FCC Test Report

FCC ID	:	**PPQ-WCBN3516A**
Equipment	:	**802.11 a/b/g/n 1x1 + BT5.0 + Zigbee(15.4) IoT Module**
Brand Name	:	**LITE-ON**
Model Name	:	**WCBN3516A**
Applicant	:	**LITE-ON Technology Corp. Bldg. C, 90, Chien 1 Road, Chung Ho, New Taipei City 23585, Taiwan, R.O.C**
Manufacturer	:	**LITE-ON TECHNOLOGY (Changzhou) CO., LTD A9 Building,No.88 Yanghu Road, Wujin Hi-Tech Industrial Development Zone ,Changzhou City,Jiangsu Province 213100 China**
Standard	:	**47 CFR FCC Part 15.247**

The product was received on Jan. 31, 2019, and testing was started from Feb. 21, 2019 and completed on Mar. 05, 2019. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2013 and shown compliance with the applicable technical standards.

The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

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

Allen Lin

Approved by: Allen Lin

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory

No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)

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PHOTOGRAPHS OF EUT V01

History of this test report

Report No.	Version	Description	Issued Date
FR912411AZ	01	Initial issue of report	Mar. 29, 2019

Summary of Test Result

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

Declaration of Conformity:
The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.
Comments and explanations:
None

Reviewed by: Sam Tsai

Report Producer: Debby Hung

1 General Description

1.1 Information

1.1.1 RF General Information

Frequency Range (MHz)	IEEE Std.	Ch. Frequency (MHz)	Channel Number
2400-2483.5	802.15.4	2405-2480	11-26 [16]

Band	Mode	BWch (MHz)	Nant
2.4-2.4835GHz	Zigbee	5	1

Note:.
- Zigbee uses a O-QPSK (250kbps) modulation for DSSS.
- BWch is the nominal channel bandwidth.

1.1.2 Antenna Information

Ant.	Brand	Model Name	Antenna Type	Connector
1	LITE-ON	-	Printed Antenna	N/A
2	LITE-ON	-	Printed Antenna	N/A

Ant.	Port	Gain (dBi)			
		2.4G	5G	Zigbee	BT
1	1	4.6	4.3	-	-
2	2	-	-	4.7	4.7

For 2.4GHz function:

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

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

For 5GHz function:

For IEEE 802.11 a/n mode (1TX/1RX)

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

For Zigbee function:

For IEEE 802.11 Zigbee mode (1TX/1RX)

Ant. 2 (port 2) could transmit/receive simultaneously.

For BT function:

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

Only Ant. 2 (port 2) could transmit/receive simultaneously.

1.1.3 EUT Information

Operational Condition				
EUT Power Type	From Host system			
EUT Function	☒	Point-to-multipoint	☐	Point-to-point

Type of EUT		
☒	Stand-alone	
☐	Combined (EUT where the radio part is fully integrated within another device)	
	Combined Equipment - Brand Name / Model No.:	…
☐	Plug-in radio (EUT intended for a variety of host systems)	
	Host System - Brand Name / Model No.:	…
☐	Other:	

1.1.4 Mode Test Duty Cycle

Mode	DC	DCF(dB)	T(s)	VBW(Hz) ≥ 1/T
Zigbee	0.49	3.098	936.25u	3k

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

1.2 Testing Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- 47 CFR FCC Part 15
- ANSI C63.10-2013
- KDB 558074 D01 v05r01

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	Barry	24.1~24.9°C / 61~69%	25/Feb/2019
Radiated	03CH03-HY	Terry	23.1~25.7°C / 55.9~57.8%	21/Feb/2019~24/Feb/2019
AC Conduction	CO04-HY	Lego	22.6~23.4°C / 56~60%	05/Mar/2019

1.4 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2)

Test Items	Uncertainty	Remark
Conducted Emission (150kHz ~ 30MHz)	3.54 dB	Confidence levels of 95%
Radiated Emission (9kHz ~ 30MHz)	1.6 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	4.3 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	3.9 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	3.5 dB	Confidence levels of 95%
Conducted Emission	1.3 dB	Confidence levels of 95%
Temperature	0.7 °C	Confidence levels of 95%
Humidity	4 %	Confidence levels of 95%

2 Test Configuration of EUT

2.1 Test Condition

RF Conducted	Abbreviation	Remark
TnomVnom	Tnom	20°C
-	Vnom	5V

2.2 Test Channel Mode

Test Software Version	QSPR 5.0-00163

Mode	PowerSetting
Zigbee	-
2405MHz	default
2440MHz	default
2480MHz	default

2.3 The Worst Case Measurement Configuration

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

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

The Worst Case Mode for Following Conformance Tests			
Tests Item	Emissions in Restricted Frequency Bands		
Test Condition	Radiated measurement If EUT consist of multiple antenna assembly (multiple antenna are used in EUT regardless of spatial multiplexing MIMO configuration), the radiated test should be performed with highest antenna gain of each antenna type.		
Operating Mode < 1GHz	CTX		
1	USB mode		
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
2	Bluetooth+WLAN 5GHz
3	Zigbee+WLAN 2.4GHz
4	Zigbee +WLAN 5GHz
Refer to Sporton Test Report No.: FA912411 for Co-location RF Exposure Evaluation.	

2.4 Support Equipment

Support Equipment – AC Conduction				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
1	Notebook	DELL	E5410	-
2	Adapter	DELL	LA90PS0-00	-
3	Test Fixture	-	-	-

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

Support Equipment – RF Conducted				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
1	Notebook	DELL	E5410	-
2	Adapter	DELL	LA90PS0-00	-
3	Test Fixture	-	-	-

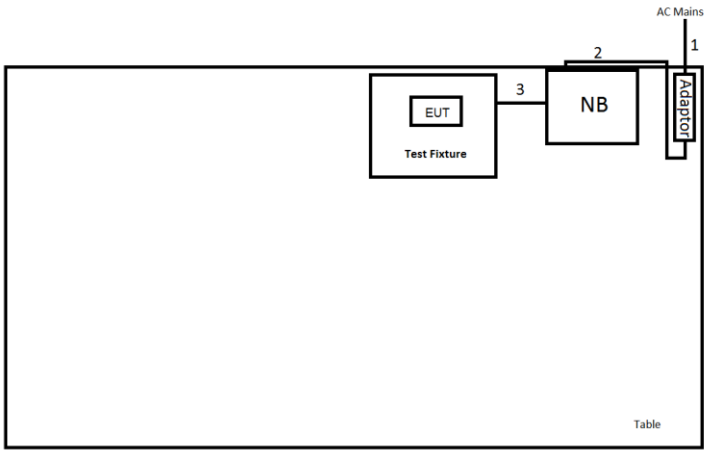
Note.Support equipment No.3 was provided by customer.

Support Equipment – Radiated Emission				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
1	Notebook	DELL	E5410	-
2	Adapter	DELL	LA90PS0-00	-
3	Test Fixture	-	-	-

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

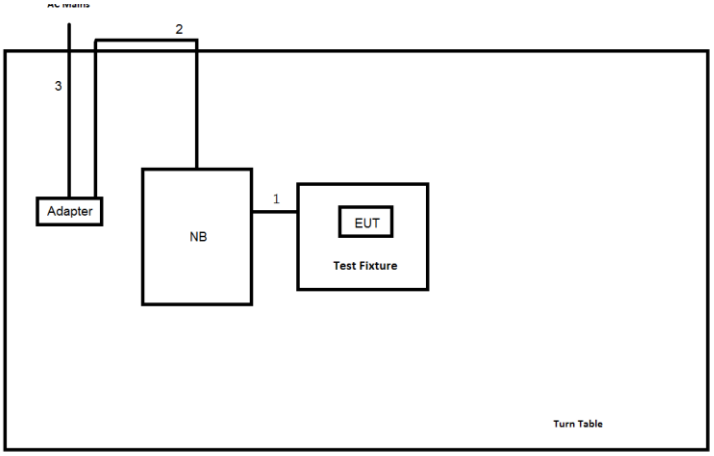
2.5 Test Setup Diagram

Test Setup Diagram – AC Line Conducted Emission Test



Item	Connection	Shielded	Length(m)	Remark
1	AC Power line	No	1.8	-
2	DC Power line	No	1.5	-
3	USB cable	No	0.2	-

Test Setup Diagram - Radiated Test



Item	Connection	Shielded	Length(m)	Remark
1	USB cable	No	0.2	-
2	DC Power line	No	1.5	-
3	AC Power line	No	1.8	-

3 Transmitter Test Result

3.1 AC Power-line Conducted Emissions

3.1.1 AC Power-line Conducted Emissions Limit

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

3.1.2 Measuring Instruments

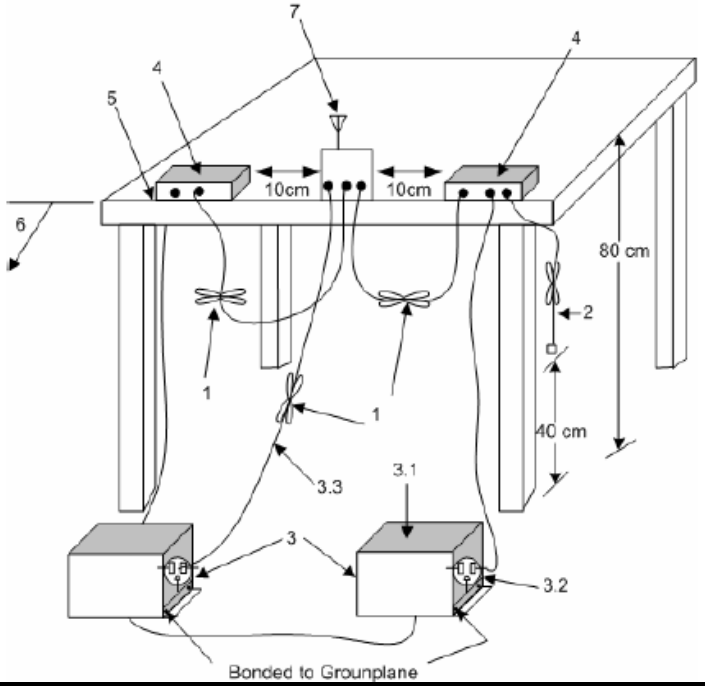
Refer a test equipment and calibration data table in this test report.

3.1.3 Test Procedures

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

3.1.4 Test Setup

AC Power-line Conducted Emissions



3.1.5 Test Result of AC Power-line Conducted Emissions

Refer as Appendix A

3.2 DTS Bandwidth

3.2.1 6dB Bandwidth Limit

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

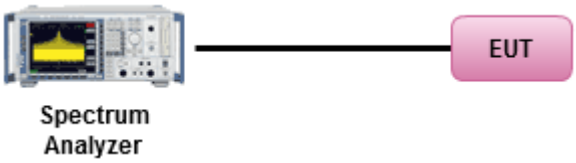
3.2.2 Measuring Instruments

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

3.2.3 Test Procedures

Test Method	
▪ For the emission bandwidth shall be measured using one of the options below:	
	☒ Refer as KDB 558074, clause 8.2 (11.8 of ANSI C63.10) DTS bandwidth measurement.
	☐ Refer as RSS-Gen, clause 6.7 for for occupied bandwidth testing.
	☐ Refer as ANSI C63.10, clause 6.9.3 for occupied bandwidth testing.

3.2.4 Test Setup

Emission Bandwidth


3.2.5 Test Result of Emission Bandwidth

Refer as Appendix B

3.3 Maximum Conducted Output Power

3.3.1 Maximum Conducted Output Power Limit

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

3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

Test Method	
▪ Maximum Peak Conducted Output Power	
	☐ Refer as KDB 558074, clause 8.3.1.1 (11.9.1.1 of ANSI C63.10) RBW ≥ EBW method.
	☐ Refer as KDB 558074, clause 8.3.1.2 (11.9.1.2 of ANSI C63.10) integrated band power method.
	☐ Refer as KDB 558074, clause 8.3.1.3 (11.9.1.3 of ANSI C63.10) peak power meter.
▪ Maximum Average Conducted Output Power	
	☐ Refer as KDB 558074, clause 8.3.2.2 (11.9.2.2 of ANSI C63.10) using a spectrum analyzer.
	☒ Refer as KDB 558074, clause 8.3.2.3 (11.9.2.3 of ANSI C63.10) using a power meter.
▪ For conducted measurement.	
	▪ If the EUT supports multiple transmit chains using options given below: Refer as KDB 662911, In-band power measurements. Using the measure-and-sum approach, measured all transmit ports individually. Sum the power (in linear power units e.g., mW) of all ports for each individual sample and save them.
	▪ If multiple transmit chains, EIRP calculation could be following as methods: $P_{total} = P_1 + P_2 + \ldots + P_n$ (calculated in linear unit [mW] and transfer to log unit [dBm]) $EIRP_{total} = P_{total} + DG$

3.3.4 Test Setup

Maximum Conducted Output Power (Power Meter)

3.3.5 Test Result of Maximum Conducted Output Power

Refer as Appendix C

3.4 Power Spectral Density

3.4.1 Power Spectral Density Limit

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

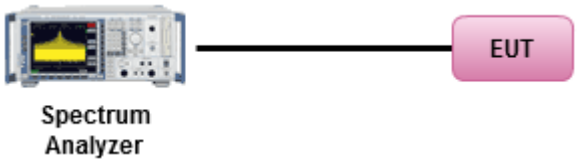
3.4.2 Measuring Instruments

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

3.4.3 Test Procedures

Test Method		
▪ Peak power spectral density procedures that the same method as used to determine the conducted output power. If maximum peak conducted output power was measured to demonstrate compliance to the output power limit, then the peak PSD procedure below (Method PKPSD) shall be used. If maximum conducted output power was measured to demonstrate compliance to the output power limit, then one of the average PSD procedures shall be used, as applicable based on the following criteria (the peak PSD procedure is also an acceptable option).		
	☒ Refer as KDB 558074, clause 8.4 (11.10 of ANSI C63.10) Method PKPSD.	
▪ For conducted measurement.		
	▪ If The EUT supports multiple transmit chains using options given below:	
		▪ Measure and sum the spectra across the outputs. Refer as KDB 662911, In-band power spectral density (PSD). Sample all transmit ports simultaneously using a spectrum analyzer for each transmit port. Where the trace bin-by-bin of each transmit port summing can be performed. (i.e., in the first spectral bin of output 1 is summed with that in the first spectral bin of output 2 and that from the first spectral bin of output 3, and so on up to the NTX output to obtain the value for the first frequency bin of the summed spectrum.). Add up the amplitude (power) values for the different transmit chains and use this as the new data trace.

3.4.4 Test Setup

Power Spectral Density


3.4.5 Test Result of Power Spectral Density

Refer as Appendix D

3.5 Emissions in Non-restricted Frequency Bands

3.5.1 Emissions in Non-restricted Frequency Bands Limit

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

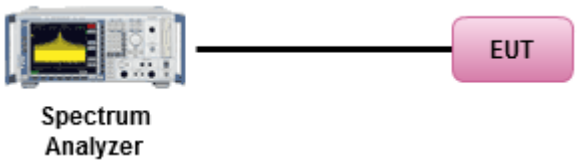
Refer a test equipment and calibration data table in this test report.

3.5.3 Test Procedures

Test Method
▪ Refer as KDB 558074, clause 8.5 (11.11 of ANSI C63.10) for non-restricted frequency bands.

3.5.4 Test Setup

Emissions in Non-restricted Frequency Bands



3.5.5 Test Result of Emissions in Non-restricted Frequency Bands

Refer as Appendix E

3.6 Emissions in Restricted Frequency Bands

3.6.1 Emissions in Restricted Frequency Bands Limit

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

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

Note 2: Test distance for frequencies at below 30 MHz, measurements may be performed at a distance closer than the EUT limit distance; however, an attempt should be made to avoid making measurements in the near field. When performing measurements 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.

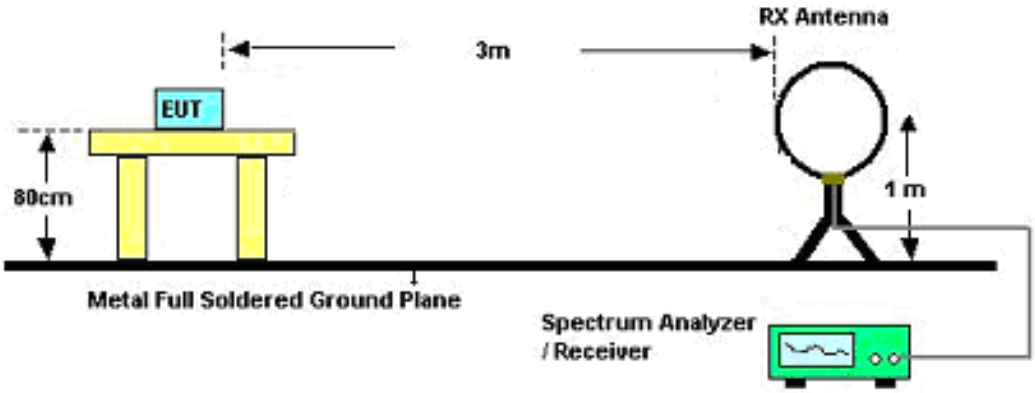
3.6.3 Test Procedures

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 8.6 (11.12 of ANSI C63.10) for restricted frequency bands.
▪ For the transmitter band-edge emissions shall be measured using following options below:	
	▪ Refer as KDB 558074 clause 8.7.1, When the performing peak or average radiated measurements, emissions within 2 MHz of the authorized band edge may be measured using the marker-delta method described below.
	▪ Refer as KDB 558074, clause 8.7.2 (6.10.6 of ANSI C63.10) for marker-delta method for band-edge measurements.
	▪ Refer as KDB 558074, clause 8.7.3 for narrower resolution bandwidth (100kHz) using the band power and summing the spectral levels (i.e., 1 MHz).
▪ Use the following spectrum analyzer settings:	
	▪ Set RBW=100 kHz for f < 1 GHz; VBW=3 * RBW; Sweep = auto; Detector function = peak; Trace = max hold.
	▪ Set RBW = 1 MHz, VBW= 3MHz for f ≥ 1 GHz for peak measurement. For average measurement, refer as 1.1.4.

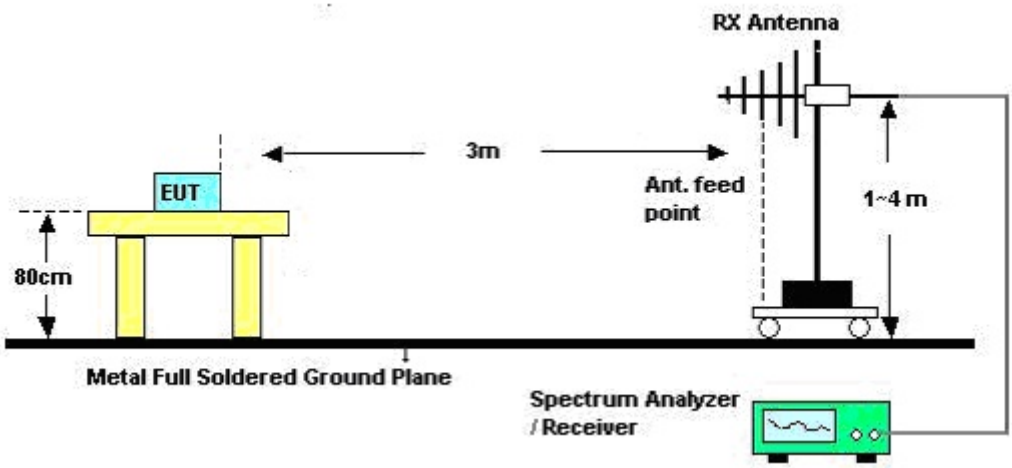
3.6.4 Test Setup

Emissions in Restricted Frequency Bands

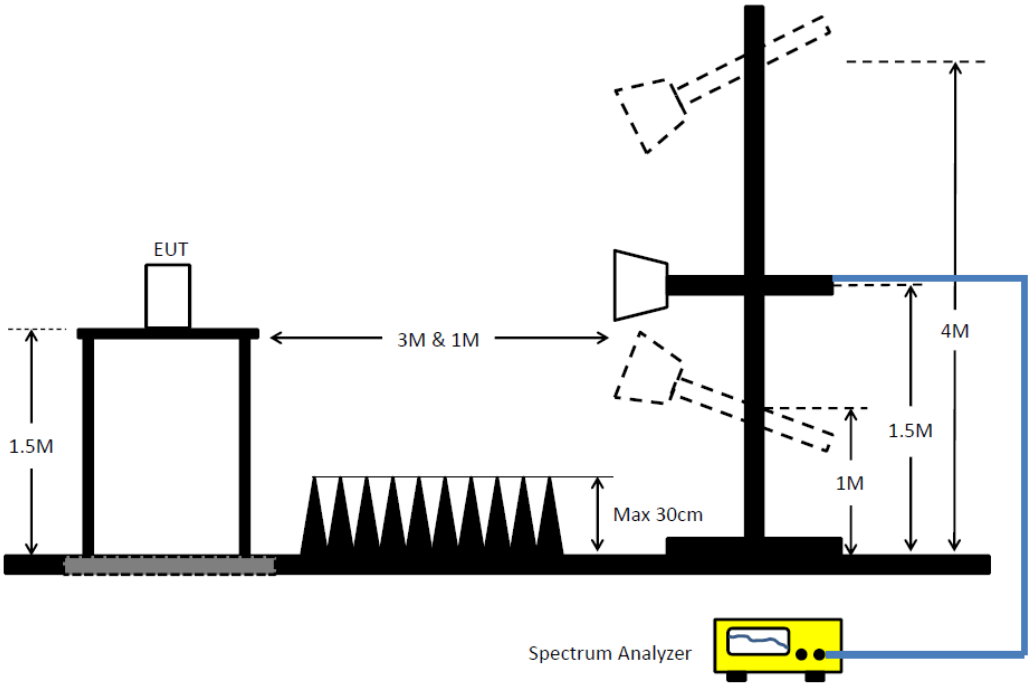
9kHz ~30MHz



30MHz~1GHz



Above 1GHz



3.6.5 Test Result of Emissions in Restricted Frequency Bands (Below 30MHz)

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

3.6.6 Test Result of Emissions in Restricted Frequency Bands

Refer as Appendix F

4 Test Equipment and Calibration Data

Instrument for AC Conduction

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
EMC Receiver	R&S	ESR	102051	9KHz ~ 3.6GHz	03/May/2018	02/May/2019
LISN	R&S	ENV216	101295	9kHz ~ 30MHz	08/Nov/2018	07/Nov/2019
RF Cable-CON	MTJ	RG142	CB002-CO	9kHz ~ 200MHz	17/Sep/2018	16/Sep/2019
AC POWER	APC	AFC-11005G	F310050055	47Hz~63Hz 5~300V	NCR	NCR
Impuls Begrenzer Puls e Limiter	SCHWARZBEC K	VTSD 9561-F	9561-F041	9 kHz ~ 30 MHz	12/Oct/2018	11/Oct/2019

NCR : Non-Calibration Require

Instrument for Radiated Test

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30MHz ~ 1GHz 3m	30/Oct/2018	29/Oct/2019
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	1GHz ~ 18GHz 3m	30/Oct/2018	29/Oct/2019
Amplifier	HP	8447D	2944A08033	10kHz ~ 1.3GHz	23/Apr/2018	19/Apr/2019
EMI Test Receiver	R&S	ESR3	102052	9kHz ~ 3.6GHz	10/Apr/2018	09/Apr/2019
Bilog Antenna with 5dB Pad	ETS	3142B & MTJ6102-05	00022055	26 MHz - 3 GHz	19/Nov/2018	18/Nov/2019
Microwave System Preamplifier	KEYSIGHT	83017A	MY53270196	1GHz ~ 26.5GHz	05/Sep/2018	04/Sep/2019
Signal Analyzer	R&S	FSV40	101500	10Hz ~ 40GHz	18/Jul/2018	17/Jul/2019
RF Cable-R03m	Jye Bao	RG142	CB021	9kHz ~ 1GHz	28/Jan/2019	27/Jan/2020
RF Cable-high	SUHNER	SUCOFLEX 106	CB222	1GHz ~ 40GHz	28/Jan/2019	27/Jan/2020
Broadband Horn Antenna	SCHWARZBEC K	BBHA 9170	BBHA 9170221	15GHz ~ 40GHz	12/Mar/2018	11/Mar/2019
Double Ridged Guide Horn Antenna	SCHWARZBEC K	BBHA 9120 D	BBHA 9120 D 1531	1GHz ~ 18GHz	18/Apr/ 2018	17/Apr/2019
Preamplifier	MITEQ	TTA1840-35-HG	1864481	18GHz ~ 40GHz	24/Aug/2018	23/Aug/2019
Loop Antenna	TESEQ	HLA 6120	31244	9kHz ~ 30MHz	28/Mar/2018	27/Mar/2019

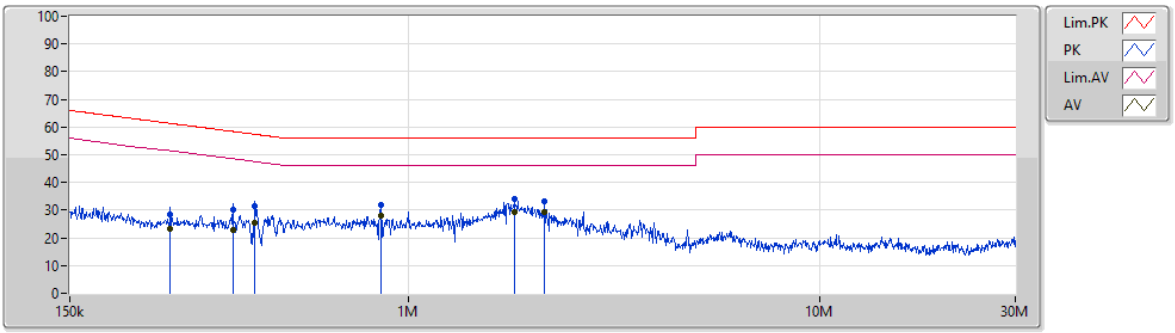
Instrument for Conducted Test

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
Spectrum Analyzer	R&S	FSV 40	101029	10Hz~40GHz	11/Sep/2018	10/Sep/2019
SMB100A Signal Generator	R&S	SMB100A03	181147	100kHz~40GHz	12/Nov/2018	10/Nov/2020
Power Sensor	Anritsu	MA2411B	0917017	300MHz ~ 40GHz	19/Feb/2019	18/Feb/2020
Power Meter	Anritsu	ML2495A	0949003	300MHz ~ 40GHz	19/Feb/2019	18/Feb/2020
Cable 0.2m	HUBER	MY10710/4	RF Cable - 01	30MHz~1G	11/Jan/2019	10/Jan/2020
Cable 0.2m	HUBER	MY10710/4	RF Cable - 01	1G~18G	11/Jan/2019	10/Jan/2020
Cable 0.5m	HUBER	MY10714/4	RF Cable – 05	30MHz~1G	11/Jan/2019	10/Jan/2020

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

AC Conduction

05/03/2019

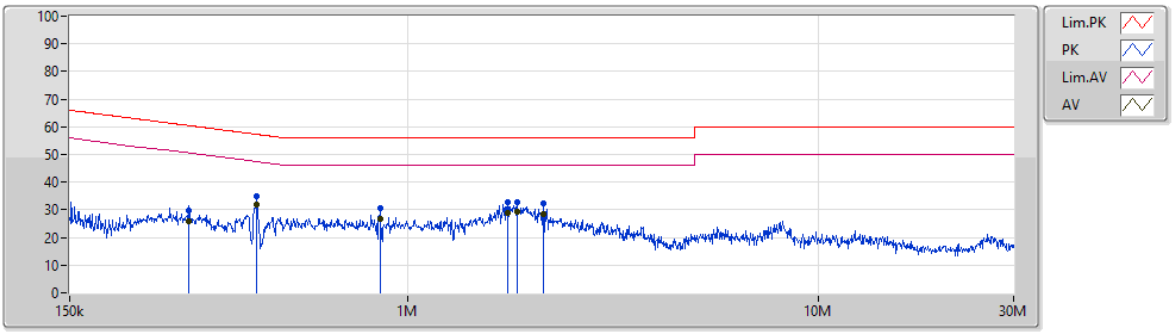


Type	Freq	Level	Limit	Margin	Factor	Condition	Comment	Raw	LISN	CL	AT
	(Hz)	(dBuV)	(dBuV)	(dB)	(dB)			(dBuV)	(dB)	(dB)	(dB)
QP	263.357k	28.27	61.32	-33.05	19.47	Neutral	-	8.80	9.59	0.01	9.87
AV	263.357k	23.46	51.32	-27.86	19.47	Neutral	-	3.99	9.59	0.01	9.87
QP	374.207k	30.17	58.41	-28.24	19.48	Neutral	-	10.69	9.59	0.01	9.88
AV	374.207k	22.72	48.41	-25.69	19.48	Neutral	-	3.24	9.59	0.01	9.88
QP	423.503k	31.65	57.38	-25.73	19.48	Neutral	-	12.17	9.59	0.01	9.88
AV	423.503k	25.30	47.38	-22.08	19.48	Neutral	-	5.82	9.59	0.01	9.88
QP	855.047k	31.89	56.00	-24.11	19.49	Neutral	-	12.40	9.59	0.02	9.88
AV	855.047k	27.83	46.00	-18.17	19.49	Neutral	-	8.34	9.59	0.02	9.88
QP	1.818M	33.85	56.00	-22.15	19.53	Neutral	-	14.32	9.61	0.03	9.89
AV	1.818M	29.44	46.00	-16.56	19.53	Neutral	"Worst"	9.91	9.61	0.03	9.89
QP	2.142M	33.18	56.00	-22.82	19.53	Neutral	-	13.65	9.61	0.03	9.89
AV	2.142M	29.10	46.00	-16.90	19.53	Neutral	-	9.57	9.61	0.03	9.89

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

AC Conduction

05/03/2019



Type	Freq	Level	Limit	Margin	Factor	Condition	Comment	Raw	LISN	CL	AT
	(Hz)	(dBuV)	(dBuV)	(dB)	(dB)			(dBuV)	(dB)	(dB)	(dB)
QP	293.329k	29.74	60.44	-30.70	19.48	Line	-	10.26	9.59	0.01	9.88
AV	293.329k	25.67	50.44	-24.77	19.48	Line	-	6.19	9.59	0.01	9.88
QP	426.898k	34.83	57.32	-22.49	19.48	Line	-	15.35	9.59	0.01	9.88
AV	426.898k	31.78	47.32	-15.54	19.48	Line	"Worst"	12.30	9.59	0.01	9.88
QP	855.047k	30.77	56.00	-25.23	19.50	Line	-	11.27	9.60	0.02	9.88
AV	855.047k	26.58	46.00	-19.42	19.50	Line	-	7.08	9.60	0.02	9.88
QP	1.754M	32.90	56.00	-23.10	19.54	Line	-	13.36	9.62	0.03	9.89
AV	1.754M	28.98	46.00	-17.02	19.54	Line	-	9.44	9.62	0.03	9.89
QP	1.848M	32.91	56.00	-23.09	19.54	Line	-	13.37	9.62	0.03	9.89
AV	1.848M	29.32	46.00	-16.68	19.54	Line	-	9.78	9.62	0.03	9.89
QP	2.142M	32.45	56.00	-23.55	19.54	Line	-	12.91	9.62	0.03	9.89
AV	2.142M	28.46	46.00	-17.54	19.54	Line	-	8.92	9.62	0.03	9.89

Summary

Mode	Max-N dB (Hz)	Max-OBW (Hz)	ITU-Code	Min-N dB (Hz)	Min-OBW (Hz)
2.4-2.4835GHz	-	-	-	-	-
Zigbee	1.163M	2.255M	2M26G1D	1.125M	2.199M

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

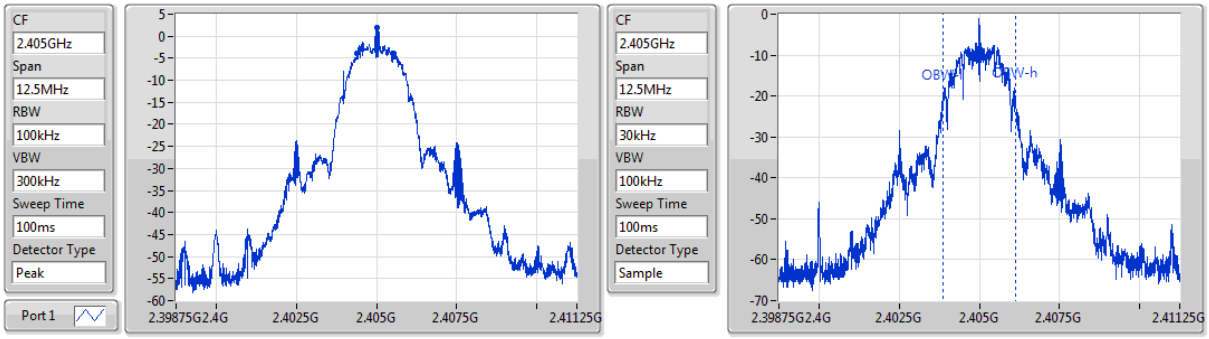
Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
Zigbee	-	-	-	-
2405MHz	Pass	500k	1.163M	2.255M
2440MHz	Pass	500k	1.125M	2.199M
2480MHz	Pass	500k	1.144M	2.236M

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

Zigbee EBW

2405MHz

25/02/2019

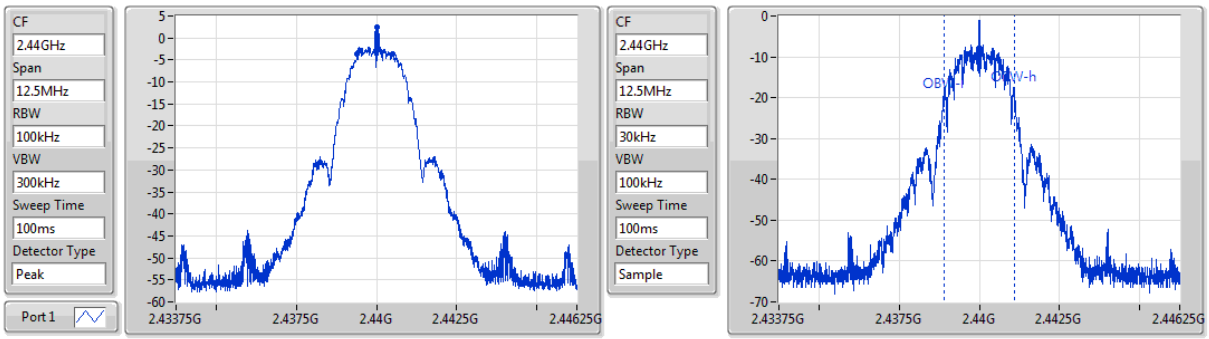


6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
1.163M	2.404388G	2.40555G	2.255M	2.403869G	2.406124G	500k	1

Zigbee EBW

2440MHz

25/02/2019

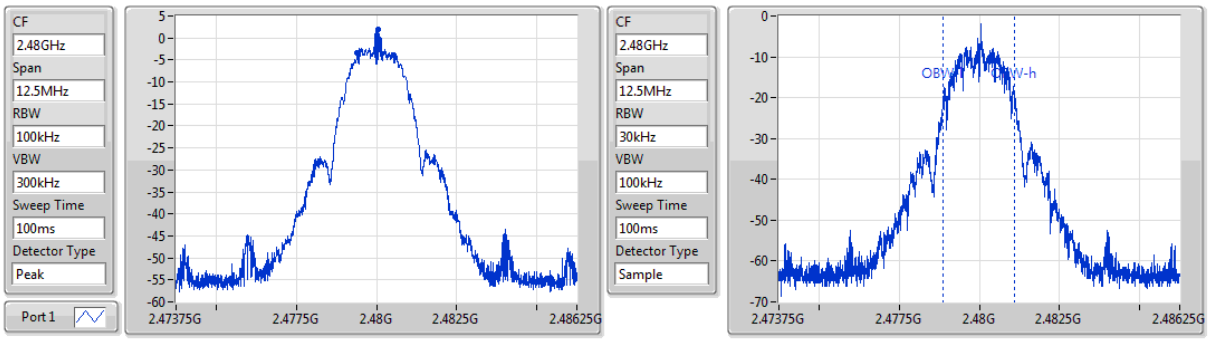


6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
1.125M	2.439394G	2.440519G	2.199M	2.438888G	2.441087G	500k	1

Zigbee EBW

2480MHz

25/02/2019



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
1.144M	2.4794G	2.480544G	2.236M	2.478876G	2.481112G	500k	1

Summary

Mode	Total Power (dBm)	Total Power (W)
2.4-2.4835GHz	-	-
Zigbee	2.26	0.00168

Result

Mode	Result	DG (dBi)	Port 1 (dBm)	Total Power (dBm)	Power Limit (dBm)
Zigbee	-	-	-	-	-
2405MHz	Pass	4.70	2.26	2.26	30.00
2440MHz	Pass	4.70	1.99	1.99	30.00
2480MHz	Pass	4.70	1.87	1.87	30.00

DG = Directional Gain; **Port X** = Port X output power
Note : Conducted average output power is for reference only

Summary

Mode	PD (dBm/RBW)
2.4-2.4835GHz	-
Zigbee	-10.92

RBW=3kHz.

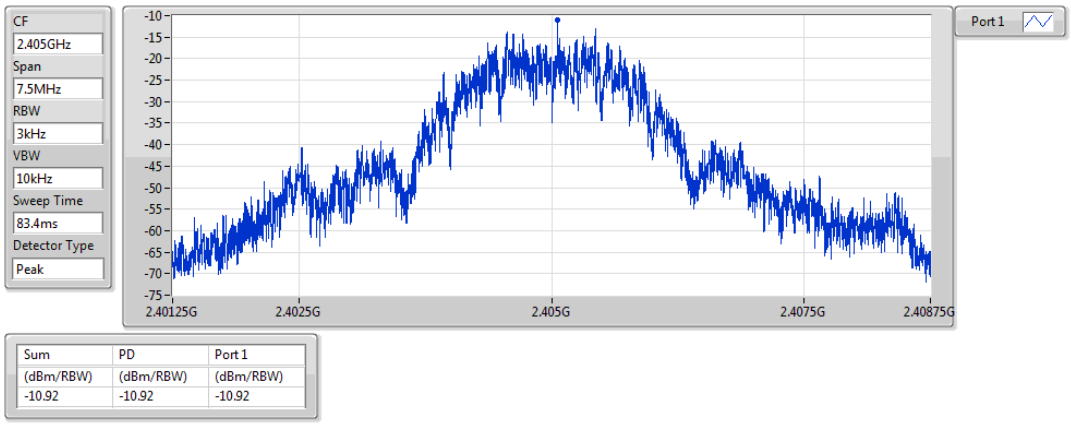
Result

Mode	Result	DG (dBi)	Port 1 (dBm/RBW)	PD (dBm/RBW)	PD Limit (dBm/RBW)
Zigbee	-	-	-	-	-
2405MHz	Pass	4.70	-10.92	-10.92	8.00
2440MHz	Pass	4.70	-12.29	-12.29	8.00
2480MHz	Pass	4.70	-12.98	-12.98	8.00

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

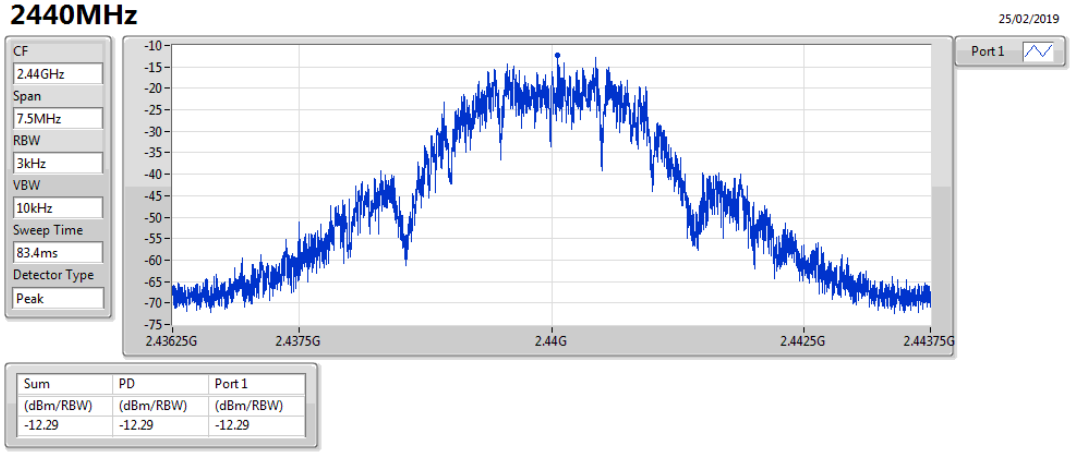
Zigbee **PSD**

2405MHz



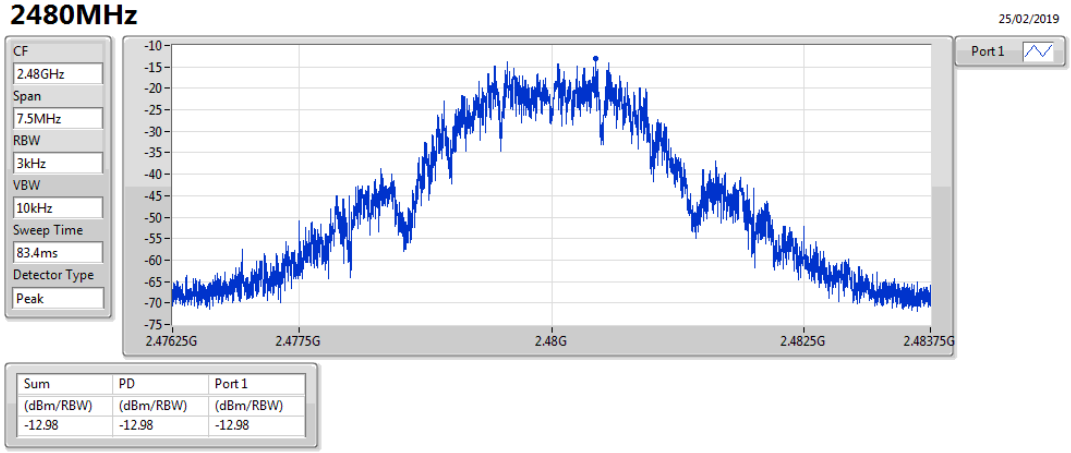
Zigbee **PSD**

2440MHz



Zigbee **PSD**

2480MHz



Summary

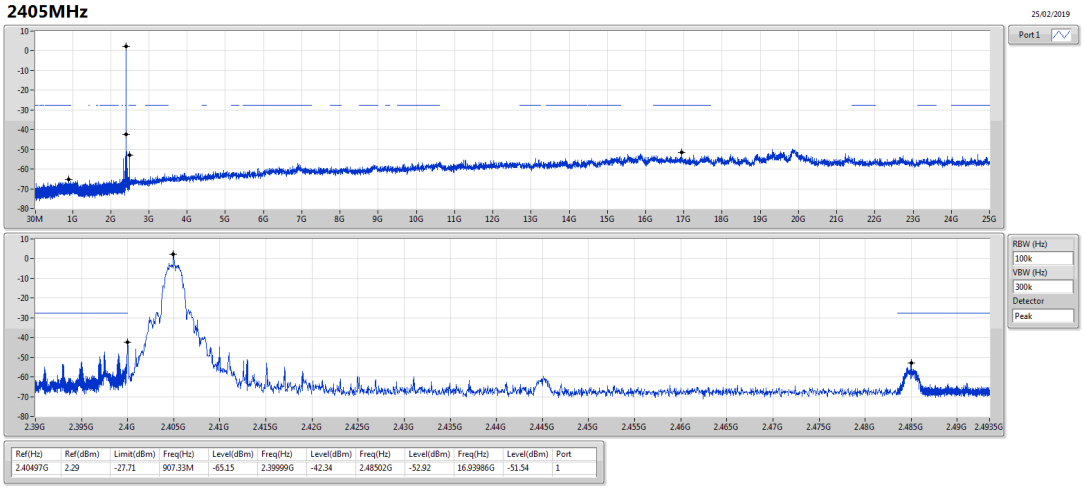
Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-	-
Zigbee	Pass	2.40497G	2.29	-27.71	907.33M	-65.15	2.39999G	-42.34	2.48502G	-52.92	16.93986G	-51.54	1

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
Zigbee	-	-	-	-	-	-	-	-	-	-	-	-	-
2405MHz	Pass	2.40497G	2.29	-27.71	907.33M	-65.15	2.39999G	-42.34	2.48502G	-52.92	16.93986G	-51.54	1
2440MHz	Pass	2.40497G	2.29	-27.71	813.23M	-55.30	2.39999G	-56.58	2.49003G	-61.96	17.43219G	-52.67	1
2480MHz	Pass	2.40497G	2.29	-27.71	826.5M	-54.45	2.39999G	-53.88	2.48402G	-44.57	17.61787G	-52.65	1

Zigbee **CSE NdB**

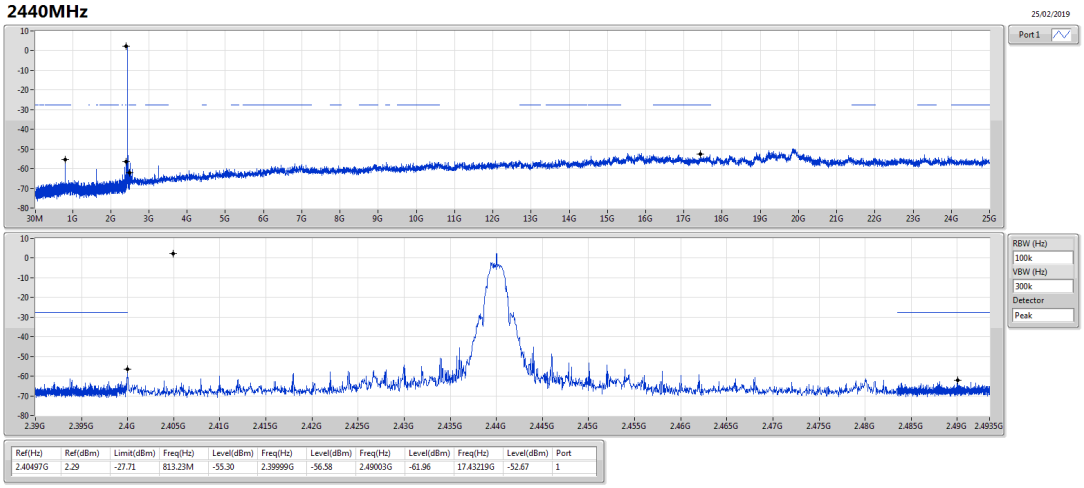
2405MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.40497G	2.29	-27.71	907.33M	-65.15	2.39999G	-42.34	2.48502G	-52.92	16.93986G	-51.54	1

Zigbee **CSE NdB**

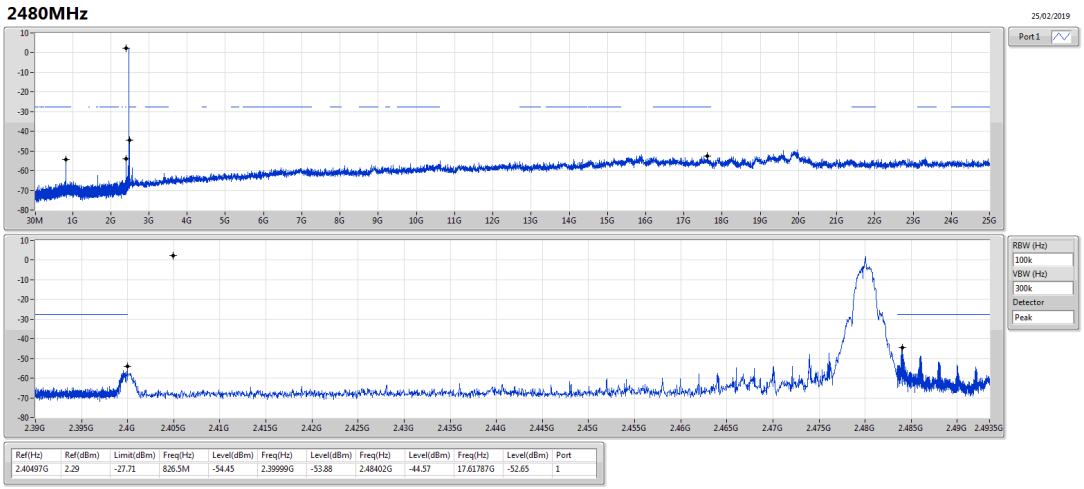
2440MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.40497G	2.29	-27.71	813.23M	-55.30	2.39999G	-56.58	2.49003G	-61.96	17.43219G	-52.67	1

Zigbee **CSE NdB**

2480MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.40497G	2.29	-27.71	826.5M	-54.45	2.39999G	-53.88	2.48402G	-44.57	17.61787G	-52.65	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	-	-	-	-	-	-	-	-	-	-	-	-
Zigbee	Pass	QP	264.74M	41.23	46.00	--4.77	-5.97	3	Horizontal	0	2.00	-

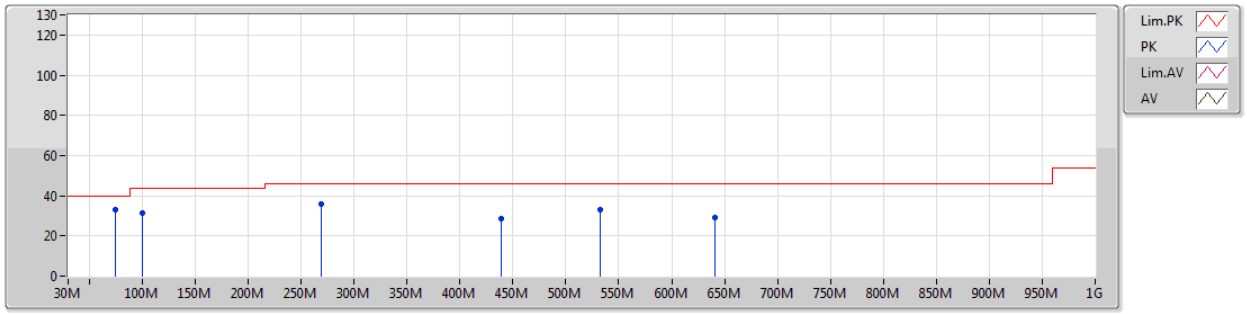
Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
Zigbee	-	-	-	-	-	-	-	-	-	-	-	-
2440MHz	Pass	PK	74.62M	33.02	40.00	-6.98	-14.28	3	Vertical	360	1.00	-
2440MHz	Pass	PK	99.84M	31.18	43.50	-12.32	-9.31	3	Vertical	360	1.00	-
2440MHz	Pass	PK	268.62M	36.08	46.00	-9.92	-6.16	3	Vertical	360	1.00	-
2440MHz	Pass	PK	439.34M	28.48	46.00	-17.52	-2.34	3	Vertical	360	1.00	-
2440MHz	Pass	PK	532.46M	33.31	46.00	-12.69	-1.33	3	Vertical	360	1.00	-
2440MHz	Pass	PK	641.1M	29.30	46.00	-16.70	0.43	3	Vertical	360	1.00	-
2440MHz	Pass	PK	163.86M	40.15	43.50	-3.35	-9.82	3	Horizontal	0	2.00	-
2440MHz	Pass	PK	425.76M	31.16	46.00	-14.84	-2.32	3	Horizontal	0	2.00	-
2440MHz	Pass	PK	532.46M	34.92	46.00	-11.08	-1.33	3	Horizontal	0	2.00	-
2440MHz	Pass	PK	598.42M	31.17	46.00	-14.83	-0.49	3	Horizontal	0	2.00	-
2440MHz	Pass	QP	154.16M	37.79	43.50	-5.80	-9.65	3	Horizontal	360	2.00	-
2440MHz	Pass	QP	264.74M	41.23	46.00	--4.77	-5.97	3	Horizontal	0	2.00	-

Zigbee

2440MHz_USB

12/03/2019

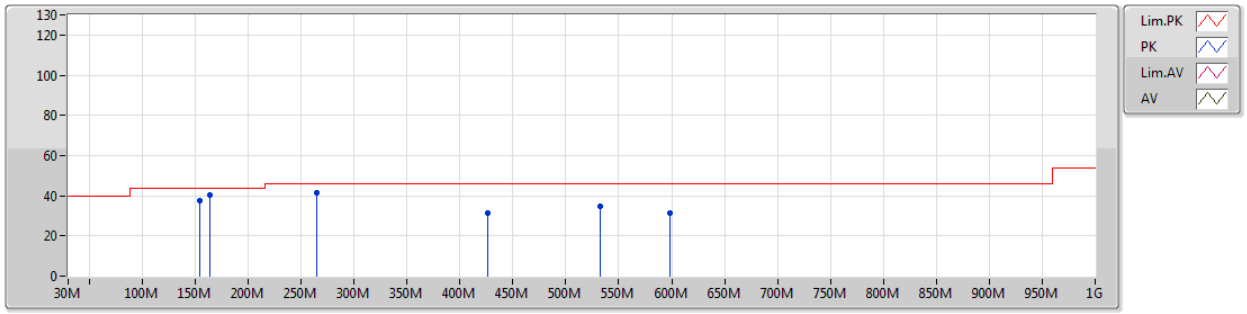


Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	74.62M	33.02	40.00	-6.98	-14.28	3	Vertical	360	1.00	-
PK	99.84M	31.18	43.50	-12.32	-9.31	3	Vertical	360	1.00	-
PK	268.62M	36.08	46.00	-9.92	-6.16	3	Vertical	360	1.00	-
PK	439.34M	28.48	46.00	-17.52	-2.34	3	Vertical	360	1.00	-
PK	532.46M	33.31	46.00	-12.69	-1.33	3	Vertical	360	1.00	-
PK	641.1M	29.30	46.00	-16.70	0.43	3	Vertical	360	1.00	-

Zigbee

2440MHz_USB

24/02/2019



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	163.86M	40.15	43.50	-3.35	-9.82	3	Horizontal	0	2.00	-
PK	425.76M	31.16	46.00	-14.84	-2.32	3	Horizontal	0	2.00	-
PK	532.46M	34.92	46.00	-11.08	-1.33	3	Horizontal	0	2.00	-
PK	598.42M	31.17	46.00	-14.83	-0.49	3	Horizontal	0	2.00	-
QP	154.16M	37.79	43.50	-5.80	-9.65	3	Horizontal	360	2.00	-
QP	264.74M	41.23	46.00	--4.77	-5.97	3	Horizontal	0	2.00	-

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	-	-	-	-	-	-	-	-	-	-	-	-
Zigbee	Pass	AV	2.4835G	49.21	54.00	-4.79	30.97	3	Vertical	270	1.47	-

Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
Zigbee	-	-	-	-	-	-	-	-	-	-	-	-
2405MHz	Pass	AV	2.3584G	47.11	54.00	-6.89	30.59	3	Vertical	259	1.12	-
2405MHz	Pass	AV	2.405G	95.41	Inf	-Inf	30.73	3	Vertical	259	1.12	-
2405MHz	Pass	PK	2.3798G	57.52	74.00	-16.48	30.66	3	Vertical	259	1.12	-
2405MHz	Pass	PK	2.4044G	98.36	Inf	-Inf	30.73	3	Vertical	259	1.12	-
2405MHz	Pass	AV	2.3756G	47.15	54.00	-6.85	30.64	3	Horizontal	208	2.22	-
2405MHz	Pass	AV	2.405G	90.37	Inf	-Inf	30.73	3	Horizontal	208	2.22	-
2405MHz	Pass	PK	2.3554G	57.90	74.00	-16.10	30.58	3	Horizontal	208	2.22	-
2405MHz	Pass	PK	2.4056G	93.17	Inf	-Inf	30.73	3	Horizontal	208	2.22	-
2405MHz	Pass	AV	4.89008G	34.90	54.00	-19.10	6.70	3	Vertical	249	2.04	-
2405MHz	Pass	PK	4.87502G	45.87	74.00	-28.13	6.66	3	Vertical	249	2.04	-
2405MHz	Pass	AV	4.8929G	34.91	54.00	-19.09	6.70	3	Horizontal	128	1.47	-
2405MHz	Pass	PK	4.89014G	46.20	74.00	-27.80	6.70	3	Horizontal	128	1.47	-
2440MHz	Pass	AV	2.352G	47.14	54.00	-6.86	30.57	3	Vertical	276	2.46	-
2440MHz	Pass	AV	2.44G	95.82	Inf	-Inf	30.84	3	Vertical	276	2.46	-
2440MHz	Pass	AV	2.4996G	48.31	54.00	-5.69	31.01	3	Vertical	276	2.46	-
2440MHz	Pass	PK	2.3492G	58.59	74.00	-15.41	30.56	3	Vertical	276	2.46	-
2440MHz	Pass	PK	2.4396G	98.87	Inf	-Inf	30.84	3	Vertical	276	2.46	-
2440MHz	Pass	PK	2.4912G	59.00	74.00	-15.00	30.99	3	Vertical	276	2.46	-
2440MHz	Pass	AV	2.3852G	47.18	54.00	-6.82	30.67	3	Horizontal	208	2.97	-
2440MHz	Pass	AV	2.44G	89.10	Inf	-Inf	30.84	3	Horizontal	208	2.97	-
2440MHz	Pass	AV	2.4988G	48.06	54.00	-5.94	31.01	3	Horizontal	208	2.97	-
2440MHz	Pass	PK	2.374G	57.57	74.00	-16.43	30.64	3	Horizontal	208	2.97	-
2440MHz	Pass	PK	2.4396G	92.16	Inf	-Inf	30.84	3	Horizontal	208	2.97	-
2440MHz	Pass	PK	2.4988G	58.38	74.00	-15.62	31.01	3	Horizontal	208	2.97	-
2440MHz	Pass	AV	4.89116G	35.28	54.00	-18.72	6.70	3	Vertical	77	1.88	-
2440MHz	Pass	PK	4.88858G	45.96	74.00	-28.04	6.69	3	Vertical	77	1.88	-
2440MHz	Pass	AV	4.88876G	35.34	54.00	-18.66	6.69	3	Horizontal	173	1.50	-
2440MHz	Pass	PK	4.8809G	46.68	74.00	-27.32	6.67	3	Horizontal	173	1.50	-
2480MHz	Pass	AV	2.48G	94.23	Inf	-Inf	30.95	3	Vertical	270	1.47	-
2480MHz	Pass	AV	2.4835G	49.21	54.00	-4.79	30.97	3	Vertical	270	1.47	-
2480MHz	Pass	PK	2.4794G	97.24	Inf	-Inf	30.95	3	Vertical	270	1.47	-
2480MHz	Pass	PK	2.4835G	60.66	74.00	-13.34	30.97	3	Vertical	270	1.47	-
2480MHz	Pass	AV	2.4798G	85.99	Inf	-Inf	30.95	3	Horizontal	194	2.53	-
2480MHz	Pass	AV	2.4944G	48.30	54.00	-5.70	31.00	3	Horizontal	194	2.53	-
2480MHz	Pass	PK	2.4806G	89.19	Inf	-Inf	30.95	3	Horizontal	194	2.53	-
2480MHz	Pass	PK	2.4862G	59.26	74.00	-14.74	30.98	3	Horizontal	194	2.53	-
2480MHz	Pass	AV	4.89362G	34.92	54.00	-19.08	6.70	3	Vertical	87	1.57	-
2480MHz	Pass	PK	4.89242G	45.89	74.00	-28.11	6.70	3	Vertical	87	1.57	-
2480MHz	Pass	AV	4.89296G	35.01	54.00	-18.99	6.70	3	Horizontal	91	1.27	-
2480MHz	Pass	PK	4.87694G	45.86	74.00	-28.14	6.67	3	Horizontal	91	1.27	-

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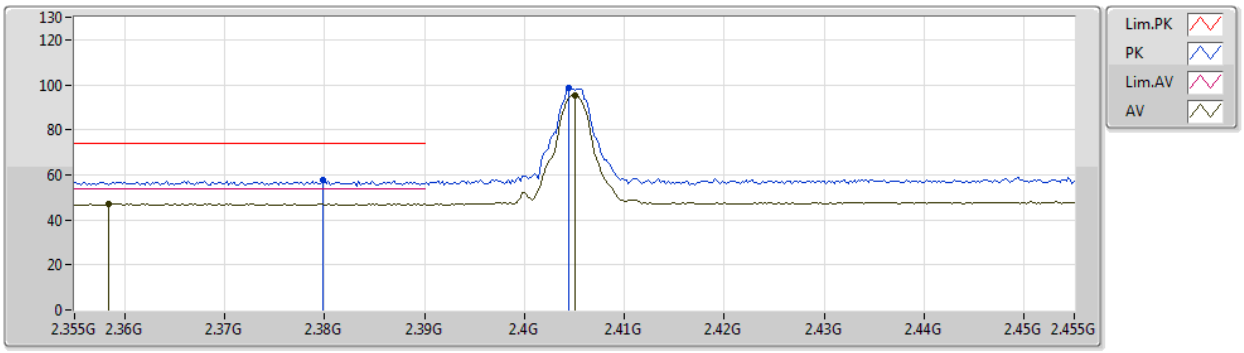
2405MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
AV	2.3584G	47.11	54.00	-6.89	30.59	3	Vertical	259	1.12	-
AV	2.405G	95.41	Inf	-Inf	30.73	3	Vertical	259	1.12	-
PK	2.3798G	57.52	74.00	-16.48	30.66	3	Vertical	259	1.12	-
PK	2.4044G	98.36	Inf	-Inf	30.73	3	Vertical	259	1.12	-

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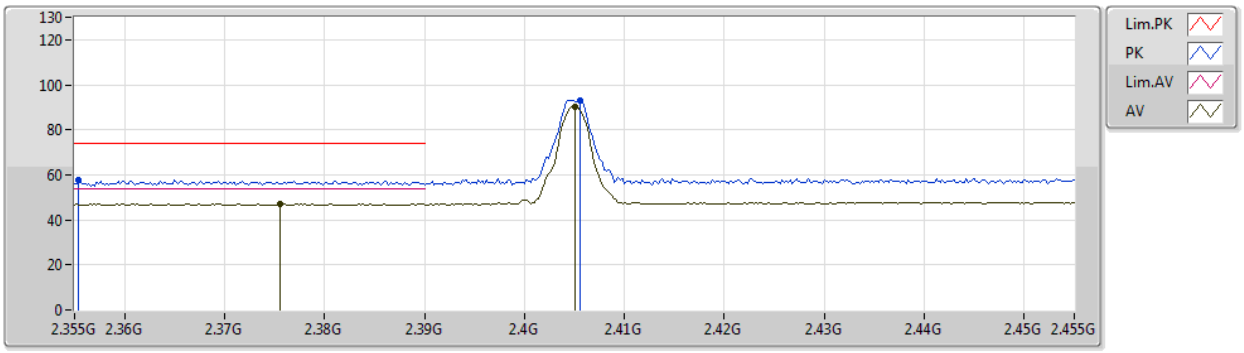
2405MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
AV	2.3756G	47.15	54.00	-6.85	30.64	3	Horizontal	208	2.22	-
AV	2.405G	90.37	Inf	-Inf	30.73	3	Horizontal	208	2.22	-
PK	2.3554G	57.90	74.00	-16.10	30.58	3	Horizontal	208	2.22	-
PK	2.4056G	93.17	Inf	-Inf	30.73	3	Horizontal	208	2.22	-

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2405MHz_TX

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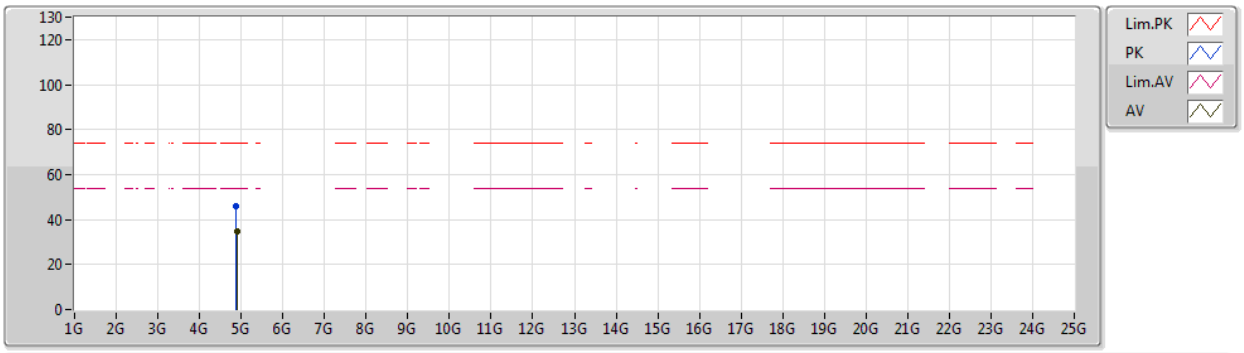

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
AV	4.89008G	34.90	54.00	-19.10	6.70	3	Vertical	249	2.04	-
PK	4.87502G	45.87	74.00	-28.13	6.66	3	Vertical	249	2.04	-

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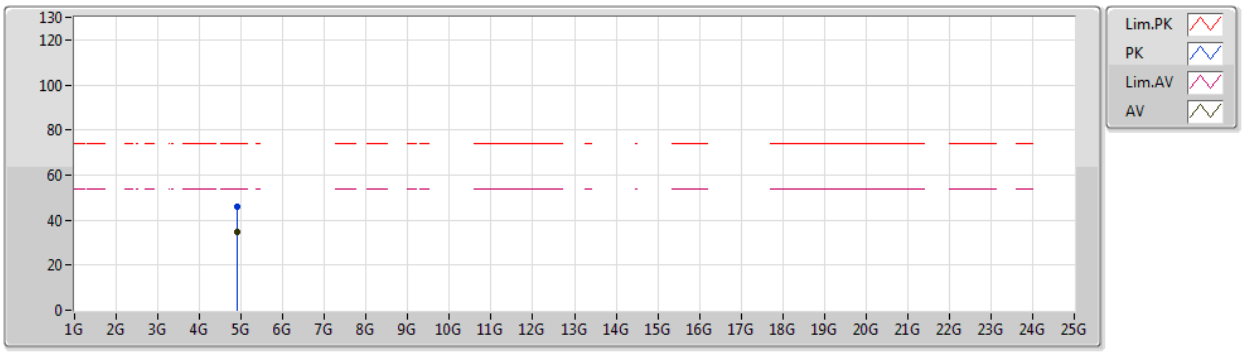
2405MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
AV	4.8929G	34.91	54.00	-19.09	6.70	3	Horizontal	128	1.47	-
PK	4.89014G	46.20	74.00	-27.80	6.70	3	Horizontal	128	1.47	-

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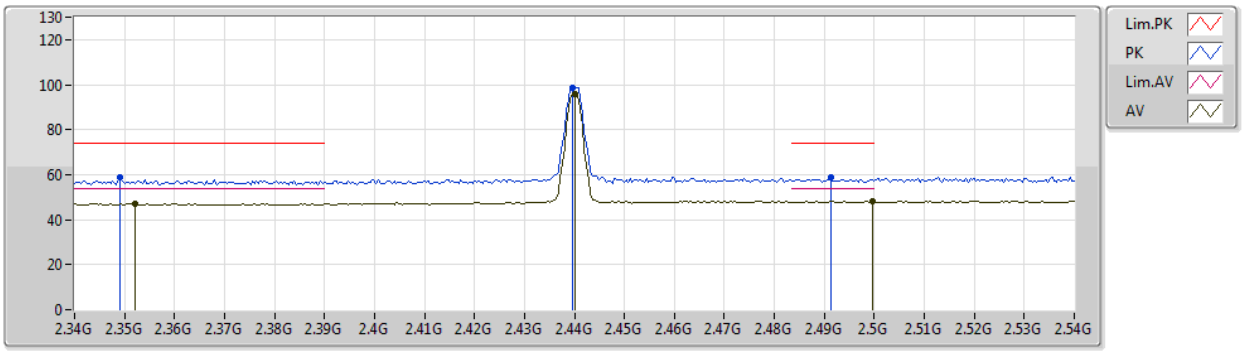
2440MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
AV	2.352G	47.14	54.00	-6.86	30.57	3	Vertical	276	2.46	-
AV	2.44G	95.82	Inf	-Inf	30.84	3	Vertical	276	2.46	-
AV	2.4996G	48.31	54.00	-5.69	31.01	3	Vertical	276	2.46	-
PK	2.3492G	58.59	74.00	-15.41	30.56	3	Vertical	276	2.46	-
PK	2.4396G	98.87	Inf	-Inf	30.84	3	Vertical	276	2.46	-
PK	2.4912G	59.00	74.00	-15.00	30.99	3	Vertical	276	2.46	-

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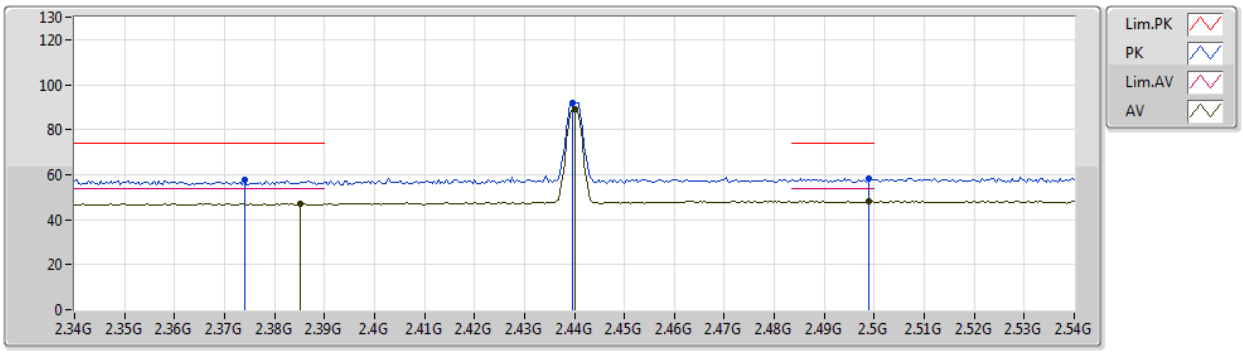
2440MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
AV	2.3852G	47.18	54.00	-6.82	30.67	3	Horizontal	208	2.97	-
AV	2.44G	89.10	Inf	-Inf	30.84	3	Horizontal	208	2.97	-
AV	2.4988G	48.06	54.00	-5.94	31.01	3	Horizontal	208	2.97	-
PK	2.374G	57.57	74.00	-16.43	30.64	3	Horizontal	208	2.97	-
PK	2.4396G	92.16	Inf	-Inf	30.84	3	Horizontal	208	2.97	-
PK	2.4988G	58.38	74.00	-15.62	31.01	3	Horizontal	208	2.97	-

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2440MHz_TX

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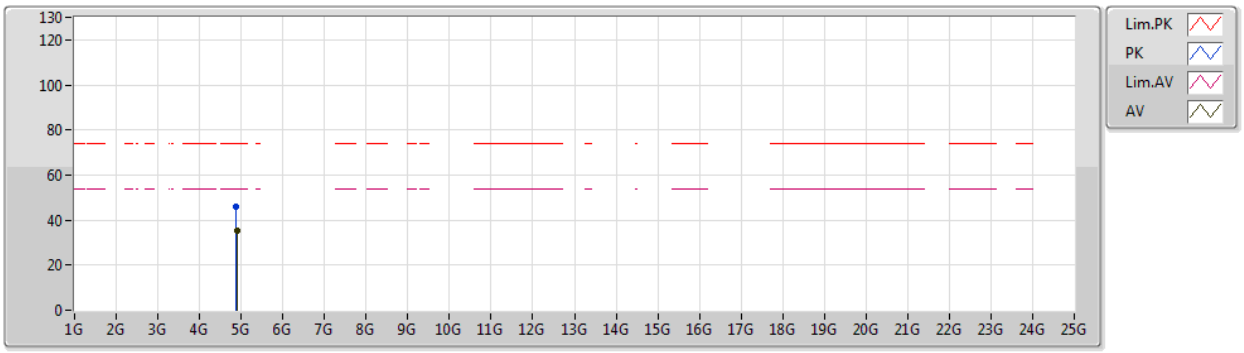

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
AV	4.89116G	35.28	54.00	-18.72	6.70	3	Vertical	77	1.88	-
PK	4.88858G	45.96	74.00	-28.04	6.69	3	Vertical	77	1.88	-

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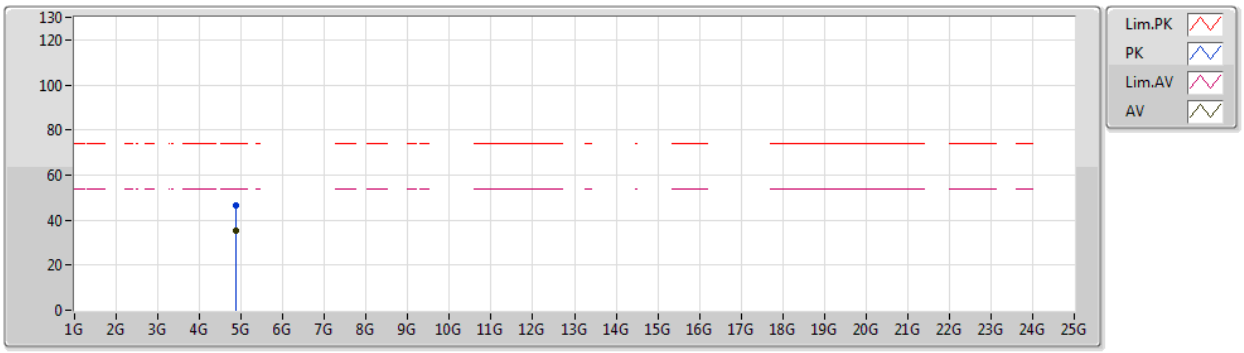
2440MHz_TX

23/02/2019



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
AV	4.88876G	35.34	54.00	-18.66	6.69	3	Horizontal	173	1.50	-
PK	4.8809G	46.68	74.00	-27.32	6.67	3	Horizontal	173	1.50	-

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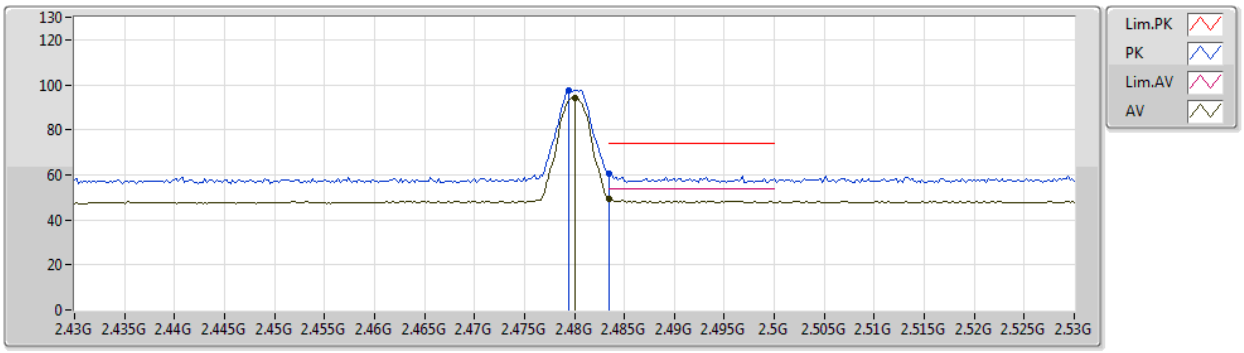
2480MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
AV	2.48G	94.23	Inf	-Inf	30.95	3	Vertical	270	1.47	-
AV	2.4835G	49.21	54.00	-4.79	30.97	3	Vertical	270	1.47	-
PK	2.4794G	97.24	Inf	-Inf	30.95	3	Vertical	270	1.47	-
PK	2.4835G	60.66	74.00	-13.34	30.97	3	Vertical	270	1.47	-

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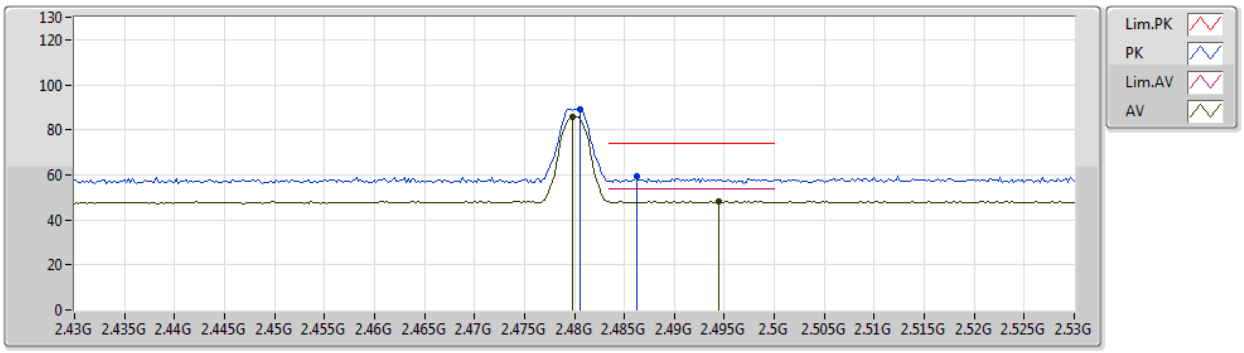
2480MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
AV	2.4798G	85.99	Inf	-Inf	30.95	3	Horizontal	194	2.53	-
AV	2.4944G	48.30	54.00	-5.70	31.00	3	Horizontal	194	2.53	-
PK	2.4806G	89.19	Inf	-Inf	30.95	3	Horizontal	194	2.53	-
PK	2.4862G	59.26	74.00	-14.74	30.98	3	Horizontal	194	2.53	-

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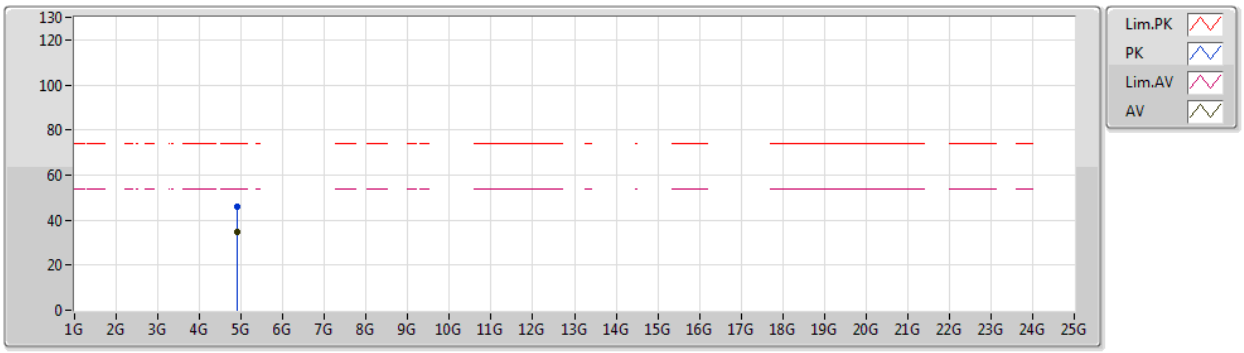
2480MHz_TX

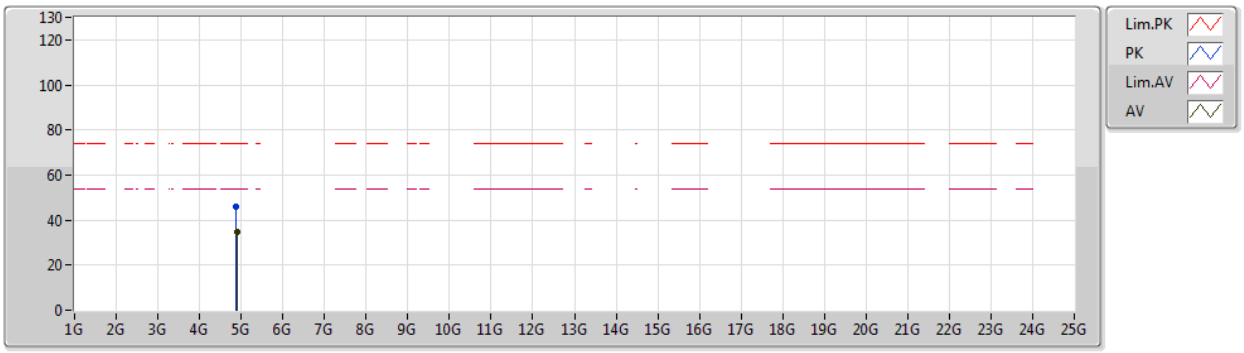


Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
AV	4.89362G	34.92	54.00	-19.08	6.70	3	Vertical	87	1.57	-
PK	4.89242G	45.89	74.00	-28.11	6.70	3	Vertical	87	1.57	-

Zigbee

2480MHz_TX

23/02/2019



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
AV	4.89296G	35.01	54.00	-18.99	6.70	3	Horizontal	91	1.27	-
PK	4.87694G	45.86	74.00	-28.14	6.67	3	Horizontal	91	1.27	-