

# FCC Test Report

FCC ID : U4FTBII  
Equipment : Wireless Equipment  
Brand Name : Datalogic  
Model Name : TBII  
Applicant : Datalogic S.r.l.  
Via S.Vitalino, 13 Calderara di Reno 40012 Italy  
Manufacturer : SparkLAN Communications, Inc.  
8F., No. 257, Sec. 2, Tiding Blvd., Neihu District,  
Taipei 11493, Taiwan  
Standard : 47 CFR FCC Part 15.247

The product was received on Dec. 13, 2018, and testing was started from Jan. 15, 2019 and completed on Jan. 15, 2019. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2013 and shown compliance with the applicable technical standards.

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

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



Approved by: Allen Lin

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

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

## Table of Contents

|                                                                            |           |
|----------------------------------------------------------------------------|-----------|
| <b>HISTORY OF THIS TEST REPORT .....</b>                                   | <b>3</b>  |
| <b>SUMMARY OF TEST RESULT .....</b>                                        | <b>4</b>  |
| <b>1      GENERAL DESCRIPTION .....</b>                                    | <b>5</b>  |
| 1.1    Information.....                                                    | 5         |
| 1.2    Testing Applied Standards .....                                     | 7         |
| 1.3    Testing Location Information .....                                  | 7         |
| 1.4    Measurement Uncertainty .....                                       | 7         |
| <b>2      TEST CONFIGURATION OF EUT.....</b>                               | <b>8</b>  |
| 2.1    The Worst Case Measurement Configuration.....                       | 8         |
| 2.2    Support Equipment.....                                              | 8         |
| 2.3    Test Setup Diagram .....                                            | 9         |
| <b>3      TRANSMITTER TEST RESULT .....</b>                                | <b>10</b> |
| 3.1    Emissions in Restricted Frequency Bands.....                        | 10        |
| <b>4      TEST EQUIPMENT AND CALIBRATION DATA.....</b>                     | <b>14</b> |
| <b>APPENDIX A. TEST RESULTS OF EMISSIONS IN RESTRICTED FREQUENCY BANDS</b> |           |
| <b>APPENDIX B. TEST PHOTOS</b>                                             |           |
| <b>PHOTOGRAPHS OF EUT V01</b>                                              |           |



## History of this test report

[illegible]

## 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                       |
| -             | 15.207           | AC Power-line Conducted Emissions           | Not Required       | FCC 15.207                       |
| -             | 15.247(a)        | DTS Bandwidth                               | Not Required       | ≥500kHz                          |
| -             | 15.247(b)        | Maximum Conducted Output Power              | Not Required       | Power [dBm]:30                   |
| -             | 15.247(e)        | Power Spectral Density                      | Not Required       | PSD [dBm/3kHz]:8                 |
| -             | 15.247(d)        | Emissions in Non-restricted Frequency Bands | Not Required       | Non-Restricted Bands:<br>>30 dBc |
| 3.1           | 15.247(d)        | Emissions in Restricted Frequency Bands     | PASS               | Restricted Bands:<br>FCC 15.209  |

**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:**

None

**Reviewed by: Jackson Tsai**

**Report Producer: Debby Hung**

# 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    | HUBER+SUHNER® | 1399.99.0149 | PCB antenna  | Mini i-Pex |
| 2    | HUBER+SUHNER® | 1399.99.0151 | PCB antenna  | Mini i-Pex |

| Ant. | Port | Gain (dBi) |    |    |
|------|------|------------|----|----|
|      |      | 2.4G       | 5G | BT |
| 1    | 1    | 1          | 1  | 1  |
| 2    | 2    | 1          | 1  | -  |

#### For 2.4GHz function:

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

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

#### For BT function:

For IEEE 802.15.1 Bluetooth mode (1TX/1RX)

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

#### For 5GHz function:

For IEEE 802.11 a/n mode (2TX/2RX)

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

### 1.1.3 EUT Information

| Operational Condition               |                                                                               |                                                    |     |
|-------------------------------------|-------------------------------------------------------------------------------|----------------------------------------------------|-----|
| <b>EUT Power Type</b>               | From Host system                                                              |                                                    |     |
| <b>EUT Function</b>                 | <input checked="" type="checkbox"/> Point-to-multipoint                       | <input checked="" type="checkbox"/> Point-to-point |     |
| 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 Table for Permissive Change

This product is an extension of original one reported under FCC ID : U4FTBII (Grant date: December 28, 2018). Below is the table for the change of the product with respect to the original one.

| Modifications                     | Performance Checking             |
|-----------------------------------|----------------------------------|
| Antenna 1 and Antenna 2 was added | Radiated Emissions was evaluated |

## 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 v05

## 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   |
|----------------|---------------|---------------|------------------|-------------|
| Radiated       | 03CH03-HY     | Justin        | 25.3°C / 48%     | 15/Jan/2019 |

## 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                   |
|--------------------------------------|-------------|--------------------------|
| Radiated Emission (9kHz ~ 30MHz)     | 1.6 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% |
| Temperature                          | 0.7 °C      | Confidence levels of 95% |
| Humidity                             | 4 %         | Confidence levels of 95% |

## 2 Test Configuration of EUT

### 2.1 The Worst Case Measurement Configuration

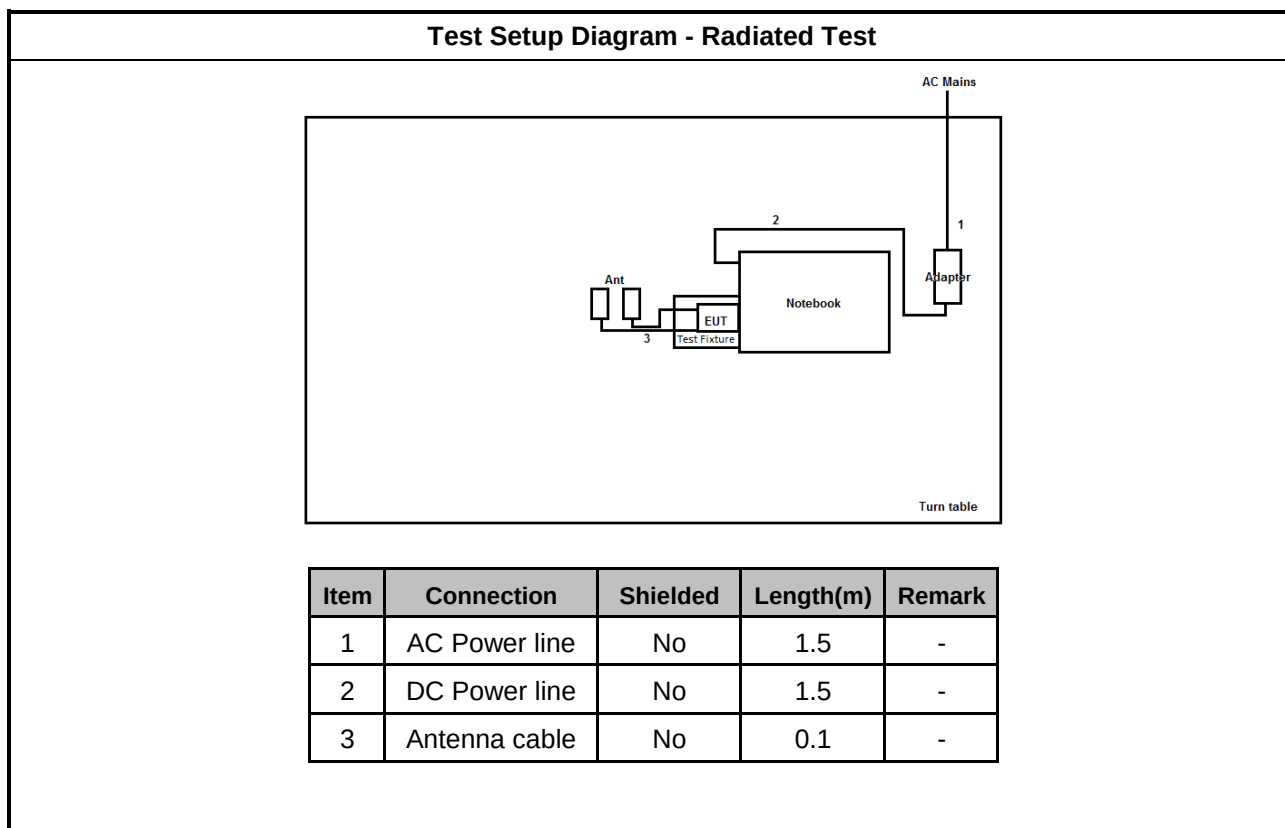
| The Worst Case Mode for Following Conformance Tests |                                                                                                                                                                                                                                                     |
|-----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Tests Item                                          | Emissions in Restricted Frequency Bands                                                                                                                                                                                                             |
| Test Condition                                      | Radiated measurement<br>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                                      | CTX                                                                                                                                                                                                                                                 |
| 1                                                   | NB Mode                                                                                                                                                                                                                                             |
| Orthogonal Planes of EUT                            | Z Plane                                                                                                                                                                                                                                             |
|                                                     |                                                                                                                                                                   |
| Worst Planes of EUT                                 | V                                                                                                                                                                                                                                                   |

### 2.2 Support Equipment

| Support Equipment – Radiated Emission |                   |            |            |        |
|---------------------------------------|-------------------|------------|------------|--------|
| No.                                   | Equipment         | Brand Name | Model Name | FCC ID |
| 1                                     | Notebook          | Dell       | E4300      | DoC    |
| 2                                     | AC Adapter for NB | Dell       | LA90PS1-00 | -      |
| 3                                     | Test Fixture      | Sporton    | -          | -      |



## 2.3 Test Setup Diagram



### 3 Transmitter Test Result

#### 3.1 Emissions in Restricted Frequency Bands

##### 3.1.1 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.

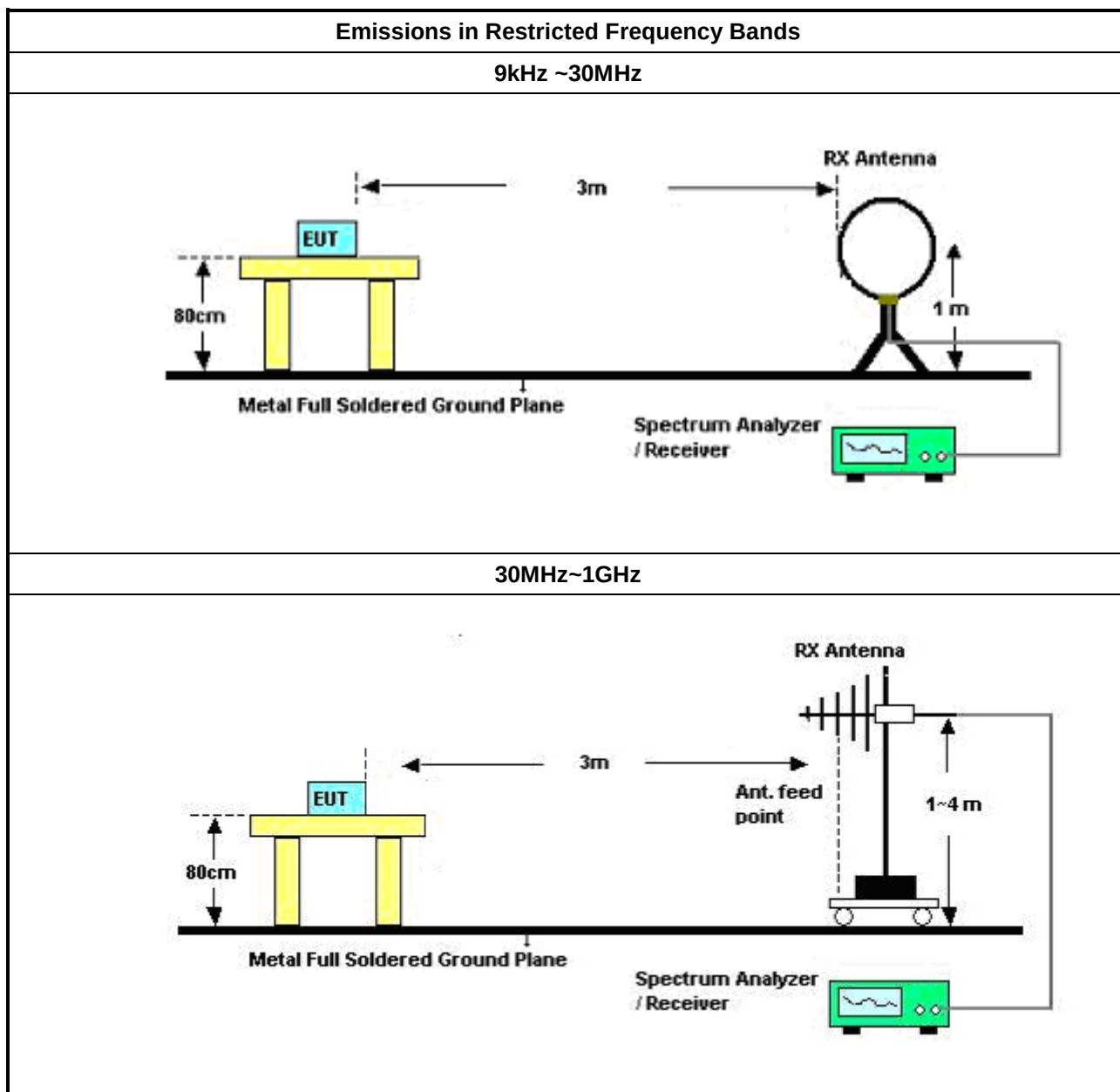
##### 3.1.2 Measuring Instruments

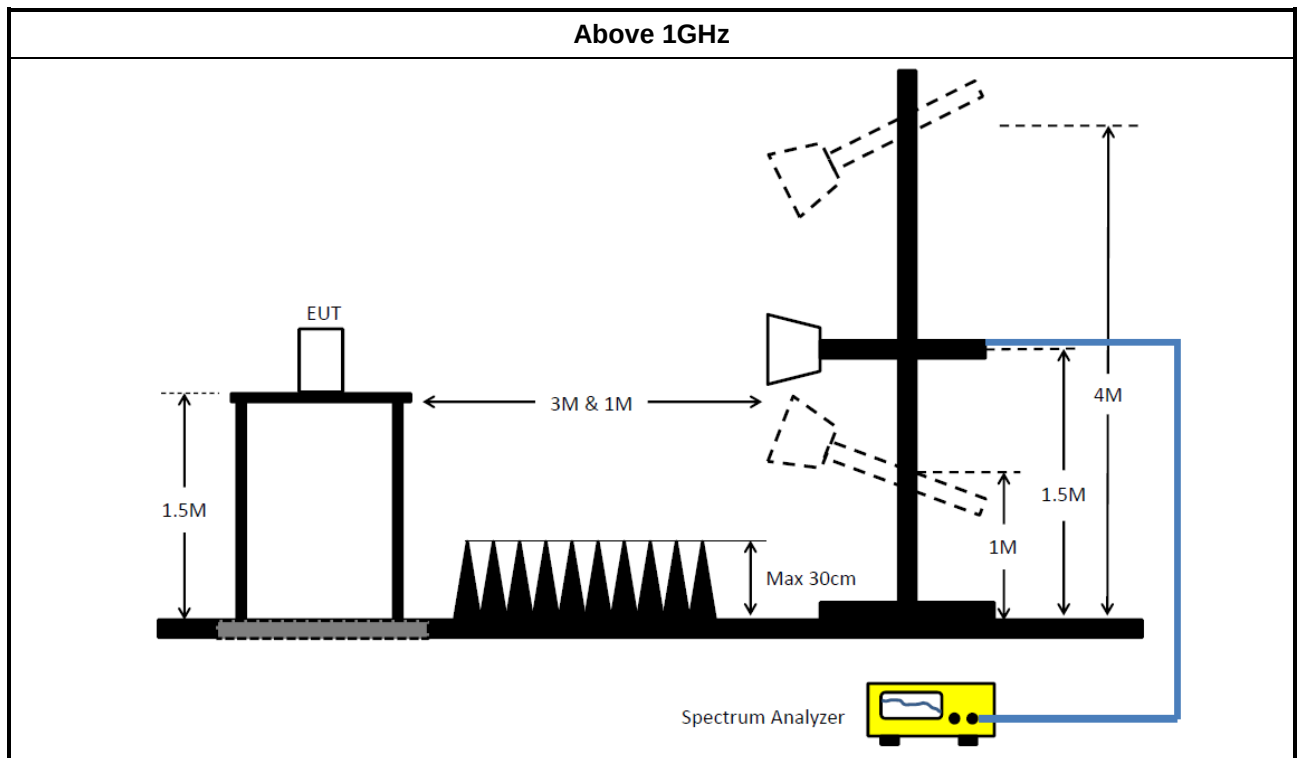
Refer a test equipment and calibration data table in this test report.

### 3.1.3 Test Procedures

| Test Method                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>The average emission levels shall be measured in [duty cycle <math>\geq 98</math> 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 8.6 (11.12 of ANSI C63.10) for restricted frequency bands.</li> </ul>                                                                                                                         |
| <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 8.7.1, 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 8.7.2 (6.10.6 of ANSI C63.10) for marker-delta method for band-edge measurements.</li> </ul>                                                                                                  |
|                                                                                                                                                                                                                             | <ul style="list-style-type: none"> <li>Refer as KDB 558074, clause 8.7.3 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>Use the following spectrum analyzer settings:</li> </ul>                                                                                                                             |                                                                                                                                                                                                                                                                  |
|                                                                                                                                                                                                                             | <ul style="list-style-type: none"> <li>Set RBW=100 kHz for <math>f &lt; 1</math> GHz; VBW=3 * RBW; Sweep = auto; Detector function = peak; Trace = max hold.</li> </ul>                                                                                          |
|                                                                                                                                                                                                                             | <ul style="list-style-type: none"> <li>Set RBW = 1 MHz, VBW= 3MHz for <math>f \geq 1</math> GHz for peak measurement.<br/>For average measurement, refer as 1.1.4.</li> </ul>                                                                                    |

### 3.1.4 Test Setup





### 3.1.5 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.

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

Refer as Appendix A

## 4 Test Equipment and Calibration Data

### 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<br>3m | 30/Oct/2018      | 29/Oct/2019          |
| 3m Semi Anechoic Chamber         | SIDT FRANKONIA | SAC-3M             | 03CH03-HY        | 1GHz ~ 18GHz<br>3m | 30/Oct/2018      | 29/Oct/2019          |
| Amplifier                        | HP             | 8447D              | 2944A08033       | 10kHz ~ 1.3GHz     | 23/Apr/2018      | 19/Apr/2019          |
| EMI Test Receiver                | R&S            | ESR3               | 102052           | 9kHz ~ 3.6GHz      | 10/Apr/2018      | 09/Apr/2019          |
| Bilog Antenna with 5dB Pad       | ETS            | 3142B & MTJ6102-05 | 00022055         | 26 MHz - 3 GHz     | 19/Nov/2018      | 18/Nov/2019          |
| Microwave System Preamplifier    | KEYSIGHT       | 83017A             | MY53270196       | 1GHz ~ 26.5GHz     | 05/Sep/2018      | 04/Sep/2019          |
| Signal Analyzer                  | R&S            | FSV40              | 101500           | 10Hz ~ 40GHz       | 18/Jul/2018      | 17/Jul/2019          |
| RF Cable-R03m                    | Jye Bao        | RG142              | CB021            | 9kHz ~ 1GHz        | 29/Jan/2018      | 28/Jan/2019          |
| RF Cable-high                    | SUHNER         | SUCOFLEX 106       | CB222            | 1GHz ~ 40GHz       | 29/Jan/2018      | 28/Jan/2019          |
| Broadband Horn Antenna           | SCHWARZBECK    | BBHA 9170          | BBHA 9170154     | 18GHz ~ 40GHz      | 06/Feb/ 2018     | 05/Feb/2019          |
| Double Ridged Guide Horn Antenna | SCHWARZBECK    | BBHA 9120 D        | BBHA 9120 D 1531 | 1GHz ~ 18GHz       | 18/Apr/ 2018     | 17/Apr/2019          |
| Preamplifier                     | MITEQ          | TTA1840-35-HG      | 1864481          | 18GHz ~ 40GHz      | 24/Aug/2018      | 23/Aug/2019          |



## RSE TX above 1GHz Result

## Appendix A

### Summary

| Mode          | Result | Type | Freq<br>(Hz) | Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Factor<br>(dB) | Dist<br>(m) | Condition  | Azimuth<br>(°) | Height<br>(m) | Comments |
|---------------|--------|------|--------------|-------------------|-------------------|----------------|----------------|-------------|------------|----------------|---------------|----------|
| 2.4-2.4835GHz | -      | -    | -            | -                 | -                 | -              | -              | -           | -          | -              | -             | -        |
| BT-LE(1Mbps)  | Pass   | AV   | 2.4956G      | 48.35             | 54.00             | -5.65          | 31.00          | 3           | Horizontal | 352            | 1.45          | -        |

## Result

| Mode         | Result | Type | Freq<br>(Hz) | Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Factor<br>(dB) | Dist<br>(m) | Condition  | Azimuth<br>(°) | Height<br>(m) | Comments |
|--------------|--------|------|--------------|-------------------|-------------------|----------------|----------------|-------------|------------|----------------|---------------|----------|
| BT-LE(1Mbps) | -      | -    | -            | -                 | -                 | -              | -              | -           | -          | -              | -             | -        |
| 2402MHz      | Pass   | AV   | 2.377G       | 47.19             | 54.00             | -6.81          | 30.64          | 3           | Vertical   | 191            | 1.26          | -        |
| 2402MHz      | Pass   | AV   | 2.402G       | 83.07             | Inf               | -Inf           | 30.72          | 3           | Vertical   | 191            | 1.26          | -        |
| 2402MHz      | Pass   | PK   | 2.377G       | 58.31             | 74.00             | -15.69         | 30.64          | 3           | Vertical   | 191            | 1.26          | -        |
| 2402MHz      | Pass   | PK   | 2.4018G      | 84.32             | Inf               | -Inf           | 30.72          | 3           | Vertical   | 191            | 1.26          | -        |
| 2402MHz      | Pass   | AV   | 2.3758G      | 47.44             | 54.00             | -6.56          | 30.64          | 3           | Horizontal | 354            | 1.77          | -        |
| 2402MHz      | Pass   | AV   | 2.402G       | 90.69             | Inf               | -Inf           | 30.72          | 3           | Horizontal | 354            | 1.77          | -        |
| 2402MHz      | Pass   | PK   | 2.3606G      | 57.72             | 74.00             | -16.28         | 30.60          | 3           | Horizontal | 354            | 1.77          | -        |
| 2402MHz      | Pass   | PK   | 2.4022G      | 91.82             | Inf               | -Inf           | 30.73          | 3           | Horizontal | 354            | 1.77          | -        |
| 2402MHz      | Pass   | AV   | 4.804G       | 40.57             | 54.00             | -13.43         | 6.49           | 3           | Vertical   | 30             | 1.50          | -        |
| 2402MHz      | Pass   | PK   | 4.80406G     | 48.13             | 74.00             | -25.87         | 6.49           | 3           | Vertical   | 30             | 1.50          | -        |
| 2402MHz      | Pass   | AV   | 4.804G       | 41.16             | 54.00             | -12.84         | 6.49           | 3           | Horizontal | 4              | 2.53          | -        |
| 2402MHz      | Pass   | PK   | 4.80424G     | 48.33             | 74.00             | -25.67         | 6.49           | 3           | Horizontal | 4              | 2.53          | -        |
| 2440MHz      | Pass   | AV   | 2.3888G      | 47.03             | 54.00             | -6.97          | 30.68          | 3           | Vertical   | 311            | 1.23          | -        |
| 2440MHz      | Pass   | AV   | 2.44G        | 81.83             | Inf               | -Inf           | 30.84          | 3           | Vertical   | 311            | 1.23          | -        |
| 2440MHz      | Pass   | AV   | 2.498G       | 48.11             | 54.00             | -5.89          | 31.01          | 3           | Vertical   | 311            | 1.23          | -        |
| 2440MHz      | Pass   | PK   | 2.3672G      | 57.60             | 74.00             | -16.40         | 30.62          | 3           | Vertical   | 311            | 1.23          | -        |
| 2440MHz      | Pass   | PK   | 2.4404G      | 83.09             | Inf               | -Inf           | 30.84          | 3           | Vertical   | 311            | 1.23          | -        |
| 2440MHz      | Pass   | PK   | 2.4936G      | 59.32             | 74.00             | -14.68         | 30.99          | 3           | Vertical   | 311            | 1.23          | -        |
| 2440MHz      | Pass   | AV   | 2.3864G      | 47.25             | 54.00             | -6.75          | 30.68          | 3           | Horizontal | 352            | 1.45          | -        |
| 2440MHz      | Pass   | AV   | 2.44G        | 91.17             | Inf               | -Inf           | 30.84          | 3           | Horizontal | 352            | 1.45          | -        |
| 2440MHz      | Pass   | AV   | 2.4956G      | 48.35             | 54.00             | -5.65          | 31.00          | 3           | Horizontal | 352            | 1.45          | -        |
| 2440MHz      | Pass   | PK   | 2.3896G      | 58.01             | 74.00             | -15.99         | 30.69          | 3           | Horizontal | 352            | 1.45          | -        |
| 2440MHz      | Pass   | PK   | 2.4404G      | 92.28             | Inf               | -Inf           | 30.84          | 3           | Horizontal | 352            | 1.45          | -        |
| 2440MHz      | Pass   | PK   | 2.4908G      | 59.45             | 74.00             | -14.55         | 30.99          | 3           | Horizontal | 352            | 1.45          | -        |
| 2440MHz      | Pass   | AV   | 4.88G        | 39.77             | 54.00             | -14.23         | 6.67           | 3           | Vertical   | 304            | 1.01          | -        |
| 2440MHz      | Pass   | AV   | 7.31886G     | 40.52             | 54.00             | -13.48         | 11.35          | 3           | Vertical   | 11             | 1.46          | -        |
| 2440MHz      | Pass   | PK   | 4.88024G     | 47.20             | 74.00             | -26.80         | 6.67           | 3           | Vertical   | 304            | 1.01          | -        |
| 2440MHz      | Pass   | PK   | 7.32G        | 51.40             | 74.00             | -22.60         | 11.35          | 3           | Vertical   | 11             | 1.46          | -        |
| 2440MHz      | Pass   | AV   | 4.88006G     | 39.32             | 54.00             | -14.68         | 6.67           | 3           | Horizontal | 346            | 1.12          | -        |
| 2440MHz      | Pass   | AV   | 7.32624G     | 40.39             | 54.00             | -13.61         | 11.37          | 3           | Horizontal | 112            | 2.46          | -        |
| 2440MHz      | Pass   | PK   | 4.87988G     | 46.68             | 74.00             | -27.32         | 6.67           | 3           | Horizontal | 346            | 1.12          | -        |
| 2440MHz      | Pass   | PK   | 7.3131G      | 52.13             | 74.00             | -21.87         | 11.34          | 3           | Horizontal | 112            | 2.46          | -        |
| 2480MHz      | Pass   | AV   | 2.48G        | 83.16             | Inf               | -Inf           | 30.95          | 3           | Vertical   | 189            | 1.03          | -        |
| 2480MHz      | Pass   | AV   | 2.4952G      | 48.10             | 54.00             | -5.90          | 31.00          | 3           | Vertical   | 189            | 1.03          | -        |
| 2480MHz      | Pass   | PK   | 2.4802G      | 84.41             | Inf               | -Inf           | 30.95          | 3           | Vertical   | 189            | 1.03          | -        |
| 2480MHz      | Pass   | PK   | 2.4884G      | 58.83             | 74.00             | -15.17         | 30.98          | 3           | Vertical   | 189            | 1.03          | -        |
| 2480MHz      | Pass   | AV   | 2.48G        | 92.66             | Inf               | -Inf           | 30.95          | 3           | Horizontal | 353            | 1.23          | -        |
| 2480MHz      | Pass   | AV   | 2.4842G      | 48.32             | 54.00             | -5.68          | 30.97          | 3           | Horizontal | 353            | 1.23          | -        |
| 2480MHz      | Pass   | PK   | 2.4802G      | 93.76             | Inf               | -Inf           | 30.95          | 3           | Horizontal | 353            | 1.23          | -        |
| 2480MHz      | Pass   | PK   | 2.494G       | 58.34             | 74.00             | -15.66         | 31.00          | 3           | Horizontal | 353            | 1.23          | -        |
| 2480MHz      | Pass   | AV   | 4.96G        | 40.95             | 54.00             | -13.05         | 6.86           | 3           | Vertical   | 307            | 1.02          | -        |
| 2480MHz      | Pass   | AV   | 7.4487G      | 40.07             | 54.00             | -13.93         | 11.68          | 3           | Vertical   | 338            | 1.50          | -        |
| 2480MHz      | Pass   | PK   | 4.95988G     | 47.77             | 74.00             | -26.23         | 6.86           | 3           | Vertical   | 307            | 1.02          | -        |
| 2480MHz      | Pass   | PK   | 7.4505G      | 51.60             | 74.00             | -22.40         | 11.68          | 3           | Vertical   | 338            | 1.50          | -        |
| 2480MHz      | Pass   | AV   | 4.95994G     | 39.44             | 54.00             | -14.56         | 6.86           | 3           | Horizontal | 348            | 1.06          | -        |
| 2480MHz      | Pass   | AV   | 7.44594G     | 39.94             | 54.00             | -14.06         | 11.66          | 3           | Horizontal | 65             | 1.50          | -        |
| 2480MHz      | Pass   | PK   | 4.95976G     | 46.96             | 74.00             | -27.04         | 6.86           | 3           | Horizontal | 348            | 1.06          | -        |





## RSE TX above 1GHz Result

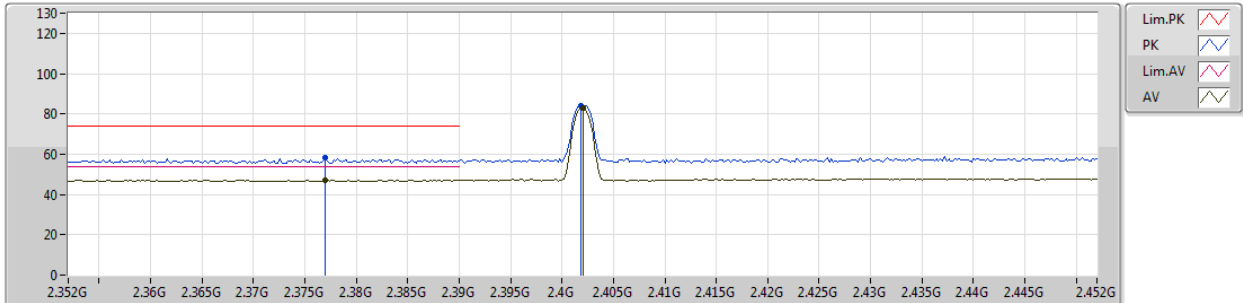
## Appendix A

| Mode    | Result | Type | Freq<br>(Hz) | Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Factor<br>(dB) | Dist<br>(m) | Condition  | Azimuth<br>(°) | Height<br>(m) | Comments |
|---------|--------|------|--------------|-------------------|-------------------|----------------|----------------|-------------|------------|----------------|---------------|----------|
| 2480MHz | Pass   | PK   | 7.455G       | 51.14             | 74.00             | -22.86         | 11.70          | 3           | Horizontal | 65             | 1.50          | -        |

### BT-LE(1Mbps)

### 2402MHz\_TX

05/01/2019

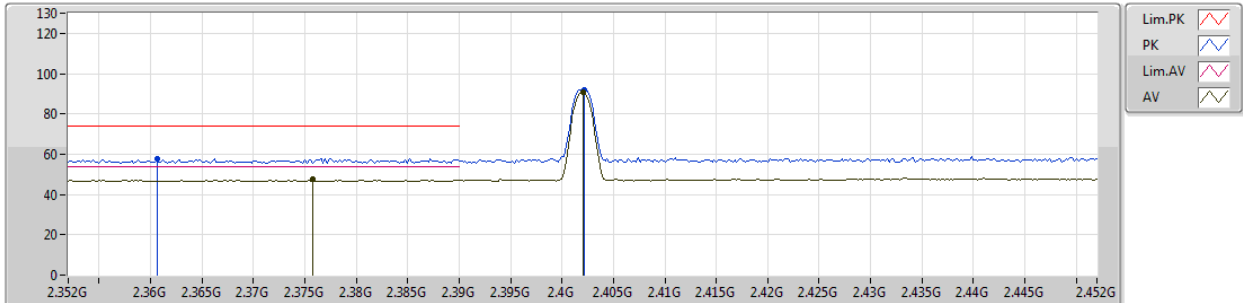


| Type | Freq<br>(Hz) | Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Factor<br>(dB) | Dist<br>(m) | Condition | Azimuth<br>(°) | Height<br>(m) | Comments |  |  |  |  |  |  |  |  |
|------|--------------|-------------------|-------------------|----------------|----------------|-------------|-----------|----------------|---------------|----------|--|--|--|--|--|--|--|--|
| AV   | 2.377G       | 47.19             | 54.00             | -6.81          | 30.64          | 3           | Vertical  | 191            | 1.26          | -        |  |  |  |  |  |  |  |  |
| AV   | 2.402G       | 83.07             | Inf               | -Inf           | 30.72          | 3           | Vertical  | 191            | 1.26          | -        |  |  |  |  |  |  |  |  |
| PK   | 2.377G       | 58.31             | 74.00             | -15.69         | 30.64          | 3           | Vertical  | 191            | 1.26          | -        |  |  |  |  |  |  |  |  |
| PK   | 2.4018G      | 84.32             | Inf               | -Inf           | 30.72          | 3           | Vertical  | 191            | 1.26          | -        |  |  |  |  |  |  |  |  |

## BT-LE(1Mbps)

## 2402MHz\_TX

05/01/2019

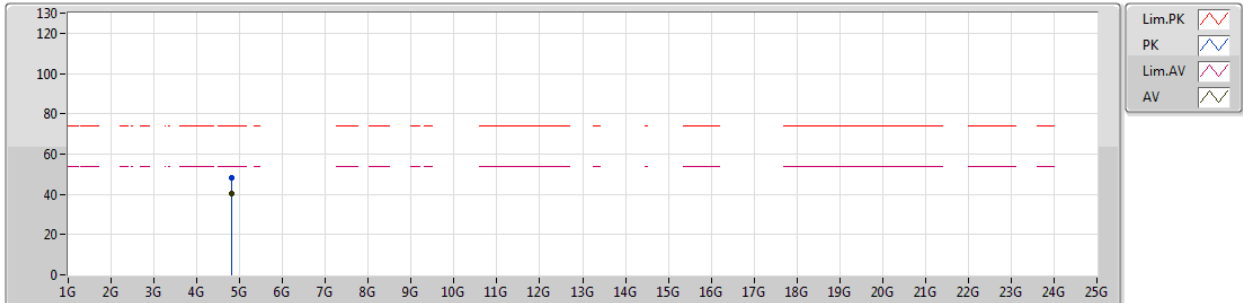


| Type | Freq<br>(Hz) | Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Factor<br>(dB) | Dist<br>(m) | Condition  | Azimuth<br>(°) | Height<br>(m) | Comments |
|------|--------------|-------------------|-------------------|----------------|----------------|-------------|------------|----------------|---------------|----------|
| AV   | 2.3758G      | 47.44             | 54.00             | -6.56          | 30.64          | 3           | Horizontal | 354            | 1.77          | -        |
| AV   | 2.402G       | 90.69             | Inf               | -Inf           | 30.72          | 3           | Horizontal | 354            | 1.77          | -        |
| PK   | 2.3606G      | 57.72             | 74.00             | -16.28         | 30.60          | 3           | Horizontal | 354            | 1.77          | -        |
| PK   | 2.4022G      | 91.82             | Inf               | -Inf           | 30.73          | 3           | Horizontal | 354            | 1.77          | -        |

### BT-LE(1Mbps)

### 2402MHz\_TX

05/01/2019

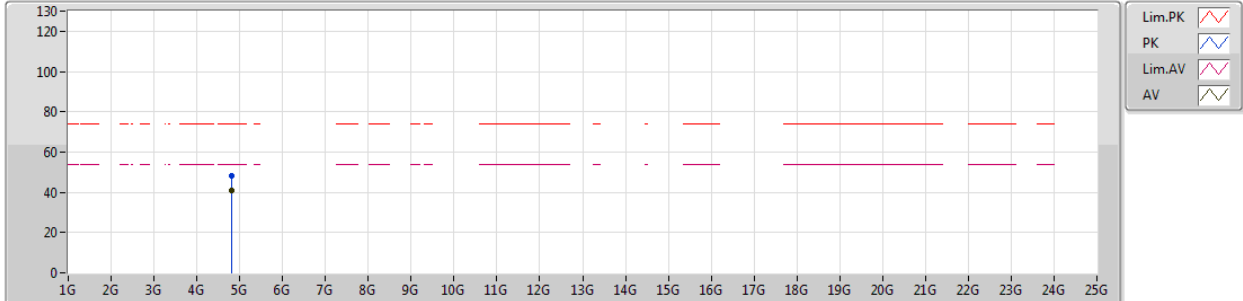


| Type | Freq<br>(Hz) | Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Factor<br>(dB) | Dist<br>(m) | Condition | Azimuth<br>(°) | Height<br>(m) | Comments |  |  |  |  |  |  |  |  |
|------|--------------|-------------------|-------------------|----------------|----------------|-------------|-----------|----------------|---------------|----------|--|--|--|--|--|--|--|--|
| AV   | 4.804G       | 40.57             | 54.00             | -13.43         | 6.49           | 3           | Vertical  | 30             | 1.50          | -        |  |  |  |  |  |  |  |  |
| PK   | 4.80406G     | 48.13             | 74.00             | -25.87         | 6.49           | 3           | Vertical  | 30             | 1.50          | -        |  |  |  |  |  |  |  |  |

## BT-LE(1Mbps)

## 2402MHz\_TX

05/01/2019

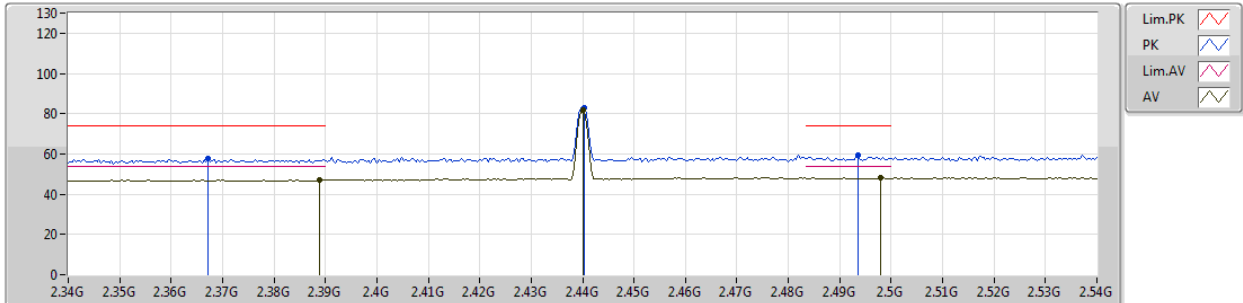


| Type | Freq<br>(Hz) | Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Factor<br>(dB) | Dist<br>(m) | Condition  | Azimuth<br>(°) | Height<br>(m) | Comments |
|------|--------------|-------------------|-------------------|----------------|----------------|-------------|------------|----------------|---------------|----------|
| AV   | 4.804G       | 41.16             | 54.00             | -12.84         | 6.49           | 3           | Horizontal | 4              | 2.53          | -        |
| PK   | 4.80424G     | 48.33             | 74.00             | -25.67         | 6.49           | 3           | Horizontal | 4              | 2.53          | -        |

### BT-LE(1Mbps)

### 2440MHz\_TX

05/01/2019

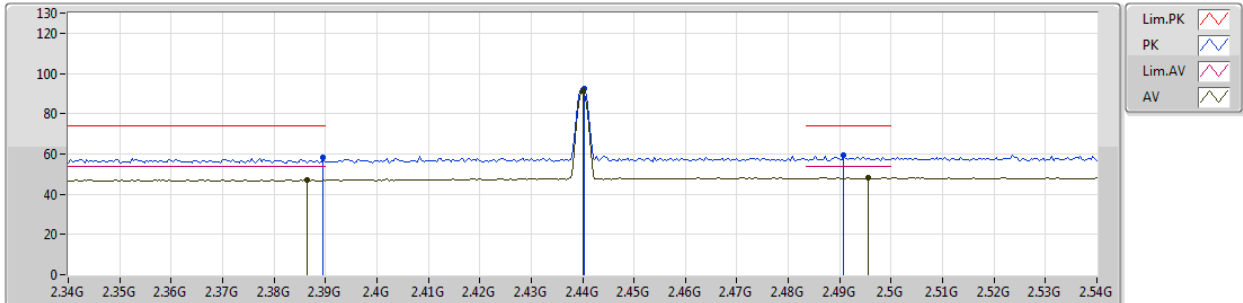


| Type | Freq<br>(Hz) | Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Factor<br>(dB) | Dist<br>(m) | Condition | Azimuth<br>(°) | Height<br>(m) | Comments |
|------|--------------|-------------------|-------------------|----------------|----------------|-------------|-----------|----------------|---------------|----------|
| AV   | 2.3888G      | 47.03             | 54.00             | -6.97          | 30.68          | 3           | Vertical  | 311            | 1.23          | -        |
| AV   | 2.44G        | 81.83             | Inf               | -Inf           | 30.84          | 3           | Vertical  | 311            | 1.23          | -        |
| AV   | 2.498G       | 48.11             | 54.00             | -5.89          | 31.01          | 3           | Vertical  | 311            | 1.23          | -        |
| PK   | 2.3672G      | 57.60             | 74.00             | -16.40         | 30.62          | 3           | Vertical  | 311            | 1.23          | -        |
| PK   | 2.4404G      | 83.09             | Inf               | -Inf           | 30.84          | 3           | Vertical  | 311            | 1.23          | -        |
| PK   | 2.4936G      | 59.32             | 74.00             | -14.68         | 30.99          | 3           | Vertical  | 311            | 1.23          | -        |

## BT-LE(1Mbps)

## 2440MHz\_TX

05/01/2019

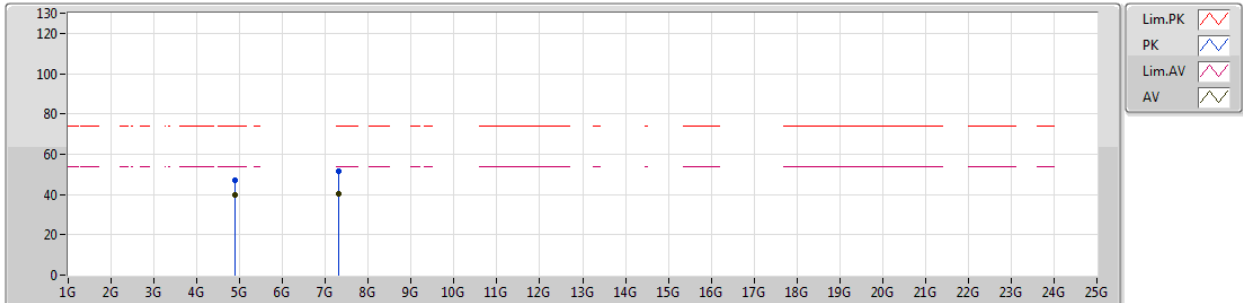


| Type | Freq<br>(Hz) | Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Factor<br>(dB) | Dist<br>(m) | Condition  | Azimuth<br>(°) | Height<br>(m) | Comments |
|------|--------------|-------------------|-------------------|----------------|----------------|-------------|------------|----------------|---------------|----------|
| AV   | 2.3864G      | 47.25             | 54.00             | -6.75          | 30.68          | 3           | Horizontal | 352            | 1.45          | -        |
| AV   | 2.44G        | 91.17             | Inf               | -Inf           | 30.84          | 3           | Horizontal | 352            | 1.45          | -        |
| AV   | 2.4956G      | 48.35             | 54.00             | -5.65          | 31.00          | 3           | Horizontal | 352            | 1.45          | -        |
| PK   | 2.3896G      | 58.01             | 74.00             | -15.99         | 30.69          | 3           | Horizontal | 352            | 1.45          | -        |
| PK   | 2.4404G      | 92.28             | Inf               | -Inf           | 30.84          | 3           | Horizontal | 352            | 1.45          | -        |
| PK   | 2.4908G      | 59.45             | 74.00             | -14.55         | 30.99          | 3           | Horizontal | 352            | 1.45          | -        |

### BT-LE(1Mbps)

### 2440MHz\_TX

05/01/2019



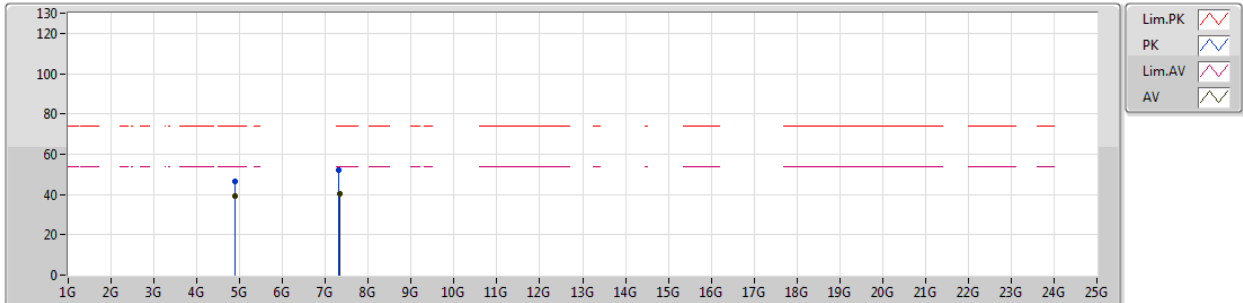
| Type | Freq<br>(Hz) | Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Factor<br>(dB) | Dist<br>(m) | Condition | Azimuth<br>(°) | Height<br>(m) | Comments |
|------|--------------|-------------------|-------------------|----------------|----------------|-------------|-----------|----------------|---------------|----------|
| AV   | 4.88G        | 39.77             | 54.00             | -14.23         | 6.67           | 3           | Vertical  | 304            | 1.01          | -        |
| AV   | 7.31886G     | 40.52             | 54.00             | -13.48         | 11.35          | 3           | Vertical  | 11             | 1.46          | -        |
| PK   | 4.88024G     | 47.20             | 74.00             | -26.80         | 6.67           | 3           | Vertical  | 304            | 1.01          | -        |
| PK   | 7.32G        | 51.40             | 74.00             | -22.60         | 11.35          | 3           | Vertical  | 11             | 1.46          | -        |



### BT-LE(1Mbps)

### 2440MHz\_TX

05/01/2019

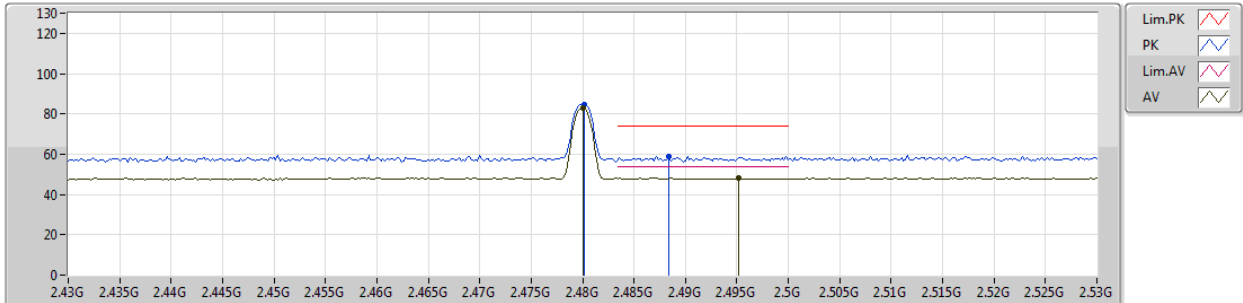


| Type | Freq<br>(Hz) | Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Factor<br>(dB) | Dist<br>(m) | Condition  | Azimuth<br>(°) | Height<br>(m) | Comments |
|------|--------------|-------------------|-------------------|----------------|----------------|-------------|------------|----------------|---------------|----------|
| AV   | 4.88006G     | 39.32             | 54.00             | -14.68         | 6.67           | 3           | Horizontal | 346            | 1.12          | -        |
| AV   | 7.32624G     | 40.39             | 54.00             | -13.61         | 11.37          | 3           | Horizontal | 112            | 2.46          | -        |
| PK   | 4.87988G     | 46.68             | 74.00             | -27.32         | 6.67           | 3           | Horizontal | 346            | 1.12          | -        |
| PK   | 7.3131G      | 52.13             | 74.00             | -21.87         | 11.34          | 3           | Horizontal | 112            | 2.46          | -        |

### BT-LE(1Mbps)

### 2480MHz\_TX

05/01/2019

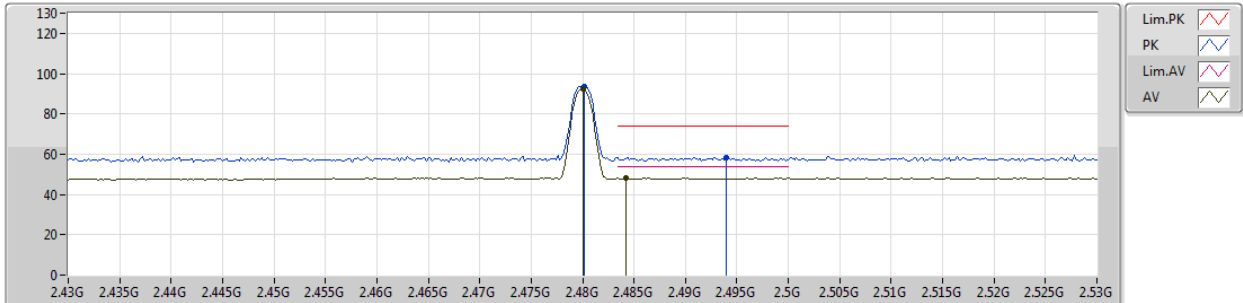


| Type | Freq<br>(Hz) | Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Factor<br>(dB) | Dist<br>(m) | Condition | Azimuth<br>(°) | Height<br>(m) | Comments |
|------|--------------|-------------------|-------------------|----------------|----------------|-------------|-----------|----------------|---------------|----------|
| AV   | 2.48G        | 83.16             | Inf               | -Inf           | 30.95          | 3           | Vertical  | 189            | 1.03          | -        |
| AV   | 2.4952G      | 48.10             | 54.00             | -5.90          | 31.00          | 3           | Vertical  | 189            | 1.03          | -        |
| PK   | 2.4802G      | 84.41             | Inf               | -Inf           | 30.95          | 3           | Vertical  | 189            | 1.03          | -        |
| PK   | 2.4884G      | 58.83             | 74.00             | -15.17         | 30.98          | 3           | Vertical  | 189            | 1.03          | -        |

### BT-LE(1Mbps)

### 2480MHz\_TX

05/01/2019

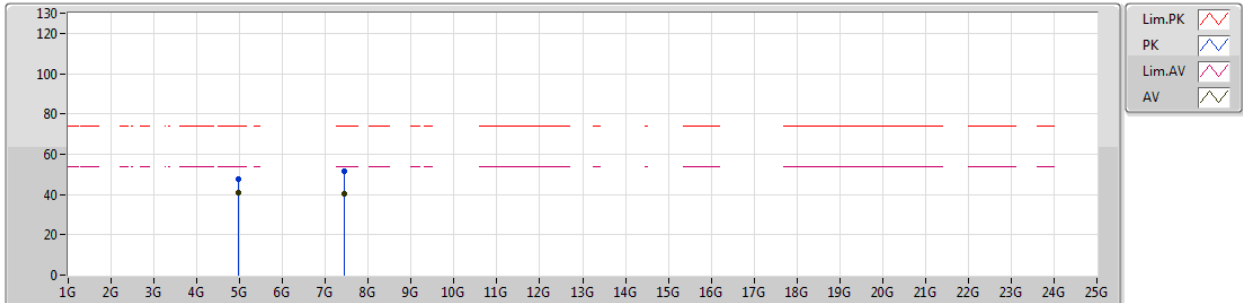


| Type | Freq<br>(Hz) | Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Factor<br>(dB) | Dist<br>(m) | Condition  | Azimuth<br>(°) | Height<br>(m) | Comments |
|------|--------------|-------------------|-------------------|----------------|----------------|-------------|------------|----------------|---------------|----------|
| AV   | 2.48G        | 92.66             | Inf               | -Inf           | 30.95          | 3           | Horizontal | 353            | 1.23          | -        |
| AV   | 2.4842G      | 48.32             | 54.00             | -5.68          | 30.97          | 3           | Horizontal | 353            | 1.23          | -        |
| PK   | 2.4802G      | 93.76             | Inf               | -Inf           | 30.95          | 3           | Horizontal | 353            | 1.23          | -        |
| PK   | 2.494G       | 58.34             | 74.00             | -15.66         | 31.00          | 3           | Horizontal | 353            | 1.23          | -        |

### BT-LE(1Mbps)

### 2480MHz\_TX

05/01/2019

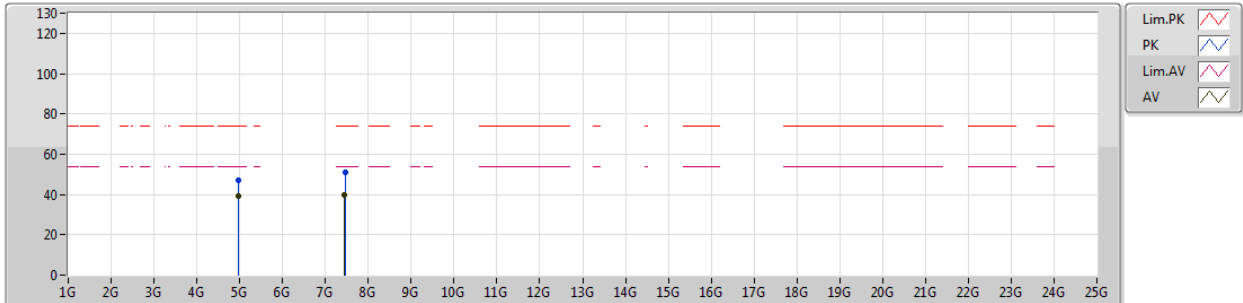


| Type | Freq<br>(Hz) | Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Factor<br>(dB) | Dist<br>(m) | Condition | Azimuth<br>(°) | Height<br>(m) | Comments |
|------|--------------|-------------------|-------------------|----------------|----------------|-------------|-----------|----------------|---------------|----------|
| AV   | 4.96G        | 40.95             | 54.00             | -13.05         | 6.86           | 3           | Vertical  | 307            | 1.02          | -        |
| AV   | 7.4487G      | 40.07             | 54.00             | -13.93         | 11.68          | 3           | Vertical  | 338            | 1.50          | -        |
| PK   | 4.95988G     | 47.77             | 74.00             | -26.23         | 6.86           | 3           | Vertical  | 307            | 1.02          | -        |
| PK   | 7.4505G      | 51.60             | 74.00             | -22.40         | 11.68          | 3           | Vertical  | 338            | 1.50          | -        |

### BT-LE(1Mbps)

### 2480MHz\_TX

05/01/2019



| Type | Freq<br>(Hz) | Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Factor<br>(dB) | Dist<br>(m) | Condition  | Azimuth<br>(°) | Height<br>(m) | Comments |
|------|--------------|-------------------|-------------------|----------------|----------------|-------------|------------|----------------|---------------|----------|
| AV   | 4.95994G     | 39.44             | 54.00             | -14.56         | 6.86           | 3           | Horizontal | 348            | 1.06          | -        |
| AV   | 7.44594G     | 39.94             | 54.00             | -14.06         | 11.66          | 3           | Horizontal | 65             | 1.50          | -        |
| PK   | 4.95976G     | 46.96             | 74.00             | -27.04         | 6.86           | 3           | Horizontal | 348            | 1.06          | -        |
| PK   | 7.455G       | 51.14             | 74.00             | -22.86         | 11.70          | 3           | Horizontal | 65             | 1.50          | -        |