

FCC Test Report

Equipment : Wi-Fi enabled Video Doorbell
Brand Name : RING
Model No. : Video Doorbell Pro
FCC ID : 2AEUPBHALP011
Standard : 47 CFR FCC Part 15.247
Operating Band : 2400 MHz – 2483.5 MHz
Function : Point-to-multipoint; Point-to-point
Applicant : Ring, Inc.
1523 26th St, Santa Monica, CA 90404, USA
Manufacturer : Chicony Electronics (Dong Guan) Co.,Ltd.
San Zhong Guan Li Qu, Qingxi Town, Dongguan City
Guangdong 523651 China

This report was evaluated for permissive change. The product sample received on Dec. 05, 2017 and completely tested on Jan. 09, 2018. 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.


Phoenix Chen/ Assistant Manager
SPORTON INTERNATIONAL INC.





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PHOTOGRAPHS OF EUT v01



Summary of Test Result

Conformance Test Specifications				
Report Clause	Ref. Std. Clause	Description	Limit	Result
3.1	15.247(d)	Emissions in Non-restricted Frequency Bands	Non-Restricted Bands: >20 dBc	Complied
3.2	15.247(d)	Emissions in Restricted Frequency Bands	Restricted Bands: FCC 15.209	Complied



1 General Description

1.1 Information

1.1.1 RF General Information

Frequency Range (MHz)	Bluetooth Mode	Ch. Frequency (MHz)	Channel Number
2400-2483.5	LE	2402-2480	0-39 [40]

Band	Mode	BWch (MHz)	Nant
2.4-2.4835GHz	BT-LE(1Mbps)	1.0	1TX

Note:

- ♦ Bluetooth LE uses a GFSK (1Mbps) modulation for DSSS.
- ♦ BWch is the nominal channel bandwidth.

1.1.2 EUT Information

Operational Condition	
EUT Power Type	From Transformer
Type of EUT	
<input checked="" type="checkbox"/>	Stand-alone
<input type="checkbox"/>	Combined (EUT where the radio part is fully integrated within another device)
	Combined Equipment - Brand Name / Model No.: ...
<input type="checkbox"/>	Plug-in radio (EUT intended for a variety of host systems)
	Host System - Brand Name / Model No.: ...
<input type="checkbox"/>	Other:



1.1.3 Mode Test Duty Cycle

Operated Mode for Worst Duty Cycle	
<input checked="" type="checkbox"/> Operated test mode for worst duty cycle	
Test Signal Duty Cycle (x)	Power Duty Factor [dB] – (10 log 1/x)
<input checked="" type="checkbox"/> 69.77% - test mode single channel – LE	1.56

1.1.4 Table for Permissive Change

This product is an extension of original one reported under Sporton project number: FR5N2432-03AL

Below is the table for the change of the product with respect to the original one.

Modifications	Performance Checking
The name of the applicant is modified.	N/A
The material of back enclosure is changed from plastic to metal.	The worst case of Emissions in Non-restricted Frequency Bands and Emissions in Restricted Frequency Bands were evaluated.

1.2 Testing Applied Standards

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

- ♦ 47 CFR FCC Part 15
- ♦ ANSI C63.10-2013
- ♦ KDB 558074 D01 v04

1.3 Testing Location Information

Testing Location		
<input checked="" type="checkbox"/>	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.		
<input type="checkbox"/>	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	TH06-HY	Tim	22.5°C / 65%	09/Jan/2018
Radiated	03CH09-HY	Jerry	23.5°C / 55%	04/Jan/2018



1.4 Measurement Uncertainty

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

Test Items	Uncertainty	Remark
Conducted Emission (150kHz ~ 30MHz)	3.6 dB	Confidence levels of 95%
Radiated Emission (9kHz ~ 30MHz)	3.0 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	4.3 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	3.9 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	3.5 dB	Confidence levels of 95%
Conducted Emission	1.3 dB	Confidence levels of 95%



2 Test Configuration of EUT

2.1 Test Condition

RF Conducted	Abbreviation	Remark
TnomVnom	Tnom	20°C
-	Vnom	110V




2.2 Test Channel Mode

Test Software	Dos

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	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	AC Mains		
Operating Mode > 1GHz	CTX		
Orthogonal Planes of EUT	X Plane	Y Plane	Z Plane
			
Worst Planes of EUT	V		



2.4 Accessories

Accessories Information				
Li-ion Battery	Brand Name	Fuji	Model Name	334060
	Power Rating	3.8 Vdc, 300 mAh		

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

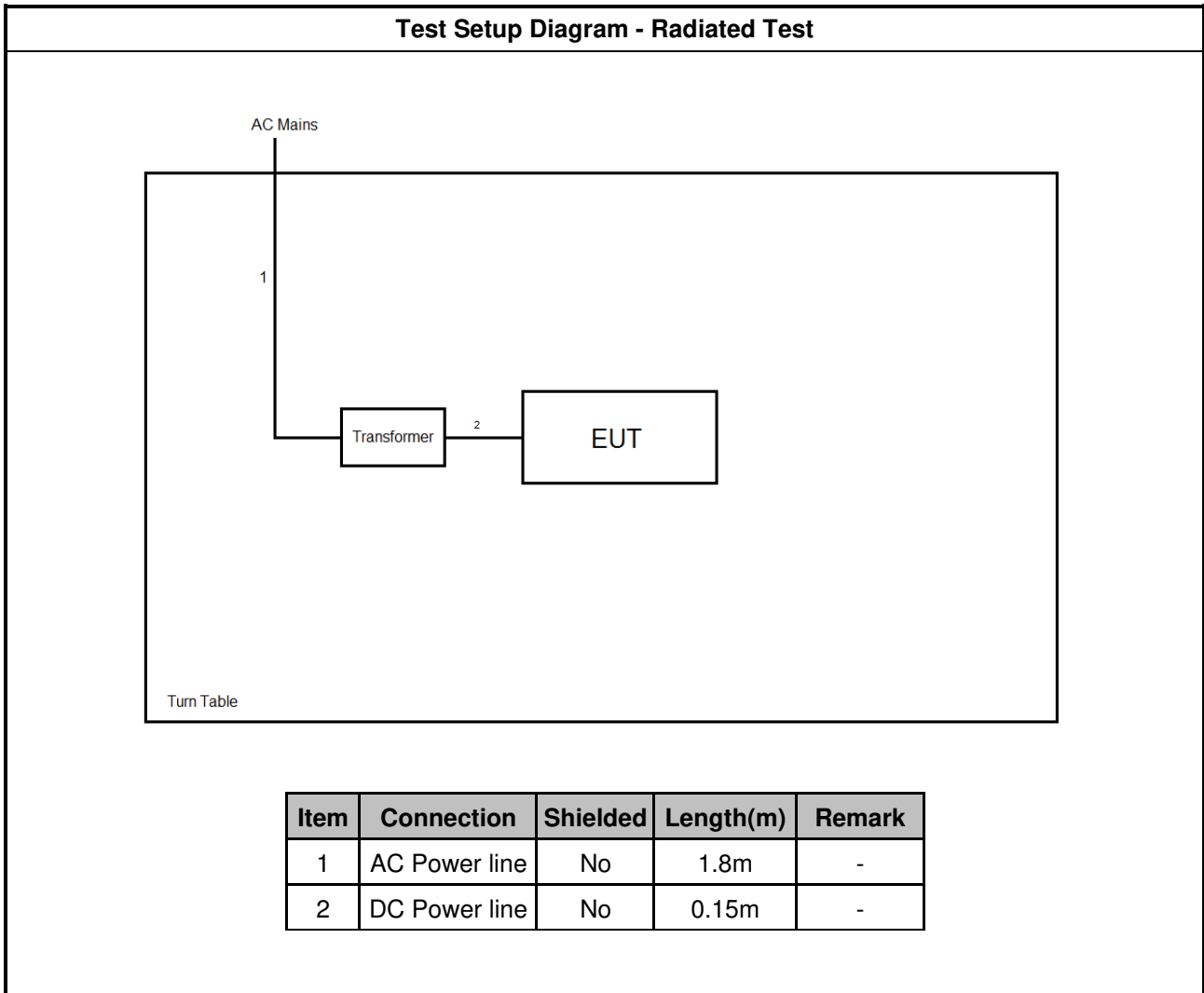
2.5 Support Equipment

Support Equipment – RF Conducted				
No.	Equipment	Brand Name	Model Name	FCC ID
1	Notebook	DELL	E5410	DoC
2	Adapter for NB	DELL	HA65NM130	DoC
3	DC Source	GW	GPS-3030DD	-

Support Equipment – Radiated Emission				
No.	Equipment	Brand Name	Model Name	FCC ID
1	Transformer	TRIAD	VPL16-1600	-

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

2.6 Test Setup Diagram



3 Transmitter Test Result

3.1 Emissions in Non-restricted Frequency Bands

3.1.1 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.

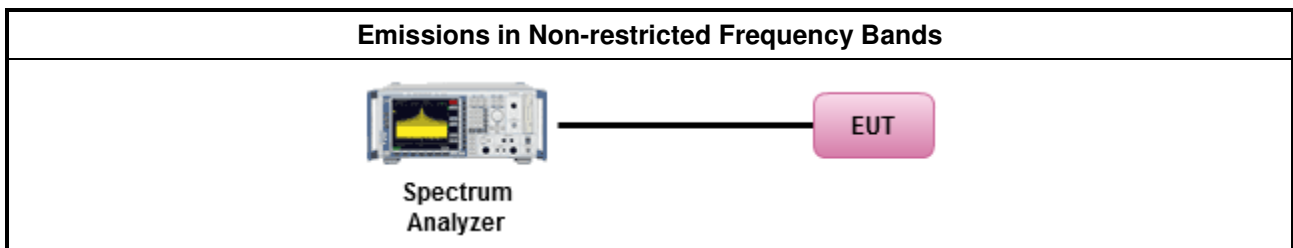
3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

Test Method
<ul style="list-style-type: none"> Refer as KDB 558074, clause 11 for unwanted emissions into non-restricted bands.

3.1.4 Test Setup



3.1.5 Test Result of Emissions in Non-restricted Frequency Bands

Refer as Appendix A

3.2 Emissions in Restricted Frequency Bands

3.2.1 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.

3.2.2 Measuring Instruments

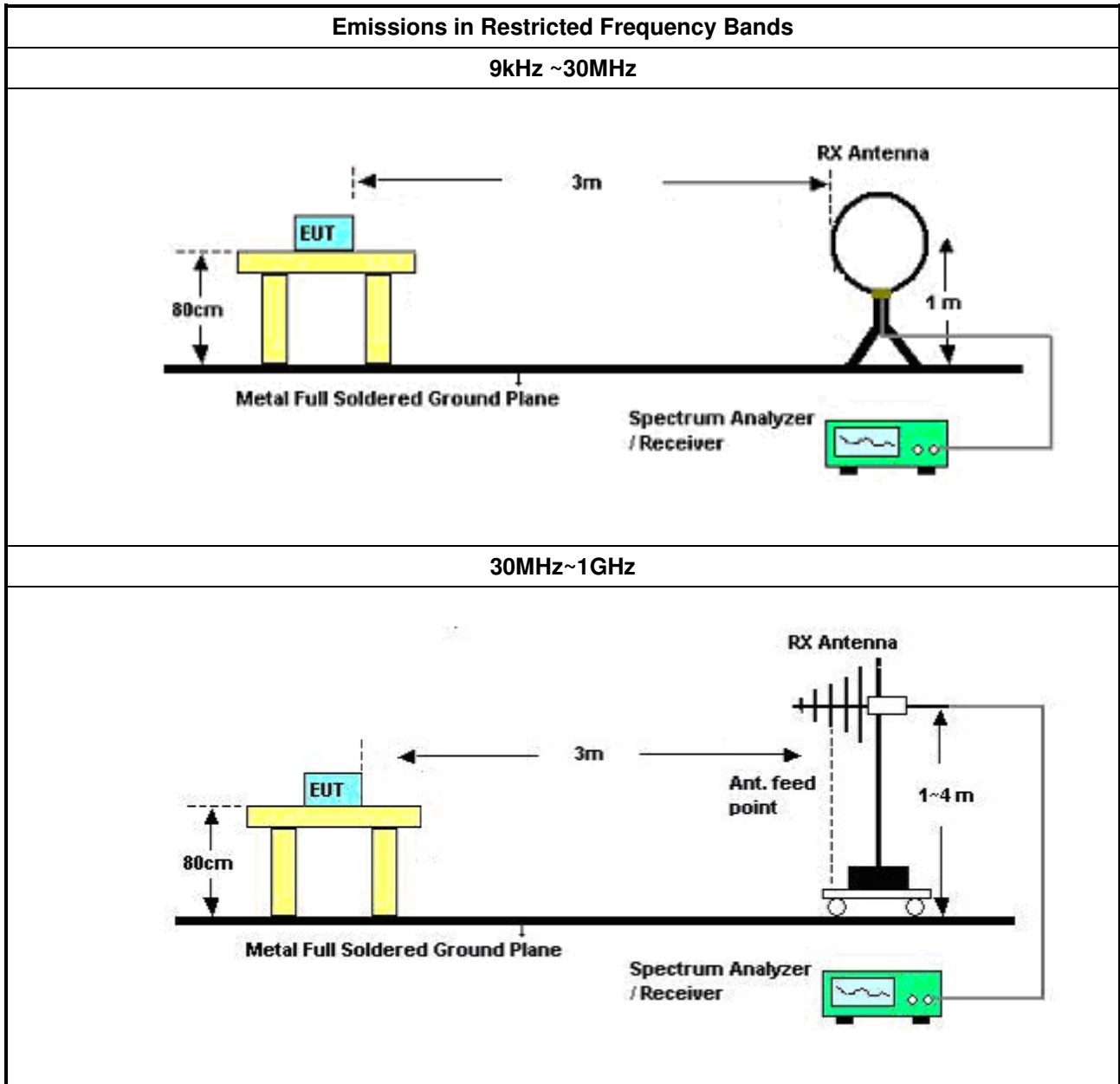
Refer a test equipment and calibration data table in this test report.

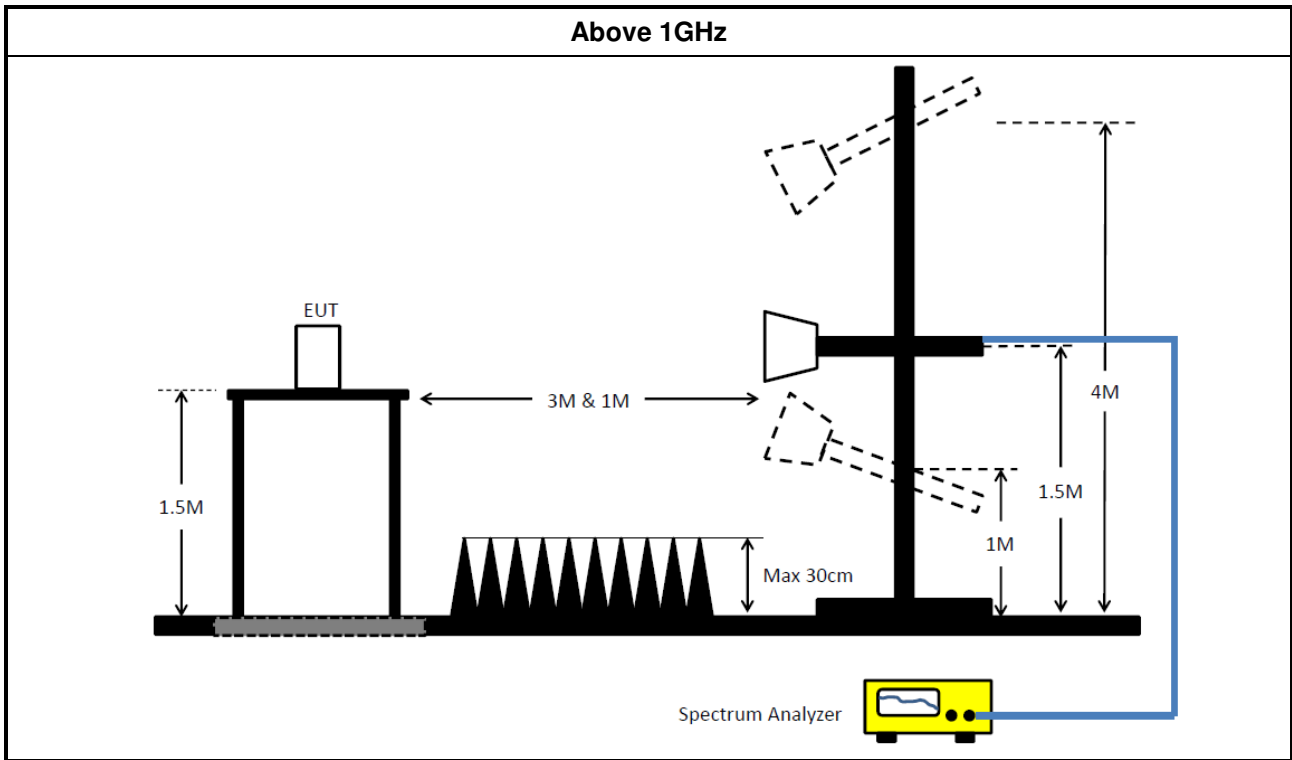


3.2.3 Test Procedures

Test Method	
<ul style="list-style-type: none"> ▪ The average emission levels shall be measured in [duty cycle \geq 98 or duty factor]. 	
<ul style="list-style-type: none"> ▪ 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. 	
<ul style="list-style-type: none"> ▪ For the transmitter unwanted emissions shall be measured using following options below: 	
	<ul style="list-style-type: none"> ▪ Refer as KDB 558074, clause 12 for unwanted emissions into restricted bands.
<input checked="" type="checkbox"/>	Refer as KDB 558074, clause 12.2.5.3 (ANSI C63.10, clause 4.1.4.2.3), Reduced VBW \geq 1/T.
<input checked="" type="checkbox"/>	Refer as KDB 558074, clause 12.2.4 measurement procedure peak limit.
<ul style="list-style-type: none"> ▪ For the transmitter band-edge emissions shall be measured using following options below: 	
	<ul style="list-style-type: none"> ▪ 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.
	<ul style="list-style-type: none"> ▪ Refer as KDB 558074, clause 13.2 (ANSI C63.10, clause 6.10.6) for marker-delta method for band-edge measurements.
	<ul style="list-style-type: none"> ▪ 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).
<ul style="list-style-type: none"> ▪ For conducted and cabinet radiation measurement, refer as KDB 558074, clause 12.2.2. 	
	<ul style="list-style-type: none"> ▪ 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
	<ul style="list-style-type: none"> ▪ 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.

3.2.4 Test Setup





3.2.5 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.

3.2.6 Test Result of Emissions in Restricted Frequency Bands

Refer as Appendix B



4 Test Equipment and Calibration Data

Instrument for Radiated Test

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
3m Semi Anechoic Chamber	TDK	SAC-3M	03CH09-HY	30MHz ~ 1GHz	25/Apr/2017	24/Apr/2018
3m Semi Anechoic Chamber	TDK	SAC-3M	03CH09-HY	1GHz ~ 18GHz	28/Jun/2017	27/Jun/2018
Amplifier	Agilent	8449B	3008A02096	1GHz ~ 26.5GHz	25/Apr/2017	24/Apr/2018
Amplifier	EMC	EMC9135	980232	9kHz~1GHz	25/Apr/2017	24/Apr/2018
Spectrum Analyzer	KEYSIGHT	N9010A	MY54200885	10Hz ~ 44GHz	20/Jul/2017	19/Jul/2018
Bilog Antenna	TESEQ	CBL 6111D	35418	30MHz~1GHz	09/Sep/2017	08/Sep/2018
Horn Antenna	SCHWARZBECK	BBHA 9120D	BBHA9120D 1534	1GHz~18GHz	28/Apr/2017	27/Apr/2018
Horn Antenna	SCHWARZBECK	BBHA9170	BBHA9170614	18GHz ~ 40GHz	06/Feb/2017	05/Feb/2018
Loop Antenna	TESTQ	HLA 6120	31244	9kHz ~ 30MHz	02/Mar/2017	01/Mar/2018
RF Cable-R03m	Jye Bao	RG142	CB021	9kHz ~ 1GHz	02/Feb/2017	01/Feb/2018
RF Cable-high	SUHNER	SUCOFLEX104	MY34918/4	1GHz ~ 40GHz	02/Feb/2017	01/Feb/2018
Receiver	R&S	ESR3	102052	9kHz ~ 3.6GHz	29/Apr/2017	28/Apr/2018

Instrument for Conducted Test

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
Spectrum Analyzer	R&S	FSV 40	101515	9kHz ~ 40GHz	08/Dec/2017	07/Dec/2018
Power Sensor	Anritsu	MA2411B	1027452	300MHz ~ 40GHz	24/Feb/2017	23/Feb/2018
Power Meter	Anritsu	ML2495A	1124009	300MHz ~ 40GHz	24/Feb/2017	23/Feb/2018
Signal Generator	R&S	SMR40	100116	10MHz ~ 40GHz	27/Jul/2017	26/Jul/2018

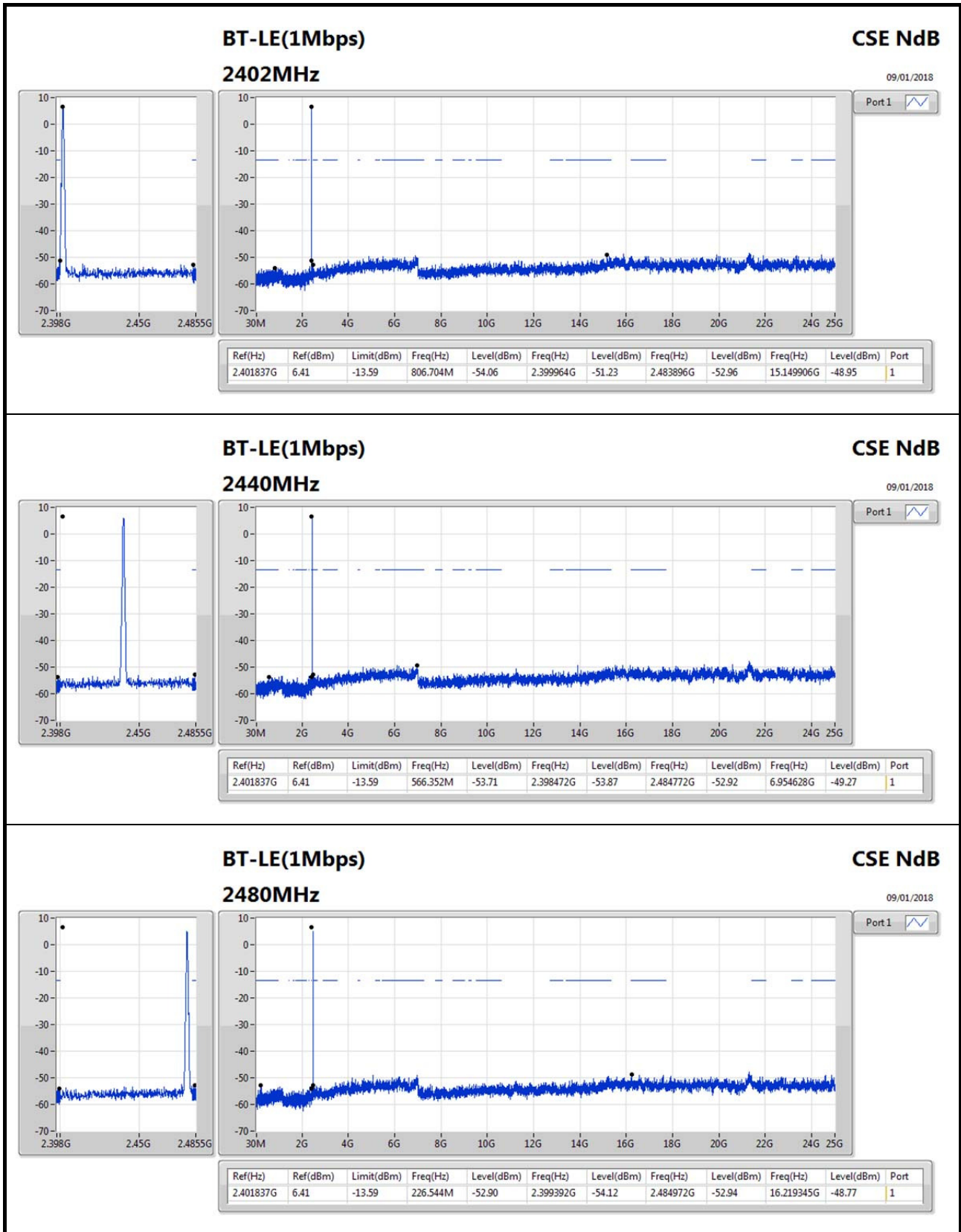


Summary

Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	2.401837G	6.41	-13.59	226.544M	-52.90	2.399392G	-54.12	2.484972G	-52.94	16.219345G	-48.77	1

Result

Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-	-	-
2402MHz_TnomVnom	Pass	2.401837G	6.41	-13.59	806.704M	-54.06	2.399964G	-51.23	2.483896G	-52.96	15.149906G	-48.95	1
2440MHz_TnomVnom	Pass	2.401837G	6.41	-13.59	566.352M	-53.71	2.398472G	-53.87	2.484772G	-52.92	6.954628G	-49.27	1
2480MHz_TnomVnom	Pass	2.401837G	6.41	-13.59	226.544M	-52.90	2.399392G	-54.12	2.484972G	-52.94	16.219345G	-48.77	1





Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	PK	703.18M	41.96	46.00	-4.04	-7.14	3	Horizontal	0	1.00	-



Result

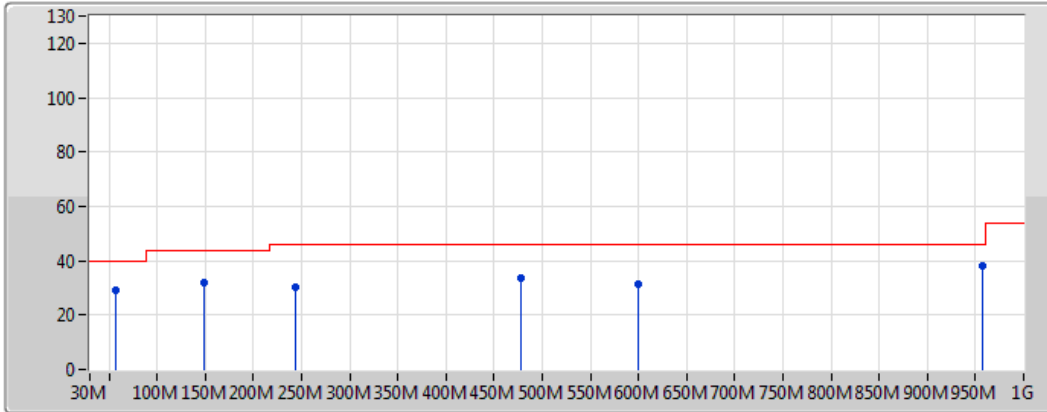
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-	-
2440MHz	Pass	PK	115.36M	35.86	43.50	-7.64	-18.53	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	198.78M	34.29	43.50	-9.21	-19.91	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	243.4M	36.65	46.00	-9.35	-16.83	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	478.14M	28.43	46.00	-17.57	-10.22	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	703.18M	41.96	46.00	-4.04	-7.14	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	792.42M	39.44	46.00	-6.56	-5.22	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	57.16M	29.02	40.00	-10.98	-24.57	3	Vertical	360	1.00	-
2440MHz	Pass	PK	148.34M	31.85	43.50	-11.65	-18.22	3	Vertical	360	1.00	-
2440MHz	Pass	PK	243.4M	30.39	46.00	-15.61	-16.83	3	Vertical	360	1.00	-
2440MHz	Pass	PK	478.14M	33.55	46.00	-12.45	-10.22	3	Vertical	360	1.00	-
2440MHz	Pass	PK	600.36M	31.32	46.00	-14.68	-8.37	3	Vertical	360	1.00	-
2440MHz	Pass	PK	957.32M	37.92	46.00	-8.08	-1.64	3	Vertical	360	1.00	-



BT-LE(1Mbps)

2440MHz_AC

04/01/2018



Legend for the plot:

- Lim.PK: Red line with a red zigzag icon
- PK: Blue line with a blue zigzag icon

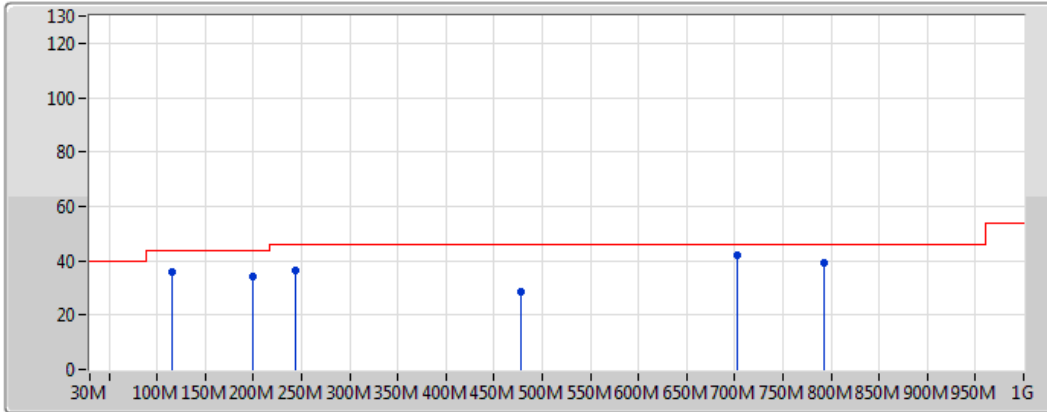
Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
PK	57.16M	29.02	40.00	-10.98	-24.57	3	Vertical	360	1.00	-	53.59	11.30	1.23	37.10
PK	148.34M	31.85	43.50	-11.65	-18.22	3	Vertical	360	1.00	-	50.07	16.35	2.03	36.60
PK	243.4M	30.39	46.00	-15.61	-16.83	3	Vertical	360	1.00	-	47.22	17.04	2.53	36.40
PK	478.14M	33.55	46.00	-12.45	-10.22	3	Vertical	360	1.00	-	43.77	22.87	3.76	36.85
PK	600.36M	31.32	46.00	-14.68	-8.37	3	Vertical	360	1.00	-	39.69	24.70	4.12	37.19
PK	957.32M	37.92	46.00	-8.08	-1.64	3	Vertical	360	1.00	-	39.56	30.23	5.44	37.31



BT-LE(1Mbps)

2440MHz_AC

04/01/2018



Legend:

- Lim.PK (Red line)
- PK (Blue line)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
PK	115.36M	35.86	43.50	-7.64	-18.53	3	Horizontal	0	1.00	-	54.39	16.46	1.74	36.74
PK	198.78M	34.29	43.50	-9.21	-19.91	3	Horizontal	0	1.00	-	54.20	14.18	2.29	36.38
PK	243.4M	36.65	46.00	-9.35	-16.83	3	Horizontal	0	1.00	-	53.48	17.04	2.53	36.40
PK	478.14M	28.43	46.00	-17.57	-10.22	3	Horizontal	0	1.00	-	38.65	22.87	3.76	36.85
PK	703.18M	41.96	46.00	-4.04	-7.14	3	Horizontal	0	1.00	-	49.10	25.86	4.36	37.35
PK	792.42M	39.44	46.00	-6.56	-5.22	3	Horizontal	0	1.00	-	44.66	27.33	4.92	37.47



Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	AV	2.483502G	48.10	54.00	-5.90	31.27	3	Horizontal	157	1.00	-



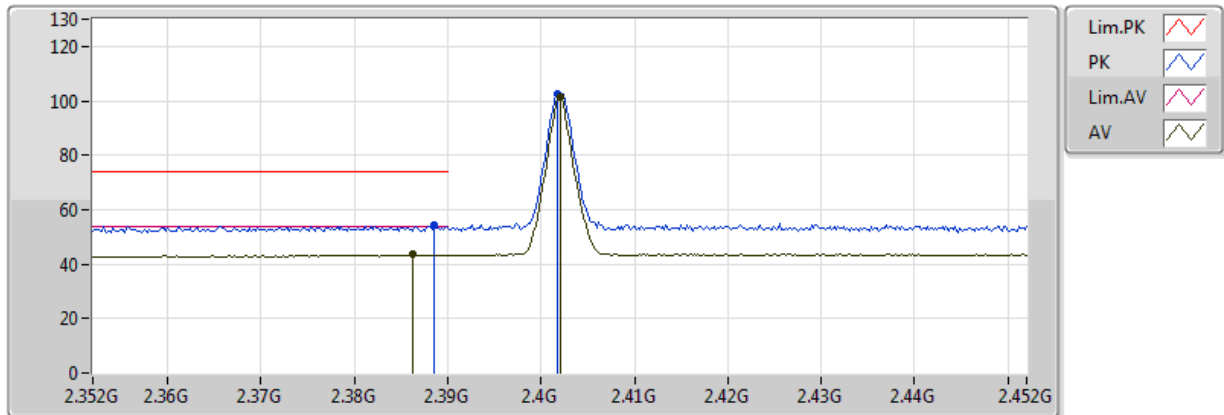
Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	AV	2.3886G	43.31	54.00	-10.69	30.93	3	Horizontal	44	1.00	-
2402MHz	Pass	AV	2.402G	100.95	Inf	-Inf	30.98	3	Horizontal	44	1.00	-
2402MHz	Pass	PK	2.389G	54.26	74.00	-19.74	30.93	3	Horizontal	44	1.00	-
2402MHz	Pass	PK	2.4022G	102.30	Inf	-Inf	30.98	3	Horizontal	44	1.00	-
2402MHz	Pass	AV	2.3862G	43.48	54.00	-10.52	30.92	3	Vertical	17	1.12	-
2402MHz	Pass	AV	2.402G	101.27	Inf	-Inf	30.98	3	Vertical	17	1.12	-
2402MHz	Pass	PK	2.3886G	54.40	74.00	-19.60	30.93	3	Vertical	17	1.12	-
2402MHz	Pass	PK	2.4018G	102.38	Inf	-Inf	30.98	3	Vertical	17	1.12	-
2402MHz	Pass	AV	4.804G	38.70	54.00	-15.30	9.42	3	Horizontal	290	1.02	-
2402MHz	Pass	PK	4.804G	48.53	74.00	-25.47	9.42	3	Horizontal	290	1.02	-
2402MHz	Pass	AV	4.804G	37.61	54.00	-16.39	9.42	3	Vertical	310	1.50	-
2402MHz	Pass	PK	4.804G	44.21	74.00	-29.79	9.42	3	Vertical	310	1.50	-
2440MHz	Pass	AV	2.39G	43.36	54.00	-10.64	30.93	3	Horizontal	154	1.34	-
2440MHz	Pass	AV	2.44G	100.39	Inf	-Inf	31.11	3	Horizontal	154	1.34	-
2440MHz	Pass	AV	2.4972G	43.96	54.00	-10.04	31.32	3	Horizontal	154	1.34	-
2440MHz	Pass	PK	2.3812G	54.13	74.00	-19.87	30.90	3	Horizontal	154	1.34	-
2440MHz	Pass	PK	2.4396G	101.75	Inf	-Inf	31.11	3	Horizontal	154	1.34	-
2440MHz	Pass	PK	2.4948G	55.58	74.00	-18.42	31.31	3	Horizontal	154	1.34	-
2440MHz	Pass	AV	2.3896G	43.07	54.00	-10.93	30.93	3	Vertical	195	1.87	-
2440MHz	Pass	AV	2.44G	100.79	Inf	-Inf	31.11	3	Vertical	195	1.87	-
2440MHz	Pass	AV	2.4944G	43.86	54.00	-10.14	31.31	3	Vertical	195	1.87	-
2440MHz	Pass	PK	2.3568G	53.87	74.00	-20.13	30.82	3	Vertical	195	1.87	-
2440MHz	Pass	PK	2.4396G	102.13	Inf	-Inf	31.11	3	Vertical	195	1.87	-
2440MHz	Pass	PK	2.4948G	55.71	74.00	-18.29	31.31	3	Vertical	195	1.87	-
2440MHz	Pass	AV	4.88G	37.77	54.00	-16.23	9.65	3	Horizontal	289	1.13	-
2440MHz	Pass	PK	4.88G	47.51	74.00	-26.49	9.65	3	Horizontal	289	1.13	-
2440MHz	Pass	AV	4.88G	38.23	54.00	-15.77	9.65	3	Vertical	60	3.69	-
2440MHz	Pass	PK	4.88G	48.44	74.00	-25.56	9.65	3	Vertical	60	3.69	-
2480MHz	Pass	AV	2.48G	101.86	Inf	-Inf	31.26	3	Horizontal	157	1.00	-
2480MHz	Pass	AV	2.483502G	48.10	54.00	-5.90	31.27	3	Horizontal	157	1.00	-
2480MHz	Pass	PK	2.4798G	103.22	Inf	-Inf	31.26	3	Horizontal	157	1.00	-
2480MHz	Pass	PK	2.483502G	55.95	74.00	-18.05	31.27	3	Horizontal	157	1.00	-
2480MHz	Pass	AV	2.48G	100.99	Inf	-Inf	31.26	3	Vertical	245	1.16	-
2480MHz	Pass	AV	2.483502G	47.80	54.00	-6.20	31.27	3	Vertical	245	1.16	-
2480MHz	Pass	PK	2.4802G	102.37	Inf	-Inf	31.26	3	Vertical	245	1.16	-
2480MHz	Pass	PK	2.483502G	56.26	74.00	-17.74	31.27	3	Vertical	245	1.16	-
2480MHz	Pass	AV	4.96G	38.34	54.00	-15.66	9.88	3	Horizontal	289	1.06	-
2480MHz	Pass	PK	4.96G	48.50	74.00	-25.50	9.88	3	Horizontal	289	1.06	-
2480MHz	Pass	AV	4.96G	38.10	54.00	-15.90	9.88	3	Vertical	60	1.06	-
2480MHz	Pass	PK	4.96G	48.22	74.00	-25.78	9.88	3	Vertical	60	1.06	-

BT-LE(1Mbps)

2402MHz_TX

04/01/2018



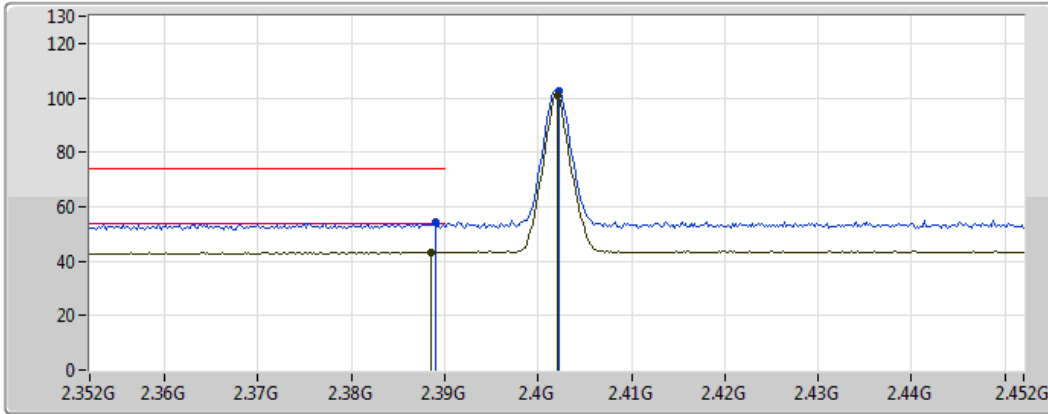
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AV	2.3862G	43.48	54.00	-10.52	30.92	3	Vertical	17	1.12	-	12.55	27.30	3.62	-
AV	2.402G	101.27	Inf	-Inf	30.98	3	Vertical	17	1.12	-	70.29	27.35	3.63	-
PK	2.3886G	54.40	74.00	-19.60	30.93	3	Vertical	17	1.12	-	23.47	27.31	3.62	-
PK	2.4018G	102.38	Inf	-Inf	30.98	3	Vertical	17	1.12	-	71.40	27.34	3.63	-



BT-LE(1Mbps)

2402MHz_TX

04/01/2018

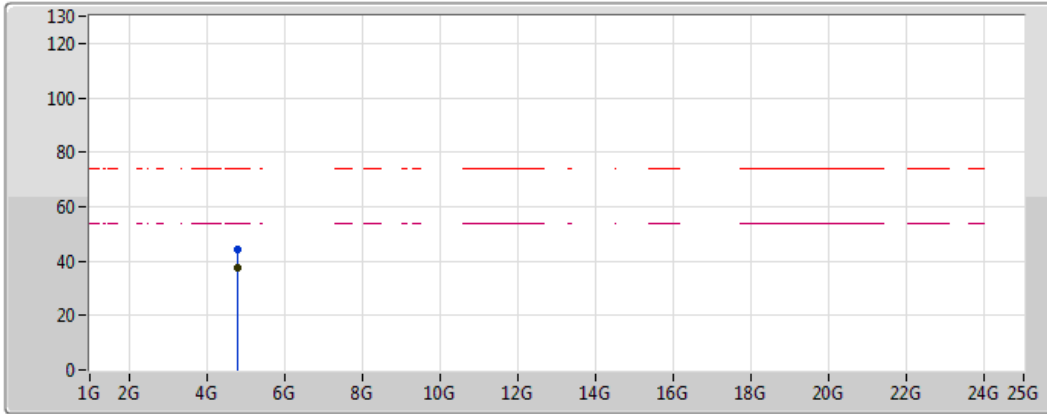






Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.3886G	43.31	54.00	-10.69	30.93	3	Horizontal	44	1.00	-	12.38	27.31	3.62	-
AV	2.402G	100.95	Inf	-Inf	30.98	3	Horizontal	44	1.00	-	69.97	27.35	3.63	-
PK	2.389G	54.26	74.00	-19.74	30.93	3	Horizontal	44	1.00	-	23.33	27.31	3.62	-
PK	2.4022G	102.30	Inf	-Inf	30.98	3	Horizontal	44	1.00	-	71.32	27.35	3.63	-

BT-LE(1Mbps)

2402MHz_TX

04/01/2018



Lim.PK	
PK	
Lim.AV	
AV	

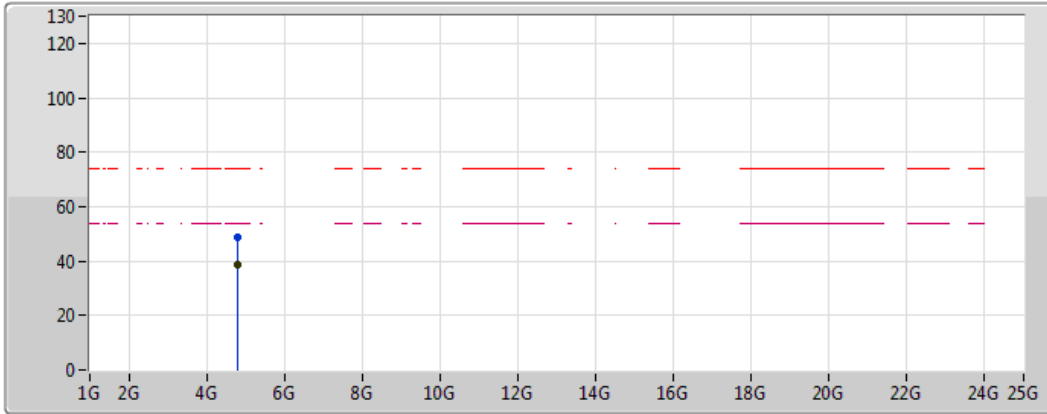
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AV	4.804G	37.61	54.00	-16.39	9.42	3	Vertical	310	1.50	-	28.19	31.19	8.08	29.85
PK	4.804G	44.21	74.00	-29.79	9.42	3	Vertical	310	1.50	-	34.79	31.19	8.08	29.85



BT-LE(1Mbps)

2402MHz_TX

04/01/2018



Legend for the graph:

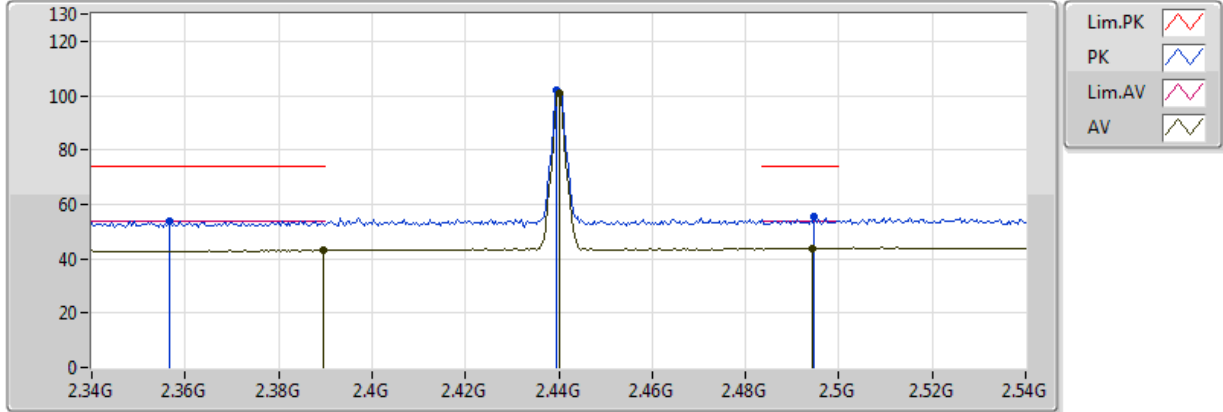
- Lim.PK: Red dashed line with a red zigzag icon
- PK: Blue solid line with a blue zigzag icon
- Lim.AV: Magenta dashed line with a magenta zigzag icon
- AV: Black solid line with a black zigzag icon

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.804G	38.70	54.00	-15.30	9.42	3	Horizontal	290	1.02	-	29.28	31.19	8.08	29.85
PK	4.804G	48.53	74.00	-25.47	9.42	3	Horizontal	290	1.02	-	39.11	31.19	8.08	29.85

BT-LE(1Mbps)

2440MHz_TX

04/01/2018



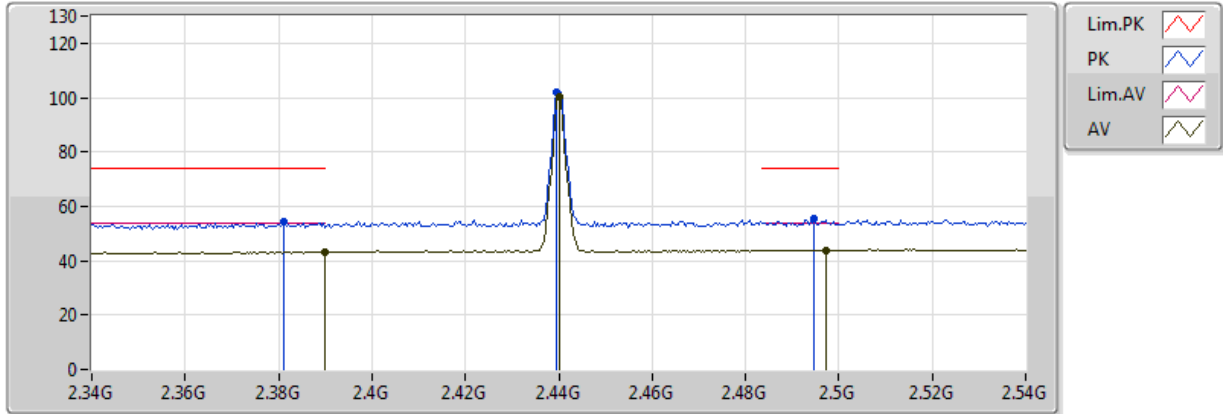
Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.3896G	43.07	54.00	-10.93	30.93	3	Vertical	195	1.87	-	12.14	27.31	3.62	-
AV	2.4944G	43.86	54.00	-10.14	31.31	3	Vertical	195	1.87	-	12.55	27.59	3.72	-
AV	2.44G	100.79	Inf	-Inf	31.11	3	Vertical	195	1.87	-	69.68	27.44	3.67	-
PK	2.3568G	53.87	74.00	-20.13	30.82	3	Vertical	195	1.87	-	23.06	27.23	3.59	-
PK	2.4948G	55.71	74.00	-18.29	31.31	3	Vertical	195	1.87	-	24.40	27.59	3.72	-
PK	2.4396G	102.13	Inf	-Inf	31.11	3	Vertical	195	1.87	-	71.02	27.44	3.67	-



BT-LE(1Mbps)

2440MHz_TX

04/01/2018

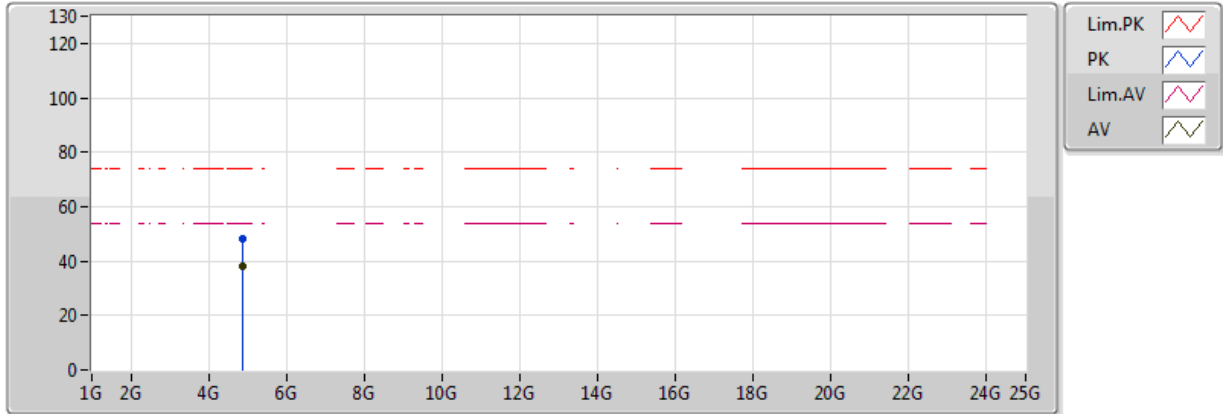


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.39G	43.36	54.00	-10.64	30.93	3	Horizontal	154	1.34	-	12.43	27.31	3.62	-
AV	2.4972G	43.96	54.00	-10.04	31.32	3	Horizontal	154	1.34	-	12.64	27.59	3.73	-
AV	2.44G	100.39	Inf	-Inf	31.11	3	Horizontal	154	1.34	-	69.28	27.44	3.67	-
PK	2.3812G	54.13	74.00	-19.87	30.90	3	Horizontal	154	1.34	-	23.23	27.29	3.61	-
PK	2.4948G	55.58	74.00	-18.42	31.31	3	Horizontal	154	1.34	-	24.27	27.59	3.72	-
PK	2.4396G	101.75	Inf	-Inf	31.11	3	Horizontal	154	1.34	-	70.64	27.44	3.67	-

BT-LE(1Mbps)

2440MHz_TX

04/01/2018

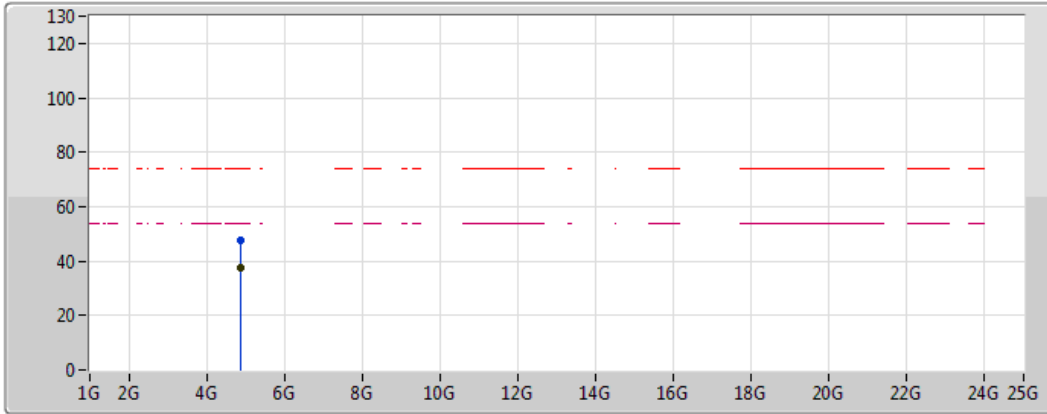






Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.88G	38.23	54.00	-15.77	9.65	3	Vertical	60	3.69	-	28.59	31.31	8.18	29.84
PK	4.88G	48.44	74.00	-25.56	9.65	3	Vertical	60	3.69	-	38.79	31.31	8.18	29.84

BT-LE(1Mbps)

2440MHz_TX

04/01/2018



Lim.PK	
PK	
Lim.AV	
AV	

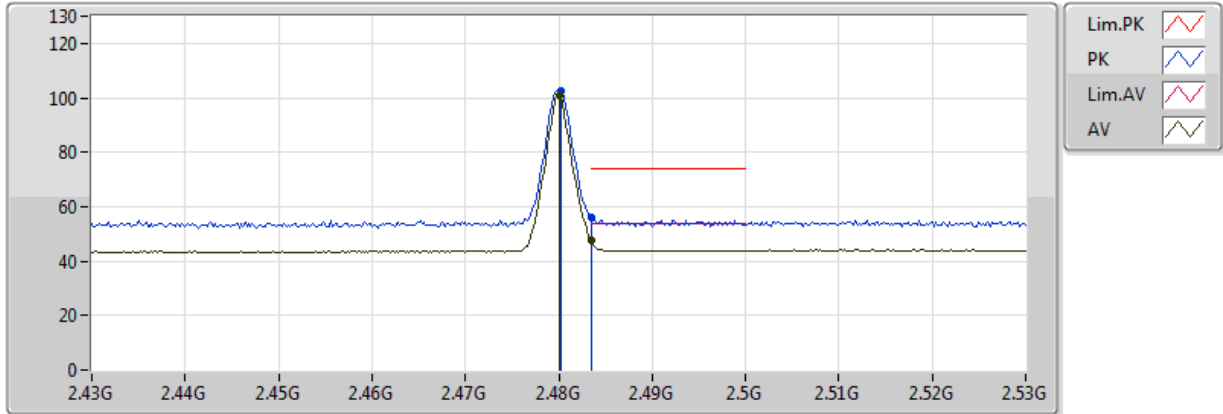
Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.88G	37.77	54.00	-16.23	9.65	3	Horizontal	289	1.13	-	28.13	31.31	8.18	29.84
PK	4.88G	47.51	74.00	-26.49	9.65	3	Horizontal	289	1.13	-	37.87	31.31	8.18	29.84



BT-LE(1Mbps)

2480MHz_TX

04/01/2018



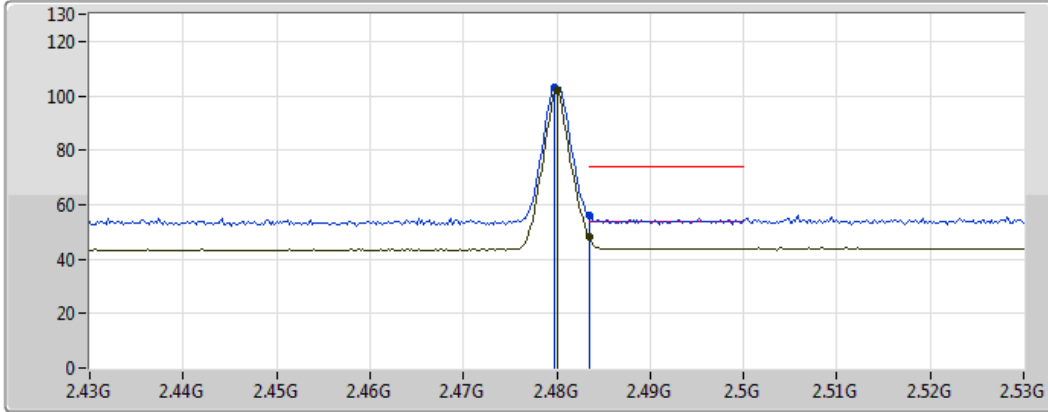
Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.483502G	47.80	54.00	-6.20	31.27	3	Vertical	245	1.16	-	16.53	27.56	3.71	-
AV	2.48G	100.99	Inf	-Inf	31.26	3	Vertical	245	1.16	-	69.73	27.55	3.71	-
PK	2.483502G	56.26	74.00	-17.74	31.27	3	Vertical	245	1.16	-	24.99	27.56	3.71	-
PK	2.4802G	102.37	Inf	-Inf	31.26	3	Vertical	245	1.16	-	71.11	27.55	3.71	-



BT-LE(1Mbps)

2480MHz_TX

04/01/2018

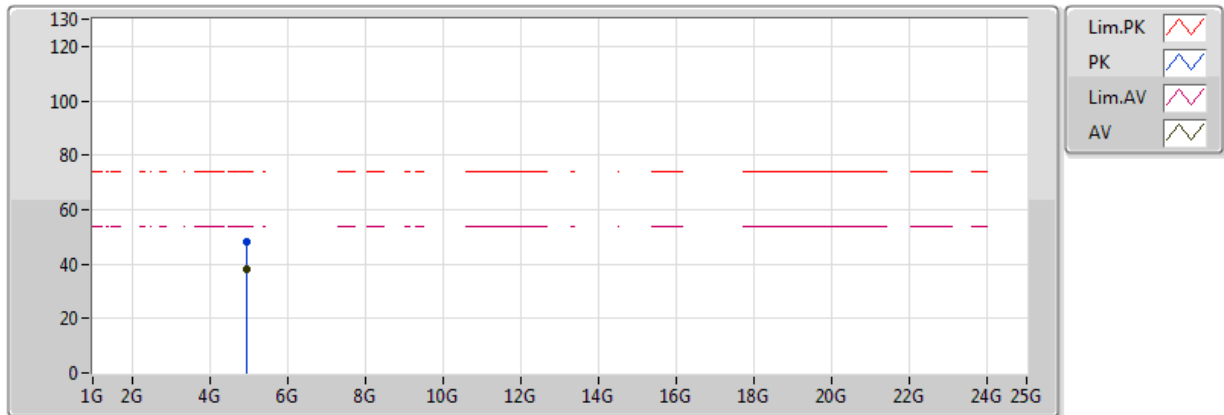


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.483502G	48.10	54.00	-5.90	31.27	3	Horizontal	157	1.00	-	16.82	27.56	3.71	-
AV	2.48G	101.86	Inf	-Inf	31.26	3	Horizontal	157	1.00	-	70.60	27.55	3.71	-
PK	2.483502G	55.95	74.00	-18.05	31.27	3	Horizontal	157	1.00	-	24.68	27.56	3.71	-
PK	2.4798G	103.22	Inf	-Inf	31.26	3	Horizontal	157	1.00	-	71.97	27.55	3.71	-

BT-LE(1Mbps)

2480MHz_TX

04/01/2018

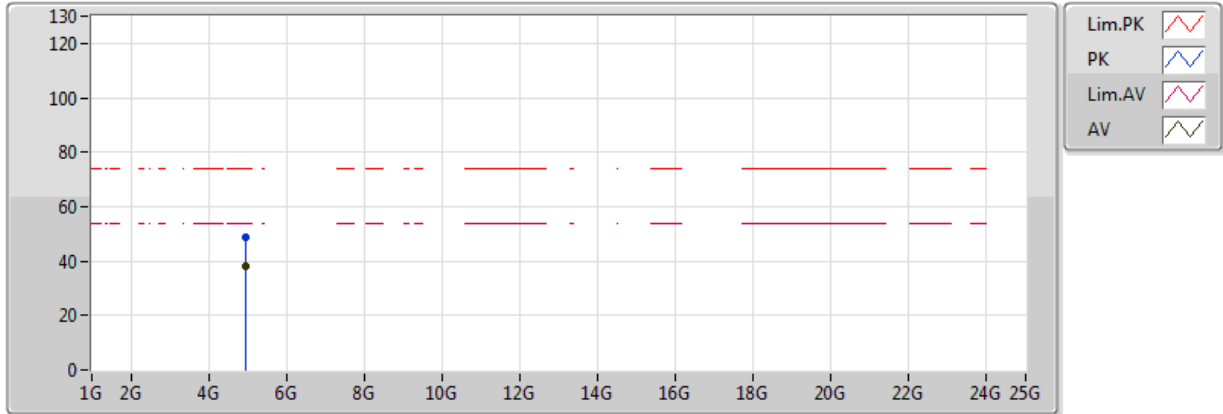


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.96G	38.10	54.00	-15.90	9.88	3	Vertical	60	1.06	-	28.21	31.44	8.27	29.82
PK	4.96G	48.22	74.00	-25.78	9.88	3	Vertical	60	1.06	-	38.34	31.44	8.27	29.82

BT-LE(1Mbps)

2480MHz_TX

04/01/2018



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.96G	38.34	54.00	-15.66	9.88	3	Horizontal	289	1.06	-	28.46	31.44	8.27	29.82
PK	4.96G	48.50	74.00	-25.50	9.88	3	Horizontal	289	1.06	-	38.62	31.44	8.27	29.82