



# FCC Test Report

**FCC ID** : SWX-ULEDAC  
**Equipment** : UniFi LED  
**Brand Name** : UBIQUITI  
**Model Name** : ULED-AC  
**Applicant/  
Manufacturer** : Ubiquiti Networks, Inc.  
685 Third Avenue, 27th Floor New York, New York  
10017 USA  
**Standard** : 47 CFR FCC Part 15.247

The product was received on Apr. 16, 2018, and testing was started from Apr. 18, 2018 and completed on Apr. 24, 2018. We, SPORTON INTERTIONAL 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 INTERTIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Approved by: Allen Lin

**SPORTON INTERTIONAL INC. EMC & Wireless Communications Laboratory**

No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)



# Table of Contents

**HISTORY OF THIS TEST REPORT .....3**

**SUMMARY OF TEST RESULT .....4**

**1 GENERAL DESCRIPTION .....5**

1.1 Information.....5

1.2 Testing Applied Standards .....7

1.3 Testing Location Information .....7

1.4 Measurement Uncertainty .....7

**2 TEST CONFIGURATION OF EUT.....8**

2.1 Test Condition .....8

2.2 Test Channel Mode .....8

2.3 The Worst Case Measurement Configuration.....9

2.4 Support Equipment.....10

2.5 Test Setup Diagram .....11

**3 TRANSMITTER TEST RESULT .....12**

3.1 AC Power-line Conducted Emissions .....12

3.2 DTS Bandwidth .....14

3.3 Maximum Conducted Output Power .....15

3.4 Power Spectral Density .....17

3.5 Emissions in Non-restricted Frequency Bands .....18

3.6 Emissions in Restricted Frequency Bands.....19

**4 TEST EQUIPMENT AND CALIBRATION DATA.....23**

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

**APPENDIX B. TEST RESULTS OF DTS BANDWIDTH**

**APPENDIX C. TEST RESULTS OF MAXIMUM CONDUCTED OUTPUT POWER**

**APPENDIX D. TEST RESULTS OF POWER SPECTRAL DENSITY**

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

**APPENDIX F. TEST RESULTS OF EMISSIONS IN RESTRICTED FREQUENCY BANDS**

**APPENDIX G. TEST PHOTOS**

**PHOTOGRAPHS OF EUT V01**



### History of this test report

Report No.	Version	Description	Issued Date
FR7N0734-02AL	01	Initial issue of report	May 18, 2018



### Summary of Test Result

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

Reviewed by: Sam Tsai

Report Producer: Jenny Yang

# 1 General Description

## 1.1 Information

### 1.1.1 RF General Information

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

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

Note:

- ◆ Bluetooth LE uses a GFSK (1Mbps) modulation for DSSS.
- ◆ BWch is the nominal channel bandwidth.

### 1.1.2 Antenna Information

Ant.	Brand	Model Name	Antenna Type	Connector
1	-	-	internal antenna	i-Pex
2	-	-	internal antenna	i-Pex
3	-	-	internal antenna	fixed on board

Ant.	Port	Gain (dBi)	
		2.4G	BT
1	1	4	-
2	2	4	-
3	1	-	3.5

**For 2.4 GHz function:**

For IEEE 802.11b/g/n mode (2TX/2RX)

Ant. 1 (port 1) and Ant. 2 (port 2) could transmit/receive simultaneously.

**For Bluetooth function:**

For Bluetooth mode (1TX/1RX)

Only Ant. 3 (port 1) can be used as transmitting/receiving antenna.



1.1.3 EUT Information

Operational Condition	
EUT Power Type	From PoE Adapter
Type of EUT	
<input checked="" type="checkbox"/>	Stand-alone
<input type="checkbox"/>	Combined (EUT where the radio part is fully integrated within another device)
	Combined Equipment - Brand Name / Model No.: ...
<input type="checkbox"/>	Plug-in radio (EUT intended for a variety of host systems)
	Host System - Brand Name / Model No.: ...
<input type="checkbox"/>	Other:

1.1.4 Mode Test Duty Cycle

Mode	DC	DCF(dB)	T(s)	VBW(Hz) ≥ 1/T
BT-LE(1Mbps)	0.621	2.069	405u	3k

## 1.2 Testing Applied Standards

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

- ◆ 47 CFR FCC Part 15
- ◆ ANSI C63.10-2013
- ◆ KDB 558074 D01 v04

## 1.3 Testing Location Information

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

Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
RF Conducted	TH06-HY	Tim	22.5°C / 65%	24/Apr/2018
Radiated	03CH03-HY	Jerry	23°C / 55%	18/Apr/2018
AC Conduction	CO04-HY	Daniel	22.9°C / 57%	19/Apr/2018

## 1.4 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2))

Test Items	Uncertainty	Remark
Conducted Emission (150kHz ~ 30MHz)	3.6 dB	Confidence levels of 95%
Radiated Emission (9kHz ~ 30MHz)	3.0 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	4.3 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	3.9 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	3.5 dB	Confidence levels of 95%
Conducted Emission	1.3 dB	Confidence levels of 95%
Temperature	0.7 °C	Confidence levels of 95%
Humidity	4 %	Confidence levels of 95%



## 2 Test Configuration of EUT

### 2.1 Test Condition

RF Conducted	Abbreviation	Remark
TnomVnom	Tnom	20°C
-	Vnom	120V

### 2.2 Test Channel Mode

Test Software	CMD
---------------	-----


Mode	Power Setting
BT-LE(1Mbps)	-
2402MHz	8
2440MHz	8
2480MHz	8



## 2.3 The Worst Case Measurement Configuration

The Worst Case Mode for Following Conformance Tests	
Tests Item	AC power-line conducted emissions
Condition	AC power-line conducted measurement for line and neutral
Operating Mode	CTX
1	AC mode

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

The Worst Case Mode for Following Conformance Tests	
Tests Item	Emissions in Restricted Frequency Bands
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	CTX
1	PoE adapter mode
Operating Mode > 1GHz	CTX
Orthogonal Planes of EUT	<p><b>Z Plane</b></p> 
Worst Planes of EUT	V

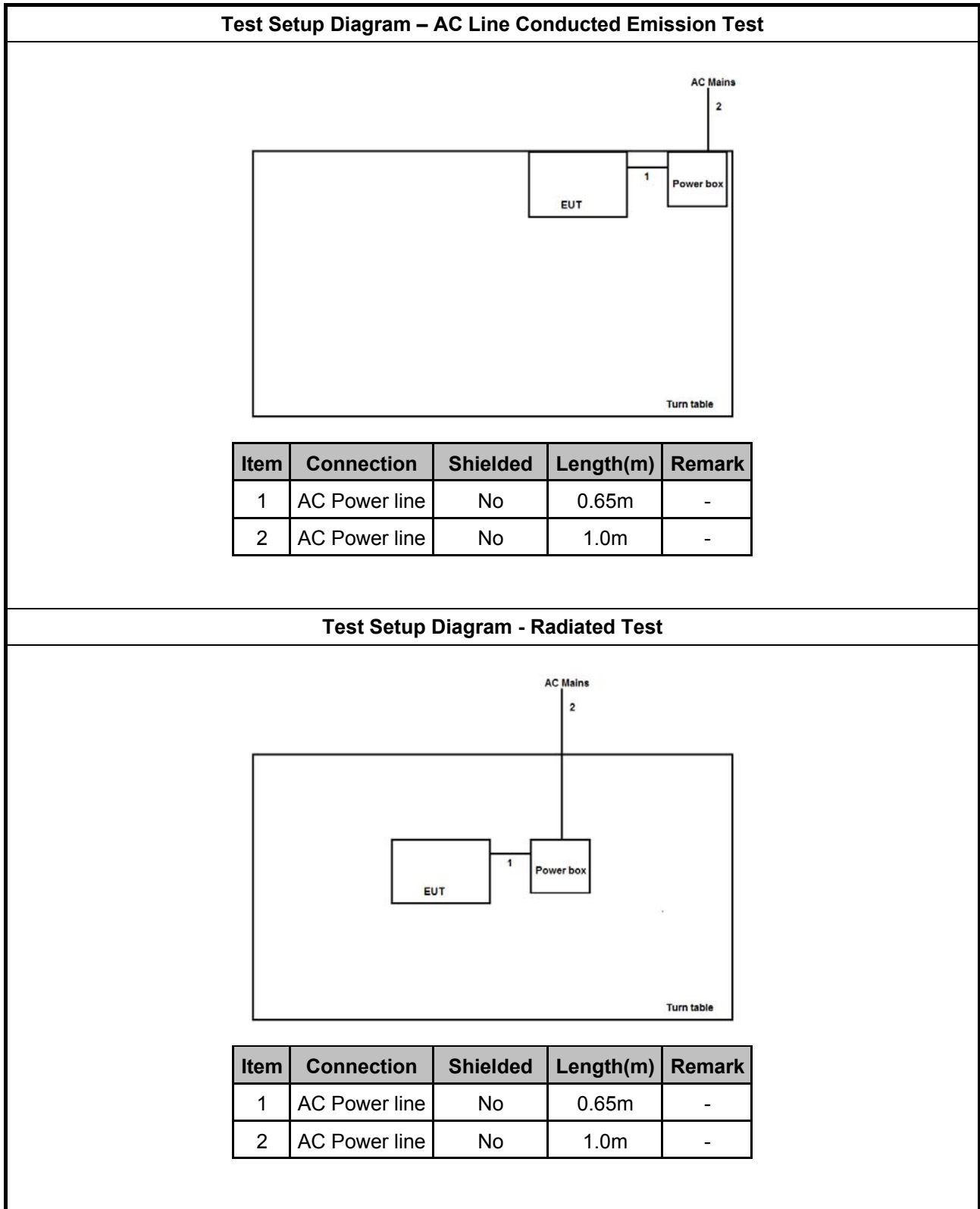
The Worst Case Mode for Following Conformance Tests	
Tests Item	Simultaneous Transmission Analysis
Operating Mode	CTX
1	Bluetooth+WLAN 2.4GHz
Refer to Sporton Test Report No.: FA7N0734-02 for Co-location RF Exposure Evaluation.	



## 2.4 Support Equipment

Support Equipment - RF Conducted				
No.	Equipment	Brand Name	Model Name	FCC ID
1	Notebook	DELL	E5410	DoC
2	Adapter for NB	DELL	HA65NM130	DoC
3	AC Source	GW	AP2750	-

## 2.5 Test Setup Diagram



### 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.

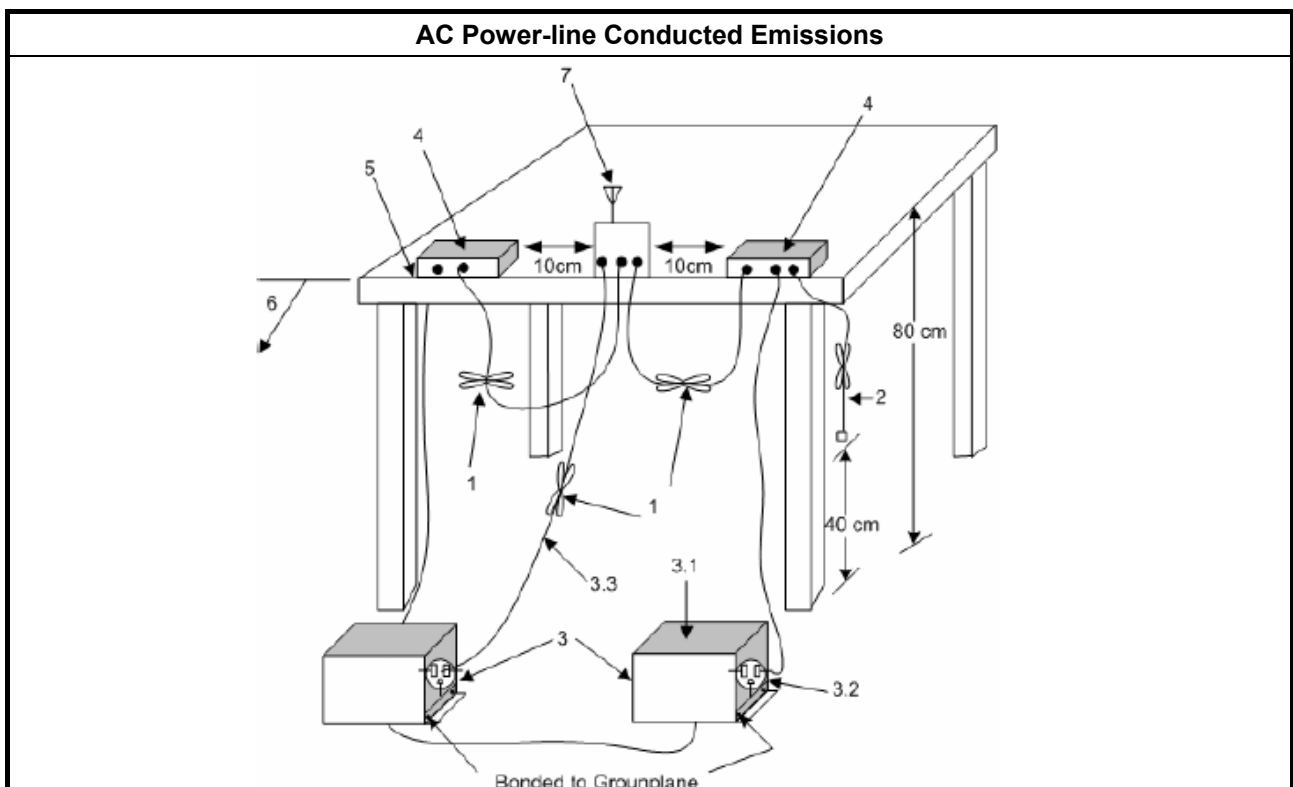
##### 3.1.2 Measuring Instruments

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

##### 3.1.3 Test Procedures

Test Method
<ul style="list-style-type: none"> <li>Refer as ANSI C63.10-2013, clause 6.2 foray power-line conducted emissions.</li> </ul>

##### 3.1.4 Test Setup





### **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>

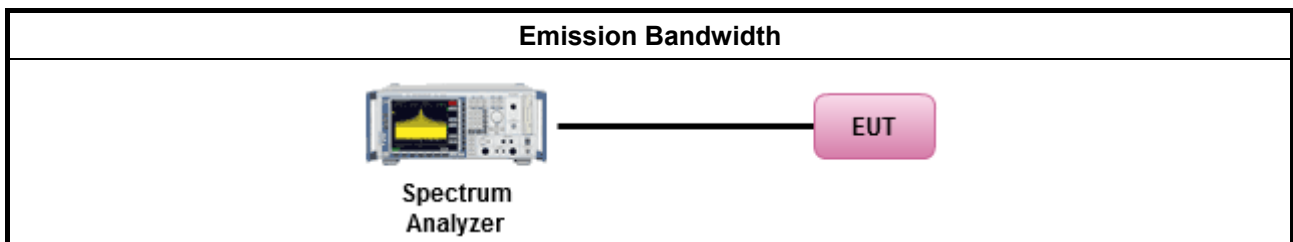
#### 3.2.2 Measuring Instruments

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 KDB 558074, clause 8.1 Option 1 for 6 dB bandwidth measurement.
<input type="checkbox"/> Refer as KDB 558074, clause 8.2 Option 2 for 6 dB bandwidth measurement.
<input type="checkbox"/> Refer as ANSI C63.10, clause 6.9.3 for occupied bandwidth testing.
<input type="checkbox"/> Refer as RSS-Gen, clause 6.7 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>
e.i.r.p. Power Limit:	
	<ul style="list-style-type: none"> <li>▪ 2400-2483.5 MHz Band</li> </ul>
	<ul style="list-style-type: none"> <li>▪ Point-to-multipoint systems (P2M): <math>P_{eirp} \leq 36</math> dBm (4 W)</li> </ul>
	<ul style="list-style-type: none"> <li>▪ Point-to-point systems (P2P): <math>P_{eirp} \leq \text{MAX}(36, [P_{Out} + G_{TX}])</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: <math>P_{eirp} \leq \text{MAX}(36, P_{Out} + G_{TX})</math> dBm</li> </ul>
	<ul style="list-style-type: none"> <li>- Overlap beam: <math>P_{eirp} \leq \text{MAX}(36, P_{Out} + G_{TX})</math> dBm</li> </ul>
	<ul style="list-style-type: none"> <li>- Aggregate power on all beams: <math>P_{eirp} \leq \text{MAX}(36, [P_{Out} + G_{TX} + 8])</math> 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.	

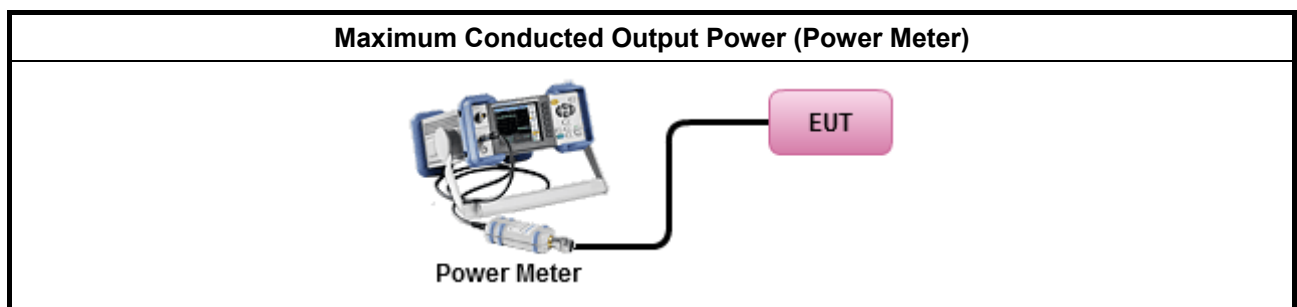
#### 3.3.2 Measuring Instruments

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 KDB 558074, clause 9.1.1 Option 1 (RBW ≥ EBW method).
<input type="checkbox"/>	Refer as KDB 558074, clause 9.1.2 Option 2 (integrated band power method)
<input type="checkbox"/>	Refer as KDB 558074, clause 9.1.3 Option 3 (peak power meter for VBW ≥ DTS BW)
<ul style="list-style-type: none"> <li>▪ Maximum Average Conducted Output Power</li> </ul>	
Duty cycle ≥ 98%	
<input type="checkbox"/>	Refer as KDB 558074, clause 9.2.2.4 Method AVGSA-2 (spectral trace averaging).
Duty cycle < 98%	
<input type="checkbox"/>	Refer as KDB 558074, clause 9.2.2.5 Method AVGSA-2 Alt. (slow sweep speed)
RF power meter and average over on/off periods with duty factor or gated trigger	
<input checked="" type="checkbox"/>	Refer as KDB 558074, clause 9.2.3.1 Method AVGPM (using an 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 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>P_{total} = P_1 + P_2 + \dots + P_n</math>                      (calculated in linear unit [mW] and transfer to log unit [dBm])  <math>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>

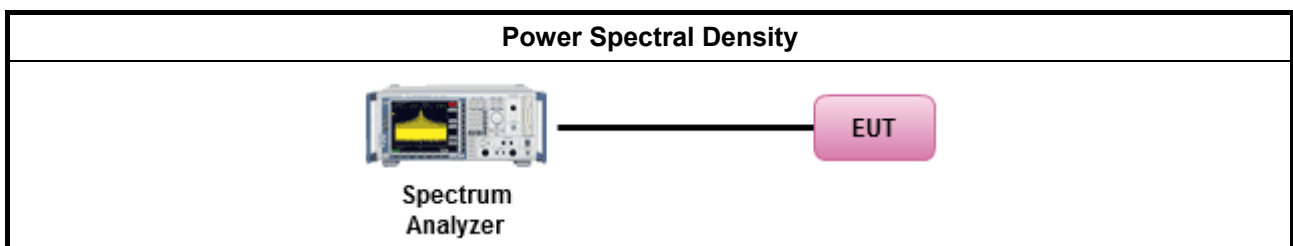
#### 3.4.2 Measuring Instruments

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 KDB 558074, clause 10.2 Method PKPSD (RBW=3-100kHz; Detector=peak).
<ul style="list-style-type: none"> <li>For conducted measurement.             <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>Measure and sum the spectra across the outputs. Refer as KDB 662911, In-band power spectral density (PSD). Sample all transmit ports simultaneously using a spectrum analyzer for each transmit port. Where the trace bin-by-bin of each transmit port summing can be performed. (i.e., in the first spectral bin of output 1 is summed with that in the first spectral bin of output 2 and that from the first spectral bin of output 3, and so on up to the NTX output to obtain the value for the first frequency bin of the summed spectrum.). Add up the amplitude (power) values for the different transmit chains and use this as the new data trace.</li> </ul> </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 (dB)
Peak output power procedure	20
Average output power procedure	30

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

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

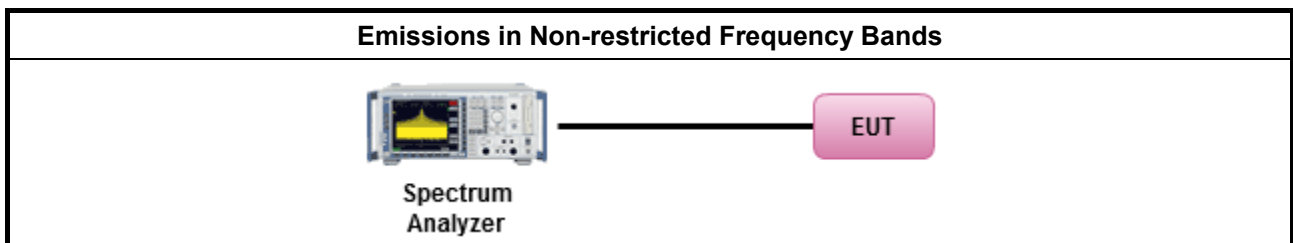
#### 3.5.2 Measuring Instruments

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

#### 3.5.3 Test Procedures

Test Method
<ul style="list-style-type: none"> <li>Refer as KDB 558074, clause 11 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.

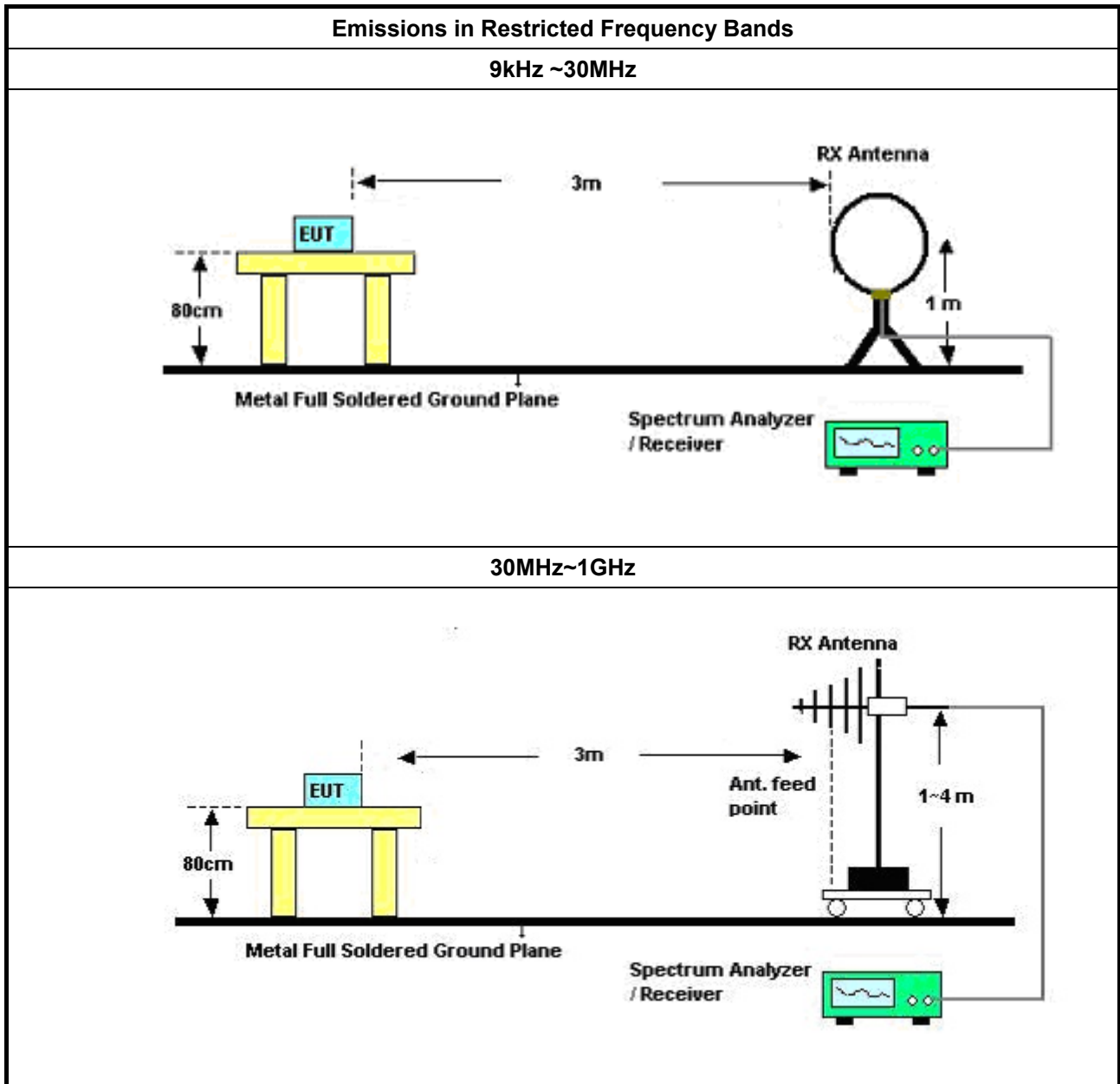
#### 3.6.2 Measuring Instruments

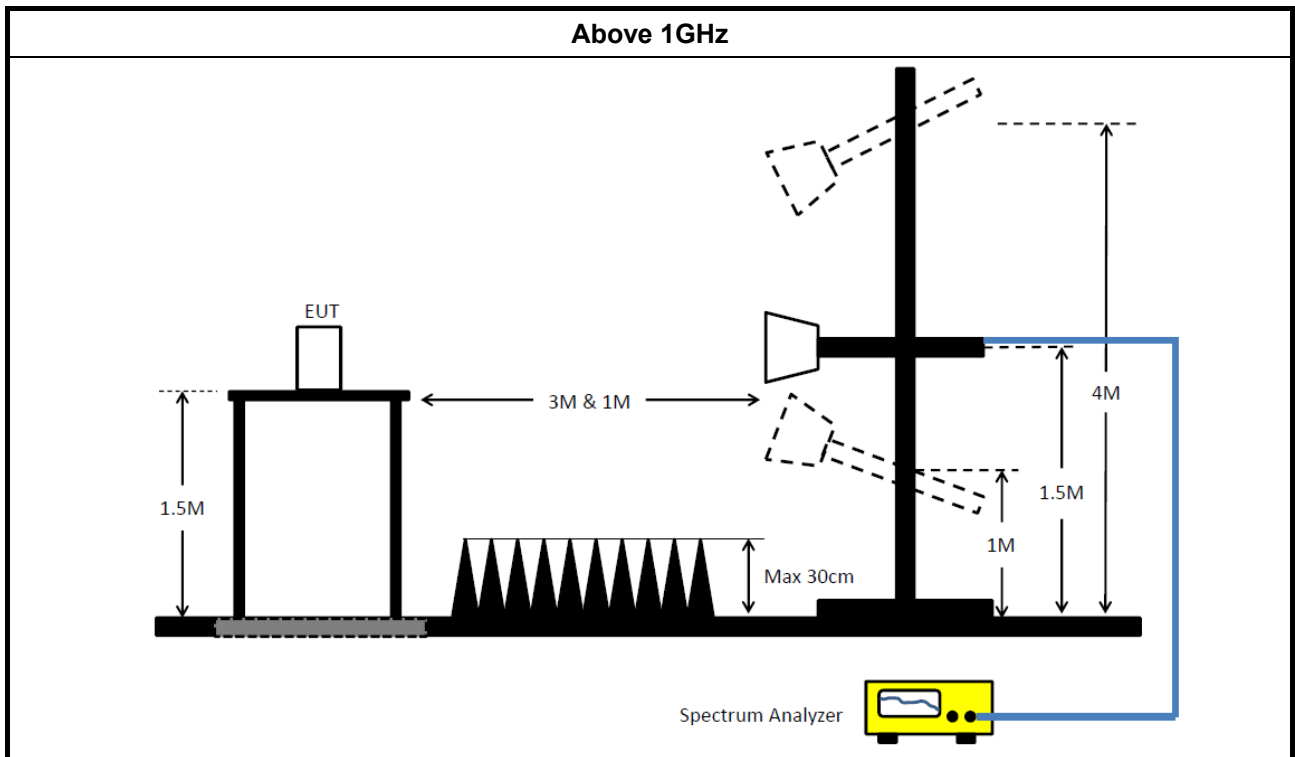
Refer a test equipment and calibration data table in this test report.

### 3.6.3 Test Procedures

Test Method	
<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 KDB 558074, clause 12 for unwanted emissions into restricted bands.</li> </ul>	
	<input checked="" type="checkbox"/> Refer as KDB 558074, clause 12.2.5.3 (ANSI C63.10, clause 4.1.4.2.3), Reduced VBW $\geq$ 1/T.
	<input checked="" type="checkbox"/> Refer as KDB 558074, clause 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 KDB 558074 clause 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 KDB 558074, clause 13.2 (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 KDB 558074, clause 13.3 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 and cabinet radiation measurement, refer as KDB 558074, clause 12.2.2.</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 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 Test Result of Emissions in Restricted Frequency Bands (Below 30MHz)

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

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

Refer as Appendix F

## 4 Test Equipment and Calibration Data

### Instrument for AC Conduction

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
EMC Receiver	R&S	ESR3	102052	9KHz ~ 3.6GHz	29/Apr/2017	28/Apr/2018
LISN	R&S	ENV216	101295	9kHz ~ 30MHz	17/Nov/2017	16/Nov/2018
RF Cable-CON	HUBER+SUHNER	RG213/U	07611832020001	9kHz ~ 30MHz	06/Oct/2017	05/Oct/2018
AC POWER	APC	AFC-11005G	F310050055	47Hz~63Hz 5~300V	NCR	NCR
Impuls Begrenzer Pulse Limiter	SCHWARZBECK	VTSD 9561-F	9561-F041	9 kHz ~ 30 MHz	12/Oct/2017	11/Oct/2018

**NCR : Non-Calibration Require**

### Instrument for Conducted Test

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
Spectrum Analyzer	R&S	FSV 40	101013	9kHz~40GHz	29/Dec/2017	28/Dec/2018
Signal Generator	R&S	SMR40	100116	10MHz ~ 40GHz	27/Jul/2017	26/Jul/2018
Power Sensor	Anritsu	MA2411B	0917017	300MHz ~ 40GHz	05/Feb/2018	04/Feb/2019
Power Meter	Anritsu	ML2495A	0949003	300MHz ~ 40GHz	05/Feb/2018	04/Feb/2019
RF Cable-0.2m	HUBER+SUHNER	SUCOFLEX_104	MY10709/4	30MHz ~ 26.5GHz	25/Aug/2017	24/Aug/2018
RF Cable-0.2m	HUBER+SUHNER	SUCOFLEX_104	MY10712/4	30MHz ~ 26.5GHz	25/Aug/2017	24/Aug/2018
RF Cable-0.5m	HUBER+SUHNER	SUCOFLEX_104	MY10713/4	30MHz ~ 26.5GHz	25/Aug/2017	24/Aug/2018

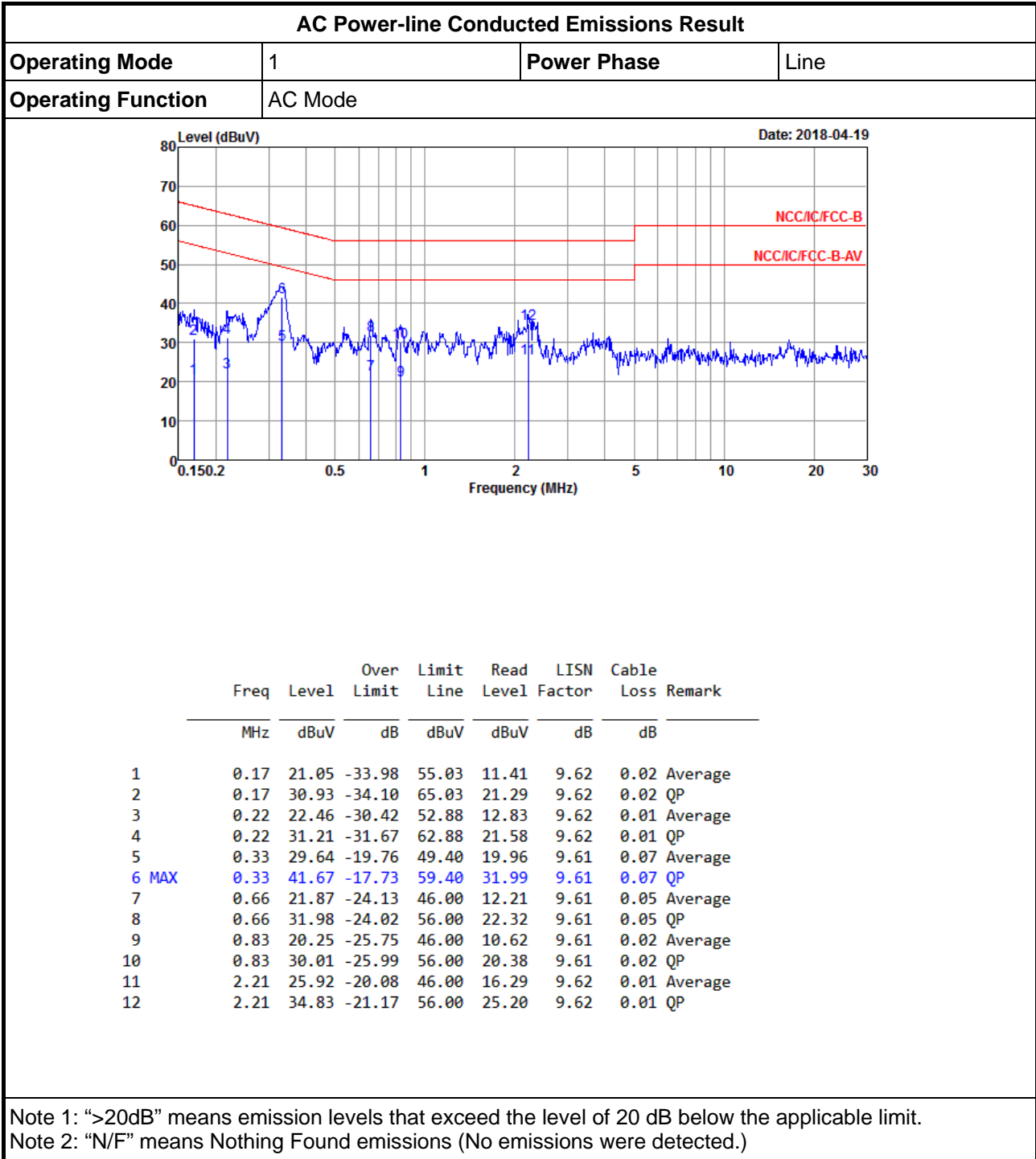
**Instrument for Radiated Test**

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30MHz ~ 1GHz 3m	31/Oct/2017	30/Oct/2018
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	1GHz ~ 18GHz 3m	01/Nov/2017	31/Oct/2018
Amplifier	HP	8447D	2944A08033	10kHz ~ 1.3GHz	20/Apr/2017	19/Apr/2018
Microwave System Preamplifier	KEYSIGHT	83017A	MY53270196	1GHz ~ 26.5GHz	31/Aug/2017	30/Aug/2018
Signal Analyzer	R&S	FSV40	101500	10Hz ~ 40GHz	28/Jun/2017	27/Jun/2018
RF Cable-R03m	Jye Bao	RG142	CB021	9kHz ~ 1GHz	26/Jan/2018	25/Jan/2019
RF Cable-high	SUHNER	SUCOFLEX 106	CB222	1GHz ~ 40GHz	26/Jan/2018	25/Jan/2019
Bilog Antenna & 6dB Attenuator	SCHAFFNER / EMCI	CBL6112B / N-6-05	22237 / AT-N-0603	30MHz ~ 1GHz	08/Jul/2017	07/Jul/2018
Double Ridged Guide Horn Antenna	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1531	1GHz ~ 18GHz	25/Apr/ 2017	24/Apr/2018
Loop Antenna	TESEQ	HLA 6120	31244	9kHz ~ 30MHz	28/Mar/2018	27/Mar/2019
RF Cable	HUBER+SUHNER	SUCOFLEX 102	MY2579/2	100 kHz~40 GHz	12/Jun/2017	11/Jun/2018
RF Cable	HUBER+SUHNER	SUCOFLEX 102	MY2580/2	100 kHz~40 GHz	11/May/2017	10/May/2018





AC Power-line Conducted Emissions Result																																																																																																																																	
Operating Mode	1	Power Phase	Neutral																																																																																																																														
Operating Function	AC Mode																																																																																																																																
Date: 2018-04-19																																																																																																																																	
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>Freq</th> <th>Level</th> <th>Over Limit</th> <th>Limit Line</th> <th>Read Level</th> <th>LISN Factor</th> <th>Cable Loss</th> <th>Remark</th> </tr> <tr> <th></th> <th>MHz</th> <th>dBuV</th> <th>dB</th> <th>dBuV</th> <th>dBuV</th> <th>dB</th> <th>dB</th> <th></th> </tr> </thead> <tbody> <tr><td>1</td><td>0.15</td><td>21.48</td><td>-34.34</td><td>55.82</td><td>11.81</td><td>9.63</td><td>0.04</td><td>Average</td></tr> <tr><td>2</td><td>0.15</td><td>32.06</td><td>-33.76</td><td>65.82</td><td>22.39</td><td>9.63</td><td>0.04</td><td>QP</td></tr> <tr><td>3</td><td>0.22</td><td>22.84</td><td>-29.86</td><td>52.70</td><td>13.20</td><td>9.62</td><td>0.02</td><td>Average</td></tr> <tr><td>4</td><td>0.22</td><td>32.27</td><td>-30.43</td><td>62.70</td><td>22.63</td><td>9.62</td><td>0.02</td><td>QP</td></tr> <tr><td>5</td><td>0.33</td><td>29.75</td><td>-19.60</td><td>49.35</td><td>20.07</td><td>9.61</td><td>0.07</td><td>Average</td></tr> <tr><td>6</td><td>0.33</td><td>41.64</td><td>-17.71</td><td>59.35</td><td>31.96</td><td>9.61</td><td>0.07</td><td>QP</td></tr> <tr><td>7</td><td>0.66</td><td>22.22</td><td>-23.78</td><td>46.00</td><td>12.55</td><td>9.62</td><td>0.05</td><td>Average</td></tr> <tr><td>8</td><td>0.66</td><td>31.98</td><td>-24.02</td><td>56.00</td><td>22.31</td><td>9.62</td><td>0.05</td><td>QP</td></tr> <tr><td>9</td><td>1.72</td><td>21.41</td><td>-24.59</td><td>46.00</td><td>11.78</td><td>9.63</td><td>0.00</td><td>Average</td></tr> <tr><td>10</td><td>1.72</td><td>26.89</td><td>-29.11</td><td>56.00</td><td>17.26</td><td>9.63</td><td>0.00</td><td>QP</td></tr> <tr><td>11</td><td>2.27</td><td>25.86</td><td>-20.14</td><td>46.00</td><td>16.21</td><td>9.63</td><td>0.02</td><td>Average</td></tr> <tr style="border: 2px solid black;"><td>12 MAX</td><td>2.27</td><td>38.42</td><td>-17.58</td><td>56.00</td><td>28.77</td><td>9.63</td><td>0.02</td><td>QP</td></tr> </tbody> </table>					Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark		MHz	dBuV	dB	dBuV	dBuV	dB	dB		1	0.15	21.48	-34.34	55.82	11.81	9.63	0.04	Average	2	0.15	32.06	-33.76	65.82	22.39	9.63	0.04	QP	3	0.22	22.84	-29.86	52.70	13.20	9.62	0.02	Average	4	0.22	32.27	-30.43	62.70	22.63	9.62	0.02	QP	5	0.33	29.75	-19.60	49.35	20.07	9.61	0.07	Average	6	0.33	41.64	-17.71	59.35	31.96	9.61	0.07	QP	7	0.66	22.22	-23.78	46.00	12.55	9.62	0.05	Average	8	0.66	31.98	-24.02	56.00	22.31	9.62	0.05	QP	9	1.72	21.41	-24.59	46.00	11.78	9.63	0.00	Average	10	1.72	26.89	-29.11	56.00	17.26	9.63	0.00	QP	11	2.27	25.86	-20.14	46.00	16.21	9.63	0.02	Average	12 MAX	2.27	38.42	-17.58	56.00	28.77	9.63	0.02	QP
	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark																																																																																																																									
	MHz	dBuV	dB	dBuV	dBuV	dB	dB																																																																																																																										
1	0.15	21.48	-34.34	55.82	11.81	9.63	0.04	Average																																																																																																																									
2	0.15	32.06	-33.76	65.82	22.39	9.63	0.04	QP																																																																																																																									
3	0.22	22.84	-29.86	52.70	13.20	9.62	0.02	Average																																																																																																																									
4	0.22	32.27	-30.43	62.70	22.63	9.62	0.02	QP																																																																																																																									
5	0.33	29.75	-19.60	49.35	20.07	9.61	0.07	Average																																																																																																																									
6	0.33	41.64	-17.71	59.35	31.96	9.61	0.07	QP																																																																																																																									
7	0.66	22.22	-23.78	46.00	12.55	9.62	0.05	Average																																																																																																																									
8	0.66	31.98	-24.02	56.00	22.31	9.62	0.05	QP																																																																																																																									
9	1.72	21.41	-24.59	46.00	11.78	9.63	0.00	Average																																																																																																																									
10	1.72	26.89	-29.11	56.00	17.26	9.63	0.00	QP																																																																																																																									
11	2.27	25.86	-20.14	46.00	16.21	9.63	0.02	Average																																																																																																																									
12 MAX	2.27	38.42	-17.58	56.00	28.77	9.63	0.02	QP																																																																																																																									
<p>Note 1: "&gt;20dB" means emission levels that exceed the level of 20 dB below the applicable limit.            Note 2: "N/F" means Nothing Found emissions (No emissions were detected.)</p>																																																																																																																																	





**Summary**

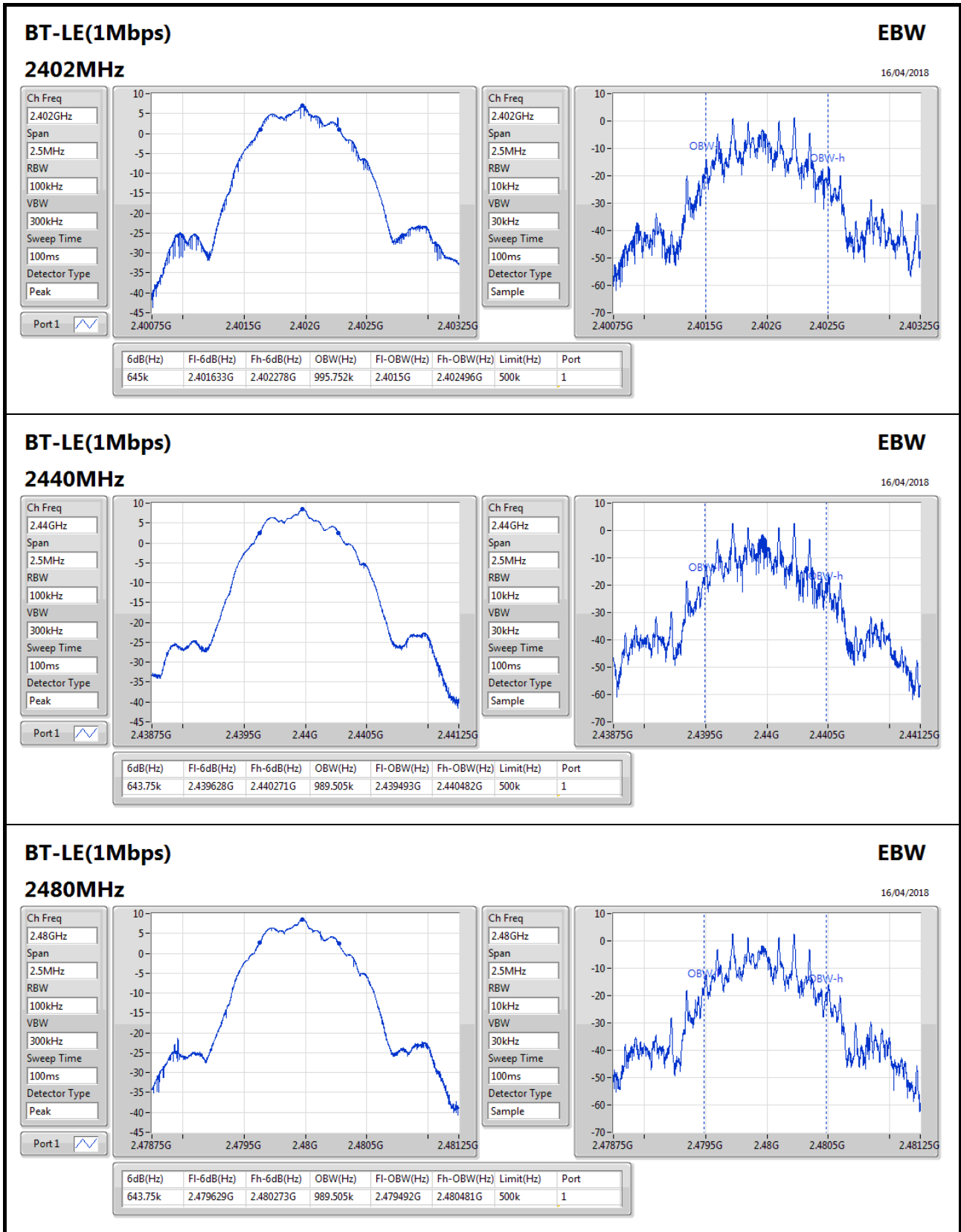
Mode	Max-N dB (Hz)	Max-OBW (Hz)	ITU-Code	Min-N dB (Hz)	Min-OBW (Hz)
2.4-2.4835GHz	-	-	-	-	-
BT-LE(1Mbps)	645k	995.752k	996KF1D	643.75k	989.505k

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

**Result**

Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
BT-LE(1Mbps)	-	-	-	-
2402MHz_TnomVnom	Pass	500k	645k	995.752k
2440MHz_TnomVnom	Pass	500k	643.75k	989.505k
2480MHz_TnomVnom	Pass	500k	643.75k	989.505k

**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)	7.77	0.00598

Result

Mode	Result	Gain (dBi)	Power (dBm)	Power Limit (dBm)
BT-LE(1Mbps)	-	-	-	-
2402MHz_TnomVnom	Pass	3.50	6.48	30.00
2440MHz_TnomVnom	Pass	3.50	7.69	30.00
2480MHz_TnomVnom	Pass	3.50	7.77	30.00



Summary

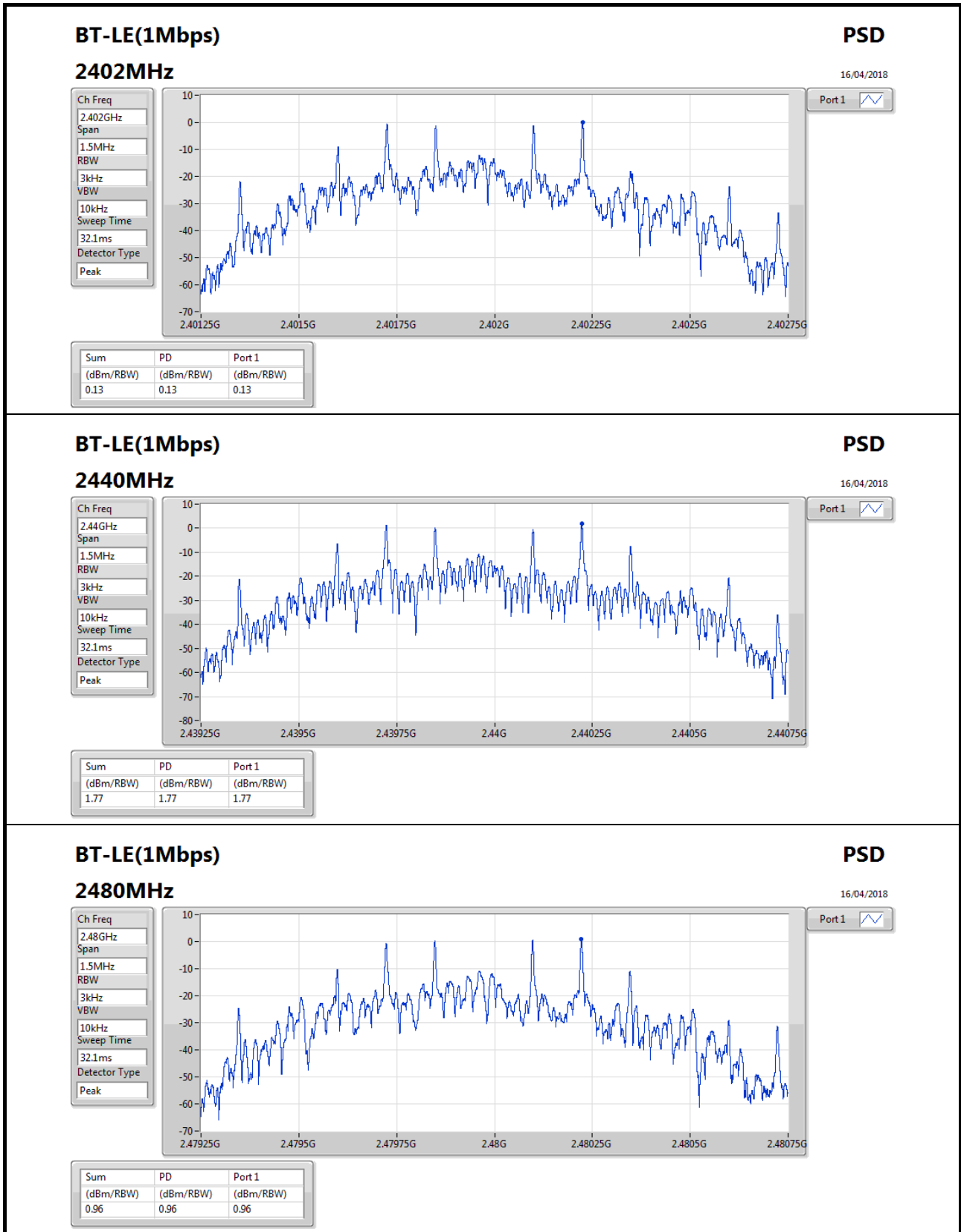
Mode	PD (dBm/RBW)
2.4-2.4835GHz	-
BT-LE(1Mbps)	1.77

RBW=3kHz.

Result

Mode	Result	Gain (dBi)	PD (dBm/RBW)	PD Limit (dBm/RBW)
BT-LE(1Mbps)	-	-	-	-
2402MHz_TnomVnom	Pass	3.50	0.13	8.00
2440MHz_TnomVnom	Pass	3.50	1.77	8.00
2480MHz_TnomVnom	Pass	3.50	0.96	8.00

RBW=3kHz.





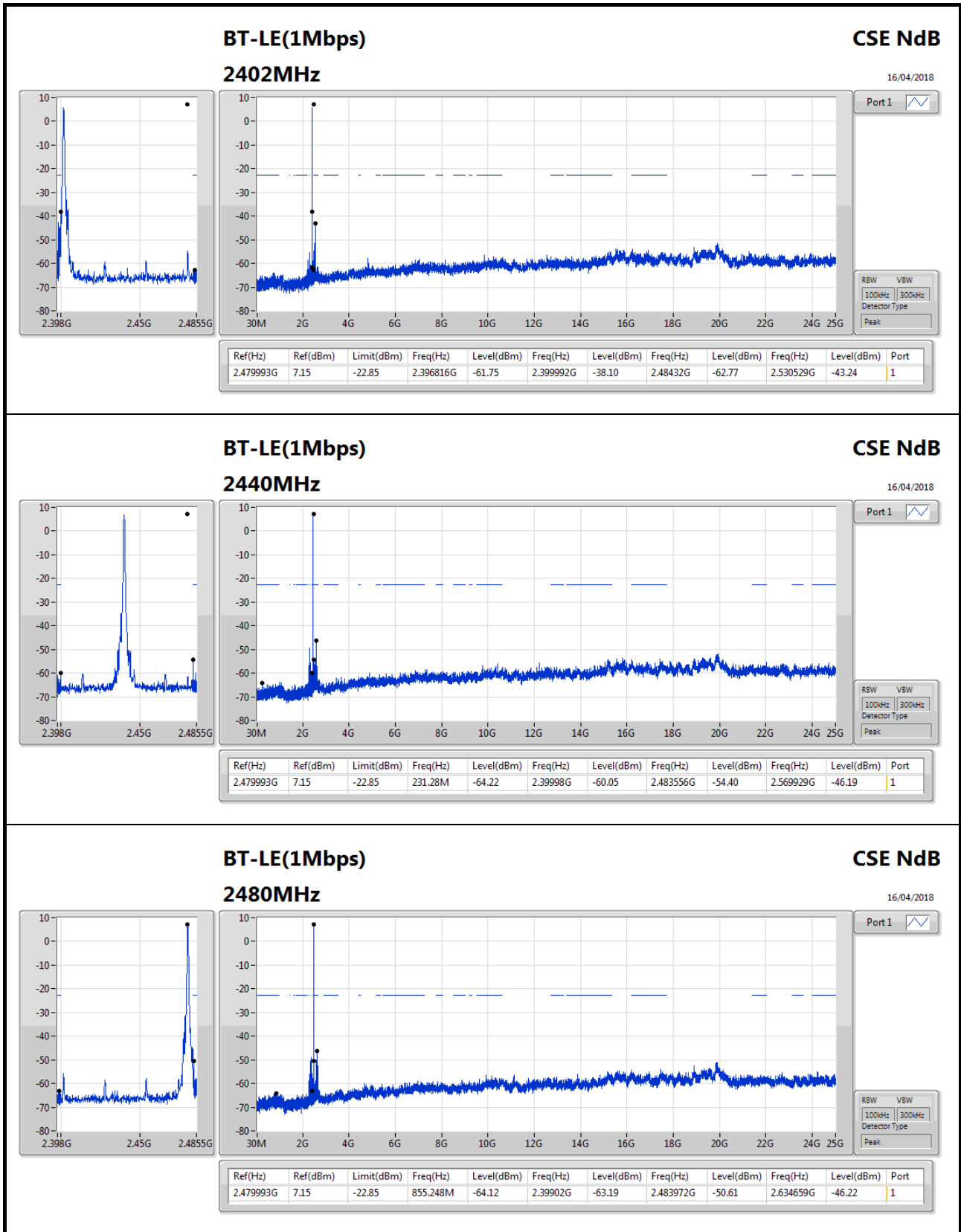
Summary

Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	2.479993G	7.15	-22.85	2.396816G	-61.75	2.399992G	-38.10	2.48432G	-62.77	2.530529G	-43.24	1

Result

Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-	-	-
2402MHz_TnomVnom	Pass	2.479993G	7.15	-22.85	2.396816G	-61.75	2.399992G	-38.10	2.48432G	-62.77	2.530529G	-43.24	1
2440MHz_TnomVnom	Pass	2.479993G	7.15	-22.85	231.28M	-64.22	2.39998G	-60.05	2.483556G	-54.40	2.569929G	-46.19	1
2480MHz_TnomVnom	Pass	2.479993G	7.15	-22.85	855.248M	-64.12	2.39902G	-63.19	2.483972G	-50.61	2.634659G	-46.22	1







Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	PK	249.22M	36.03	46.00	-9.97	-17.25	3	Horizontal	0	1.00	-



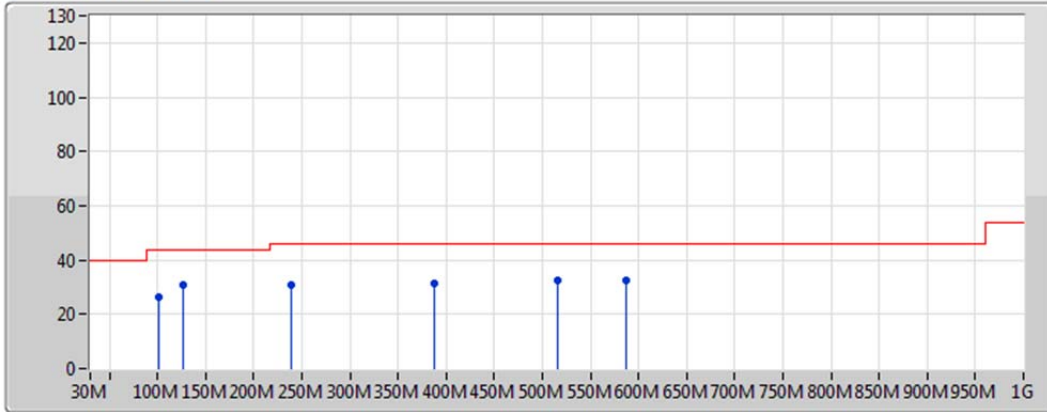
**Result**

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-	-
2440MHz	Pass	PK	103.72M	28.15	43.50	-15.35	-20.69	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	127M	27.08	43.50	-16.42	-19.22	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	249.22M	36.03	46.00	-9.97	-17.25	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	305.48M	29.12	46.00	-16.88	-16.54	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	400.54M	27.17	46.00	-18.83	-14.00	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	720.64M	28.71	46.00	-17.29	-9.23	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	101.78M	26.47	43.50	-17.03	-20.90	3	Vertical	360	1.00	-
2440MHz	Pass	PK	127M	31.08	43.50	-12.42	-19.22	3	Vertical	360	1.00	-
2440MHz	Pass	PK	239.52M	30.58	46.00	-15.42	-18.69	3	Vertical	360	1.00	-
2440MHz	Pass	PK	386.96M	31.26	46.00	-14.74	-14.46	3	Vertical	360	1.00	-
2440MHz	Pass	PK	515M	32.34	46.00	-13.66	-12.12	3	Vertical	360	1.00	-
2440MHz	Pass	PK	586.78M	32.29	46.00	-13.71	-10.95	3	Vertical	360	1.00	-

### BT-LE(1Mbps)

### 2440MHz\_

18/04/2018



Legend:

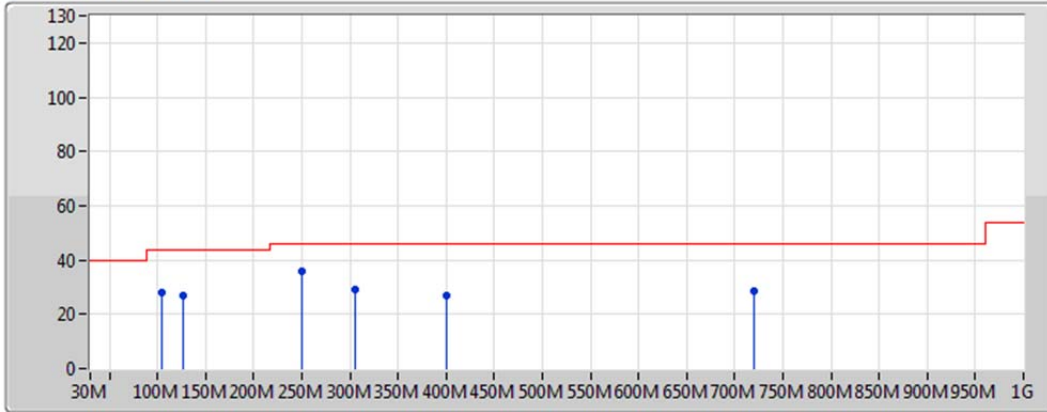
- Lim.PK (Red line)
- PK (Blue line)



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
PK	101.78M	26.47	43.50	-17.03	-20.90	3	Vertical	360	1.00	-	47.37	15.33	0.57	36.79
PK	127M	31.08	43.50	-12.42	-19.22	3	Vertical	360	1.00	-	50.30	16.77	0.70	36.69
PK	239.52M	30.58	46.00	-15.42	-18.69	3	Vertical	360	1.00	-	49.27	16.49	1.23	36.40
PK	386.96M	31.26	46.00	-14.74	-14.46	3	Vertical	360	1.00	-	45.72	20.62	1.51	36.59
PK	515M	32.34	46.00	-13.66	-12.12	3	Vertical	360	1.00	-	44.46	23.23	1.60	36.96
PK	586.78M	32.29	46.00	-13.71	-10.95	3	Vertical	360	1.00	-	43.24	24.57	1.64	37.15

### BT-LE(1Mbps)

### 2440MHz\_

18/04/2018



Lim.PK   
 PK 

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
PK	103.72M	28.15	43.50	-15.35	-20.69	3	Horizontal	0	1.00	-	48.84	15.52	0.57	36.79
PK	127M	27.08	43.50	-16.42	-19.22	3	Horizontal	0	1.00	-	46.30	16.77	0.70	36.69
PK	249.22M	36.03	46.00	-9.97	-17.25	3	Horizontal	0	1.00	-	53.28	17.90	1.26	36.41
PK	305.48M	29.12	46.00	-16.88	-16.54	3	Horizontal	0	1.00	-	45.66	18.45	1.46	36.45
PK	400.54M	27.17	46.00	-18.83	-14.00	3	Horizontal	0	1.00	-	41.17	21.09	1.52	36.61
PK	720.64M	28.71	46.00	-17.29	-9.23	3	Horizontal	0	1.00	-	37.94	26.28	1.87	37.38



Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	AV	2.483502G	52.44	54.00	-1.56	30.91	3	Vertical	223	2.16	-



Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	AV	2.3804G	45.71	54.00	-8.29	30.55	3	Horizontal	97	3.19	-
2402MHz	Pass	AV	2.402G	98.76	Inf	-Inf	30.62	3	Horizontal	97	3.19	-
2402MHz	Pass	PK	2.3682G	54.89	74.00	-19.11	30.50	3	Horizontal	97	3.19	-
2402MHz	Pass	PK	2.4022G	99.76	Inf	-Inf	30.62	3	Horizontal	97	3.19	-
2402MHz	Pass	AV	2.3682G	45.65	54.00	-8.35	30.50	3	Vertical	49	2.38	-
2402MHz	Pass	AV	2.402G	100.24	Inf	-Inf	30.62	3	Vertical	49	2.38	-
2402MHz	Pass	PK	2.378G	55.19	74.00	-18.81	30.53	3	Vertical	49	2.38	-
2402MHz	Pass	PK	2.4022G	101.37	Inf	-Inf	30.62	3	Vertical	49	2.38	-
2402MHz	Pass	AV	4.80352G	33.37	54.00	-20.63	1.21	3	Horizontal	32	2.94	-
2402MHz	Pass	PK	4.80376G	42.90	74.00	-31.10	1.21	3	Horizontal	32	2.94	-
2402MHz	Pass	AV	4.80424G	37.60	54.00	-16.40	1.21	3	Vertical	222	1.11	-
2402MHz	Pass	PK	4.80328G	46.09	74.00	-27.91	1.21	3	Vertical	222	1.11	-
2440MHz	Pass	AV	2.3892G	45.88	54.00	-8.12	30.57	3	Horizontal	37	3.19	-
2440MHz	Pass	AV	2.440G	93.56	Inf	-Inf	30.76	3	Horizontal	37	3.19	-
2440MHz	Pass	AV	2.4864G	46.31	54.00	-7.69	30.92	3	Horizontal	37	3.19	-
2440MHz	Pass	PK	2.3548G	54.69	74.00	-19.31	30.45	3	Horizontal	37	3.19	-
2440MHz	Pass	PK	2.440G	88.69	Inf	-Inf	30.76	3	Horizontal	37	3.19	-
2440MHz	Pass	PK	2.483502G	54.76	74.00	-19.24	30.91	3	Horizontal	37	3.19	-
2440MHz	Pass	AV	2.3564G	45.70	54.00	-8.30	30.46	3	Vertical	223	1.65	-
2440MHz	Pass	AV	2.4411G	98.95	Inf	-Inf	30.76	3	Vertical	223	1.65	-
2440MHz	Pass	AV	2.484G	46.95	54.00	-7.05	30.92	3	Vertical	223	1.65	-
2440MHz	Pass	PK	2.3468G	54.59	74.00	-19.41	30.42	3	Vertical	223	1.65	-
2440MHz	Pass	PK	2.440G	100.01	Inf	-Inf	30.76	3	Vertical	223	1.65	-
2440MHz	Pass	PK	2.486G	56.20	74.00	-17.80	30.92	3	Vertical	223	1.65	-
2440MHz	Pass	AV	4.88058G	34.65	54.00	-19.35	1.36	3	Horizontal	28	2.84	-
2440MHz	Pass	AV	7.32122G	44.27	54.00	-9.73	7.36	3	Horizontal	149	1.06	-
2440MHz	Pass	PK	4.88072G	44.23	74.00	-29.77	1.36	3	Horizontal	28	2.84	-
2440MHz	Pass	PK	7.32272G	52.93	74.00	-21.07	7.36	3	Horizontal	149	1.06	-
2440MHz	Pass	AV	4.88052G	41.94	54.00	-12.06	1.36	3	Vertical	225	1.01	-
2440MHz	Pass	AV	7.32122G	47.25	54.00	-6.75	7.36	3	Vertical	233	1.19	-
2440MHz	Pass	PK	4.88036G	49.04	74.00	-24.96	1.36	3	Vertical	225	1.01	-
2440MHz	Pass	PK	7.3211G	55.28	74.00	-18.72	7.36	3	Vertical	233	1.19	-
2480MHz	Pass	AV	2.48G	92.13	Inf	-Inf	30.90	3	Horizontal	9	3.04	-
2480MHz	Pass	AV	2.483502G	48.94	54.00	-5.06	30.91	3	Horizontal	9	3.04	-
2480MHz	Pass	PK	2.4796G	93.35	Inf	-Inf	30.90	3	Horizontal	9	3.04	-
2480MHz	Pass	PK	2.483502G	57.24	74.00	-16.76	30.91	3	Horizontal	9	3.04	-
2480MHz	Pass	AV	2.48G	96.86	Inf	-Inf	30.90	3	Vertical	223	2.16	-
2480MHz	Pass	AV	2.483502G	52.44	54.00	-1.56	30.91	3	Vertical	223	2.16	-
2480MHz	Pass	PK	2.4796G	97.96	Inf	-Inf	30.90	3	Vertical	223	2.16	-
2480MHz	Pass	PK	2.483502G	59.47	74.00	-14.53	30.91	3	Vertical	223	2.16	-
2480MHz	Pass	AV	4.95952G	33.31	54.00	-20.69	1.51	3	Horizontal	312	2.94	-
2480MHz	Pass	AV	7.43916G	38.18	54.00	-15.82	7.66	3	Horizontal	165	1.06	-
2480MHz	Pass	PK	4.96012G	43.71	74.00	-30.29	1.52	3	Horizontal	312	2.94	-
2480MHz	Pass	PK	7.43952G	47.75	74.00	-26.25	7.66	3	Horizontal	165	1.06	-
2480MHz	Pass	AV	4.95958G	39.23	54.00	-14.77	1.52	3	Vertical	227	1.01	-
2480MHz	Pass	AV	7.43922G	41.06	54.00	-12.94	7.66	3	Vertical	218	1.70	-
2480MHz	Pass	PK	4.96054G	47.06	74.00	-26.94	1.52	3	Vertical	227	1.01	-



## RSE TX above 1GHz Result

## Appendix F.2

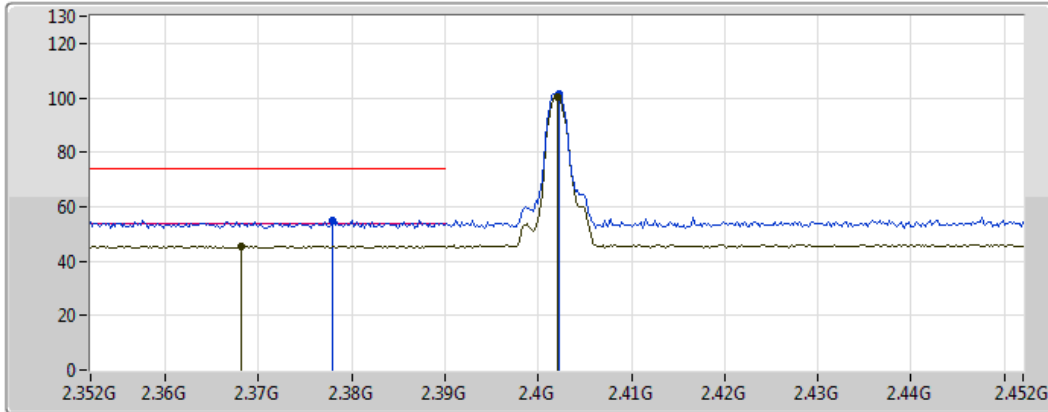
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2480MHz	Pass	PK	7.44072G	50.15	74.00	-23.85	7.66	3	Vertical	218	1.70	-







### BT-LE(1Mbps)

### 2402MHz\_TX

18/04/2018



Legend for the spectrum plot:

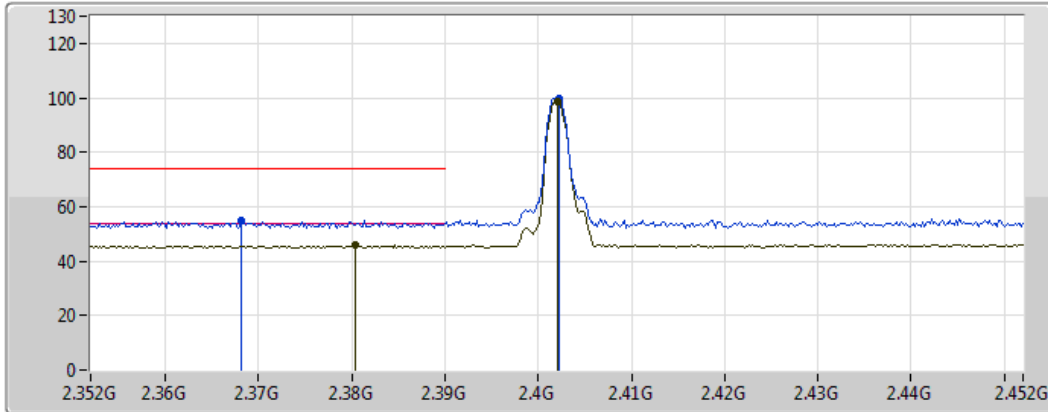
- Lim.PK 
- PK 
- Lim.AV 
- AV 

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.3682G	45.65	54.00	-8.35	30.50	3	Vertical	49	2.38	-	15.15	26.93	3.57	-
AV	2.402G	100.24	Inf	-Inf	30.62	3	Vertical	49	2.38	-	69.62	27.03	3.59	-
PK	2.378G	55.19	74.00	-18.81	30.53	3	Vertical	49	2.38	-	24.66	26.96	3.57	-
PK	2.4022G	101.37	Inf	-Inf	30.62	3	Vertical	49	2.38	-	70.75	27.03	3.59	-

### BT-LE(1Mbps)

### 2402MHz\_TX

18/04/2018



Legend for plot:

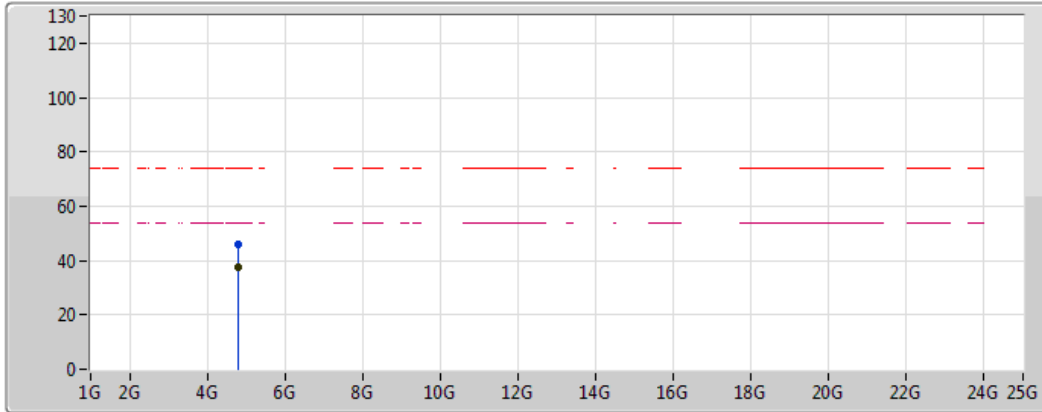
- Lim.PK (Red line)
- PK (Blue line)
- Lim.AV (Green line)
- AV (Yellow line)





Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.3804G	45.71	54.00	-8.29	30.55	3	Horizontal	97	3.19	-	15.16	26.97	3.58	-
AV	2.402G	98.76	Inf	-Inf	30.62	3	Horizontal	97	3.19	-	68.14	27.03	3.59	-
PK	2.3682G	54.89	74.00	-19.11	30.50	3	Horizontal	97	3.19	-	24.39	26.93	3.57	-
PK	2.4022G	99.76	Inf	-Inf	30.62	3	Horizontal	97	3.19	-	69.14	27.03	3.59	-

### BT-LE(1Mbps)

### 2402MHz\_TX

18/04/2018



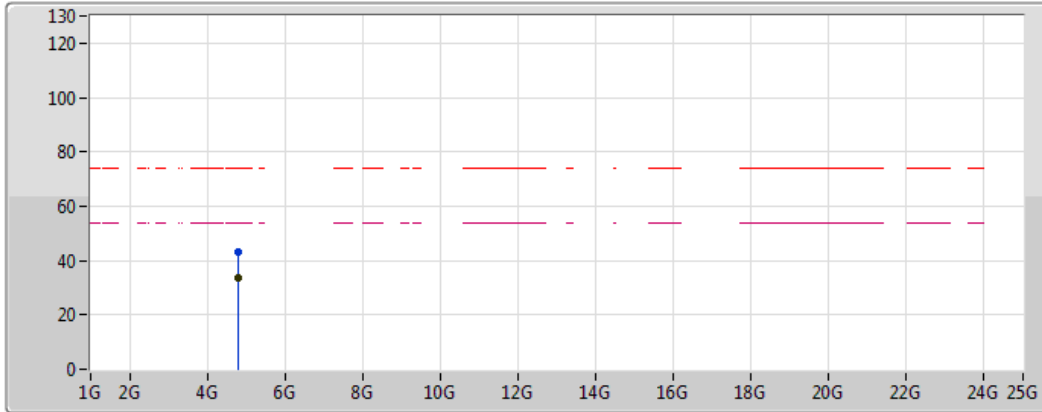
Lim.PK	
PK	
Lim.AV	
AV	





Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.80424G	37.60	54.00	-16.40	1.21	3	Vertical	222	1.11	-	36.39	31.19	5.19	35.17
PK	4.80328G	46.09	74.00	-27.91	1.21	3	Vertical	222	1.11	-	44.88	31.19	5.19	35.17

### BT-LE(1Mbps)

### 2402MHz\_TX

18/04/2018



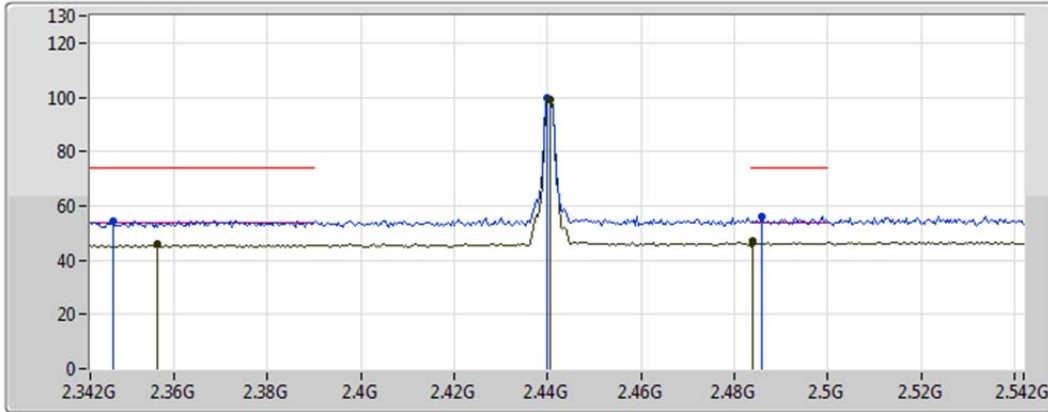
Lim.PK	
PK	
Lim.AV	
AV	

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.80352G	33.37	54.00	-20.63	1.21	3	Horizontal	32	2.94	-	32.16	31.19	5.19	35.17
PK	4.80376G	42.90	74.00	-31.10	1.21	3	Horizontal	32	2.94	-	41.69	31.19	5.19	35.17

### BT-LE(1Mbps)

### 2440MHz\_TX

18/04/2018



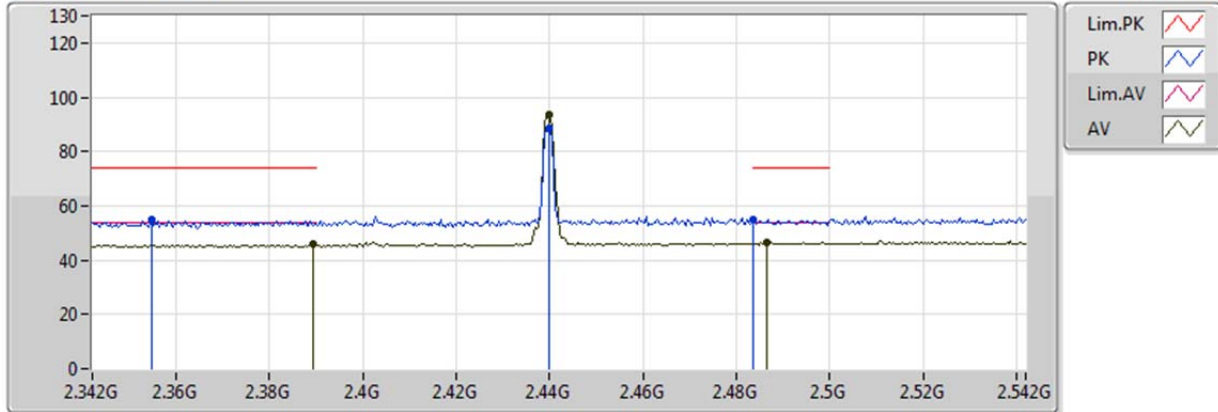
Lim.PK	
PK	
Lim.AV	
AV	

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.3564G	45.70	54.00	-8.30	30.46	3	Vertical	223	1.65	-	15.24	26.90	3.56	-
AV	2.4411G	98.95	Inf	-Inf	30.76	3	Vertical	223	1.65	-	68.19	27.14	3.62	-
AV	2.484G	46.95	54.00	-7.05	30.92	3	Vertical	223	1.65	-	16.03	27.26	3.66	-
PK	2.3468G	54.59	74.00	-19.41	30.42	3	Vertical	223	1.65	-	24.17	26.87	3.55	-
PK	2.440G	100.01	Inf	-Inf	30.76	3	Vertical	223	1.65	-	69.25	27.14	3.62	-
PK	2.486G	56.20	74.00	-17.80	30.92	3	Vertical	223	1.65	-	25.28	27.26	3.66	-

### BT-LE(1Mbps)

### 2440MHz\_TX

18/04/2018

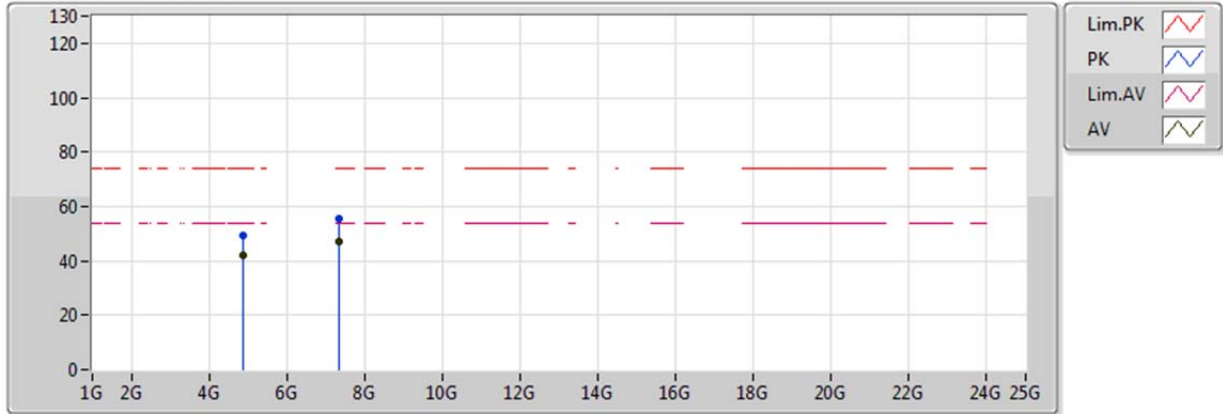


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.3892G	45.88	54.00	-8.12	30.57	3	Horizontal	37	3.19	-	15.31	26.99	3.58	-
AV	2.440G	93.56	Inf	-Inf	30.76	3	Horizontal	37	3.19	-	62.80	27.14	3.62	-
AV	2.4864G	46.31	54.00	-7.69	30.92	3	Horizontal	37	3.19	-	15.39	27.26	3.66	-
PK	2.3548G	54.69	74.00	-19.31	30.45	3	Horizontal	37	3.19	-	24.24	26.89	3.56	-
PK	2.440G	88.69	Inf	-Inf	30.76	3	Horizontal	37	3.19	-	57.93	27.14	3.62	-
PK	2.483502G	54.76	74.00	-19.24	30.91	3	Horizontal	37	3.19	-	23.85	27.25	3.66	-

### BT-LE(1Mbps)

### 2440MHz\_TX

18/04/2018

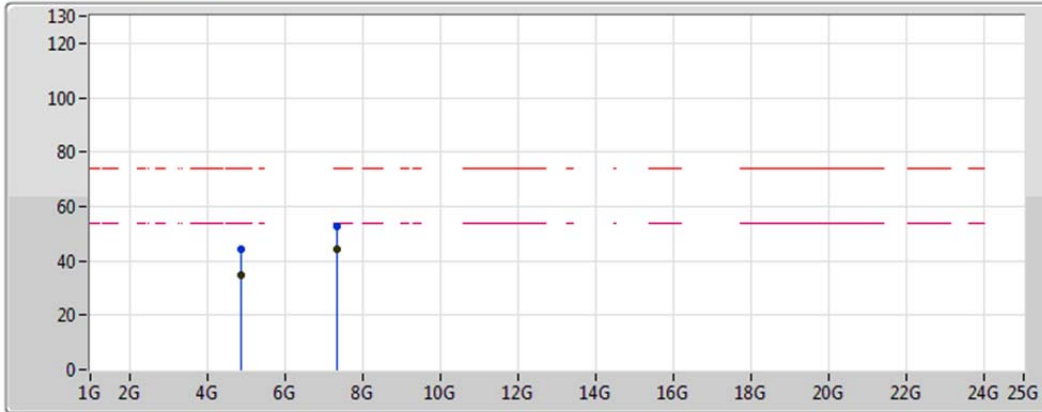


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.88052G	41.94	54.00	-12.06	1.36	3	Vertical	225	1.01	-	40.58	31.31	5.24	35.20
AV	7.32122G	47.25	54.00	-6.75	7.36	3	Vertical	233	1.19	-	39.89	36.05	6.59	35.28
PK	4.88036G	49.04	74.00	-24.96	1.36	3	Vertical	225	1.01	-	47.68	31.31	5.24	35.20
PK	7.3211G	55.28	74.00	-18.72	7.36	3	Vertical	233	1.19	-	47.92	36.05	6.59	35.28

### BT-LE(1Mbps)

### 2440MHz\_TX

18/04/2018



Legend for the graph:

- Lim.PK: Red dashed line with a red zigzag icon
- PK: Blue solid line with a blue zigzag icon
- Lim.AV: Magenta dashed line with a magenta zigzag icon
- AV: Black solid line with a black zigzag icon

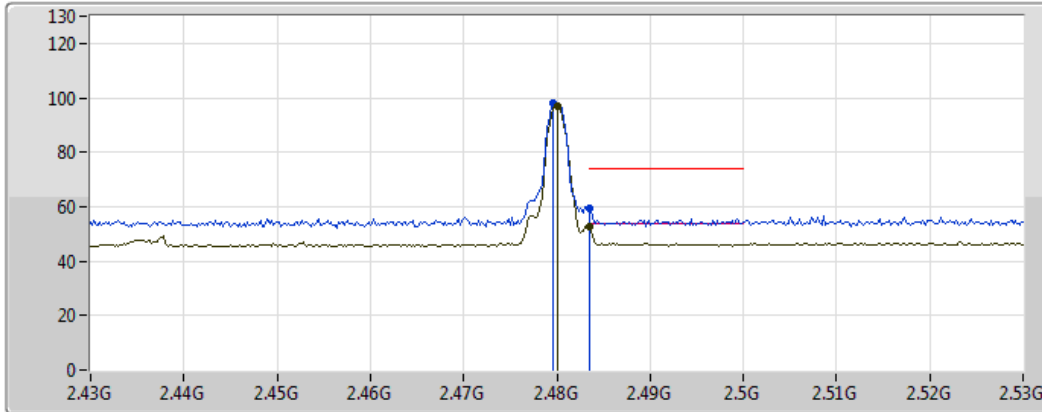
Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.88058G	34.65	54.00	-19.35	1.36	3	Horizontal	28	2.84	-	33.29	31.31	5.24	35.20
AV	7.32122G	44.27	54.00	-9.73	7.36	3	Horizontal	149	1.06	-	36.91	36.05	6.59	35.28
PK	4.88072G	44.23	74.00	-29.77	1.36	3	Horizontal	28	2.84	-	42.87	31.32	5.24	35.20
PK	7.32272G	52.93	74.00	-21.07	7.36	3	Horizontal	149	1.06	-	45.57	36.05	6.59	35.28







### BT-LE(1Mbps)

### 2480MHz\_TX

18/04/2018



Legend for the spectrum plot:

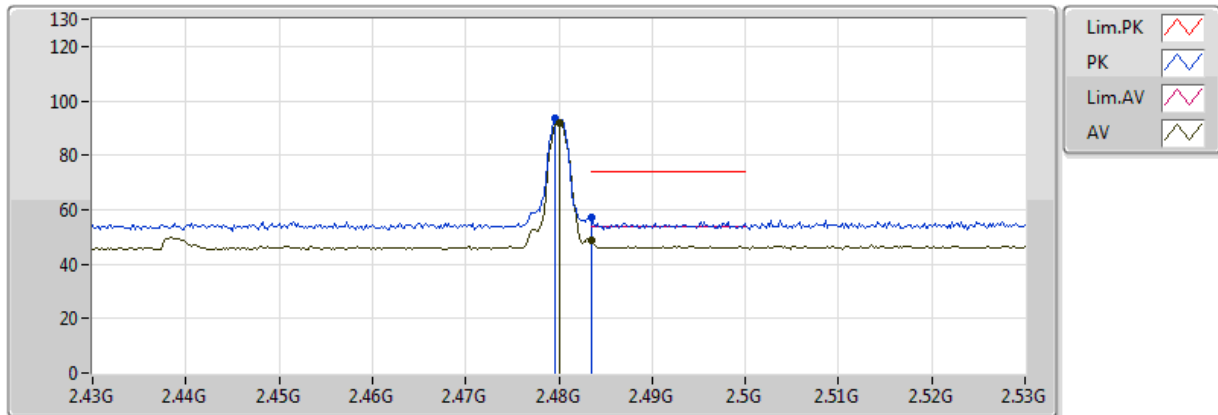
- Lim.PK: 
- PK: 
- Lim.AV: 
- AV: 

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.48G	96.86	Inf	-Inf	30.90	3	Vertical	223	2.16	-	65.96	27.24	3.65	-
AV	2.483502G	52.44	54.00	-1.56	30.91	3	Vertical	223	2.16	-	21.53	27.25	3.66	-
PK	2.4796G	97.96	Inf	-Inf	30.90	3	Vertical	223	2.16	-	67.06	27.24	3.65	-
PK	2.483502G	59.47	74.00	-14.53	30.91	3	Vertical	223	2.16	-	28.56	27.25	3.66	-

### BT-LE(1Mbps)

### 2480MHz\_TX

18/04/2018

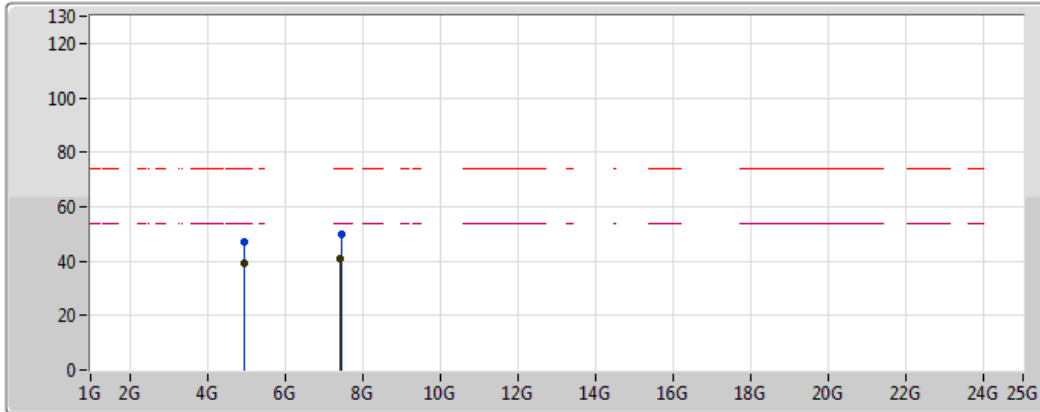


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.48G	92.13	Inf	-Inf	30.90	3	Horizontal	9	3.04	-	61.23	27.24	3.65	-
AV	2.483502G	48.94	54.00	-5.06	30.91	3	Horizontal	9	3.04	-	18.03	27.25	3.66	-
PK	2.4796G	93.35	Inf	-Inf	30.90	3	Horizontal	9	3.04	-	62.45	27.24	3.65	-
PK	2.483502G	57.24	74.00	-16.76	30.91	3	Horizontal	9	3.04	-	26.33	27.25	3.66	-

### BT-LE(1Mbps)

### 2480MHz\_TX

18/04/2018

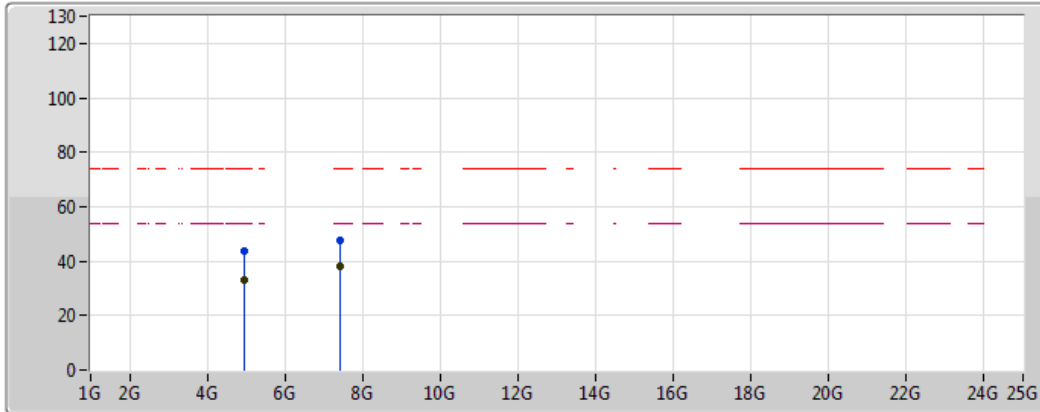


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.95958G	39.23	54.00	-14.77	1.52	3	Vertical	227	1.01	-	37.71	31.44	5.29	35.21
AV	7.43922G	41.06	54.00	-12.94	7.66	3	Vertical	218	1.70	-	33.40	36.34	6.62	35.31
PK	4.96054G	47.06	74.00	-26.94	1.52	3	Vertical	227	1.01	-	45.54	31.44	5.29	35.21
PK	7.44072G	50.15	74.00	-23.85	7.66	3	Vertical	218	1.70	-	42.49	36.35	6.62	35.31

### BT-LE(1Mbps)

### 2480MHz\_TX

18/04/2018



Legend for the spectrum plot:

- Lim.PK: Red dashed line
- PK: Blue solid line
- Lim.AV: Magenta dashed line
- AV: Green solid line

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	4.95952G	33.31	54.00	-20.69	1.51	3	Horizontal	312	2.94	-	31.80	31.44	5.29	35.21
AV	7.43916G	38.18	54.00	-15.82	7.66	3	Horizontal	165	1.06	-	30.52	36.34	6.62	35.31
PK	4.96012G	43.71	74.00	-30.29	1.52	3	Horizontal	312	2.94	-	42.19	31.44	5.29	35.21
PK	7.43952G	47.75	74.00	-26.25	7.66	3	Horizontal	165	1.06	-	40.09	36.34	6.62	35.31