FCC Test Report

FCC ID	:	**2AJOTTA-1113**
Equipment	:	**Smart Phone**
Brand Name	:	**NOKIA**
Model Name	:	**TA-1113**
Applicant	:	**HMD Global Oy** **Bertel Jungin aukio 9, 02600 Espoo, Finland**
Manufacturer	:	**HMD Global Oy** **Bertel Jungin aukio 9, 02600 Espoo, Finland**
Standard	:	**47 CFR FCC Part 15.247**

The product was received on Jul. 23, 2018, and testing was started from Aug. 20, 2018 and completed on Aug. 31, 2018. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2013 and shown compliance with the applicable technical standards.

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

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

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 Test Channel Mode 8
2.3 The Worst Case Measurement Configuration 9
2.4 Accessories and Support Equipment 10
2.5 Test Setup Diagram 11

3 TRANSMITTER TEST RESULT 13

3.1 AC Power-line Conducted Emissions 13
3.2 DTS Bandwidth 14
3.3 Maximum Conducted Output Power 15
3.4 Power Spectral Density 17
3.5 Emissions in Non-restricted Frequency Bands 18
3.6 Emissions in Restricted Frequency Bands 19

4 TEST EQUIPMENT AND CALIBRATION DATA 22

APPENDIX A. TEST RESULTS OF AC POWER-LINE CONDUCTED EMISSIONS

APPENDIX B. TEST RESULTS OF DTS BANDWIDTH

APPENDIX C. TEST RESULTS OF MAXIMUM CONDUCTED OUTPUT POWER

APPENDIX D. TEST RESULTS OF POWER SPECTRAL DENSITY

APPENDIX E. TEST RESULTS OF EMISSIONS IN NON-RESTRICTED FREQUENCY BANDS

APPENDIX F. TEST RESULTS OF EMISSIONS IN RESTRICTED FREQUENCY BANDS

APPENDIX G. TEST RESULTS OF RADIATED EMISSION CO-LOCATION

APPENDIX H. TEST PHOTOS

PHOTOGRAPHS OF EUT V01

History of this test report

Report No.	Version	Description	Issued Date
FR871938AL	01	Initial issue of report	Sep. 26, 2018

Summary of Test Result

Report Clause	Ref. Std. Clause	Test Items	Result (PASS/FAIL)	Remark
1.1.2	15.203	Antenna Requirement	PASS	FCC 15.203
3.1	15.207	AC Power-line Conducted Emissions	PASS	FCC 15.207
3.2	15.247(a)	DTS Bandwidth	PASS	≥500kHz
3.3	15.247(b)	Maximum Conducted Output Power	PASS	Power [dBm]:30
3.4	15.247(e)	Power Spectral Density	PASS	PSD [dBm/3kHz]:8
3.5	15.247(d)	Emissions in Non-restricted Frequency Bands	PASS	Non-Restricted Bands: >20 dBc
3.6	15.247(d)	Emissions in Restricted Frequency Bands	PASS	Restricted Bands: FCC 15.209

Reviewed by: Jackson Tsai

Report Producer: Michelle Tsai

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.	Port	Brand	Model Name	Antenna Type	Connector
1	1	-	32ROOW0051A	Monopole	mini Murata

Ant.	Port	Gain (dBi)	
		2.4G	BT
1	1	0.64	0.64

For 2.4GHz function:

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

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

For BT function:

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

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

1.1.3 EUT Information

Operational Condition				
EUT Power Type	From AC Adapter / Battery			
EUT Function	☒	Point-to-multipoint	☐	Point-to-point

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

1.1.4 Mode Test Duty Cycle

Mode	DC	DCF(dB)	T(s)	VBW(Hz) ≥ 1/T
BT-LE(1Mbps)	0.851	0.701	2.128m	1k

1.1.5 Table for Multiple Listing

There are two sample of EUT.

Sample No.	Description
Sample 1	Dual SIM with Battery 1 for Model TA-1113
Sample 2	Dual SIM with Battery 2 for Model TA-1113

Note: Sample1 configuration was 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 v05

1.3 Testing Location Information

Testing Location						
☒	HWA YA	ADD	:	No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)		
		TEL	:	886-3-327-3456	FAX :	886-3-327-0973
Test site Designation No. TW1190 with FCC.						
☐	JHUBEI	ADD	:	No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County, Taiwan (R.O.C.)		
		TEL	:	886-3-656-9065	FAX :	886-3-656-9085
Test site Designation No. TW0006 with FCC.						

Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
RF Conducted	TH06-HY	Tim	26.5°C / 65%	23/Aug/2018
Radiated	03CH03-HY	Jeff	28°C / 51%	20/Aug/2018
AC Conduction	CO04-HY	Jerry	24.5°C / 55.5%	31/Aug/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%
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	3.8V

2.2 Test Channel Mode

Test Software	-

Mode	PowerSetting
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	AC power-line conducted emissions
Condition	AC power-line conducted measurement for line and neutral
Operating Mode	CTX
1	Adapter Mode without earphone
2	Adapter Mode with earphone
Mode 1 configuration was tested and found to be the worst case and measured during the test.	

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 Receiver Radiated Unwanted Emissions		
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 without earphone		
2	Adapter Mode with earphone		
Mode 1 configuration was tested and found to be the worst case and measured during the test.			
Orthogonal Planes of EUT	**X Plane**	**Y Plane**	**Z Plane**
Worst Planes of EUT	V		

The Worst Case Mode for Following Conformance Tests	
Tests Item	Simultaneous Transmission Analysis
Test Condition	Radiated measurement
Operating Mode	Normal Link
1	Bluetooth+WLAN 2.4GHz
Refer to Sporton Test Report No.: Appendix G for Radiated Emission Co-location.	

2.4 Accessories and Support Equipment

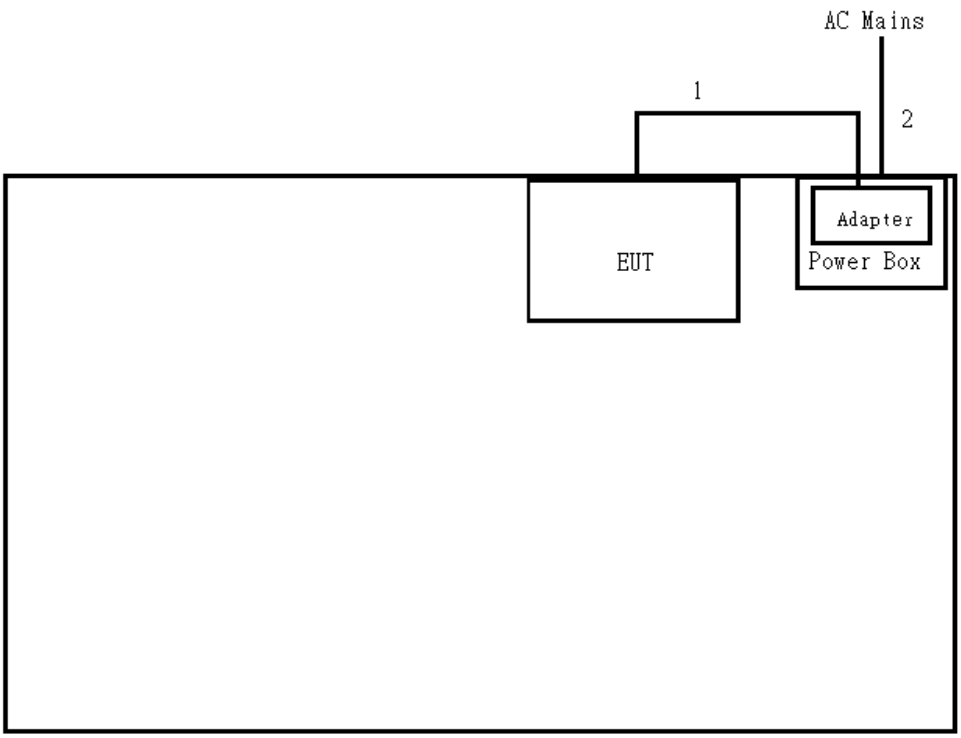
Accessories				
AC Adapter 1	Brand Name	Salcomp	Model Name	AD-10WU
	Power Rating	I/P: 100 - 240 Vac, 0.3 A, O/P: 5 Vdc, 2 A		
AC Adapter 2	Brand Name	Salcomp	Model Name	FC0102
	Power Rating	I/P: 100 - 240 Vac, 0.3 A, O/P: 5 Vdc, 2 A		
AC Adapter 3	Brand Name	DVE	Model Name	AD-10WU
	Power Rating	I/P: 100 - 240 Vac, 0.3 A, O/P: 5 Vdc, 2 A		
Battery 1	Brand Name	SCUD	Model Name	HE362
	Power Rating	4.4 Vdc, 3400 mAh	Type	Li-ion
Battery 2	Brand Name	McNair	Model Name	HE363
	Power Rating	4.4 Vdc, 3400 mAh	Type	Li-ion
Earphone 1	Brand Name	OBO	Model Name	WH-108
	Signal Line	1.5 meter, non-shielded cable, w/o ferrite core		
Earphone 2	Brand Name	FIT	Model Name	WH-108
	Signal Line	1.5 meter, non-shielded cable, w/o ferrite core		
USB Cable 1	Brand Name	Fuconn	Model Name	JCT022-F001
	Signal Line	1.0 meter, non-shielded cable, w/o ferrite core		
USB Cable 2	Brand Name	FIT	Model Name	CUBB01M-FA014-DH
	Signal Line	1.0 meter, non-shielded cable, w/o ferrite core		

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

Support Equipment – RF Conducted				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
1	DC Power Supply	GW	GPS-3030DD	-

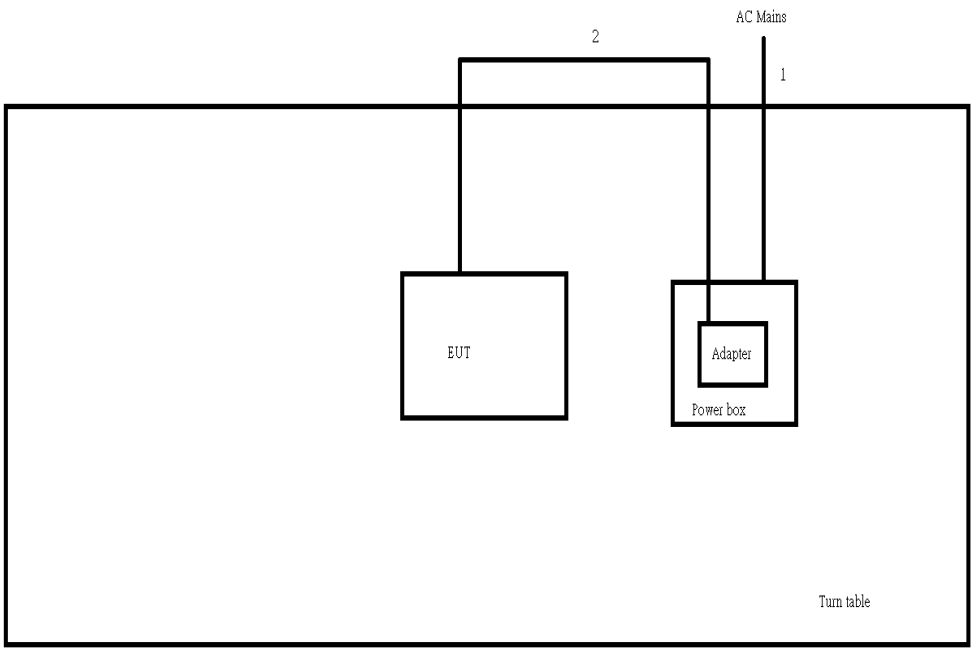
2.5 Test Setup Diagram

Test Setup Diagram – AC Line Conducted Emission Test



Item	Connection	Shielded	Length(m)	Remark
1	USB Cable	No	1.0	-
2	AC Power line	No	1.5	-

Test Setup Diagram - Radiated Test



Item	Connection	Shielded	Length(m)	Remark
1	AC Power line	No	1.5	-
2	USB Cable	No	1.0	-

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

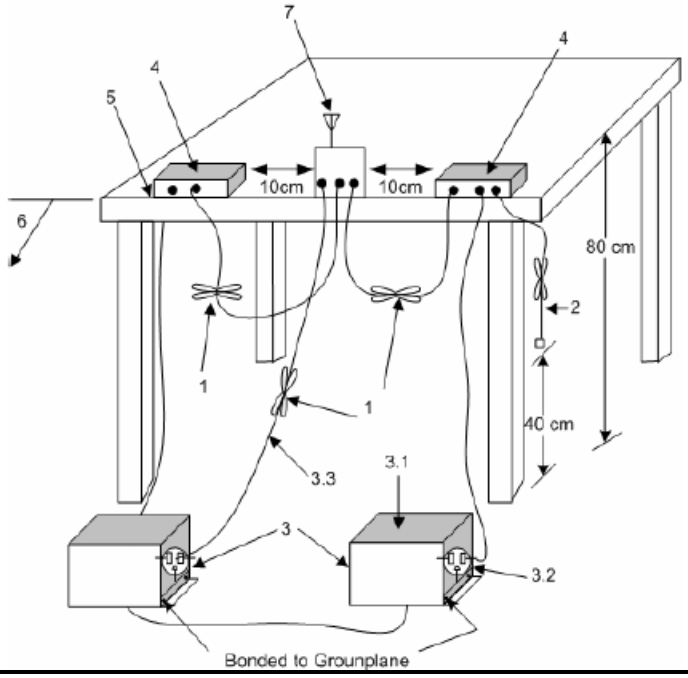
Refer a test equipment and calibration data table in this test report.

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

Refer as Appendix A

3.2 DTS Bandwidth

3.2.1 6dB Bandwidth Limit

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

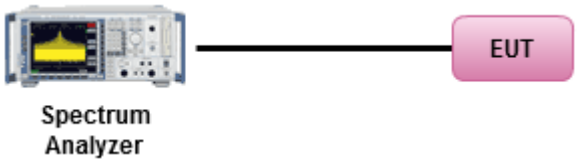
3.2.2 Measuring Instruments

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

3.2.3 Test Procedures

Test Method	
▪ For the emission bandwidth shall be measured using one of the options below:	
	☒ Refer as KDB 558074, clause 8.2 (11.9.2.2 of ANSI C63.10) DTS bandwidth measurement.
	☐ Refer as RSS-Gen, clause 6.7 for occupied bandwidth testing.
	☐ Refer as ANSI C63.10, clause 6.9.3 for occupied bandwidth testing.

3.2.4 Test Setup

Emission Bandwidth


3.2.5 Test Result of Emission Bandwidth

Refer as Appendix B

3.3 Maximum Conducted Output Power

3.3.1 Maximum Conducted Output Power Limit

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

3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

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

3.3.4 Test Setup

Maximum Conducted Output Power (Power Meter)

3.3.5 Test Result of Maximum Conducted Output Power

Refer as Appendix C

3.4 Power Spectral Density

3.4.1 Power Spectral Density Limit

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

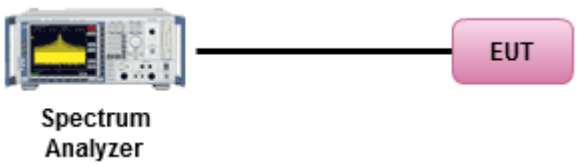
3.4.2 Measuring Instruments

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

3.4.3 Test Procedures

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

3.4.4 Test Setup

Power Spectral Density


3.4.5 Test Result of Power Spectral Density

Refer as Appendix D

3.5 Emissions in Non-restricted Frequency Bands

3.5.1 Emissions in Non-restricted Frequency Bands Limit

Un-restricted Band Emissions Limit	
RF output power procedure	**Limit (dB)**
Peak output power procedure	20
Average output power procedure	30
Note 1: If the peak output power procedure is used to measure the fundamental emission power to demonstrate compliance to requirements, then the peak conducted output power measured within any 100 kHz outside the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum measured in-band peak PSD level. Note 2: If the average output power procedure is used to measure the fundamental emission power to demonstrate compliance to requirements, then the power in any 100 kHz outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum measured in-band average PSD level.	

3.5.2 Measuring Instruments

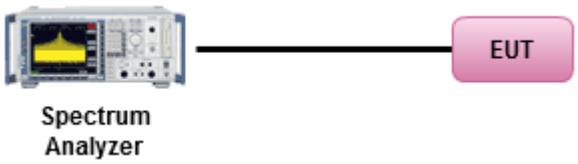
Refer a test equipment and calibration data table in this test report.

3.5.3 Test Procedures

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

3.5.4 Test Setup

Emissions in Non-restricted Frequency Bands



3.5.5 Test Result of Emissions in Non-restricted Frequency Bands

Refer as Appendix E

3.6 Emissions in Restricted Frequency Bands

3.6.1 Emissions in Restricted Frequency Bands Limit

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

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

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

Note 3: Using the distance of 1m during the test for above 18 GHz, and the test value to correct for the distance factor at 3m.

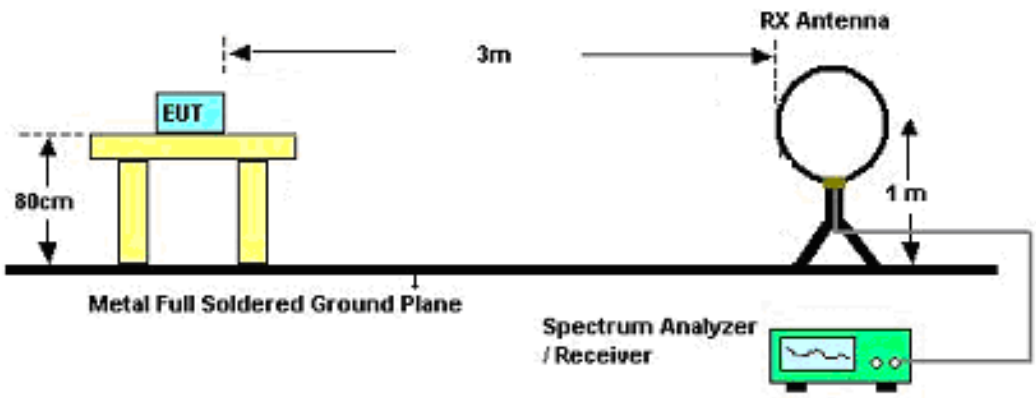
3.6.2 Measuring Instruments

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

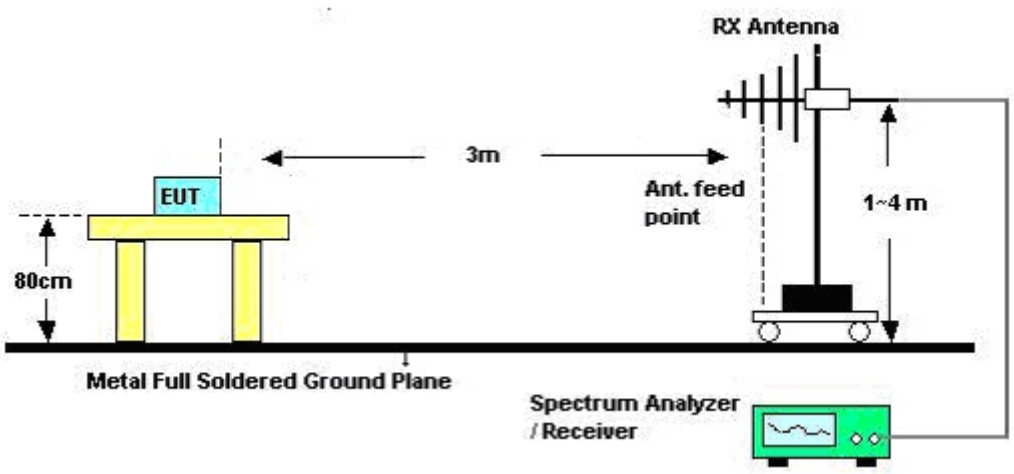
3.6.3 Test Procedures

Test Method	
▪ The average emission levels shall be measured in [duty cycle ≥ 98 or duty factor].	
▪ Refer as ANSI C63.10, clause 6.10.3 band-edge testing shall be performed at the lowest frequency channel and highest frequency channel within the allowed operating band.	
▪ For the transmitter unwanted emissions shall be measured using following options below:	
	▪ Refer as KDB 558074, clause 8.6 (11.12 of ANSI C63.10) for restricted frequency bands.
▪ For the transmitter band-edge emissions shall be measured using following options below:	
	▪ Refer as KDB 558074 clause 8.7.1, When the performing peak or average radiated measurements, emissions within 2 MHz of the authorized band edge may be measured using the marker-delta method described below.
	▪ Refer as KDB 558074, clause 8.7.2 (6.10.6 of ANSI C63.10) for marker-delta method for band-edge measurements.
	▪ Refer as KDB 558074, clause 8.7.3 for narrower resolution bandwidth (100kHz) using the band power and summing the spectral levels (i.e., 1 MHz).

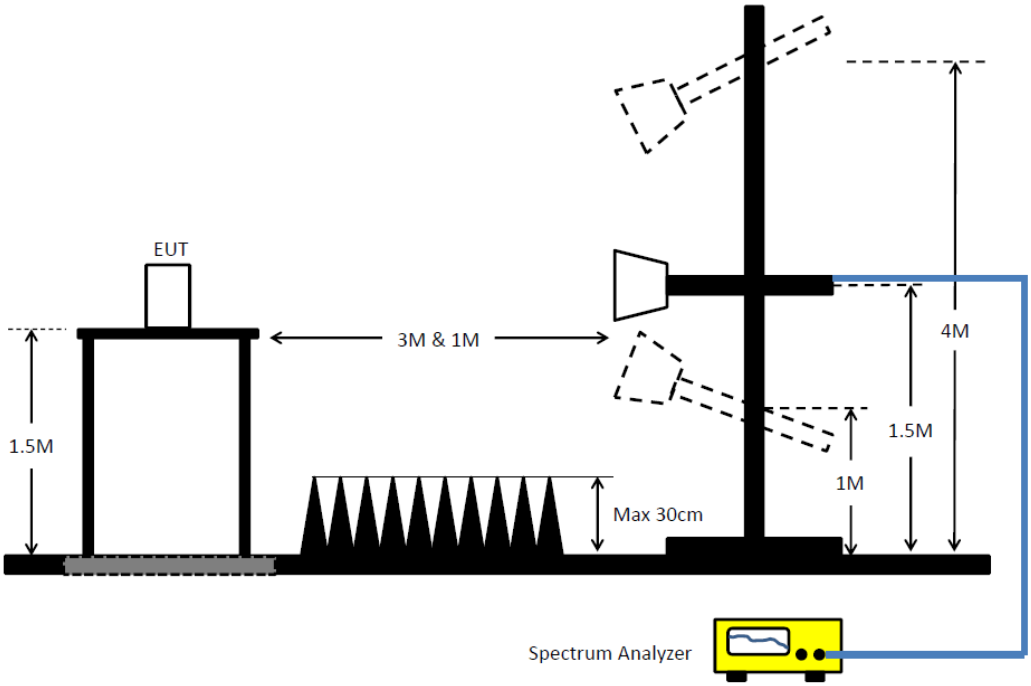
3.6.4 Test Setup

Emissions in Restricted Frequency Bands
9kHz ~30MHz


30MHz~1GHz



Above 1GHz



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

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

3.6.6 Test Result of Emissions in Restricted Frequency Bands

Refer as Appendix F

4 Test Equipment and Calibration Data

Instrument for AC Conduction

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
EMC Receiver	R&S	ESR	102051	9KHz ~ 3.6GHz	03/May/2018	02/May/2019
LISN	R&S	ENV216	101295	9kHz ~ 30MHz	17/Nov/2017	16/Nov/2018
RF Cable-CON	HUBER+SUHNER	RG213/U	07611832020001	9kHz ~ 30MHz	06/Oct/2017	05/Oct/2018
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/2017	11/Oct/2018

NCR : Non-Calibration Require.

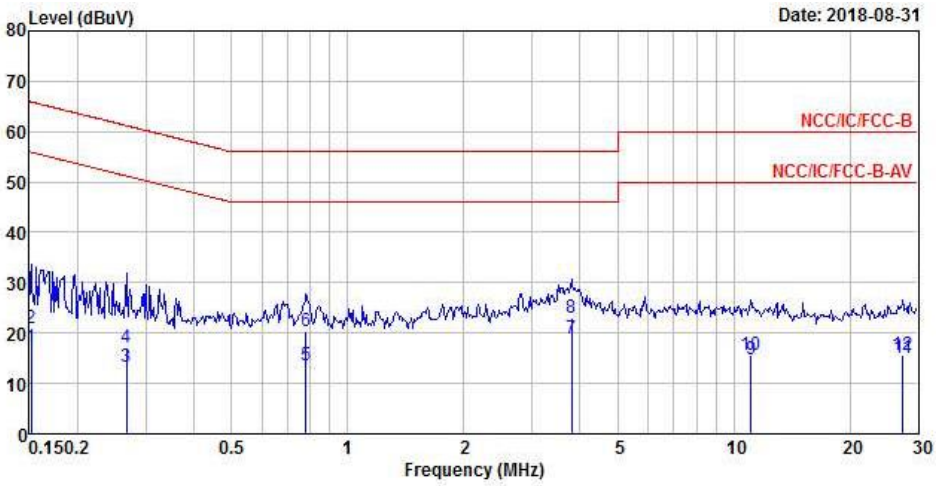
Instrument for Radiated Test

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30MHz ~ 1GHz 3m	31/Oct/2017	30/Oct/2018
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	1GHz ~ 18GHz 3m	01/Nov/2017	31/Oct/2018
Amplifier	HP	8447D	2944A08033	10kHz ~ 1.3GHz	23/Apr/2018	19/Apr/2019
Microwave System Preamplifier	KEYSIGHT	83017A	MY53270196	1GHz ~ 26.5GHz	31/Aug/2017	30/Aug/2018
Signal Analyzer	R&S	FSP40	100305	10Hz ~ 40GHz	04/Jan/2018	03/Jan/2019
RF Cable-R03m	Jye Bao	RG142	CB021	9kHz ~ 1GHz	29/Jan/2018	28/Jan/2019
RF Cable-high	SUHNER	SUCOFLEX 106	CB222	1GHz ~ 40GHz	29/Jan/2018	28/Jan/2019
Bilog Antenna	SCHAFFNER	CBL 6112B	2723	30MHz ~ 1GHz	09/Sep/2017	08/Sep/2018
Receiver	R&S	ESCS 30	100354	9kHz ~ 2.75GHz	08/Dec/2017	07/Dec/2018
Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA 9170154	18GHz ~ 40GHz	06/Feb/ 2018	05/Feb/2019
Double Ridged Guide Horn Antenna	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1531	1GHz ~ 18GHz	18/Apr/ 2018	17/Apr/2019
Loop Antenna	TESEQ	HLA 6120	31244	9kHz ~ 30MHz	28/Mar/2018	27/Mar/2019

Instrument for Conducted Test

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
Spectrum Analyzer	R&S	FSV 40	101013	9kHz~40GHz	29/Dec/2017	28/Dec/2018
Signal Generator	R&S	SMR 40	100116	10MHz ~ 40GHz	23/Jul/2018	22/Jul/2019
Pulse Power Sensor	Anritsu	MA2411B	1027452	300MHz ~ 40GHz	27/Feb/2018	26/Feb/2019
Power Meter	Anritsu	ML2495A	1124009	300MHz ~ 40GHz	27/Feb/2018	26/Feb/2019
CABLE 0.2m	HUBER	MY37960/4	RF Cable - 17	1 to 18GHz	17/Jan/2018	16/Jan/2019
CABLE 0.2m	HUBER	MY37960/4	RF Cable - 17	30 to 1000MHz	17/Jan/2018	16/Jan/2019
CABLE 0.5m	HUBER	MY37963/4	RF Cable - 22	1 to 18GHz	17/Jan/2018	16/Jan/2019

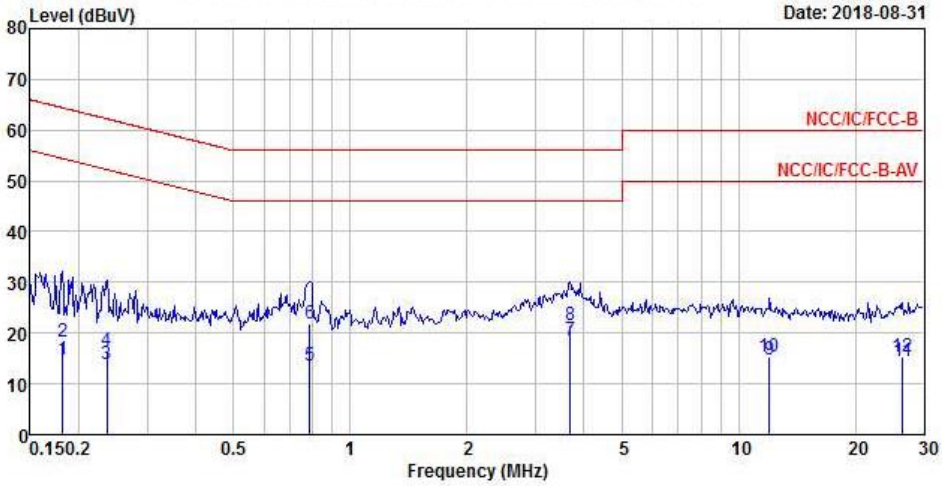
AC Power-line Conducted Emissions Result			
Operating Mode	1	**Power Phase**	Neutral
Operating Function	Adapter Mode without earphone		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.15	16.99	-38.92	55.91	7.32	9.63	0.04	Average
2	0.15	20.91	-45.00	65.91	11.24	9.63	0.04	QP
3	0.27	13.39	-37.81	51.20	3.73	9.62	0.04	Average
4	0.27	17.20	-44.00	61.20	7.54	9.62	0.04	QP
5	0.78	13.50	-32.50	46.00	3.85	9.62	0.03	Average
6	0.78	20.47	-35.53	56.00	10.82	9.62	0.03	QP
7 MAX	3.80	19.00	-27.00	46.00	9.28	9.64	0.08	Average
8	3.80	23.00	-33.00	56.00	13.28	9.64	0.08	QP
9	11.08	14.88	-35.12	50.00	5.04	9.69	0.15	Average
10	11.08	15.68	-44.32	60.00	5.84	9.69	0.15	QP
11	27.42	15.08	-34.92	50.00	5.24	9.69	0.15	Average
12	27.42	15.77	-44.23	60.00	5.93	9.69	0.15	QP

Note 1: “>20dB” means emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found emissions (No emissions were detected.)

AC Power-line Conducted Emissions Result			
Operating Mode	1	**Power Phase**	Line
Operating Function	Adapter Mode without earphone		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.18	14.89	-39.53	54.42	5.26	9.62	0.01	Average
2	0.18	18.34	-46.08	64.42	8.71	9.62	0.01	QP
3	0.24	13.92	-38.30	52.22	4.28	9.62	0.02	Average
4	0.24	16.54	-45.68	62.22	6.90	9.62	0.02	QP
5	0.79	13.50	-32.50	46.00	3.86	9.61	0.03	Average
6	0.79	21.90	-34.10	56.00	12.26	9.61	0.03	QP
7 MAX	3.68	18.61	-27.39	46.00	8.90	9.63	0.08	Average
8	3.68	21.43	-34.57	56.00	11.72	9.63	0.08	QP
9	12.00	14.65	-35.35	50.00	4.89	9.65	0.11	Average
10	12.00	15.27	-44.73	60.00	5.51	9.65	0.11	QP
11	26.42	14.51	-35.49	50.00	4.88	9.54	0.09	Average
12	26.42	15.35	-44.65	60.00	5.72	9.54	0.09	QP

Note 1: “>20dB” means emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found emissions (No emissions were detected.)

Summary

Mode	Max-N dB (Hz)	Max-OBW (Hz)	ITU-Code	Min-N dB (Hz)	Min-OBW (Hz)
2.4-2.4835GHz	-	-	-	-	-
BT-LE(1Mbps)	666.25k	1.038M	1M04F1D	663.75k	1.037M

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

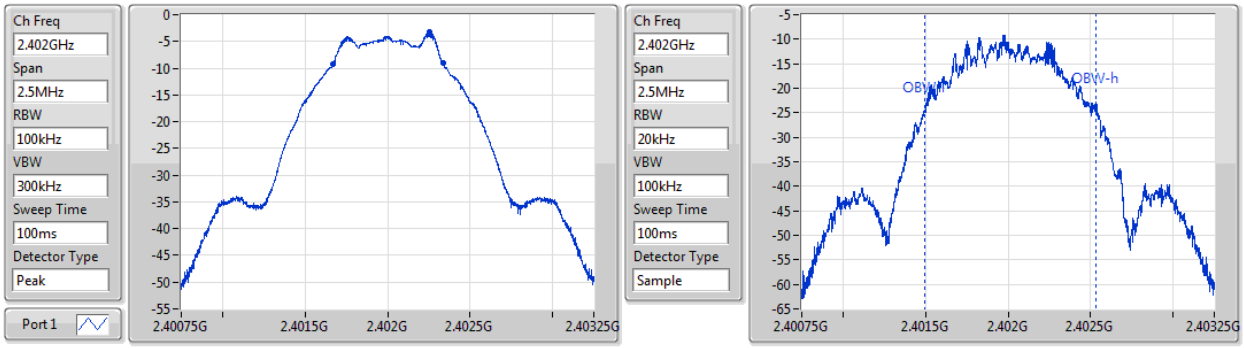
Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
BT-LE(1Mbps)	-	-	-	-
2402MHz_TnomVnom	Pass	500k	663.75k	1.038M
2440MHz_TnomVnom	Pass	500k	665k	1.038M
2480MHz_TnomVnom	Pass	500k	666.25k	1.037M

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

BT-LE(1Mbps) EBW

2402MHz

23/08/2018

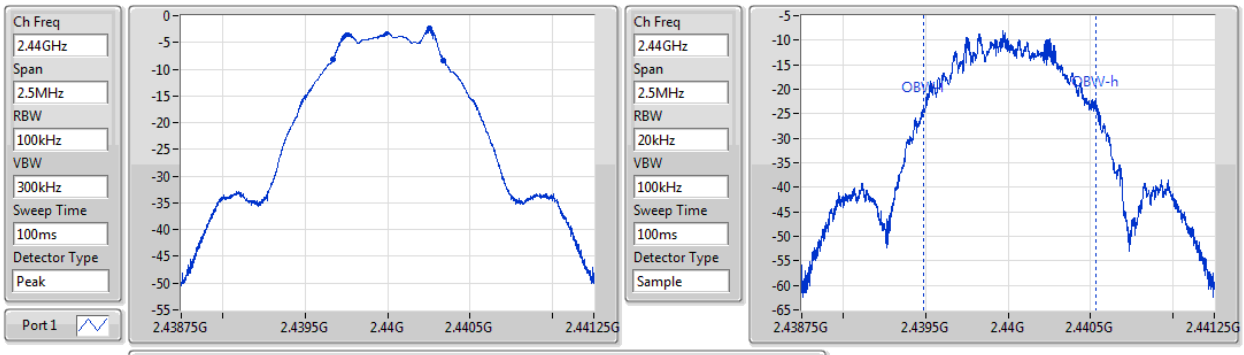


6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
663.75k	2.401671G	2.402335G	1.038M	2.401494G	2.402532G	500k	1

BT-LE(1Mbps) EBW

2440MHz

23/08/2018

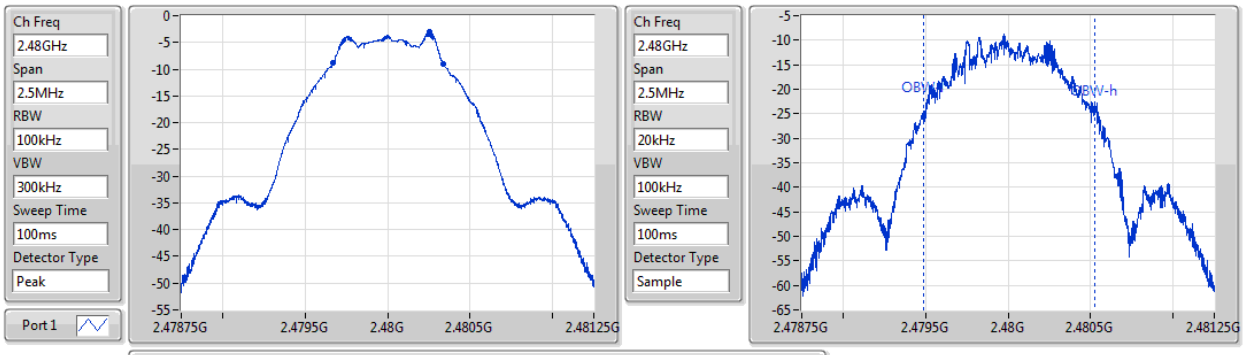


6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
665k	2.439671G	2.440336G	1.038M	2.439492G	2.44053G	500k	1

BT-LE(1Mbps) EBW

2480MHz

23/08/2018



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
666.25k	2.479671G	2.480338G	1.037M	2.479492G	2.480528G	500k	1

Summary

Mode	Power (dBm)	Power (W)
2.4-2.4835GHz	-	-
BT-LE(1Mbps)	-0.45	0.00090

Result

Mode	Result	Gain (dBi)	Power (dBm)	Power Limit (dBm)
BT-LE(1Mbps)	-	-	-	-
2402MHz_TnomVnom	Pass	0.64	-1.31	30.00
2440MHz_TnomVnom	Pass	0.64	-0.45	30.00
2480MHz_TnomVnom	Pass	0.64	-1.02	30.00

Summary

Mode	Power	Power
	(dBm)	(W)
2.4-2.4835GHz	-	-
BT-LE(1Mbps)	-1.81	0.00065

Result

Mode	Result	Gain (dBi)	Power (dBm)	Power Limit (dBm)
BT-LE(1Mbps)	-	-	-	-
2402MHz_TnomVnom	Pass	0.64	-2.92	30.00
2440MHz_TnomVnom	Pass	0.64	-1.81	30.00
2480MHz_TnomVnom	Pass	0.64	-2.57	30.00

Summary

Mode	PD (dBm/RBW)
2.4-2.4835GHz	-
BT-LE(1Mbps)	-19.00

RBW=3kHz.

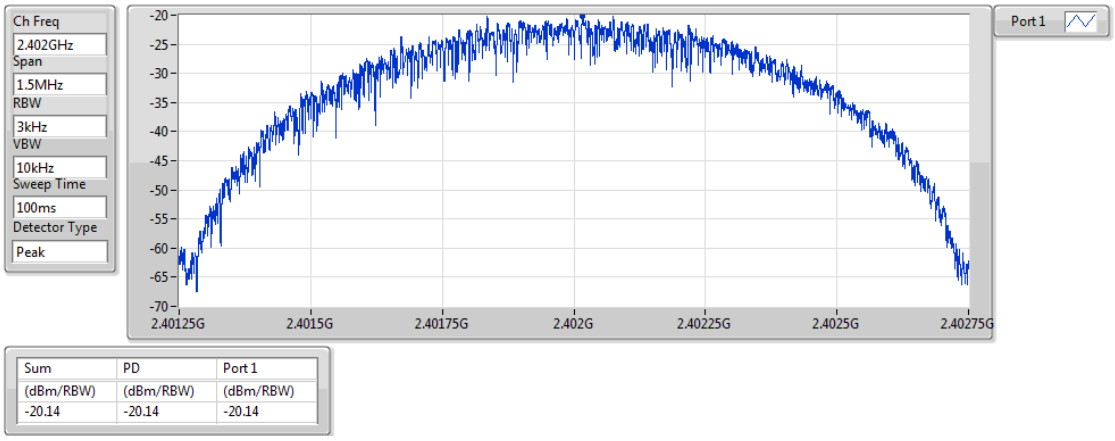
Result

Mode	Result	Gain (dBi)	PD (dBm/RBW)	PD Limit (dBm/RBW)
BT-LE(1Mbps)	-	-	-	-
2402MHz_TnomVnom	Pass	0.64	-20.14	8.00
2440MHz_TnomVnom	Pass	0.64	-19.00	8.00
2480MHz_TnomVnom	Pass	0.64	-19.57	8.00

RBW=3kHz.

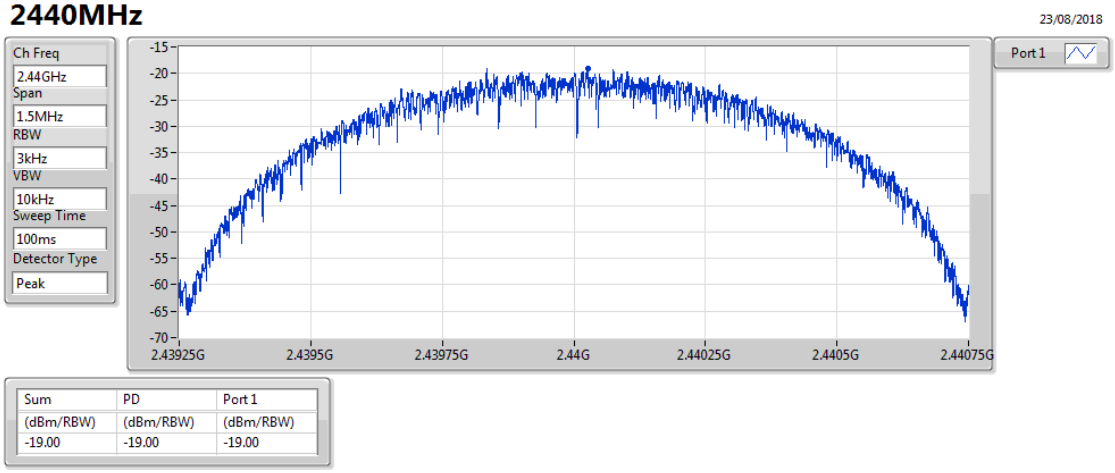
BT-LE(1Mbps) **PSD**

2402MHz



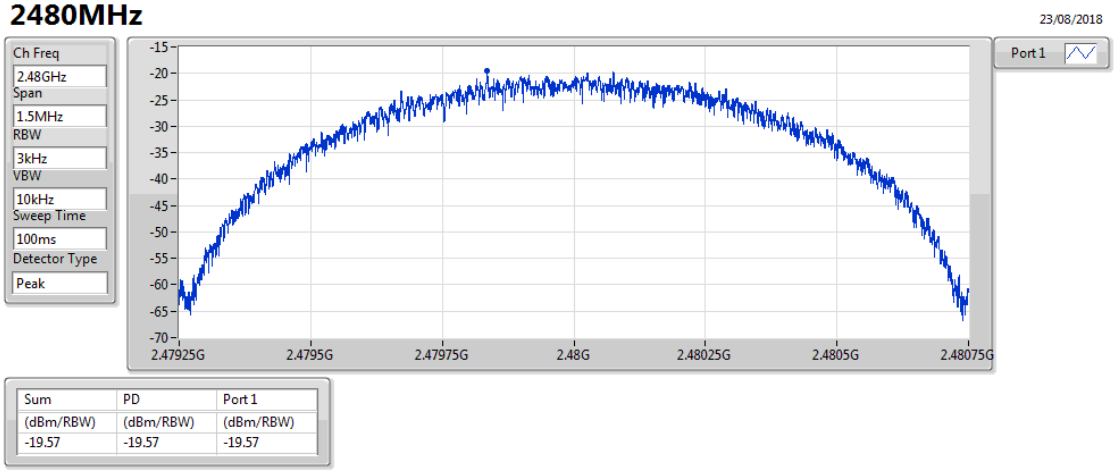
BT-LE(1Mbps) **PSD**

2440MHz



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

2480MHz



Summary

Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	2.479826G	-4.62	-24.62	2.120944G	-62.30	2.398192G	-61.75	2.483668G	-60.54	15.209007G	-52.60	1

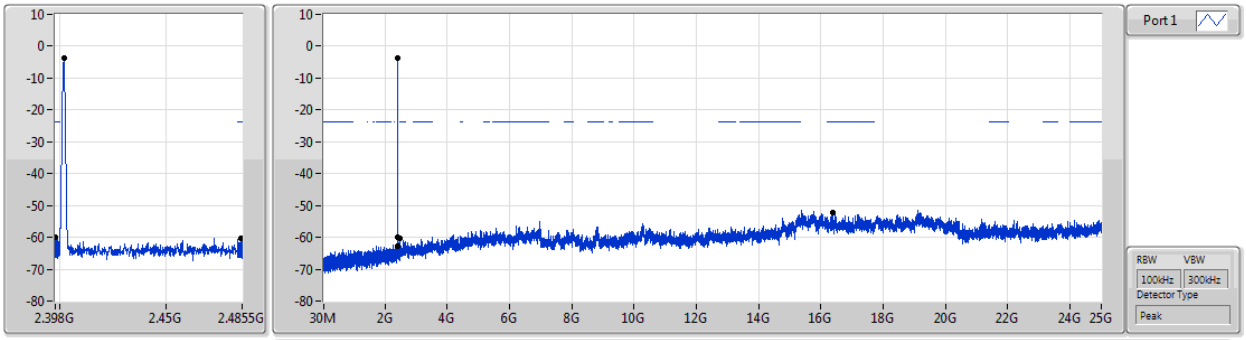
Result

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	2.402171G	-3.80	-23.80	2.395632G	-62.84	2.398188G	-59.85	2.484896G	-60.22	16.368504G	-52.39	1
2440MHz_TnomVnom	Pass	2.44008G	-3.97	-23.97	2.068848G	-61.72	2.398824G	-61.92	2.484508G	-60.75	16.376947G	-53.35	1
2480MHz_TnomVnom	Pass	2.479826G	-4.62	-24.62	2.120944G	-62.30	2.398192G	-61.75	2.483668G	-60.54	15.209007G	-52.60	1

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

2402MHz

23/08/2018

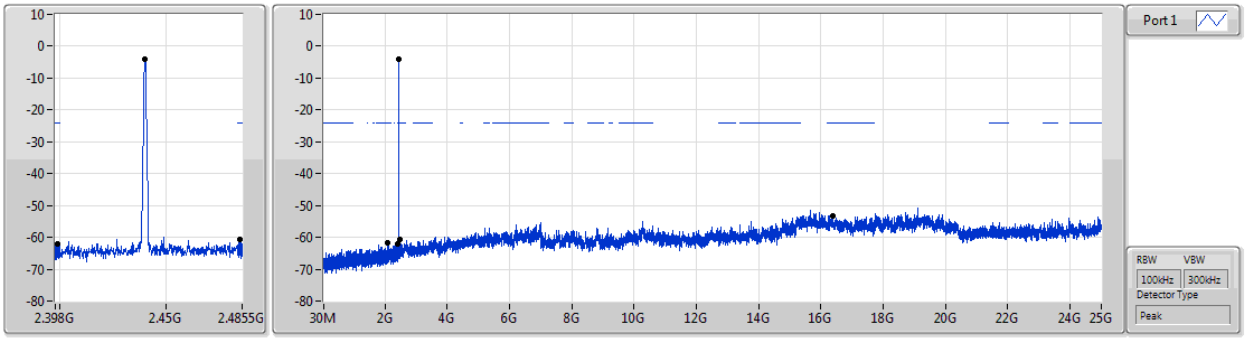


Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.402171G	-3.80	-23.80	2.395632G	-62.84	2.398188G	-59.85	2.484896G	-60.22	16.368504G	-52.39	1

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

2440MHz

23/08/2018

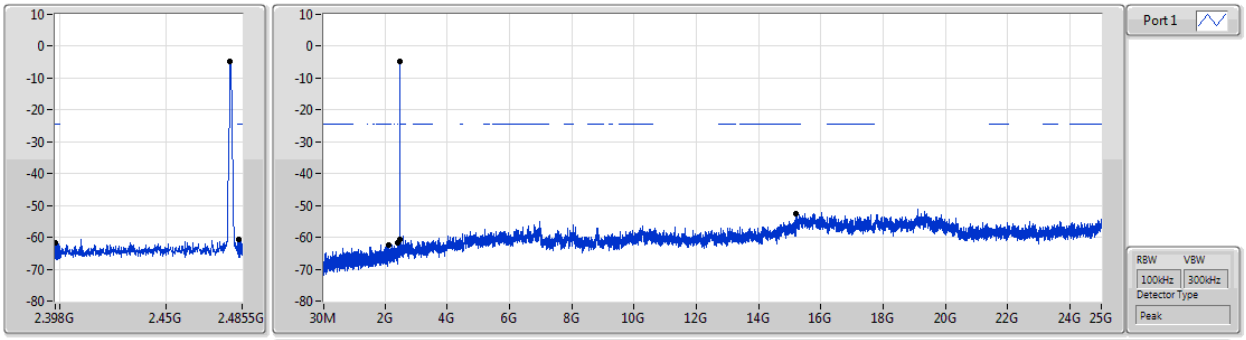


Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.44008G	-3.97	-23.97	2.068848G	-61.72	2.398824G	-61.92	2.484508G	-60.75	16.376947G	-53.35	1

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

2480MHz

23/08/2018



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.479826G	-4.62	-24.62	2.120944G	-62.30	2.398192G	-61.75	2.483668G	-60.54	15.209007G	-52.60	1

Summary

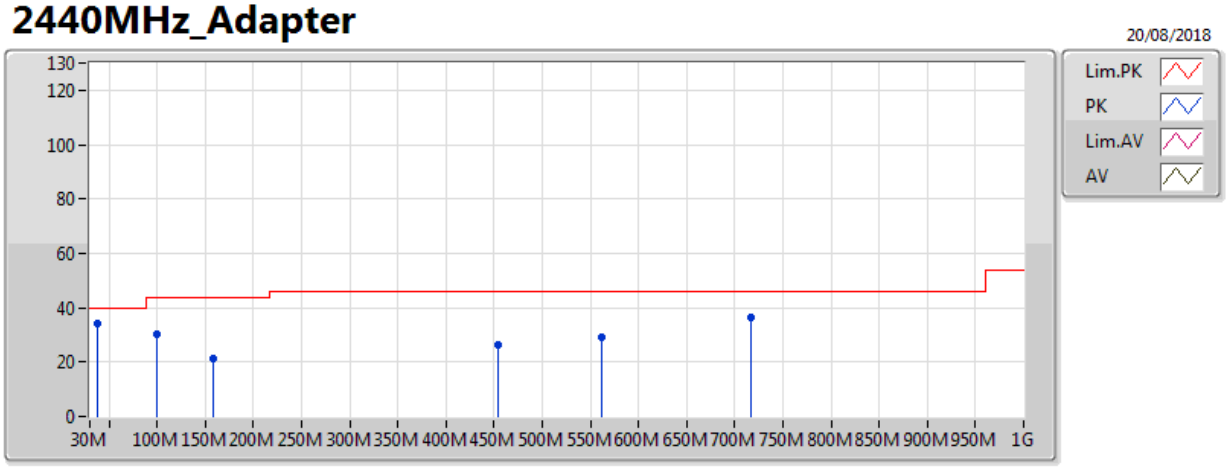
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	PK	37.76M	34.30	40.00	-5.70	-6.81	3	Vertical	360	1.00	-

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	37.76M	34.30	40.00	-5.70	-6.81	3	Vertical	360	1.00	-
2440MHz	Pass	PK	99.84M	30.01	43.50	-13.49	-9.33	3	Vertical	360	1.00	-
2440MHz	Pass	PK	158.04M	21.29	43.50	-22.21	-9.91	3	Vertical	360	1.00	-
2440MHz	Pass	PK	454.86M	26.24	46.00	-19.76	-2.26	3	Vertical	360	1.00	-
2440MHz	Pass	PK	561.56M	28.86	46.00	-17.14	-0.51	3	Vertical	360	1.00	-
2440MHz	Pass	PK	716.76M	36.59	46.00	-9.41	0.69	3	Vertical	360	1.00	-
2440MHz	Pass	PK	30M	21.77	40.00	-18.23	-2.38	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	99.84M	23.37	43.50	-20.13	-9.33	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	185.2M	21.12	43.50	-22.38	-10.50	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	353.98M	23.86	46.00	-22.14	-4.48	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	468.44M	26.49	46.00	-19.51	-1.85	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	547.98M	27.97	46.00	-18.03	-0.30	3	Horizontal	0	1.00	-

BT-LE(1Mbps)

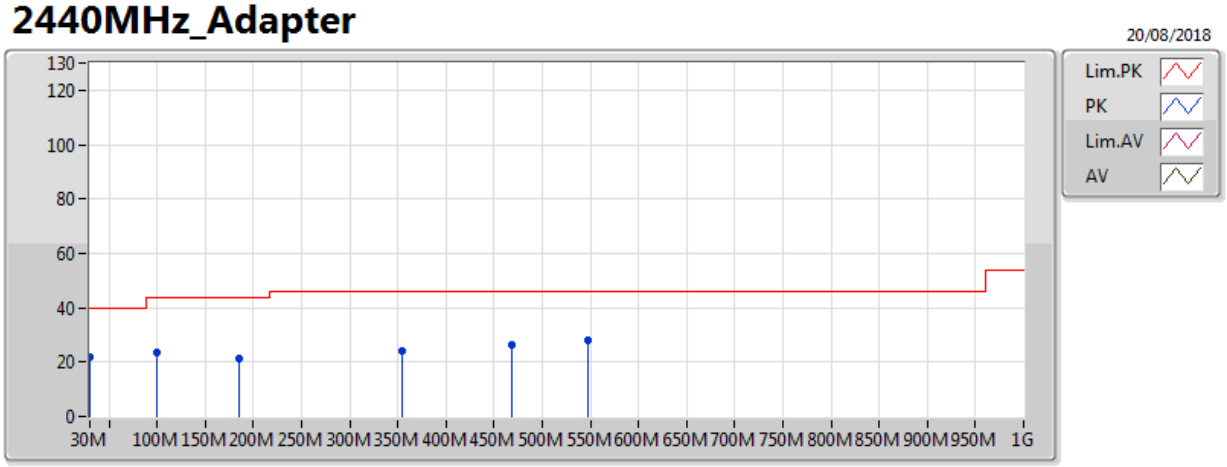
2440MHz_Adapter



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	37.76M	34.30	40.00	-5.70	-6.81	3	Vertical	360	1.00	-
PK	99.84M	30.01	43.50	-13.49	-9.33	3	Vertical	360	1.00	-
PK	158.04M	21.29	43.50	-22.21	-9.91	3	Vertical	360	1.00	-
PK	454.86M	26.24	46.00	-19.76	-2.26	3	Vertical	360	1.00	-
PK	561.56M	28.86	46.00	-17.14	-0.51	3	Vertical	360	1.00	-
PK	716.76M	36.59	46.00	-9.41	0.69	3	Vertical	360	1.00	-

BT-LE(1Mbps)

2440MHz_Adapter



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
PK	30M	21.77	40.00	-18.23	-2.38	3	Horizontal	0	1.00	-
PK	99.84M	23.37	43.50	-20.13	-9.33	3	Horizontal	0	1.00	-
PK	185.2M	21.12	43.50	-22.38	-10.50	3	Horizontal	0	1.00	-
PK	353.98M	23.86	46.00	-22.14	-4.48	3	Horizontal	0	1.00	-
PK	468.44M	26.49	46.00	-19.51	-1.85	3	Horizontal	0	1.00	-
PK	547.98M	27.97	46.00	-18.03	-0.30	3	Horizontal	0	1.00	-

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	AV	2.4912G	48.56	54.00	-5.44	30.72	3	Vertical	131	1.30	-

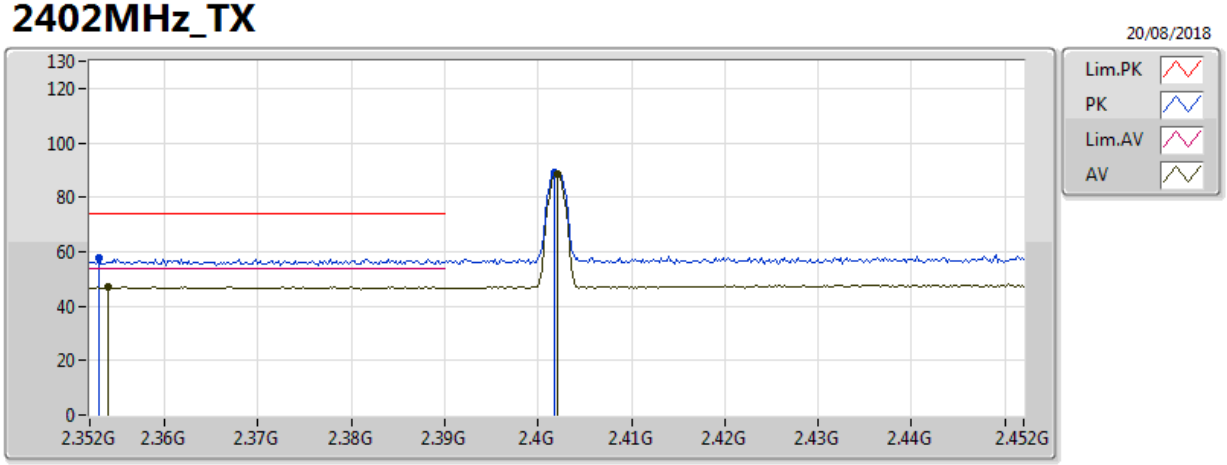
Result

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	2.354G	47.11	54.00	-6.89	30.26	3	Vertical	130	1.11	-
2402MHz	Pass	AV	2.402G	88.76	Inf	-Inf	30.41	3	Vertical	130	1.11	-
2402MHz	Pass	PK	2.353G	57.54	74.00	-16.46	30.26	3	Vertical	130	1.11	-
2402MHz	Pass	PK	2.4018G	89.31	Inf	-Inf	30.41	3	Vertical	130	1.11	-
2402MHz	Pass	AV	2.3692G	47.11	54.00	-6.89	30.31	3	Horizontal	39	1.01	-
2402MHz	Pass	AV	2.402G	86.80	Inf	-Inf	30.41	3	Horizontal	39	1.01	-
2402MHz	Pass	PK	2.3638G	58.07	74.00	-15.93	30.29	3	Horizontal	39	1.01	-
2402MHz	Pass	PK	2.4018G	87.36	Inf	-Inf	30.41	3	Horizontal	39	1.01	-
2402MHz	Pass	AV	4.80178G	32.90	54.00	-21.10	5.78	3	Vertical	0	1.50	-
2402MHz	Pass	PK	4.80304G	45.45	74.00	-28.55	5.78	3	Vertical	0	1.50	-
2402MHz	Pass	AV	4.80178G	32.79	54.00	-21.21	5.78	3	Horizontal	313	1.50	-
2402MHz	Pass	PK	4.79812G	45.55	74.00	-28.45	5.78	3	Horizontal	313	1.50	-
2440MHz	Pass	AV	2.3448G	46.90	54.00	-7.10	30.23	3	Vertical	131	1.30	-
2440MHz	Pass	AV	2.44G	88.24	Inf	-Inf	30.55	3	Vertical	131	1.30	-
2440MHz	Pass	AV	2.4912G	48.56	54.00	-5.44	30.72	3	Vertical	131	1.30	-
2440MHz	Pass	PK	2.3512G	57.76	74.00	-16.24	30.25	3	Vertical	131	1.30	-
2440MHz	Pass	PK	2.4396G	88.83	Inf	-Inf	30.55	3	Vertical	131	1.30	-
2440MHz	Pass	PK	2.488G	58.22	74.00	-15.78	30.71	3	Vertical	131	1.30	-
2440MHz	Pass	AV	2.3416G	47.17	54.00	-6.83	30.22	3	Horizontal	40	1.00	-
2440MHz	Pass	AV	2.44G	86.38	Inf	-Inf	30.55	3	Horizontal	40	1.00	-
2440MHz	Pass	AV	2.4996G	48.09	54.00	-5.91	30.75	3	Horizontal	40	1.00	-
2440MHz	Pass	PK	2.3708G	58.28	74.00	-15.72	30.31	3	Horizontal	40	1.00	-
2440MHz	Pass	PK	2.4396G	87.00	Inf	-Inf	30.55	3	Horizontal	40	1.00	-
2440MHz	Pass	PK	2.492G	58.23	74.00	-15.77	30.72	3	Horizontal	40	1.00	-
2440MHz	Pass	AV	4.89038G	32.92	54.00	-21.08	5.98	3	Vertical	360	1.50	-
2440MHz	Pass	AV	7.3221G	39.37	54.00	-14.63	11.15	3	Vertical	26	1.50	-
2440MHz	Pass	PK	4.871G	45.83	74.00	-28.17	5.93	3	Vertical	360	1.50	-
2440MHz	Pass	PK	7.31772G	51.94	74.00	-22.06	11.15	3	Vertical	26	1.50	-
2440MHz	Pass	AV	4.89278G	32.82	54.00	-21.18	5.98	3	Horizontal	0	1.50	-
2440MHz	Pass	AV	7.3203G	39.37	54.00	-14.63	11.15	3	Horizontal	324	1.50	-
2440MHz	Pass	PK	4.89236G	45.15	74.00	-28.85	5.98	3	Horizontal	0	1.50	-
2440MHz	Pass	PK	7.30548G	51.77	74.00	-22.23	11.10	3	Horizontal	324	1.50	-
2480MHz	Pass	AV	2.48G	87.01	Inf	-Inf	30.68	3	Vertical	132	1.39	-
2480MHz	Pass	AV	2.4884G	48.30	54.00	-5.70	30.71	3	Vertical	132	1.39	-
2480MHz	Pass	PK	2.4802G	87.62	Inf	-Inf	30.68	3	Vertical	132	1.39	-
2480MHz	Pass	PK	2.4982G	58.48	74.00	-15.52	30.75	3	Vertical	132	1.39	-
2480MHz	Pass	AV	2.48G	84.86	Inf	-Inf	30.68	3	Horizontal	43	1.19	-
2480MHz	Pass	AV	2.4972G	48.33	54.00	-5.67	30.74	3	Horizontal	43	1.19	-
2480MHz	Pass	PK	2.4802G	85.51	Inf	-Inf	30.68	3	Horizontal	43	1.19	-
2480MHz	Pass	PK	2.495G	58.54	74.00	-15.46	30.74	3	Horizontal	43	1.19	-
2480MHz	Pass	AV	4.95628G	34.74	54.00	-19.26	6.11	3	Vertical	94	3.19	-
2480MHz	Pass	AV	7.44996G	38.95	54.00	-15.05	11.51	3	Vertical	244	1.46	-
2480MHz	Pass	PK	4.9549G	45.41	74.00	-28.59	6.11	3	Vertical	94	3.19	-
2480MHz	Pass	PK	7.4283G	51.49	74.00	-22.51	11.45	3	Vertical	244	1.46	-
2480MHz	Pass	AV	4.95202G	33.13	54.00	-20.87	6.10	3	Horizontal	0	1.50	-
2480MHz	Pass	AV	7.44978G	38.77	54.00	-15.23	11.51	3	Horizontal	29	1.50	-
2480MHz	Pass	PK	4.9525G	45.34	74.00	-28.66	6.10	3	Horizontal	0	1.50	-

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2480MHz	Pass	PK	7.45314G	51.71	74.00	-22.29	11.52	3	Horizontal	29	1.50	-

BT-LE(1Mbps)

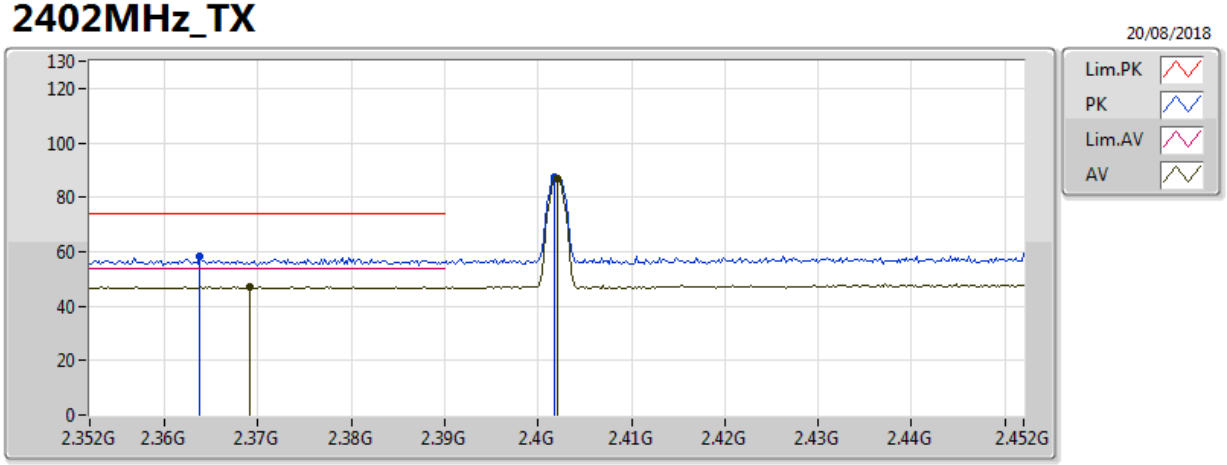
2402MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
AV	2.354G	47.11	54.00	-6.89	30.26	3	Vertical	130	1.11	-
AV	2.402G	88.76	Inf	-Inf	30.41	3	Vertical	130	1.11	-
PK	2.353G	57.54	74.00	-16.46	30.26	3	Vertical	130	1.11	-
PK	2.4018G	89.31	Inf	-Inf	30.41	3	Vertical	130	1.11	-

BT-LE(1Mbps)

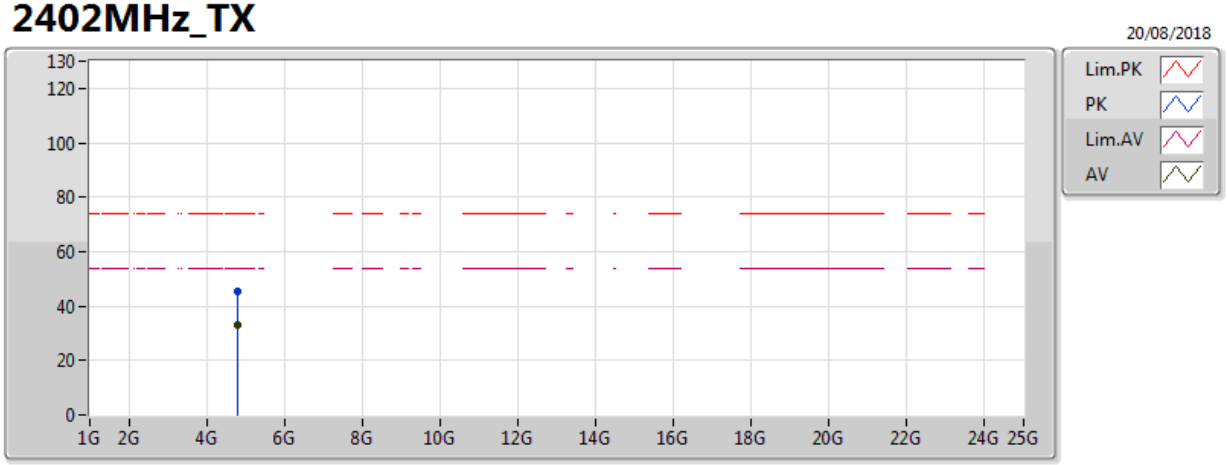
2402MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
AV	2.3692G	47.11	54.00	-6.89	30.31	3	Horizontal	39	1.01	-
AV	2.402G	86.80	Inf	-Inf	30.41	3	Horizontal	39	1.01	-
PK	2.3638G	58.07	74.00	-15.93	30.29	3	Horizontal	39	1.01	-
PK	2.4018G	87.36	Inf	-Inf	30.41	3	Horizontal	39	1.01	-

BT-LE(1Mbps)

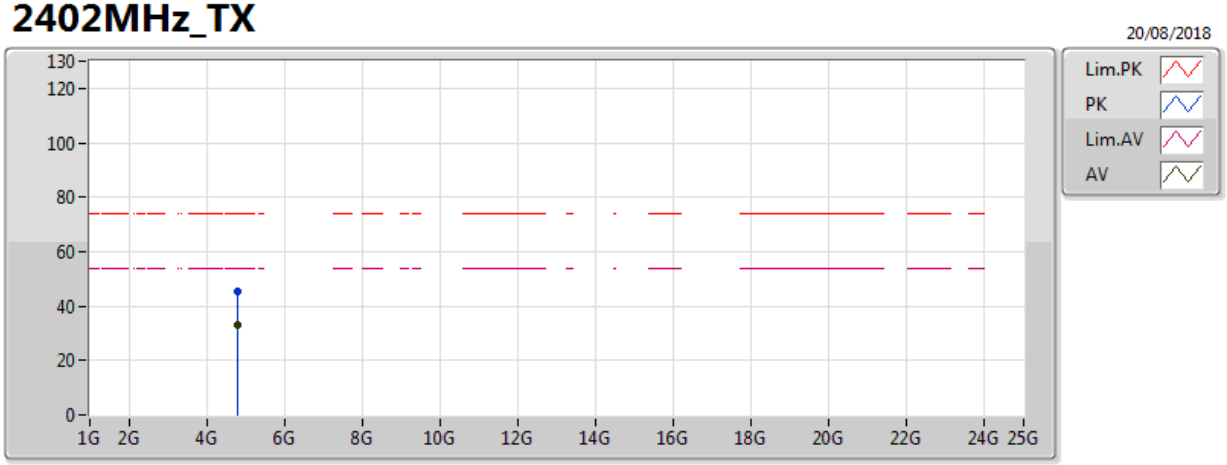
2402MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
AV	4.80178G	32.90	54.00	-21.10	5.78	3	Vertical	0	1.50	-
PK	4.80304G	45.45	74.00	-28.55	5.78	3	Vertical	0	1.50	-

BT-LE(1Mbps)

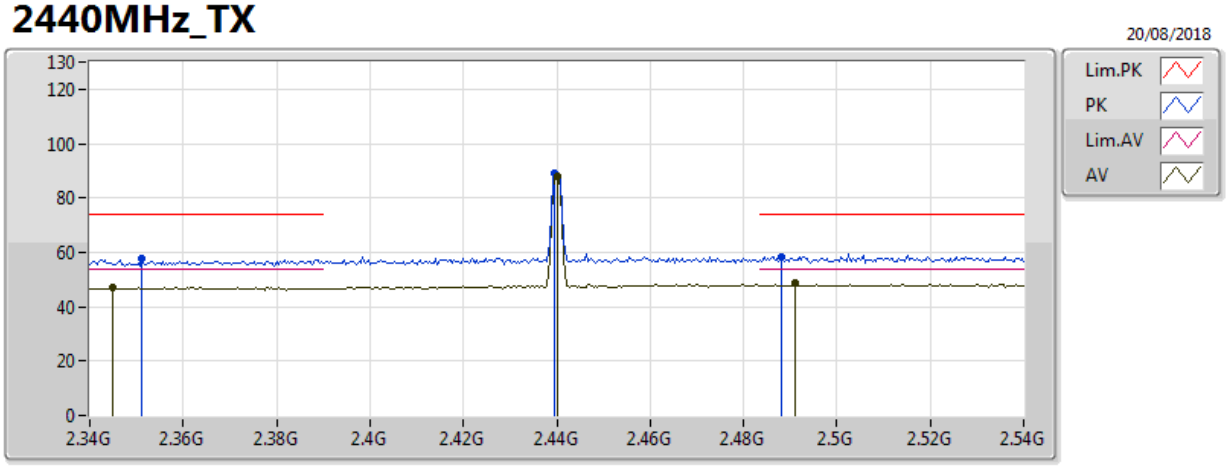
2402MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
AV	4.80178G	32.79	54.00	-21.21	5.78	3	Horizontal	313	1.50	-
PK	4.79812G	45.55	74.00	-28.45	5.78	3	Horizontal	313	1.50	-

BT-LE(1Mbps)

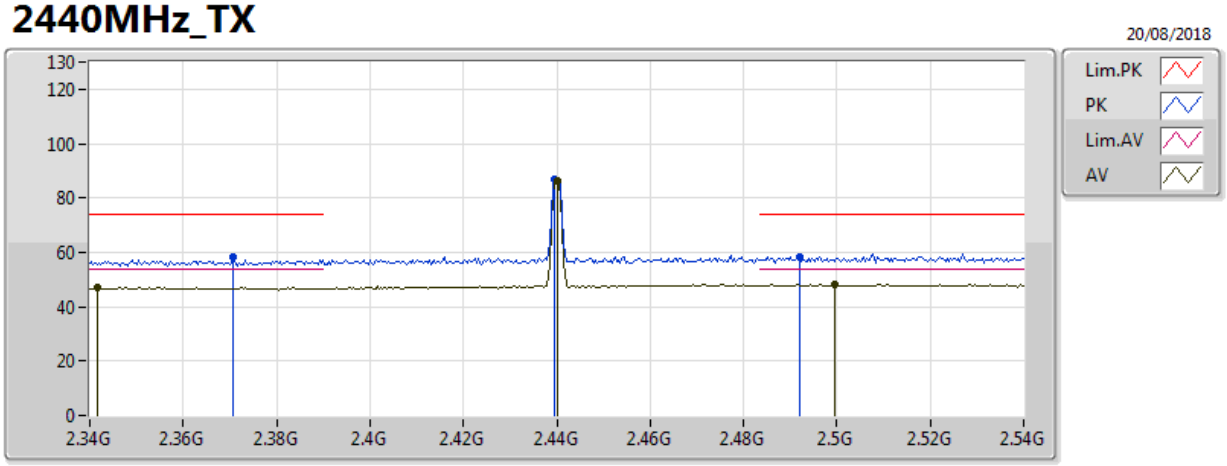
2440MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
AV	2.3448G	46.90	54.00	-7.10	30.23	3	Vertical	131	1.30	-
AV	2.44G	88.24	Inf	-Inf	30.55	3	Vertical	131	1.30	-
AV	2.4912G	48.56	54.00	-5.44	30.72	3	Vertical	131	1.30	-
PK	2.3512G	57.76	74.00	-16.24	30.25	3	Vertical	131	1.30	-
PK	2.4396G	88.83	Inf	-Inf	30.55	3	Vertical	131	1.30	-
PK	2.488G	58.22	74.00	-15.78	30.71	3	Vertical	131	1.30	-

BT-LE(1Mbps)

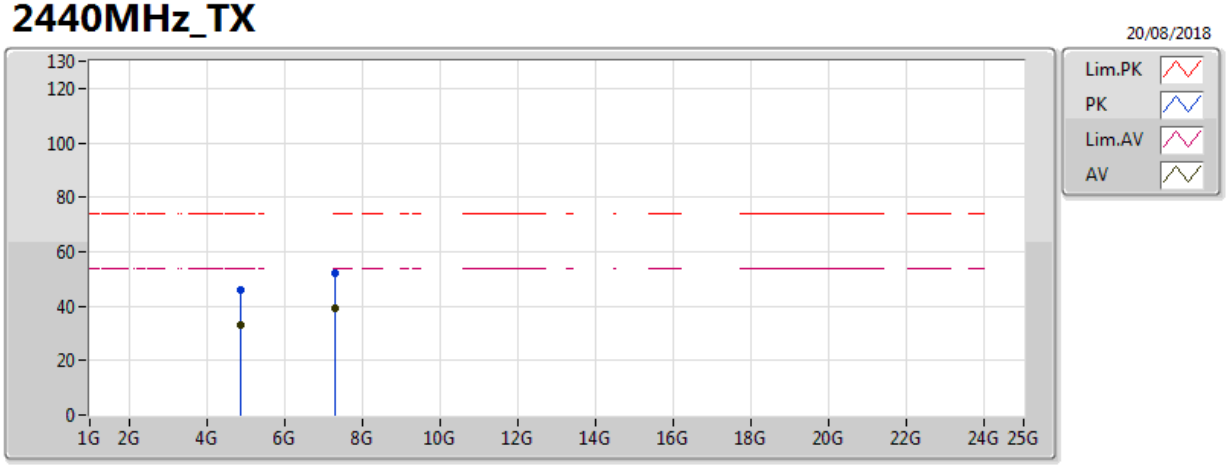
2440MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
AV	2.3416G	47.17	54.00	-6.83	30.22	3	Horizontal	40	1.00	-
AV	2.44G	86.38	Inf	-Inf	30.55	3	Horizontal	40	1.00	-
AV	2.4996G	48.09	54.00	-5.91	30.75	3	Horizontal	40	1.00	-
PK	2.3708G	58.28	74.00	-15.72	30.31	3	Horizontal	40	1.00	-
PK	2.4396G	87.00	Inf	-Inf	30.55	3	Horizontal	40	1.00	-
PK	2.492G	58.23	74.00	-15.77	30.72	3	Horizontal	40	1.00	-

BT-LE(1Mbps)

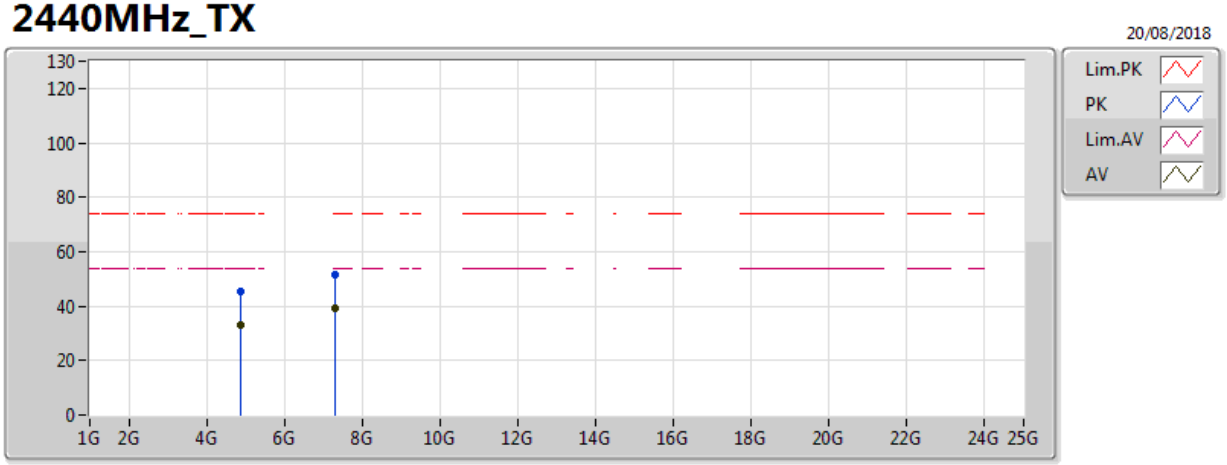
2440MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
AV	4.89038G	32.92	54.00	-21.08	5.98	3	Vertical	360	1.50	-
AV	7.3221G	39.37	54.00	-14.63	11.15	3	Vertical	26	1.50	-
PK	4.871G	45.83	74.00	-28.17	5.93	3	Vertical	360	1.50	-
PK	7.31772G	51.94	74.00	-22.06	11.15	3	Vertical	26	1.50	-

BT-LE(1Mbps)

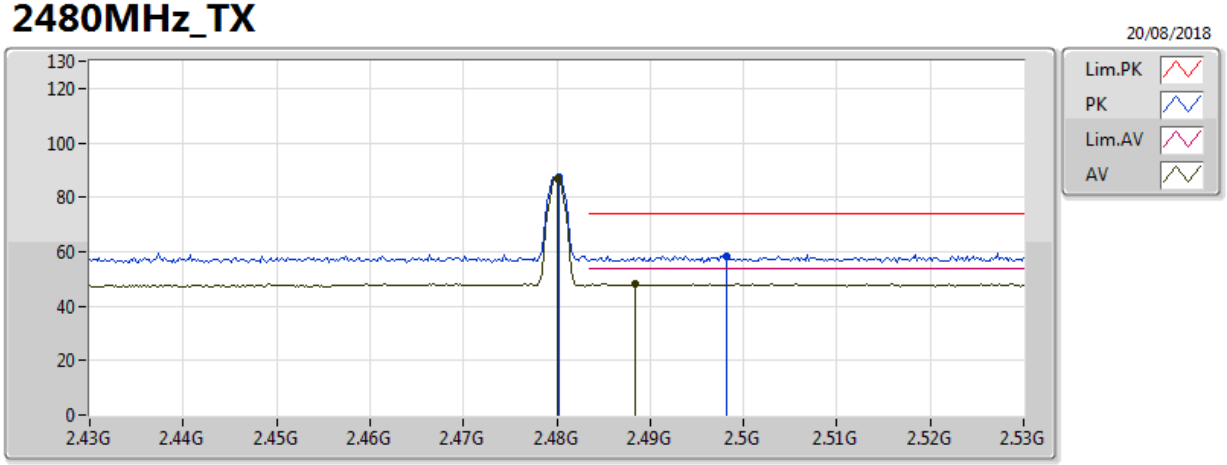
2440MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
AV	4.89278G	32.82	54.00	-21.18	5.98	3	Horizontal	0	1.50	-
AV	7.3203G	39.37	54.00	-14.63	11.15	3	Horizontal	324	1.50	-
PK	4.89236G	45.15	74.00	-28.85	5.98	3	Horizontal	0	1.50	-
PK	7.30548G	51.77	74.00	-22.23	11.10	3	Horizontal	324	1.50	-

BT-LE(1Mbps)

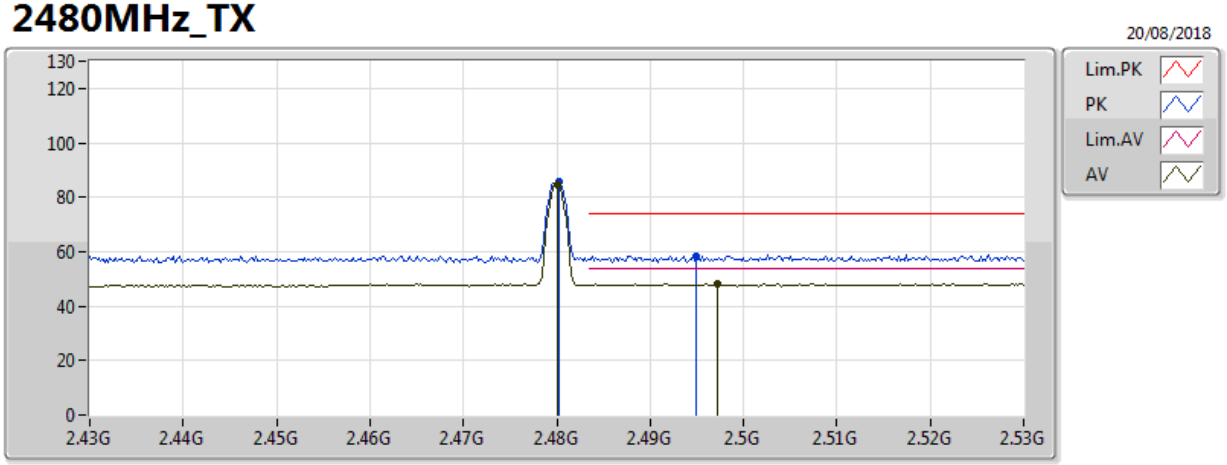
2480MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
AV	2.48G	87.01	Inf	-Inf	30.68	3	Vertical	132	1.39	-
AV	2.4884G	48.30	54.00	-5.70	30.71	3	Vertical	132	1.39	-
PK	2.4802G	87.62	Inf	-Inf	30.68	3	Vertical	132	1.39	-
PK	2.4982G	58.48	74.00	-15.52	30.75	3	Vertical	132	1.39	-

BT-LE(1Mbps)

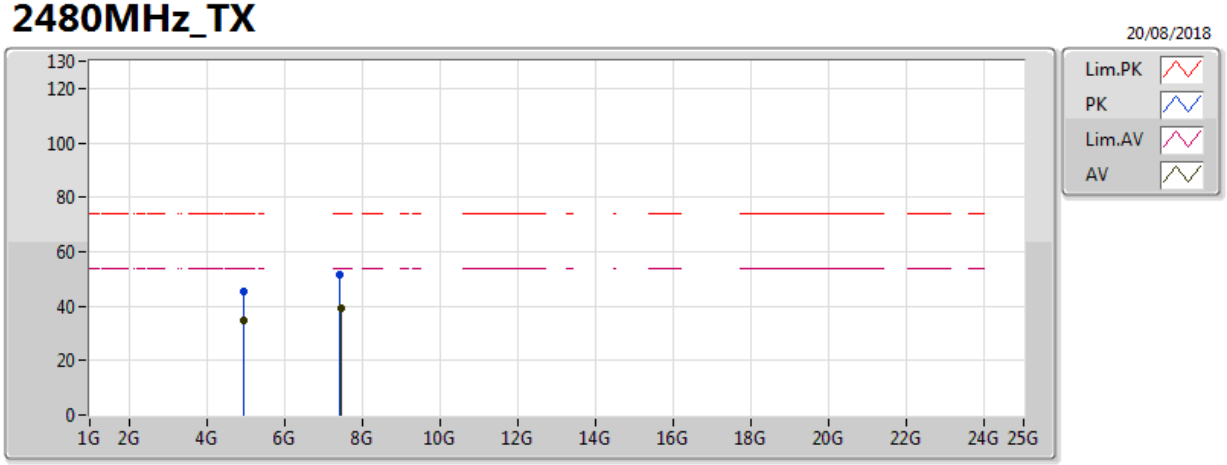
2480MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
AV	2.48G	84.86	Inf	-Inf	30.68	3	Horizontal	43	1.19	-
AV	2.4972G	48.33	54.00	-5.67	30.74	3	Horizontal	43	1.19	-
PK	2.4802G	85.51	Inf	-Inf	30.68	3	Horizontal	43	1.19	-
PK	2.495G	58.54	74.00	-15.46	30.74	3	Horizontal	43	1.19	-

BT-LE(1Mbps)

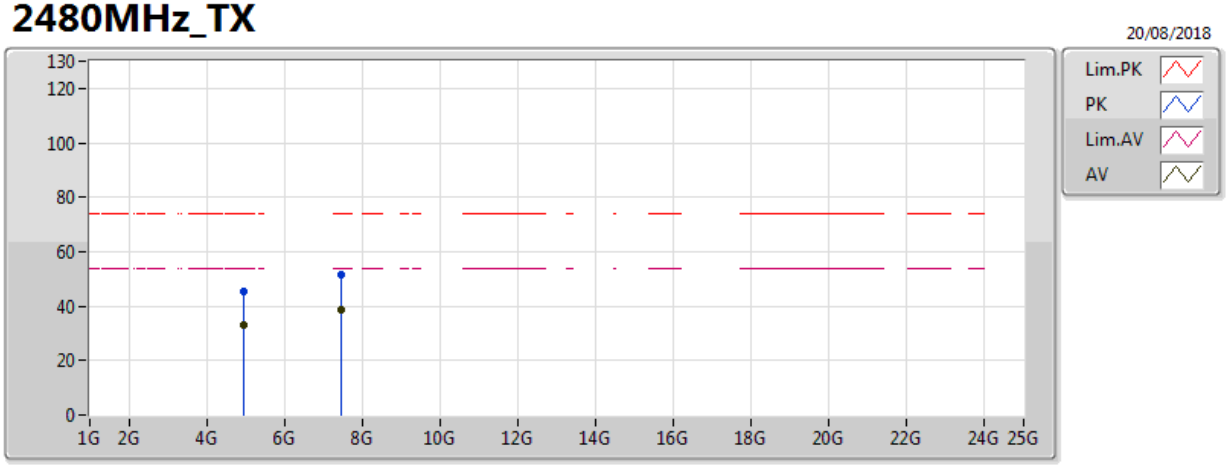
2480MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
AV	4.95628G	34.74	54.00	-19.26	6.11	3	Vertical	94	3.19	-
AV	7.44996G	38.95	54.00	-15.05	11.51	3	Vertical	244	1.46	-
PK	4.9549G	45.41	74.00	-28.59	6.11	3	Vertical	94	3.19	-
PK	7.4283G	51.49	74.00	-22.51	11.45	3	Vertical	244	1.46	-

BT-LE(1Mbps)

2480MHz_TX



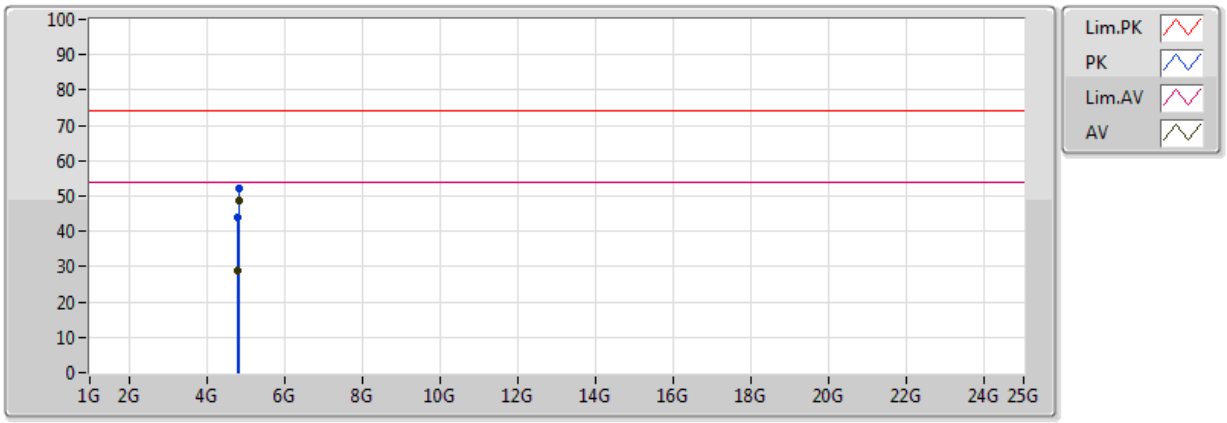
Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
AV	4.95202G	33.13	54.00	-20.87	6.10	3	Horizontal	0	1.50	-
AV	7.44978G	38.77	54.00	-15.23	11.51	3	Horizontal	29	1.50	-
PK	4.9525G	45.34	74.00	-28.66	6.10	3	Horizontal	0	1.50	-
PK	7.45314G	51.71	74.00	-22.29	11.52	3	Horizontal	29	1.50	-

Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
1	Pass	AV	4.824G	48.68	54.00	-5.32	2.13	3	Vertical	201	1.66	-

Radiation-above 1GHz_1

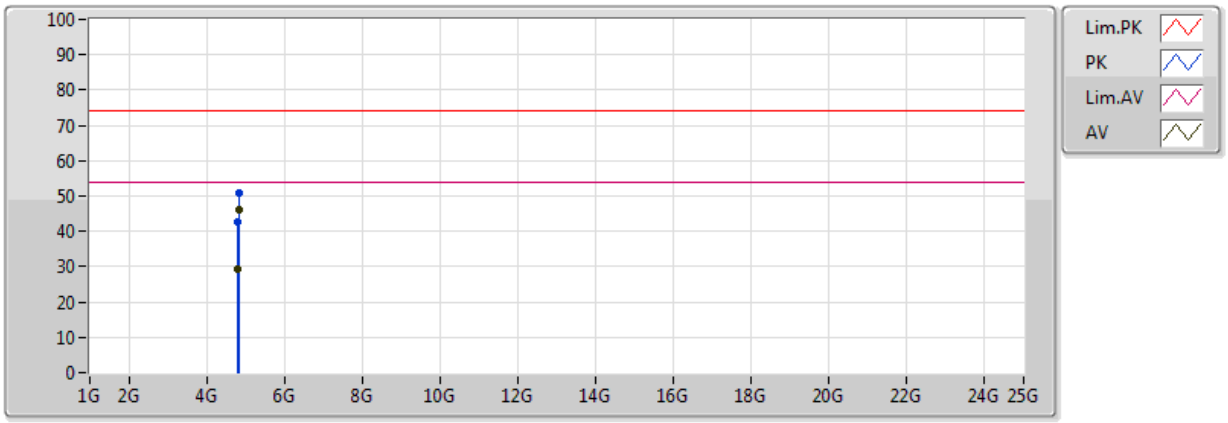
31/08/2018



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
AV	4.80483G	28.82	54.00	-25.18	2.08	3	Vertical	152	1.56	-
AV	4.824G	48.68	54.00	-5.32	2.13	3	Vertical	201	1.66	-
PK	4.80483G	44.13	74.00	-29.87	2.08	3	Vertical	152	1.56	-
PK	4.82404G	51.97	74.00	-22.03	2.13	3	Vertical	201	1.66	-

Radiation-above 1GHz_1

31/08/2018



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comments
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	
AV	4.80654G	29.21	54.00	-24.79	2.09	3	Horizontal	54	1.39	-
AV	4.824G	45.92	54.00	-8.08	2.13	3	Horizontal	169	1.74	-
PK	4.80654G	42.60	74.00	-31.40	2.09	3	Horizontal	54	1.39	-
PK	4.82406G	50.81	74.00	-23.19	2.13	3	Horizontal	169	1.74	-