FCC Test Report

Equipment	:	**Security Controller**
Brand Name	:	**Tesla**
Model No.	:	**1089774**
FCC ID	:	**2AEIM-1089774**
Standard	:	**47 CFR FCC Part 15.247**
Frequency	:	**2400 MHz – 2483.5 MHz**
Function	:	**☒Point-to-multipoint; ☐Point-to-point**
Applicant / Manufacturer	:	**Tesla Motors, Inc. 3500 Deer Creek Road Palo Alto, California US 94304 United States Of America**

The product sample received on May 03, 2017 and completely tested on Jun. 12, 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 INTERNATIONALINC., the test report shall not be reproduced except in full.

Phoenix Chen
SPORTON INTERNATIONAL INC.

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	Complied
3.2	15.247(a)	DTS Bandwidth	≥500kHz	Complied
3.3	15.247(b)	Maximum Conducted 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: >30 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
FR741006AL	Rev. 01	Initial issue of report	Jun. 30, 2017
FR741006AL	Rev. 02	Revise the test location designation No.	Aug. 01. 2017

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	1TX

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

1.1.2 Antenna Information

Ant.	Port	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	1	-	-	PCB	fixed on board	3.94

1.1.3 EUT Information

Operational Condition		
EUT Power Type	From DC Power Source	
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)	1	0	n/a (DC>=0.98)	n/a (DC>=0.98)

1.2 Testing Applied Standards

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

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

1.3 Testing Location Information

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

Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
RF Conducted	TH06-HY	Ryan	24.5°C / 65%	06/Jun/2017
Radiated	03CH03-HY	Thor	24.5°C / 65.4%	12/Jun/2017

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 (30MHz ~ 1,000MHz)	2.1 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	2.6 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	2.9 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	12V

2.2 Test Channel Mode

Test Software Version	BTool v1.40.15

Mode	Power Setting
BT-LE(1Mbps)	-
2402MHz	0xC
2440MHz	0xC
2480MHz	0xC

2.3 The Worst Case Measurement Configuration

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	DC Power Source	
Operating Mode > 1GHz	CTX	
Orthogonal Planes of EUT	**Y Plane**	**Z Plane**
		
Worst Planes of EUT		V

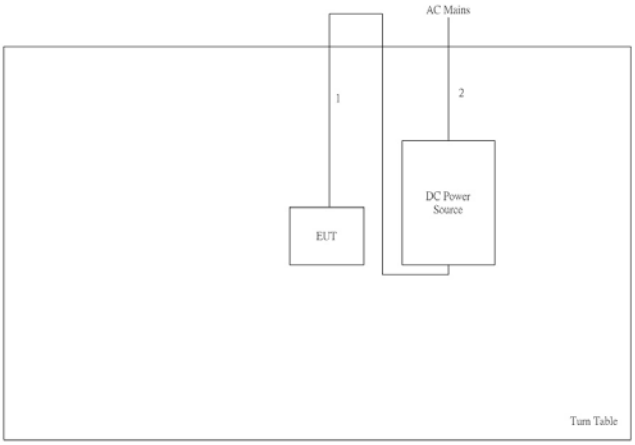
2.4 Support Equipment

Support Equipment – RF Conducted				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
1	DC Power Supply	G.W.	GPC-6030D	-

Support Equipment – Radiated Emission				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
1	DC Power Supply	G.W.	GPC-6030D	-

2.5 Test Setup Diagram

Test Setup Diagram - Radiated Test



Item	Connection	Shielded	Length
1	DC Power cable	No	0.3m
2	Power cable	No	1.8m

3 Transmitter Test Result

3.1 AC Power-line Conducted Emissions

3.1.1 AC Power-line Conducted Emissions Limit

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

3.1.2 Measuring Instruments

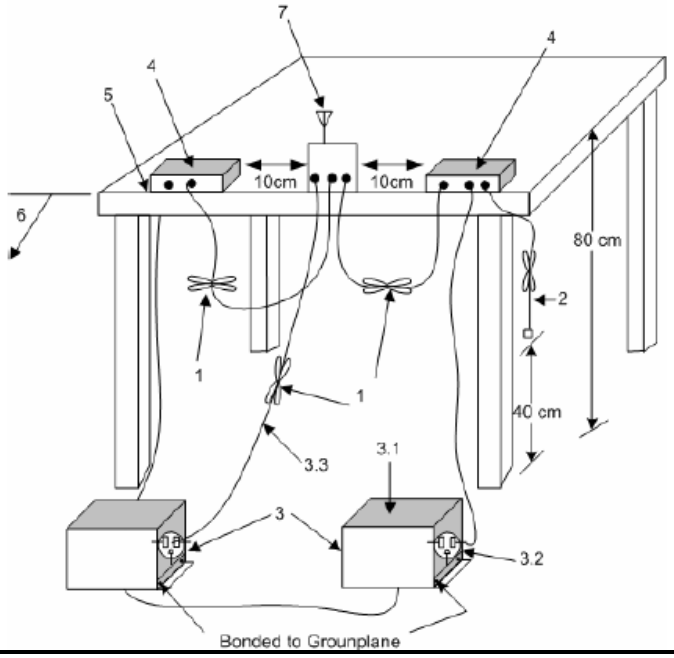
Refer a test equipment and calibration data table in this test report.

3.1.3 Test Procedures

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

3.1.4 Test Setup

AC Power-line Conducted Emissions



3.1.5 Test Result of AC Power-line Conducted Emissions

Please refer to Part 15.247 which states, “Measurements to demonstrate compliance with the conducted limits are not required for devices which only employ DC power source 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.

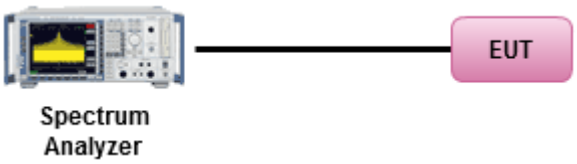
3.2.2 Measuring Instruments

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 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 9.1.1 Option 1 (RBW ≥ EBW method).
	☐ Refer as KDB 558074, clause 9.1.2 Option 2 (integrated band power method)
	☐ Refer as KDB 558074, clause 9.1.3 Option 3 (peak power meter for VBW ≥ DTS BW)
▪ Maximum Average Conducted Output Power	
	Duty cycle ≥ 98%
	☐ Refer as KDB 558074, clause 9.2.2.4 Method AVGSA-2 (spectral trace averaging).
	Duty cycle < 98%
	☐ Refer as KDB 558074, clause 9.2.2.5 Method AVGSA-2 Alt. (slow sweep speed)
	RF power meter and average over on/off periods with duty factor or gated trigger
	☒ Refer as KDB 558074, clause 9.2.3.1 Method AVGPM (using an RF average power meter).
▪ For conducted measurement.	
	▪ If the EUT supports multiple transmit chains using options given below: Refer as KDB 662911, In-band power measurements. Using the measure-and-sum approach, measured all transmit ports individually. Sum the power (in linear power units e.g., mW) of all ports for each individual sample and save them.
	▪ If multiple transmit chains, EIRP calculation could be following as methods: $P_{total} = P_1 + P_2 + \ldots + P_n$ (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 B

3.4 Power Spectral Density

3.4.1 Power Spectral Density Limit

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

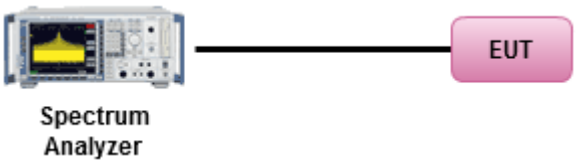
3.4.2 Measuring Instruments

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).
▪ 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 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.	

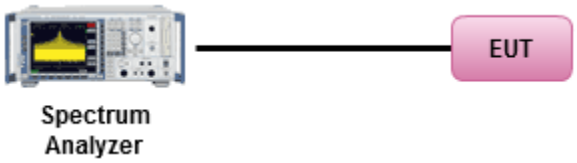
3.5.2 Measuring Instruments

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 below30 MHz at a closer distance than the limit distance, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two or more distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB / decade). The test report shall specify the extrapolation method used to determine compliance of the EUT.

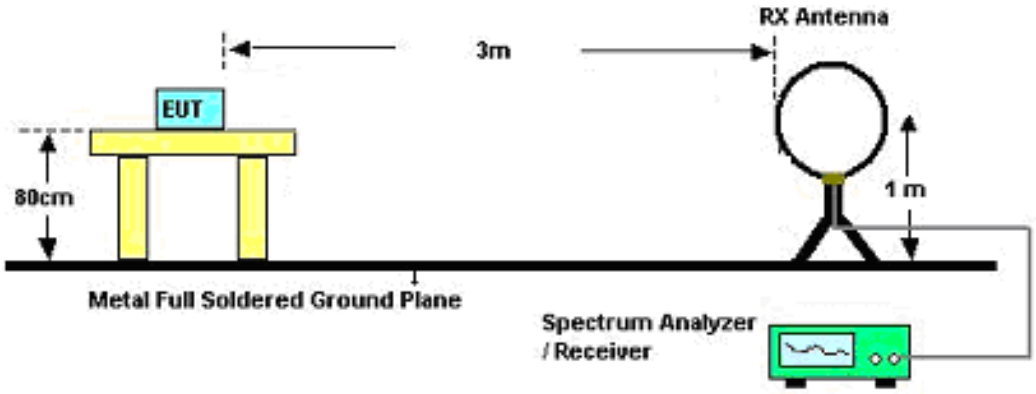
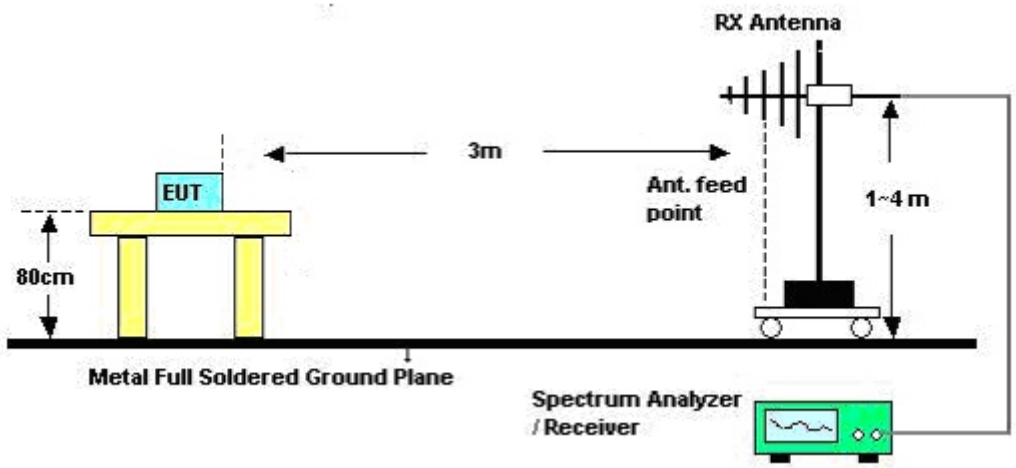
3.6.2 Measuring Instruments

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

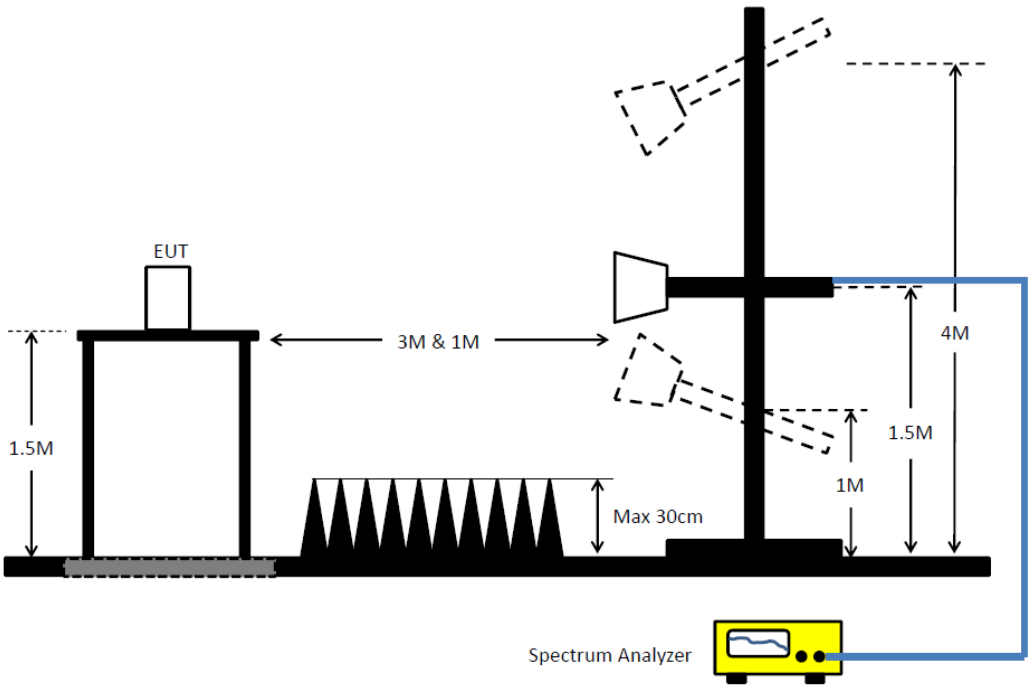
3.6.3 Test Procedures

Test Method
▪ The average emission levels shall be measured in [duty cycle ≥ 98 or duty factor].
▪ Refer as ANSI C63.10, clause 6.10.3 band-edge testing shall be performed at the lowest frequency channel and highest frequency channel within the allowed operating band.
▪ For the transmitter unwanted emissions shall be measured using following options below:
▪ Refer as KDB 558074, clause 12 for unwanted emissions into restricted bands.
☒ Refer as KDB 558074, clause 12.2.5.3 (ANSI C63.10, clause 4.1.4.2.3), Reduced VBW≥1/T.
☒ Refer as KDB 558074, clause 12.2.4 measurement procedure peak limit.
▪ For the transmitter band-edge emissions shall be measured using following options below:
▪ Refer as KDB 558074 clause 13.1, When the performing peak or average radiated measurements, emissions within 2 MHz of the authorized band edge may be measured using the marker-delta method described below.
▪ Refer as KDB 558074, clause 13.2 (ANSI C63.10, clause 6.10.6) for marker-delta method for band-edge measurements.
▪ Refer as KDB 558074, clause 13.3 for narrower resolution bandwidth (100kHz) using the band power and summing the spectral levels (i.e., 1 MHz).
▪ For conducted and cabinet radiation measurement, refer as KDB 558074, clause 12.2.2.
▪ For conducted unwanted emissions into restricted bands (absolute emission limits). Devices with multiple transmit chains using options given below: (1) Measure and sum the spectra across the outputs or (2) Measure and add 10 log(N) dB
▪ For KDB 662911 The methodology described here may overestimate array gain, thereby resulting in apparent failures to satisfy the out-of-band limits even if the device is actually compliant. In such cases, compliance may be demonstrated by performing radiated tests around the frequencies at which the apparent failures occurred.

3.6.4 Test Setup

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

3.6.6 Test Result of Emissions in Restricted Frequency Bands

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
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30MHz ~ 1GHz	28/Nov/2016	27/Nov/2017
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	1GHz ~ 18GHz	16/Dec/2016	15/Dec/2017
Amplifier	HP	8447D	2944A08033	10kHz ~ 1.3GHz	19/Apr/2017	18/Apr/2018
Amplifier	KEYSIGHT	83017A	MY53270197	1GHz ~ 26.5GHz	29/Aug/2016	28/Aug/2017
Spectrum	R&S	FSV40	101515	9kHz ~ 40GHz	28/Nov/2016	27/Nov/2017
Bilog Antenna	SCHAFFNER	CBL 6112D	2723	30MHz ~ 1GHz	01/Oct/2016	30/Sep/2017
Horn Antenna	SCHWARZBECK	BBHA 9120D	BBHA 9120D 1531	1GHz ~ 18GHz	25/Apr/2017	24/Apr/2018
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA 9170221	18GHz ~ 40GHz	06/Feb/2017	05/Feb/2018
Loop Antenna	TESEQ	HLA 6120	24155	9 kHz~30 MHz	02/Mar/2017	01/Mar/2018
RF-Cable-high	SUHNER	SUHNER	CB222	1GHz ~ 40GHz	28/Oct/2016	27/Oct/2017
RF Cable-R03m	Jye Bao	RG142	CB021	9kHz ~ 1GHz	27/Oct/2016	26/Oct/2017

Instrument for Conducted Test

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
Spectrum Analyzer	R&S	FSV 40	101013	10Hz~40GHz	30/Dec/2016	29/Dec/2017
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	21/Jul/2016	20/Jul/2017
RF Cable-0.2m	HUBER+SUHNER	SUCOFLEX_104	MY677/3	30MHz~26.5GHz	02/Oct/2016	01/Oct/2017
RF Cable-0.2m	HUBER+SUHNER	SUCOFLEX_104	MY678/3	30MHz~26.5GHz	02/Oct/2016	01/Oct/2017
RF Cable-0.5m	HUBER+SUHNER	SUCOFLEX_104	MY10717/4	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	718.75k	1.071M	1M07F1D	695k	1.053M

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;

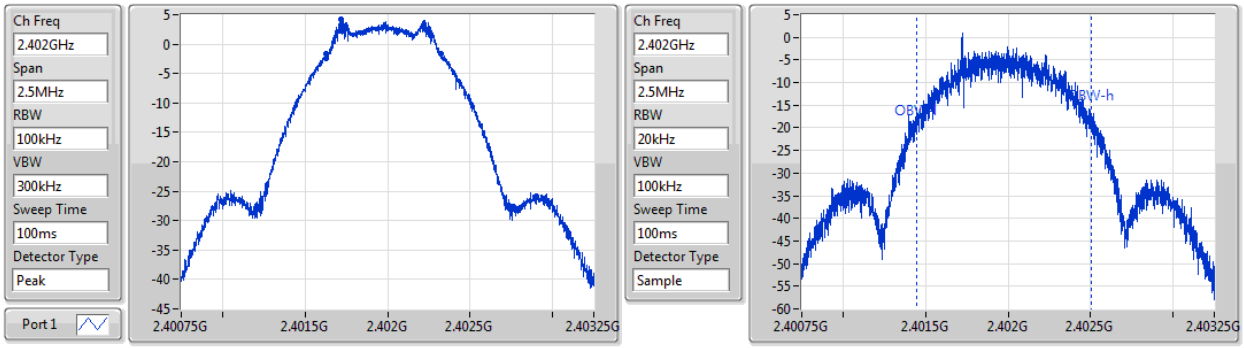
Result

Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	500k	695k	1.053M
2440MHz	Pass	500k	710k	1.054M
2480MHz	Pass	500k	718.75k	1.071M

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

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

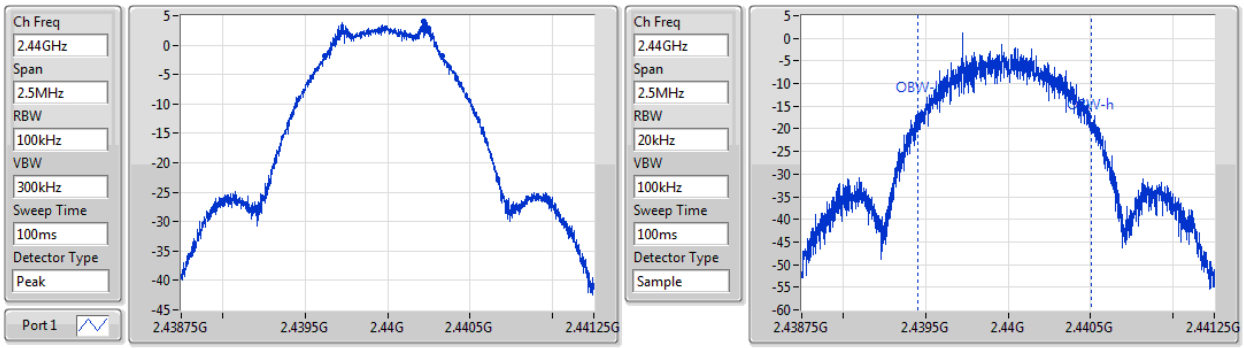
2402MHz



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
695k	2.401629G	2.402324G	1.053M	2.401449G	2.402502G	500k	1

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

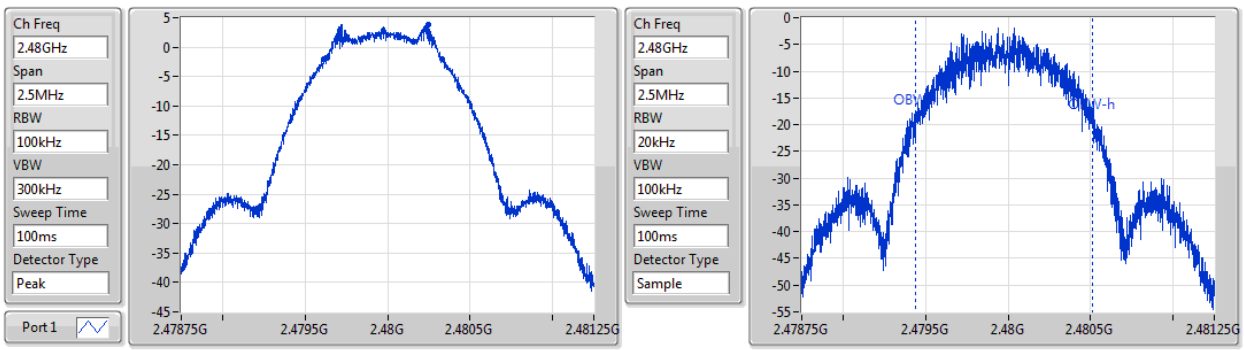
2440MHz



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
710k	2.439624G	2.440334G	1.054M	2.43945G	2.440505G	500k	1

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

2480MHz



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
718.75k	2.479614G	2.480333G	1.071M	2.479438G	2.480508G	500k	1

Summary

Mode	Power	Power
	(dBm)	(W)
BT-LE(1Mbps)	-	-
2.4-2.4835GHz	4.93	0.00311

Result

Mode	Result	Gain (dBi)	Power (dBm)	Power Limit (dBm)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	3.94	4.93	30.00
2440MHz	Pass	3.94	4.68	30.00
2480MHz	Pass	3.94	4.45	30.00

Summary

Mode	PD (dBm/RBW)
BT-LE(1Mbps)	-
2.4-2.4835GHz	-7.45

RBW=3kHz.

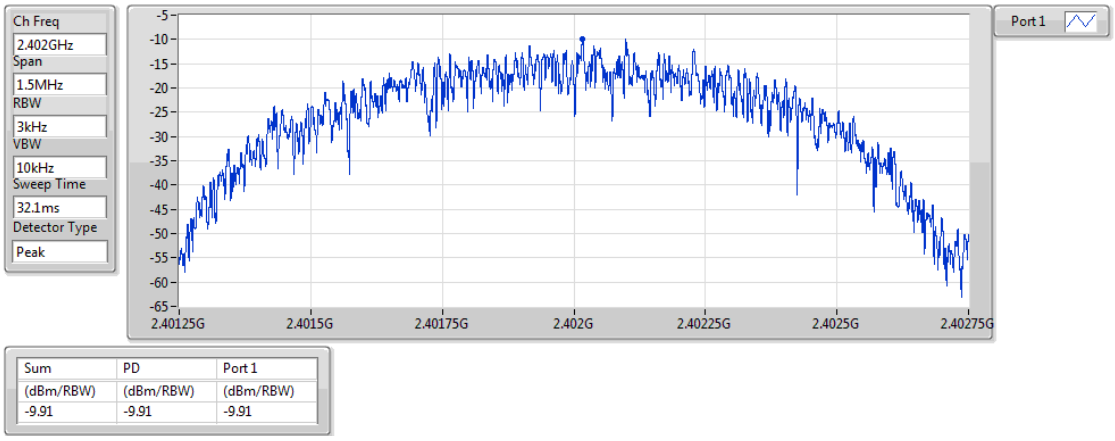
Result

Mode	Result	Gain (dBi)	PD (dBm/RBW)	PD Limit (dBm/RBW)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	3.94	-9.91	8.00
2440MHz	Pass	3.94	-7.45	8.00
2480MHz	Pass	3.94	-9.71	8.00

RBW=3kHz.

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

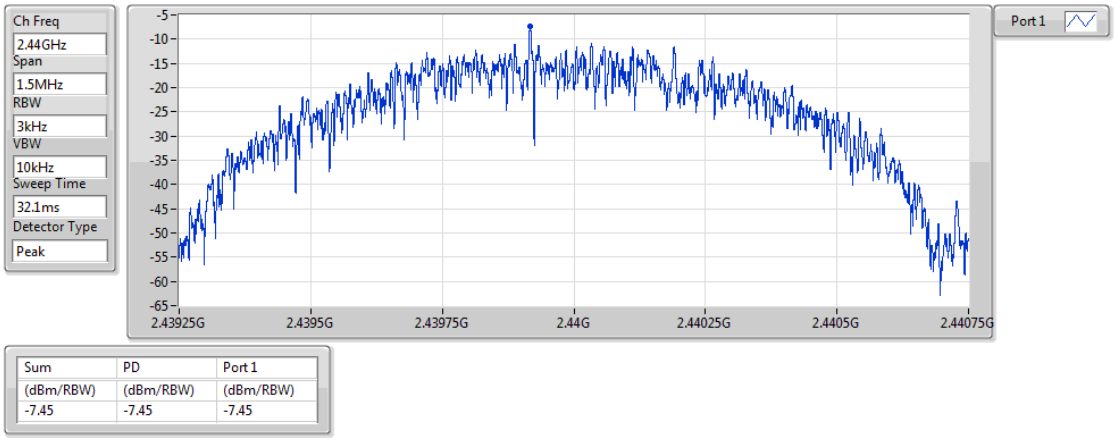
2402MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-9.91	-9.91	-9.91

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

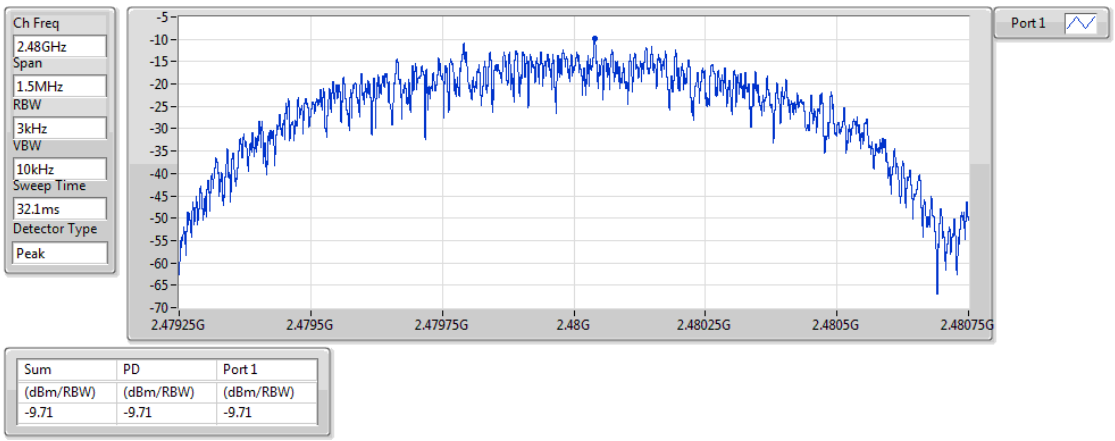
2440MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-7.45	-7.45	-7.45

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

2480MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-9.71	-9.71	-9.71

Summary

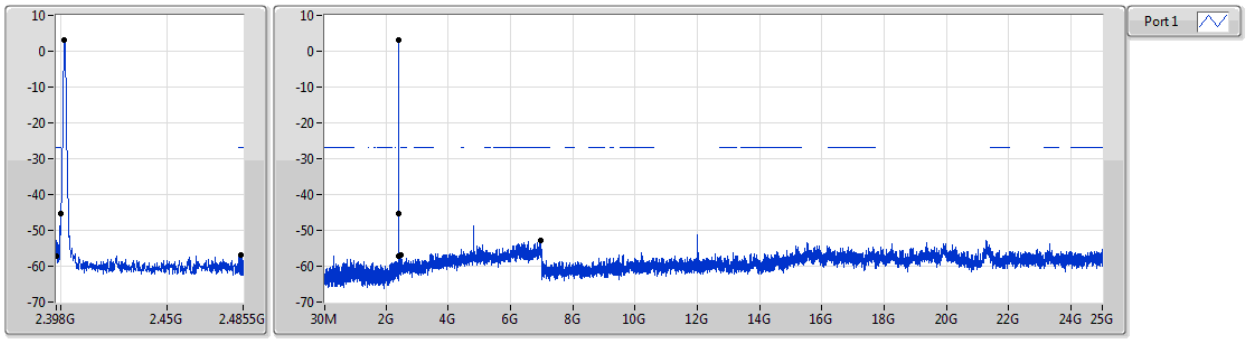
Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-	-	-
2.4-2.4835GHz	Pass	2.401837G	3.24	-26.76	2.398G	-57.25	2.399992G	-45.19	2.484476G	-56.78	6.960257G	-52.82	1

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	3.24	-26.76	2.398G	-57.25	2.399992G	-45.19	2.484476G	-56.78	6.960257G	-52.82	1
2440MHz	Pass	2.401837G	3.24	-26.76	304.688M	-55.65	2.39824G	-57.36	2.485144G	-56.70	6.751998G	-52.36	1
2480MHz	Pass	2.401837G	3.24	-26.76	309.424M	-55.84	2.399296G	-57.91	2.483608G	-54.52	6.915228G	-52.90	1

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

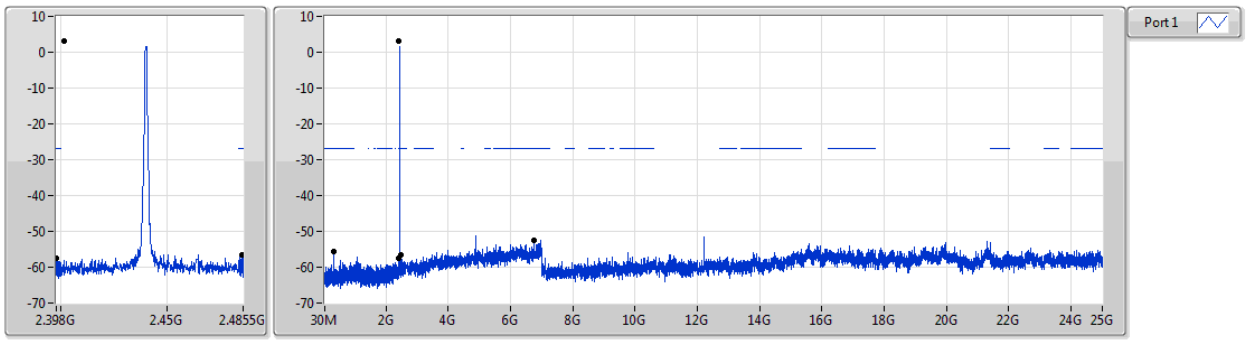
2402MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.401837G	3.24	-26.76	2.398G	-57.25	2.399992G	-45.19	2.484476G	-56.78	6.960257G	-52.82	1

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

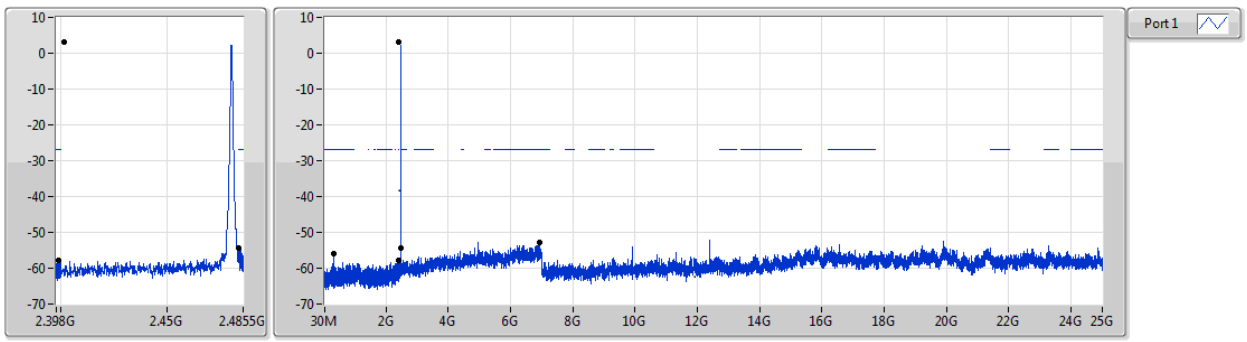
2440MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.401837G	3.24	-26.76	304.688M	-55.65	2.39824G	-57.36	2.485144G	-56.70	6.751998G	-52.36	1

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

2480MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.401837G	3.24	-26.76	309.424M	-55.84	2.399296G	-57.91	2.483608G	-54.52	6.915228G	-52.90	1

Summary

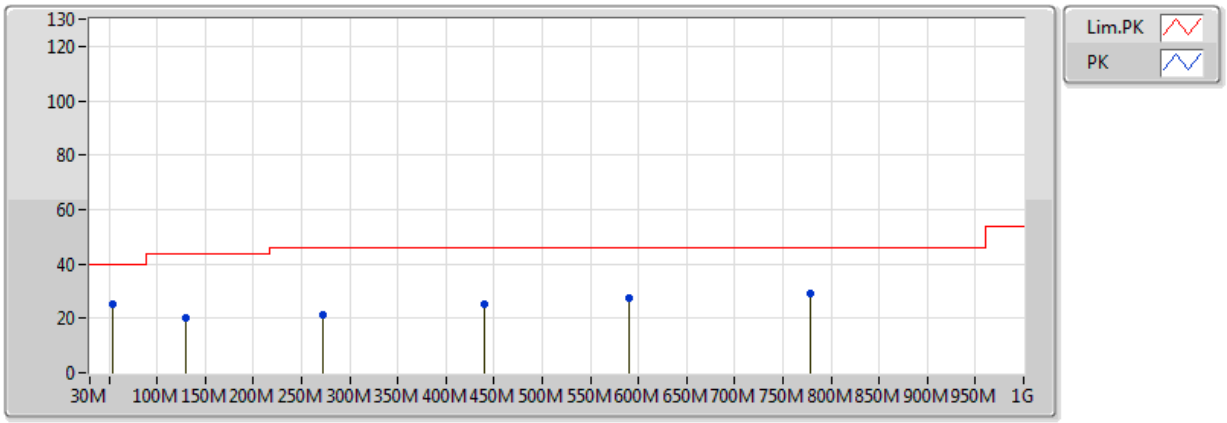
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Pol. (H/V)	Azimuth (°)	Height (m)	Comments
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-	-
2.4-2.4835GHz	Pass	PK	39.7M	25.98	40.00	-14.02	-7.95	3	H	0	1.00	-

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	39.7M	25.98	40.00	-14.02	-7.95	3	H	0	1.00	-
2440MHz	Pass	PK	123.12M	20.68	43.50	-22.82	-7.91	3	H	0	1.00	-
2440MHz	Pass	PK	206.54M	26.83	43.50	-16.67	-10.13	3	H	0	1.00	-
2440MHz	Pass	PK	433.52M	26.76	46.00	-19.24	-2.64	3	H	0	1.00	-
2440MHz	Pass	PK	610.06M	28.63	46.00	-17.37	-0.44	3	H	0	1.00	-
2440MHz	Pass	PK	747.8M	29.55	46.00	-16.45	1.22	3	H	0	1.00	-
2440MHz	Pass	PK	53.28M	25.45	40.00	-14.55	-13.22	3	V	0	1.00	-
2440MHz	Pass	PK	128.94M	20.31	43.50	-23.19	-7.88	3	V	0	1.00	-
2440MHz	Pass	PK	272.5M	21.54	46.00	-24.46	-6.25	3	V	0	1.00	-
2440MHz	Pass	PK	439.34M	25.06	46.00	-20.94	-2.51	3	V	0	1.00	-
2440MHz	Pass	PK	590.66M	27.65	46.00	-18.35	-0.56	3	V	0	1.00	-
2440MHz	Pass	PK	778.84M	29.18	46.00	-16.82	1.56	3	V	0	1.00	-

BT-LE(1Mbps)

2440MHz_DC source

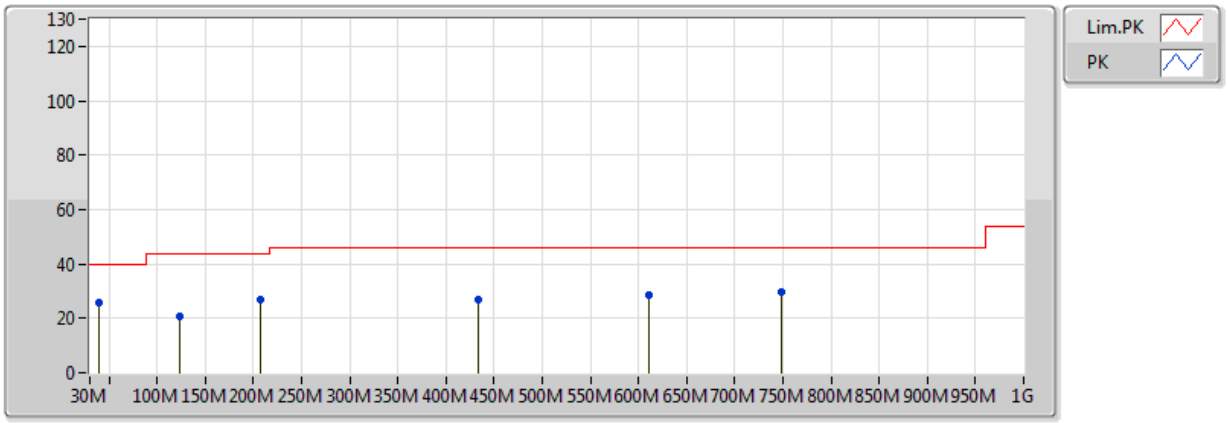


EUT=Z axis

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
PK	53.28M	25.45	40.00	-14.55	-13.22	3	V	0	1.00	-
PK	128.94M	20.31	43.50	-23.19	-7.88	3	V	0	1.00	-
PK	272.5M	21.54	46.00	-24.46	-6.25	3	V	0	1.00	-
PK	439.34M	25.06	46.00	-20.94	-2.51	3	V	0	1.00	-
PK	590.66M	27.65	46.00	-18.35	-0.56	3	V	0	1.00	-
PK	778.84M	29.18	46.00	-16.82	1.56	3	V	0	1.00	-

BT-LE(1Mbps)

2440MHz_DC source



EUT=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	39.7M	25.98	40.00	-14.02	-7.95	3	H	0	1.00	-
PK	123.12M	20.68	43.50	-22.82	-7.91	3	H	0	1.00	-
PK	206.54M	26.83	43.50	-16.67	-10.13	3	H	0	1.00	-
PK	433.52M	26.76	46.00	-19.24	-2.64	3	H	0	1.00	-
PK	610.06M	28.63	46.00	-17.37	-0.44	3	H	0	1.00	-
PK	747.8M	29.55	46.00	-16.45	1.22	3	H	0	1.00	-

Summary

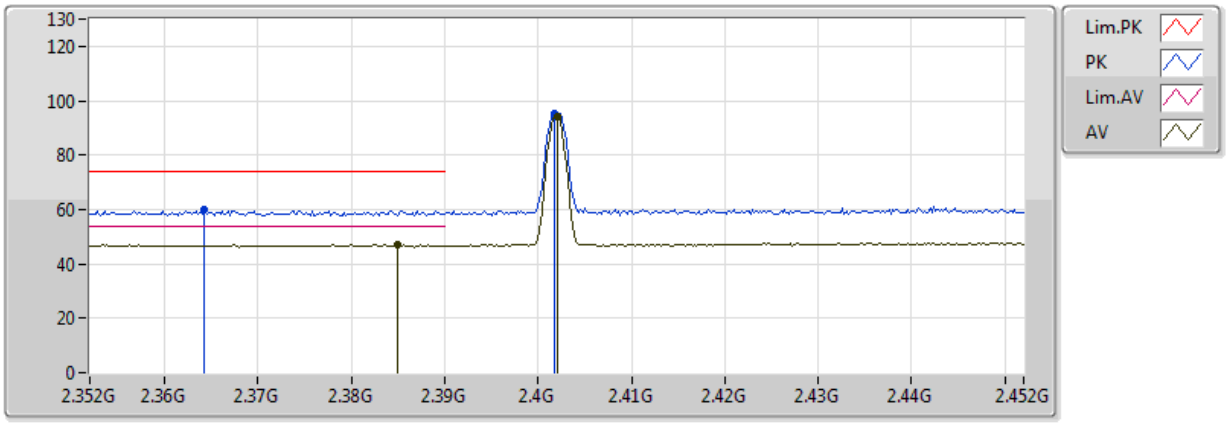
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Pol. (H/V)	Azimuth (°)	Height (m)	Comments
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-	-
2.4-2.4835GHz	Pass	AV	2.4838G	48.25	54.00	-5.75	31.78	3	H	320	1.17	-

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	2.359G	46.97	54.00	-7.03	31.34	3	H	320	1.31	-
2402MHz	Pass	AV	2.402G	102.90	Inf	-Inf	31.49	3	H	320	1.31	-
2402MHz	Pass	AV	4.804G	46.43	54.00	-7.57	6.43	3	H	302	1.00	-
2402MHz	Pass	PK	2.3608G	59.36	74.00	-14.64	31.34	3	H	320	1.31	-
2402MHz	Pass	PK	2.4022G	103.69	Inf	-Inf	31.49	3	H	320	1.31	-
2402MHz	Pass	PK	4.804G	53.43	74.00	-20.57	6.43	3	H	302	1.00	-
2402MHz	Pass	AV	2.385G	47.22	54.00	-6.78	31.43	3	V	176	1.36	-
2402MHz	Pass	AV	2.402G	94.37	Inf	-Inf	31.49	3	V	176	1.36	-
2402MHz	Pass	AV	4.804G	37.43	54.00	-16.57	6.43	3	V	322	2.24	-
2402MHz	Pass	PK	2.3642G	59.78	74.00	-14.22	31.35	3	V	176	1.36	-
2402MHz	Pass	PK	2.4018G	95.23	Inf	-Inf	31.49	3	V	176	1.36	-
2402MHz	Pass	PK	4.804G	48.43	74.00	-25.57	6.43	3	V	322	2.24	-
2440MHz	Pass	AV	2.3508G	47.00	54.00	-7.00	31.31	3	H	320	1.05	-
2440MHz	Pass	AV	2.44G	102.90	Inf	-Inf	31.62	3	H	320	1.05	-
2440MHz	Pass	AV	2.484G	47.98	54.00	-6.02	31.78	3	H	320	1.05	-
2440MHz	Pass	AV	4.88G	45.62	54.00	-8.38	6.62	3	H	303	1.01	-
2440MHz	Pass	PK	2.3716G	59.32	74.00	-14.68	31.38	3	H	320	1.05	-
2440MHz	Pass	PK	2.4396G	103.78	Inf	-Inf	31.62	3	H	320	1.05	-
2440MHz	Pass	PK	2.498G	60.53	74.00	-13.47	31.83	3	H	320	1.05	-
2440MHz	Pass	PK	4.88G	52.62	74.00	-21.38	6.62	3	H	303	1.01	-
2440MHz	Pass	AV	2.3496G	47.09	54.00	-6.91	31.30	3	V	175	1.50	-
2440MHz	Pass	AV	2.44G	94.45	Inf	-Inf	31.62	3	V	175	1.50	-
2440MHz	Pass	AV	2.5G	47.91	54.00	-6.09	31.84	3	V	175	1.50	-
2440MHz	Pass	AV	4.88G	37.62	54.00	-16.38	6.62	3	V	54	1.97	-
2440MHz	Pass	PK	2.364G	59.43	74.00	-14.57	31.35	3	V	175	1.50	-
2440MHz	Pass	PK	2.4396G	95.35	Inf	-Inf	31.62	3	V	175	1.50	-
2440MHz	Pass	PK	2.4948G	60.19	74.00	-13.81	31.82	3	V	175	1.50	-
2440MHz	Pass	PK	4.88G	48.62	74.00	-25.38	6.62	3	V	54	1.97	-
2480MHz	Pass	AV	2.48G	103.28	Inf	-Inf	31.77	3	H	320	1.17	-
2480MHz	Pass	AV	2.4838G	48.25	54.00	-5.75	31.78	3	H	320	1.17	-
2480MHz	Pass	AV	4.96G	39.23	54.00	-14.77	6.82	3	H	307	1.02	-
2480MHz	Pass	PK	2.4798G	104.12	Inf	-Inf	31.77	3	H	320	1.17	-
2480MHz	Pass	PK	2.4908G	60.82	74.00	-13.18	31.81	3	H	320	1.17	-
2480MHz	Pass	PK	4.96G	50.29	74.00	-23.71	6.82	3	H	307	1.02	-
2480MHz	Pass	AV	2.48G	98.11	Inf	-Inf	31.77	3	V	283	3.69	-
2480MHz	Pass	AV	2.4902G	48.20	54.00	-5.80	31.80	3	V	283	3.69	-
2480MHz	Pass	AV	4.96G	37.45	54.00	-16.55	6.82	3	V	145	1.47	-
2480MHz	Pass	PK	2.4802G	98.93	Inf	-Inf	31.77	3	V	283	3.69	-
2480MHz	Pass	PK	2.4968G	60.33	74.00	-13.67	31.83	3	V	283	3.69	-
2480MHz	Pass	PK	4.96G	49.49	74.00	-24.51	6.82	3	V	145	1.47	-

BT-LE(1Mbps)

2402MHz_TX

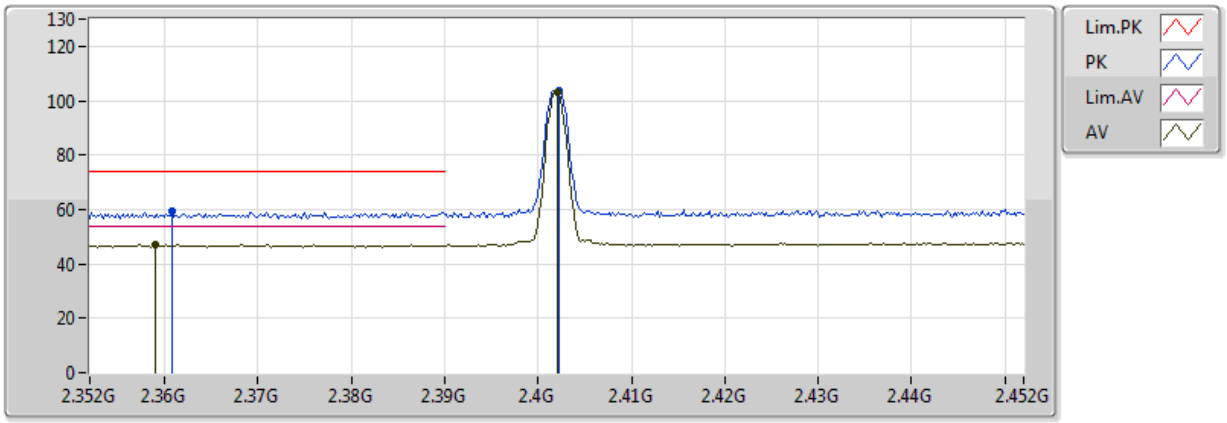


EUT=Z axis

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	2.385G	47.22	54.00	-6.78	31.43	3	V	176	1.36	-
AV	2.402G	94.37	Inf	-Inf	31.49	3	V	176	1.36	-
PK	2.3642G	59.78	74.00	-14.22	31.35	3	V	176	1.36	-
PK	2.4018G	95.23	Inf	-Inf	31.49	3	V	176	1.36	-

BT-LE(1Mbps)

2402MHz_TX

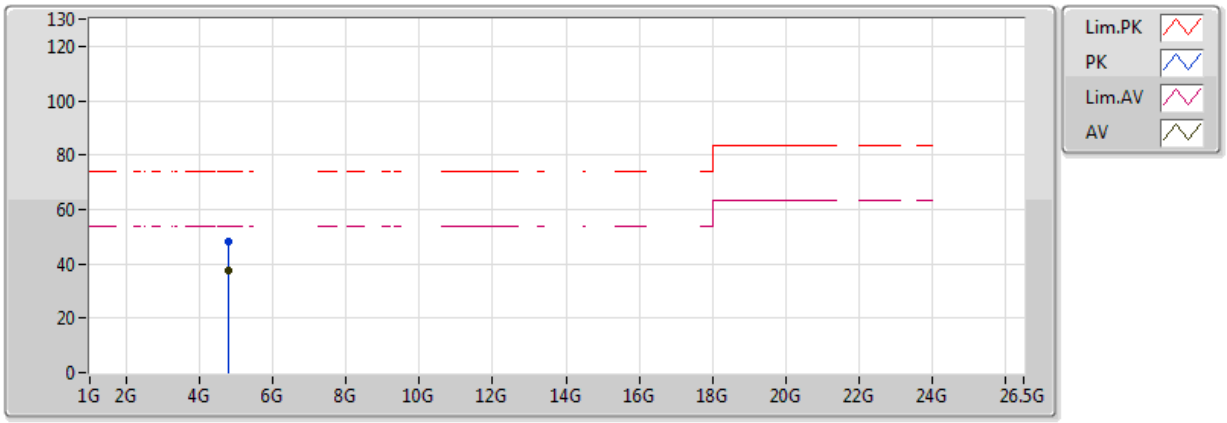


EUT=Z axis

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	2.359G	46.97	54.00	-7.03	31.34	3	H	320	1.31	-
AV	2.402G	102.90	Inf	-Inf	31.49	3	H	320	1.31	-
PK	2.3608G	59.36	74.00	-14.64	31.34	3	H	320	1.31	-
PK	2.4022G	103.69	Inf	-Inf	31.49	3	H	320	1.31	-

BT-LE(1Mbps)

2402MHz_TX

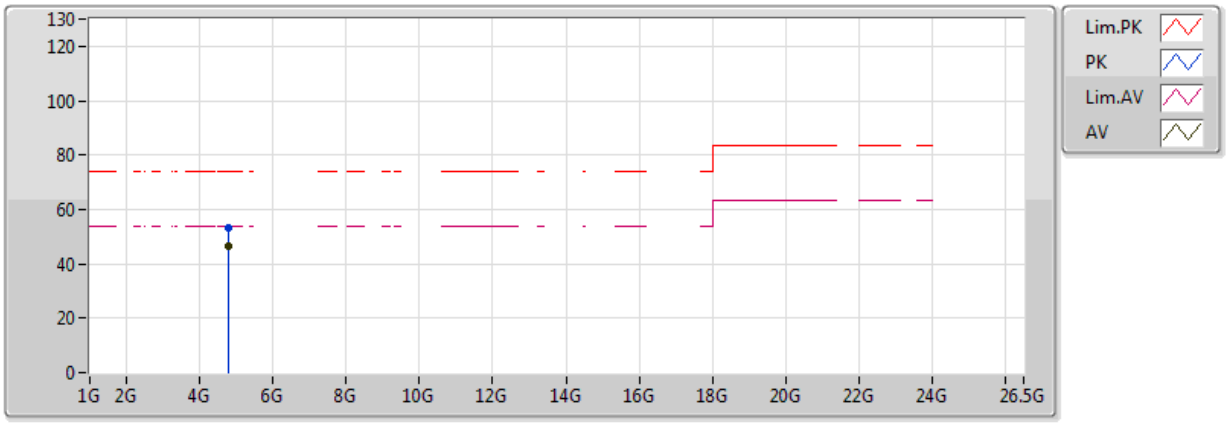


EUT=Z axis

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	4.804G	37.43	54.00	-16.57	6.43	3	V	322	2.24	-
PK	4.804G	48.43	74.00	-25.57	6.43	3	V	322	2.24	-

BT-LE(1Mbps)

2402MHz_TX

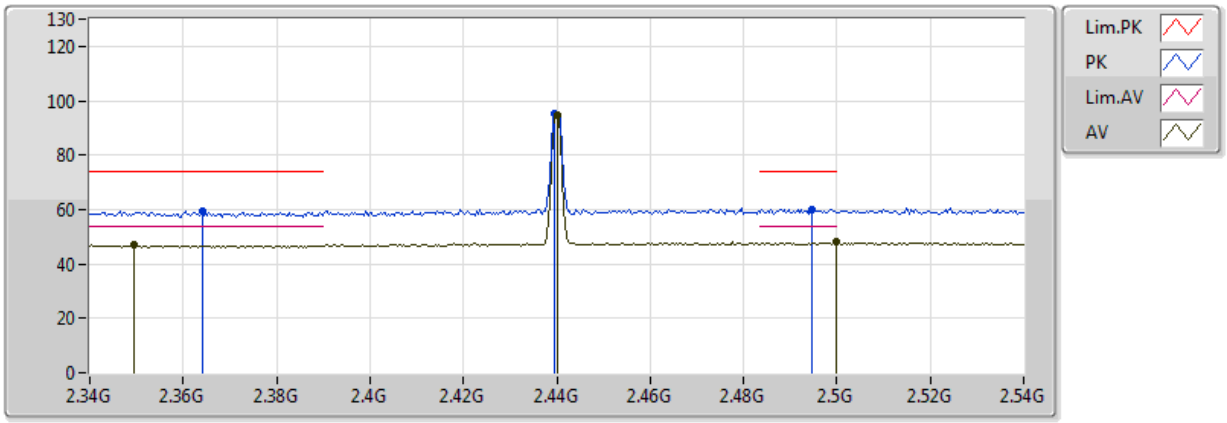


EUT=Z axis

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	4.804G	46.43	54.00	-7.57	6.43	3	H	302	1.00	-
PK	4.804G	53.43	74.00	-20.57	6.43	3	H	302	1.00	-

BT-LE(1Mbps)

2440MHz_TX

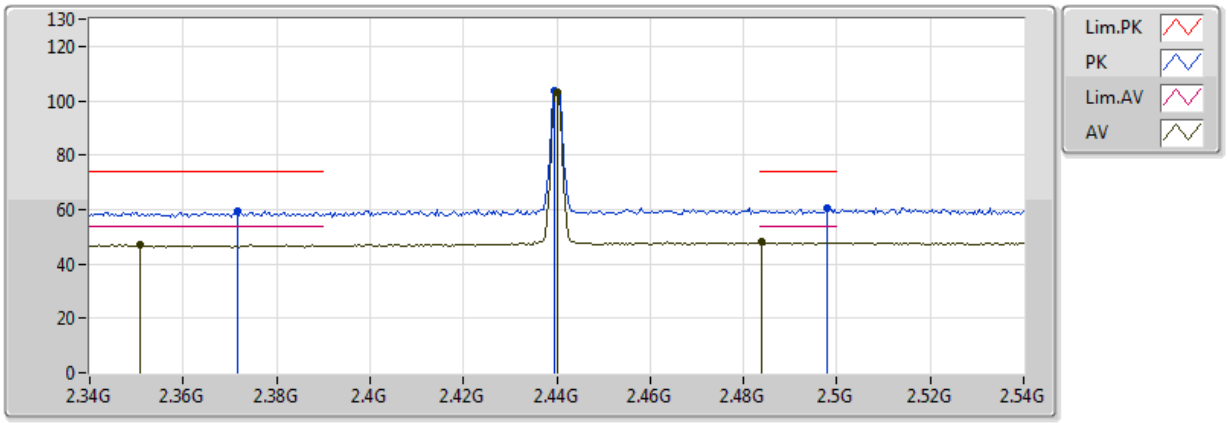


EUT=Z axis

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	2.3496G	47.09	54.00	-6.91	31.30	3	V	175	1.50	-
AV	2.44G	94.45	Inf	-Inf	31.62	3	V	175	1.50	-
AV	2.5G	47.91	54.00	-6.09	31.84	3	V	175	1.50	-
PK	2.364G	59.43	74.00	-14.57	31.35	3	V	175	1.50	-
PK	2.4396G	95.35	Inf	-Inf	31.62	3	V	175	1.50	-
PK	2.4948G	60.19	74.00	-13.81	31.82	3	V	175	1.50	-

BT-LE(1Mbps)

2440MHz_TX

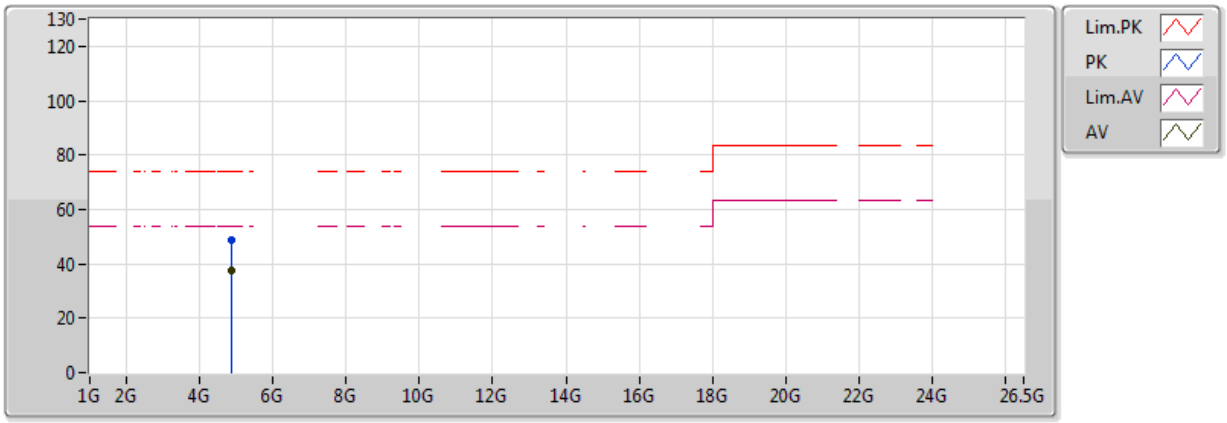


EUT=Z axis

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	2.3508G	47.00	54.00	-7.00	31.31	3	H	320	1.05	-
AV	2.44G	102.90	Inf	-Inf	31.62	3	H	320	1.05	-
AV	2.484G	47.98	54.00	-6.02	31.78	3	H	320	1.05	-
PK	2.3716G	59.32	74.00	-14.68	31.38	3	H	320	1.05	-
PK	2.4396G	103.78	Inf	-Inf	31.62	3	H	320	1.05	-
PK	2.498G	60.53	74.00	-13.47	31.83	3	H	320	1.05	-

BT-LE(1Mbps)

2440MHz_TX

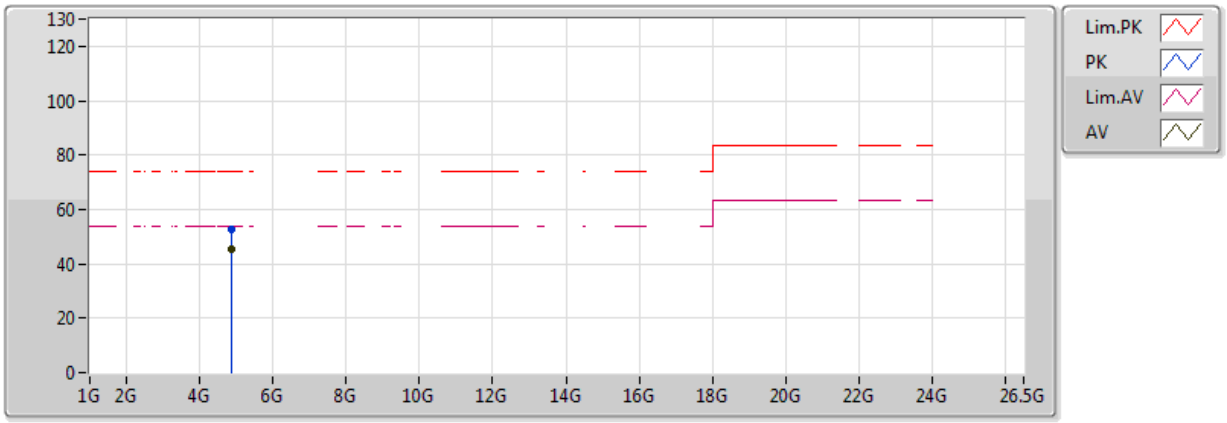


EUT=Z axis

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	4.88G	37.62	54.00	-16.38	6.62	3	V	54	1.97	-
PK	4.88G	48.62	74.00	-25.38	6.62	3	V	54	1.97	-

BT-LE(1Mbps)

2440MHz_TX

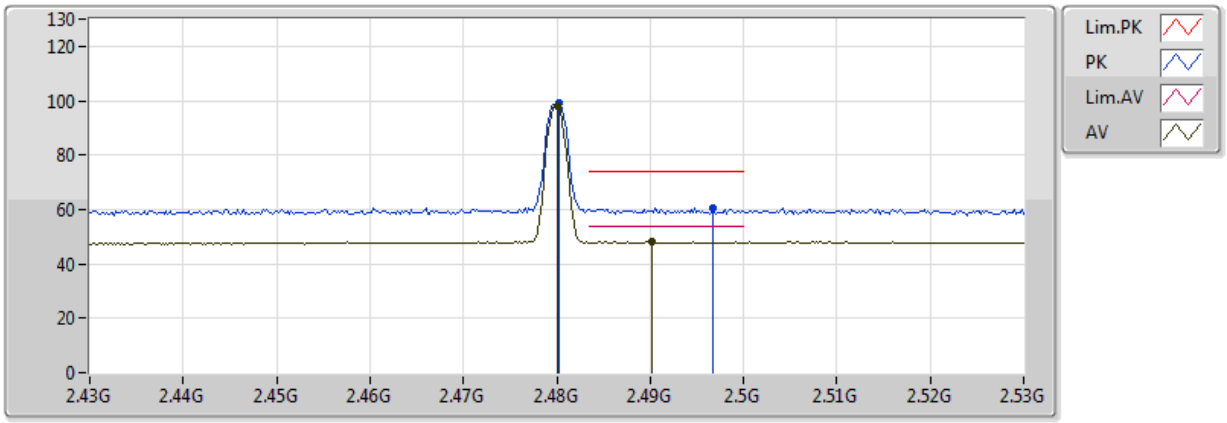


EUT=Z axis

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	4.88G	45.62	54.00	-8.38	6.62	3	H	303	1.01	-
PK	4.88G	52.62	74.00	-21.38	6.62	3	H	303	1.01	-

BT-LE(1Mbps)

2480MHz_TX

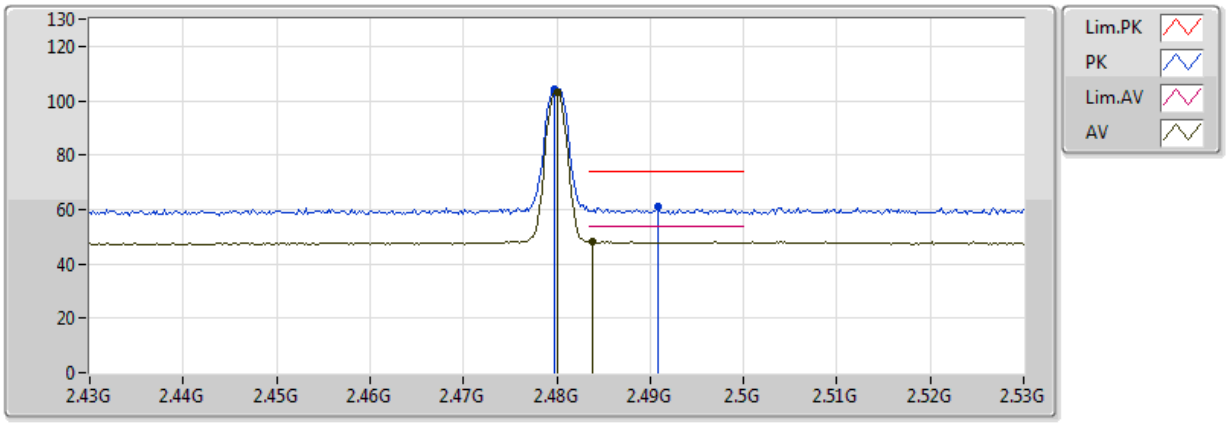


EUT=Z axis

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	98.11	Inf	-Inf	31.77	3	V	283	3.69	-
AV	2.4902G	48.20	54.00	-5.80	31.80	3	V	283	3.69	-
PK	2.4802G	98.93	Inf	-Inf	31.77	3	V	283	3.69	-
PK	2.4968G	60.33	74.00	-13.67	31.83	3	V	283	3.69	-

BT-LE(1Mbps)

2480MHz_TX

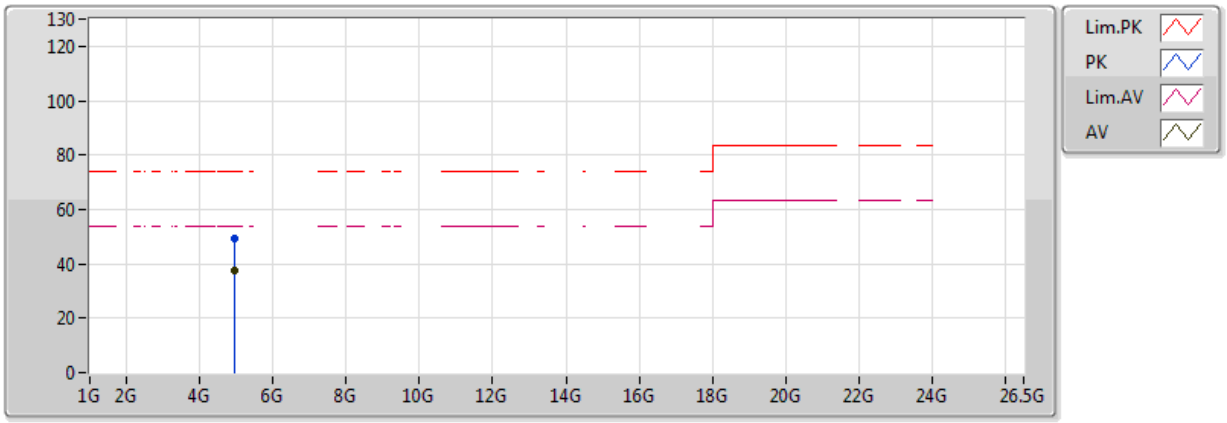


EUT=Z axis

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	103.28	Inf	-Inf	31.77	3	H	320	1.17	-
AV	2.4838G	48.25	54.00	-5.75	31.78	3	H	320	1.17	-
PK	2.4798G	104.12	Inf	-Inf	31.77	3	H	320	1.17	-
PK	2.4908G	60.82	74.00	-13.18	31.81	3	H	320	1.17	-

BT-LE(1Mbps)

2480MHz_TX

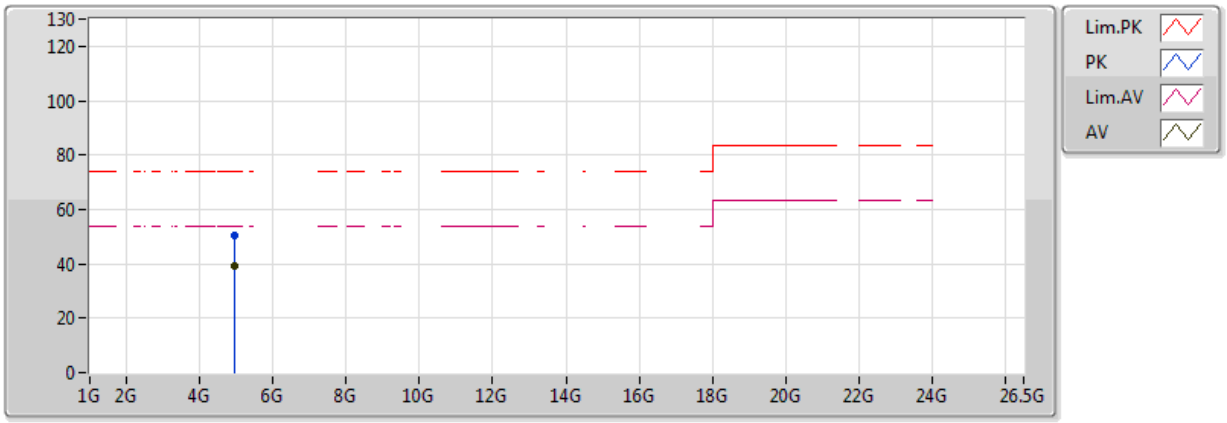


EUT=Z axis

Type	Freq(Hz)	Level(dBuV/m)	Limit(dBuV/m)	Margin(dB)	Factor(dB)	Dist(m)	Pol.(H/V)	Azimuth(°)	Height(m)	Comments
AV	4.96G	37.45	54.00	-16.55	6.82	3	V	145	1.47	-
PK	4.96G	49.49	74.00	-24.51	6.82	3	V	145	1.47	-

BT-LE(1Mbps)

2480MHz_TX



EUT=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	4.96G	39.23	54.00	-14.77	6.82	3	H	307	1.02	-
PK	4.96G	50.29	74.00	-23.71	6.82	3	H	307	1.02	-