



# RADIO TEST REPORT

**FCC ID** : 2AYRA-03639  
**Equipment** : Velop AX5400 WiFi 6 System  
**Brand Name** : LINKSYS  
**Model Name** : MX5500, MX55EC, MX55MS, MX55WH  
**Applicant** : Linksys USA, Inc.  
 12045 East Waterfront Drive Playa Vista, CA 90094,  
 United States.  
**Standard** : 47 CFR FCC Part 15.247

The product was received on Feb. 03, 2021, and testing was started from Feb. 03, 2021 and completed on May 11, 2021. We, Sporton International Inc. Hsinchu 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 test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. Hsinchu Laboratory, the test report shall not be reproduced except in full.

  
 Approved by: Cliff Chang

**Sporton International Inc. Hsinchu Laboratory**  
 No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.)



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**Photographs of EUT v01**



## History of this test report

Report No.	Version	Description	Issued Date
FR122657AD	01	Initial issue of report	May 27, 2021



## 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)	DTS Bandwidth	PASS	-
3.3	15.247(b)	Maximum Conducted Output Power	PASS	-
3.4	15.247(e)	Power Spectral Density	PASS	-
3.5	15.247(d)	Emissions in Non-restricted Frequency Bands	PASS	-
3.6	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: Vicky Huang**



# 1 General Description

## 1.1 Information

### 1.1.1 RF General Information

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

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

Note:

- ♦ Bluetooth LE uses a GFSK modulation.
- ♦ BWch is the nominal channel bandwidth.

### 1.1.2 Antenna Information

Ant.	Port			Brand	Model Name	Antenna Type	Connector	Gain (dBi)
	2.4GHz	5GHz	Bluetooth					
1	2	1	-	Galtronics	02102140-07315-1	PCB	U.FL	Note
2	1	2	-	Galtronics	02102140-07315-2	PCB	U.FL	
3	-	3	-	Galtronics	02102142-07315-1	PCB	U.FL	
4	-	4	-	Galtronics	02102142-07315-2	PCB	U.FL	
5	-	-	1	Galtronics	02036073-07315	PCBA Launched	N/A	

Note:

#### <Antenna Gain>

Ant.	Port	WLAN Gain (dBi)		
		2.4 GHz	5GHz Band 1	5GHz Band 4
1	1	1.67	2.85	2.84
2	2	1.67	2.85	2.84
3	3	-	4.90	4.60
4	4	-	4.90	4.60

Ant.	Bluetooth Gain (dBi)
5	5.3



< Directional Gain >

Ant.	Port	Gain (dBi)			
		4T1S		4T4S	
		5GHz Band 1	5GHz Band 4	5GHz Band 1	5GHz Band 4
1	1	5.48	5.5	1.58	2.03
2	2				
3	3				
4	4				

Note: The above information was declared by manufacturer.

**For 2.4GHz function:**

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

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

**For Bluetooth mode (1TX/1RX)**

Only Port 1 can be use as transmit and receive antenna.

1.1.3 Mode Test Duty Cycle

Mode	DC	DCF(dB)	T(s)	VBW(Hz) ≥ 1/T
BT-LE(1Mbps)	0.855	0.68	2.137m	1k

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>Function</b>	<input checked="" type="checkbox"/>	Point-to-multipoint	<input type="checkbox"/>	Point-to-point
<b>Test Software Version</b>	QSPR V5.0-00196			
<b>Support Mode</b>	<input checked="" type="checkbox"/>	LE 1M PHY: 1 Mb/s		
	<input type="checkbox"/>	LE Coded PHY (S=2): 500 Kb/s		
	<input type="checkbox"/>	LE Coded PHY (S=8): 125 Kb/s		
	<input type="checkbox"/>	LE 2M PHY: 2 Mb/s		

Note: The above information was declared by manufacturer.



**1.1.5 Table for Multiple Listing**

The brand/model names in the following table are all refer to the identical product.

<b>Brand Name</b>	<b>Model Name</b>	<b>Description</b>
LINKSYS	MX5500	All the models are identical, the difference model served as marketing strategy.
	MX55EC	
	MX55MS	
	MX55WH	

Note 1: From the above models, model: MX5500 was selected as representative model for the test and its data was recorded in this report.

Note 2: The above information was declared by manufacturer.



### 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
- ♦ ANSI C63.10-2013

The following reference test guidance is not within the scope of accreditation of TAF.

- ♦ FCC KDB 558074 D01 v05r02
- ♦ FCC KDB 414788 D01 v01r01

### 1.3 Testing Location Information

Testing Location Information	
Test Lab. : Sporton International Inc. Hsinchu Laboratory	
Hsinchu (TAF: 3787)	ADD: No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.) TEL: 886-3-656-9065 FAX: 886-3-656-9085 Test site Designation No. TW3787 with FCC. Conformity Assessment Body Identifier (CABID) TW3787 with ISED.

Test Condition	Test Site No.	Test Engineer	Test Environment (°C / %)	Test Date
RF Conducted	TH01-CB	Serway Li	21.2-23.2 / 54-57	Feb. 03, 2021~ Mar. 10, 2021
Radiated (Below 1GHz)	03CH06-CB	Eason Chen	20.1-21.3 / 56-58	Feb. 26, 2021~ May 07, 2021
Radiated (Above 1GHz)	03CH01-CB	Eason Chen	21-22.2 / 55-57	Feb. 26, 2021~ May 07, 2021
AC Conduction	CO02-CB	Wei Li	23~24 / 57~60	Mar. 26, 2021~ May 11, 2021

### 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 (9kHz ~ 30MHz)	3.8 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	5.6 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	5.0 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	4.9 dB	Confidence levels of 95%
Conducted Emission	2.8 dB	Confidence levels of 95%
Output Power Measurement	1.4 dB	Confidence levels of 95%
Power Density Measurement	2.8 dB	Confidence levels of 95%
Bandwidth Measurement	0.4%	Confidence levels of 95%





## **2 Test Configuration of EUT**

### **2.1 Test Channel Mode**

<b>Mode</b>	<b>Power Setting</b>
BT-LE(1Mbps)	-
2402MHz	Default
2440MHz	Default
2480MHz	Default



## 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 1 + RJ-45 cable 1
2	EUT + Adapter 2 + RJ-45 cable 1
3	EUT + Adapter 3 + RJ-45 cable 1
4	EUT + Adapter 4 + RJ-45 cable 1
For operating mode 2 is the worst case and it was record in this test report.	

The Worst Case Mode for Following Conformance Tests	
<b>Tests Item</b>	DTS Bandwidth Maximum Conducted Output Power Power Spectral Density Emissions in Non-restricted Frequency Bands
<b>Test Condition</b>	Conducted measurement at transmit chains



<b>The Worst Case Mode for Following Conformance Tests</b>	
<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
1	EUT-WLAN 2.4GHz + Adapter 1 + RJ-45 cable 1
2	EUT-WLAN 2.4GHz + Adapter 2 + RJ-45 cable 1
Mode 1 has been evaluated to be the worst case between Mode 1~2, thus measurement for Mode 3~4 will follow this same test mode.	
3	EUT-Bluetooth + Adapter 1 + RJ-45 cable 1
4	EUT-WLAN 5GHz + Adapter 1 + RJ-45 cable 1
Mode 1 has been evaluated to be the worst case between Mode 1~4, thus measurement for Mode 5~6 will follow this same test mode.	
5	EUT-WLAN 2.4GHz + Adapter 3 + RJ-45 cable 1
6	EUT-WLAN 2.4GHz + Adapter 4 + RJ-45 cable 1
Mode 1 has been evaluated to be the worst case between Mode 1~6, thus measurement for Mode 7 will follow this same test mode.	
7	EUT-WLAN 2.4GHz + Adapter 1 + RJ-45 cable 2
For operating mode 1 is the worst case and it was record in this test report.	
<b>Operating Mode &gt; 1GHz</b>	CTX

<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+Bluetooth
Refer to Sporton Test Report No.: FA122657 for Co-location RF Exposure Evaluation.	

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

### 2.3 EUT Operation during Test

For CTX Mode:  
The EUT was programmed to be in continuously transmitting mode.

For Normal Link:  
During the test, the EUT operation to normal function.



### 2.4 Accessories

Accessories			
Equipment Name	Brand Name	Model Name	Rating
Adapter 1 (Fixed plug)	Ktec	KSA-24W-120200HU	INPUT: 100-240V~50/60Hz, 0.6A OUTPUT: 12V, 2.0A
Adapter 2 (Fixed plug)	APD	WB-24J12FU	INPUT: 100-240V~50-60Hz, 0.7A Max. OUTPUT: 12V, 2A
Adapter 3 (Removable plug)	Ktec	KSA-24W-120200D5	INPUT: 100-240V~50/60Hz, 0.6A OUTPUT: 12.0V, 2.0A 24.0W
Adapter 4 (Removable plug)	APD	WB-24J12R	INPUT: 100-240V~50-60Hz, 0.7A Max. OUTPUT: 12.0V, 2.0A 24.0W
Other			
US plug*2 (for adapter 3 and adapter 4 use)			
RJ-45 cable 1*1, non-shielded, 1.8m, Type: flat wire			
RJ-45 cable 2*1, non-shielded, 1.8m, Type:round wire			

### 2.5 Support Equipment

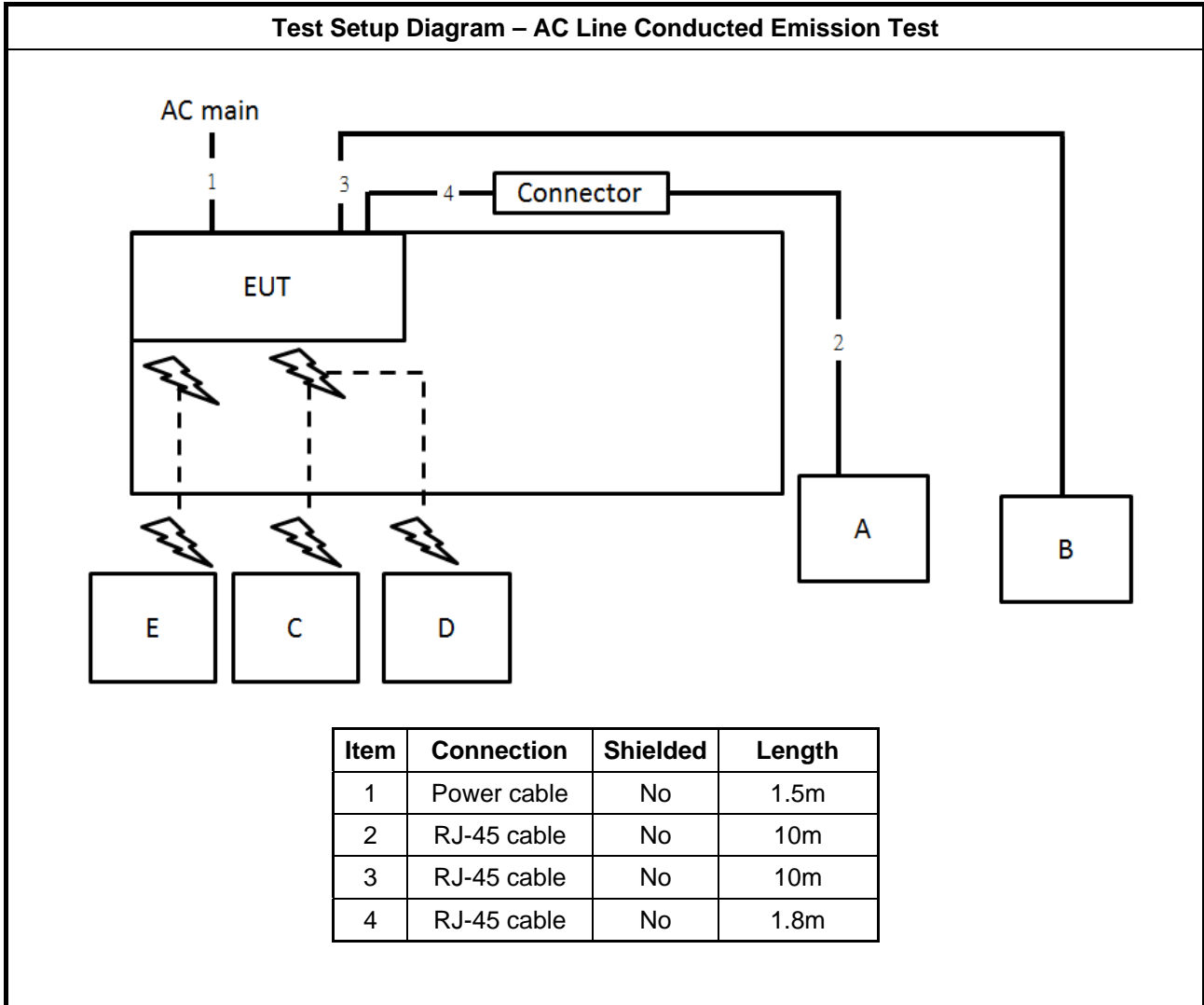
For AC Conduction:

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	iPad	Apple	A1430	N/A

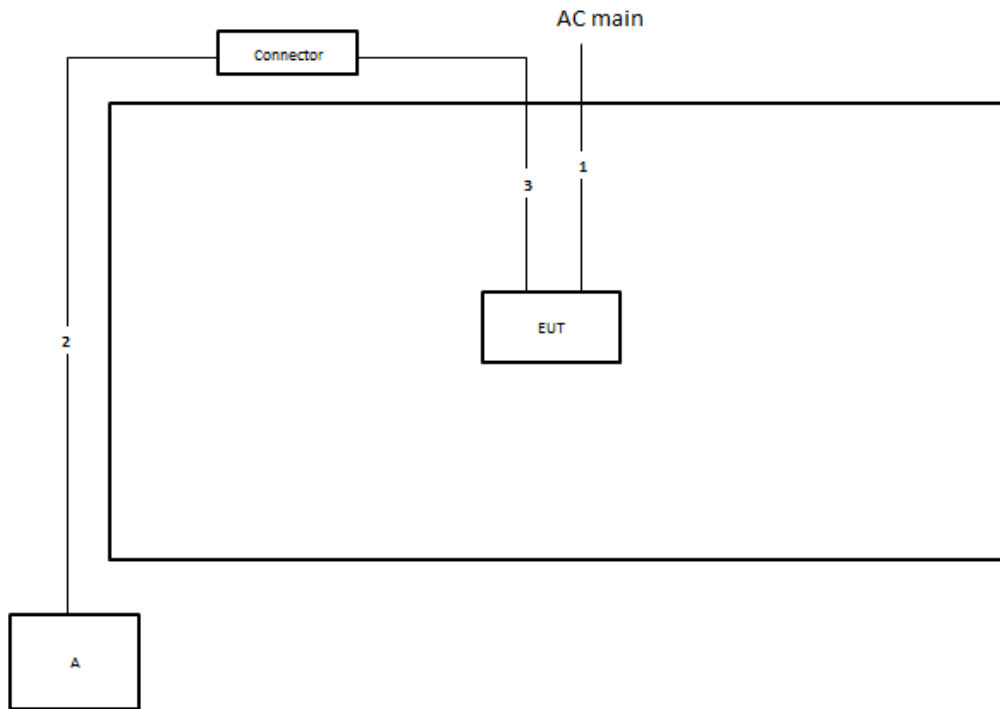
For Radiated and RF Conducted:

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

## 2.6 Test Setup Diagram

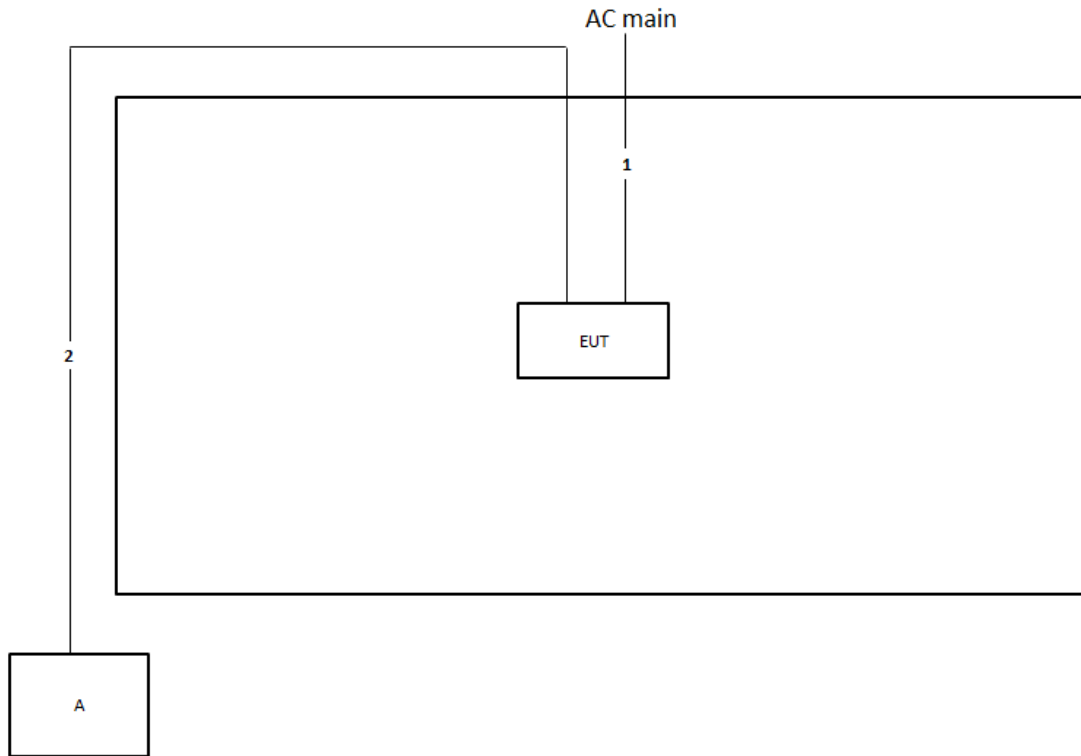


**Test Setup Diagram - Radiated Test < 1GHz**



Item	Connection	Shielded	Length
1	Power cable	No	1.5m
2	RJ-45 cable	No	10m
3	RJ-45 cable	No	1.8m

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



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



### 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

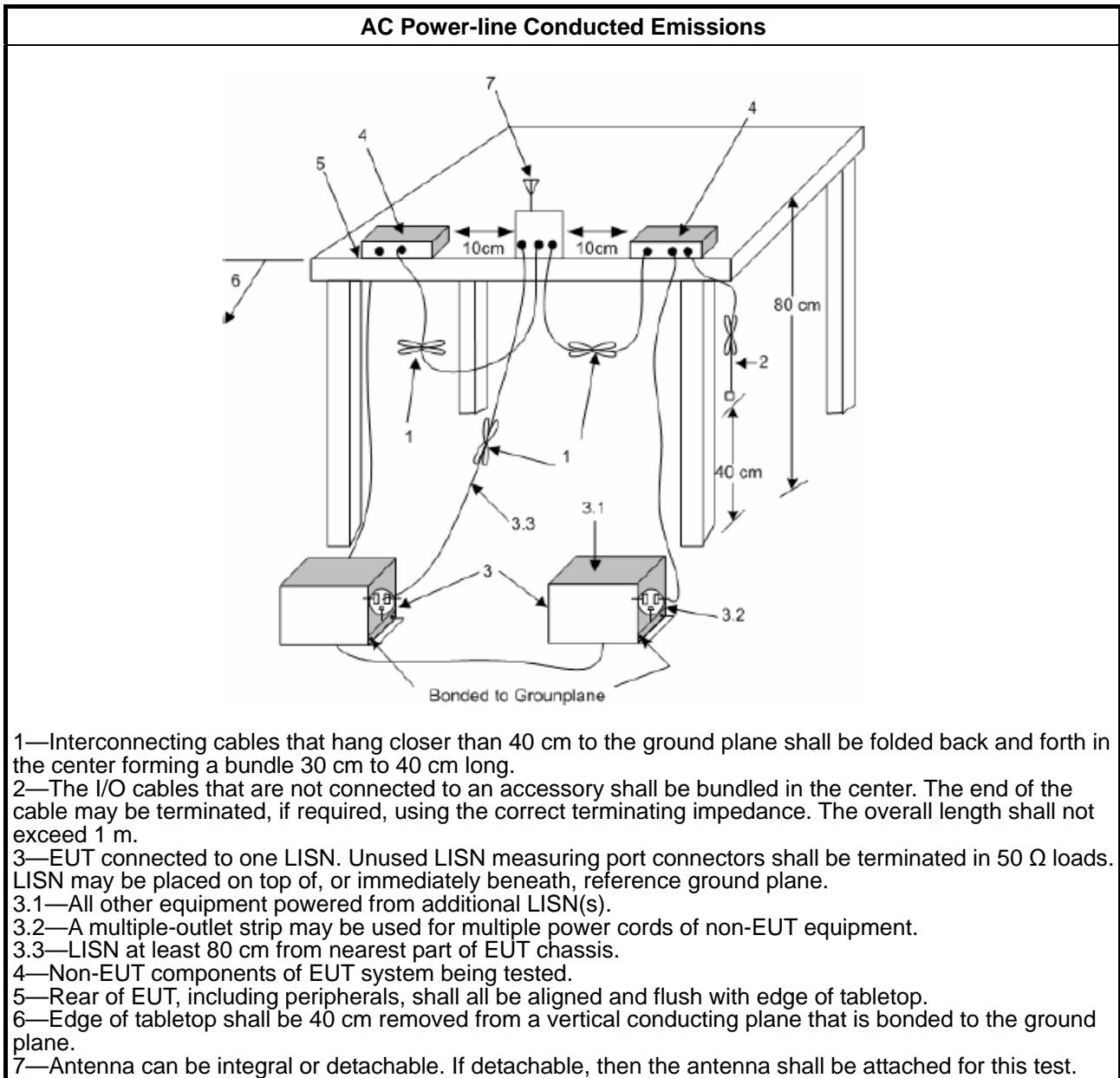
Refer a test equipment and calibration data table in this test report.

##### 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



#### 1.1.1. Measurement Results Calculation

The measured Level is calculated using:

- a. Corrected Reading: LISN Factor (LISN) + Attenuator (AT/AUX) + Cable Loss (CL) + Read Level (Raw) = Level
- b. Margin = -Limit + Level

### 3.1.5 Test Result of AC Power-line Conducted Emissions

Refer as Appendix A

### 3.2 DTS Bandwidth

#### 3.2.1 6dB Bandwidth Limit

6dB Bandwidth Limit
<b>Systems using digital modulation techniques:</b>
<ul style="list-style-type: none"> <li>▪ 6 dB bandwidth <math>\geq</math> 500 kHz.</li> </ul>

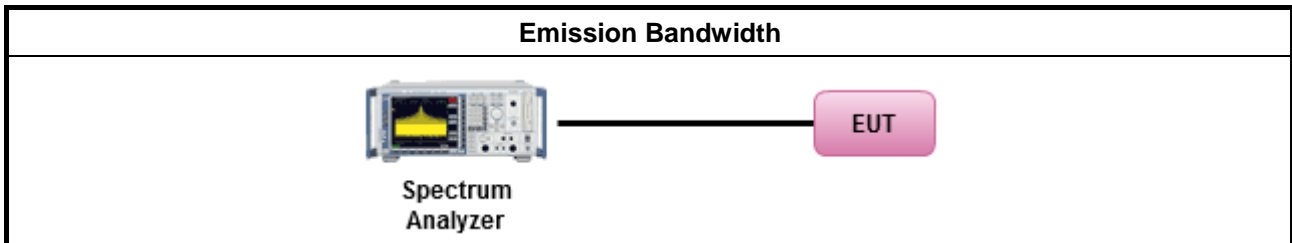
#### 3.2.2 Measuring Instruments

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

#### 3.2.3 Test Procedures

Test Method
<ul style="list-style-type: none"> <li>▪ For the emission bandwidth shall be measured using one of the options below:</li> </ul>
<input checked="" type="checkbox"/> Refer as FCC KDB 558074, clause 8.2 & C63.10 clause 11.8.1 Option 1 for 6 dB bandwidth measurement.
<input type="checkbox"/> Refer as FCC KDB 558074, clause 8.2 & C63.10 clause 11.8.2 Option 2 for 6 dB bandwidth measurement.
<input type="checkbox"/> Refer as ANSI C63.10, clause 6.9.1 for occupied bandwidth testing.

#### 3.2.4 Test Setup



#### 3.2.5 Test Result of Emission Bandwidth

Refer as Appendix B



### 3.3 Maximum Conducted Output Power

#### 3.3.1 Maximum Conducted Output Power Limit

Maximum Conducted Output Power Limit	
	<ul style="list-style-type: none"><li>▪ If <math>G_{TX} \leq 6</math> dBi, then <math>P_{Out} \leq 30</math> dBm (1 W)</li></ul>
	<ul style="list-style-type: none"><li>▪ Point-to-multipoint systems (P2M): If <math>G_{TX} &gt; 6</math> dBi, then <math>P_{Out} = 30 - (G_{TX} - 6)</math> dBm</li></ul>
	<ul style="list-style-type: none"><li>▪ Point-to-point systems (P2P): If <math>G_{TX} &gt; 6</math> dBi, then <math>P_{Out} = 30 - (G_{TX} - 6)/3</math> dBm</li></ul>
	<ul style="list-style-type: none"><li>▪ Smart antenna system (SAS):</li></ul>
	<ul style="list-style-type: none"><li>- Single beam: If <math>G_{TX} &gt; 6</math> dBi, then <math>P_{Out} = 30 - (G_{TX} - 6)/3</math> dBm</li></ul>
	<ul style="list-style-type: none"><li>- Overlap beam: If <math>G_{TX} &gt; 6</math> dBi, then <math>P_{Out} = 30 - (G_{TX} - 6)/3</math> dBm</li></ul>
	<ul style="list-style-type: none"><li>- Aggregate power on all beams: If <math>G_{TX} &gt; 6</math> dBi, then <math>P_{Out} = 30 - (G_{TX} - 6)/3 + 8</math> dB dBm</li></ul>
$P_{Out}$ = maximum peak conducted output power or maximum conducted output power in dBm, $G_{TX}$ = the maximum transmitting antenna directional gain in dBi.	

#### 3.3.2 Measuring Instruments

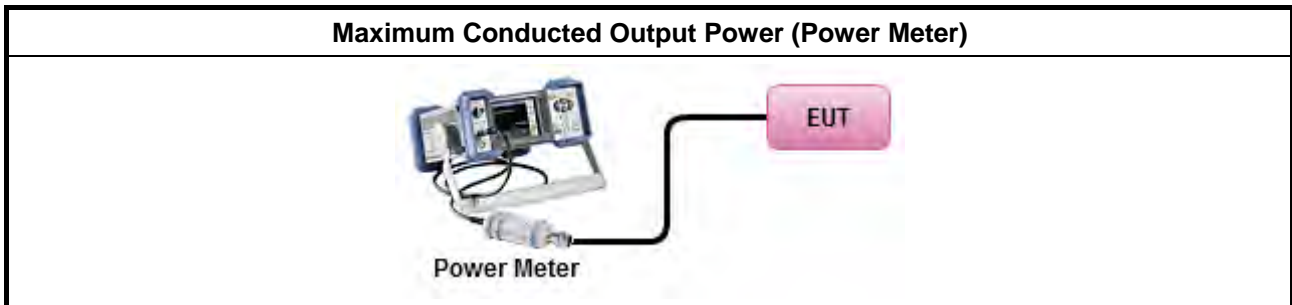
Refer a test equipment and calibration data table in this test report.



**3.3.3 Test Procedures**

Test Method	
<ul style="list-style-type: none"> <li>▪ Maximum Peak Conducted Output Power</li> </ul>	
	<input type="checkbox"/> Refer as FCC KDB 558074, clause 8.3.1.1 & C63.10 clause 11.9.1.1 (RBW ≥ EBW method).
	<input type="checkbox"/> Refer as FCC KDB 558074, clause 8.3.1.3 & C63.10 clause 11.9.1.3 (peak power meter).
<ul style="list-style-type: none"> <li>▪ Maximum Conducted Output Power</li> </ul>	
[duty cycle ≥ 98% or external video / power trigger]	
	<input type="checkbox"/> Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.2 Method AVGSA-1.
	<input type="checkbox"/> Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.3 Method AVGSA-1A. (alternative)
duty cycle < 98% and average over on/off periods with duty factor	
	<input type="checkbox"/> Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.4 Method AVGSA-2.
	<input type="checkbox"/> Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.5 Method AVGSA-2A (alternative)
	<input type="checkbox"/> Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.6 Method AVGSA-3
	<input type="checkbox"/> Refer as FCC KDB 558074, clause 8.3.2.2 & C63.10 clause 11.9.2.2.7 Method AVGSA-3A (alternative)
Measurement using a power meter (PM)	
	<input type="checkbox"/> Refer as FCC KDB 558074, clause 8.3.2.3 & C63.10 clause 11.9.2.3.1 Method AVGPM (using an RF average power meter).
	<input checked="" type="checkbox"/> Refer as FCC KDB 558074, clause 8.3.2.3 & C63.10 clause 11.9.2.3.2 Method AVGPM-G (using an gate RF average power meter).
<ul style="list-style-type: none"> <li>▪ For conducted measurement.</li> </ul>	
	<ul style="list-style-type: none"> <li>▪ If the EUT supports multiple transmit chains using options given below: Refer as FCC KDB 662911, In-band power measurements. Using the measure-and-sum approach, measured all transmit ports individually. Sum the power (in linear power units e.g., mW) of all ports for each individual sample and save them.</li> </ul>
	<ul style="list-style-type: none"> <li>▪ If multiple transmit chains, EIRP calculation could be following as methods:  <math display="block">P_{total} = P_1 + P_2 + \dots + P_n</math>                     (calculated in linear unit [mW] and transfer to log unit [dBm])  <math display="block">EIRP_{total} = P_{total} + DG</math> </li> </ul>

### 3.3.4 Test Setup



### 3.3.5 Test Result of Maximum Conducted Output Power

Refer as Appendix C



### 3.4 Power Spectral Density

#### 3.4.1 Power Spectral Density Limit

Power Spectral Density Limit
<ul style="list-style-type: none"> <li>Power Spectral Density (PSD) ≤ 8 dBm/3kHz</li> </ul>

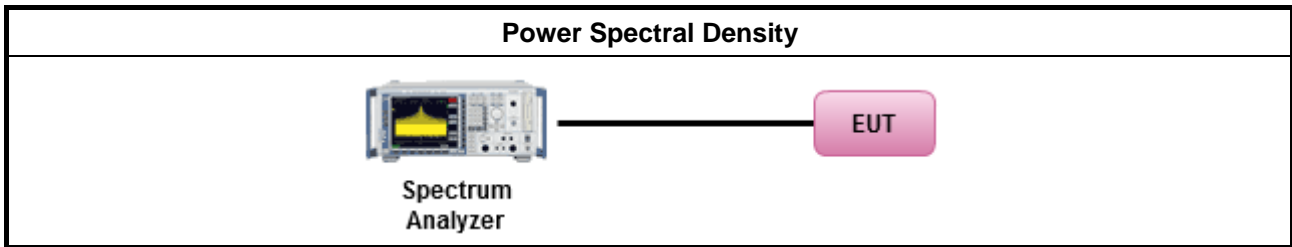
#### 3.4.2 Measuring Instruments

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

#### 3.4.3 Test Procedures

Test Method
<ul style="list-style-type: none"> <li>Peak power spectral density procedures that the same method as used to determine the conducted output power. If maximum peak conducted output power was measured to demonstrate compliance to the output power limit, then the peak PSD procedure below (Method PKPSD) shall be used. If maximum conducted output power was measured to demonstrate compliance to the output power limit, then one of the average PSD procedures shall be used, as applicable based on the following criteria (the peak PSD procedure is also an acceptable option).</li> </ul>
<input checked="" type="checkbox"/> Refer as FCC KDB 558074, clause 8.4 & C63.10 clause 11.10 Method Max. PSD. [duty cycle ≥ 98% or external video / power trigger]
<ul style="list-style-type: none"> <li>For conducted measurement.</li> </ul>
<ul style="list-style-type: none"> <li>If The EUT supports multiple transmit chains using options given below: <ul style="list-style-type: none"> <li><input type="checkbox"/> Option 1: Measure and sum the spectra across the outputs. Refer as FCC KDB 662911, In-band power spectral density (PSD). Sample all transmit ports simultaneously using a spectrum analyzer for each transmit port. Where the trace bin-by-bin of each transmit port summing can be performed. (i.e., in the first spectral bin of output 1 is summed with that in the first spectral bin of output 2 and that from the first spectral bin of output 3, and so on up to the NTX output to obtain the value for the first frequency bin of the summed spectrum.). Add up the amplitude (power) values for the different transmit chains and use this as the new data trace.</li> <li><input type="checkbox"/> Option 2: Measure and sum spectral maxima across the outputs. With this technique, spectra are measured at each output of the device at the required resolution bandwidth. The maximum value (peak) of each spectrum is determined. These maximum values are then summed mathematically in linear power units across the outputs. These operations shall be performed separately over frequency spans that have different out-of-band or spurious emission limits,</li> <li><input type="checkbox"/> Option 3: Measure and add 10 log(N) dB, where N is the number of transmit chains. Refer as FCC KDB 662911, In-band power spectral density (PSD). Performed at each transmit chains and each transmit chains shall be compared with the limit have been reduced with 10 log(N). Or each transmit chains shall be add 10 log(N) to compared with the limit.</li> </ul> </li> </ul>

### 3.4.4 Test Setup



### 3.4.5 Test Result of Power Spectral Density

Refer as Appendix D

### 3.5 Emissions in Non-restricted Frequency Bands

#### 3.5.1 Emissions in Non-restricted Frequency Bands Limit

Un-restricted Band Emissions Limit	
RF output power procedure	Limit (dBc)
Peak output power procedure	20
Average output power procedure	30

Note 1: If the peak output power procedure is used to measure the fundamental emission power to demonstrate compliance to requirements, then the peak conducted output power measured within any 100 kHz outside the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum measured in-band peak PSD level.

Note 2: If the average output power procedure is used to measure the fundamental emission power to demonstrate compliance to requirements, then the power in any 100 kHz outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum measured in-band average PSD level.

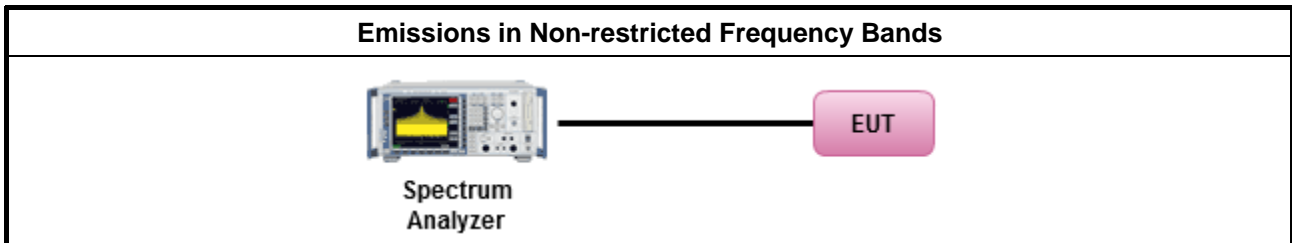
#### 3.5.2 Measuring Instruments

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

#### 3.5.3 Test Procedures

Test Method
<ul style="list-style-type: none"> <li>Refer as FCC KDB 558074, clause 8.5 for unwanted emissions into non-restricted bands.</li> </ul>

#### 3.5.4 Test Setup



#### 3.5.5 Test Result of Emissions in Non-restricted Frequency Bands

Refer as Appendix E





### 3.6 Emissions in Restricted Frequency Bands

#### 3.6.1 Emissions in Restricted Frequency Bands Limit

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

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

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

#### 3.6.2 Measuring Instruments

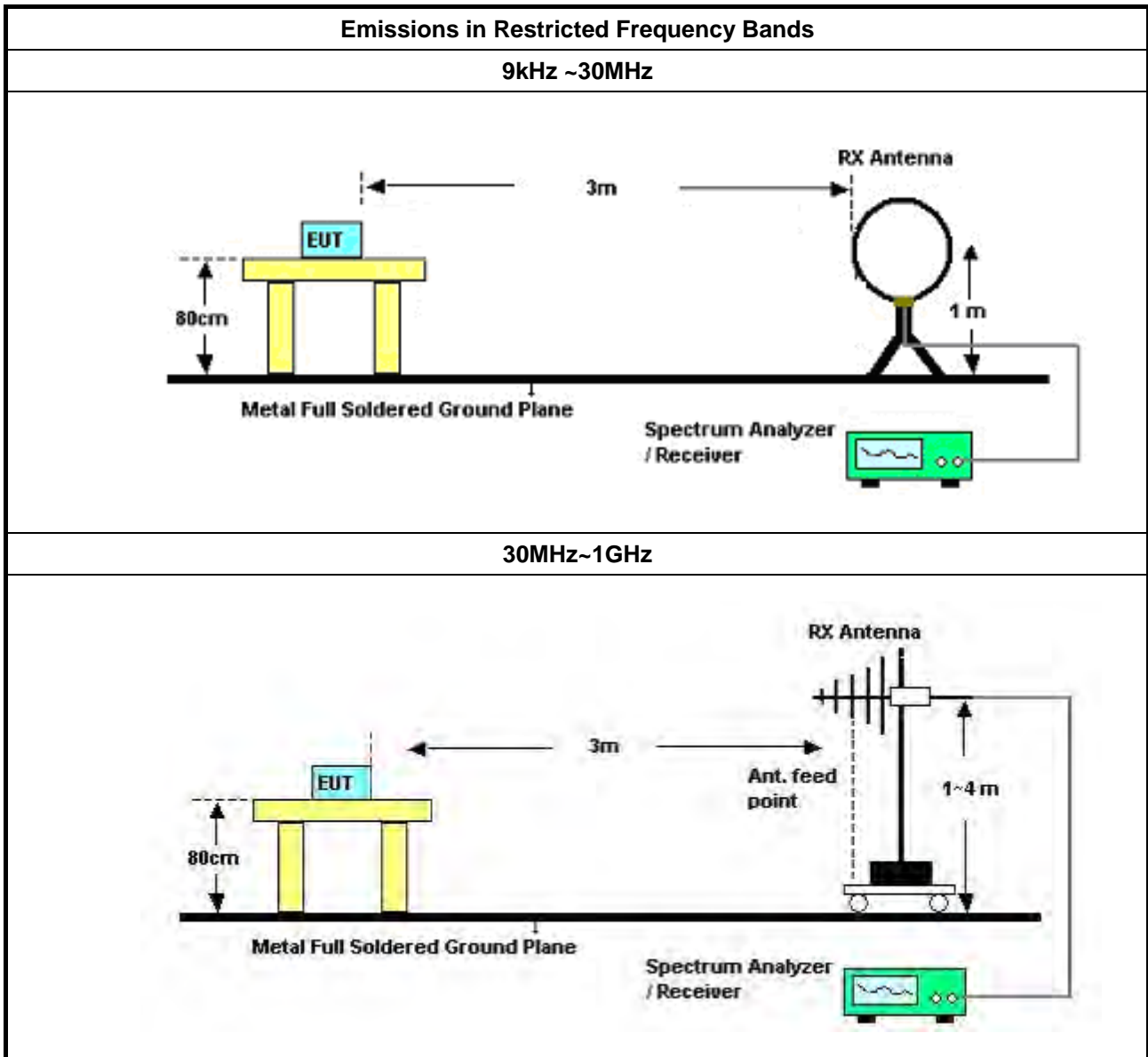
Refer a test equipment and calibration data table in this test report.

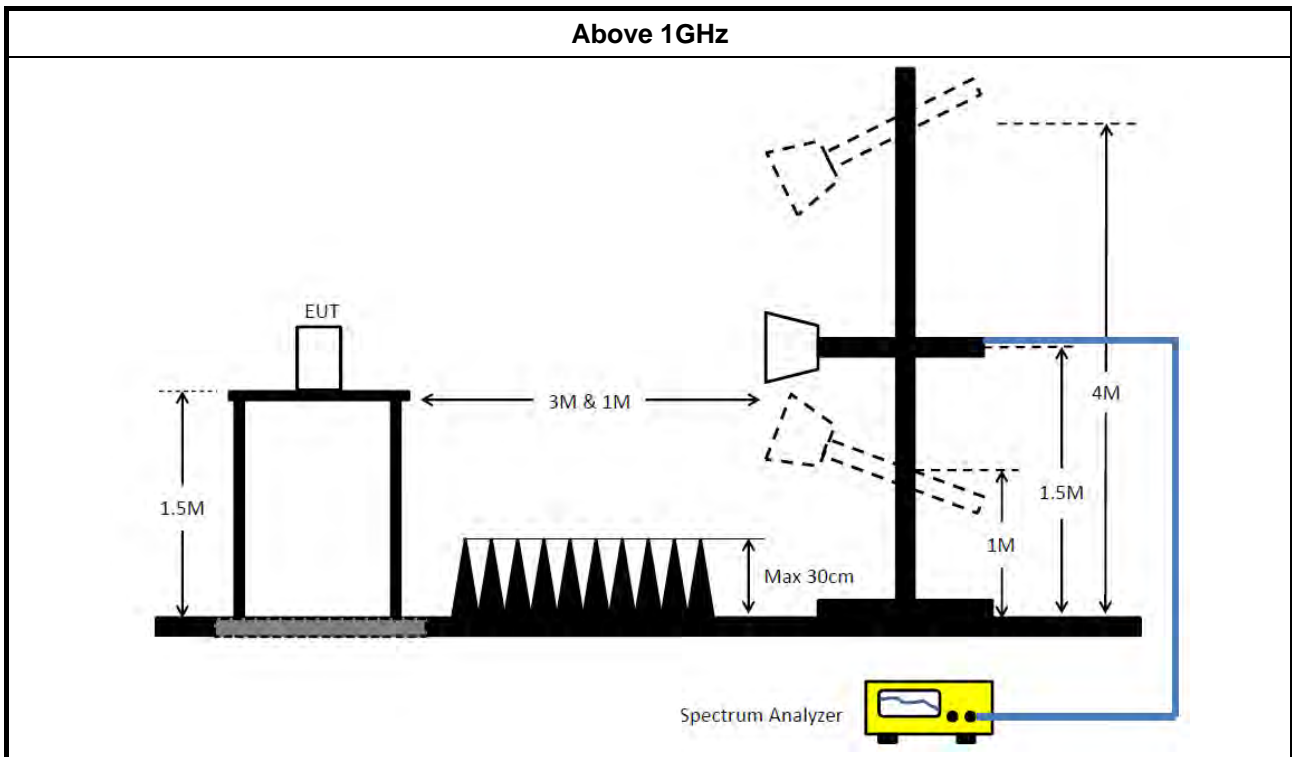


**3.6.3 Test Procedures**

<b>Test Method</b>	
<ul style="list-style-type: none"> <li>▪ The average emission levels shall be measured in [duty cycle <math>\geq</math> 98 or 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:</li> </ul>	
	<ul style="list-style-type: none"> <li>▪ Refer as FCC KDB 558074, clause 8.6 for unwanted emissions into restricted bands.</li> </ul>
<input type="checkbox"/>	Refer as FCC KDB 558074, clause 8.6 & C63.10 clause 11.12.2.5.1(trace averaging for duty cycle $\geq$ 98%).
<input type="checkbox"/>	Refer as FCC KDB 558074, clause 8.6 & C63.10 clause 11.12.2.5.2(trace averaging + duty factor).
<input checked="" type="checkbox"/>	Refer as FCC KDB 558074, clause 8.6 & C63.10 clause 11.12.2.5.3(Reduced VBW $\geq$ 1/T).
<input type="checkbox"/>	Refer as ANSI C63.10, clause 11.12.2.5.3 (Reduced VBW). VBW $\geq$ 1/T, where T is pulse time.
<input type="checkbox"/>	Refer as ANSI C63.10, clause 7.5 average value of pulsed emissions.
<input checked="" type="checkbox"/>	Refer as FCC KDB 558074, clause 8.6 & C63.10 clause 11.12.2.4 measurement procedure peak limit.
<ul style="list-style-type: none"> <li>▪ For the transmitter band-edge emissions shall be measured using following options below:</li> </ul>	
	<ul style="list-style-type: none"> <li>▪ Refer as FCC KDB 558074 clause 8.7 &amp; c63.10 clause 11.13.1, When the performing peak or average radiated measurements, emissions within 2 MHz of the authorized band edge may be measured using the marker-delta method described below.</li> </ul>
	<ul style="list-style-type: none"> <li>▪ Refer as FCC KDB 558074, clause 8.7 (ANSI C63.10, clause 6.10.6) for marker-delta method for band-edge measurements.</li> </ul>
	<ul style="list-style-type: none"> <li>▪ Refer as FCC KDB 558074, clause 8.7 for narrower resolution bandwidth (100kHz) using the band power and summing the spectral levels (i.e., 1 MHz).</li> </ul>
	<ul style="list-style-type: none"> <li>▪ For conducted unwanted emissions into restricted bands (absolute emission limits). Devices with multiple transmit chains using options given below: (1) Measure and sum the spectra across the outputs or (2) Measure and add 10 log(N) dB</li> </ul>
	<ul style="list-style-type: none"> <li>▪ For FCC KDB 662911 The methodology described here may overestimate array gain, thereby resulting in apparent failures to satisfy the out-of-band limits even if the device is actually compliant. In such cases, compliance may be demonstrated by performing radiated tests around the frequencies at which the apparent failures occurred.</li> </ul>

**3.6.4 Test Setup**





### 3.6.5 Measurement Results Calculation

The measured Level is calculated using:

Corrected Reading: Antenna factor (AF) + Cable loss (CL) + Read level (Raw) - Preamp factor (PA)(if applicable) = Level.

### 3.6.6 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 10th harmonic or 40 GHz, whichever is appropriate.

### 3.6.7 Test Result of Emissions in Restricted Frequency Bands

Refer as Appendix F



## 4 Test Equipment and Calibration Data

Instrument	Brand	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
LISN	Schwarzbeck	NSLK 8127	8127650	9kHz ~ 30MHz	Dec. 04, 2020	Dec. 03, 2021	Conduction (CO02-CB)
LISN	Schwarzbeck	NSLK 8127	8127478	9kHz ~ 30MHz	Nov. 20, 2020	Nov. 19, 2021	Conduction (CO02-CB)
EMI Receiver	Agilent	N9038A	My52260123	9kHz ~ 8.4GHz	Mar. 03, 2021	Mar. 02, 2022	Conduction (CO02-CB)
COND Cable	Woken	Cable	2	0.15MHz ~ 30MHz	Oct. 20, 2020	Oct. 19, 2021	Conduction (CO02-CB)
Pulse Limiter	Schwarzbeck	VTSD 9561F-N	00378	9kHz ~ 30MHz	Mar. 18, 2021	Mar. 17, 2022	Conduction (CO02-CB)
Software	SPORTON	SENSE	V5.10	-	N.C.R.	N.C.R.	Conduction (CO02-CB)
3m Semi Anechoic Chamber NSA	TDK	SAC-3M	03CH06-CB	30 MHz ~ 1 GHz	Aug. 10, 2020	Aug. 09, 2021	Radiation (03CH06-CB)
Bilog Antenna with 6 dB attenuator	TESEQ & EMC1	CBL6112D & N-6-06	37878 & AT-N0606	20MHz ~ 2GHz	Aug. 02, 2020	Aug. 01, 2021	Radiation (03CH06-CB)
Loop Antenna	Teseq	HLA 6120	24155	9kHz - 30 MHz	Apr. 13, 2020	Apr. 12, 2021	Radiation (03CH06-CB)
Loop Antenna	Teseq	HLA 6120	31244	9kHz - 30 MHz	Mar. 16, 2021	Mar. 15, 2022	Radiation (03CH06-CB)
Pre-Amplifier	Agilent	310N	187290	0.1MHz ~ 1GHz	Nov. 05, 2020	Nov. 04, 2021	Radiation (03CH06-CB)
Spectrum analyzer	R&S	FSP40	100080	9kHz~40GHz	Dec. 15, 2020	Dec. 14, 2021	Radiation (03CH06-CB)
EMI Test Receiver	R&S	ESCS	826547/017	9kHz ~ 2.75GHz	May 13, 2020	May 12, 2021	Radiation (03CH06-CB)
RF Cable-low	Woken	RG402	Low Cable-05+24	30MHz~1GHz	Oct. 05, 2020	Oct. 04, 2021	Radiation (03CH06-CB)
Test Software	SPORTON	SENSE	V5.10	-	N.C.R.	N.C.R.	Radiation (03CH06-CB)
3m Semi Anechoic Chamber VSWR	TDK	SAC-3M	03CH01-CB	1GHz ~18GHz 3m	May 29, 2020	May 28, 2021	Radiation (03CH01-CB)
Horn Antenna	ETS-LINDGRE N	3115	00075790	750MHz ~ 18GHz	Nov. 06, 2020	Nov. 05, 2021	Radiation (03CH01-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Jul. 21, 2020	Jul. 20, 2021	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Jan. 07, 2021	Jan. 06, 2022	Radiation (03CH01-CB)
Pre-Amplifier	MITEQ	TTA1840-35-H G	1864479	18GHz ~ 40GHz	Jul. 08, 2020	Jul. 07, 2021	Radiation (03CH01-CB)
Spectrum Analyzer	R&S	FSP40	100056	9kHz ~ 40GHz	Apr. 16, 2020	Apr. 15, 2021	Radiation (03CH01-CB)



Instrument	Brand	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
Spectrum Analyzer	R&S	FSP40	100056	9kHz ~ 40GHz	May 03, 2021	May 02, 2023	Radiation (03CH01-CB)
RF Cable-high	Woken	RG402	High Cable-16	1 GHz ~ 18 GHz	Oct. 05, 2020	Oct. 04, 2021	Radiation (03CH01-CB)
RF Cable-high	Woken	RG402	High Cable-16+17	1 GHz ~ 18 GHz	Oct. 05, 2020	Oct. 04, 2021	Radiation (03CH01-CB)
RF Cable-high	Woken	RG402	High Cable-40G#1	18GHz ~ 40 GHz	Jul. 16, 2020	Jul. 15, 2021	Radiation (03CH01-CB)
RF Cable-high	Woken	RG402	High Cable-40G#2	18GHz ~ 40 GHz	Jul. 16, 2020	Jul. 15, 2021	Radiation (03CH01-CB)
Test Software	SPORTON	SENSE	V5.10	-	N.C.R.	N.C.R.	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSV40	100979	9kHz~40GHz	May 05, 2020	May 04, 2021	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-06	1 GHz ~ 26.5 GHz	Oct. 05, 2020	Oct. 04, 2021	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-07	1 GHz ~26.5 GHz	Oct. 05, 2020	Oct. 04, 2021	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-08	1 GHz ~26.5 GHz	Oct. 05, 2020	Oct. 04, 2021	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-09	1 GHz ~26.5 GHz	Oct. 05, 2020	Oct. 04, 2021	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-10	1 GHz ~26.5 GHz	Oct. 05, 2020	Oct. 04, 2021	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-30	1 GHz ~26.5 GHz	Oct. 05, 2020	Oct. 04, 2021	Conducted (TH01-CB)
Power Sensor	Anritsu	MA2411B	1339408	300MHz~40GHz	Sep. 02, 2020	Sep. 01, 2021	Conducted (TH01-CB)
Power Meter	Anritsu	ML2495A	1517009	300MHz~40GHz	Sep. 02, 2020	Sep. 01, 2021	Conducted (TH01-CB)
Test Software	SPORTON	SENSE	V5.10	-	N.C.R.	N.C.R.	Conducted (TH01-CB)

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

NCR means Non-Calibration required.



## AC Power-line Conducted Emissions Result

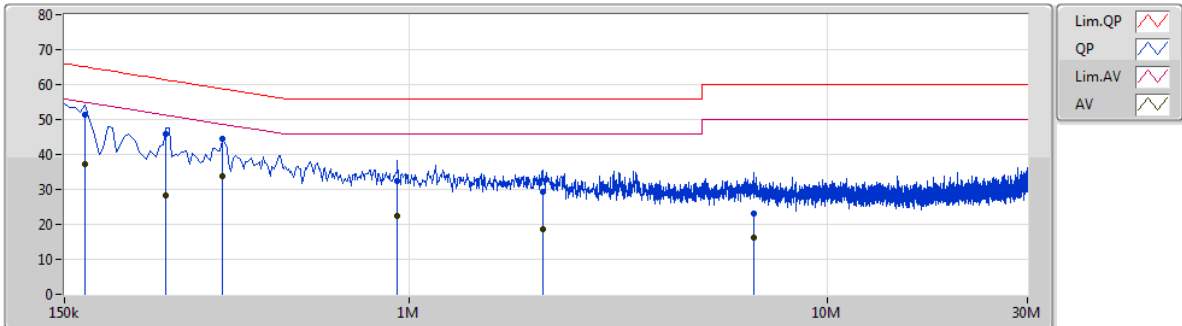
Appendix A

### Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition
Mode 2	Pass	AV	361.5k	36.99	48.70	-11.71	Neutral

### Mode 2

26/03/2021

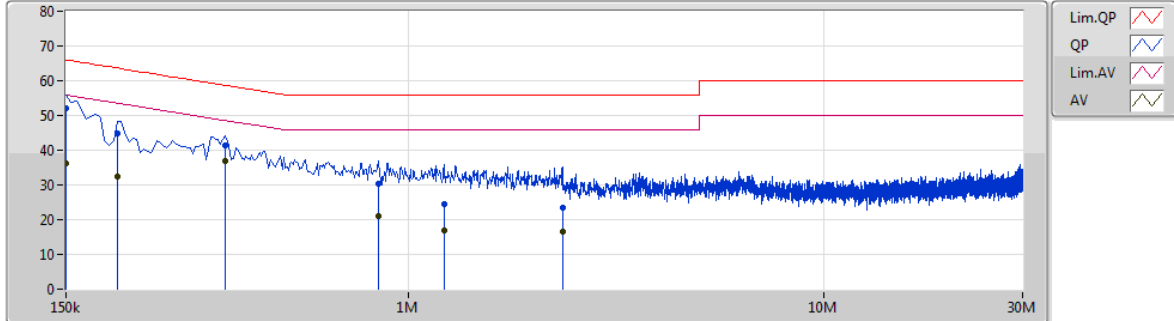


Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)
QP	168k	51.51	65.06	-13.55	10.29	Line	"Worst"	41.22	0.07	0.07	10.15
AV	168k	37.07	55.06	-17.99	10.29	Line	-	26.78	0.07	0.07	10.15
QP	262.5k	45.73	61.35	-15.62	10.28	Line	-	35.45	0.07	0.07	10.14
AV	262.5k	28.31	51.35	-23.04	10.28	Line	-	18.03	0.07	0.07	10.14
QP	357k	44.36	58.79	-14.43	10.26	Line	-	34.10	0.08	0.06	10.12
AV	357k	33.63	48.79	-15.16	10.26	Line	-	23.37	0.08	0.06	10.12
QP	937.5k	32.31	56.00	-23.69	10.27	Line	-	22.04	0.09	0.08	10.10
AV	937.5k	22.47	46.00	-23.53	10.27	Line	-	12.20	0.09	0.08	10.10
QP	2.081M	29.40	56.00	-26.60	10.34	Line	-	19.06	0.11	0.10	10.13
AV	2.081M	18.72	46.00	-27.28	10.34	Line	-	8.38	0.11	0.10	10.13
QP	6.653M	23.25	60.00	-36.75	10.50	Line	-	12.75	0.21	0.18	10.11
AV	6.653M	16.36	50.00	-33.64	10.50	Line	-	5.86	0.21	0.18	10.11



## Mode 2

26/03/2021



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)
QP	150k	51.91	66.00	-14.09	10.28	Neutral	-	41.63	0.06	0.07	10.15
AV	150k	36.11	56.00	-19.89	10.28	Neutral	-	25.83	0.06	0.07	10.15
QP	199.5k	44.87	63.63	-18.76	10.29	Neutral	-	34.58	0.06	0.07	10.16
AV	199.5k	32.36	53.63	-21.27	10.29	Neutral	-	22.07	0.06	0.07	10.16
QP	361.5k	41.43	58.70	-17.27	10.24	Neutral	-	31.19	0.06	0.06	10.12
AV	361.5k	36.99	48.70	-11.71	10.24	Neutral	"Worst"	26.75	0.06	0.06	10.12
QP	847.5k	30.27	56.00	-25.73	10.26	Neutral	-	20.01	0.08	0.08	10.10
AV	847.5k	21.15	46.00	-24.85	10.26	Neutral	-	10.89	0.08	0.08	10.10
QP	1.217M	24.42	56.00	-31.58	10.28	Neutral	-	14.14	0.08	0.09	10.11
AV	1.217M	16.95	46.00	-29.05	10.28	Neutral	-	6.67	0.08	0.09	10.11
QP	2.346M	23.52	56.00	-32.48	10.33	Neutral	-	13.19	0.10	0.11	10.12
AV	2.346M	16.44	46.00	-29.56	10.33	Neutral	-	6.11	0.10	0.11	10.12



Summary

Mode	Max-N dB (Hz)	Max-OBW (Hz)	ITU-Code	Min-N dB (Hz)	Min-OBW (Hz)
2.4-2.4835GHz	-	-	-	-	-
BT-LE(1Mbps)	663.75k	1.026M	1M03F1D	663.75k	1.021M

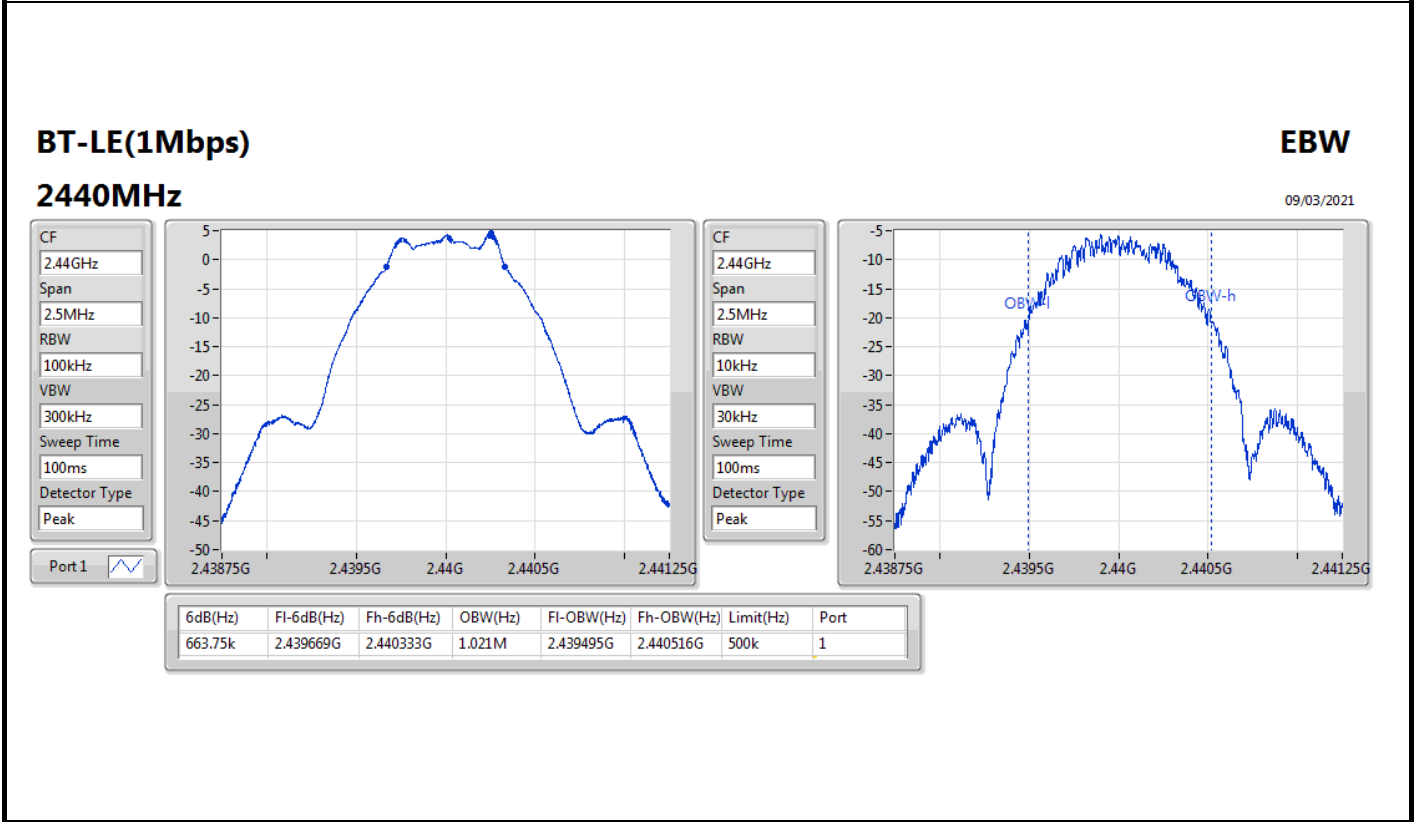
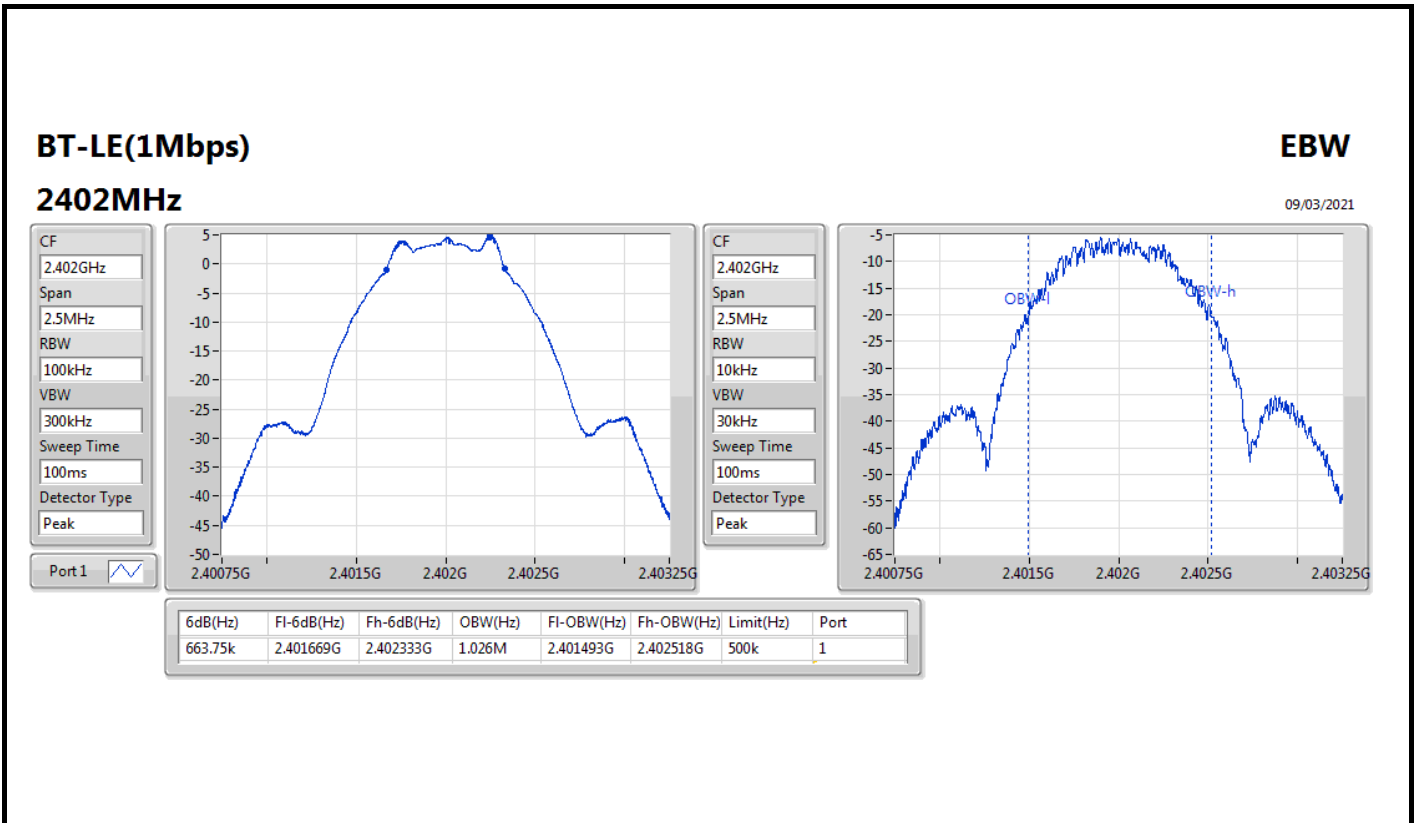
**Max-N dB** = Maximum 6dB down bandwidth; **Max-OBW** = Maximum 99% occupied bandwidth;  
**Min-N dB** = Minimum 6dB down bandwidth; **Min-OBW** = Minimum 99% occupied bandwidth;

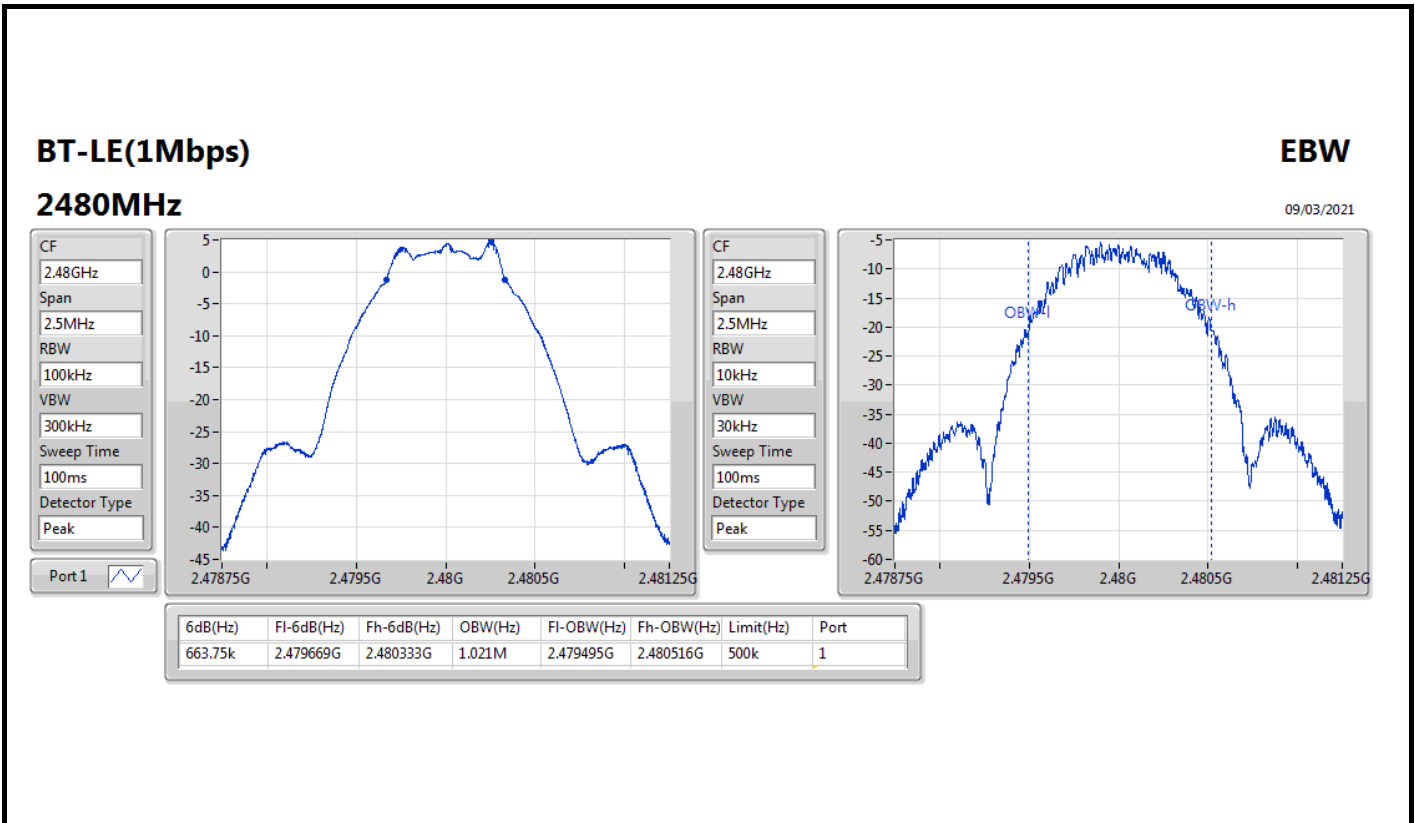


Result

Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	500k	663.75k	1.026M
2440MHz	Pass	500k	663.75k	1.021M
2480MHz	Pass	500k	663.75k	1.021M

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







**Summary**

Mode	Power (dBm)	Power (W)
2.4-2.4835GHz	-	-
BT-LE(1Mbps)	4.52	0.00283



**Result**

Mode	Result	Gain (dBi)	Power (dBm)	Power Limit (dBm)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	5.30	4.52	30.00
2440MHz	Pass	5.30	4.31	30.00
2480MHz	Pass	5.30	4.39	30.00

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



Summary

Mode	PD (dBm/RBW)
2.4-2.4835GHz	-
BT-LE(1Mbps)	-11.61

RBW=3 kHz.



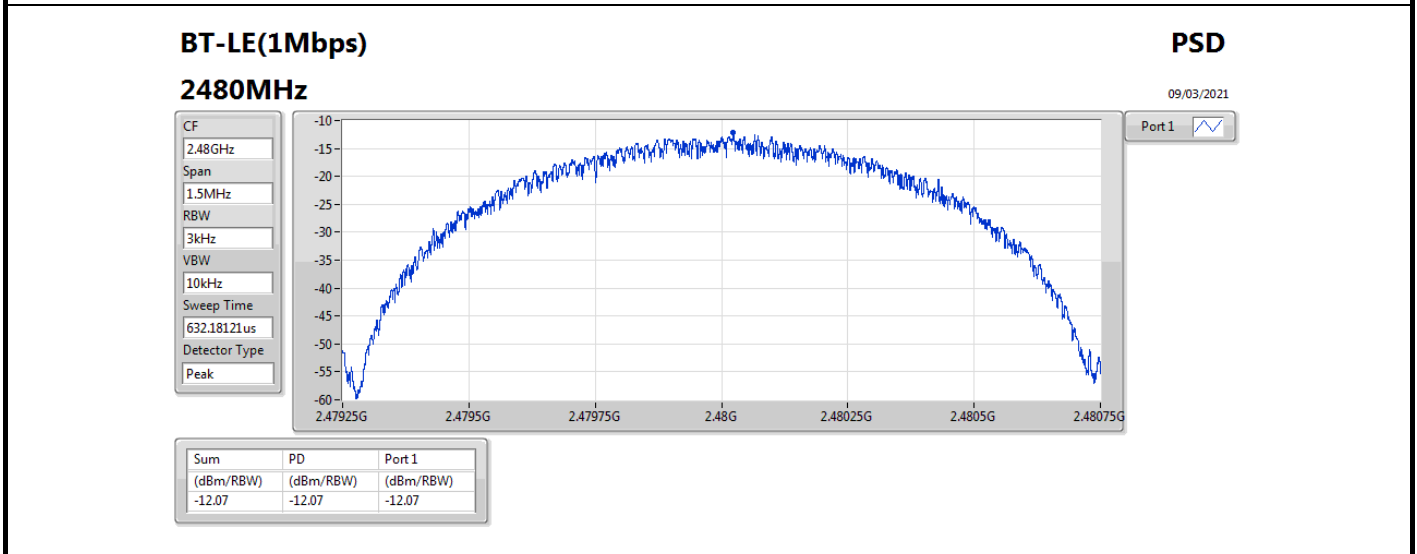
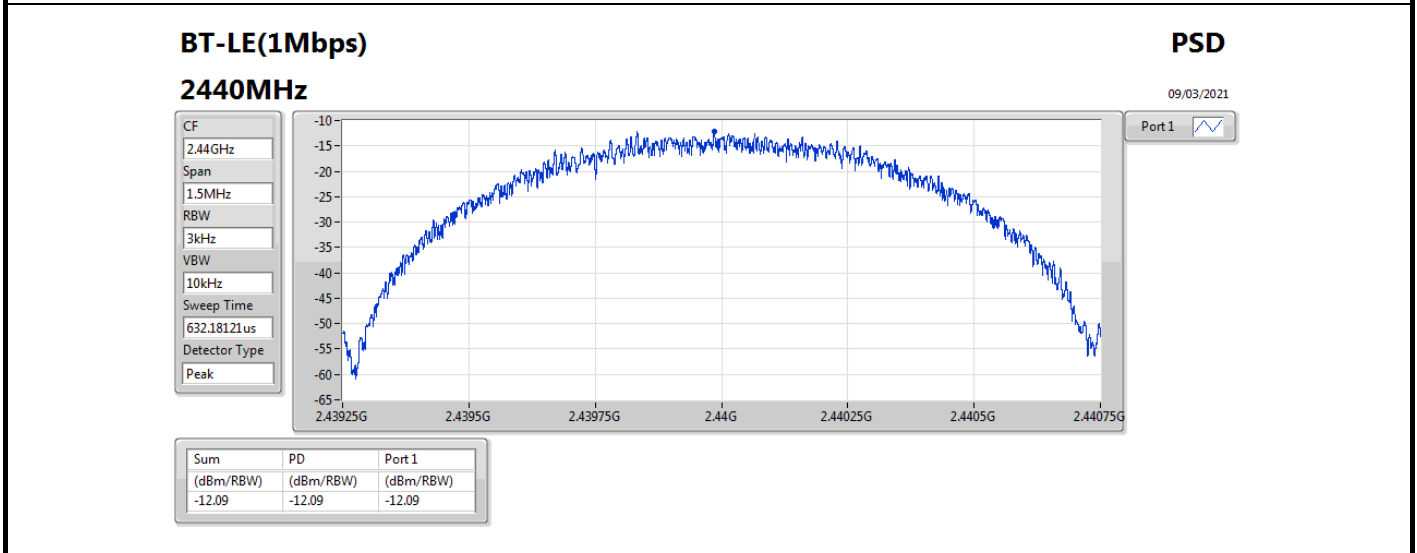
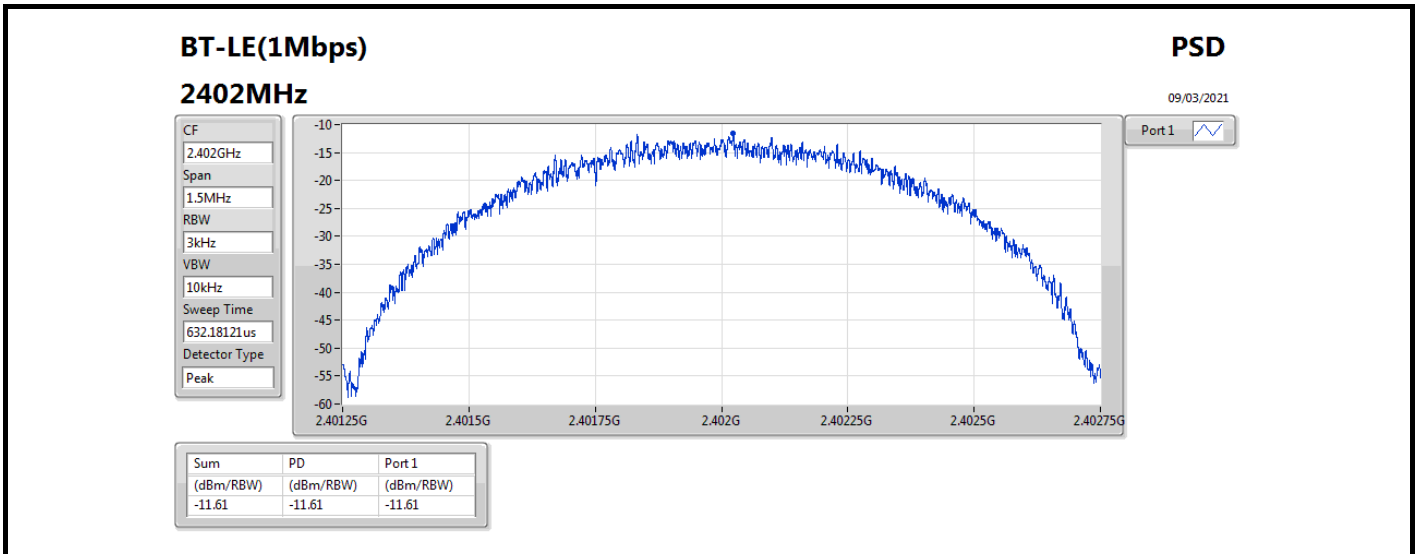


Result

Mode	Result	Gain (dBi)	PD (dBm/RBW)	PD Limit (dBm/RBW)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	5.30	-11.61	8.00
2440MHz	Pass	5.30	-12.09	8.00
2480MHz	Pass	5.30	-12.07	8.00

DG = Directional Gain; RBW=3 kHz;

PD = trace bin-by-bin of each transmits port summing can be performed maximum power density; Port X = Port X power density;





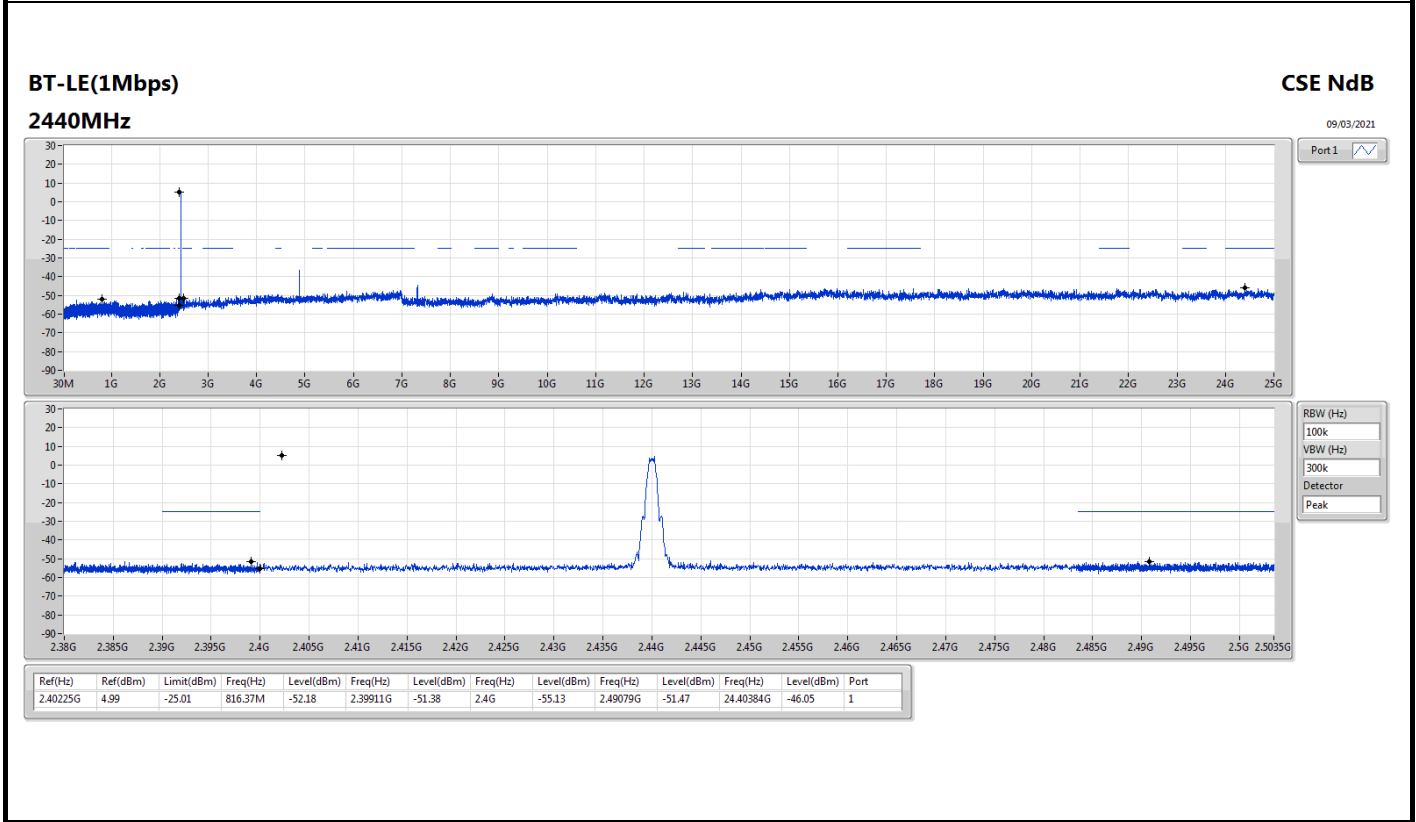
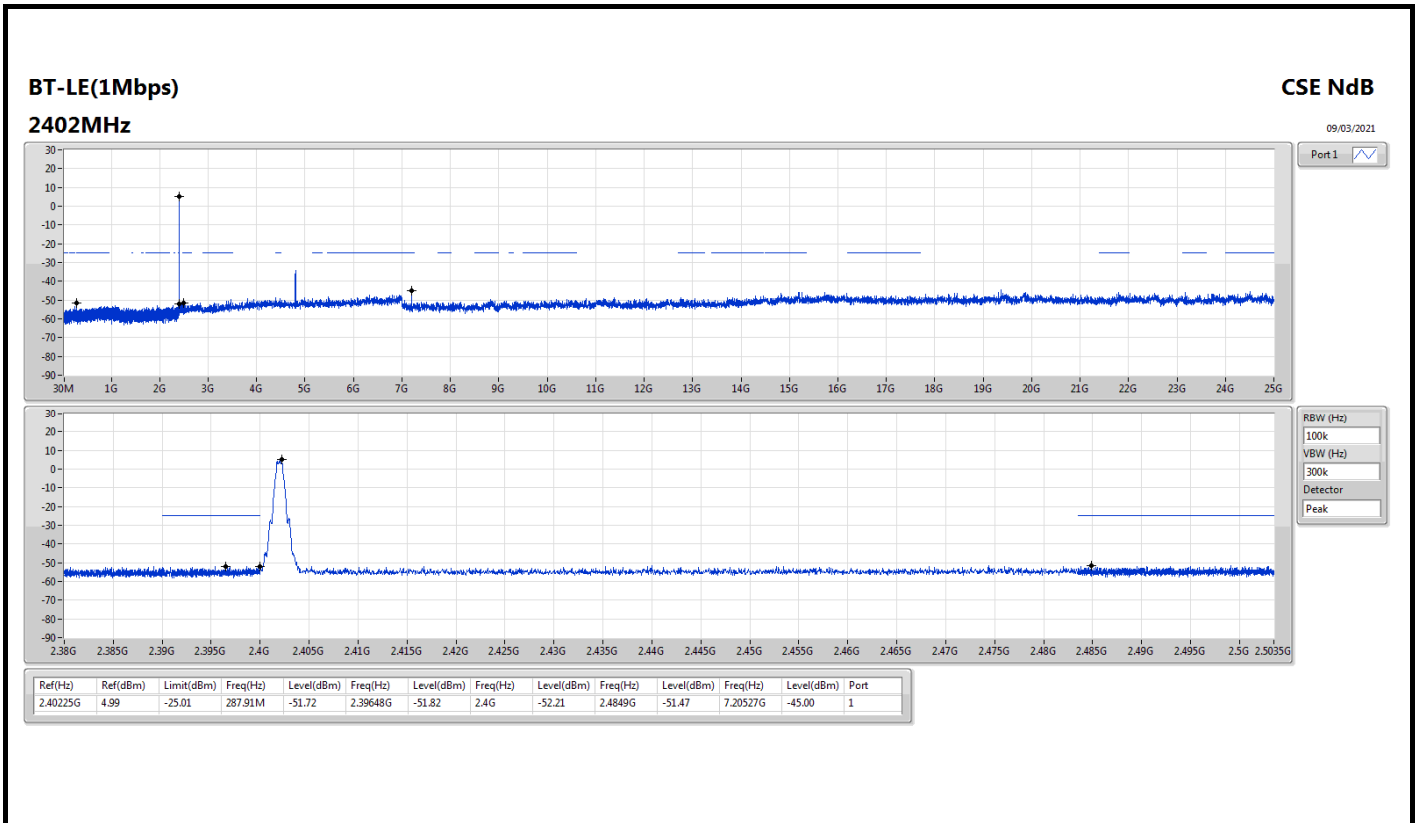
Summary

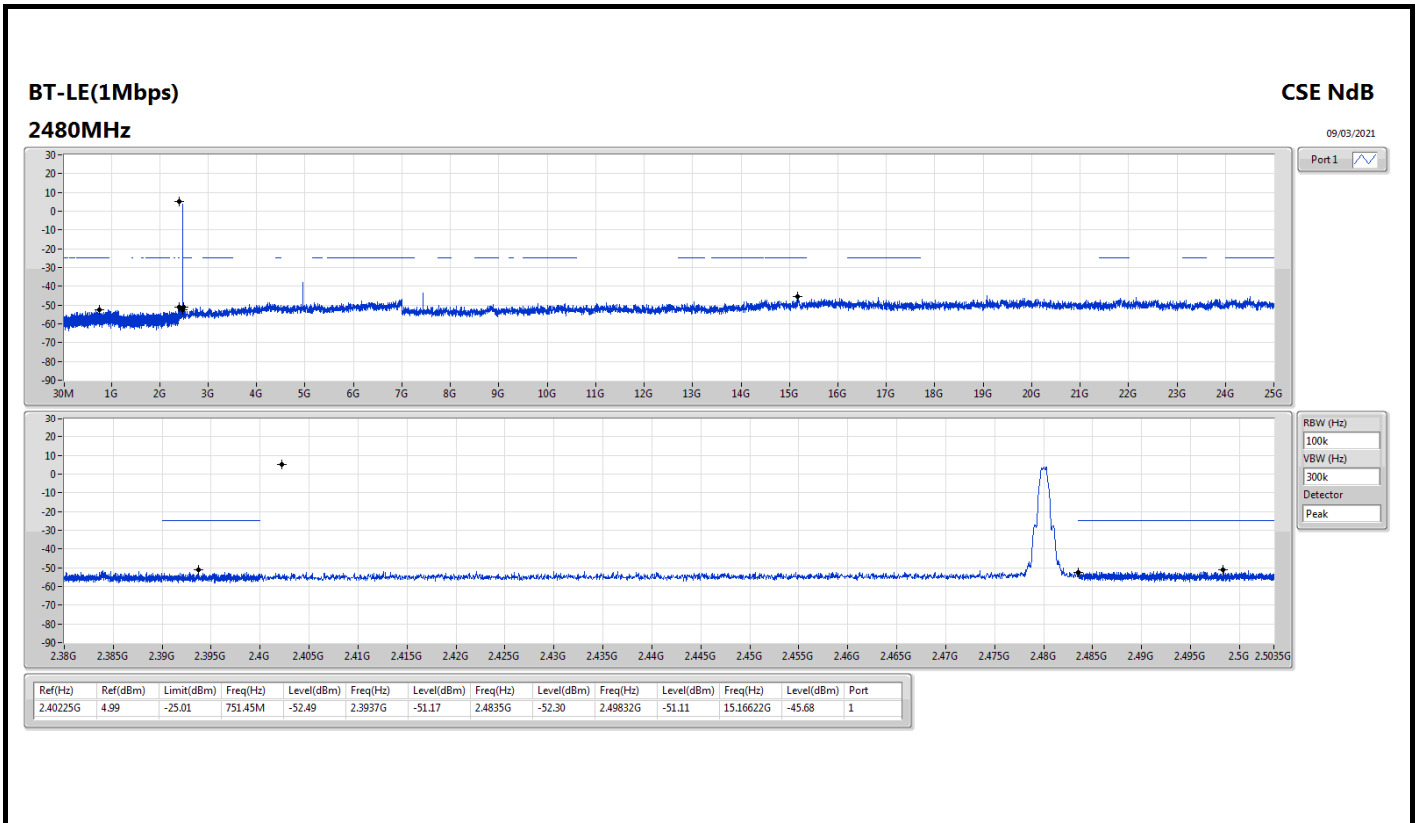
Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	2.40225G	4.99	-25.01	751.45M	-52.49	2.3937G	-51.17	2.4835G	-52.30	2.49832G	-51.11	15.16622G	-45.68	1

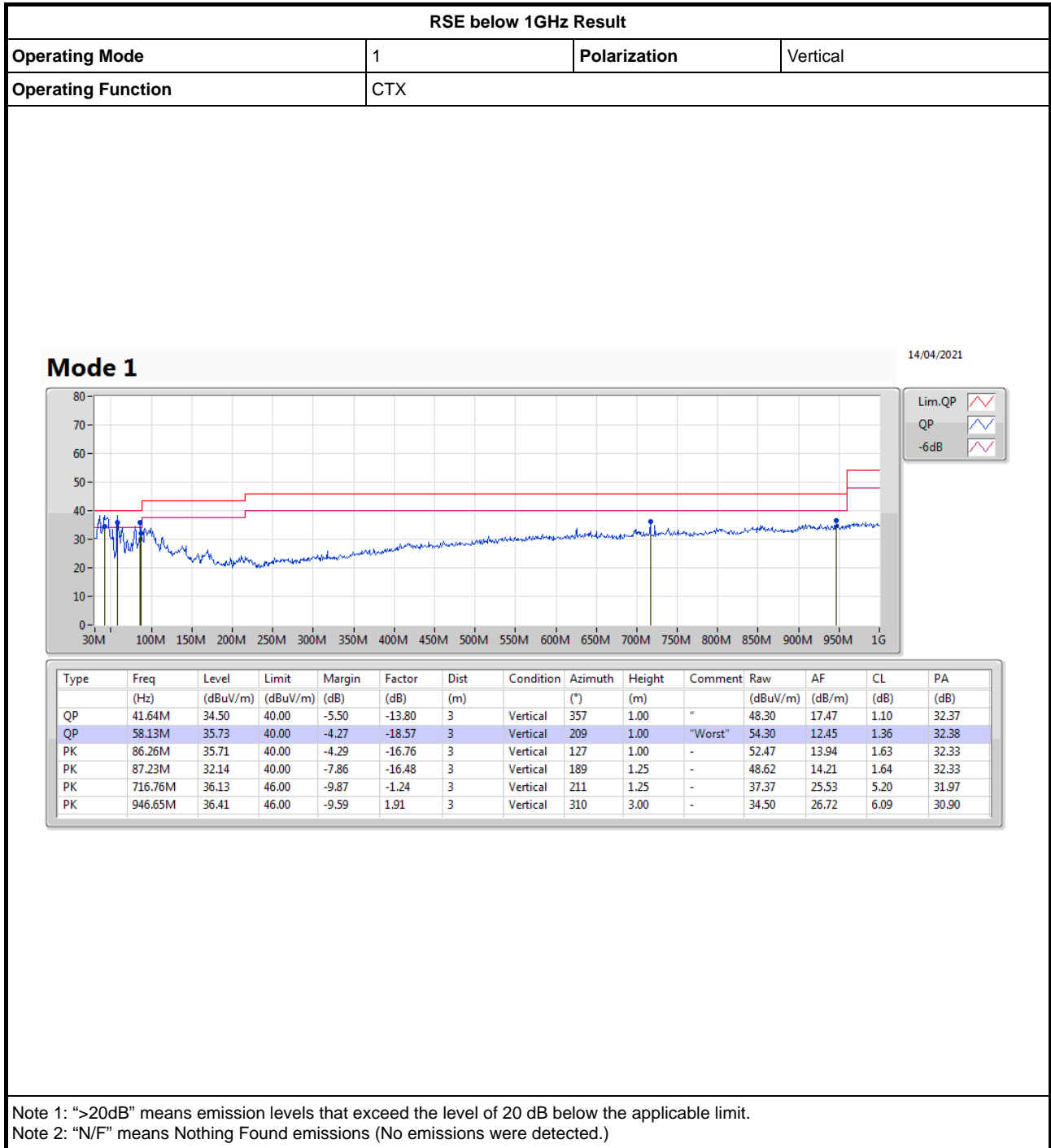


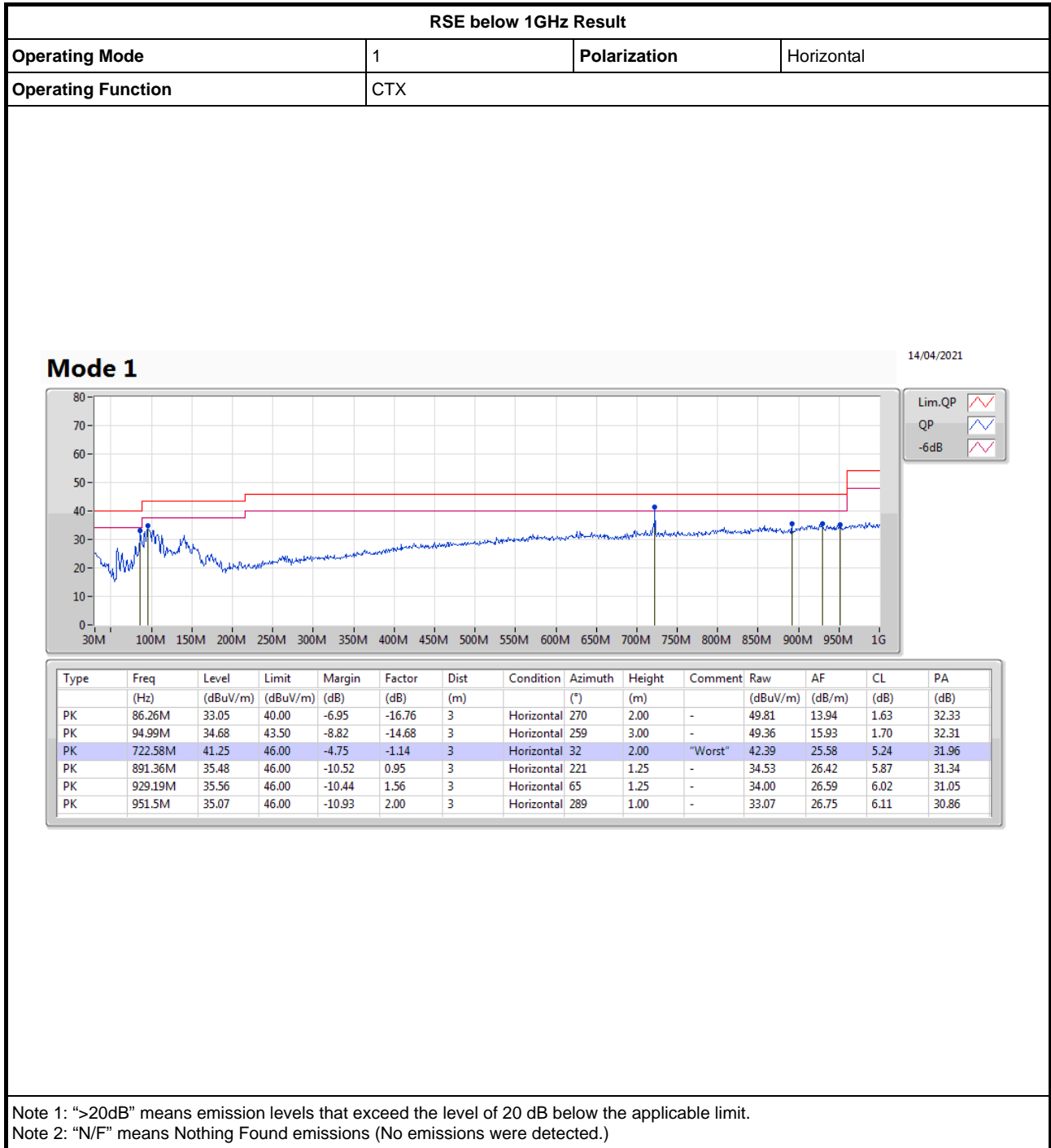
Result

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-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	2.40225G	4.99	-25.01	287.91M	-51.72	2.39648G	-51.82	2.4G	-52.21	2.4849G	-51.47	7.20527G	-45.00	1
2440MHz	Pass	2.40225G	4.99	-25.01	816.37M	-52.18	2.39911G	-51.38	2.4G	-55.13	2.49079G	-51.47	24.40384G	-46.05	1
2480MHz	Pass	2.40225G	4.99	-25.01	751.45M	-52.49	2.3937G	-51.17	2.4835G	-52.30	2.49832G	-51.11	15.16622G	-45.68	1













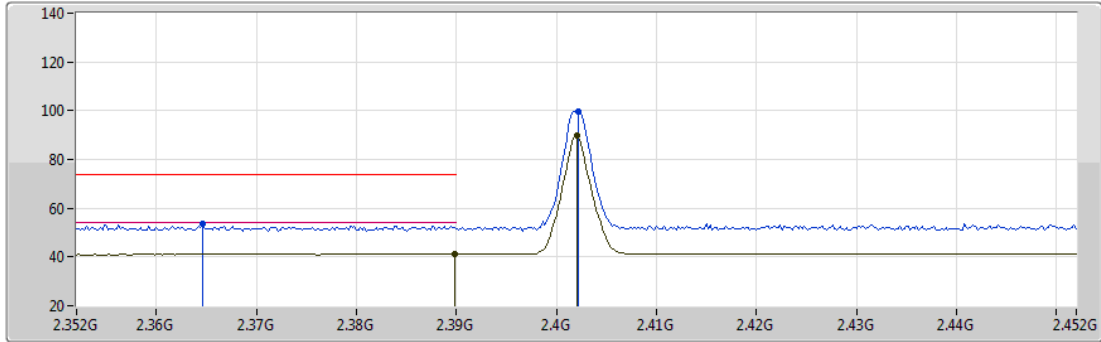
Summary

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-LE(1Mbps)	Pass	AV	4.80404G	49.10	54.00	-4.90	3	Vertical	23	1.66	-

**BT-LE(1Mbps)**

02/02/2021

**2402MHz\_TX**



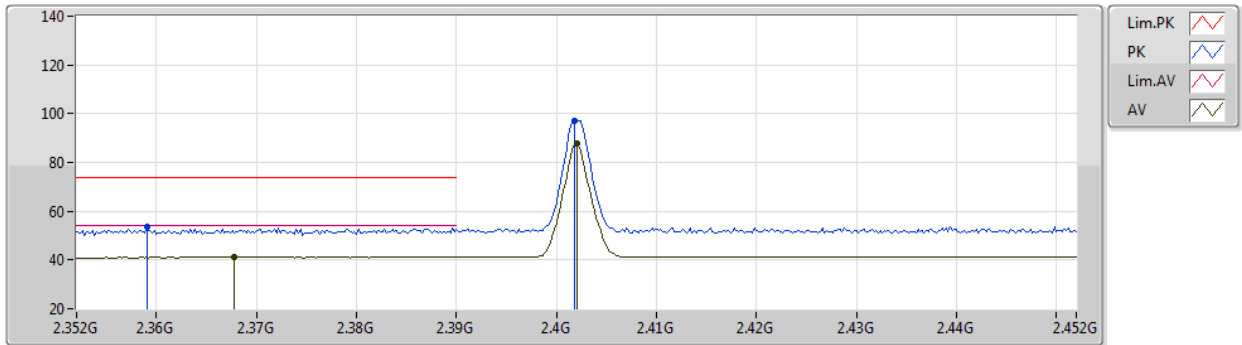
EUT Y\_1TX  
Setting Default  
01-F-N-2

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	2.3646G	53.54	74.00	-20.46	24.05	3	Vertical	32	2.74	-	27.33	2.16	-
AV	2.3898G	41.05	54.00	-12.95	11.48	3	Vertical	32	2.74	-	27.38	2.19	-
PK	2.4022G	99.59	Inf	-Inf	69.99	3	Vertical	32	2.74	-	27.40	2.20	-
AV	2.402G	89.78	Inf	-Inf	60.18	3	Vertical	32	2.74	-	27.40	2.20	-

**BT-LE(1Mbps)**

02/02/2021

**2402MHz\_TX**



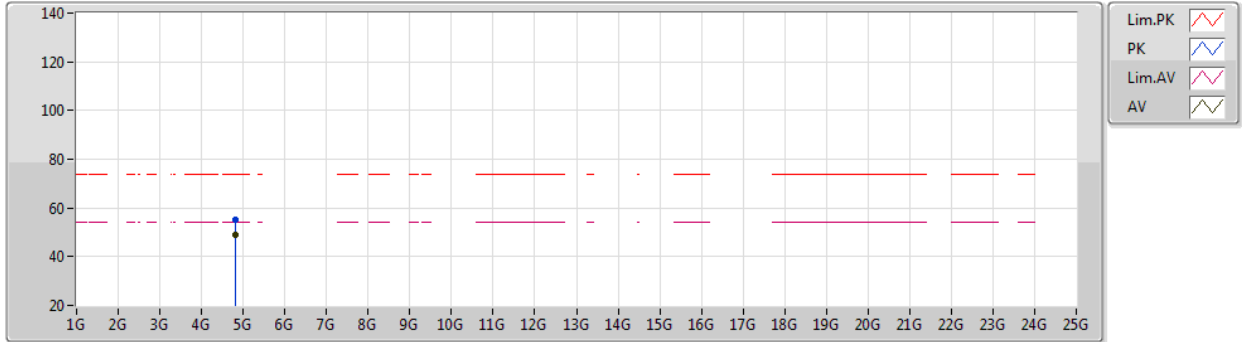
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Setting Default  
01-F-N-2

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	2.359G	53.47	74.00	-20.53	23.99	3	Horizontal	270	2.84	-	27.32	2.16	-
AV	2.3678G	41.03	54.00	-12.97	11.52	3	Horizontal	270	2.84	-	27.34	2.17	-
PK	2.4018G	97.02	Inf	-Inf	67.42	3	Horizontal	270	2.84	-	27.40	2.20	-
AV	2.402G	87.63	Inf	-Inf	58.03	3	Horizontal	270	2.84	-	27.40	2.20	-

**BT-LE(1Mbps)**

02/02/2021

**2402MHz\_TX**



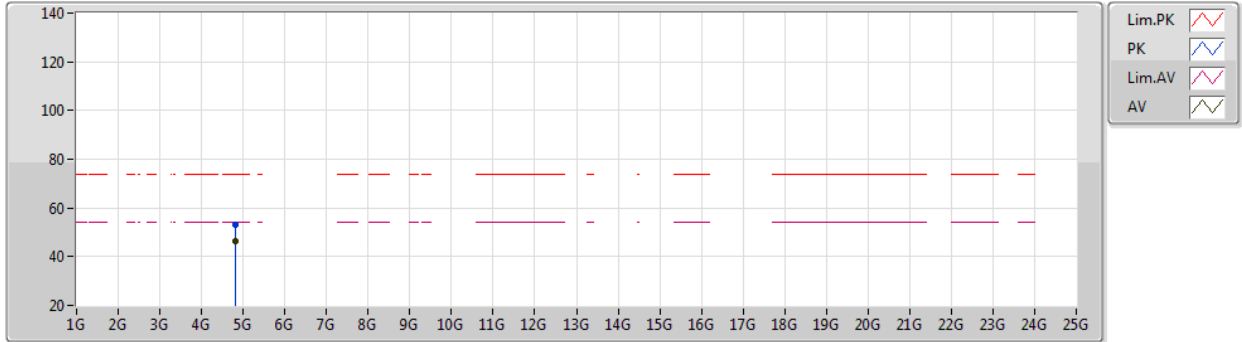
EUT Y\_1TX  
Setting Default  
01-F-N-2

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	4.80452G	55.03	74.00	-18.97	52.46	3	Vertical	23	1.66	-	32.13	5.00	34.56
AV	4.80404G	49.10	54.00	-4.90	46.54	3	Vertical	23	1.66	-	32.12	5.00	34.56

**BT-LE(1Mbps)**

02/02/2021

**2402MHz\_TX**



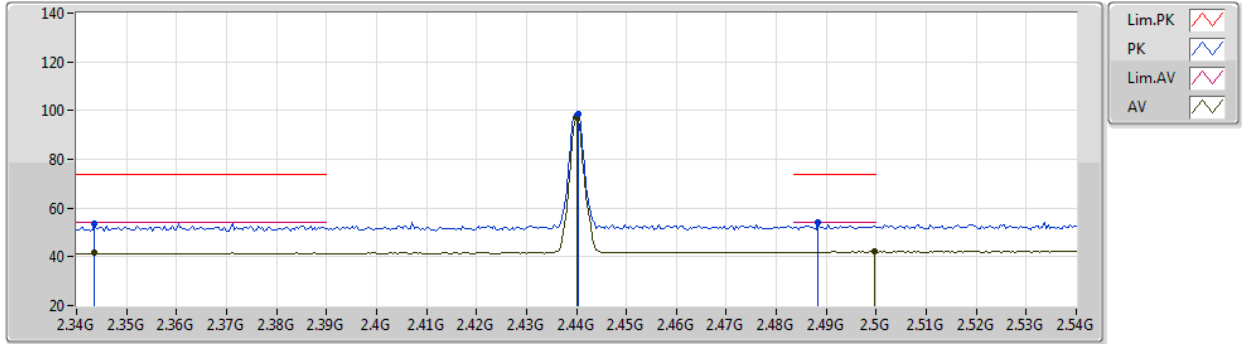
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Setting Default  
01-F-N-2

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	4.80448G	53.09	74.00	-20.91	50.52	3	Horizontal	132	2.05	-	32.13	5.00	34.56
AV	4.80404G	46.16	54.00	-7.84	43.60	3	Horizontal	132	2.05	-	32.12	5.00	34.56

**BT-LE(1Mbps)**

02/02/2021

**2440MHz\_TX**



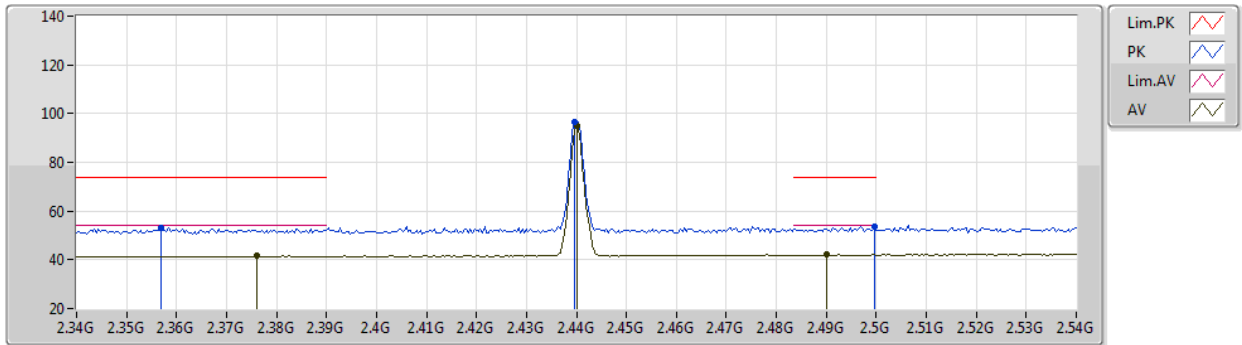
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Setting Default  
01-F-N-2

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	2.3436G	53.43	74.00	-20.57	23.99	3	Vertical	15	3.00	-	27.30	2.14	-
AV	2.3436G	41.48	54.00	-12.52	12.04	3	Vertical	15	3.00	-	27.30	2.14	-
PK	2.4404G	98.78	Inf	-Inf	69.06	3	Vertical	15	3.00	-	27.48	2.24	-
AV	2.44G	97.19	Inf	-Inf	67.47	3	Vertical	15	3.00	-	27.48	2.24	-
PK	2.4884G	53.98	74.00	-20.02	23.96	3	Vertical	15	3.00	-	27.73	2.29	-
AV	2.4996G	42.23	54.00	-11.77	12.13	3	Vertical	15	3.00	-	27.80	2.30	-

**BT-LE(1Mbps)**

02/02/2021

**2440MHz\_TX**



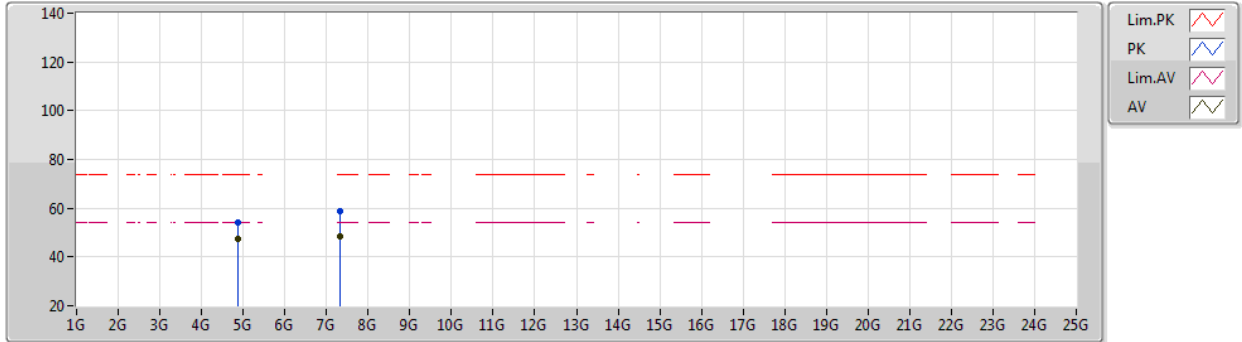
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Setting Default  
01-F-N-2

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	2.3568G	53.15	74.00	-20.85	23.68	3	Horizontal	250	2.78	-	27.31	2.16	-
AV	2.376G	41.55	54.00	-12.45	12.02	3	Horizontal	250	2.78	-	27.35	2.18	-
PK	2.4396G	96.41	Inf	-Inf	66.69	3	Horizontal	250	2.78	-	27.48	2.24	-
AV	2.44G	95.00	Inf	-Inf	65.28	3	Horizontal	250	2.78	-	27.48	2.24	-
PK	2.4996G	53.56	74.00	-20.44	23.46	3	Horizontal	250	2.78	-	27.80	2.30	-
AV	2.49G	42.25	54.00	-11.75	12.22	3	Horizontal	250	2.78	-	27.74	2.29	-

**BT-LE(1Mbps)**

02/02/2021

**2440MHz\_TX**



EUT Y\_1TX  
Setting Default  
01-F-N-2

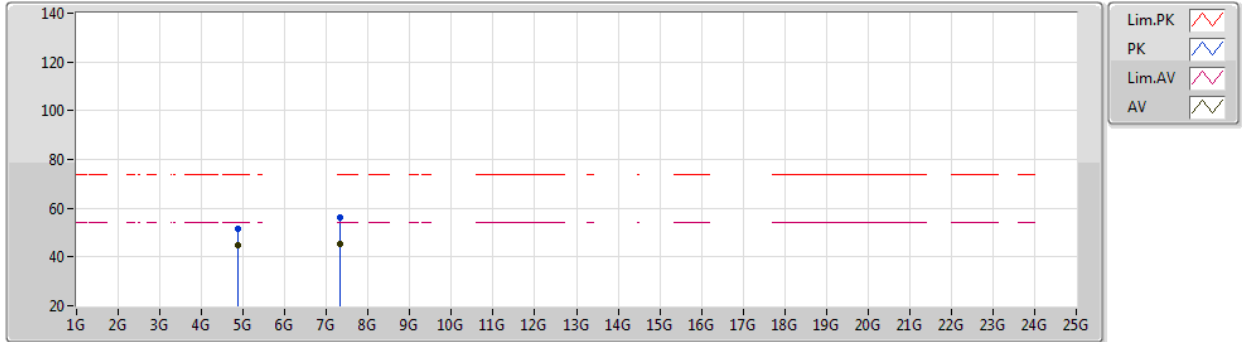
Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	4.8804G	53.95	74.00	-20.05	50.97	3	Vertical	36	1.75	-	32.46	5.04	34.52
AV	4.88G	47.27	54.00	-6.73	44.29	3	Vertical	36	1.75	-	32.46	5.04	34.52
PK	7.31994G	58.63	74.00	-15.37	49.78	3	Vertical	340	1.61	-	37.18	6.32	34.65
AV	7.32048G	48.42	54.00	-5.58	39.57	3	Vertical	340	1.61	-	37.18	6.32	34.65



**BT-LE(1Mbps)**

02/02/2021

**2440MHz\_TX**



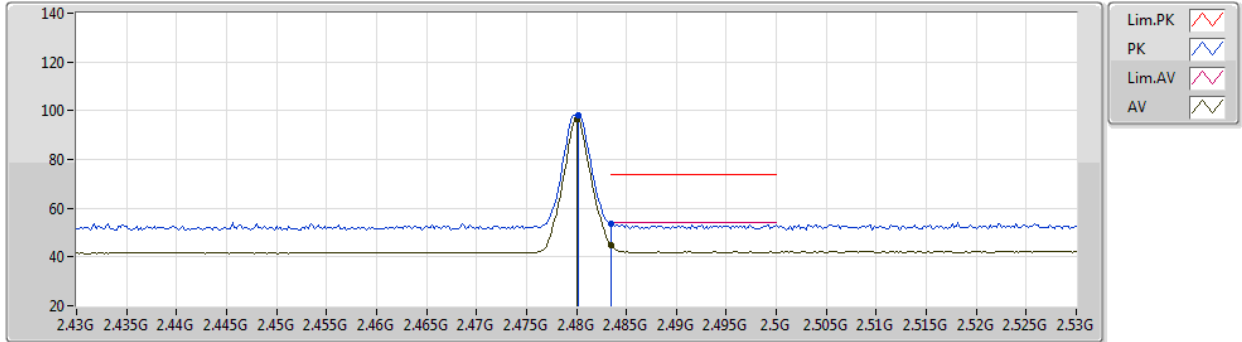
EUT Y\_1TX  
Setting Default  
01-F-N-2

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	4.8805G	51.67	74.00	-22.33	48.69	3	Horizontal	137	2.09	-	32.46	5.04	34.52
AV	4.88002G	44.62	54.00	-9.38	41.64	3	Horizontal	137	2.09	-	32.46	5.04	34.52
PK	7.31982G	55.99	74.00	-18.01	47.14	3	Horizontal	65	1.79	-	37.18	6.32	34.65
AV	7.32058G	45.25	54.00	-8.75	36.40	3	Horizontal	65	1.79	-	37.18	6.32	34.65

**BT-LE(1Mbps)**

02/02/2021

**2480MHz\_TX**



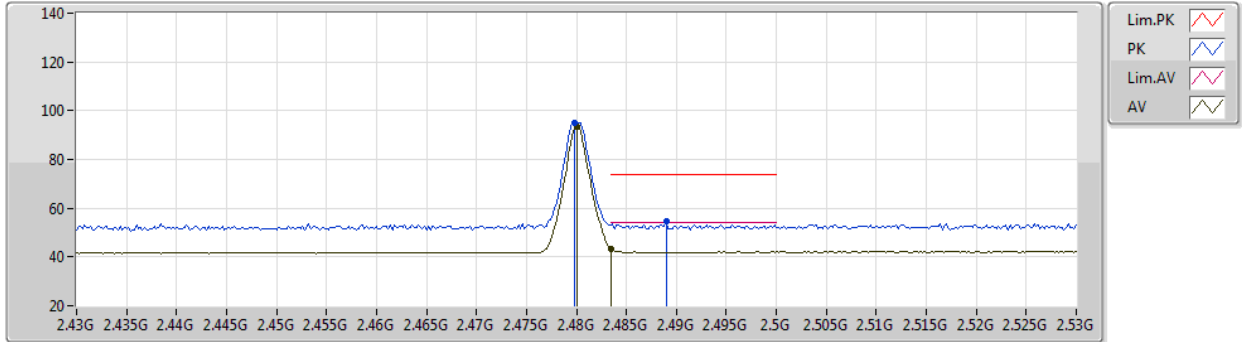
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Setting Default  
01-F-N-2

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	2.4802G	97.91	Inf	-Inf	67.95	3	Vertical	42	2.63	-	27.68	2.28	-
AV	2.48G	96.42	Inf	-Inf	66.46	3	Vertical	42	2.63	-	27.68	2.28	-
PK	2.4835G	53.46	74.00	-20.54	23.48	3	Vertical	42	2.63	-	27.70	2.28	-
AV	2.4835G	44.74	54.00	-9.26	14.76	3	Vertical	42	2.63	-	27.70	2.28	-

**BT-LE(1Mbps)**

02/02/2021

**2480MHz\_TX**



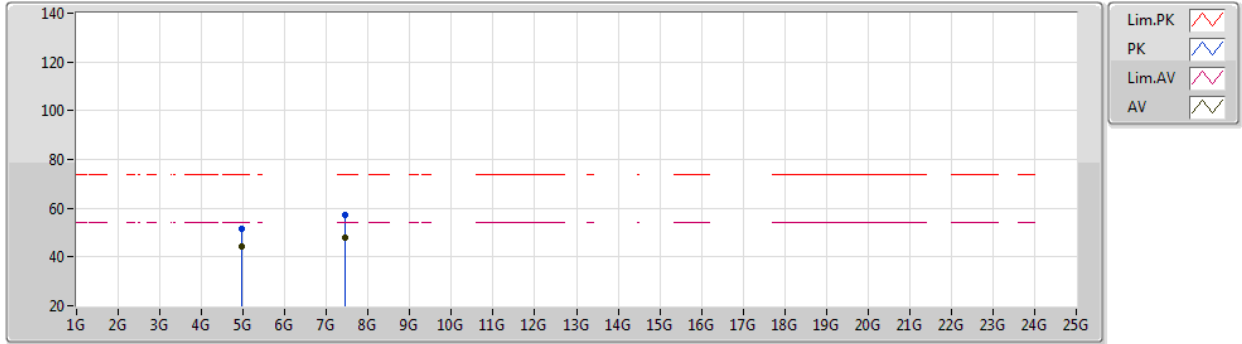
EUT Y\_1TX  
Setting Default  
01-F-N-2

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	95.07	Inf	-Inf	65.11	3	Horizontal	267	3.00	-	27.68	2.28	-
AV	2.48G	93.54	Inf	-Inf	63.58	3	Horizontal	267	3.00	-	27.68	2.28	-
PK	2.489G	54.53	74.00	-19.47	24.51	3	Horizontal	267	3.00	-	27.73	2.29	-
AV	2.4835G	43.52	54.00	-10.48	13.54	3	Horizontal	267	3.00	-	27.70	2.28	-

**BT-LE(1Mbps)**

02/02/2021

**2480MHz\_TX**



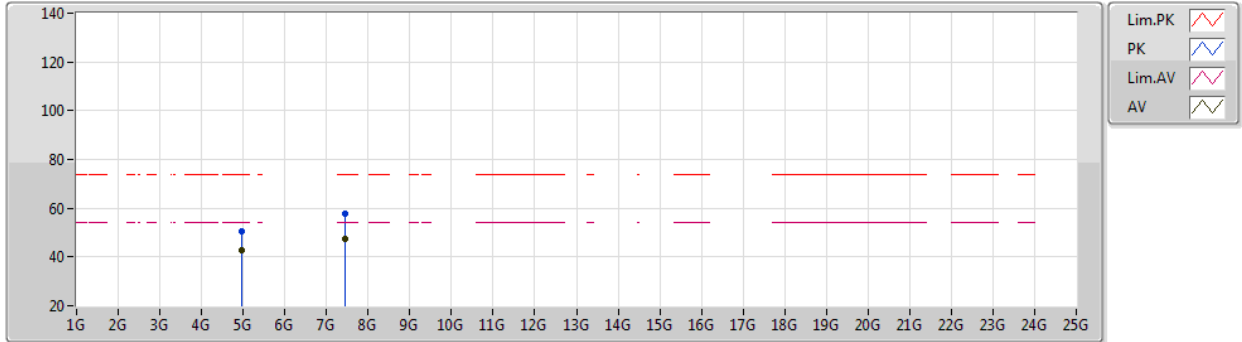
EUT Y\_1TX  
Setting Default  
01-F-N-2

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	4.9595G	51.63	74.00	-22.37	48.26	3	Vertical	58	1.80	-	32.78	5.08	34.49
AV	4.95998G	44.54	54.00	-9.46	41.17	3	Vertical	58	1.80	-	32.78	5.08	34.49
PK	7.4399G	57.23	74.00	-16.77	48.29	3	Vertical	64	1.79	-	37.22	6.38	34.66
AV	7.43998G	47.94	54.00	-6.06	39.00	3	Vertical	64	1.79	-	37.22	6.38	34.66

**BT-LE(1Mbps)**

02/02/2021

**2480MHz\_TX**



EUT Y\_1TX  
Setting Default  
01-F-N-2

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	4.96046G	50.62	74.00	-23.38	47.25	3	Horizontal	136	1.95	-	32.78	5.08	34.49
AV	4.95998G	42.84	54.00	-11.16	39.47	3	Horizontal	136	1.95	-	32.78	5.08	34.49
PK	7.43998G	57.52	74.00	-16.48	48.58	3	Horizontal	69	2.11	-	37.22	6.38	34.66
AV	7.43998G	47.58	54.00	-6.42	38.64	3	Horizontal	69	2.11	-	37.22	6.38	34.66