2.28	-
2440MHz	Pass	PK	2.3776G	54.89	74.00	-19.11	30.73	3	Horizontal	34	2.28	-
2440MHz	Pass	PK	2.4396G	103.37	Inf	-Inf	30.95	3	Horizontal	34	2.28	-
2440MHz	Pass	PK	2.4916G	55.82	74.00	-18.18	31.14	3	Horizontal	34	2.28	-
2440MHz	Pass	AV	4.87952G	36.93	54.00	-17.07	2.27	3	Vertical	360	1.03	-
2440MHz	Pass	PK	4.87952G	45.67	74.00	-28.33	2.27	3	Vertical	360	1.03	-
2440MHz	Pass	AV	4.88036G	38.44	54.00	-15.56	2.27	3	Horizontal	270	1.12	-
2440MHz	Pass	PK	4.88036G	46.99	74.00	-27.01	2.27	3	Horizontal	270	1.12	-
2480MHz	Pass	AV	2.4798G	102.96	Inf	-Inf	31.10	3	Vertical	74	1.10	-
2480MHz	Pass	AV	2.483502G	49.09	54.00	-4.91	31.11	3	Vertical	74	1.10	-
2480MHz	Pass	PK	2.4798G	104.11	Inf	-Inf	31.10	3	Vertical	74	1.10	-
2480MHz	Pass	PK	2.4836G	57.14	74.00	-16.86	31.11	3	Vertical	74	1.10	-
2480MHz	Pass	AV	2.48G	100.03	Inf	-Inf	31.10	3	Horizontal	37	2.48	-
2480MHz	Pass	AV	2.483502G	47.97	54.00	-6.03	31.11	3	Horizontal	37	2.48	-
2480MHz	Pass	PK	2.4798G	101.19	Inf	-Inf	31.10	3	Horizontal	37	2.48	-
2480MHz	Pass	PK	2.4866G	55.03	74.00	-18.97	31.12	3	Horizontal	37	2.48	-
2480MHz	Pass	AV	4.95994G	37.38	54.00	-16.62	2.47	3	Vertical	119	1.01	-
2480MHz	Pass	PK	4.95946G	45.27	74.00	-28.73	2.47	3	Vertical	119	1.01	-
2480MHz	Pass	AV	4.95946G	38.52	54.00	-15.48	2.47	3	Horizontal	275	1.04	-
2480MHz	Pass	PK	4.95952G	46.60	74.00	-27.40	2.47	3	Horizontal	275	1.04	-

BT-LE(1Mbps)

2402MHz_TX

27/07/2018

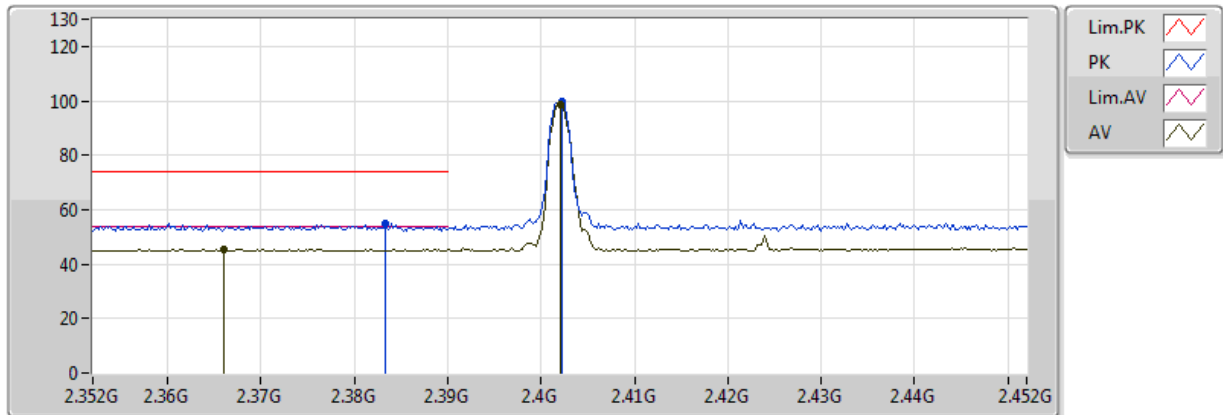


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
AV	2.367G	45.45	54.00	-8.55	30.70	3	Vertical	126	1.22	-
AV	2.402G	101.51	Inf	-Inf	30.82	3	Vertical	126	1.22	-
PK	2.3662G	55.03	74.00	-18.97	30.70	3	Vertical	126	1.22	-
PK	2.4022G	102.58	Inf	-Inf	30.82	3	Vertical	126	1.22	-

BT-LE(1Mbps)

2402MHz_TX

27/07/2018

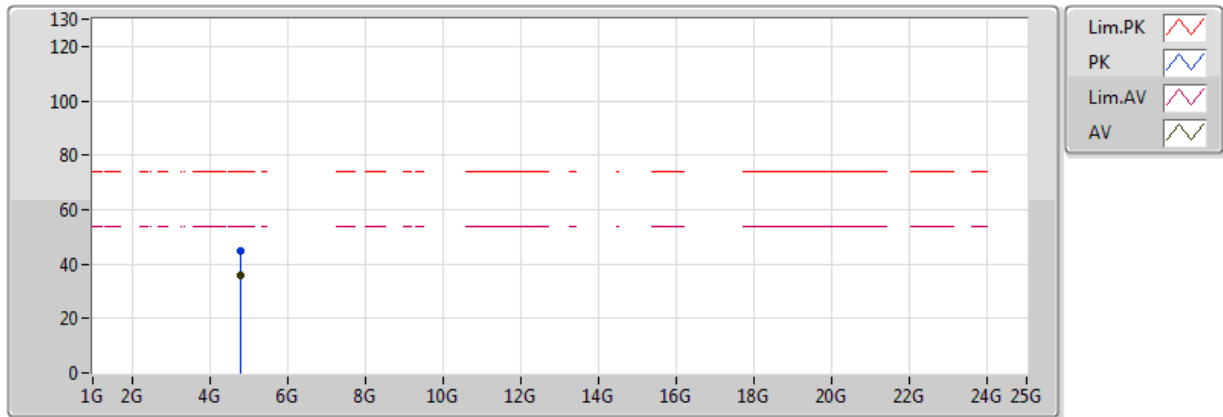


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
AV	2.366G	45.58	54.00	-8.42	30.69	3	Horizontal	47	1.49	-
AV	2.402G	98.49	Inf	-Inf	30.82	3	Horizontal	47	1.49	-
PK	2.3834G	54.96	74.00	-19.04	30.75	3	Horizontal	47	1.49	-
PK	2.4022G	99.58	Inf	-Inf	30.82	3	Horizontal	47	1.49	-

BT-LE(1Mbps)

2402MHz_TX

27/07/2018

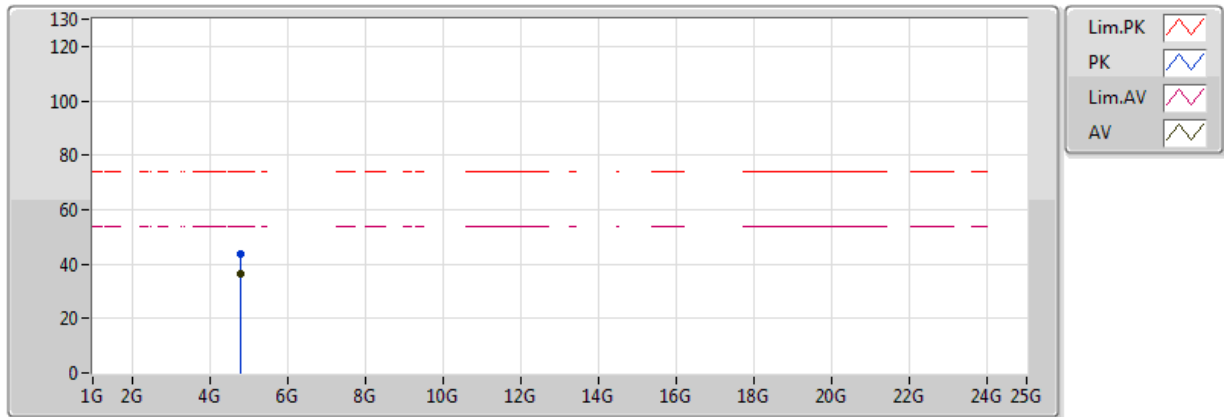


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
AV	4.80436G	35.93	54.00	-18.07	2.08	3	Vertical	1	1.03	-
PK	4.80436G	44.80	74.00	-29.20	2.08	3	Vertical	1	1.03	-

BT-LE(1Mbps)

2402MHz_TX

27/07/2018

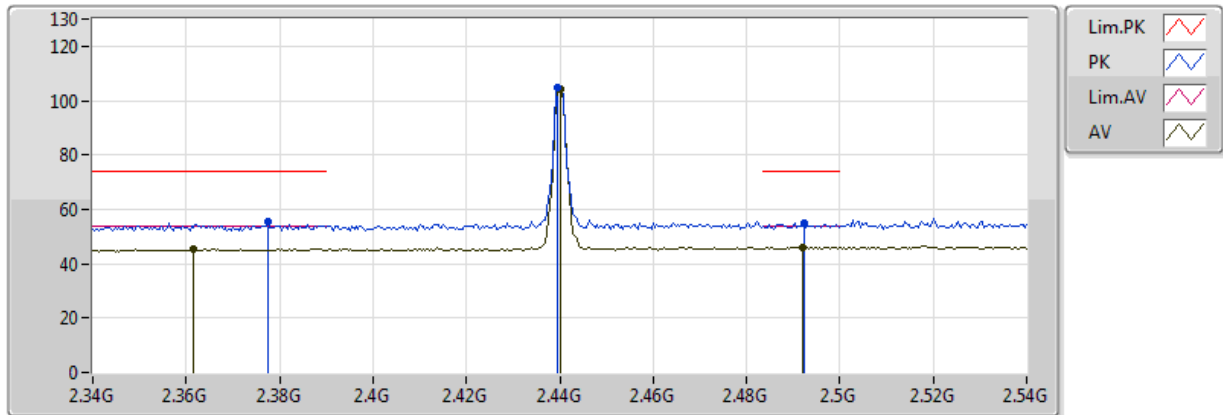


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
AV	4.80352G	36.17	54.00	-17.83	2.08	3	Horizontal	318	1.15	-
PK	4.8049G	43.81	74.00	-30.19	2.08	3	Horizontal	318	1.15	-

BT-LE(1Mbps)

2440MHz_TX

27/07/2018

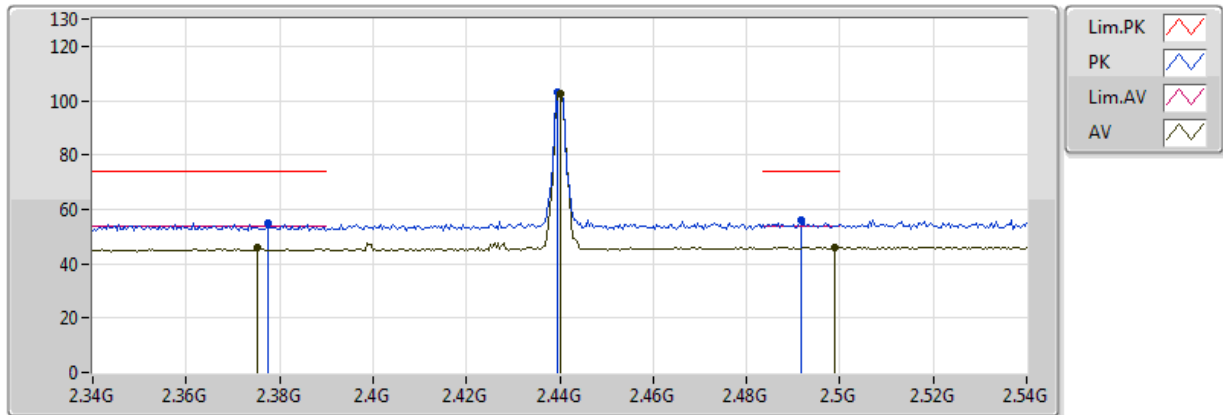


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
PK	2.3776G	55.43	74.00	-18.57	30.73	3	Vertical	66	1.20	-
AV	2.3616G	45.61	54.00	-8.39	30.67	3	Vertical	66	1.20	-
PK	2.4396G	105.00	Inf	-Inf	30.95	3	Vertical	66	1.20	-
AV	2.44G	104.02	Inf	-Inf	30.95	3	Vertical	66	1.20	-
PK	2.4924G	54.91	74.00	-19.09	31.14	3	Vertical	66	1.20	-
AV	2.492G	46.18	54.00	-7.82	31.14	3	Vertical	66	1.20	-

BT-LE(1Mbps)

2440MHz_TX

27/07/2018

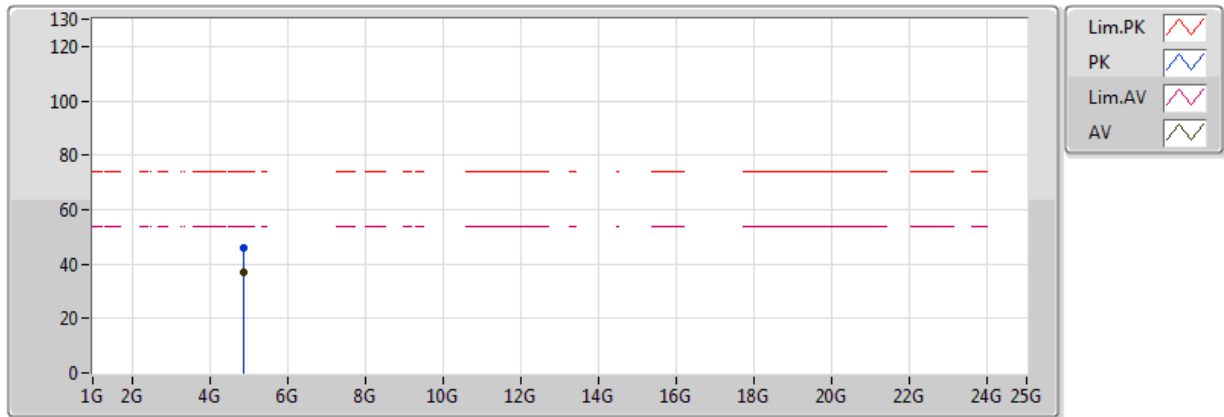


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
AV	2.3752G	45.84	54.00	-8.16	30.72	3	Horizontal	34	2.28	-
AV	2.44G	102.43	Inf	-Inf	30.95	3	Horizontal	34	2.28	-
AV	2.4988G	46.01	54.00	-7.99	31.17	3	Horizontal	34	2.28	-
PK	2.3776G	54.89	74.00	-19.11	30.73	3	Horizontal	34	2.28	-
PK	2.4396G	103.37	Inf	-Inf	30.95	3	Horizontal	34	2.28	-
PK	2.4916G	55.82	74.00	-18.18	31.14	3	Horizontal	34	2.28	-

BT-LE(1Mbps)

2440MHz_TX

27/07/2018

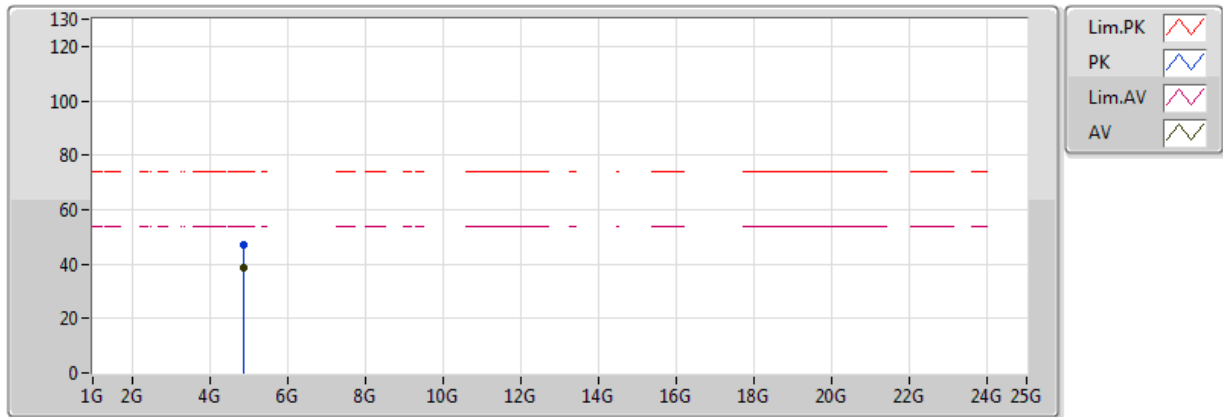


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
AV	4.87952G	36.93	54.00	-17.07	2.27	3	Vertical	360	1.03	-
PK	4.87952G	45.67	74.00	-28.33	2.27	3	Vertical	360	1.03	-

BT-LE(1Mbps)

2440MHz_TX

27/07/2018

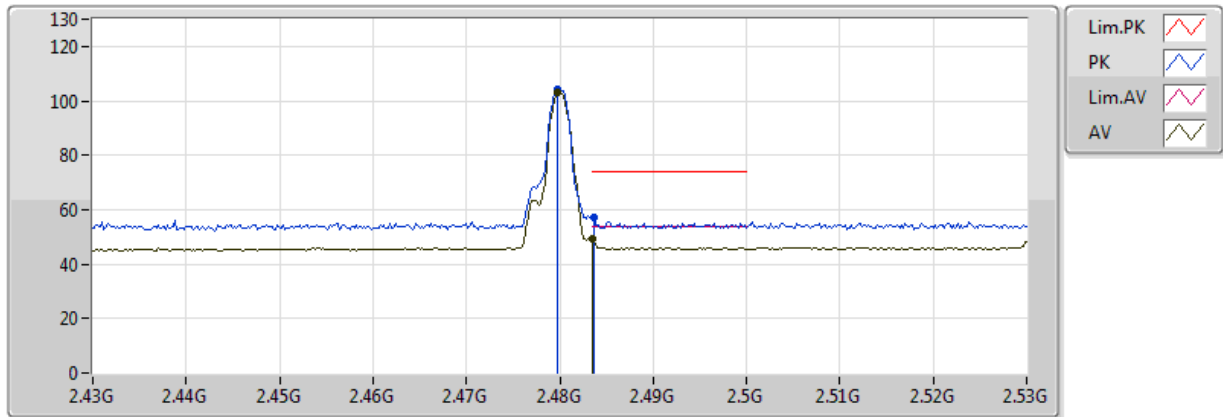


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
AV	4.88036G	38.44	54.00	-15.56	2.27	3	Horizontal	270	1.12	-
PK	4.88036G	46.99	74.00	-27.01	2.27	3	Horizontal	270	1.12	-

BT-LE(1Mbps)

2480MHz_TX

27/07/2018

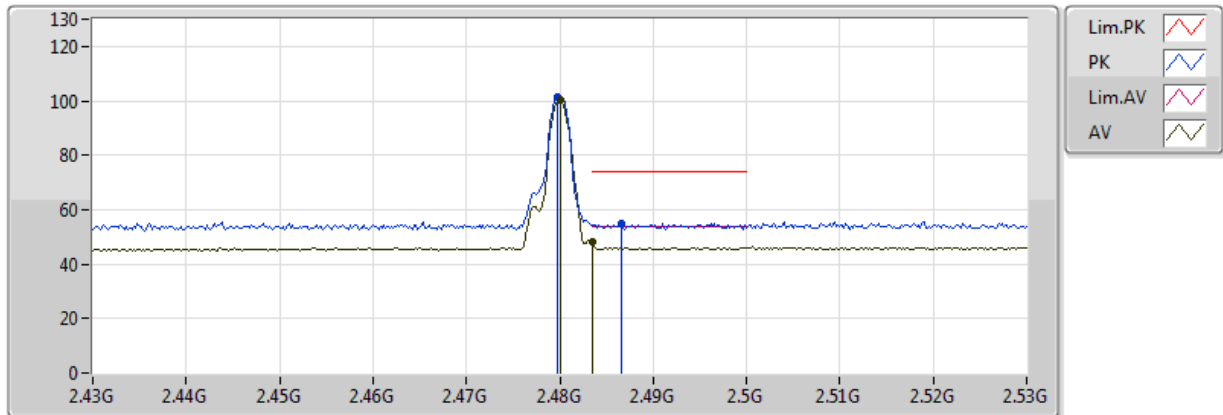


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
AV	2.4798G	102.96	Inf	-Inf	31.10	3	Vertical	74	1.10	-
AV	2.483502G	49.09	54.00	-4.91	31.11	3	Vertical	74	1.10	-
PK	2.4798G	104.11	Inf	-Inf	31.10	3	Vertical	74	1.10	-
PK	2.4836G	57.14	74.00	-16.86	31.11	3	Vertical	74	1.10	-

BT-LE(1Mbps)

2480MHz_TX

27/07/2018

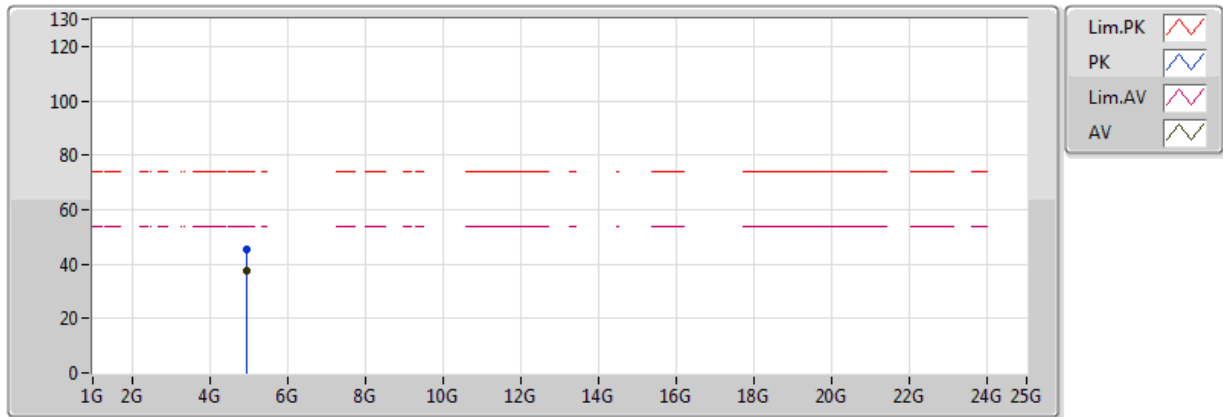


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
AV	2.48G	100.03	Inf	-Inf	31.10	3	Horizontal	37	2.48	-
AV	2.483502G	47.97	54.00	-6.03	31.11	3	Horizontal	37	2.48	-
PK	2.4798G	101.19	Inf	-Inf	31.10	3	Horizontal	37	2.48	-
PK	2.4866G	55.03	74.00	-18.97	31.12	3	Horizontal	37	2.48	-

BT-LE(1Mbps)

2480MHz_TX

27/07/2018

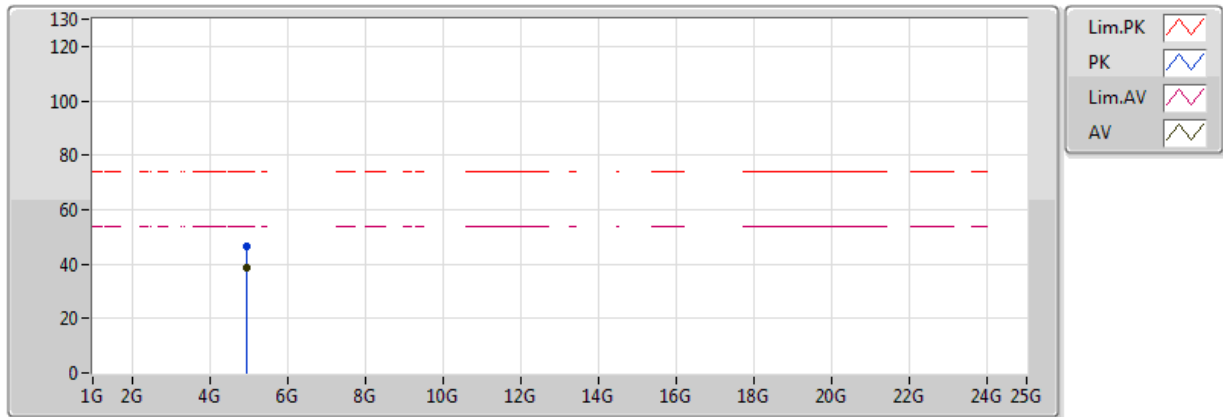


Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
AV	4.95994G	37.38	54.00	-16.62	2.47	3	Vertical	119	1.01	-
PK	4.95946G	45.27	74.00	-28.73	2.47	3	Vertical	119	1.01	-

BT-LE(1Mbps)

2480MHz_TX

27/07/2018



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
AV	4.95946G	38.52	54.00	-15.48	2.47	3	Horizontal	275	1.04	-
PK	4.95952G	46.60	74.00	-27.40	2.47	3	Horizontal	275	1.04	-