



# FCC RADIO TEST REPORT

**FCC ID** : Q87-03433

**Equipment** : LINKSYS MR9000 TRI-BAND WIFI 5 ROUTER,  
LINKSYS MR9000X TRI-BAND WIFI 5 ROUTER,  
LINKSYS MR8900 TRI-BAND WIFI 5 ROUTER,  
LINKSYS MR8950 TRI-BAND WIFI 5 ROUTER

**Brand Name** : LINKSYS

**Model Name** : MR9000, MR9000X, MR8900, MR8950

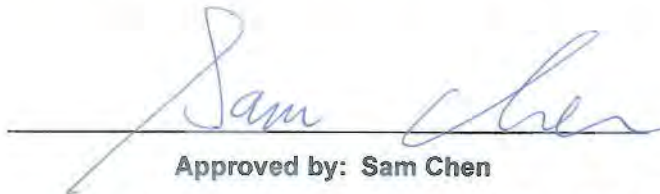
**Applicant** : Linksys LLC  
121 Theory Drive, Irvine CA 92617, United States

**Standard** : 47 CFR FCC Part 15.247

The product was received on Apr. 02, 2019, and testing was started from Apr. 02, 2019 and completed on Jun. 03, 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: Sam Chen

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



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**Appendix H. Test Photos**

**Photographs of EUT v01**



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: Viola Huang**



# 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)
1	1	FIT	ANEP5M3-CCG01-EH	Dipole Antenna	I-PEX	Note 1
2	2	FIT	ANEP5M3-CCG00-EH	Dipole Antenna	I-PEX	
3	3	FIT	ANEP5M1-CCG00-EH	Dipole Antenna	I-PEX	
4	4	FIT	ANEP5M1-CCG01-EH	Dipole Antenna	I-PEX	
5	1	FIT	ANTS1M1-CCG00-EH	PIFA Antenna	N/A	

Note 1:

Ant.	Port	Gain (dBi)			
		WLAN 2.4G	WLAN 5G Band 1	WLAN 5G Band 4	BT
1	1	2.84	2.60	2.44	-
2	2	2.36	2.87	2.28	-
3	3	-	-	2.93	-
4	4	-	-	3.01	-
5	1	-	-	-	2.90

Note 2: The above information was declared by manufacturer.

Note 3: The EUT has five antennas.

**<For 2.4GHz Band>****For IEEE 802.11b/g/n/VHT mode (2TX/2RX)**

Port 1 and Port 2 can be used as transmitting/receiving antenna.

Port 1 and Port 2 could transmit/receive simultaneously.

**<For 5GHz Band 1>****For IEEE 802.11a/n/ac mode (2TX/2RX)**

Port 1 and Port 2 can be used as transmitting/receiving antenna.

Port 1 and Port 2 could transmit/receive simultaneously.

**<For 5GHz Band 4>****For IEEE 802.11a/n/ac mode (4TX/4RX)**

Port 1, Port 2, Port 3 and Port 4 can be used as transmitting/receiving antenna.

Port 1, Port 2, Port 3 and Port 4 could transmit/receive simultaneously.

**<For Bluetooth>****For BT function (1TX/1RX)**

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

**1.1.3 Mode Test Duty Cycle**

Mode	DC	DCF(dB)
BT-BR(1Mbps)	0.854	0.69
BT-EDR(2Mbps)	0.833	0.79
BT-EDR(3Mbps)	0.842	0.75

Note:

- ♦ DC is Duty Cycle.
- ♦ DCF is Duty Cycle Factor.

**1.1.4 EUT Operational Condition**

<b>EUT Power Type</b>	From Power Adapter
<b>Test Software Version</b>	QRCT Version3.0.187.0

**1.1.5 Table for EUT supports function**

Function	Supports type
AP Router	Master

**1.1.6 Table for Multiple Listing**

The four equipment names and four model names in the following table are all refer to the identical product.

Equipment Name	Model Name	Description
LINKSYS MR9000 TRI-BAND WIFI 5 ROUTER	MR9000	Marketing purpose to sell in different retailers.
LINKSYS MR9000X TRI-BAND WIFI 5 ROUTER	MR9000X	
LINKSYS MR8900 TRI-BAND WIFI 5 ROUTER	MR8900	
LINKSYS MR8950 TRI-BAND WIFI 5 ROUTER	MR8950	

From the above models, model: MR9000 was selected as representative model for the test and its data was recorded in this report.





## 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		
<input type="checkbox"/>	HWA YA	ADD : No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.) TEL : 886-3-327-3456 FAX : 886-3-327-0973
<input checked="" type="checkbox"/>	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	Brian Sun	22~24°C / 50~60%	Apr. 18, 2019~May 15, 2019
Radiated	03CH01-CB for below 1GHz 03CH03-CB for above 1GHz	Brian Sun	22~24°C / 50~60%	Apr. 02, 2019~Jun. 03, 2019
AC Conduction	CO01-CB	Wei Li	23~23.6°C / 55~58%	Apr. 11, 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)	3.6 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	4.3 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	5.1 dB	Confidence levels of 95%
Conducted Emission	1.7 dB	Confidence levels of 95%
Output Power Measurement	1.33 dB	Confidence levels of 95%
Bandwidth Measurement	$9.74 \times 10^{-8}$	Confidence levels of 95%



## 2 Test Configuration of EUT

### 2.1 Test Channel Mode

Mode	PowerSetting
BT-BR(1Mbps)	-
2402MHz	63
2440MHz	63
2480MHz	63
BT-EDR(2Mbps)	-
2402MHz	63
2440MHz	63
2480MHz	63
BT-EDR(3Mbps)	-
2402MHz	63
2440MHz	63
2480MHz	63

## 2.2 The Worst Case Measurement Configuration

The Worst Case Mode for Following Conformance Tests	
<b>Tests Item</b>	AC power-line conducted emissions
<b>Condition</b>	AC power-line conducted measurement for line and neutral
<b>Operating Mode</b>	Normal Link
1	EUT + Adapter 2 with US plug
2	EUT + Adapter 1
3	EUT + Adapter 3
Mode 2 generated the worst test result, so it was recorded in this report.	

The Worst Case Mode for Following Conformance Tests	
<b>Tests Item</b>	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
<b>Test Condition</b>	Conducted measurement at transmit chains

The Worst Case Mode for Following Conformance Tests	
<b>Tests Item</b>	Emissions in Restricted Frequency Bands
<b>Test Condition</b>	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.
<b>Operating Mode &lt; 1GHz</b>	CTX The EUT was performed at Y axis and Z axis position for Emissions in Restricted above 1GHz test, and the worst case was found at Z axis. So the measurement will follow this same test configuration.
1	EUT_2.4GHz in Z axis + Adapter 1
2	EUT_2.4GHz in Z axis + Adapter 2 with US plug
3	EUT_2.4GHz in Z axis + Adapter 3
Mode 2 has been evaluated to be the worst case among Mode 1~3, thus measurement for Mode 4~6 will follow this same test mode.	
4	EUT_5GHz in Z axis + Adapter 2 with US plug
5	EUT_Bluetooth 2.0 in Z axis + Adapter 2 with US plug
6	EUT_ Bluetooth 4.0 in Z axis + Adapter 2 with US plug
Mode 2 generated the worst test result, so it was recorded in this report.	



<b>Operating Mode &gt; 1GHz</b>	CTX
	The EUT was performed at Y axis and Z axis position for Emissions in Restricted test, and the worst case was found at Z axis. So the measurement will follow this same test configuration.
1	EUT in Z axis

<b>The Worst Case Mode for Following Conformance Tests</b>	
<b>Tests Item</b>	Simultaneous Transmission Analysis - Co-location RF Exposure Evaluation
<b>Operating Mode</b>	
1	WLAN 2.4GHz + WLAN 5GHz B1 + WLAN 5GHz B4 + Bluetooth
Refer to Sporton Test Report No.: FA941701 for Co-location RF Exposure Evaluation.	

## 2.3 EUT Operation during Test

For CTX Mode:

The EUT was programmed to be in continuously transmitting/receiving mode.

For Normal Link:

During the test, the EUT operation to normal function.

## 2.4 Accessories

<b>Accessories</b>			
<b>Equipment Name</b>	<b>Brand Name</b>	<b>Model Name</b>	<b>Rating</b>
Adapter 1 (Fixed plug)	KTEC	KSA-24W-120200HU	INPUT: 100-240V, 50/60Hz 0.6A OUTPUT: 12V, 2.0A
Adapter 2 (Interchangeable plug)	KTEC	KSA-24W-120200D5	INPUT: 100-240V, 50/60Hz 0.6A OUTPUT: 12V, 2.0A
Adapter 3 (Fixed plug)	APD	WB-24J12FU-ABBC	INPUT: 100-240V, 50-60Hz 0.7A Max. OUTPUT: 12V, 2A
<b>Other</b>			
US plug*1 (only for adapter 2 use)			

Note: The power adapter does not affect the test result of RF tests, so only adapter 3 was tested and recorded in this report.



## 2.5 Support Equipment

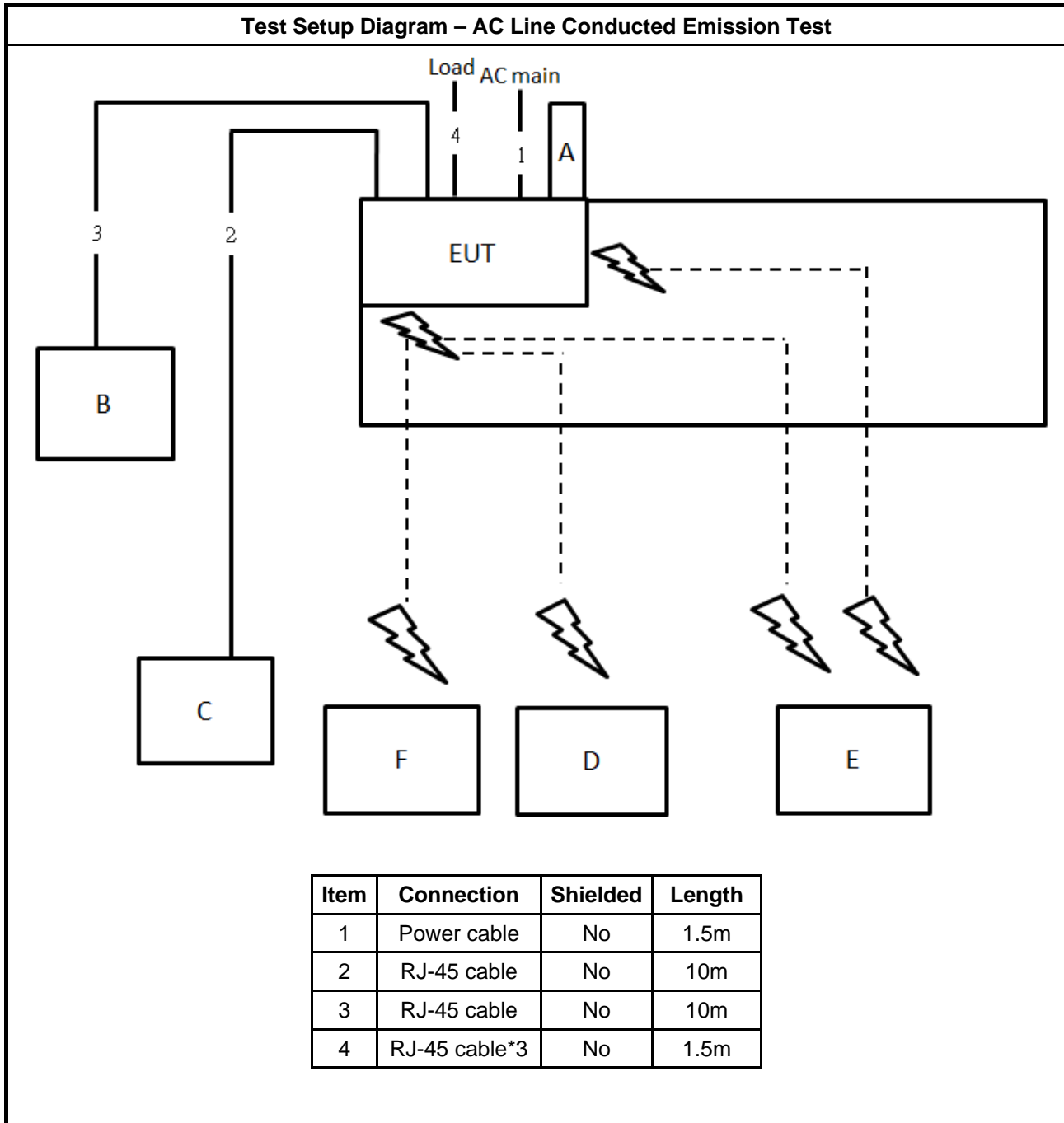
For AC Conduction:

Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID
A	Flash disk3.0	Transcend	JetFlash-700	N/A
B	LAN NB	DELL	E6430	N/A
C	WAN NB	DELL	E6430	N/A
D	2.4G NB	DELL	E6430	N/A
E	5G-1 & BT NB	Apple	A1278	N/A
F	5G-2 NB	DELL	E6430	N/A

For Radiated and RF Conducted test:

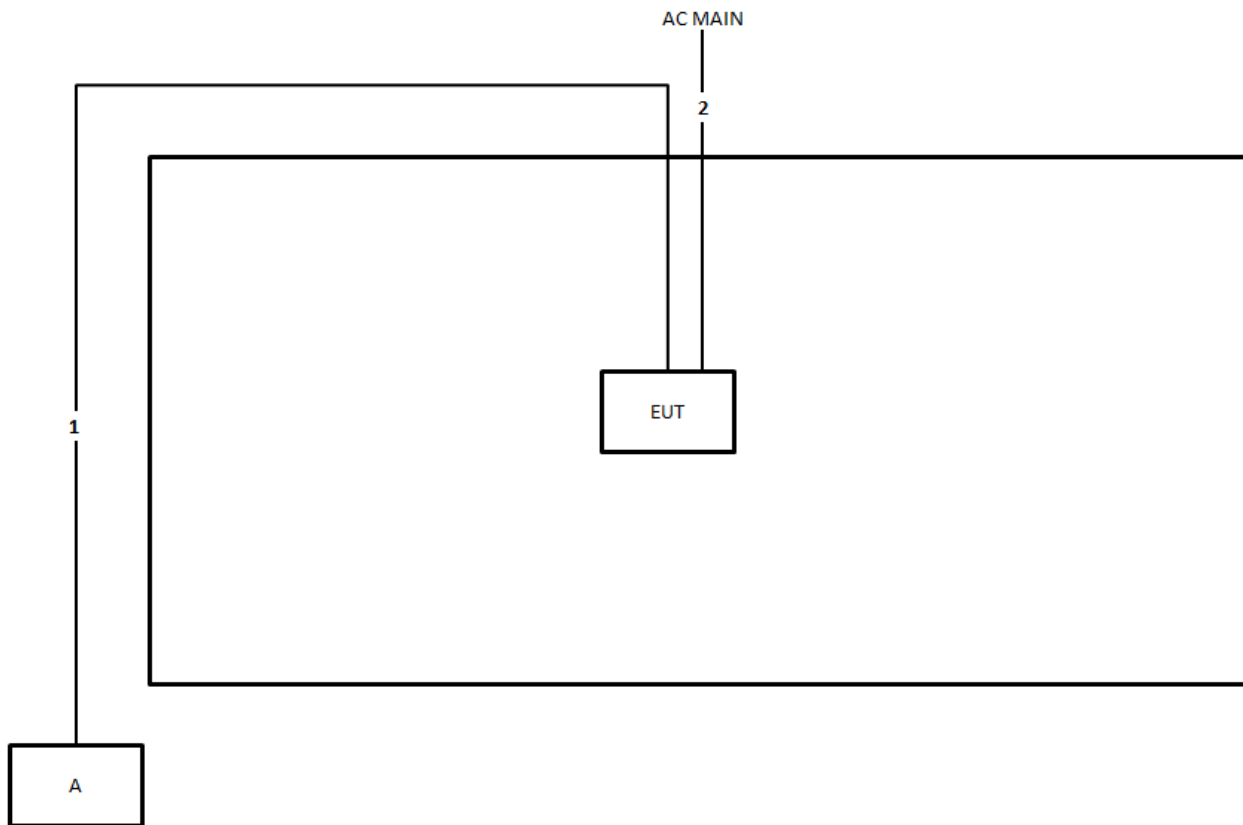
Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID
A	NB	DELL	E4300	N/A

## 2.6 Test Setup Diagram





**Test Setup Diagram - Radiated Test**



Item	Connection	Shielded	Length
1	RJ-45 cable	No	10m
2	Power cable	No	1.5m



### 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

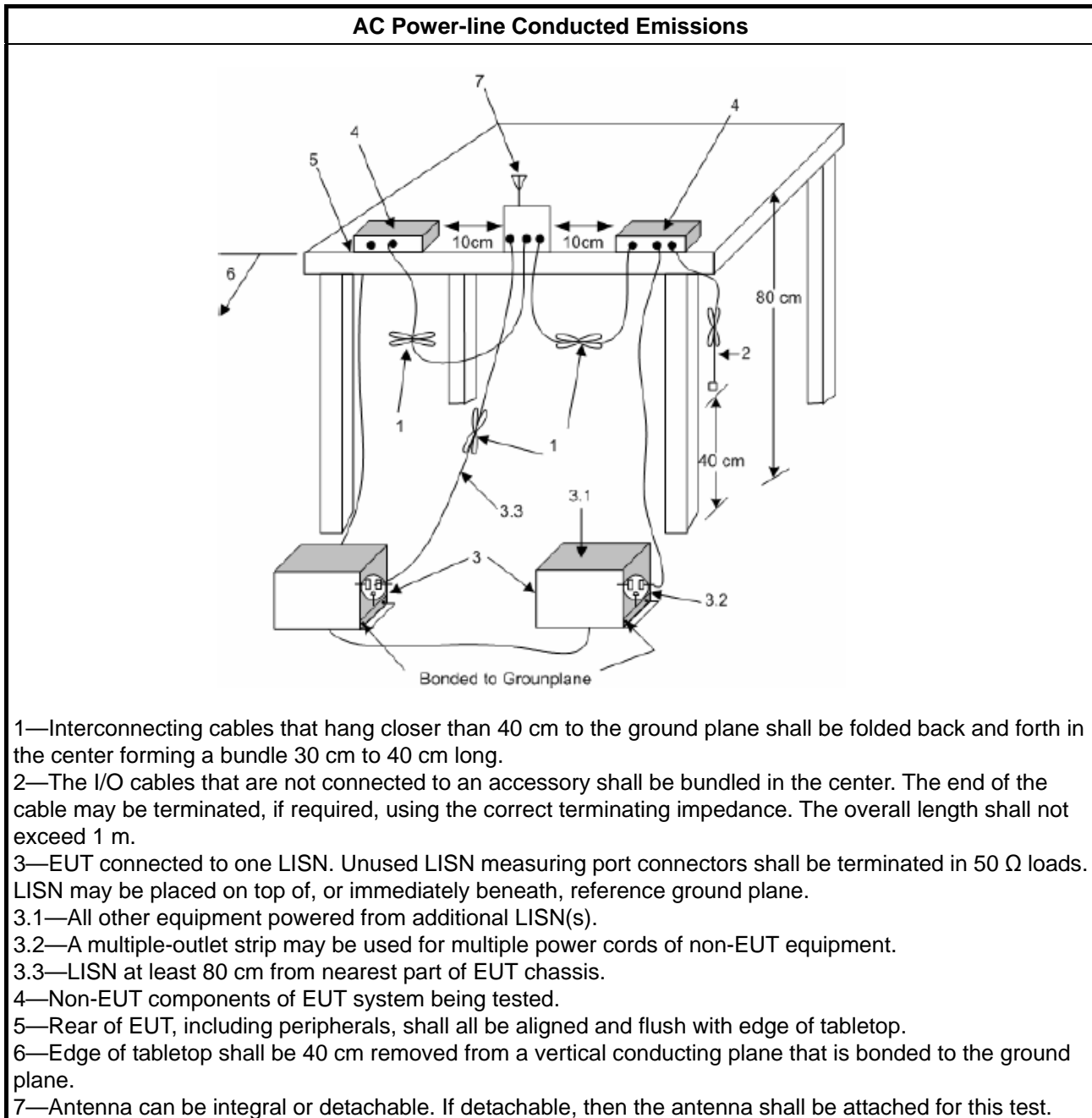
Refer a test equipment and calibration data table in this test report.

##### 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	

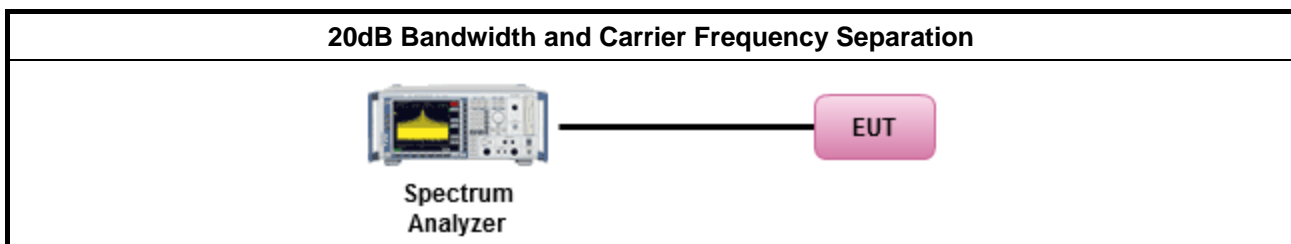
### 3.2.2 Measuring Instruments

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	

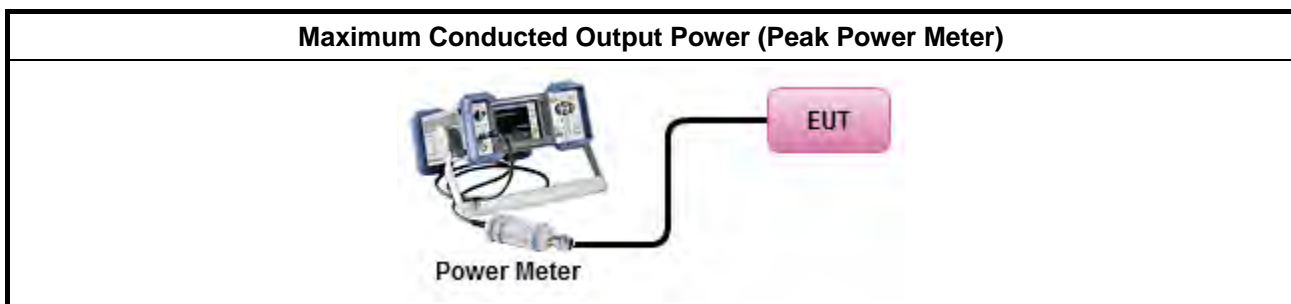
#### 3.3.2 Measuring Instruments

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

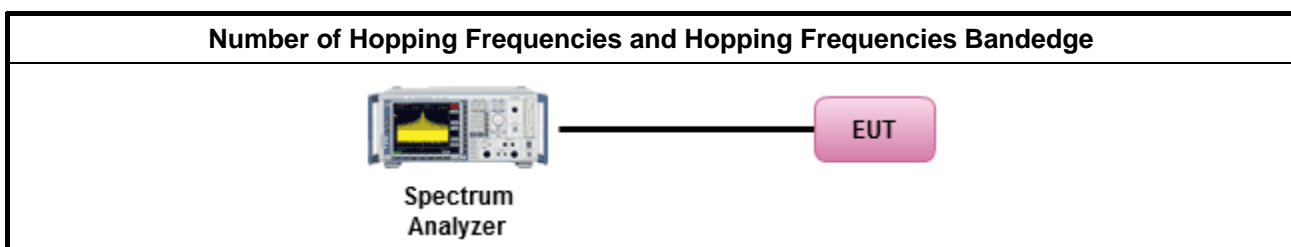
#### 3.4.3 Measuring Instruments

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	

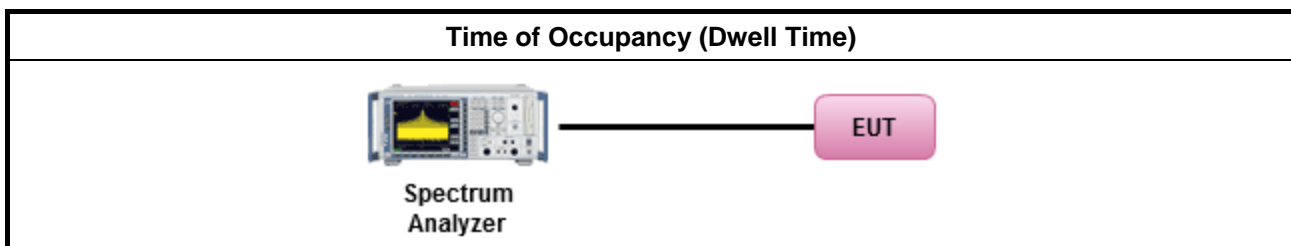
#### 3.5.2 Measuring Instruments

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.	

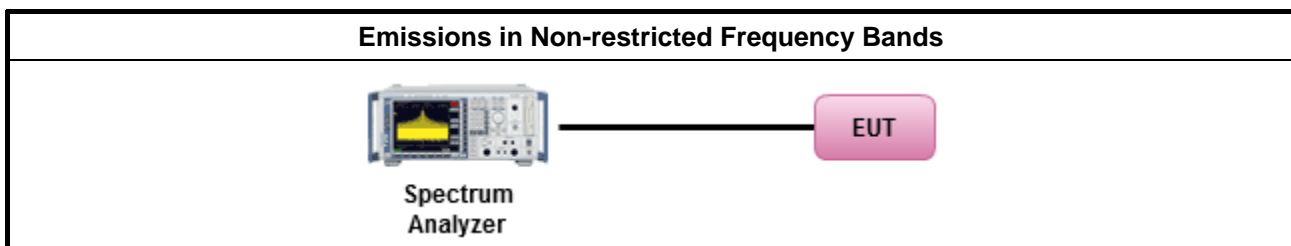
#### 3.6.2 Measuring Instruments

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

#### 3.6.3 Test Procedures

Test Method
<ul style="list-style-type: none"> <li>Refer as ANSI C63.10-2013, clause 7.8.8 for unwanted emissions into non-restricted bands.</li> </ul>

#### 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.

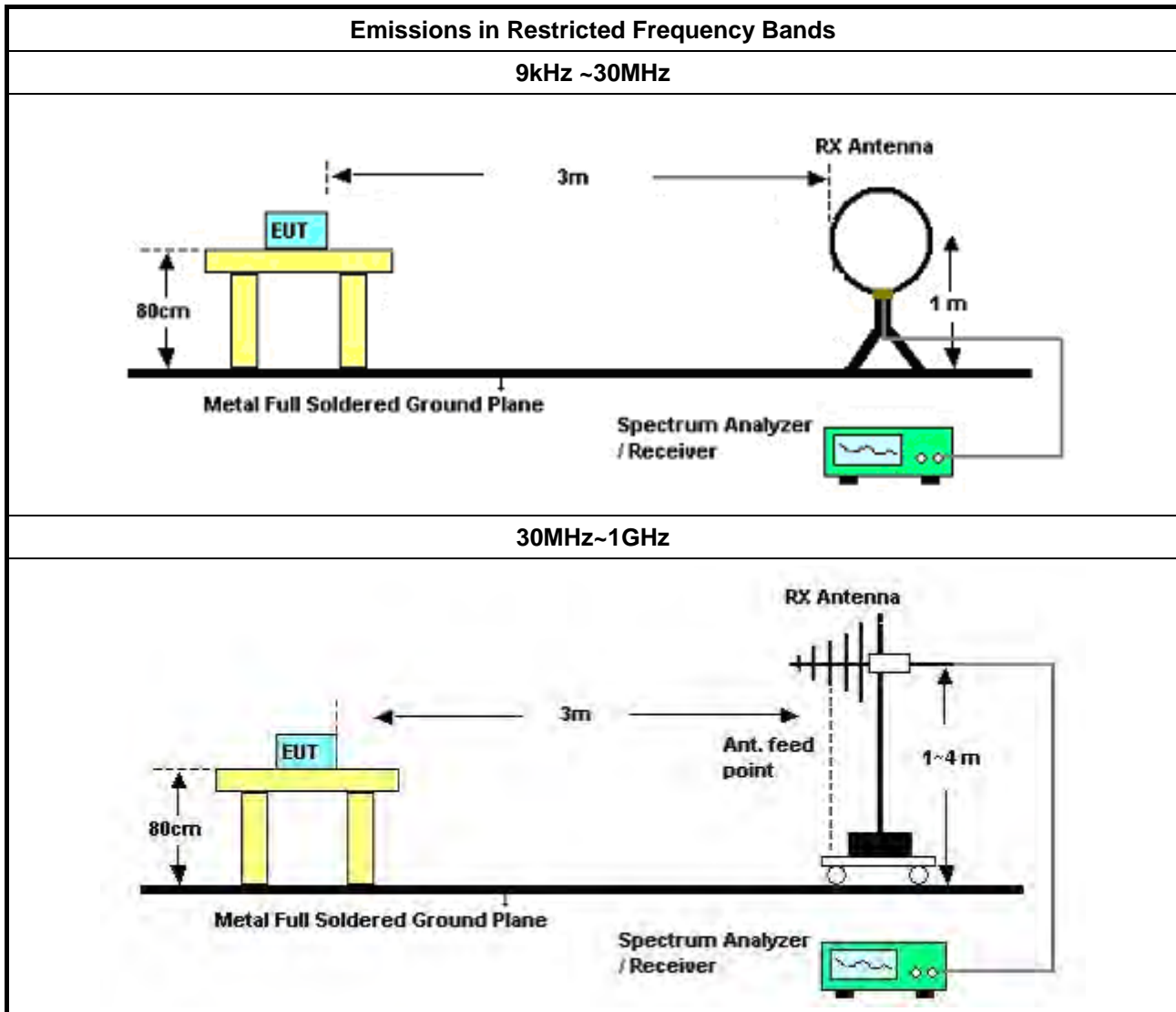
#### 3.7.2 Measuring Instruments

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

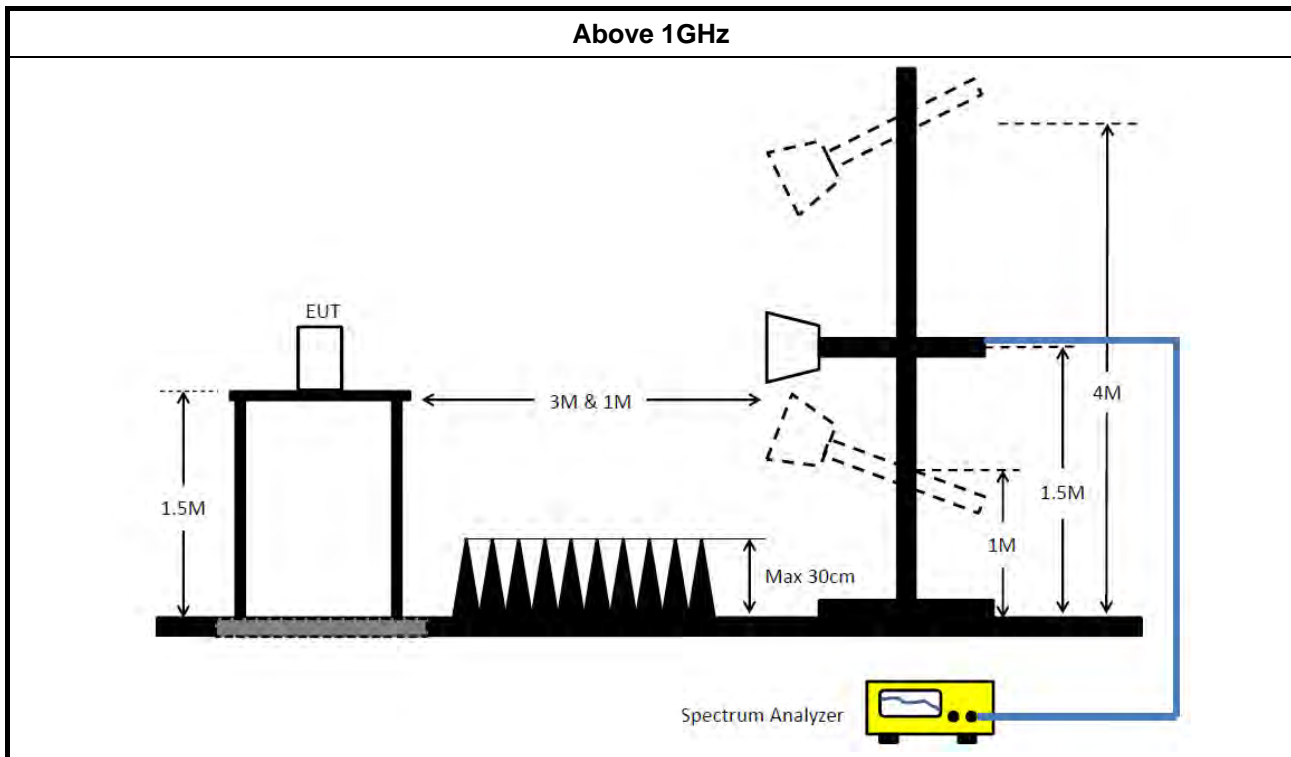
#### 3.7.3 Test Procedures

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
EMI Receiver	Agilent	N9038A	My52260123	9kHz ~ 8.45GHz	Jan. 28, 2019	Jan. 29, 2020	Conduction (CO01-CB)
LISN	F.C.C.	FCC-LISN-50-1 6-2	04083	150kHz ~ 100MHz	Dec. 24, 2018	Dec. 23, 2019	Conduction (CO01-CB)
LISN	Schwarzbeck	NSLK 8127	8127647	9kHz ~ 30MHz	Jan. 11, 2019	Jan. 10, 2020	Conduction (CO01-CB)
COND Cable	Woken	Cable	Low cable-CO01	150kHz ~ 30MHz	May 22, 2018	May 21, 2019	Conduction (CO01-CB)
Software	Audix	E3	6.120210n	-	N.C.R.	N.C.R.	Conduction (CO01-CB)
BILOG ANTENNA with 6dB Attenuator	TESEQ & EMCI	CBL6112D & N-6-06	37880 & AT-N0609	20MHz ~ 2GHz	Aug. 27, 2018	Aug. 26, 2019	Radiation (03CH01-CB)
Loop Antenna	Teseq	HLA 6120	24155	9kHz - 30 MHz	Mar. 29, 2019	Mar. 28, 2020	Radiation (03CH01-CB)
Horn Antenna	ETS • Lindgren	3115	6821	750MHz~18GHz	Jan. 24, 2019	Jan. 23, 2020	Radiation (03CH03-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Jun. 28, 2018	Jun. 27, 2019	Radiation (03CH03-CB)
Pre-Amplifier	EMCI	EMC330N	980332	20MHz ~ 3GHz	May 02, 2018	May 01, 2019	Radiation (03CH01-CB)
Pre-Amplifier	EMCI	EMC330N	980332	20MHz ~ 3GHz	May 01, 2019	Apr. 30, 2020	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02097	1GHz ~ 26.5GHz	Dec. 20, 2018	Dec. 19, 2019	Radiation (03CH03-CB)
Pre-Amplifier	MITEQ	TTA1840-35-HG	1864479	18GHz ~ 40GHz	Jul. 04, 2018	Jul. 03, 2019	Radiation (03CH03-CB)
Spectrum Analyzer	R&S	FSP40	100056	9kHz ~ 40GHz	Jan. 31, 2019	Jan. 30, 2020	Radiation (03CH01-CB)
Spectrum Analyzer	R&S	FSP40	100142	9kHz~40GHz	Dec. 26, 2018	Dec. 25, 2019	Radiation (03CH03-CB)
EMI Test Receiver	R&S	ESCS	100359	9kHz ~ 2.75GHz	Jul. 03, 2018	Jul. 02, 2019	Radiation (03CH01-CB)
RF Cable-low	Woken	Low Cable-16+17	N/A	30 MHz ~ 1 GHz	Oct. 08, 2018	Oct. 07, 2019	Radiation (03CH01-CB)
RF Cable-high	Woken	RG402	High Cable-20+27	1GHz ~ 18GHz	Oct. 08, 2018	Oct. 07, 2019	Radiation (03CH03-CB)
RF Cable-high	Woken	RG402	High Cable-27	1GHz ~ 18GHz	Oct. 08, 2018	Oct. 07, 2019	Radiation (03CH03-CB)
RF Cable-high	Woken	RG402	High Cable-40G#1	18GHz ~ 40 GHz	Jul. 27, 2018	Jul. 26, 2019	Radiation (03CH03-CB)
RF Cable-high	Woken	RG402	High Cable-40G#2	18GHz ~ 40 GHz	Jul. 27, 2018	Jul. 26, 2019	Radiation (03CH03-CB)



Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
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	U2021XA	MY53410001	50MHz~18GHz	Nov. 05, 2018	Nov. 04, 2019	Conducted (TH01-CB)

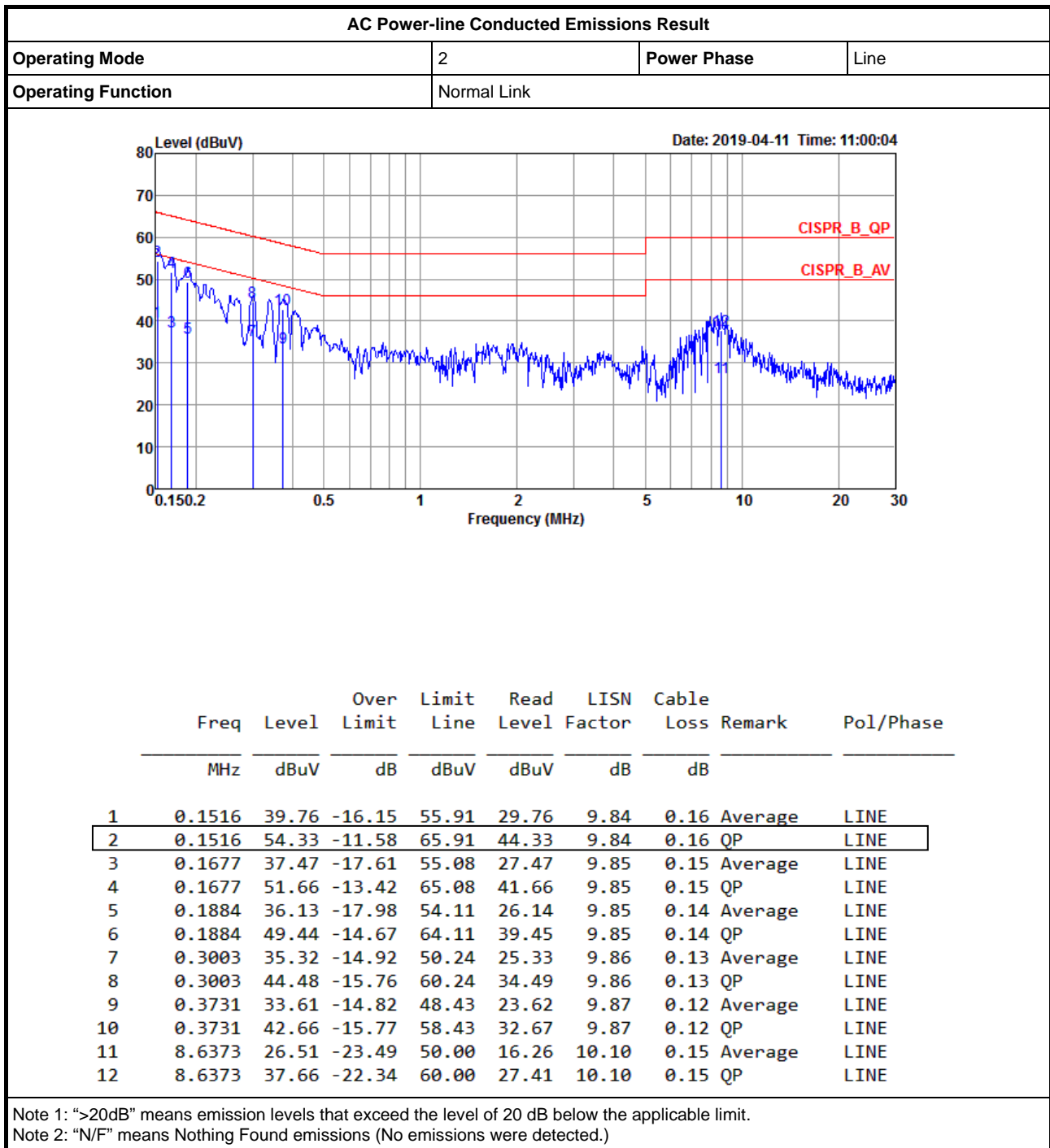
Note: Calibration Interval of instruments listed above is one year.

N.C.R. means Non-Calibration required.



## AC Power-line Conducted Emissions Result

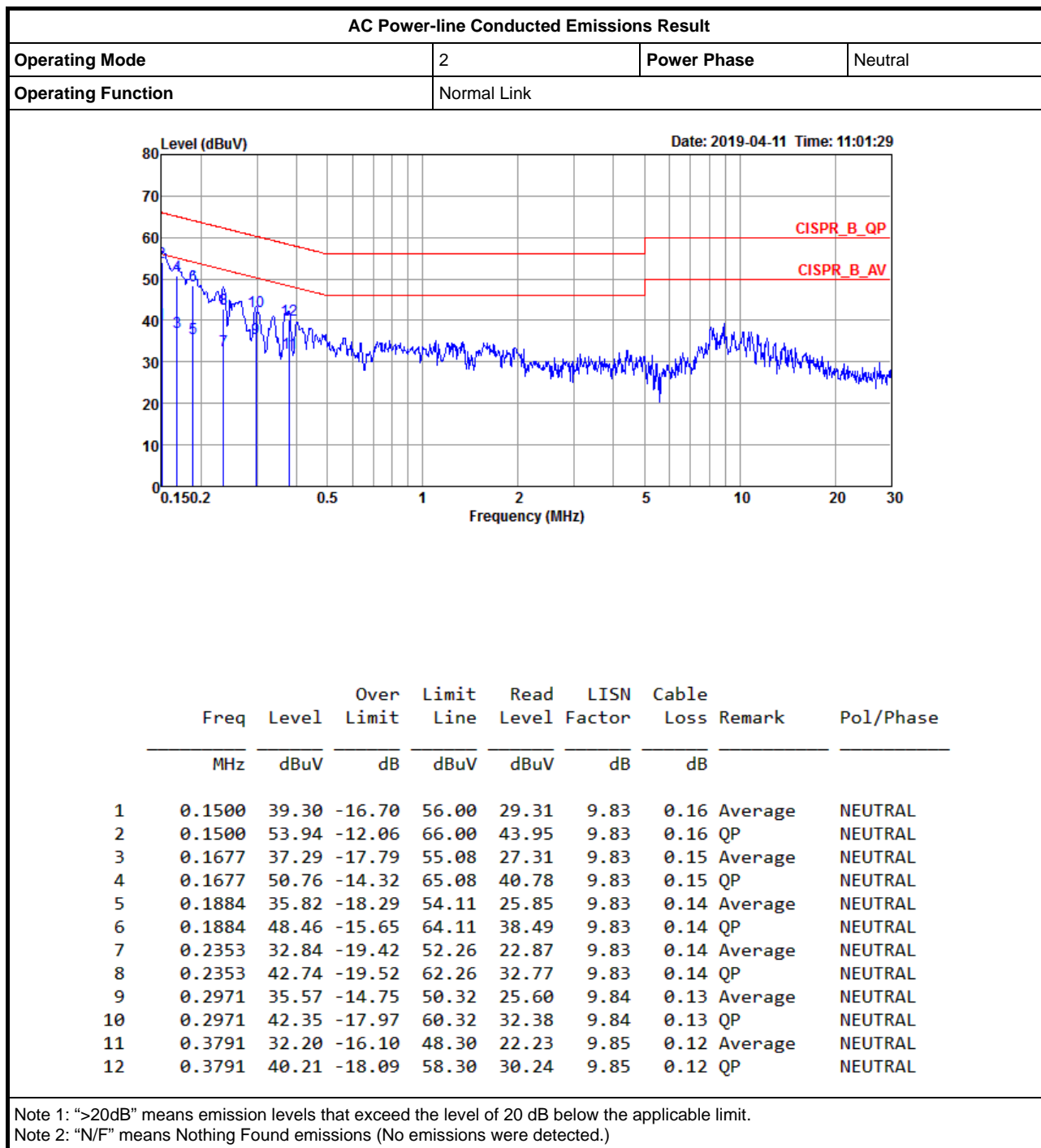
Appendix A





# AC Power-line Conducted Emissions Result

Appendix A





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)	921.25k	873.313k	873KF1D	918.75k	870.815k
BT-EDR(2Mbps)	1.318M	1.196M	1M20G1D	1.313M	1.189M
BT-EDR(3Mbps)	1.283M	1.211M	1M21G1D	1.269M	1.198M

**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;

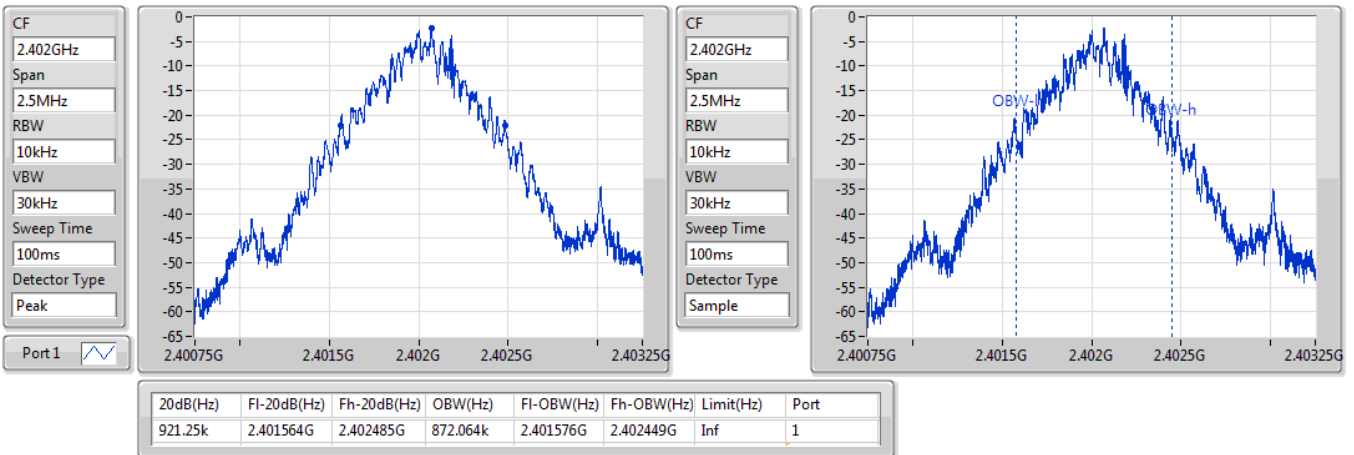
**Result**

Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
BT-BR(1Mbps)	-	-	-	-
2402MHz	Pass	Inf	921.25k	872.064k
2440MHz	Pass	Inf	920k	870.815k
2480MHz	Pass	Inf	918.75k	873.313k
BT-EDR(2Mbps)	-	-	-	-
2402MHz	Pass	Inf	1.313M	1.189M
2440MHz	Pass	Inf	1.316M	1.193M
2480MHz	Pass	Inf	1.318M	1.196M
BT-EDR(3Mbps)	-	-	-	-
2402MHz	Pass	Inf	1.269M	1.198M
2440MHz	Pass	Inf	1.269M	1.204M
2480MHz	Pass	Inf	1.283M	1.211M

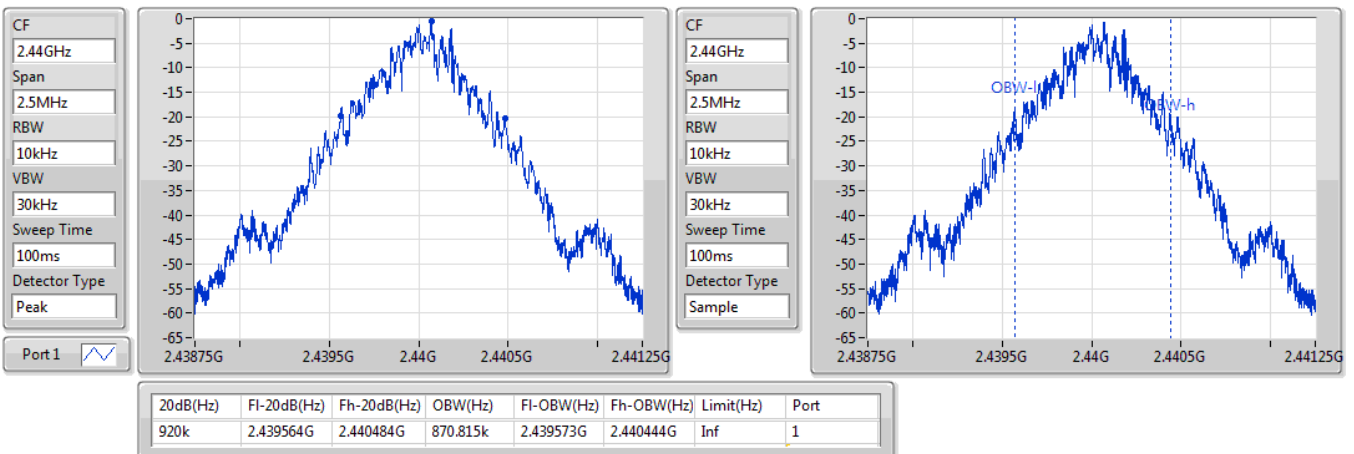
**Port X-N dB** = Port X 20dB down bandwidth; **Port X-OBW** = Port X 99% occupied bandwidth;

**BT-BR(1Mbps)**
**2402MHz**
**EBW**

15/05/2019


**BT-BR(1Mbps)**
**2440MHz**
**EBW**

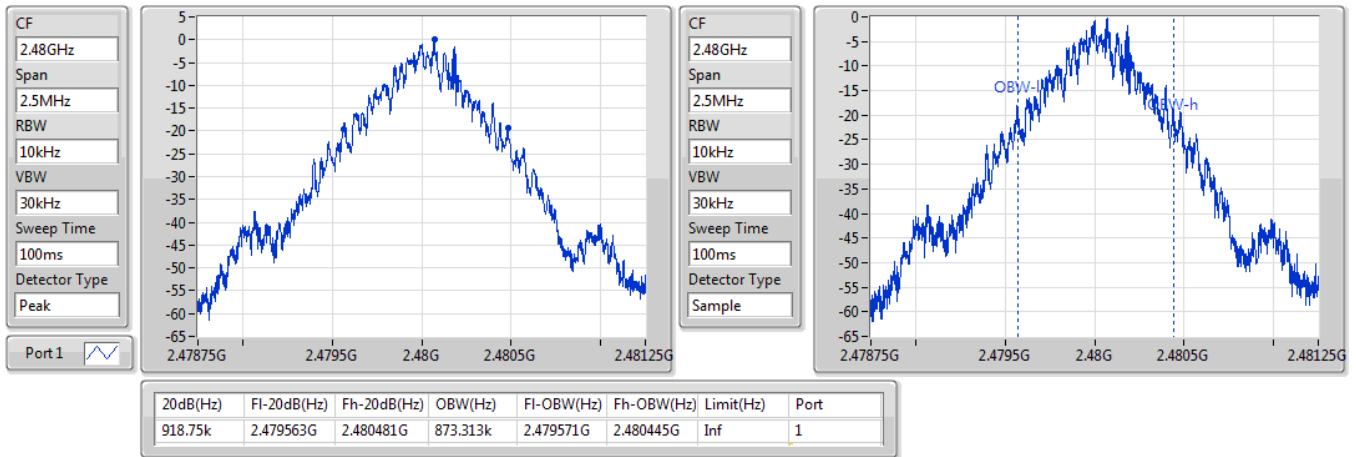
15/05/2019



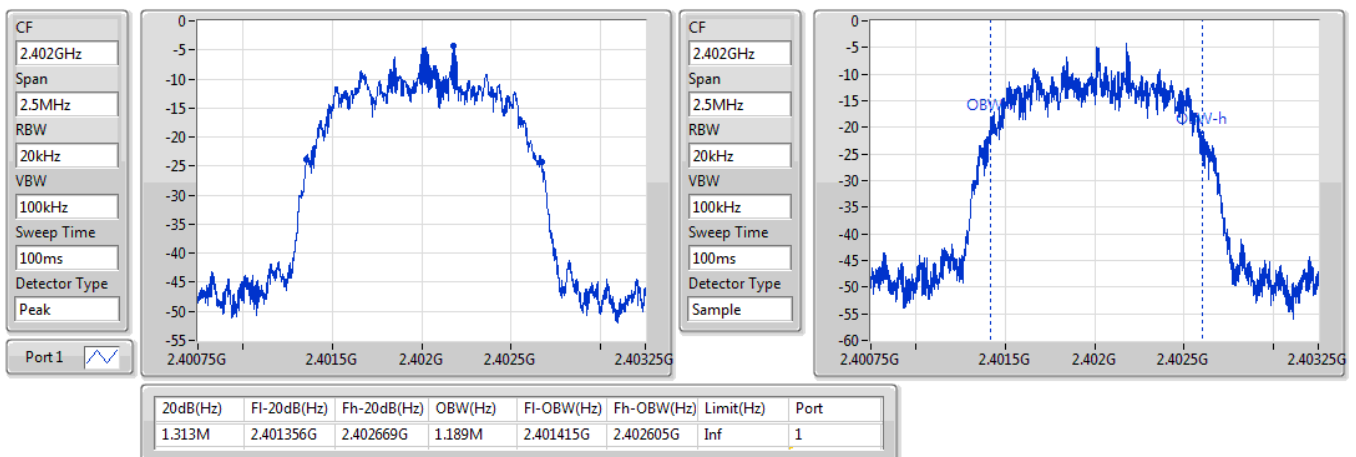


**BT-BR(1Mbps)**
**EBW**
**2480MHz**

15/05/2019

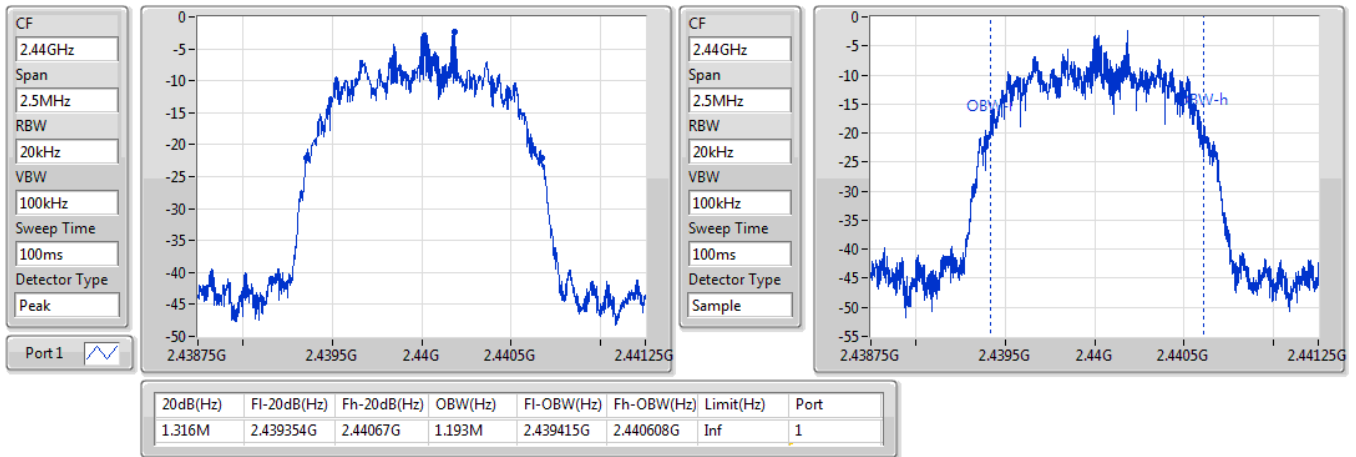

**BT-EDR(2Mbps)**
**EBW**
**2402MHz**

15/05/2019

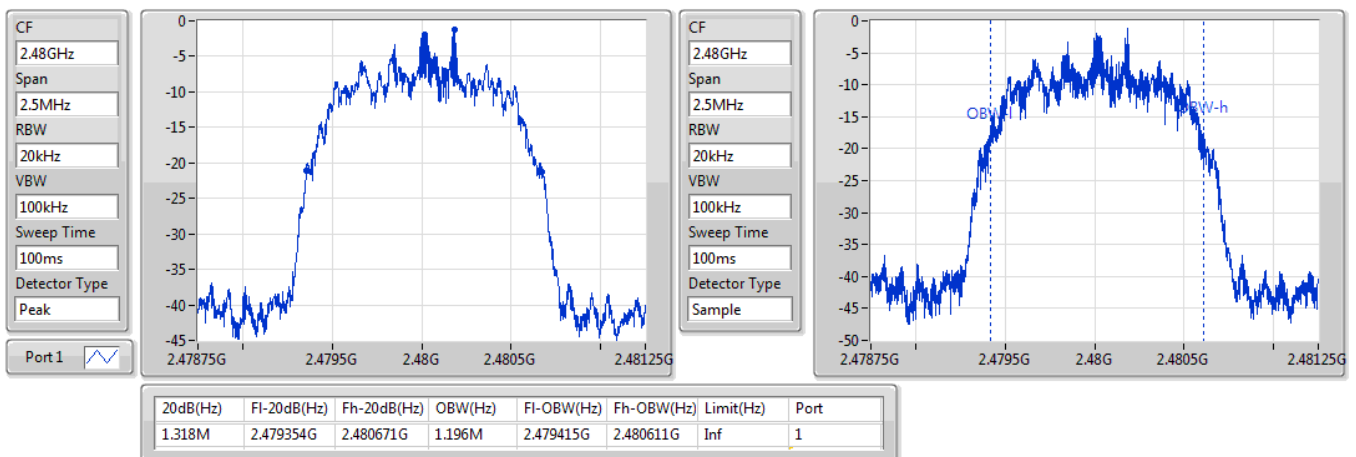


**BT-EDR(2Mbps)**
**EBW**
**2440MHz**

15/05/2019

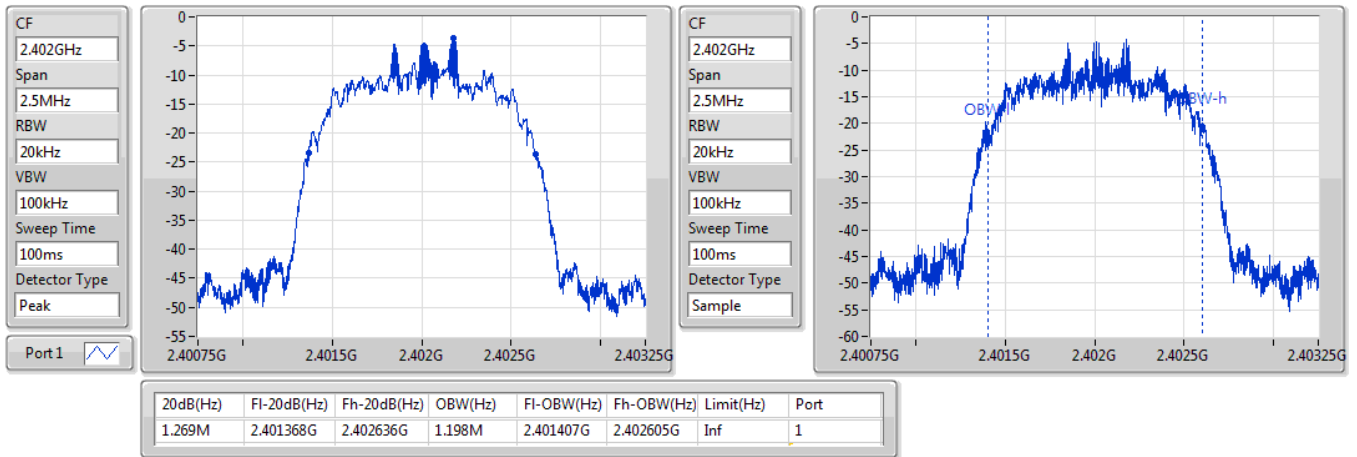

**BT-EDR(2Mbps)**
**EBW**
**2480MHz**

15/05/2019

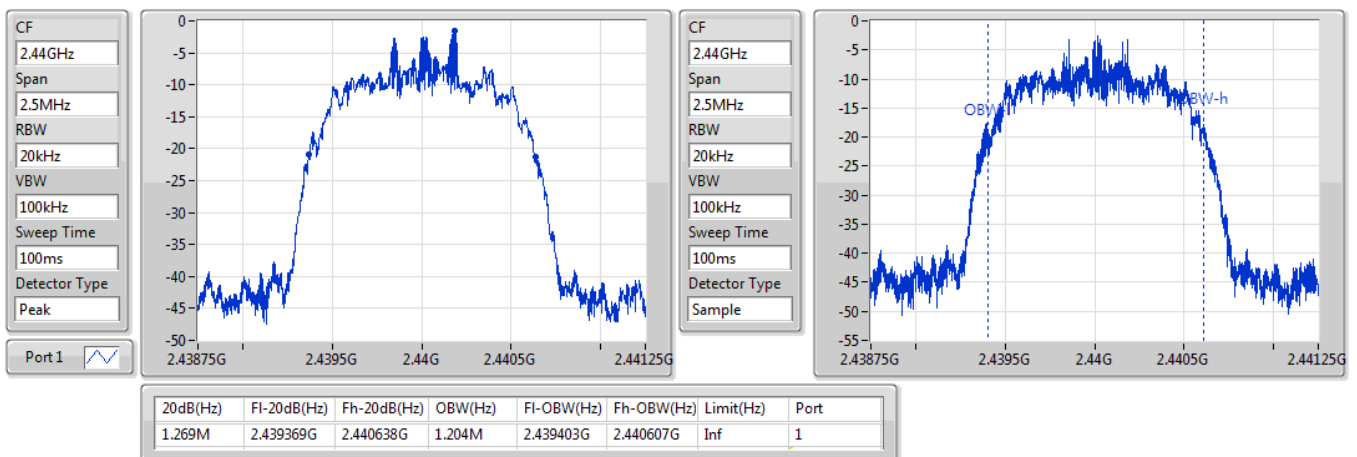


**BT-EDR(3Mbps)**
**EBW**
**2402MHz**

15/05/2019


**BT-EDR(3Mbps)**
**EBW**
**2440MHz**

15/05/2019

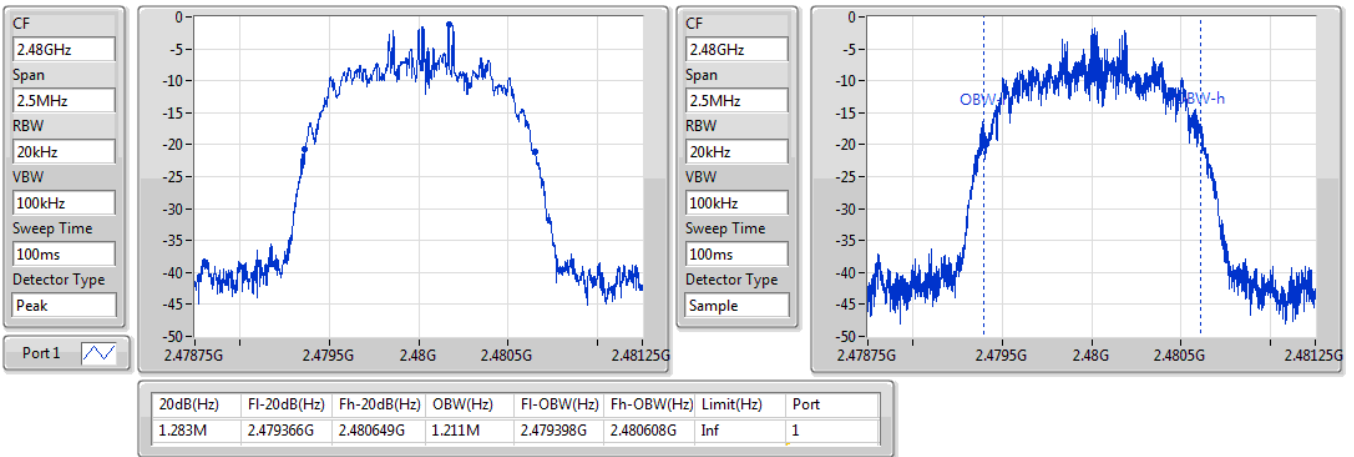


## BT-EDR(3Mbps)

2480MHz

EBW

15/05/2019





**Summary**

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

## Result

Mode	Result	Fl (Hz)	Fh (Hz)	Ch.Space (Hz)	Limit (Hz)
BT-BR(1Mbps)	-	-	-	-	-
2402MHz	Pass	2.402178G	2.40318G	1.002M	613.5525k
2440MHz	Pass	2.440178G	2.44118G	1.002M	612.72k
2480MHz	Pass	2.479178G	2.480178G	1.0005M	611.8875k
BT-EDR(2Mbps)	-	-	-	-	-
2402MHz	Pass	2.402017G	2.403019G	1.002M	874.458k
2440MHz	Pass	2.440017G	2.441018G	1.0005M	876.456k
2480MHz	Pass	2.479017G	2.480019G	1.002M	877.788k
BT-EDR(3Mbps)	-	-	-	-	-
2402MHz	Pass	2.402178G	2.403178G	1.0005M	845.154k
2440MHz	Pass	2.440178G	2.441177G	999k	845.154k
2480MHz	Pass	2.479178G	2.480178G	1.0005M	854.478k

## BT-BR(1Mbps)

2.402G/2.403GHz

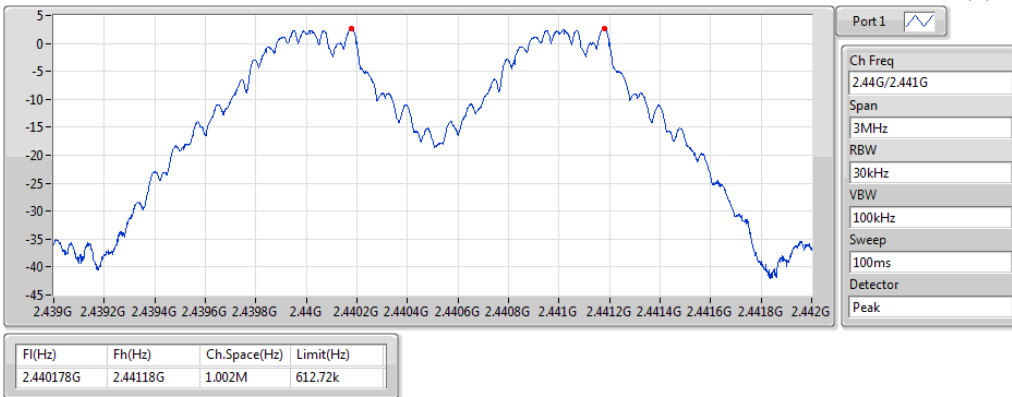
## Channel Separation



## BT-BR(1Mbps)

2.44G/2.441GHz

## Channel Separation



## BT-BR(1Mbps)

2.48G/2.479GHz

## Channel Separation

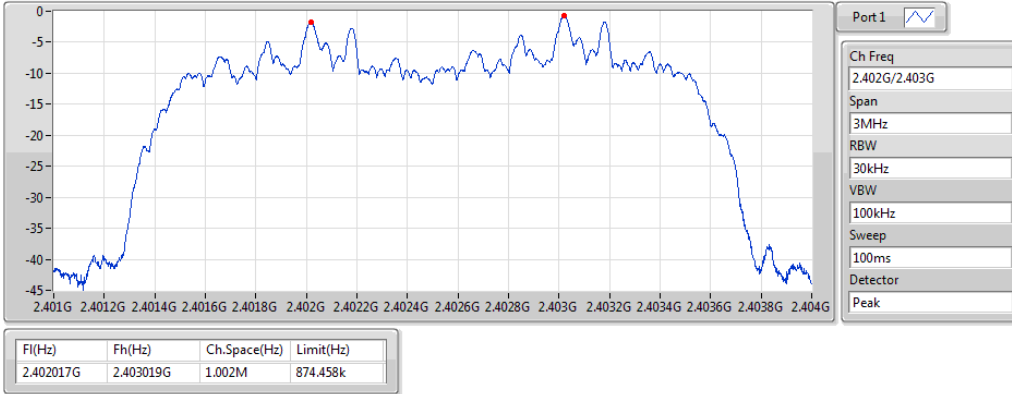


## BT-EDR(2Mbps)

2.402G/2.403GHz

## Channel Separation

15/05/2019

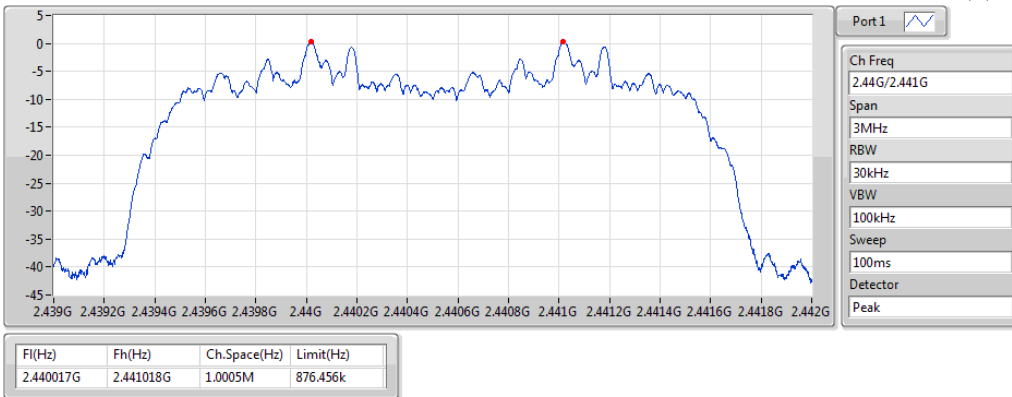


## BT-EDR(2Mbps)

2.44G/2.441GHz

## Channel Separation

15/05/2019

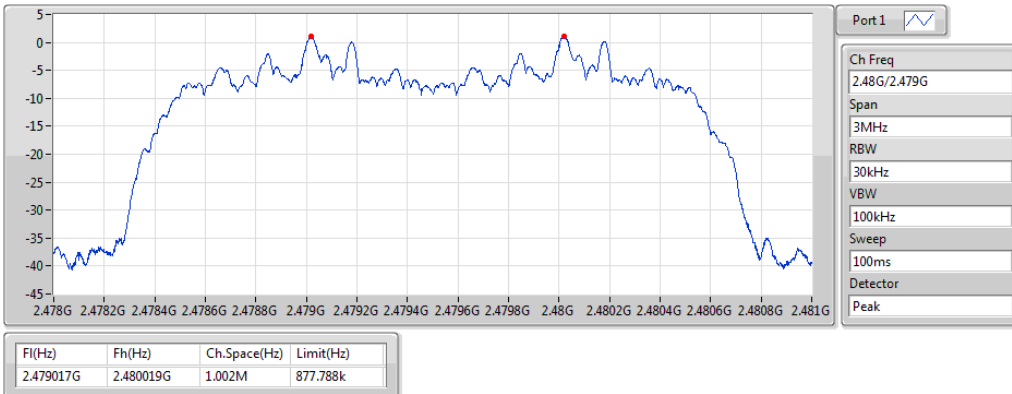


## BT-EDR(2Mbps)

2.48G/2.479GHz

## Channel Separation

15/05/2019

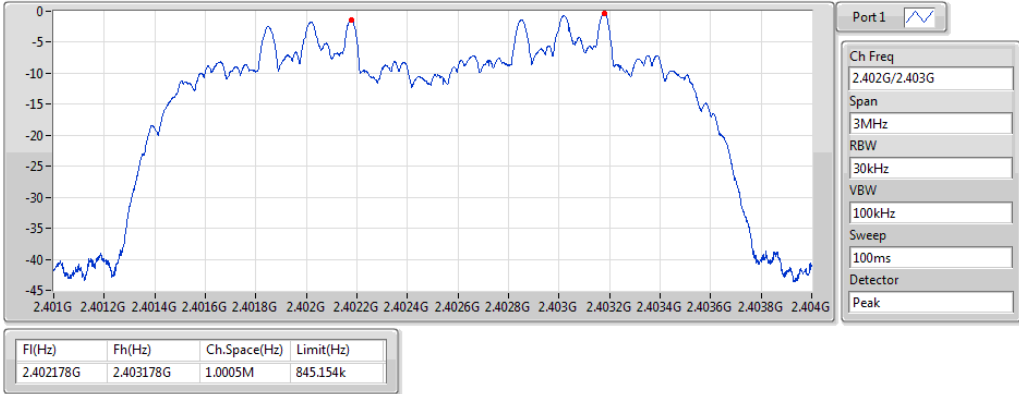




## BT-EDR(3Mbps)

## Channel Separation

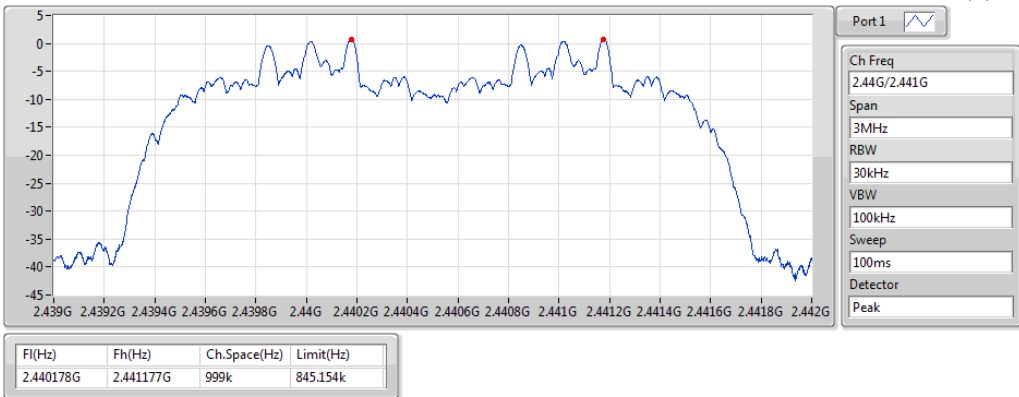
2.402G/2.403GHz



## BT-EDR(3Mbps)

## Channel Separation

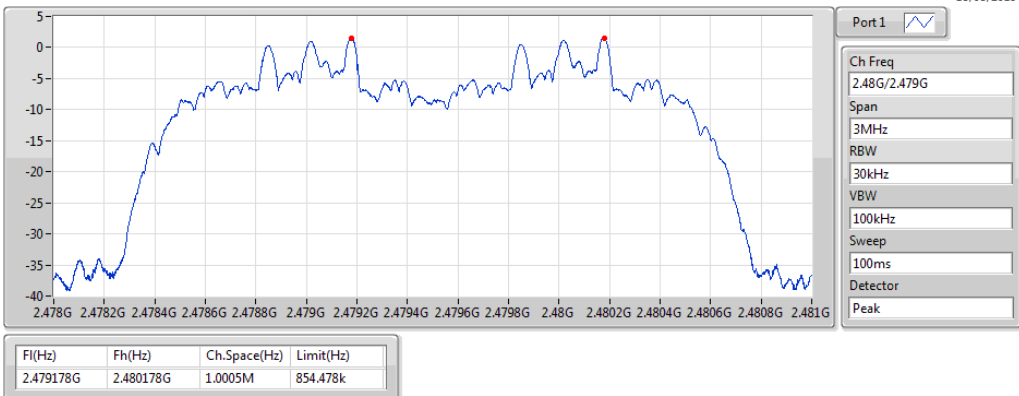
2.44G/2.441GHz



## BT-EDR(3Mbps)

## Channel Separation

2.48G/2.479GHz





## Average Power-FHSS

## Appendix C.1

### Summary

Mode	Power (dBm)	Power (W)
2.4-2.4835GHz	-	-
BT-BR(1Mbps)	5.76	0.00377
BT-EDR(2Mbps)	2.71	0.00187
BT-EDR(3Mbps)	2.63	0.00183

**Result**

Mode	Result	Gain (dBi)	Power (dBm)	Power Limit (dBm)
BT-BR(1Mbps)	-	-	-	-
2402MHz	Pass	2.90	3.70	21.00
2440MHz	Pass	2.90	5.31	21.00
2480MHz	Pass	2.90	5.76	21.00
BT-EDR(2Mbps)	-	-	-	-
2402MHz	Pass	2.90	-0.96	21.00
2440MHz	Pass	2.90	1.65	21.00
2480MHz	Pass	2.90	2.71	21.00
BT-EDR(3Mbps)	-	-	-	-
2402MHz	Pass	2.90	-0.32	21.00
2440MHz	Pass	2.90	1.71	21.00
2480MHz	Pass	2.90	2.63	21.00

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



**Summary**

Mode	Power (dBm)	Power (W)
2.4-2.4835GHz	-	-
BT-BR(1Mbps)	5.78	0.00378
BT-EDR(2Mbps)	4.67	0.00293
BT-EDR(3Mbps)	5.01	0.00317

### Result

Mode	Result	Gain (dBi)	Power (dBm)	Power Limit (dBm)
BT-BR(1Mbps)	-	-	-	-
2402MHz	Pass	2.90	3.72	21.00
2440MHz	Pass	2.90	5.34	21.00
2480MHz	Pass	2.90	5.78	21.00
BT-EDR(2Mbps)	-	-	-	-
2402MHz	Pass	2.90	1.83	21.00
2440MHz	Pass	2.90	3.83	21.00
2480MHz	Pass	2.90	4.67	21.00
BT-EDR(3Mbps)	-	-	-	-
2402MHz	Pass	2.90	2.30	21.00
2440MHz	Pass	2.90	4.26	21.00
2480MHz	Pass	2.90	5.01	21.00

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

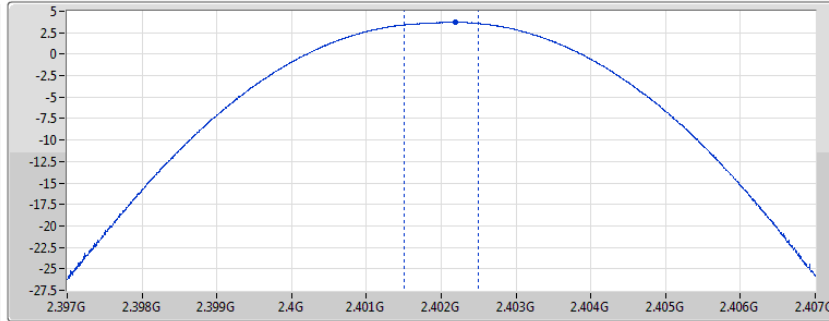
## BT-BR(1Mbps)

## PK Power

2402MHz

15/05/2019

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)
3.72	3.72

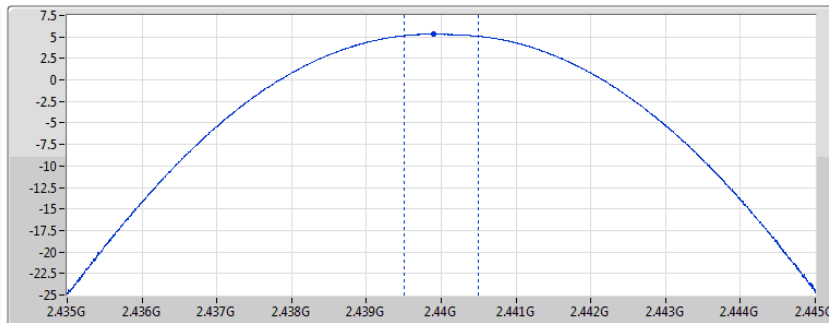
## BT-BR(1Mbps)

## PK Power

2440MHz

15/05/2019

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)
5.34	5.34

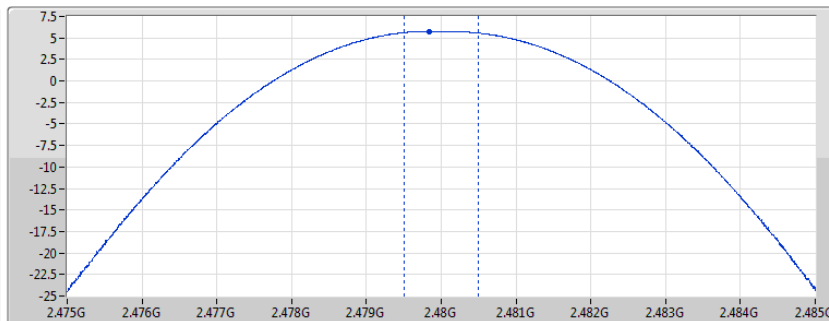
## BT-BR(1Mbps)

## PK Power

2480MHz

15/05/2019

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)
5.78	5.78

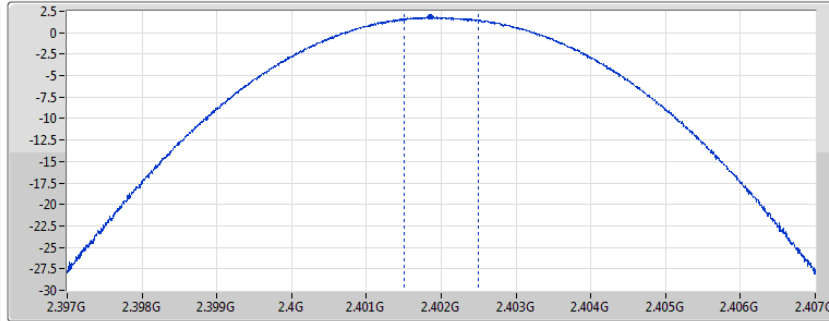
### BT-EDR(2Mbps)

### PK Power

2402MHz

15/05/2019

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)
1.83	1.83

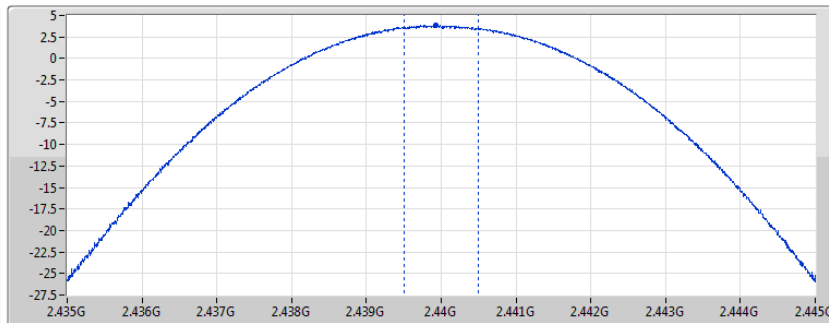
### BT-EDR(2Mbps)

### PK Power

2440MHz

15/05/2019

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)
3.83	3.83

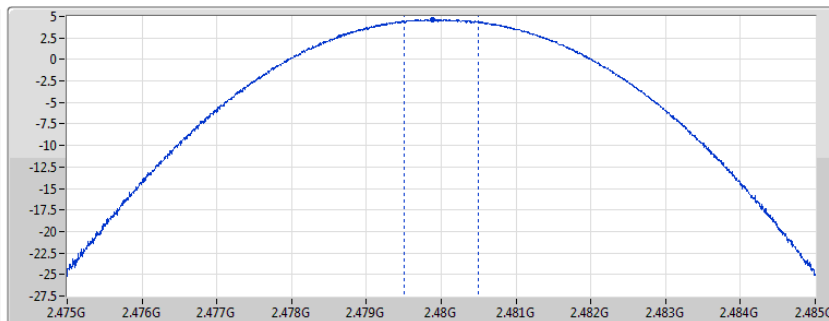
### BT-EDR(2Mbps)

### PK Power

2480MHz

15/05/2019

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)
4.67	4.67

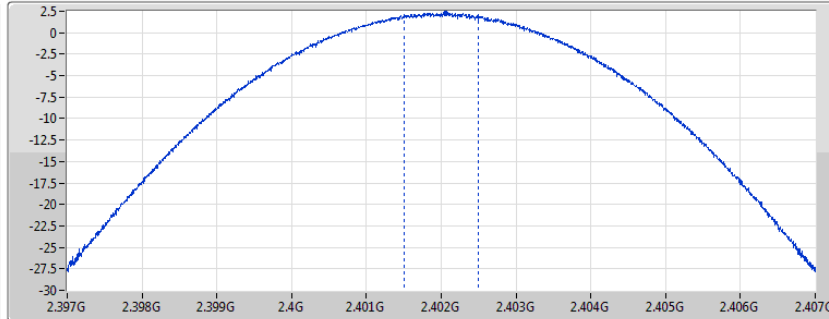
## BT-EDR(3Mbps)

## PK Power

2402MHz

15/05/2019

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)
2.30	2.30

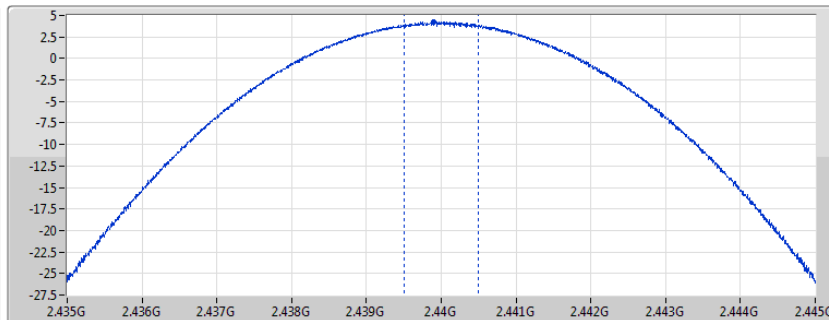
## BT-EDR(3Mbps)

## PK Power

2440MHz

15/05/2019

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)
4.26	4.26

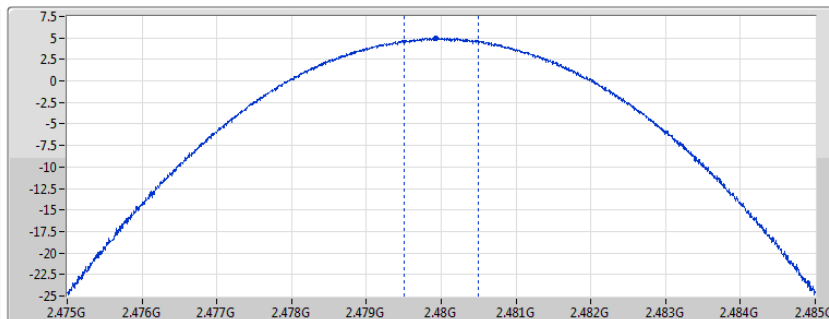
## BT-EDR(3Mbps)

## PK Power

2480MHz

15/05/2019

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)
5.01	5.01





**Summary**

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

**Result**

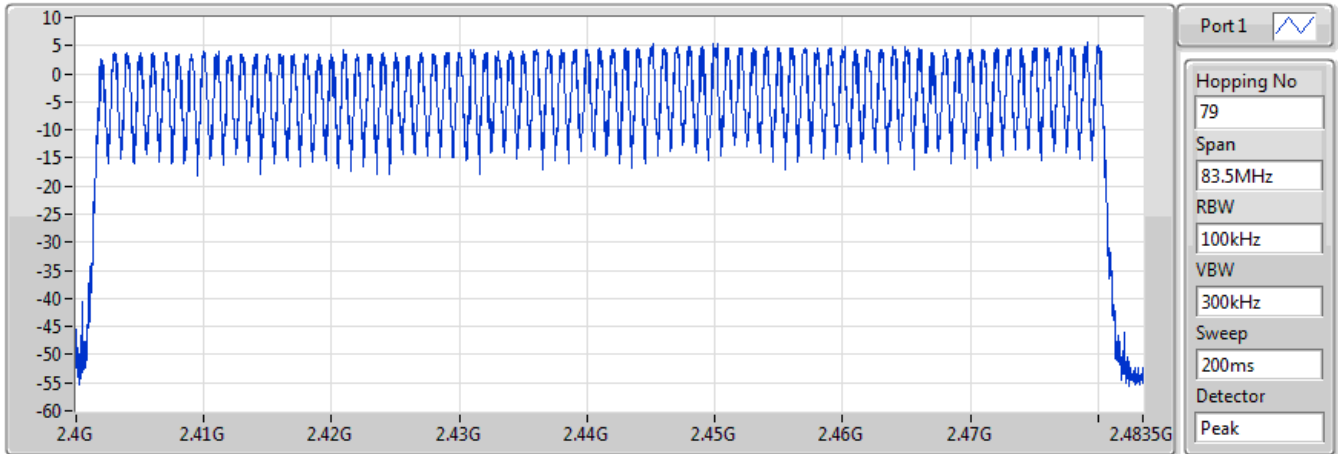
Mode	Result	Hopping No	Limit
BT-BR(1Mbps)	-	-	-
2440MHz	Pass	79	15
BT-EDR(2Mbps)	-	-	-
2440MHz	Pass	79	15
BT-EDR(3Mbps)	-	-	-
2440MHz	Pass	79	15

**BT-BR(1Mbps)**

**2440MHz**

**Hopping Ch**

15/05/2019

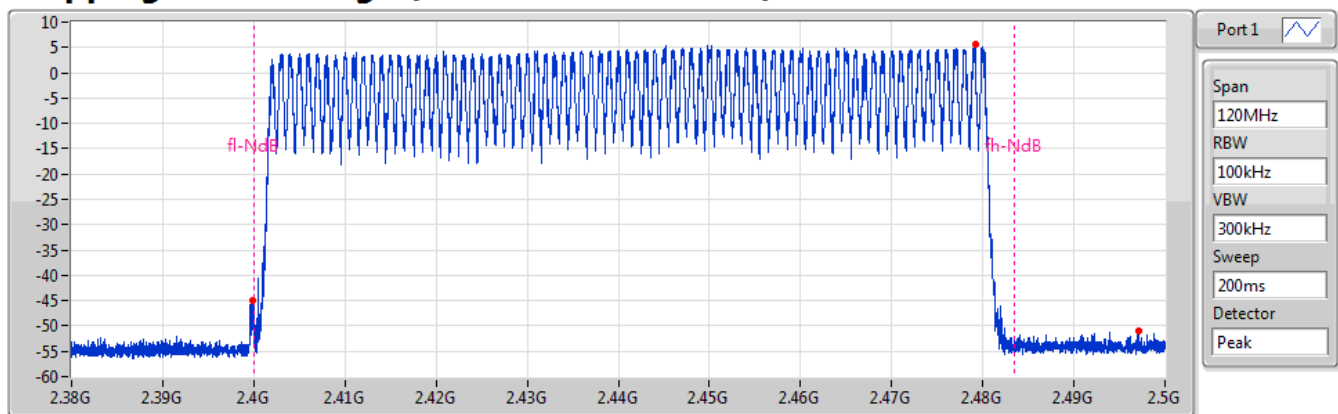


**BT-BR(1Mbps)**

**2440MHz**

**Hopping Ch Bandedge (Non-restricted Band)**

15/05/2019



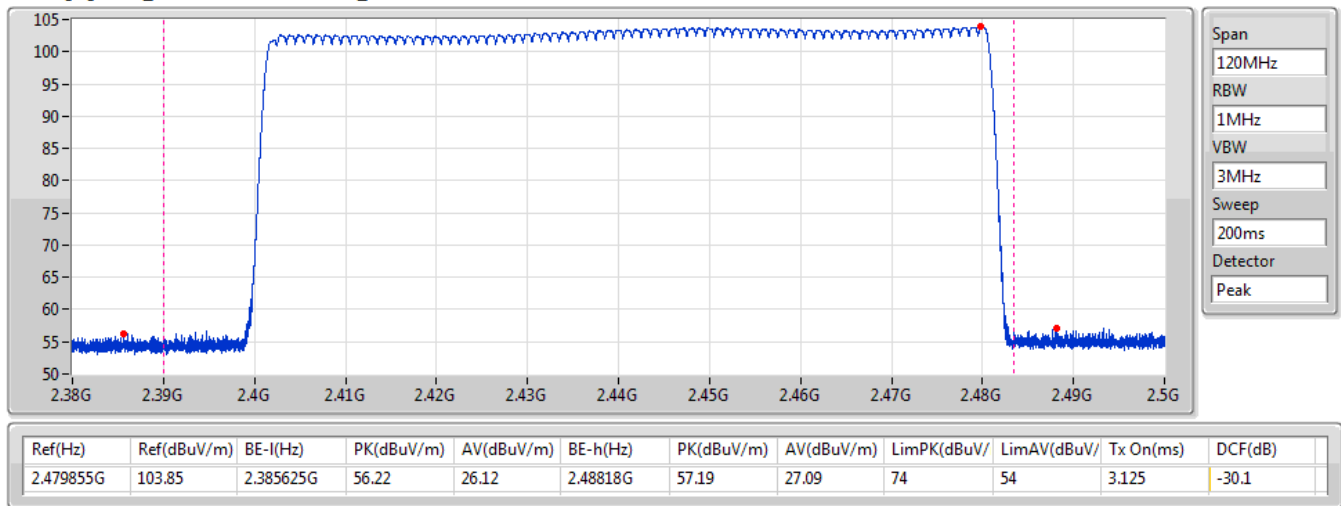
Limit(dBm)	Ref(Hz)	Ref(dBm)	BE-l(Hz)	BE-l(dBm)	BE-h(Hz)	BE-h(dBm)
-14.42	2.47918G	5.58	2.39989G	-44.91	2.497105G	-51.04

### BT-BR(1Mbps)

2440MHz

### Hopping Ch Bandedge (Restricted Band)

15/05/2019

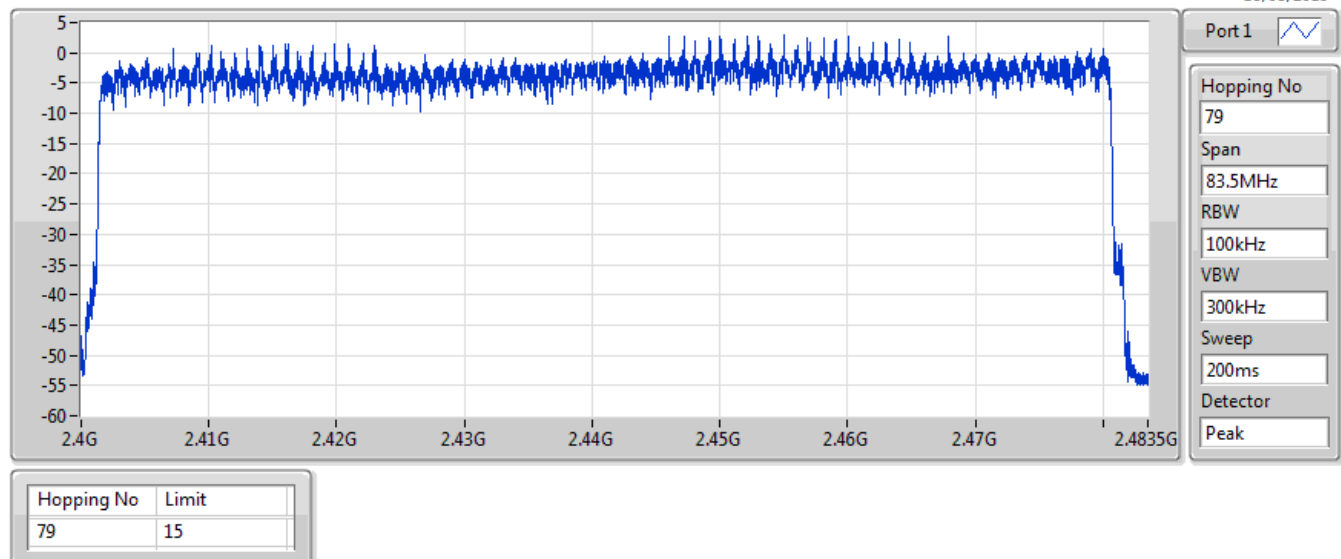


### BT-EDR(2Mbps)

2440MHz

### Hopping Ch

15/05/2019

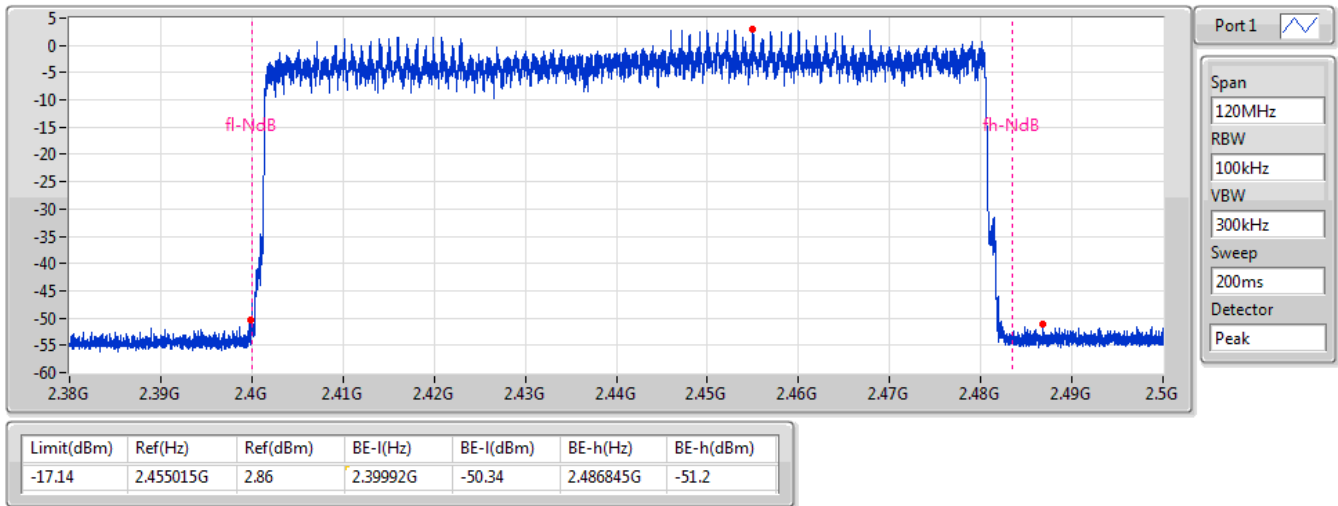


**BT-EDR(2Mbps)**

**2440MHz**

**Hopping Ch Bandedge (Non-restricted Band)**

15/05/2019

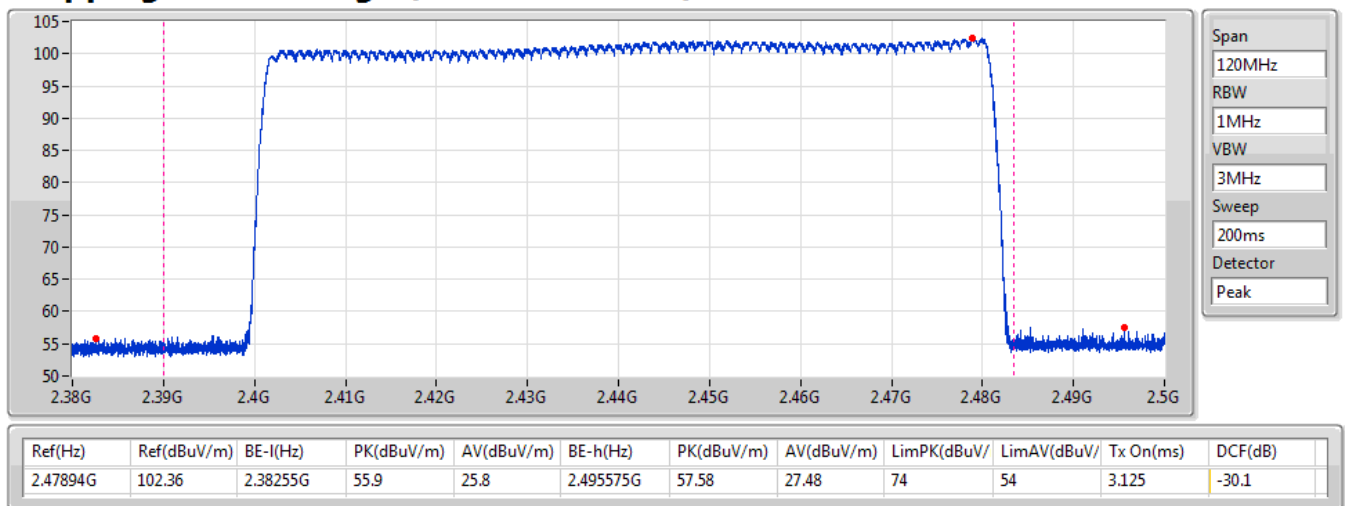


**BT-EDR(2Mbps)**

**2440MHz**

**Hopping Ch Bandedge (Restricted Band)**

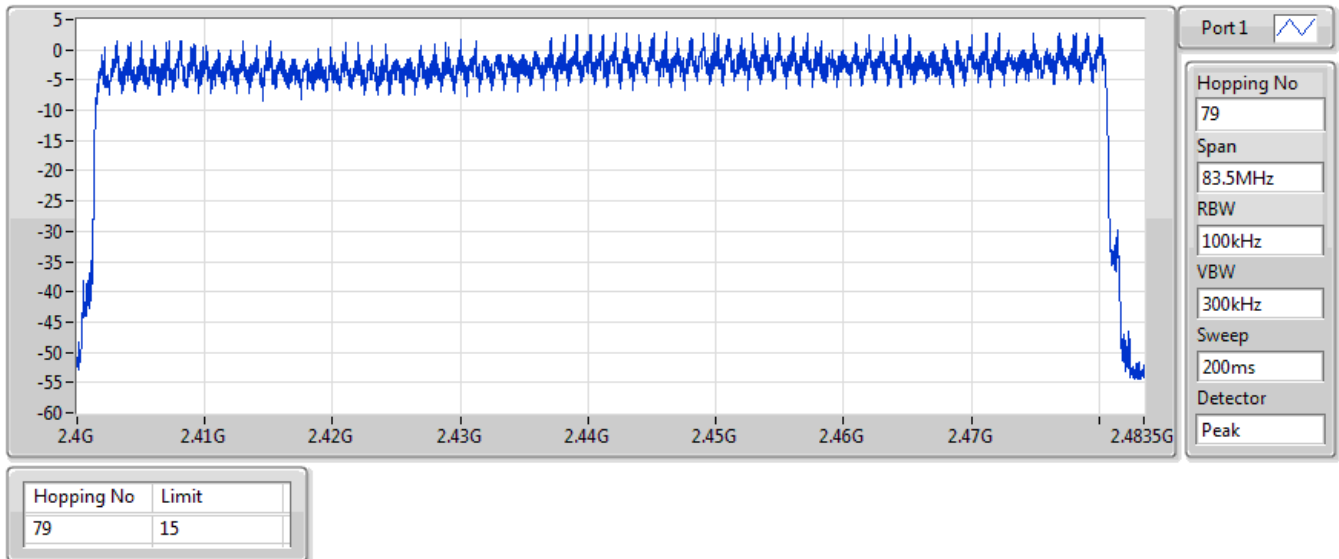
15/05/2019



## BT-EDR(3Mbps) 2440MHz

## Hopping Ch

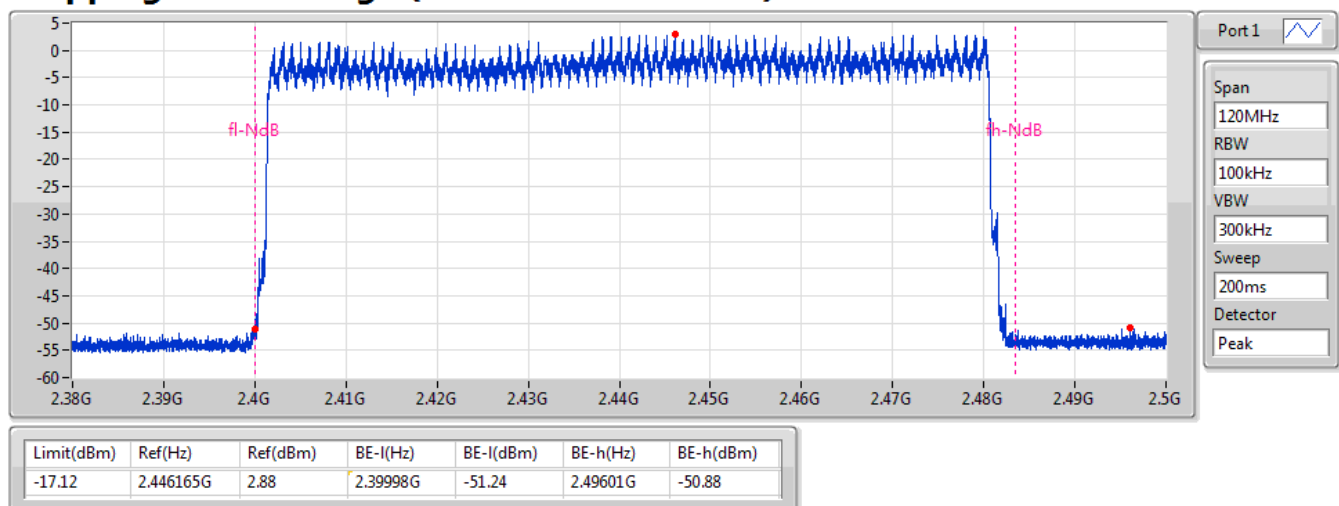
15/05/2019



## BT-EDR(3Mbps) 2440MHz

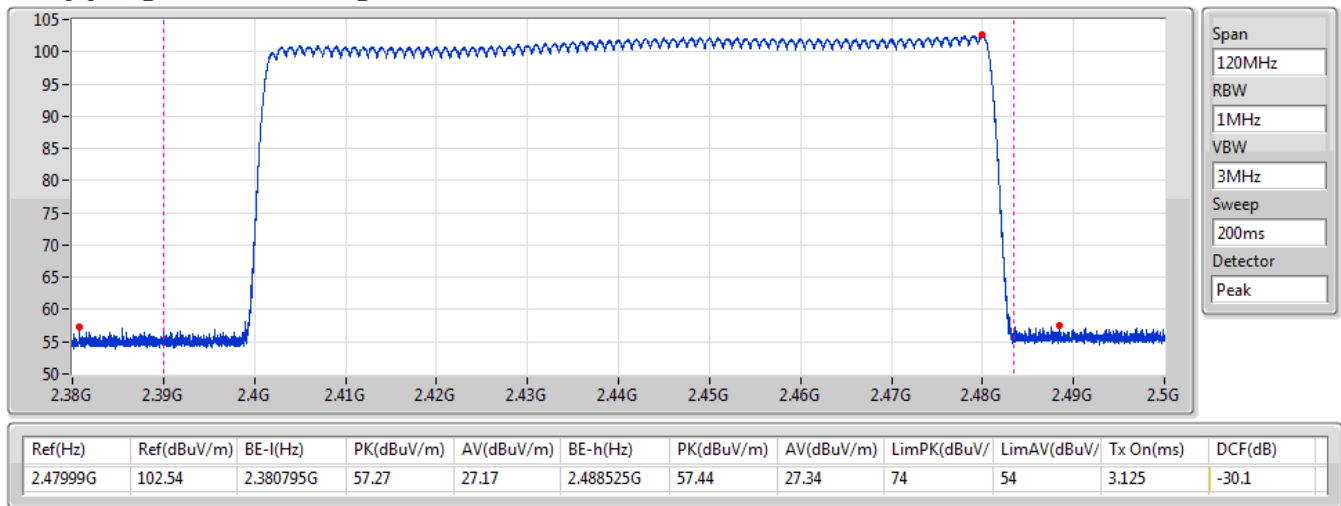
## Hopping Ch Bandedge (Non-restricted Band)

15/05/2019



**BT-EDR(3Mbps)****2440MHz****Hopping Ch Bandedge (Restricted Band)**

15/05/2019





**Summary**

Mode	Max-Dwell (s)
2.4-2.4835GHz	-
BT-BR(1Mbps)	309.0334m
BT-EDR(2Mbps)	42.5334m
BT-EDR(3Mbps)	54.366m



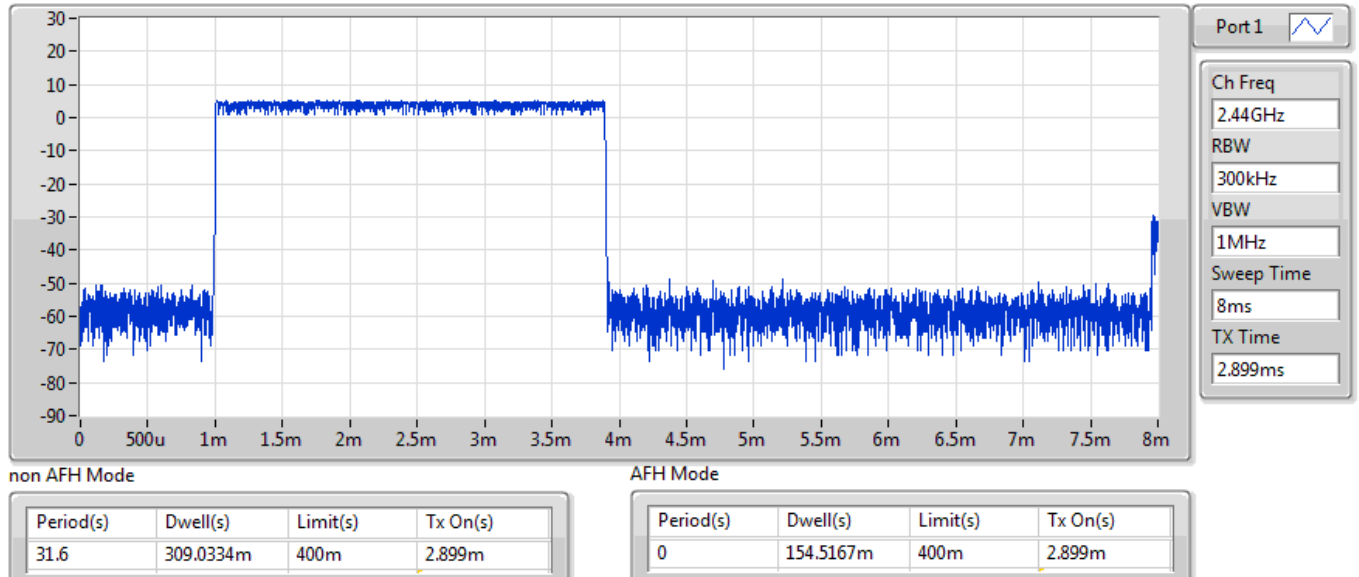
**Result**

Mode	Result	Period (s)	Dwell (s)	Limit (s)	Tx On (s)
BT-BR(1Mbps)	-	-	-	-	-
2440MHz	Pass	31.6	309.0334m	400m	2.899m
BT-EDR(2Mbps)	-	-	-	-	-
2440MHz	Pass	31.6	42.5334m	400m	399u
BT-EDR(3Mbps)	-	-	-	-	-
2440MHz	Pass	31.6	54.366m	400m	510u

## BT-BR(1Mbps)

2440MHz

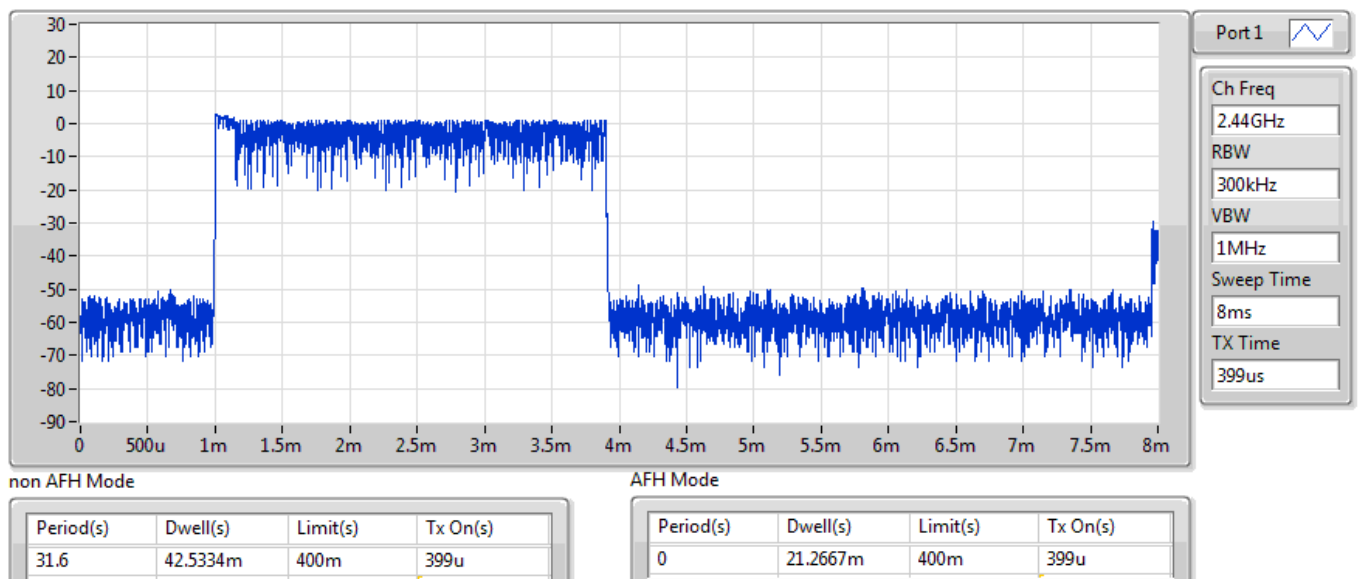
15/05/2019



## BT-EDR(2Mbps)

2440MHz

15/05/2019

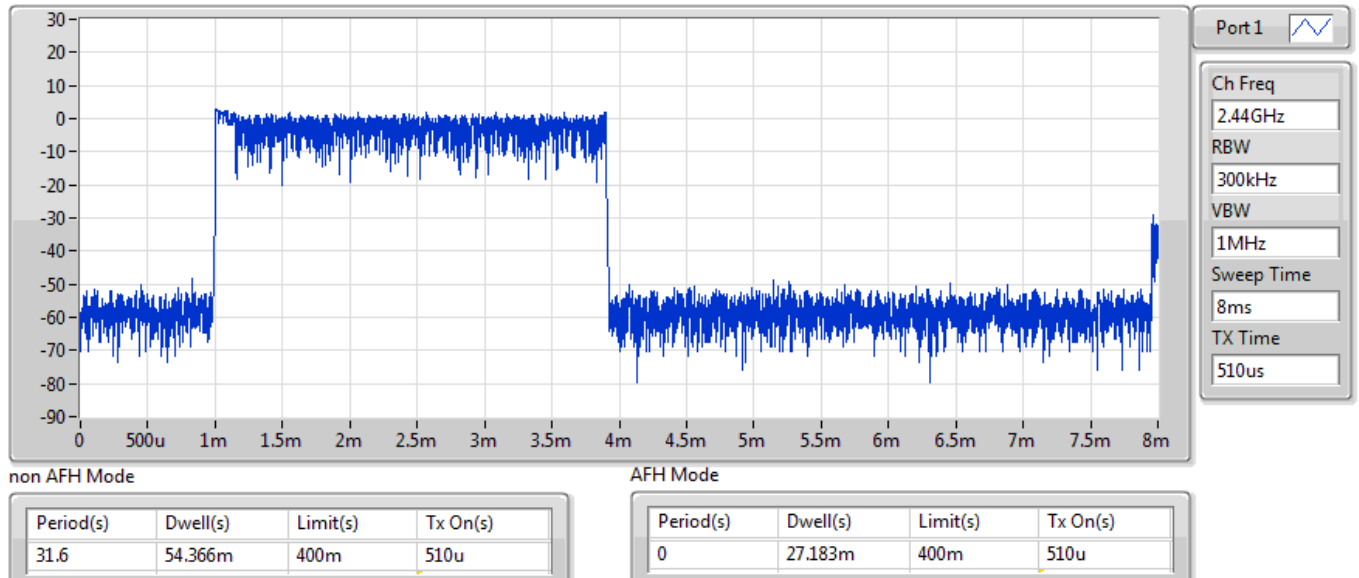


## BT-EDR(3Mbps)

2440MHz

## Dwell

15/05/2019



**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	2.402G	3.47	-16.53	1.99189G	-62.49	2.39968G	-42.45	2.48392G	-61.56	2.55586G	-51.01	1
BT-EDR(2Mbps)	Pass	2.402G	0.43	-19.57	2.11177G	-62.72	2.4G	-42.11	2.48496G	-61.59	24.23732G	-53.54	1
BT-EDR(3Mbps)	Pass	2.402G	0.53	-19.47	804.04M	-62.63	2.4G	-42.84	2.48454G	-60.82	16.55143G	-54.98	1

**Result**

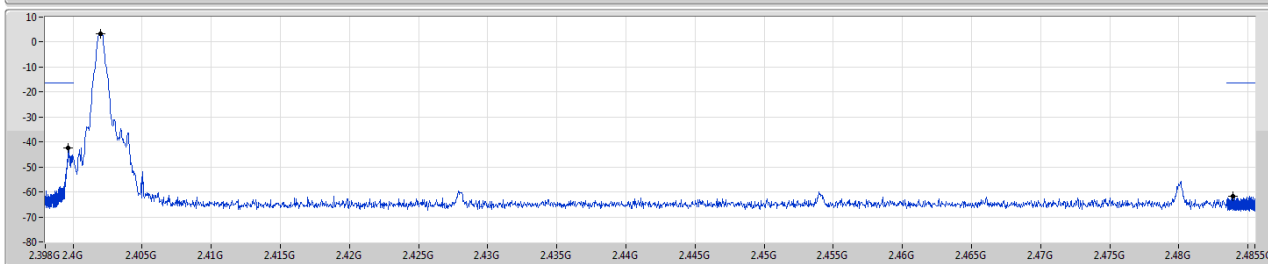
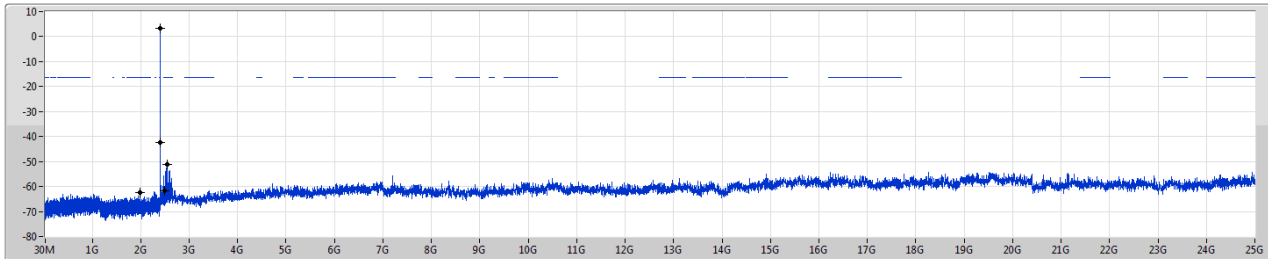
Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
BT-BR(1Mbps)	-	-	-	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	2.402G	3.47	-16.53	1.99189G	-62.49	2.39968G	-42.45	2.48392G	-61.56	2.55586G	-51.01	1
2440MHz	Pass	2.44016G	5.11	-14.89	1.81162G	-62.82	2.3982G	-61.59	2.48369G	-61.57	2.59526G	-51.57	1
2480MHz	Pass	2.48008G	4.89	-15.11	2.15794G	-62.76	2.39937G	-62.01	2.48451G	-54.92	2.584G	-51.14	1
BT-EDR(2Mbps)	-	-	-	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	2.402G	0.43	-19.57	2.11177G	-62.72	2.4G	-42.11	2.48496G	-61.59	24.23732G	-53.54	1
2440MHz	Pass	2.44004G	1.84	-18.16	689.19M	-62.77	2.39939G	-62.34	2.48492G	-61.43	2.59526G	-52.64	1
2480MHz	Pass	2.47987G	2.81	-17.19	2.07477G	-62.51	2.39908G	-61.41	2.48352G	-58.18	2.63466G	-52.17	1
BT-EDR(3Mbps)	-	-	-	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	2.402G	0.53	-19.47	804.04M	-62.63	2.4G	-42.84	2.48454G	-60.82	16.55143G	-54.98	1
2440MHz	Pass	2.44004G	2.54	-17.46	2.19761G	-62.19	2.39896G	-62.48	2.48383G	-61.58	2.59526G	-51.33	1
2480MHz	Pass	2.48003G	2.18	-17.82	2.15498G	-62.94	2.39916G	-62.36	2.48356G	-56.88	2.63466G	-52.18	1

BT-BR(1Mbps)

2402MHz

CSE NdB

15/05/2019



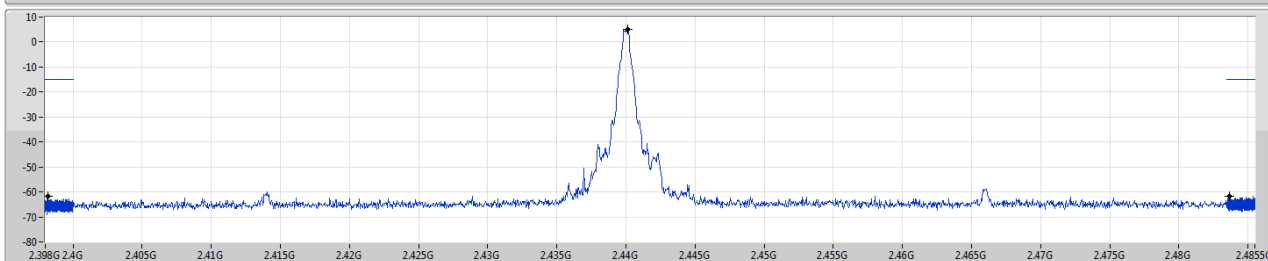
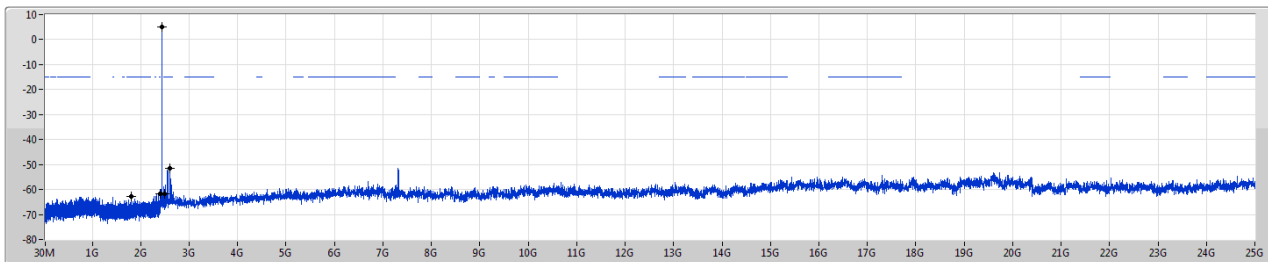
Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.402G	3.47	-16.53	1.99189G	-62.49	2.39968G	-42.45	2.48392G	-61.56	2.55586G	-51.01	1

BT-BR(1Mbps)

2440MHz

CSE NdB

15/05/2019



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.44016G	5.11	-14.89	1.81162G	-62.82	2.3982G	-61.59	2.48369G	-61.57	2.59526G	-51.57	1

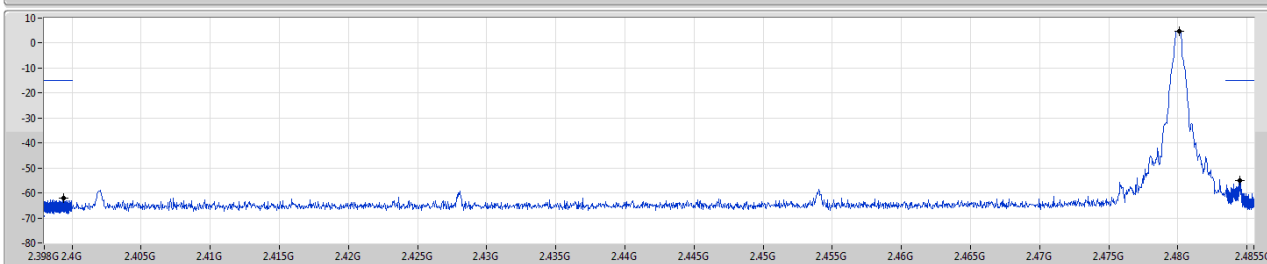
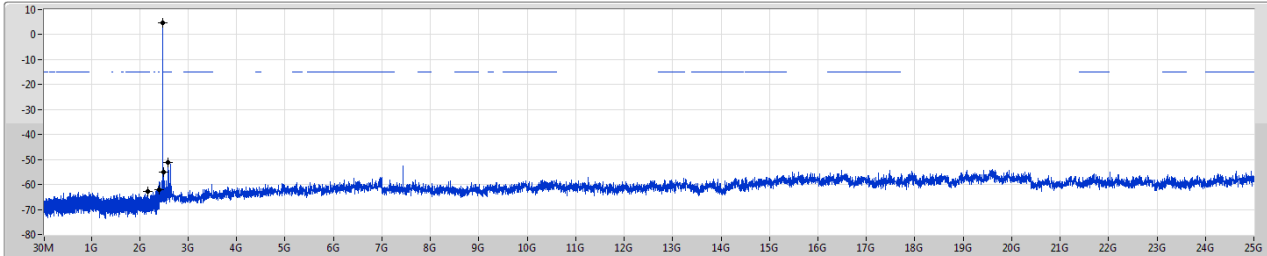
## BT-BR(1Mbps)

2480MHz

CSE NdB

15/05/2019

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
2.48008G	4.89	-15.11	2.15794G	-62.76	2.39937G	-62.01	2.48451G	-54.92	2.584G	-51.14	1

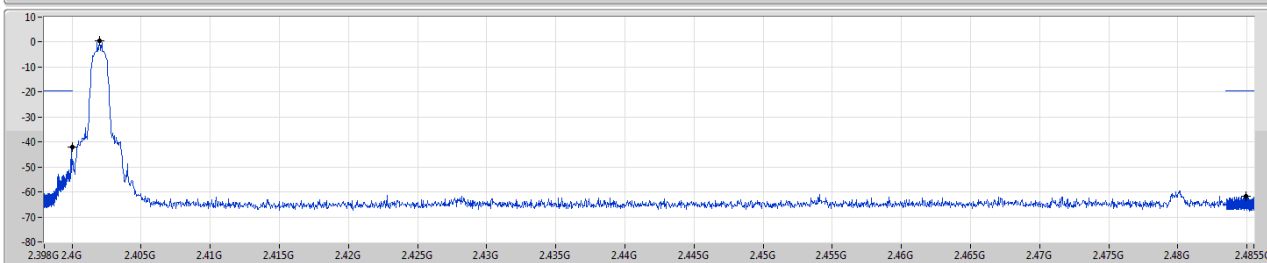
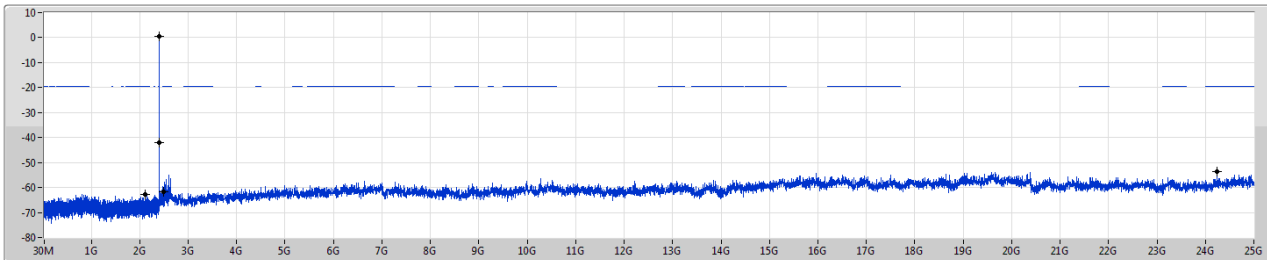
## BT-EDR(2Mbps)

2402MHz

CSE NdB

15/05/2019

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
2.402G	0.43	-19.57	2.11177G	-62.72	2.4G	-42.11	2.48496G	-61.59	2.423732G	-53.54	1

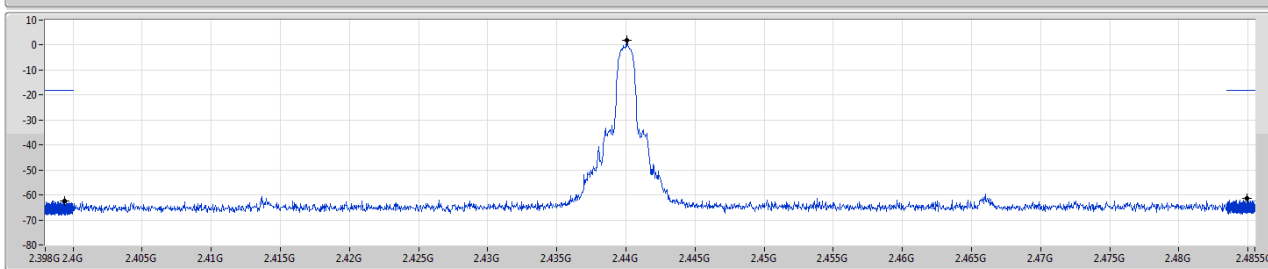
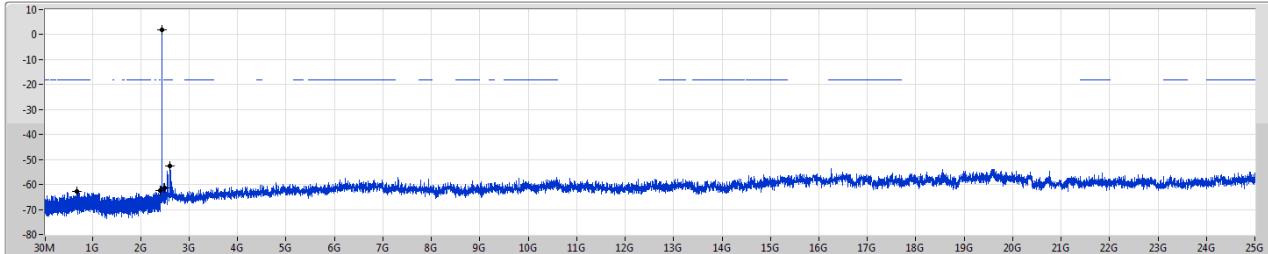
BT-EDR(2Mbps)

2440MHz

CSE NdB

15/05/2019

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	1.84	-18.16	689.19M	-62.77	2.39939G	-62.34	2.48492G	-61.43	2.59526G	-52.64	1

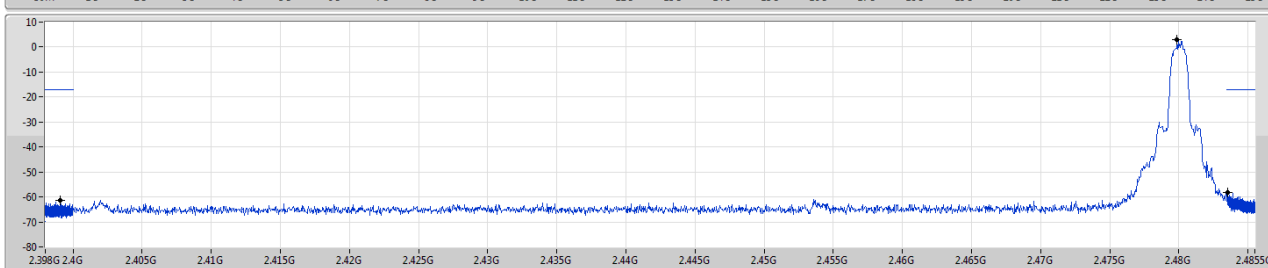
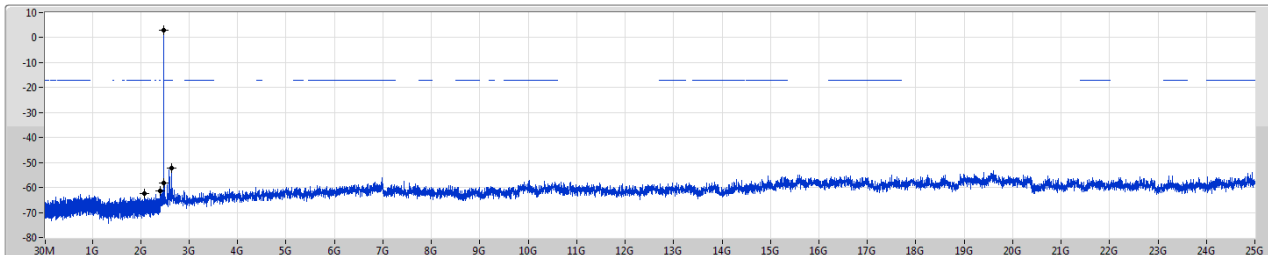
BT-EDR(2Mbps)

2480MHz

CSE NdB

15/05/2019

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
2.47987G	2.81	-17.19	2.07477G	-62.51	2.39908G	-61.41	2.48352G	-58.18	2.63466G	-52.17	1



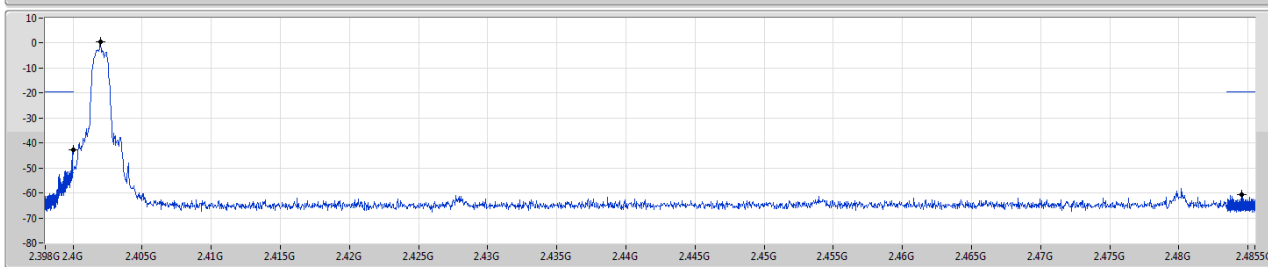
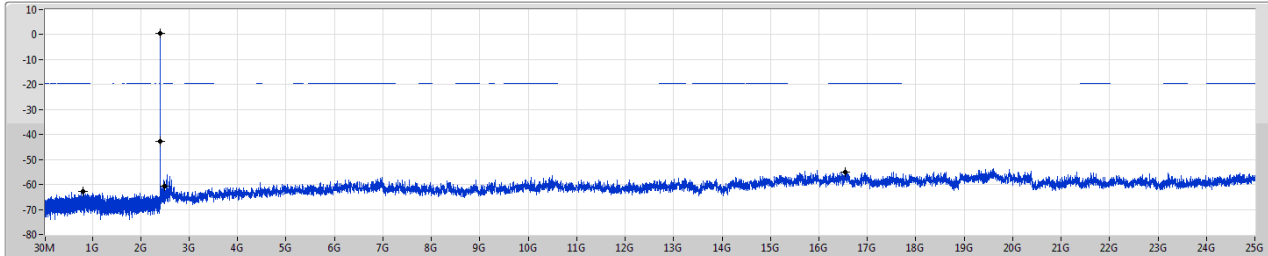
BT-EDR(3Mbps)

2402MHz

CSE NdB

15/05/2019

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	0.53	-19.47	804.04M	-62.63	2.4G	-42.84	2.48454G	-60.82	16.55143G	-54.98	1

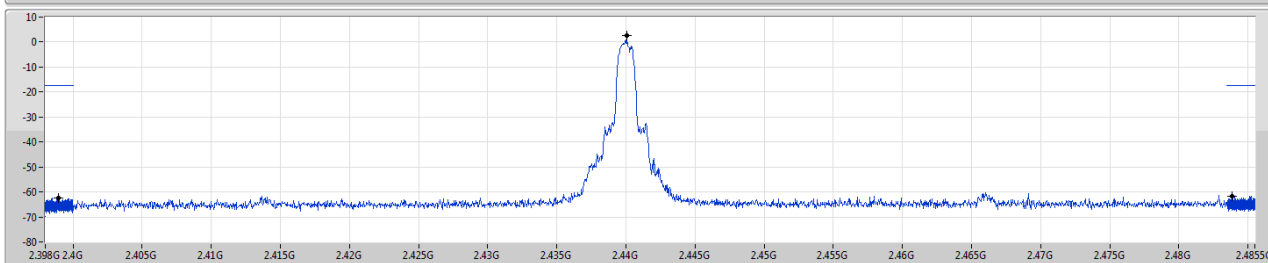
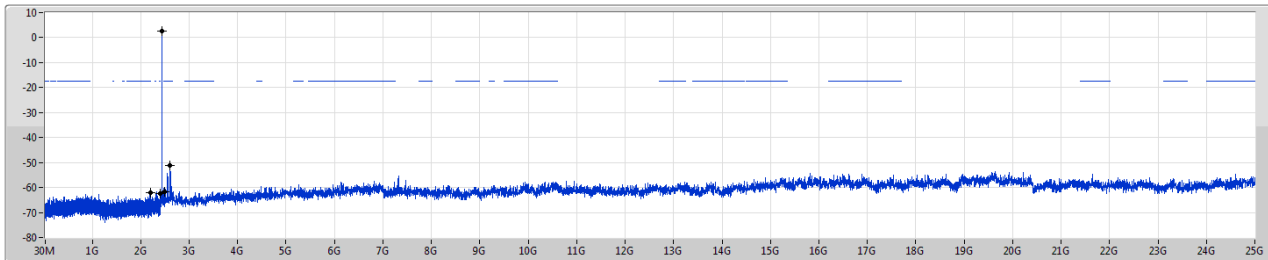
BT-EDR(3Mbps)

2440MHz

CSE NdB

15/05/2019

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
244004G	2.54	-17.46	2.19761G	-62.19	2.39896G	-62.48	2.48383G	-61.58	2.59526G	-51.33	1

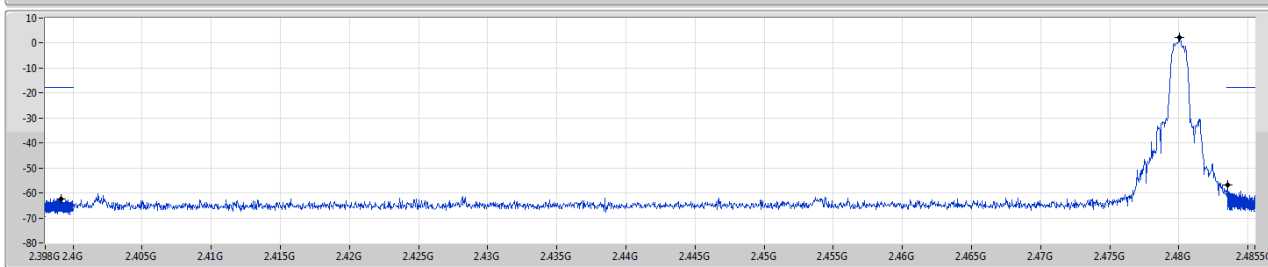
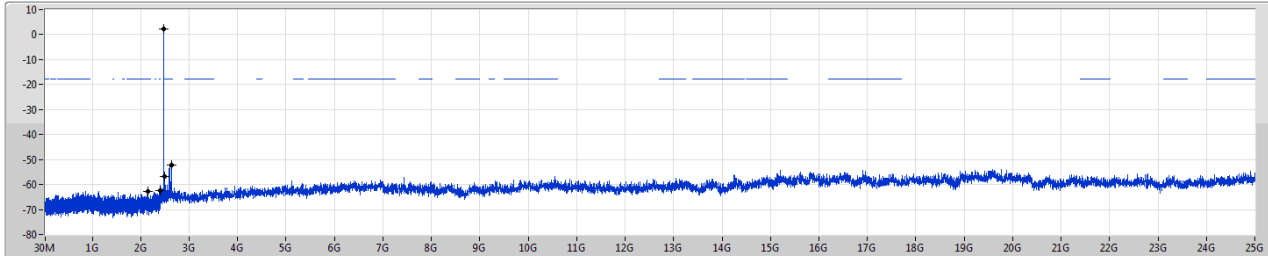
BT-EDR(3Mbps)

2480MHz

CSE NdB

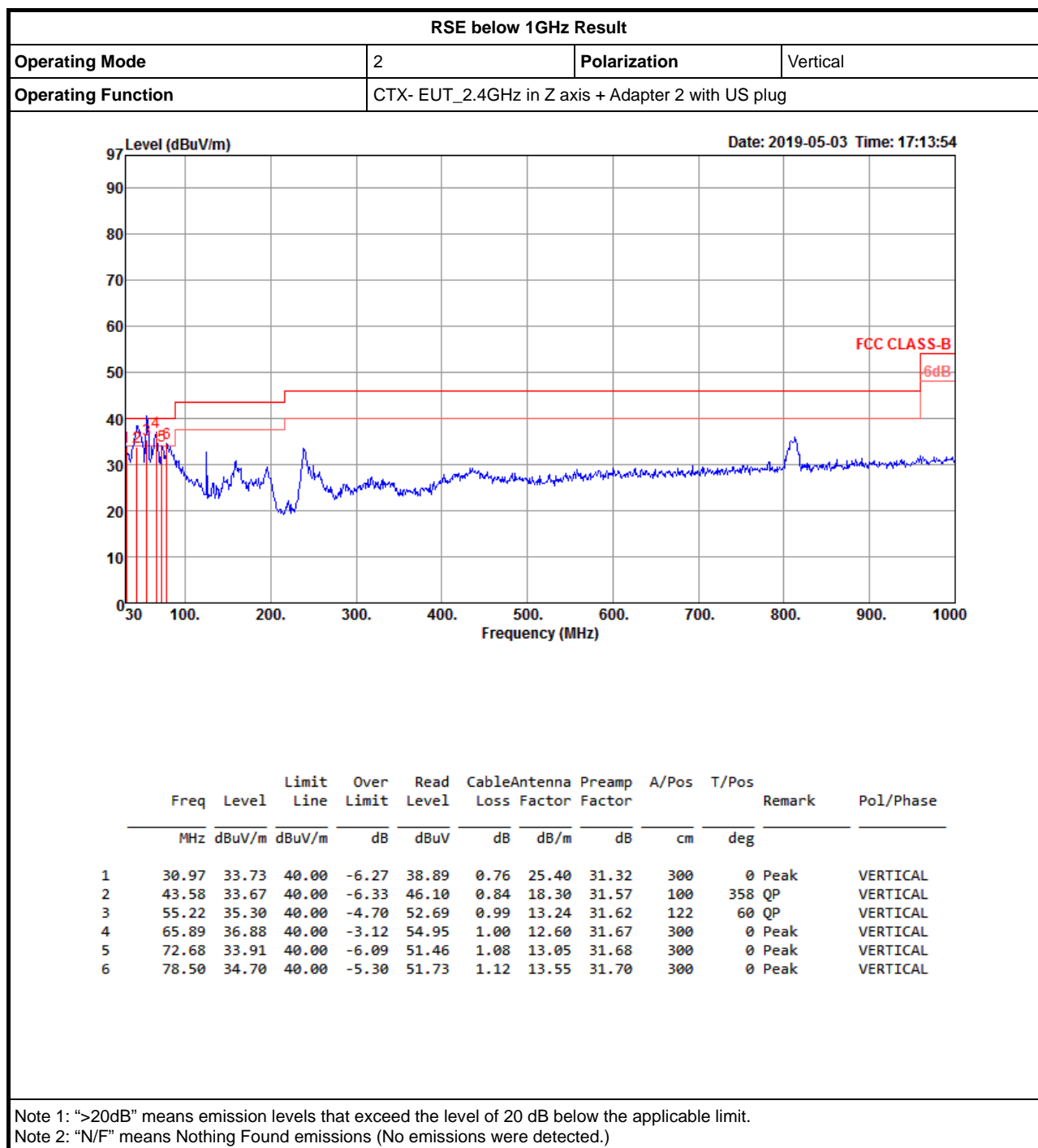
15/05/2019

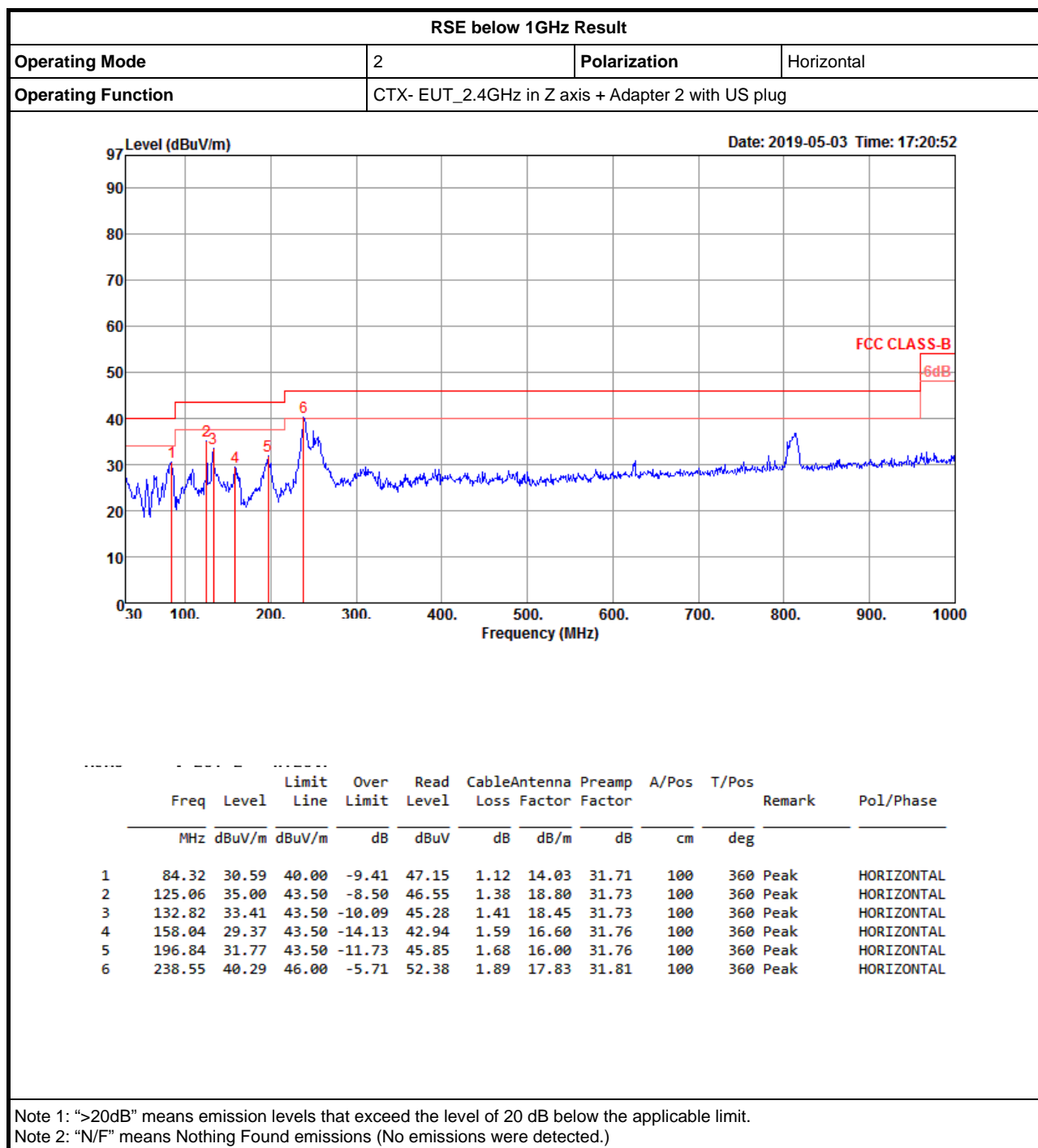
Port1



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
2.48003G	2.18	-17.82	2.15498G	-62.94	2.39916G	-62.36	2.48356G	-56.88	2.63466G	-52.18	1







## RSE TX above 1GHz Result

## Appendix G.2

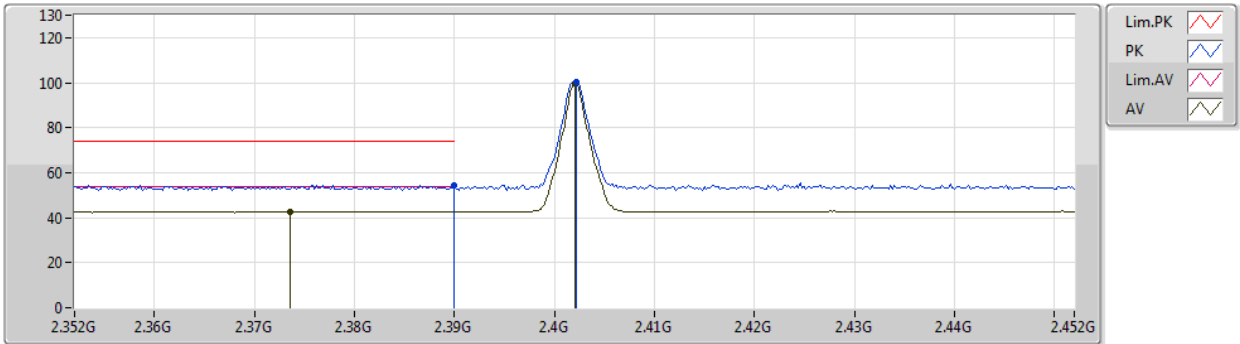
### Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-
BT-BR(1Mbps)	Pass	AV	4.96001G	49.27	54.00	-4.73	4.20	3	Vertical	35	2.76	-

## BT-BR(1Mbps)

## 2402MHz\_TX

14/05/2019



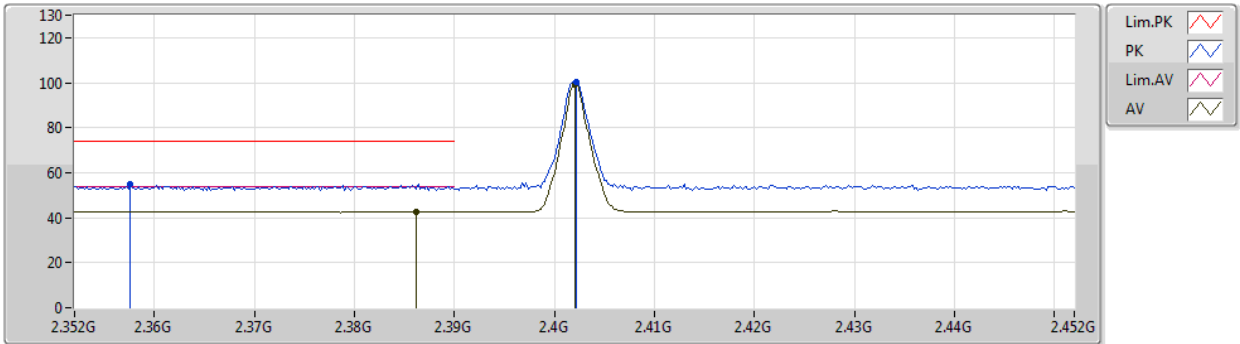
EUT\_Z\_1TX  
Setting 63  
01-L-3  
FSP(100056)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment				
PK	2.39G	54.49	74.00	-19.51	30.80	3	Vertical	88	2.94	-				
AV	2.3736G	42.73	54.00	-11.27	30.74	3	Vertical	88	2.94	-				
PK	2.4022G	100.41	Inf	-Inf	30.84	3	Vertical	88	2.94	-				
AV	2.402G	99.48	Inf	-Inf	30.84	3	Vertical	88	2.94	-				

## BT-BR(1Mbps)

## 2402MHz\_TX

14/05/2019



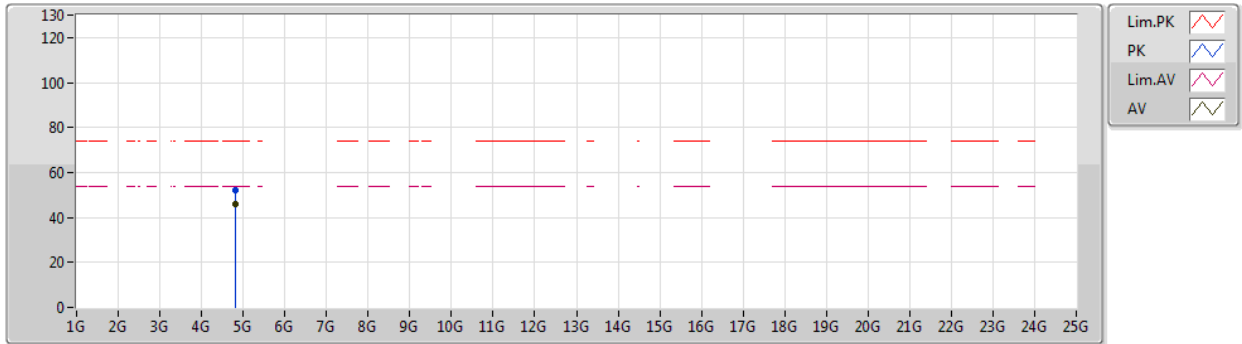
EUT\_Z\_1TX  
Setting 63  
01-L-3  
FSP(100056)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment				
PK	2.3576G	55.06	74.00	-18.94	30.68	3	Horizontal	291	1.20	-				
AV	2.3862G	42.68	54.00	-11.32	30.79	3	Horizontal	291	1.20	-				
PK	2.4022G	100.16	Inf	-Inf	30.84	3	Horizontal	291	1.20	-				
AV	2.402G	99.26	Inf	-Inf	30.84	3	Horizontal	291	1.20	-				

## BT-BR(1Mbps)

## 2402MHz\_TX

14/05/2019



EUT\_Z\_1TX  
Setting 63  
01-L-3  
FSP(100056)

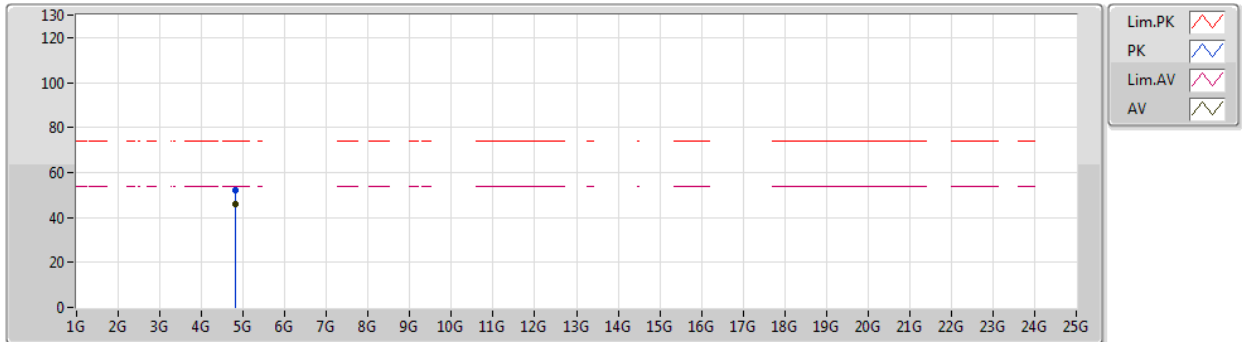
Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment				
PK	4.80437G	52.19	74.00	-21.81	3.50	3	Vertical	358	1.03	-				
AV	4.80401G	45.86	54.00	-8.14	3.49	3	Vertical	358	1.03	-				



## BT-BR(1Mbps)

## 2402MHz\_TX

14/05/2019



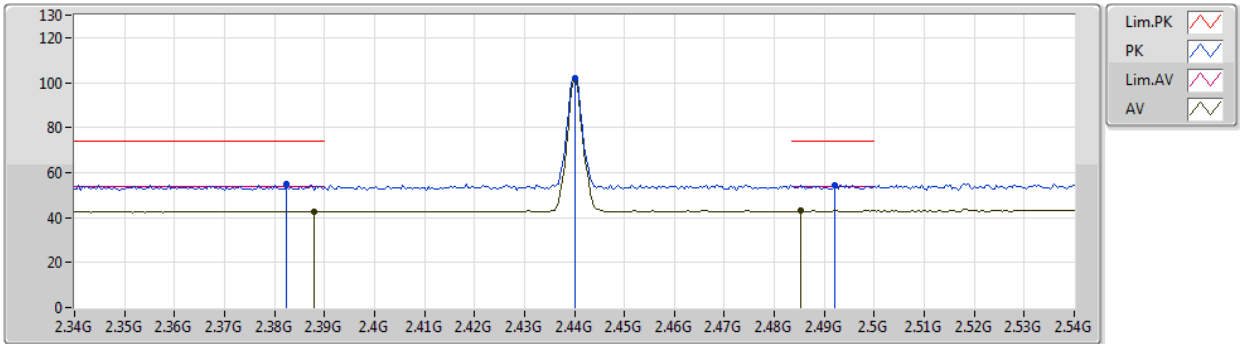
EUT\_Z\_1TX  
Setting 63  
01-L-3  
FSP(100056)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment				
PK	4.80426G	51.95	74.00	-22.05	3.50	3	Horizontal	281	1.06	-				
AV	4.80404G	45.73	54.00	-8.27	3.49	3	Horizontal	281	1.06	-				

## BT-BR(1Mbps)

## 2440MHz\_TX

14/05/2019



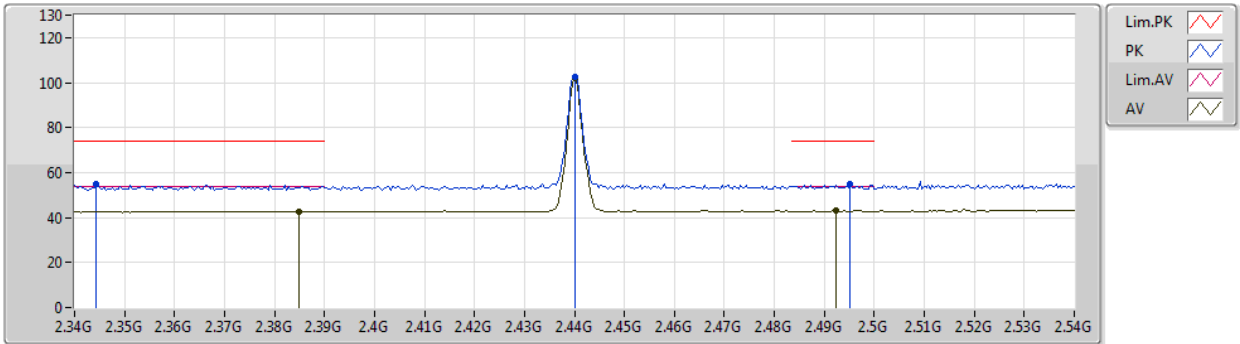
EUT\_Z\_1TX  
Setting 63  
01-L-3  
FSP(100056)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment				
PK	2.3824G	54.80	74.00	-19.20	30.78	3	Vertical	107	2.37	-				
AV	2.388G	42.68	54.00	-11.32	30.79	3	Vertical	107	2.37	-				
PK	2.44G	102.09	Inf	-Inf	30.90	3	Vertical	107	2.37	-				
AV	2.44G	101.18	Inf	-Inf	30.90	3	Vertical	107	2.37	-				
PK	2.492G	54.55	74.00	-19.45	30.98	3	Vertical	107	2.37	-				
AV	2.4852G	43.01	54.00	-10.99	30.97	3	Vertical	107	2.37	-				

## BT-BR(1Mbps)

## 2440MHz\_TX

14/05/2019



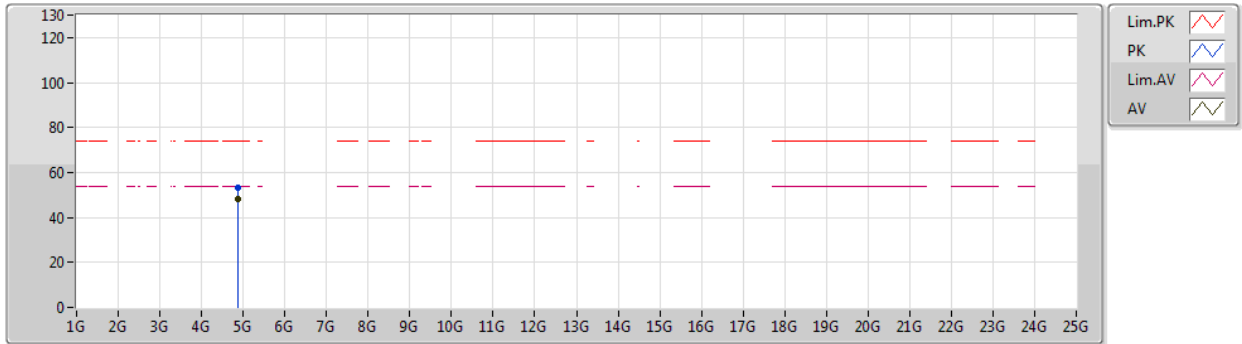
EUT\_Z\_1TX  
Setting 63  
01-L-3  
FSP(100056)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment				
PK	2.3444G	54.96	74.00	-19.04	30.63	3	Horizontal	291	1.65	-				
AV	2.3848G	42.64	54.00	-11.36	30.78	3	Horizontal	291	1.65	-				
PK	2.44G	102.72	Inf	-Inf	30.90	3	Horizontal	291	1.65	-				
AV	2.44G	101.78	Inf	-Inf	30.90	3	Horizontal	291	1.65	-				
PK	2.4952G	55.03	74.00	-18.97	30.99	3	Horizontal	291	1.65	-				
AV	2.4924G	43.03	54.00	-10.97	30.98	3	Horizontal	291	1.65	-				

## BT-BR(1Mbps)

## 2440MHz\_TX

14/05/2019



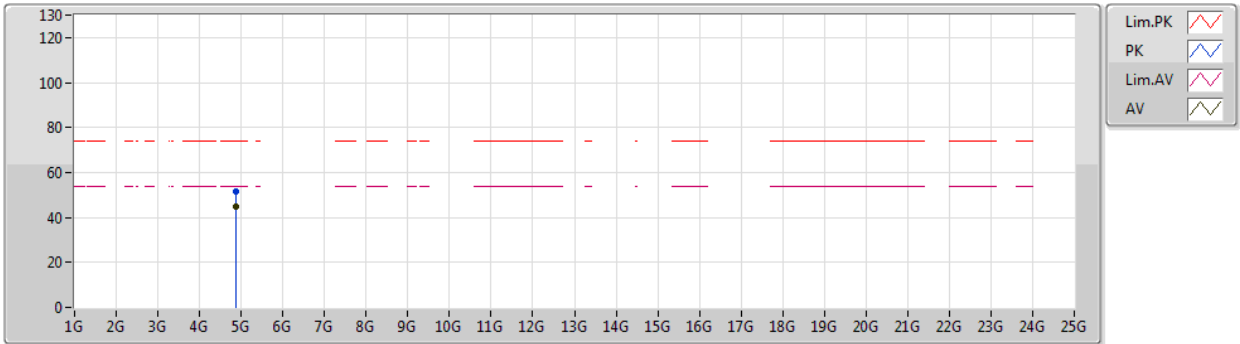
EUT\_Z\_1TX  
Setting 63  
01-L-3  
FSP(100056)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment				
PK	4.88009G	53.19	74.00	-20.81	3.84	3	Vertical	321	1.15	-				
AV	4.88006G	47.92	54.00	-6.08	3.84	3	Vertical	321	1.15	-				

## BT-BR(1Mbps)

## 2440MHz\_TX

14/05/2019



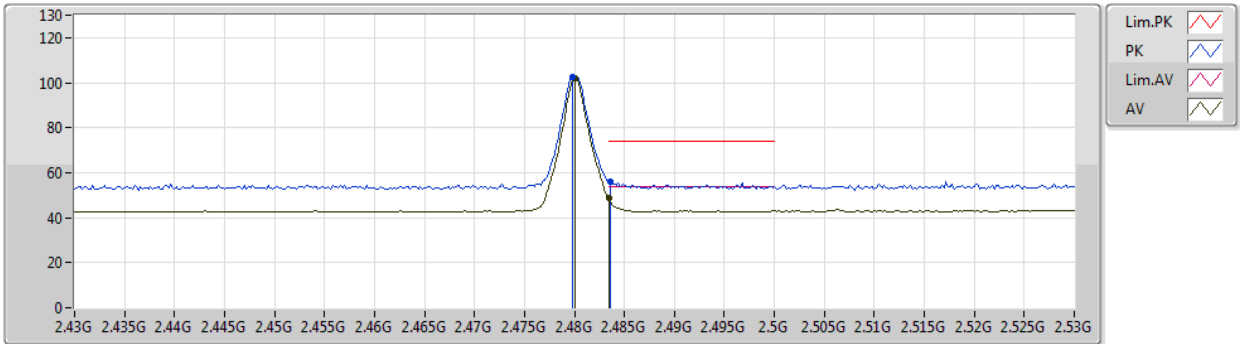
EUT\_Z\_1TX  
Setting 63  
01-L-3  
FSP(100056)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment				
PK	4.87973G	51.75	74.00	-22.25	3.84	3	Horizontal	290	1.09	-				
AV	4.88004G	44.69	54.00	-9.31	3.84	3	Horizontal	290	1.09	-				

## BT-BR(1Mbps)

## 2480MHz\_TX

14/05/2019



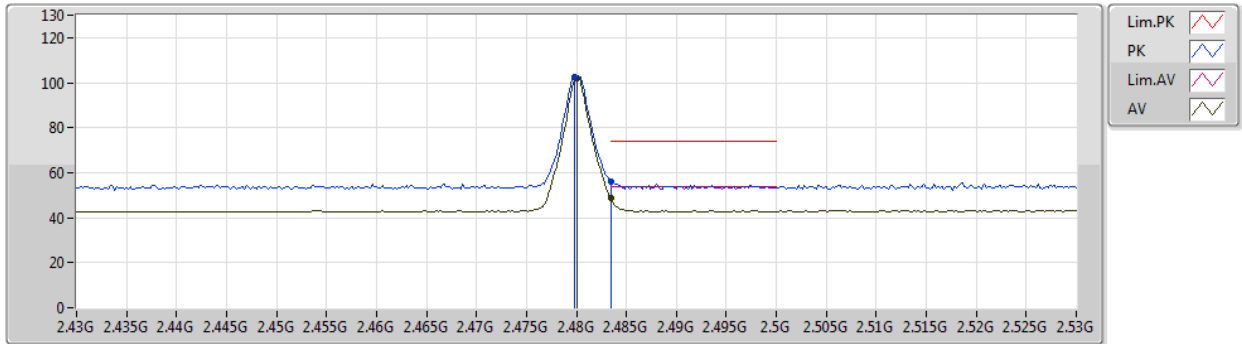
EUT\_Z\_1TX  
Setting 63  
01-L-3  
FSP(100056)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment				
PK	2.4798G	102.70	Inf	-Inf	30.96	3	Vertical	283	2.57	-				
AV	2.48G	101.80	Inf	-Inf	30.96	3	Vertical	283	2.57	-				
PK	2.4836G	56.28	74.00	-17.72	30.96	3	Vertical	283	2.57	-				
AV	2.4835G	48.52	54.00	-5.48	30.96	3	Vertical	283	2.57	-				

## BT-BR(1Mbps)

## 2480MHz\_TX

14/05/2019



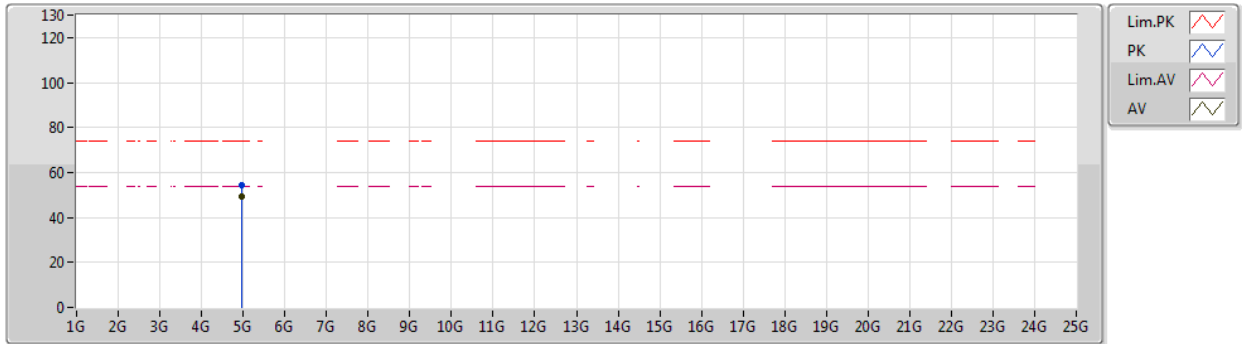
EUT\_Z\_1TX  
Setting 63  
01-L-3  
FSP(100056)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment				
PK	2.4798G	102.81	Inf	-Inf	30.96	3	Horizontal	290	1.36	-				
AV	2.48G	101.90	Inf	-Inf	30.96	3	Horizontal	290	1.36	-				
PK	2.4835G	56.08	74.00	-17.92	30.96	3	Horizontal	290	1.36	-				
AV	2.4835G	48.63	54.00	-5.37	30.96	3	Horizontal	290	1.36	-				

## BT-BR(1Mbps)

## 2480MHz\_TX

14/05/2019



EUT\_Z\_1TX  
Setting 63  
01-L-3  
FSP(100056)

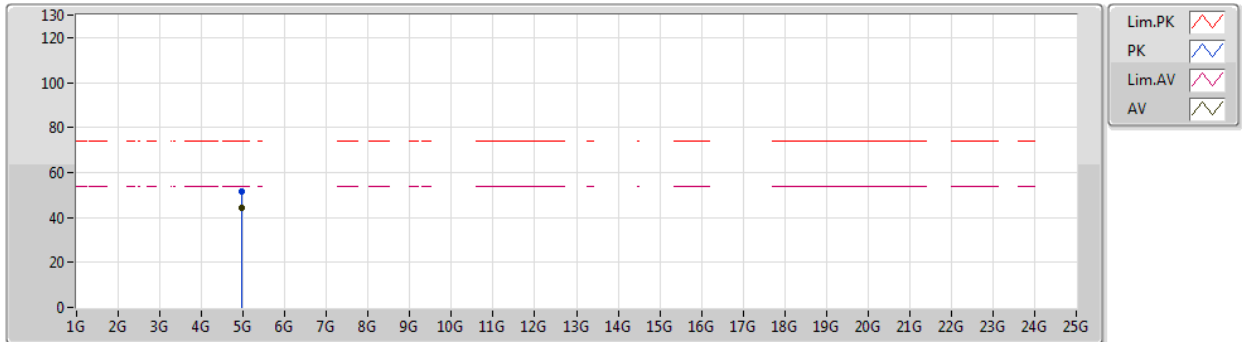
Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment				
PK	4.9602G	54.38	74.00	-19.62	4.20	3	Vertical	35	2.76	-				
AV	4.96001G	49.27	54.00	-4.73	4.20	3	Vertical	35	2.76	-				



## BT-BR(1Mbps)

## 2480MHz\_TX

14/05/2019



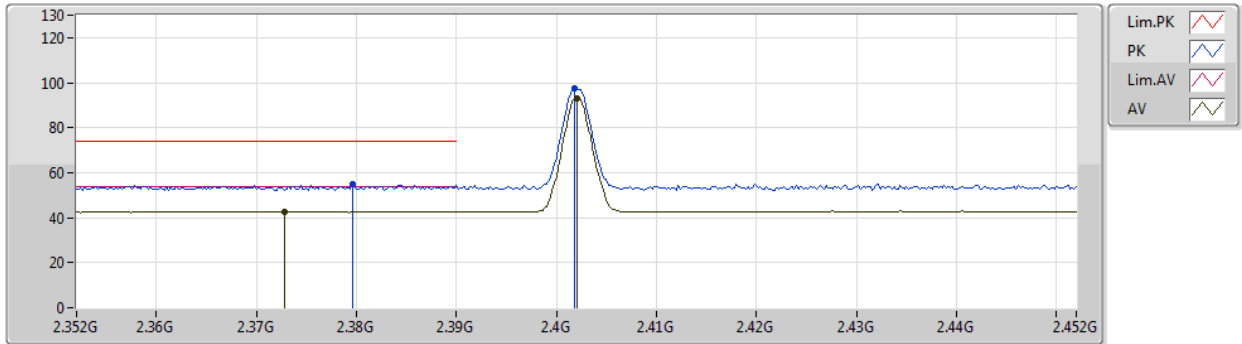
EUT\_Z\_1TX  
Setting 63  
01-L-3  
FSP(100056)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment				
PK	4.96014G	51.52	74.00	-22.48	4.20	3	Horizontal	282	1.00	-				
AV	4.96003G	44.05	54.00	-9.95	4.20	3	Horizontal	282	1.00	-				

## BT-EDR(3Mbps)

14/05/2019

## 2402MHz\_TX



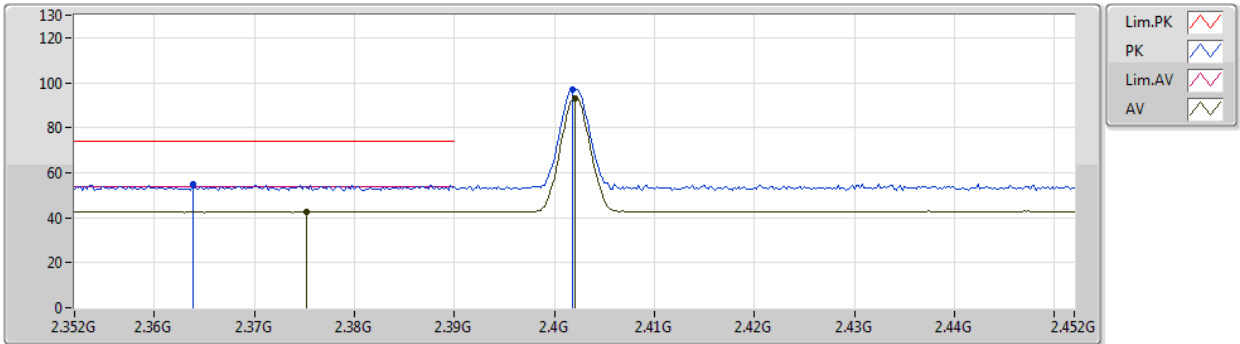
EUT\_Z\_1TX  
Setting 63  
01-L-3  
FSP(100056)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment				
PK	2.3796G	54.71	74.00	-19.29	30.76	3	Vertical	88	2.96	-				
AV	2.3728G	42.64	54.00	-11.36	30.74	3	Vertical	88	2.96	-				
PK	2.4018G	97.35	Inf	-Inf	30.84	3	Vertical	88	2.96	-				
AV	2.402G	93.16	Inf	-Inf	30.84	3	Vertical	88	2.96	-				

## BT-EDR(3Mbps)

14/05/2019

## 2402MHz\_TX



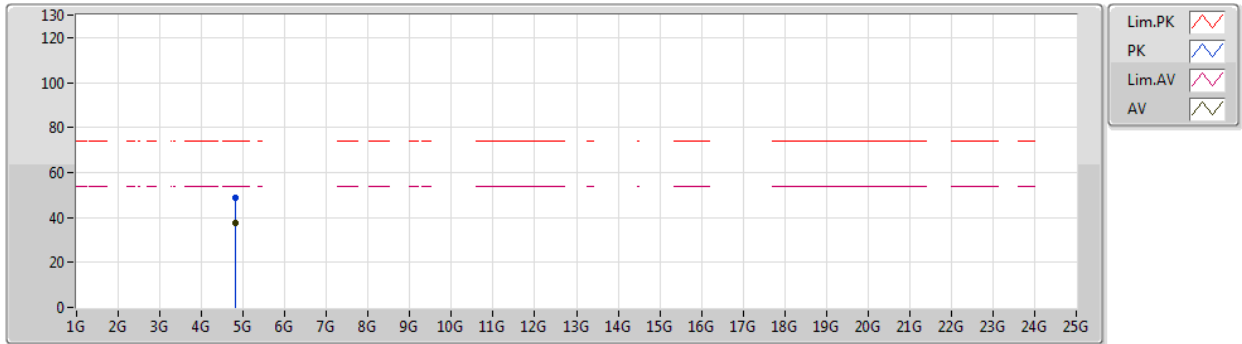
EUT\_Z\_1TX  
Setting 63  
01-L-3  
FSP(100056)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment				
PK	2.3638G	55.06	74.00	-18.94	30.70	3	Horizontal	292	1.20	-				
AV	2.3752G	42.70	54.00	-11.30	30.75	3	Horizontal	292	1.20	-				
PK	2.4018G	97.01	Inf	-Inf	30.84	3	Horizontal	292	1.20	-				
AV	2.402G	92.82	Inf	-Inf	30.84	3	Horizontal	292	1.20	-				

## BT-EDR(3Mbps)

## 2402MHz\_TX

14/05/2019



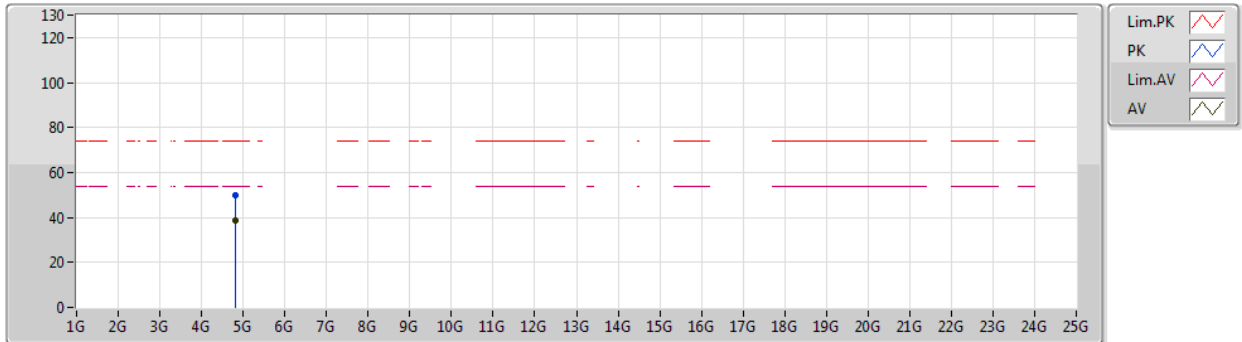
EUT\_Z\_1TX  
Setting 63  
01-L-3  
FSP(100056)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment				
PK	4.80399G	48.77	74.00	-25.23	3.49	3	Vertical	79	1.11	-				
AV	4.80402G	37.34	54.00	-16.66	3.49	3	Vertical	79	1.11	-				

## BT-EDR(3Mbps)

## 2402MHz\_TX

14/05/2019



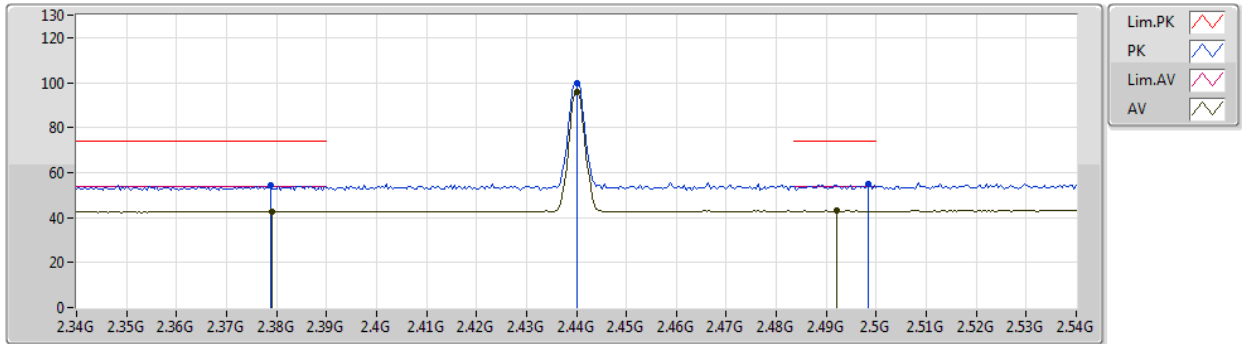
EUT\_Z\_1TX  
Setting 63  
01-L-3  
FSP(100056)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment				
PK	4.80394G	50.04	74.00	-23.96	3.49	3	Horizontal	283	1.07	-				
AV	4.80391G	38.93	54.00	-15.07	3.49	3	Horizontal	283	1.07	-				

## BT-EDR(3Mbps)

## 2440MHz\_TX

14/05/2019



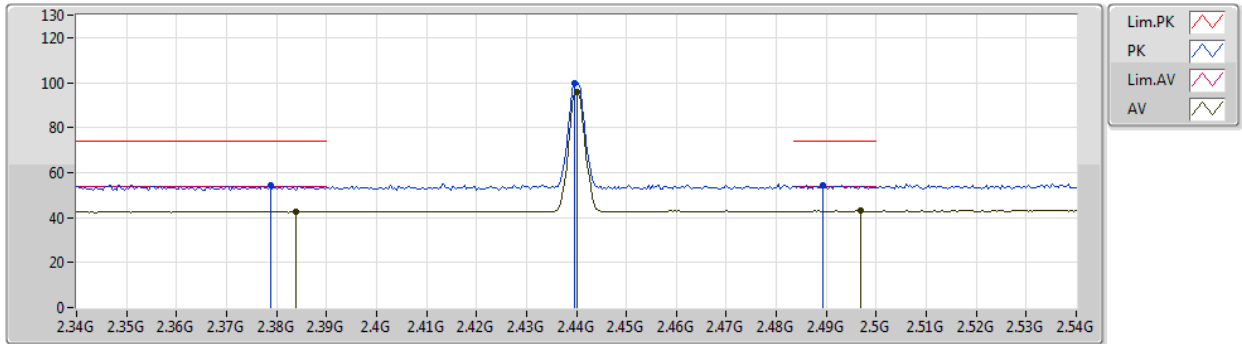
EUT\_Z\_1TX  
Setting 63  
01-L-3  
FSP(100056)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment				
PK	2.3788G	54.21	74.00	-19.79	30.76	3	Vertical	106	2.36	-				
AV	2.3792G	42.62	54.00	-11.38	30.76	3	Vertical	106	2.36	-				
PK	2.44G	99.79	Inf	-Inf	30.90	3	Vertical	106	2.36	-				
AV	2.44G	95.68	Inf	-Inf	30.90	3	Vertical	106	2.36	-				
PK	2.4984G	54.64	74.00	-19.36	30.99	3	Vertical	106	2.36	-				
AV	2.492G	42.98	54.00	-11.02	30.98	3	Vertical	106	2.36	-				

## BT-EDR(3Mbps)

## 2440MHz\_TX

14/05/2019



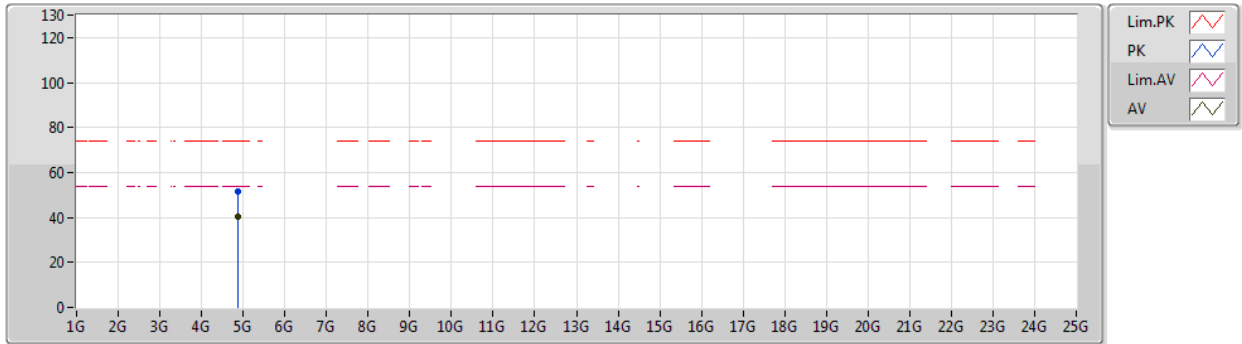
EUT\_Z\_1TX  
Setting 63  
01-L-3  
FSP(100056)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment				
PK	2.3788G	54.33	74.00	-19.67	30.76	3	Horizontal	292	1.66	-				
AV	2.384G	42.68	54.00	-11.32	30.78	3	Horizontal	292	1.66	-				
PK	2.4396G	99.89	Inf	-Inf	30.90	3	Horizontal	292	1.66	-				
AV	2.44G	95.83	Inf	-Inf	30.90	3	Horizontal	292	1.66	-				
PK	2.4892G	54.31	74.00	-19.69	30.97	3	Horizontal	292	1.66	-				
AV	2.4968G	43.02	54.00	-10.98	30.99	3	Horizontal	292	1.66	-				

## BT-EDR(3Mbps)

## 2440MHz\_TX

14/05/2019



EUT\_Z\_1TX  
Setting 63  
01-L-3  
FSP(100056)

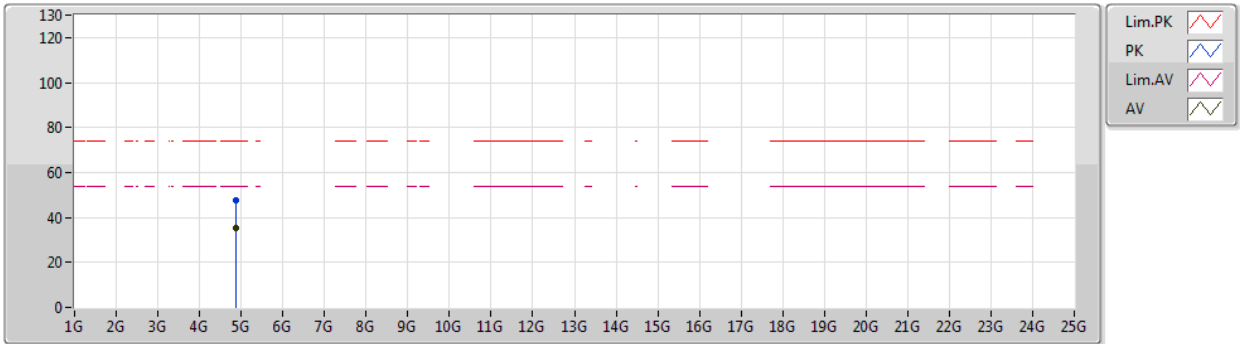
Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment				
PK	4.87963G	51.32	74.00	-22.68	3.84	3	Vertical	317	1.01	-				
AV	4.87994G	40.21	54.00	-13.79	3.84	3	Vertical	317	1.01	-				



## BT-EDR(3Mbps)

## 2440MHz\_TX

14/05/2019



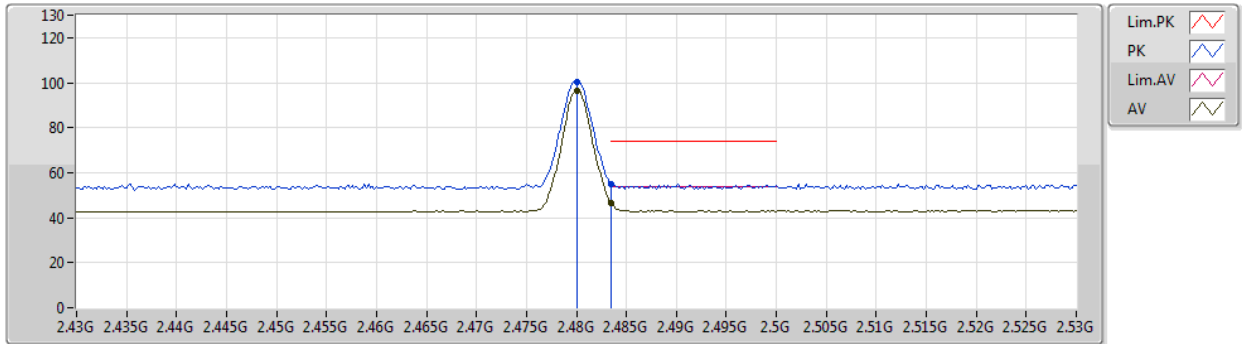
EUT\_Z\_1TX  
Setting 63  
01-L-3  
FSP(100056)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment				
PK	4.8794G	47.70	74.00	-26.30	3.84	3	Horizontal	286	1.17	-				
AV	4.87997G	35.44	54.00	-18.56	3.84	3	Horizontal	286	1.17	-				

## BT-EDR(3Mbps)

## 2480MHz\_TX

14/05/2019



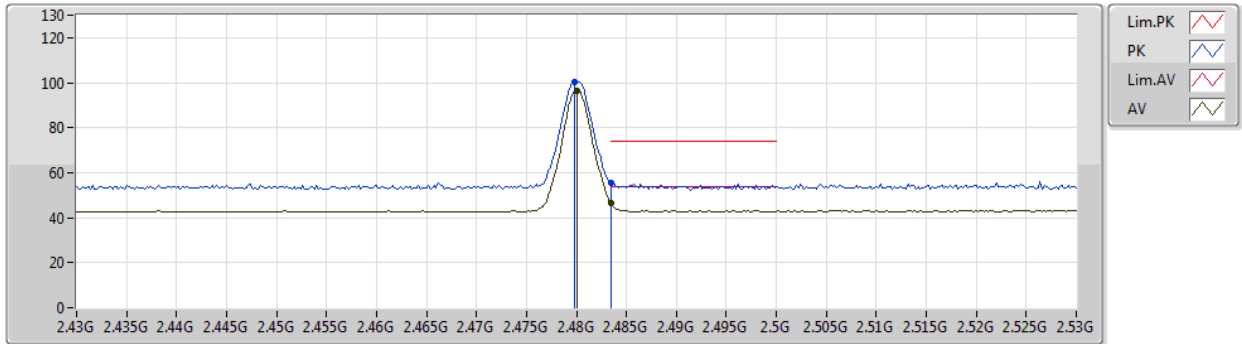
EUT\_Z\_1TX  
Setting 63  
01-L-3  
FSP(100056)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment				
PK	2.48G	100.29	Inf	-Inf	30.96	3	Vertical	284	2.58	-				
AV	2.48G	96.21	Inf	-Inf	30.96	3	Vertical	284	2.58	-				
PK	2.4835G	55.06	74.00	-18.94	30.96	3	Vertical	284	2.58	-				
AV	2.4835G	46.70	54.00	-7.30	30.96	3	Vertical	284	2.58	-				

## BT-EDR(3Mbps)

## 2480MHz\_TX

14/05/2019



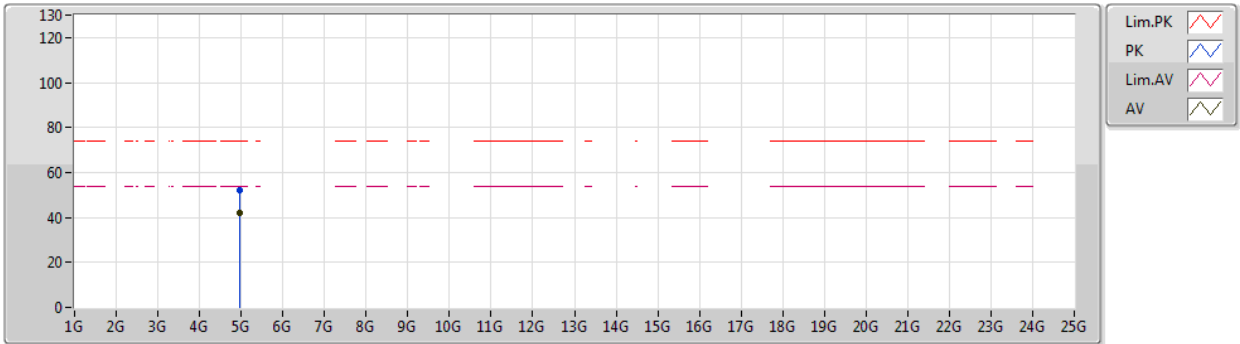
EUT\_Z\_1TX  
Setting 63  
01-L-3  
FSP(100056)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment				
PK	2.4798G	100.54	Inf	-Inf	30.96	3	Horizontal	288	1.35	-				
AV	2.48G	96.43	Inf	-Inf	30.96	3	Horizontal	288	1.35	-				
PK	2.4835G	55.66	74.00	-18.34	30.96	3	Horizontal	288	1.35	-				
AV	2.4835G	46.74	54.00	-7.26	30.96	3	Horizontal	288	1.35	-				

## BT-EDR(3Mbps)

## 2480MHz\_TX

14/05/2019



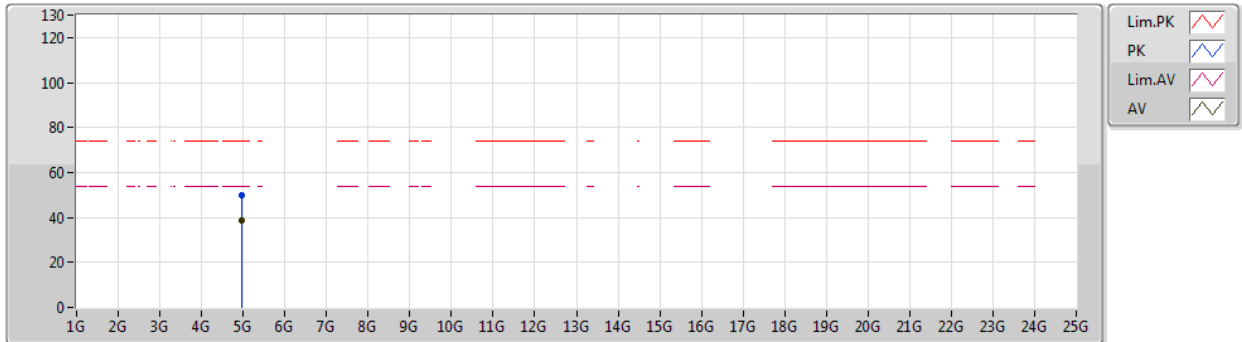
EUT\_Z\_1TX  
Setting 63  
01-L-3  
FSP(100056)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment				
PK	4.9598G	52.09	74.00	-21.91	4.20	3	Vertical	256	2.56	-				
AV	4.96003G	41.97	54.00	-12.03	4.20	3	Vertical	256	2.56	-				

## BT-EDR(3Mbps)

## 2480MHz\_TX

14/05/2019



EUT\_Z\_1TX  
Setting 63  
01-L-3  
FSP(100056)

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment				
PK	4.95987G	50.02	74.00	-23.98	4.20	3	Horizontal	283	1.06	-				
AV	4.95993G	38.70	54.00	-15.30	4.20	3	Horizontal	283	1.06	-				