FCC Test Report

Equipment	:	**Computer**
Brand Name	:	**Advantech**
Model No.	:	**DLT-V4108xxxxxxxxxx (where "x" may be any alphanumeric character, "-" or blank.)**
FCC ID	:	**M82-DLV4108**
Standard	:	**47 CFR FCC Part 15.247**
RF Specification	:	**Bluetooth LE**
Frequency	:	**2400 MHz – 2483.5 MHz**
FCC Classification	:	**DTS**
Applicant / Manufacturer	:	**Advantech Co., Ltd.** No.1, Alley 20, Lane 26, Rueiguang Rd., Neihu District,Taipei City, Taiwan, R.O.C.

The product sample received on Dec. 26, 2016 and completely tested on Jan. 11, 2017. We, SPORTON, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2013 and shown compliance with the applicable technical standards.

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

Reviewed by:

Phoenix Chen / Assistant Manager

Testing Laboratory 1190

Table of Contents

Summary of Test Result

Conformance Test Specifications				
Report Clause	**Ref. Std. Clause**	**Description**	**Limit**	**Result**
1.1.2	15.203	Antenna Requirement	FCC 15.203	Complied
3.1	15.207	AC Power-line Conducted Emissions	FCC 15.207	N/A
3.2	15.247(a)	DTS Bandwidth	≥500kHz	Complied
3.3	15.247(b)	Fundamental Emission Output Power	Power [dBm]:30	Complied
3.4	15.247(e)	Power Spectral Density	PSD [dBm/3kHz]:8	Complied
3.5	15.247(d)	Emissions in Non-restricted Frequency Bands	Non-Restricted Bands: > 20 dBc	Complied
3.6	15.247(d)	Emissions in Restricted Frequency Bands	Restricted Bands: FCC 15.209	Complied

Revision History

Report No.	Version	Description	Issued Date
FR6N1001AL	Rev. 01	Initial issue of report	Mar. 29, 2017

1 General Description

1.1 Information

1.1.1 RF General Information

Band	Mode	BWch (MHz)	Channel Number	Nant
2.4-2.4835GHz	BT-LE(1Mbps)	1	0-39[40]	1TX

Note:
- Bluetooth LE (Low Energy) using GFSK modulation for DTS digital modulation.
- BWch is the nominal channel bandwidth.

1.1.2 Antenna Information

	Antenna Category
☒	Integral antenna (antenna permanently attached)
	☒ Temporary RF connector provided
	☐ No temporary RF connector provided Transmit chains bypass antenna and soldered temporary RF connector provided for connected measurement. In case of conducted measurements the transmitter shall be connected to the measuring equipment via a suitable attenuator and correct for all losses in the RF path.
☒	External antenna (dedicated antennas)
	☒ Single power level with corresponding antenna(s).
	☐ Multiple power level and corresponding antenna(s).

Antenna General Information				
No.	Ant. Cat.	Ant. Type	Model No.	Gain (dBi)
1	External	PIFA	MA231.LBC.002	2.84
2	Integral	PCB	DL-WFAK79377500	6.50

Note: The EUT has two antenna configurations.

Type 1: PCB antenna only supports 1 TX and Port 1 for emission.

Type 2: PIFA antenna only supports 1 TX and Port 1 for emission.

1.1.3 Type of EUT

Identify EUT	
EUT Serial Number	N/A
Presentation of Equipment	☒ Production ; ☐ Pre-Production ; ☐ Prototype

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)	0.706	1.512	441.25u	3k

1.1.5 EUT Operational Condition

Supply Voltage	☐ AC mains	☒ DC	
Type of DC Source	☐ External AC Adapter	☒ DC Sourse	☐ Battery

1.1.6 EUT Operate Information

Items	Description			
Operate Condition	☒	Point-to-multipoint (P2M)	☐	Point-to-point (P2P)

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 v03r05

1.3 Testing Location Information

Testing Location			
☒	HWA YA	ADD :	No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C.
		TEL :	886-3-327-3456 FAX : 886-3-327-0973

Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
RF Conducted	TH01-HY	Ryan	24.5°C / 65%	09/Jan/2017
Radiated	03CH02-HY	Edwen	20.8°C / 55%	11/Jan/2017

Test site registered number [553509] with FCC.

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)

Measurement Uncertainty		
Test Item		**Uncertainty**
AC power-line conducted emissions		±2.3 dB
Emission bandwidth, 6dB bandwidth		±0.6 %
RF output power, conducted		±0.1 dB
Power density, conducted		±0.6 dB
Unwanted emissions, conducted	9 – 150 kHz	±0.4 dB
	0.15 – 30 MHz	±0.4 dB
	30 – 1000 MHz	±0.6 dB
	1 – 18 GHz	±0.5 dB
	18 – 40 GHz	±0.5 dB
	40 – 200 GHz	N/A
All emissions, radiated	9 – 150 kHz	±2.5 dB
	0.15 – 30 MHz	±2.3 dB
	30 – 1000 MHz	±2.6 dB
	1 – 18 GHz	±3.6 dB
	18 – 40 GHz	±3.8 dB
	40 – 200 GHz	N/A
Temperature		±0.8 °C
Humidity		±5 %
DC and low frequency voltages		±0.9%
Time		±1.4 %
Duty Cycle		±0.6 %

2 Test Configuration of EUT

2.1 Test Condition

RF Conducted	Abbreviation	Remark
TN,VN	TN	20°C
-	VN	24V

2.2 Test Channel Mode

Test Software Version	BtUSB_V18.12.12

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	DTS Bandwidth, Fundamental Emission 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		
User Position	☐ EUT will be placed in fixed position.		
	☒ EUT will be placed in mobile position and operating multiple positions.		
	☐ EUT will be a hand-held or body-worn battery-powered devices and operating multiple positions.		
Operating Mode < 1GHz	☒ 1. DC Sourse		
Operating Mode > 1GHz	☒ 1. PCB+PCB Mode		
	☒ 2. PCB+PIFA Mode		
Orthogonal Planes of EUT	**X Plane**	**Y Plane**	**Z Plane**
			
Worst Planes of EUT			V

2.4 Accessories and Support Equipment

Specification of Accessory		
A cable MDR 50P/BNC+Audio Jack*3+USB-A+D-SUB 9P	Model Name	1700019307

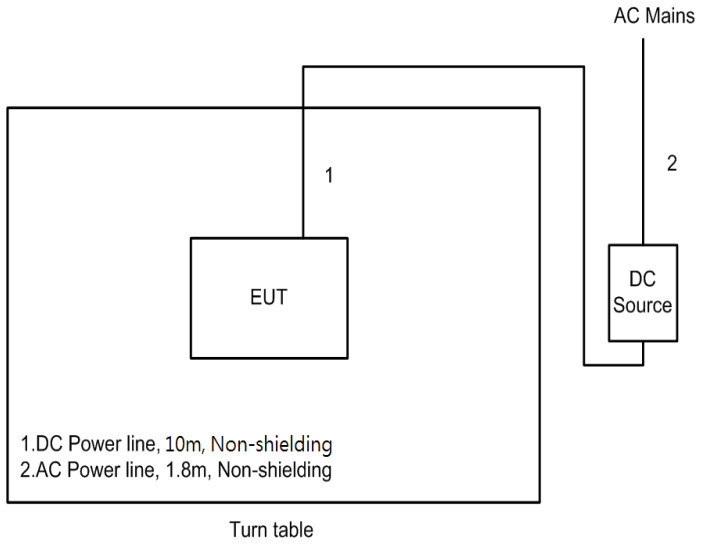
Reminder: Regarding to more detail and other information, please refer to user manual.

Support Equipment - RF Conducted			
No.	**Equipment**	**Brand Name**	**Model Name**
-	-	-	-

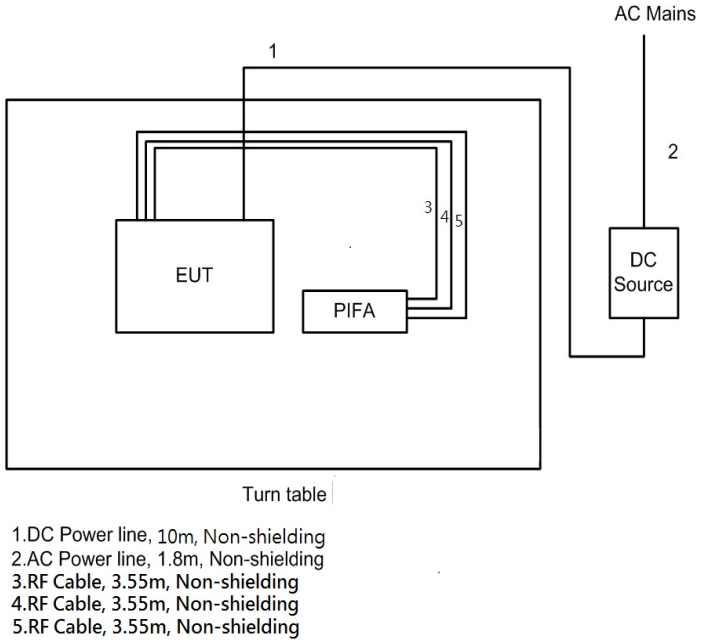
Support Equipment - Radiated Emission			
No.	**Equipment**	**Brand Name**	**Model Name**
-	-	-	-

2.5 Test Setup Diagram

Test Setup Diagram - Radiated Test (below 1GHz)- Mode 1



Test Setup Diagram - Radiated Test(above 1GHz)- Mode 2



3 Transmitter Test Result

3.1 AC Power-line Conducted Emissions

3.1.1 AC Power-line Conducted Emissions Limit

AC Power-line Conducted Emissions Limit		
Frequency Emission (MHz)	**Quasi-Peak**	**Average**
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50
Note 1: * Decreases with the logarithm of the frequency.		

3.1.2 Measuring Instruments

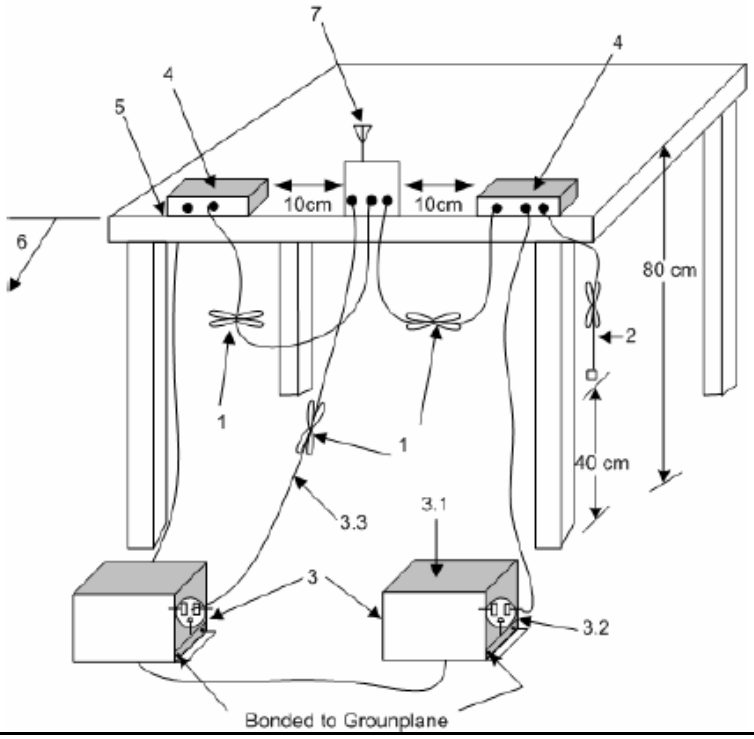
Refer a test equipment and calibration data table in this test report.

3.1.3 Test Procedures

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

3.1.4 Test Setup

AC Power-line Conducted Emissions



3.1.5 Test Result of AC Power-line Conducted Emissions

Please refer to Part 15.207(c) clause 2.3 which states, “Measurements to demonstrate compliance with the conducted limits are not required for devices which only employ battery power for operation and which do not operate from the AC power lines or contain provisions for operation while connected to the AC power lines”. Therefore, for this device, AC Power Line Conducted Emissions investigation is not required.

3.2 DTS Bandwidth

3.2.1 6dB Bandwidth Limit

6dB Bandwidth Limit
Systems using digital modulation techniques:
▪ 6 dB bandwidth ≥ 500 kHz.

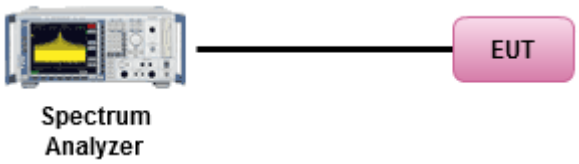
3.2.2 Measuring Instruments

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 8.1 Option 1 for 6 dB bandwidth measurement.
	☐ Refer as KDB 558074, clause 8.2 Option 2 for 6 dB bandwidth measurement.
	☐ 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 A

3.3 Fundamental Emission Output Power

3.3.1 Fundamental Emission Output Power Limit

Maximum Peak Conducted Output Power or Maximum Conducted Output Power Limit		
▪ 2400-2483.5 MHz Band:		
	▪ 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. **P_{eirp}** = e.i.r.p. Power in dBm.		

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 (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 Method AVGPM (using an RF average power meter).
▪ For conducted measurement.	
	▪ If the EUT supports multiple transmit chains using options given below: Refer as FCC 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

RF Output Power (Power Meter)


3.3.5 Test Result of Maximum Peak Conducted Output Power

Refer as Appendix B

3.3.6 Test Result of Maximum Average Conducted Output Power

Refer as Appendix B

3.4 Power Spectral Density

3.4.1 Power Spectral Density Limit

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

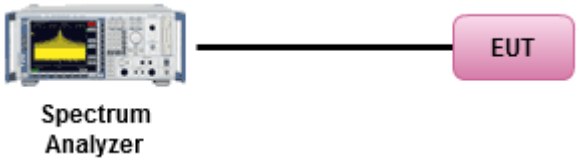
3.4.2 Measuring Instruments

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).	
	Duty cycle ≥ 98%	
	☐ Refer as KDB 558074, clause 10.5 Method AVGPSD-2 (spectral trace averaging).	
	Duty cycle < 98%	
	☐ Refer as KDB 558074, clause 10.6 Method AVGPSD-2 Alt. (slow sweep speed)	
▪ For conducted measurement.		
	▪ If The EUT supports multiple transmit chains using options given below:	
		☐ Option 1: Measure and sum the spectra across the outputs. Refer as FCC 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 N_{TX} 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.
		☐ Option 2: Measure and sum spectral maxima across the outputs. With this technique, spectra are measured at each output of the device at the required resolution bandwidth. The maximum value (peak) of each spectrum is determined. These maximum values are then summed mathematically in linear power units across the outputs. These operations shall be performed separately over frequency spans that have different out-of-band or spurious emission limits,
		☐ Option 3: Measure and add 10 log(N) dB, where N is the number of transmit chains. Refer as KDB 662911, In-band power spectral density (PSD). Performed at each transmit chains and each transmit chains shall be compared with the limit have been reduced with 10 log(N). Or each transmit chains shall be add 10 log(N) to compared with the limit.

3.4.4 Test Setup

Power Spectral Density
 Spectrum Analyzer

3.4.5 Test Result of Power Spectral Density

Refer as Appendix C

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.	

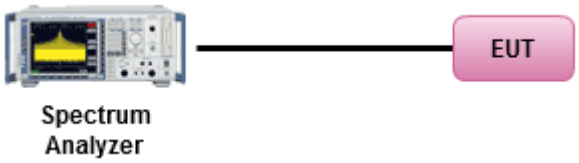
3.5.2 Measuring Instruments

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

Emissions in Non-restricted Frequency Bands


3.5.5 Test Result of Emissions in Non-restricted Frequency Bands

Refer as Appendix D

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.

3.6.2 Measuring Instruments

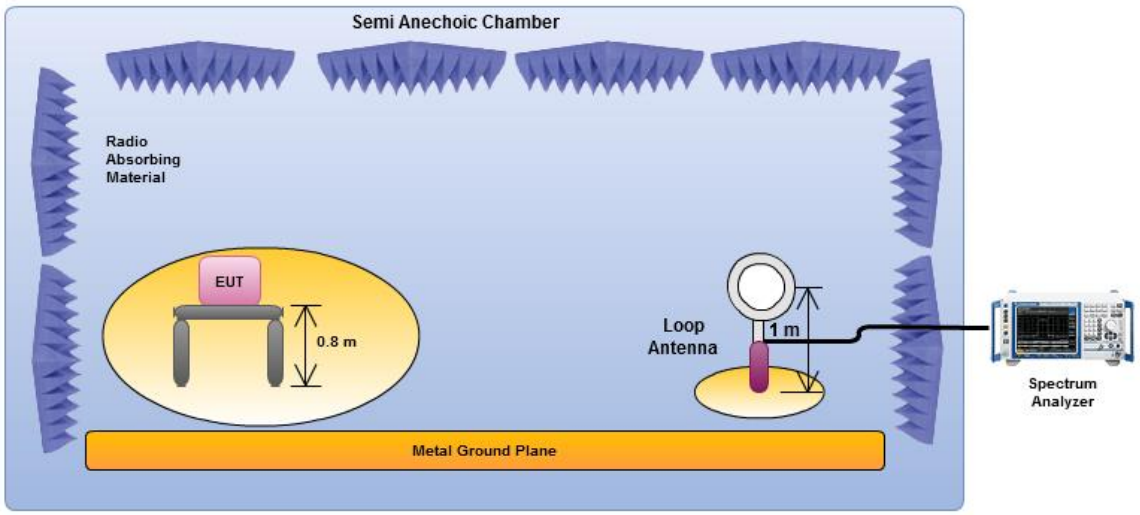
Refer a test equipment and calibration data table in this test report.

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 12.2.5.1 Option 1 (trace averaging for duty cycle ≥98%)
		☐ Refer as KDB 558074, clause 12.2.5.2 Option 2 (trace averaging + duty factor).
		☒ Refer as KDB 558074, clause 12.2.5.3 Option 3 (Reduced VBW≥1/T).
		☐ Refer as ANSI C63.10, clause 4.1.4.2.3 (Reduced VBW). VBW ≥ 1/T, where T is pulse time.
		☐ Refer as ANSI C63.10, clause 4.1.4.2.4 average value of pulsed emissions.
		☒ Refer as KDB 558074, clause 11.3 and 12.2.4 measurement procedure peak limit.
		☒ Refer as KDB 558074, clause 12.2.3 measurement procedure Quasi-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 6.9.3) 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.	

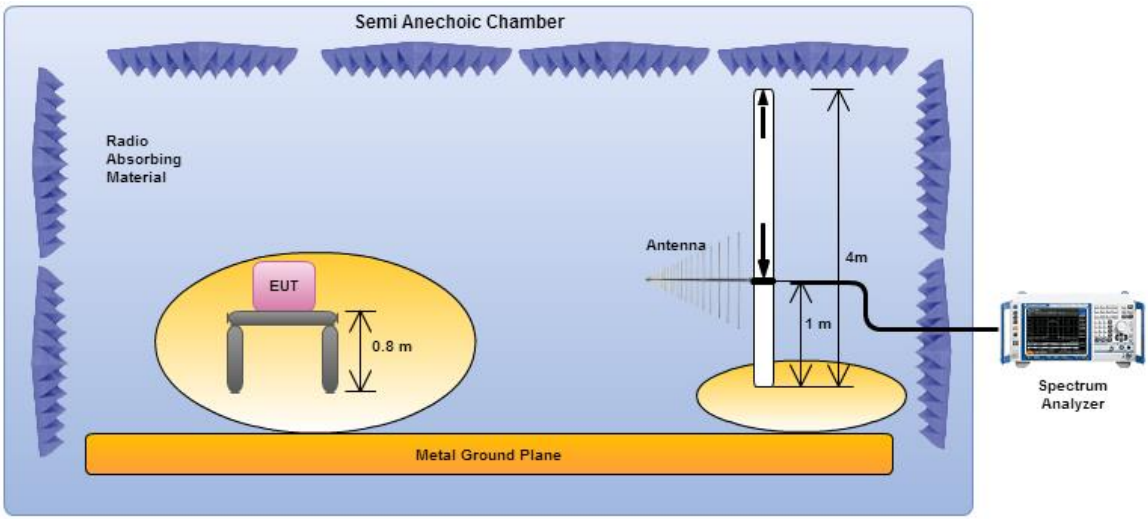
3.6.4 Test Setup

Transmitter Spurious and Out of Band Emissions (9 kHz - 30 MHz)



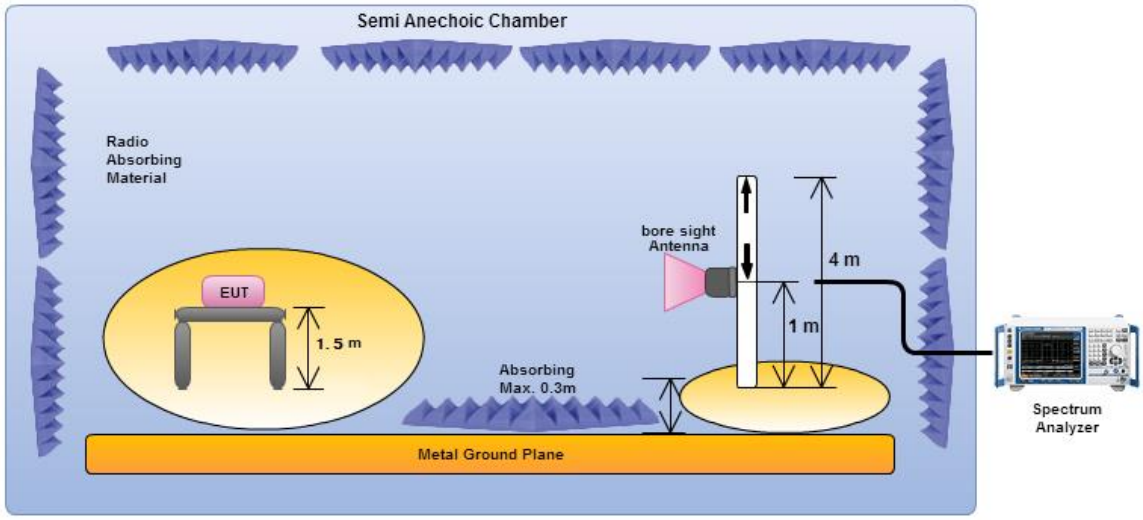
Magnetic field tests shall be performed in the frequency range of 9 kHz to 30 MHz using a calibrated loop antenna.

Transmitter Radiated Unwanted Emissions (below 1GHz)



Electric field tests shall be performed in the frequency range of 30 MHz to 1000 MHz using a calibrated bi-log antenna.

Transmitter Radiated Unwanted Emissions (above 1GHz)



Electric field tests shall be performed in the frequency range of 1 GHz to 10th harmonic of highest fundamental frequency or 40 GHz using a calibrated horn antenna.

3.6.5 Transmitter Radiated Unwanted Emissions (Below 30MHz)

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported. Any spurious which has more than 20 dB of margin compared to the applicable limit is not necessarily reported.

3.6.6 Transmitter Radiated Unwanted Emissions

Refer as Appendix E.

4 Test Equipment and Calibration Data

Instrument for Radiated Test

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
Spectrum Analyzer	R&S	FSP40	100593	9KHz - 40GHz	26/Oct/2016	25/Oct/2017
3m Semi Anechoic	SIDT FRANKONIA	SAC-3M	03CH02-HY	30MHz-1GHz 3M	03/Jun/2016	02/Jun/2017
Amplifier	Agilent	8447D	2944A11149	100KHz-1.3GHz	01/Jul/2016	30/Jun/2017
Amplifier	Agilent	8449B	3008A02373	1GHz-26.5GHz	02/Sep/2016	01/Sep/2017
Horn Antenna	SCHWARZBECK	BBHA9120D	BBHA9120D 01543	1GHz-18GHz	22/Apr/2016	21/Apr/2017
Horn Antenna	SCHWARZBECK	BBHA9170	BBHA9170154	18GHz-40GHz	29/Jan/2016	28/Jan/2017
Bilog Antenna	SCHAFFNER	CBL6112B	2723	30MHz-1GHz	01/Oct/2016	30/Sep/2017
Loop Antenna	TESEQ	HLA 6120	31244	9KHz-30MHz	02/Feb/2015	01/Feb/2017
DC Power Source	G.W.	GPS-3030DD	GEN865896	DC 0V ~ 30V	14/Jan/2016	13/Jan/2017
RF Cable-high	SUHNER	SUCOFLEX106	MY17173/4	1GHz ~ 40GHz	03/Mar/2016	02/Mar/2017
RF Cable-R03m	Jye Bao	RG142	CB021	9kHz ~ 1GHz	05/Nov/2016	04/Nov/2017

Instrument for Conducted Test

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
Spectrum Analyzer	R&S	FSV 40	101500	9kHz~40GHz	12/May/2016	11/May/ 2017
Power Sensor	Anritsu	MA2411B	917017	300MHz ~ 40GHz	04/Feb/2016	03/Feb/2017
Power Meter	Anritsu	ML2495A	949003	300MHz ~ 40GHz	04/Feb/2016	03/Feb/2017
Signal Generator	R&S	SMR40	100116	10MHz ~ 40GHz	21/Jul/2016	20/Jul/2017
DC Power Source	G.W.	GPS-3030DD	GEN865896	DC 0V ~ 30V	14/Jan/2016	13/Jan/2017
RF Cable-0.2m	HUBER+SUHNER	SUCOFLEX_104	MY10709/4	30MHz ~ 26.5GHz	02/Oct/2016	01/Oct/2017
RF Cable-0.2m	HUBER+SUHNER	SUCOFLEX_104	MY10710/4	30MHz ~ 26.5GHz	02/Oct/2016	01/Oct/2017
RF Cable-0.5m	HUBER+SUHNER	SUCOFLEX_104	MY10713/4	30MHz ~ 26.5GHz	02/Oct/2016	01/Oct/2017

Summary

Mode	Max-N dB (Hz)	Max-OBW (Hz)	ITU-Code	Min-N dB (Hz)	Min-OBW (Hz)
BT-LE(1Mbps)	-	-	-	-	-
2.4-2.4835GHz	655k	1.027M	1M03F1D	652.5k	1.021M

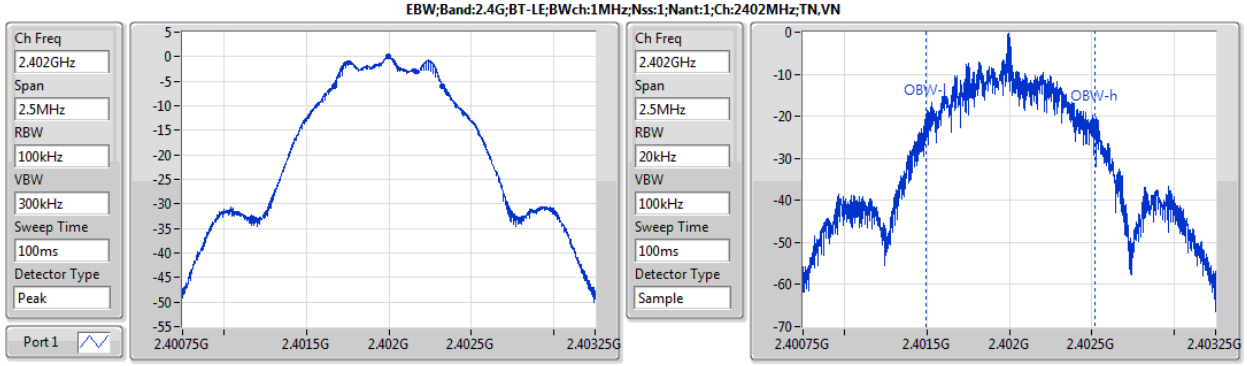
Max-N dB = Maximum 6dB down bandwidth; **Max-OBW** = Maximum 99% occupied bandwidth;
Min-N dB = Minimum 6dB down bandwidth; **Min-OBW** = Minimum 99% occupied bandwidth;

Result

Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	500k	655k	1.021M
2440MHz	Pass	500k	652.5k	1.026M
2480MHz	Pass	500k	655k	1.027M

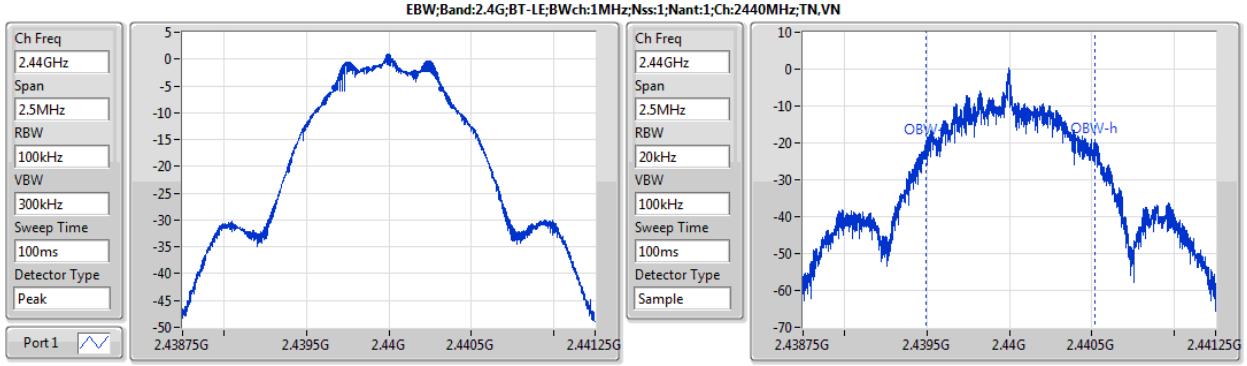
Port X-N dB = Port **X** 6dB down bandwidth; **Port X-OBW** = Port **X** 99% occupied bandwidth;

EBW;Band:2.4G;BT-LE;BWch:1MHz;Nss:1;Nant:1;Ch:2402MHz;TN,VN



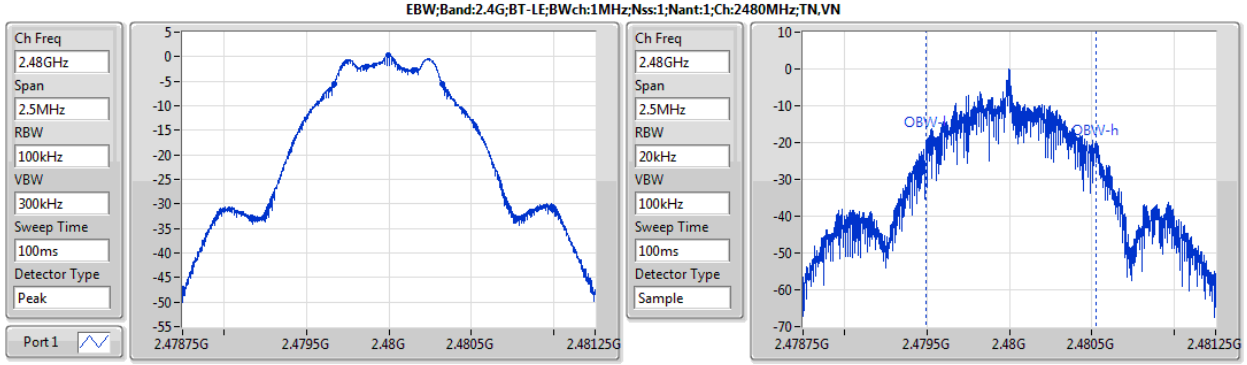
6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
655k	2.401666G	2.402321G	1.021M	2.401498G	2.402518G	500k	1

EBW;Band:2.4G;BT-LE;BWch:1MHz;Nss:1;Nant:1;Ch:2440MHz;TN,VN



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
652.5k	2.439668G	2.44032G	1.026M	2.439494G	2.44052G	500k	1

EBW;Band:2.4G;BT-LE;BWch:1MHz;Nss:1;Nant:1;Ch:2480MHz;TN,VN



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
655k	2.479666G	2.480321G	1.027M	2.479498G	2.480525G	500k	1

Summary

Mode	Sum (dBm)	Power (W)
BT-LE(1Mbps)	-	-
2.4-2.4835GHz	0.92	0.00124

Result

Mode	Result	DG (dBi)	Sum (dBm)	Sum Lim. (dBm)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	5.50	0.53	30.00
2440MHz	Pass	5.50	0.92	30.00
2480MHz	Pass	5.50	0.80	30.00

Summary

Mode	Sum	Power
	(dBm)	(W)
BT-LE(1Mbps)	-	-
2.4-2.4835GHz	0.20	0.00105

Result

Mode	Result	DG (dBi)	Sum (dBm)	Sum Lim. (dBm)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	5.50	-0.14	30.00
2440MHz	Pass	5.50	0.20	30.00
2480MHz	Pass	5.50	0.10	30.00

Summary

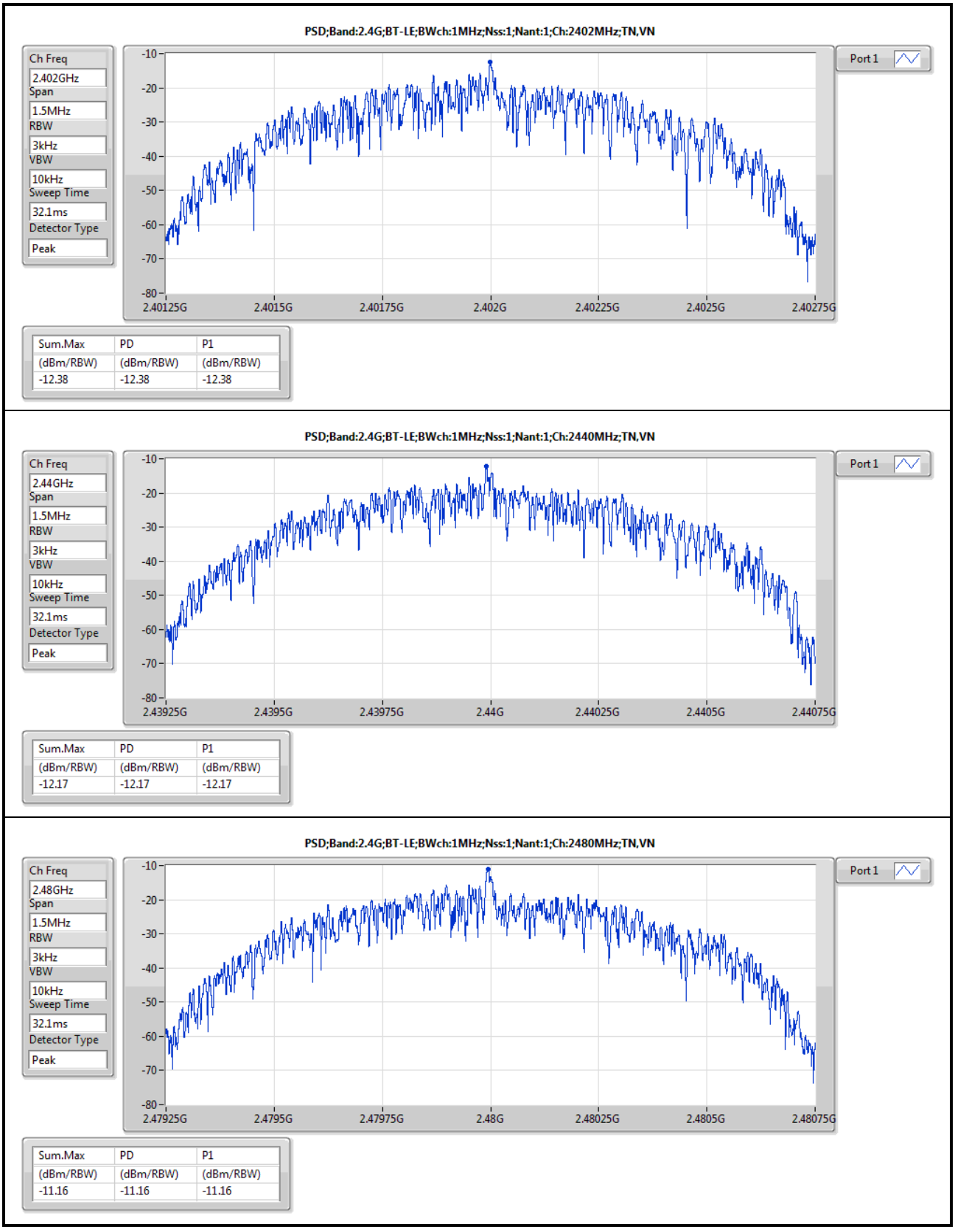
Mode	PD (dBm/RBW)
BT-LE(1Mbps)	-
2.4-2.4835GHz	-11.16

RBW=3kHz.

Result

Mode	Result	DG (dBi)	PD (dBm/RBW)	PD.Limit (dBm/RBW)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	5.50	-12.38	8.00
2440MHz	Pass	5.50	-12.17	8.00
2480MHz	Pass	5.50	-11.16	8.00

RBW=3kHz.

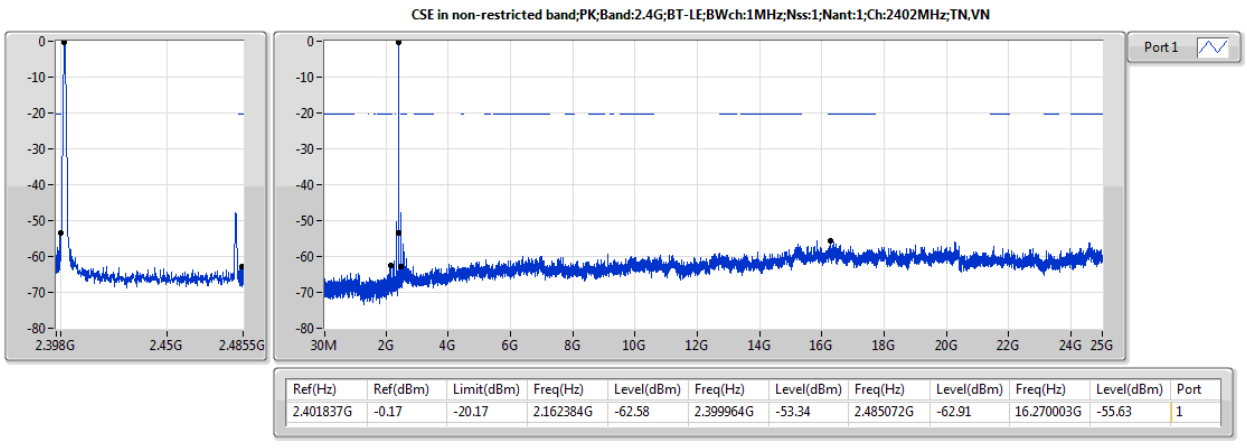

PSD;Band:2.4G;BT-LE;BWch:1MHz;Nss:1;Nant:1;Ch:2402MHz;TN,VN
Ch Freq
2.402GHz
Span
1.5MHz
RBW
3kHz
VBW
10kHz
Sweep Time
32.1ms
Detector Type
Peak
Port 1
-10
-20
-30
-40
-50
-60
-70
-80
2.40125G
2.4015G
2.40175G
2.402G
2.40225G
2.4025G
2.40275G
Sum.Max (dBm/RBW) -12.38
PD (dBm/RBW) -12.38
P1 (dBm/RBW) -12.38
PSD;Band:2.4G;BT-LE;BWch:1MHz;Nss:1;Nant:1;Ch:2440MHz;TN,VN
Ch Freq
2.44GHz
Span
1.5MHz
RBW
3kHz
VBW
10kHz
Sweep Time
32.1ms
Detector Type
Peak
Port 1
2.43925G
2.4395G
2.43975G
2.44G
2.44025G
2.4405G
2.44075G
Sum.Max (dBm/RBW) -12.17
PD (dBm/RBW) -12.17
P1 (dBm/RBW) -12.17
PSD;Band:2.4G;BT-LE;BWch:1MHz;Nss:1;Nant:1;Ch:2480MHz;TN,VN
Ch Freq
2.48GHz
Span
1.5MHz
RBW
3kHz
VBW
10kHz
Sweep Time
32.1ms
Detector Type
Peak
Port 1
2.47925G
2.4795G
2.47975G
2.48G
2.48025G
2.4805G
2.48075G
Sum.Max (dBm/RBW) -11.16
PD (dBm/RBW) -11.16
P1 (dBm/RBW) -11.16

Summary

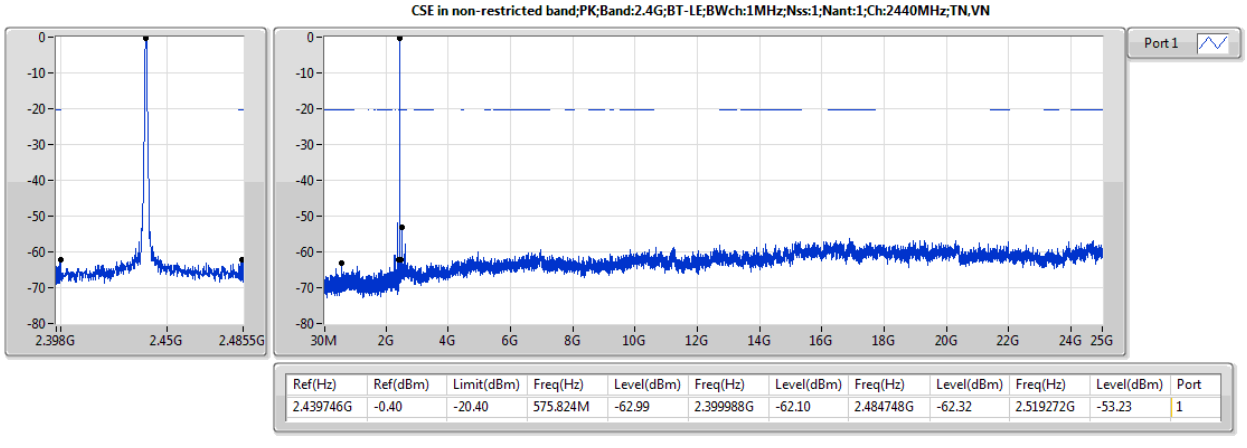
Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-	-	-
2.4-2.4835GHz	Pass	2.479993G	0.34	-19.66	2.077136G	-64.46	2.399996G	-49.03	2.483612G	-57.24	2.558672G	-52.88	1

Result

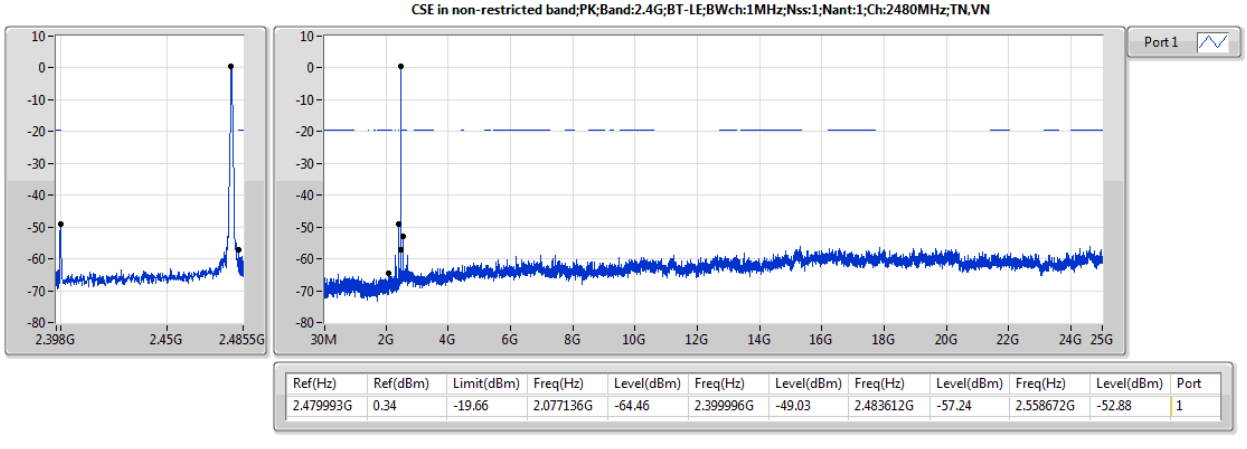
Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	2.401837G	-0.17	-20.17	2.162384G	-62.58	2.399964G	-53.34	2.485072G	-62.91	16.270003G	-55.63	1
2440MHz	Pass	2.439746G	-0.40	-20.40	575.824M	-62.99	2.399988G	-62.10	2.484748G	-62.32	2.519272G	-53.23	1
2480MHz	Pass	2.479993G	0.34	-19.66	2.077136G	-64.46	2.399996G	-49.03	2.483612G	-57.24	2.558672G	-52.88	1



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.401837G	-0.17	-20.17	2.162384G	-62.58	2.399964G	-53.34	2.485072G	-62.91	16.270003G	-55.63	1



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.439746G	-0.40	-20.40	575.824M	-62.99	2.399988G	-62.10	2.484748G	-62.32	2.519272G	-53.23	1



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.479993G	0.34	-19.66	2.077136G	-64.46	2.399996G	-49.03	2.483612G	-57.24	2.558672G	-52.88	1

Summary

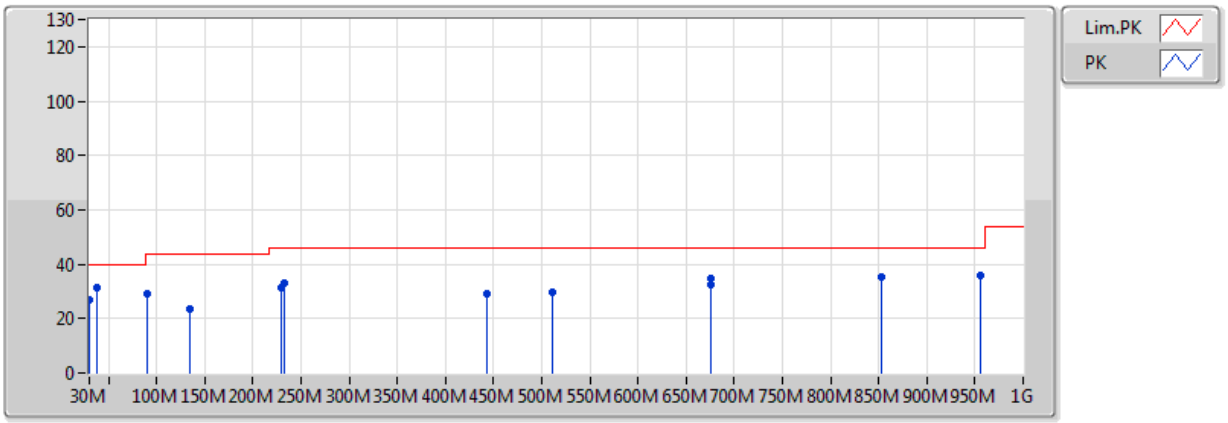
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Pol. (H/V)	Azimuth (°)	Height (m)	Comments
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-	-
2.4-2.4835GHz	Pass	PK	37.76M	31.58	40.00	-8.42	-8.08	3	V	NaN	NaN	-

Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Pol. (H/V)	Azimuth (°)	Height (m)	Comments
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-	-
2440MHz	Pass	PK	30M	27.00	40.00	-13.00	-4.25	3	H	NaN	NaN	-
2440MHz	Pass	PK	134.76M	23.77	43.50	-19.73	-9.39	3	H	NaN	NaN	-
2440MHz	Pass	PK	231.76M	32.97	46.00	-13.03	-9.58	3	H	NaN	NaN	-
2440MHz	Pass	PK	511.12M	29.61	46.00	-16.39	-2.16	3	H	NaN	NaN	-
2440MHz	Pass	PK	676.02M	34.72	46.00	-11.28	-0.49	3	H	NaN	NaN	-
2440MHz	Pass	PK	852.56M	35.16	46.00	-10.84	2.23	3	H	NaN	NaN	-
2440MHz	Pass	PK	37.76M	31.58	40.00	-8.42	-8.08	3	V	NaN	NaN	-
2440MHz	Pass	PK	90.14M	28.97	43.50	-14.53	-12.53	3	V	NaN	NaN	-
2440MHz	Pass	PK	229.82M	31.52	46.00	-14.48	-9.82	3	V	NaN	NaN	-
2440MHz	Pass	PK	443.22M	29.30	46.00	-16.70	-3.16	3	V	NaN	NaN	-
2440MHz	Pass	PK	676.02M	32.46	46.00	-13.54	-0.49	3	V	NaN	NaN	-
2440MHz	Pass	PK	955.38M	36.04	46.00	-9.96	3.31	3	V	NaN	NaN	-

BT-LE(1Mbps)

2440MHz_PCB



PCB ANT = ANT A+ANT B
EUT = Z axis, ANT= Z axis

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
PK	30M	27.00	40.00	-13.00	-4.25	3	H	NaN	NaN	-
PK	134.76M	23.77	43.50	-19.73	-9.39	3	H	NaN	NaN	-
PK	231.76M	32.97	46.00	-13.03	-9.58	3	H	NaN	NaN	-
PK	511.12M	29.61	46.00	-16.39	-2.16	3	H	NaN	NaN	-
PK	676.02M	34.72	46.00	-11.28	-0.49	3	H	NaN	NaN	-
PK	852.56M	35.16	46.00	-10.84	2.23	3	H	NaN	NaN	-
PK	37.76M	31.58	40.00	-8.42	-8.08	3	V	NaN	NaN	-
PK	90.14M	28.97	43.50	-14.53	-12.53	3	V	NaN	NaN	-
PK	229.82M	31.52	46.00	-14.48	-9.82	3	V	NaN	NaN	-
PK	443.22M	29.30	46.00	-16.70	-3.16	3	V	NaN	NaN	-
PK	676.02M	32.46	46.00	-13.54	-0.49	3	V	NaN	NaN	-
PK	955.38M	36.04	46.00	-9.96	3.31	3	V	NaN	NaN	-

Summary

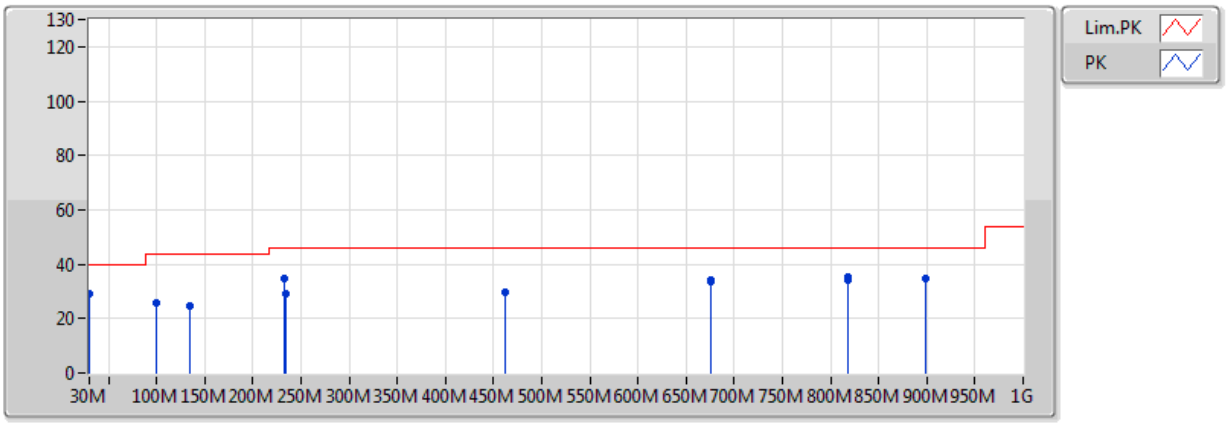
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Pol. (H/V)	Azimuth (°)	Height (m)	Comments
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-	-
2.4-2.4835GHz	Pass	PK	30M	29.32	40.00	-10.68	-4.25	3	V	NaN	NaN	-

Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Pol. (H/V)	Azimuth (°)	Height (m)	Comments
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-	-
2440MHz	Pass	PK	30M	28.89	40.00	-11.11	-4.25	3	H	NaN	NaN	-
2440MHz	Pass	PK	134.76M	24.81	43.50	-18.69	-9.39	3	H	NaN	NaN	-
2440MHz	Pass	PK	231.76M	34.68	46.00	-11.32	-9.58	3	H	NaN	NaN	-
2440MHz	Pass	PK	676.02M	33.89	46.00	-12.11	-0.49	3	H	NaN	NaN	-
2440MHz	Pass	PK	817.64M	35.20	46.00	-10.80	1.48	3	H	NaN	NaN	-
2440MHz	Pass	PK	899.12M	34.81	46.00	-11.19	3.08	3	H	NaN	NaN	-
2440MHz	Pass	PK	30M	29.32	40.00	-10.68	-4.25	3	V	NaN	NaN	-
2440MHz	Pass	PK	99.84M	25.93	43.50	-17.57	-10.50	3	V	NaN	NaN	-
2440MHz	Pass	PK	233.7M	29.06	46.00	-16.94	-9.33	3	V	NaN	NaN	-
2440MHz	Pass	PK	462.62M	29.45	46.00	-16.55	-2.90	3	V	NaN	NaN	-
2440MHz	Pass	PK	676.02M	34.24	46.00	-11.76	-0.49	3	V	NaN	NaN	-
2440MHz	Pass	PK	817.64M	33.91	46.00	-12.09	1.48	3	V	NaN	NaN	-

BT-LE(1Mbps)

2440MHz_PIFA



PIFA+PCB ANT = ANT A+ANT B
EUT =Z axis, ANT=Z axis

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
PK	30M	28.89	40.00	-11.11	-4.25	3	H	NaN	NaN	-
PK	134.76M	24.81	43.50	-18.69	-9.39	3	H	NaN	NaN	-
PK	231.76M	34.68	46.00	-11.32	-9.58	3	H	NaN	NaN	-
PK	676.02M	33.89	46.00	-12.11	-0.49	3	H	NaN	NaN	-
PK	817.64M	35.20	46.00	-10.80	1.48	3	H	NaN	NaN	-
PK	899.12M	34.81	46.00	-11.19	3.08	3	H	NaN	NaN	-
PK	30M	29.32	40.00	-10.68	-4.25	3	V	NaN	NaN	-
PK	99.84M	25.93	43.50	-17.57	-10.50	3	V	NaN	NaN	-
PK	233.7M	29.06	46.00	-16.94	-9.33	3	V	NaN	NaN	-
PK	462.62M	29.45	46.00	-16.55	-2.90	3	V	NaN	NaN	-
PK	676.02M	34.24	46.00	-11.76	-0.49	3	V	NaN	NaN	-
PK	817.64M	33.91	46.00	-12.09	1.48	3	V	NaN	NaN	-

Summary

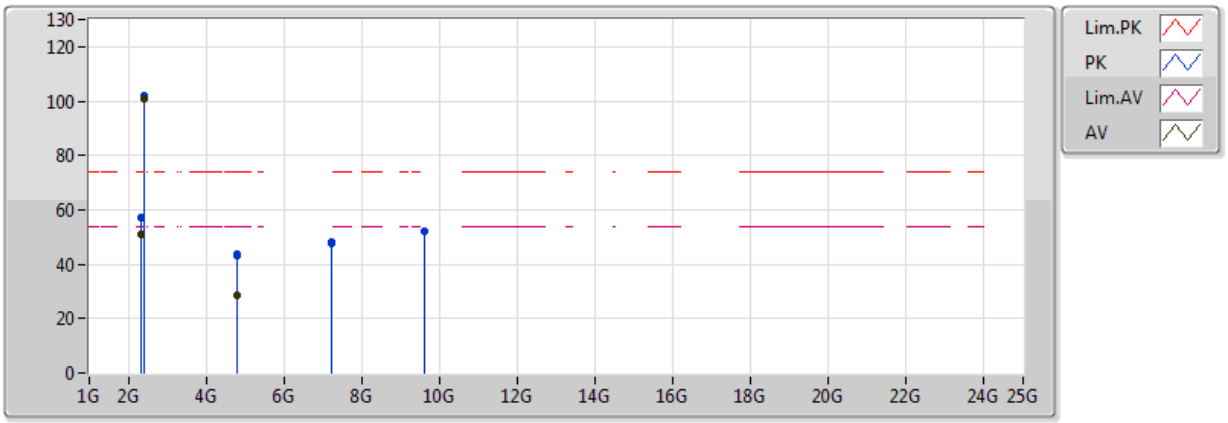
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Pol. (H/V)	Azimuth (°)	Height (m)	Comments
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-	-
2.4-2.4835GHz	Pass	AV	2.321832G	51.05	54.00	-2.95	30.02	3	H	NaN	NaN	-

Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Pol. (H/V)	Azimuth (°)	Height (m)	Comments
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	AV	2.321832G	51.05	54.00	-2.95	30.02	3	H	NaN	NaN	-
2402MHz	Pass	AV	2.402004G	100.72	Inf	-Inf	30.27	3	H	NaN	NaN	-
2402MHz	Pass	AV	4.804G	28.62	54.00	-25.38	0.91	3	H	NaN	NaN	-
2402MHz	Pass	PK	2.321628G	57.03	74.00	-16.97	30.02	3	H	NaN	NaN	-
2402MHz	Pass	PK	2.4018G	101.81	Inf	-Inf	30.27	3	H	NaN	NaN	-
2402MHz	Pass	PK	4.804G	43.67	74.00	-30.33	0.91	3	H	NaN	NaN	-
2402MHz	Pass	PK	7.206G	47.69	Inf	-Inf	6.18	3	H	NaN	NaN	-
2402MHz	Pass	PK	9.608G	52.23	Inf	-Inf	9.45	3	H	NaN	NaN	-
2402MHz	Pass	AV	4.804G	28.83	54.00	-25.17	0.91	3	V	NaN	NaN	-
2402MHz	Pass	PK	4.804G	43.13	74.00	-30.87	0.91	3	V	NaN	NaN	-
2402MHz	Pass	PK	7.206G	48.25	Inf	-Inf	6.18	3	V	NaN	NaN	-
2402MHz	Pass	PK	9.608G	52.14	Inf	-Inf	9.45	3	V	NaN	NaN	-
2440MHz	Pass	AV	2.35978G	48.30	54.00	-5.70	30.14	3	H	NaN	NaN	-
2440MHz	Pass	AV	2.43996G	99.54	Inf	-Inf	30.39	3	H	NaN	NaN	-
2440MHz	Pass	AV	2.49962G	43.29	54.00	-10.71	30.58	3	H	NaN	NaN	-
2440MHz	Pass	AV	4.88G	28.81	54.00	-25.19	1.07	3	H	NaN	NaN	-
2440MHz	Pass	AV	7.32G	33.87	54.00	-20.13	6.46	3	H	NaN	NaN	-
2440MHz	Pass	PK	2.36016G	55.76	74.00	-18.24	30.14	3	H	NaN	NaN	-
2440MHz	Pass	PK	2.43996G	100.84	Inf	-Inf	30.39	3	H	NaN	NaN	-
2440MHz	Pass	PK	2.4981G	54.38	74.00	-19.62	30.57	3	H	NaN	NaN	-
2440MHz	Pass	PK	4.88G	43.46	74.00	-30.54	1.07	3	H	NaN	NaN	-
2440MHz	Pass	PK	7.32G	48.29	74.00	-25.71	6.46	3	H	NaN	NaN	-
2440MHz	Pass	PK	9.76G	51.92	Inf	-Inf	9.62	3	H	NaN	NaN	-
2440MHz	Pass	AV	4.88G	29.16	54.00	-24.84	1.07	3	V	NaN	NaN	-
2440MHz	Pass	AV	7.32G	33.97	54.00	-20.03	6.46	3	V	NaN	NaN	-
2440MHz	Pass	PK	4.88G	43.68	74.00	-30.32	1.07	3	V	NaN	NaN	-
2440MHz	Pass	PK	7.32G	48.84	74.00	-25.16	6.46	3	V	NaN	NaN	-
2440MHz	Pass	PK	9.76G	52.50	Inf	-Inf	9.62	3	V	NaN	NaN	-
2480MHz	Pass	AV	2.48G	99.10	Inf	-Inf	30.52	3	H	NaN	NaN	-
2480MHz	Pass	AV	2.48352G	45.40	54.00	-8.60	30.53	3	H	NaN	NaN	-
2480MHz	Pass	AV	4.96G	29.05	54.00	-24.95	1.25	3	H	NaN	NaN	-
2480MHz	Pass	AV	7.44G	33.81	54.00	-20.19	6.75	3	H	NaN	NaN	-
2480MHz	Pass	PK	2.48016G	100.36	Inf	-Inf	30.52	3	H	NaN	NaN	-
2480MHz	Pass	PK	2.48352G	56.99	74.00	-17.01	30.53	3	H	NaN	NaN	-
2480MHz	Pass	PK	4.96G	43.77	74.00	-30.23	1.25	3	H	NaN	NaN	-
2480MHz	Pass	PK	7.44G	48.38	74.00	-25.62	6.75	3	H	NaN	NaN	-
2480MHz	Pass	PK	9.92G	52.80	Inf	-Inf	9.79	3	H	NaN	NaN	-
2480MHz	Pass	AV	4.96G	29.04	54.00	-24.96	1.25	3	V	NaN	NaN	-
2480MHz	Pass	AV	7.44G	33.87	54.00	-20.13	6.75	3	V	NaN	NaN	-
2480MHz	Pass	PK	4.96G	43.94	74.00	-30.06	1.25	3	V	NaN	NaN	-
2480MHz	Pass	PK	7.44G	48.47	74.00	-25.53	6.75	3	V	NaN	NaN	-
2480MHz	Pass	PK	9.92G	53.09	Inf	-Inf	9.79	3	V	NaN	NaN	-

BT-LE(1Mbps)

2402MHz_PCB

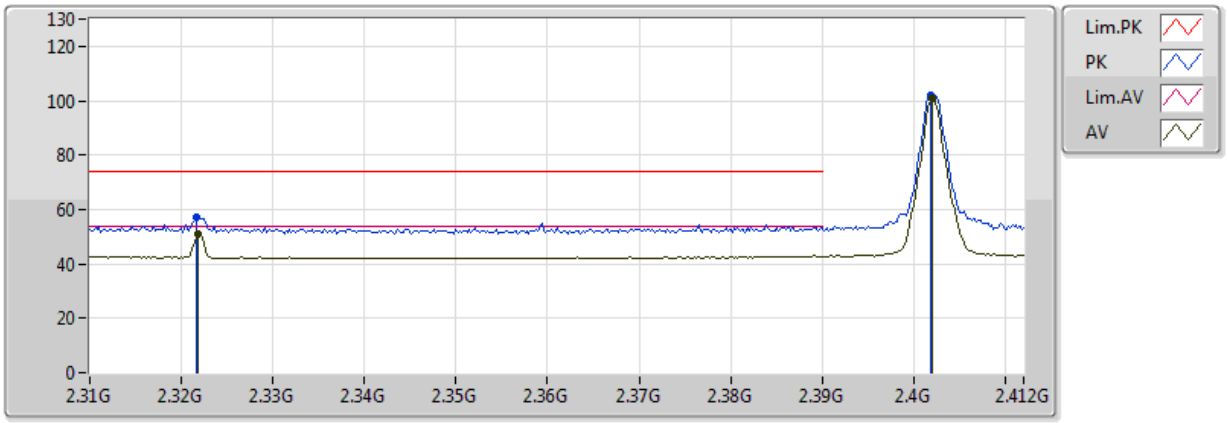


PCB ANT = ANT A+ANT B
EUT = Z axis, ANT= Z axis

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	2.321832G	51.05	54.00	-2.95	30.02	3	H	NaN	NaN	-
AV	2.402004G	100.72	Inf	-Inf	30.27	3	H	NaN	NaN	-
AV	4.804G	28.62	54.00	-25.38	0.91	3	H	NaN	NaN	-
PK	2.321628G	57.03	74.00	-16.97	30.02	3	H	NaN	NaN	-
PK	2.4018G	101.81	Inf	-Inf	30.27	3	H	NaN	NaN	-
PK	4.804G	43.67	74.00	-30.33	0.91	3	H	NaN	NaN	-
PK	7.206G	47.69	Inf	-Inf	6.18	3	H	NaN	NaN	-
PK	9.608G	52.23	Inf	-Inf	9.45	3	H	NaN	NaN	-
AV	4.804G	28.83	54.00	-25.17	0.91	3	V	NaN	NaN	-
PK	4.804G	43.13	74.00	-30.87	0.91	3	V	NaN	NaN	-
PK	7.206G	48.25	Inf	-Inf	6.18	3	V	NaN	NaN	-
PK	9.608G	52.14	Inf	-Inf	9.45	3	V	NaN	NaN	-

BT-LE(1Mbps)

2402MHz_PCB

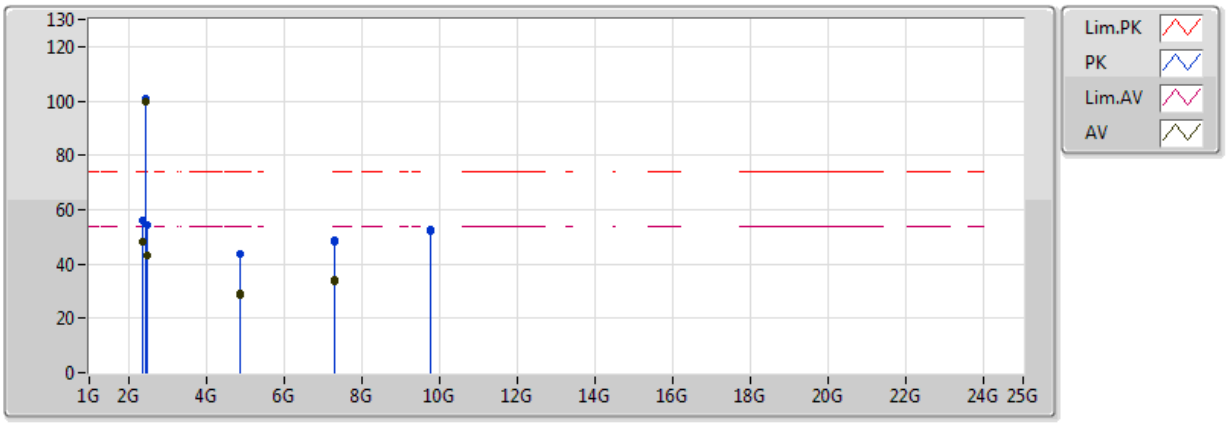


PCB ANT = ANT A+ANT B
EUT = Z axis, ANT= Z axis

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	2.321832G	51.05	54.00	-2.95	30.02	3	H	NaN	NaN	-
AV	2.402004G	100.72	Inf	-Inf	30.27	3	H	NaN	NaN	-
PK	2.321628G	57.03	74.00	-16.97	30.02	3	H	NaN	NaN	-
PK	2.4018G	101.81	Inf	-Inf	30.27	3	H	NaN	NaN	-

BT-LE(1Mbps)

2440MHz_PCB

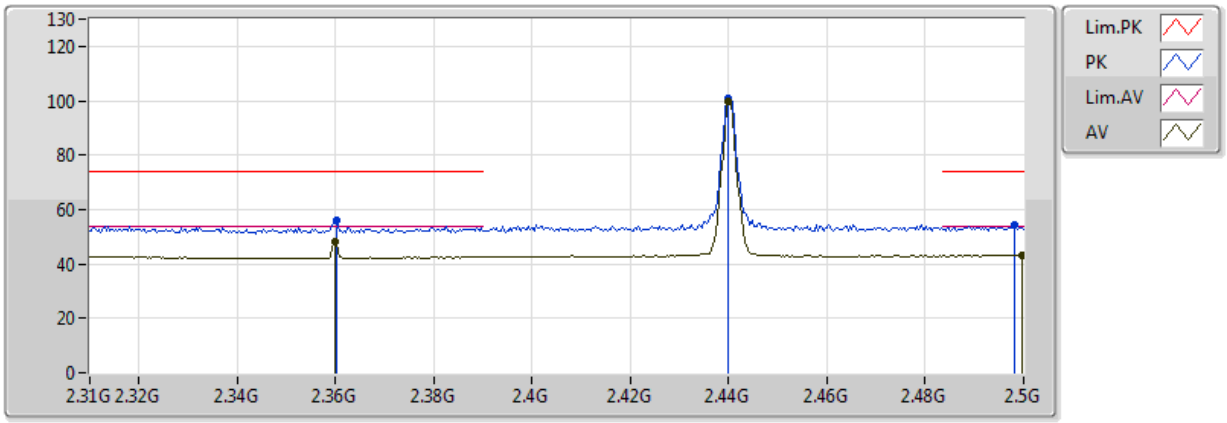


PCB ANT = ANT A+ANT B
EUT = Z axis, ANT= Z axis

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	2.35978G	48.30	54.00	-5.70	30.14	3	H	NaN	NaN	-
AV	2.43996G	99.54	Inf	-Inf	30.39	3	H	NaN	NaN	-
AV	2.49962G	43.29	54.00	-10.71	30.58	3	H	NaN	NaN	-
AV	4.88G	28.81	54.00	-25.19	1.07	3	H	NaN	NaN	-
AV	7.32G	33.87	54.00	-20.13	6.46	3	H	NaN	NaN	-
PK	2.36016G	55.76	74.00	-18.24	30.14	3	H	NaN	NaN	-
PK	2.43996G	100.84	Inf	-Inf	30.39	3	H	NaN	NaN	-
PK	2.4981G	54.38	74.00	-19.62	30.57	3	H	NaN	NaN	-
PK	4.88G	43.46	74.00	-30.54	1.07	3	H	NaN	NaN	-
PK	7.32G	48.29	74.00	-25.71	6.46	3	H	NaN	NaN	-
PK	9.76G	51.92	Inf	-Inf	9.62	3	H	NaN	NaN	-
AV	4.88G	29.16	54.00	-24.84	1.07	3	V	NaN	NaN	-
AV	7.32G	33.97	54.00	-20.03	6.46	3	V	NaN	NaN	-
PK	4.88G	43.68	74.00	-30.32	1.07	3	V	NaN	NaN	-
PK	7.32G	48.84	74.00	-25.16	6.46	3	V	NaN	NaN	-
PK	9.76G	52.50	Inf	-Inf	9.62	3	V	NaN	NaN	-

BT-LE(1Mbps)

2440MHz_PCB

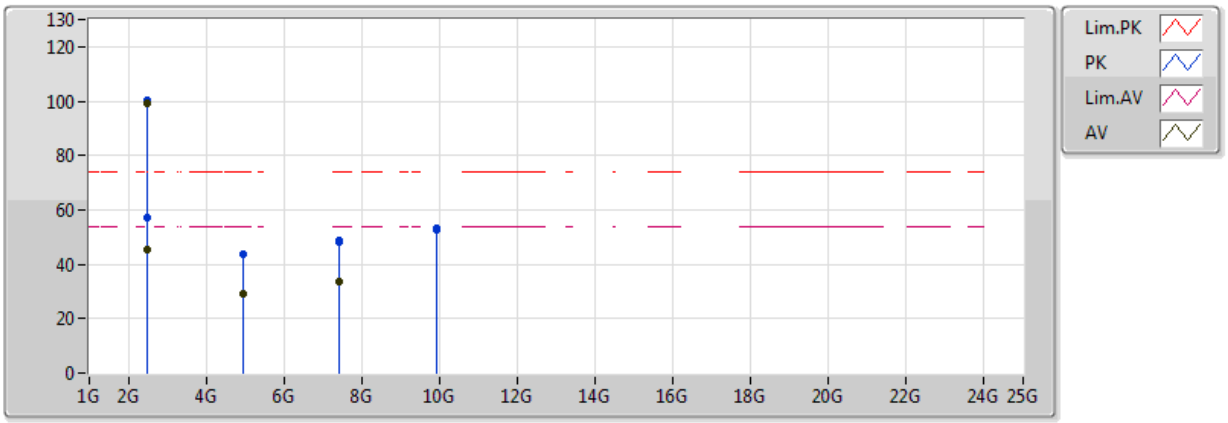


PCB ANT = ANT A+ANT B
EUT = Z axis, ANT= Z axis

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	2.35978G	48.30	54.00	-5.70	30.14	3	H	NaN	NaN	-
AV	2.43996G	99.54	Inf	-Inf	30.39	3	H	NaN	NaN	-
AV	2.49962G	43.29	54.00	-10.71	30.58	3	H	NaN	NaN	-
PK	2.36016G	55.76	74.00	-18.24	30.14	3	H	NaN	NaN	-
PK	2.43996G	100.84	Inf	-Inf	30.39	3	H	NaN	NaN	-
PK	2.4981G	54.38	74.00	-19.62	30.57	3	H	NaN	NaN	-

BT-LE(1Mbps)

2480MHz_PCB

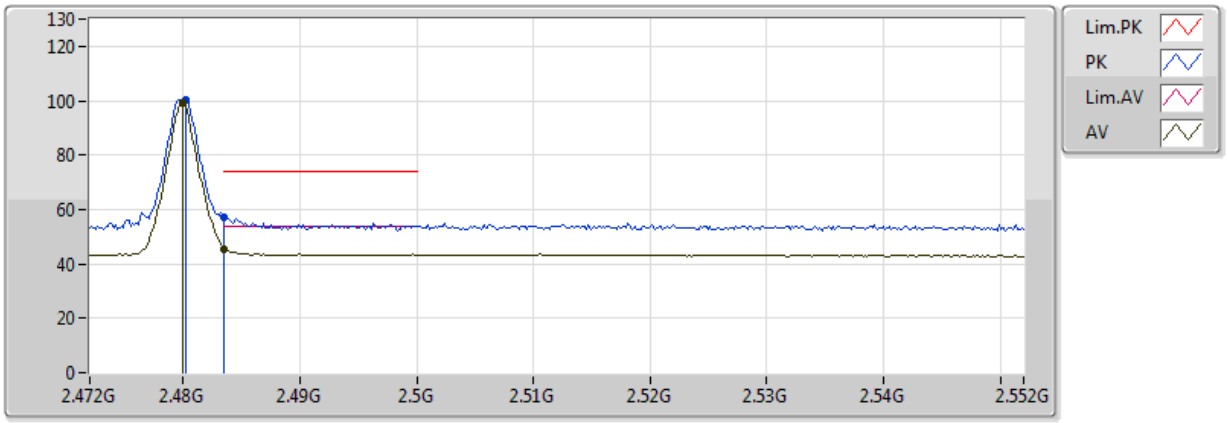


PCB ANT = ANT A+ANT B
EUT = Z axis, ANT= Z axis

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	2.48G	99.10	Inf	-Inf	30.52	3	H	NaN	NaN	-
AV	2.48352G	45.40	54.00	-8.60	30.53	3	H	NaN	NaN	-
AV	4.96G	29.05	54.00	-24.95	1.25	3	H	NaN	NaN	-
AV	7.44G	33.81	54.00	-20.19	6.75	3	H	NaN	NaN	-
PK	2.48016G	100.36	Inf	-Inf	30.52	3	H	NaN	NaN	-
PK	2.48352G	56.99	74.00	-17.01	30.53	3	H	NaN	NaN	-
PK	4.96G	43.77	74.00	-30.23	1.25	3	H	NaN	NaN	-
PK	7.44G	48.38	74.00	-25.62	6.75	3	H	NaN	NaN	-
PK	9.92G	52.80	Inf	-Inf	9.79	3	H	NaN	NaN	-
AV	4.96G	29.04	54.00	-24.96	1.25	3	V	NaN	NaN	-
AV	7.44G	33.87	54.00	-20.13	6.75	3	V	NaN	NaN	-
PK	4.96G	43.94	74.00	-30.06	1.25	3	V	NaN	NaN	-
PK	7.44G	48.47	74.00	-25.53	6.75	3	V	NaN	NaN	-
PK	9.92G	53.09	Inf	-Inf	9.79	3	V	NaN	NaN	-

BT-LE(1Mbps)

2480MHz_PCB



PCB ANT = ANT A+ANT B
EUT = Z axis, ANT= Z axis

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	2.48G	99.10	Inf	-Inf	30.52	3	H	NaN	NaN	-
AV	2.48352G	45.40	54.00	-8.60	30.53	3	H	NaN	NaN	-
PK	2.48016G	100.36	Inf	-Inf	30.52	3	H	NaN	NaN	-
PK	2.48352G	56.99	74.00	-17.01	30.53	3	H	NaN	NaN	-

Summary

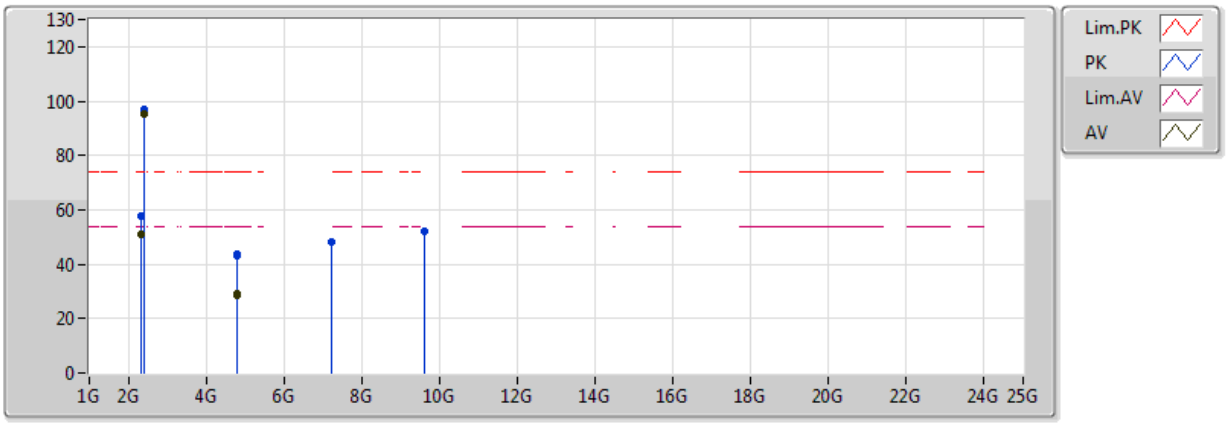
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Pol. (H/V)	Azimuth (°)	Height (m)	Comments
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-	-
2.4-2.4835GHz	Pass	AV	2.322036G	51.10	54.00	-2.90	30.02	3	H	NaN	NaN	-

Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Pol. (H/V)	Azimuth (°)	Height (m)	Comments
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	AV	2.322036G	51.10	54.00	-2.90	30.02	3	H	NaN	NaN	-
2402MHz	Pass	AV	2.402004G	95.40	Inf	-Inf	30.27	3	H	NaN	NaN	-
2402MHz	Pass	AV	4.804G	28.75	54.00	-25.25	0.91	3	H	NaN	NaN	-
2402MHz	Pass	PK	2.321832G	57.97	74.00	-16.03	30.02	3	H	NaN	NaN	-
2402MHz	Pass	PK	2.4018G	96.72	Inf	-Inf	30.27	3	H	NaN	NaN	-
2402MHz	Pass	PK	4.804G	43.47	74.00	-30.53	0.91	3	H	NaN	NaN	-
2402MHz	Pass	PK	7.206G	48.38	Inf	-Inf	6.18	3	H	NaN	NaN	-
2402MHz	Pass	PK	9.608G	51.99	Inf	-Inf	9.45	3	H	NaN	NaN	-
2402MHz	Pass	AV	4.804G	29.09	54.00	-24.91	0.91	3	V	NaN	NaN	-
2402MHz	Pass	PK	4.804G	43.12	74.00	-30.88	0.91	3	V	NaN	NaN	-
2402MHz	Pass	PK	7.206G	48.36	Inf	-Inf	6.18	3	V	NaN	NaN	-
2402MHz	Pass	PK	9.608G	51.85	Inf	-Inf	9.45	3	V	NaN	NaN	-
2440MHz	Pass	AV	2.35978G	44.94	54.00	-9.06	30.14	3	H	NaN	NaN	-
2440MHz	Pass	AV	2.43996G	92.58	Inf	-Inf	30.39	3	H	NaN	NaN	-
2440MHz	Pass	AV	2.49734G	41.55	54.00	-12.45	30.57	3	H	NaN	NaN	-
2440MHz	Pass	AV	4.88G	29.02	54.00	-24.98	1.07	3	H	NaN	NaN	-
2440MHz	Pass	AV	7.32G	33.95	54.00	-20.05	6.46	3	H	NaN	NaN	-
2440MHz	Pass	PK	2.35978G	53.25	74.00	-20.75	30.14	3	H	NaN	NaN	-
2440MHz	Pass	PK	2.43996G	94.23	Inf	-Inf	30.39	3	H	NaN	NaN	-
2440MHz	Pass	PK	2.49202G	53.96	74.00	-20.04	30.55	3	H	NaN	NaN	-
2440MHz	Pass	PK	4.88G	42.10	74.00	-31.90	1.07	3	H	NaN	NaN	-
2440MHz	Pass	PK	7.32G	47.70	74.00	-26.30	6.46	3	H	NaN	NaN	-
2440MHz	Pass	PK	9.76G	49.65	Inf	-Inf	9.62	3	H	NaN	NaN	-
2440MHz	Pass	AV	4.88G	29.03	54.00	-24.97	1.07	3	V	NaN	NaN	-
2440MHz	Pass	AV	7.32G	34.78	54.00	-19.22	6.46	3	V	NaN	NaN	-
2440MHz	Pass	PK	4.88G	43.68	74.00	-30.32	1.07	3	V	NaN	NaN	-
2440MHz	Pass	PK	7.32G	48.11	74.00	-25.89	6.46	3	V	NaN	NaN	-
2440MHz	Pass	PK	9.76G	50.09	Inf	-Inf	9.62	3	V	NaN	NaN	-
2480MHz	Pass	AV	2.48G	93.46	Inf	-Inf	30.52	3	H	NaN	NaN	-
2480MHz	Pass	AV	2.48352G	42.25	54.00	-11.75	30.53	3	H	NaN	NaN	-
2480MHz	Pass	AV	4.96G	29.26	54.00	-24.74	1.25	3	H	NaN	NaN	-
2480MHz	Pass	AV	7.44G	34.74	54.00	-19.26	6.75	3	H	NaN	NaN	-
2480MHz	Pass	PK	2.47968G	95.22	Inf	-Inf	30.51	3	H	NaN	NaN	-
2480MHz	Pass	PK	2.48416G	54.65	74.00	-19.35	30.53	3	H	NaN	NaN	-
2480MHz	Pass	PK	4.96G	43.98	74.00	-30.02	1.25	3	H	NaN	NaN	-
2480MHz	Pass	PK	7.44G	48.77	74.00	-25.23	6.75	3	H	NaN	NaN	-
2480MHz	Pass	PK	9.92G	51.89	Inf	-Inf	9.79	3	H	NaN	NaN	-
2480MHz	Pass	AV	4.96G	29.11	54.00	-24.89	1.25	3	V	NaN	NaN	-
2480MHz	Pass	AV	7.44G	34.86	54.00	-19.14	6.75	3	V	NaN	NaN	-
2480MHz	Pass	PK	4.96G	43.35	74.00	-30.65	1.25	3	V	NaN	NaN	-
2480MHz	Pass	PK	7.44G	48.14	74.00	-25.86	6.75	3	V	NaN	NaN	-
2480MHz	Pass	PK	9.92G	52.11	Inf	-Inf	9.79	3	V	NaN	NaN	-

BT-LE(1Mbps)

2402MHz_PIFA

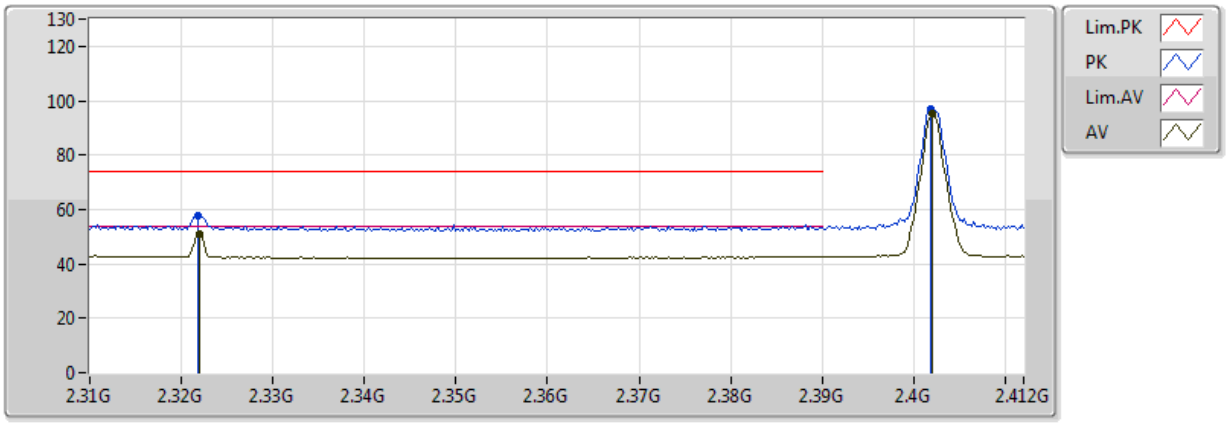


PIFA+PCB ANT = ANT A+ANT B
EUT =Z axis, ANT=Z axis

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	2.322036G	51.10	54.00	-2.90	30.02	3	H	NaN	NaN	-
AV	2.402004G	95.40	Inf	-Inf	30.27	3	H	NaN	NaN	-
AV	4.804G	28.75	54.00	-25.25	0.91	3	H	NaN	NaN	-
PK	2.321832G	57.97	74.00	-16.03	30.02	3	H	NaN	NaN	-
PK	2.4018G	96.72	Inf	-Inf	30.27	3	H	NaN	NaN	-
PK	4.804G	43.47	74.00	-30.53	0.91	3	H	NaN	NaN	-
PK	7.206G	48.38	Inf	-Inf	6.18	3	H	NaN	NaN	-
PK	9.608G	51.99	Inf	-Inf	9.45	3	H	NaN	NaN	-
AV	4.804G	29.09	54.00	-24.91	0.91	3	V	NaN	NaN	-
PK	4.804G	43.12	74.00	-30.88	0.91	3	V	NaN	NaN	-
PK	7.206G	48.36	Inf	-Inf	6.18	3	V	NaN	NaN	-
PK	9.608G	51.85	Inf	-Inf	9.45	3	V	NaN	NaN	-

BT-LE(1Mbps)

2402MHz_PIFA

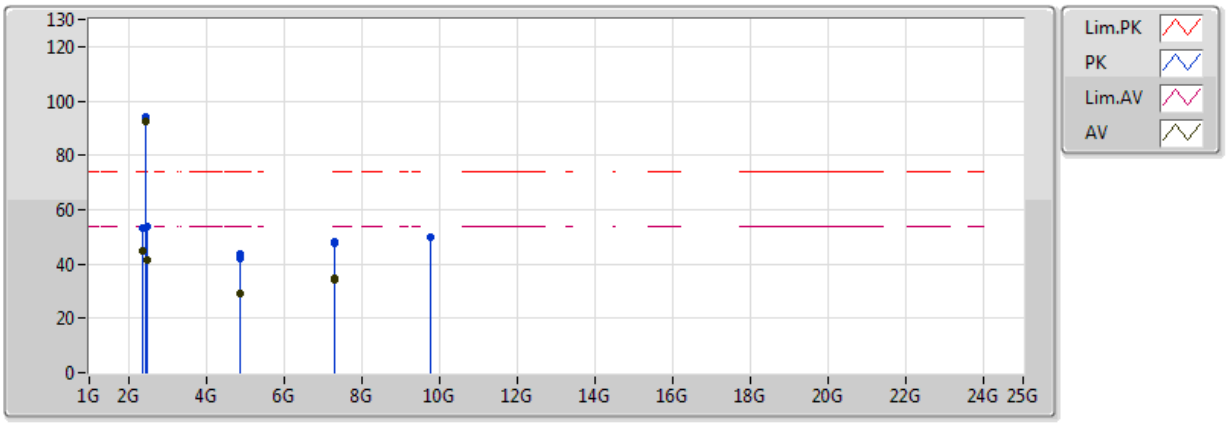


PIFA+PCB ANT = ANT A+ANT B
EUT =Z axis, ANT=Z axis

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	2.322036G	51.10	54.00	-2.90	30.02	3	H	NaN	NaN	-
AV	2.402004G	95.40	Inf	-Inf	30.27	3	H	NaN	NaN	-
PK	2.321832G	57.97	74.00	-16.03	30.02	3	H	NaN	NaN	-
PK	2.4018G	96.72	Inf	-Inf	30.27	3	H	NaN	NaN	-

BT-LE(1Mbps)

2440MHz_PIFA

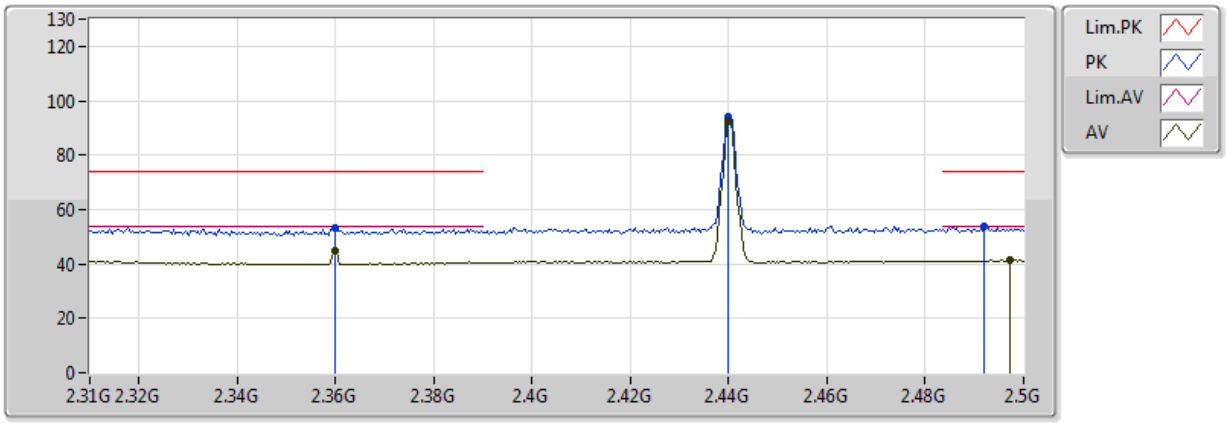


PIFA+PCB ANT = ANT A+ANT B
EUT =Z axis, ANT=Z axis

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	2.35978G	44.94	54.00	-9.06	30.14	3	H	NaN	NaN	-
AV	2.43996G	92.58	Inf	-Inf	30.39	3	H	NaN	NaN	-
AV	2.49734G	41.55	54.00	-12.45	30.57	3	H	NaN	NaN	-
AV	4.88G	29.02	54.00	-24.98	1.07	3	H	NaN	NaN	-
AV	7.32G	33.95	54.00	-20.05	6.46	3	H	NaN	NaN	-
PK	2.35978G	53.25	74.00	-20.75	30.14	3	H	NaN	NaN	-
PK	2.43996G	94.23	Inf	-Inf	30.39	3	H	NaN	NaN	-
PK	2.49202G	53.96	74.00	-20.04	30.55	3	H	NaN	NaN	-
PK	4.88G	42.10	74.00	-31.90	1.07	3	H	NaN	NaN	-
PK	7.32G	47.70	74.00	-26.30	6.46	3	H	NaN	NaN	-
PK	9.76G	49.65	Inf	-Inf	9.62	3	H	NaN	NaN	-
AV	4.88G	29.03	54.00	-24.97	1.07	3	V	NaN	NaN	-
AV	7.32G	34.78	54.00	-19.22	6.46	3	V	NaN	NaN	-
PK	4.88G	43.68	74.00	-30.32	1.07	3	V	NaN	NaN	-
PK	7.32G	48.11	74.00	-25.89	6.46	3	V	NaN	NaN	-
PK	9.76G	50.09	Inf	-Inf	9.62	3	V	NaN	NaN	-

BT-LE(1Mbps)

2440MHz_PIFA

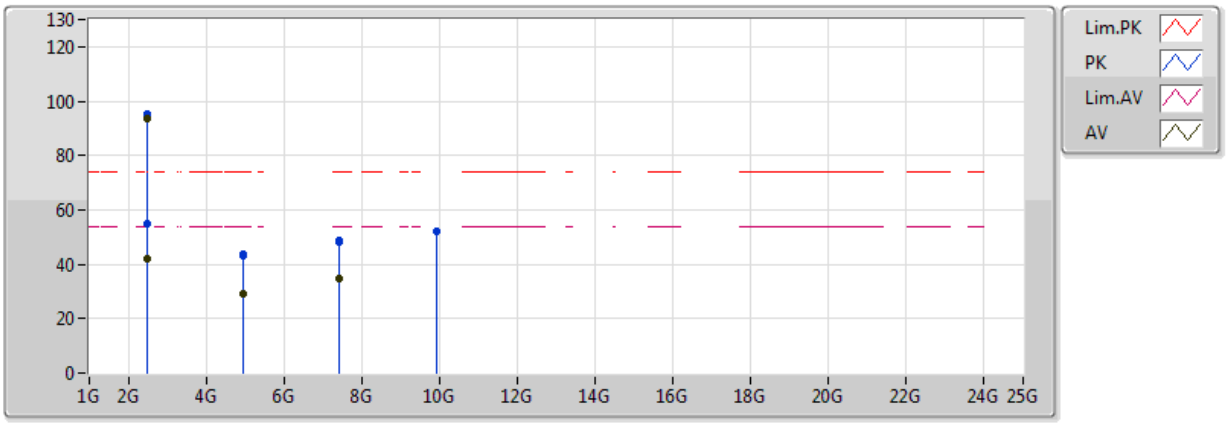


PIFA+PCB ANT = ANT A+ANT B
EUT =Z axis, ANT=Z axis

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	2.35978G	44.94	54.00	-9.06	30.14	3	H	NaN	NaN	-
AV	2.43996G	92.58	Inf	-Inf	30.39	3	H	NaN	NaN	-
AV	2.49734G	41.55	54.00	-12.45	30.57	3	H	NaN	NaN	-
PK	2.35978G	53.25	74.00	-20.75	30.14	3	H	NaN	NaN	-
PK	2.43996G	94.23	Inf	-Inf	30.39	3	H	NaN	NaN	-
PK	2.49202G	53.96	74.00	-20.04	30.55	3	H	NaN	NaN	-

BT-LE(1Mbps)

2480MHz_PIFA

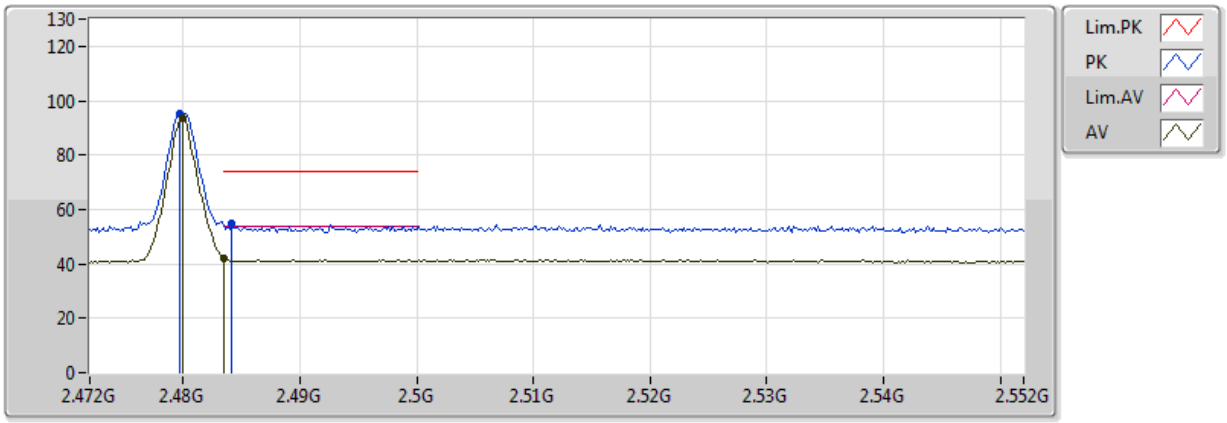


PIFA+PCB ANT = ANT A+ANT B
EUT =Z axis, ANT=Z axis

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	2.48G	93.46	Inf	-Inf	30.52	3	H	NaN	NaN	-
AV	2.48352G	42.25	54.00	-11.75	30.53	3	H	NaN	NaN	-
AV	4.96G	29.26	54.00	-24.74	1.25	3	H	NaN	NaN	-
AV	7.44G	34.74	54.00	-19.26	6.75	3	H	NaN	NaN	-
PK	2.47968G	95.22	Inf	-Inf	30.51	3	H	NaN	NaN	-
PK	2.48416G	54.65	74.00	-19.35	30.53	3	H	NaN	NaN	-
PK	4.96G	43.98	74.00	-30.02	1.25	3	H	NaN	NaN	-
PK	7.44G	48.77	74.00	-25.23	6.75	3	H	NaN	NaN	-
PK	9.92G	51.89	Inf	-Inf	9.79	3	H	NaN	NaN	-
AV	4.96G	29.11	54.00	-24.89	1.25	3	V	NaN	NaN	-
AV	7.44G	34.86	54.00	-19.14	6.75	3	V	NaN	NaN	-
PK	4.96G	43.35	74.00	-30.65	1.25	3	V	NaN	NaN	-
PK	7.44G	48.14	74.00	-25.86	6.75	3	V	NaN	NaN	-
PK	9.92G	52.11	Inf	-Inf	9.79	3	V	NaN	NaN	-

BT-LE(1Mbps)

2480MHz_PIFA



PIFA+PCB ANT = ANT A+ANT B
EUT =Z axis, ANT=Z axis

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	2.48G	93.46	Inf	-Inf	30.52	3	H	NaN	NaN	-
AV	2.48352G	42.25	54.00	-11.75	30.53	3	H	NaN	NaN	-
PK	2.47968G	95.22	Inf	-Inf	30.51	3	H	NaN	NaN	-
PK	2.48416G	54.65	74.00	-19.35	30.53	3	H	NaN	NaN	-