



# FCC RADIO TEST REPORT

**FCC ID** : W59MN10  
**Equipment** : Epic Mesh Node  
**Brand Name** : Luxul  
**Model Name** : MN-10  
**Applicant** : Luxul Wireless  
12884 S Frontrunner Blvd Suite 201 Draper Utah  
United States 84020  
**Standard** : 47 CFR FCC Part 15.247

The product was received on Dec. 25, 2019, and testing was started from Dec. 25, 2019 and completed on Jan. 20, 2020. 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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**Photographs of EUT v01**





## 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:**

1. The test configuration, test mode and test software were written in this test report are declared by the manufacturer.
2. 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	Model Name	Antenna Type	Connector	Gain (dBi)
	WLAN 2.4GHz	WLAN 5GHz (Band 1)	WLAN 5GHz (Band 4)	Bluetooth					
1	1	2	-	-	HONGBO	WRG-AC87	PIFA	I-PEX	Note 1
2	2	1	-	-	HONGBO	WRG-AC87	PIFA	I-PEX	
3	-	-	1	-	HONGBO	WRG-AC87	PIFA	I-PEX	
4	-	-	2	-	HONGBO	WRG-AC87	PIFA	I-PEX	
5	-	-	3	-	HONGBO	WRG-AC87	PIFA	I-PEX	
6	-	-	4	-	HONGBO	WRG-AC87	PIFA	I-PEX	
7	-	-	-	1	ALPHA	WRG-AC87	PCB	N/A	

Note 1

Ant.	Gain (dBi)				Directional Gain (dBi)		
	WLAN 2.4GHz	WLAN 5GHz (Band 1)	WLAN 5GHz (Band 4)	Bluetooth	WLAN 2.4GHz	WLAN 5GHz (Band 1)	WLAN 5GHz (Band 4)
1	2.61	3.34	-	-	4.37	5.40	-
2	2.61	3.34	-	-			-
3	-	-	5.45	-	-	-	8.51
4	-	-	5.45	-	-	-	
5	-	-	5.45	-	-	-	
6	-	-	5.45	-	-	-	
7	-	-	-	2.80	-	-	-

Note 2: The above information was declared by manufacturer.

**For IEEE 802.11b/g/n/VHT (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 function:**

**Band 1**

**For IEEE 802.11a/n/ac (2TX/2RX):**

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

Port 1 and Port 2 could transmit/receive simultaneously.

**Band 4**

**For IEEE 802.11a/n/ac (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 function:**

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

**1.1.3 Mode Test Duty Cycle**

Mode	DC	DCF(dB)	T(s)	VBW(Hz) $\geq 1/T$
BT-BR(1Mbps)	0.787	1.04	2.898m	1k
BT-EDR(2Mbps)	0.772	1.12	2.911m	1k
BT-EDR(3Mbps)	0.749	1.26	2.912m	1k

Note:

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

**1.1.4 EUT Operational Condition**

EUT Power Type	From Power Adapter
Test Software Version	telnet

**1.1.5 Table for EUT Operation Mode**

Operation Mode	WLAN 2.4GHz	WLAN 5GHz Band 1	WLAN 5GHz Band 4	Bluetooth
AP Router	V	V	V (AP Router and Mesh function)	V
Repeater	V	V	V (Repeater and Mesh function)	V

Note: The applicant designated the AP Router mode to perform all test and its test result was written in the 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
- ♦ FCC KDB 414788 D01 v01r01

### 1.3 Testing Location Information

Testing Location		
<input type="checkbox"/>	HWAYA	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	TH03-CB	Lucas Huang	21.7-24.3°C / 54-64%	Jan. 13, 2020~ Jan. 20, 2020
Radiated (Below 1GHz)	03CH06CB	KJ Chang	23-24.3°C / 56-60%	Jan. 18, 2020
Radiated (Above 1GHz)	03CH06CB	KJ Chang	14.8-15.4°C / 54-56%	Dec. 25, 2019~ Jan. 17, 2020
AC Conduction	CO01-CB	Max Lin	21~22°C / 58~59%	Jan. 20, 2020

Test site Designation No. TW0006 with FCC.  
Test site registered number IC 4086D 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)	4.3 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	5.1 dB	Confidence levels of 95%
Conducted Emission	2.4 dB	Confidence levels of 95%
Output Power Measurement	1.5 dB	Confidence levels of 95%
Bandwidth Measurement	2%	Confidence levels of 95%





## 2 Test Configuration of EUT

### 2.1 Test Channel Mode

Mode	Power Setting
BT-BR(1Mbps)	-
2402MHz	0x08
2440MHz	0x08
2480MHz	0x08
BT-EDR(2Mbps)	-
2402MHz	0x08
2440MHz	0x08
2480MHz	0x08
BT-EDR(3Mbps)	-
2402MHz	0x08
2440MHz	0x08
2480MHz	0x08



## 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	EUT_ AP Router

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	EUT_ AP Router
Operating Mode > 1GHz	CTX

The Worst Case Mode for Following Conformance Tests	
Tests Item	Simultaneous Transmission Analysis - Co-location RF Exposure Evaluation
Operating Mode	
1	WLAN 2.4GHz + WLAN 5GHz Band 1 + WLAN 5GHz Band 4 + Bluetooth
Refer to Sporton Test Report No.: FA9D2627 for Co-location RF Exposure Evaluation.	

Note: The EUT can only be used in Z-axis position.

## 2.3 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.



## 2.4 Accessories

Accessories			
Equipment Name	Brand Name	Model Name	Rating
Adapter	APD	WA-30P12FU	Input: 100-240V~, 50-60Hz, 0.9A Max. Output: 12V, 2.5A
Other			
RJ-45 cable*1: Non-Shielded, 1.0m			



## 2.5 Support Equipment

For AC Conduction:

Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID
A	WAN NB	DELL	E6430	N/A
B	LAN NB	DELL	E6430	N/A
C	2.4G NB	DELL	E6430	N/A
D	5G NB	DELL	E6430	N/A
E	AP-1	Luxul	MN-10	N/A
F	AP-2	Luxul	MN-10	N/A
G	Smart phone	Samsung	Galaxy J2	N/A
H	AP-1 NB	DELL	E6430	N/A
I	AP-2 NB	DELL	E6430	N/A

For Radiated (below 1GHz):

Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID
A	NB	DELL	E4300	N/A
B	NB	DELL	E4300	N/A
C	AP-1	Luxul	MN-10	N/A
D	PHONE	HTC	One X9	N/A
E	NB	DELL	E4300	N/A
F	NB	DELL	E4300	N/A
G	AP-2	Luxul	MN-10	N/A
H	NB	DELL	E4300	N/A
I	NB	DELL	E4300	N/A

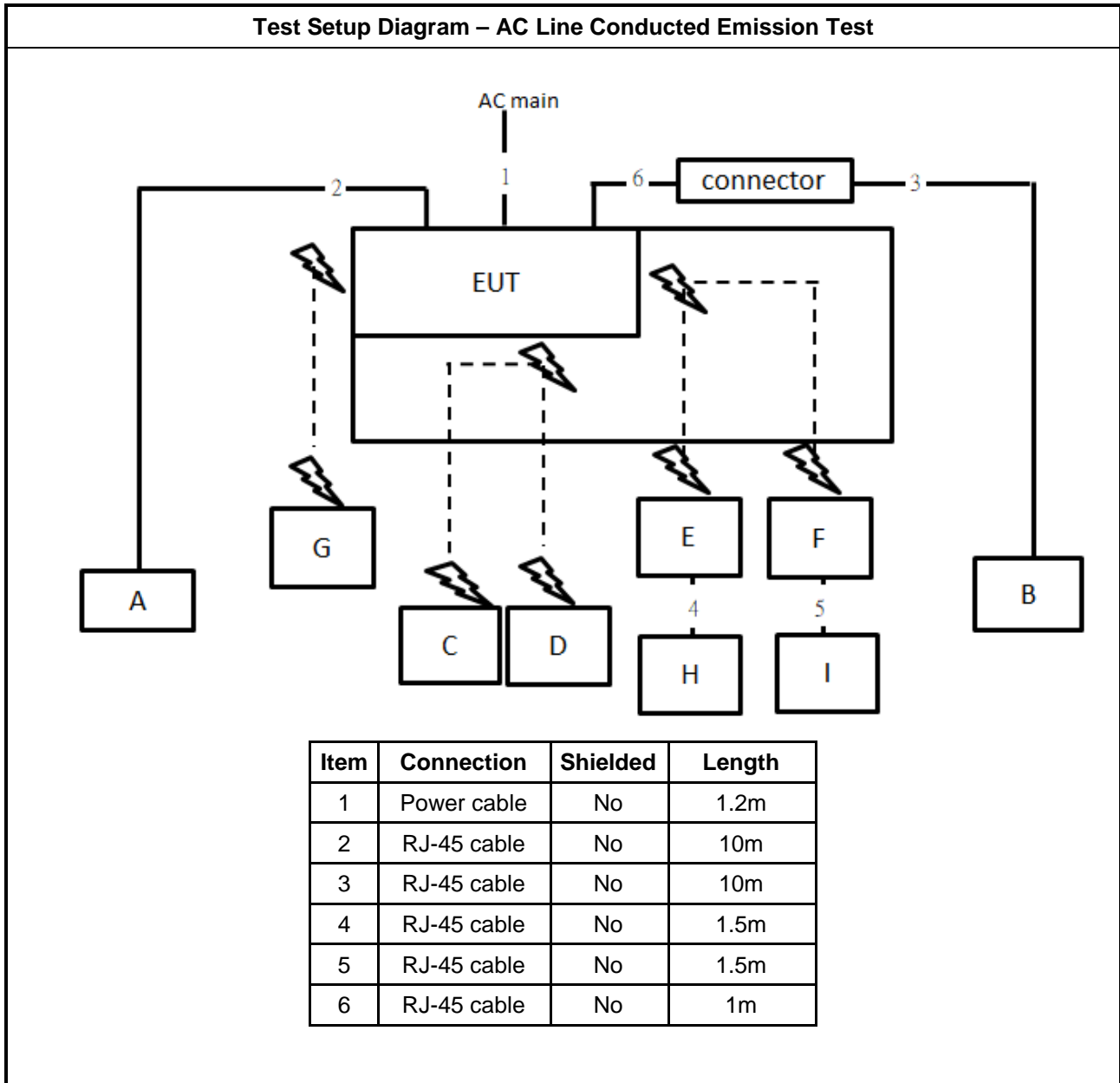
For Radiated (above 1GHz):

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

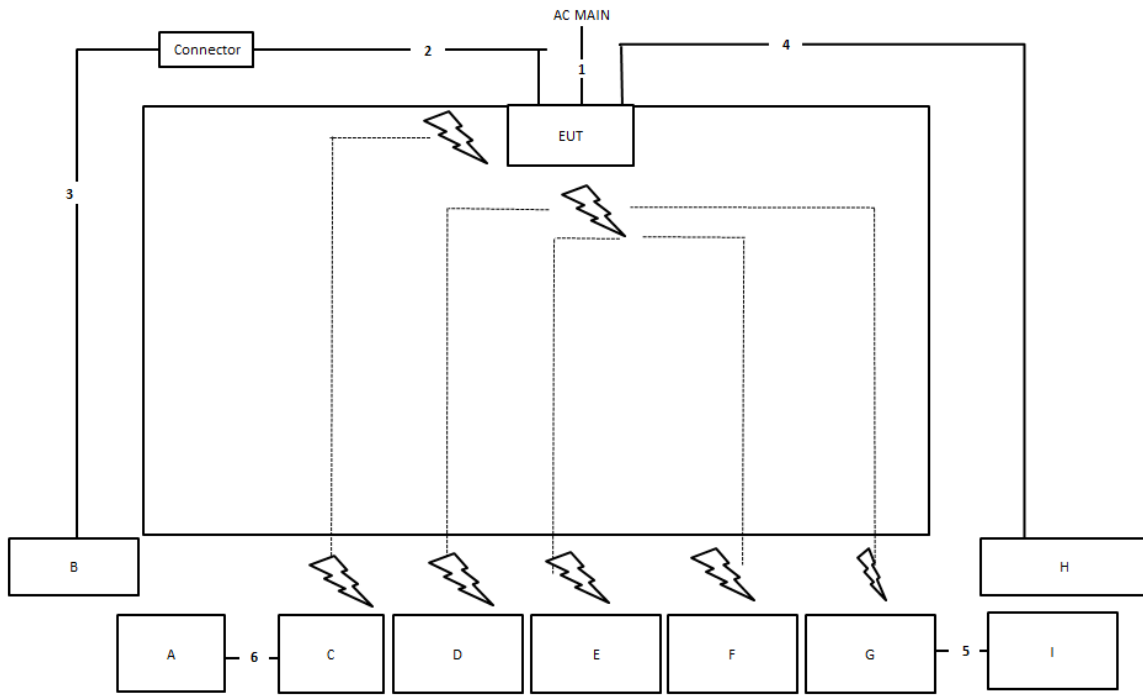
For RF Conducted:

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

## 2.6 Test Setup Diagram



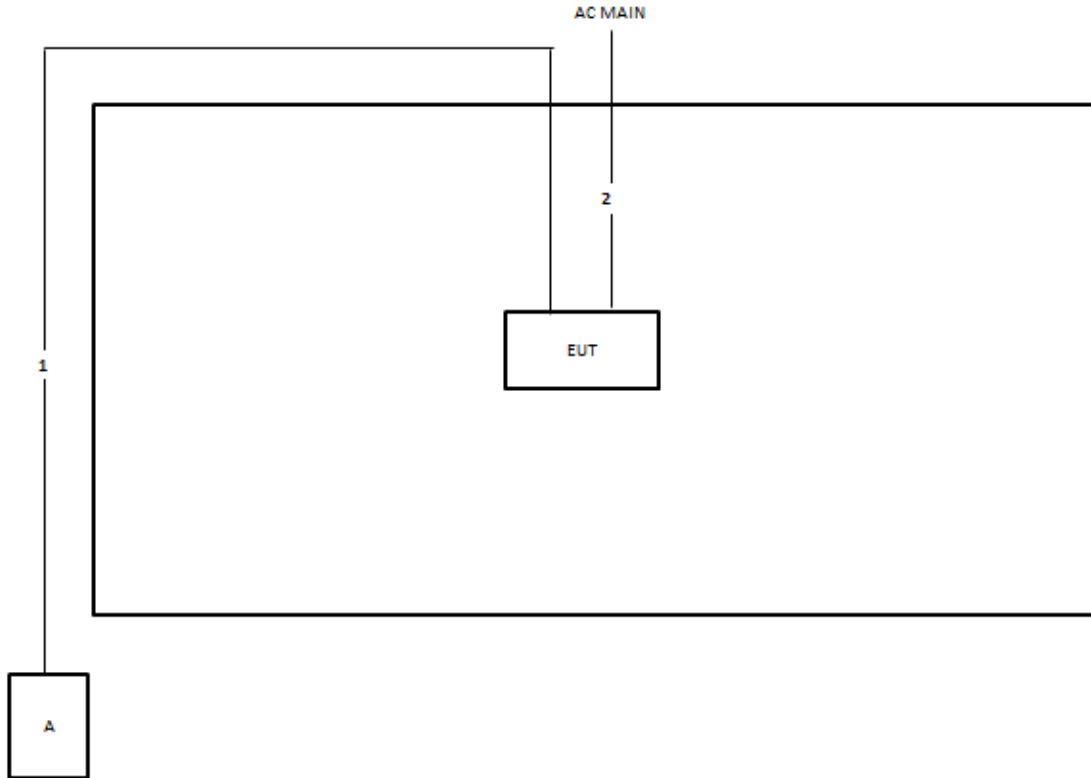
**Test Setup Diagram - Radiated Test < 1GHz**



Item	Connection	Shielded	Length
1	Power cable	No	1.2m
2	RJ-45 cable	No	1m
3	RJ-45 cable	No	10m
4	RJ-45 cable	No	10m
5	RJ-45 cable	No	1.5m
6	RJ-45 cable	No	1.5m



Test Setup Diagram - Radiated Test > 1GHz



Item	Connection	Shielded	Length
1	RJ-45 cable	No	10m
2	Power cable	No	1.2m



### 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

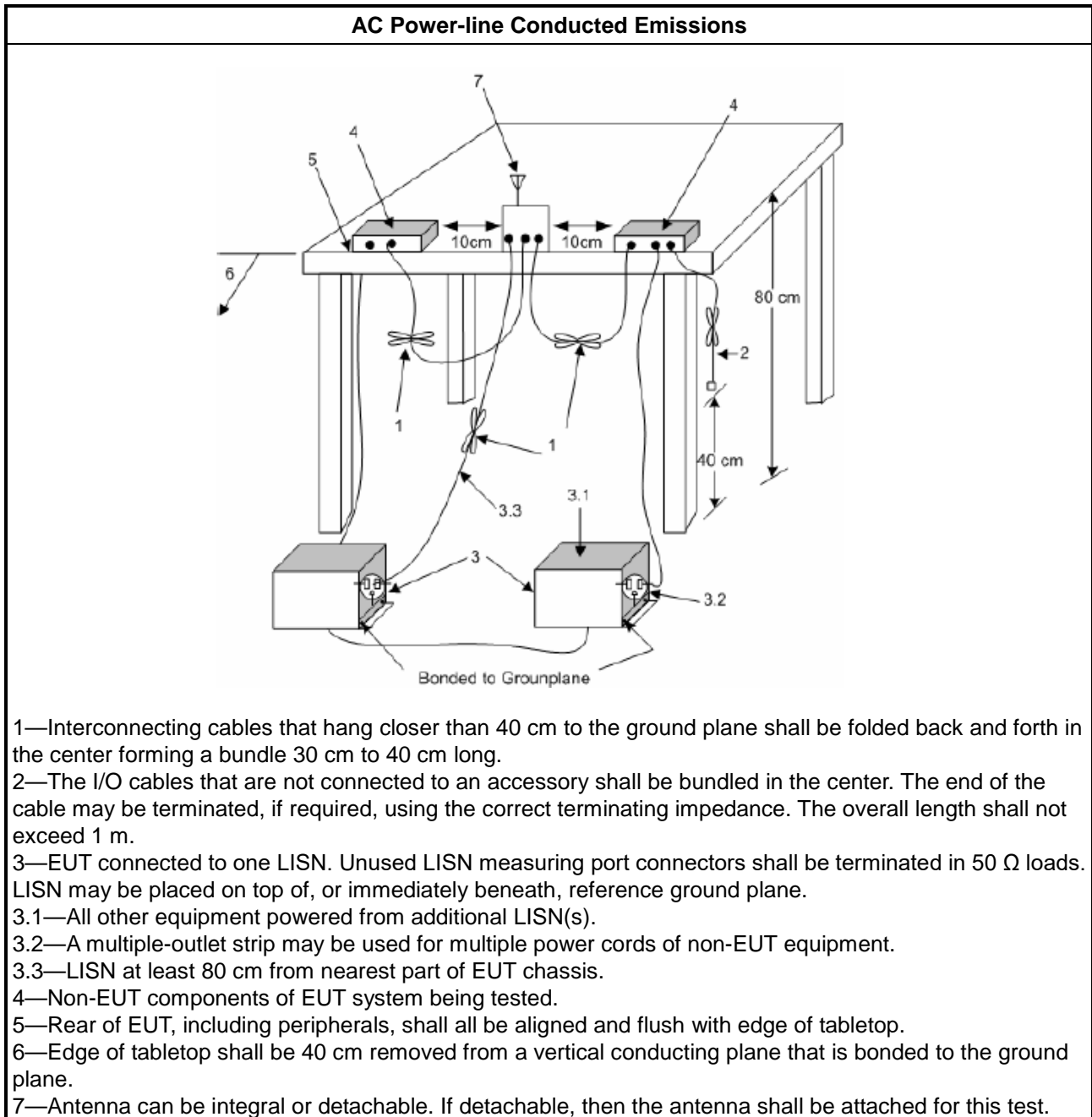
Refer a test equipment and calibration data table in this test report.

##### 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 $ChS \geq MAX$ (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	

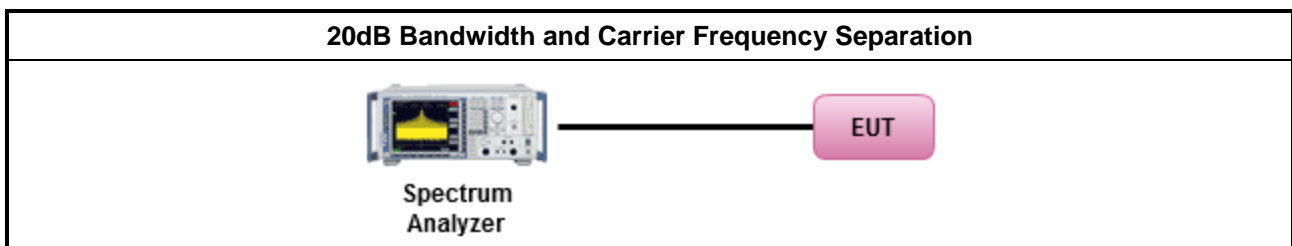
#### 3.2.2 Measuring Instruments

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	
<ul style="list-style-type: none"> <li>▪ 902-928 MHz Band:</li> </ul>	
	<ul style="list-style-type: none"> <li>▪ <math>N \geq 50</math>; Power 30dBm; EIRP 36dBm</li> </ul>
	<ul style="list-style-type: none"> <li>▪ <math>50 &gt; N \geq 25</math>; Power 24dBm; EIRP 30dBm</li> </ul>
<ul style="list-style-type: none"> <li>▪ 2400-2483.5 MHz Band:</li> </ul>	
	<ul style="list-style-type: none"> <li>▪ <math>N \geq 75</math>; Power 30dBm; EIRP 36dBm</li> </ul>
	<ul style="list-style-type: none"> <li>▪ <math>75 &gt; N \geq 15</math>; Power 21dBm; EIRP 27dBm</li> </ul>
<ul style="list-style-type: none"> <li>▪ 5725-5850 MHz Band:</li> </ul>	
	<ul style="list-style-type: none"> <li>▪ <math>N \geq 75</math>; Power 30dBm; EIRP 36dBm</li> </ul>
N: Number of Hopping Frequencies	

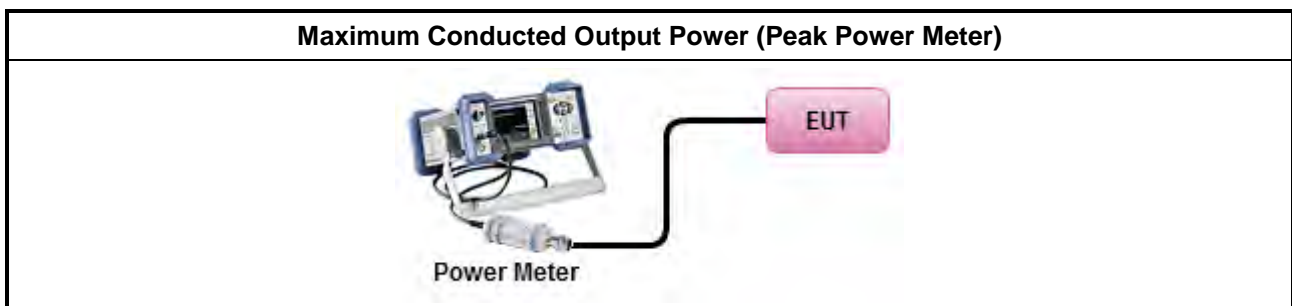
#### 3.3.2 Measuring Instruments

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

#### 3.3.3 Test Procedures

Test Method
<ul style="list-style-type: none"> <li>▪ Refer as ANSI C63.10-2013, clause 7.8.5 for output power measurement.</li> </ul>

#### 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

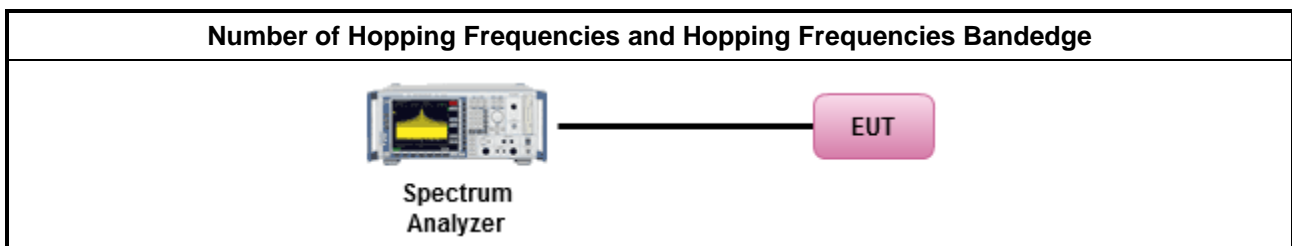
#### 3.4.3 Measuring Instruments

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	

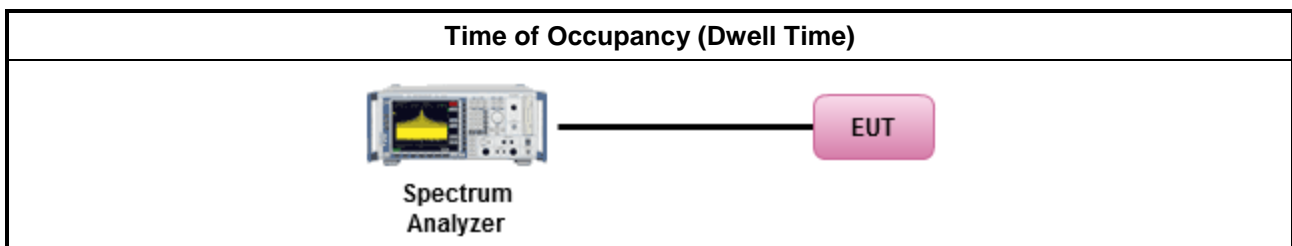
#### 3.5.2 Measuring Instruments

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.	

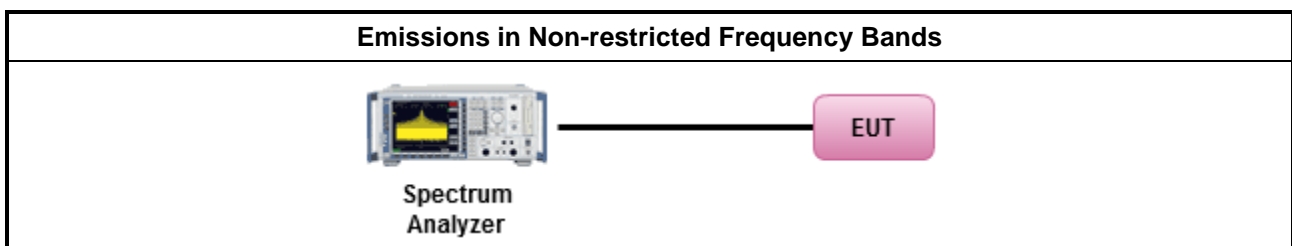
#### 3.6.2 Measuring Instruments

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.

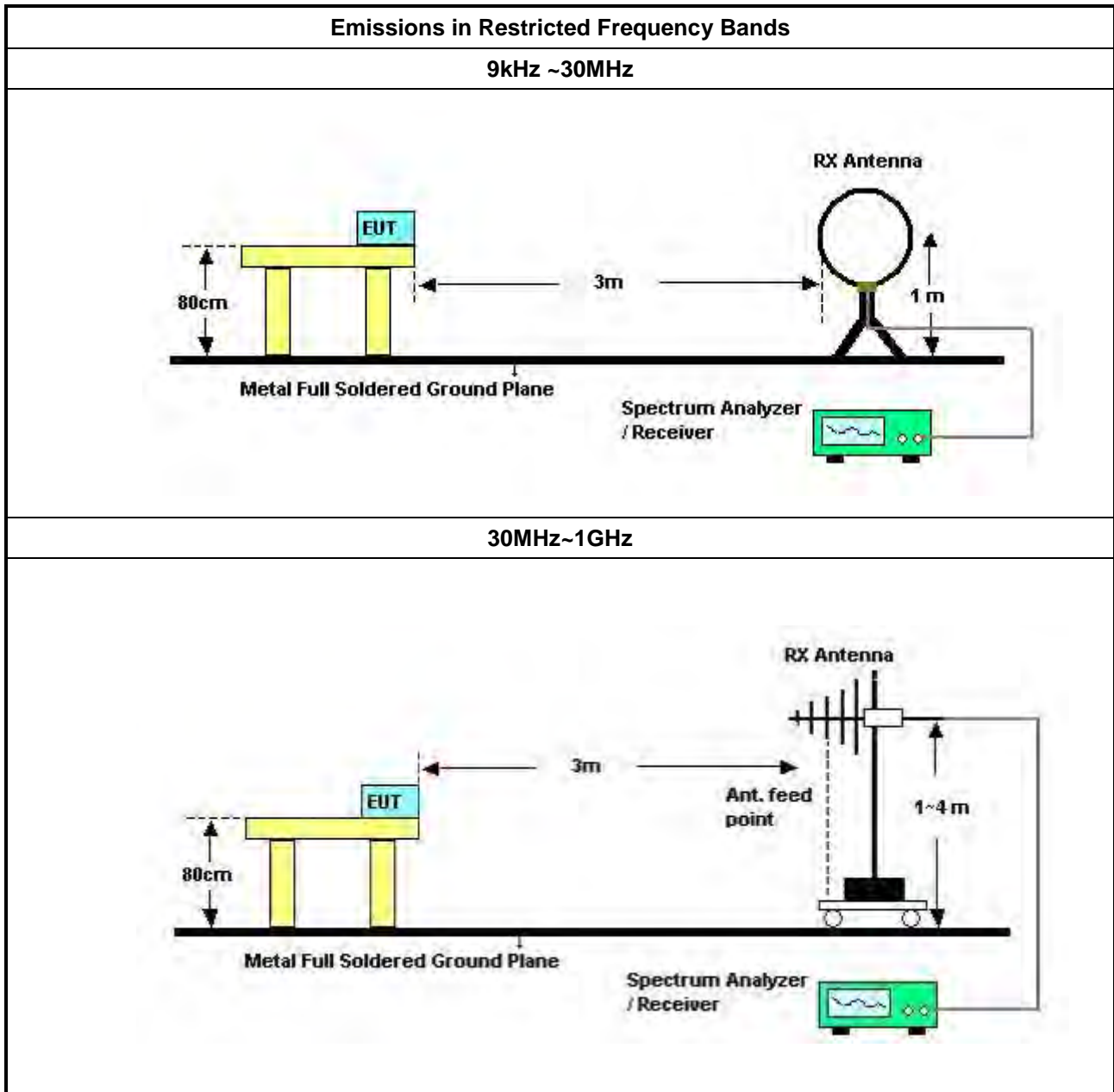
#### 3.7.2 Measuring Instruments

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

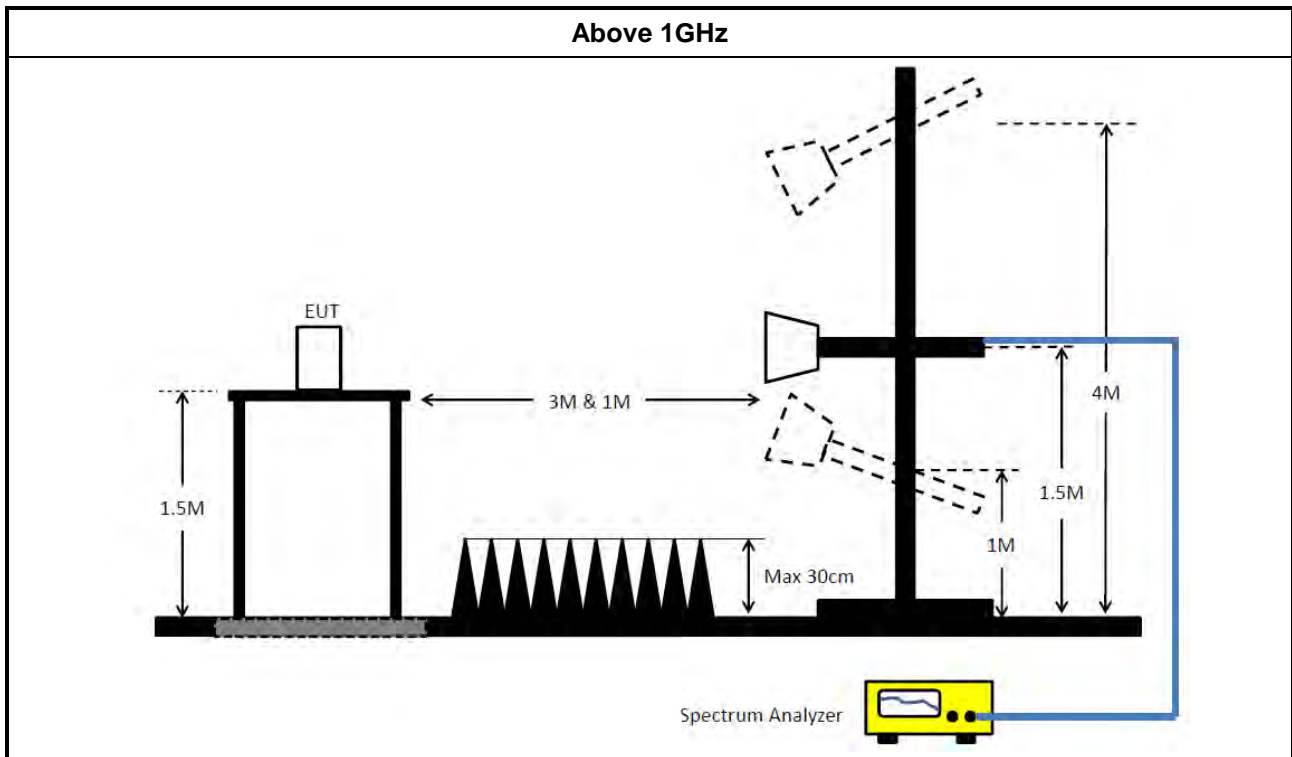
#### 3.7.3 Test Procedures

Test Method	
<ul style="list-style-type: none"> <li>The average emission levels shall be measured in [hopping duty factor].</li> </ul>	
<ul style="list-style-type: none"> <li>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.</li> </ul>	
<ul style="list-style-type: none"> <li>For the transmitter unwanted emissions shall be measured using following options below:               <ul style="list-style-type: none"> <li>Refer as ANSI C63.10, clause 4.1.4.2.1 QP value.</li> <li>Refer as ANSI C63.10, clause 4.1.4.2.2 measurement procedure peak.</li> <li>Refer as ANSI C63.10, clause 4.1.4.2.4 average value of hopping pulsed emissions.</li> </ul> </li> </ul>	

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)

There is a comparison data of both open-field test site and alternative test site - semi-Anechoic chamber according to KDB414788 Radiated Test Site, and the result came out very similar.

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-50-16-2	04083	150kHz ~ 100MHz	Dec. 25, 2019	Dec. 24, 2020	Conduction (CO01-CB)
LISN	Schwarzbeck	NSLK 8127	8127478	9kHz ~ 30MHz	Oct. 30, 2019	Oct. 29, 2020	Conduction (CO01-CB)
COND Cable	Woken	Cable	Low cable-CO01	9kHz ~ 30MHz	May 21, 2019	May 20, 2020	Conduction (CO01-CB)
Software	Audix	E3	6.120210n	-	N.C.R.	N.C.R.	Conduction (CO01-CB)
Bilog Antenna with 6 dB attenuator	TESEQ & EMCI	CBL6112D & N-6-06	37878 & AT-N0606	20MHz ~ 2GHz	Aug. 03, 2019	Aug. 02, 2020	Radiation (03CH06-CB)
Loop Antenna	Teseq	HLA 6120	24155	9kHz - 30 MHz	Mar. 29, 2019	Mar. 28, 2020	Radiation (03CH06-CB)
Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-1292	1GHz~18GHz	Jul. 17, 2019	Jul. 16, 2020	Radiation (03CH06-CB)
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170507	15GHz ~ 40GHz	Jun. 12, 2019	Jun. 11, 2020	Radiation (03CH06-CB)
Pre-Amplifier	Agilent	310N	187290	0.1MHz ~ 1GHz	May 07, 2019	May 06, 2020	Radiation (03CH06-CB)
Pre-Amplifier	Agilent	83017A	MY53270064	0.5GHz ~ 26.5GHz	May 08, 2019	May 07, 2020	Radiation (03CH06-CB)
Pre-Amplifier	MITEQ	TTA1840-35-HG	1864479	18GHz ~ 40GHz	Jul. 03, 2019	Jul. 02, 2020	Radiation (03CH06-CB)
Spectrum analyzer	R&S	FSP40	100080	9kHz~40GHz	Oct. 21, 2019	Oct. 20, 2020	Radiation (03CH06-CB)
EMI Test Receiver	R&S	ESCS	826547/017	9kHz ~ 2.75GHz	May 15, 2019	May 14, 2020	Radiation (03CH06-CB)
RF Cable-low	HUBER+SUHNER	RG402	Low Cable-05+24	30MHz~1GHz	Oct. 07, 2019	Oct. 06, 2020	Radiation (03CH06-CB)
RF Cable-high	HUBER+SUHNER	RG402	High Cable-05	1GHz~18GHz	Oct. 07, 2019	Oct. 06, 2020	Radiation (03CH06-CB)
RF Cable-high	HUBER+SUHNER	RG402	High Cable-05+24	1GHz~18GHz	Oct. 07, 2019	Oct. 06, 2020	Radiation (03CH06-CB)
RF Cable-high	Woken	RG402	High Cable-40G#1	18GHz ~ 40 GHz	Jul. 24, 2019	Jul. 23, 2020	Radiation (03CH06-CB)



Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
Spectrum analyzer	R&S	FSV40	101028	9kHz~40GHz	Nov. 01, 2019	Oct. 31, 2020	Conducted (TH03-CB)
Power Sensor	Anritsu	MA2411B	1726195	300MHz~40GHz	Aug. 13, 2019	Aug. 12, 2020	Conducted (TH03-CB)
Power Meter	Anritsu	ML2495A	1035008	300MHz~40GHz	Aug. 13, 2019	Aug. 12, 2020	Conducted (TH03-CB)
RF Cable-high	Woken	RG402	High Cable-11	1 GHz – 26.5 GHz	Oct. 07, 2019	Oct. 06, 2020	Conducted (TH03-CB)
RF Cable-high	Woken	RG402	High Cable-12	1 GHz – 26.5 GHz	Oct. 07, 2019	Oct. 06, 2020	Conducted (TH03-CB)
RF Cable-high	Woken	RG402	High Cable-13	1 GHz – 26.5 GHz	Oct. 07, 2019	Oct. 06, 2020	Conducted (TH03-CB)
RF Cable-high	Woken	RG402	High Cable-14	1 GHz – 26.5 GHz	Oct. 07, 2019	Oct. 06, 2020	Conducted (TH03-CB)
RF Cable-high	Woken	RG402	High Cable-15	1 GHz – 26.5 GHz	Oct. 07, 2019	Oct. 06, 2020	Conducted (TH03-CB)

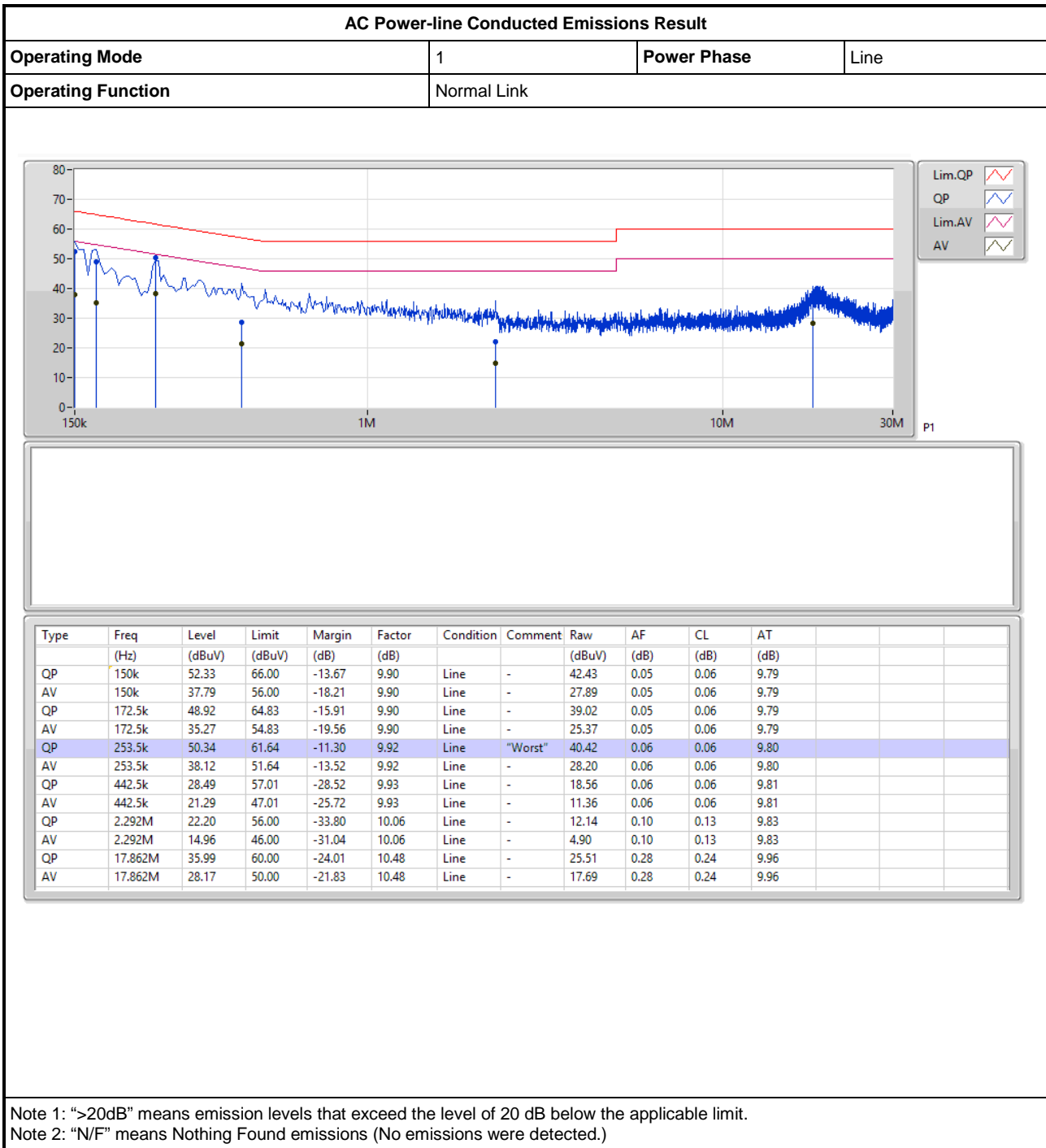
Note: Calibration Interval of instruments listed above is one year.

NCR means Non-Calibration required.



# AC Power-line Conducted Emissions Result

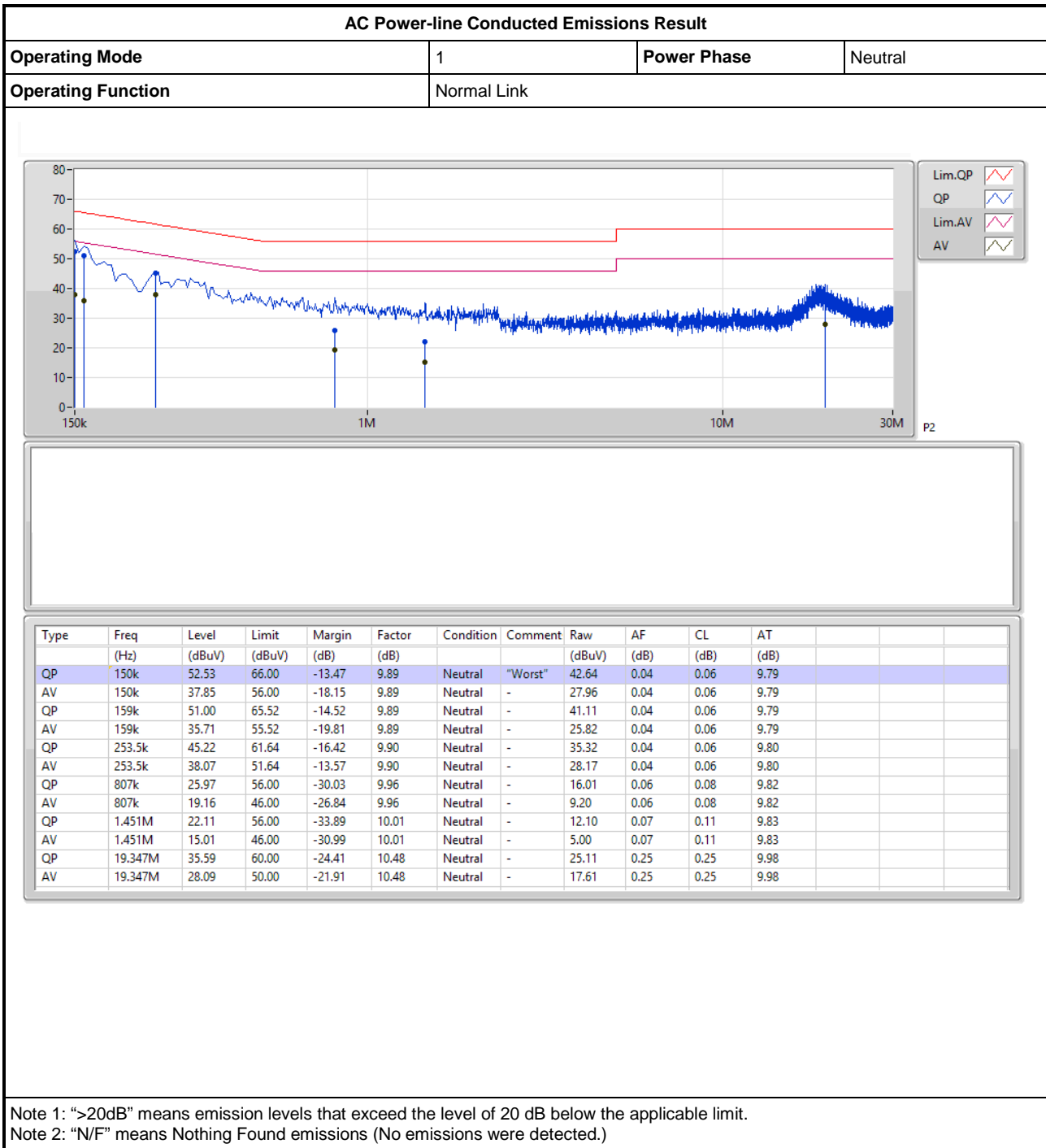
Appendix A





# 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	877.061k	877KF1D	921.25k	869.565k
BT-EDR(2Mbps)	1.316M	1.206M	1M21G1D	1.304M	1.191M
BT-EDR(3Mbps)	1.268M	1.213M	1M21G1D	1.263M	1.203M

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

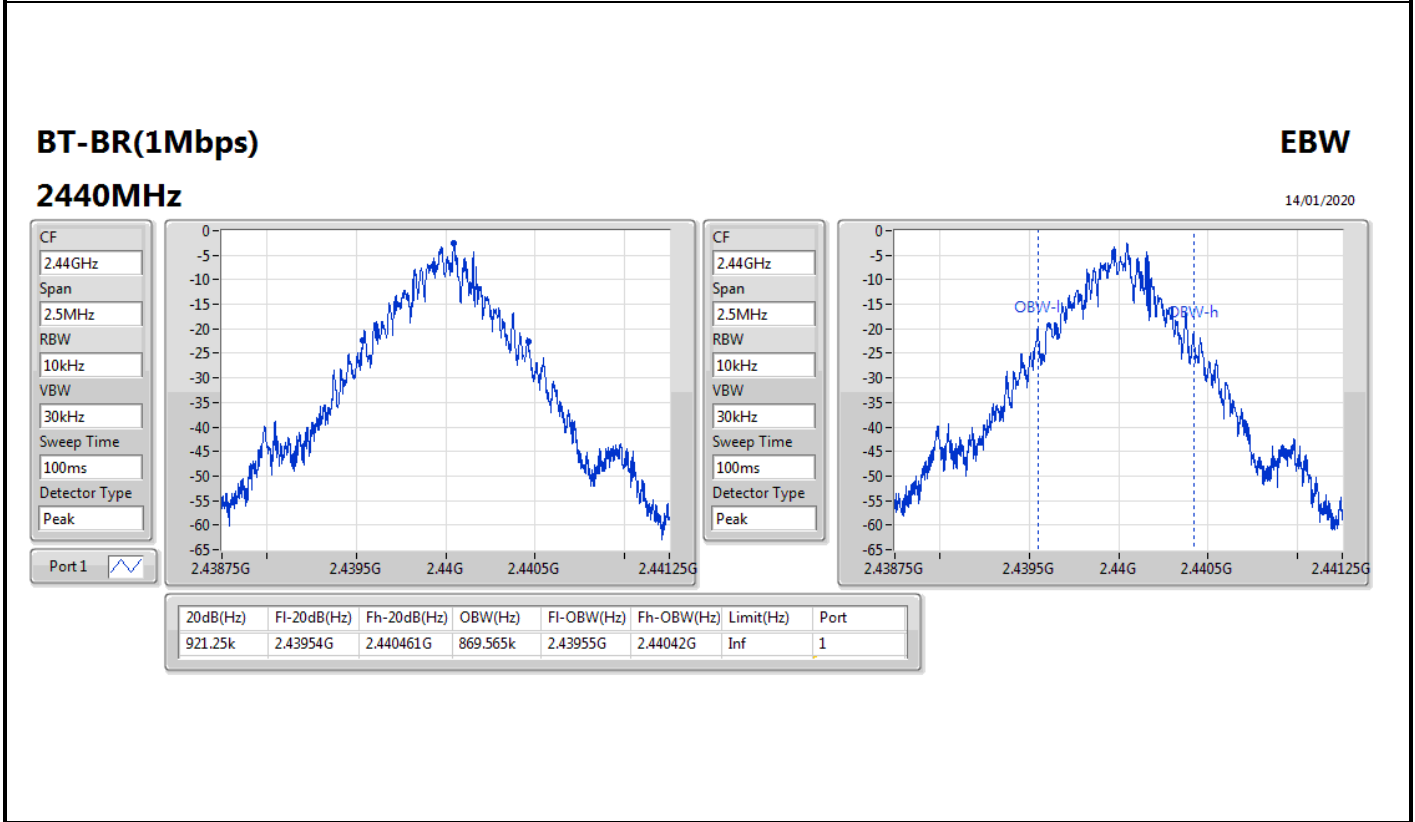
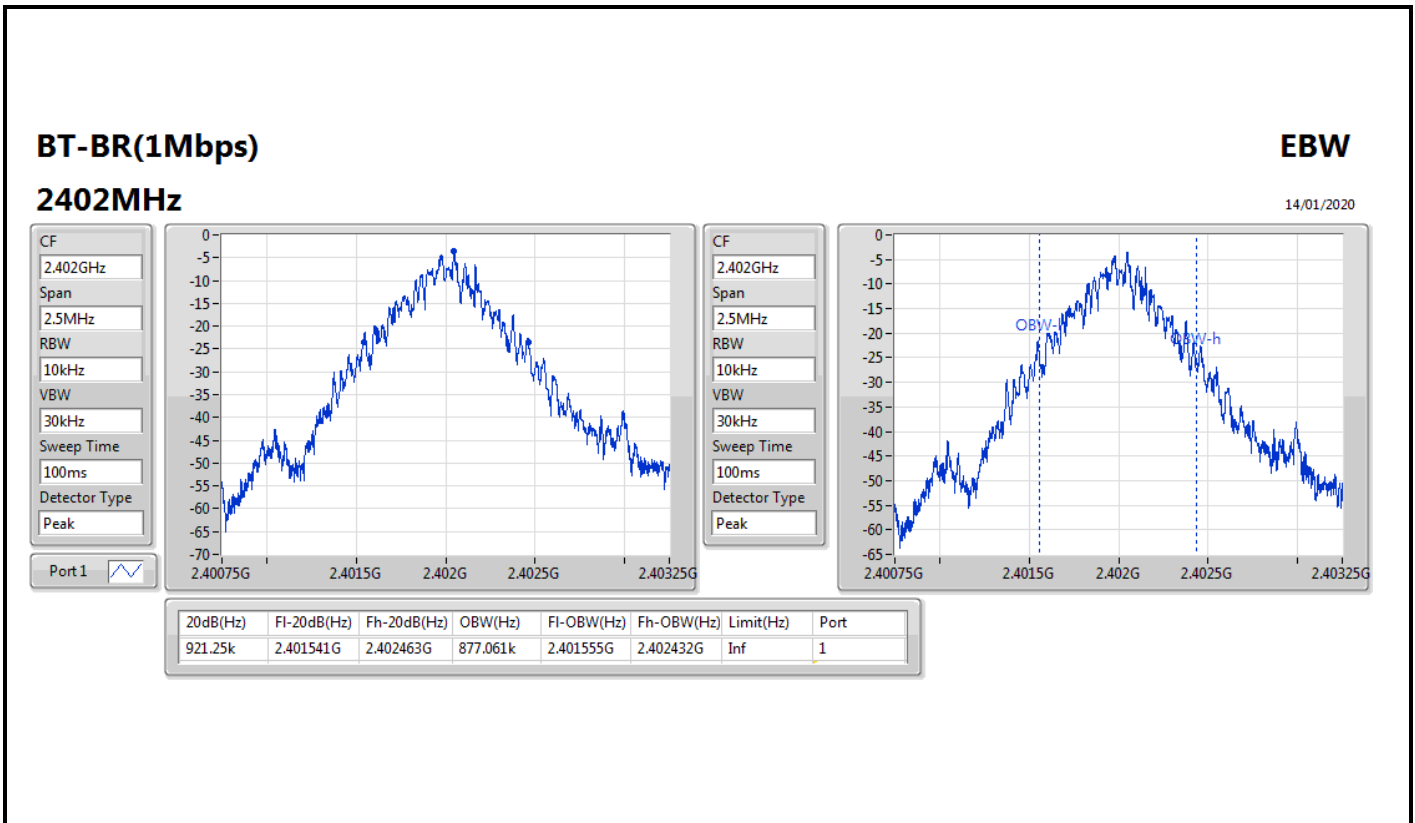
**Min-N dB** = Minimum 20dB down bandwidth; **Min-OBW** = Minimum 99% occupied bandwidth;



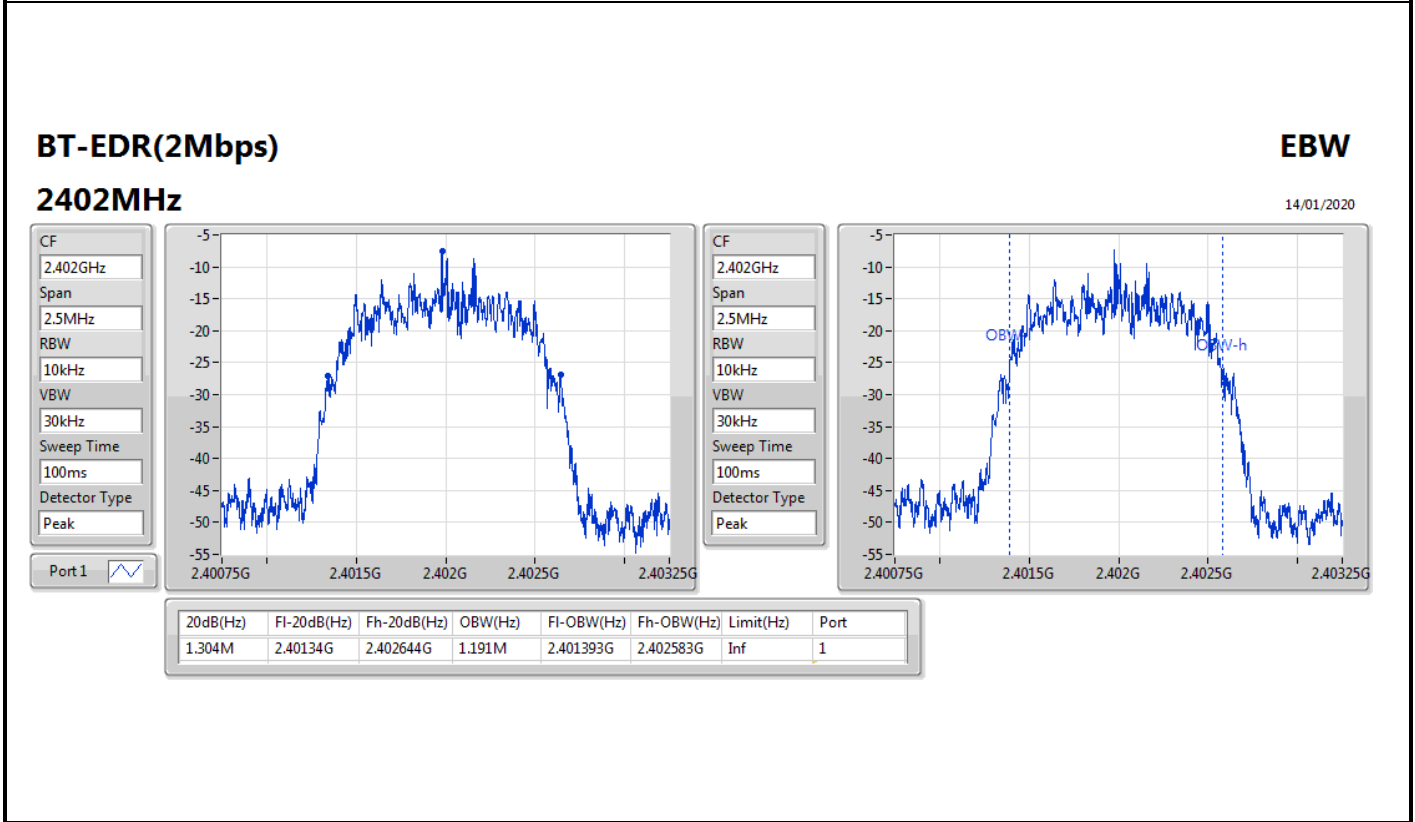
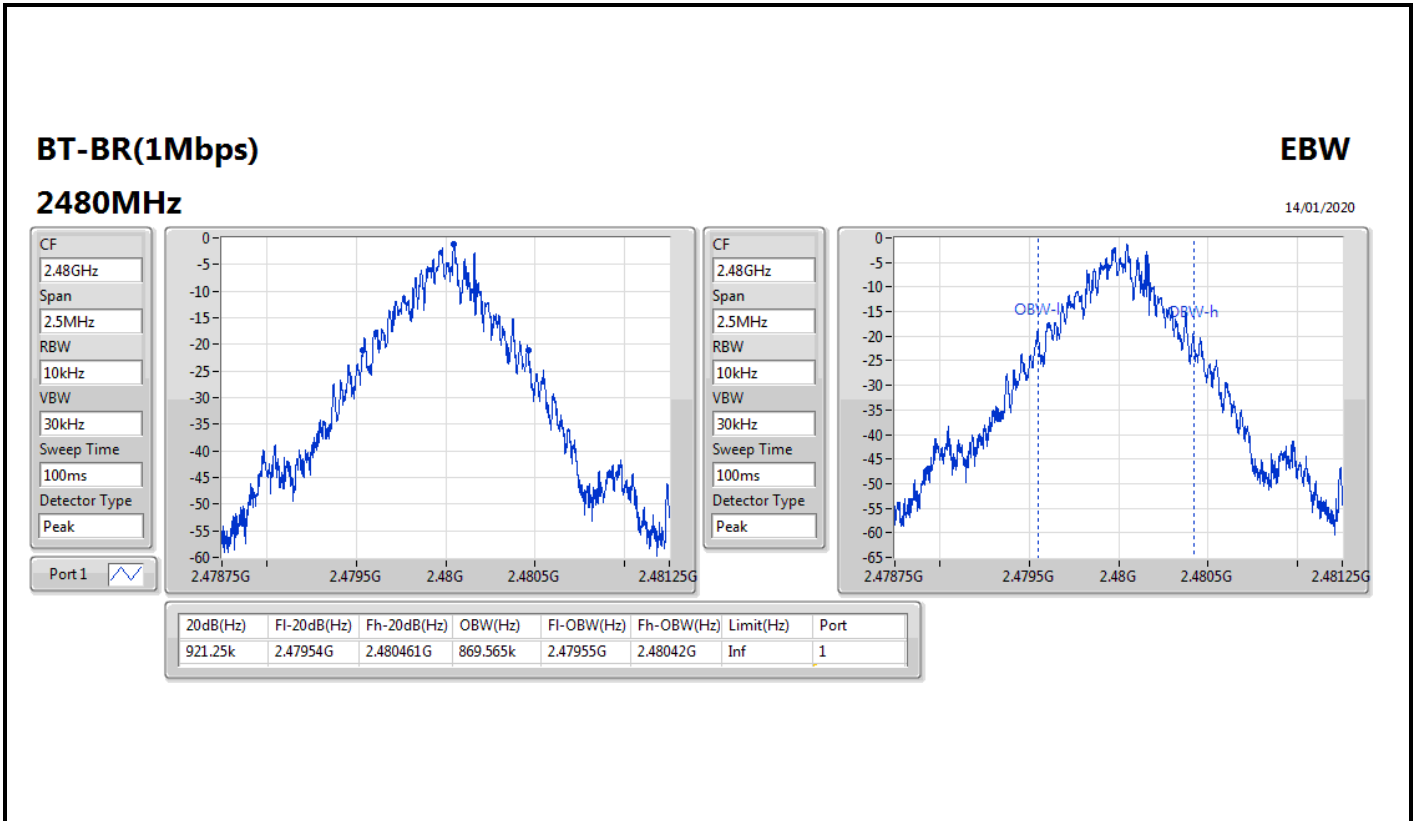
**Result**

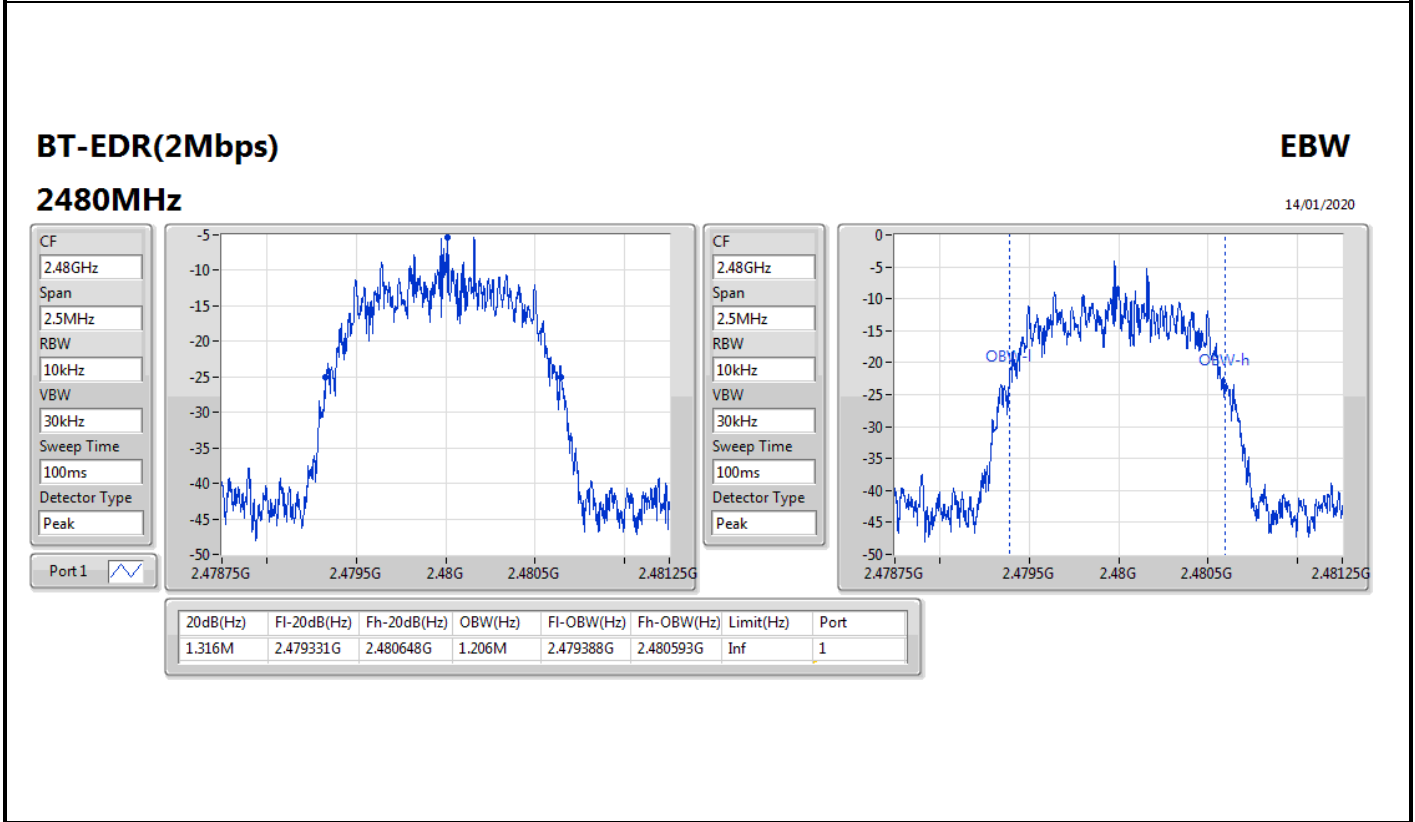
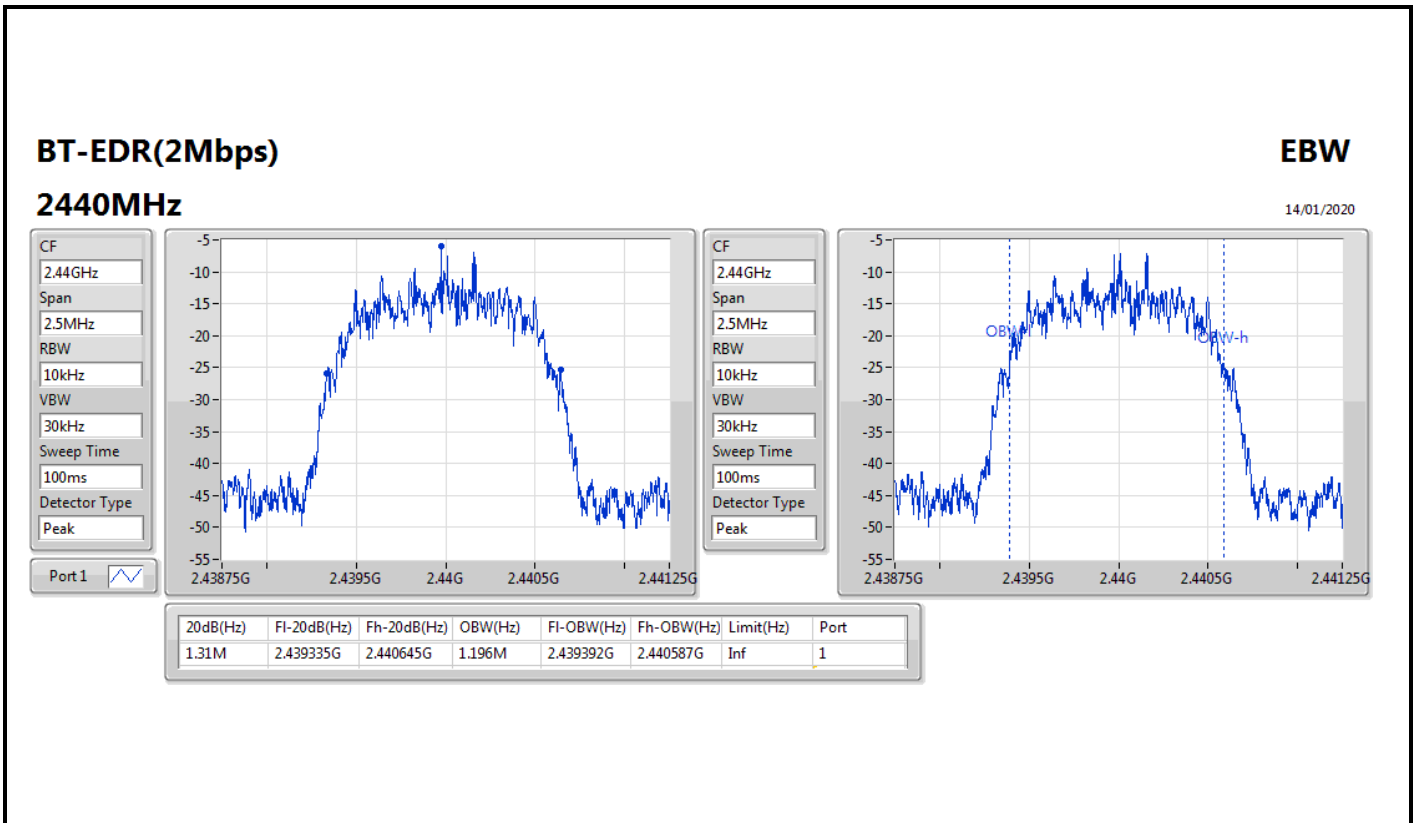
Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
BT-BR(1Mbps)	-	-	-	-
2402MHz	Pass	Inf	921.25k	877.061k
2440MHz	Pass	Inf	921.25k	869.565k
2480MHz	Pass	Inf	921.25k	869.565k
BT-EDR(2Mbps)	-	-	-	-
2402MHz	Pass	Inf	1.304M	1.191M
2440MHz	Pass	Inf	1.31M	1.196M
2480MHz	Pass	Inf	1.316M	1.206M
BT-EDR(3Mbps)	-	-	-	-
2402MHz	Pass	Inf	1.263M	1.203M
2440MHz	Pass	Inf	1.264M	1.211M
2480MHz	Pass	Inf	1.268M	1.213M

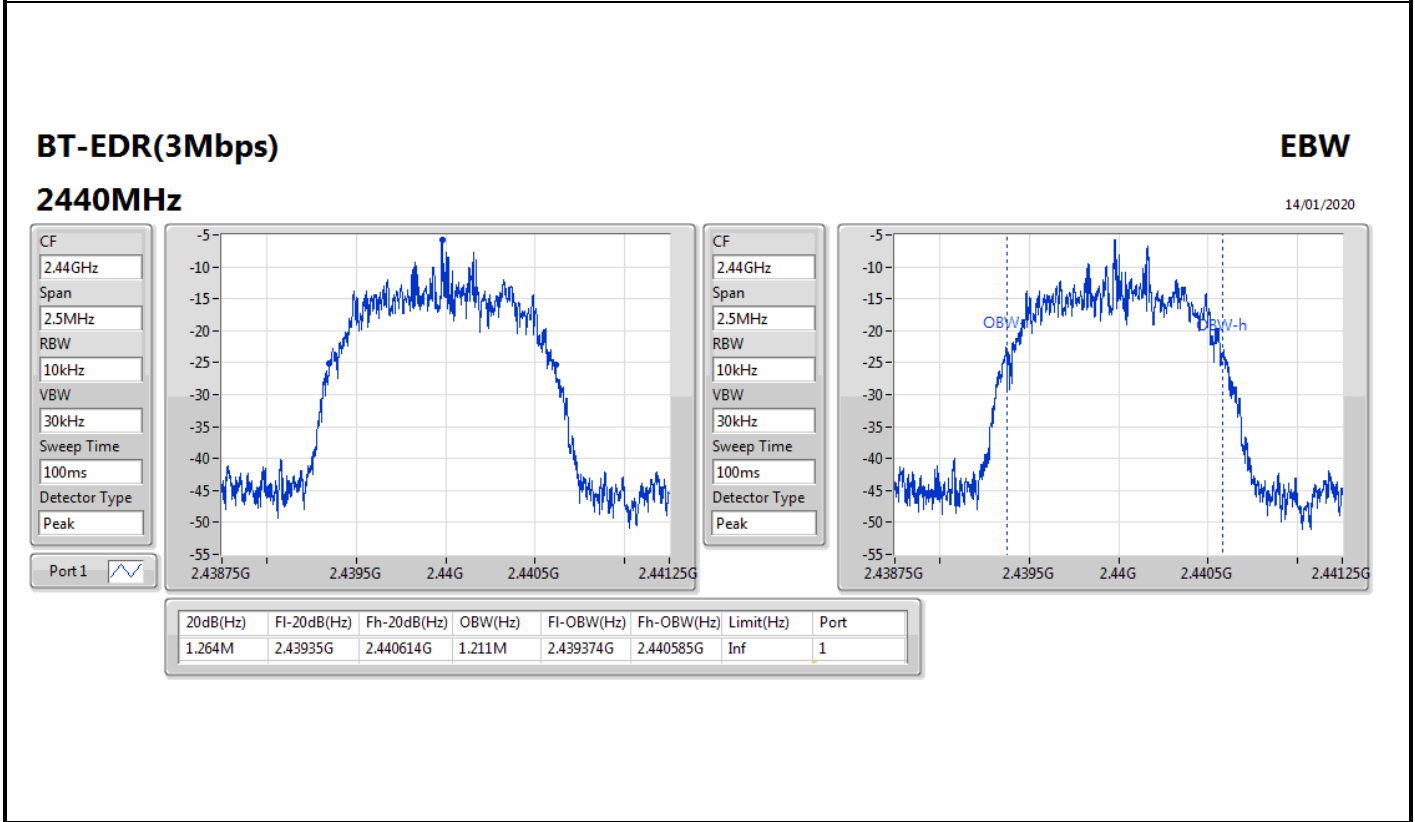
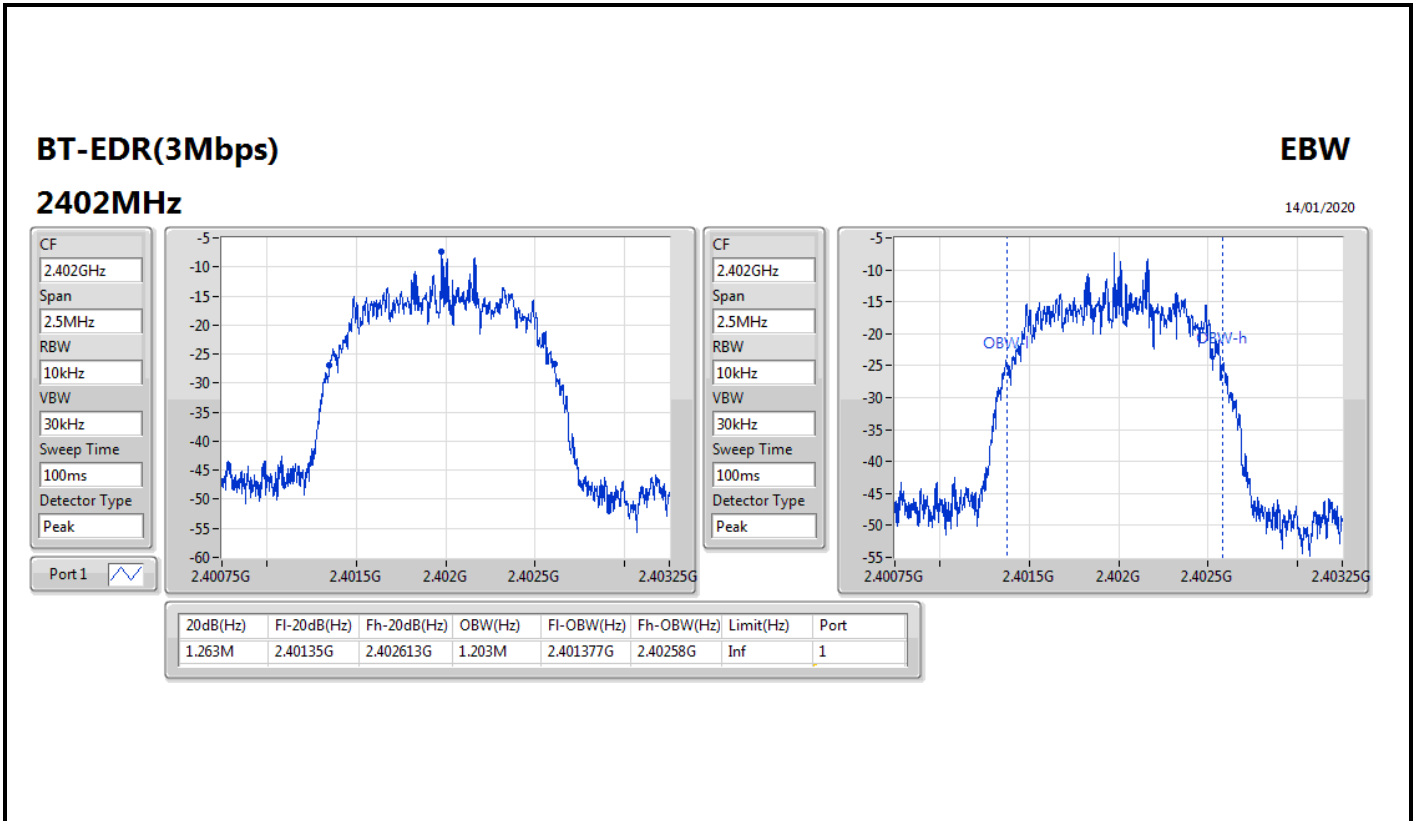
**Port X-N dB** = Port X 20dB down bandwidth; **Port X-OBW** = Port X 99% occupied bandwidth;

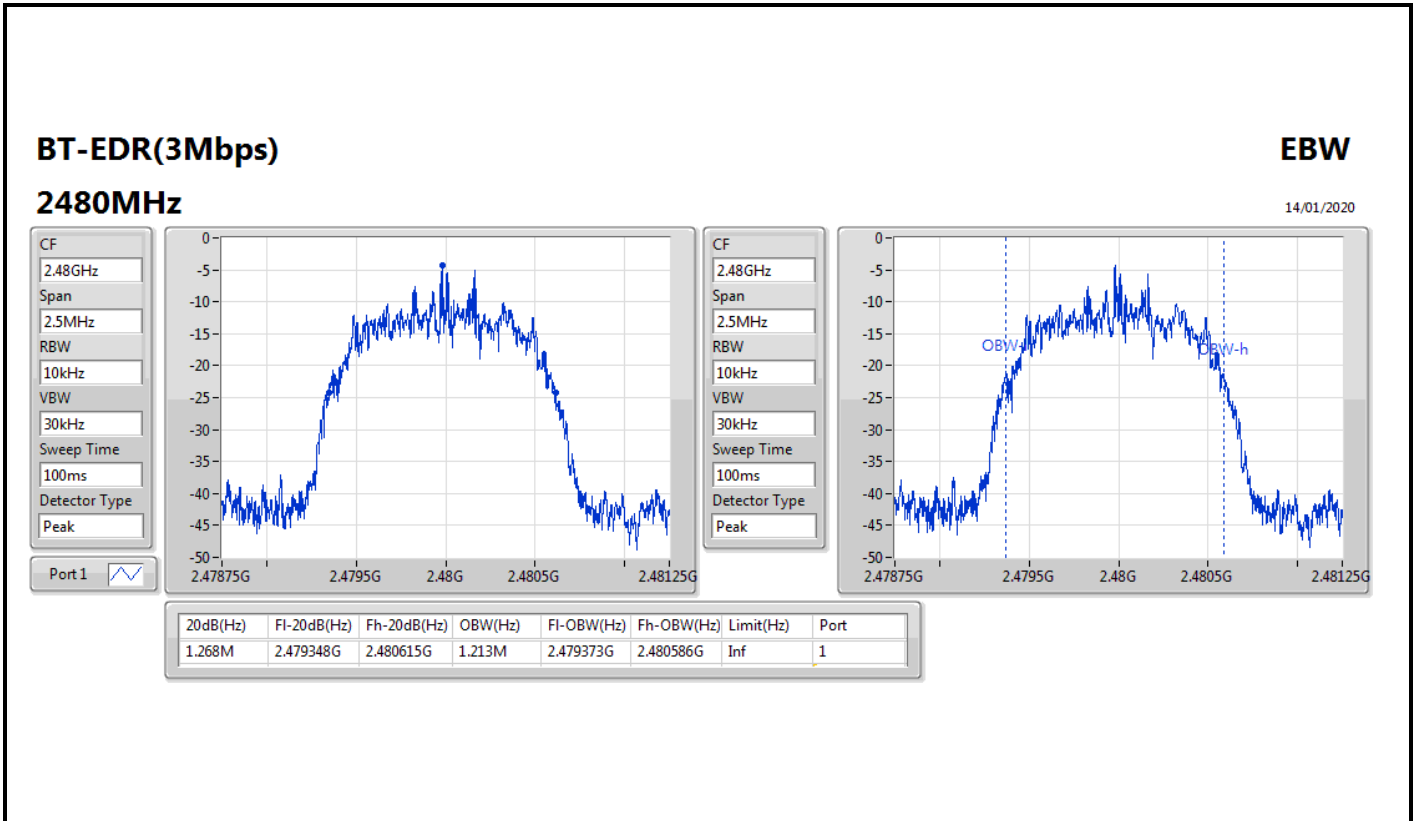














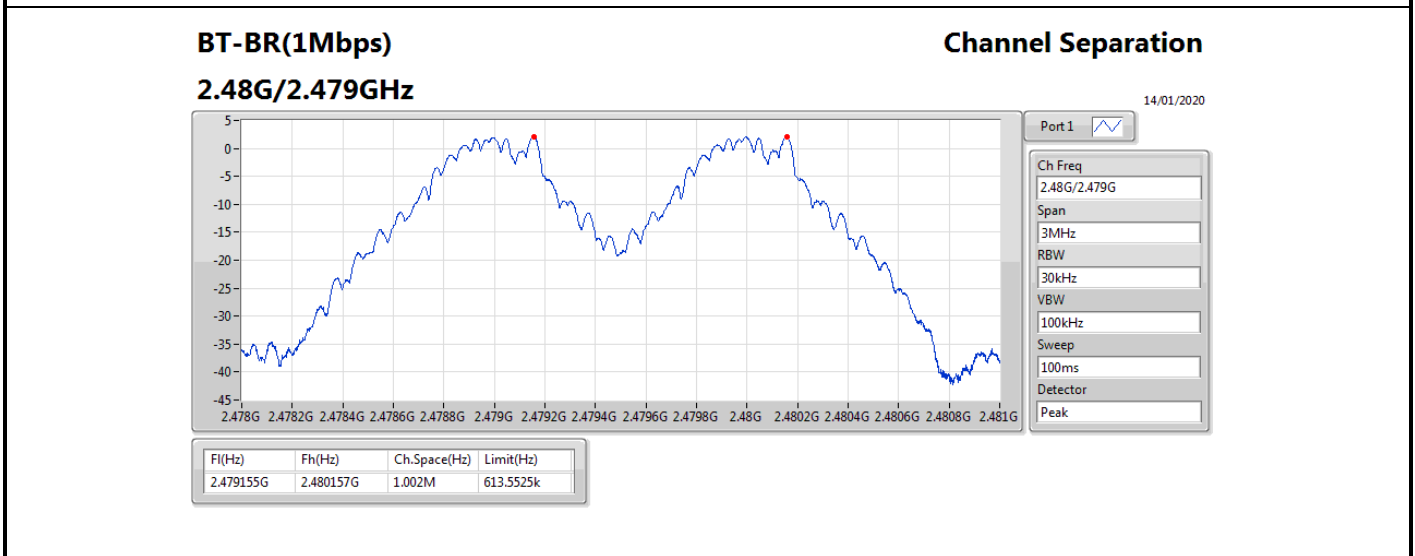
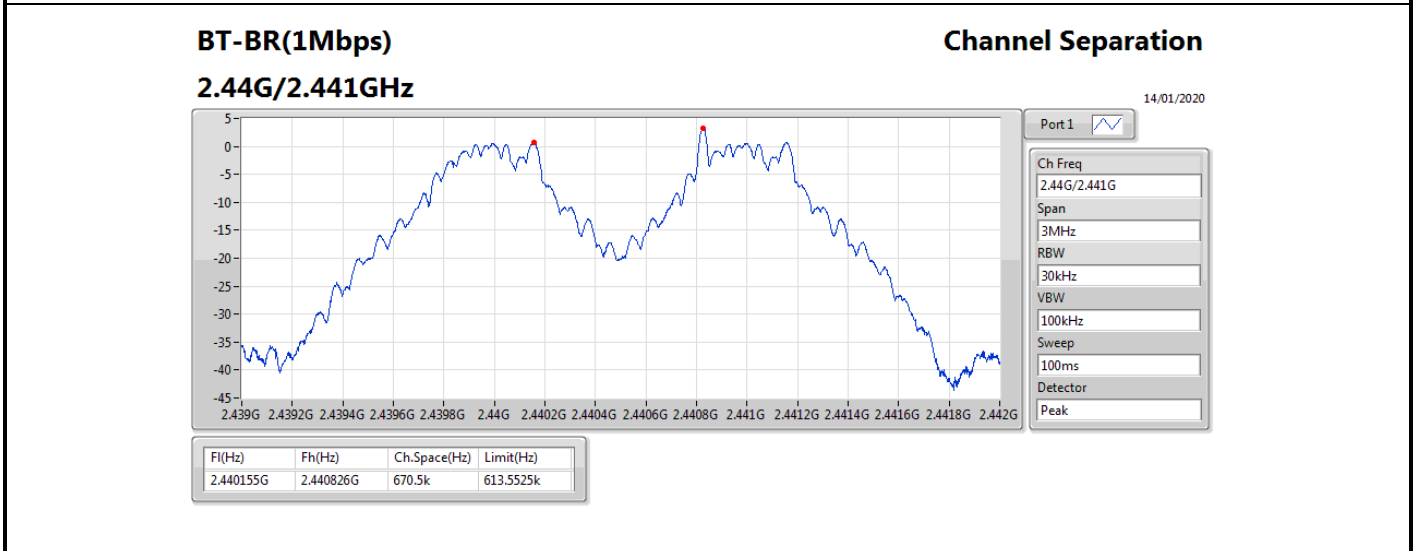
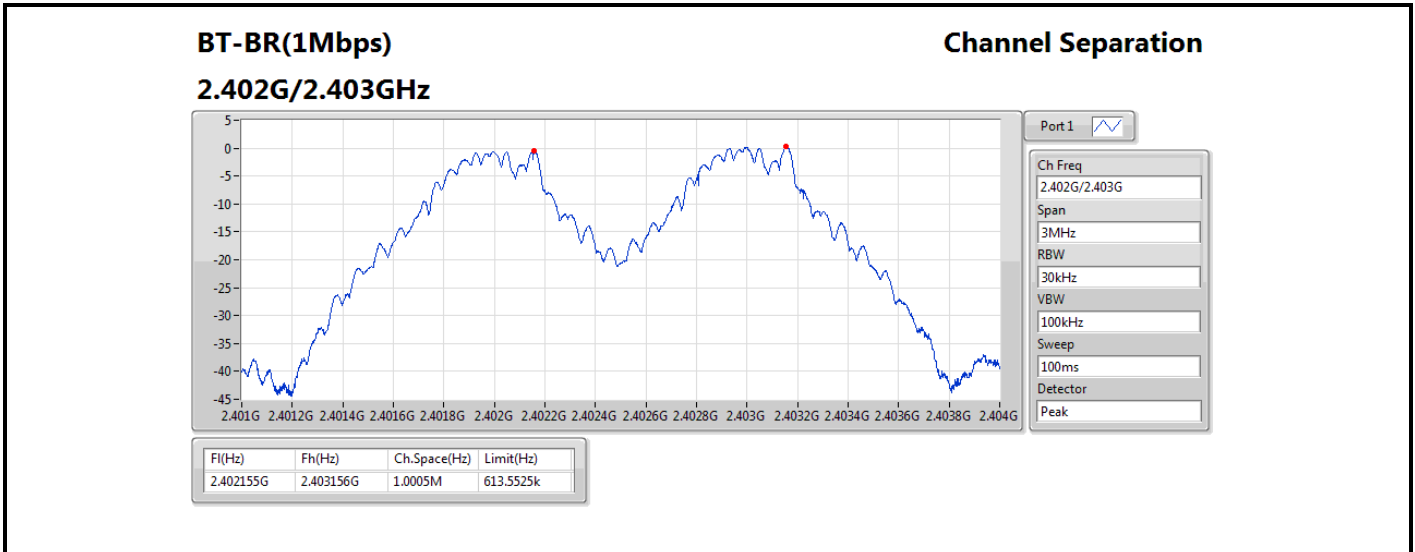
**Summary**

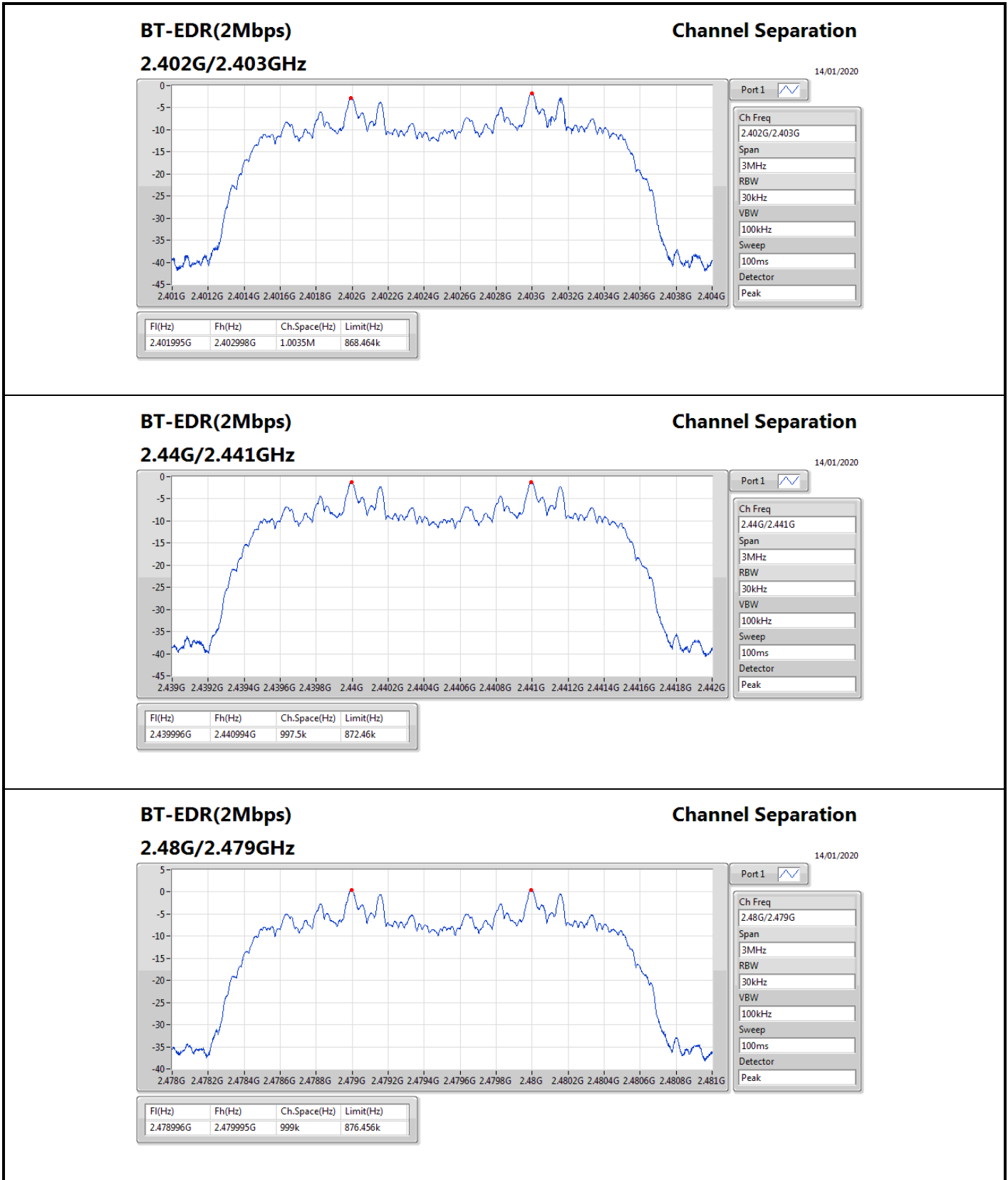
Mode	Max-Space (Hz)	Min-Space (Hz)
2.4-2.4835GHz	-	-
BT-BR(1Mbps)	1.002M	670.5k
BT-EDR(2Mbps)	1.0035M	997.5k
BT-EDR(3Mbps)	1.002M	1.0005M



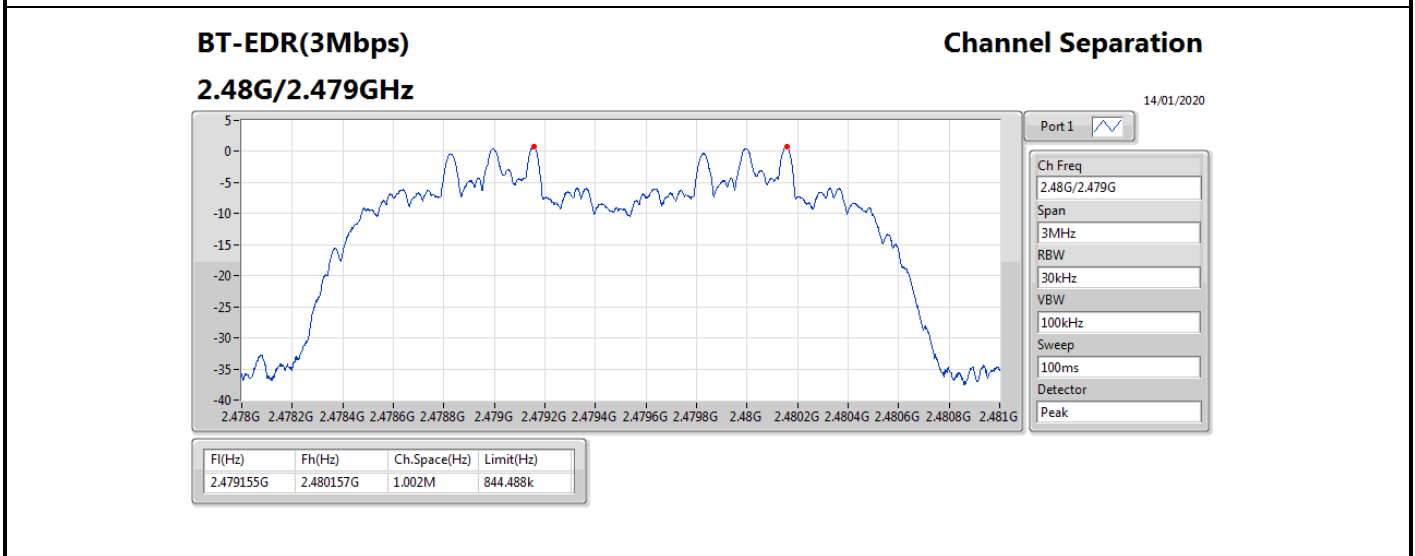
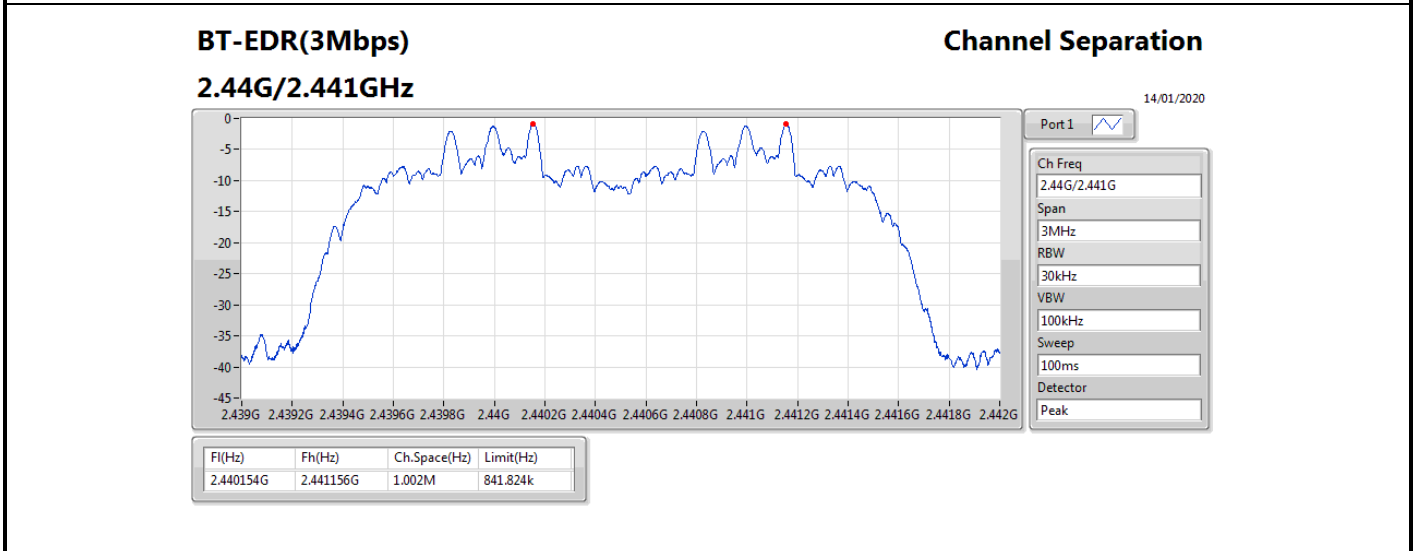
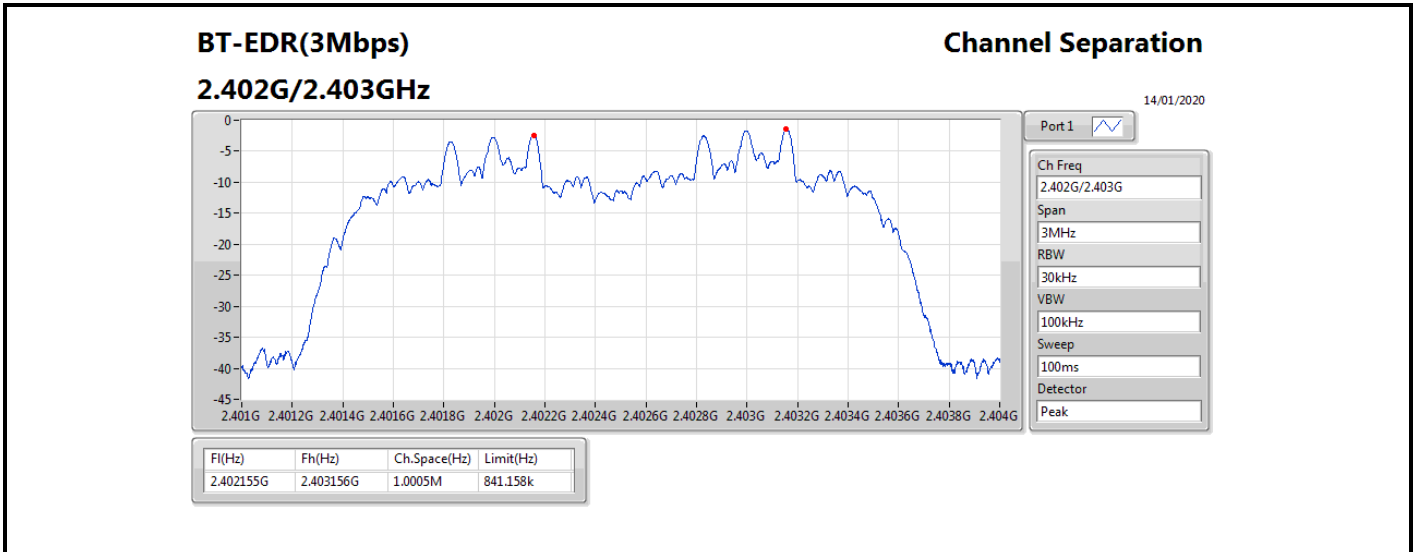
**Result**

Mode	Result	Fl (Hz)	Fh (Hz)	Ch.Space (Hz)	Limit (Hz)
BT-BR(1Mbps)	-	-	-	-	-
2402MHz	Pass	2.402155G	2.403156G	1.0005M	613.5525k
2440MHz	Pass	2.440155G	2.440826G	670.5k	613.5525k
2480MHz	Pass	2.479155G	2.480157G	1.002M	613.5525k
BT-EDR(2Mbps)	-	-	-	-	-
2402MHz	Pass	2.401995G	2.402998G	1.0035M	868.464k
2440MHz	Pass	2.439996G	2.440994G	997.5k	872.46k
2480MHz	Pass	2.478996G	2.479995G	999k	876.456k
BT-EDR(3Mbps)	-	-	-	-	-
2402MHz	Pass	2.402155G	2.403156G	1.0005M	841.158k
2440MHz	Pass	2.440154G	2.441156G	1.002M	841.824k
2480MHz	Pass	2.479155G	2.480157G	1.002M	844.488k











**Summary**

Mode	Power (dBm)	Power (W)
2.4-2.4835GHz	-	-
BT-BR(1Mbps)	4.71	0.00296
BT-EDR(2Mbps)	1.97	0.00157
BT-EDR(3Mbps)	1.92	0.00156



**Result**

Mode	Result	Gain (dBi)	Power (dBm)	Power Limit (dBm)
BT-BR(1Mbps)	-	-	-	-
2402MHz	Pass	2.80	2.21	21.00
2440MHz	Pass	2.80	3.25	21.00
2480MHz	Pass	2.80	4.71	21.00
BT-EDR(2Mbps)	-	-	-	-
2402MHz	Pass	2.80	-1.88	21.00
2440MHz	Pass	2.80	0.13	21.00
2480MHz	Pass	2.80	1.97	21.00
BT-EDR(3Mbps)	-	-	-	-
2402MHz	Pass	2.80	-1.45	21.00
2440MHz	Pass	2.80	0.10	21.00
2480MHz	Pass	2.80	1.92	21.00

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



**Summary**

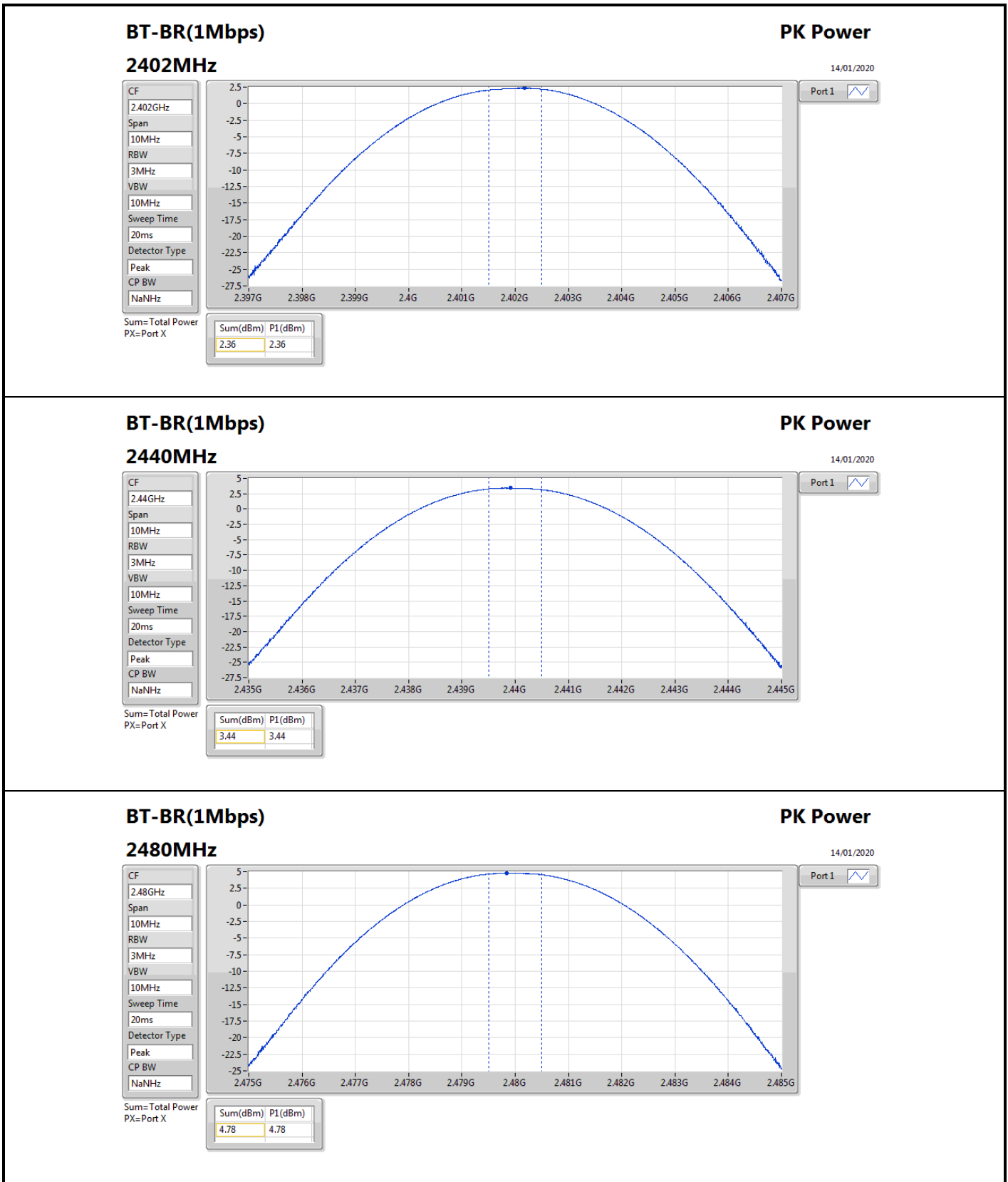
Mode	Power (dBm)	Power (W)
2.4-2.4835GHz	-	-
BT-BR(1Mbps)	4.78	0.00301
BT-EDR(2Mbps)	3.74	0.00237
BT-EDR(3Mbps)	4.07	0.00255

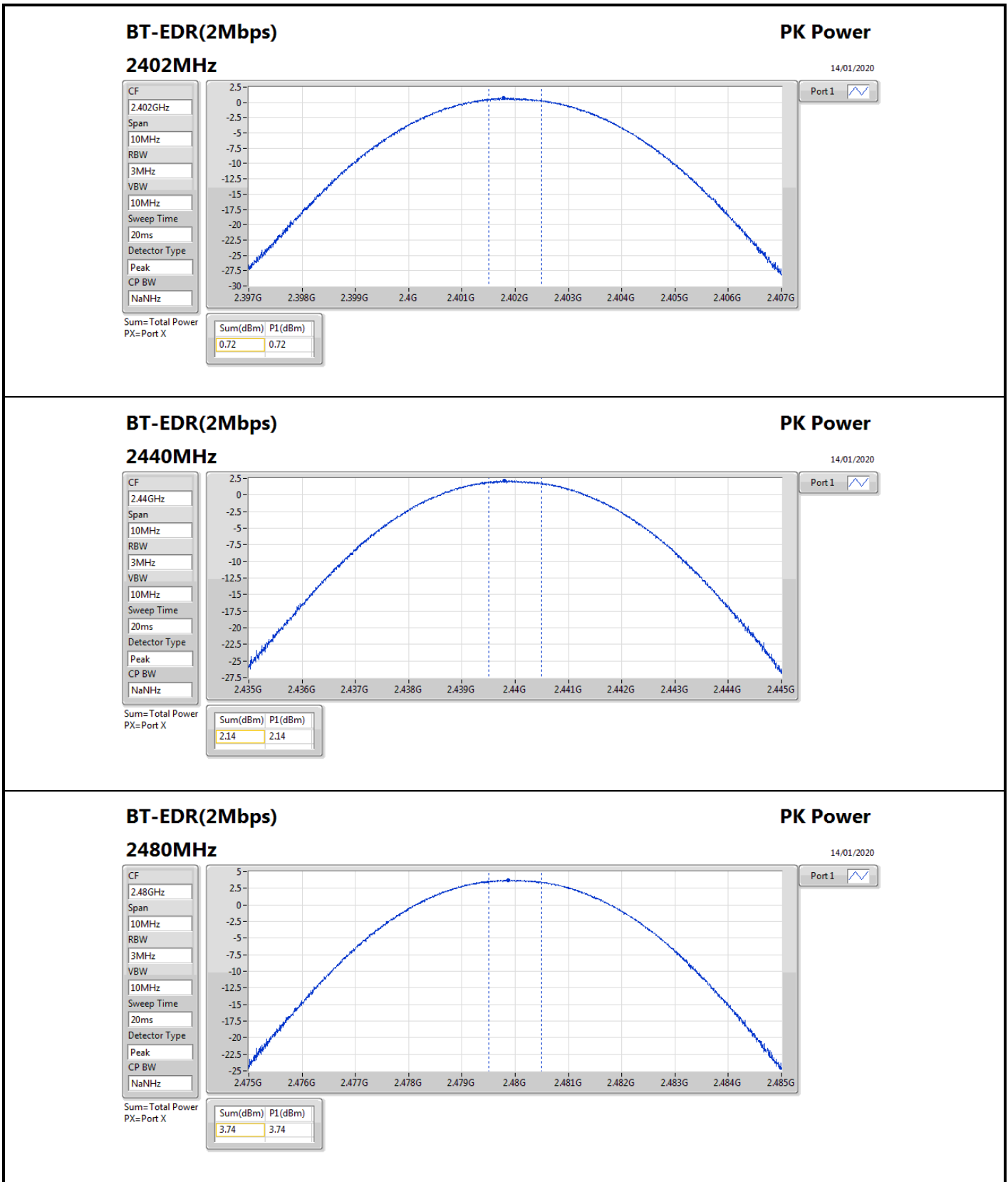


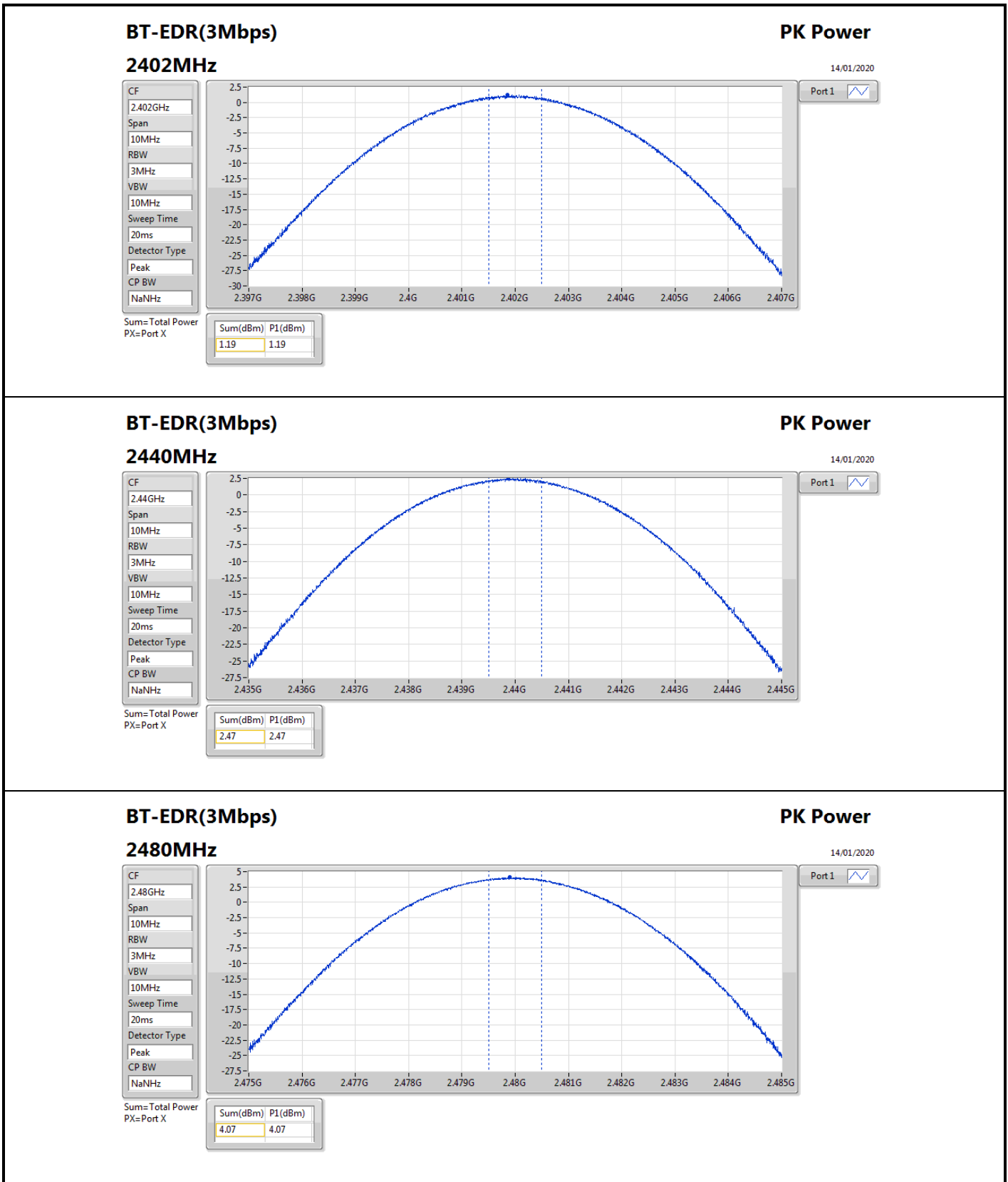
Result

Mode	Result	Gain (dBi)	Power (dBm)	Power Limit (dBm)
BT-BR(1Mbps)	-	-	-	-
2402MHz	Pass	2.80	2.36	21.00
2440MHz	Pass	2.80	3.44	21.00
2480MHz	Pass	2.80	4.78	21.00
BT-EDR(2Mbps)	-	-	-	-
2402MHz	Pass	2.80	0.72	21.00
2440MHz	Pass	2.80	2.14	21.00
2480MHz	Pass	2.80	3.74	21.00
BT-EDR(3Mbps)	-	-	-	-
2402MHz	Pass	2.80	1.19	21.00
2440MHz	Pass	2.80	2.47	21.00
2480MHz	Pass	2.80	4.07	21.00

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











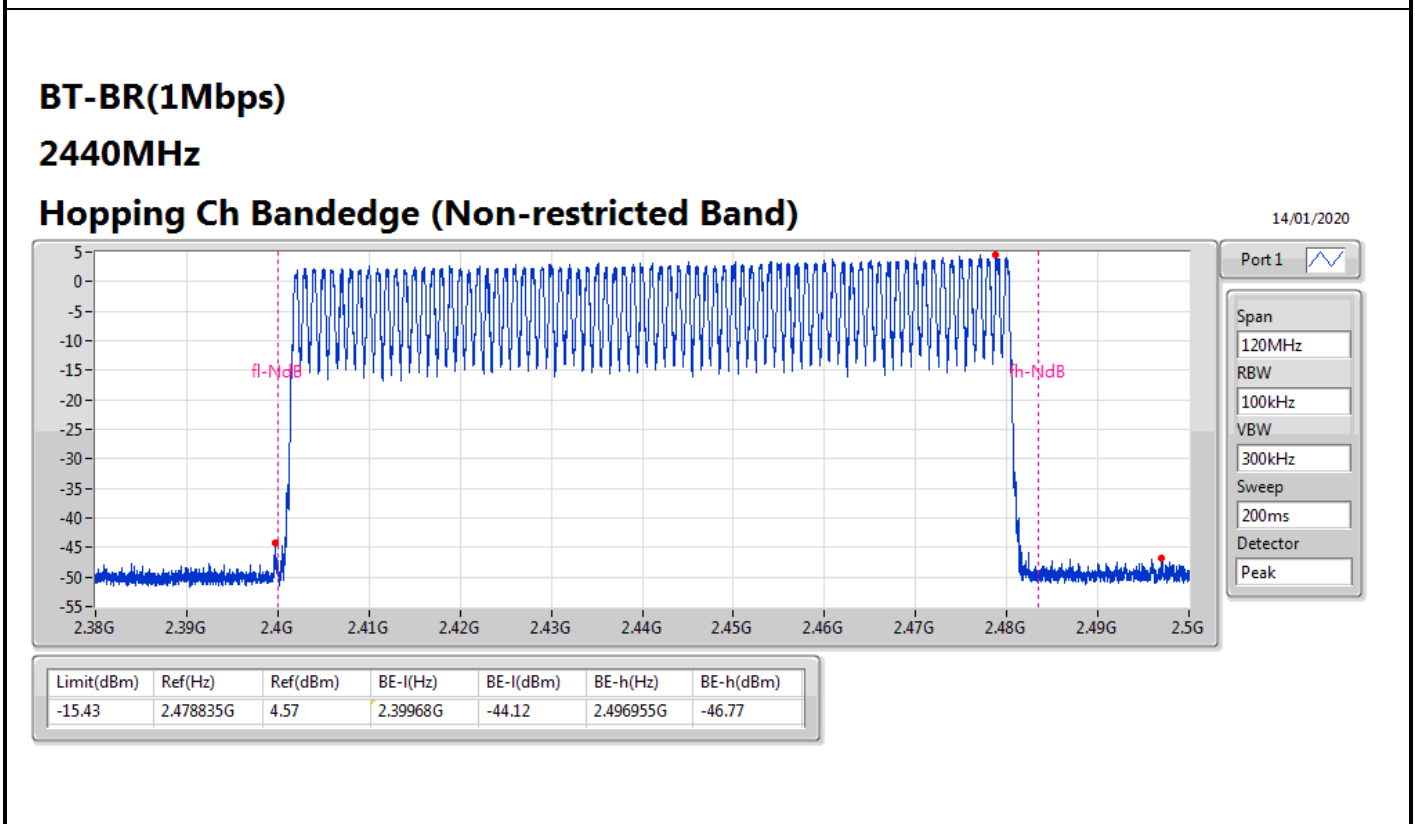
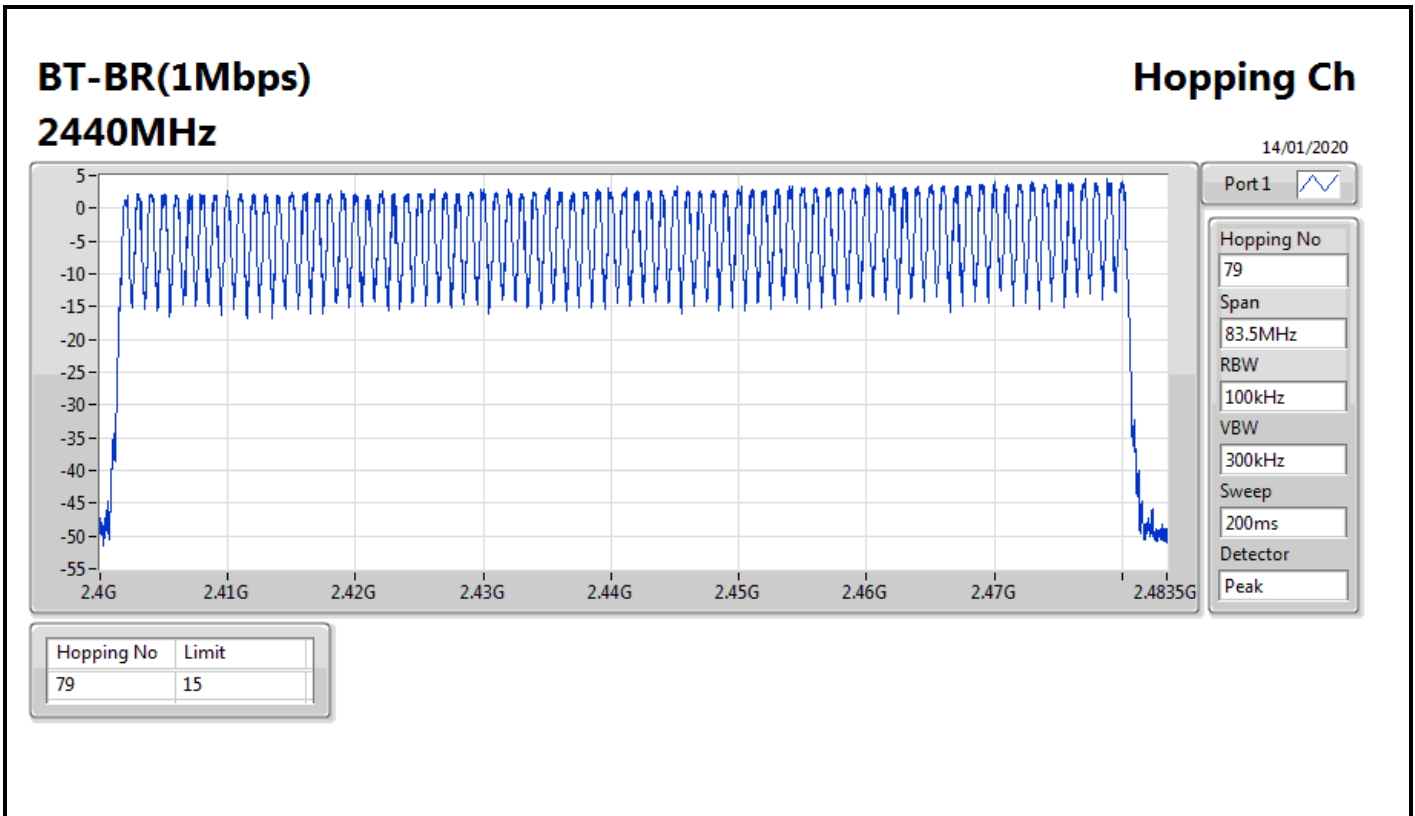
**Summary**

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



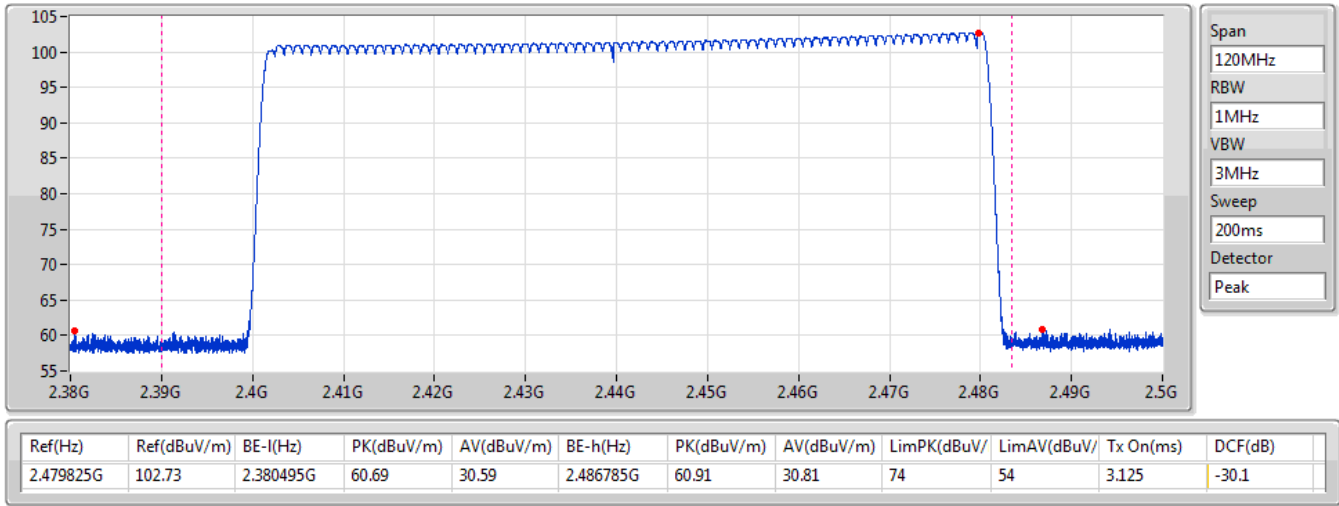
**Result**

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



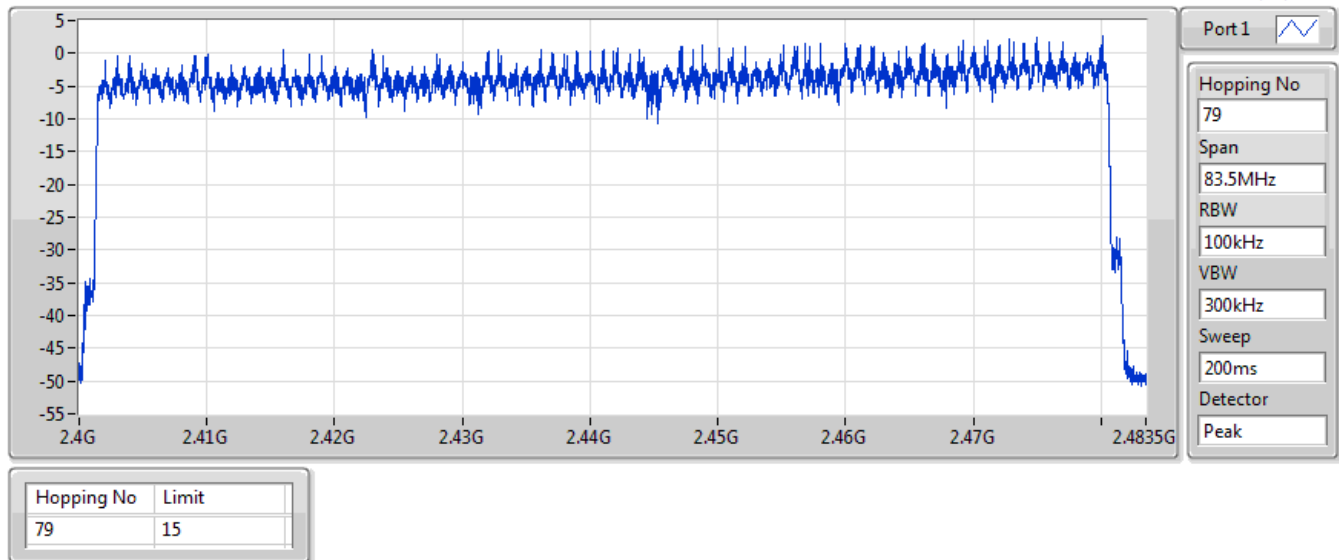
**BT-BR(1Mbps)**  
**2440MHz**  
**Hopping Ch Bandedge (Restricted Band)**

14/01/2020



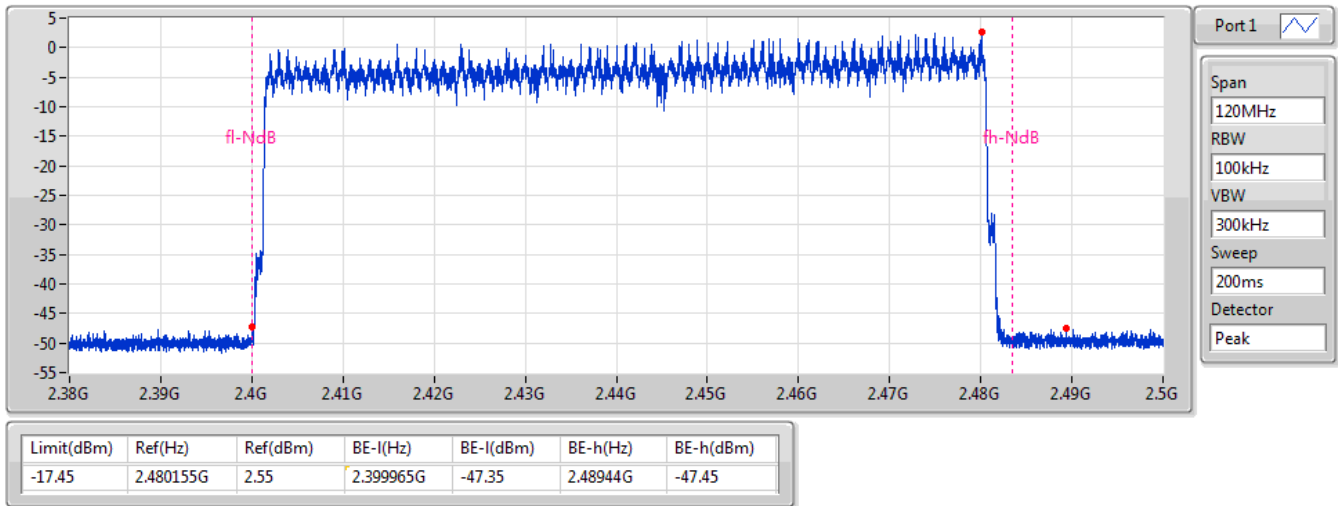
**BT-EDR(2Mbps)** **Hopping Ch**  
**2440MHz**

14/01/2020



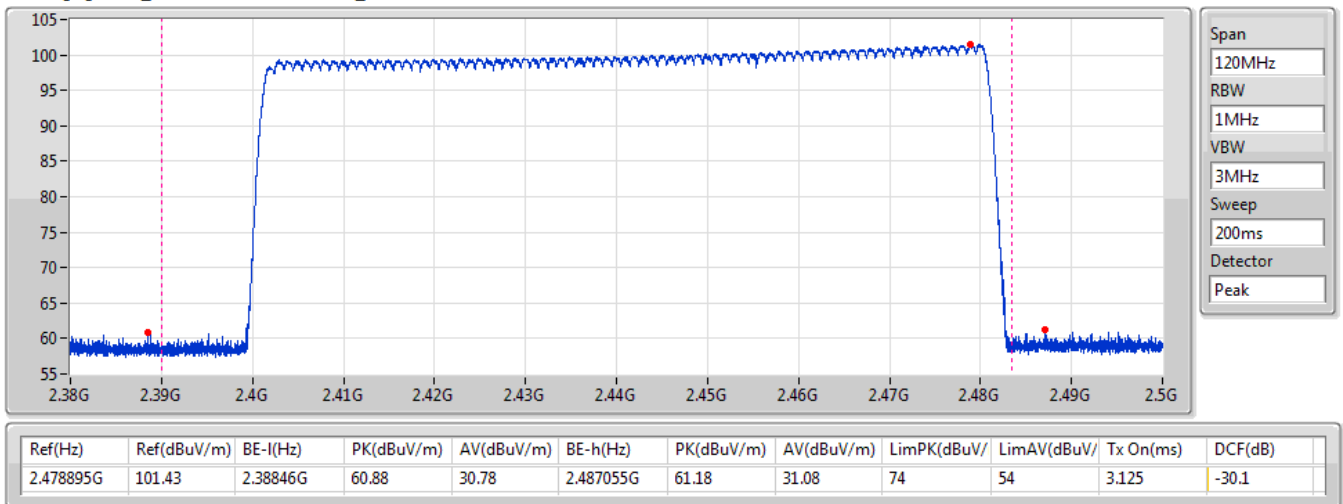
**BT-EDR(2Mbps)**  
**2440MHz**  
**Hopping Ch Bandedge (Non-restricted Band)**

14/01/2020



**BT-EDR(2Mbps)**  
**2440MHz**  
**Hopping Ch Bandedge (Restricted Band)**

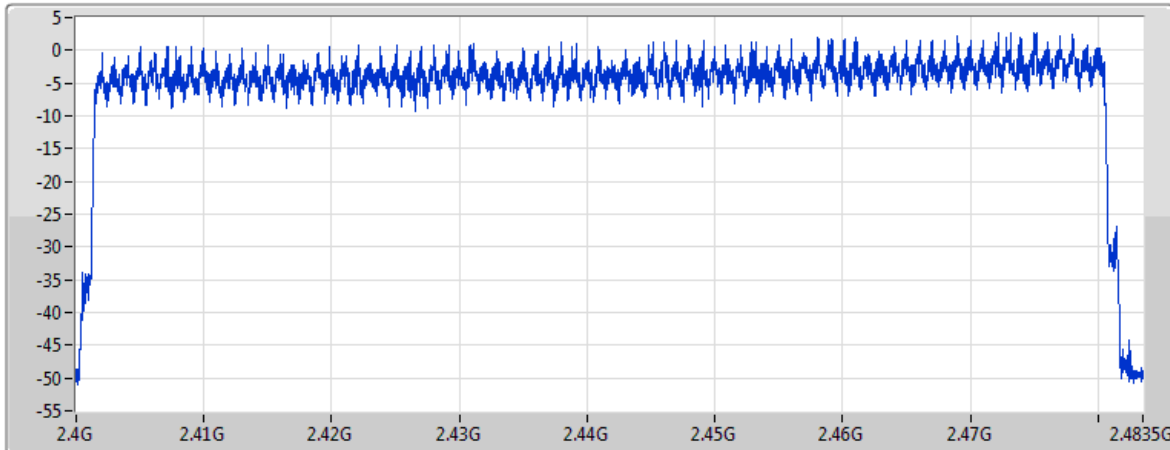
14/01/2020




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

**Hopping Ch**

14/01/2020



Port 1 

Hopping No  
79

Span  
83.5MHz

RBW  
100kHz

VBW  
300kHz

Sweep  
200ms

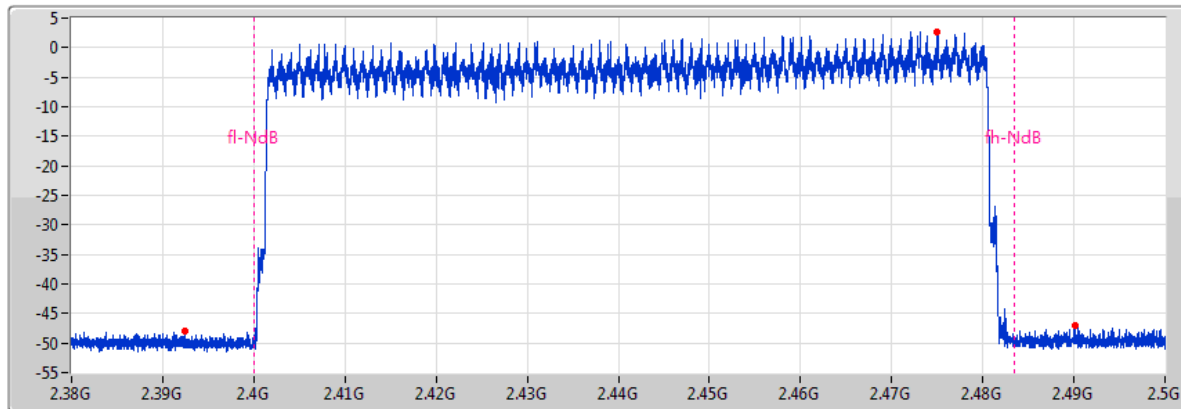
Detector  
Peak


Hopping No	Limit
79	15

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

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

14/01/2020



Port 1 

Span  
120MHz

RBW  
100kHz

VBW  
300kHz

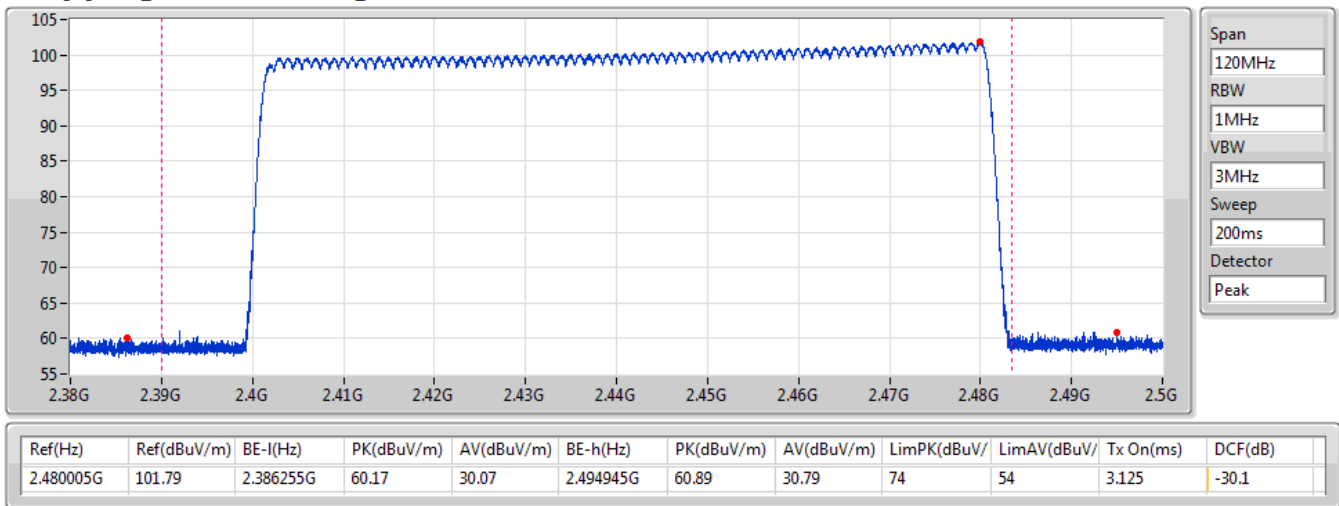
Sweep  
200ms

Detector  
Peak

Limit(dBm)	Ref(Hz)	Ref(dBm)	BE-l(Hz)	BE-l(dBm)	BE-h(Hz)	BE-h(dBm)
-17.27	2.474995G	2.73	2.39245G	-48.07	2.490175G	-46.92

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

14/01/2020





**Summary**

<b>Mode</b>	<b>Max-Dwell (s)</b>
2.4-2.4835GHz	-
BT-BR(1Mbps)	309.43315m
BT-EDR(2Mbps)	310.33925m
BT-EDR(3Mbps)	162.16525m





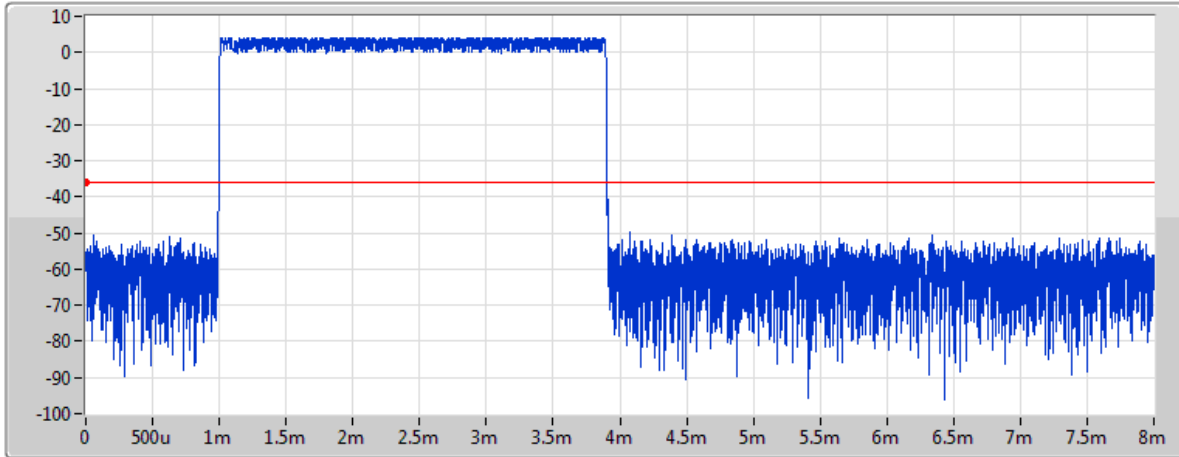
**Result**

Mode	Result	Period (s)	Dwell (s)	Limit (s)	Tx On (s)
BT-BR(1Mbps)	-	-	-	-	-
2440MHz	Pass	31.6	309.43315m	400m	2.90275m
BT-EDR(2Mbps)	-	-	-	-	-
2440MHz	Pass	31.6	310.33925m	400m	2.91125m
BT-EDR(3Mbps)	-	-	-	-	-
2440MHz	Pass	31.6	162.16525m	400m	1.52125m

### BT-BR(1Mbps)

2440MHz

14/01/2020



Port 1 

Ch Freq  
2.44GHz

RBW  
300kHz

VBW  
1MHz

Sweep Time  
8ms

TX Time  
2.90275ms

non AFH Mode

Period(s)	Dwell(s)	Limit(s)	Tx On(s)
31.6	309.43315m	400m	2.90275m

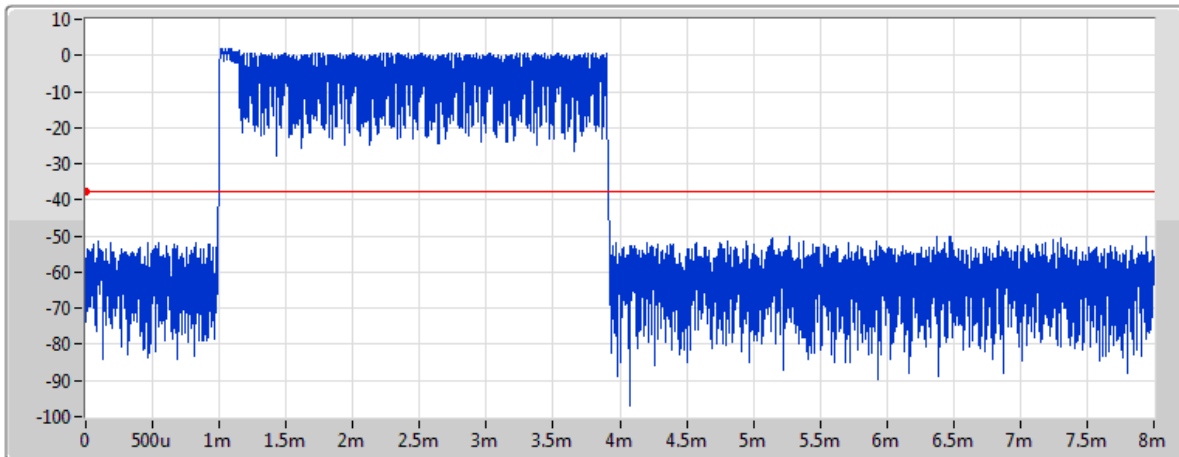
AFH Mode

Period(s)	Dwell(s)	Limit(s)	Tx On(s)
8	154.716575m	400m	2.90275m

### BT-EDR(2Mbps)

2440MHz

14/01/2020



Port 1 

Ch Freq  
2.44GHz

RBW  
300kHz

VBW  
1MHz

Sweep Time  
8ms

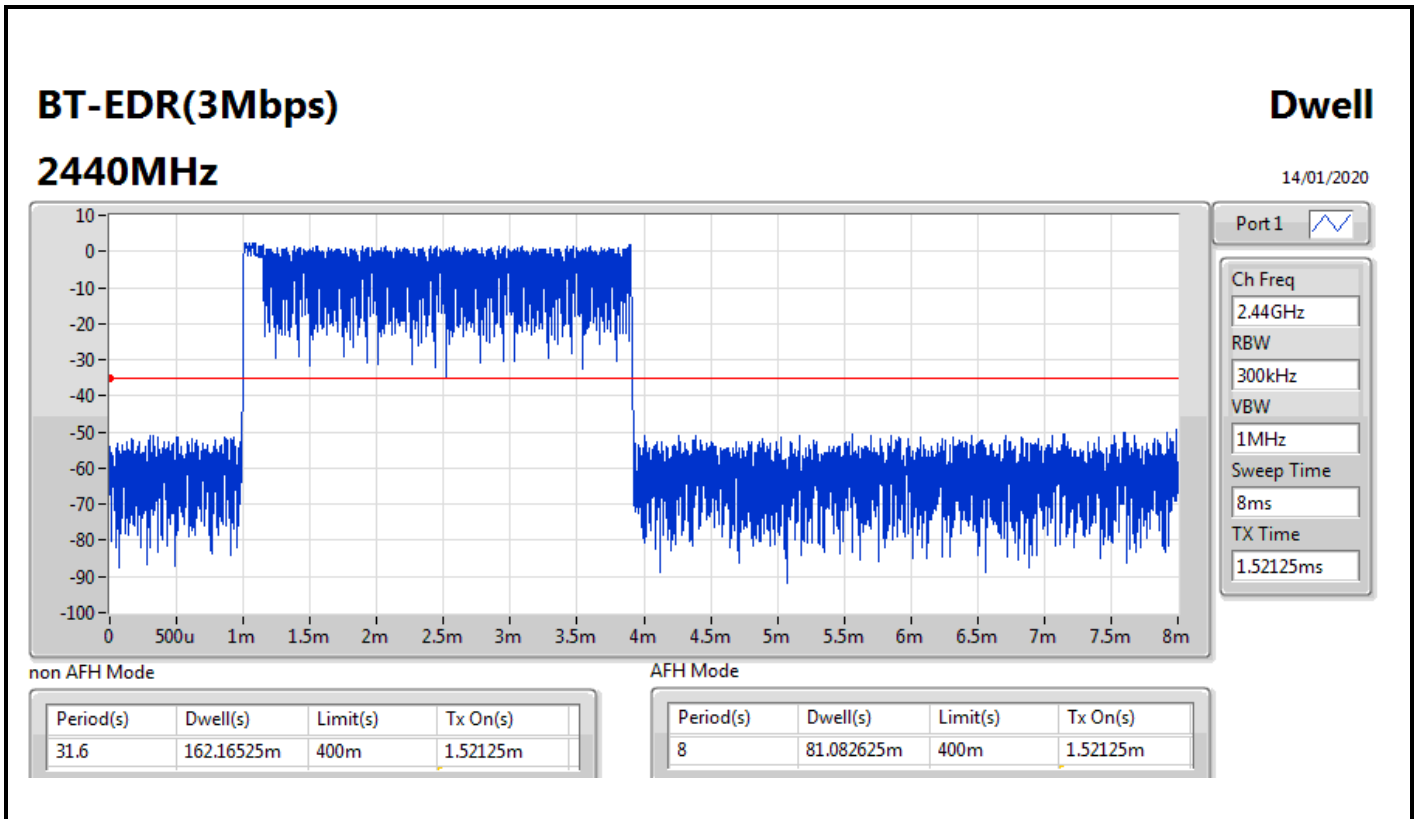
TX Time  
2.91125ms

non AFH Mode

Period(s)	Dwell(s)	Limit(s)	Tx On(s)
31.6	310.33925m	400m	2.91125m

AFH Mode

Period(s)	Dwell(s)	Limit(s)	Tx On(s)
8	155.169625m	400m	2.91125m





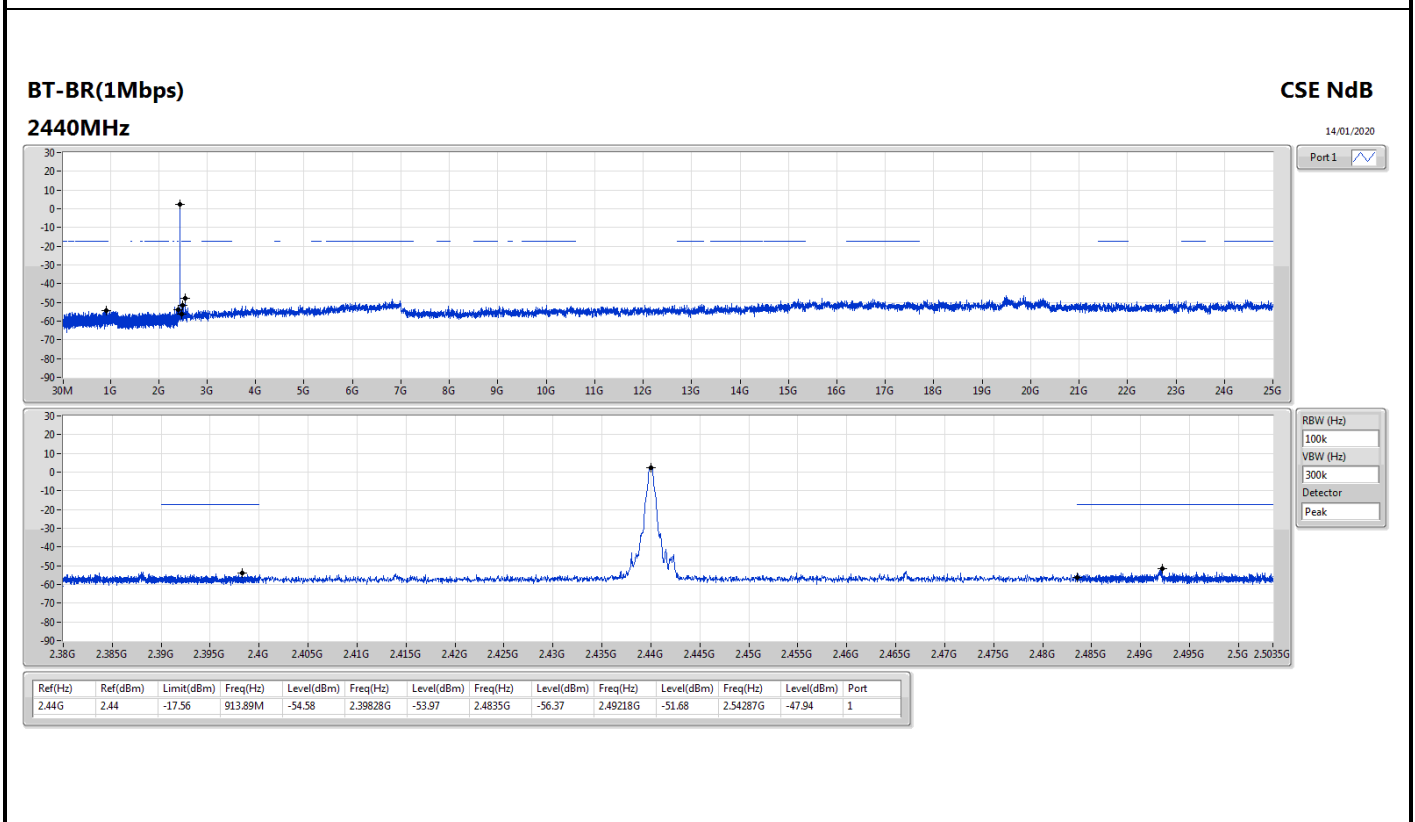
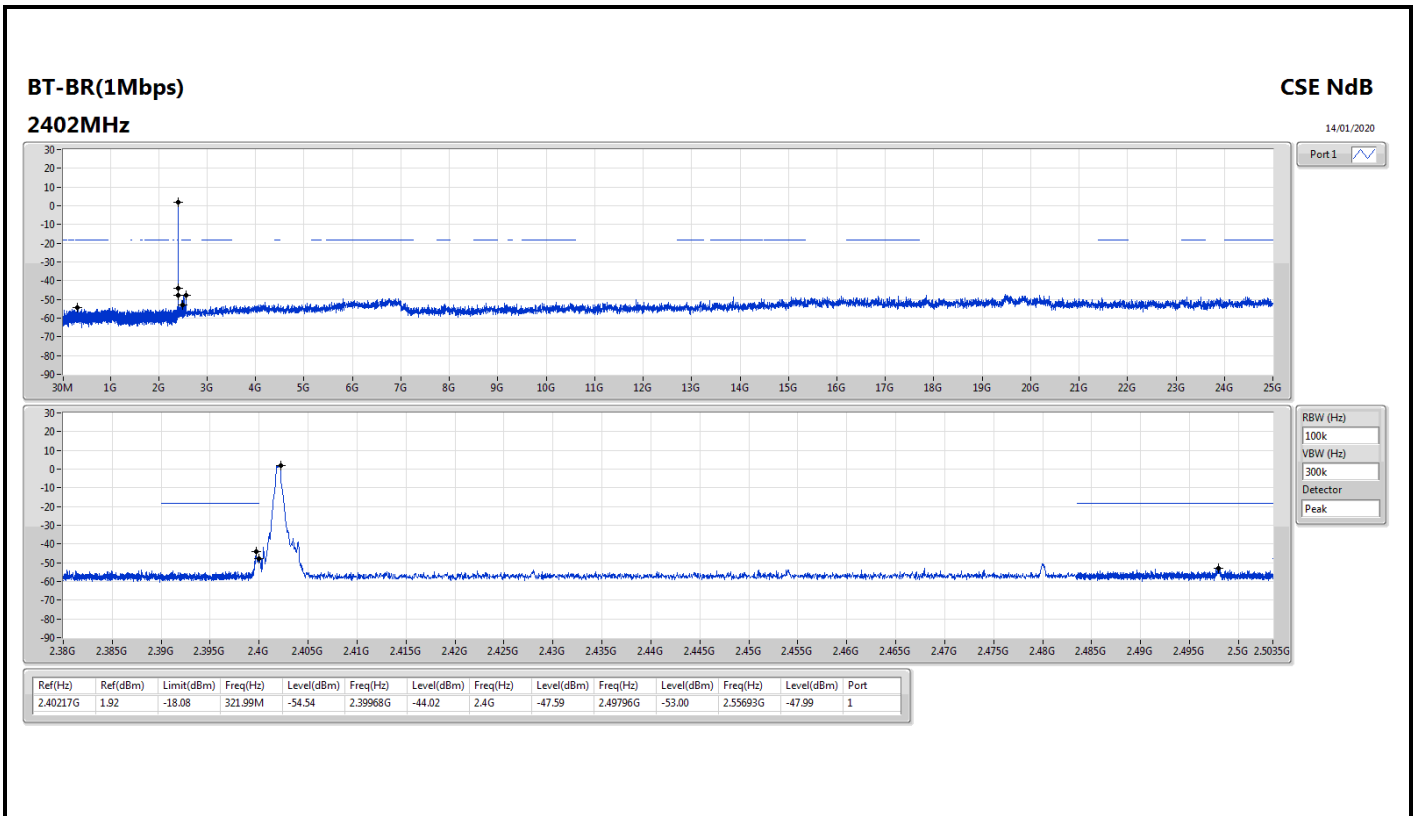
Summary

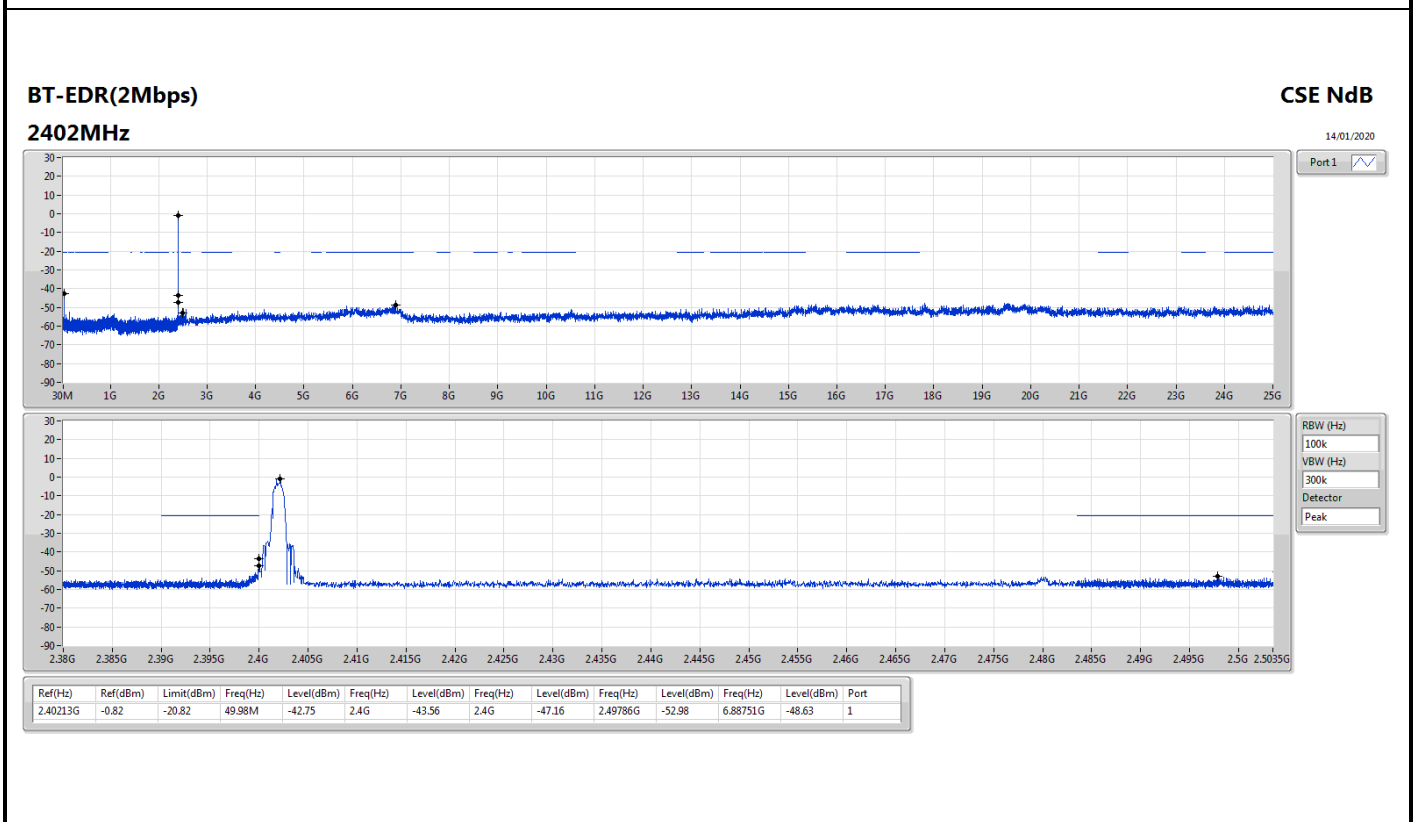
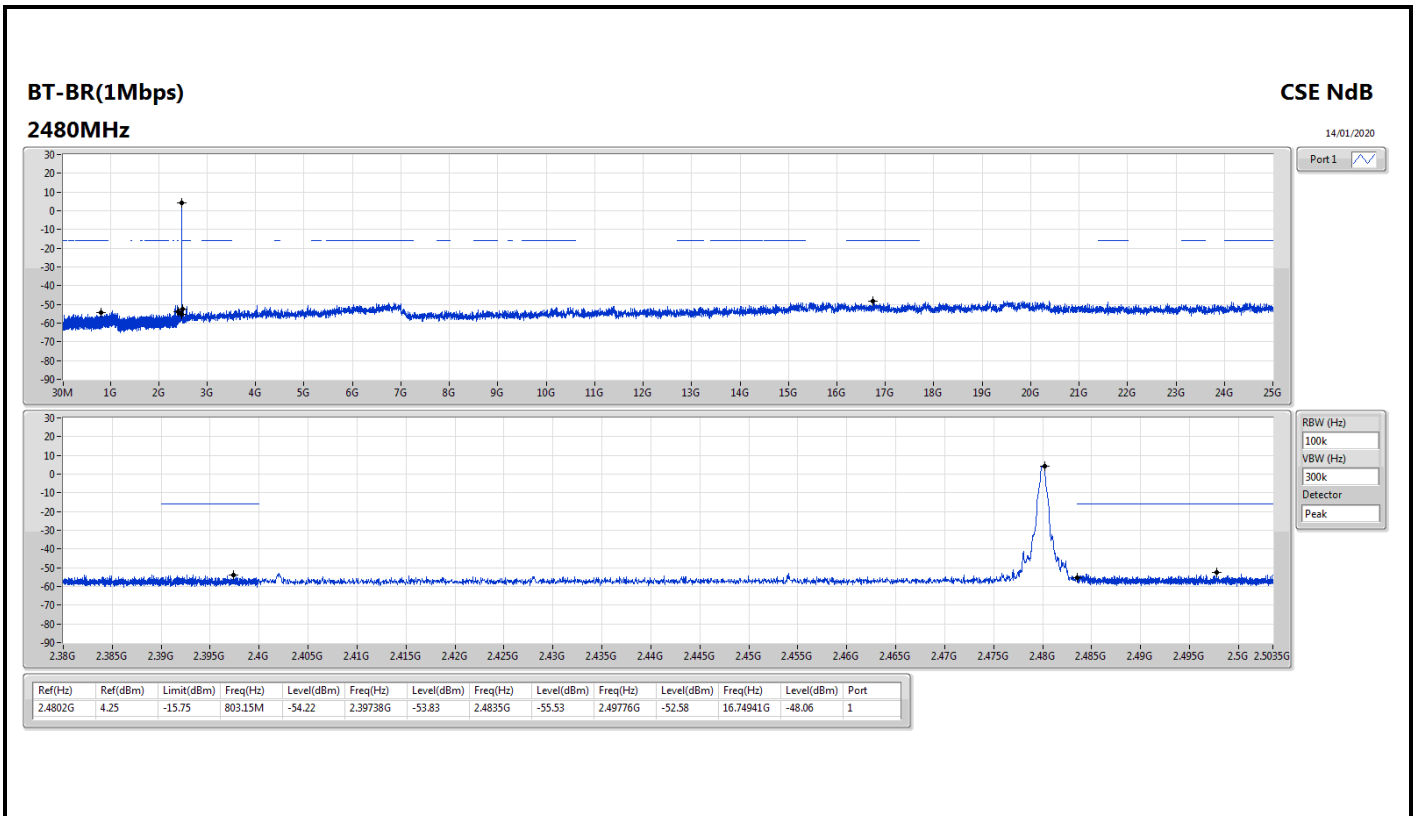
Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BT-BR(1Mbps)	Pass	2.40217G	1.92	-18.08	321.99M	-54.54	2.39968G	-44.02	2.4G	-47.59	2.49796G	-53.00	2.55693G	-47.99	1
BT-EDR(2Mbps)	Pass	2.40213G	-0.82	-20.82	49.98M	-42.75	2.4G	-43.56	2.4G	-47.16	2.49786G	-52.98	6.88751G	-48.63	1
BT-EDR(3Mbps)	Pass	2.40213G	-0.54	-20.54	49.98M	-43.09	2.4G	-43.57	2.4G	-43.40	2.49378G	-53.71	16.76347G	-47.97	1

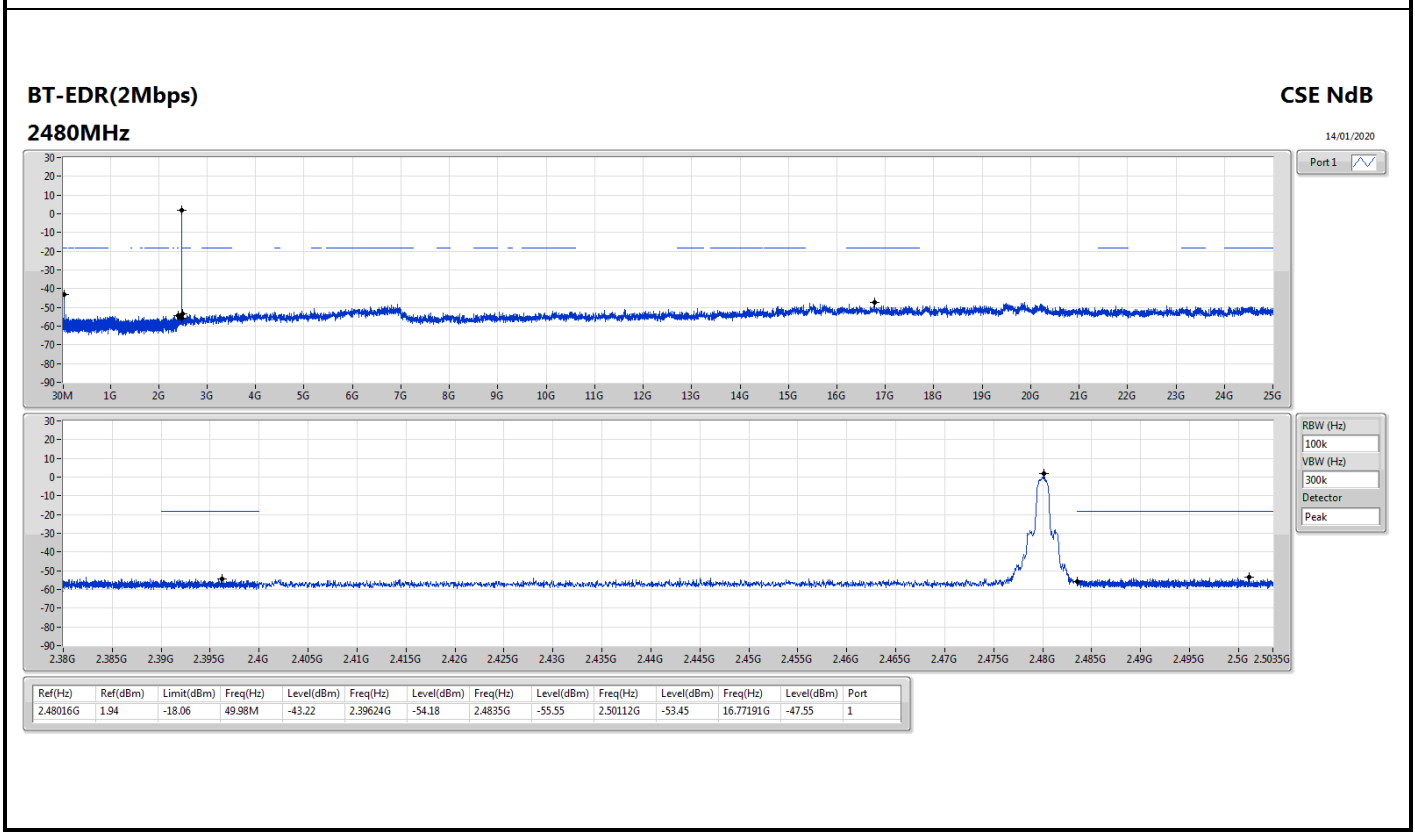
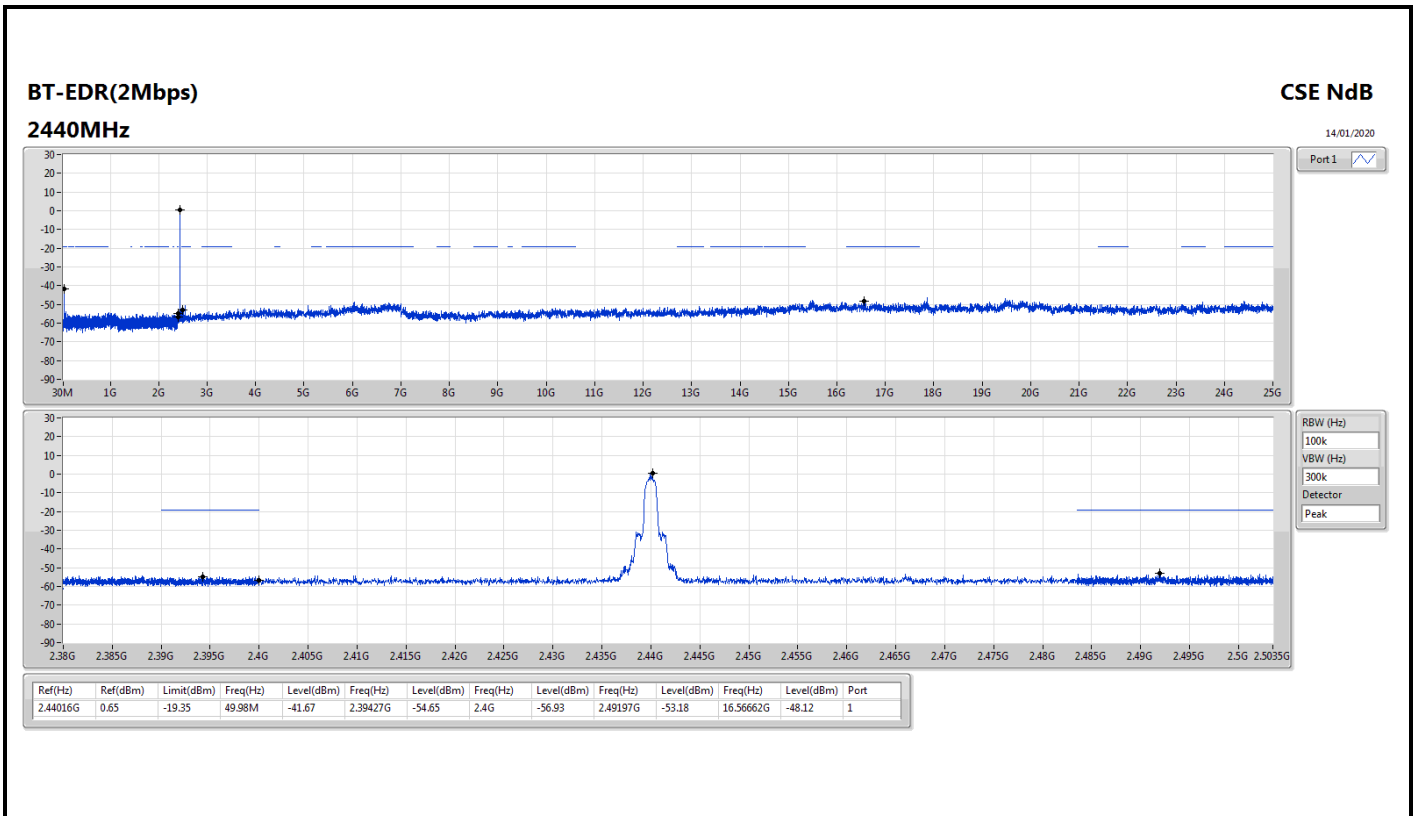


Result

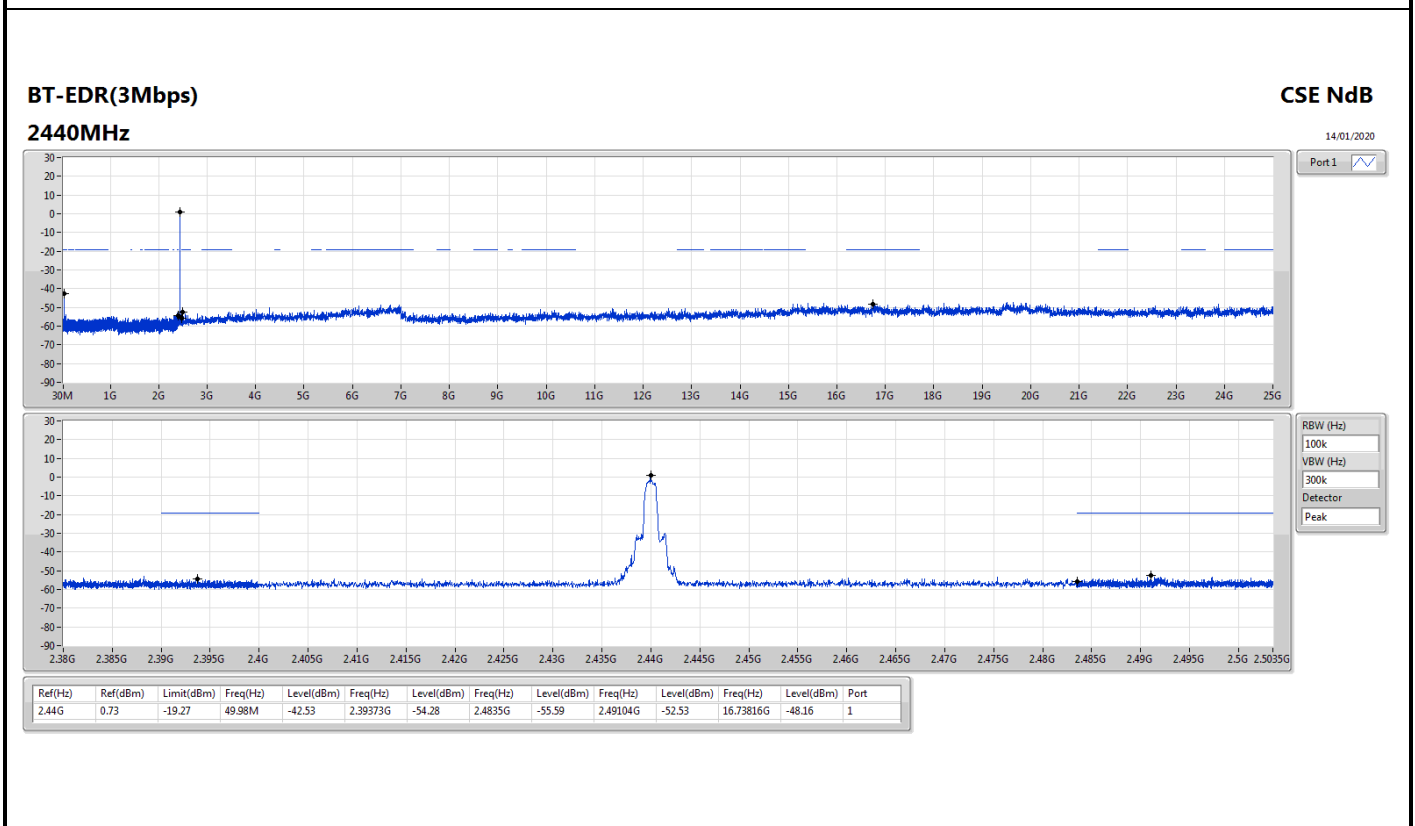
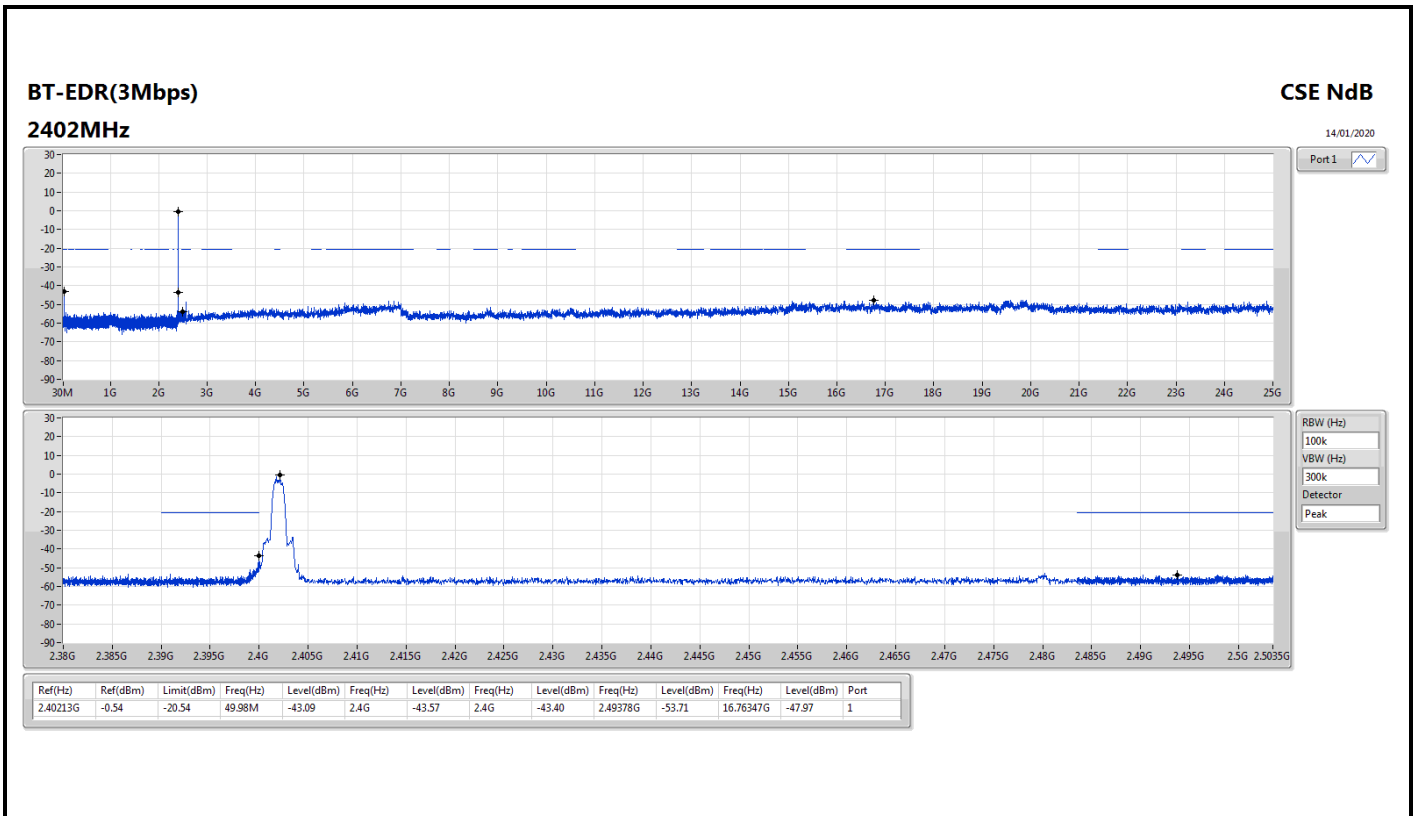
Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
BT-BR(1Mbps)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	2.40217G	1.92	-18.08	321.99M	-54.54	2.39968G	-44.02	2.4G	-47.59	2.49796G	-53.00	2.55693G	-47.99	1
2440MHz	Pass	2.44G	2.44	-17.56	913.89M	-54.58	2.39828G	-53.97	2.4835G	-56.37	2.49218G	-51.68	2.54287G	-47.94	1
2480MHz	Pass	2.4802G	4.25	-15.75	803.15M	-54.22	2.39738G	-53.83	2.4835G	-55.53	2.49776G	-52.58	16.74941G	-48.06	1
BT-EDR(2Mbps)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	2.40213G	-0.82	-20.82	49.98M	-42.75	2.4G	-43.56	2.4G	-47.16	2.49786G	-52.98	6.88751G	-48.63	1
2440MHz	Pass	2.44016G	0.65	-19.35	49.98M	-41.67	2.39427G	-54.65	2.4G	-56.93	2.49197G	-53.18	16.56662G	-48.12	1
2480MHz	Pass	2.48016G	1.94	-18.06	49.98M	-43.22	2.39624G	-54.18	2.4835G	-55.55	2.50112G	-53.45	16.77191G	-47.55	1
BT-EDR(3Mbps)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	2.40213G	-0.54	-20.54	49.98M	-43.09	2.4G	-43.57	2.4G	-43.40	2.49378G	-53.71	16.76347G	-47.97	1
2440MHz	Pass	2.44G	0.73	-19.27	49.98M	-42.53	2.39373G	-54.28	2.4835G	-55.59	2.49104G	-52.53	16.73816G	-48.16	1
2480MHz	Pass	2.47983G	2.78	-17.22	49.98M	-42.75	2.39239G	-54.57	2.4835G	-53.91	2.48454G	-52.54	24.84252G	-48.46	1

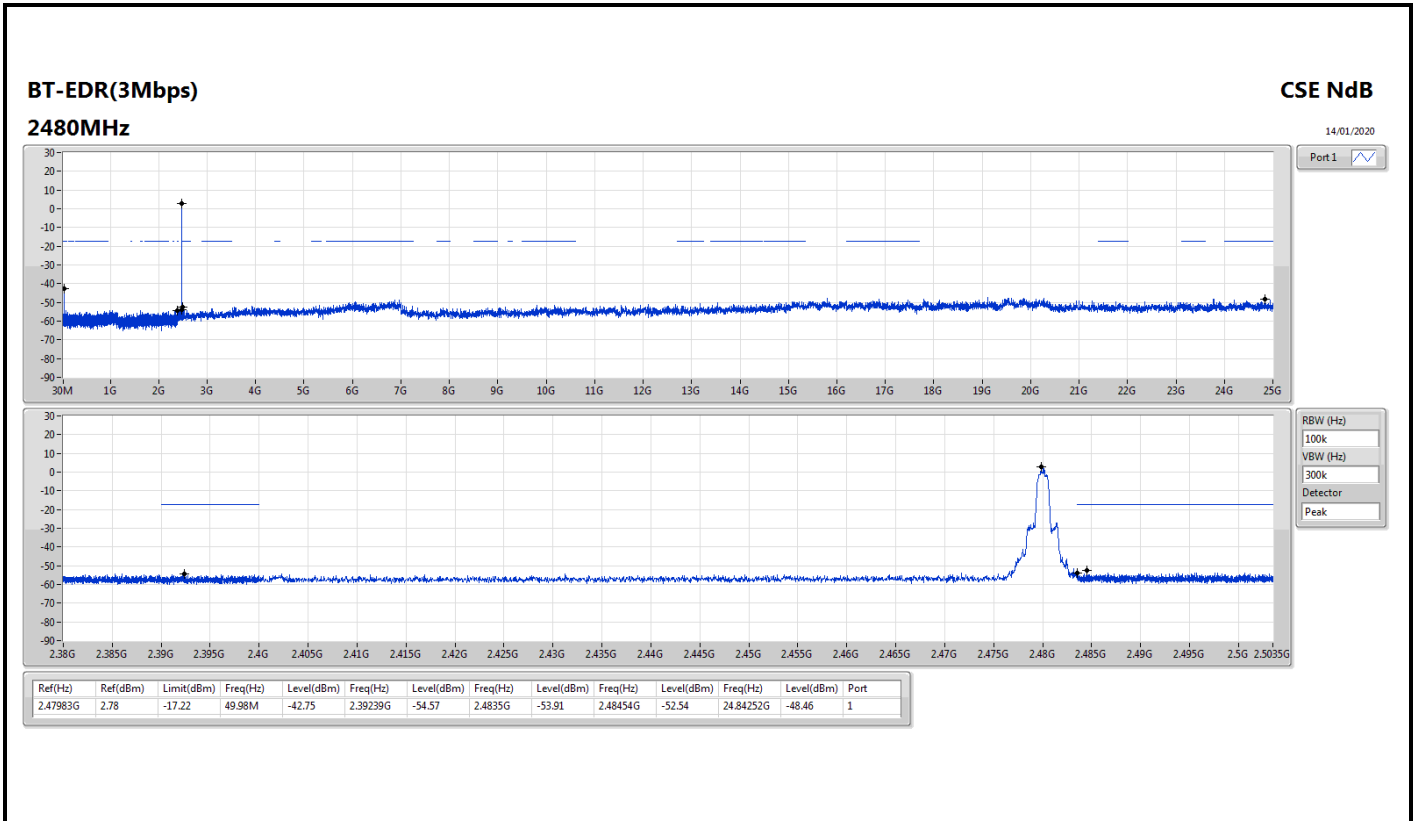






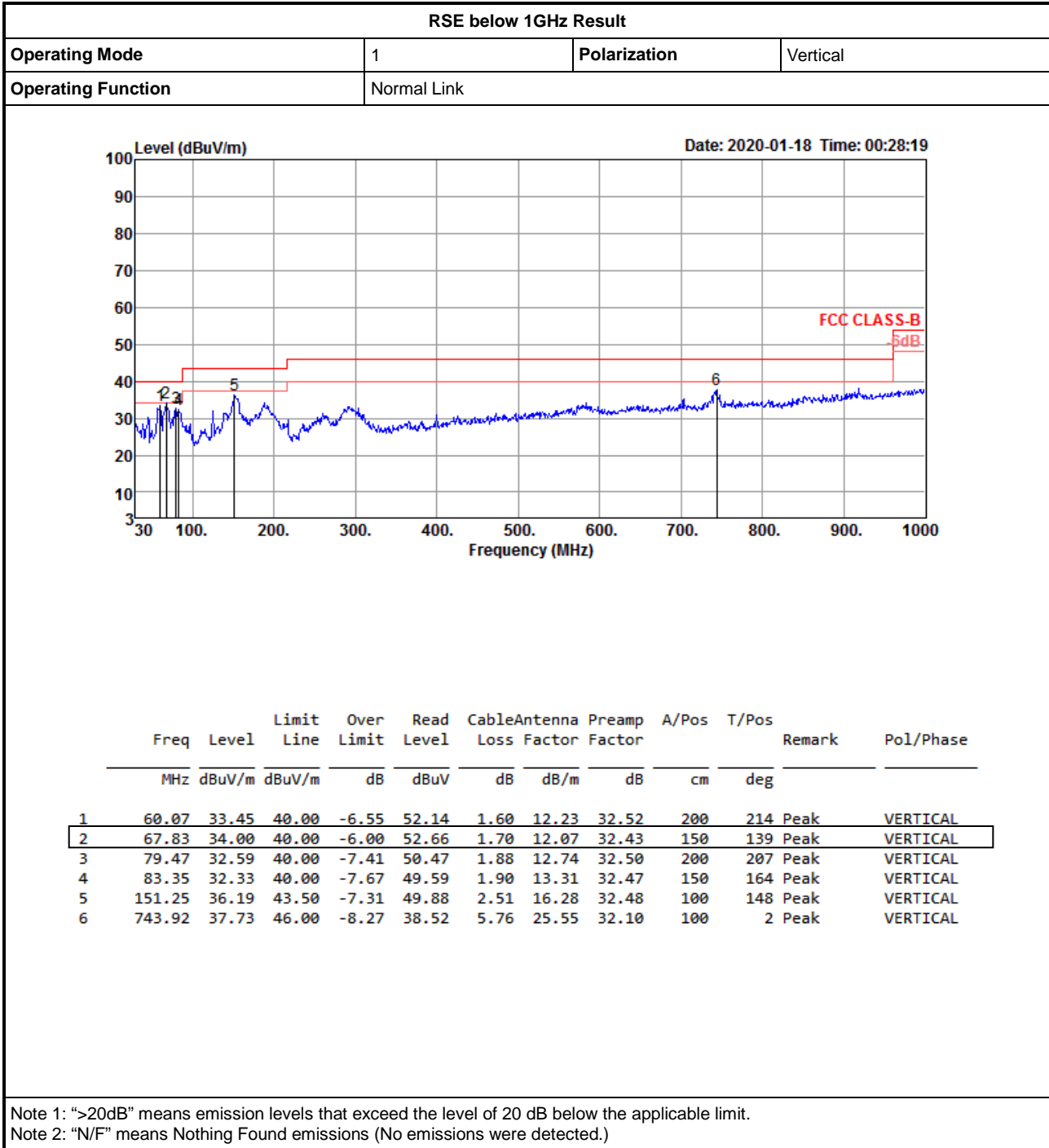


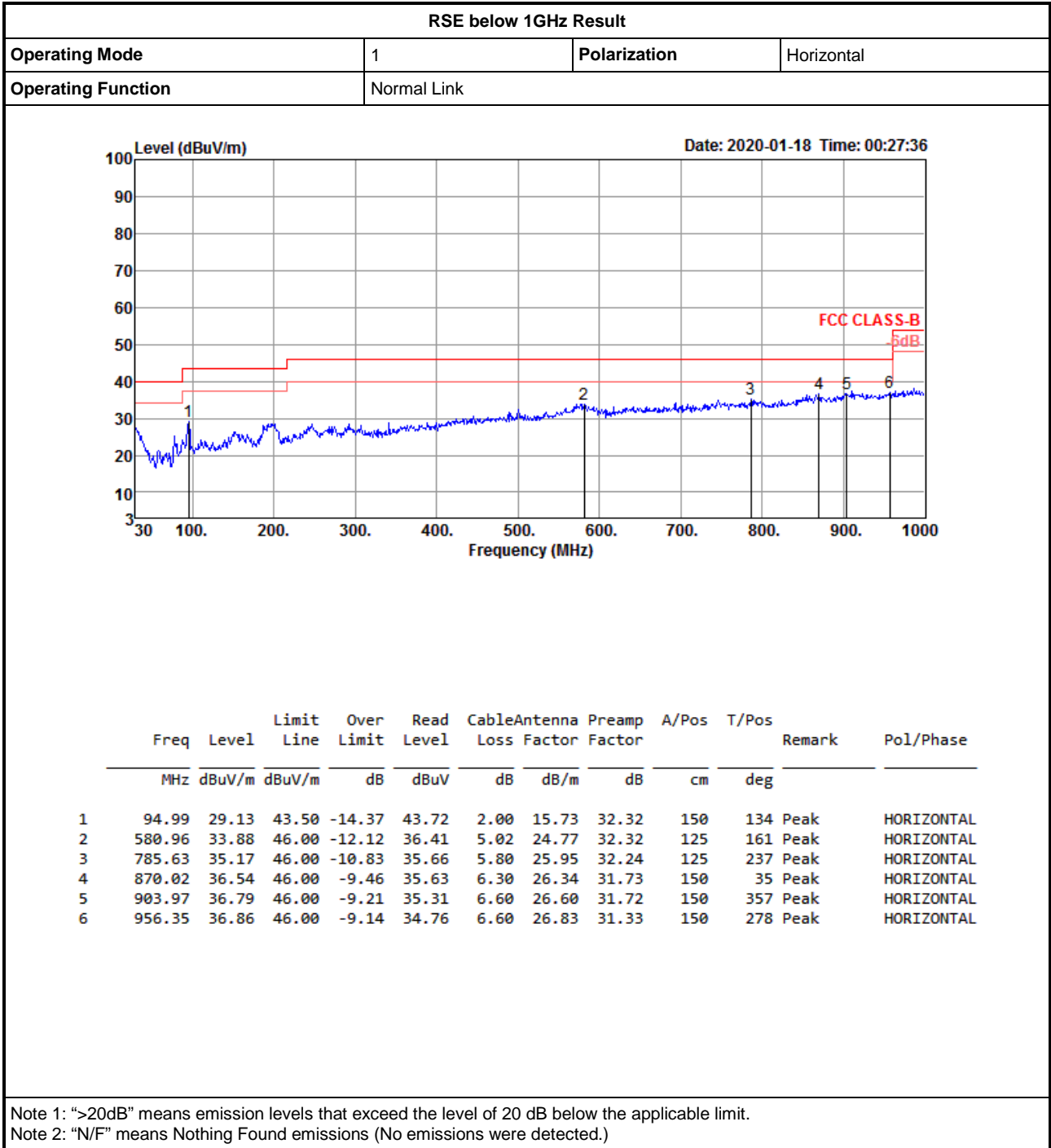






RSE below 1GHz Result







Summary

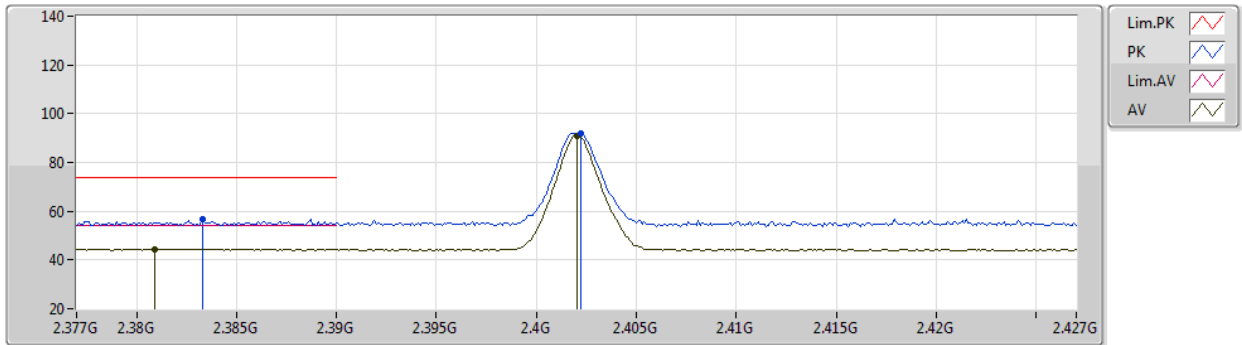
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-
BT-BR(1Mbps)	Pass	AV	2.4835G	47.26	54.00	-6.74	3	Horizontal	5	2.86	-



BT-BR(1Mbps)

13/01/2020

2402MHz\_TX



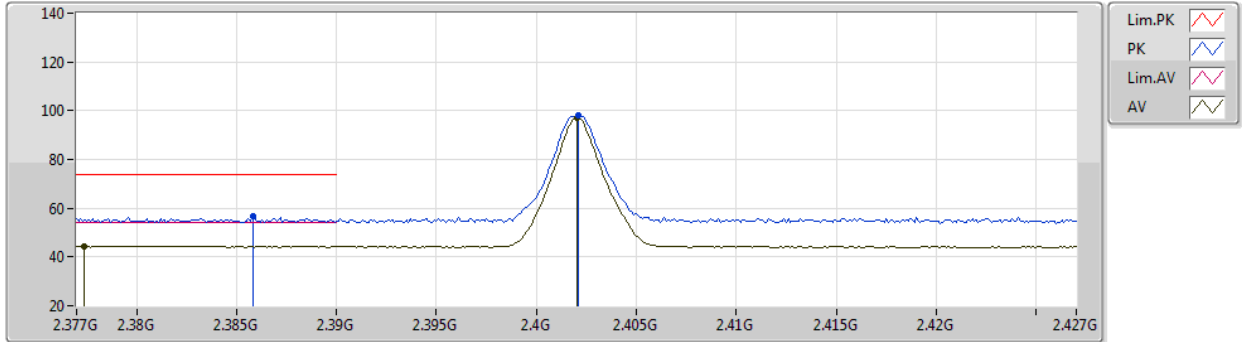
EUT Z\_1TX  
Setting 0x08  
06-E-S-5

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	2.3833G	56.73	74.00	-17.27	25.09	3	Vertical	240	1.14	-	27.65	3.99	-
AV	2.3809G	44.42	54.00	-9.58	12.77	3	Vertical	240	1.14	-	27.66	3.99	-
PK	2.4022G	92.07	Inf	-Inf	60.48	3	Vertical	240	1.14	-	27.59	4.00	-
AV	2.402G	91.11	Inf	-Inf	59.52	3	Vertical	240	1.14	-	27.59	4.00	-

**BT-BR(1Mbps)**

13/01/2020

**2402MHz\_TX**



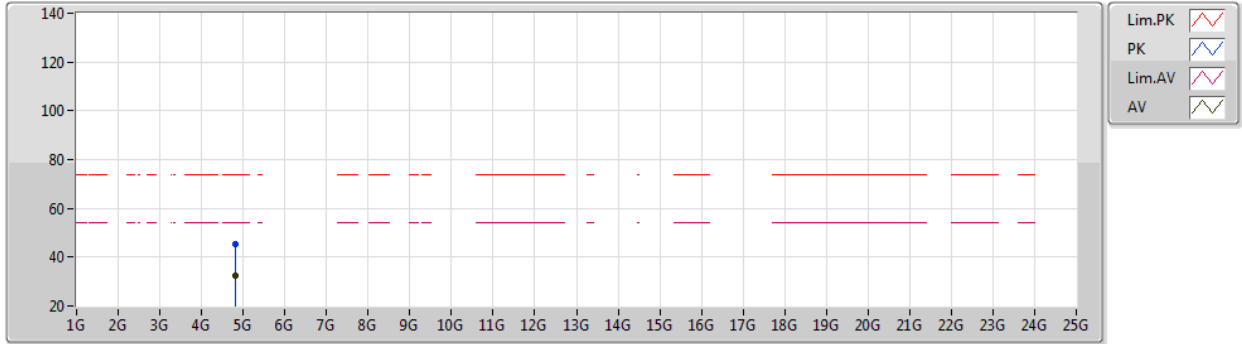
EUT Z\_1TX  
Setting 0x08  
06-E-S-5

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	2.3858G	56.83	74.00	-17.17	25.20	3	Horizontal	13	1.07	-	27.64	3.99	-
AV	2.3774G	44.34	54.00	-9.66	12.68	3	Horizontal	13	1.07	-	27.67	3.99	-
PK	2.4021G	97.91	Inf	-Inf	66.32	3	Horizontal	13	1.07	-	27.59	4.00	-
AV	2.402G	97.01	Inf	-Inf	65.42	3	Horizontal	13	1.07	-	27.59	4.00	-

**BT-BR(1Mbps)**

13/01/2020

**2402MHz\_TX**



EUT\_Z\_1TX  
Setting 0x08  
06-E-S-5

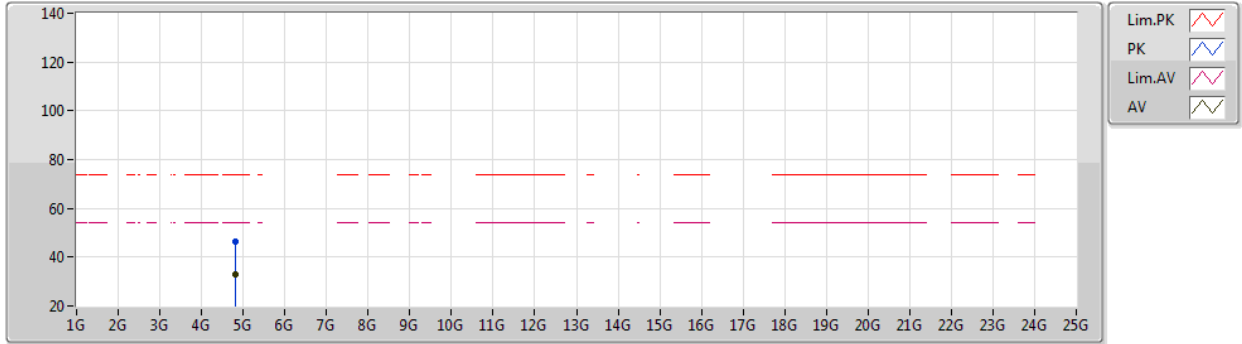
Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	4.80483G	45.58	74.00	-28.42	40.95	3	Vertical	287	1.07	-	31.00	5.31	31.68
AV	4.80386G	32.60	54.00	-21.40	27.97	3	Vertical	287	1.07	-	31.00	5.31	31.68



**BT-BR(1Mbps)**

13/01/2020

**2402MHz\_TX**



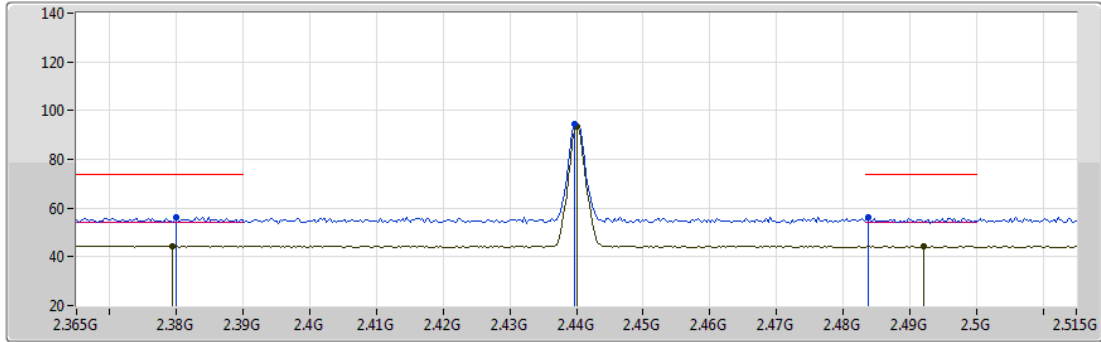
EUT\_Z\_1TX  
Setting 0x08  
06-E-S-5

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	4.80521G	46.53	74.00	-27.47	41.89	3	Horizontal	283	1.22	-	31.01	5.31	31.68
AV	4.80408G	32.76	54.00	-21.24	28.13	3	Horizontal	283	1.22	-	31.00	5.31	31.68

**BT-BR(1Mbps)**

13/01/2020

**2440MHz\_TX**



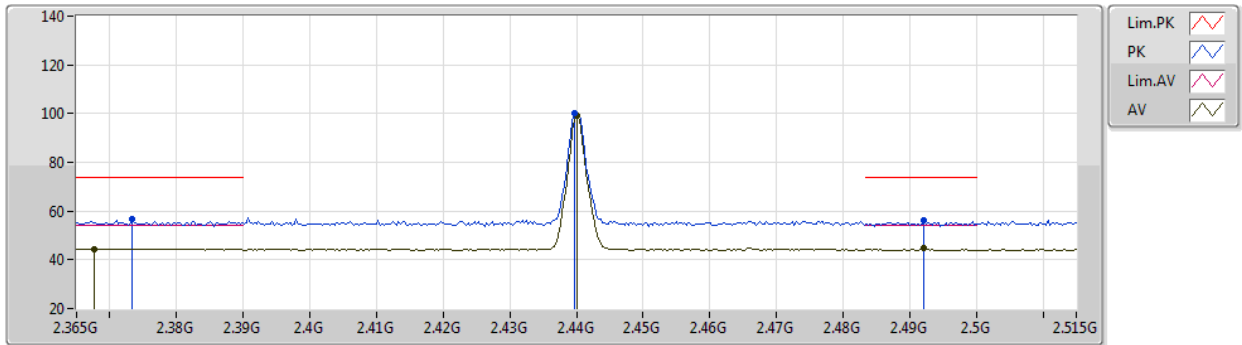
EUT\_Z\_1TX  
Setting 0x08  
06-E-S-5

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	2.38G	56.29	74.00	-17.71	24.64	3	Vertical	45	1.14	-	27.66	3.99	-
AV	2.3794G	44.37	54.00	-9.63	12.72	3	Vertical	45	1.14	-	27.66	3.99	-
PK	2.4397G	94.55	Inf	-Inf	63.05	3	Vertical	45	1.14	-	27.48	4.02	-
AV	2.44G	93.62	Inf	-Inf	62.12	3	Vertical	45	1.14	-	27.48	4.02	-
PK	2.4838G	55.96	74.00	-18.04	24.57	3	Vertical	45	1.14	-	27.35	4.04	-
AV	2.4922G	44.19	54.00	-9.81	12.82	3	Vertical	45	1.14	-	27.32	4.05	-

**BT-BR(1Mbps)**

13/01/2020

**2440MHz\_TX**



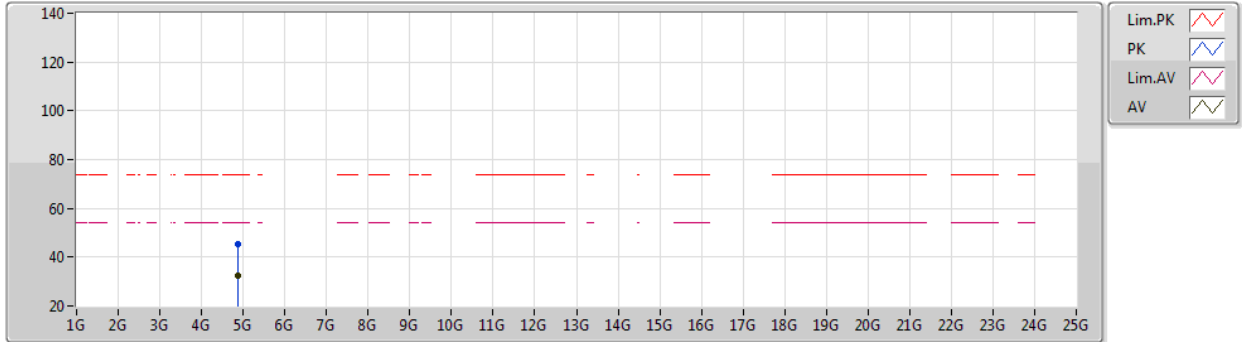
EUT\_Z\_1TX  
Setting 0x08  
06-E-S-5

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	2.3734G	56.82	74.00	-17.18	25.15	3	Horizontal	9	1.05	-	27.68	3.99	-
AV	2.3677G	44.51	54.00	-9.49	12.83	3	Horizontal	9	1.05	-	27.70	3.98	-
PK	2.4397G	100.24	Inf	-Inf	68.74	3	Horizontal	9	1.05	-	27.48	4.02	-
AV	2.44G	99.30	Inf	-Inf	67.80	3	Horizontal	9	1.05	-	27.48	4.02	-
PK	2.4922G	55.95	74.00	-18.05	24.58	3	Horizontal	9	1.05	-	27.32	4.05	-
AV	2.4922G	44.57	54.00	-9.43	13.20	3	Horizontal	9	1.05	-	27.32	4.05	-

**BT-BR(1Mbps)**

13/01/2020

**2440MHz\_TX**



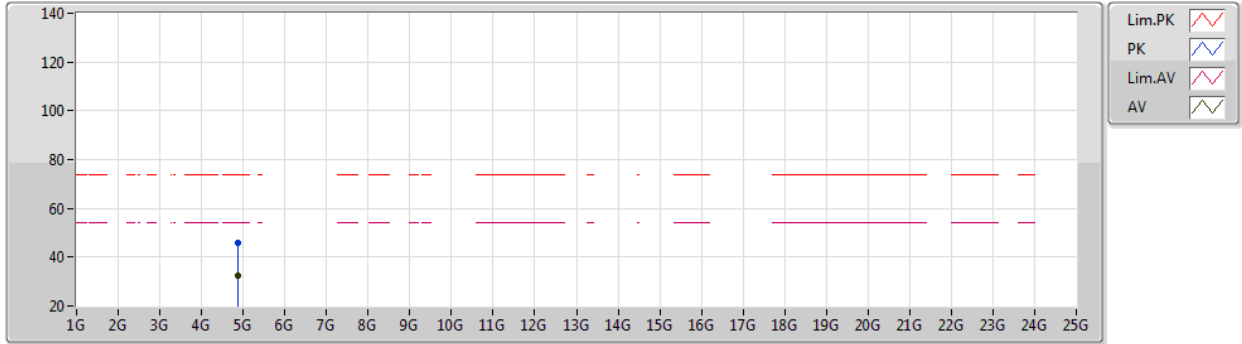
EUT\_Z\_1TX  
Setting 0x08  
06-E-S-5

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	4.87773G	45.37	74.00	-28.63	40.51	3	Vertical	11	2.80	-	31.08	5.41	31.63
AV	4.88043G	32.61	54.00	-21.39	27.75	3	Vertical	11	2.80	-	31.08	5.41	31.63

**BT-BR(1Mbps)**

13/01/2020

**2440MHz\_TX**



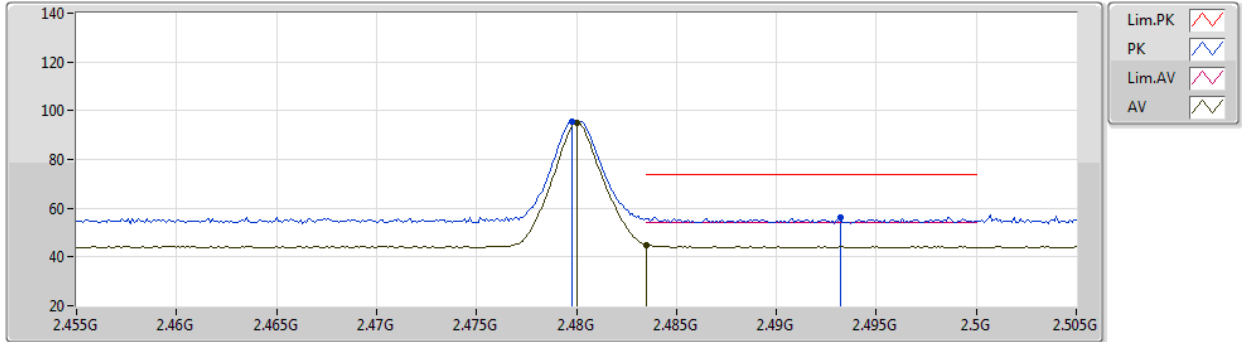
EUT\_Z\_1TX  
Setting 0x08  
06-E-S-5

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	4.88059G	46.04	74.00	-27.96	41.18	3	Horizontal	149	1.82	-	31.08	5.41	31.63
AV	4.87849G	32.63	54.00	-21.37	27.77	3	Horizontal	149	1.82	-	31.08	5.41	31.63

**BT-BR(1Mbps)**

13/01/2020

**2480MHz\_TX**



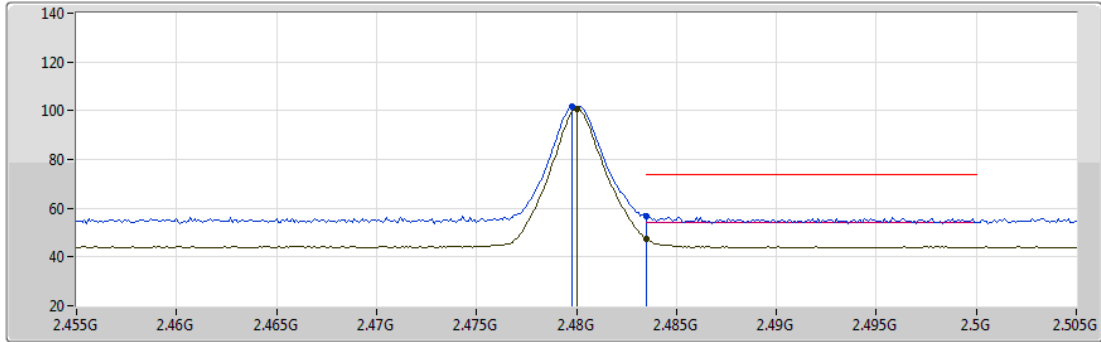
EUT\_Z\_1TX  
Setting 0x08  
06-E-S-5

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	2.4798G	95.70	Inf	-Inf	64.30	3	Vertical	31	2.96	-	27.36	4.04	-
AV	2.48G	94.80	Inf	-Inf	63.40	3	Vertical	31	2.96	-	27.36	4.04	-
PK	2.4932G	56.37	74.00	-17.63	25.00	3	Vertical	31	2.96	-	27.32	4.05	-
AV	2.4835G	44.92	54.00	-9.08	13.53	3	Vertical	31	2.96	-	27.35	4.04	-

**BT-BR(1Mbps)**

13/01/2020

**2480MHz\_TX**



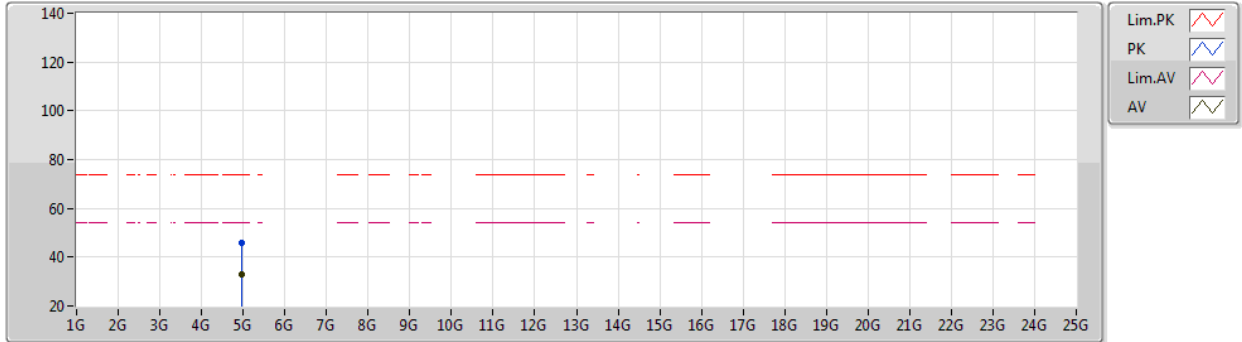
EUT Z\_1TX  
Setting 0x08  
06-E-S-5

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	2.4798G	101.67	Inf	-Inf	70.27	3	Horizontal	5	2.86	-	27.36	4.04	-
AV	2.48G	100.76	Inf	-Inf	69.36	3	Horizontal	5	2.86	-	27.36	4.04	-
PK	2.4835G	56.66	74.00	-17.34	25.27	3	Horizontal	5	2.86	-	27.35	4.04	-
AV	2.4835G	47.26	54.00	-6.74	15.87	3	Horizontal	5	2.86	-	27.35	4.04	-

**BT-BR(1Mbps)**

13/01/2020

**2480MHz\_TX**



EUT\_Z\_1TX  
Setting 0x08  
06-E-S-5

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	4.9614G	45.89	74.00	-28.11	40.58	3	Vertical	231	2.57	-	31.35	5.54	31.58
AV	4.9617G	32.93	54.00	-21.07	27.62	3	Vertical	231	2.57	-	31.35	5.54	31.58

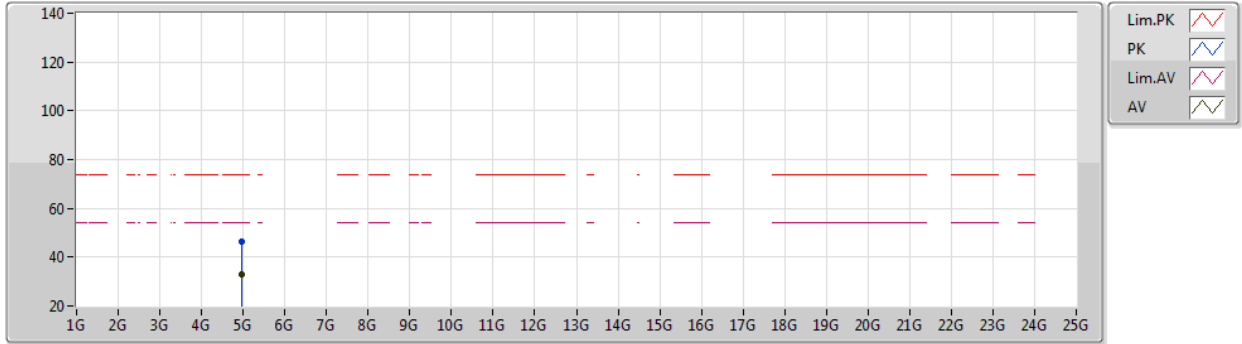




BT-BR(1Mbps)

13/01/2020

2480MHz\_TX



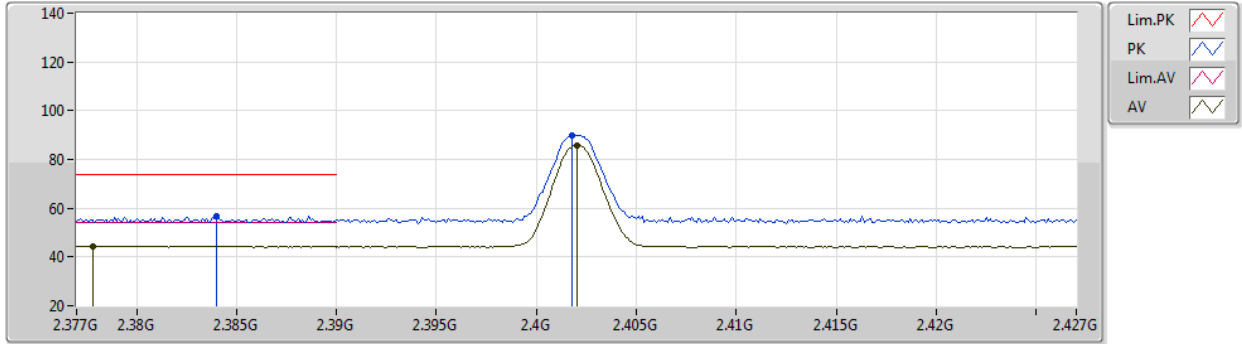
EUT Z\_1TX  
Setting 0x08  
06-E-S-5

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	4.95863G	46.28	74.00	-27.72	41.00	3	Horizontal	343	2.75	-	31.33	5.53	31.58
AV	4.96034G	32.99	54.00	-21.01	27.69	3	Horizontal	343	2.75	-	31.34	5.54	31.58

**BT-EDR(3Mbps)**

13/01/2020

**2402MHz\_TX**



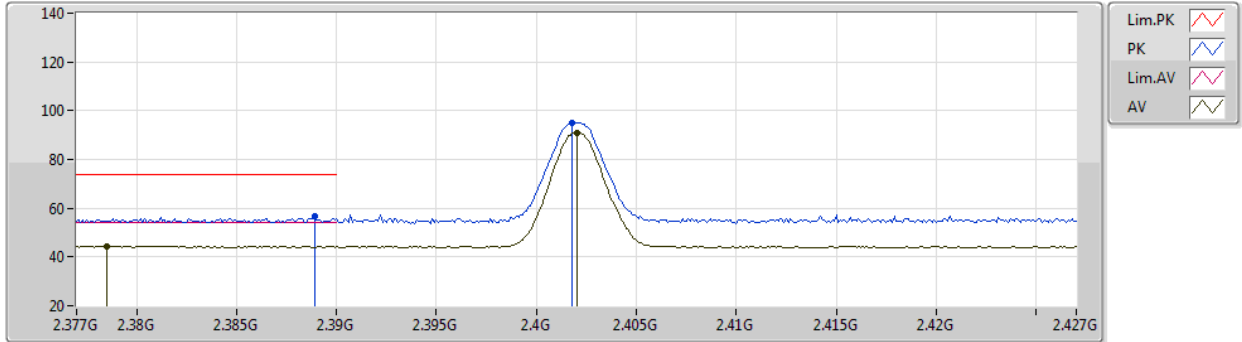
EUT Z\_1TX  
Setting 0x08  
06-E-S-5

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	2.384G	56.89	74.00	-17.11	25.25	3	Vertical	41	1.19	-	27.65	3.99	-
AV	2.3778G	44.40	54.00	-9.60	12.74	3	Vertical	41	1.19	-	27.67	3.99	-
PK	2.4018G	89.88	Inf	-Inf	58.29	3	Vertical	41	1.19	-	27.59	4.00	-
AV	2.402G	85.69	Inf	-Inf	54.10	3	Vertical	41	1.19	-	27.59	4.00	-

BT-EDR(3Mbps)

13/01/2020

2402MHz\_TX



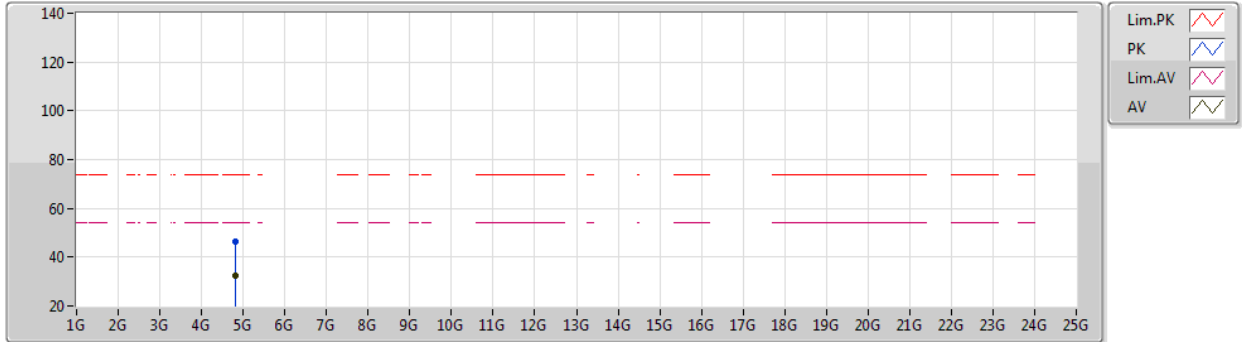
EUT Z\_1TX  
Setting 0x08  
06-E-S-5

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	2.3889G	56.55	74.00	-17.45	24.93	3	Horizontal	11	1.07	-	27.63	3.99	-
AV	2.3785G	44.30	54.00	-9.70	12.65	3	Horizontal	11	1.07	-	27.66	3.99	-
PK	2.4018G	95.10	Inf	-Inf	63.51	3	Horizontal	11	1.07	-	27.59	4.00	-
AV	2.402G	90.94	Inf	-Inf	59.35	3	Horizontal	11	1.07	-	27.59	4.00	-

**BT-EDR(3Mbps)**

13/01/2020

**2402MHz\_TX**



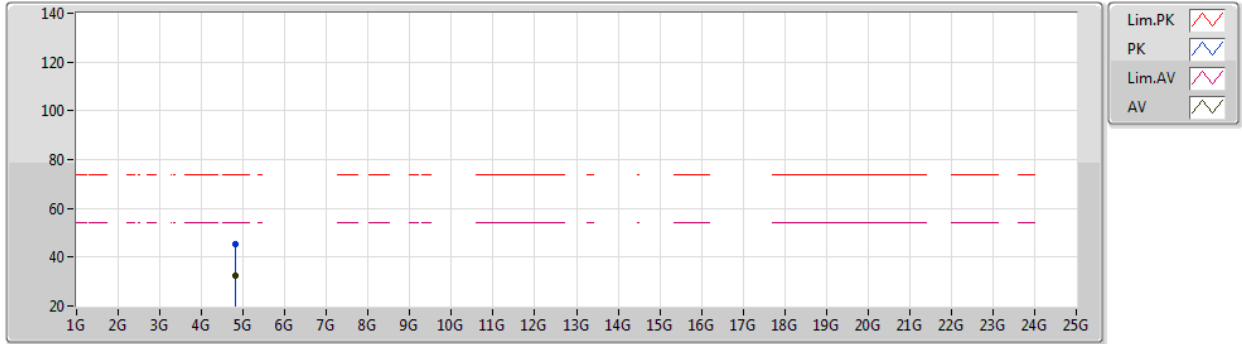
EUT Z\_1TX  
Setting 0x08  
06-E-S-5

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	4.80544G	46.17	74.00	-27.83	41.53	3	Vertical	73	1.48	-	31.01	5.31	31.68
AV	4.80501G	32.64	54.00	-21.36	28.00	3	Vertical	73	1.48	-	31.01	5.31	31.68

**BT-EDR(3Mbps)**

13/01/2020

**2402MHz\_TX**



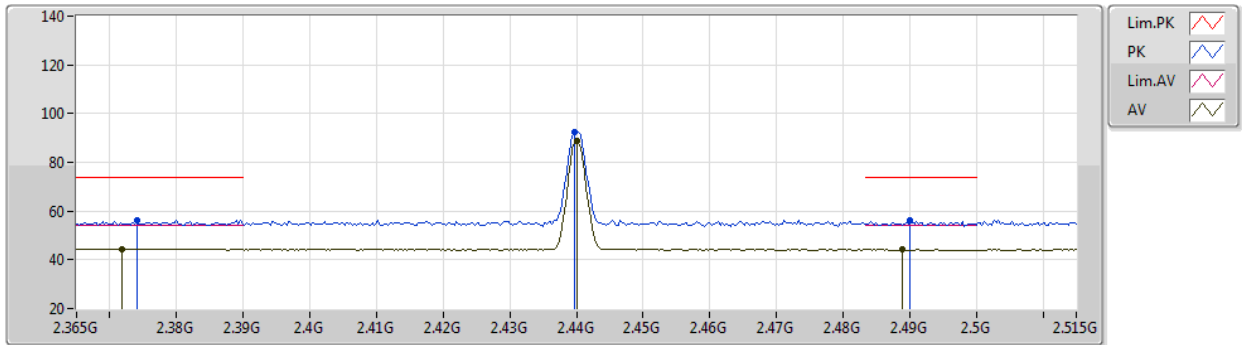
EUT\_Z\_1TX  
Setting 0x08  
06-E-S-5

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	4.80498G	45.17	74.00	-28.83	40.54	3	Horizontal	66	2.67	-	31.00	5.31	31.68
AV	4.80645G	32.49	54.00	-21.51	27.85	3	Horizontal	66	2.67	-	31.01	5.31	31.68

BT-EDR(3Mbps)

13/01/2020

2440MHz\_TX



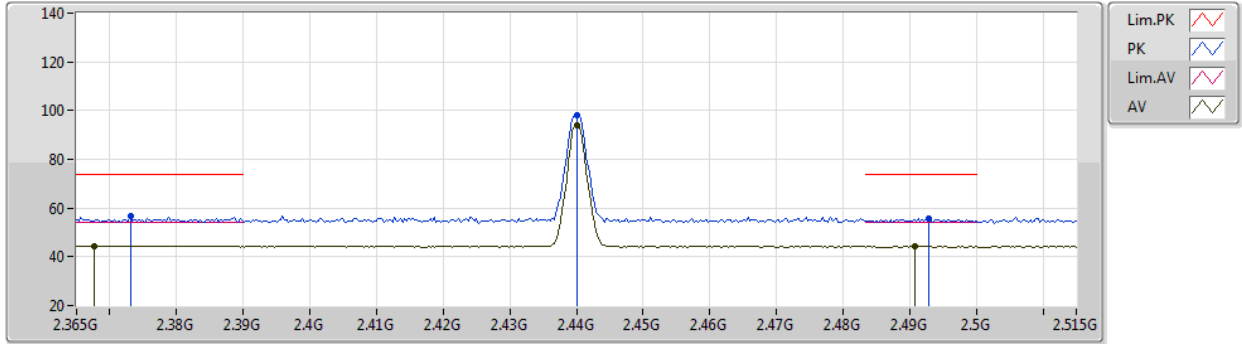
EUT\_Z\_1TX  
Setting 0x08  
06-E-S-5

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	2.374G	56.20	74.00	-17.80	24.53	3	Vertical	41	1.16	-	27.68	3.99	-
AV	2.3719G	44.41	54.00	-9.59	12.74	3	Vertical	41	1.16	-	27.68	3.99	-
PK	2.4397G	92.52	Inf	-Inf	61.02	3	Vertical	41	1.16	-	27.48	4.02	-
AV	2.44G	88.54	Inf	-Inf	57.04	3	Vertical	41	1.16	-	27.48	4.02	-
PK	2.4901G	56.09	74.00	-17.91	24.71	3	Vertical	41	1.16	-	27.33	4.05	-
AV	2.4889G	44.19	54.00	-9.81	12.82	3	Vertical	41	1.16	-	27.33	4.04	-

**BT-EDR(3Mbps)**

13/01/2020

**2440MHz\_TX**



EUT\_Z\_1TX  
Setting 0x08  
06-E-S-5

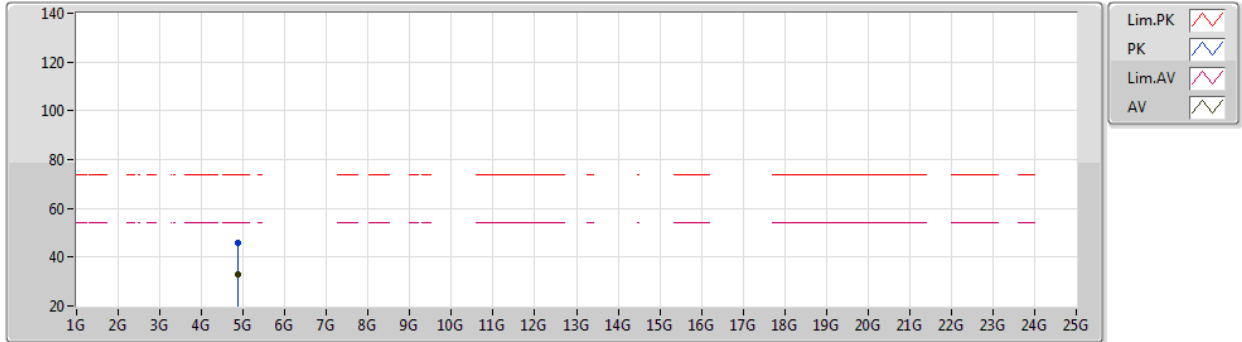
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PK	2.3731G	56.70	74.00	-17.30	25.03	3	Horizontal	8	1.07	-	27.68	3.99	-
AV	2.3677G	44.43	54.00	-9.57	12.75	3	Horizontal	8	1.07	-	27.70	3.98	-
PK	2.44G	98.03	Inf	-Inf	66.53	3	Horizontal	8	1.07	-	27.48	4.02	-
AV	2.44G	94.06	Inf	-Inf	62.56	3	Horizontal	8	1.07	-	27.48	4.02	-
PK	2.4928G	55.93	74.00	-18.07	24.56	3	Horizontal	8	1.07	-	27.32	4.05	-
AV	2.4907G	44.32	54.00	-9.68	12.94	3	Horizontal	8	1.07	-	27.33	4.05	-



**BT-EDR(3Mbps)**

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EUT\_Z\_1TX  
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Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	4.88113G	45.70	74.00	-28.30	40.84	3	Vertical	325	2.10	-	31.08	5.41	31.63
AV	4.88062G	32.75	54.00	-21.25	27.89	3	Vertical	325	2.10	-	31.08	5.41	31.63

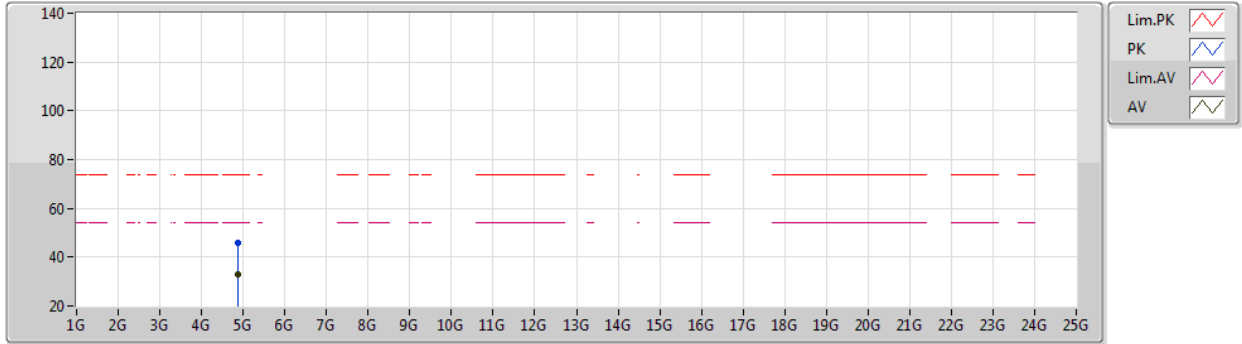




**BT-EDR(3Mbps)**

13/01/2020

**2440MHz\_TX**



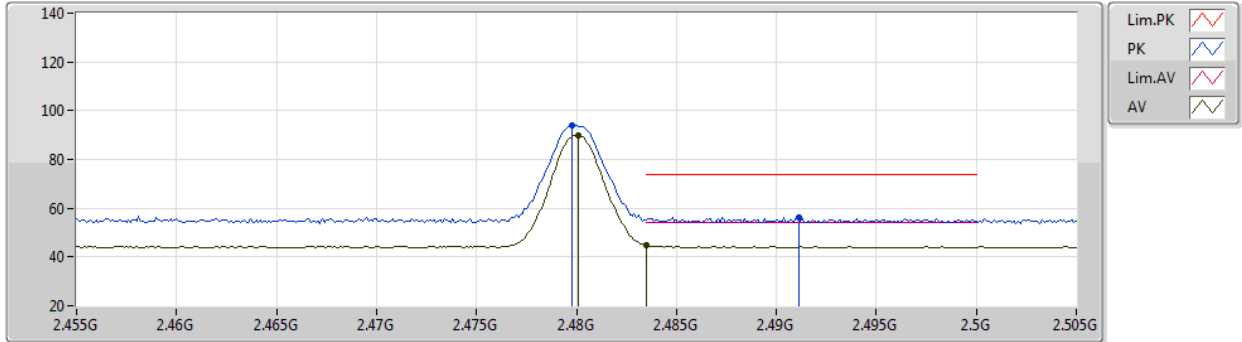
EUT\_Z\_1TX  
Setting 0x08  
06-E-S-5

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	4.87913G	46.04	74.00	-27.96	41.18	3	Horizontal	100	1.41	-	31.08	5.41	31.63
AV	4.87803G	32.80	54.00	-21.20	27.94	3	Horizontal	100	1.41	-	31.08	5.41	31.63

**BT-EDR(3Mbps)**

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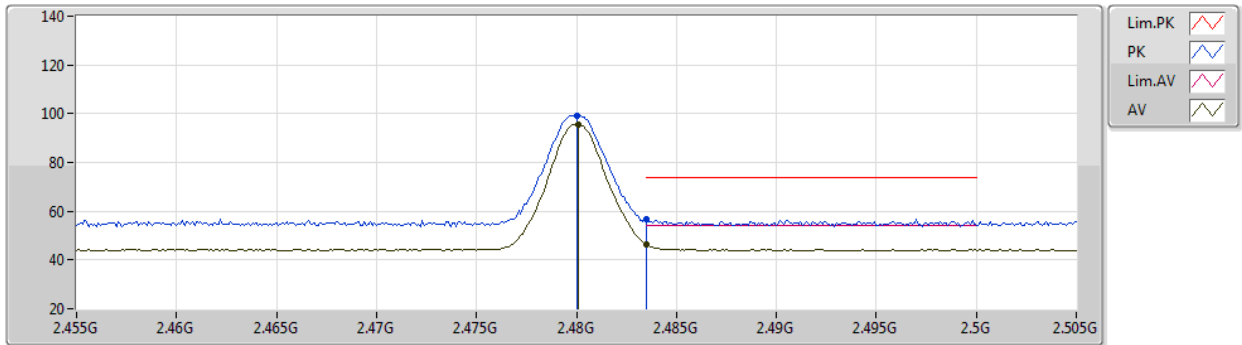
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06-E-S-5

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	2.4798G	93.74	Inf	-Inf	62.34	3	Vertical	27	2.95	-	27.36	4.04	-
AV	2.4801G	89.75	Inf	-Inf	58.35	3	Vertical	27	2.95	-	27.36	4.04	-
PK	2.4911G	56.19	74.00	-17.81	24.81	3	Vertical	27	2.95	-	27.33	4.05	-
AV	2.4835G	44.73	54.00	-9.27	13.34	3	Vertical	27	2.95	-	27.35	4.04	-

**BT-EDR(3Mbps)**

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**2480MHz\_TX**



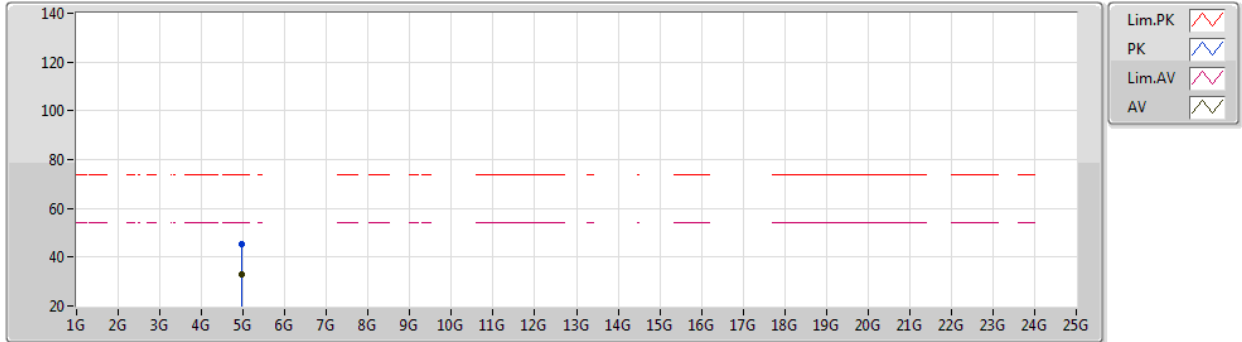
EUT\_Z\_1TX  
Setting 0x08  
06-E-S-5

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	2.48G	99.06	Inf	-Inf	67.66	3	Horizontal	5	2.86	-	27.36	4.04	-
AV	2.4801G	95.74	Inf	-Inf	64.34	3	Horizontal	5	2.86	-	27.36	4.04	-
PK	2.4835G	56.90	74.00	-17.10	25.51	3	Horizontal	5	2.86	-	27.35	4.04	-
AV	2.4835G	46.39	54.00	-7.61	15.00	3	Horizontal	5	2.86	-	27.35	4.04	-

**BT-EDR(3Mbps)**

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**2480MHz\_TX**



EUT Z\_1TX  
Setting 0x08  
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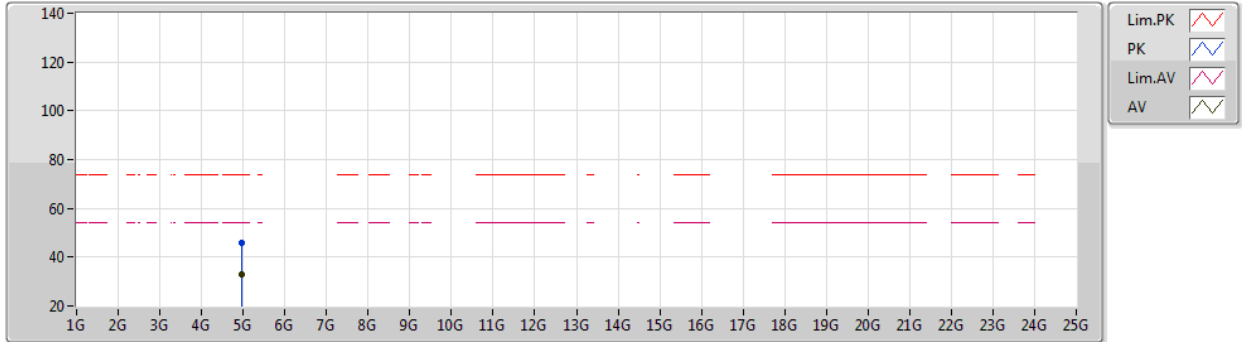
Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	4.95847G	45.42	74.00	-28.58	40.14	3	Vertical	33	2.96	-	31.33	5.53	31.58
AV	4.96166G	33.04	54.00	-20.96	27.73	3	Vertical	33	2.96	-	31.35	5.54	31.58



**BT-EDR(3Mbps)**

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EUT\_Z\_1TX  
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Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	4.96007G	46.00	74.00	-28.00	40.70	3	Horizontal	290	2.82	-	31.34	5.54	31.58
AV	4.96247G	32.86	54.00	-21.14	27.55	3	Horizontal	290	2.82	-	31.35	5.54	31.58