



# **CERTIFICATION TEST REPORT**

**Report Number.** : 4789793179-E4V2

**Applicant** : SAMSUNG ELECTRONICS CO., LTD.  
129 SAMSUNG-RO, YEONGTONG-GU, SUWON-SI,  
GYEONGGI-DO, 16677, KOREA

**Model** : SM-A125U, SM-S127DL, SM-A125U1/DS

**FCC ID** : A3LSMA125U

**EUT Description** : GSM/CDMA/WCDMA/LTE Phone + BT/BLE, DTS/UNII a/b/g/n/ac and  
NFC

**Test Standard(s)** : FCC 47 CFR PART 15 SUBPART C

**Date Of Issue:**

March 08, 2021

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Revision History

| <u>Rev.</u> | <u>Issue Date</u> | <u>Revisions</u>                  | <u>Revised By</u> |
|-------------|-------------------|-----------------------------------|-------------------|
| V1          | 03/02/21          | Initial issue                     | Hyunsik Yun       |
| V2          | 03/08/21          | Updated to address TCB's question | Hyunsik Yun       |

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# 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** SAMSUNG ELECTRONICS CO., LTD.

**EUT DESCRIPTION:** GSM/CDMA/WCDMA/LTE Phone + BT/BLE, DTS/UNII a/b/g/n/ac and NFC

**MODEL:** SM-A125U, SM-S127DL, SM-A125U1/DS

**SERIAL NUMBER:** R38R100SMVZ (CONDUCTED);  
R37R100SNBW, R38R100SPAF (RADIATED);

**DATE TESTED:** FEB 10, 2021 – FEB 26, 2021;

| APPLICABLE STANDARDS     |              |
|--------------------------|--------------|
| STANDARD                 | TEST RESULTS |
| CFR 47 Part 15 Subpart C | Complies     |

UL Korea, Ltd. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Korea, Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

**Note:** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Korea, Ltd. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Korea, Ltd. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by IAS, any agency of the Federal Government, or any agency of any government.

Approved & Released For  
UL Korea, Ltd. By:



Junwhan Lee  
Suwon Lab Engineer  
UL Korea, Ltd.

Tested By:



Hyunsik Yun  
Suwon Lab Engineer  
UL Korea, Ltd.

## 2. TEST METHODOLOGY

1. FCC CFR 47 Part 2.
2. FCC CFR 47 Part 15.
3. KDB 558074 D01 15.247 Meas Guidance v05r02.
4. ANSI C63.10-2013.

## 3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea. Line conducted emissions are measured only at the 218 address. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

| 218 Maeyeong-ro                     |           |
|-------------------------------------|-----------|
| <input checked="" type="checkbox"/> | Chamber 1 |
| <input checked="" type="checkbox"/> | Chamber 2 |
| <input type="checkbox"/>            | Chamber 3 |

UL Korea, Ltd. is accredited by IAS, Laboratory Code TL-637. The full scope of accreditation can be viewed at <https://www.iasonline.org/wp-content/uploads/2017/05/TL-637-cert-New.pdf>.

## 4. DECISION RULES AND MEASUREMENT UNCERTAINTY

### 4.1. METROLOGICAL TRACEABILITY

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

### 4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

$$\begin{aligned} \text{Field Strength (dBuV/m)} &= \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \\ &\text{Cable Loss (dB)} - \text{Preamp Gain (dB)} \\ 28.9 \text{ dBuV/m} &= 36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} \end{aligned}$$

### 4.3. DECISION RULES

Decision rule for statement(s) of conformity is based on Procedure 1, Clause 4.4.2 in IEC Guide 115:2007.

### 4.4. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

| PARAMETER                              | UNCERTAINTY |
|--|-------------|
| Conducted Disturbance, 0.15 to 30 MHz  | 3.01 dB     |
| Radiated Disturbance, 30 MHz to 1 GHz  | 4.26 dB     |
| Radiated Disturbance, 1 GHz to 18 GHz  | 5.90 dB     |
| Radiated Disturbance, 18 GHz to 40 GHz | 5.49 dB     |

Uncertainty figures are valid to a confidence level of 95%.

## 5. EQUIPMENT UNDER TEST

### 5.1. EUT DESCRIPTION

The EUT is a GSM/CDMA/WCDMA/LTE Phone + BT/BLE, DTS/UNII a/b/g/n/ac and NFC. This test report addresses the DTS (BLE) operational mode.

This report covers the Samsung models SM-A125U, SM-A125U1/DS and SM-S127DL. These models are identical in hardware except SM-A125U1/DS has dual SIM tray and SM-S127DL is not supported CDMA.

With some pre-scan, model SM-A125U was set for final test.

### 5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum peak conducted output power as follows:

| Frequency Range [MHz] | Mode    | Power Mode | Output Power [dBm] | Output Power [mW] |
|-----------------------|---------|------------|--------------------|-------------------|
| 2 402 ~ 2 480         | 125kbps | Peak       | 5.854              | 3.849             |
|                       |         | Average    | 5.828              | 3.827             |
|                       | 2Mbps   | Peak       | 5.865              | 3.859             |
|                       |         | Average    | 5.421              | 3.484             |

### 5.3. DESCRIPTION OF AVAILABLE ANTENNAS

An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

**The internal antenna was Permanently attached.  
Therefore this E.U.T Complies with the requirement of §15.203.**

The radio utilizes an internal antennas, with maximum gain of -4.26 dBi.



### 5.4. WORST-CASE CONFIGURATION AND MODE

Radiated emission below 1GHz and power line conducted emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

Radiated emission above 1GHz was performed with the EUT set to transmit low/mid/high channels.

The fundamental of the EUT was investigated in three orthogonal orientations X, Y and Z it was determined that X orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in X orientation.

Note : All radiated and power line conducted tests were performed attached with travel adapter and earphone for the worst case condition mode.

#### Power verification

The Output Power of all data rate are all investigated, the 125 kbps(37 pkt) and 2 Mbps(255 pkt) power is the worst case for symbol rate. All tests were performed in these two modes.

| Symbol Rate [Ms/s] | Mode               | Frequency [MHz] | Conducted Burst Avg [dBm] | Symbol Rate [Ms/s] | Mode            | Frequency [MHz] | Conducted Burst Avg [dBm] |
|--------------------|--------------------|-----------------|---------------------------|--------------------|-----------------|-----------------|---------------------------|
| 1                  | 1Mbps (37 pkt)     | 2402            | 4.776                     | 2                  | 2Mbps (37 pkt)  | 2402            | 4.423                     |
|                    |                    | 2440            | 5.769                     |                    |                 | 2440            | 5.412                     |
|                    |                    | 2480            | 3.982                     |                    |                 | 2480            | 3.694                     |
|                    | 1Mbps (255 pkt)    | 2402            | 4.809                     |                    | 2Mbps (255 pkt) | 2402            | 4.440                     |
|                    |                    | 2440            | 5.780                     |                    |                 | <b>2440</b>     | <b>5.421</b>              |
|                    |                    | 2480            | 3.995                     |                    |                 | 2480            | 3.690                     |
| 1                  | 125 kbps (37 pkt)  | 2402            | 4.857                     |                    |                 |                 |                           |
|                    |                    | <b>2440</b>     | <b>5.828</b>              |                    |                 |                 |                           |
|                    |                    | 2480            | 4.077                     |                    |                 |                 |                           |
|                    | 125 kbps (255 pkt) | 2402            | 4.830                     |                    |                 |                 |                           |
|                    |                    | 2440            | 5.800                     |                    |                 |                 |                           |
|                    |                    | 2480            | 4.040                     |                    |                 |                 |                           |
|                    | 500 kbps (37 pkt)  | 2402            | 4.567                     |                    |                 |                 |                           |
|                    |                    | 2440            | 5.546                     |                    |                 |                 |                           |
|                    |                    | 2480            | 3.808                     |                    |                 |                 |                           |
|                    | 500 kbps (255 pkt) | 2402            | 4.560                     |                    |                 |                 |                           |
|                    |                    | 2440            | 5.531                     |                    |                 |                 |                           |
|                    |                    | 2480            | 3.779                     |                    |                 |                 |                           |

## 5.5. DESCRIPTION OF TEST SETUP

### SUPPORT EQUIPMENT

| Support Equipment List |              |             |                |        |
|------------------------|--------------|-------------|----------------|--------|
| Description            | Manufacturer | Model       | Serial Number  | FCC ID |
| Charger                | SAMSUNG      | EP-TA200    | R37NBH409C3SE3 | N/A    |
| Data Cable             | SAMSUNG      | EP-DR140AWE | N/A            | N/A    |
| Earphone               | SAMSUNG      | EHS64AVFWE  | N/A            | N/A    |

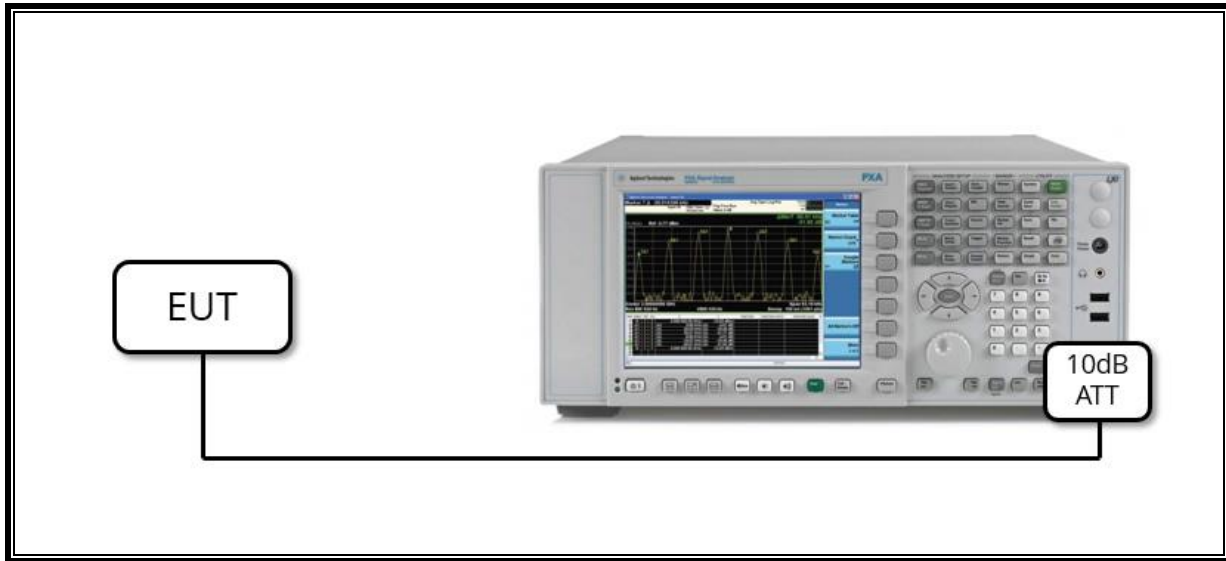
### I/O CABLE

| I/O Cable List |          |                      |                |            |                  |         |
|----------------|----------|----------------------|----------------|------------|------------------|---------|
| Cable No.      | Port     | # of identical ports | Connector Type | Cable Type | Cable Length (m) | Remarks |
| 1              | DC Power | 1                    | C Type         | Shielded   | 1.0 m            | N/A     |
| 2              | Audio    | 2                    | AUX            | Unshielded | 1.1 m            | N/A     |

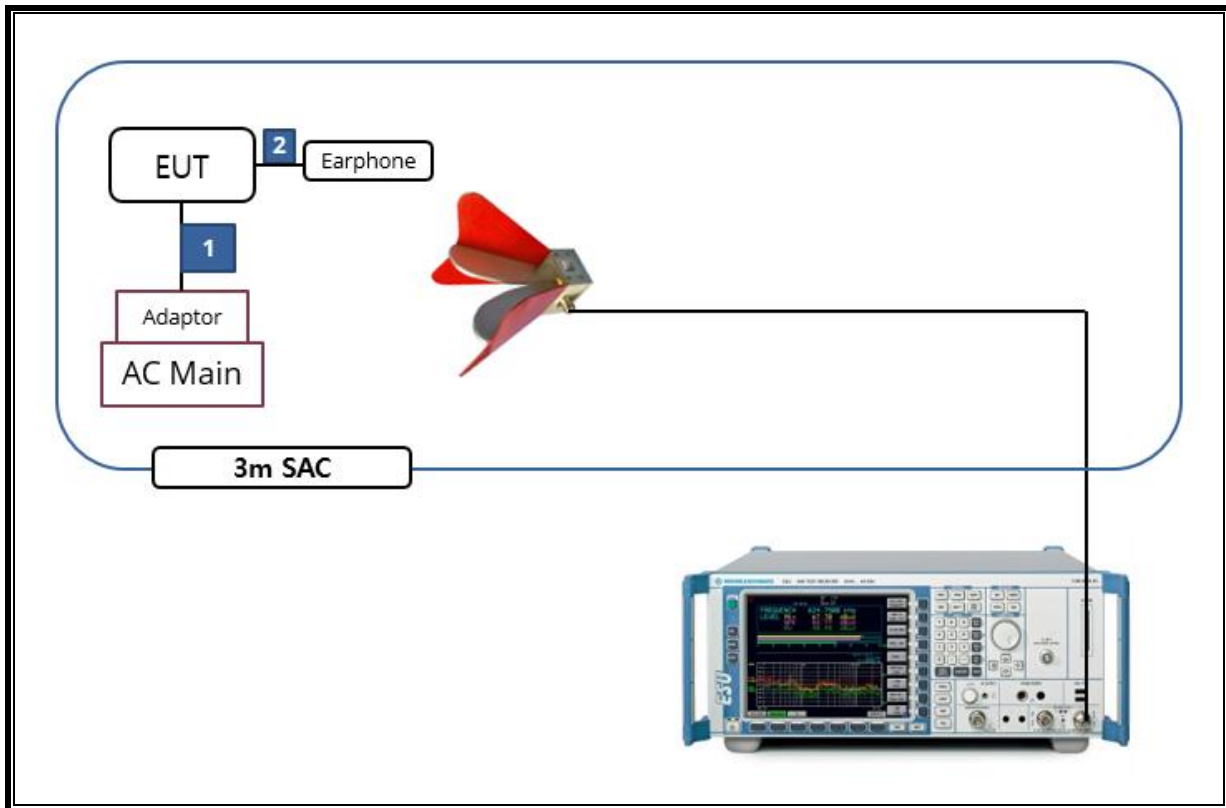
### TEST SETUP

The EUT is a stand-alone unit during the tests.  
 Test software in hidden menu exercised the EUT to enable BLE mode.

**SETUP DIAGRAM FOR TESTS (CONDUCTED TEST SETUP)**



**SETUP DIAGRAM FOR TESTS (RADIATED TEST SETUP)**



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## 6. MEASUREMENT METHOD

6 dB BW : KDB 558074 D01 v05r02, Section 8.2.

OUTPUT POWER : KDB 558074 D01 v05r02, Section 8.3.1.1

POWER SPECTRAL DENSITY : KDB 558074 D01 v05r02, Section 8.4.

Out-of-band Emissions (Conducted) : KDB 558074 D01 v05r02, Section 8.5.

Out-of-band Emissions in Non-restricted Bands: KDB 558074 D01 v05r02, Section 8.5.

Out-of-band Emissions in Restricted Bands : KDB 558074 D01 v05r02, Section 8.6.

AC Power Line Conducted Emission : ANSI C63.10-2013, Section 6.2

## 7. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

| Test Equipment List         |               |                        |            |          |
|-----------------------------|---------------|------------------------|------------|----------|
| Description                 | Manufacturer  | Model                  | S/N        | Cal Due  |
| Antenna, Bilog, 30MHz-1GHz  | SCHWARZBECK   | VULB9163               | 750        | 08-19-22 |
| Antenna, Bilog, 30MHz-1GHz  | SCHWARZBECK   | VULB9163               | 749        | 08-13-22 |
| Antenna, Bilog, 30MHz-1GHz  | SCHWARZBECK   | VULB9163               | 845        | 08-13-22 |
| Antenna, Horn, 18 GHz       | ETS           | 3115                   | 00167211   | 07-27-22 |
| Antenna, Horn, 18 GHz       | ETS           | 3115                   | 00161451   | 08-15-22 |
| Antenna, Horn, 18 GHz       | ETS           | 3117                   | 00168724   | 07-27-22 |
| Antenna, Horn, 18 GHz       | ETS           | 3117                   | 00168717   | 08-15-22 |
| Antenna, Horn, 40 GHz       | ETS           | 3116C                  | 00166155   | 08-04-22 |
| Antenna, Horn, 40 GHz       | ETS           | 3116C                  | 00168645   | 10-02-21 |
| Preamplifier                | ETS           | 3116C-PA               | 00168841   | 08-06-21 |
| Preamplifier, 1000 MHz      | Sonoma        | 310N                   | 341282     | 08-03-21 |
| Preamplifier, 1000 MHz      | Sonoma        | 310N                   | 351741     | 08-03-21 |
| Preamplifier, 1000 MHz      | Sonoma        | 310N                   | 370599     | 08-06-21 |
| Preamplifier, 18 GHz        | Miteq         | AFS42-00101800-25-S-42 | 1876511    | 08-03-21 |
| Preamplifier, 18 GHz        | Miteq         | AFS42-00101800-25-S-42 | 1896138    | 08-03-21 |
| Preamplifier, 18 GHz        | Miteq         | AFS42-00101800-25-S-42 | 2029169    | 08-04-21 |
| Spectrum Analyzer, 44 GHz   | Agilent / HP  | N9030A                 | MY54170614 | 08-05-21 |
| Spectrum Analyzer, 44 GHz   | Agilent / HP  | N9030A                 | MY54490312 | 08-05-21 |
| Spectrum Analyzer, 43.5 GHz | R&S           | FSW43                  | 104089     | 08-06-21 |
| Average Power Sensor        | Agilent / HP  | U2000                  | MY54270007 | 08-05-21 |
| Attenuator                  | PASTERNAK     | PE7087-10              | A001       | 08-03-21 |
| Attenuator                  | PASTERNAK     | PE7087-10              | A008       | 08-03-21 |
| Attenuator                  | PASTERNAK     | PE7004-10              | 2          | 08-04-21 |
| Attenuator                  | PASTERNAK     | PE7087-10              | A009       | 08-03-21 |
| EMI Test Receive, 40 GHz    | R&S           | ESU40                  | 100439     | 08-03-21 |
| EMI Test Receive, 40 GHz    | R&S           | ESU40                  | 100457     | 08-03-21 |
| EMI Test Receive, 3 GHz     | R&S           | ESR3                   | 101832     | 08-03-21 |
| Low Pass Filter 5GHz        | Micro-Tronics | LPS17541               | 009        | 08-03-21 |
| Low Pass Filter 5GHz        | Micro-Tronics | LPS17541               | 015        | 08-03-21 |
| Low Pass Filter 5GHz        | Micro-Tronics | LPS17541               | 020        | 08-04-21 |
| High Pass Filter 3GHz       | Micro-Tronics | HPM17543               | 010        | 08-03-21 |
| High Pass Filter 3GHz       | Micro-Tronics | HPM17543               | 015        | 08-03-21 |
| High Pass Filter 3GHz       | Micro-Tronics | HPM17543               | 020        | 08-04-21 |
| High Pass Filter 6GHz       | Micro-Tronics | HPS17542               | 009        | 08-03-21 |
| High Pass Filter 6GHz       | Micro-Tronics | HPS17542               | 016        | 08-03-21 |
| High Pass Filter 6GHz       | Micro-Tronics | HPS17542               | 021        | 08-04-21 |
| LISN                        | R&S           | ENV-216                | 101837     | 08-06-21 |
| Antenna, Loop, 9kHz-30MHz   | R&S           | HFH2-Z2                | 100418     | 10-02-21 |
| UL Software                 |               |                        |            |          |
| Description                 | Manufacturer  | Model                  | Version    |          |
| Radiated software           | UL            | UL EMC                 | Ver 9.5    |          |
| AC Line Conducted software  | UL            | UL EMC                 | Ver 9.5    |          |

## 8. TEST RESULTS SUMMARY

| FCC Part Section  | Test Description                        | Test Limit     | Test Condition       | Test Result |
|-------------------|---|----------------|----------------------|-------------|
| 15.247 (a)(2)     | Occupied Bandwidth(6dB)                 | > 500kHz       | Conducted            | PASS        |
| 2.1051, 15.247(d) | Band Edge / Conducted Spurious Emission | -20 dBc        |                      | PASS        |
| 15.247 (b)(3)     | TX conducted output power               | < 30 dBm       |                      | PASS        |
| 15.247(e)         | PSD                                     | < 8 dBm/3kHz   |                      | PASS        |
| 15.207(a)         | AC Power Line conducted emissions       | Section 11     | Power Line conducted | PASS        |
| 15.205, 15.209    | Radiated Spurious Emission              | < 54dBuV/m(Av) | Radiated             | PASS        |

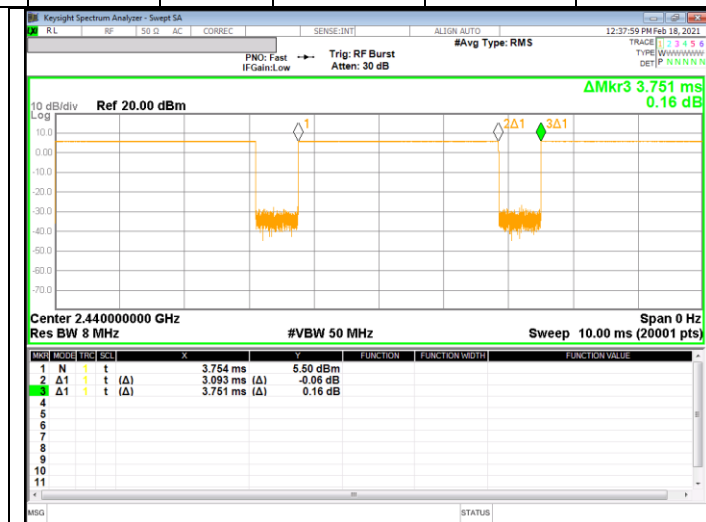
## 9. ANTENNA PORT TEST RESULTS

### 9.1. ON TIME AND DUTY CYCLE

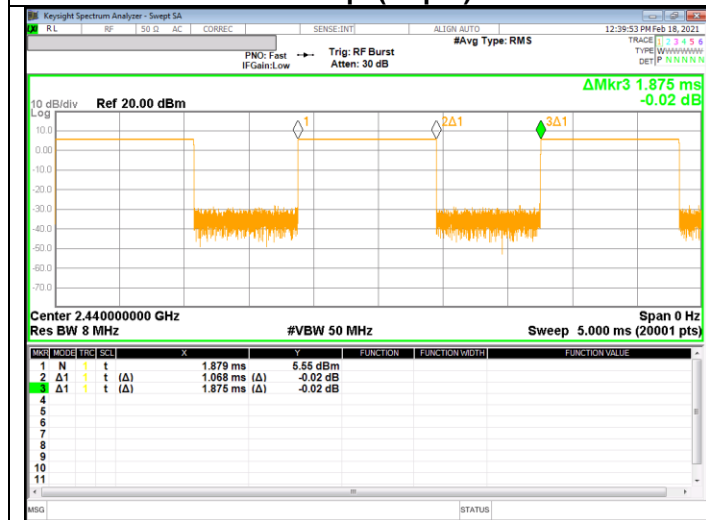
#### LIMITS

None; for reporting purposes only.

| Mode                      | On time [msec] | Period [msec] | Duty cycle x [Linear] | Duty Cycle [%] | Duty Cycle Correction Factor [dB] | 1/T Minimum CBW [kHz] |
|---------------------------|----------------|---------------|-----------------------|----------------|-----------------------------------|-----------------------|
| 2 400 ~ 2 483.5 MHz Bands |                |               |                       |                |                                   |                       |
| 125 kbps [37pkt]          | 3.093          | 3.751         | 0.825                 | 82.458         | 0.84                              | 0.323                 |
| 2 Mbps [255pkt]           | 1.068          | 1.875         | 0.570                 | 56.960         | 2.44                              | 0.936                 |



125 kbps(37 pkt)



2 Mbps(255 pkt)

**9.2. 6 dB & 99% BANDWIDTH**

**LIMITS**

FCC §15.247 (a) (2)

RSS-247 5.2 (a)

The minimum 6 dB bandwidth shall be at least 500 kHz.

**RESULTS**

**9.2.1. 125 kbps**

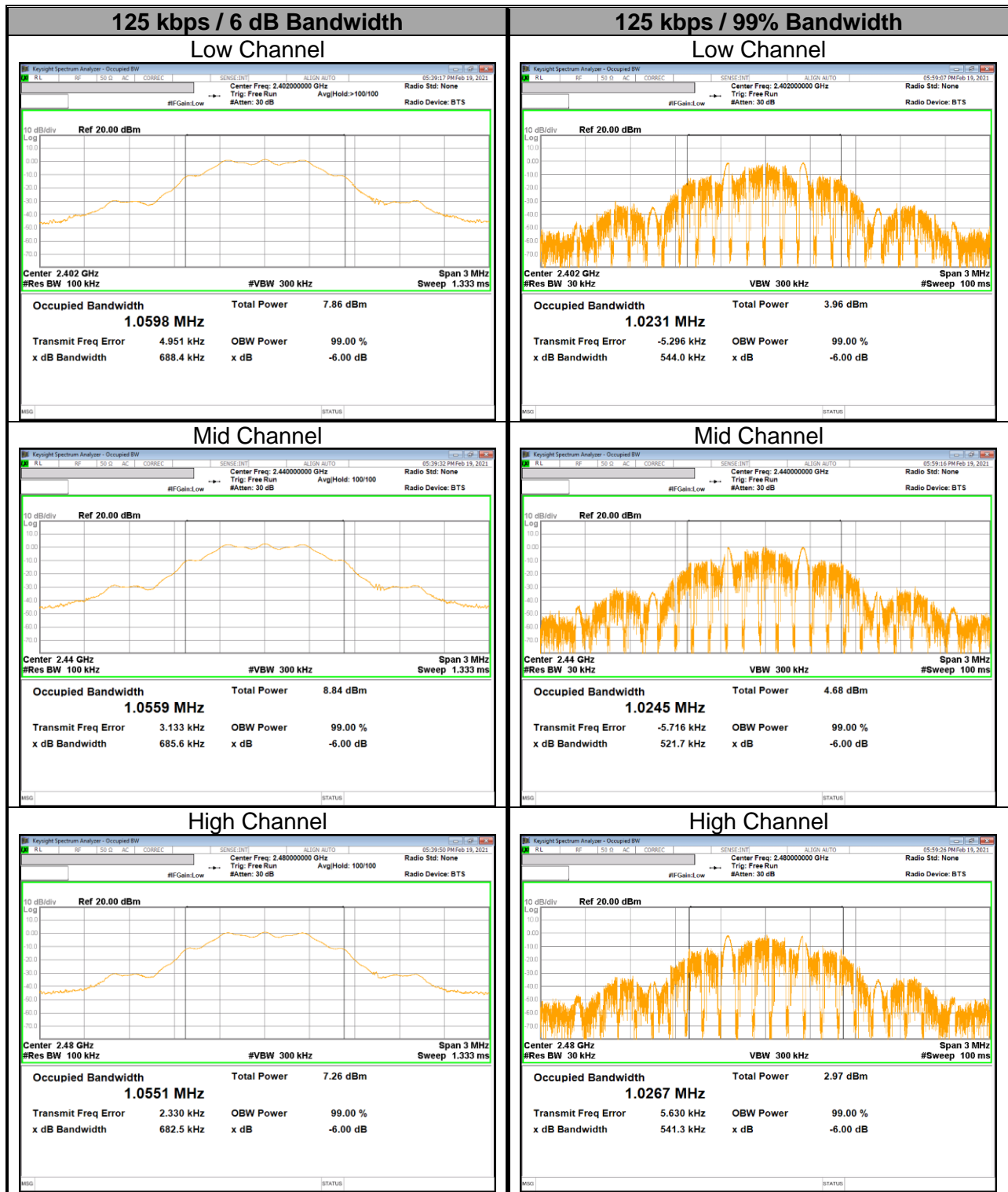
| Channel | Frequency [MHz] | 6 dB Bandwidth [kHz] | Minimum Limit [kHz] | 99% Bandwidth [kHz] |
|---------|-----------------|----------------------|---------------------|---------------------|
| Low     | 2 402           | 688.4                | 500.0               | 1 023.1             |
| Mid     | 2 440           | 685.6                | 500.0               | 1 024.5             |
| High    | 2 480           | <b>682.5</b>         | 500.0               | 1 026.7             |

**9.2.2. 2 Mbps**

| Channel | Frequency [MHz] | 6 dB Bandwidth [kHz] | Minimum Limit [kHz] | 99% Bandwidth [kHz] |
|---------|-----------------|----------------------|---------------------|---------------------|
| Low     | 2 402           | <b>1 169.0</b>       | 500.00              | 2 108.8             |
| Mid     | 2 440           | 1 172.0              | 500.00              | 2 068.0             |
| High    | 2 480           | 1 173.0              | 500.00              | 2 066.0             |



**9.2.3. 6 dB & 99% BANDWIDTH PLOTS**





### 9.3. OUTPUT POWER

#### LIMITS

FCC §15.247 (b) (3)

The maximum antenna gain is less than or equal to 6 dBi, therefore the limit is 30 dBm.

#### TEST PROCEDURE

Peak power is measured using ANSI C63.10(2013) under section 11.9.1.1 utilizing spectrum analyzer.

#### RESULTS

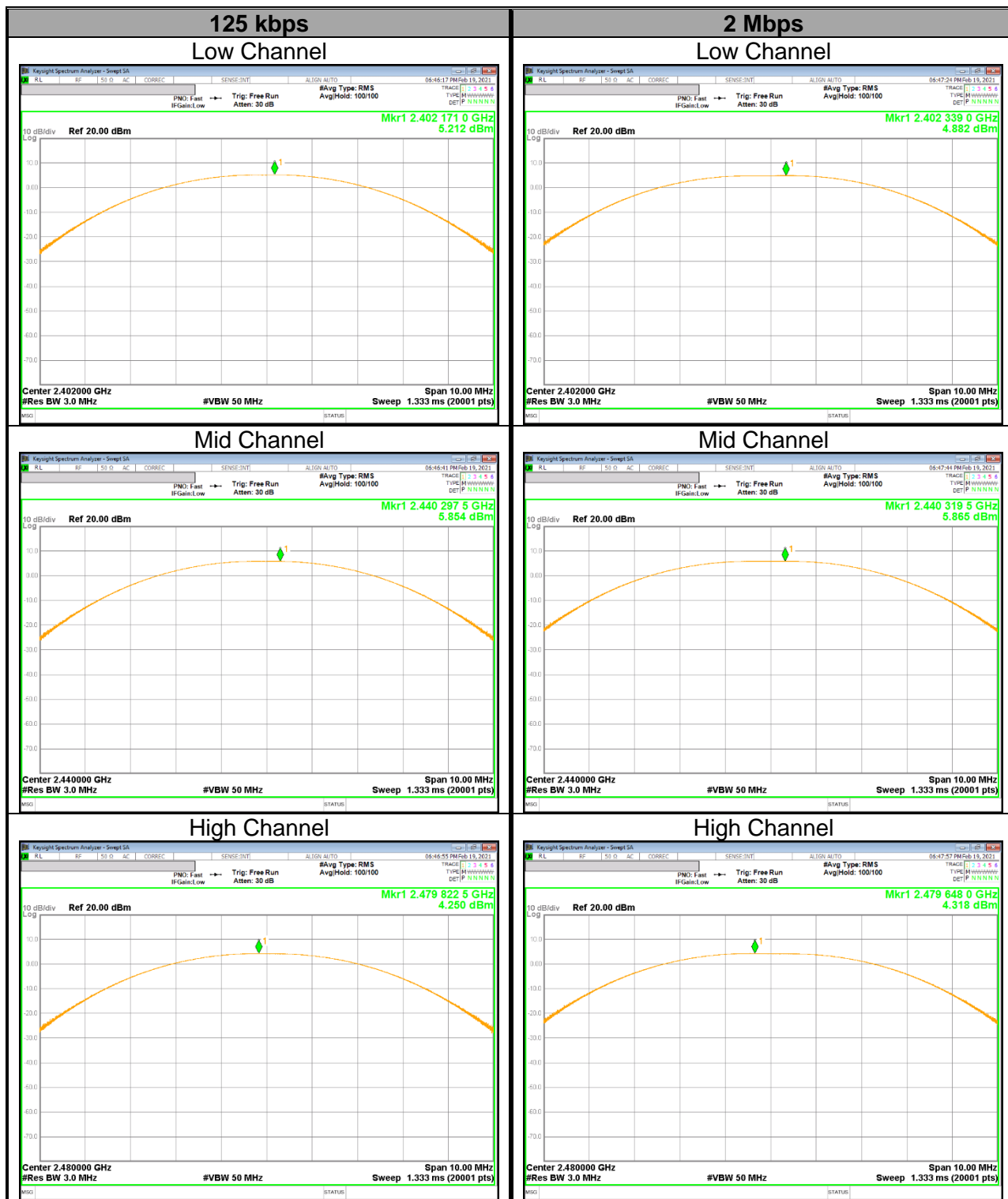
##### 9.3.1. 125 kbps

| Channel      | Frequency [MHz] | Peak Power [dBm] | Limit [dBm]   | Margin [dB]    |
|--------------|-----------------|------------------|---------------|----------------|
| Low          | 2402            | 5.212            | 30.000        | -24.788        |
| Mid          | 2440            | 5.854            | 30.000        | -24.146        |
| High         | 2480            | 4.250            | 30.000        | -25.750        |
| <b>Worst</b> |                 | <b>5.854</b>     | <b>30.000</b> | <b>-24.146</b> |

##### 9.3.2. 2 Mbps

| Channel      | Frequency [MHz] | Peak Power [dBm] | Limit [dBm]   | Margin [dB]    |
|--------------|-----------------|------------------|---------------|----------------|
| Low          | 2402            | 4.882            | 30.000        | -25.118        |
| Mid          | 2440            | 5.865            | 30.000        | -24.135        |
| High         | 2480            | 4.318            | 30.000        | -25.682        |
| <b>Worst</b> |                 | <b>5.865</b>     | <b>30.000</b> | <b>-24.135</b> |

### 9.3.3. PEAK POWER PLOTS



## 9.4. AVERAGE POWER

### LIMITS

None; for reporting purposes only.

### TEST PROCEDURE

Measurements perform using a wideband RF frame average power sensor. The cable assembly insertion loss and duty cycle correction factor were entered as an offset in the power meter to allow for direct reading of power.

### RESULTS

#### 9.4.1. 125 kbps

| Channel | Frequency [MHz] | AV Power [dBm] | AV Power [mW] |
|---------|-----------------|----------------|---------------|
| Low     | 2402            | 4.857          | 3.060         |
| Mid     | 2440            | 5.828          | 3.827         |
| High    | 2480            | 4.077          | 2.557         |

#### 9.4.2. 2 Mbps

| Channel | Frequency [MHz] | AV Power [dBm] | AV Power [mW] |
|---------|-----------------|----------------|---------------|
| Low     | 2402            | 4.440          | 2.780         |
| Mid     | 2440            | 5.421          | 3.484         |
| High    | 2480            | 3.690          | 2.339         |

## 9.5. POWER SPECTRAL DENSITY

### LIMITS

FCC §15.247 (e)

RSS-247 (5.2) (b)

The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

### RESULTS

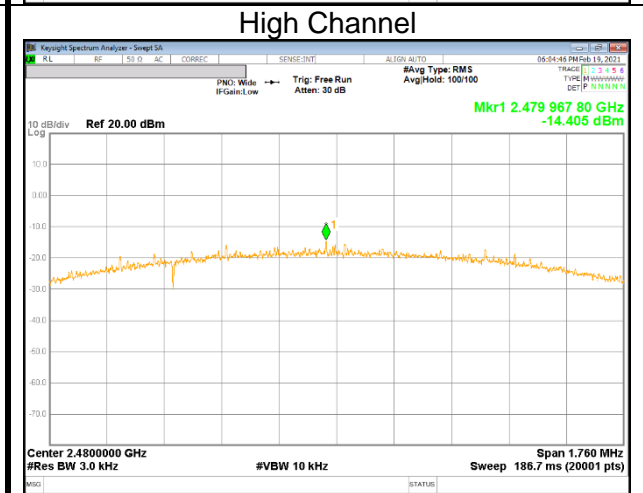
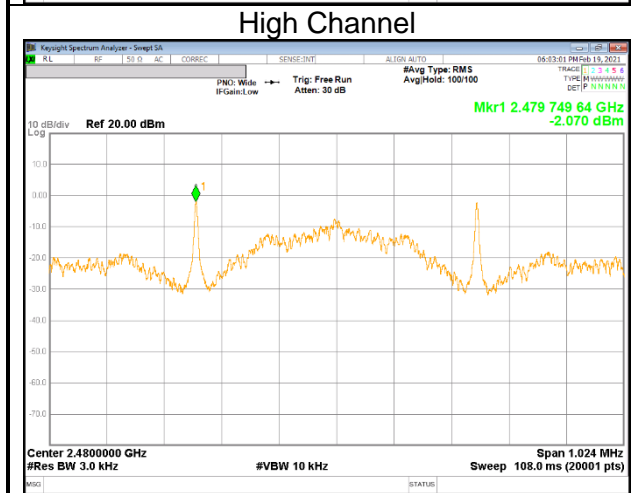
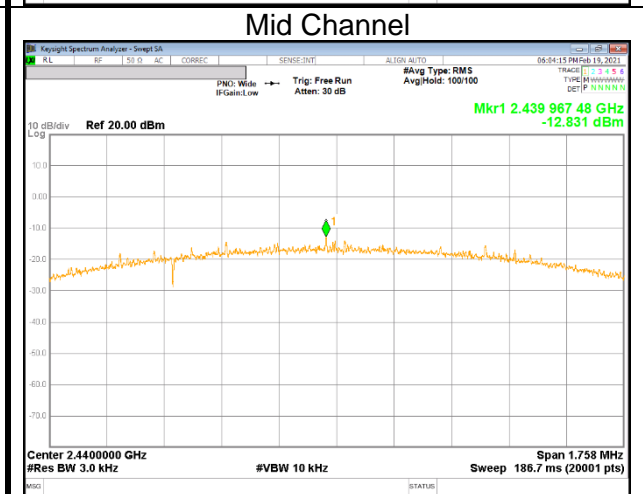
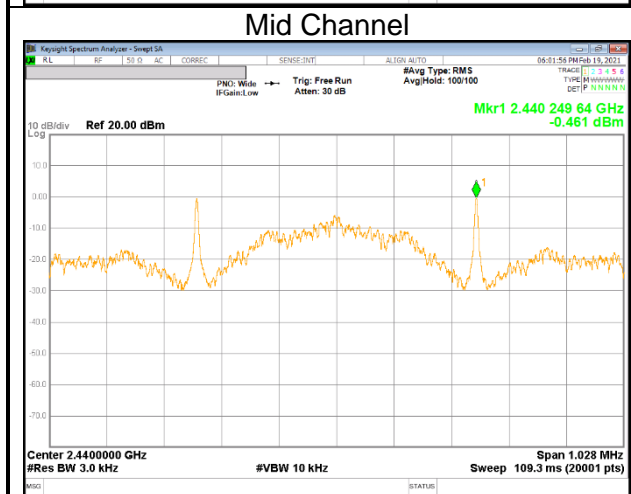
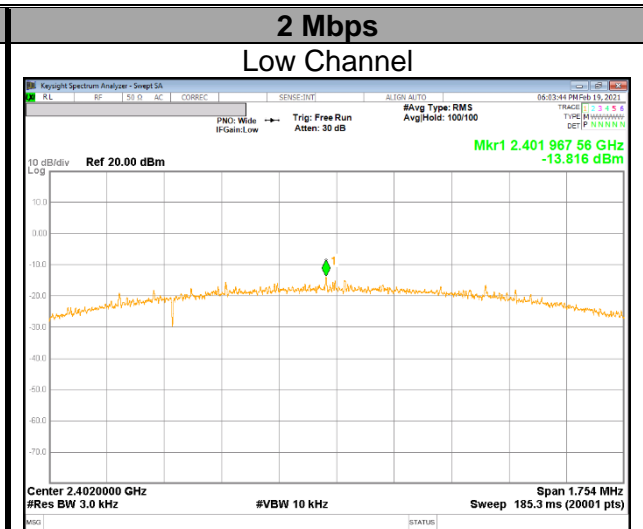
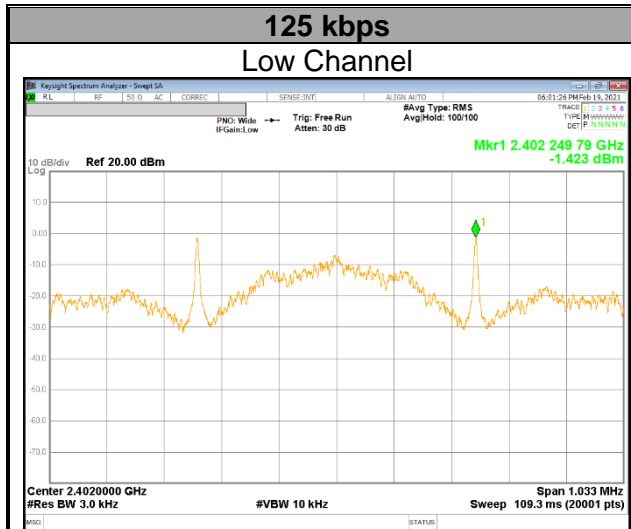
#### 9.5.1. 125 kbps

| Channel | Frequency [MHz] | PSD [dBm/3kHz] | Limit [dBm/3kHz] | Margin [dB] |
|---------|-----------------|----------------|------------------|-------------|
| Low     | 2402            | -1.423         | 8.000            | -9.423      |
| Mid     | 2440            | -0.461         | 8.000            | -8.461      |
| High    | 2480            | -2.070         | 8.000            | -10.070     |

#### 9.5.2. 2Mbps

| Channel | Frequency [MHz] | PSD [dBm/3kHz] | Limit [dBm/3kHz] | Margin [dB] |
|---------|-----------------|----------------|------------------|-------------|
| Low     | 2402            | -13.816        | 8.000            | -21.816     |
| Mid     | 2440            | -12.831        | 8.000            | -20.831     |
| High    | 2480            | -14.405        | 8.000            | -22.405     |

9.5.3. PSD TEST PLOTS



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## **9.6. CONDUCTED SPURIOUS EMISSIONS**

### **LIMITS**

FCC §15.247 (d)

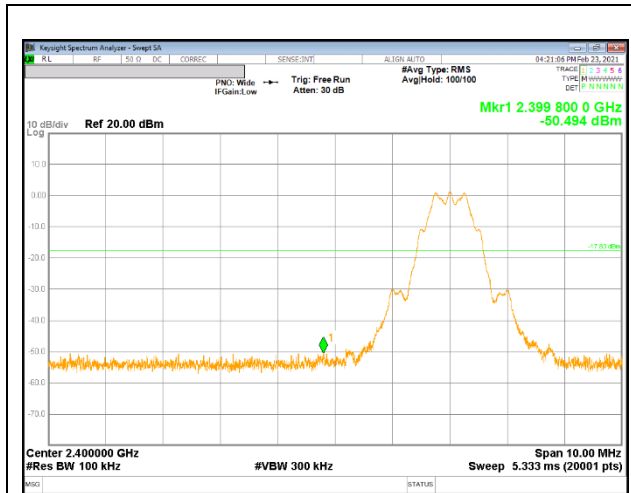
RSS-247 5.5

Output power was measured based on the use of a peak measurement.  
Therefore, spurious emissions are required to be 20 dBc.

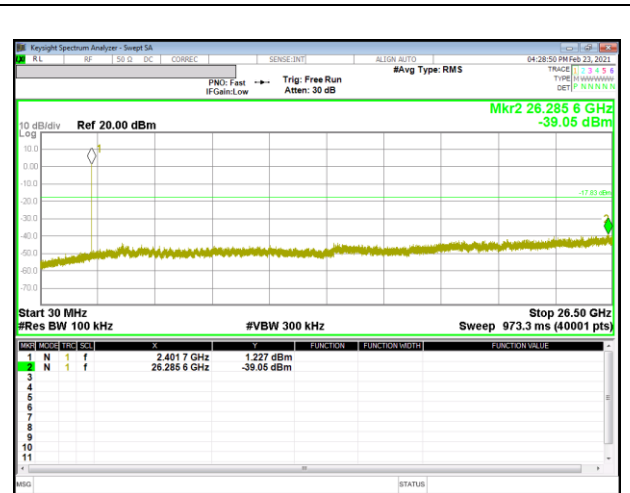
### **RESULTS**



### 9.6.1. 125 kbps



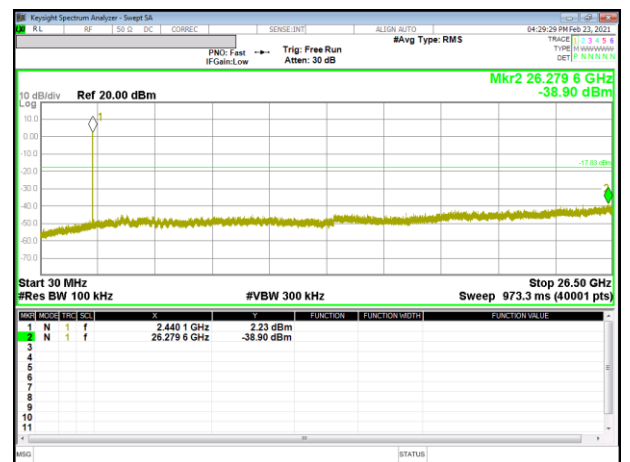
**LOW CHANNEL BANDEDGE**



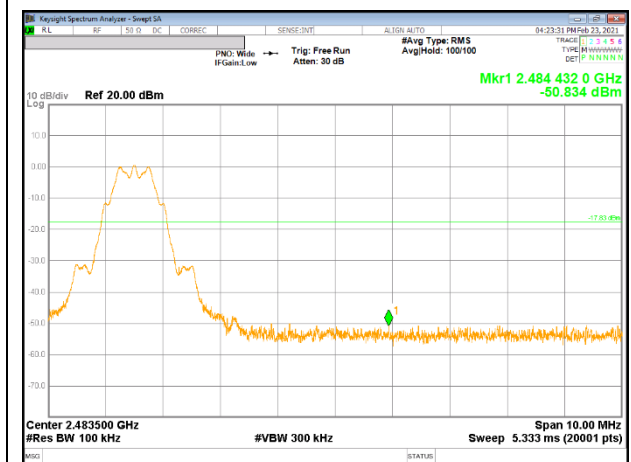
**OUT-OF-BAND LOW CHANNEL**



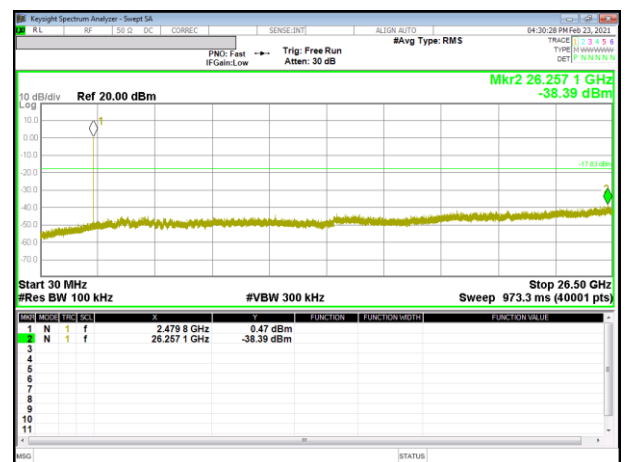
**IN-BAND REFERENCE LEVEL**



**OUT-OF-BAND MID CHANNEL**

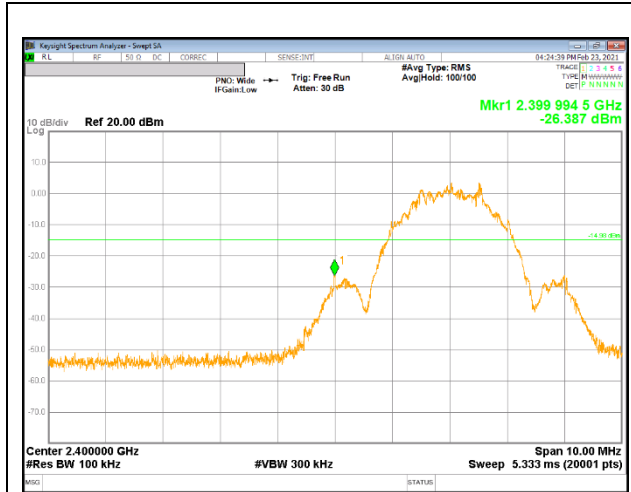


**HIGH CHANNEL BANDEDGE**

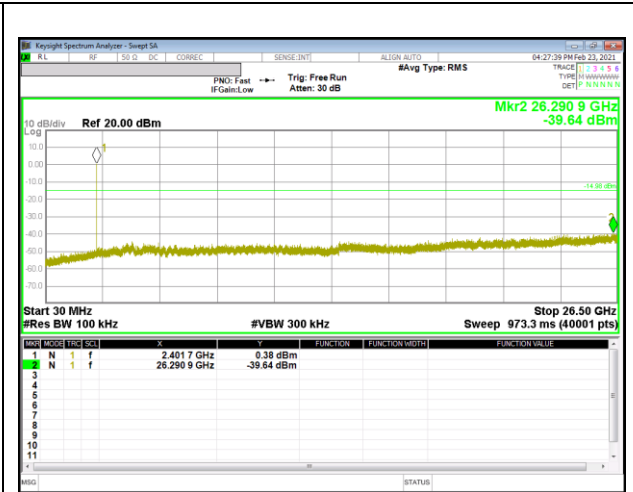


**OUT-OF-BAND HIGH CHANNEL**

9.6.2. 2Mbps



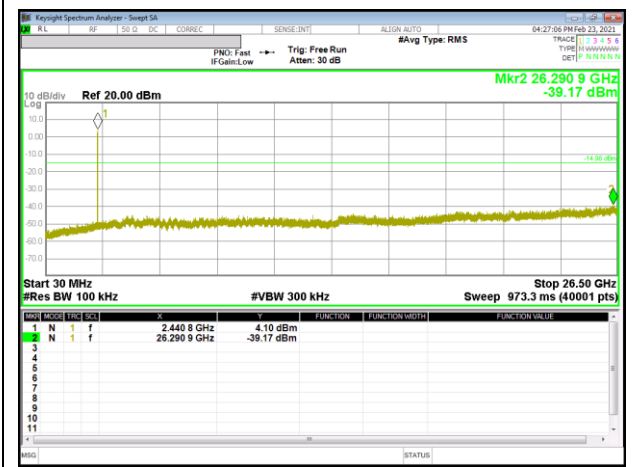
LOW CHANNEL BANDEDGE



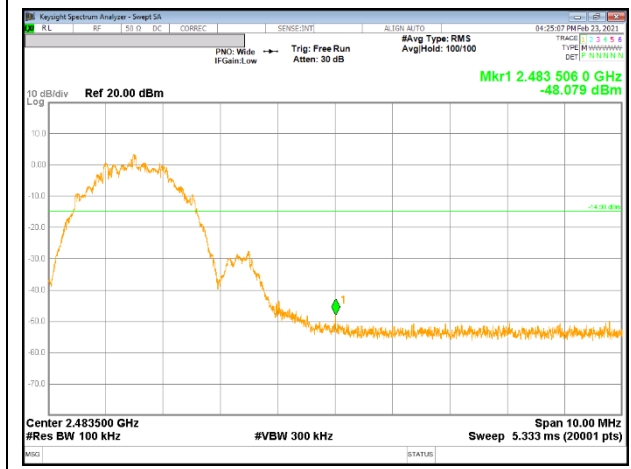
OUT-OF-BAND LOW CHANNEL



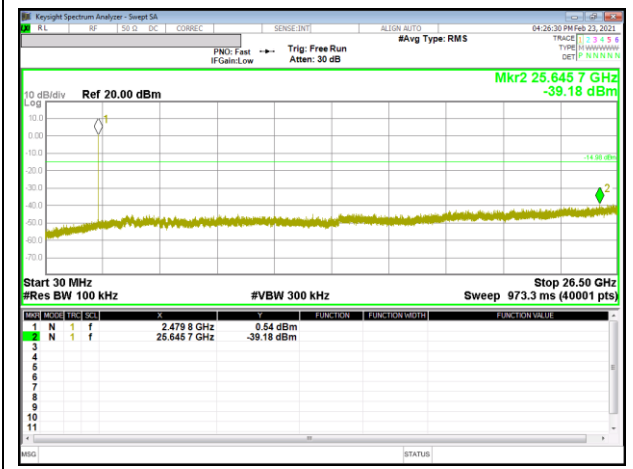
IN-BAND REFERENCE LEVEL



OUT-OF-BAND MID CHANNEL



HIGH CHANNEL BANDEDGE



OUT-OF-BAND HIGH CHANNEL

## 10. RADIATED TEST RESULTS

### 10.1. LIMITS AND PROCEDURE

#### LIMITS

FCC §15.205 and §15.209

| Limits for radiated disturbance of an intentional radiator |                            |                          |
|--|----------------------------|--------------------------|
| Frequency range (MHz)                                      | Limits ( $\mu\text{V/m}$ ) | Measurement Distance (m) |
| 0.009 – 0.490  | 2400 / F (kHz)             | 300                      |
| 0.490 – 1.705  | 24000 / F (kHz)            | 30                       |
| 1.705 – 30.0   | 30                         | 30                       |
| 30 – 88  | 100**                      | 3                        |
| 88 - 216   | 150**                      | 3                        |
| 216 – 960  | 200**                      | 3                        |
| Above 960  | 500                        | 3                        |

\*\* Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g. §§ 15.231 and 15.241.

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## **TEST PROCEDURE**

The EUT is placed on a non-conducting table 80 cm above the ground plane for below 1GHz and 150 cm for above 1GHz. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.10. The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 3 MHz for peak measurements and add duty cycle factor for average measurements. (Restricted bandedge, Final detection of spurious harmonic emissions) Duty cycle factor =  $10 \log(1/x)$ . For this sample: For 125 kbps, DCF =  $10 \log(1/0.825) = 0.838$  dB (Spectrum Analyzer round it up to 0.84 dB) and for 2 Mbps, DCF =  $10 \log(1/0.570) = 2.444$  dB (Spectrum Analyzer round it up to 2.44 dB)

Pre-scans to detect harmonic and spurious emissions, the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 30 kHz for peak measurements.

The spectrum from 1 GHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.  
(From 30MHz to 1GHz, test was performed with the EUT set to transmit at the channel with highest output power)

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

Note : Emission was pre-scanned from 9kHz to 30MHz; No emissions were detected which was at least 20dB below the specification limit (consider distance correction factor).  
Per FCC part 15.31(o), test results were not reported.

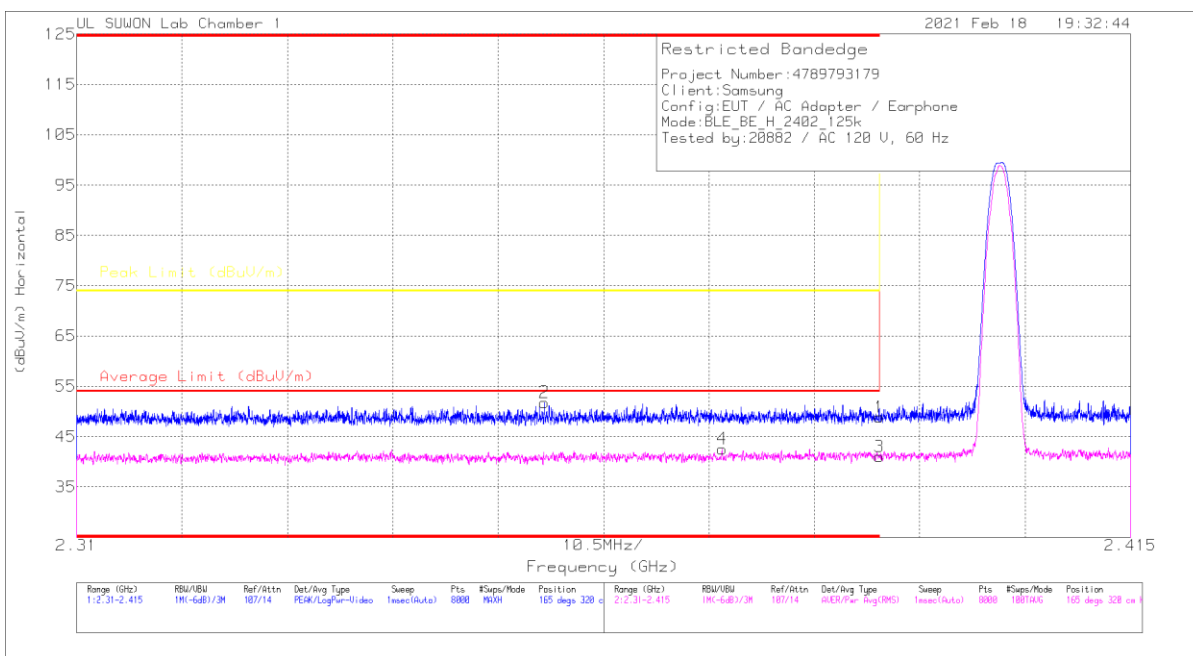
Although these tests were performed other than open field test site, adequate comparison measurements were confirmed against 30 m open are test site.  
Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the one of tests made in an open field based on KDB 414788.

## 10.2. TRANSMITTER ABOVE 1 GHz

### 10.2.1. 125 kbps

#### BANDEDGE (LOW CHANNEL)

#### HORIZONTAL RESULT

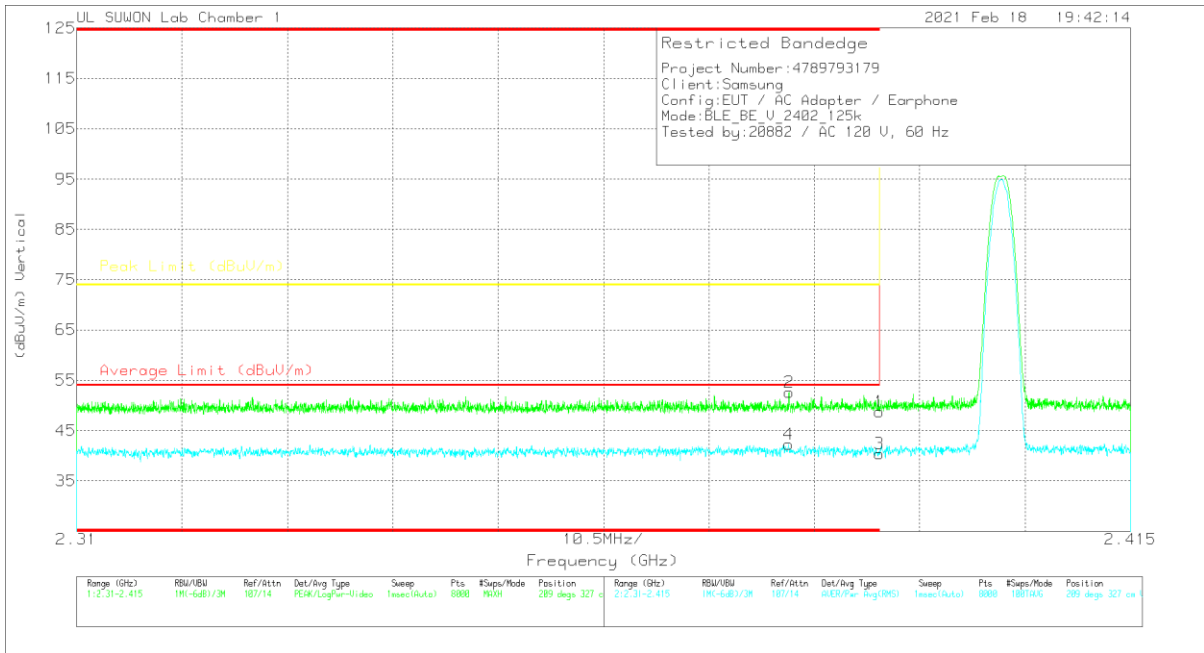


#### Trace Markers

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | 3117_00168717 | 10dB_ATT[dB] | DC Cor (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|-----|---------------|--------------|-------------|----------------------------|------------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1      | * 2.39          | 42.64                | Pk  | 31.8          | -25.6        | 0           | 48.84                      | -                      | -           | 74                  | -25.16         | 165            | 320         | H        |
| 2      | * 2.3566        | 45.81                | Pk  | 31.7          | -25.7        | 0           | 51.81                      | -                      | -           | 74                  | -22.19         | 165            | 320         | H        |
| 3      | * 2.39          | 33.98                | RMS | 31.8          | -25.6        | .84         | 41.02                      | 54                     | -12.98      | -                   | -              | 165            | 320         | H        |
| 4      | * 2.37432       | 35.65                | RMS | 31.7          | -25.6        | .84         | 42.59                      | 54                     | -11.41      | -                   | -              | 165            | 320         | H        |

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band  
 Pk - Peak detector  
 RMS - RMS detection

**VERTICAL RESULT**



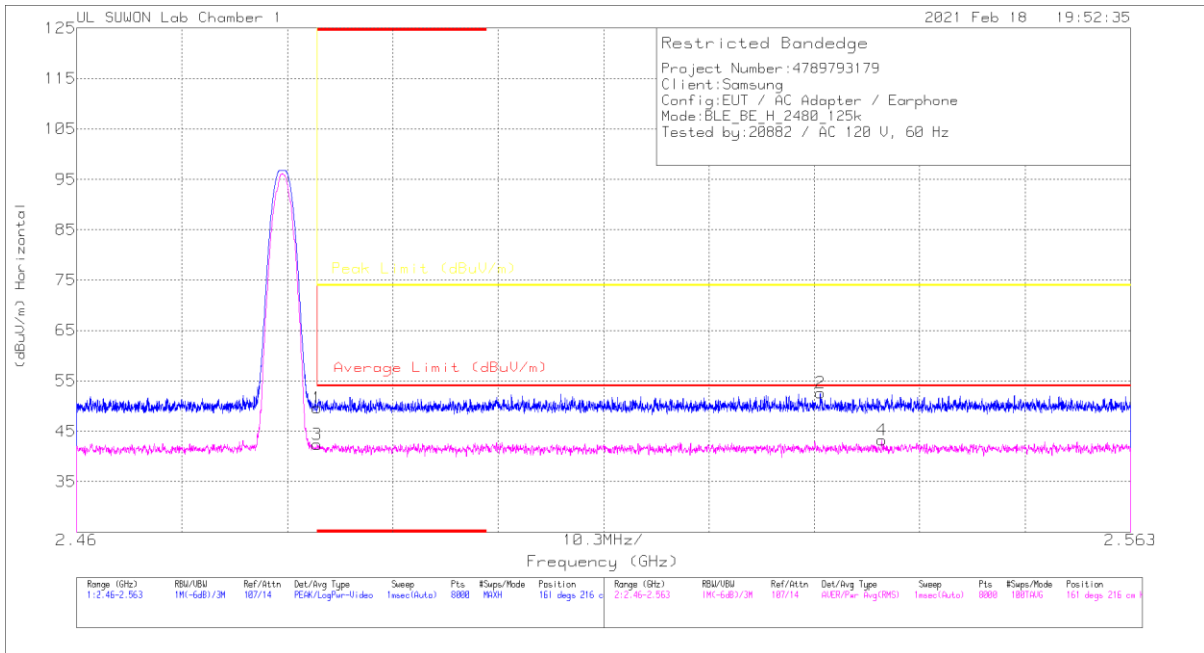
**Trace Markers**

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | 3117_00168717 | 10dB_ATT[dB] | DC Cor (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|-----|---------------|--------------|-------------|----------------------------|------------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1      | * 2.39          | 42.55                | Pk  | 31.8          | -25.6        | 0           | 48.75                      | -                      | -           | 74                  | -25.25         | 209            | 327         | V        |
| 2      | * 2.38096       | 46.41                | Pk  | 31.8          | -25.6        | 0           | 52.61                      | -                      | -           | 74                  | -21.39         | 209            | 327         | V        |
| 3      | * 2.39          | 33.38                | RMS | 31.8          | -25.6        | .84         | 40.42                      | 54                     | -13.58      | -                   | -              | 209            | 327         | V        |
| 4      | * 2.38093       | 35.19                | RMS | 31.8          | -25.6        | .84         | 42.23                      | 54                     | -11.77      | -                   | -              | 209            | 327         | V        |

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band  
 PK - Peak detector  
 RMS - RMS detection

**BANDEDGE (HIGH CHANNEL)**

**HORIZONTAL RESULT**

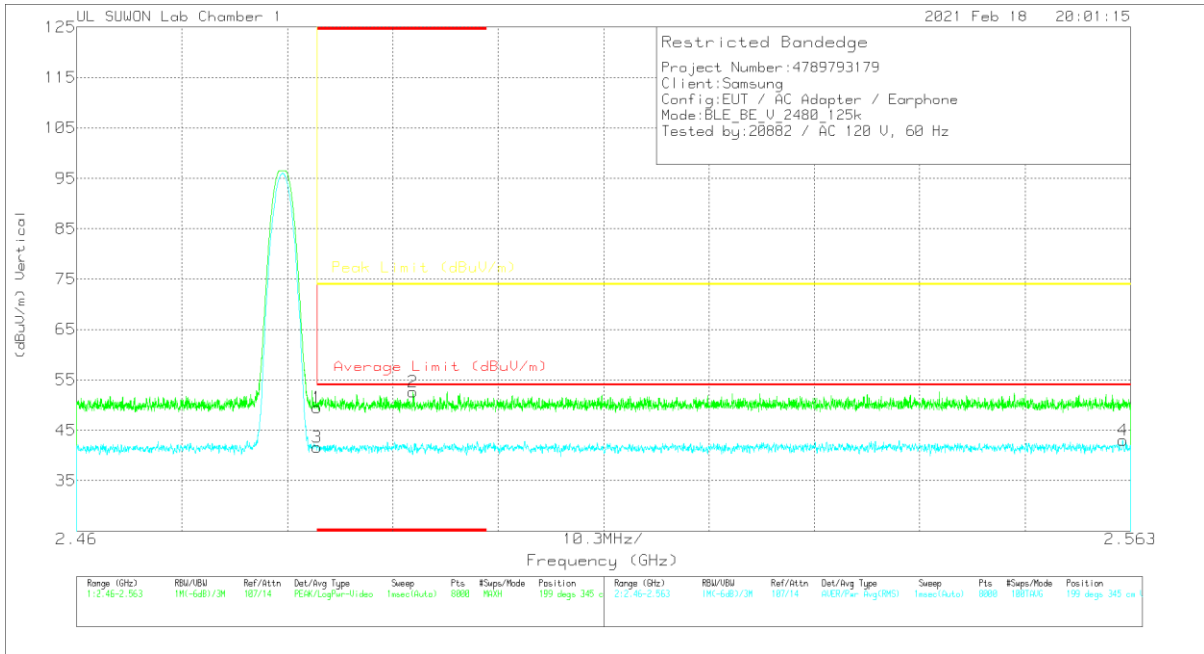


**Trace Markers**

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | 3117_00168717 | 10dB_ATT[dB] | DC Corr (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|-----|---------------|--------------|--------------|----------------------------|------------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1      | * 2.4835        | 42.93                | PK  | 32            | -25.3        | 0            | 49.63                      | -                      | -           | 74                  | -24.37         | 161            | 216         | H        |
| 2      | 2.53268         | 45.72                | PK  | 32            | -25.1        | 0            | 52.62                      | -                      | -           | 74                  | -21.38         | 161            | 216         | H        |
| 3      | * 2.4835        | 34.87                | RMS | 32            | -25.3        | .84          | 42.41                      | 54                     | -11.59      | -                   | -              | 161            | 216         | H        |
| 4      | 2.53869         | 35.59                | RMS | 32            | -25.1        | .84          | 43.33                      | 54                     | -10.67      | -                   | -              | 161            | 216         | H        |

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band  
 PK - Peak detector  
 RMS - RMS detection

### VERTICAL RESULT



### Trace Markers

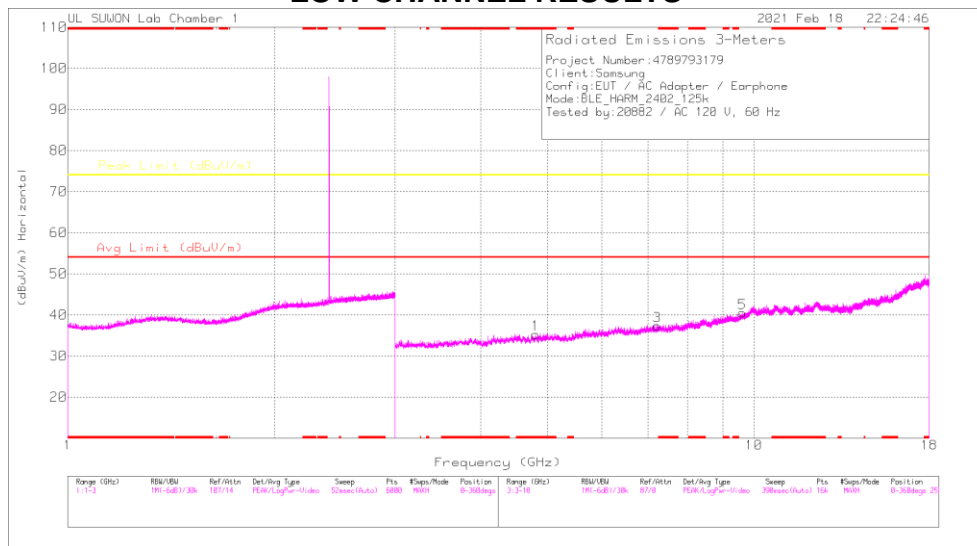
| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | 3117_00168717 | 10dB_ATT[dB] | DC Corr (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|-----|---------------|--------------|--------------|----------------------------|------------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1      | * 2.4835        | 42.84                | PK  | 32            | -25.3        | 0            | 49.54                      | -                      | -           | 74                  | -24.46         | 199            | 345         | V        |
| 2      | * 2.49288       | 45.85                | PK  | 32            | -25.2        | 0            | 52.65                      | -                      | -           | 74                  | -21.35         | 199            | 345         | V        |
| 3      | * 2.4835        | 34.13                | RMS | 32            | -25.3        | .84          | 41.67                      | 54                     | -12.33      | -                   | -              | 199            | 345         | V        |
| 4      | 2.56224         | 35.17                | RMS | 32.1          | -25.1        | .84          | 43.01                      | 54                     | -10.99      | -                   | -              | 199            | 345         | V        |

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band  
 PK - Peak detector  
 RMS - RMS detection

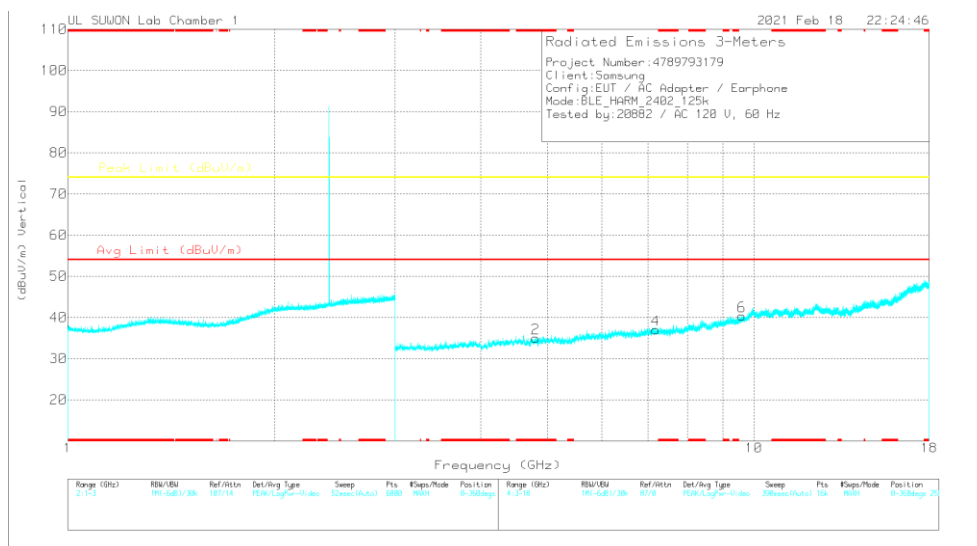


**HARMONICS AND SPURIOUS EMISSIONS**

**LOW CHANNEL RESULTS**



**HORIZONTAL**



**VERTICAL**

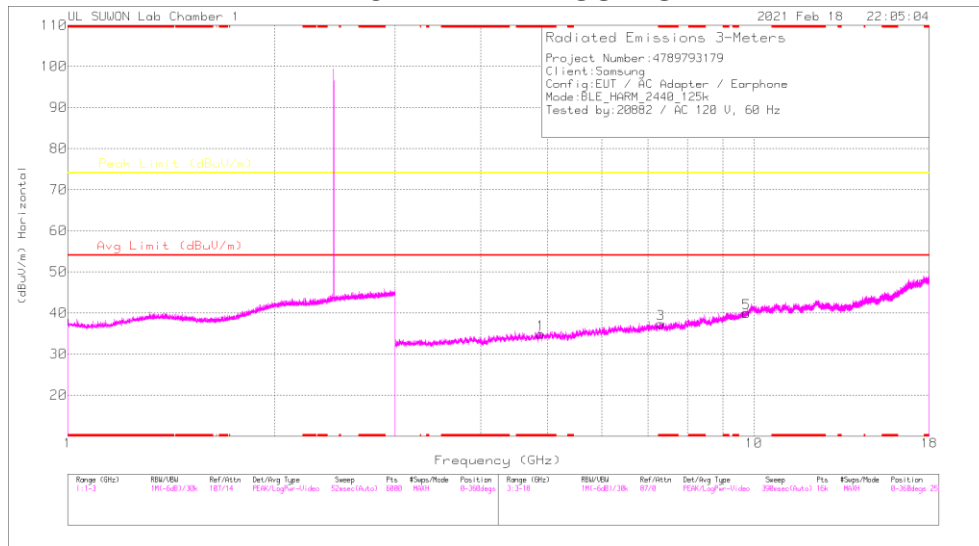
Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

**RADIATED EMISSIONS**

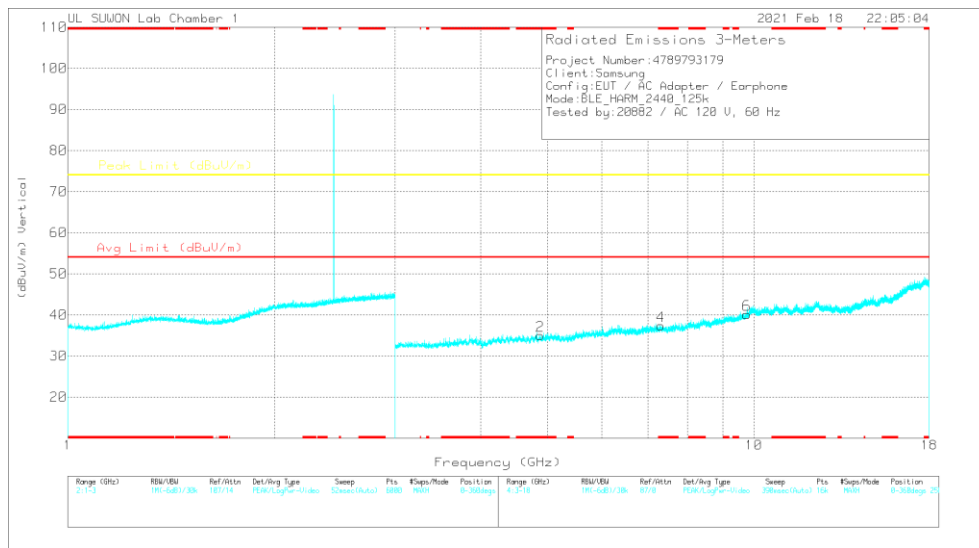
| Frequency (GHz) | Meter Reading (dBuV) | Det | 3117_00168717 | 3GHz_HPI[dB] | DC Corr (dB) | Corrected Reading (dBuV/m) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|-----------------|----------------------|-----|---------------|--------------|--------------|----------------------------|--------------------|-------------|---------------------|-------------|----------------|-------------|----------|
| * 4.80485       | 40.74                | PK2 | 34.1          | -31.4        | 0            | 43.44                      | -                  | -           | 74                  | -30.56      | 360            | 100         | H        |
| * 4.80579       | 40.92                | PK2 | 34.1          | -31.4        | 0            | 43.62                      | -                  | -           | 74                  | -30.38      | 360            | 100         | V        |
| 7.22259         | 37.56                | PK2 | 35.9          | -27.5        | 0            | 45.96                      | -                  | -           | 74                  | -28.04      | 360            | 100         | H        |
| 7.19447         | 37.83                | PK2 | 35.9          | -27.7        | 0            | 46.03                      | -                  | -           | 74                  | -27.97      | 360            | 100         | V        |
| 9.62357         | 36.48                | PK2 | 37.2          | -23          | 0            | 50.68                      | -                  | -           | 74                  | -23.32      | 360            | 100         | H        |
| 9.62274         | 35.5                 | PK2 | 37.2          | -23.1        | 0            | 49.6                       | -                  | -           | 74                  | -24.4       | 360            | 100         | V        |

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band  
 PK2 - KDB558074 Method: Maximum Peak

### MID CHANNEL RESULTS



### HORIZONTAL



### VERTICAL

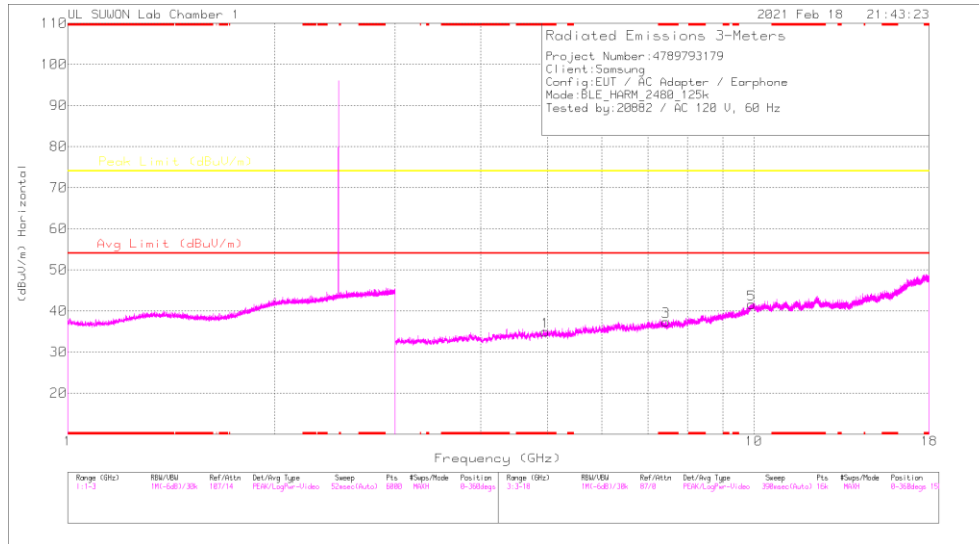
Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

### RADIATED EMISSIONS

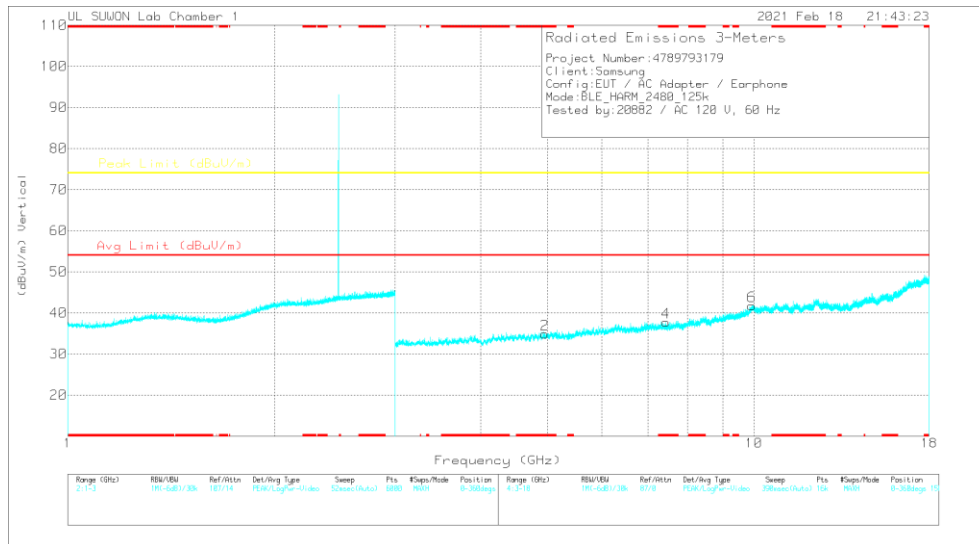
| Frequency (GHz) | Meter Reading (dBuV) | Det | 3117_00168717 | 3GHz_HP[dB] | DC Corr (dB) | Corrected Reading (dBuV/m) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|-----------------|----------------------|-----|---------------|-------------|--------------|----------------------------|--------------------|-------------|---------------------|-------------|----------------|-------------|----------|
| * 4.88591       | 41.01                | PK2 | 34.1          | -31.4       | 0            | 43.71                      | -                  | -           | 74                  | -30.29      | 360            | 100         | H        |
| * 4.87658       | 41.61                | PK2 | 34.1          | -31.4       | 0            | 44.31                      | -                  | -           | 74                  | -29.69      | 360            | 100         | V        |
| * 7.31955       | 38.52                | PK2 | 35.8          | -27.2       | 0            | 47.12                      | -                  | -           | 74                  | -26.88      | 360            | 100         | H        |
| * 7.31767       | 37.88                | PK2 | 35.8          | -27.4       | 0            | 46.28                      | -                  | -           | 74                  | -27.72      | 360            | 100         | V        |
| 9.76063         | 35.58                | PK2 | 37.4          | -23.7       | 0            | 49.28                      | -                  | -           | 74                  | -24.72      | 360            | 100         | H        |
| 9.76028         | 36.26                | PK2 | 37.4          | -23.7       | 0            | 49.96                      | -                  | -           | 74                  | -24.04      | 360            | 100         | V        |

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band  
 PK2 - KDB558074 Method: Maximum Peak

### HIGH CHANNEL RESULTS



### HORIZONTAL



### VERTICAL

Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

### RADIATED EMISSIONS

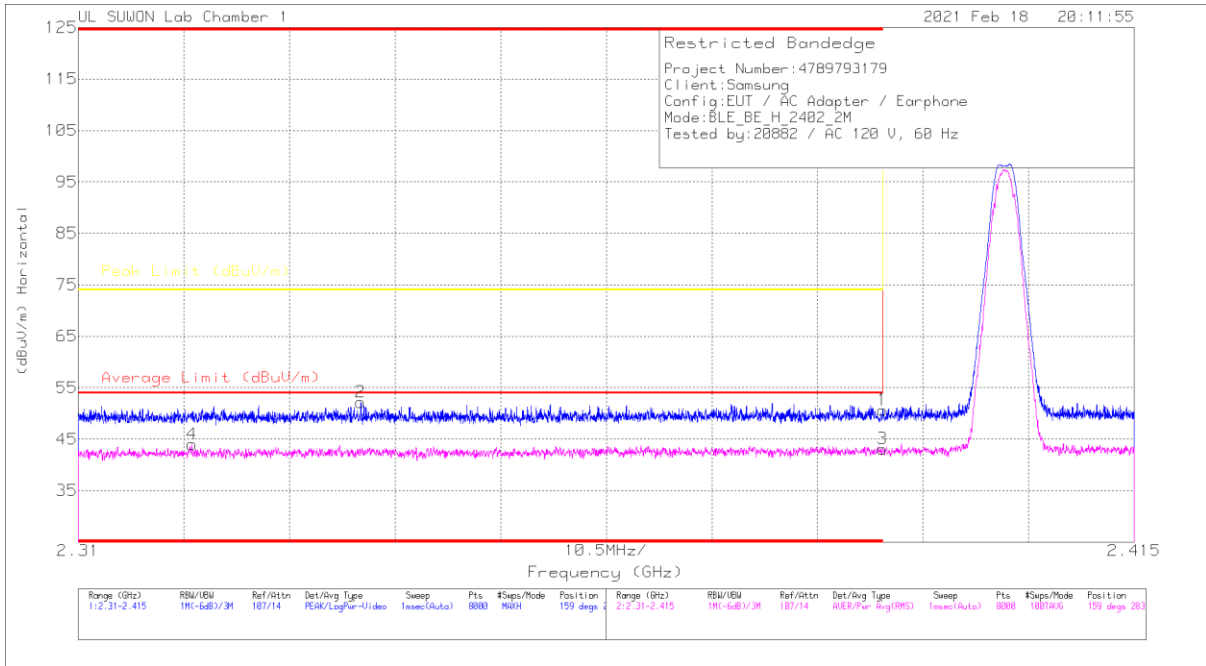
| Frequency (GHz) | Meter Reading (dBuV) | Det | 3117_00168717 | 3GHz_HP[dB] | DC Corr (dB) | Corrected Reading (dBuV/m) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|-----------------|----------------------|-----|---------------|-------------|--------------|----------------------------|--------------------|-------------|---------------------|-------------|----------------|-------------|----------|
| * 4.96205       | 40.77                | PK2 | 34.1          | -31.4       | 0            | 43.47                      | -                  | -           | 74                  | -30.53      | 360            | 100         | H        |
| * 4.96393       | 40.81                | PK2 | 34.1          | -31.4       | 0            | 43.51                      | -                  | -           | 74                  | -30.49      | 360            | 100         | V        |
| * 7.43827       | 37.79                | PK2 | 35.8          | -26.8       | 0            | 46.79                      | -                  | -           | 74                  | -27.21      | 360            | 100         | H        |
| * 7.43966       | 37.06                | PK2 | 35.8          | -26.8       | 0            | 46.06                      | -                  | -           | 74                  | -27.94      | 360            | 100         | V        |
| 9.92135         | 35.23                | PK2 | 37.7          | -21.5       | 0            | 51.43                      | -                  | -           | 74                  | -22.57      | 360            | 100         | H        |
| 9.92081         | 35.06                | PK2 | 37.7          | -21.6       | 0            | 51.16                      | -                  | -           | 74                  | -22.84      | 360            | 100         | V        |

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band  
 PK2 - KDB558074 Method: Maximum Peak

**10.2.2. 2Mbps**

**BANDEDGE (LOW CHANNEL)**

**HORIZONTAL RESULT**

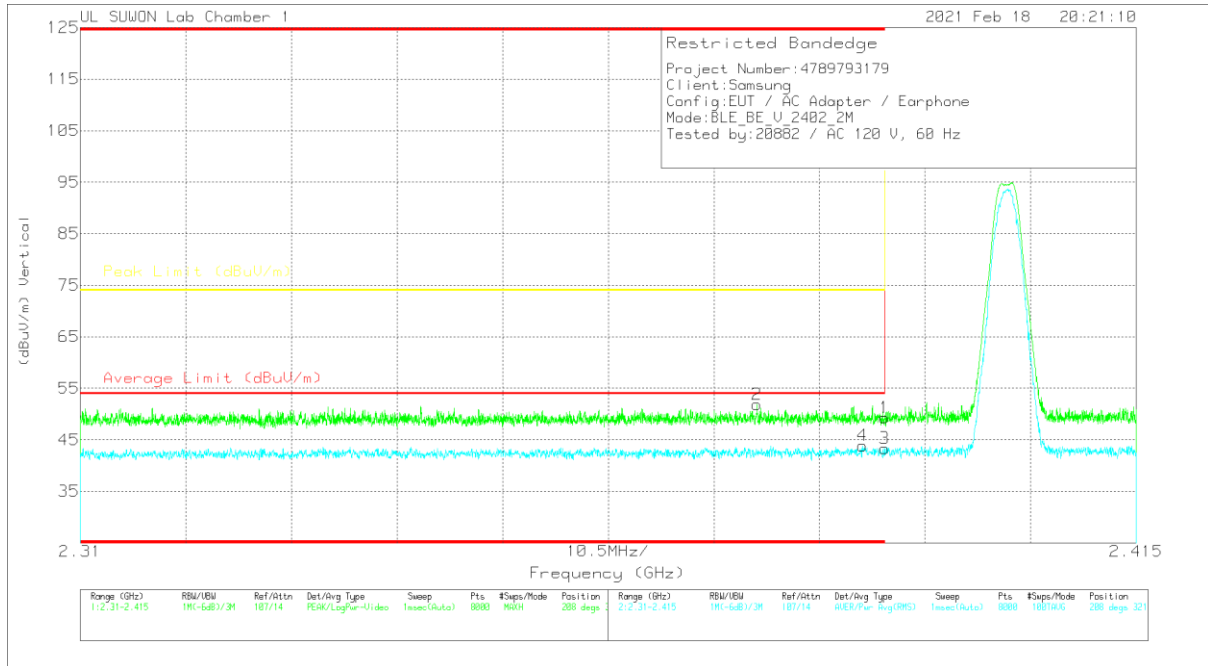


**Trace Markers**

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | 3117_00168717 | 10dB_ATT[dB] | DC Corr (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Asimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|-----|---------------|--------------|--------------|----------------------------|------------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1      | * 2.39          | 44.49                | Pk  | 31.8          | -25.6        | 0            | 50.69                      | -                      | -           | 74                  | -23.31         | 159            | 283         | H        |
| 2      | * 2.33809       | 46.09                | Pk  | 31.7          | -25.6        | 0            | 52.19                      | -                      | -           | 74                  | -21.81         | 159            | 283         | H        |
| 3      | * 2.39          | 34.49                | RMS | 31.8          | -25.6        | 2.44         | 43.13                      | 54                     | -10.87      | -                   | -              | 159            | 283         | H        |
| 4      | * 2.32129       | 35.66                | RMS | 31.6          | -25.7        | 2.44         | 44                         | 54                     | -10         | -                   | -              | 159            | 283         | H        |

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band  
 Pk - Peak detector  
 RMS - RMS detection

### VERTICAL RESULT



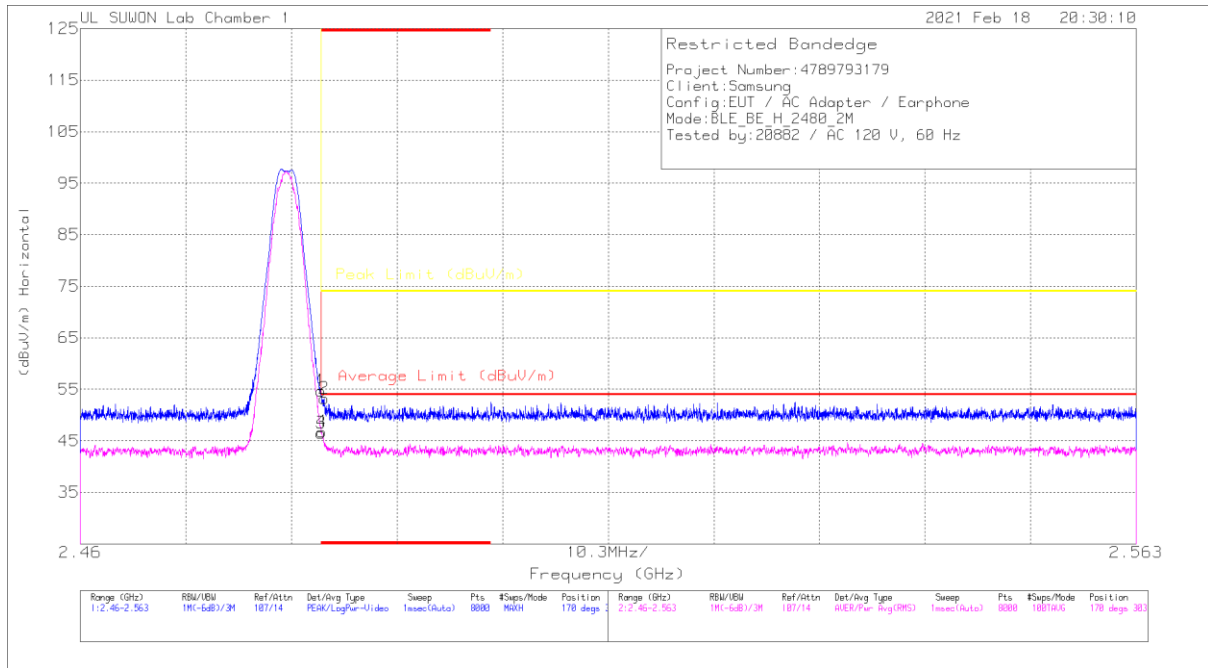
### Trace Markers

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | 3117_00168717 | 10dB_ATT[dB] | DC Cor (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|-----|---------------|--------------|-------------|----------------------------|------------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1      | * 2.39          | 43.08                | Pk  | 31.8          | -25.6        | 0           | 49.28                      | -                      | -           | 74                  | -24.72         | 208            | 321         | V        |
| 2      | * 2.37728       | 45.57                | Pk  | 31.8          | -25.5        | 0           | 51.87                      | -                      | -           | 74                  | -22.13         | 208            | 321         | V        |
| 3      | * 2.39          | 34.68                | RMS | 31.8          | -25.6        | 2.44        | 43.32                      | 54                     | -10.68      | -                   | -              | 208            | 321         | V        |
| 4      | * 2.38778       | 35.13                | RMS | 31.8          | -25.5        | 2.44        | 43.87                      | 54                     | -10.13      | -                   | -              | 208            | 321         | V        |

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band  
 PK - Peak detector  
 RMS - RMS detection

**BANDEDGE (HIGH CHANNEL)**

**HORIZONTAL RESULT**

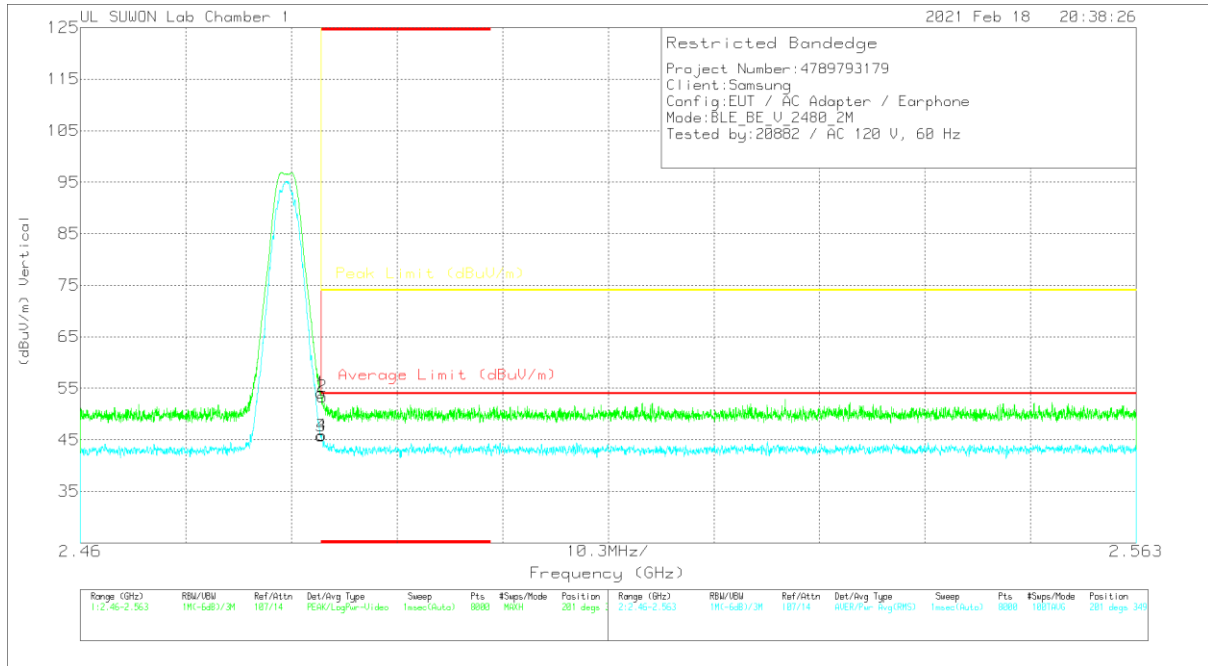


**Trace Markers**

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | 3117_00168717 | 10dB_ATT[dB] | DC Cor (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|-----|---------------|--------------|-------------|----------------------------|------------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1      | * 2.4835        | 48.01                | PK  | 32            | -25.3        | 0           | 54.71                      | -                      | -           | 74                  | -19.29         | 170            | 303         | H        |
| 2      | * 2.48377       | 46.56                | PK  | 32            | -25.3        | 0           | 53.26                      | -                      | -           | 74                  | -20.74         | 170            | 303         | H        |
| 3      | * 2.4835        | 37.4                 | RMS | 32            | -25.3        | 2.44        | 46.54                      | 54                     | -7.46       | -                   | -              | 170            | 303         | H        |
| 4      | * 2.48354       | 37.63                | RMS | 32            | -25.3        | 2.44        | 46.77                      | 54                     | -7.23       | -                   | -              | 170            | 303         | H        |

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band  
 Pk - Peak detector  
 RMS - RMS detection

### VERTICAL RESULT



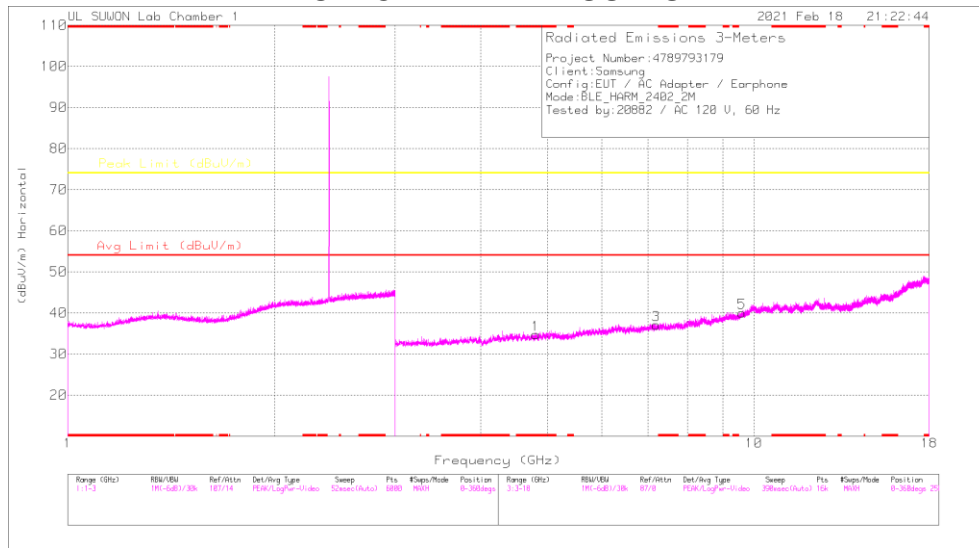
### Trace Markers

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | 3117_00168717 | 10dB_ATT[dB] | DC Cor (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|-----|---------------|--------------|-------------|----------------------------|------------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1      | * 2.4835        | 47.38                | Pk  | 32            | -25.3        | 0           | 54.08                      | -                      | -           | 74                  | -19.92         | 201            | 349         | V        |
| 2      | * 2.48359       | 46.72                | Pk  | 32            | -25.3        | 0           | 53.42                      | -                      | -           | 74                  | -20.58         | 201            | 349         | V        |
| 3      | * 2.4835        | 36.62                | RMS | 32            | -25.3        | 2.44        | 45.76                      | 54                     | -8.24       | -                   | -              | 201            | 349         | V        |
| 4      | * 2.48354       | 36.73                | RMS | 32            | -25.3        | 2.44        | 45.87                      | 54                     | -8.13       | -                   | -              | 201            | 349         | V        |

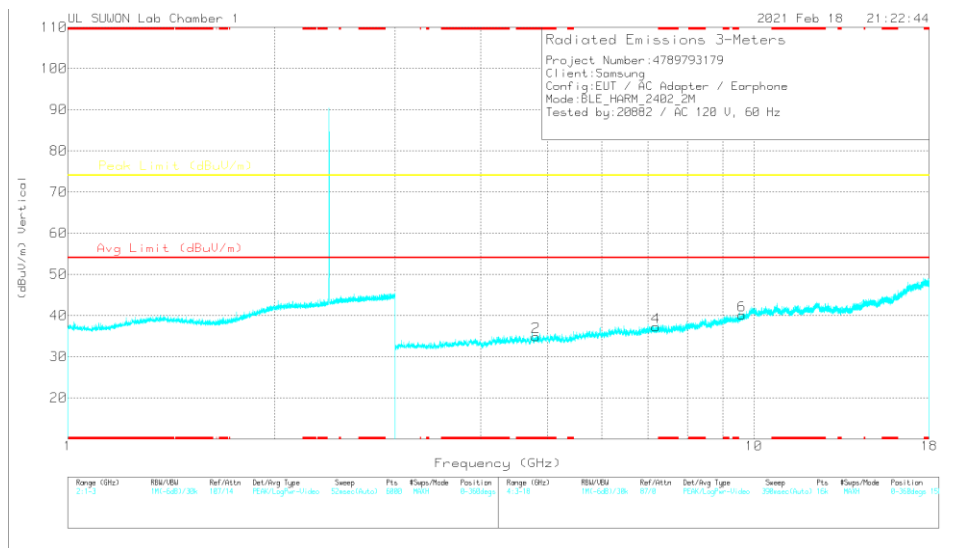
\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band  
 Pk - Peak detector  
 RMS - RMS detection

**HARMONICS AND SPURIOUS EMISSIONS**

**LOW CHANNEL RESULTS**



**HORIZONTAL**



**VERTICAL**

Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

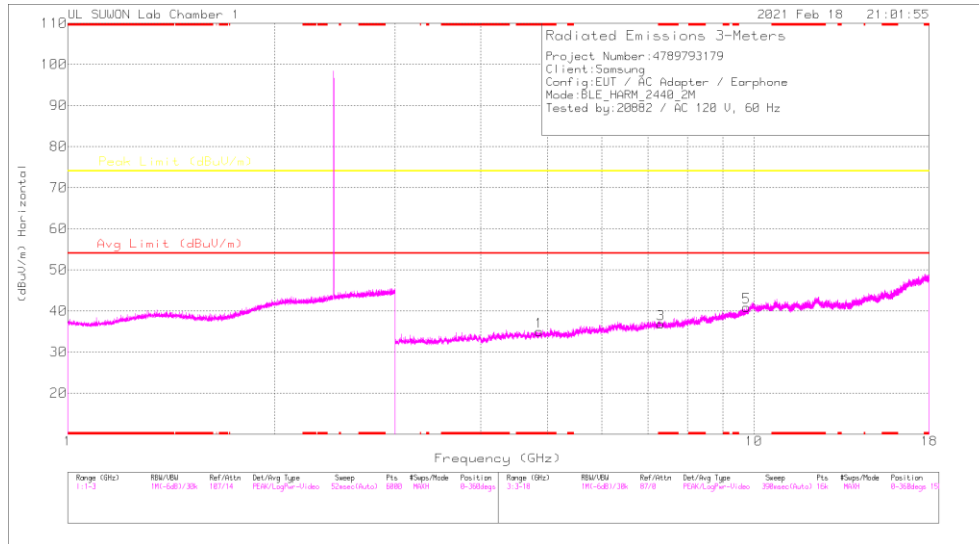
**RADIATED EMISSIONS**

| Frequency (GHz) | Meter Reading (dBuV) | Det | 3117_00168717 | 3GHz_HPI[dB] | DC Corr (dB) | Corrected Reading (dBuV/m) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|-----------------|----------------------|-----|---------------|--------------|--------------|----------------------------|--------------------|-------------|---------------------|-------------|----------------|-------------|----------|
| * 4.81039       | 40.84                | PK2 | 34.1          | -31.5        | 0            | 43.44                      | -                  | -           | 74                  | -30.56      | 360            | 100         | H        |
| * 4.80849       | 42                   | PK2 | 34.1          | -31.4        | 0            | 44.7                       | -                  | -           | 74                  | -29.3       | 360            | 100         | V        |
| 7.20626         | 38.27                | PK2 | 35.9          | -27.5        | 0            | 46.67                      | -                  | -           | 74                  | -27.33      | 360            | 100         | H        |
| 7.20689         | 37.81                | PK2 | 35.9          | -27.6        | 0            | 46.11                      | -                  | -           | 74                  | -27.89      | 360            | 100         | V        |
| 9.60756         | 34.85                | PK2 | 37.1          | -23          | 0            | 48.95                      | -                  | -           | 74                  | -25.05      | 360            | 100         | H        |
| 9.6094          | 34.99                | PK2 | 37.1          | -23          | 0            | 49.09                      | -                  | -           | 74                  | -24.91      | 360            | 100         | V        |

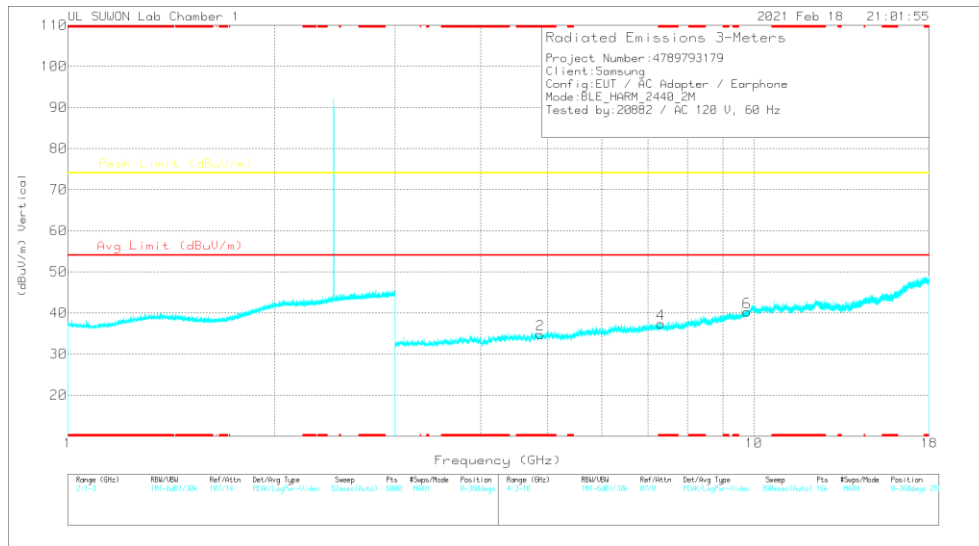
\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band  
 PK2 - KDB558074 Method: Maximum Peak



### MID CHANNEL RESULTS



### HORIZONTAL



### VERTICAL

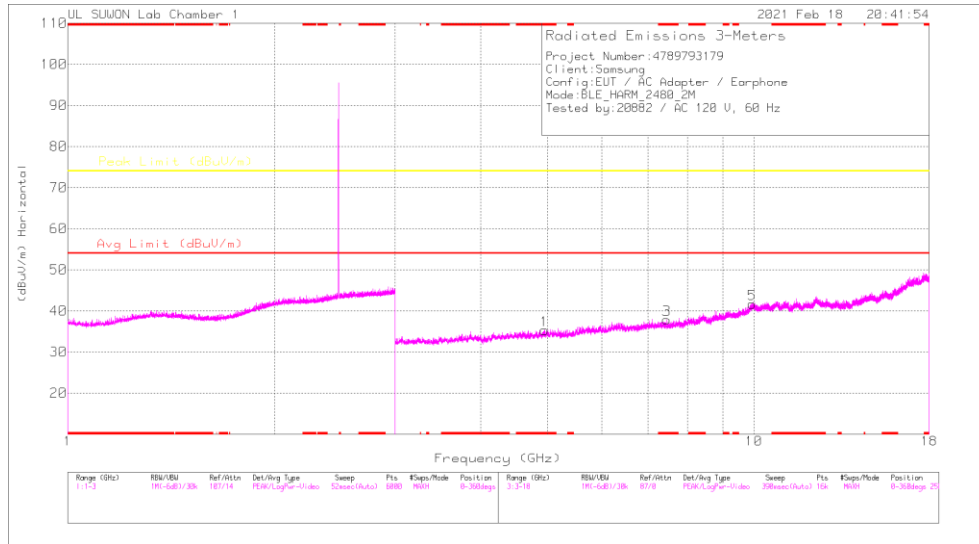
Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

### RADIATED EMISSIONS

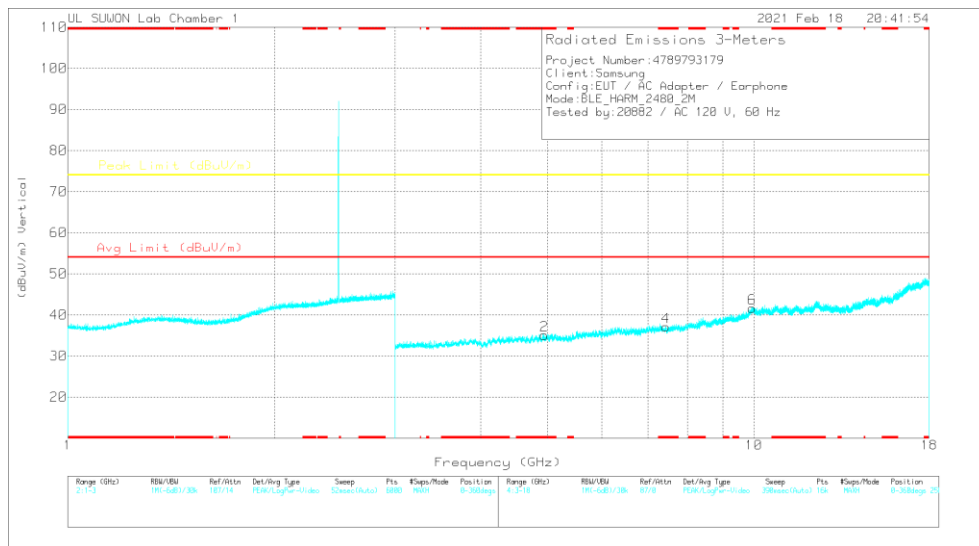
| Frequency (GHz) | Meter Reading (dBuV) | Det | 3117_00168717 | 3GHz_HP[dB] | DC Corr (dB) | Corrected Reading (dBuV/m) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|-----------------|----------------------|-----|---------------|-------------|--------------|----------------------------|--------------------|-------------|---------------------|-------------|----------------|-------------|----------|
| * 4.86644       | 41.88                | PK2 | 34.1          | -31.4       | 0            | 44.58                      | -                  | -           | 74                  | -29.42      | 360            | 100         | H        |
| * 4.87807       | 40.31                | PK2 | 34.1          | -31.4       | 0            | 43.01                      | -                  | -           | 74                  | -30.99      | 360            | 100         | V        |
| * 7.31672       | 38.13                | PK2 | 35.8          | -27.4       | 0            | 46.53                      | -                  | -           | 74                  | -27.47      | 360            | 100         | H        |
| * 7.31539       | 37.76                | PK2 | 35.8          | -27.4       | 0            | 46.16                      | -                  | -           | 74                  | -27.84      | 360            | 100         | V        |
| 9.75549         | 35.47                | PK2 | 37.4          | -23.7       | 0            | 49.17                      | -                  | -           | 74                  | -24.83      | 360            | 100         | H        |
| 9.75319         | 36.36                | PK2 | 37.4          | -23.7       | 0            | 50.06                      | -                  | -           | 74                  | -23.94      | 360            | 100         | V        |

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band  
 PK2 - KDB558074 Method: Maximum Peak

### HIGH CHANNEL RESULTS



### HORIZONTAL



### VERTICAL

Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

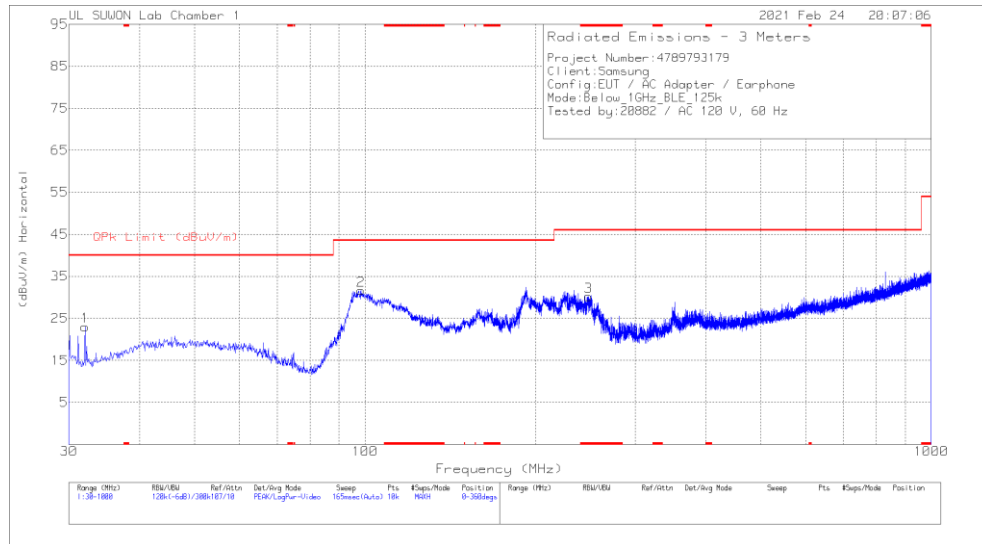
### RADIATED EMISSIONS

| Frequency (GHz) | Meter Reading (dBuV) | Det | 3117_00168717 | 3GHz_HP[dB] | DC Corr (dB) | Corrected Reading (dBuV/m) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|-----------------|----------------------|-----|---------------|-------------|--------------|----------------------------|--------------------|-------------|---------------------|-------------|----------------|-------------|----------|
| * 4.95381       | 41.42                | PK2 | 34.1          | -31.5       | 0            | 44.02                      | -                  | -           | 74                  | -29.98      | 360            | 100         | H        |
| * 4.95382       | 42.08                | PK2 | 34.1          | -31.5       | 0            | 44.68                      | -                  | -           | 74                  | -29.32      | 360            | 100         | V        |
| * 7.45744       | 37.16                | PK2 | 35.8          | -26.8       | 0            | 46.16                      | -                  | -           | 74                  | -27.84      | 360            | 100         | H        |
| * 7.45889       | 37.77                | PK2 | 35.8          | -26.9       | 0            | 46.67                      | -                  | -           | 74                  | -27.33      | 360            | 100         | V        |
| 9.9318          | 34.15                | PK2 | 37.7          | -21.5       | 0            | 50.35                      | -                  | -           | 74                  | -23.65      | 360            | 100         | H        |
| 9.93254         | 33.92                | PK2 | 37.7          | -21.5       | 0            | 50.12                      | -                  | -           | 74                  | -23.88      | 360            | 100         | V        |

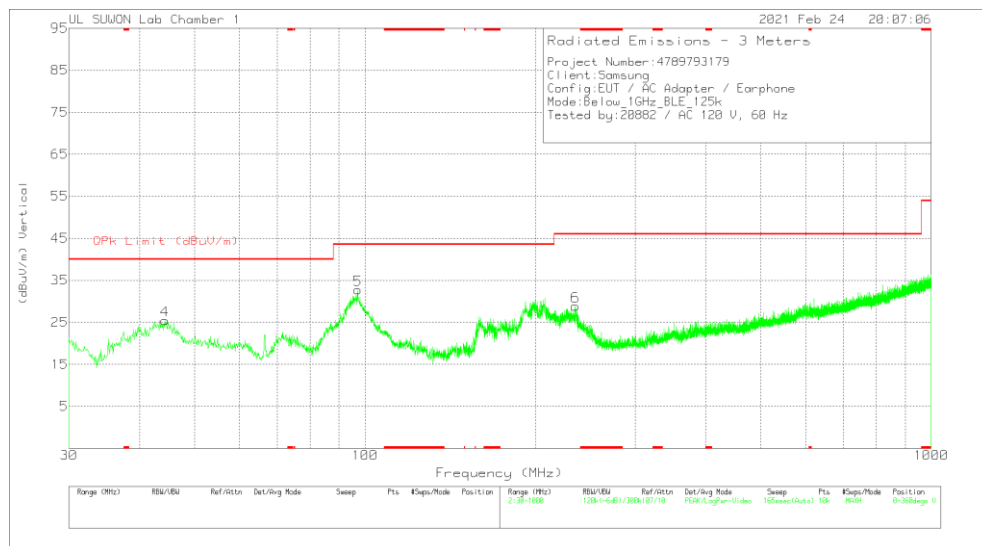
\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band  
 PK2 - KDB558074 Method: Maximum Peak

### 10.3. WORST CASE BELOW 1 GHZ

#### SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION)



**HORIZONTAL**



**VERTICAL**

#### Below 1GHz Data

| Marker | Frequency (MHz) | Meter Reading (dBuV) | Det | VULB9163_750 | Below_1G[dB] | DC Corr (dB) | Corrected Reading (dBuV/m) | QPk Limit (dBuV/m) | Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|-----|--------------|--------------|--------------|----------------------------|--------------------|-------------|----------------|-------------|----------|
| 1      | 32.037          | 38.33                | Pk  | 15.6         | -30.9        | 0            | 23.03                      | 40                 | -16.97      | 0-360          | 400         | H        |
| 2      | 98.482          | 44.03                | Pk  | 17.3         | -29.7        | 0            | 31.63                      | 43.52              | -11.89      | 0-360          | 300         | H        |
| 3      | * 248.444       | 39.76                | Pk  | 18.5         | -28.1        | 0            | 30.16                      | 46.02              | -15.86      | 0-360          | 100         | H        |
| 4      | 44.356          | 36.48                | Pk  | 19.6         | -30.6        | 0            | 25.48                      | 40                 | -14.52      | 0-360          | 100         | V        |
| 5      | 97.124          | 45.37                | Pk  | 17.1         | -29.7        | 0            | 32.77                      | 43.52              | -10.75      | 0-360          | 100         | V        |
| 6      | 235.349         | 38.97                | Pk  | 17.9         | -28          | 0            | 28.87                      | 46.02              | -17.15      | 0-360          | 100         | V        |

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band  
 Pk - Peak detector

## 11. AC POWER LINE CONDUCTED EMISSIONS

### LIMITS

FCC §15.207 (a)

RSS-Gen 8.8

| Frequency of Emission (MHz) | Conducted Limit (dBuV) |          |
|-----------------------------|------------------------|----------|
|                             | Quasi-peak             | Average  |
| 0.15-0.5                    | 66 to 56               | 56 to 46 |
| 0.5-5                       | 56                     | 46       |
| 5-30                        | 60                     | 50       |

\*Decreases with the logarithm of the frequency.

### TEST PROCEDURE

The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.10.

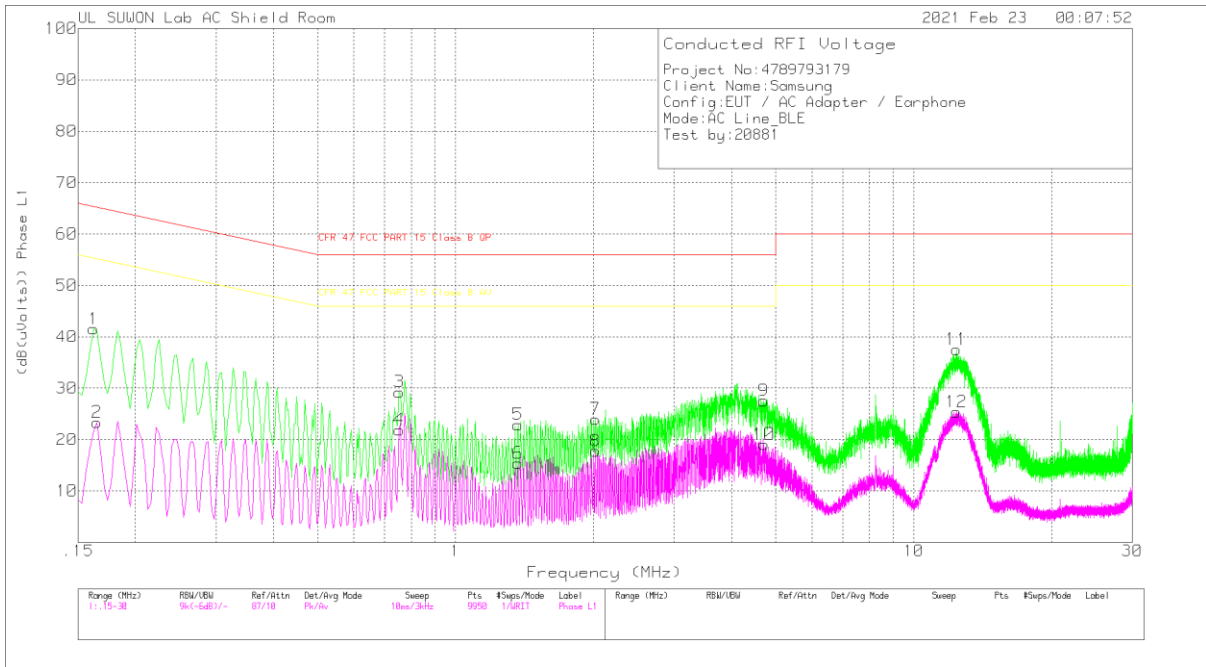
The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

Line conducted data is recorded for both NEUTRAL and HOT lines.

### RESULTS

### 11.1.1. AC Power Line

### LINE 1 RESULTS



#### Trace Markers

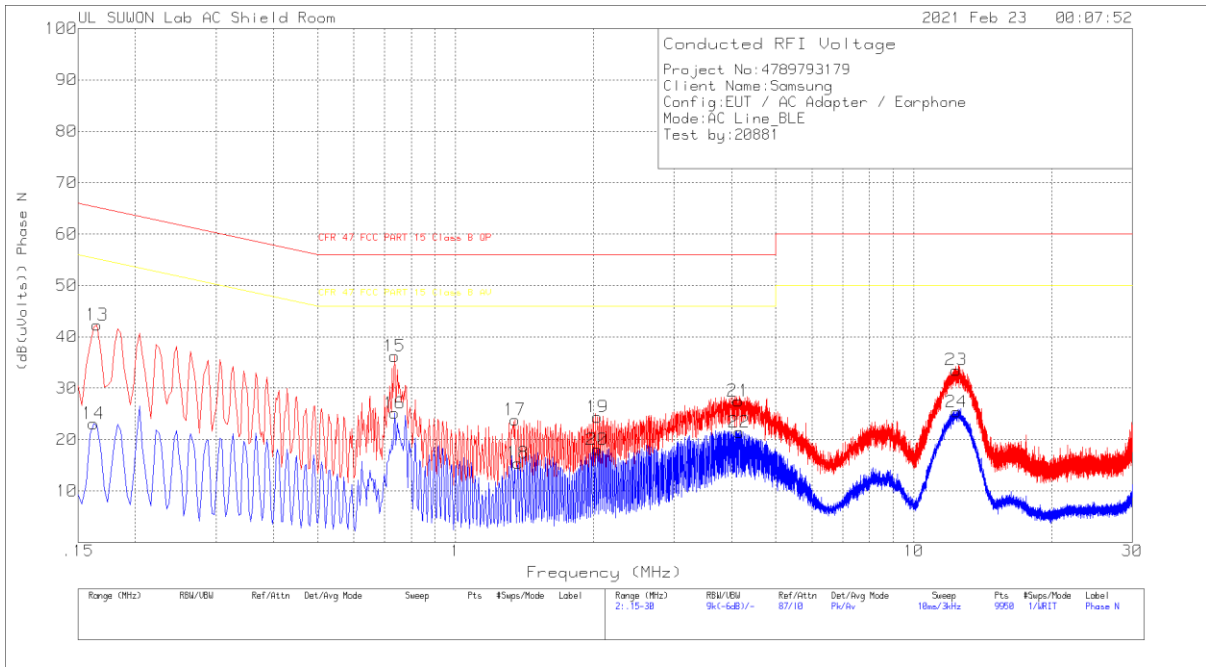
Range 1: Phase L1 .15 - 30MHz

| Marker | Frequency (MHz) | Meter Reading (dBuV) | Det | 101836_Wit h EX_L1[dB] | CABLELOS S(dB) | Corrected Reading (dB(uVolts)) | CFR 47 FCC PART 15 Class B QP | Margin (dB) | CFR 47 FCC PART 15 Class B AV | Margin (dB) |
|--------|-----------------|----------------------|-----|------------------------|----------------|--------------------------------|-------------------------------|-------------|-------------------------------|-------------|
| 1      | .162            | 31.53                | Pk  | 9.9                    | .1             | 41.53                          | 65.36                         | -23.83      | -                             | -           |
| 2      | .165            | 13.25                | Av  | 10                     | .1             | 23.35                          | -                             | -           | 55.21                         | -31.86      |
| 3      | .753            | 19.15                | Pk  | 9.9                    | .2             | 29.25                          | 56                            | -26.75      | -                             | -           |
| 4      | .753            | 11.81                | Av  | 9.9                    | .2             | 21.91                          | -                             | -           | 46                            | -24.09      |
| 5      | 1.368           | 12.8                 | Pk  | 9.8                    | .3             | 22.9                           | 56                            | -33.1       | -                             | -           |
| 6      | 1.368           | 5.29                 | Av  | 9.8                    | .3             | 15.39                          | -                             | -           | 46                            | -30.61      |
| 7      | 2.019           | 13.96                | Pk  | 9.7                    | .3             | 23.96                          | 56                            | -32.04      | -                             | -           |
| 8      | 2.019           | 7.79                 | Av  | 9.7                    | .3             | 17.79                          | -                             | -           | 46                            | -28.21      |
| 9      | 4.707           | 17.46                | Pk  | 9.8                    | .3             | 27.56                          | 56                            | -28.44      | -                             | -           |
| 10     | 4.71            | 8.96                 | Av  | 9.8                    | .3             | 19.06                          | -                             | -           | 46                            | -26.94      |
| 11     | 12.387          | 27.24                | Pk  | 10                     | .3             | 37.54                          | 60                            | -22.46      | -                             | -           |
| 12     | 12.387          | 15.06                | Av  | 10                     | .3             | 25.36                          | -                             | -           | 50                            | -24.64      |

Pk - Peak detector

Av - Average detection

### LINE 2 RESULTS



#### Trace Markers

Range 2: Phase N .15 - 30MHz

| Marker | Frequency (MHz) | Meter Reading (dBuV) | Det | 101836_Wit h EX_N[dB] | CABLELOS S(dB) | Corrected Reading (dB(uVolts)) | CFR 47 FCC PART 15 Class B QP | Margin (dB) | CFR 47 FCC PART 15 Class B AV | Margin (dB) |
|--------|-----------------|----------------------|-----|-----------------------|----------------|--------------------------------|-------------------------------|-------------|-------------------------------|-------------|
| 13     | .165            | 32.21                | Pk  | 10                    | .1             | 42.31                          | 65.21                         | -22.9       | -                             | -           |
| 14     | .162            | 13.01                | Av  | 10                    | .1             | 23.11                          | -                             | -           | 55.36                         | -32.25      |
| 15     | .735            | 26.15                | Pk  | 9.9                   | .2             | 36.25                          | 56                            | -19.75      | -                             | -           |
| 16     | .735            | 15.04                | Av  | 9.9                   | .2             | 25.14                          | -                             | -           | 46                            | -20.86      |
| 17     | 1.347           | 13.74                | Pk  | 9.8                   | .3             | 23.84                          | 56                            | -32.16      | -                             | -           |
| 18     | 1.368           | 5.33                 | Av  | 9.8                   | .3             | 15.43                          | -                             | -           | 46                            | -30.57      |
| 19     | 2.04            | 14.29                | Pk  | 9.8                   | .3             | 24.39                          | 56                            | -31.61      | -                             | -           |
| 20     | 2.037           | 7.97                 | Av  | 9.8                   | .3             | 18.07                          | -                             | -           | 46                            | -27.93      |
| 21     | 4.14            | 17.41                | Pk  | 9.8                   | .3             | 27.51                          | 56                            | -28.49      | -                             | -           |
| 22     | 4.161           | 11.35                | Av  | 9.8                   | .3             | 21.45                          | -                             | -           | 46                            | -24.55      |
| 23     | 12.378          | 23.23                | Pk  | 10                    | .3             | 33.53                          | 60                            | -26.47      | -                             | -           |
| 24     | 12.393          | 15.08                | Av  | 10                    | .3             | 25.38                          | -                             | -           | 50                            | -24.62      |

Pk - Peak detector

Av - Average detection

## END OF TEST REPORT