

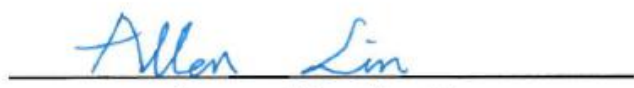
FCC Test Report

FCC ID : E2K-N03G001
Equipment : Internet of Things Gateway
Brand Name : DELL
Model Name : N03G001
Applicant/Manufacturer : Dell Inc.
One Dell Way, Round Rock, Texas 78682, USA
Standard : 47 CFR FCC Part 15.247

The product was received on Jan. 26, 2017, and testing was started from Mar. 06, 2017 and completed on Feb. 01, 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 variant report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.


Approved by: Allen Lin

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory

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

Table of Contents

HISTORY OF THIS TEST REPORT	3
SUMMARY OF TEST RESULT	4
1 GENERAL DESCRIPTION	5
1.1 Information.....	5
1.2 Testing Applied Standards	7
1.3 Testing Location Information	7
1.4 Measurement Uncertainty	7
2 TEST CONFIGURATION OF EUT.....	8
2.1 Test Condition	8
2.2 The Worst Case Measurement Configuration	8
2.3 Accessories	9
2.4 Support Equipment.....	9
2.5 Test Setup Diagram	10
3 TRANSMITTER TEST RESULT	11
3.1 AC Power-line Conducted Emissions	11
3.2 Maximum Conducted Output Power	12
3.3 Emissions in Restricted Frequency Bands.....	14
4 TEST EQUIPMENT AND CALIBRATION DATA.....	17
APPENDIX A. TEST RESULTS OF AC POWER-LINE CONDUCTED EMISSIONS	
APPENDIX B. TEST RESULTS OF MAXIMUM CONDUCTED OUTPUT POWER	
APPENDIX C. TEST RESULTS OF EMISSIONS IN RESTRICTED FREQUENCY BANDS	
APPENDIX D. TEST PHOTOS	
PHOTOGRAPHS OF EUT V01	



History of this test report

[illegible]

Summary of Test Result

Report Clause	Ref. Std. Clause	Test Items	Result (PASS/FAIL)	Remark
1.1.2	15.203	Antenna Requirement	PASS	FCC 15.203
3.1	15.207	AC Power-line Conducted Emissions	PASS	FCC 15.207
3.2	15.247(b)	Maximum Conducted Output Power	PASS	Power [dBm]:30
3.3	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: Jenny Yang

1 General Description

1.1 Information

1.1.1 RF General Information

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

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

Note:

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

1.1.2 Antenna Information

Ant.	Brand	Model Name	Antenna Type	Connector
1	parsec	PTA WIFI Blade	blade antenna	SMA

Ant.	Port	Peak Gain (dBi)	
		2.4G	BT
1	1	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 BT function:

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

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

1.1.3 EUT Information

Operational Condition			
EUT Power Type	From AC Adapter		
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 Table for Permissive Change

This product is an extension of original one reported under Sporton project number: FR712529-01AL

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

Modifications	Performance Checking
Antenna was added	AC Power-line Conducted Emissions Maximum Conducted Output Power Emissions in Restricted Frequency Bands

1.1.5 Table for Multiple Listing

SKU		Description
1	Base	The only difference among these SKUs is I/O port.
2	GPA	
3	Media	

Note. SKU 3 configuration was pretested and found to be the worst case and measured during the test.

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
AC Conduction	CO04-HY	Lego	23°C / 54%	24/Jan/2019
RF Conducted	TH01-HY	Gary	21.5°C / 62%	06/Mar/2017
	TH01-HY	Barry	24.6°C / 69%	01/Feb/2019
Radiated	03CH09-HY	Kevin	22.9°C / 47%	31/Jan/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	120V

2.2 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	Adapter Mode

The Worst Case Mode for Following Conformance Tests	
Tests Item	Maximum Conducted Output Power
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	CTX		
1	Adapter Mode		
Orthogonal Planes of EUT	X Plane	Y Plane	Z Plane
			
Worst Planes of EUT	V		

2.3 Accessories

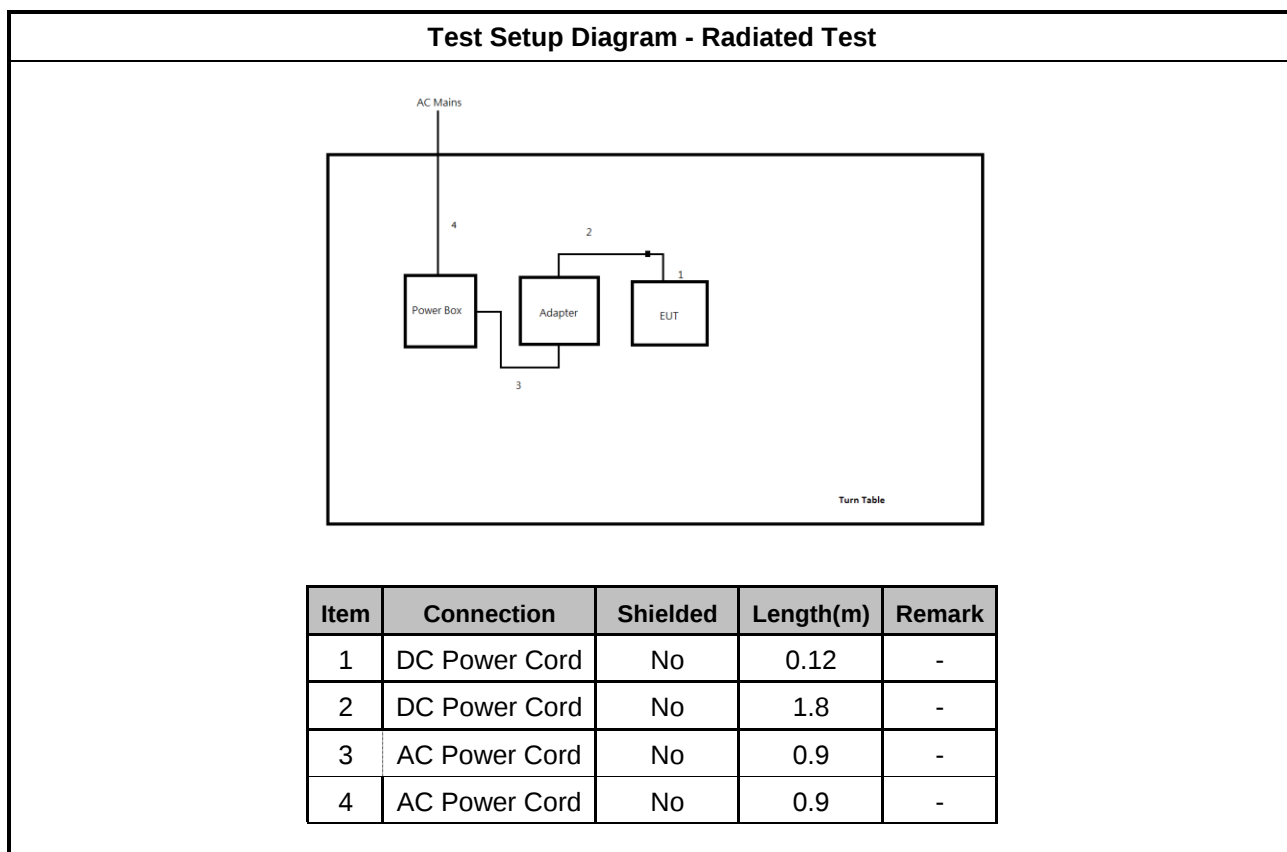
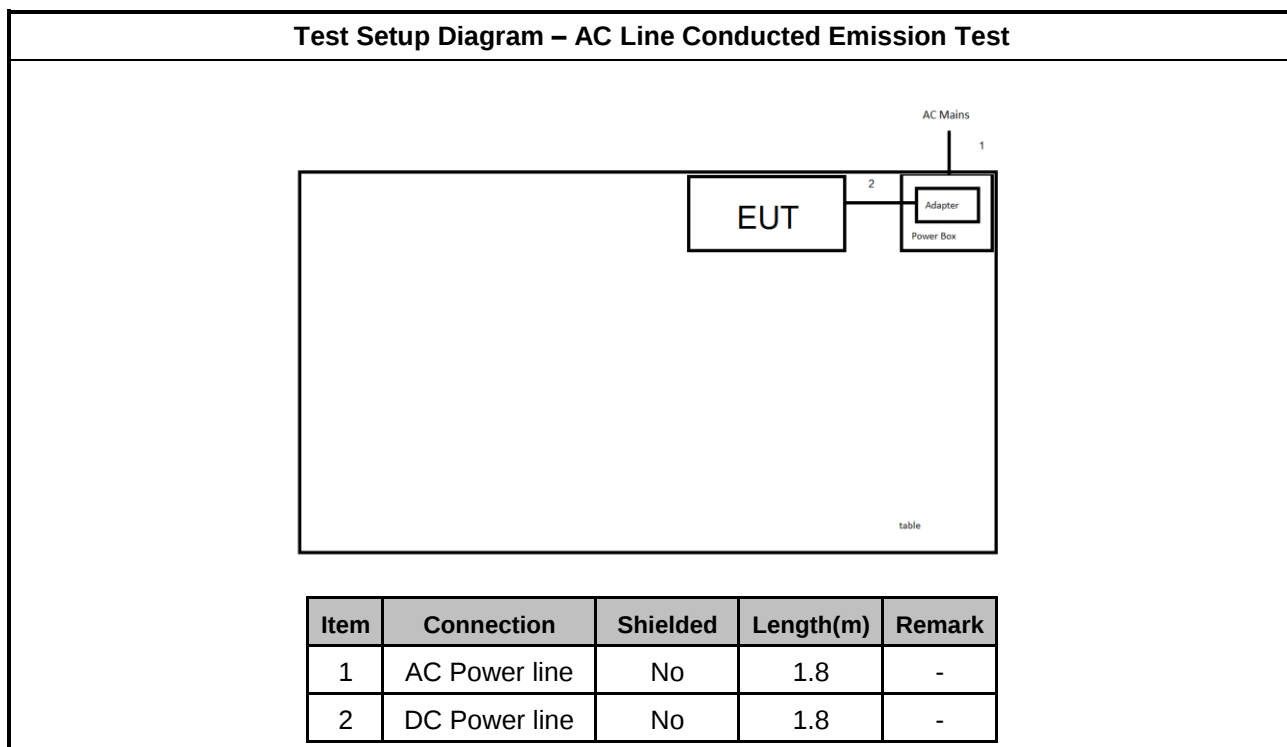
Accessories				
AC Adapter	Brand Name	DELL	Model Name	DA65NM130
	Manufacturer	DELTA	SN	
	Power Rating	I/P: 100 - 240Vac, 1.7A, O/P: 19.5 Vdc, 3.34A		
	Power Cord	0.9 meter, non-shielded cable, w/o ferrite core 1.8 meter, non-shielded cable, w/o ferrite core(DC output cable) 0.12 meter, non-shielded cable, w/o ferrite core(DC to DC cable)		

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

2.4 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

2.5 Test Setup Diagram



3 Transmitter Test Result

3.1 AC Power-line Conducted Emissions

3.1.1 AC Power-line Conducted Emissions Limit

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

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

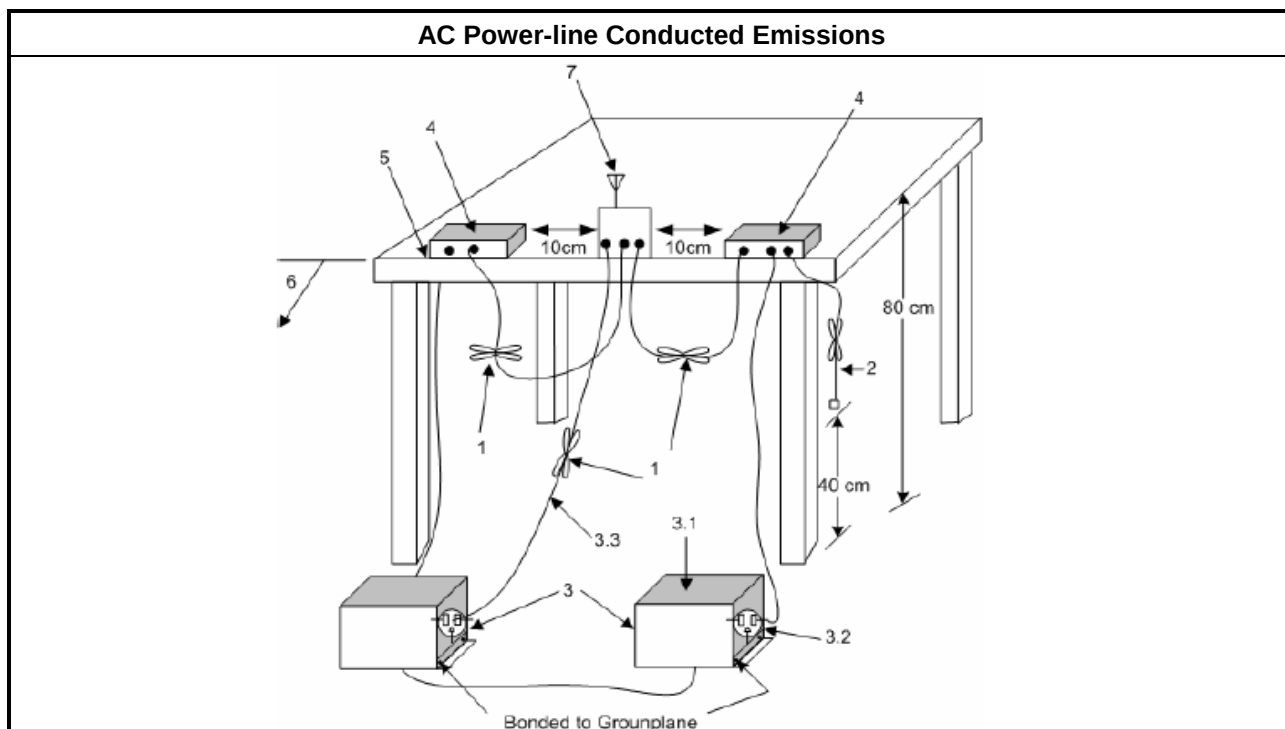
3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

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

3.1.4 Test Setup



3.1.5 Test Result of AC Power-line Conducted Emissions

Refer as Appendix A

3.2 Maximum Conducted Output Power

3.2.1 Maximum Conducted Output Power Limit

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

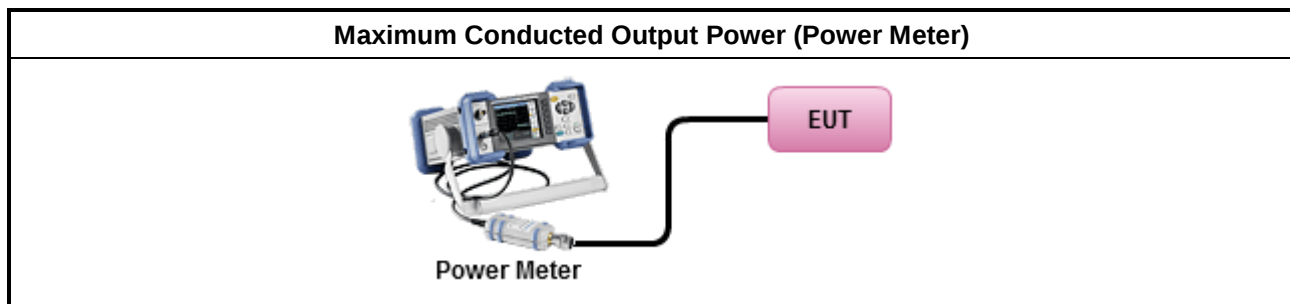
3.2.2 Measuring Instruments

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

3.2.3 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: $P_{total} = P_1 + P_2 + \dots + P_n$ (calculated in linear unit [mW] and transfer to log unit [dBm]) $EIRP_{total} = P_{total} + DG$	

3.2.4 Test Setup



3.2.5 Test Result of Maximum Conducted Output Power

Refer as Appendix B

3.3 Emissions in Restricted Frequency Bands

3.3.1 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.

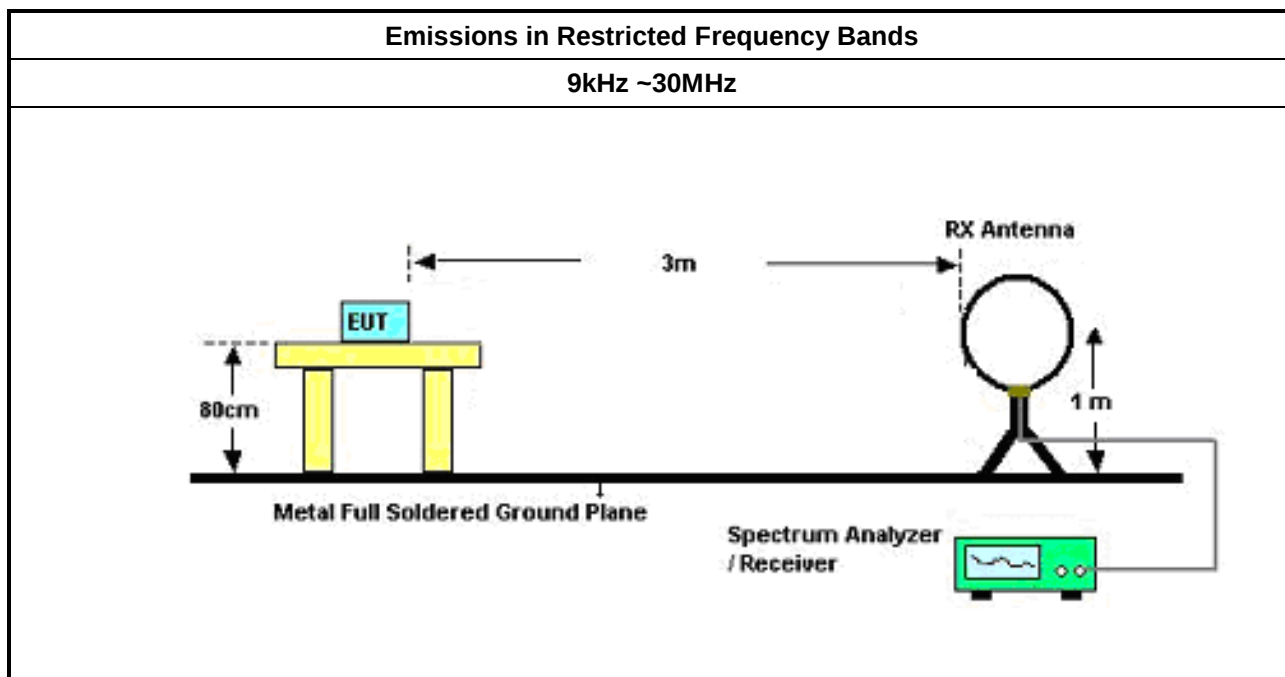
3.3.2 Measuring Instruments

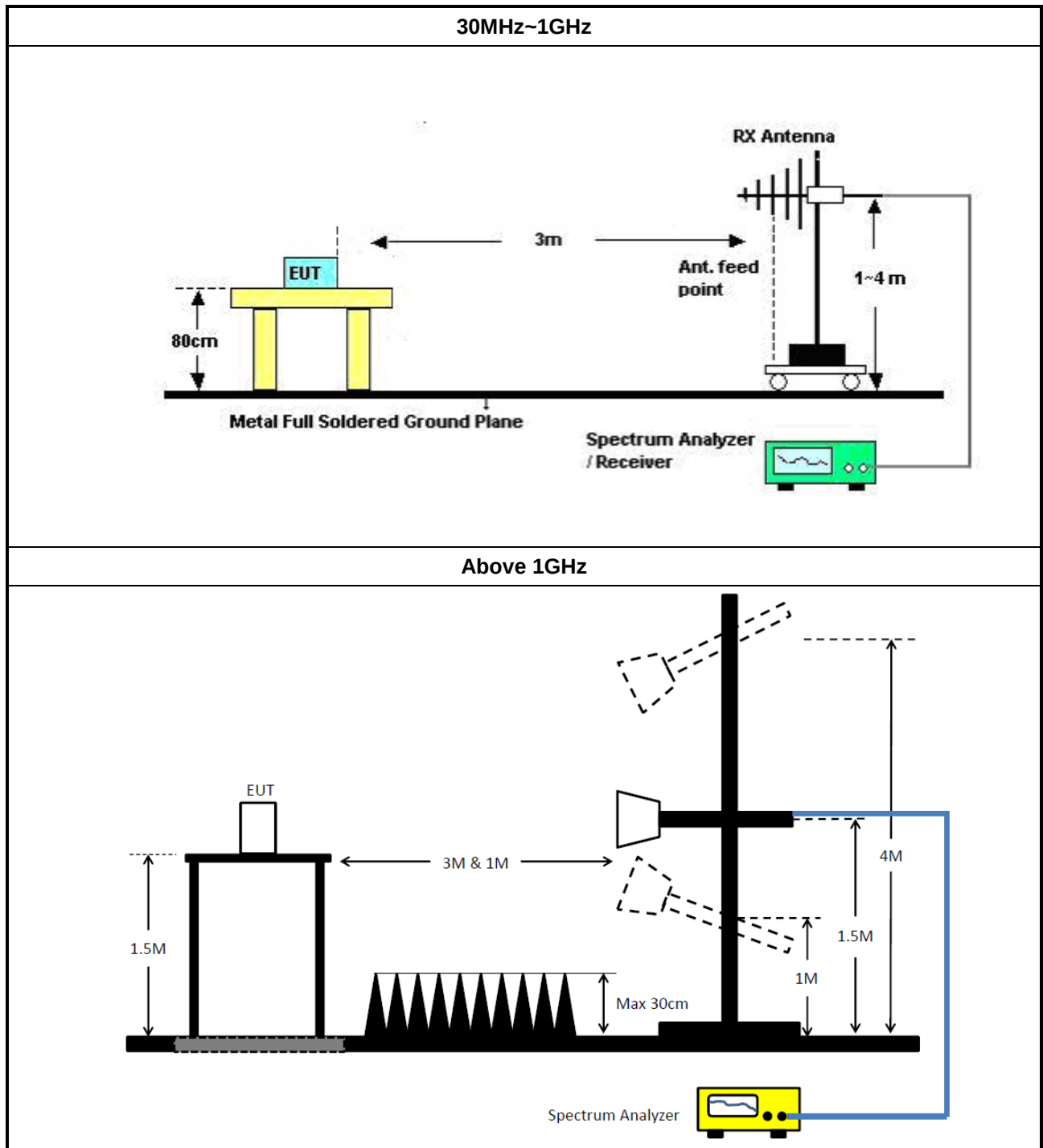
Refer a test equipment and calibration data table in this test report.

3.3.3 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 $f \geq 1$ GHz for peak measurement. For average measurement, refer as 1.1.4.

3.3.4 Test Setup





3.3.5 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.

3.3.6 Test Result of Emissions in Restricted Frequency Bands

Refer as Appendix C

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 Pulse Limiter	SCHWARZBECK	VTSD 9561-F	9561-F041	9 kHz ~ 30 MHz	12/Oct/2018	11/Oct/2019

NCR : Non-Calibration Require

Instrument for Conducted Test

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
Spectrum Analyzer	R&S	FSV 40	101013	9kHz~40GHz	30/Dec/2016	29/Dec/2017
Power Sensor	Anritsu	MA2411B	0917017	300MHz ~ 40GHz	10/Feb/2017	09/Feb/2018
Power Meter	Anritsu	ML2495A	0949003	300MHz ~ 40GHz	10/Feb/2017	09/Feb/2018
Signal Generator	R&S	SMR40	100116	10MHz ~ 40GHz	21/Jul/2016	20/Jul/2017
RF Cable-0.2m	HUBER+ SUHNER	SUCOFLEX_104	MY10710/4	30MHz ~ 26.5GHz	02/Oct/2016	01/Oct/2017
RF Cable-0.2m	HUBER+ SUHNER	SUCOFLEX_104	MY10709/4	30MHz ~ 26.5GHz	02/Oct/2016	01/Oct/2017
RF Cable-0.5m	HUBER+ SUHNER	SUCOFLEX_104	MY10713/4	30MHz ~ 26.5GHz	02/Oct/2016	01/Oct/2017
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	05/Feb/2018	04/Feb/2019
Power Meter	Anritsu	ML2495A	0949003	300MHz ~ 40GHz	05/Feb/2018	04/Feb/2019
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 0.2m	HUBER	MY10711/4	RF Cable - 01	30MHz~1G	11/Jan/2019	10/Jan/2020
Cable 0.2m	HUBER	MY10711/4	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
Cable 0.5m	HUBER	MY10714/4	RF Cable - 05	1G~18G	11/Jan/2019	10/Jan/2020

Instrument for Radiated Test

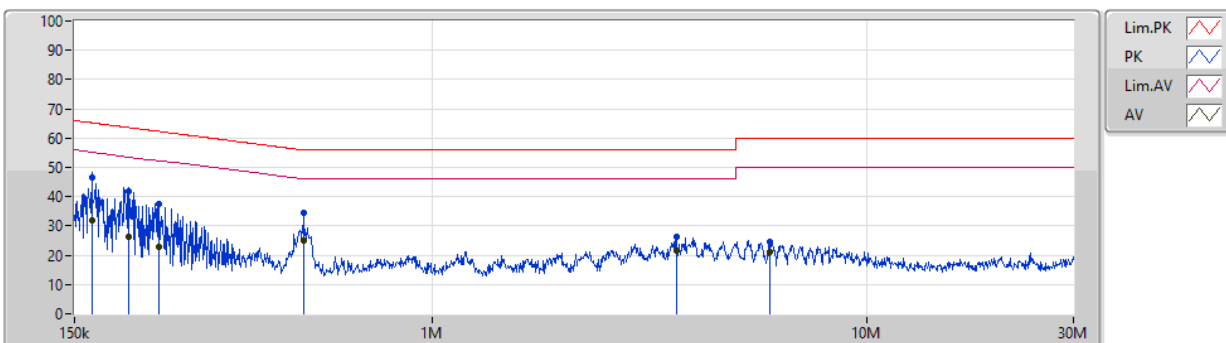
Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
3m Semi Anechoic Chamber	TDK	SAC-3M	03CH09-HY	30MHz ~ 1GHz	23/Apr/2018	22/Apr/2019
3m Semi Anechoic Chamber	TDK	SAC-3M	03CH09-HY	1GHz ~ 18GHz	14/Jun/2018	13/Jun/2019
Microwave Preamplifier	Agilent	8449B	3008A02096	1GHz ~ 26.5GHz	10/May/2018	09/May/2019
Amplifier	EMC	EMC9135	980232	9KHz~1GHz	27/Apr/2018	26/Apr/2019
EMI Test Receiver	R&S	ESR3	102052	9kHz ~ 3.6GHz	10/Apr/2018	09/Apr/2019
EXA Signal Analyzer	KEYSIGHT	N9010A	MY54200885	10Hz ~ 44GHz	31/Jul/2018	30/Jul/2019
Bilog Antenna & 5dB Attenuator	TESEQ & MTJ	CBL6111D & MTJ6102-05	35418 / 3	30MHz~1GHz	02/Oct/2018	03/Oct/2019
Double Ridged Guide Horn Antenna	SCHWARZBECK	BBHA 9120 D	BBHA9120 D 1534	1GHz~18GHz	30/Apr/2018	29/Apr/2019
Loop Antenna	TESEQ	HLA 6120	31244	9k-30MHz	29/Mar/2018	28/Mar/2019
RF Cable-R03m	Jye Bao	RG142	CB031	9kHz ~ 1GHz	1/Feb/2018	31/Jan/2019
RF Cable-high	HUBER+SUHNER	SUCOFLEX104	SN 556626/4 + 556627	1GHz ~ 40GHz	14/Mar/2018	13/Mar/2019
RF Cable-high	SUHNER	SUCOFLEX104	MY34918/4	1GHz ~ 40GHz	14/Mar/2018	13/Mar/2019

AC Power-line Conducted Emissions Result

Operating Mode	1	Power Phase	Neutral
Operating Function	Adapter Mode		

AC Conduction

24/01/2019



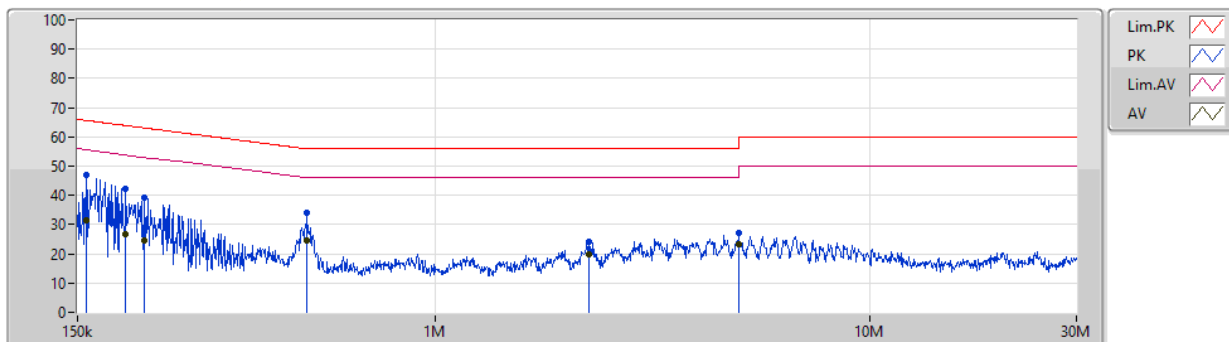
Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)			
QP	164.425k	46.66	65.24	-18.58	19.48	Neutral	"Worst"	27.18	9.60	0.01	9.87			
AV	164.425k	31.78	55.24	-23.46	19.48	Neutral	-	12.30	9.60	0.01	9.87			
QP	199.949k	41.73	63.61	-21.88	19.47	Neutral	-	22.26	9.59	0.01	9.87			
AV	199.949k	26.48	53.61	-27.13	19.47	Neutral	-	7.01	9.59	0.01	9.87			
QP	234.567k	37.41	62.29	-24.88	19.47	Neutral	-	17.94	9.59	0.01	9.87			
AV	234.567k	22.99	52.29	-29.30	19.47	Neutral	-	3.52	9.59	0.01	9.87			
QP	504.824k	34.35	56.00	-21.65	19.48	Neutral	-	14.87	9.59	0.01	9.88			
AV	504.824k	25.13	46.00	-20.87	19.48	Neutral	-	5.65	9.59	0.01	9.88			
QP	3.656M	26.10	56.00	-29.90	19.54	Neutral	-	6.56	9.61	0.04	9.89			
AV	3.656M	21.65	46.00	-24.35	19.54	Neutral	-	2.11	9.61	0.04	9.89			
QP	5.998M	24.76	60.00	-35.24	19.59	Neutral	-	5.17	9.64	0.06	9.89			
AV	5.998M	21.19	50.00	-28.81	19.59	Neutral	-	1.60	9.64	0.06	9.89			

AC Power-line Conducted Emissions Result

Operating Mode	1	Power Phase	Line
Operating Function	Adapter Mode		

AC Conduction

24/01/2019



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)			
QP	157.361k	46.82	65.60	-18.78	19.48	Line	"Worst"	27.34	9.60	0.01	9.87			
AV	157.361k	31.40	55.60	-24.20	19.48	Line	-	11.92	9.60	0.01	9.87			
QP	193.664k	42.23	63.88	-21.65	19.48	Line	-	22.75	9.60	0.01	9.87			
AV	193.664k	26.91	53.88	-26.97	19.48	Line	-	7.43	9.60	0.01	9.87			
QP	213.989k	39.43	63.06	-23.63	19.48	Line	-	19.95	9.60	0.01	9.87			
AV	213.989k	24.46	53.06	-28.60	19.48	Line	-	4.98	9.60	0.01	9.87			
QP	504.824k	34.03	56.00	-21.97	19.48	Line	-	14.55	9.59	0.01	9.88			
AV	504.824k	24.54	46.00	-21.46	19.48	Line	-	5.06	9.59	0.01	9.88			
QP	2.265M	24.02	56.00	-31.98	19.55	Line	-	4.47	9.62	0.04	9.89			
AV	2.265M	19.83	46.00	-26.17	19.55	Line	-	0.28	9.62	0.04	9.89			
QP	5M	27.13	60.00	-32.87	19.58	Line	-	7.55	9.64	0.05	9.89			
AV	5M	23.36	50.00	-26.64	19.58	Line	-	3.78	9.64	0.05	9.89			

**Summary**

Mode	Power (dBm)	Power (W)
2.4-2.4835GHz	-	-
BT-LE(1Mbps)	9.53	0.00897

Result

Mode	Result	Gain (dBi)	Power (dBm)	Power Limit (dBm)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	4.70	8.95	21.00
2440MHz	Pass	4.70	9.53	21.00
2480MHz	Pass	4.70	7.86	21.00

Summary

Mode	Power	Power
	(dBm)	(W)
2.4-2.4835GHz	-	-
BT-LE(1Mbps)	8.11	0.00647

Result

Mode	Result	Gain (dBi)	Power (dBm)	Power Limit (dBm)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	4.70	7.42	30.00
2440MHz	Pass	4.70	8.11	30.00
2480MHz	Pass	4.70	7.00	30.00

**Summary**

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	PK	30M	31.34	40.00	-8.66	-13.40	3	Vertical	360	1.00	-

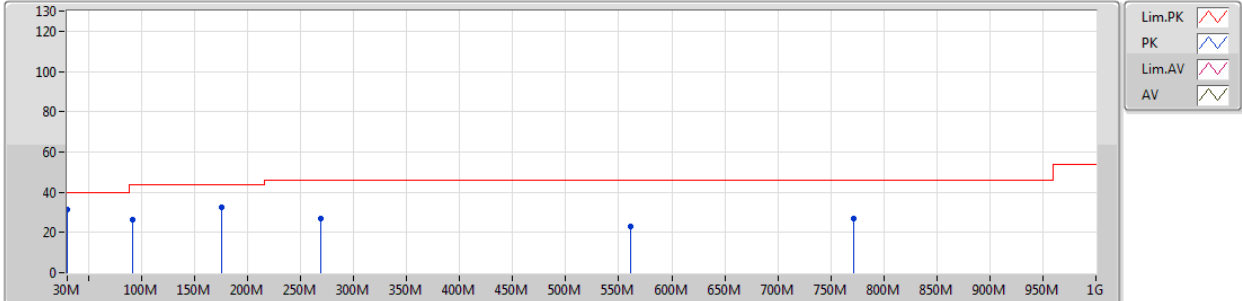
Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-	-
2440MHz	Pass	PK	30M	31.34	40.00	-8.66	-13.40	3	Vertical	360	1.00	-
2440MHz	Pass	PK	92.08M	26.22	43.50	-17.28	-22.15	3	Vertical	360	1.00	-
2440MHz	Pass	PK	175.5M	32.49	43.50	-11.01	-21.03	3	Vertical	360	1.00	-
2440MHz	Pass	PK	268.62M	26.78	46.00	-19.22	-16.26	3	Vertical	360	1.00	-
2440MHz	Pass	PK	561.56M	22.82	46.00	-23.18	-10.33	3	Vertical	360	1.00	-
2440MHz	Pass	PK	771.08M	26.85	46.00	-19.15	-8.18	3	Vertical	360	1.00	-
2440MHz	Pass	PK	55.22M	24.49	40.00	-15.51	-25.17	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	189.08M	33.45	43.50	-10.05	-21.38	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	253.1M	32.88	46.00	-13.12	-16.67	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	429.64M	22.31	46.00	-23.69	-13.12	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	650.8M	24.50	46.00	-21.50	-9.96	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	885.54M	27.72	46.00	-18.28	-6.96	3	Horizontal	0	1.00	-

BT-LE(1Mbps)

2440MHz_Adapter

31/01/2019

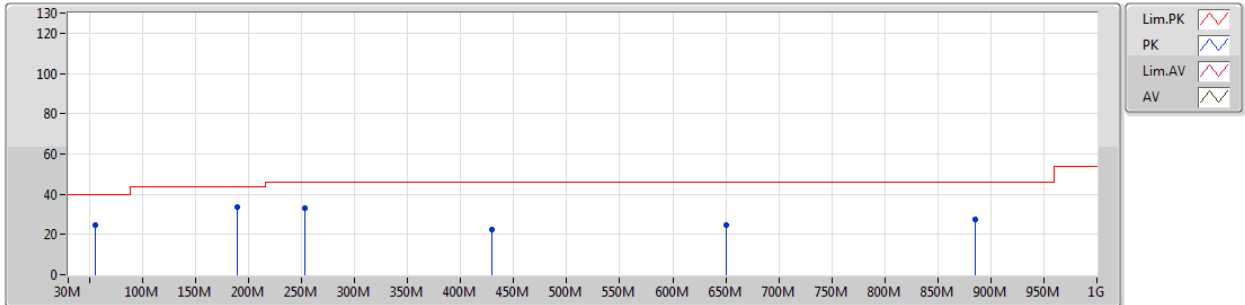


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
PK	30M	31.34	40.00	-8.66	-13.40	3	Vertical	360	1.00	-
PK	92.08M	26.22	43.50	-17.28	-22.15	3	Vertical	360	1.00	-
PK	175.5M	32.49	43.50	-11.01	-21.03	3	Vertical	360	1.00	-
PK	268.62M	26.78	46.00	-19.22	-16.26	3	Vertical	360	1.00	-
PK	561.56M	22.82	46.00	-23.18	-10.33	3	Vertical	360	1.00	-
PK	771.08M	26.85	46.00	-19.15	-8.18	3	Vertical	360	1.00	-

BT-LE(1Mbps)

2440MHz_Adapter

31/01/2019



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
PK	55.22M	24.49	40.00	-15.51	-25.17	3	Horizontal	0	1.00	-
PK	189.08M	33.45	43.50	-10.05	-21.38	3	Horizontal	0	1.00	-
PK	253.1M	32.88	46.00	-13.12	-16.67	3	Horizontal	0	1.00	-
PK	429.64M	22.31	46.00	-23.69	-13.12	3	Horizontal	0	1.00	-
PK	650.8M	24.50	46.00	-21.50	-9.96	3	Horizontal	0	1.00	-
PK	885.54M	27.72	46.00	-18.28	-6.96	3	Horizontal	0	1.00	-



RSE TX above 1GHz Result

Appendix C.2

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	4.80346G	48.13	54.00	-5.87	2.08	3	Horizontal	351	2.99	-

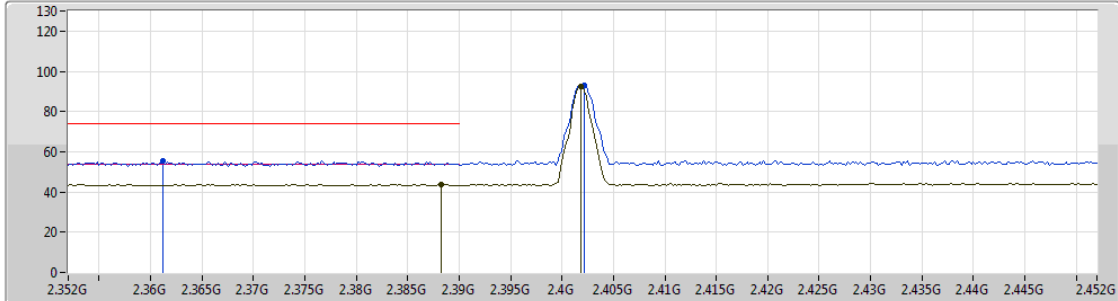
Result

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	2.3882G	43.83	54.00	-10.17	30.77	3	Vertical	15	1.69	-
2402MHz	Pass	AV	2.4018G	92.28	Inf	-Inf	30.82	3	Vertical	15	1.69	-
2402MHz	Pass	PK	2.3612G	55.24	74.00	-18.76	30.67	3	Vertical	15	1.69	-
2402MHz	Pass	PK	2.4022G	92.98	Inf	-Inf	30.82	3	Vertical	15	1.69	-
2402MHz	Pass	AV	2.3804G	43.84	54.00	-10.16	30.75	3	Horizontal	348	2.85	-
2402MHz	Pass	AV	2.402G	105.06	Inf	-Inf	30.82	3	Horizontal	348	2.85	-
2402MHz	Pass	PK	2.3794G	55.98	74.00	-18.02	30.74	3	Horizontal	348	2.85	-
2402MHz	Pass	PK	2.4022G	105.75	Inf	-Inf	30.82	3	Horizontal	348	2.85	-
2402MHz	Pass	AV	4.80334G	38.69	54.00	-15.31	2.08	3	Vertical	118	2.47	-
2402MHz	Pass	PK	4.80334G	45.95	74.00	-28.05	2.08	3	Vertical	118	2.47	-
2402MHz	Pass	AV	4.80346G	48.13	54.00	-5.87	2.08	3	Horizontal	351	2.99	-
2402MHz	Pass	PK	4.80346G	52.20	74.00	-21.80	2.08	3	Horizontal	351	2.99	-
2440MHz	Pass	PK	2.3688G	55.53	74.00	-18.47	30.70	3	Vertical	252	2.69	-
2440MHz	Pass	AV	2.3884G	44.13	54.00	-9.87	30.77	3	Vertical	252	2.69	-
2440MHz	Pass	PK	2.4396G	95.96	Inf	-Inf	30.95	3	Vertical	252	2.69	-
2440MHz	Pass	AV	2.44G	95.32	Inf	-Inf	30.95	3	Vertical	252	2.69	-
2440MHz	Pass	PK	2.496G	55.91	74.00	-18.09	31.16	3	Vertical	252	2.69	-
2440MHz	Pass	AV	2.4916G	44.42	54.00	-9.58	31.14	3	Vertical	252	2.69	-
2440MHz	Pass	AV	2.3792G	43.87	54.00	-10.13	30.74	3	Horizontal	355	2.78	-
2440MHz	Pass	AV	2.44G	104.51	Inf	-Inf	30.95	3	Horizontal	355	2.78	-
2440MHz	Pass	AV	2.4884G	44.43	54.00	-9.57	31.13	3	Horizontal	355	2.78	-
2440MHz	Pass	PK	2.3652G	55.78	74.00	-18.22	30.69	3	Horizontal	355	2.78	-
2440MHz	Pass	PK	2.4404G	105.17	Inf	-Inf	30.95	3	Horizontal	355	2.78	-
2440MHz	Pass	PK	2.492G	55.69	74.00	-18.31	31.14	3	Horizontal	355	2.78	-
2440MHz	Pass	AV	4.87946G	32.34	54.00	-21.66	2.27	3	Vertical	355	2.43	-
2440MHz	Pass	PK	4.87946G	42.86	74.00	-31.14	2.27	3	Vertical	355	2.43	-
2440MHz	Pass	AV	4.87952G	36.30	54.00	-17.70	2.27	3	Horizontal	170	1.02	-
2440MHz	Pass	PK	4.87964G	44.47	74.00	-29.53	2.27	3	Horizontal	170	1.02	-
2480MHz	Pass	AV	2.4798G	94.88	Inf	-Inf	31.09	3	Vertical	22	2.41	-
2480MHz	Pass	AV	2.4972G	44.77	54.00	-9.23	31.16	3	Vertical	22	2.41	-
2480MHz	Pass	PK	2.4798G	95.58	Inf	-Inf	31.09	3	Vertical	22	2.41	-
2480MHz	Pass	PK	2.4852G	56.31	74.00	-17.69	31.12	3	Vertical	22	2.41	-
2480MHz	Pass	AV	2.4798G	104.05	Inf	-Inf	31.09	3	Horizontal	352	2.99	-
2480MHz	Pass	AV	2.4966G	44.62	54.00	-9.38	31.16	3	Horizontal	352	2.99	-
2480MHz	Pass	PK	2.4798G	104.74	Inf	-Inf	31.09	3	Horizontal	352	2.99	-
2480MHz	Pass	PK	2.4928G	55.82	74.00	-18.18	31.14	3	Horizontal	352	2.99	-
2480MHz	Pass	AV	4.95952G	35.35	54.00	-18.65	2.47	3	Vertical	172	2.03	-
2480MHz	Pass	PK	4.95952G	44.04	74.00	-29.96	2.47	3	Vertical	172	2.03	-
2480MHz	Pass	AV	4.95988G	42.29	54.00	-11.71	2.47	3	Horizontal	174	2.80	-
2480MHz	Pass	PK	4.95958G	50.91	74.00	-23.09	2.47	3	Horizontal	174	2.80	-

BT-LE(1Mbps)

2402MHz_TX

31/01/2019



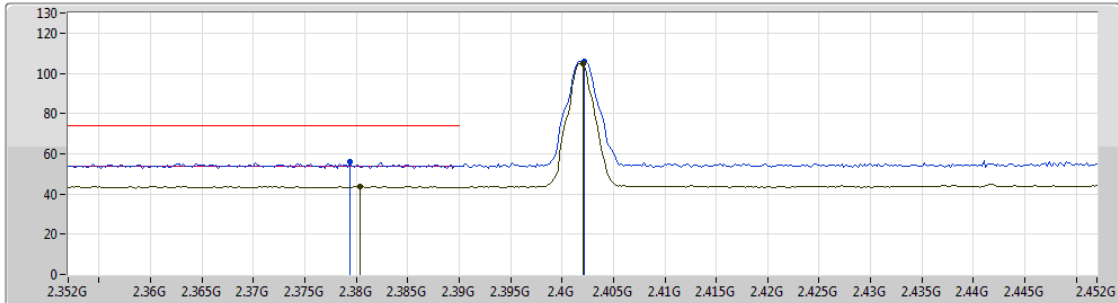
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AV	

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments								
AV	2.3882G	43.83	54.00	-10.17	30.77	3	Vertical	15	1.69	-								
AV	2.4018G	92.28	Inf	-Inf	30.82	3	Vertical	15	1.69	-								
PK	2.3612G	55.24	74.00	-18.76	30.67	3	Vertical	15	1.69	-								
PK	2.4022G	92.98	Inf	-Inf	30.82	3	Vertical	15	1.69	-								

BT-LE(1Mbps)

2402MHz_TX

31/01/2019



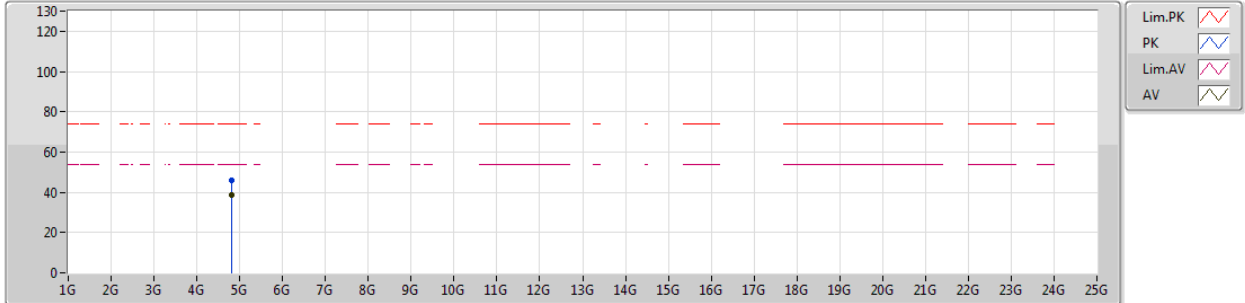
Lim.PK	
PK	
Lim.AV	
AV	

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments								
AV	2.3804G	43.84	54.00	-10.16	30.75	3	Horizontal	348	2.85	-								
AV	2.402G	105.06	Inf	-Inf	30.82	3	Horizontal	348	2.85	-								
PK	2.3794G	55.98	74.00	-18.02	30.74	3	Horizontal	348	2.85	-								
PK	2.4022G	105.75	Inf	-Inf	30.82	3	Horizontal	348	2.85	-								

BT-LE(1Mbps)

2402MHz_TX

31/01/2019

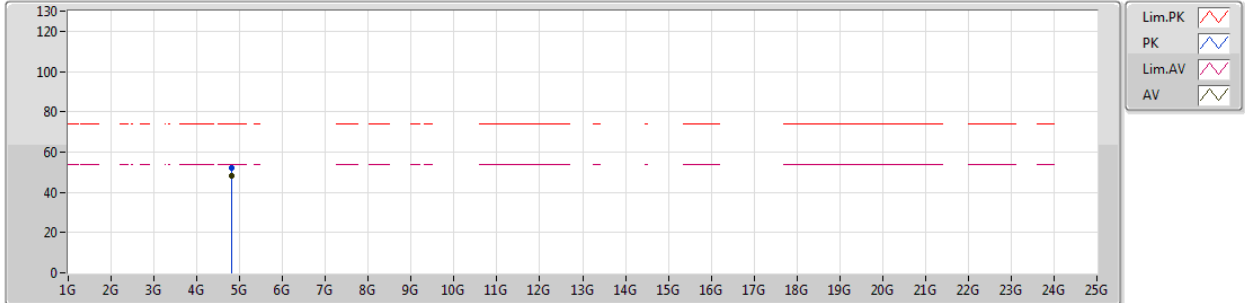


Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments								
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)		(m)		(°)	(m)									
AV	4.80334G	38.69	54.00	-15.31	2.08	3	Vertical	118	2.47	-								
PK	4.80334G	45.95	74.00	-28.05	2.08	3	Vertical	118	2.47	-								

BT-LE(1Mbps)

2402MHz_TX

31/01/2019

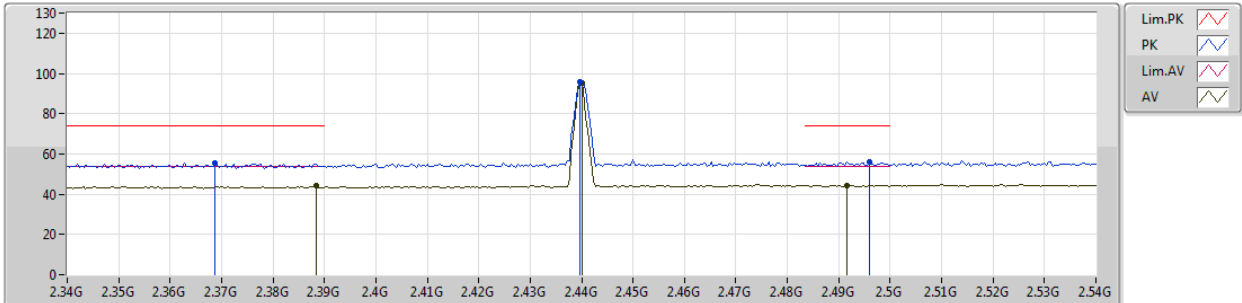


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
AV	4.80346G	48.13	54.00	-5.87	2.08	3	Horizontal	351	2.99	-
PK	4.80346G	52.20	74.00	-21.80	2.08	3	Horizontal	351	2.99	-

BT-LE(1Mbps)

2440MHz_TX

31/01/2019

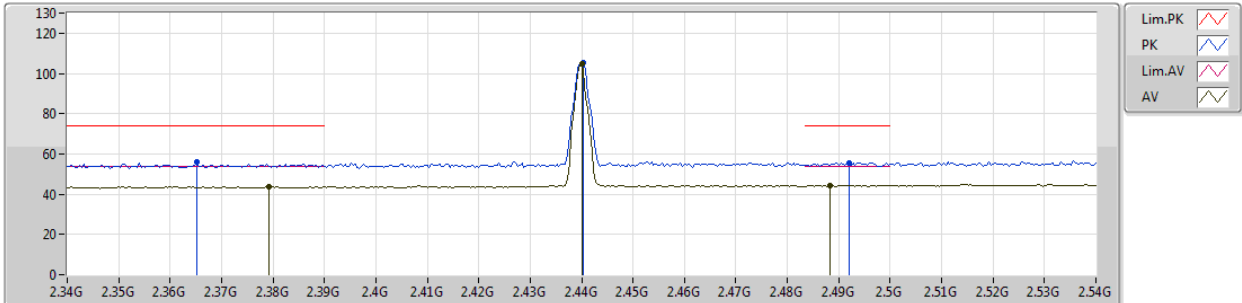


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
PK	2.3688G	55.53	74.00	-18.47	30.70	3	Vertical	252	2.69	-
AV	2.3884G	44.13	54.00	-9.87	30.77	3	Vertical	252	2.69	-
PK	2.4396G	95.96	Inf	-Inf	30.95	3	Vertical	252	2.69	-
AV	2.44G	95.32	Inf	-Inf	30.95	3	Vertical	252	2.69	-
PK	2.496G	55.91	74.00	-18.09	31.16	3	Vertical	252	2.69	-
AV	2.4916G	44.42	54.00	-9.58	31.14	3	Vertical	252	2.69	-

BT-LE(1Mbps)

2440MHz_TX

31/01/2019

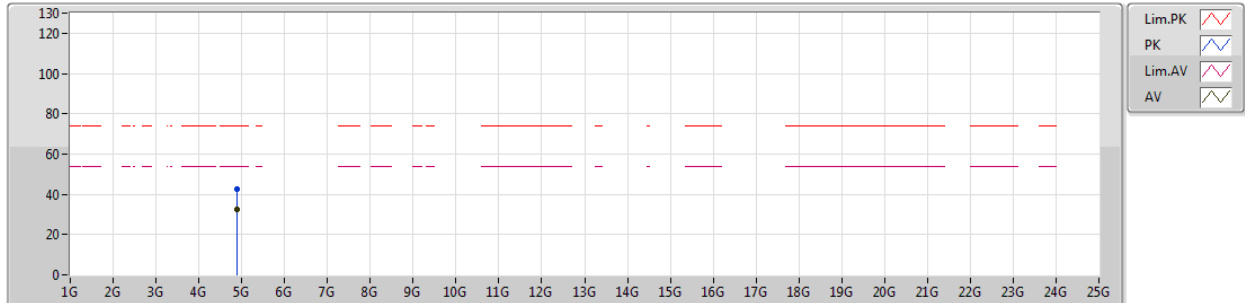


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
AV	2.3792G	43.87	54.00	-10.13	30.74	3	Horizontal	355	2.78	-
AV	2.44G	104.51	Inf	-Inf	30.95	3	Horizontal	355	2.78	-
AV	2.4884G	44.43	54.00	-9.57	31.13	3	Horizontal	355	2.78	-
PK	2.3652G	55.78	74.00	-18.22	30.69	3	Horizontal	355	2.78	-
PK	2.4404G	105.17	Inf	-Inf	30.95	3	Horizontal	355	2.78	-
PK	2.492G	55.69	74.00	-18.31	31.14	3	Horizontal	355	2.78	-

BT-LE(1Mbps)

2440MHz_TX

31/01/2019

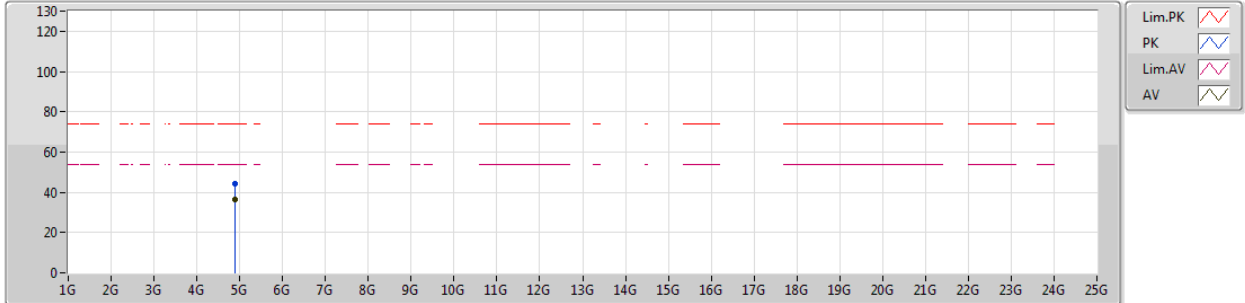


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments								
AV	4.87946G	32.34	54.00	-21.66	2.27	3	Vertical	355	2.43	-								
PK	4.87946G	42.86	74.00	-31.14	2.27	3	Vertical	355	2.43	-								

BT-LE(1Mbps)

2440MHz_TX

31/01/2019

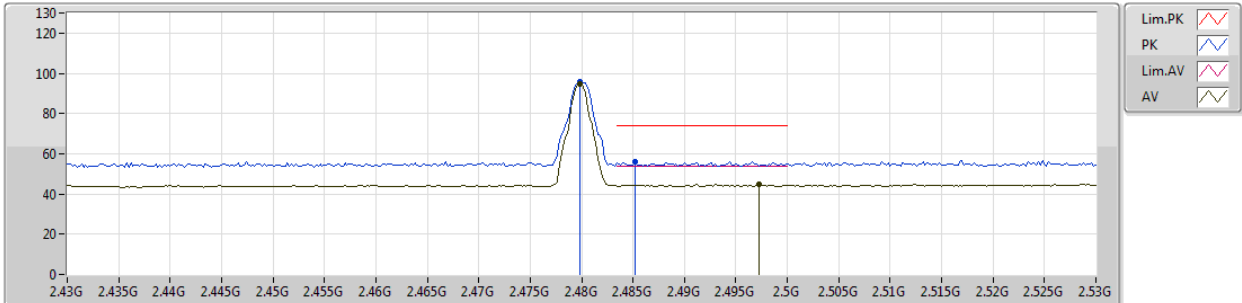


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
AV	4.87952G	36.30	54.00	-17.70	2.27	3	Horizontal	170	1.02	-
PK	4.87964G	44.47	74.00	-29.53	2.27	3	Horizontal	170	1.02	-

BT-LE(1Mbps)

2480MHz_TX

31/01/2019

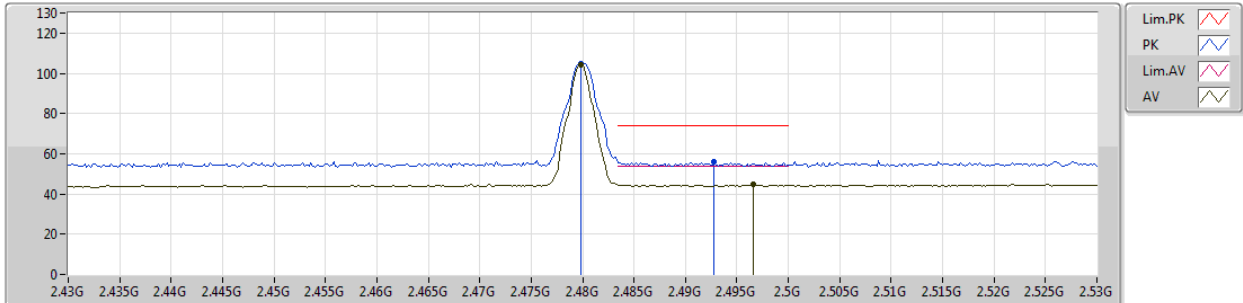


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
AV	2.4798G	94.88	Inf	-Inf	31.09	3	Vertical	22	2.41	-
AV	2.4972G	44.77	54.00	-9.23	31.16	3	Vertical	22	2.41	-
PK	2.4798G	95.58	Inf	-Inf	31.09	3	Vertical	22	2.41	-
PK	2.4852G	56.31	74.00	-17.69	31.12	3	Vertical	22	2.41	-

BT-LE(1Mbps)

2480MHz_TX

31/01/2019

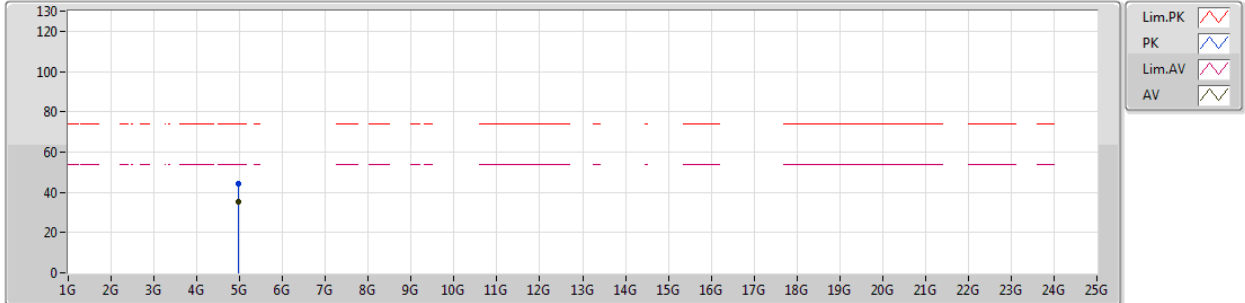


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
AV	2.4798G	104.05	Inf	-Inf	31.09	3	Horizontal	352	2.99	-
AV	2.4966G	44.62	54.00	-9.38	31.16	3	Horizontal	352	2.99	-
PK	2.4798G	104.74	Inf	-Inf	31.09	3	Horizontal	352	2.99	-
PK	2.4928G	55.82	74.00	-18.18	31.14	3	Horizontal	352	2.99	-

BT-LE(1Mbps)

2480MHz_TX

31/01/2019

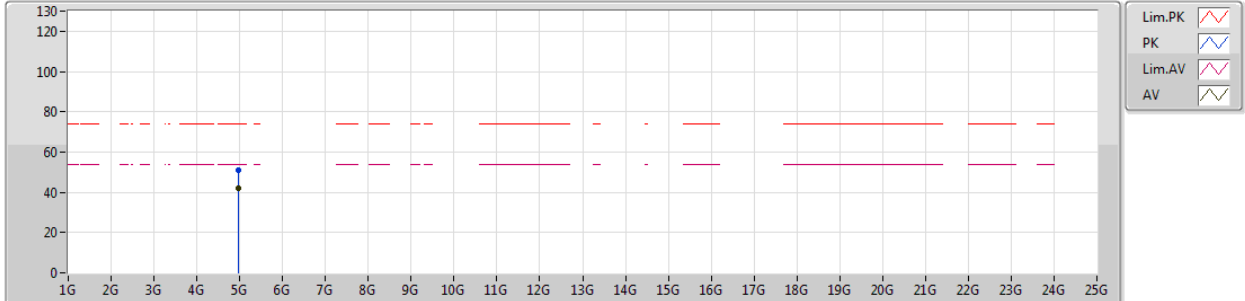


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
AV	4.95952G	35.35	54.00	-18.65	2.47	3	Vertical	172	2.03	-
PK	4.95952G	44.04	74.00	-29.96	2.47	3	Vertical	172	2.03	-

BT-LE(1Mbps)

2480MHz_TX

31/01/2019



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments								
AV	4.95988G	42.29	54.00	-11.71	2.47	3	Horizontal	174	2.80	-								
PK	4.95958G	50.91	74.00	-23.09	2.47	3	Horizontal	174	2.80	-								