

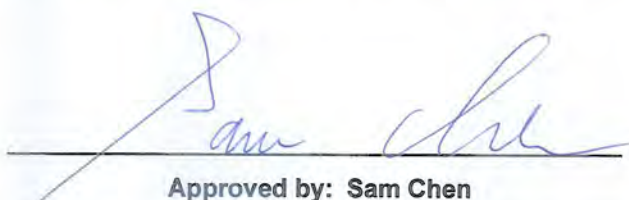


# FCC RADIO TEST REPORT

**FCC ID** : 2AHKM-CODA5519  
**Equipment** : DOCSIS 3.1 Wi-Fi 6 EMTA Gateway  
**Brand Name** : hitron  
**Model Name** : CODA-5519, CODA-5512, CODA-5719, CODA-5712, CODA-5610, CODA-5810, CODA-5814, CODA5610  
**Applicant** : Hitron Technologies Inc.  
No. 1-8, Li-Hsin 1st Rd. Hsinchu Science Park,  
Hsinchu 30078, Taiwan  
**Manufacturer** : Hitron Technologies Inc.  
No. 1-8, Li-Hsin 1st Rd. Hsinchu Science Park,  
Hsinchu 30078, Taiwan  
**Standard** : 47 CFR FCC Part 15.247

The product was received on Nov. 28, 2019, and testing was started from May 28, 2020 and completed on Jul. 23, 2020. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2013 and shown compliance with the applicable technical standards.

The 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: Sam Chen

**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 Applicable Standards .....                                             | 9         |
| 1.3 Testing Location Information .....                                     | 9         |
| 1.4 Measurement Uncertainty .....                                          | 9         |
| <b>2 Test Configuration of EUT .....</b>                                   | <b>10</b> |
| 2.1 The Worst Case Measurement Configuration .....                         | 10        |
| 2.2 EUT Operation during Test .....                                        | 11        |
| 2.3 Accessories .....                                                      | 11        |
| 2.4 Support Equipment.....                                                 | 12        |
| 2.5 Test Setup Diagram .....                                               | 14        |
| <b>3 Transmitter Test Result .....</b>                                     | <b>18</b> |
| 3.1 AC Power-line Conducted Emissions .....                                | 18        |
| 3.2 Emissions in Restricted Frequency Bands.....                           | 20        |
| <b>4 Test Equipment and Calibration Data .....</b>                         | <b>24</b> |
| <b>Appendix A. Test Results of AC Power-line Conducted Emissions</b>       |           |
| <b>Appendix B. Test Results of Emissions in Restricted Frequency Bands</b> |           |
| <b>Appendix C. Test Photos</b>                                             |           |
| <b>Photographs of EUT v01</b>                                              |           |



## History of this test report

TEL : 886-3-656-9065  
FAX : 886-3-656-9085  
Report Template No.: CB-A10\_10 Ver1.2

Page Number : 3 of 24  
Issued Date : Aug. 24, 2020  
Report Version : 01



## Summary of Test Result

| Report Clause | Ref Std. Clause | Test Items                              | Result (PASS/FAIL) | Remark |
|---------------|-----------------|-----------------------------------------|--------------------|--------|
| 1.1.2         | 15.203          | Antenna Requirement                     | PASS               | -      |
| 3.1           | 15.207          | AC Power-line Conducted Emissions       | PASS               | -      |
| 3.2           | 15.247(d)       | Emissions in Restricted Frequency Bands | PASS               | -      |

**Declaration of Conformity:**

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

**Comments and Explanations:**

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

**Reviewed by: Sam Chen**

**Report Producer: Cindy Peng**



# 1 General Description

## 1.1 Information

### 1.1.1 RF General Information

| Frequency Range (MHz) | IEEE Std. 802.11              | Ch. Frequency (MHz) | Channel Number |
|-----------------------|-------------------------------|---------------------|----------------|
| 2400-2483.5           | b, g, n (HT20),<br>ax (HEW20) | 2412-2462           | 1-11 [11]      |
| 2400-2483.5           | ax (HEW40)                    | 2422-2452           | 3-9 [7]        |

| Band          | Mode           | BWch (MHz) | Nant |
|---------------|----------------|------------|------|
| 2.4-2.4835GHz | 802.11b        | 20         | 1TX  |
| 2.4-2.4835GHz | 802.11g        | 20         | 4TX  |
| 2.4-2.4835GHz | 802.11n HT20   | 20         | 4TX  |
| 2.4-2.4835GHz | 802.11ax HEW20 | 20         | 4TX  |
| 2.4-2.4835GHz | 802.11ax HEW40 | 40         | 4TX  |

**Note:**

- ♦ 11b mode uses a combination of DSSS-DBPSK, DQPSK, CCK modulation.
- ♦ 11g, HT20 use a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM modulation.
- ♦ HEW20, HEW40 use a combination of OFDMA-BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM modulation.
- ♦ BWch is the nominal channel bandwidth.

**1.1.2 Antenna Information**

| Ant. | Port | Brand  | Model Name     | Type | Connector | Gain (dBi) |                |                |                |                |
|------|------|--------|----------------|------|-----------|------------|----------------|----------------|----------------|----------------|
|      |      |        |                |      |           | 2.4GHz     | 5GHz<br>Band 1 | 5GHz<br>Band 2 | 5GHz<br>Band 3 | 5GHz<br>Band 4 |
| 1    | 3    | WIESON | GY196HC112-011 | PCB  | MHF       | 2.8        | 2.6            | 3              | 3.4            | 3              |
| 2    | 2    | WIESON | GY196HC112-012 | PCB  | MHF       | 2.8        | 2.6            | 3              | 3.4            | 3              |
| 3    | 1    | WIESON | GY196HC112-013 | PCB  | MHF       | 2.8        | 2.6            | 3              | 3.4            | 3              |
| 4    | 4    | WIESON | GY196HC112-014 | PCB  | MHF       | 2.8        | 2.6            | 3              | 3.4            | 3              |

Note: The above information was declared by manufacturer.

**For 2.4GHz function:****For IEEE 802.11b mode (1TX/1RX)**

The EUT supports the antenna with TX and RX diversity functions.

Port 1, Port 2, Port 3 and Port 4 support transmit and receive functions, but only one of them will be used at one time.

**For IEEE 802.11g/n/ax mode (4TX/4RX)**

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

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

**For 5GHz function:****For IEEE 802.11a/n/ac/ax mode (4TX/4RX)**

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

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

**1.1.3 EUT Operational Condition**

|                              |                                                                 |                     |                          |                     |
|------------------------------|-----------------------------------------------------------------|---------------------|--------------------------|---------------------|
| <b>EUT Power Type</b>        | From power adapter                                              |                     |                          |                     |
| <b>Beamforming Function</b>  | <input checked="" type="checkbox"/>                             | With beamforming    | <input type="checkbox"/> | Without beamforming |
|                              | The product has beamforming function for 802.11n/ac/ax in 5GHz. |                     |                          |                     |
| <b>Function</b>              | <input checked="" type="checkbox"/>                             | Point-to-multipoint | <input type="checkbox"/> | Point-to-point      |
| <b>Test Software Version</b> | DUT GUI V610.23                                                 |                     |                          |                     |

Note: The above information was declared by manufacturer.



### 1.1.4 Table for Multiple Listing

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

| EUT                                                                                                          | Model Name | Frequency Configuration       | MoCA | Voice (SLIC) | LAN             | Wi-Fi   | BBU | USB |
|--------------------------------------------------------------------------------------------------------------|------------|-------------------------------|------|--------------|-----------------|---------|-----|-----|
| 1                                                                                                            | CODA-5519  | 5~85 US                       | Yes  | PEF42078     | PHY: GPY212     | WAV614+ | Yes | Yes |
|                                                                                                              |            | 108 ~ 1002 DS                 |      |              | Switch: PEF7085 | Wave624 |     |     |
| 2                                                                                                            | CODA-5512  | 5~85 US                       | Yes  | No           | PHY: GPY212     | WAV614+ | No  | Yes |
|                                                                                                              |            | 108 ~ 1002 DS                 |      |              | Switch: PEF7085 | Wave624 |     |     |
| 3                                                                                                            | CODA-5719  | 5-85/ 5~204MHz US             | Yes  | PEF42078     | PHY: GPY212     | WAV614+ | Yes | Yes |
|                                                                                                              |            | 108 ~ 1002 / 258 ~ 1002Mhz DS |      |              | Switch: PEF7085 | Wave624 |     |     |
| 4                                                                                                            | CODA-5712  | 5-85/ 5~204MHz US             | Yes  | No           | PHY: GPY212     | WAV614+ | No  | Yes |
|                                                                                                              |            | 108 ~ 1002 / 258 ~ 1002Mhz DS |      |              | Switch: PEF7085 | Wave624 |     |     |
| 5                                                                                                            | CODA-5610  | 5-42/ 5~85MHz US              | No   | No           | PHY: GPY212     | WAV614+ | No  | Yes |
|                                                                                                              |            | 108 ~ 1002 DS                 |      |              | Switch: PEF7085 | Wave624 |     |     |
| 6                                                                                                            | CODA-5810  | 5-85/ 5~204MHz US             | No   | No           | PHY: GPY212     | WAV614+ | No  | Yes |
|                                                                                                              |            | 108 ~ 1218 / 258 ~ 1218Mhz DS |      |              | Switch: PEF7085 | Wave624 |     |     |
| 7                                                                                                            | CODA-5814  | 5-85/ 5~204MHz US             | No   | PEF42078     | PHY: GPY212     | WAV614+ | Yes | Yes |
|                                                                                                              |            |                               |      |              | Switch: PEF7085 | Wave624 |     |     |
| -                                                                                                            | CODA5610   | 5-42/ 5~85MHz US              | No   | No           | PHY: GPY212     | WAV614+ | No  | Yes |
|                                                                                                              |            | 108 ~ 1002 DS                 |      |              | Switch: PEF7085 | Wave624 |     |     |
| Note: The model “CODA-5610” and “CODA5610” are identical, different model names serve as marketing strategy. |            |                               |      |              |                 |         |     |     |



### 1.1.5 Table for Class II Change

This product is an extension of original one reported under Sporton project number: FR020705AA

Below is the table for the change of the product with respect to the original one.

| Modifications                                                                                                                                                                                                                                                                                             | Performance Checking                                                                                                                                 |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"><li>1. Changing the color of RJ-45 cable to “orange” from “yellow”.</li><li>2. Removing one adapter (Brand Name: APD, Model Name: DA-60Y12).</li><li>3. Adding 5GHz band 2 and band 3 (5250~5350 MHz, 5470~5725 MHz).</li><li>4. Adding the 160MHz bandwidth.</li></ul> | It does not affect the test result.                                                                                                                  |
| <ul style="list-style-type: none"><li>5. Changing the hardware of model names: CODA-5512, CODA-5719, CODA-5712, CODA-5610, the detail please refer to the section 1.1.5.</li><li>6. Adding three model names: CODA-5810, CODA-5814, CODA5610.</li></ul>                                                   | <ul style="list-style-type: none"><li>1. AC Power-line Conducted Emissions.</li><li>2. Emissions in Restricted Frequency Bands Below 1GHz.</li></ul> |





## 1.2 Applicable Standards

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

- ♦ 47 CFR FCC Part 15
- ♦ ANSI C63.10-2013

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

- ♦ FCC KDB 558074 D01 v05r02
- ♦ FCC KDB 662911 D01 v02r01
- ♦ FCC KDB 414788 D01 v01r01

## 1.3 Testing Location Information

| Testing Location                    |        |                                                                                                                               |
|-------------------------------------|--------|-------------------------------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/>            | HWA YA | ADD : No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)<br>TEL : 886-3-327-3456 FAX : 886-3-327-0973        |
| <input checked="" type="checkbox"/> | JHUBEI | ADD : No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C.<br>TEL : 886-3-656-9065 FAX : 886-3-656-9085 |

| Test Condition      | Test Site No. | Test Engineer | Test Environment     | Test Date                  | Remark        |
|---------------------|---------------|---------------|----------------------|----------------------------|---------------|
| Radiated Below 1GHz | 03CH04-CB     | Paul Chen     | 25.4~26°C / 58~62%   | May 28, 2020~Jul. 23, 2020 | Mode 1~Mode 4 |
|                     | 03CH05-CB     | Paul Chen     | 25.1~26.9°C / 58~60% | May 28, 2020~Jul. 23, 2020 | Mode 5~Mode 6 |
| AC Conduction       | CO02-CB       | GN Hou        | 22~23°C / 58~62%     | Jun. 08, 2020              | Mode 1~Mode 6 |

Test site Designation No. TW0006 with FCC.

Test site registered number IC 4086D with Industry Canada.

## 1.4 Measurement Uncertainty

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

| Test Items                           | Uncertainty | Remark                   |
|--------------------------------------|-------------|--------------------------|
| Conducted Emission (150kHz ~ 30MHz)  | 2.0 dB      | Confidence levels of 95% |
| Radiated Emission (30MHz ~ 1,000MHz) | 5.6 dB      | Confidence levels of 95% |



## 2 Test Configuration of EUT

### 2.1 The Worst Case Measurement Configuration

| The Worst Case Mode for Following Conformance Tests |                                                          |
|-----------------------------------------------------|----------------------------------------------------------|
| <b>Tests Item</b>                                   | AC power-line conducted emissions                        |
| <b>Condition</b>                                    | AC power-line conducted measurement for line and neutral |
| <b>Operating Mode</b>                               | Normal Link                                              |
| 1                                                   | EUT 2 + Adapter                                          |
| 2                                                   | EUT 3 + Adapter                                          |
| 3                                                   | EUT 4 + Adapter                                          |
| 4                                                   | EUT 5 + Adapter                                          |
| 5                                                   | EUT 6 + Adapter                                          |
| 6                                                   | EUT 7 + Adapter                                          |

| The Worst Case Mode for Following Conformance Tests |                                                                                                                                                                                                                                                     |
|-----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Tests Item</b>                                   | Emissions in Restricted Frequency Bands                                                                                                                                                                                                             |
| <b>Test Condition</b>                               | 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. |
| <b>Operating Mode &lt; 1GHz</b>                     | Normal Link                                                                                                                                                                                                                                         |
| 1                                                   | EUT 2 + Adapter                                                                                                                                                                                                                                     |
| 2                                                   | EUT 3 + Adapter                                                                                                                                                                                                                                     |
| 3                                                   | EUT 4 + Adapter                                                                                                                                                                                                                                     |
| 4                                                   | EUT 5 + Adapter                                                                                                                                                                                                                                     |
| 5                                                   | EUT 6 + Adapter                                                                                                                                                                                                                                     |
| 6                                                   | EUT 7 + Adapter                                                                                                                                                                                                                                     |

| The Worst Case Mode for Following Conformance Tests |                                                                         |
|-----------------------------------------------------|-------------------------------------------------------------------------|
| <b>Tests Item</b>                                   | Simultaneous Transmission Analysis - Co-location RF Exposure Evaluation |
| <b>Operating Mode</b>                               |                                                                         |
| 1                                                   | WLAN 2.4GHz + WLAN 5GHz                                                 |

Refer to Sporton Test Report No.: FA020705-01 for Co-location RF Exposure Evaluation.

Note: The EUT can only be used at Y axis position



## 2.2 EUT Operation during Test

During the test, the EUT operation to normal function.

## 2.3 Accessories

| Accessories                          |            |                |                                                  |                       |
|--------------------------------------|------------|----------------|--------------------------------------------------|-----------------------|
| Equipment Name                       | Brand Name | Model Name     | Rating                                           | DC Power Line         |
| Adapter                              | Frecom     | F60X-120450SPA | Input: 100-240~50/60Hz 1.6A<br>Output: 12V, 4.5A | Non-Shielded,<br>1.5m |
| Others                               |            |                |                                                  |                       |
| AC power cable*1: Non-Shielded, 1.2m |            |                |                                                  |                       |
| RJ-45 cable*1:Non-Shielded 1.5m      |            |                |                                                  |                       |



## 2.4 Support Equipment

For AC Conduction:

Mode 1, Mode 3, Mode 4 and Mode 5

| Support Equipment |                         |            |                       |        |
|-------------------|-------------------------|------------|-----------------------|--------|
| No.               | Equipment               | Brand Name | Model Name            | FCC ID |
| A                 | 2.5G LAN PC             | DELL       | T3400                 | N/A    |
| B                 | LAN NB                  | DELL       | E6430                 | N/A    |
| C                 | CO<br>(Terminal System) | Jinghong   | D3 CMTS<br>JH-HE3416B | N/A    |
| D                 | Flash disk3.0           | Transcend  | C55210 2808           | N/A    |
| E                 | 2.4G NB                 | DELL       | E6430                 | N/A    |
| F                 | 5G NB                   | DELL       | E6430                 | N/A    |

Mode 2 and Mode 6

| Support Equipment |                         |            |                       |        |
|-------------------|-------------------------|------------|-----------------------|--------|
| No.               | Equipment               | Brand Name | Model Name            | FCC ID |
| A                 | 2.5G LAN PC             | DELL       | T3400                 | N/A    |
| B                 | LAN NB                  | DELL       | E6430                 | N/A    |
| C                 | Phone                   | SAMPO      | HT-B 907WL            | N/A    |
| D                 | Phone                   | SAMPO      | HT-B 907WL            | N/A    |
| E                 | CO<br>(Terminal System) | Jinghong   | D3 CMTS<br>JH-HE3416B | N/A    |
| F                 | Flash disk3.0           | Transcend  | C55210 2808           | N/A    |
| G                 | 2.4G NB                 | DELL       | E6430                 | N/A    |
| H                 | 5G NB                   | DELL       | E6430                 | N/A    |

For Radiated (below 1GHz):

Mode 1, Mode 3, Mode 4 and Mode 5

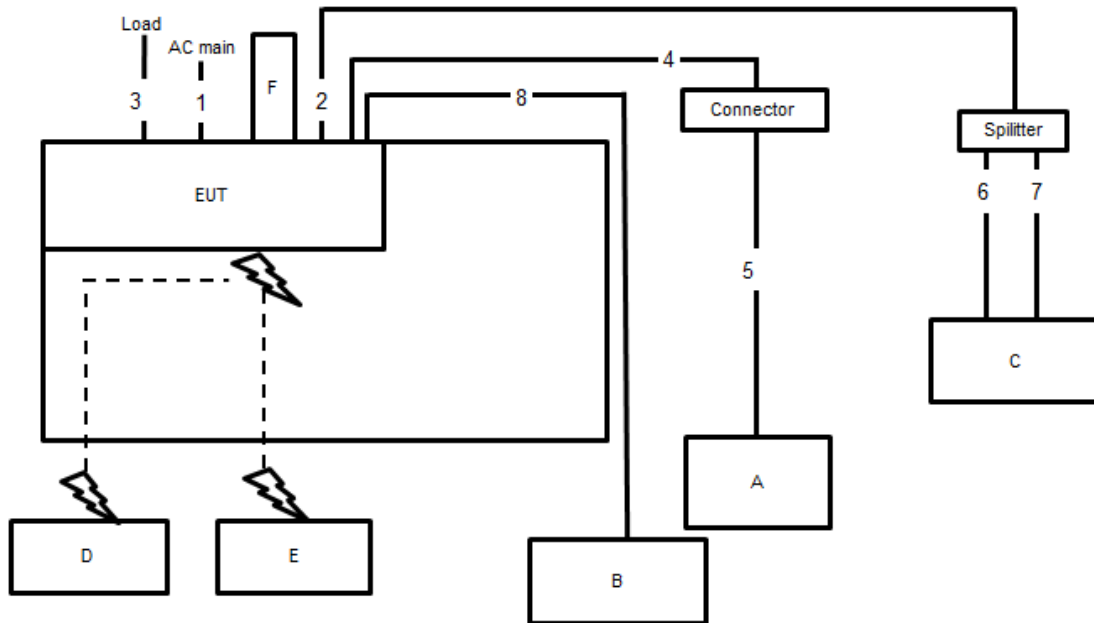
| Support Equipment |                         |            |                       |        |
|-------------------|-------------------------|------------|-----------------------|--------|
| No.               | Equipment               | Brand Name | Model Name            | FCC ID |
| A                 | PC                      | DELL       | T3400                 | N/A    |
| B                 | NB                      | DELL       | E4300                 | N/A    |
| C                 | NB                      | DELL       | E4300                 | N/A    |
| D                 | Flash disk3.0           | Transcend  | C55210 2808           | N/A    |
| G                 | CO<br>(Terminal System) | Jinghong   | D3 CMTS<br>JH-HE3416B | N/A    |
| H                 | NB                      | DELL       | E4300                 | N/A    |

**Mode 2 and Mode 6**

| Support Equipment |                         |            |                       |        |
|-------------------|-------------------------|------------|-----------------------|--------|
| No.               | Equipment               | Brand Name | Model Name            | FCC ID |
| A                 | PC                      | DELL       | T3400                 | N/A    |
| B                 | NB                      | DELL       | E4300                 | N/A    |
| C                 | NB                      | DELL       | E4300                 | N/A    |
| D                 | Flash disk3.0           | Transcend  | C55210 2808           | N/A    |
| E                 | Phone                   | PHILIPS    | M20                   | N/A    |
| F                 | Phone                   | PHILIPS    | M20                   | N/A    |
| G                 | CO<br>(Terminal System) | Jinghong   | D3 CMTS<br>JH-HE3416B | N/A    |
| H                 | NB                      | DELL       | E4300                 | N/A    |



Mode 1, Mode 3, Mode 4 and Mode 5

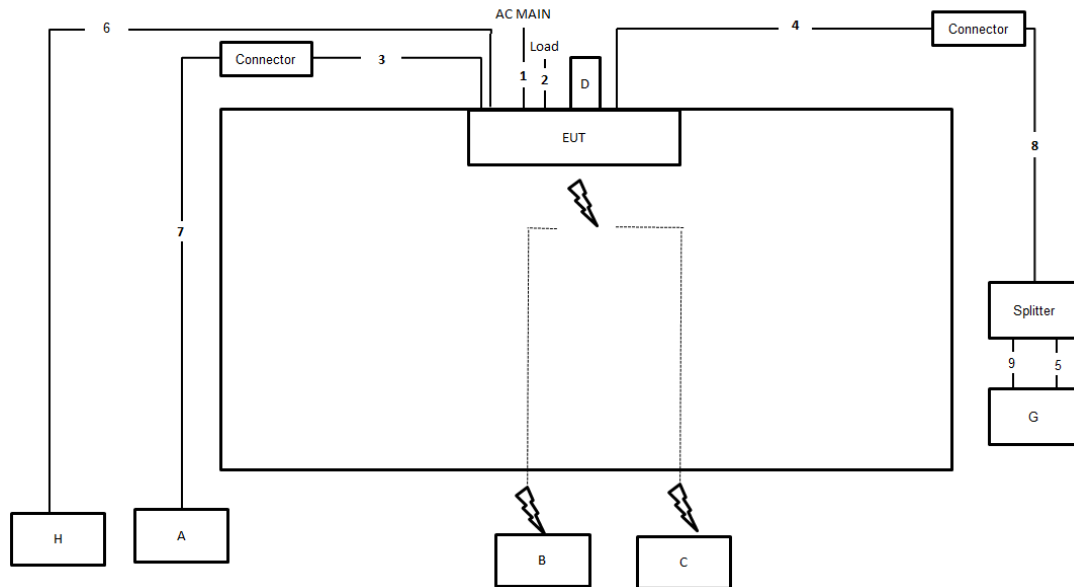


| Item | Connection    | Shielded | Length |
|------|---------------|----------|--------|
| 1    | Power cable   | No       | 2.7m   |
| 2    | Coaxial cable | Yes      | 10m    |
| 3    | RJ-45 cable   | No       | 1.5m   |
| 4    | RJ-45 cable   | No       | 1.5m   |
| 5    | RJ-45 cable   | No       | 10m    |
| 6    | Coaxial cable | Yes      | 1m     |
| 7    | Coaxial cable | Yes      | 1m     |
| 8    | RJ-45 cable   | No       | 10m    |



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

Mode 1, Mode 3, Mode 4 and Mode 5



| Item | Connection    | Shielded | Length |
|------|---------------|----------|--------|
| 1    | Power cable   | No       | 2.7m   |
| 2    | RJ-45 cable   | No       | 1.5m   |
| 3    | RJ-45 cable   | No       | 1.5m   |
| 4    | Coaxial cable | Yes      | 10m    |
| 5    | Coaxial cable | Yes      | 1.1m   |
| 6    | RJ-45 cable   | No       | 10m    |
| 7    | RJ-45 cable   | No       | 10m    |
| 8    | Coaxial cable | Yes      | 1.7m   |
| 9    | Coaxial cable | Yes      | 1.0m   |





| Item | Connection    | Shielded | Length |
|------|---------------|----------|--------|
| 1    | Power cable   | No       | 2.7m   |
| 2    | RJ-45 cable   | No       | 1.5m   |
| 3    | RJ-45 cable   | No       | 1.5m   |
| 4    | Coaxial cable | Yes      | 10m    |
| 5    | Coaxial cable | Yes      | 1.1m   |
| 6    | RJ-45 cable   | No       | 10m    |
| 7    | RJ-45 cable   | No       | 10m    |
| 8    | Coaxial cable | Yes      | 1.7m   |
| 9    | Coaxial cable | Yes      | 1.0m   |
| 10   | RJ-11 cable   | No       | 1.5m   |
| 11   | RJ-11 cable   | No       | 1.5m   |



### 3 Transmitter Test Result

#### 3.1 AC Power-line Conducted Emissions

##### 3.1.1 AC Power-line Conducted Emissions Limit

| AC Power-line Conducted Emissions Limit |            |           |
|-----------------------------------------|------------|-----------|
| Frequency Emission (MHz)                | Quasi-Peak | Average   |
| 0.15-0.5                                | 66 - 56 *  | 56 - 46 * |
| 0.5-5                                   | 56         | 46        |
| 5-30                                    | 60         | 50        |

Note 1: \* Decreases with the logarithm of the frequency.

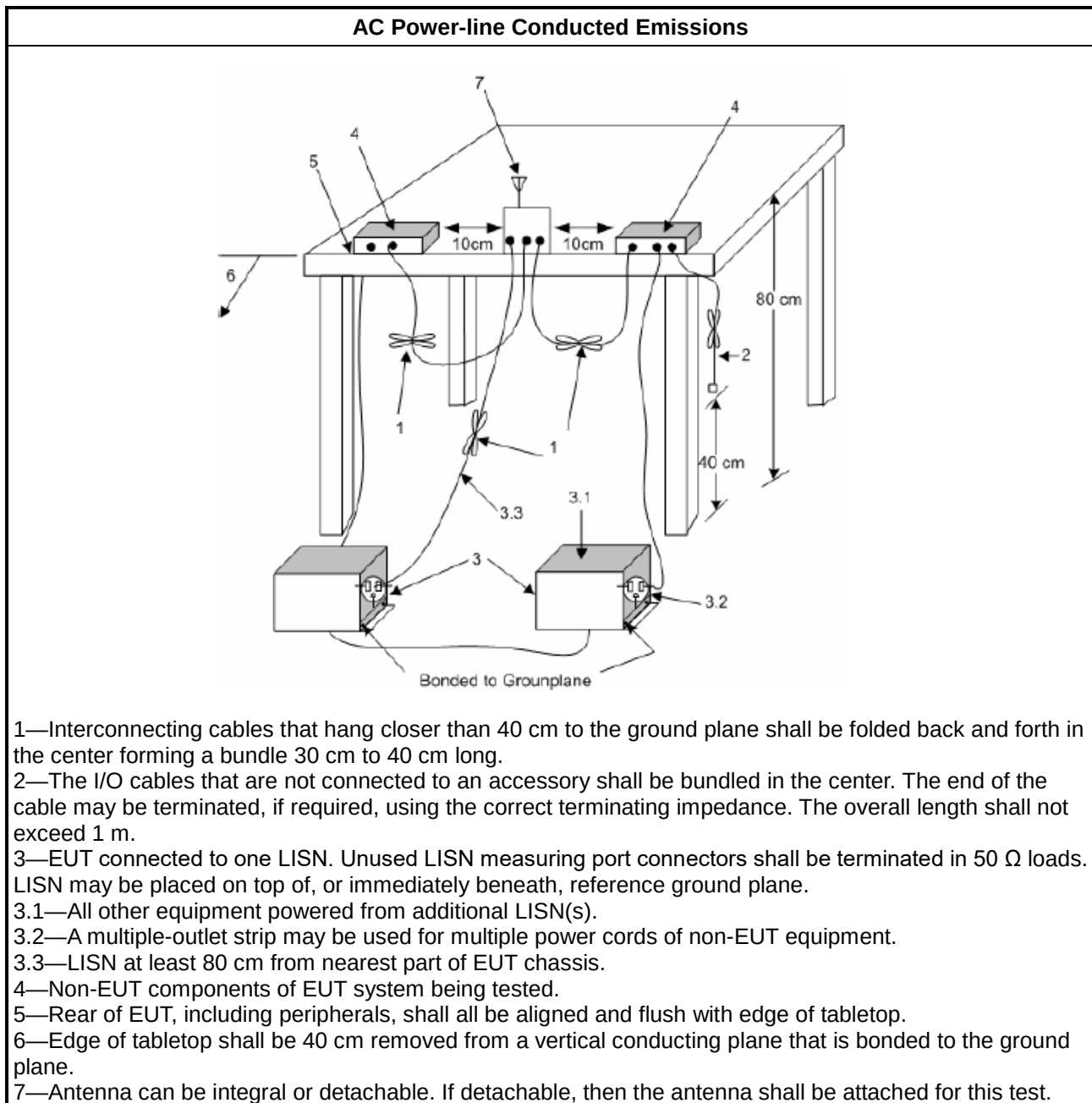
##### 3.1.2 Measuring Instruments

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

##### 3.1.3 Test Procedures

| Test Method                                                                                                      |
|------------------------------------------------------------------------------------------------------------------|
| <input checked="" type="checkbox"/> Refer as ANSI C63.10-2013, clause 6.2 for AC power-line conducted emissions. |

### 3.1.4 Test Setup



### 3.1.5 Measurement Results Calculation

The measured Level is calculated using:

- Corrected Reading (dBuV) = LISN Factor + Cable Loss + Read Level = Level
- Margin = - Limit + (Read Level + LISN Factor + Cable Loss)

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

Refer as Appendix A

## 3.2 Emissions in Restricted Frequency Bands

### 3.2.1 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.

### 3.2.2 Measuring Instruments

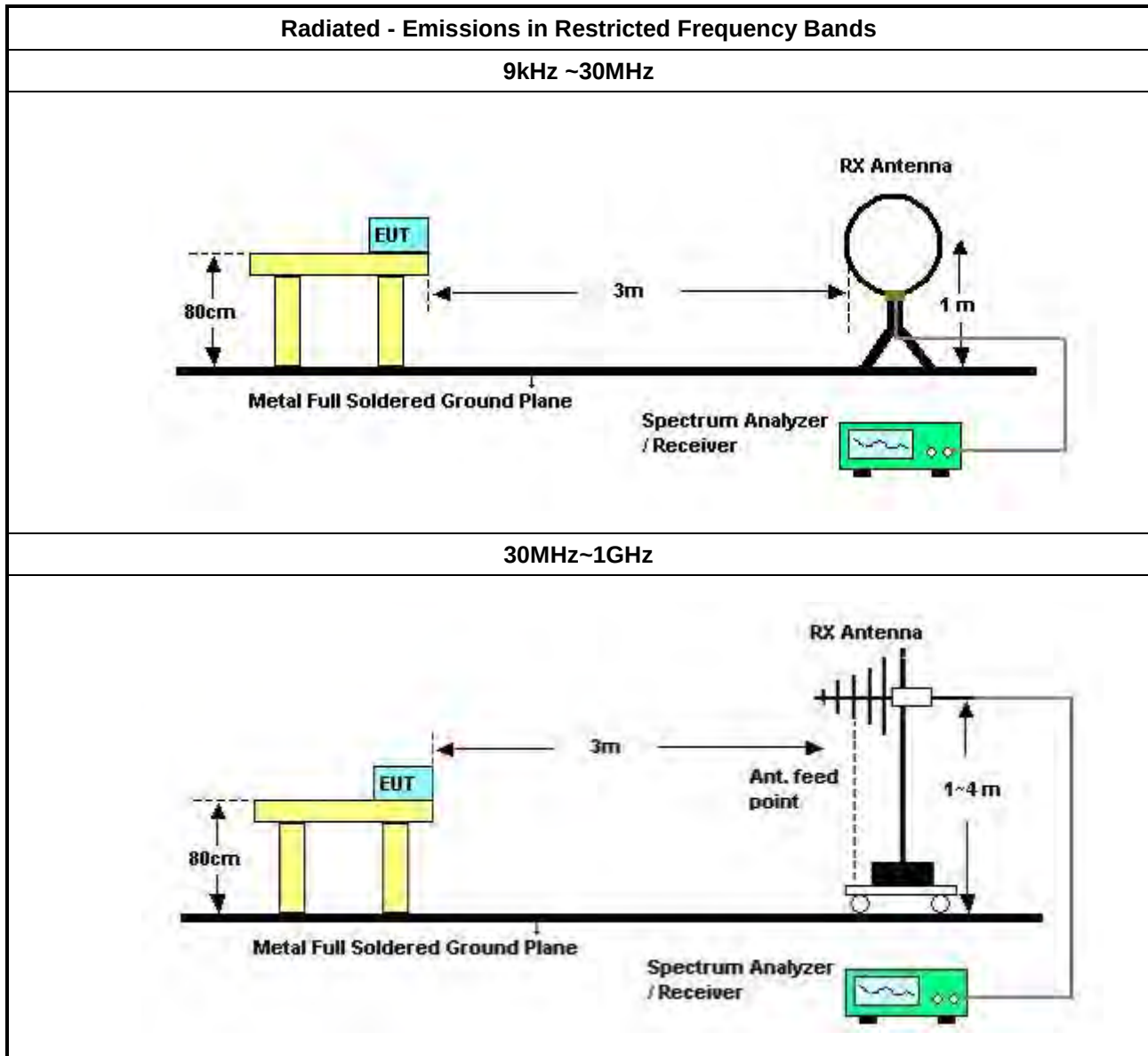
Refer a test equipment and calibration data table in this test report.



### 3.2.3 Test Procedures

| Test Method                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ▪ The average emission levels shall be measured in [duty cycle $\geq 98$ or duty factor].                                                                                   |                                                                                                                                                                                                                                                                                                                                                |
| ▪ Refer as ANSI C63.10, clause 6.10.3 band-edge testing shall be performed at the lowest frequency channel and highest frequency channel within the allowed operating band. |                                                                                                                                                                                                                                                                                                                                                |
| ▪ For the transmitter unwanted emissions shall be measured using following options below:                                                                                   |                                                                                                                                                                                                                                                                                                                                                |
|                                                                                                                                                                             | ▪ Refer as FCC KDB 558074, clause 8.6 for unwanted emissions into restricted bands.                                                                                                                                                                                                                                                            |
|                                                                                                                                                                             | <input type="checkbox"/> Refer as FCC KDB 558074, clause 8.6 & C63.10 clause 11.12.2.5.1(trace averaging for duty cycle $\geq 98\%$ ).                                                                                                                                                                                                         |
|                                                                                                                                                                             | <input type="checkbox"/> Refer as FCC KDB 558074, clause 8.6 & C63.10 clause 11.12.2.5.2(trace averaging + duty factor).                                                                                                                                                                                                                       |
|                                                                                                                                                                             | <input checked="" type="checkbox"/> Refer as FCC KDB 558074, clause 8.6 & C63.10 clause 11.12.2.5.3(Reduced VBW $\geq 1/T$ ).                                                                                                                                                                                                                  |
|                                                                                                                                                                             | <input type="checkbox"/> Refer as ANSI C63.10, clause 11.12.2.5.3 (Reduced VBW). VBW $\geq 1/T$ , where T is pulse time.                                                                                                                                                                                                                       |
|                                                                                                                                                                             | <input type="checkbox"/> Refer as ANSI C63.10, clause 7.5 average value of pulsed emissions.                                                                                                                                                                                                                                                   |
|                                                                                                                                                                             | <input checked="" type="checkbox"/> Refer as FCC KDB 558074, clause 8.6 & C63.10 clause 11.12.2.4 measurement procedure peak limit.                                                                                                                                                                                                            |
| ▪ For the transmitter band-edge emissions shall be measured using following options below:                                                                                  |                                                                                                                                                                                                                                                                                                                                                |
|                                                                                                                                                                             | ▪ Refer as FCC KDB 558074 clause 8.7 & C63.10 clause 11.13.1, When the performing peak or average radiated measurements, emissions within 2 MHz of the authorized band edge may be measured using the marker-delta method described below.                                                                                                     |
|                                                                                                                                                                             | ▪ Refer as FCC KDB 558074, clause 8.7 (ANSI C63.10, clause 6.10.6) for marker-delta method for band-edge measurements.                                                                                                                                                                                                                         |
|                                                                                                                                                                             | ▪ Refer as FCC KDB 558074, clause 8.7 for narrower resolution bandwidth (100kHz) using the band power and summing the spectral levels (i.e., 1 MHz).                                                                                                                                                                                           |
|                                                                                                                                                                             | ▪ For conducted unwanted emissions into restricted bands (absolute emission limits).<br>Devices with multiple transmit chains using options given below:<br>(1) Measure and sum the spectra across the outputs or<br>(2) Measure and add 10 log(N) dB                                                                                          |
|                                                                                                                                                                             | ▪ For FCC KDB 662911 The methodology described here may overestimate array gain, thereby resulting in apparent failures to satisfy the out-of-band limits even if the device is actually compliant. In such cases, compliance may be demonstrated by performing radiated tests around the frequencies at which the apparent failures occurred. |

### 3.2.4 Test Setup



### 3.2.5 Measurement Results Calculation

The measured Level is calculated using:

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamplifier Factor (if applicable) = Level.

### 3.2.6 Emissions in Restricted Frequency Bands (Below 30MHz)

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

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

The radiated emissions were investigated from 9 kHz or the lowest frequency generated within the device, up to the 10th harmonic or 40 GHz, whichever is appropriate.



### **3.2.7 Test Result of Emissions in Restricted Frequency Bands**

Refer as Appendix B



## 4 Test Equipment and Calibration Data

| Instrument                         | Manufacturer     | Model No.          | Serial No.       | Characteristics  | Calibration Date | Calibration Due Date | Remark                |
|------------------------------------|------------------|--------------------|------------------|------------------|------------------|----------------------|-----------------------|
| LISN                               | Schwarzbeck      | NSLK 8127          | 8127650          | 9kHz ~ 30MHz     | Nov. 21, 2019    | Nov. 20, 2020        | Conduction (CO02-CB)  |
| LISN                               | Schwarzbeck      | NSLK 8127          | 8127478          | 9kHz ~ 30MHz     | Oct. 30, 2019    | Oct. 29, 2020        | Conduction (CO02-CB)  |
| EMI Receiver                       | Agilent          | N9038A             | MY52260140       | 9kHz ~ 8.4GHz    | Mar. 10, 2020    | Mar. 09, 2021        | Conduction (CO02-CB)  |
| Pulse Limiter                      | Schwarzbeck      | VTSD 9561F-N       | 00378            | 9kHz ~ 30MHz     | Mar. 19, 2020    | Mar. 18, 2021        | Conduction (CO02-CB)  |
| COND Cable                         | Woken            | Cable              | 2                | 0.15MHz ~ 30MHz  | Oct. 21, 2019    | Oct. 20, 2020        | Conduction (CO02-CB)  |
| Software                           | Audix            | E3                 | 6.120210n        | -                | N.C.R.           | N.C.R.               | Conduction (CO02-CB)  |
| Loop Antenna                       | Teseq            | HLA 6120           | 24155            | 9kHz - 30 MHz    | Mar. 29, 2019    | Mar. 28, 2020        | Radiation (03CH05-CB) |
| Loop Antenna                       | Teseq            | HLA 6120           | 24155            | 9kHz - 30 MHz    | Apr. 13, 2020    | Apr. 12, 2021        | Radiation (03CH05-CB) |
| Bilog Antenna with 6dB Attenuator  | TESEQ & EMCI     | CBL 6112D & N-6-06 | 35236 & AT-N0610 | 30MHz ~ 2GHz     | Mar. 28, 2019    | Mar. 27, 2020        | Radiation (03CH05-CB) |
| Bilog Antenna with 6dB Attenuator  | TESEQ & EMCI     | CBL 6112D & N-6-06 | 35236 & AT-N0610 | 30MHz ~ 2GHz     | Mar. 27, 2020    | Mar. 26, 2021        | Radiation (03CH05-CB) |
| Pre-Amplifier                      | EMCI             | EMC330N            | 980331           | 20MHz ~ 3GHz     | May 01, 2019     | Apr. 30, 2020        | Radiation (03CH05-CB) |
| Pre-Amplifier                      | EMCI             | EMC330N            | 980331           | 20MHz ~ 3GHz     | Apr. 28, 2020    | Apr. 27, 2021        | Radiation (03CH05-CB) |
| Spectrum Analyzer                  | R&S              | FSP40              | 100304           | 9kHz ~ 40GHz     | Aug. 15, 2019    | Aug. 14, 2020        | Radiation (03CH05-CB) |
| EMI Test Receiver                  | R&S              | ESCS               | 826547/017       | 9kHz ~ 2.75GHz   | May 15, 2019     | May 14, 2020         | Radiation (03CH05-CB) |
| EMI Test Receiver                  | R&S              | ESCS               | 826547/017       | 9kHz ~ 2.75GHz   | May 13, 2020     | May 12, 2021         | Radiation (03CH05-CB) |
| RF Cable-low                       | Woken            | RG402              | LOW Cable-04+23  | 30MHz~1GHz       | Oct. 07, 2019    | Oct. 06, 2020        | Radiation (03CH05-CB) |
| Loop Antenna                       | Teseq            | HLA 6120           | 24155            | 9kHz - 30 MHz    | Apr. 13, 2020    | Apr. 12, 2021        | Radiation (03CH04-CB) |
| BILOG ANTENNA with 6 dB attenuator | Schaffner & EMCI | CBL6112B & N-6-06  | 22021&AT-N0607   | 30MHz ~ 1GHz     | Oct. 12, 2019    | Oct. 11, 2020        | Radiation (03CH04-CB) |
| Pre-Amplifier                      | Agilent          | 83017A             | MY53270063       | 0.5GHz ~ 26.5GHz | Mar. 11, 2020    | Mar. 10, 2021        | Radiation (03CH04-CB) |
| Spectrum Analyzer                  | R&S              | FSP40              | 100142           | 9kHz~40GHz       | Dec. 18, 2019    | Dec. 17, 2020        | Radiation (03CH04-CB) |
| EMI Test Receiver                  | R&S              | ESCS               | 826547/017       | 9kHz ~ 2.75GHz   | May 13, 2020     | May 12, 2021         | Radiation (03CH04-CB) |
| RF Cable-low                       | Woken            | RG402              | Low Cable-03+22  | 30MHz ~ 1GHz     | Oct. 07, 2019    | Oct. 06, 2020        | Radiation (03CH04-CB) |

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

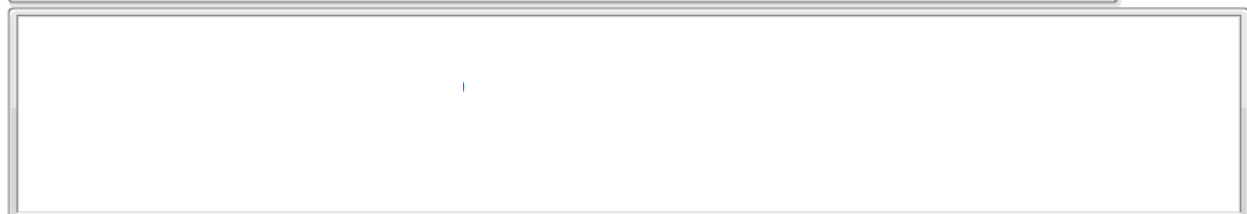
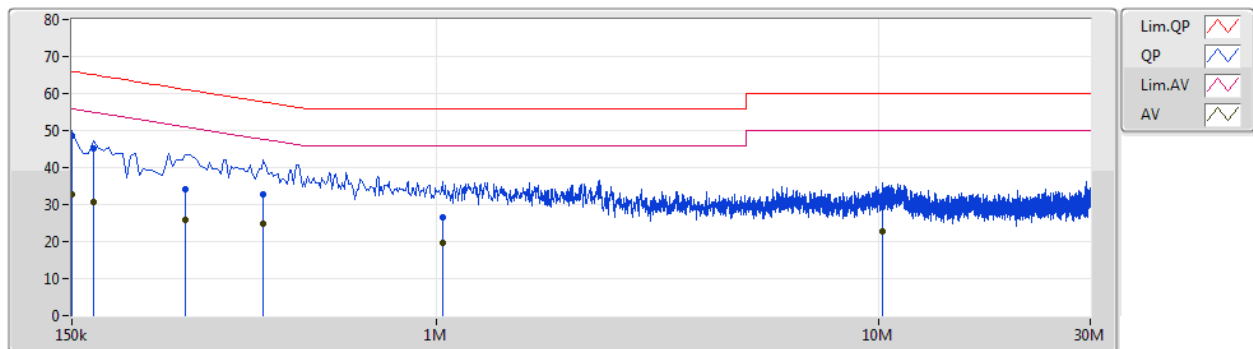
N.C.R. means Non-Calibration required.



|           |        |                 |                    |
|-----------|--------|-----------------|--------------------|
| Test Mode | Mode 1 | Frequency Range | 0.15 MHz to 30 MHz |
|-----------|--------|-----------------|--------------------|

Line

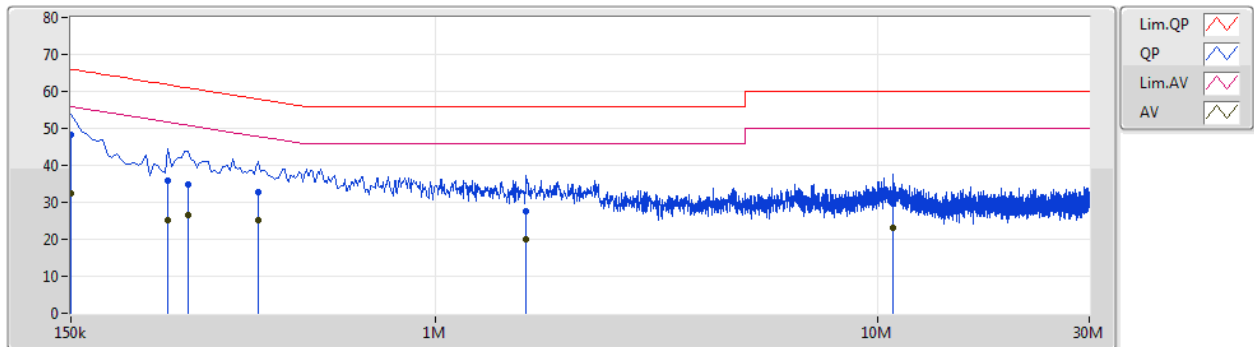
08/06/2020



| Type | Freq<br>(Hz) | Level<br>(dBuV) | Limit<br>(dBuV) | Margin<br>(dB) | Factor<br>(dB) | Condition | Comment | Raw<br>(dBuV) | AF<br>(dB) | CL<br>(dB) | AT<br>(dB) |  |  |  |
|------|--------------|-----------------|-----------------|----------------|----------------|-----------|---------|---------------|------------|------------|------------|--|--|--|
| QP   | 150k         | 48.69           | 66.00           | -17.31         | 10.20          | Line      | "Worst" | 38.49         | 0.05       | 0.05       | 10.10      |  |  |  |
| AV   | 150k         | 32.88           | 56.00           | -23.12         | 10.20          | Line      | -       | 22.68         | 0.05       | 0.05       | 10.10      |  |  |  |
| QP   | 168k         | 45.17           | 65.06           | -19.89         | 10.21          | Line      | -       | 34.96         | 0.05       | 0.06       | 10.10      |  |  |  |
| AV   | 168k         | 30.62           | 55.06           | -24.44         | 10.21          | Line      | -       | 20.41         | 0.05       | 0.06       | 10.10      |  |  |  |
| QP   | 271.5k       | 34.30           | 61.07           | -26.77         | 10.22          | Line      | -       | 24.08         | 0.05       | 0.07       | 10.10      |  |  |  |
| AV   | 271.5k       | 25.85           | 51.07           | -25.22         | 10.22          | Line      | -       | 15.63         | 0.05       | 0.07       | 10.10      |  |  |  |
| QP   | 406.5k       | 32.82           | 57.72           | -24.90         | 10.23          | Line      | -       | 22.59         | 0.05       | 0.08       | 10.10      |  |  |  |
| AV   | 406.5k       | 24.76           | 47.72           | -22.96         | 10.23          | Line      | -       | 14.53         | 0.05       | 0.08       | 10.10      |  |  |  |
| QP   | 1.032M       | 26.63           | 56.00           | -29.37         | 10.28          | Line      | -       | 16.35         | 0.06       | 0.12       | 10.10      |  |  |  |
| AV   | 1.032M       | 19.66           | 46.00           | -26.34         | 10.28          | Line      | -       | 9.38          | 0.06       | 0.12       | 10.10      |  |  |  |
| QP   | 10.167M      | 29.21           | 60.00           | -30.79         | 10.50          | Line      | -       | 18.71         | 0.23       | 0.16       | 10.11      |  |  |  |
| AV   | 10.167M      | 22.60           | 50.00           | -27.40         | 10.50          | Line      | -       | 12.10         | 0.23       | 0.16       | 10.11      |  |  |  |

### Neutral

08/06/2020

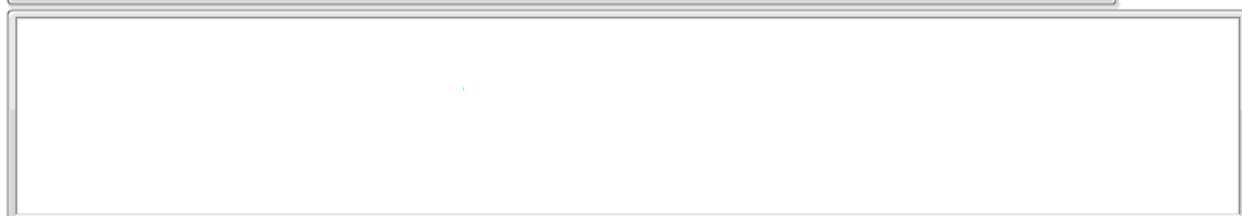
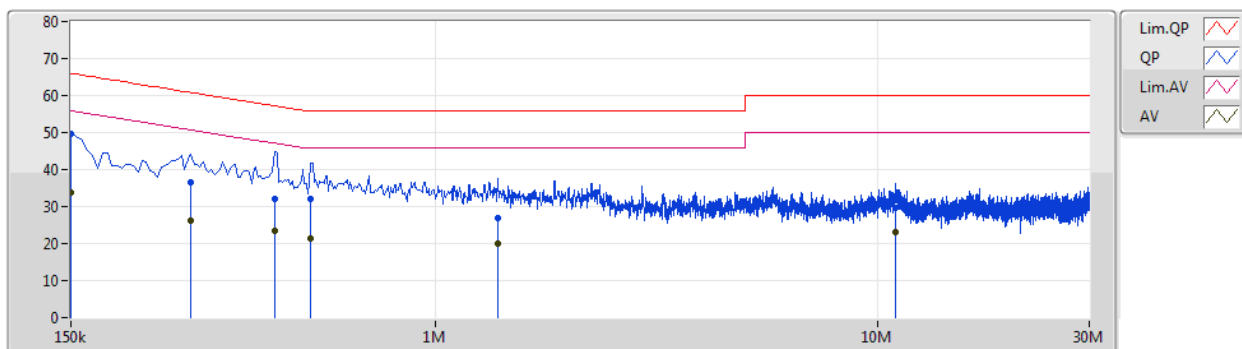


| Type | Freq<br>(Hz) | Level<br>(dBuV) | Limit<br>(dBuV) | Margin<br>(dB) | Factor | Condition | Comment | Raw<br>(dBuV) | AF<br>(dB) | CL<br>(dB) | AT<br>(dB) |  |  |  |
|------|--------------|-----------------|-----------------|----------------|--------|-----------|---------|---------------|------------|------------|------------|--|--|--|
| QP   | 150k         | 48.31           | 66.00           | -17.69         | 10.20  | Neutral   | "Worst" | 38.11         | 0.05       | 0.05       | 10.10      |  |  |  |
| AV   | 150k         | 32.43           | 56.00           | -23.57         | 10.20  | Neutral   | -       | 22.23         | 0.05       | 0.05       | 10.10      |  |  |  |
| QP   | 249k         | 35.95           | 61.79           | -25.84         | 10.22  | Neutral   | -       | 25.73         | 0.05       | 0.07       | 10.10      |  |  |  |
| AV   | 249k         | 25.10           | 51.79           | -26.69         | 10.22  | Neutral   | -       | 14.88         | 0.05       | 0.07       | 10.10      |  |  |  |
| QP   | 276k         | 34.94           | 60.93           | -25.99         | 10.22  | Neutral   | -       | 24.72         | 0.05       | 0.07       | 10.10      |  |  |  |
| AV   | 276k         | 26.47           | 50.93           | -24.46         | 10.22  | Neutral   | -       | 16.25         | 0.05       | 0.07       | 10.10      |  |  |  |
| QP   | 397.5k       | 32.72           | 57.91           | -25.19         | 10.23  | Neutral   | -       | 22.49         | 0.05       | 0.08       | 10.10      |  |  |  |
| AV   | 397.5k       | 25.07           | 47.91           | -22.84         | 10.23  | Neutral   | -       | 14.84         | 0.05       | 0.08       | 10.10      |  |  |  |
| QP   | 1.604M       | 27.62           | 56.00           | -28.38         | 10.32  | Neutral   | -       | 17.30         | 0.07       | 0.15       | 10.10      |  |  |  |
| AV   | 1.604M       | 20.15           | 46.00           | -25.85         | 10.32  | Neutral   | -       | 9.83          | 0.07       | 0.15       | 10.10      |  |  |  |
| QP   | 10.829M      | 29.65           | 60.00           | -30.35         | 10.48  | Neutral   | -       | 19.17         | 0.20       | 0.17       | 10.11      |  |  |  |
| AV   | 10.829M      | 22.95           | 50.00           | -27.05         | 10.48  | Neutral   | -       | 12.47         | 0.20       | 0.17       | 10.11      |  |  |  |

|           |        |                 |                    |
|-----------|--------|-----------------|--------------------|
| Test Mode | Mode 2 | Frequency Range | 0.15 MHz to 30 MHz |
|-----------|--------|-----------------|--------------------|

Line

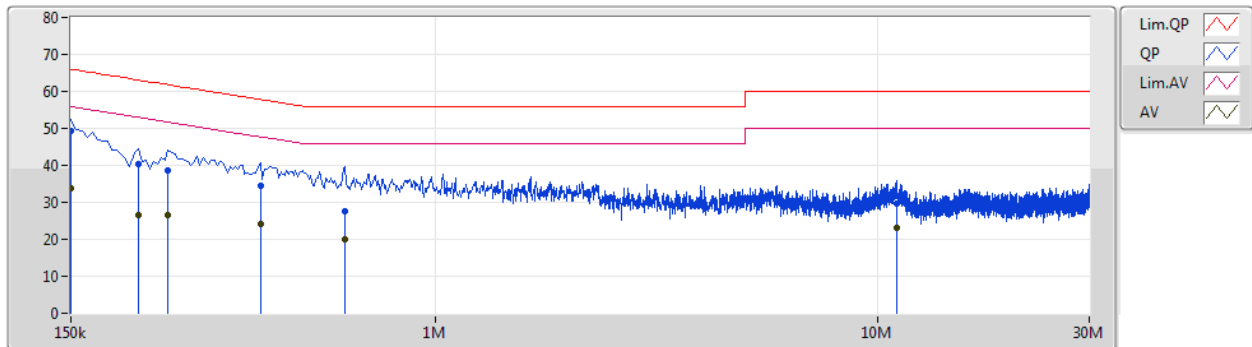
08/06/2020



| Type | Freq<br>(Hz) | Level<br>(dBuV) | Limit<br>(dBuV) | Margin<br>(dB) | Factor<br>(dB) | Condition | Comment | Raw<br>(dBuV) | AF<br>(dB) | CL<br>(dB) | AT<br>(dB) |  |  |  |
|------|--------------|-----------------|-----------------|----------------|----------------|-----------|---------|---------------|------------|------------|------------|--|--|--|
| QP   | 150k         | 49.56           | 66.00           | -16.44         | 10.20          | Line      | "Worst" | 39.36         | 0.05       | 0.05       | 10.10      |  |  |  |
| AV   | 150k         | 33.73           | 56.00           | -22.27         | 10.20          | Line      | -       | 23.53         | 0.05       | 0.05       | 10.10      |  |  |  |
| QP   | 280.5k       | 36.58           | 60.80           | -24.22         | 10.22          | Line      | -       | 26.36         | 0.05       | 0.07       | 10.10      |  |  |  |
| AV   | 280.5k       | 26.32           | 50.80           | -24.48         | 10.22          | Line      | -       | 16.10         | 0.05       | 0.07       | 10.10      |  |  |  |
| QP   | 433.5k       | 32.10           | 57.19           | -25.09         | 10.23          | Line      | -       | 21.87         | 0.05       | 0.08       | 10.10      |  |  |  |
| AV   | 433.5k       | 23.35           | 47.19           | -23.84         | 10.23          | Line      | -       | 13.12         | 0.05       | 0.08       | 10.10      |  |  |  |
| QP   | 523.5k       | 31.93           | 56.00           | -24.07         | 10.24          | Line      | -       | 21.69         | 0.05       | 0.09       | 10.10      |  |  |  |
| AV   | 523.5k       | 21.28           | 46.00           | -24.72         | 10.24          | Line      | -       | 11.04         | 0.05       | 0.09       | 10.10      |  |  |  |
| QP   | 1.383M       | 27.01           | 56.00           | -28.99         | 10.31          | Line      | -       | 16.70         | 0.07       | 0.14       | 10.10      |  |  |  |
| AV   | 1.383M       | 20.06           | 46.00           | -25.94         | 10.31          | Line      | -       | 9.75          | 0.07       | 0.14       | 10.10      |  |  |  |
| QP   | 10.946M      | 29.70           | 60.00           | -30.30         | 10.53          | Line      | -       | 19.17         | 0.25       | 0.17       | 10.11      |  |  |  |
| AV   | 10.946M      | 23.09           | 50.00           | -26.91         | 10.53          | Line      | -       | 12.56         | 0.25       | 0.17       | 10.11      |  |  |  |

### Neutral

08/06/2020

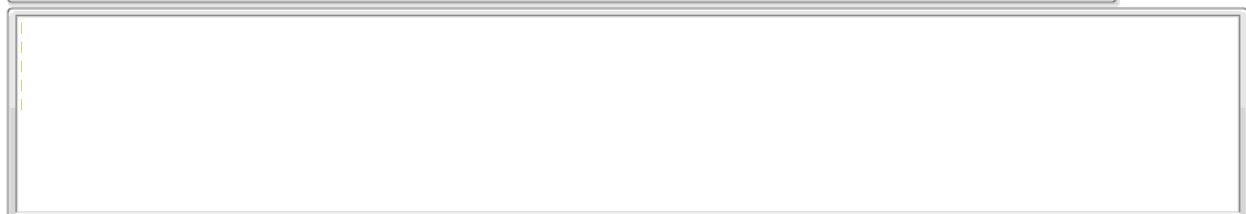
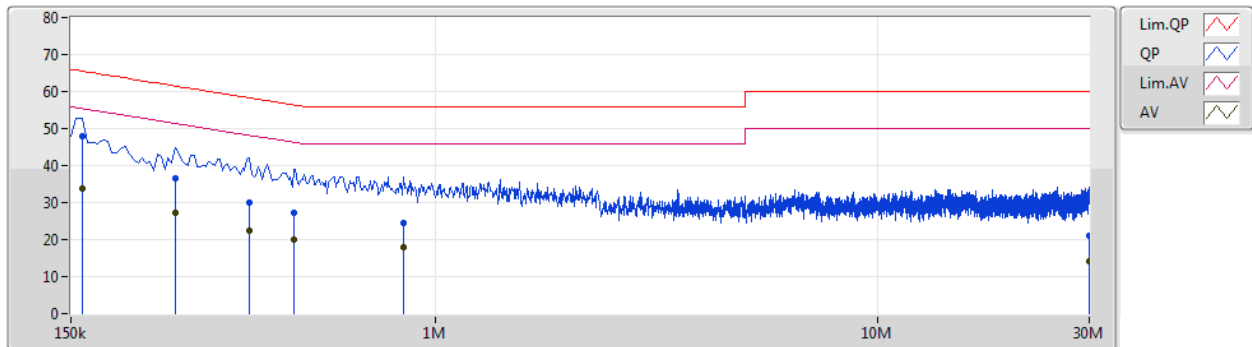


| Type | Freq<br>(Hz) | Level<br>(dBuV) | Limit<br>(dBuV) | Margin<br>(dB) | Factor | Condition | Comment | Raw<br>(dBuV) | AF<br>(dB) | CL<br>(dB) | AT<br>(dB) |  |  |  |
|------|--------------|-----------------|-----------------|----------------|--------|-----------|---------|---------------|------------|------------|------------|--|--|--|
| QP   | 150k         | 49.32           | 66.00           | -16.68         | 10.20  | Neutral   | "Worst" | 39.12         | 0.05       | 0.05       | 10.10      |  |  |  |
| AV   | 150k         | 33.70           | 56.00           | -22.30         | 10.20  | Neutral   | -       | 23.50         | 0.05       | 0.05       | 10.10      |  |  |  |
| QP   | 213k         | 40.51           | 63.09           | -22.58         | 10.22  | Neutral   | -       | 30.29         | 0.05       | 0.07       | 10.10      |  |  |  |
| AV   | 213k         | 26.65           | 53.09           | -26.44         | 10.22  | Neutral   | -       | 16.43         | 0.05       | 0.07       | 10.10      |  |  |  |
| QP   | 249k         | 38.77           | 61.79           | -23.02         | 10.22  | Neutral   | -       | 28.55         | 0.05       | 0.07       | 10.10      |  |  |  |
| AV   | 249k         | 26.41           | 51.79           | -25.38         | 10.22  | Neutral   | -       | 16.19         | 0.05       | 0.07       | 10.10      |  |  |  |
| QP   | 402k         | 34.45           | 57.82           | -23.37         | 10.23  | Neutral   | -       | 24.22         | 0.05       | 0.08       | 10.10      |  |  |  |
| AV   | 402k         | 24.14           | 47.82           | -23.68         | 10.23  | Neutral   | -       | 13.91         | 0.05       | 0.08       | 10.10      |  |  |  |
| QP   | 622.5k       | 27.74           | 56.00           | -28.26         | 10.25  | Neutral   | -       | 17.49         | 0.05       | 0.10       | 10.10      |  |  |  |
| AV   | 622.5k       | 20.06           | 46.00           | -25.94         | 10.25  | Neutral   | -       | 9.81          | 0.05       | 0.10       | 10.10      |  |  |  |
| QP   | 11.036M      | 29.64           | 60.00           | -30.36         | 10.48  | Neutral   | -       | 19.16         | 0.20       | 0.17       | 10.11      |  |  |  |
| AV   | 11.036M      | 23.10           | 50.00           | -26.90         | 10.48  | Neutral   | -       | 12.62         | 0.20       | 0.17       | 10.11      |  |  |  |

|           |        |                 |                    |
|-----------|--------|-----------------|--------------------|
| Test Mode | Mode 3 | Frequency Range | 0.15 MHz to 30 MHz |
|-----------|--------|-----------------|--------------------|

### Line

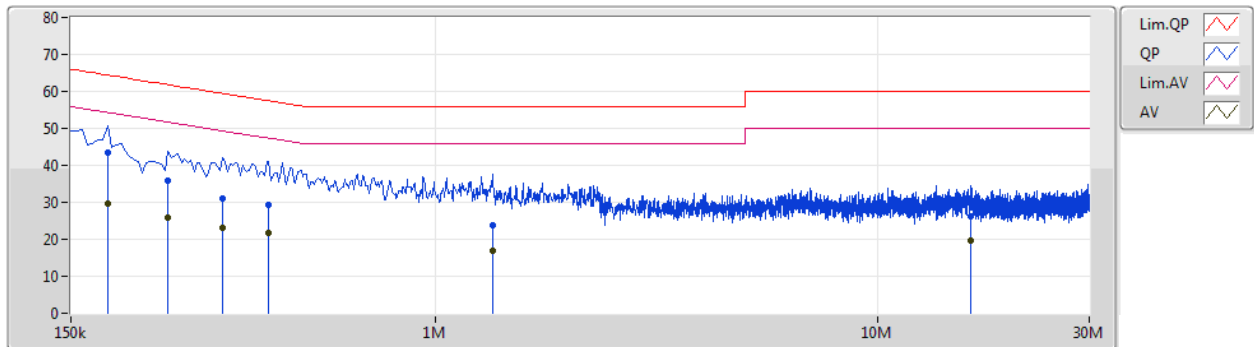
08/06/2020



| Type | Freq<br>(Hz) | Level<br>(dBuV) | Limit<br>(dBuV) | Margin<br>(dB) | Factor<br>(dB) | Condition | Comment | Raw<br>(dBuV) | AF<br>(dB) | CL<br>(dB) | AT<br>(dB) |  |  |  |
|------|--------------|-----------------|-----------------|----------------|----------------|-----------|---------|---------------|------------|------------|------------|--|--|--|
| QP   | 159k         | 48.09           | 65.52           | -17.43         | 10.21          | Line      | "Worst" | 37.88         | 0.05       | 0.06       | 10.10      |  |  |  |
| AV   | 159k         | 33.95           | 55.52           | -21.57         | 10.21          | Line      | -       | 23.74         | 0.05       | 0.06       | 10.10      |  |  |  |
| QP   | 258k         | 36.61           | 61.49           | -24.88         | 10.22          | Line      | -       | 26.39         | 0.05       | 0.07       | 10.10      |  |  |  |
| AV   | 258k         | 27.21           | 51.49           | -24.28         | 10.22          | Line      | -       | 16.99         | 0.05       | 0.07       | 10.10      |  |  |  |
| QP   | 379.5k       | 30.06           | 58.29           | -28.23         | 10.23          | Line      | -       | 19.83         | 0.05       | 0.08       | 10.10      |  |  |  |
| AV   | 379.5k       | 22.36           | 48.29           | -25.93         | 10.23          | Line      | -       | 12.13         | 0.05       | 0.08       | 10.10      |  |  |  |
| QP   | 478.5k       | 27.40           | 56.36           | -28.96         | 10.24          | Line      | -       | 17.16         | 0.05       | 0.09       | 10.10      |  |  |  |
| AV   | 478.5k       | 20.03           | 46.36           | -26.33         | 10.24          | Line      | -       | 9.79          | 0.05       | 0.09       | 10.10      |  |  |  |
| QP   | 847.5k       | 24.62           | 56.00           | -31.38         | 10.27          | Line      | -       | 14.35         | 0.06       | 0.11       | 10.10      |  |  |  |
| AV   | 847.5k       | 17.96           | 46.00           | -28.04         | 10.27          | Line      | -       | 7.69          | 0.06       | 0.11       | 10.10      |  |  |  |
| QP   | 29.985M      | 21.06           | 60.00           | -38.94         | 11.00          | Line      | -       | 10.06         | 0.63       | 0.24       | 10.13      |  |  |  |
| AV   | 29.985M      | 14.21           | 50.00           | -35.79         | 11.00          | Line      | -       | 3.21          | 0.63       | 0.24       | 10.13      |  |  |  |

### Neutral

08/06/2020

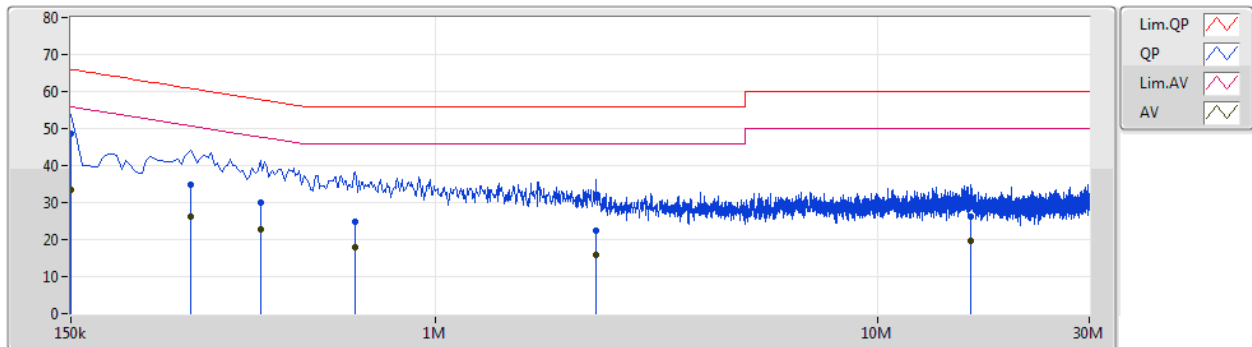


| Type | Freq<br>(Hz) | Level<br>(dBuV) | Limit<br>(dBuV) | Margin<br>(dB) | Factor | Condition | Comment | Raw<br>(dBuV) | AF<br>(dB) | CL<br>(dB) | AT<br>(dB) |  |  |  |
|------|--------------|-----------------|-----------------|----------------|--------|-----------|---------|---------------|------------|------------|------------|--|--|--|
| QP   | 181.5k       | 43.47           | 64.41           | -20.94         | 10.21  | Neutral   | "Worst" | 33.26         | 0.05       | 0.06       | 10.10      |  |  |  |
| AV   | 181.5k       | 29.65           | 54.41           | -24.76         | 10.21  | Neutral   | -       | 19.44         | 0.05       | 0.06       | 10.10      |  |  |  |
| QP   | 249k         | 35.96           | 61.79           | -25.83         | 10.22  | Neutral   | -       | 25.74         | 0.05       | 0.07       | 10.10      |  |  |  |
| AV   | 249k         | 25.73           | 51.79           | -26.06         | 10.22  | Neutral   | -       | 15.51         | 0.05       | 0.07       | 10.10      |  |  |  |
| QP   | 330k         | 30.99           | 59.44           | -28.45         | 10.23  | Neutral   | -       | 20.76         | 0.05       | 0.08       | 10.10      |  |  |  |
| AV   | 330k         | 23.15           | 49.44           | -26.29         | 10.23  | Neutral   | -       | 12.92         | 0.05       | 0.08       | 10.10      |  |  |  |
| QP   | 420k         | 29.40           | 57.45           | -28.05         | 10.23  | Neutral   | -       | 19.17         | 0.05       | 0.08       | 10.10      |  |  |  |
| AV   | 420k         | 21.66           | 47.45           | -25.79         | 10.23  | Neutral   | -       | 11.43         | 0.05       | 0.08       | 10.10      |  |  |  |
| QP   | 1.343M       | 23.71           | 56.00           | -32.29         | 10.31  | Neutral   | -       | 13.40         | 0.07       | 0.14       | 10.10      |  |  |  |
| AV   | 1.343M       | 16.82           | 46.00           | -29.18         | 10.31  | Neutral   | -       | 6.51          | 0.07       | 0.14       | 10.10      |  |  |  |
| QP   | 16.184M      | 26.37           | 60.00           | -33.63         | 10.56  | Neutral   | -       | 15.81         | 0.24       | 0.21       | 10.11      |  |  |  |
| AV   | 16.184M      | 19.62           | 50.00           | -30.38         | 10.56  | Neutral   | -       | 9.06          | 0.24       | 0.21       | 10.11      |  |  |  |

|           |        |                 |                    |
|-----------|--------|-----------------|--------------------|
| Test Mode | Mode 4 | Frequency Range | 0.15 MHz to 30 MHz |
|-----------|--------|-----------------|--------------------|

Line

08/06/2020



| Type | Freq (Hz) | Level (dBuV) | Limit (dBuV) | Margin (dB) | Factor (dB) | Condition | Comment | Raw (dBuV) | AF (dB) | CL (dB) | AT (dB) |
|------|-----------|--------------|--------------|-------------|-------------|-----------|---------|------------|---------|---------|---------|
| QP   | 150k      | 48.58        | 66.00        | -17.42      | 10.20       | Line      | "Worst" | 38.38      | 0.05    | 0.05    | 10.10   |
| AV   | 150k      | 33.60        | 56.00        | -22.40      | 10.20       | Line      | -       | 23.40      | 0.05    | 0.05    | 10.10   |
| QP   | 280.5k    | 34.87        | 60.80        | -25.93      | 10.22       | Line      | -       | 24.65      | 0.05    | 0.07    | 10.10   |
| AV   | 280.5k    | 26.16        | 50.80        | -24.64      | 10.22       | Line      | -       | 15.94      | 0.05    | 0.07    | 10.10   |
| QP   | 402k      | 30.10        | 57.82        | -27.72      | 10.23       | Line      | -       | 19.87      | 0.05    | 0.08    | 10.10   |
| AV   | 402k      | 22.61        | 47.82        | -25.21      | 10.23       | Line      | -       | 12.38      | 0.05    | 0.08    | 10.10   |
| QP   | 658.5k    | 24.69        | 56.00        | -31.31      | 10.26       | Line      | -       | 14.43      | 0.06    | 0.10    | 10.10   |
| AV   | 658.5k    | 17.78        | 46.00        | -28.22      | 10.26       | Line      | -       | 7.52       | 0.06    | 0.10    | 10.10   |
| QP   | 2.301M    | 22.54        | 56.00        | -33.46      | 10.36       | Line      | -       | 12.18      | 0.10    | 0.16    | 10.10   |
| AV   | 2.301M    | 15.80        | 46.00        | -30.20      | 10.36       | Line      | -       | 5.44       | 0.10    | 0.16    | 10.10   |
| QP   | 16.22M    | 26.26        | 60.00        | -33.74      | 10.67       | Line      | -       | 15.59      | 0.35    | 0.21    | 10.11   |
| AV   | 16.22M    | 19.52        | 50.00        | -30.48      | 10.67       | Line      | -       | 8.85       | 0.35    | 0.21    | 10.11   |

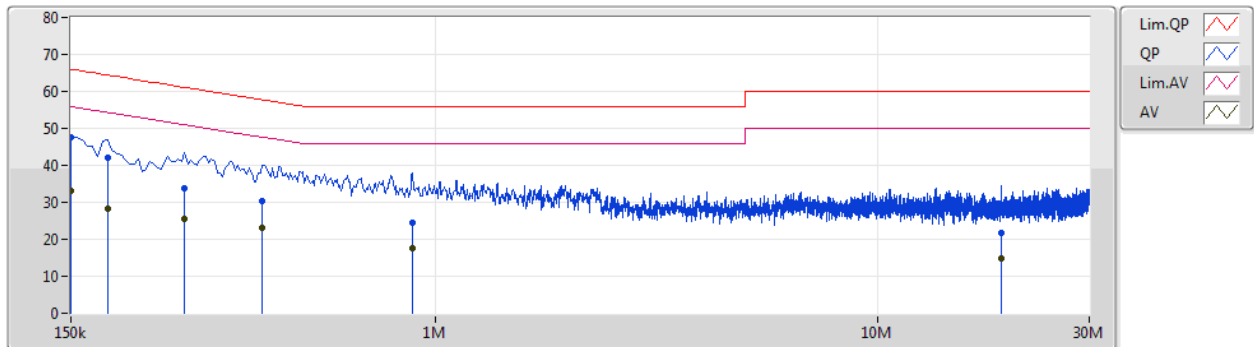


## AC Power Port Conducted Emission Result

Appendix A

Neutral

08/06/2020



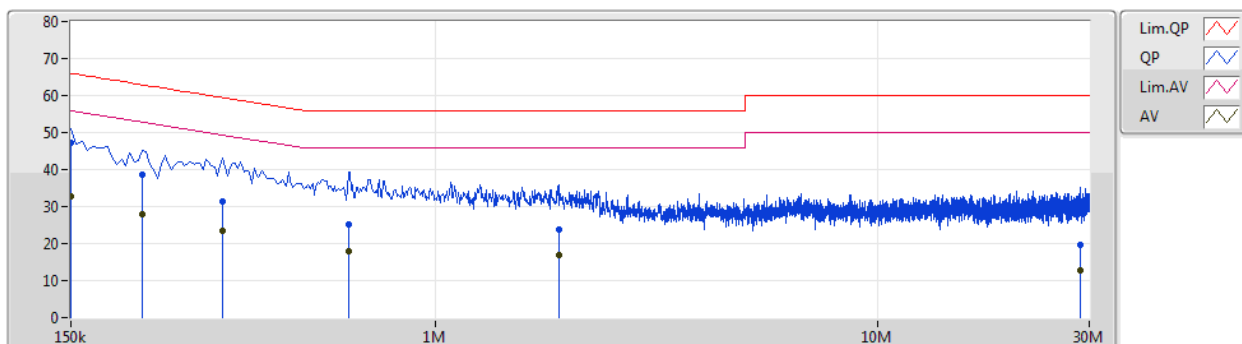
| Type | Freq<br>(Hz) | Level<br>(dBuV) | Limit<br>(dBuV) | Margin<br>(dB) | Factor | Condition | Comment | Raw<br>(dBuV) | AF<br>(dB) | CL<br>(dB) | AT<br>(dB) |  |  |  |
|------|--------------|-----------------|-----------------|----------------|--------|-----------|---------|---------------|------------|------------|------------|--|--|--|
| QP   | 150k         | 47.73           | 66.00           | -18.27         | 10.20  | Neutral   | "Worst" | 37.53         | 0.05       | 0.05       | 10.10      |  |  |  |
| AV   | 150k         | 33.12           | 56.00           | -22.88         | 10.20  | Neutral   | -       | 22.92         | 0.05       | 0.05       | 10.10      |  |  |  |
| QP   | 181.5k       | 42.16           | 64.41           | -22.25         | 10.21  | Neutral   | -       | 31.95         | 0.05       | 0.06       | 10.10      |  |  |  |
| AV   | 181.5k       | 28.35           | 54.41           | -26.06         | 10.21  | Neutral   | -       | 18.14         | 0.05       | 0.06       | 10.10      |  |  |  |
| QP   | 271.5k       | 33.85           | 61.07           | -27.22         | 10.22  | Neutral   | -       | 23.63         | 0.05       | 0.07       | 10.10      |  |  |  |
| AV   | 271.5k       | 25.44           | 51.07           | -25.63         | 10.22  | Neutral   | -       | 15.22         | 0.05       | 0.07       | 10.10      |  |  |  |
| QP   | 406.5k       | 30.41           | 57.72           | -27.31         | 10.23  | Neutral   | -       | 20.18         | 0.05       | 0.08       | 10.10      |  |  |  |
| AV   | 406.5k       | 22.97           | 47.72           | -24.75         | 10.23  | Neutral   | -       | 12.74         | 0.05       | 0.08       | 10.10      |  |  |  |
| QP   | 888k         | 24.55           | 56.00           | -31.45         | 10.27  | Neutral   | -       | 14.28         | 0.06       | 0.11       | 10.10      |  |  |  |
| AV   | 888k         | 17.69           | 46.00           | -28.31         | 10.27  | Neutral   | -       | 7.42          | 0.06       | 0.11       | 10.10      |  |  |  |
| QP   | 18.951M      | 21.68           | 60.00           | -38.32         | 10.57  | Neutral   | -       | 11.11         | 0.25       | 0.21       | 10.11      |  |  |  |
| AV   | 18.951M      | 14.90           | 50.00           | -35.10         | 10.57  | Neutral   | -       | 4.33          | 0.25       | 0.21       | 10.11      |  |  |  |



|           |        |                 |                    |
|-----------|--------|-----------------|--------------------|
| Test Mode | Mode 5 | Frequency Range | 0.15 MHz to 30 MHz |
|-----------|--------|-----------------|--------------------|

Line

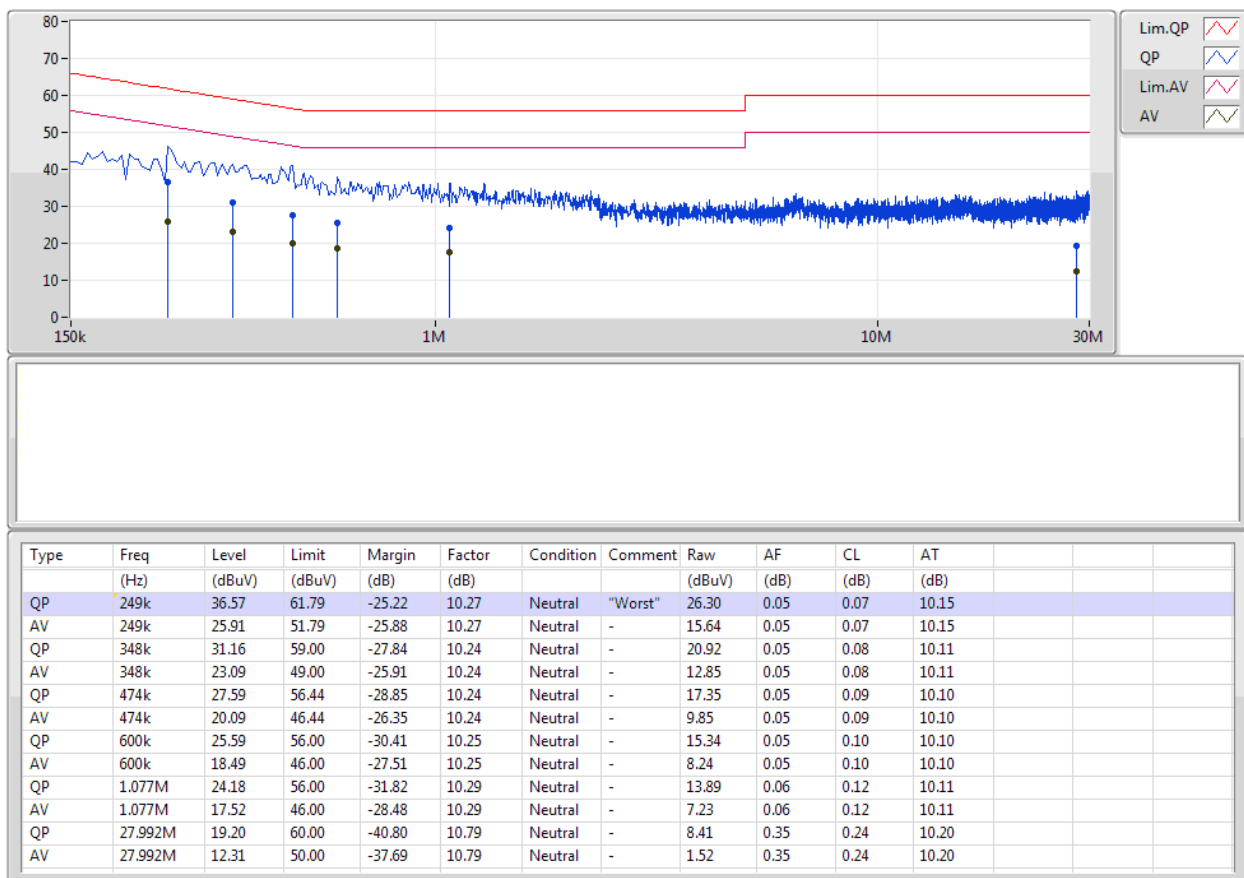
24/07/2020



| Type | Freq<br>(Hz) | Level<br>(dBuV) | Limit<br>(dBuV) | Margin<br>(dB) | Factor<br>(dB) | Condition | Comment | Raw<br>(dBuV) | AF<br>(dB) | CL<br>(dB) | AT<br>(dB) |  |  |  |
|------|--------------|-----------------|-----------------|----------------|----------------|-----------|---------|---------------|------------|------------|------------|--|--|--|
| QP   | 150k         | 47.37           | 66.00           | -18.63         | 10.25          | Line      | "Worst" | 37.12         | 0.05       | 0.05       | 10.15      |  |  |  |
| AV   | 150k         | 32.84           | 56.00           | -23.16         | 10.25          | Line      | -       | 22.59         | 0.05       | 0.05       | 10.15      |  |  |  |
| QP   | 217.5k       | 38.57           | 62.92           | -24.35         | 10.28          | Line      | -       | 28.29         | 0.05       | 0.07       | 10.16      |  |  |  |
| AV   | 217.5k       | 27.92           | 52.92           | -25.00         | 10.28          | Line      | -       | 17.64         | 0.05       | 0.07       | 10.16      |  |  |  |
| QP   | 330k         | 31.45           | 59.44           | -27.99         | 10.25          | Line      | -       | 21.20         | 0.05       | 0.08       | 10.12      |  |  |  |
| AV   | 330k         | 23.36           | 49.44           | -26.08         | 10.25          | Line      | -       | 13.11         | 0.05       | 0.08       | 10.12      |  |  |  |
| QP   | 636k         | 25.25           | 56.00           | -30.75         | 10.27          | Line      | -       | 14.98         | 0.06       | 0.10       | 10.11      |  |  |  |
| AV   | 636k         | 18.08           | 46.00           | -27.92         | 10.27          | Line      | -       | 7.81          | 0.06       | 0.10       | 10.11      |  |  |  |
| QP   | 1.905M       | 23.75           | 56.00           | -32.25         | 10.38          | Line      | -       | 13.37         | 0.09       | 0.16       | 10.13      |  |  |  |
| AV   | 1.905M       | 17.00           | 46.00           | -29.00         | 10.38          | Line      | -       | 6.62          | 0.09       | 0.16       | 10.13      |  |  |  |
| QP   | 28.617M      | 19.69           | 60.00           | -40.31         | 11.04          | Line      | -       | 8.65          | 0.60       | 0.24       | 10.20      |  |  |  |
| AV   | 28.617M      | 12.84           | 50.00           | -37.16         | 11.04          | Line      | -       | 1.80          | 0.60       | 0.24       | 10.20      |  |  |  |

### Neutral

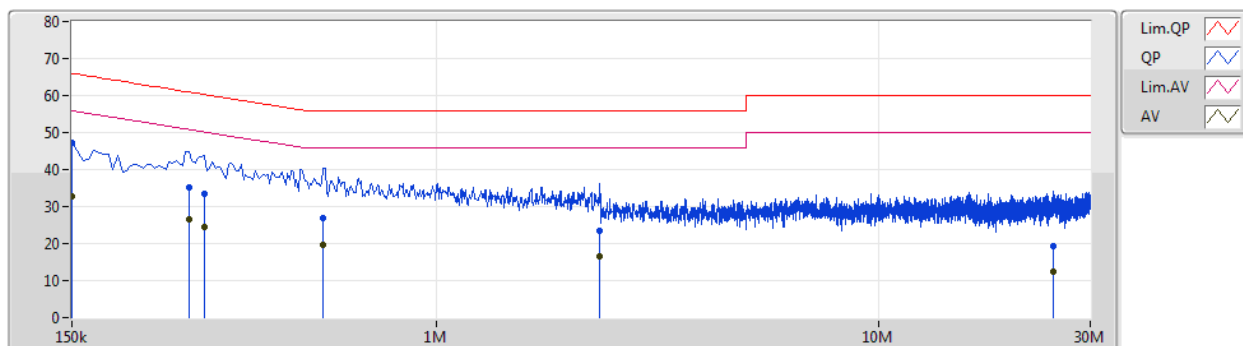
24/07/2020



|                  |        |                        |                    |
|------------------|--------|------------------------|--------------------|
| <b>Test Mode</b> | Mode 6 | <b>Frequency Range</b> | 0.15 MHz to 30 MHz |
|------------------|--------|------------------------|--------------------|

Line

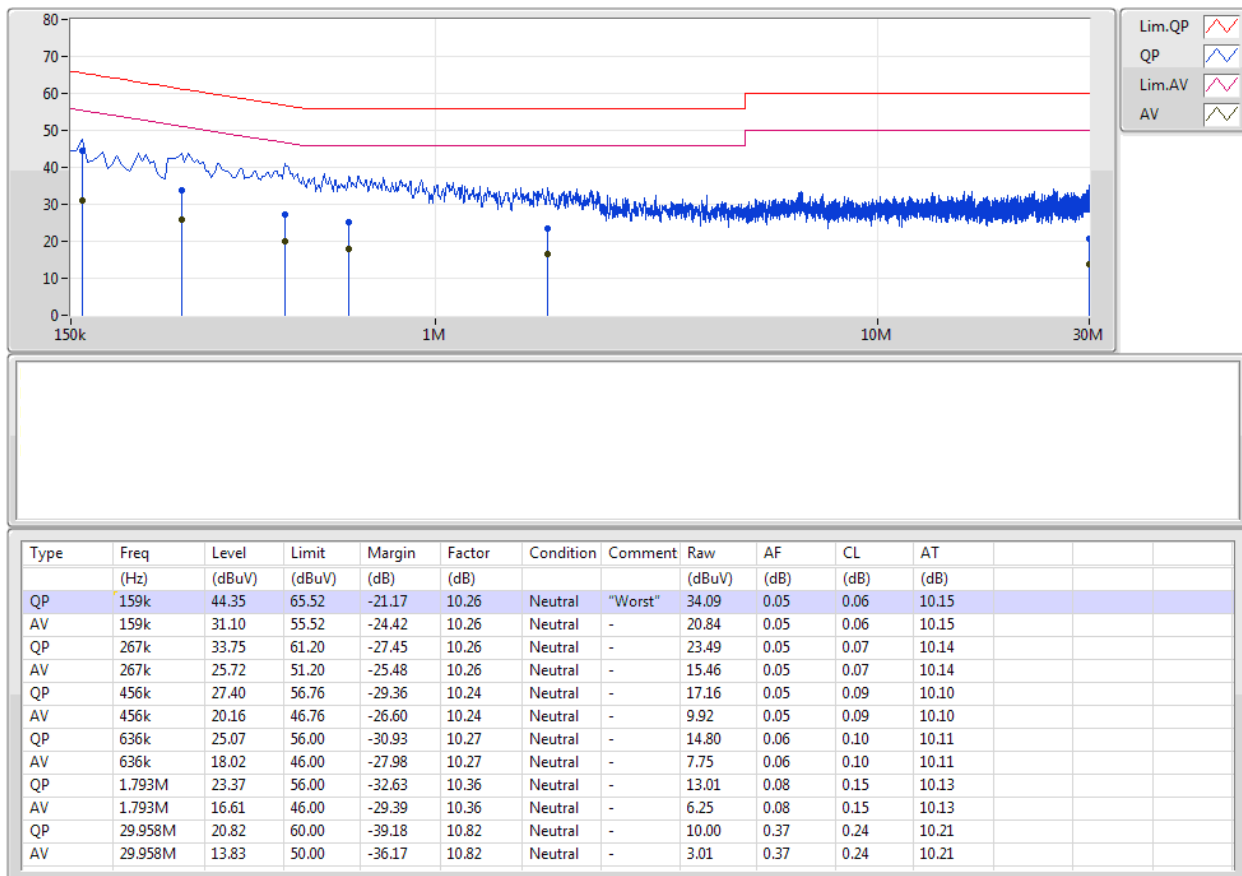
24/07/2020



| Type | Freq    | Level  | Limit  | Margin | Factor | Condition | Comment | Raw    | AF   | CL   | AT    |  |  |  |
|------|---------|--------|--------|--------|--------|-----------|---------|--------|------|------|-------|--|--|--|
|      | (Hz)    | (dBuV) | (dBuV) | (dB)   | (dB)   |           |         | (dBuV) | (dB) | (dB) | (dB)  |  |  |  |
| QP   | 150k    | 47.39  | 66.00  | -18.61 | 10.25  | Line      | "Worst" | 37.14  | 0.05 | 0.05 | 10.15 |  |  |  |
| AV   | 150k    | 32.82  | 56.00  | -23.18 | 10.25  | Line      | -       | 22.57  | 0.05 | 0.05 | 10.15 |  |  |  |
| QP   | 276k    | 35.10  | 60.93  | -25.83 | 10.26  | Line      | -       | 24.84  | 0.05 | 0.07 | 10.14 |  |  |  |
| AV   | 276k    | 26.40  | 50.93  | -24.53 | 10.26  | Line      | -       | 16.14  | 0.05 | 0.07 | 10.14 |  |  |  |
| QP   | 298.5k  | 33.41  | 60.28  | -26.87 | 10.26  | Line      | -       | 23.15  | 0.05 | 0.08 | 10.13 |  |  |  |
| AV   | 298.5k  | 24.44  | 50.28  | -25.84 | 10.26  | Line      | -       | 14.18  | 0.05 | 0.08 | 10.13 |  |  |  |
| QP   | 555k    | 26.73  | 56.00  | -29.27 | 10.24  | Line      | -       | 16.49  | 0.05 | 0.09 | 10.10 |  |  |  |
| AV   | 555k    | 19.61  | 46.00  | -26.39 | 10.24  | Line      | -       | 9.37   | 0.05 | 0.09 | 10.10 |  |  |  |
| QP   | 2.342M  | 23.47  | 56.00  | -32.53 | 10.39  | Line      | -       | 13.08  | 0.10 | 0.16 | 10.13 |  |  |  |
| AV   | 2.342M  | 16.55  | 46.00  | -29.45 | 10.39  | Line      | -       | 6.16   | 0.10 | 0.16 | 10.13 |  |  |  |
| QP   | 24.738M | 19.23  | 60.00  | -40.77 | 10.94  | Line      | -       | 8.29   | 0.52 | 0.23 | 10.19 |  |  |  |
| AV   | 24.738M | 12.50  | 50.00  | -37.50 | 10.94  | Line      | -       | 1.56   | 0.52 | 0.23 | 10.19 |  |  |  |

### Neutral

24/07/2020





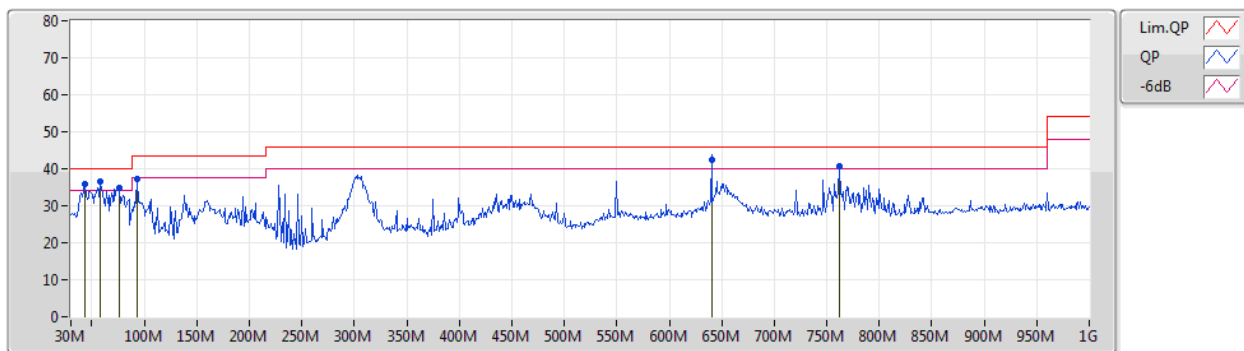
## Radiated Emission below 1GHz Result

Appendix B

|           |        |                 |                     |
|-----------|--------|-----------------|---------------------|
| Test Mode | Mode 1 | Frequency Range | 30 MHz to 1,000 MHz |
|-----------|--------|-----------------|---------------------|

Vertical 30 MHz to 1,000 MHz

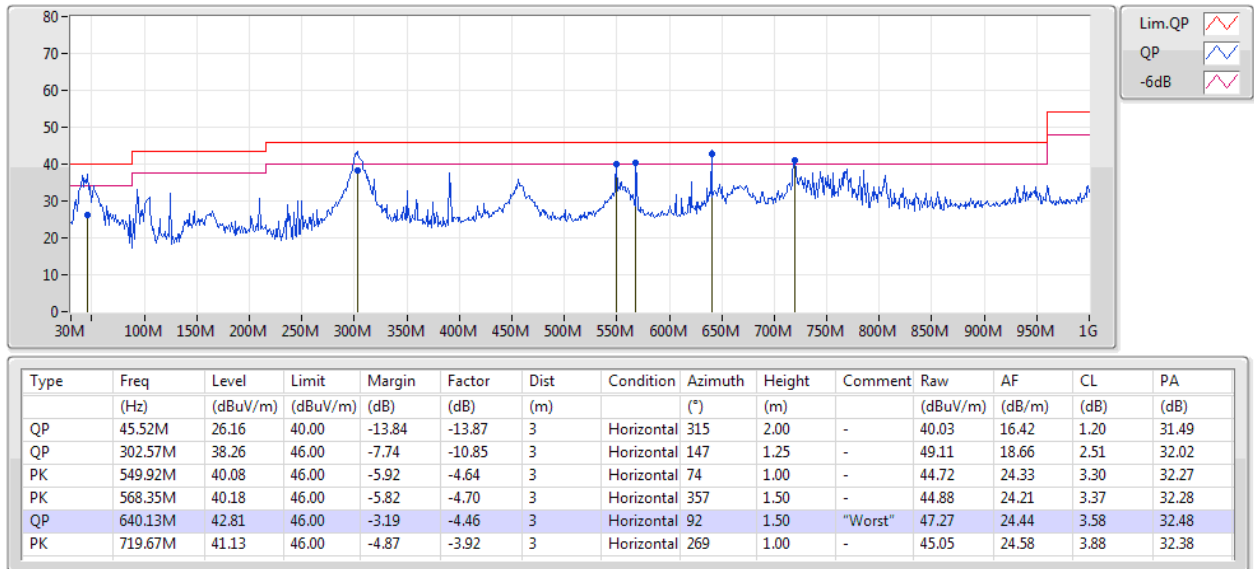
22/07/2020



| 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) | Comment | Raw<br>(dBuV/m) | AF<br>(dB/m) | CL<br>(dB) | PA<br>(dB) |
|------|--------------|-------------------|-------------------|----------------|----------------|-------------|-----------|----------------|---------------|---------|-----------------|--------------|------------|------------|
| PK   | 43.58M       | 35.69             | 40.00             | -4.31          | -13.01         | 3           | Vertical  | 214            | 1.00          | -       | 48.70           | 17.19        | 1.26       | 31.46      |
| PK   | 58.13M       | 36.49             | 40.00             | -3.51          | -17.83         | 3           | Vertical  | 0              | 1.00          | -       | 54.32           | 12.80        | 1.16       | 31.79      |
| PK   | 76.56M       | 34.70             | 40.00             | -5.30          | -17.86         | 3           | Vertical  | 218            | 1.25          | -       | 52.56           | 12.56        | 1.33       | 31.75      |
| PK   | 93.05M       | 37.19             | 43.50             | -6.31          | -15.05         | 3           | Vertical  | 0              | 2.00          | -       | 52.24           | 15.37        | 1.46       | 31.88      |
| QP   | 640.13M      | 42.55             | 46.00             | -3.45          | -4.46          | 3           | Vertical  | 269            | 1.00          | "Worst" | 47.01           | 24.44        | 3.58       | 32.48      |
| PK   | 762.35M      | 40.68             | 46.00             | -5.32          | -3.17          | 3           | Vertical  | 78             | 1.00          | -       | 43.85           | 25.14        | 3.98       | 32.29      |

### Horizontal 30 MHz to 1,000 MHz

22/07/2020





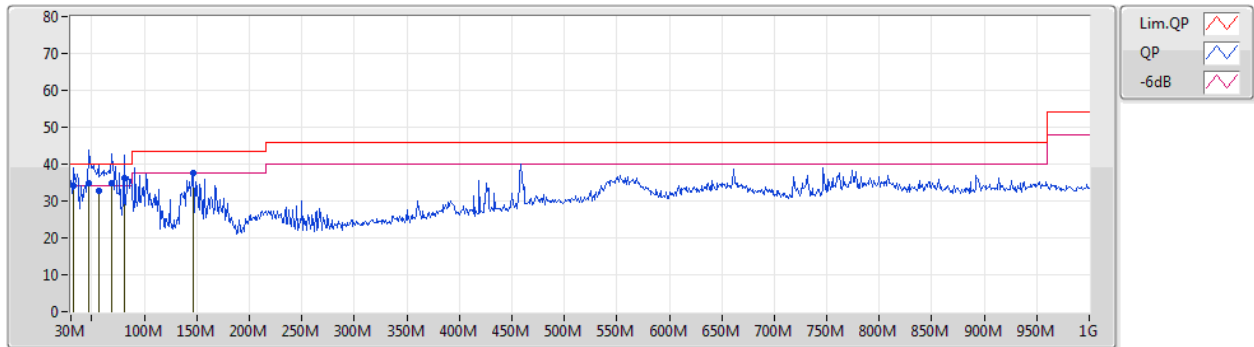
## Radiated Emission below 1GHz Result

Appendix B

|           |        |                 |                     |
|-----------|--------|-----------------|---------------------|
| Test Mode | Mode 2 | Frequency Range | 30 MHz to 1,000 MHz |
|-----------|--------|-----------------|---------------------|

Vertical 30 MHz to 1,000 MHz

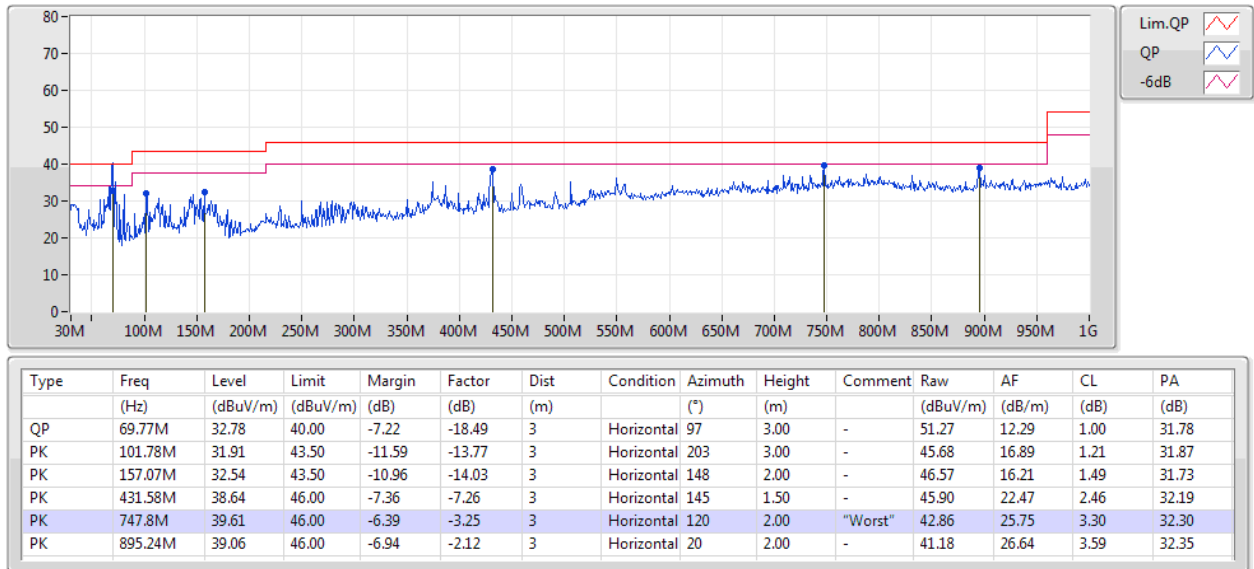
22/07/2020



| 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) | Comment | Raw<br>(dBuV/m) | AF<br>(dB/m) | CL<br>(dB) | PA<br>(dB) |
|------|--------------|-------------------|-------------------|----------------|----------------|-------------|-----------|----------------|---------------|---------|-----------------|--------------|------------|------------|
| QP   | 32.91M       | 33.99             | 40.00             | -6.01          | -8.32          | 3           | Vertical  | 237            | 1.00          | -       | 42.31           | 22.49        | 0.70       | 31.51      |
| QP   | 47.46M       | 34.67             | 40.00             | -5.33          | -15.96         | 3           | Vertical  | 159            | 1.00          | -       | 50.63           | 14.73        | 0.85       | 31.54      |
| QP   | 56.19M       | 32.84             | 40.00             | -7.16          | -18.28         | 3           | Vertical  | 360            | 1.25          | -       | 51.12           | 12.58        | 0.90       | 31.76      |
| QP   | 68.8M        | 34.71             | 40.00             | -5.29          | -18.53         | 3           | Vertical  | 360            | 3.00          | -       | 53.24           | 12.28        | 0.98       | 31.79      |
| QP   | 80.44M       | 36.18             | 40.00             | -3.82          | -17.95         | 3           | Vertical  | 110            | 1.50          | "Worst" | 54.13           | 12.79        | 1.01       | 31.75      |
| PK   | 146.4M       | 37.66             | 43.50             | -5.84          | -13.71         | 3           | Vertical  | 96             | 1.00          | -       | 51.37           | 16.76        | 1.43       | 31.90      |

### Horizontal 30 MHz to 1,000 MHz

22/07/2020







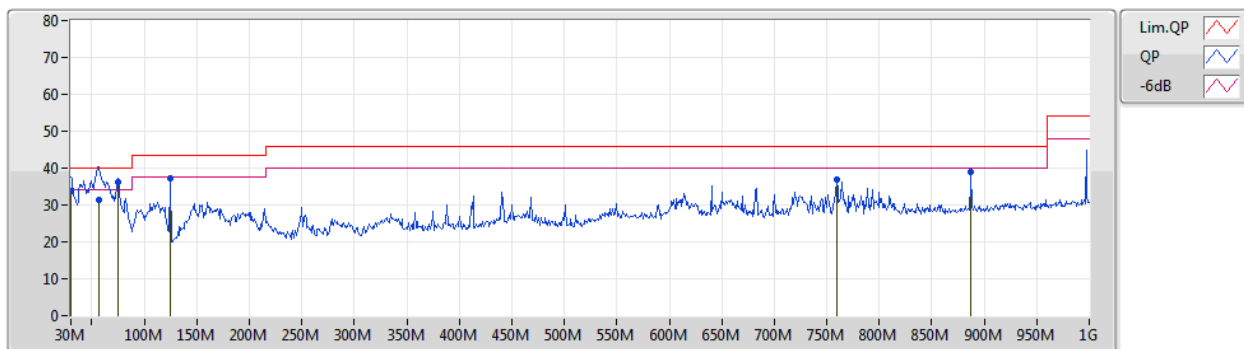
## Radiated Emission below 1GHz Result

Appendix B

|           |        |                 |                     |
|-----------|--------|-----------------|---------------------|
| Test Mode | Mode 3 | Frequency Range | 30 MHz to 1,000 MHz |
|-----------|--------|-----------------|---------------------|

Vertical 30 MHz to 1,000 MHz

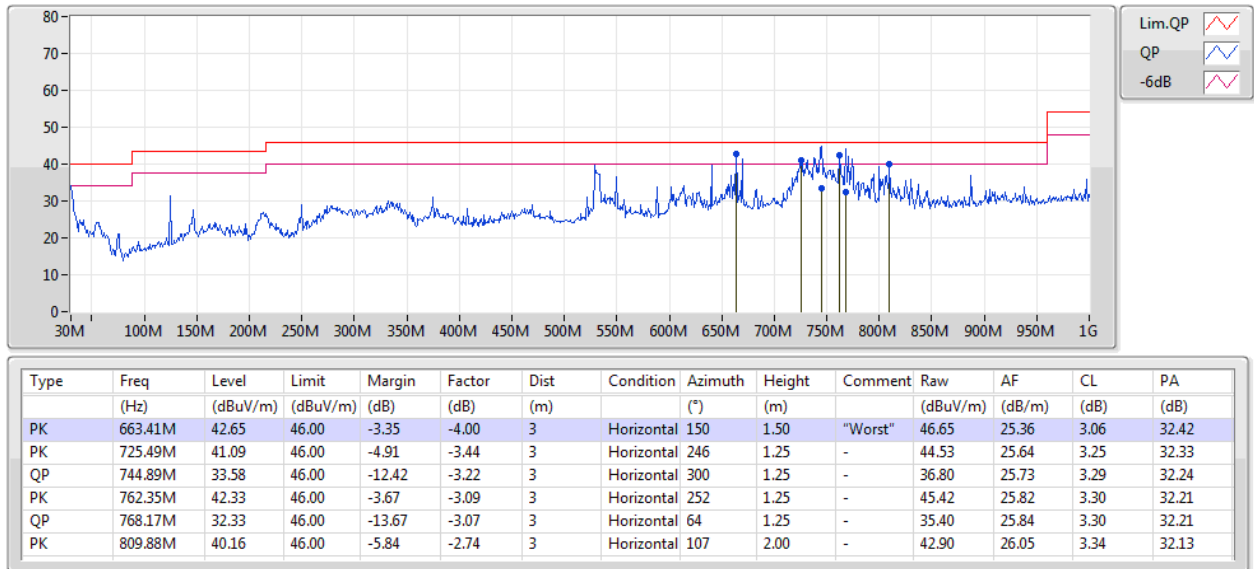
05/06/2020



| 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) | Comment | Raw<br>(dBuV/m) | AF<br>(dB/m) | CL<br>(dB) | PA<br>(dB) |
|------|--------------|-------------------|-------------------|----------------|----------------|-------------|-----------|----------------|---------------|---------|-----------------|--------------|------------|------------|
| QP   | 30M          | 33.95             | 40.00             | -6.05          | -7.55          | 3           | Vertical  | 36             | 1.00          | -       | 41.50           | 24.10        | 0.70       | 32.35      |
| QP   | 56.19M       | 31.30             | 40.00             | -8.70          | -18.97         | 3           | Vertical  | 193            | 1.50          | -       | 50.27           | 12.58        | 0.90       | 32.45      |
| QP   | 74.62M       | 36.20             | 40.00             | -3.80          | -19.25         | 3           | Vertical  | 194            | 1.50          | "Worst" | 55.45           | 12.20        | 1.00       | 32.45      |
| PK   | 125.06M      | 37.17             | 43.50             | -6.33          | -13.16         | 3           | Vertical  | 73             | 1.00          | -       | 50.33           | 17.95        | 1.33       | 32.44      |
| PK   | 759.44M      | 36.92             | 46.00             | -9.08          | -3.10          | 3           | Vertical  | 47             | 1.00          | -       | 40.02           | 25.81        | 3.30       | 32.21      |
| PK   | 887.48M      | 39.02             | 46.00             | -6.98          | -1.61          | 3           | Vertical  | 191            | 1.25          | -       | 40.63           | 26.58        | 3.57       | 31.76      |

### Horizontal 30 MHz to 1,000 MHz

05/06/2020



|           |        |                 |                     |
|-----------|--------|-----------------|---------------------|
| Test Mode | Mode 4 | Frequency Range | 30 MHz to 1,000 MHz |
|-----------|--------|-----------------|---------------------|

### Vertical 30 MHz to 1,000 MHz

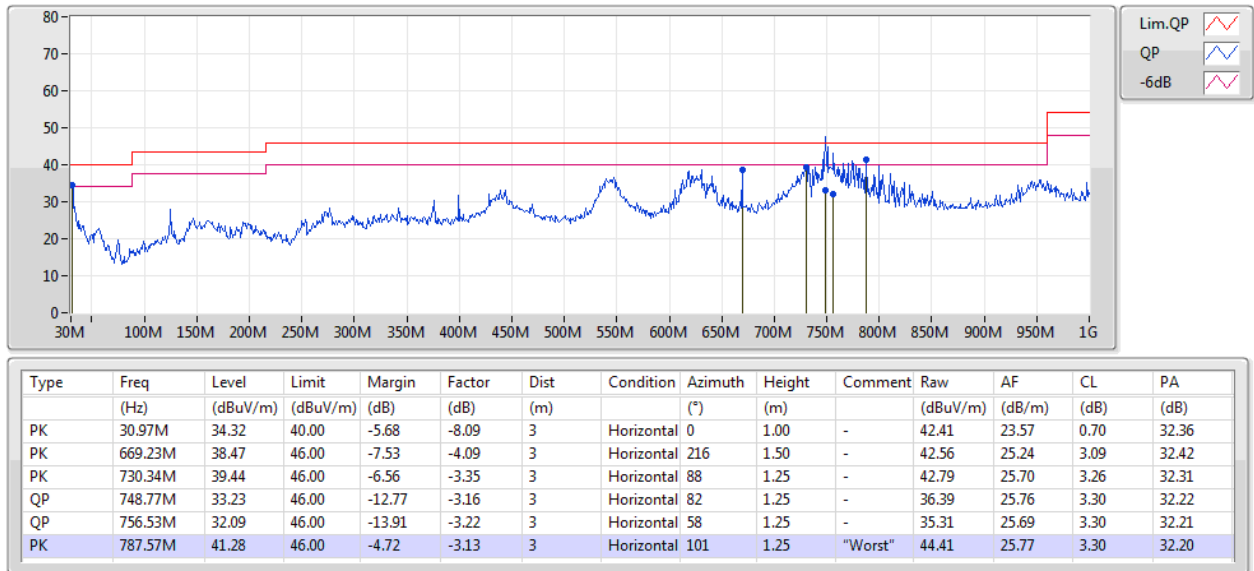
22/07/2020



| 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) | Comment | Raw<br>(dBuV/m) | AF<br>(dB/m) | CL<br>(dB) | PA<br>(dB) |
|------|--------------|-------------------|-------------------|----------------|----------------|-------------|-----------|----------------|---------------|---------|-----------------|--------------|------------|------------|
| PK   | 42.61M       | 33.50             | 40.00             | -6.50          | -14.79         | 3           | Vertical  | 187            | 1.00          | -       | 48.29           | 16.90        | 0.80       | 32.49      |
| QP   | 56.19M       | 34.73             | 40.00             | -5.27          | -19.03         | 3           | Vertical  | 214            | 1.25          | -       | 53.76           | 12.52        | 0.90       | 32.45      |
| PK   | 74.62M       | 35.03             | 40.00             | -4.97          | -19.29         | 3           | Vertical  | 118            | 2.00          | "Worst" | 54.32           | 12.16        | 1.00       | 32.45      |
| PK   | 125.06M      | 36.44             | 43.50             | -7.06          | -13.01         | 3           | Vertical  | 248            | 1.00          | -       | 49.45           | 18.10        | 1.33       | 32.44      |
| PK   | 723.55M      | 39.14             | 46.00             | -6.86          | -3.46          | 3           | Vertical  | 0              | 1.00          | -       | 42.60           | 25.63        | 3.25       | 32.34      |
| PK   | 757.5M       | 39.10             | 46.00             | -6.90          | -3.23          | 3           | Vertical  | 143            | 1.50          | -       | 42.33           | 25.68        | 3.30       | 32.21      |

### Horizontal 30 MHz to 1,000 MHz

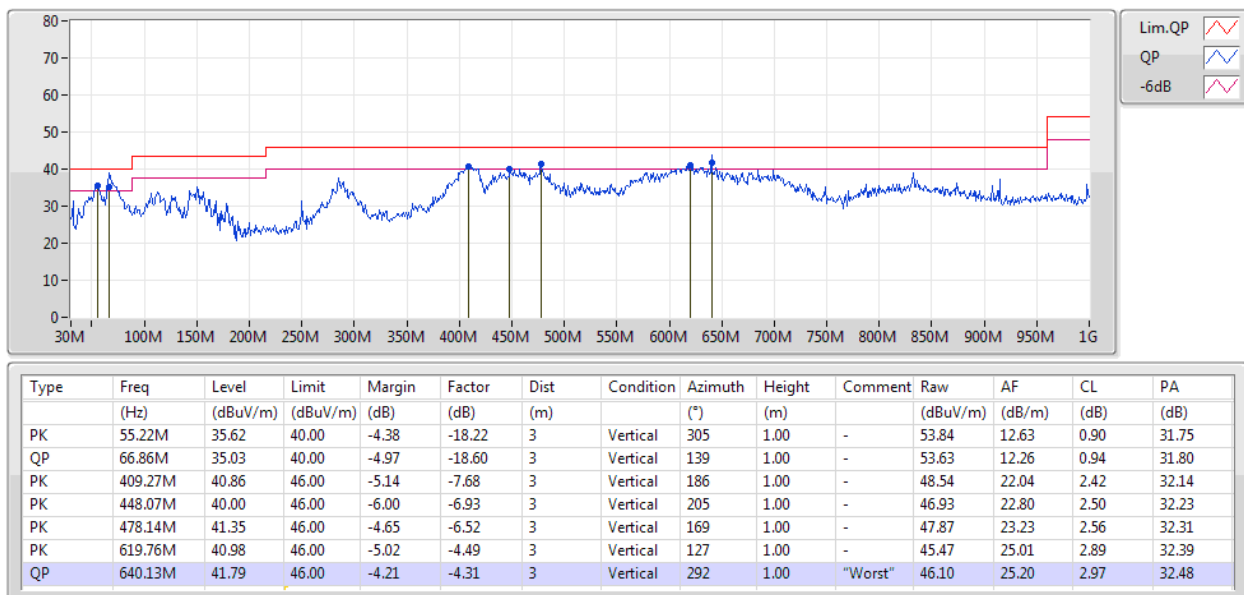
22/07/2020



|           |        |                 |                     |
|-----------|--------|-----------------|---------------------|
| Test Mode | Mode 5 | Frequency Range | 30 MHz to 1,000 MHz |
|-----------|--------|-----------------|---------------------|

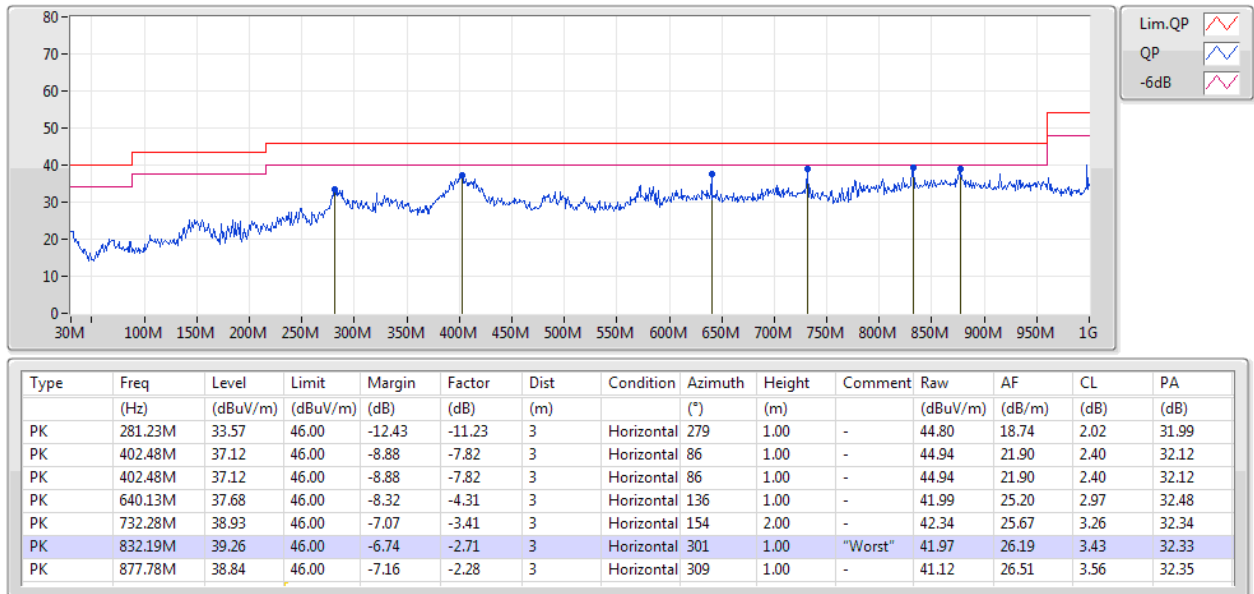
### Vertical 30 MHz to 1,000 MHz

22/07/2020



### Horizontal 30 MHz to 1,000 MHz

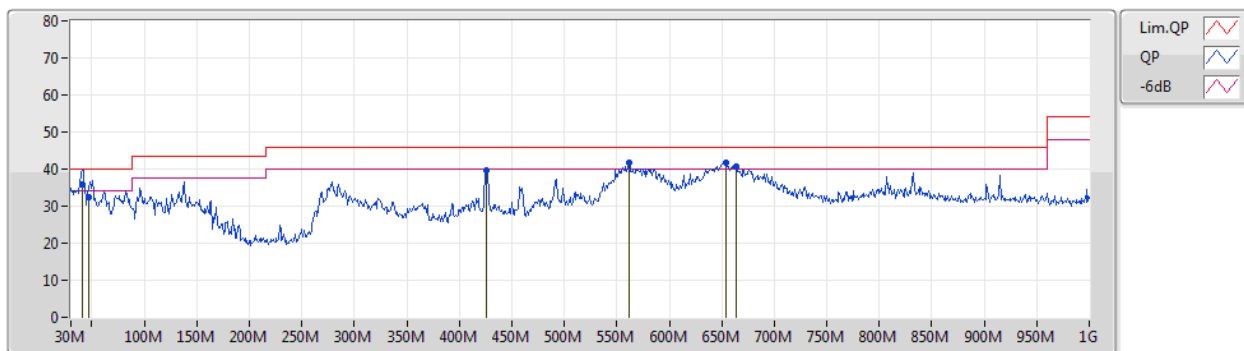
22/07/2020



|           |        |                 |                     |
|-----------|--------|-----------------|---------------------|
| Test Mode | Mode 6 | Frequency Range | 30 MHz to 1,000 MHz |
|-----------|--------|-----------------|---------------------|

### Vertical 30 MHz to 1,000 MHz

22/07/2020



| 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) | Comment | Raw<br>(dBuV/m) | AF<br>(dB/m) | CL<br>(dB) | PA<br>(dB) |
|------|--------------|-------------------|-------------------|----------------|----------------|-------------|-----------|----------------|---------------|---------|-----------------|--------------|------------|------------|
| QP   | 40.67M       | 35.75             | 40.00             | -4.25          | -12.57         | 3           | Vertical  | 228            | 2.00          | "Worst" | 48.32           | 18.07        | 0.80       | 31.44      |
| QP   | 47.46M       | 32.48             | 40.00             | -7.52          | -15.96         | 3           | Vertical  | 209            | 2.00          | -       | 48.44           | 14.73        | 0.85       | 31.54      |
| PK   | 425.76M      | 39.75             | 46.00             | -6.25          | -7.36          | 3           | Vertical  | 159            | 1.00          | -       | 47.11           | 22.37        | 2.45       | 32.18      |
| PK   | 425.76M      | 39.75             | 46.00             | -6.25          | -7.36          | 3           | Vertical  | 159            | 1.00          | -       | 47.11           | 22.37        | 2.45       | 32.18      |
| PK   | 561.56M      | 41.58             | 46.00             | -4.42          | -4.90          | 3           | Vertical  | 199            | 1.00          | -       | 46.48           | 24.65        | 2.72       | 32.27      |
| PK   | 653.71M      | 41.60             | 46.00             | -4.40          | -4.18          | 3           | Vertical  | 271            | 1.00          | -       | 45.78           | 25.31        | 3.02       | 32.51      |
| PK   | 663.41M      | 40.62             | 46.00             | -5.38          | -4.08          | 3           | Vertical  | 271            | 1.00          | -       | 44.70           | 25.36        | 3.06       | 32.50      |

### Horizontal 30 MHz to 1,000 MHz

22/07/2020

