



FCC RADIO TEST REPORT

FCC ID : BKMAE-8111
Equipment : ELPAP11
Brand Name : EPSON
Model Name : WN8111BEP
Applicant : Seiko Epson Corporation
3-3-5 Owa Suwa-shi, Nagano-ken 392-8502 Japan
Manufacturer : Arcadyan Technology Corporation
No.8, Sec.2, Guangfu Rd., Hsinchu, 30071 Taiwan
Standard : 47 CFR FCC Part 15.247

The product was received on Apr. 25, 2019, and testing was started from May 07, 2019 and completed on May 31, 2019. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2013 and shown compliance with the applicable technical standards.

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

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


Approved by: Cliff Chang

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory
No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)



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TEL : 886-3-656-9065
FAX : 886-3-656-9085
Report Template No.: CB Ver1.0



Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
1.1.2	15.203	Antenna Requirement	PASS	-
3.1	15.207	AC Power-line Conducted Emissions	PASS	-
3.2	15.247(a)	20dB Bandwidth	PASS	-
3.2	15.247(a)	Carrier Frequency Separation	PASS	-
3.3	15.247(b)	Maximum Conducted Output Power	PASS	-
3.4	15.247(a)	Number of Hopping Frequencies and Hopping Band edge	PASS	-
3.5	15.247(a)	Time of Occupancy (Dwell Time)	PASS	-
3.6	15.247(d)	Emissions in Non-restricted Frequency Bands	PASS	-
3.7	15.247(d)	Emissions in Restricted Frequency Bands	PASS	-

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:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

Reviewed by: Sam Chen

Report Producer: Sandy Chuang

1 General Description

1.1 Information

1.1.1 RF General Information

Frequency Range (MHz)	Bluetooth Version	Ch. Frequency (MHz)	Channel Number
2400-2483.5	BR / EDR	2402-2480	0-78 [79]

Band	Mode	BWch (MHz)	Nant
2.4-2.4835GHz	BT-BR(1Mbps)	1	1TX
2.4-2.4835GHz	BT-EDR(2Mbps)	1	1TX
2.4-2.4835GHz	BT-EDR(3Mbps)	1	1TX

Note:

- ♦ Bluetooth BR uses a GFSK (1Mbps).
- ♦ Bluetooth EDR uses a combination of $\pi/4$ -DQPSK (2Mbps) and 8DPSK (3Mbps).
- ♦ Bluetooth BR/EDR uses as a system using FHSS modulation.
- ♦ BWch is the nominal channel bandwidth.
- ♦ Nss-Min is the minimum number of spatial streams.
- ♦ Nant is the number of outputs. e.g., 2(2, 3) means have 2 outputs for port 2 and port 3. 2 means have 2 outputs for port 1 and port 2.

**1.1.2 Antenna Information**

Ant.	Port	Brand	P/N	Antenna Type	Connector	Gain (dBi)		
						WLAN 2.4GHz	WLAN 5GHz	Bluetooth
1	1	Wieson	GT128HT346C-001	Chip	N/A	0.71	4.64	0.71
2	2	Wieson	GT128HT346C-001	Chip	N/A	1.76	3.33	-

Note1: The above information was declared by manufacturer.

Note2: The EUT has two antennas.

<For 2.4GHz Band>**For IEEE 802.11b/g/n mode(1TX/1RX):**

The EUT supports the antenna with TX and RX diversity functions.

Both Port 1 and Port 2 support transmit and receive functions, but only one of them will be used at one time.

The port 1 and port 2 were test for radiated emission test and the worst case was found in port 2. thus, it was selected to test and record for conducted.

<For 5GHz Band>**For IEEE 802.11a/n/ac mode(1TX/1RX):**

The EUT supports the antenna with TX and RX diversity functions.

Both Port 1 and Port 2 support transmit and receive functions, but only one of them will be used at one time.

The port 1 and port 2 were test for radiated emission test and the worst case was found in port 1. thus, it was selected to test and record for conducted.

<For Bluetooth>

Only Port 1 can be used as transmitting/receiving antenna.

1.1.3 Mode Test Duty Cycle

Mode	DC	DCF(dB)
BT-BR(1Mbps)	0.741	1.3
BT-EDR(2Mbps)	0.769	1.14
BT-EDR(3Mbps)	0.767	1.15

1.1.4 EUT Operational Condition

EUT Power Type	From host system
Test Software Version	BlueTool(1.9.5.8)



1.2 Applicable Standards

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

- ♦ 47 CFR FCC Part 15
- ♦ FCC KDB 558074 D01 v05r02

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
☒	JHUBEI	ADD : No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C.	TEL : 886-3-656-9065	FAX : 886-3-656-9085

Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
RF Conducted	TH01-CB	Ekko Heieh	21~24°C / 50~59%	May 07, 2019~ May 31, 2019
Radiated (Below 1GHz)	03CH03-CB	Cola Fan	25~27°C / 55~65%	May 20, 2019~ May 25, 2019
Radiated (Above 1GHz)	03CH06-CB	Brian Sun	22~24°C / 50~60%	May 07, 2019~ May 31, 2019
AC Conduction	CO02-CB	GN Hou	22.1~23.8°C / 61~63%	May 22, 2019

Test site Designation No. TW0006 with FCC.

Test site registered number IC 4086B with Industry Canada.

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)	2.0 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)	4.7 dB	Confidence levels of 95%
Conducted Emission	1.3 dB	Confidence levels of 95%
Output Power Measurement	1.3 dB	Confidence levels of 95%
Power Density Measurement	1.3 dB	Confidence levels of 95%
Bandwidth Measurement	9.74 x10 ⁻⁸	Confidence levels of 95%



2 Test Configuration of EUT

2.1 Test Channel Mode

Mode	PowerSetting
BT-BR(1Mbps)	-
2402MHz	Default
2440MHz	Default
2480MHz	Default
BT-EDR(2Mbps)	-
2402MHz	Default
2440MHz	Default
2480MHz	Default
BT-EDR(3Mbps)	-
2402MHz	Default
2440MHz	Default
2480MHz	Default

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	Normal Link
1	2.4GHz + Bluetooth
2	5GHz + Bluetooth
For operating mode 2 is the worst case and it was record in this test report.	

The Worst Case Mode for Following Conformance Tests	
Tests Item	20dB Bandwidth Carrier Frequency Separation Maximum Conducted Output Power Number of Hopping Frequencies Hopping Bandedge Time of Occupancy (Dwell Time) 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	Normal Link
1	Place EUT in Z axis + 2.4GHz + Bluetooth
2	Place EUT in Z axis + 5GHz + Bluetooth
Mode 1 has been evaluated to be the worst case among Mode 1~2, thus measurement for Mode 3 will follow this same test mode.	
3	Place EUT in Y axis + 2.4GHz + Bluetooth
For operating mode 2 is the worst case and it was record in this test report.	
Operating Mode > 1GHz	CTX
The EUT was performed at X axis, Y axis and Z axis position. The worst case was found at Z axis, thus the measurement will follow this same test configuration.	



2.3 EUT Operation during Test

For CTX Mode:

The EUT was programmed to be in continuously transmitting mode.

For Normal Link:

During the test, the EUT operation to normal function.

2.4 Accessories

N/A



2.5 Support Equipment

For AC Conduction:

Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID
A	PC	SAIVIA	SGH8190LP1	N/A
B	LCD Monitor	DELL	E1913C	N/A
C	Printer	EPSON	LQ-300+	N/A
D	Modem	ACEEX	DM1414	N/A
E	Keyboard	iCooky	SK068	N/A
F	Mouse	Logitech	Logitech	N/A
G	2.4/5G AP	ASUS	RP-N53	MSQ-RPN53
H	Bluetooth Speaker	MARUS	MSK06C-RD	N/A

For Radiated (below 1GHz):

Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID
A	Notebook	Acer	Z5WBH	N/A
B	Bluetooth Speaker	MARUS	MSK06C-RD	N/A
C	WLAN AP	Netgear	R8000	N/A
D	Earphone	SHYARO CHI	MIC-04	N/A
E	Mouse	Logitech	M-U0026	N/A
F	Notebook	DELL	E4300	N/A

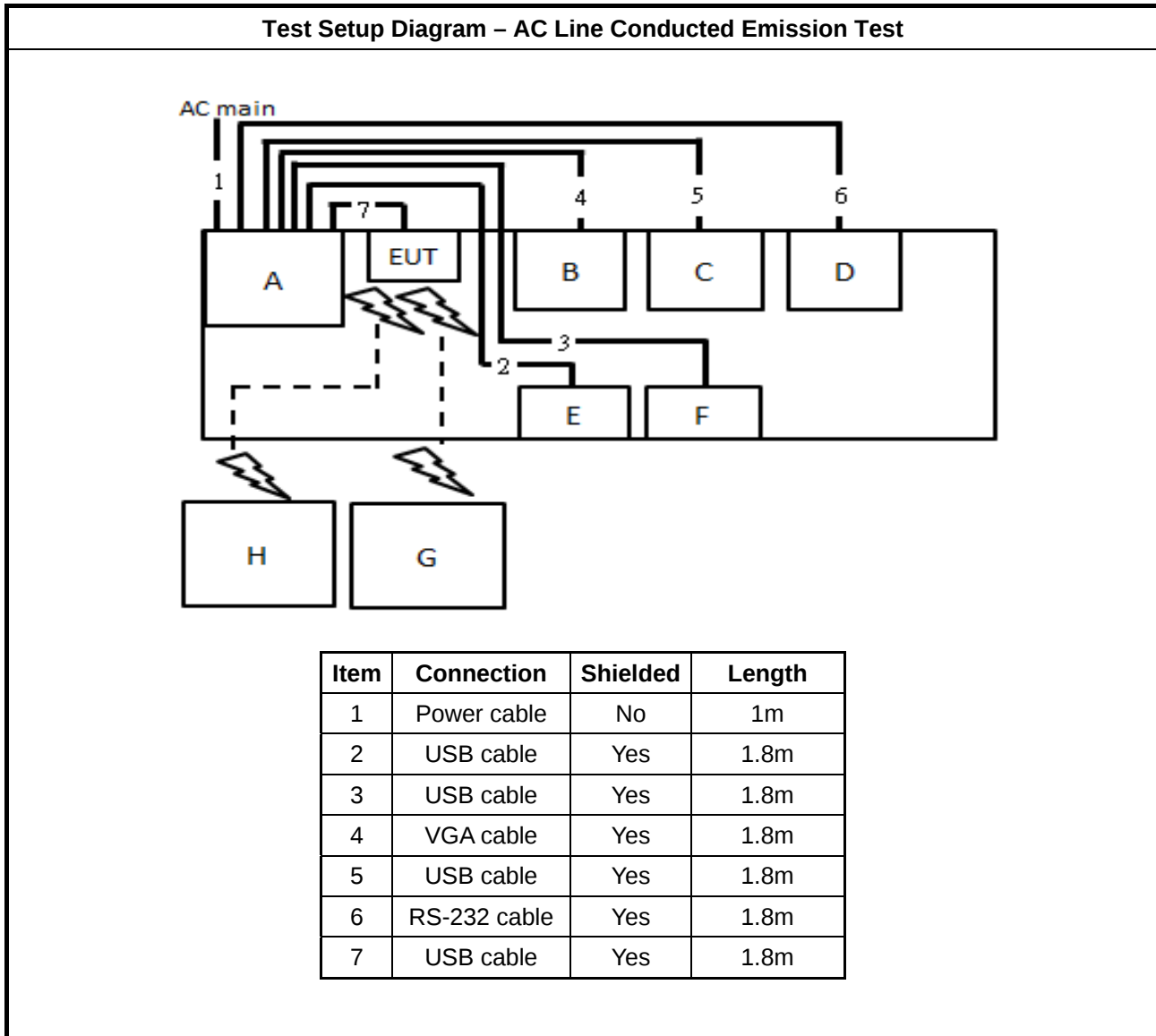
For Radiated (above 1GHz):

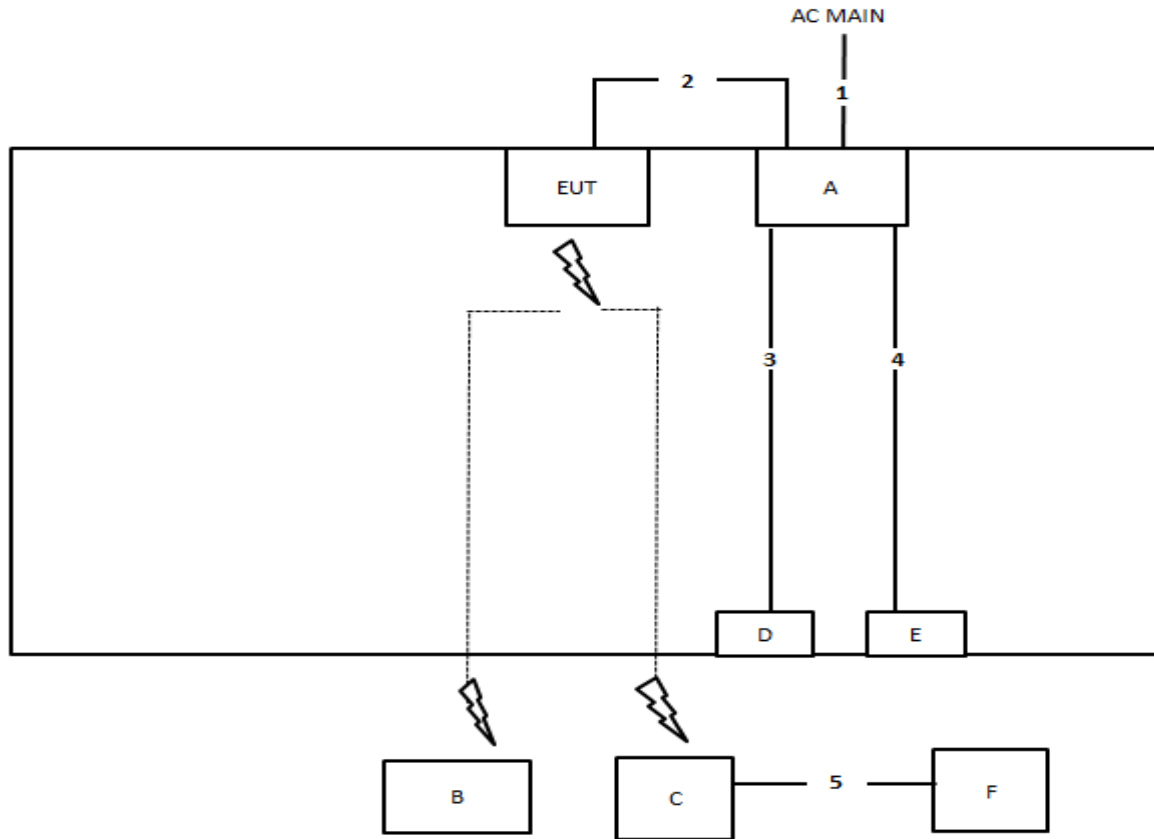
Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID
A	Notebook	Acer	Z5WBH	N/A

For RF Conducted:

Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID
A	Notebook	Acer	Z5WBH	N/A

2.6 Test Setup Diagram

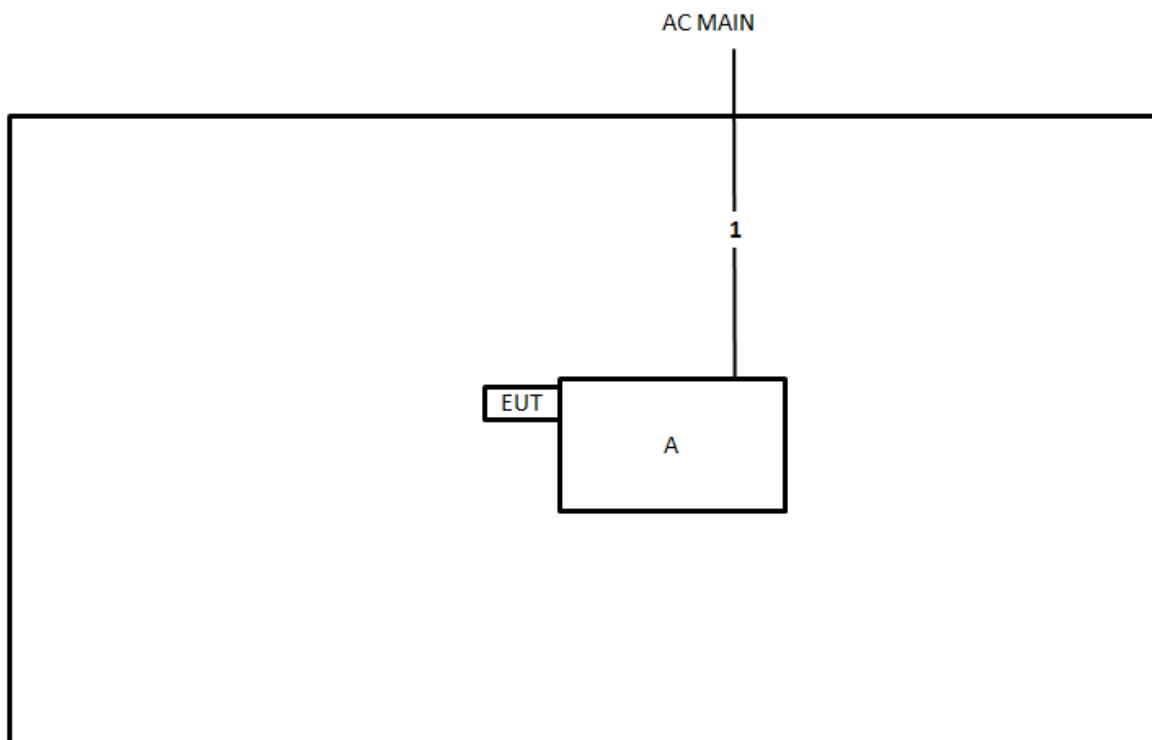


Test Setup Diagram - Radiated Test < 1GHz


Item	Connection	Shielded	Length
1	Power cable	No	1.8m
2	USB cable	Yes	1.0m
3	Audio cable	No	1.1m
4	USB cable	Yes	1.8m
5	RJ-45 cable	No	1.5m



Test Setup Diagram - Radiated Test > 1GHz



Item	Connection	Shielded	Length
1	Power cable	No	2.6m



3 Transmitter Test Result

3.1 AC Power-line Conducted Emissions

3.1.1 AC Power-line Conducted Emissions Limit

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

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

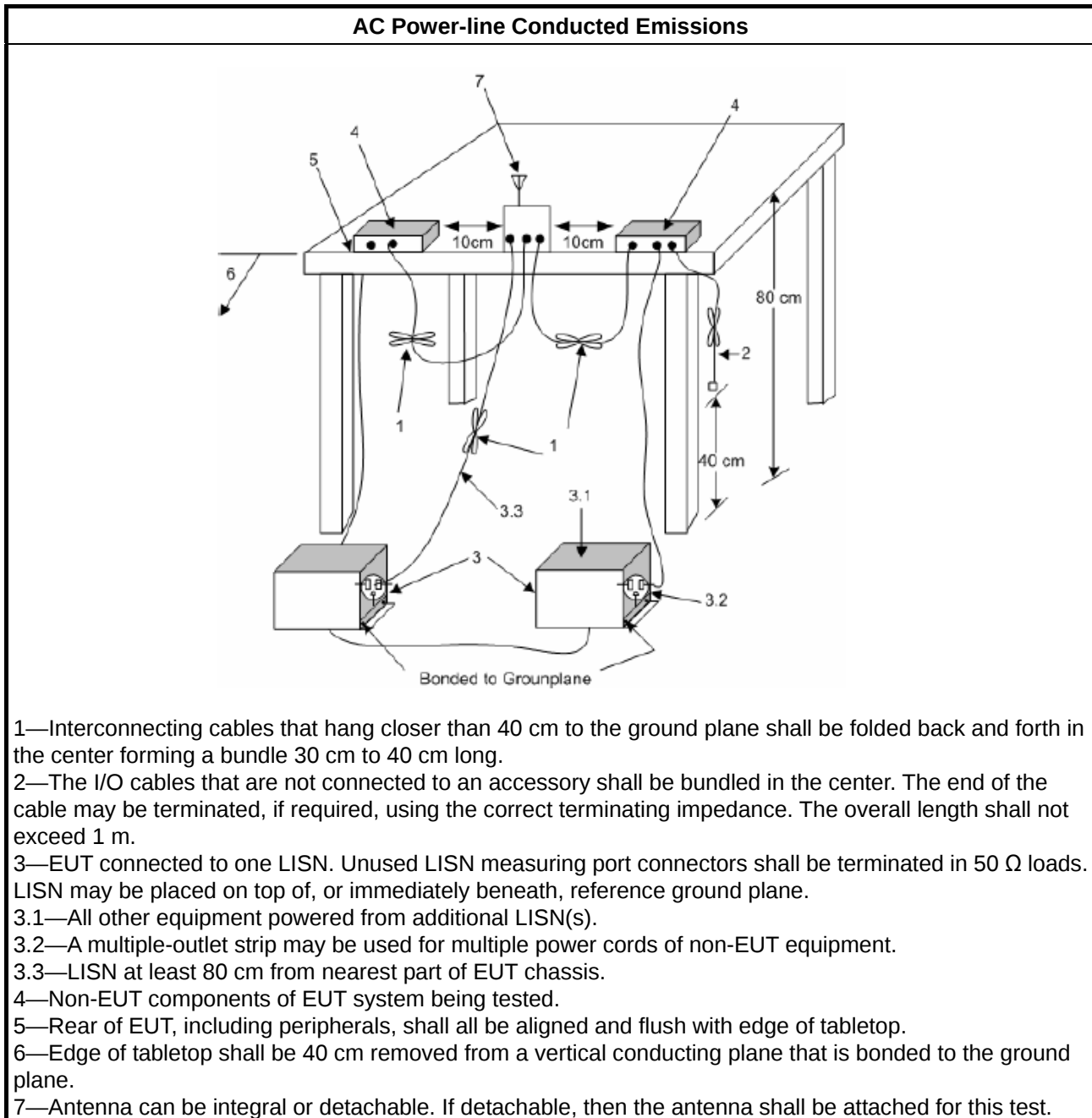
3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

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

3.1.4 Test Setup



3.1.5 Test Result of AC Power-line Conducted Emissions

Refer as Appendix A

3.2 20dB Bandwidth and Carrier Frequency Separation

3.2.1 20dB Bandwidth and Carrier Frequency Separation Limit

20dB Bandwidth and Carrier Frequency Separation Limit for Frequency Hopping Systems	
▪ 902-928 MHz Band:	
	▪ $N \geq 50$ and $ChS \geq \text{MAX}$ (20 dB bandwidth, 25 kHz); 20 dB bandwidth $\leq$ 250 kHz.
	▪ $50 > N \geq 25$ and $ChS \geq \text{MAX}$ (20 dB bandwidth, 25 kHz); 20 dB bandwidth $>$ 250 kHz.
▪ 2400-2483.5 MHz Band:	
	▪ $N \geq 75$ and $ChS \geq \text{MAX}$ (20 dB bandwidth, 25 kHz).
	▪ $75 > N \geq 15$ and $ChS \geq \text{MAX}$ (20 dB bandwidth 2/3, 25 kHz).
▪ 5725-5850 MHz Band:	
	▪ $N \geq 75$ and $ChS \geq \text{MAX}$ (20 dB bandwidth, 25 kHz); 20 dB bandwidth $\leq$ 1 MHz.
N: Number of Hopping Frequencies; ChS: Hopping Channel Separation	

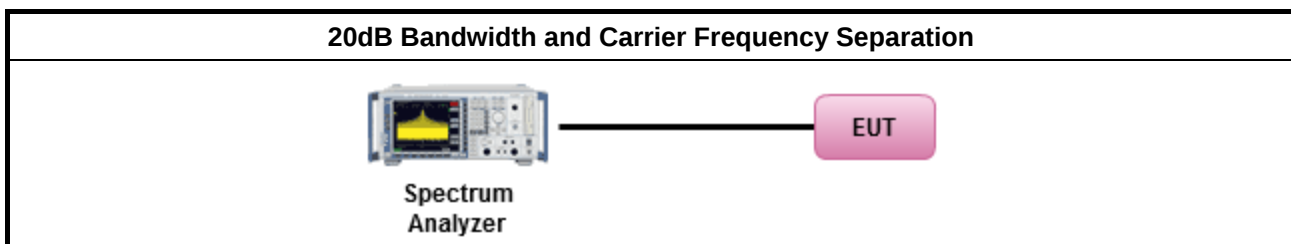
3.2.2 Measuring Instruments

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

3.2.3 Test Procedures

Test Method
▪ Refer as ANSI C63.10-2013, clause 6.9.1 for 20 dB bandwidth measurement.
▪ Refer as ANSI C63.10-2013, clause 7.8.2 for carrier frequency separation measurement.

3.2.4 Test Setup



3.2.5 Test Result of 20dB Bandwidth

Refer as Appendix B

3.2.6 Test Result of Carrier Frequency Separation

Refer as Appendix B

3.3 Maximum Conducted Output Power

3.3.1 Maximum Conducted Output Power Limit

Maximum Conducted Output Power Limit	
▪ 902-928 MHz Band:	
	▪ $N \geq 50$; Power 30dBm; EIRP 36dBm
	▪ $50 > N \geq 25$; Power 24dBm; EIRP 30dBm
▪ 2400-2483.5 MHz Band:	
	▪ $N \geq 75$; Power 30dBm; EIRP 36dBm
	▪ $75 > N \geq 15$; Power 21dBm; EIRP 27dBm
▪ 5725-5850 MHz Band:	
	▪ $N \geq 75$; Power 30dBm; EIRP 36dBm
N: Number of Hopping Frequencies	

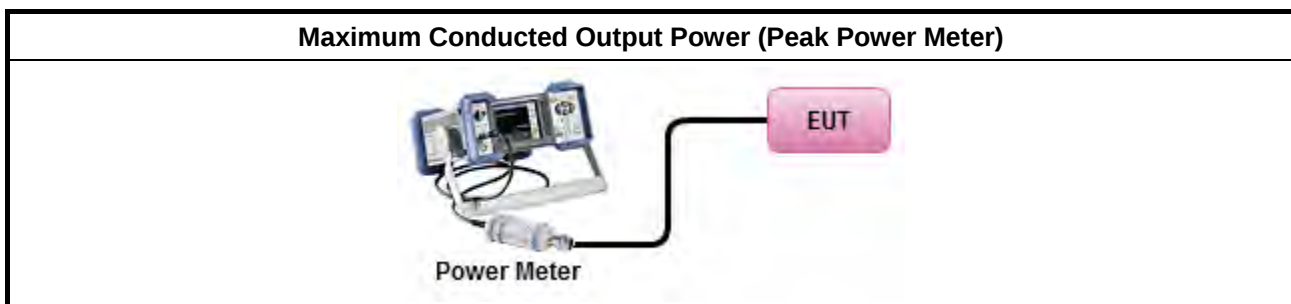
3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

Test Method
▪ Refer as ANSI C63.10-2013, clause 7.8.5 for output power measurement.

3.3.4 Test Setup



3.3.5 Test Result of Maximum Conducted Output Power

Refer as Appendix C

3.4 Number of Hopping Frequencies and Hopping Bandedge

3.4.1 Number of Hopping Frequencies Limit

Number of Hopping Frequencies Limit	
▪ 902-928 MHz Band:	
	▪ $N \geq 50$ and $ChS \geq MAX$ (20 dB bandwidth, 25 kHz); 20 dB bandwidth $\leq$ 250 kHz.
	▪ $50 > N \geq 25$ and $ChS \geq MAX$ (20 dB bandwidth, 25 kHz); 20 dB bandwidth $>$ 250 kHz.
▪ 2400-2483.5 MHz Band:	
	▪ $N \geq 75$ and $ChS \geq MAX$ (20 dB bandwidth, 25 kHz).
	▪ $75 > N \geq 15$ and $ChS \geq MAX$ (20 dB bandwidth 2/3, 25 kHz).
▪ 5725-5850 MHz Band:	
	▪ $N \geq 75$ and $ChS \geq MAX$ (20 dB bandwidth, 25 kHz); 20 dB bandwidth $\leq$ 1 MHz.
N: Number of Hopping Frequencies; ChS : Hopping Channel Separation	

3.4.2 Hopping Bandedge Limit

Refer clause 3.6.1 and clause 3.7.1

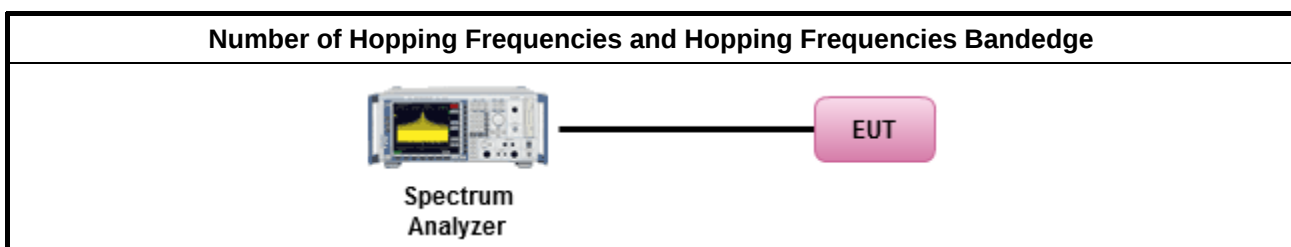
3.4.3 Measuring Instruments

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

3.4.4 Test Procedures

Test Method
▪ Refer as ANSI C63.10-2013, clause 7.8.3 for number of hopping frequencies measurement.
▪ Refer as ANSI C63.10-2013, clause 7.8.6 for hopping frequencies Bandedge measurement.

3.4.5 Test Setup



3.4.6 Test Result of Number of Hopping Frequencies

Refer as Appendix D

3.4.7 Test Result of Number of Hopping Frequencies Bandedge

Refer as Appendix D

3.5 Time of Occupancy (Dwell Time)

3.5.1 Time of Occupancy (Dwell Time) Limit

20dB Bandwidth and Carrier Frequency Separation Limit for Frequency Hopping Systems	
▪ 902-928 MHz Band:	
	▪ $N \geq 50$; 0.4s in 20s period
	▪ $50 > N \geq 25$; 0.4s in 10s period
▪ 2400-2483.5 MHz Band:	
	▪ $N \geq 75$; 0.4s in $N \times 0.4$ period
	▪ $75 > N \geq 15$; 0.4s in $N \times 0.4$ period
▪ 5725-5850 MHz Band:	
	▪ $N \geq 75$; 0.4s in 30s period
N: Number of Hopping Frequencies	

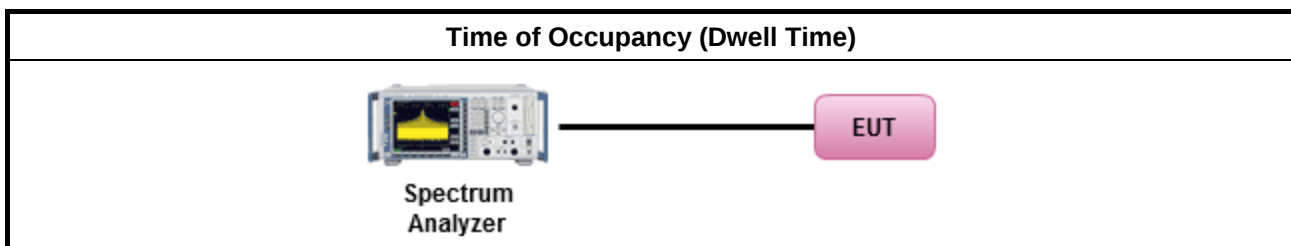
3.5.2 Measuring Instruments

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

3.5.3 Test Procedures

Test Method	
▪ Refer as ANSI C63.10-2013, clause 7.8.4 for dwell time measurement.	
▪ Bluetooth ACL packets can be 1, 3, or 5 time slots. Following as dwell time. Operate DH5 at maximum dwell time and maximum duty cycle.	
	▪ The DH5 packet can cover up to 5 time slots. Operate DH5 at maximum dwell time and maximum duty cycle. A maximum length packet has duration of 5 time slots. The hopping rate is 1600 hops/second so the maximum dwell time is $5/1600$ seconds, or 3.125ms. DH5 Packet permit maximum $1600 / 79 / 6 = 3.37$ hops per second in each channel.

3.5.4 Test Setup



3.5.5 Test Result of Time of Occupancy (Dwell Time)

Refer as Appendix E

3.6 Emissions in Non-restricted Frequency Bands

3.6.1 Emissions in Non-restricted Frequency Bands Limit

Un-restricted Band Emissions Limit	
RF output power procedure	Limit (dBc)
Peak output power procedure	20
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.	

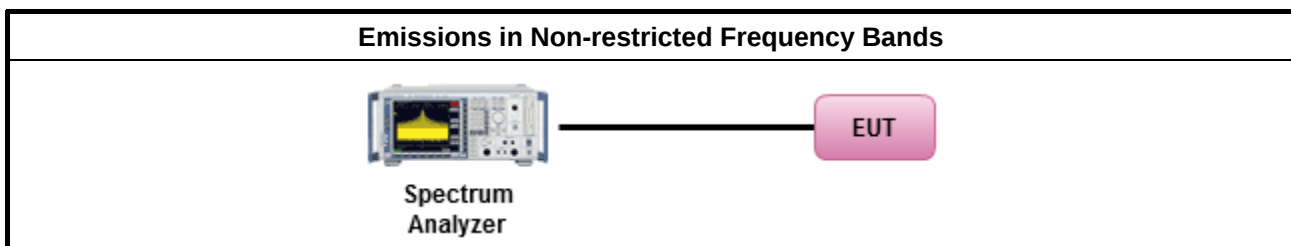
3.6.2 Measuring Instruments

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

3.6.3 Test Procedures

Test Method
Refer as ANSI C63.10-2013, clause 7.8.8 for unwanted emissions into non-restricted bands.

3.6.4 Test Setup



3.6.5 Test Result of Emissions in Non-restricted Frequency Bands

Refer as Appendix F



3.7 Emissions in Restricted Frequency Bands

3.7.1 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.

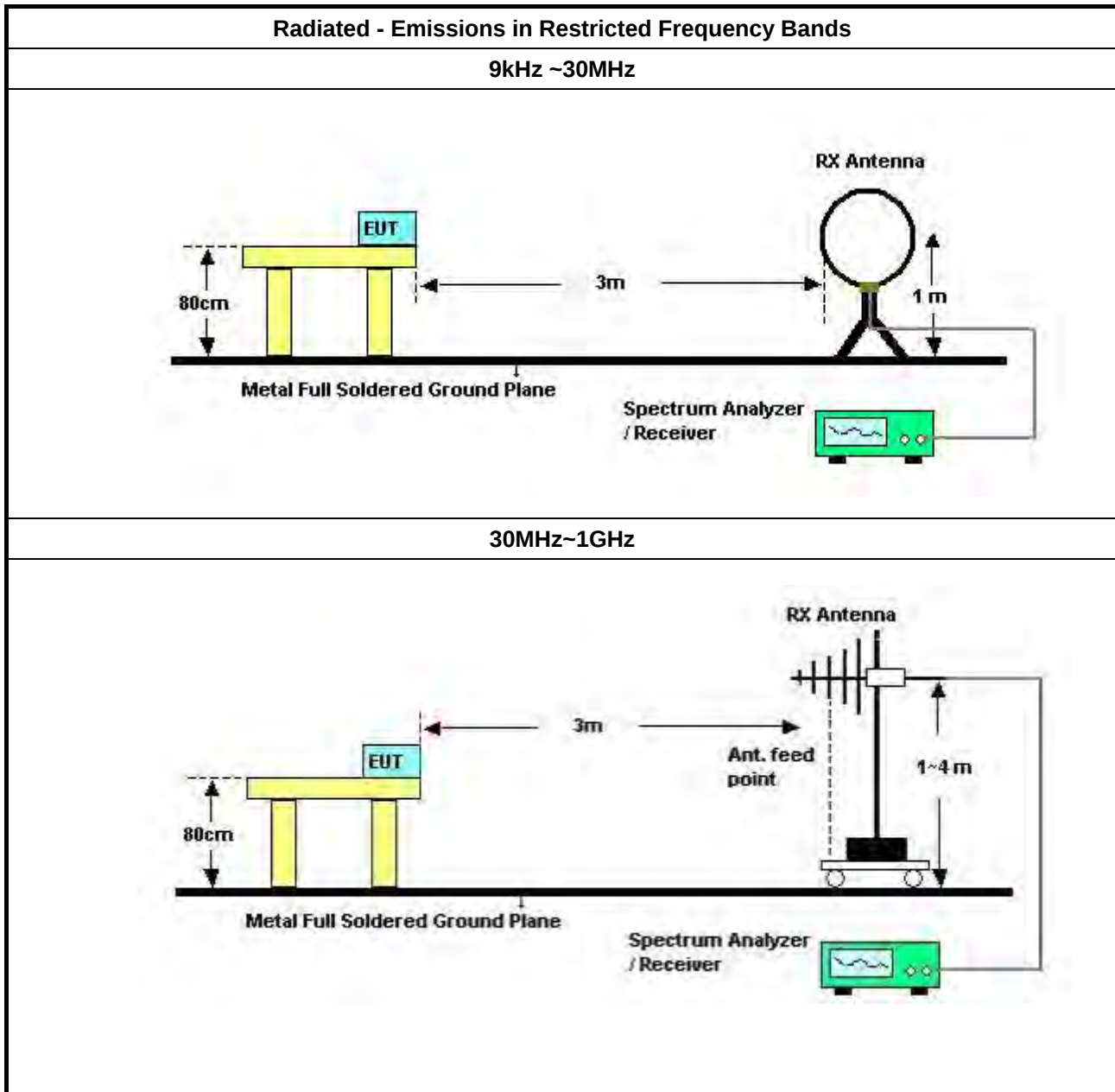
3.7.2 Measuring Instruments

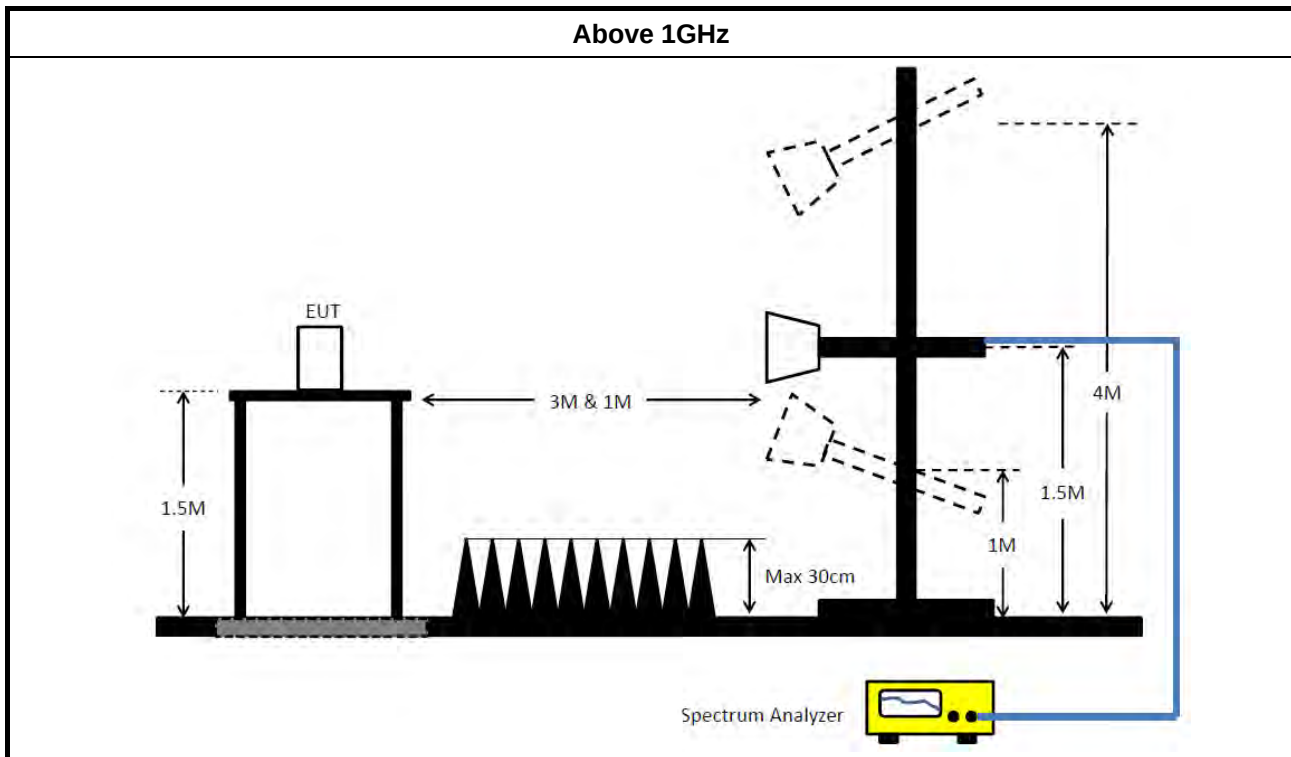
Refer a test equipment and calibration data table in this test report.

3.7.3 Test Procedures

Test Method	
▪ The average emission levels shall be measured in [hopping 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 ANSI C63.10, clause 4.1.4.2.1 QP value.
	▪ Refer as ANSI C63.10, clause 4.1.4.2.2 measurement procedure peak.
	▪ Refer as ANSI C63.10, clause 4.1.4.2.4 average value of hopping pulsed emissions.

3.7.4 Test Setup





3.7.5 Measurement Results Calculation

The measured Level is calculated using:

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

3.7.6 Emissions in Restricted Frequency Bands (Below 30MHz)

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

The radiated emissions were investigated from 9 kHz or the lowest frequency generated within the device, up to the 10 harmonic or 40 GHz, whichever is appropriate.

3.7.7 Test Result of Emissions in Restricted Frequency Bands

Refer as Appendix G



4 Test Equipment and Calibration Data

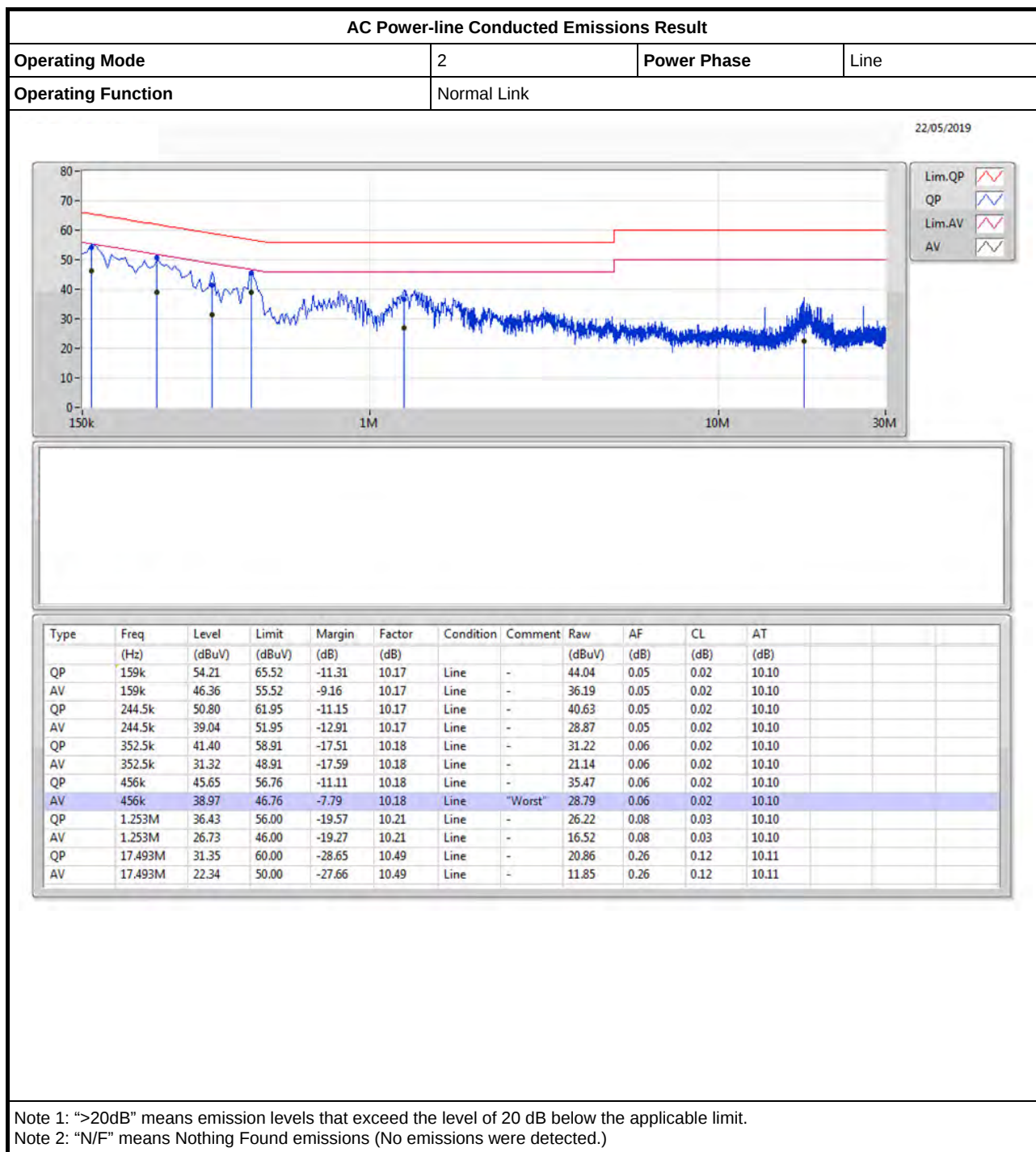
Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
LISN	Schwarzbeck	NSLK 8127	8127650	9kHz ~ 30MHz	Nov. 21, 2018	Nov. 20, 2019	Conduction (CO02-CB)
LISN	Schwarzbeck	NSLK 8127	8127478	9kHz ~ 30MHz	Nov. 05, 2018	Nov. 04, 2019	Conduction (CO02-CB)
EMI Receiver	Agilent	N9038A	MY52260140	9kHz ~ 8.4GHz	Jan. 16, 2019	Jan. 15, 2020	Conduction (CO02-CB)
COND Cable	Woken	Cable	2	0.15MHz ~ 30MHz	Nov. 06, 2018	Nov. 05, 2019	Conduction (CO02-CB)
Software	Audix	E3	6.120210n	-	N.C.R.	N.C.R.	Conduction (CO02-CB)
Loop Antenna	Teseq	HLA 6120	24155	9kHz - 30 MHz	Mar. 29, 2019	Mar. 28, 2020	Radiation (03CH03-CB)
Bilog Antenna	Schaffner	CBL6112B & N-6-06	2928 & AT-N0607	20MHz ~ 2GHz	Jan. 02, 2019	Jan. 01, 2020	Radiation (03CH03-CB)
Pre-Amplifier	Agilent	8447D	2944A10259	9kHz ~ 1.3GHz	Jan. 16, 2019	Jan. 15, 2020	Radiation (03CH03-CB)
Spectrum Analyzer	R&S	FSP40	100056	9kHz ~ 40GHz	Jan. 31, 2019	Jan. 30, 2020	Radiation (03CH03-CB)
EMI Test Receiver	R&S	ESCS	100359	9kHz ~ 2.75GHz	Jul. 03, 2018	Jul. 02, 2019	Radiation (03CH03-CB)
Low Cable	Woken	RG402	Low Cable-02+27	25MHz ~ 1GHz	Oct. 08, 2018	Oct. 07, 2019	Radiation (03CH03-CB)
Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-1292	1GHz~18GHz	Jul. 20, 2018	Jul. 19, 2019	Radiation (03CH06-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Jun. 28, 2018	Jun. 27, 2019	Radiation (03CH06-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Jan. 08, 2019	Jan. 07, 2020	Radiation (03CH06-CB)
Pre-Amplifier	MITEQ	TTA1840-35-H G	1864479	18GHz ~ 40GHz	Jul. 04, 2018	Jul. 03, 2019	Radiation (03CH06-CB)
Spectrum analyzer	R&S	FSP40	100080	9kHz~40GHz	Oct. 03, 2018	Oct. 02, 2019	Radiation (03CH06-CB)
RF Cable	HUBER+SUHNER	RG402	High Cable-05	1GHz~18GHz	Oct. 08, 2018	Oct. 07, 2019	Radiation (03CH06-CB)
RF Cable	HUBER+SUHNER	RG402	High Cable-05+24	1GHz~18GHz	Oct. 08, 2018	Oct. 07, 2019	Radiation (03CH06-CB)



Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
RF Cable-high	Woken	High Cable-40G#1	N/A	18GHz ~ 40 GHz	Jul. 27, 2018	Jul. 26, 2019	Radiation (03CH06-CB)
RF Cable-high	Woken	High Cable-40G#2	N/A	18GHz ~ 40 GHz	Jul. 27, 2018	Jul. 26, 2019	Radiation (03CH06-CB)
Spectrum analyzer	R&S	FSV40	100979	9kHz~40GHz	Feb. 25, 2019	Feb. 24, 2020	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-06	1 GHz – 26.5 GHz	Oct. 08, 2018	Oct. 07, 2019	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-07	1 GHz –26.5 GHz	Oct. 08, 2018	Oct. 07, 2019	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-08	1 GHz –26.5 GHz	Oct. 08, 2018	Oct. 07, 2019	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-09	1 GHz –26.5 GHz	Oct. 08, 2018	Oct. 07, 2019	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-10	1 GHz –26.5 GHz	Oct. 08, 2018	Oct. 07, 2019	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-28	1 GHz –26.5 GHz	Nov. 19, 2018	Nov. 18, 2019	Conducted (TH01-CB)
Power Sensor	Agilent	E9327A	US40442088	50MHz~18GHz	Jan. 15, 2019	Jan. 14, 2020	Conducted (TH01-CB)
Power Meter	Agilent	E4416A	GB41291199	50MHz~18GHz	Jan. 15, 2019	Jan. 14, 2020	Conducted (TH01-CB)

Note: Calibration Interval of instruments listed above is one year.

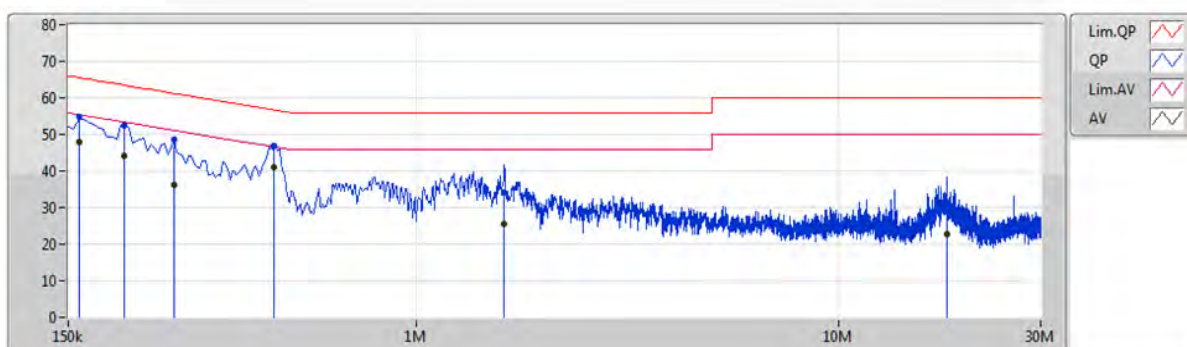
NCR means Non-Calibration required.



AC Power-line Conducted Emissions Result

Operating Mode	2	Power Phase	Neutral
Operating Function	Normal Link		

22/05/2019



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	AF (dB)	CL (dB)	AT (dB)			
QP	159k	54.75	65.52	-10.77	10.15	Neutral	-	44.60	0.03	0.02	10.10			
AV	159k	48.04	55.52	-7.48	10.15	Neutral	-	37.89	0.03	0.02	10.10			
QP	204k	52.38	63.44	-11.06	10.15	Neutral	-	42.23	0.03	0.02	10.10			
AV	204k	43.98	53.44	-9.46	10.15	Neutral	-	33.83	0.03	0.02	10.10			
QP	267k	48.67	61.20	-12.53	10.15	Neutral	-	38.52	0.03	0.02	10.10			
AV	267k	36.24	51.20	-14.96	10.15	Neutral	-	26.09	0.03	0.02	10.10			
QP	460.5k	46.78	56.69	-9.91	10.16	Neutral	-	36.62	0.04	0.02	10.10			
AV	460.5k	40.90	46.69	-5.79	10.16	Neutral	"Worst"	30.74	0.04	0.02	10.10			
QP	1.613M	34.25	56.00	-21.75	10.19	Neutral	-	24.06	0.05	0.04	10.10			
AV	1.613M	25.43	46.00	-20.57	10.19	Neutral	-	15.24	0.05	0.04	10.10			
QP	17.984M	30.88	60.00	-29.12	10.44	Neutral	-	20.44	0.21	0.12	10.11			
AV	17.984M	22.71	50.00	-27.29	10.44	Neutral	-	12.27	0.21	0.12	10.11			

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-BR(1Mbps)	918.75k	883.308k	883KF1D	915k	874.563k
BT-EDR(2Mbps)	1.334M	1.213M	1M21G1D	1.331M	1.207M
BT-EDR(3Mbps)	1.285M	1.214M	1M21G1D	1.281M	1.212M

Max-N dB = Maximum 20dB down bandwidth; **Max-OBW** = Maximum 99% occupied bandwidth;

Min-N dB = Minimum 20dB down bandwidth; **Min-OBW** = Minimum 99% occupied bandwidth;

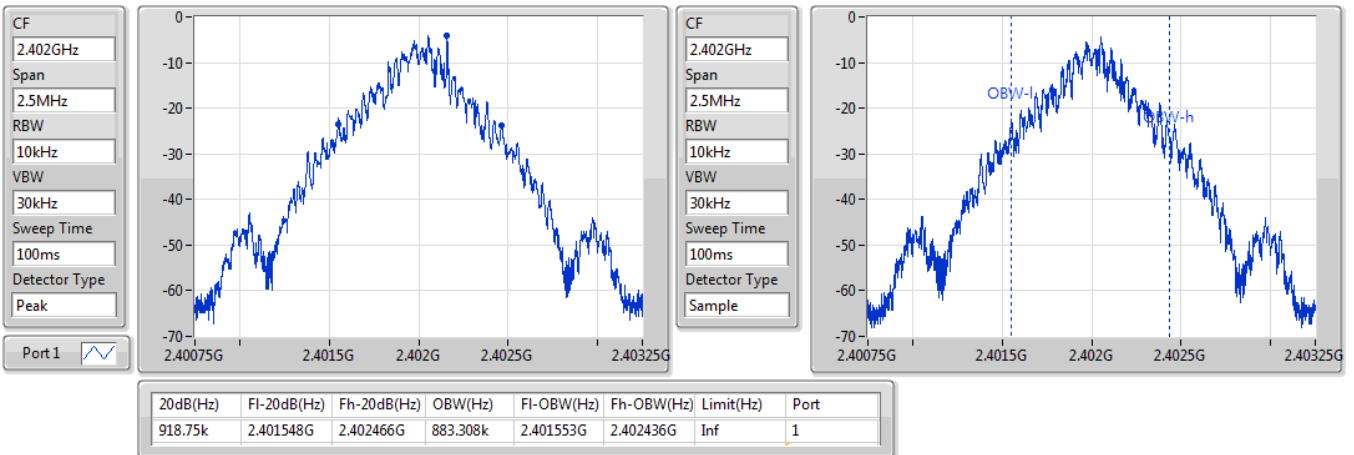
Result

Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
BT-BR(1Mbps)	-	-	-	-
2402MHz	Pass	Inf	918.75k	883.308k
2440MHz	Pass	Inf	918.75k	877.061k
2480MHz	Pass	Inf	915k	874.563k
BT-EDR(2Mbps)	-	-	-	-
2402MHz	Pass	Inf	1.331M	1.212M
2440MHz	Pass	Inf	1.331M	1.207M
2480MHz	Pass	Inf	1.334M	1.213M
BT-EDR(3Mbps)	-	-	-	-
2402MHz	Pass	Inf	1.285M	1.212M
2440MHz	Pass	Inf	1.283M	1.214M
2480MHz	Pass	Inf	1.281M	1.213M

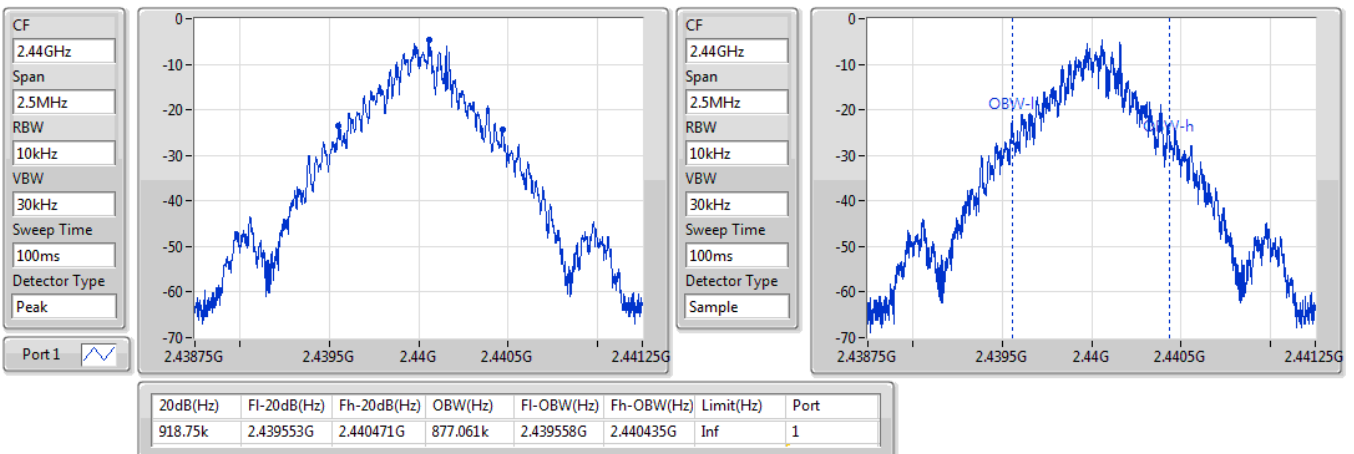
Port X-N dB = Port X 20dB down bandwidth; **Port X-OBW** = Port X 99% occupied bandwidth;

BT-BR(1Mbps)
2402MHz
EBW

11/05/2019

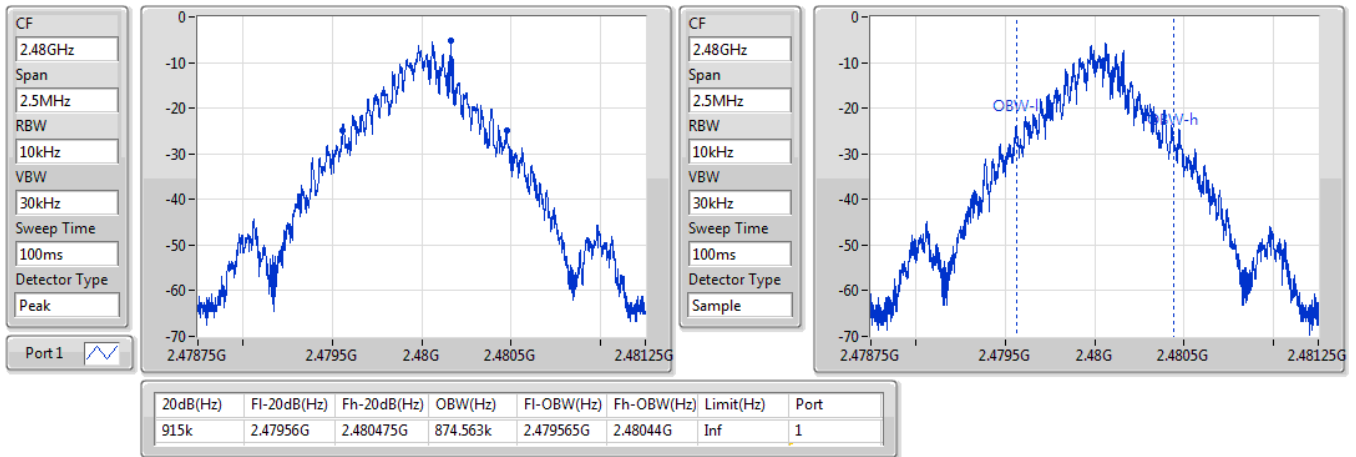

BT-BR(1Mbps)
2440MHz
EBW

11/05/2019

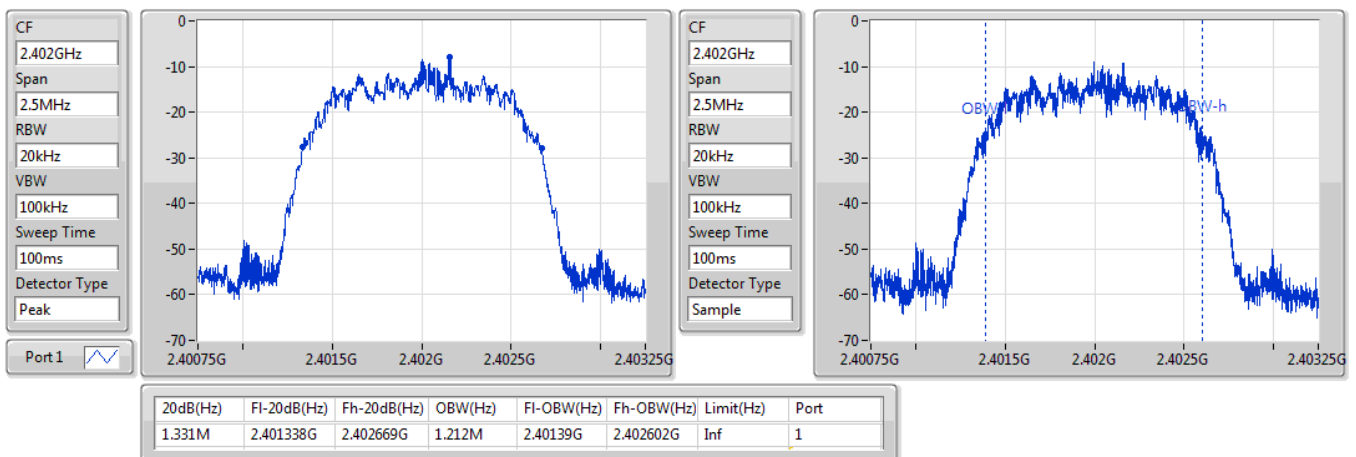


BT-BR(1Mbps)
EBW
2480MHz

11/05/2019

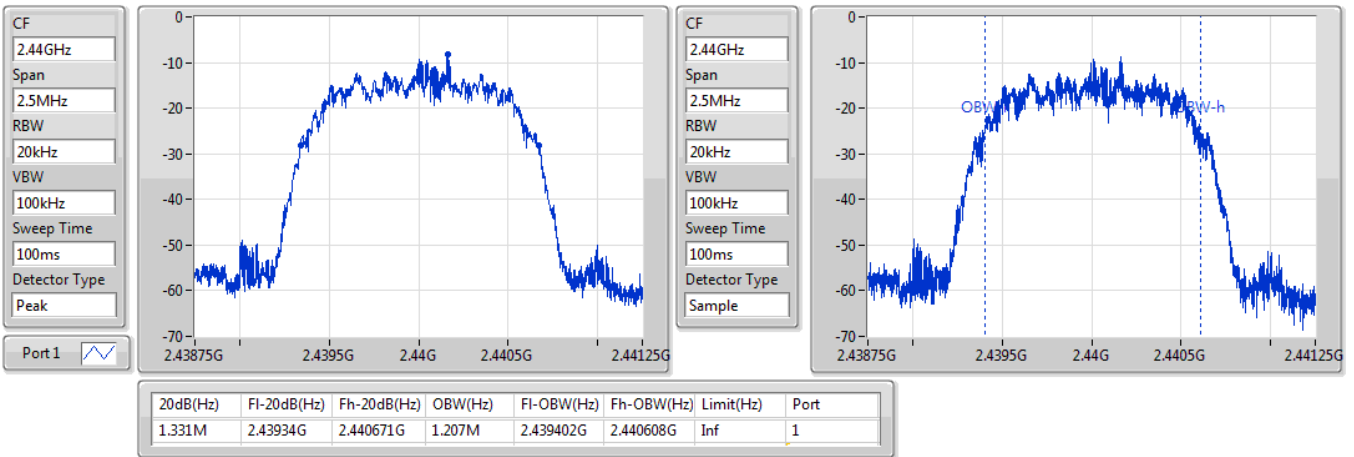

BT-EDR(2Mbps)
EBW
2402MHz

11/05/2019

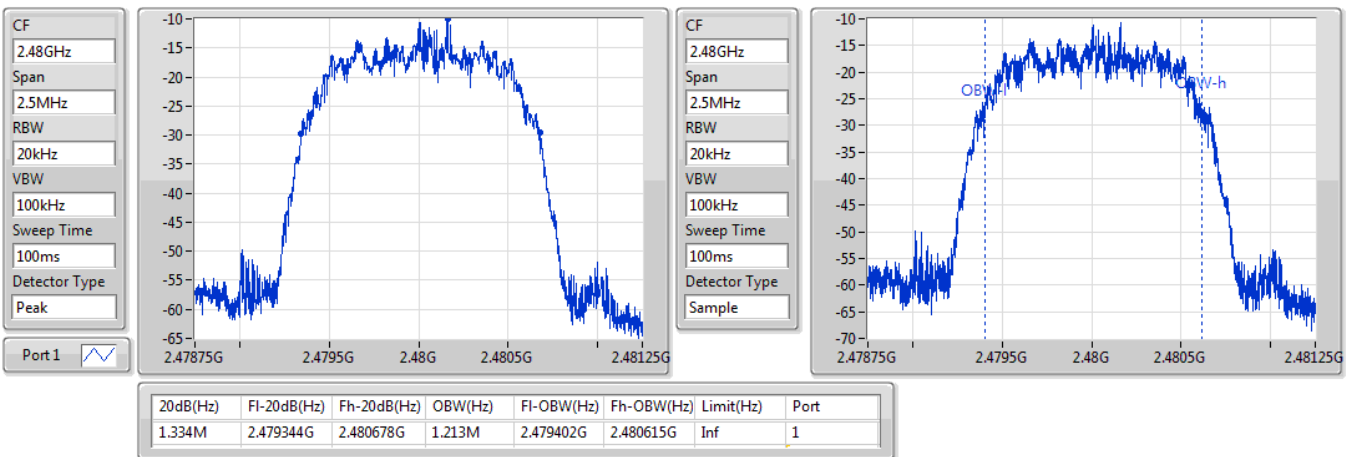


BT-EDR(2Mbps)
EBW
2440MHz

11/05/2019

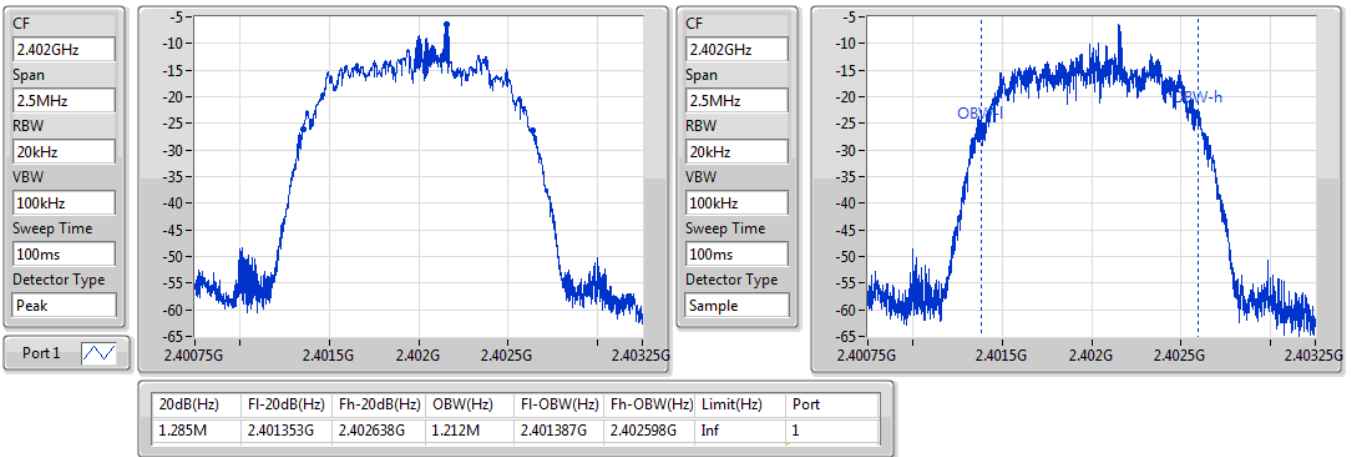

BT-EDR(2Mbps)
EBW
2480MHz

11/05/2019

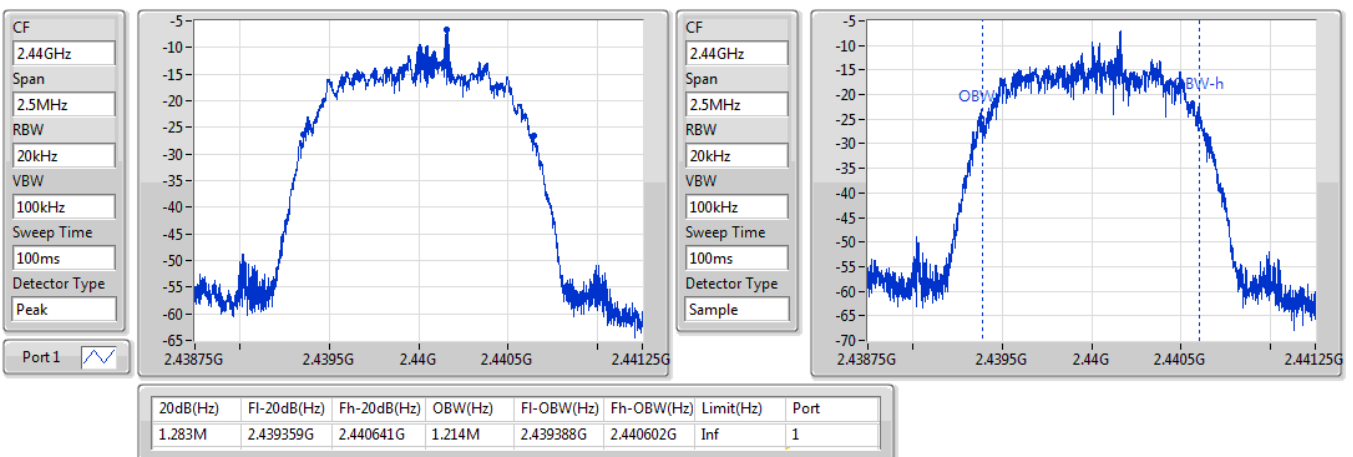


BT-EDR(3Mbps)
EBW
2402MHz

11/05/2019


BT-EDR(3Mbps)
EBW
2440MHz

11/05/2019

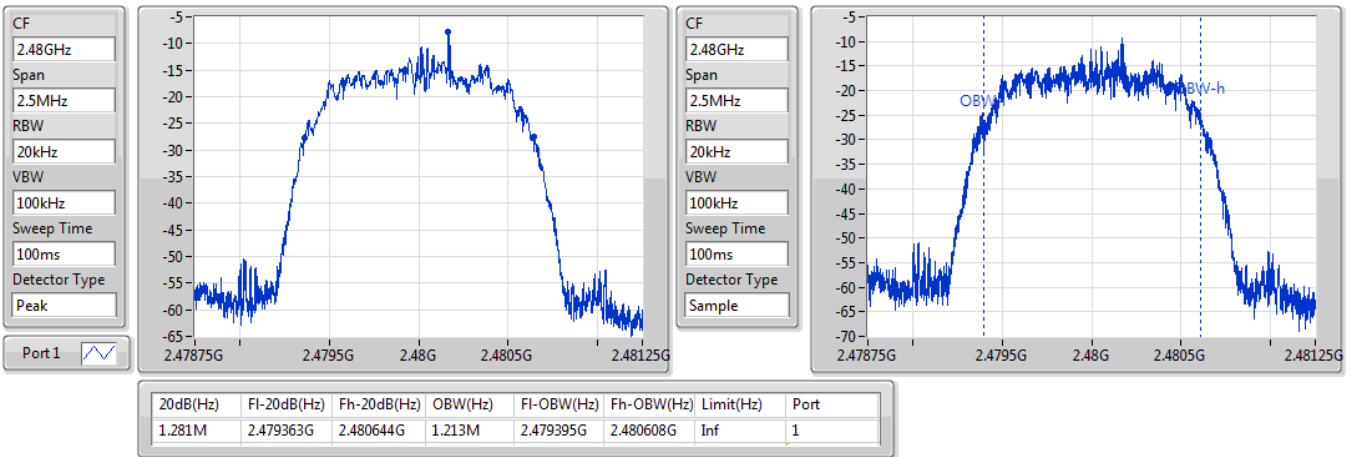


BT-EDR(3Mbps)

2480MHz

EBW

11/05/2019



Summary

Mode	Max-Space (Hz)	Min-Space (Hz)
2.4-2.4835GHz	-	-
BT-BR(1Mbps)	1.0035M	1.0005M
BT-EDR(2Mbps)	1.0005M	999k
BT-EDR(3Mbps)	1.002M	999k

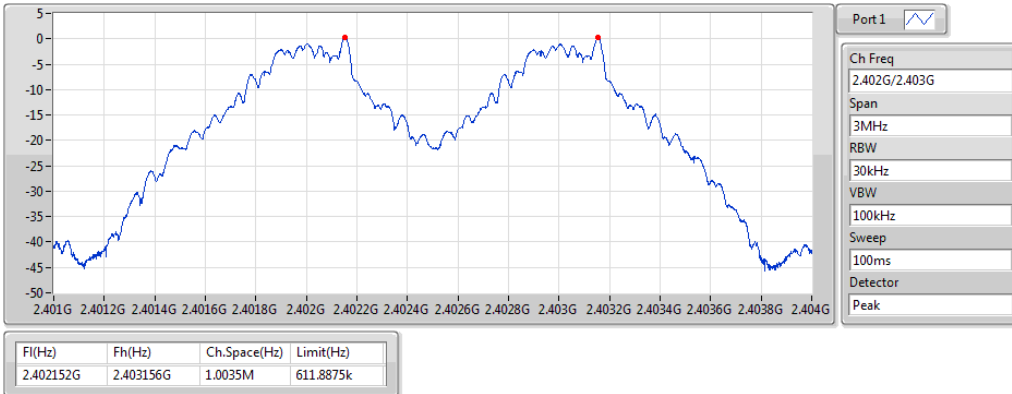
Result

Mode	Result	Fl (Hz)	Fh (Hz)	Ch.Space (Hz)	Limit (Hz)
BT-BR(1Mbps)	-	-	-	-	-
2402MHz	Pass	2.402152G	2.403156G	1.0035M	611.8875k
2440MHz	Pass	2.440158G	2.441159G	1.0005M	611.8875k
2480MHz	Pass	2.479163G	2.480163G	1.0005M	609.39k
BT-EDR(2Mbps)	-	-	-	-	-
2402MHz	Pass	2.402004G	2.403004G	1.0005M	886.446k
2440MHz	Pass	2.44001G	2.441009G	999k	886.446k
2480MHz	Pass	2.479011G	2.480012G	1.0005M	888.444k
BT-EDR(3Mbps)	-	-	-	-	-
2402MHz	Pass	2.402155G	2.403154G	999k	855.81k
2440MHz	Pass	2.440158G	2.44116G	1.002M	854.478k
2480MHz	Pass	2.479163G	2.480163G	1.0005M	853.146k

BT-BR(1Mbps)

2.402G/2.403GHz

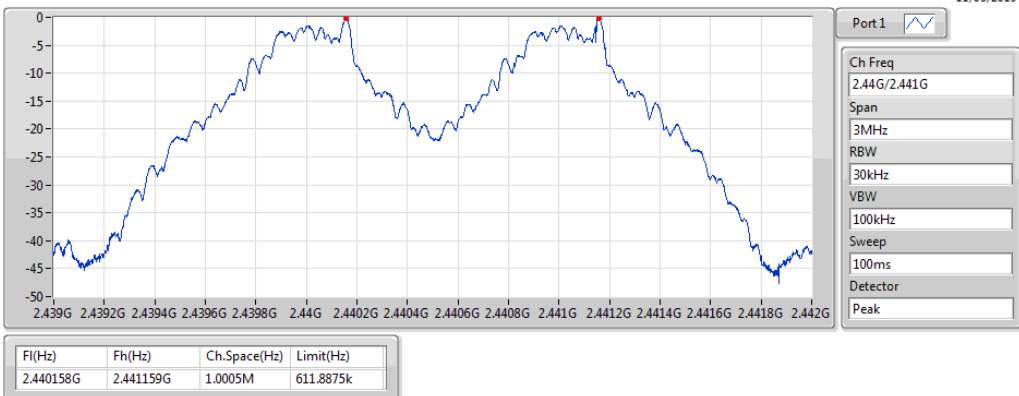
Channel Separation



BT-BR(1Mbps)

2.44G/2.441GHz

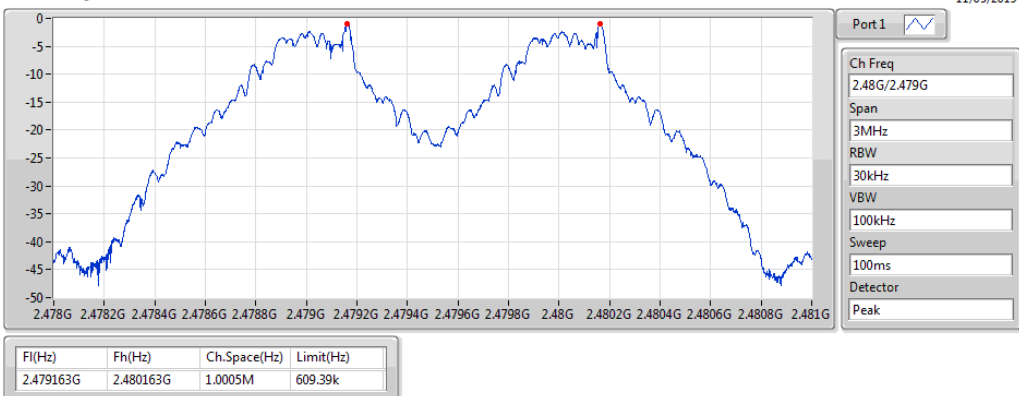
Channel Separation



BT-BR(1Mbps)

2.48G/2.479GHz

Channel Separation

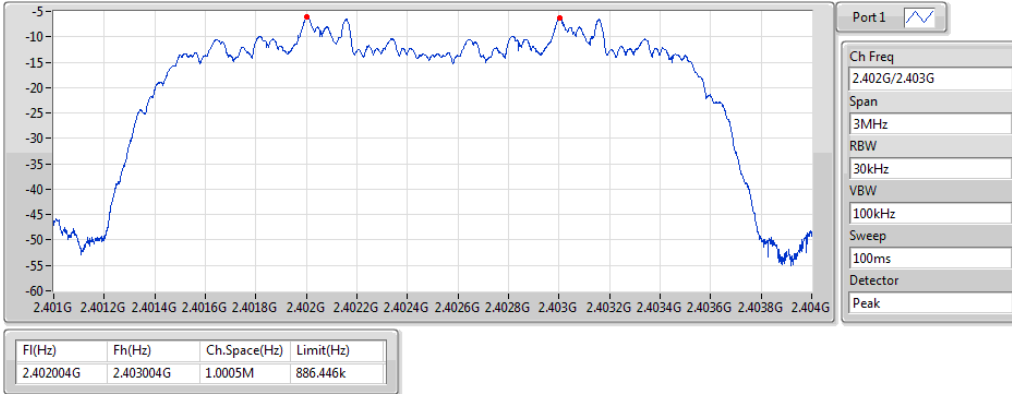


BT-EDR(2Mbps)

2.402G/2.403GHz

Channel Separation

11/05/2019

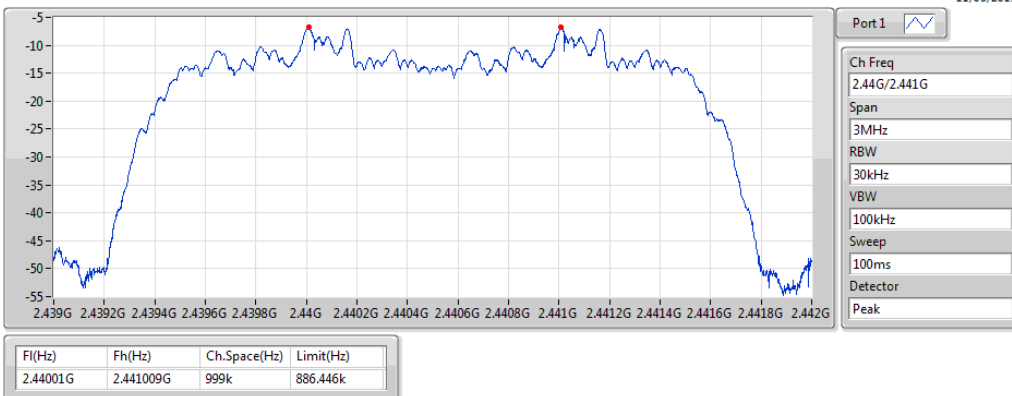


BT-EDR(2Mbps)

2.44G/2.441GHz

Channel Separation

11/05/2019

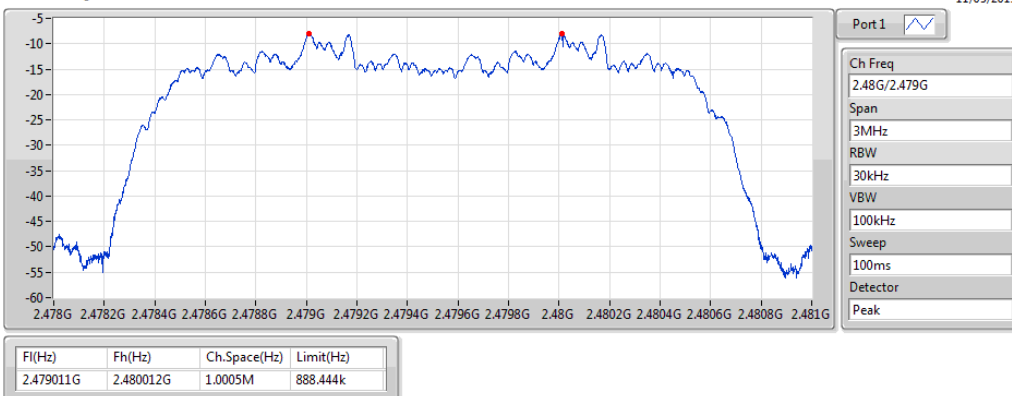


BT-EDR(2Mbps)

2.48G/2.479GHz

Channel Separation

11/05/2019



BT-EDR(3Mbps)

2.402G/2.403GHz

Channel Separation

11/05/2019

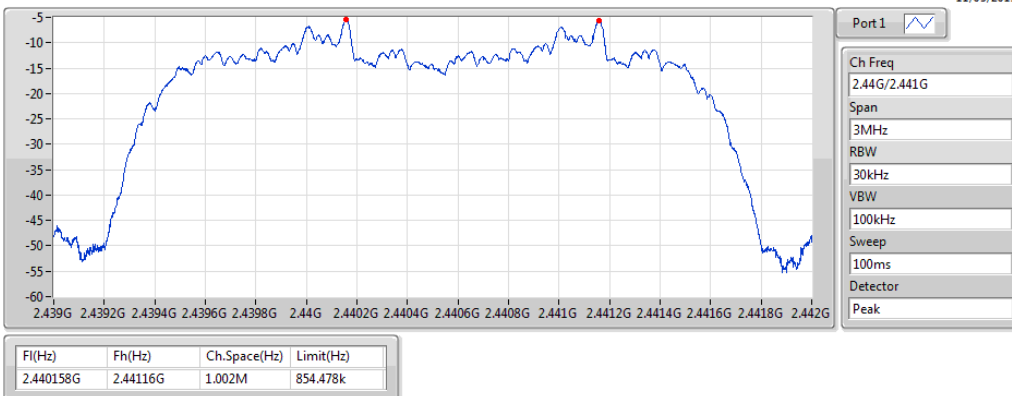


BT-EDR(3Mbps)

2.44G/2.441GHz

Channel Separation

11/05/2019

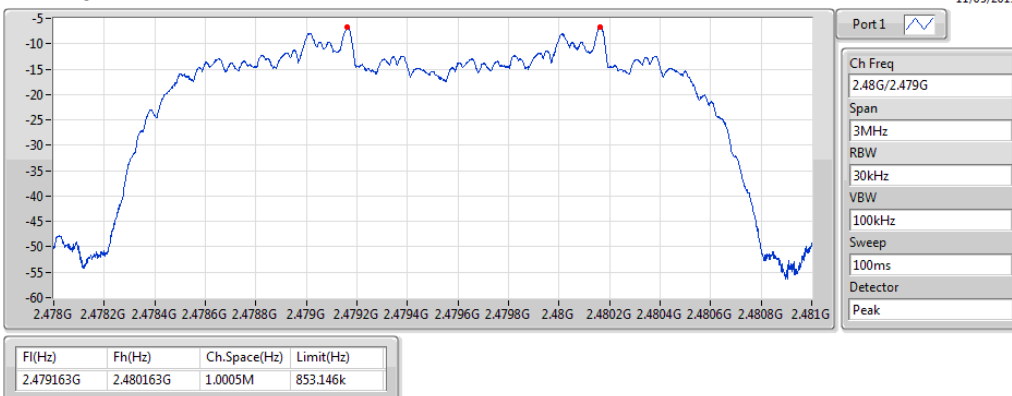


BT-EDR(3Mbps)

2.48G/2.479GHz

Channel Separation

11/05/2019





Average Power-FHSS Results

Appendix C.1

Summary

Mode	Power (dBm)	Power (W)
2.4-2.4835GHz	-	-
BT-BR(1Mbps)	1.69	0.00148
BT-EDR(2Mbps)	-3.20	0.00048
BT-EDR(3Mbps)	-3.21	0.00048

Result

Mode	Result	Gain (dBi)	Power (dBm)	Power Limit (dBm)
BT-BR(1Mbps)	-	-	-	-
2402MHz	Pass	0.71	1.69	30.00
2440MHz	Pass	0.71	1.18	30.00
2480MHz	Pass	0.71	0.30	30.00
BT-EDR(2Mbps)	-	-	-	-
2402MHz	Pass	0.71	-3.20	30.00
2440MHz	Pass	0.71	-3.58	30.00
2480MHz	Pass	0.71	-12.51	30.00
BT-EDR(3Mbps)	-	-	-	-
2402MHz	Pass	0.71	-3.21	30.00
2440MHz	Pass	0.71	-3.62	30.00
2480MHz	Pass	0.71	-4.85	30.00

DG = Directional Gain; **Port X** = Port X output power

**Summary**

Mode	Power (dBm)	Power (W)
2.4-2.4835GHz	-	-
BT-BR(1Mbps)	1.77	0.00150
BT-EDR(2Mbps)	-1.15	0.00077
BT-EDR(3Mbps)	-0.67	0.00086

Result

Mode	Result	Gain (dBi)	Power (dBm)	Power Limit (dBm)
BT-BR(1Mbps)	-	-	-	-
2402MHz	Pass	0.71	1.77	21.00
2440MHz	Pass	0.71	1.28	21.00
2480MHz	Pass	0.71	0.39	21.00
BT-EDR(2Mbps)	-	-	-	-
2402MHz	Pass	0.71	-1.15	21.00
2440MHz	Pass	0.71	-1.59	21.00
2480MHz	Pass	0.71	-2.76	21.00
BT-EDR(3Mbps)	-	-	-	-
2402MHz	Pass	0.71	-0.67	21.00
2440MHz	Pass	0.71	-1.18	21.00
2480MHz	Pass	0.71	-2.34	21.00

DG = Directional Gain; **Port X** = Port X output power

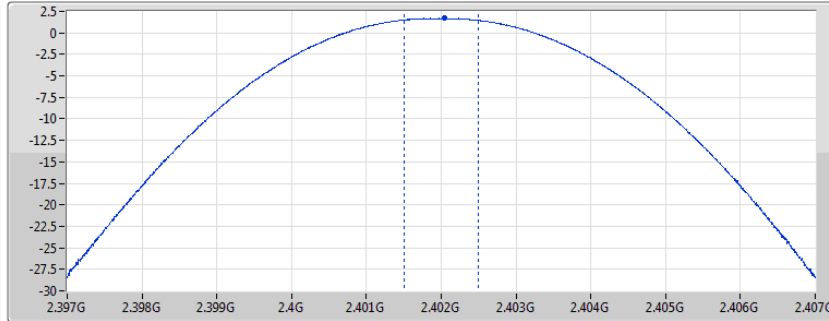
BT-BR(1Mbps)

PK Power

2402MHz

11/05/2019

CF
2.402GHz
Span
10MHz
RBW
3MHz
VBW
10MHz
Sweep Time
20ms
Detector Type
Peak
CP BW
NaNHz



Port1

Sum=Total Power
PX=Port X

Sum(dBm)	P1(dBm)
1.77	1.77

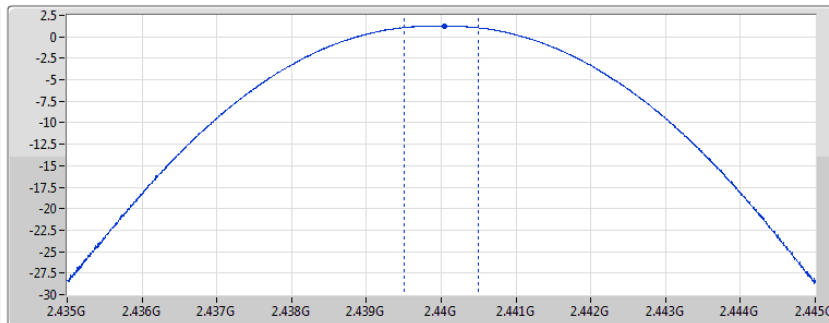
BT-BR(1Mbps)

PK Power

2440MHz

11/05/2019

CF
2.44GHz
Span
10MHz
RBW
3MHz
VBW
10MHz
Sweep Time
20ms
Detector Type
Peak
CP BW
NaNHz



Port1

Sum=Total Power
PX=Port X

Sum(dBm)	P1(dBm)
1.28	1.28

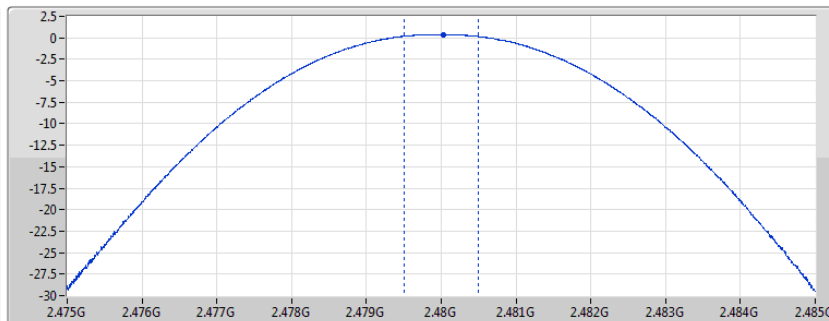
BT-BR(1Mbps)

PK Power

2480MHz

11/05/2019

CF
2.48GHz
Span
10MHz
RBW
3MHz
VBW
10MHz
Sweep Time
20ms
Detector Type
Peak
CP BW
NaNHz



Port1

Sum=Total Power
PX=Port X

Sum(dBm)	P1(dBm)
0.39	0.39

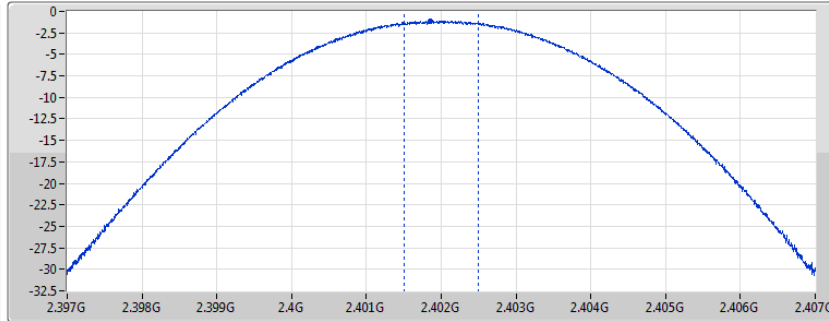
BT-EDR(2Mbps)

PK Power

2402MHz

11/05/2019

CF
2.402GHz
Span
10MHz
RBW
3MHz
VBW
10MHz
Sweep Time
20ms
Detector Type
Peak
CP BW
NaNHz



Port1

Sum=Total Power
PX=Port X

Sum(dBm)	P1(dBm)
-1.15	-1.15

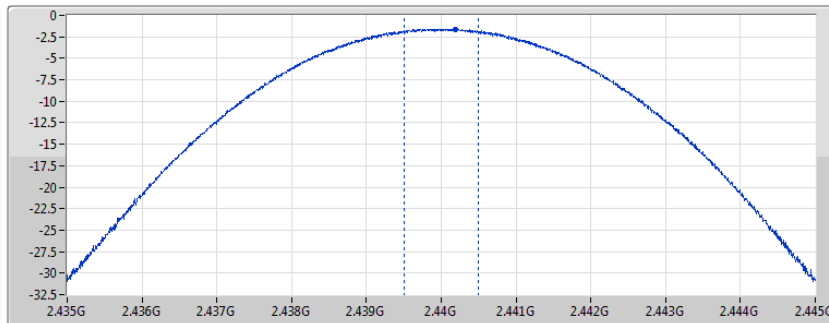
BT-EDR(2Mbps)

PK Power

2440MHz

11/05/2019

CF
2.44GHz
Span
10MHz
RBW
3MHz
VBW
10MHz
Sweep Time
20ms
Detector Type
Peak
CP BW
NaNHz



Port1

Sum=Total Power
PX=Port X

Sum(dBm)	P1(dBm)
-1.59	-1.59

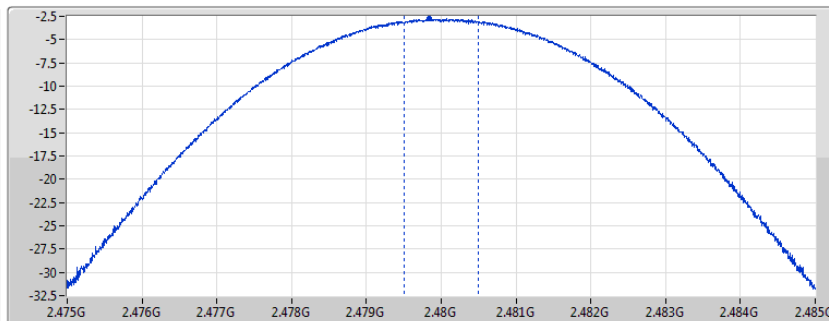
BT-EDR(2Mbps)

PK Power

2480MHz

11/05/2019

CF
2.48GHz
Span
10MHz
RBW
3MHz
VBW
10MHz
Sweep Time
20ms
Detector Type
Peak
CP BW
NaNHz



Port1

Sum=Total Power
PX=Port X

Sum(dBm)	P1(dBm)
-2.76	-2.76

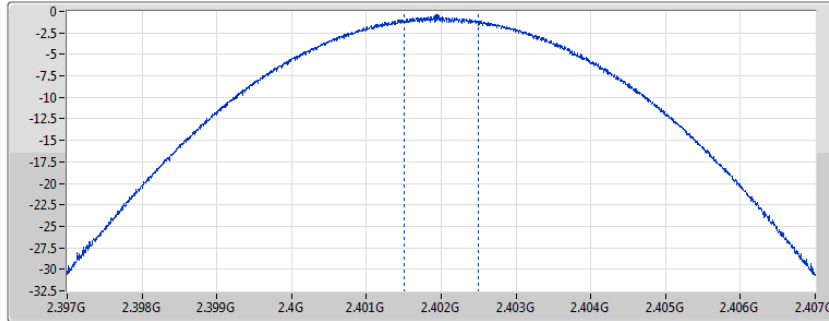
BT-EDR(3Mbps)

PK Power

2402MHz

11/05/2019

CF
2.402GHz
Span
10MHz
RBW
3MHz
VBW
10MHz
Sweep Time
20ms
Detector Type
Peak
CP BW
NaNHz



Sum=Total Power
PX=Port X

Sum(dBm)	P1(dBm)
-0.67	-0.67

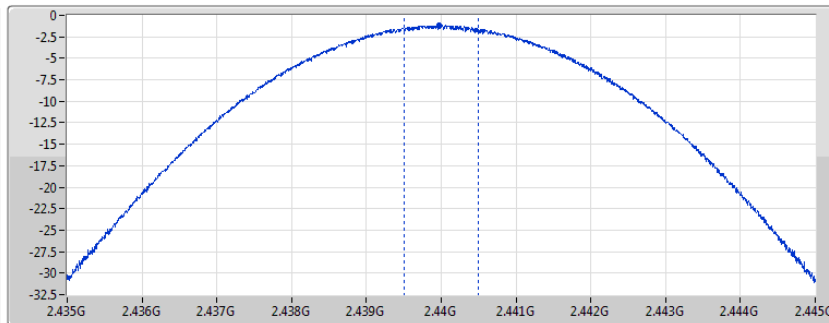
BT-EDR(3Mbps)

PK Power

2440MHz

11/05/2019

CF
2.44GHz
Span
10MHz
RBW
3MHz
VBW
10MHz
Sweep Time
20ms
Detector Type
Peak
CP BW
NaNHz



Sum=Total Power
PX=Port X

Sum(dBm)	P1(dBm)
-1.18	-1.18

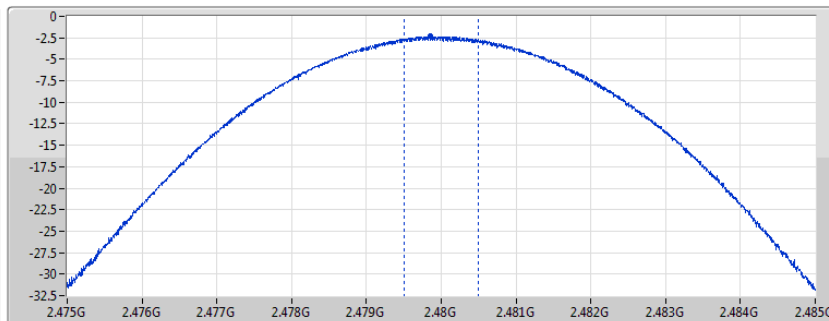
BT-EDR(3Mbps)

PK Power

2480MHz

11/05/2019

CF
2.48GHz
Span
10MHz
RBW
3MHz
VBW
10MHz
Sweep Time
20ms
Detector Type
Peak
CP BW
NaNHz



Sum=Total Power
PX=Port X

Sum(dBm)	P1(dBm)
-2.34	-2.34

Summary

Mode	Max-Hop No
2.4-2.4835GHz	-
BT-BR(1Mbps)	79
BT-EDR(2Mbps)	79
BT-EDR(3Mbps)	79

Result

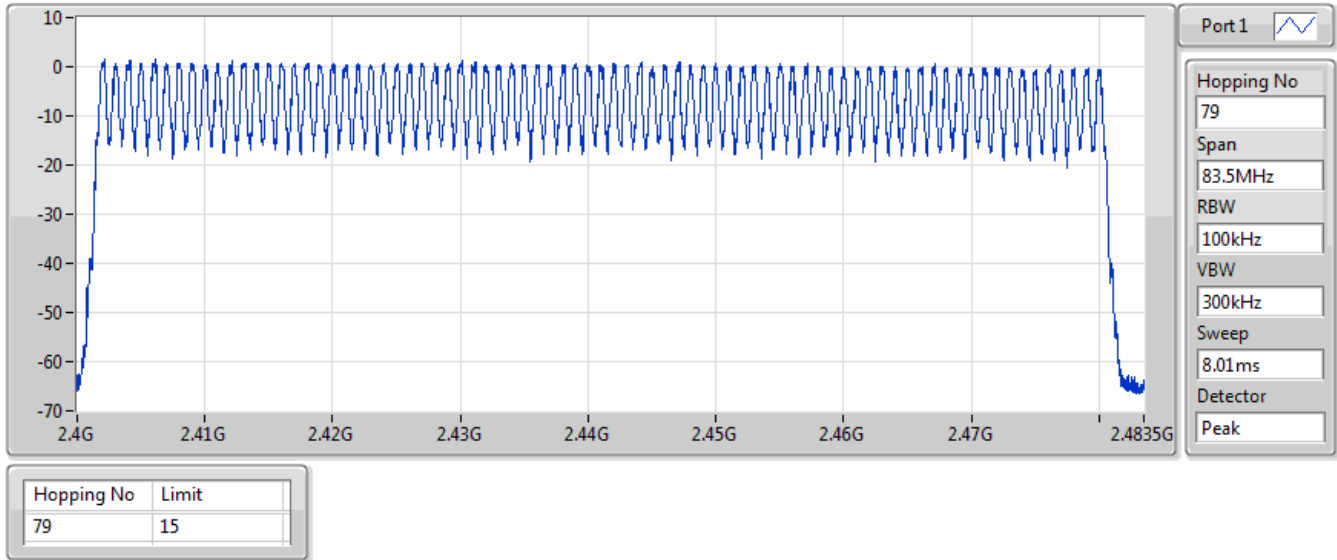
Mode	Result	Hopping No	Limit
BT-BR(1Mbps)	-	-	-
2440MHz	Pass	79	15
BT-EDR(2Mbps)	-	-	-
2440MHz	Pass	79	15
BT-EDR(3Mbps)	-	-	-
2440MHz	Pass	79	15

BT-BR(1Mbps)

2440MHz

Hopping Ch

11/05/2019

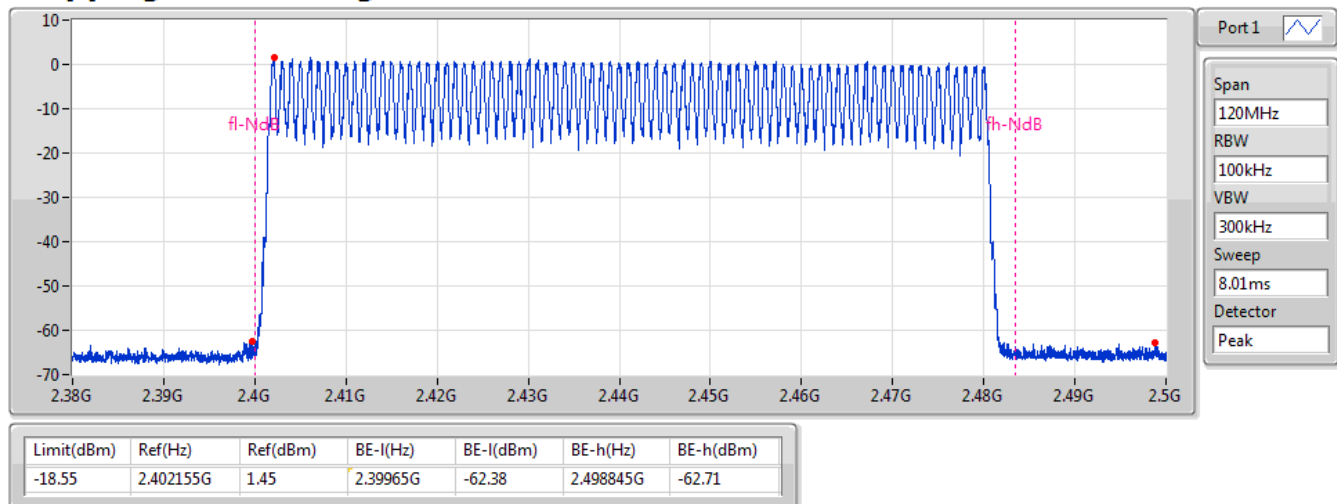


BT-BR(1Mbps)

2440MHz

Hopping Ch Bandedge (Non-restricted Band)

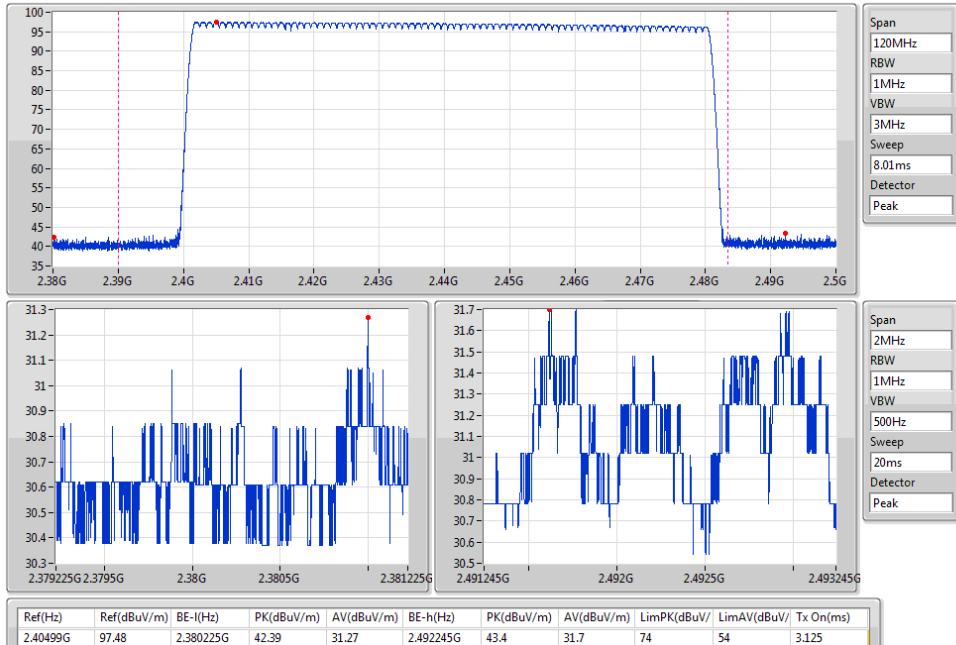
11/05/2019



BT-BR(1Mbps)

2440MHz

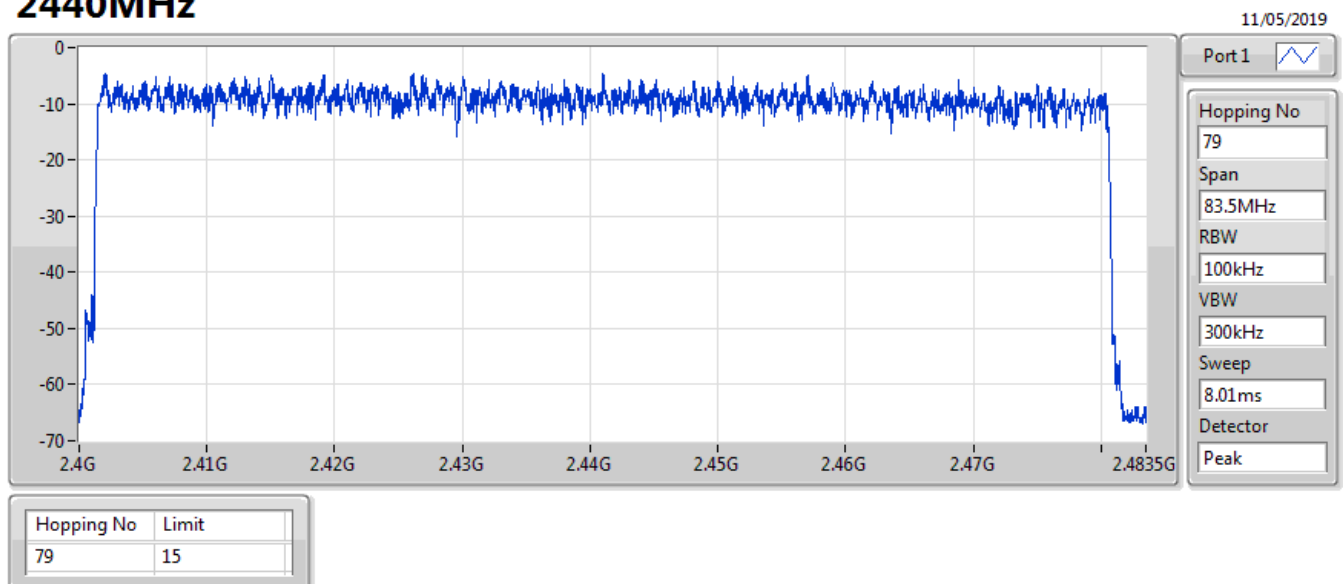
Hopping Ch Bandedge (Restricted Band)



BT-EDR(2Mbps)

2440MHz

Hopping Ch

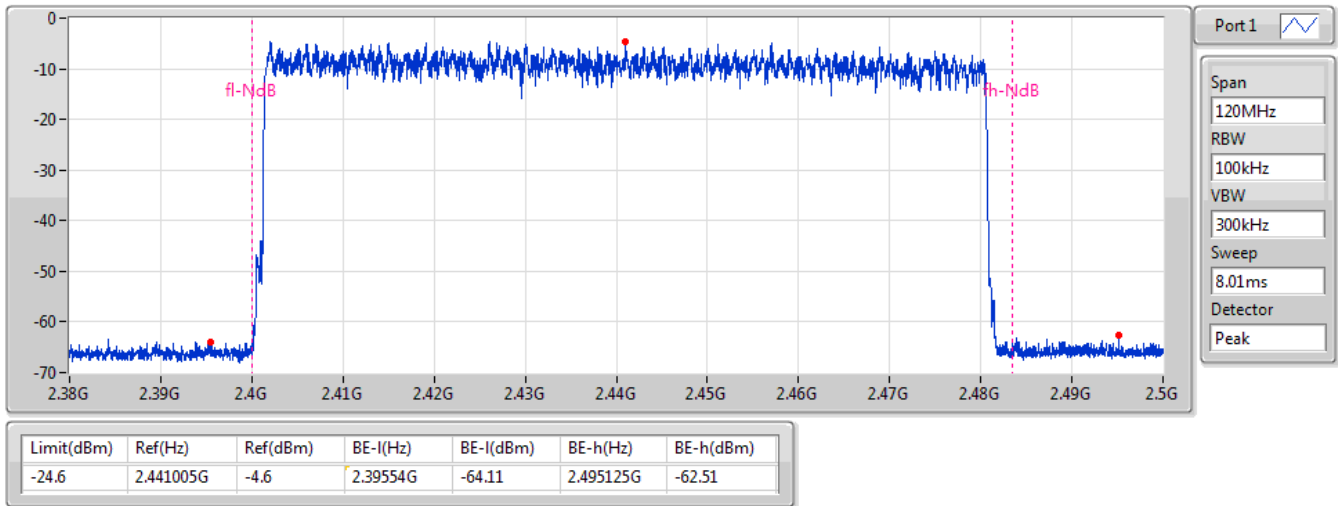


BT-EDR(2Mbps)

2440MHz

Hopping Ch Bandedge (Non-restricted Band)

11/05/2019

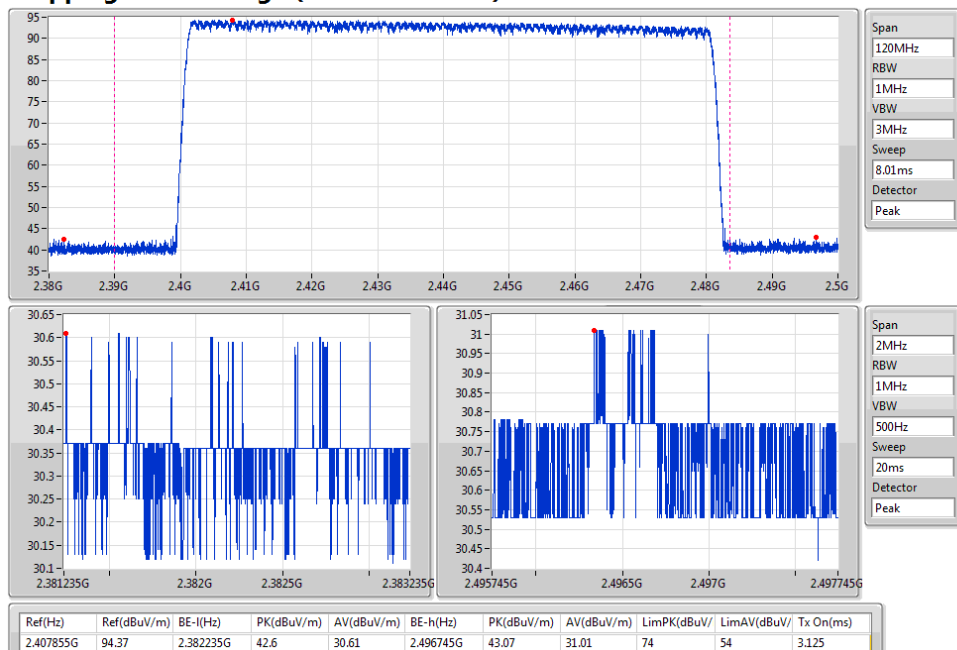


BT-EDR(2Mbps)

2440MHz

Hopping Ch Bandedge (Restricted Band)

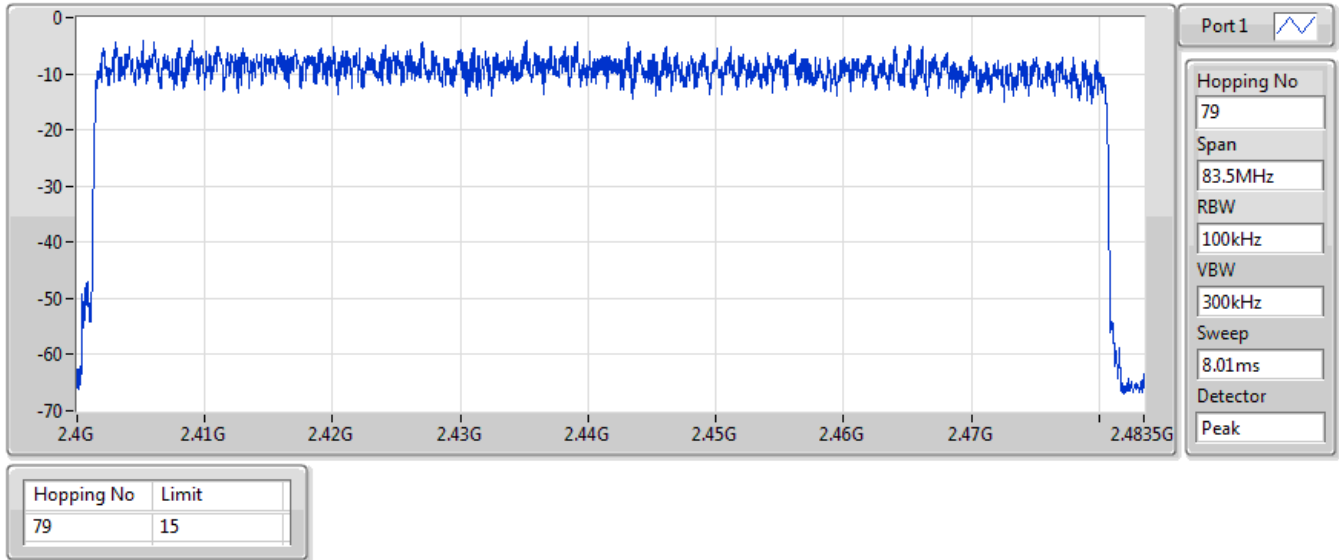
11/05/2019



BT-EDR(3Mbps) 2440MHz

Hopping Ch

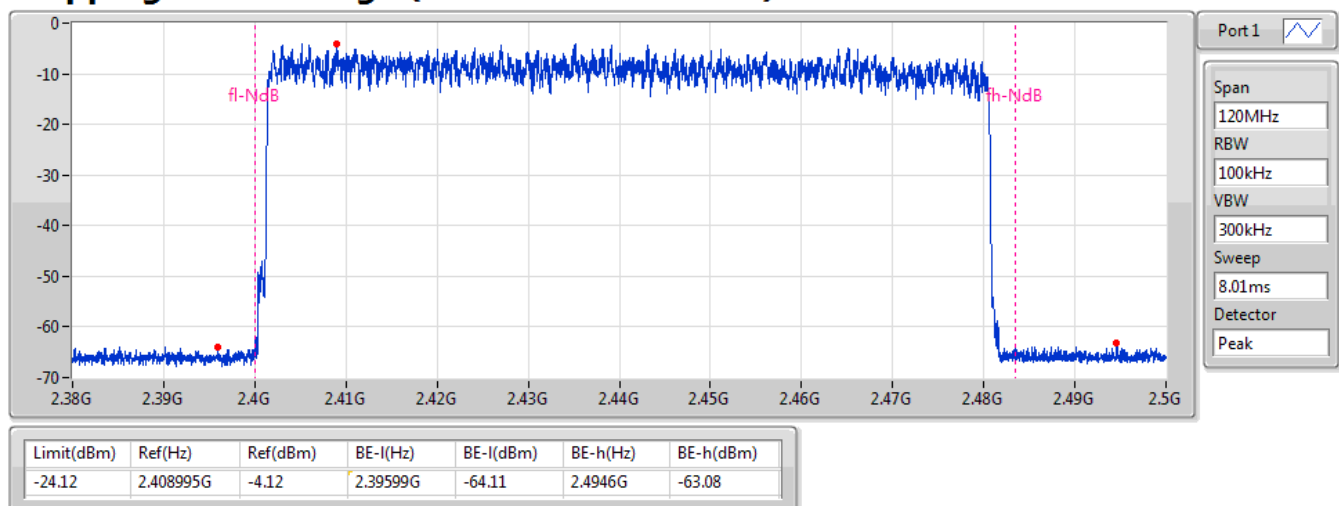
11/05/2019



BT-EDR(3Mbps) 2440MHz

Hopping Ch Bandedge (Non-restricted Band)

11/05/2019

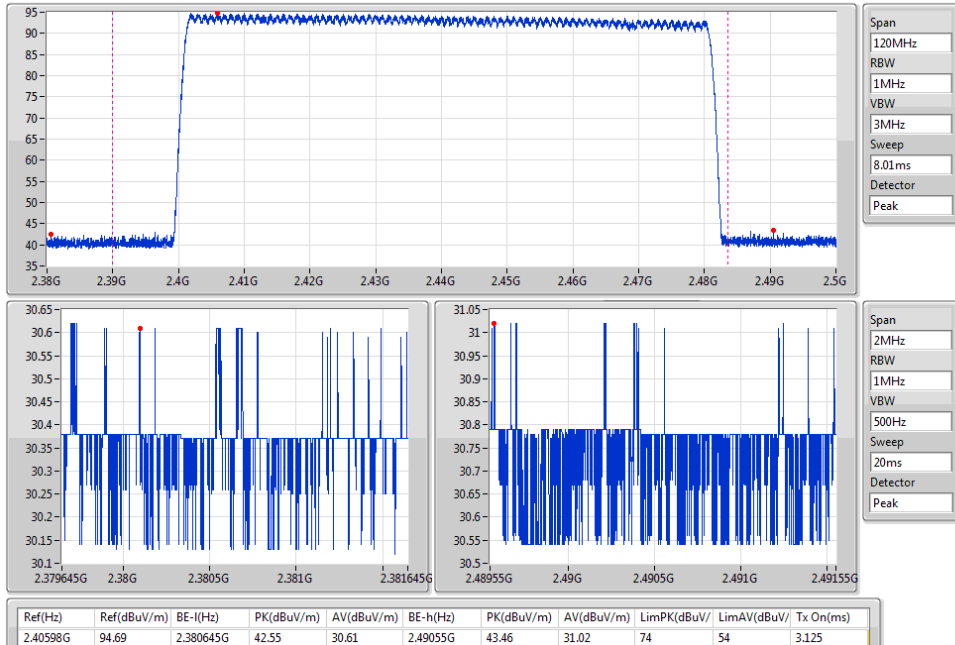


BT-EDR(3Mbps)

2440MHz

Hopping Ch Bandedge (Restricted Band)

11/05/2019



**Summary**

Mode	Max-Dwell (s)
2.4-2.4835GHz	-
BT-BR(1Mbps)	308.2872m
BT-EDR(2Mbps)	311.3786m
BT-EDR(3Mbps)	308.7136m

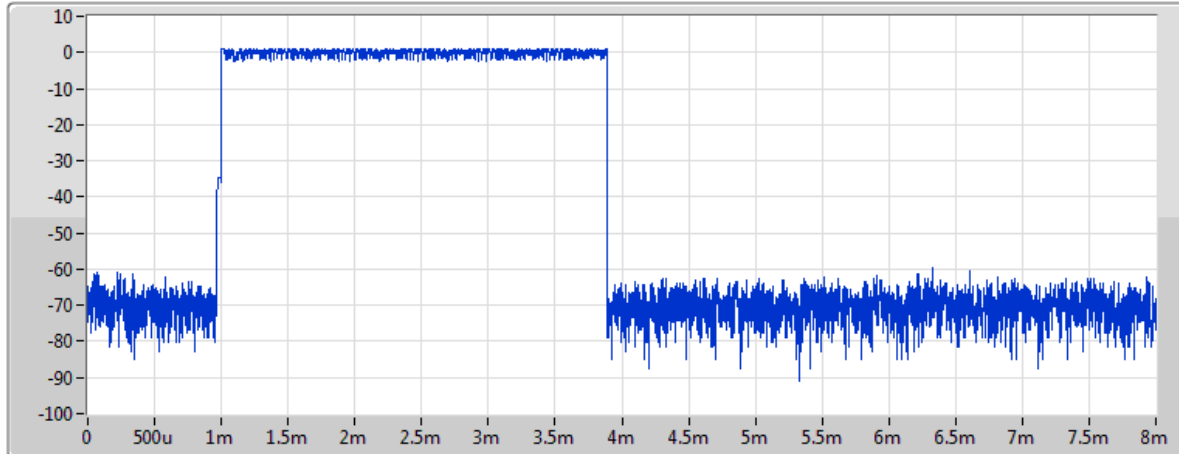
Result

Mode	Result	Period (s)	Dwell (s)	Limit (s)	Tx On (s)
BT-BR(1Mbps)	-	-	-	-	-
2440MHz	Pass	31.6	308.2872m	400m	2.892m
BT-EDR(2Mbps)	-	-	-	-	-
2440MHz	Pass	31.6	311.3786m	400m	2.921m
BT-EDR(3Mbps)	-	-	-	-	-
2440MHz	Pass	31.6	308.7136m	400m	2.896m

BT-BR(1Mbps)

2440MHz

11/05/2019



Port1 

Ch Freq
2.44GHz

RBW
300kHz

VBW
1MHz

Sweep Time
8ms

TX Time
2.892ms

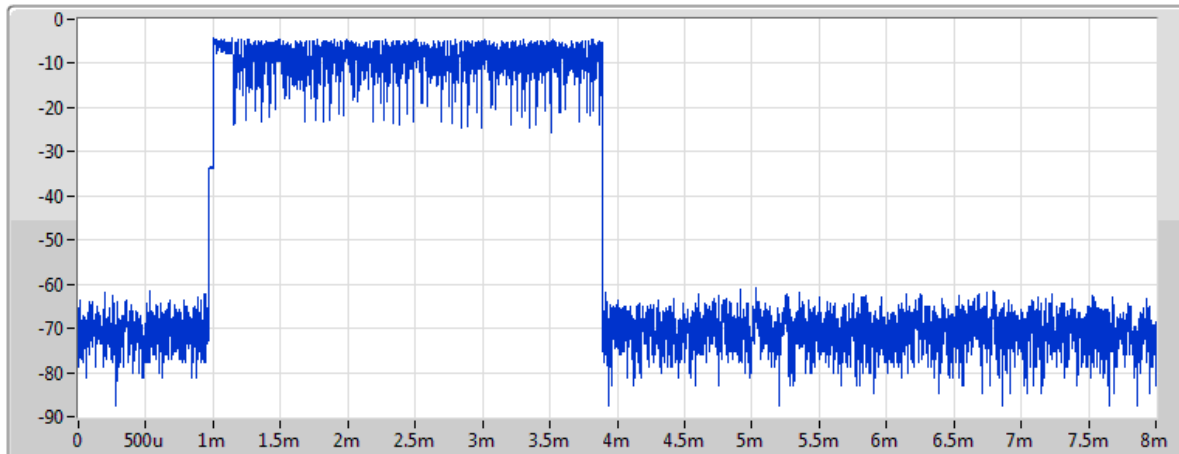
non AFH Mode

Period(s)	Dwell(s)	Limit(s)	Tx On(s)
31.6	308.2872m	400m	2.892m

BT-EDR(2Mbps)

2440MHz

11/05/2019



Port1 

Ch Freq
2.44GHz

RBW
300kHz

VBW
1MHz

Sweep Time
8ms

TX Time
2.921ms

non AFH Mode

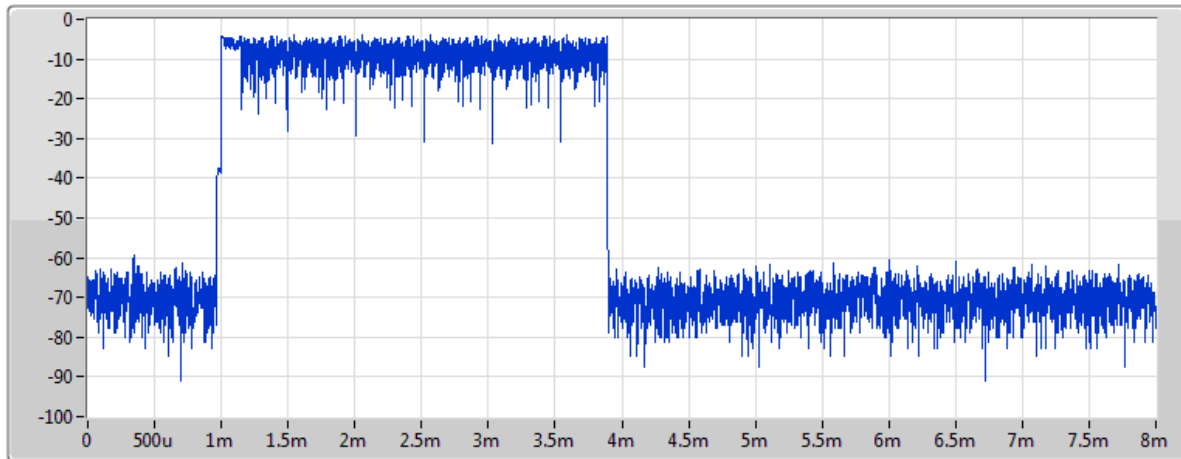
Period(s)	Dwell(s)	Limit(s)	Tx On(s)
31.6	311.3786m	400m	2.921m

BT-EDR(3Mbps)

2440MHz

Dwell

11/05/2019



Port 1 

Ch Freq

2.44GHz

RBW

300kHz

VBW

1MHz

Sweep Time

8ms

TX Time

2.896ms

non AFH Mode

Period(s)	Dwell(s)	Limit(s)	Tx On(s)
31.6	308.7136m	400m	2.896m



CSE-FHSS(Non-restricted Band) Results

Appendix F

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-BR(1Mbps)	Pass	2.44G	0.25	-19.75	95.71M	-44.20	2.39929G	-44.01	2.48354G	-43.41	24.4878G	-37.67	1
BT-EDR(2Mbps)	Pass	2.48016G	-7.65	-27.65	669.36M	-43.81	2.39973G	-44.50	2.4838G	-43.99	15.25966G	-37.76	1
BT-EDR(3Mbps)	Pass	2.47999G	-7.19	-27.19	543.86M	-42.34	2.39859G	-45.19	2.48414G	-44.48	24.83958G	-37.70	1

Result

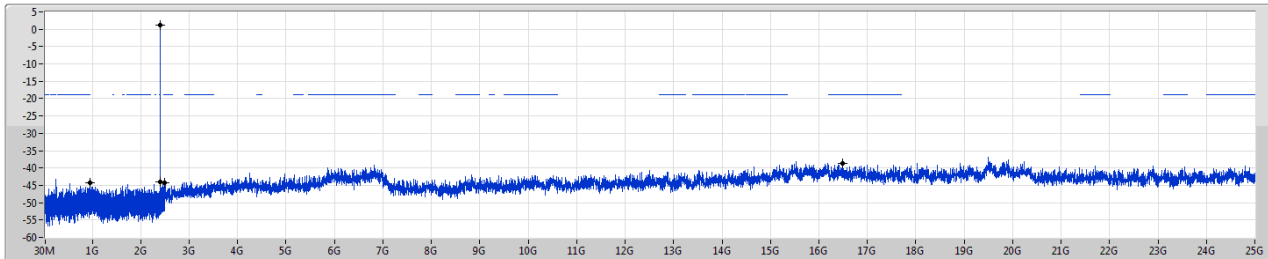
Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
BT-BR(1Mbps)	-	-	-	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	2.402G	1.09	-18.91	947.3M	-44.14	2.398G	-43.92	2.48415G	-44.28	16.49515G	-38.76	1
2440MHz	Pass	2.44G	0.25	-19.75	95.71M	-44.20	2.39929G	-44.01	2.48354G	-43.41	24.4878G	-37.67	1
2480MHz	Pass	2.48008G	-0.56	-20.56	1.86313G	-44.21	2.39833G	-44.68	2.48413G	-43.72	6.75763G	-38.70	1
BT-EDR(2Mbps)	-	-	-	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	2.40192G	-6.42	-26.42	1.99011G	-44.86	2.39921G	-45.13	2.48375G	-44.52	16.50359G	-37.54	1
2440MHz	Pass	2.44004G	-6.37	-26.37	543.86M	-42.24	2.39882G	-44.16	2.4845G	-43.71	15.20619G	-38.67	1
2480MHz	Pass	2.48016G	-7.65	-27.65	669.36M	-43.81	2.39973G	-44.50	2.4838G	-43.99	15.25966G	-37.76	1
BT-EDR(3Mbps)	-	-	-	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	2.402G	-5.01	-25.01	543.86M	-42.23	2.39841G	-44.83	2.48473G	-44.12	21.81138G	-38.70	1
2440MHz	Pass	2.44021G	-5.25	-25.25	665.81M	-44.17	2.39856G	-43.94	2.48429G	-43.70	16.38258G	-37.91	1
2480MHz	Pass	2.47999G	-7.19	-27.19	543.86M	-42.34	2.39859G	-45.19	2.48414G	-44.48	24.83958G	-37.70	1

BT-BR(1Mbps)

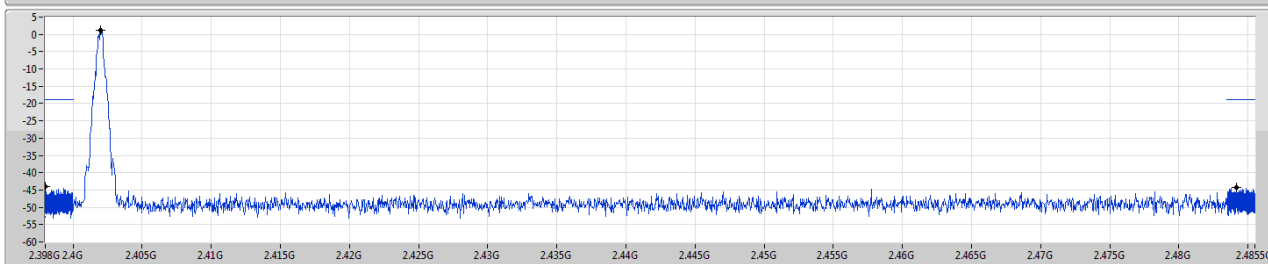
CSE NdB

2402MHz

11/05/2019



Port 1



RBW (Hz)
100k
VBW (Hz)
300k
Detector
Peak

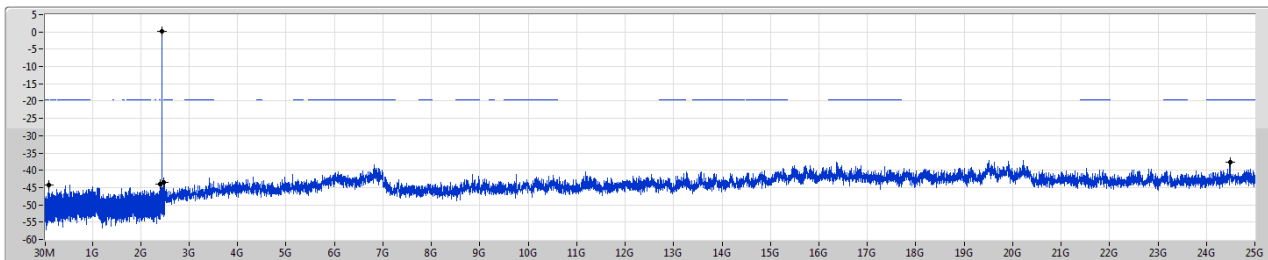
Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.402G	1.09	-18.91	947.3M	-44.14	2.398G	-43.92	2.48415G	-44.28	16.49515G	-38.76	1

BT-BR(1Mbps)

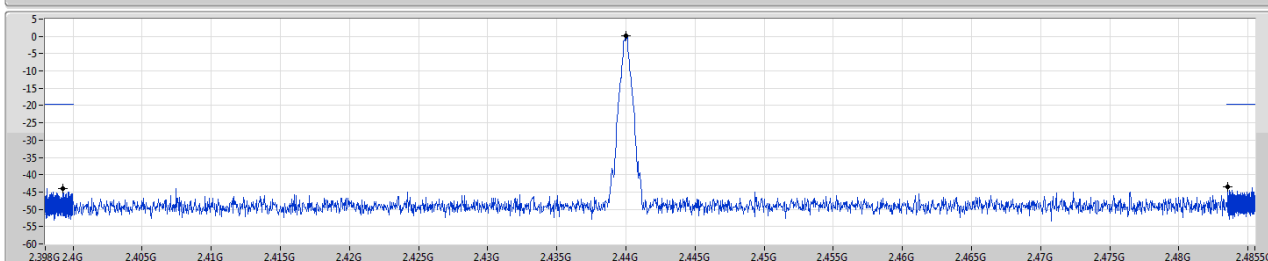
CSE NdB

2440MHz

11/05/2019



Port 1



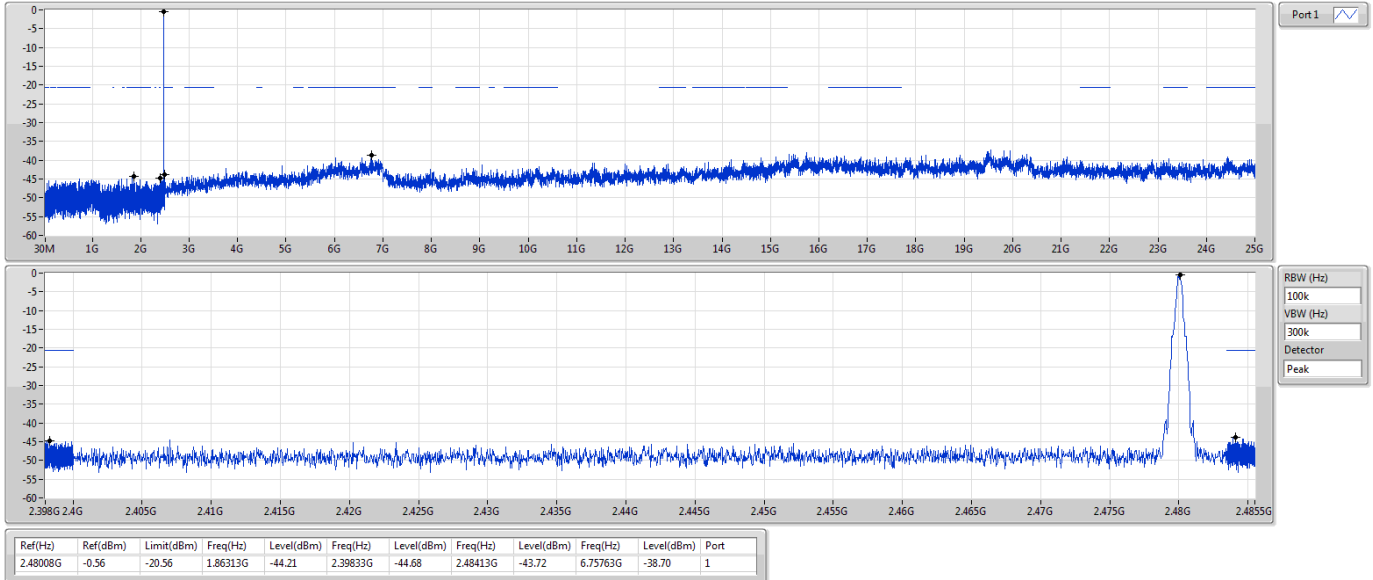
RBW (Hz)
100k
VBW (Hz)
300k
Detector
Peak

Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.44G	0.25	-19.75	95.71M	-44.20	2.39929G	-44.01	2.48354G	-43.41	24.4878G	-37.67	1

BT-BR(1Mbps)

CSE NdB

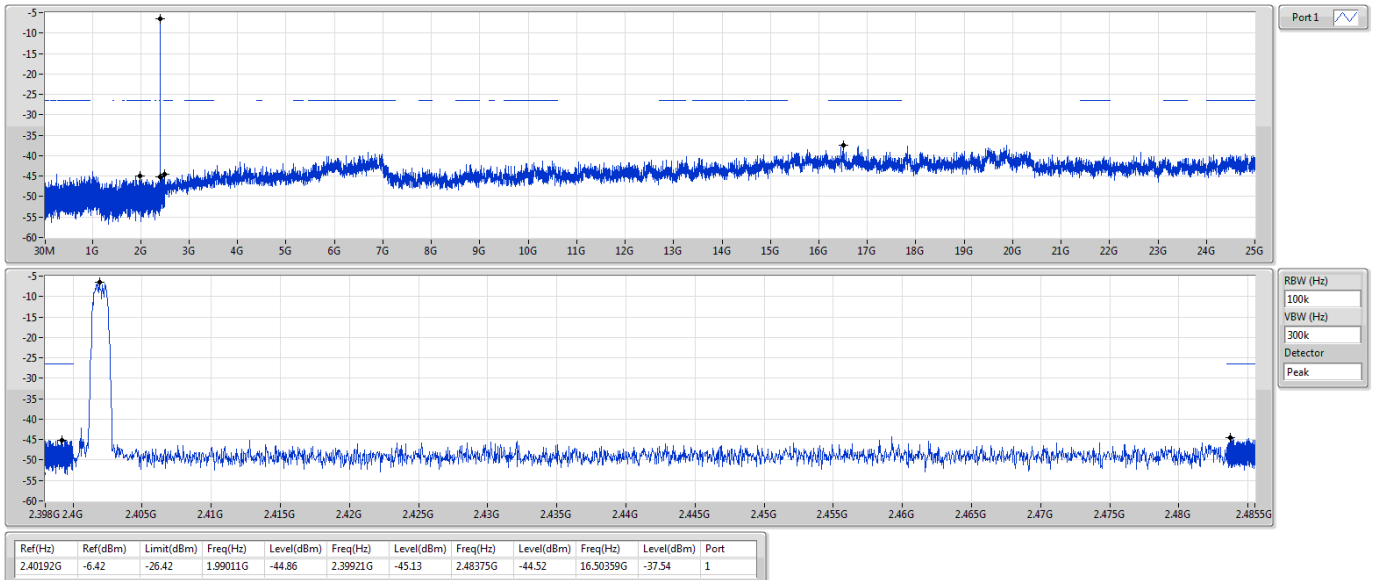
2480MHz



BT-EDR(2Mbps)

CSE NdB

2402MHz



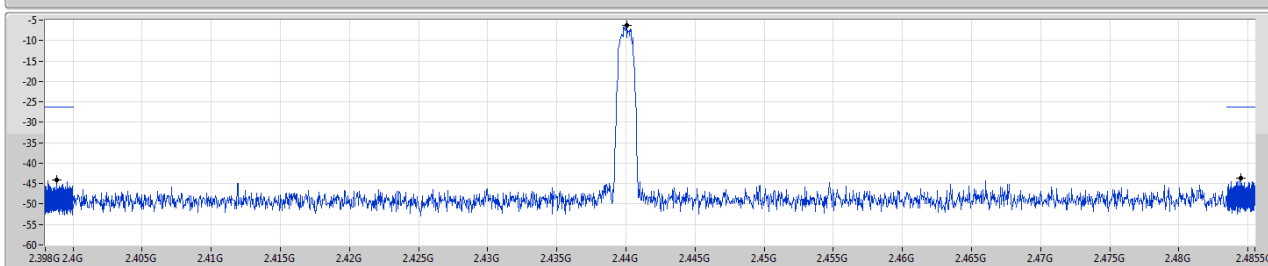
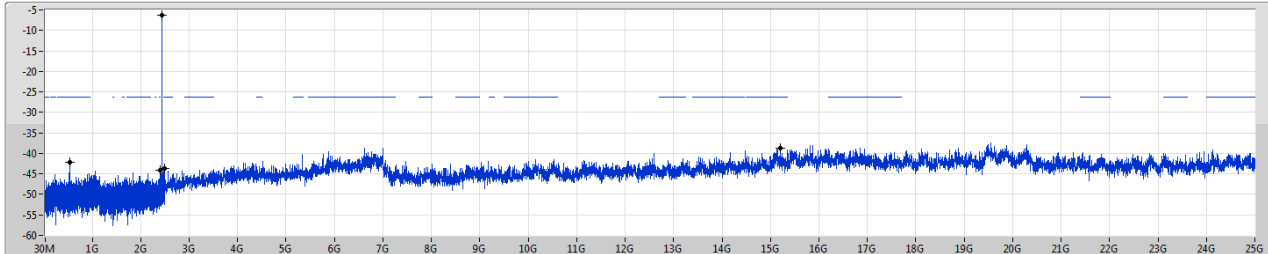
BT-EDR(2Mbps)

2440MHz

CSE NdB

11/05/2019

Port1



RBW (Hz)
100k
VBW (Hz)
300k
Detector
Peak

Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.44004G	-6.37	-26.37	543.86M	-42.24	2.39882G	-44.16	2.4845G	-43.71	15.20619G	-38.67	1

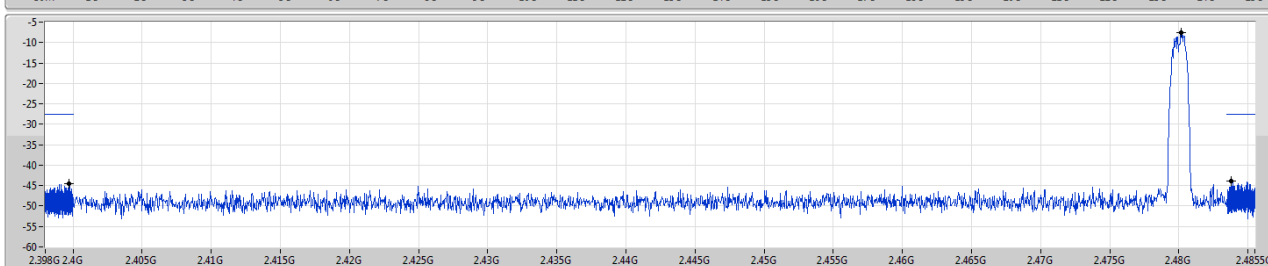
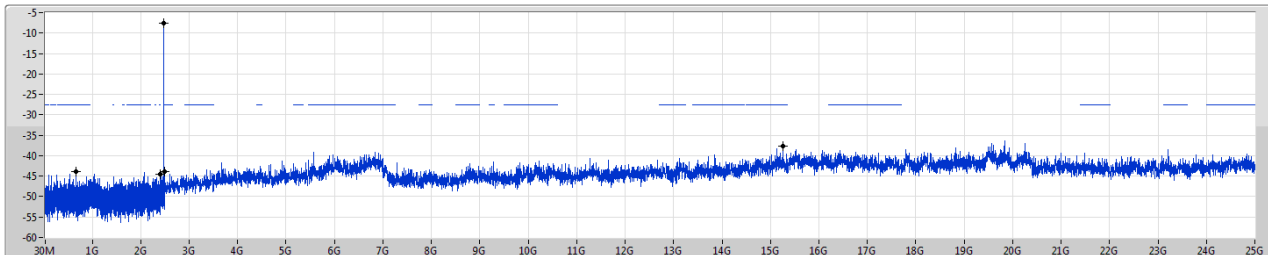
BT-EDR(2Mbps)

2480MHz

CSE NdB

11/05/2019

Port1



RBW (Hz)
100k
VBW (Hz)
300k
Detector
Peak

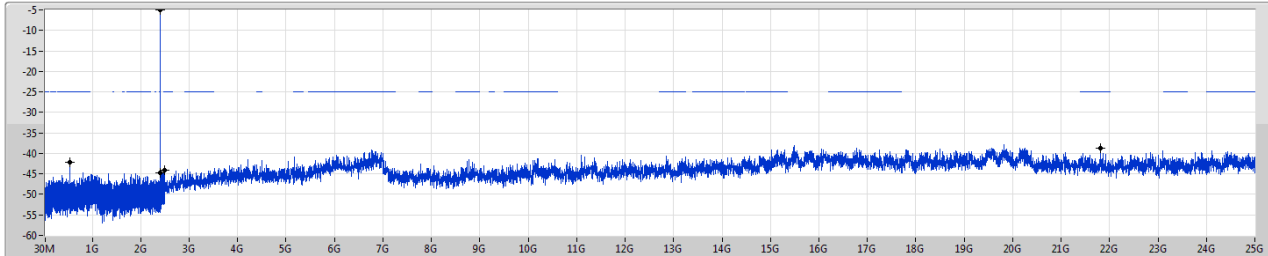
Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.48016G	-7.65	-27.65	669.36M	-43.81	2.39973G	-44.50	2.4838G	-43.99	15.25966G	-37.76	1

BT-EDR(3Mbps)

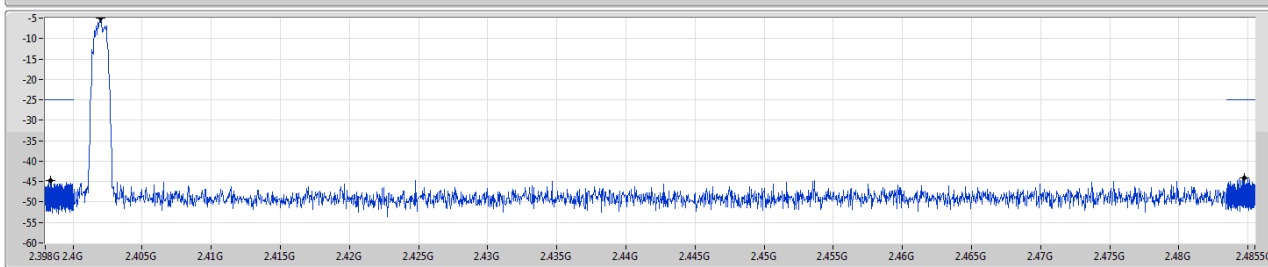
CSE NdB

2402MHz

11/05/2019



Port1



RBW (Hz)
100k
VBW (Hz)
300k
Detector
Peak

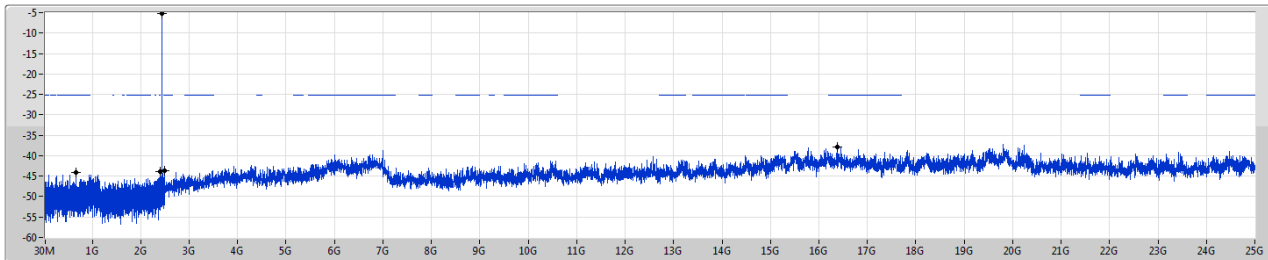
Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2402G	-5.01	-25.01	543.86M	-42.23	2.39841G	-44.83	2.48473G	-44.12	21.81138G	-38.70	1

BT-EDR(3Mbps)

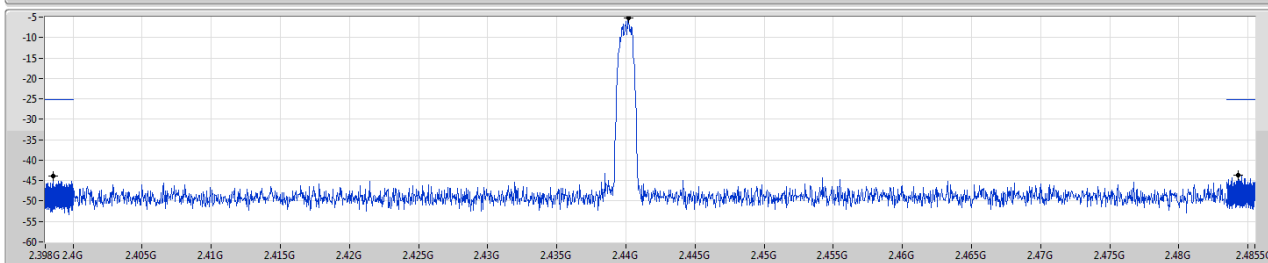
CSE NdB

2440MHz

11/05/2019



Port1



RBW (Hz)
100k
VBW (Hz)
300k
Detector
Peak

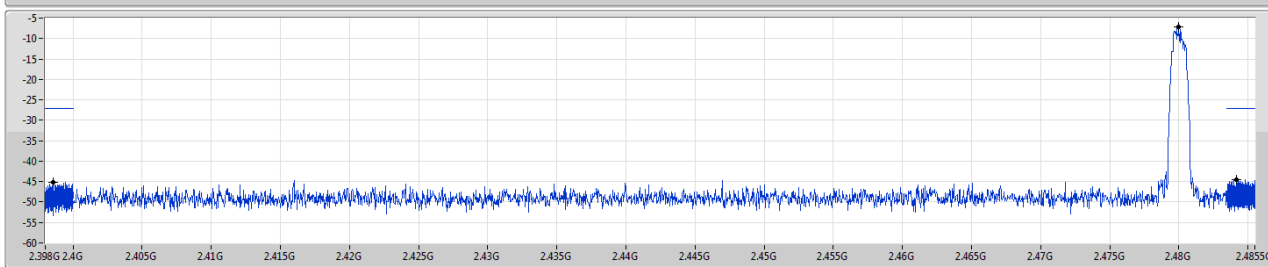
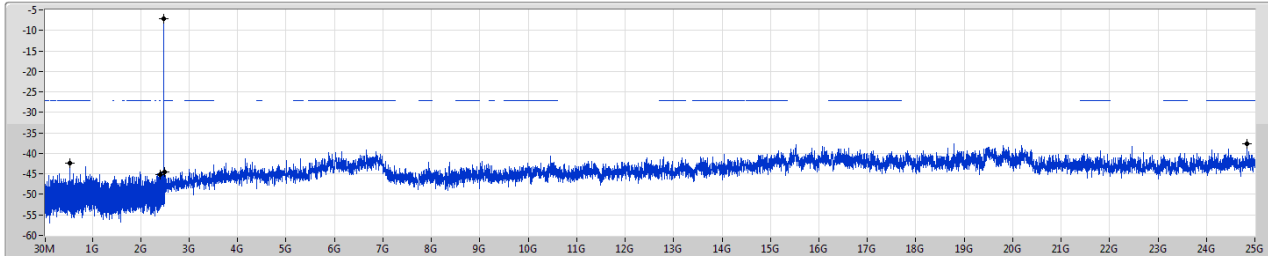
Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
244021G	-5.25	-25.25	665.81M	-44.17	2.39856G	-43.94	2.48429G	-43.70	16.38258G	-37.91	1

BT-EDR(3Mbps)

CSE NdB

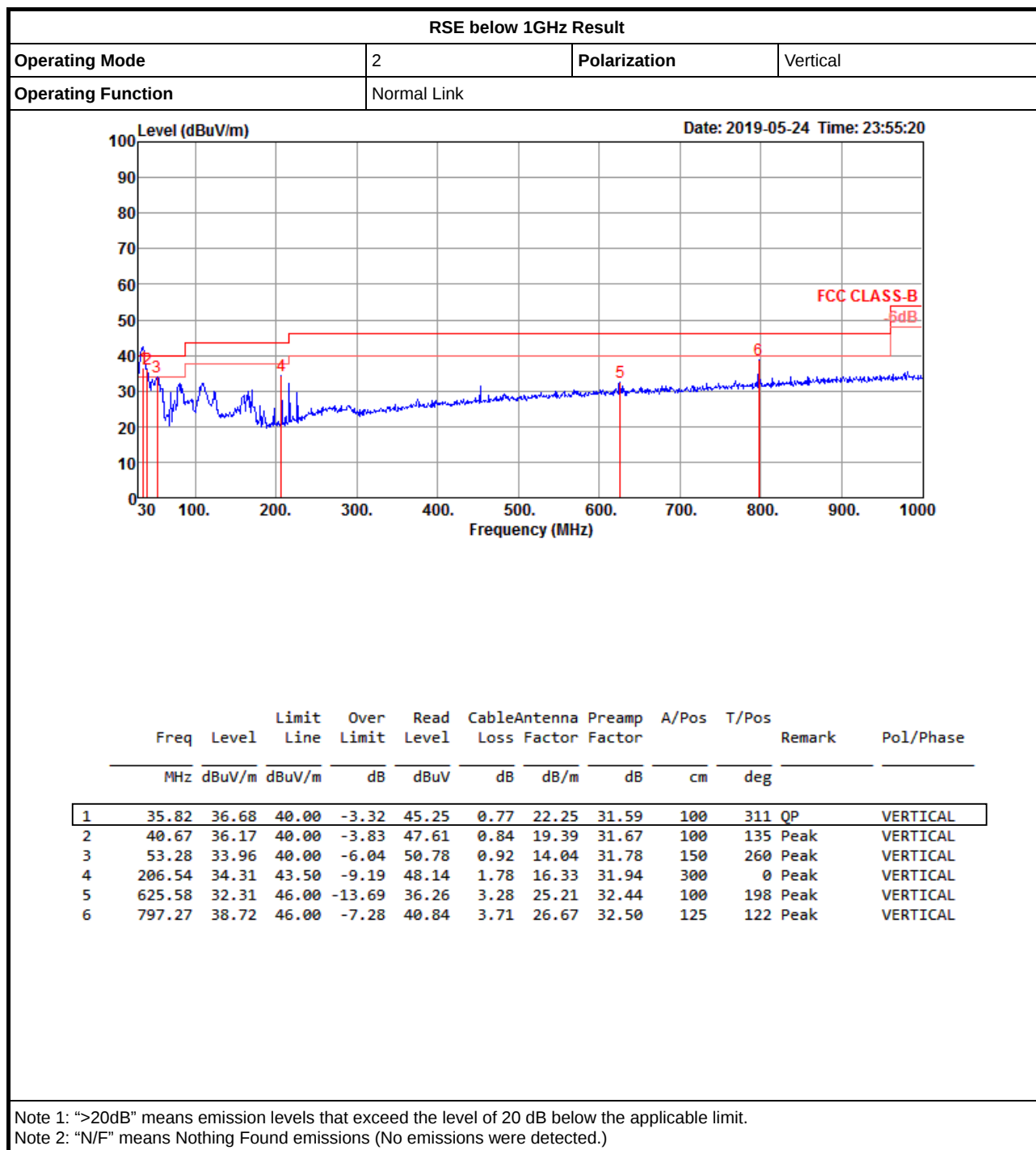
2480MHz

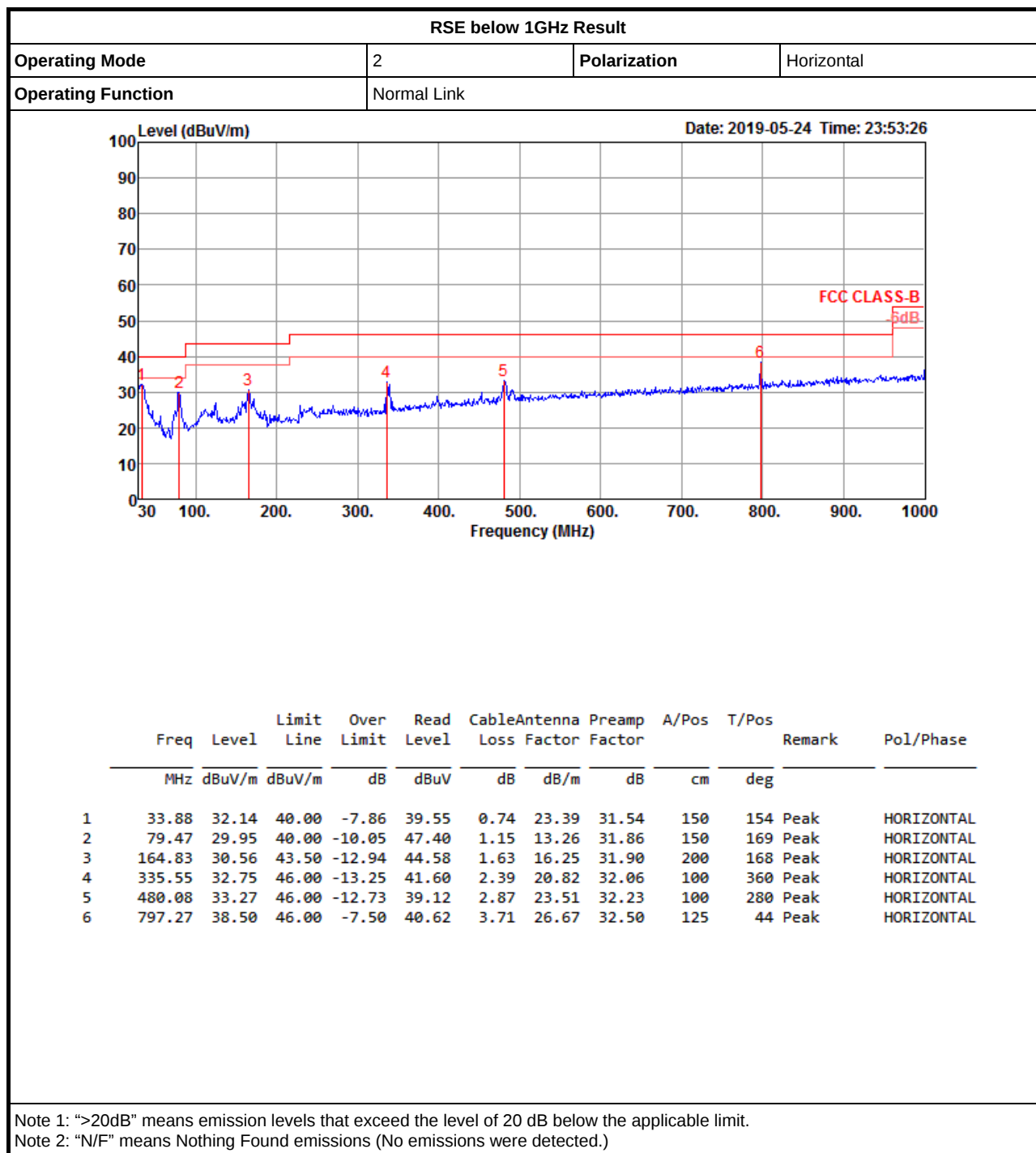
11/05/2019



RBW (Hz)
100k
VBW (Hz)
300k
Detector
Peak

Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.47999G	-7.19	-27.19	543.86M	-42.34	2.39859G	-45.19	2.48414G	-44.48	2.483958G	-37.70	1





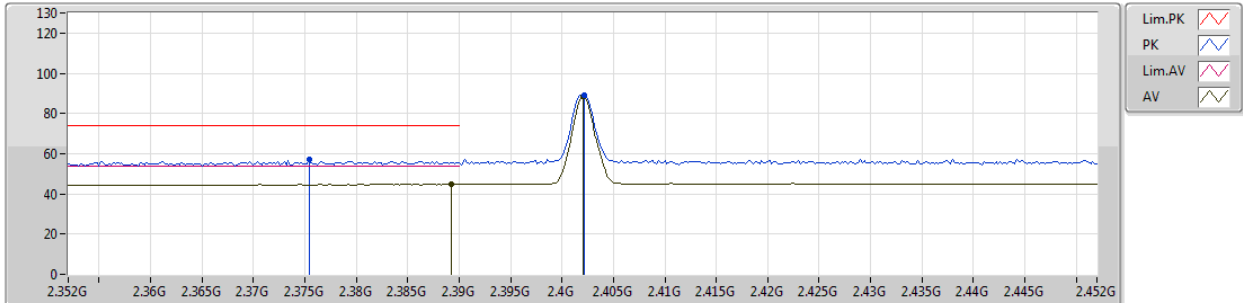
**Summary**

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-BR(1Mbps)	Pass	AV	2.4835G	46.58	54.00	-7.42	32.41	3	Horizontal	79	1.02	-
BT-EDR(3Mbps)	Pass	AV	2.4974G	45.43	54.00	-8.57	32.45	3	Horizontal	2	1.45	-

BT-BR(1Mbps)

2402MHz_TX

10/05/2019



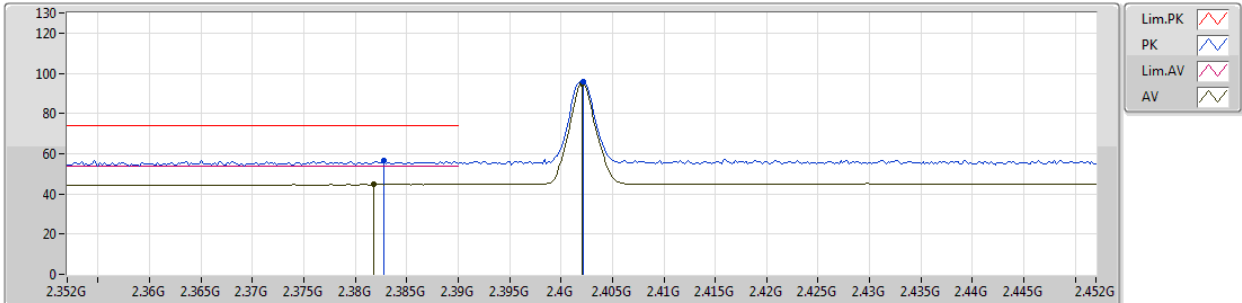
EUT Z_1TX
Setting Default(0)
06-B-2
FSP

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
PK	2.3754G	56.97	74.00	-17.03	32.07	3	Vertical	138	1.01	-
AV	2.3892G	44.89	54.00	-9.11	32.13	3	Vertical	138	1.01	-
PK	2.4022G	89.35	Inf	-Inf	32.16	3	Vertical	138	1.01	-
AV	2.402G	88.45	Inf	-Inf	32.16	3	Vertical	138	1.01	-

BT-BR(1Mbps)

2402MHz_TX

10/05/2019



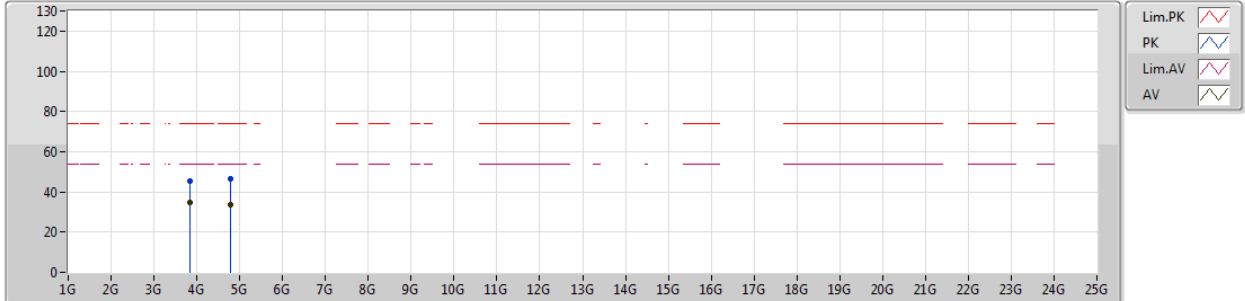
EUT_Z_1TX
Setting Default(0)
06-B-2
FSP

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
PK	2.3828G	56.87	74.00	-17.13	32.10	3	Horizontal	10	1.13	-
AV	2.3818G	44.82	54.00	-9.18	32.10	3	Horizontal	10	1.13	-
PK	2.4022G	95.85	Inf	-Inf	32.16	3	Horizontal	10	1.13	-
AV	2.402G	94.96	Inf	-Inf	32.16	3	Horizontal	10	1.13	-

BT-BR(1Mbps)

2402MHz_TX

10/05/2019



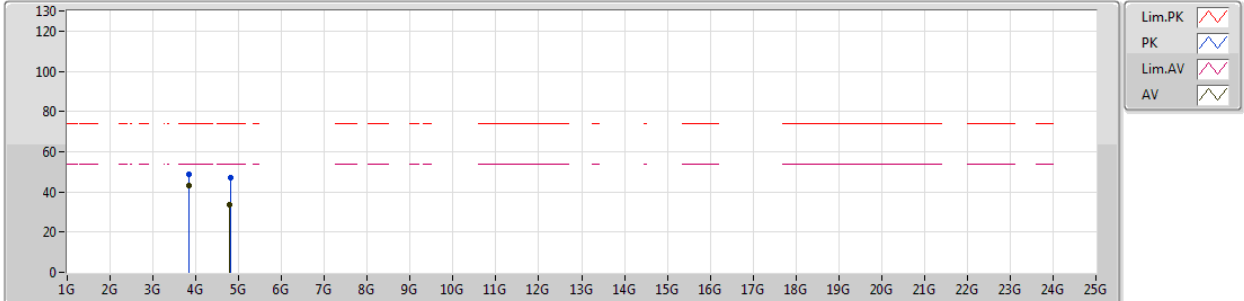
EUT_Z_1TX
Setting Default(0)
06-B-2
FSP

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments								
PK	3.84306G	45.22	74.00	-28.78	3.29	3	Vertical	52	2.90	-								
AV	3.84314G	34.74	54.00	-19.26	3.29	3	Vertical	52	2.90	-								
PK	4.79434G	46.76	74.00	-27.24	6.52	3	Vertical	128	1.50	-								
AV	4.79128G	33.73	54.00	-20.27	6.50	3	Vertical	128	1.50	-								

BT-BR(1Mbps)

10/05/2019

2402MHz_TX



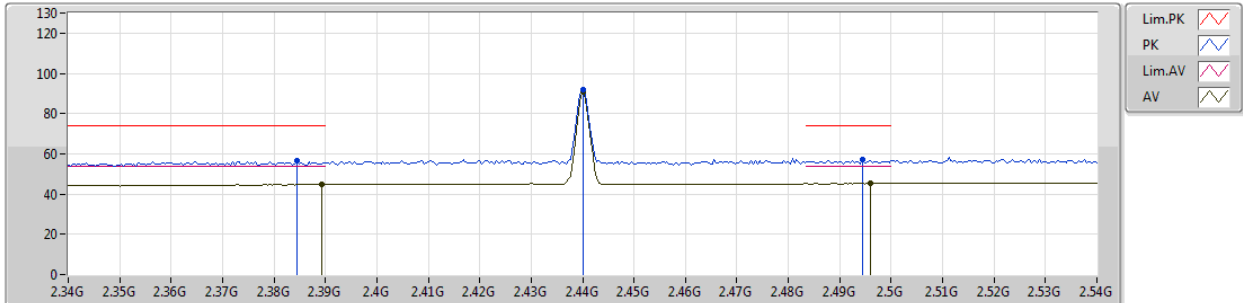
EUT_Z_1TX
Setting Default(0)
06-B-2
FSP

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
PK	3.84312G	48.58	74.00	-25.42	3.29	3	Horizontal	318	1.10	-
AV	3.84317G	43.29	54.00	-10.71	3.29	3	Horizontal	318	1.10	-
PK	4.79872G	47.02	74.00	-26.98	6.53	3	Horizontal	21	1.50	-
AV	4.79488G	33.73	54.00	-20.27	6.52	3	Horizontal	21	1.50	-

BT-BR(1Mbps)

2440MHz_TX

10/05/2019



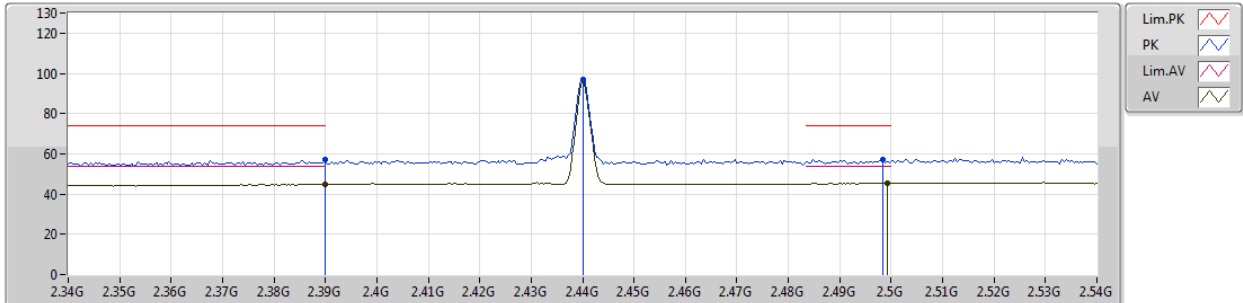
EUT Z_1TX
Setting Default(0)
06-B-2
FSP

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
PK	2.3844G	56.35	74.00	-17.65	32.10	3	Vertical	127	2.63	-
AV	2.3892G	44.79	54.00	-9.21	32.13	3	Vertical	127	2.63	-
PK	2.44G	91.78	Inf	-Inf	32.28	3	Vertical	127	2.63	-
AV	2.44G	90.85	Inf	-Inf	32.28	3	Vertical	127	2.63	-
PK	2.4944G	56.99	74.00	-17.01	32.45	3	Vertical	127	2.63	-
AV	2.496G	45.30	54.00	-8.70	32.45	3	Vertical	127	2.63	-

BT-BR(1Mbps)

2440MHz_TX

10/05/2019



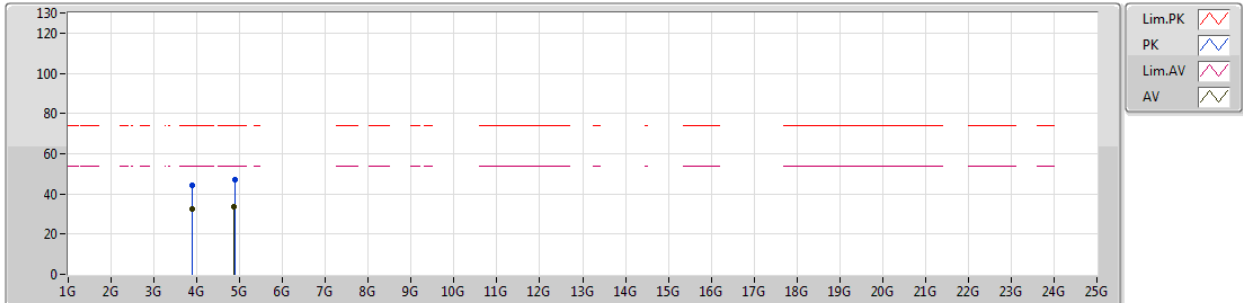
EUT_Z_1TX
Setting Default(0)
06-B-2
FSP

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
PK	2.39G	57.37	74.00	-16.63	32.13	3	Horizontal	359	1.48	-
AV	2.39G	44.87	54.00	-9.13	32.13	3	Horizontal	359	1.48	-
PK	2.44G	97.09	Inf	-Inf	32.28	3	Horizontal	359	1.48	-
AV	2.44G	96.22	Inf	-Inf	32.28	3	Horizontal	359	1.48	-
PK	2.4984G	57.40	74.00	-16.60	32.46	3	Horizontal	359	1.48	-
AV	2.4992G	45.37	54.00	-8.63	32.46	3	Horizontal	359	1.48	-

BT-BR(1Mbps)

10/05/2019

2440MHz_TX



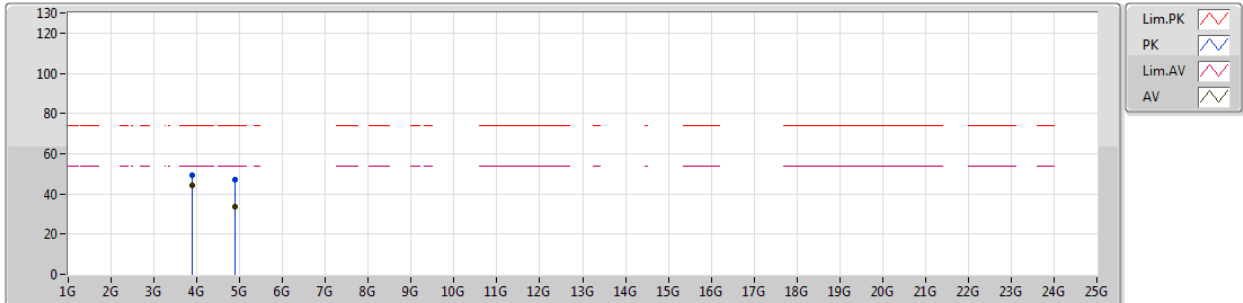
EUT Z_1TX
Setting Default(0)
06-B-2
FSP

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
PK	3.89068G	44.38	74.00	-29.62	3.48	3	Vertical	272	2.65	-
AV	3.90404G	32.67	54.00	-21.33	3.53	3	Vertical	272	2.65	-
PK	4.8792G	47.07	74.00	-26.93	6.72	3	Vertical	45	1.50	-
AV	4.87654G	33.89	54.00	-20.11	6.71	3	Vertical	45	1.50	-

BT-BR(1Mbps)

10/05/2019

2440MHz_TX



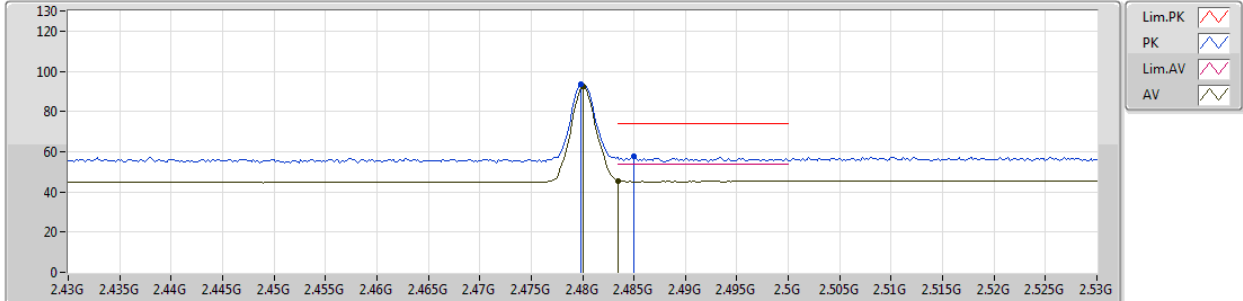
EUT_Z_1TX
Setting Default(0)
06-B-2
FSP

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
PK	3.90388G	49.18	74.00	-24.82	3.53	3	Horizontal	321	1.07	-
AV	3.90402G	44.00	54.00	-10.00	3.53	3	Horizontal	321	1.07	-
PK	4.88102G	47.26	74.00	-26.74	6.72	3	Horizontal	101	1.03	-
AV	4.88414G	33.89	54.00	-20.11	6.73	3	Horizontal	101	1.03	-

BT-BR(1Mbps)

2480MHz_TX

10/05/2019



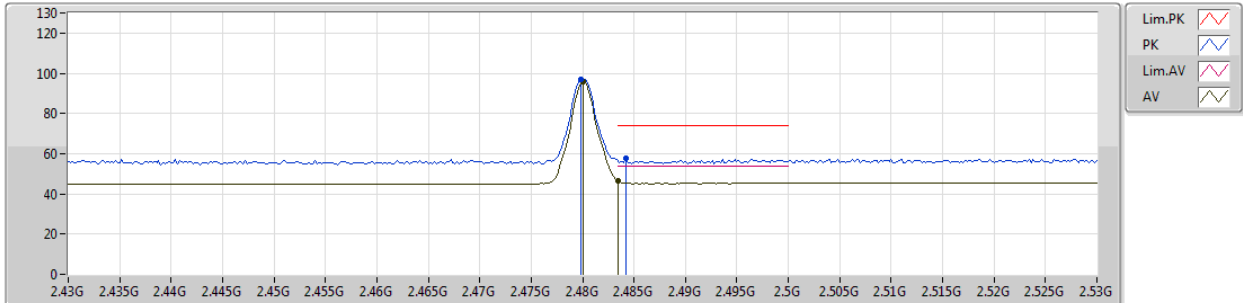
EUT_Z_1TX
Setting Default(0)
06-B-2
FSP

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
PK	2.4798G	93.33	Inf	-Inf	32.40	3	Vertical	140	1.06	-
AV	2.48G	92.44	Inf	-Inf	32.40	3	Vertical	140	1.06	-
PK	2.485G	57.86	74.00	-16.14	32.42	3	Vertical	140	1.06	-
AV	2.4835G	45.60	54.00	-8.40	32.41	3	Vertical	140	1.06	-

BT-BR(1Mbps)

2480MHz_TX

10/05/2019



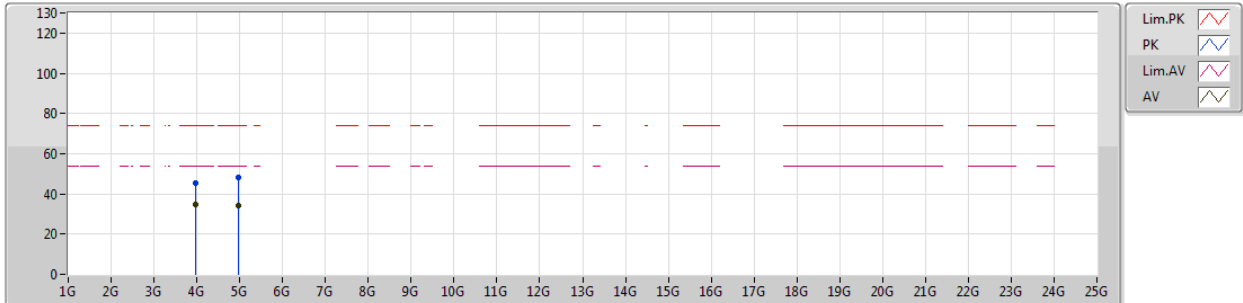
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Setting Default(0)
06-B-2
FSP

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
PK	2.4798G	96.79	Inf	-Inf	32.40	3	Horizontal	79	1.02	-
AV	2.48G	95.94	Inf	-Inf	32.40	3	Horizontal	79	1.02	-
PK	2.4842G	57.52	74.00	-16.48	32.42	3	Horizontal	79	1.02	-
AV	2.4835G	46.58	54.00	-7.42	32.41	3	Horizontal	79	1.02	-

BT-BR(1Mbps)

10/05/2019

2480MHz_TX



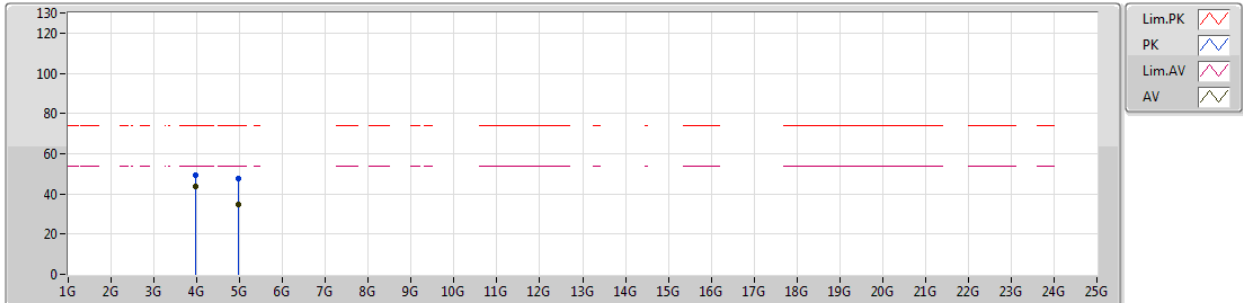
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Setting Default(0)
06-B-2
FSP

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
PK	3.96832G	45.48	74.00	-28.52	3.76	3	Vertical	118	2.77	-
AV	3.96802G	34.94	54.00	-19.06	3.76	3	Vertical	118	2.77	-
PK	4.96232G	47.91	74.00	-26.09	6.93	3	Vertical	129	1.50	-
AV	4.96012G	34.39	54.00	-19.61	6.93	3	Vertical	129	1.50	-

BT-BR(1Mbps)

10/05/2019

2480MHz_TX



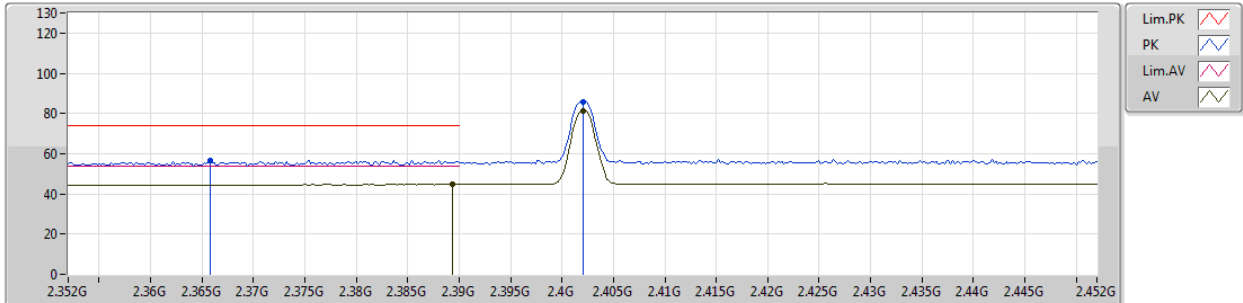
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Setting Default(0)
06-B-2
FSP

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
PK	3.96797G	49.45	74.00	-24.55	3.76	3	Horizontal	313	1.01	-
AV	3.96801G	43.90	54.00	-10.10	3.76	3	Horizontal	313	1.01	-
PK	4.95956G	47.47	74.00	-26.53	6.93	3	Horizontal	264	1.50	-
AV	4.9623G	34.56	54.00	-19.44	6.93	3	Horizontal	264	1.50	-

BT-EDR(3Mbps)

2402MHz_TX

10/05/2019



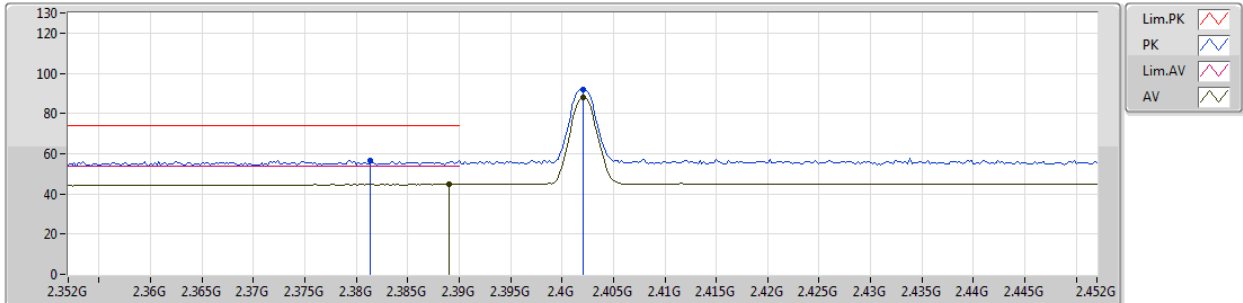
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Setting Default(0)
06-B-2
FSP

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
PK	2.3658G	56.60	74.00	-17.40	32.04	3	Vertical	138	1.00	-
AV	2.3894G	44.94	54.00	-9.06	32.13	3	Vertical	138	1.00	-
PK	2.402G	85.65	Inf	-Inf	32.16	3	Vertical	138	1.00	-
AV	2.402G	81.47	Inf	-Inf	32.16	3	Vertical	138	1.00	-

BT-EDR(3Mbps)

10/05/2019

2402MHz_TX



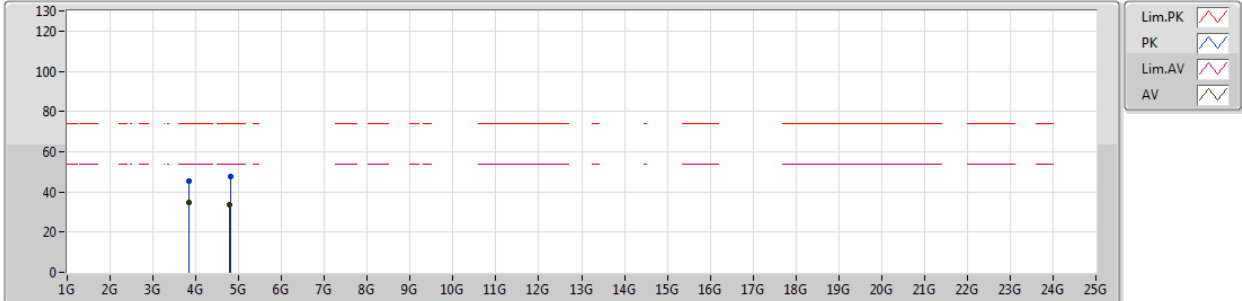
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Setting Default(0)
06-B-2
FSP

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
PK	2.3814G	56.63	74.00	-17.37	32.10	3	Horizontal	10	1.12	-
AV	2.389G	44.82	54.00	-9.18	32.12	3	Horizontal	10	1.12	-
PK	2.402G	91.85	Inf	-Inf	32.16	3	Horizontal	10	1.12	-
AV	2.402G	87.72	Inf	-Inf	32.16	3	Horizontal	10	1.12	-

BT-EDR(3Mbps)

10/05/2019

2402MHz_TX



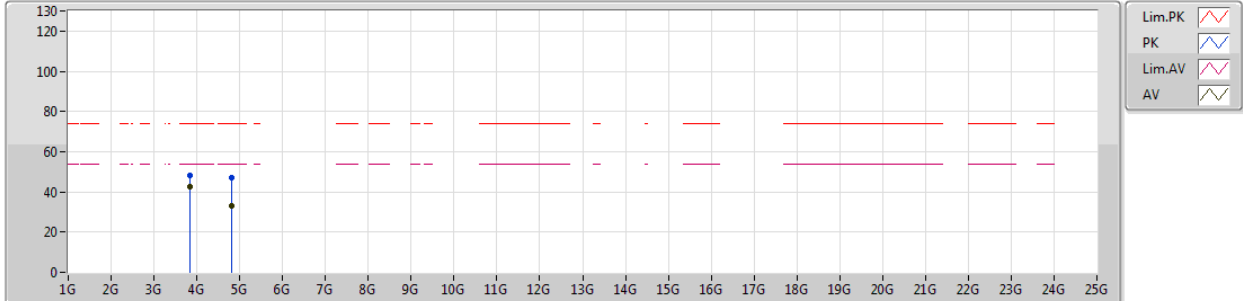
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Setting Default(0)
06-B-2
FSP

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments								
PK	3.84328G	45.23	74.00	-28.77	3.29	3	Vertical	52	2.90	-								
AV	3.84322G	34.57	54.00	-19.43	3.29	3	Vertical	52	2.90	-								
PK	4.80736G	47.47	74.00	-26.53	6.54	3	Vertical	100	1.50	-								
AV	4.79098G	33.69	54.00	-20.31	6.50	3	Vertical	100	1.50	-								

BT-EDR(3Mbps)

10/05/2019

2402MHz_TX



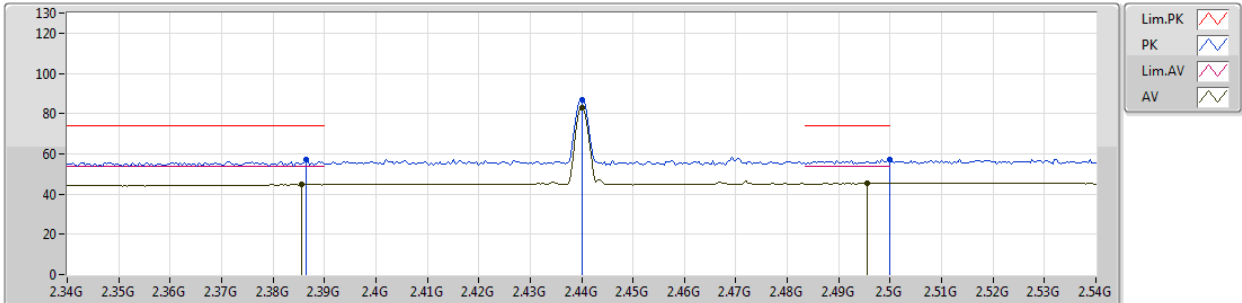
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Setting Default(0)
06-B-2
FSP

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
PK	3.84319G	48.42	74.00	-25.58	3.29	3	Horizontal	319	1.11	-
AV	3.84313G	42.86	54.00	-11.14	3.29	3	Horizontal	319	1.11	-
PK	4.79972G	47.08	74.00	-26.92	6.53	3	Horizontal	248	1.02	-
AV	4.79914G	33.31	54.00	-20.69	6.53	3	Horizontal	248	1.02	-

BT-EDR(3Mbps)

10/05/2019

2440MHz_TX



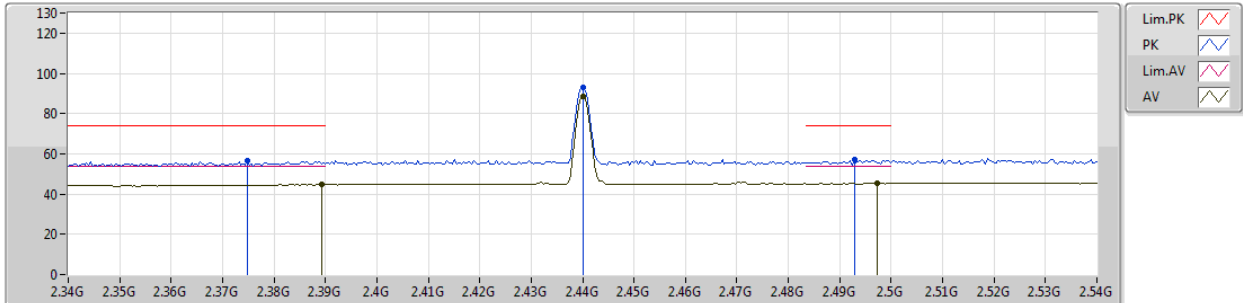
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Setting Default(0)
06-B-2
FSP

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
PK	2.3864G	57.02	74.00	-16.98	32.11	3	Vertical	130	2.64	-
AV	2.3856G	44.79	54.00	-9.21	32.11	3	Vertical	130	2.64	-
PK	2.44G	86.84	Inf	-Inf	32.28	3	Vertical	130	2.64	-
AV	2.44G	82.78	Inf	-Inf	32.28	3	Vertical	130	2.64	-
PK	2.5G	57.27	74.00	-16.73	32.46	3	Vertical	130	2.64	-
AV	2.4956G	45.35	54.00	-8.65	32.45	3	Vertical	130	2.64	-

BT-EDR(3Mbps)

2440MHz_TX

10/05/2019



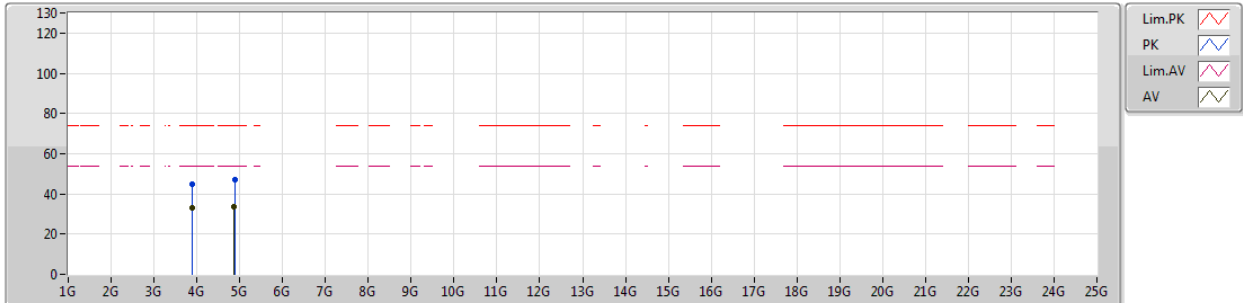
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Setting Default(0)
06-B-2
FSP

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
PK	2.3748G	56.37	74.00	-17.63	32.07	3	Horizontal	0	1.52	-
AV	2.3892G	44.78	54.00	-9.22	32.13	3	Horizontal	0	1.52	-
PK	2.44G	92.94	Inf	-Inf	32.28	3	Horizontal	0	1.52	-
AV	2.44G	88.73	Inf	-Inf	32.28	3	Horizontal	0	1.52	-
PK	2.4928G	57.09	74.00	-16.91	32.43	3	Horizontal	0	1.52	-
AV	2.4972G	45.35	54.00	-8.65	32.45	3	Horizontal	0	1.52	-

BT-EDR(3Mbps)

10/05/2019

2440MHz_TX



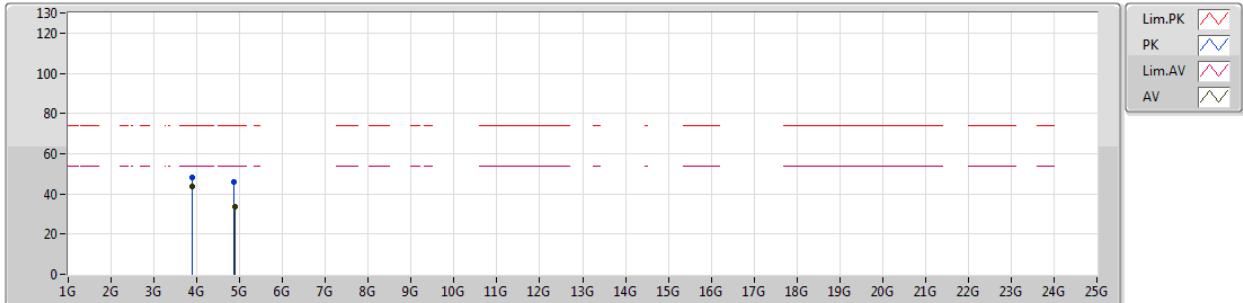
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Setting Default(0)
06-B-2
FSP

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
PK	3.90407G	45.10	74.00	-28.90	3.53	3	Vertical	231	1.00	-
AV	3.90398G	33.24	54.00	-20.76	3.53	3	Vertical	231	1.00	-
PK	4.8826G	47.01	74.00	-26.99	6.72	3	Vertical	360	1.27	-
AV	4.87706G	33.55	54.00	-20.45	6.72	3	Vertical	360	1.27	-

BT-EDR(3Mbps)

10/05/2019

2440MHz_TX



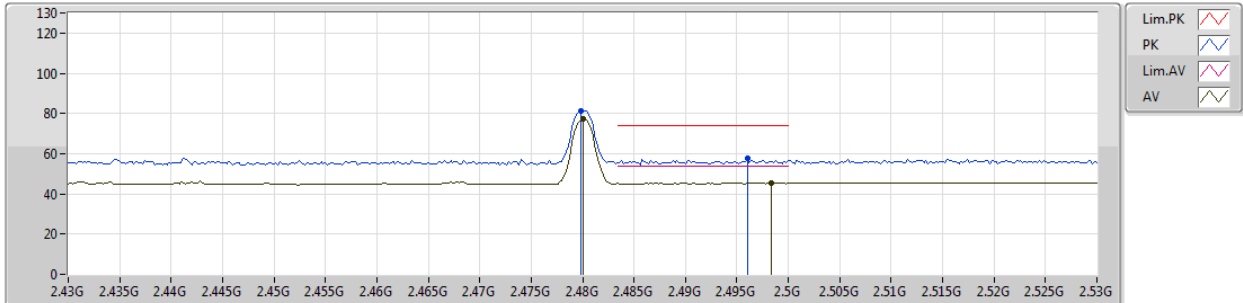
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Setting Default(0)
06-B-2
FSP

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
PK	3.90405G	48.42	74.00	-25.58	3.53	3	Horizontal	318	1.03	-
AV	3.90402G	43.49	54.00	-10.51	3.53	3	Horizontal	318	1.03	-
PK	4.87706G	46.20	74.00	-27.80	6.72	3	Horizontal	267	1.07	-
AV	4.89194G	33.78	54.00	-20.22	6.76	3	Horizontal	267	1.07	-

BT-EDR(3Mbps)

2480MHz_TX

10/05/2019



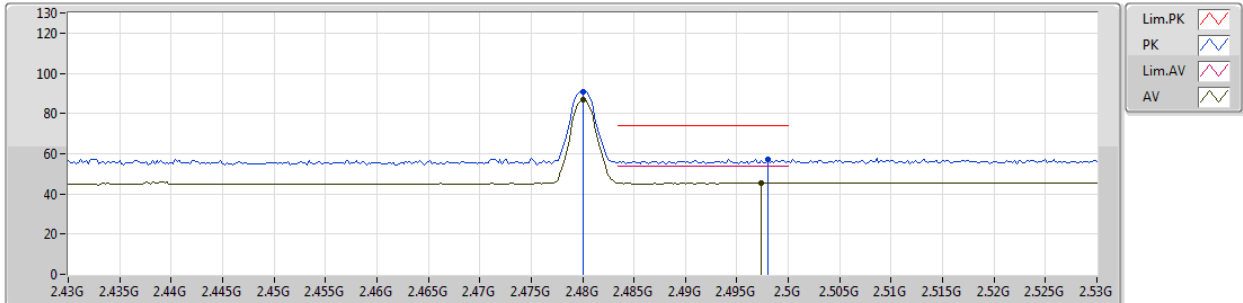
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Setting Default(0)
06-B-2
FSP

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
PK	2.4798G	81.38	Inf	-Inf	32.40	3	Vertical	253	2.72	-
AV	2.48G	77.18	Inf	-Inf	32.40	3	Vertical	253	2.72	-
PK	2.496G	57.88	74.00	-16.12	32.45	3	Vertical	253	2.72	-
AV	2.4984G	45.37	54.00	-8.63	32.46	3	Vertical	253	2.72	-

BT-EDR(3Mbps)

2480MHz_TX

10/05/2019



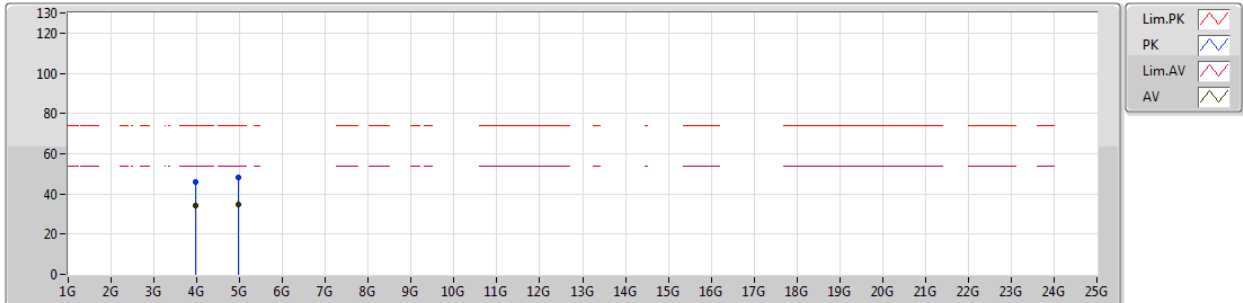
EUT_Z_1TX
Setting Default(0)
06-B-2
FSP

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
PK	2.48G	90.84	Inf	-Inf	32.40	3	Horizontal	2	1.45	-
AV	2.48G	86.68	Inf	-Inf	32.40	3	Horizontal	2	1.45	-
PK	2.498G	57.35	74.00	-16.65	32.46	3	Horizontal	2	1.45	-
AV	2.4974G	45.43	54.00	-8.57	32.45	3	Horizontal	2	1.45	-

BT-EDR(3Mbps)

10/05/2019

2480MHz_TX



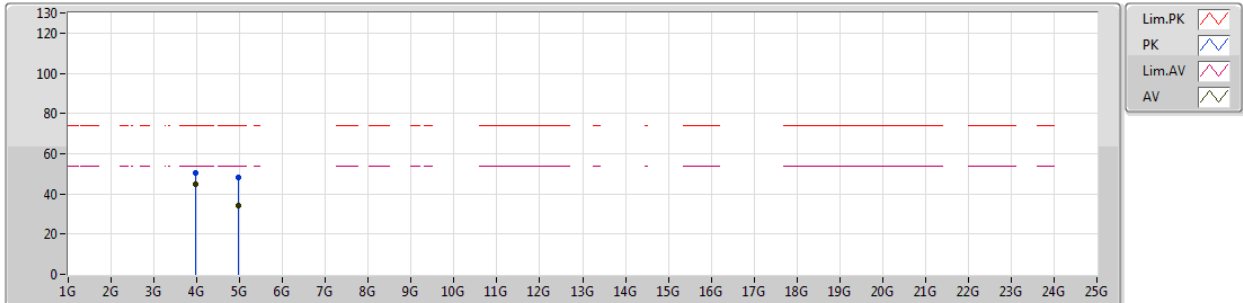
EUT Z_1TX
Setting Default(0)
06-B-2
FSP

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
PK	3.96792G	46.19	74.00	-27.81	3.76	3	Vertical	162	1.08	-
AV	3.968G	34.35	54.00	-19.65	3.76	3	Vertical	162	1.08	-
PK	4.95994G	48.10	74.00	-25.90	6.93	3	Vertical	278	1.37	-
AV	4.95668G	34.66	54.00	-19.34	6.92	3	Vertical	278	1.37	-

BT-EDR(3Mbps)

10/05/2019

2480MHz_TX



EUT_Z_1TX
Setting Default(0)
06-B-2
FSP

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
PK	3.96801G	50.37	74.00	-23.63	3.76	3	Horizontal	315	1.04	-
AV	3.96798G	44.83	54.00	-9.17	3.76	3	Horizontal	315	1.04	-
PK	4.95934G	48.00	74.00	-26.00	6.93	3	Horizontal	327	1.12	-
AV	4.95642G	34.45	54.00	-19.55	6.91	3	Horizontal	327	1.12	-