

**MEASUREMENT REPORT**  
**FCC Part 30 5G mmWave****Applicant Name:**

Samsung Electronics Co., Ltd.  
129, Samsung-ro,  
Yeongtong-gu, Suwon-si  
Gyeonggi-do, 16677, Korea

**Date of Testing:**

01/15/2021-02/24/2021

**Test Site/Location:**

PCTEST Lab. Columbia, MD, USA

**Test Report Serial No.:**

1M2101040001-06-R1.A3L

**FCC ID:**

**A3LSMA426U**

**APPLICANT:**

**Samsung Electronics Co., Ltd.**

**Application Type:**

Certification

**Model:**

SM-A426U

**Additional Model(s):**

SM-A426U1/DS, SM-S426DL, SM-A426U1

**EUT Type:**

Portable Handset

**FCC Classification:**

Part 30 Mobile Transmitter (5GM)

**FCC Rule Part(s):**

30

**Test Procedure(s):**

ANSI C63.26-2015, KDB 971168 D01 v03r01,  
KDB 842590 D01 v01r01

Note: This revised Test Report (S/N: 1M2101040001-06-R1.A3L) supersedes and replaces the previously issued test report on the same subject device for the same type of testing as indicated. Please discard or destroy the previously issued test report(s) and dispose of it accordingly.

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in §2.947. Test results reported herein relate only to the item(s) tested.

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

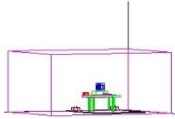
  
Randy Ortanez  
President

|                                                   |                                                                                                                                  |                                                                                       |                                          |
|---------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|------------------------------------------|
| <b>FCC ID:</b> A3LSMA426U                         |  <b>MEASUREMENT REPORT</b><br>(CERTIFICATION) |  | <b>Approved by:</b><br>Technical Manager |
| <b>Test Report S/N:</b><br>1M2101040001-06-R1.A3L | <b>Test Dates:</b><br>01/15/2021-02/24/2021                                                                                      | <b>EUT Type:</b><br>Portable Handset                                                  | Page 1 of 99                             |

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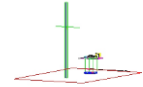
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| <b>Test Report S/N:</b><br>1M2101040001-06-R1.A3L | <b>Test Dates:</b><br>01/15/2021-02/24/2021                                                                                       | <b>EUT Type:</b><br>Portable Handset                                                  | Page 2 of 99                             |



# MEASUREMENT REPORT

## FCC Part 30



| Band | Antenna | Bandwidth [MHz] | Tx Frequency [MHz] | CCs Active | Mode | Modulation   | EIRP          |                 | Emission Designator |
|------|---------|-----------------|--------------------|------------|------|--------------|---------------|-----------------|---------------------|
|      |         |                 |                    |            |      |              | Max Power [W] | Max Power [dBm] |                     |
| n261 | Ant1    | 50              | 27525 - 28325      | 1          | SISO | QPSK         | 0.487         | 26.88           | 45M6G7D             |
|      |         |                 |                    |            | 2Tx  | QPSK         | 0.980         | 29.91           | 45M6G7D             |
|      |         |                 |                    |            | 2Tx  | $\pi/2$ BPSK | 0.983         | <b>29.92</b>    | 45M5G7D             |
|      |         |                 |                    |            | 2Tx  | 16QAM        | 0.662         | 28.21           | 45M3W7D             |
|      |         |                 |                    |            | 2Tx  | 64QAM        | 0.406         | 26.08           | 45M2W7D             |
|      |         |                 |                    | 2          | 2Tx  | QPSK         | 0.505         | 27.03           | 94M9G7D             |
|      |         |                 |                    |            | 2Tx  | $\pi/2$ BPSK | 0.503         | 27.01           | 94M8G7D             |
|      |         |                 |                    |            | 2Tx  | 16QAM        | 0.361         | 25.58           | 94M8W7D             |
|      |         |                 |                    |            | 2Tx  | 64QAM        | 0.222         | 23.46           | 94M6W7D             |
|      |         | 100             | 27550 - 28300      | 1          | SISO | QPSK         | 0.505         | 27.03           | 93M4G7D             |
|      |         |                 |                    |            | 2Tx  | QPSK         | 0.983         | 29.93           | 93M4G7D             |
|      |         |                 |                    |            | 2Tx  | $\pi/2$ BPSK | 0.990         | <b>29.96</b>    | 90M2G7D             |
|      |         |                 |                    |            | 2Tx  | 16QAM        | 0.649         | 28.13           | 92M7W7D             |
|      |         |                 |                    |            | 2Tx  | 64QAM        | 0.400         | 26.02           | 92M8W7D             |
|      |         |                 |                    | 2          | 2Tx  | QPSK         | 0.509         | 27.06           | 191MG7D             |
|      |         |                 |                    |            | 2Tx  | $\pi/2$ BPSK | 0.510         | 27.07           | 191MG7D             |
|      |         |                 |                    |            | 2Tx  | 16QAM        | 0.356         | 25.51           | 191MW7D             |
|      |         |                 |                    |            | 2Tx  | 64QAM        | 0.222         | 23.46           | 192MW7D             |
| n261 | Ant2    | 50              | 27525 - 28325      | 1          | SISO | QPSK         | 0.664         | 28.22           | -                   |
|      |         |                 |                    |            | 2Tx  | QPSK         | 1.077         | 30.32           | -                   |
|      |         |                 |                    |            | 2Tx  | $\pi/2$ BPSK | 1.118         | <b>30.49</b>    | -                   |
|      |         |                 |                    |            | 2Tx  | 16QAM        | 0.729         | 28.62           | -                   |
|      |         |                 |                    |            | 2Tx  | 64QAM        | 0.459         | 26.62           | -                   |
|      |         |                 |                    | 2          | 2Tx  | QPSK         | 0.508         | 27.06           | -                   |
|      |         |                 |                    |            | 2Tx  | $\pi/2$ BPSK | 0.505         | 27.03           | -                   |
|      |         |                 |                    |            | 2Tx  | 16QAM        | 0.356         | 25.52           | -                   |
|      |         |                 |                    |            | 2Tx  | 64QAM        | 0.222         | 23.47           | -                   |
|      |         | 100             | 27550 - 28300      | 1          | SISO | QPSK         | 0.682         | 28.34           | -                   |
|      |         |                 |                    |            | 2Tx  | QPSK         | 1.057         | 30.24           | -                   |
|      |         |                 |                    |            | 2Tx  | $\pi/2$ BPSK | 1.114         | <b>30.47</b>    | -                   |
|      |         |                 |                    |            | 2Tx  | 16QAM        | 0.733         | 28.65           | -                   |
|      |         |                 |                    |            | 2Tx  | 64QAM        | 0.437         | 26.41           | -                   |
|      |         |                 |                    | 2          | 2Tx  | QPSK         | 0.530         | 27.24           | -                   |
|      |         |                 |                    |            | 2Tx  | $\pi/2$ BPSK | 0.532         | 27.26           | -                   |
|      |         |                 |                    |            | 2Tx  | 16QAM        | 0.378         | 25.77           | -                   |
|      |         |                 |                    |            | 2Tx  | 64QAM        | 0.228         | 23.58           | -                   |

### EUT Overview (Band n261)

|                                            |                                                                                                                            |                                       |                                                                                       |                                   |
|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------|
| FCC ID: A3LSMA426U                         |  PCTEST®<br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021                                                                                       | EUT Type:<br>Portable Handset         |                                                                                       | Page 3 of 99                      |

| Band | Antenna | Bandwidth [MHz] | Tx Frequency [MHz] | CCs Active | Mode | Modulation   | EIRP          |                 | Emission Designator |
|------|---------|-----------------|--------------------|------------|------|--------------|---------------|-----------------|---------------------|
|      |         |                 |                    |            |      |              | Max Power [W] | Max Power [dBm] |                     |
| n260 | Ant1    | 50              | 37025 - 39975      | 1          | SISO | QPSK         | 0.336         | 25.27           | 45M6G7D             |
|      |         |                 |                    |            | 2Tx  | QPSK         | 0.539         | 27.31           | 45M6G7D             |
|      |         |                 |                    |            | 2Tx  | $\pi/2$ BPSK | 0.542         | 27.34           | 45M5G7D             |
|      |         |                 |                    |            | 2Tx  | 16QAM        | 0.343         | 25.35           | 45M3W7D             |
|      |         |                 |                    |            | 2Tx  | 64QAM        | 0.207         | 23.17           | 45M3W7D             |
|      |         |                 |                    | 2          | 2Tx  | QPSK         | 0.281         | 24.48           | 95M1G7D             |
|      |         |                 |                    |            | 2Tx  | $\pi/2$ BPSK | 0.281         | 24.48           | 94M9G7D             |
|      |         |                 |                    |            | 2Tx  | 16QAM        | 0.200         | 23.01           | 95M0W7D             |
|      |         |                 |                    |            | 2Tx  | 64QAM        | 0.112         | 20.49           | 95M1W7D             |
|      |         | 100             | 37050 - 39950      | 1          | SISO | QPSK         | 0.329         | 25.17           | 93M4G7D             |
|      |         |                 |                    |            | 2Tx  | QPSK         | 0.552         | 27.42           | 93M4G7D             |
|      |         |                 |                    |            | 2Tx  | $\pi/2$ BPSK | 0.501         | 27.00           | 90M8G7D             |
|      |         |                 |                    |            | 2Tx  | 16QAM        | 0.291         | 24.64           | 93M4W7D             |
|      |         |                 |                    |            | 2Tx  | 64QAM        | 0.196         | 22.93           | 93M2W7D             |
|      |         |                 |                    | 2          | 2Tx  | QPSK         | 0.262         | 24.19           | 191MG7D             |
|      |         |                 |                    |            | 2Tx  | $\pi/2$ BPSK | 0.261         | 24.16           | 191MG7D             |
|      |         |                 |                    |            | 2Tx  | 16QAM        | 0.184         | 22.65           | 191MW7D             |
|      |         |                 |                    |            | 2Tx  | 64QAM        | 0.111         | 20.44           | 192MW7D             |
| n260 | Ant2    | 50              | 37025 - 39975      | 1          | SISO | QPSK         | 0.621         | 27.93           | -                   |
|      |         |                 |                    |            | 2Tx  | QPSK         | 0.991         | 29.96           | -                   |
|      |         |                 |                    |            | 2Tx  | $\pi/2$ BPSK | 0.954         | 29.80           | -                   |
|      |         |                 |                    |            | 2Tx  | 16QAM        | 0.633         | 28.01           | -                   |
|      |         |                 |                    |            | 2Tx  | 64QAM        | 0.379         | 25.79           | -                   |
|      |         |                 |                    | 2          | 2Tx  | QPSK         | 0.494         | 26.94           | -                   |
|      |         |                 |                    |            | 2Tx  | $\pi/2$ BPSK | 0.496         | 26.96           | -                   |
|      |         |                 |                    |            | 2Tx  | 16QAM        | 0.344         | 25.37           | -                   |
|      |         |                 |                    |            | 2Tx  | 64QAM        | 0.188         | 22.74           | -                   |
|      |         | 100             | 37050 - 39950      | 1          | SISO | QPSK         | 0.627         | 27.97           | -                   |
|      |         |                 |                    |            | 2Tx  | QPSK         | 0.979         | 29.91           | -                   |
|      |         |                 |                    |            | 2Tx  | $\pi/2$ BPSK | 0.972         | 29.88           | -                   |
|      |         |                 |                    |            | 2Tx  | 16QAM        | 0.618         | 27.91           | -                   |
|      |         |                 |                    |            | 2Tx  | 64QAM        | 0.392         | 25.93           | -                   |
|      |         |                 |                    | 2          | 2Tx  | QPSK         | 0.499         | 26.98           | -                   |
|      |         |                 |                    |            | 2Tx  | $\pi/2$ BPSK | 0.505         | 27.03           | -                   |
|      |         |                 |                    |            | 2Tx  | 16QAM        | 0.356         | 25.51           | -                   |
|      |         |                 |                    |            | 2Tx  | 64QAM        | 0.187         | 22.72           | -                   |

### EUT Overview (Band n260)

**Note:** Due to similar antenna performance from both patch antennas, the Occupied Bandwidth was only measured on one antenna for each band.

|                                            |                                                                                                                               |                                                                                       |                                   |
|--------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------|
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| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021                                                                                          | EUT Type:<br>Portable Handset                                                         | Page 4 of 99                      |

## 1.0 INTRODUCTION

### 1.1 Scope

Measurement and determination of electromagnetic emissions (EMC) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission and the Innovation, Science and Economic Development Canada.

### 1.2 PCTEST Test Location

These measurement tests were conducted at the PCTEST facility located at 7185 Oakland Mills Road, Columbia, MD 21046. The measurement facility is compliant with the test site requirements specified in ANSI C63.4-2014.

### 1.3 Test Facility / Accreditations

Measurements were performed at PCTEST Engineering Lab located in Columbia, MD 21046, U.S.A.

- PCTEST is an ISO/IEC 17025-2017 accredited test facility under the American Association for Laboratory Accreditation (A2LA) with Certificate number 2041.01 for Specific Absorption Rate (SAR), Hearing Aid Compatibility (HAC) testing, where applicable, and Electromagnetic Compatibility (EMC) testing for FCC and Innovation, Science, and Economic Development Canada rules.
- PCTEST TCB is a Telecommunication Certification Body (TCB) accredited to ISO/IEC 17065-2012 by A2LA (Certificate number 2041.03) in all scopes of FCC Rules and ISSED Standards (RSS).
- PCTEST facility is a registered (2451B) test laboratory with the site description on file with ISSED.

|                                            |                                                                                                                                                                                                              |                                       |                                                                                       |                                   |
|--------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------|
| FCC ID: A3LSMA426U                         |  <b>PCTEST</b><br>Proud to be part of  | MEASUREMENT REPORT<br>(CERTIFICATION) |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021                                                                                                                                                                         | EUT Type:<br>Portable Handset         |                                                                                       | Page 5 of 99                      |

## 2.0 PRODUCT INFORMATION

### 2.1 Equipment Description

The Equipment Under Test (EUT) is the **Samsung Portable Handset FCC ID: A3LSMA426U**. The test data contained in this report pertains only to the emissions due to the EUT's 5G mmWave function.

The EUT contains two antennas, referred to herein as Ant1 (L Patch) and Ant2 (R Patch). Each of the patch antennas is comprised of two separate antenna feeds - one for horizontal and one for vertical polarization. Only one array antenna can be active at a time.

The EUT supports up to 4CC for DL, and 2CC for UL. For each CC, the EUT supports both 50MHz bandwidth and 100MHz bandwidth. The EUT supports a subcarrier spacing (SCS) of 120kHz with two transmission schemes, CP-OFDM and DFT-s-OFDM, with pi/2-BPSK, QPSK, 16-QAM, and 64-QAM modulations. Different Beam IDs are supported, each corresponding to a different position in space for each antenna. During testing, FTM (Factory Test Mode) was used to operate the transmitter. MIMO operation was achieved by enabling two Beam IDs at the same time: one is from the list of H Beam IDs and other is from the list of V Beam IDs.

**Test Device Serial No.:** 0112H, 0010H

### 2.2 Device Capabilities

This device contains the following capabilities:

800/850/1900 CDMA/EvDO Rev0/A, 1x Advanced (BC0, BC1, BC10), 850/1900 GSM/GPRS/EDGE, 850/1700/1900 WCDMA/HSPA, Multi-band LTE, 5G NR (n5, n71, n41, n66, n2, n25, n77, n260, n261), 802.11b/g/n WLAN, 802.11a/n/ac UNII (5GHz), Bluetooth (1x, EDR, LE), NFC

### 2.3 Test Configuration

The EUT was tested per the guidance of KDB 842590 D01 v01r01 and ANSI C63.26-2015. See Section 7.0 of this test report for a description of the radiated tests.

EIRP Simulation data for all Beam IDs was used to determine the worst case Beam ID for SISO operation and Beam ID pair for 2Tx (DFT-s-OFDM) and MIMO (CP-OFDM) operation. These Beam ID's were used for final measurements.

All testing was performed using FTM (Factory Test Mode) software at continuous Tx operation. When implemented out in the field, the EUT will operate with a maximum uplink configuration. The FTM software was also used for the EUT operation in the EN-DC mode.

### 2.4 EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and no modifications were made during testing.

|                                            |                                                                                                                                                                                                              |                                       |                                                                                       |                                   |
|--------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------|
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| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021                                                                                                                                                                         | EUT Type:<br>Portable Handset         |                                                                                       | Page 6 of 99                      |

## 3.0 DESCRIPTION OF TESTS

### 3.1 Measurement Procedure

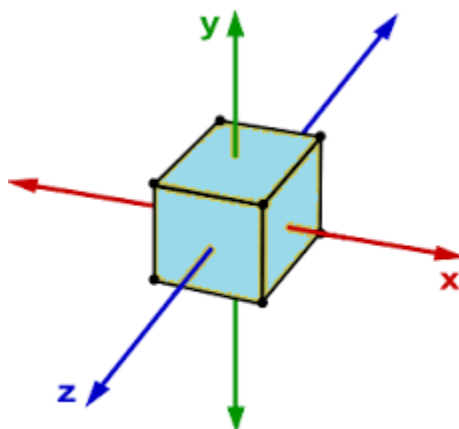
The measurement procedures described in the document titled "American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services" (ANSI C63.26-2015) and the guidance provided in KDB 842590 D01 v01r01 were used in the measurement of the EUT.

### 3.2 Radiated Power and Radiated Spurious Emissions

#### §30.202, §30.203

The radiated test facilities consisted of an indoor 3 meter semi-anechoic chamber used for final measurements and exploratory measurements, when necessary for radiated emissions measurements in the spurious domain. The measurement area is contained within the semi-anechoic chamber which is shielded from any ambient interference. The test site inside the chamber is a 6m x 5.2m elliptical, obstruction-free area in accordance with Figure 5.7 of Clause 5 in ANSI C63.4-2014. Absorbers are arranged on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections for measurements above 1GHz. For measurements below 1GHz, the absorbers are removed. A raised turntable is used for radiated measurement. The turn table is a continuously rotatable, remote-controlled, metallic turntable and 2 meters (6.56 ft.) in diameter. The turn table is flush with the raised floor of the chamber in order to maintain its function as a ground plane. An 80cm tall test table made of Styrodur is placed on top of the turn table. A Styrodur pedestal is placed on top of the test table to bring the total table height to 1.5m for measurements above 1GHz.

Radiated power (EIRP) measurements were performed in a full anechoic chamber (FAC) conforming to the site validation requirements of CISPR 16-1-4. Radiated spurious emission measurements from 30MHz - 18GHz were performed in a semi anechoic chamber (SAC) conforming to the site validation requirements of CISPR 16-1-4. A positioner was used to manipulate the EUT through several positions in space by rotating about the roll axis as shown in the figure below. The positioner was mounted on top of a turntable bringing the total EUT height to 1.5m.



**Figure 3-1. Rotation of the EUT Through Three Orthogonal Planes**

|                                            |                                              |                                       |                |                                   |
|--------------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMA426U                         | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021         | EUT Type:<br>Portable Handset         |                | Page 7 of 99                      |

The equipment under test was transmitting while connected to its integral antenna and is placed on a turntable. The measurement antenna is in the far field of the EUT per formula  $2D^2/\lambda$  where D is the larger between the dimension of the measurement antenna and the transmitting antenna of the EUT. In this case, "D" is the largest dimension of the measurement antenna. The EUT is manipulated through all orthogonal planes representative of its typical use to achieve the highest reading on the receive spectrum analyzer.

| Frequency Range (GHz) | Wavelength(cm) | Far Field Distance (m) | Measurement Distance (m) |
|-----------------------|----------------|------------------------|--------------------------|
| 18-40                 | 0.749          | 0.54                   | 1.00                     |
| 40-60                 | 0.500          | 1.39                   | 1.50                     |
| 60-90                 | 0.333          | 0.91                   | 1.00                     |
| 90-140                | 0.214          | 0.58                   | 1.00                     |
| 140-200               | 0.150          | 0.39                   | 1.00                     |

**Table 3-1. Far-Field Distance & Measurement Distance per Frequency Range**

Radiated power levels are investigated while the receive antenna was rotated through all angles to determine the worst case polarization/positioning. It was determined that H=0 degree and V=90 degree are the worst case positions when the EUT was transmitting horizontally and vertically polarized beams, respectively.

The maximized power level is recorded using the spectrum analyzer "Channel Power" function with the integration bandwidth set to the emissions' occupied bandwidth. The EIRP is calculated from the raw power level measured with the spectrum analyzer using the formulas shown below.

### Effective Isotropic Radiated Power Sample Calculation

The measured e.i.r.p is converted to E-field in V/m. Then, the distance correction is applied before converting back to calculated e.i.r.p, as explained in KDB 971168 D01.

$$\begin{aligned}
 \text{Field Strength [dB}\mu\text{V/m]} &= \text{Measured Value [dBm]} + \text{AFCL [dB/m]} + 107 \\
 &= -32.74 \text{ dBm} + (40.7 \text{ dB/m} + 8.78 \text{ dB}) + 107 = 123.74 \text{ dB}\mu\text{V/m} \\
 &= 10^{(123.74/20)/1000000} = 1.54 \text{ V/m} \\
 \text{e.i.r.p. [dBm]} &= 10 * \log((\text{E-Field} * D_m)^2/30) + 30 \text{ dB} \\
 &= 10 * \log((1.54 \text{ V/m} * 1.00 \text{ m})^2/30) + 30 \text{ dB} \\
 &= 18.98 \text{ dBm e.i.r.p.}
 \end{aligned}$$

|                                            |                                                                                                                                                                                                              |                                       |                                                                                       |                                   |
|--------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------|
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## 4.0 MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.4-2014. All measurement uncertainty values are shown with a coverage factor of  $k = 2$  to indicate a 95% level of confidence. The measurement uncertainty shown below meets or exceeds the  $U_{\text{CISPR}}$  measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

| Contribution                     | Expanded Uncertainty ( $\pm$ dB) |
|----------------------------------|----------------------------------|
| Conducted Bench Top Measurements | 1.13                             |
| Radiated Disturbance (<1GHz)     | 4.98                             |
| Radiated Disturbance (>1GHz)     | 5.07                             |
| Radiated Disturbance (>18GHz)    | 5.09                             |

|                                                   |                                                                                                                                   |                                                                                       |                                          |
|---------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|------------------------------------------|
| FCC ID: A3LSMA426U                                |  <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |  | <b>Approved by:</b><br>Technical Manager |
| <b>Test Report S/N:</b><br>1M2101040001-06-R1.A3L | <b>Test Dates:</b><br>01/15/2021-02/24/2021                                                                                       | <b>EUT Type:</b><br>Portable Handset                                                  | Page 9 of 99                             |

## 5.0 TEST EQUIPMENT CALIBRATION DATA

Test Equipment Calibration is traceable to an accredited ISO/IEC 17025 calibration facility. Measurements antennas used during testing were calibrated in accordance to the requirements of ANSI C63.5-2017.

| Manufacturer        | Model   | Description                             | Cal Date   | Cal Interval | Cal Due    | Serial Number |
|---------------------|---------|-----------------------------------------|------------|--------------|------------|---------------|
| Agilent             | N9030A  | PXA Signal Analyzer (44GHz)             | 8/17/2020  | Annual       | 8/17/2021  | MY52350166    |
| ETS-Lindgren        | 3116C   | DRG Horn Antenna                        | 3/11/2019  | Biennial     | 3/11/2021  | 218893        |
| OML Inc.            | M19RH   | WR-19 Horn Antenna, 24dBi, 40 - 60GHz   | 12/30/2018 | Biennial     | 2/30/2021  | 18073001      |
| OML Inc.            | M12RH   | WR-12 Horn Antenna, 24dBi, 60 - 90GHz   | 12/30/2018 | Biennial     | 2/30/2021  | 18073001      |
| OML Inc.            | M08RH   | WR-08 Horn Antenna, 24dBi, 90 - 140GHz  | 12/30/2018 | Biennial     | 2/30/2021  | 18073001      |
| OML Inc.            | M05RH   | WR-05 Horn Antenna, 24dBi, 140 - 220GHz | 12/30/2018 | Biennial     | 2/30/2021  | 18073001      |
| Rohde & Schwarz     | ESU26   | EMI Test Receiver (26.5GHz)             | 7/15/2020  | Annual       | 7/15/2021  | 100342        |
| Rohde & Schwarz     | FSW67   | Signal / Spectrum Analyzer              | 8/10/2020  | Annual       | 8/10/2021  | 103200        |
| Sunol               | DRH-118 | Horn Antenna (1-18GHz)                  | 10/3/2019  | Biennial     | 10/3/2021  | A050307       |
| Sunol               | JB5     | Bi-Log Antenna (30M - 5GHz)             | 7/27/2020  | Biennial     | 7/27/2022  | A051107       |
| Virginia Diodes Inc | SAX679  | SAX Module (40 - 60GHz)                 | 8/28/2020  | Annual       | 8/28/2021  | SAX679        |
| Virginia Diodes Inc | SAX680  | SAX Module (60 - 90GHz)                 | 8/14/2020  | Annual       | 8/14/2021  | SAX680        |
| Virginia Diodes Inc | SAX681  | SAX Module (90 - 140GHz)                | 10/22/2020 | Annual       | 10/22/2021 | SAX681        |
| Virginia Diodes Inc | SAX682  | SAX Module (140 - 220GHz)               | 9/24/2020  | Annual       | 9/24/2021  | SAX682        |

**Table 5-1. Test Equipment**

|                                                   |                                                                                                                                   |                                                                                       |                                          |
|---------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|------------------------------------------|
| FCC ID: A3LSMA426U                                |  <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |  | <b>Approved by:</b><br>Technical Manager |
| <b>Test Report S/N:</b><br>1M2101040001-06-R1.A3L | <b>Test Dates:</b><br>01/15/2021-02/24/2021                                                                                       | <b>EUT Type:</b><br>Portable Handset                                                  | Page 10 of 99                            |

## 6.0 SAMPLE CALCULATIONS

### Emission Designator

#### QPSK Modulation

**Emission Designator = 800MG7D**

BW = 800 MHz

G = Phase Modulation

7 = Quantized/Digital Info

D = Data transmission, telemetry, telecommand

#### QAM Modulation

**Emission Designator = 802MW7D**

BW = 802 MHz

W = Amplitude/Angle Modulated

7 = Quantized/Digital Info

D = Data transmission, telemetry, telecommand

|                                            |                                                                                                                                                                                                              |                                       |                                                                                       |                                   |
|--------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------|
| FCC ID: A3LSMA426U                         |  <b>PCTEST</b><br>Proud to be part of  | MEASUREMENT REPORT<br>(CERTIFICATION) |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021                                                                                                                                                                         | EUT Type:<br>Portable Handset         |                                                                                       | Page 11 of 99                     |

## 7.0 TEST RESULTS

### 7.1 Summary

Company Name: Samsung Electronics Co., Ltd.  
FCC ID: A3LSMA426U  
FCC Classification: Part 30 Mobile Transmitter (5GM)  
Mode(s): TDD

| FCC Part Section(s) | Test Description                       | Test Limit                                                                                         | Test Condition | Test Result | Reference   |
|---------------------|----------------------------------------|----------------------------------------------------------------------------------------------------|----------------|-------------|-------------|
| 2.1049              | Occupied Bandwidth                     | N/A                                                                                                | RADIATED       | PASS        | Section 7.2 |
| 2.1046, 30.202      | Equivalent Isotropic Radiated Power    | 43dBm                                                                                              |                | PASS        | Section 7.3 |
| 2.1051, 30.203      | Spurious Emissions                     | -13dBm/MHz for all out-of-band emissions                                                           |                | PASS        | Section 7.4 |
| 2.1051, 30.203      | Out-of-Band Emissions at the Band Edge | -13dBm/MHz for all out-of-band emissions, -5dBm/MHz from the band edge up to 10% of the channel BW |                | PASS        | Section 7.5 |
| 2.1055              | Frequency Stability                    | Fundamental emissions stay within authorized frequency block                                       |                | PASS        | Section 7.6 |

**Table 7-1. Summary of Radiated Test Results**

#### Notes:

- 1) All modes of operation and modulations were investigated. The test results shown in the following sections represent the worst case emissions.
- 2) Per 2.1057(a)(2), spurious emissions were investigated up to 100GHz for n261 and up to 200GHz for n260.
- 3) The radiated RF output power and all out-of-band emissions in the spurious domain are evaluated to the EIRP limits.
- 4) "CC" refers to "Component Carriers".
- 5) Beam IDs were chosen based on which Beam ID produces the highest EIRP during EIRP simulation.
- 6) All testing was performed using FTM (Factory Test Mode) software at continuous Tx operation (100% duty cycle).
- 7) The CP-OFDM and DFT-s-OFDM transmission schemes were investigated fully for each test type and only the worst case data is included.

|                                            |                                                                                                                                                                                                              |                                       |                                                                                       |                                   |
|--------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------|
| FCC ID: A3LSMA426U                         |  <b>PCTEST</b><br>Proud to be part of  | MEASUREMENT REPORT<br>(CERTIFICATION) |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021                                                                                                                                                                         | EUT Type:<br>Portable Handset         |                                                                                       | Page 12 of 99                     |

## 7.2 Occupied Bandwidth

§2.1049

### Test Overview

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured. All modes of operation were investigated and the worst case configuration results are reported in this section.

### Test Procedure Used

ANSI C63.26-2015 Section 5.4.3  
 KDB 842590 D01 v01r01 Section 4.3

### Test Settings

1. The signal analyzer's automatic bandwidth measurement capability was used to perform the 99% occupied bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. RBW = 1 – 5% of the expected OBW
3. VBW  $\geq 3 \times$  RBW
4. Detector = Peak
5. Trace mode = max hold
6. Sweep = auto couple
7. The trace was allowed to stabilize
8. If necessary, steps 2 – 7 were repeated after changing the RBW such that it would be within 1 – 5% of the 99% occupied bandwidth observed in Step 7

### Test Notes

1. The EUT supports CP-OFDM and DFT-s-OFDM. OBW was measured for both waveforms and the worst case has been included in the report.
2. Due to similar antenna performance from both patch antennas, the Occupied Bandwidth was only measured on one antenna for each band.

|                                            |                                                                                                                                                                                                              |                                       |                                                                                       |                                   |
|--------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------|
| FCC ID: A3LSMA426U                         |  <b>PCTEST</b><br>Proud to be part of  | MEASUREMENT REPORT<br>(CERTIFICATION) |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021                                                                                                                                                                         | EUT Type:<br>Portable Handset         |                                                                                       | Page 13 of 99                     |

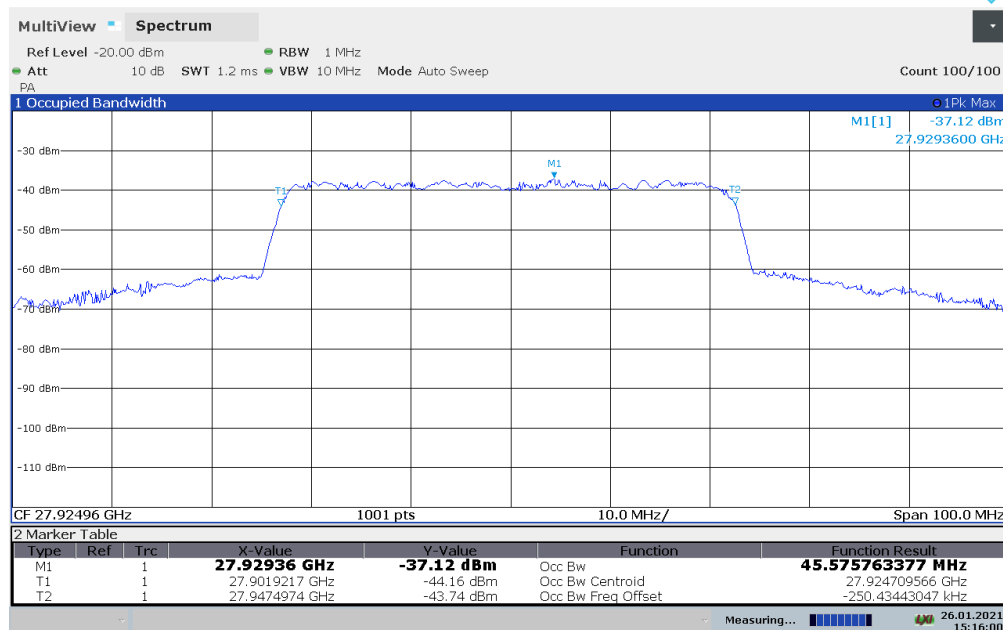
## Band n261

| Channel | Bandwidth | CCs Active | Transmission Scheme | Modulation | OBW [MHz] |
|---------|-----------|------------|---------------------|------------|-----------|
| Mid     | 50        | 1          | CP-OFDM             | QPSK       | 45.58     |
|         |           |            | DFT-s-OFDM          | pi/2-BPSK  | 45.46     |
|         |           |            | CP-OFDM             | 16QAM      | 45.30     |
|         |           |            | CP-OFDM             | 64QAM      | 45.22     |
|         |           | 2          | CP-OFDM             | QPSK       | 94.93     |
|         |           |            | DFT-s-OFDM          | pi/2-BPSK  | 94.77     |
|         |           |            | CP-OFDM             | 16QAM      | 94.79     |
|         |           |            | CP-OFDM             | 64QAM      | 94.62     |
|         | 100       | 1          | CP-OFDM             | QPSK       | 93.36     |
|         |           |            | DFT-s-OFDM          | pi/2-BPSK  | 90.20     |
|         |           |            | CP-OFDM             | 16QAM      | 92.70     |
|         |           |            | CP-OFDM             | 64QAM      | 92.80     |
|         |           | 2          | CP-OFDM             | QPSK       | 191.24    |
|         |           |            | DFT-s-OFDM          | pi/2-BPSK  | 190.96    |
|         |           |            | CP-OFDM             | 16QAM      | 190.99    |
|         |           |            | CP-OFDM             | 64QAM      | 191.56    |

Table 7-2. Summary of Ant 1 Occupied Bandwidths (n261 L Patch)

|                                            |                                                                                                                            |                                       |                                                                                       |                                   |
|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------|
| FCC ID: A3LSMA426U                         |  PCTEST®<br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021                                                                                       | EUT Type:<br>Portable Handset         |                                                                                       | Page 14 of 99                     |

ACLRRResults



15:16:01 26.01.2021

Plot 7-1. Ant 1 Occupied Bandwidth Plot (50MHz-1CC – QPSK – Mid Channel)

ACLRRResults

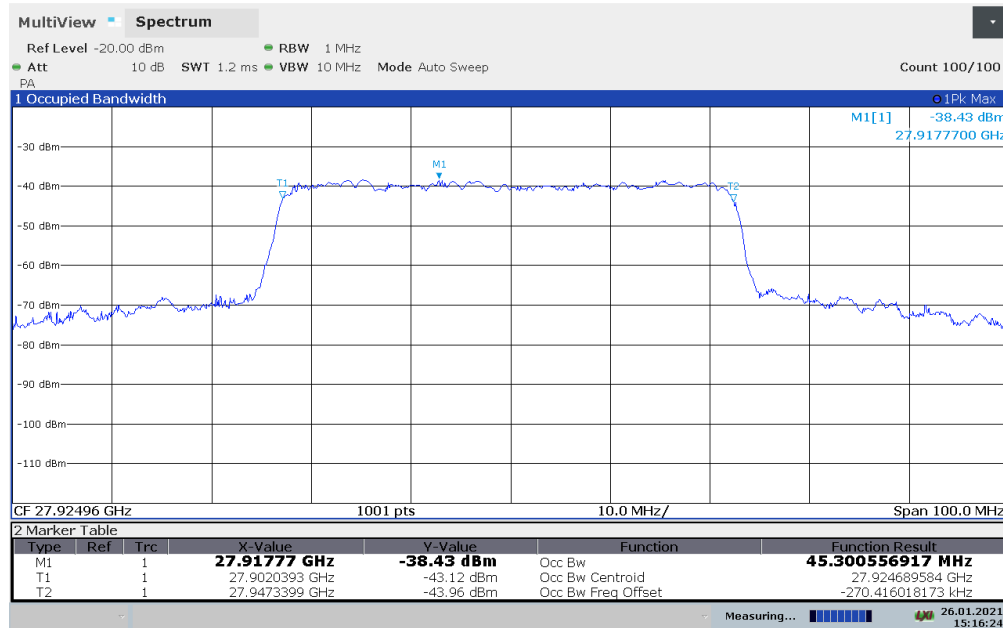


15:15:29 26.01.2021

Plot 7-2. Ant 1 Occupied Bandwidth Plot (50MHz-1CC – pi/2-BPSK – Mid Channel)

|                                            |                                              |                                       |                |                                   |
|--------------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMA426U                         | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021         | EUT Type:<br>Portable Handset         |                | Page 15 of 99                     |

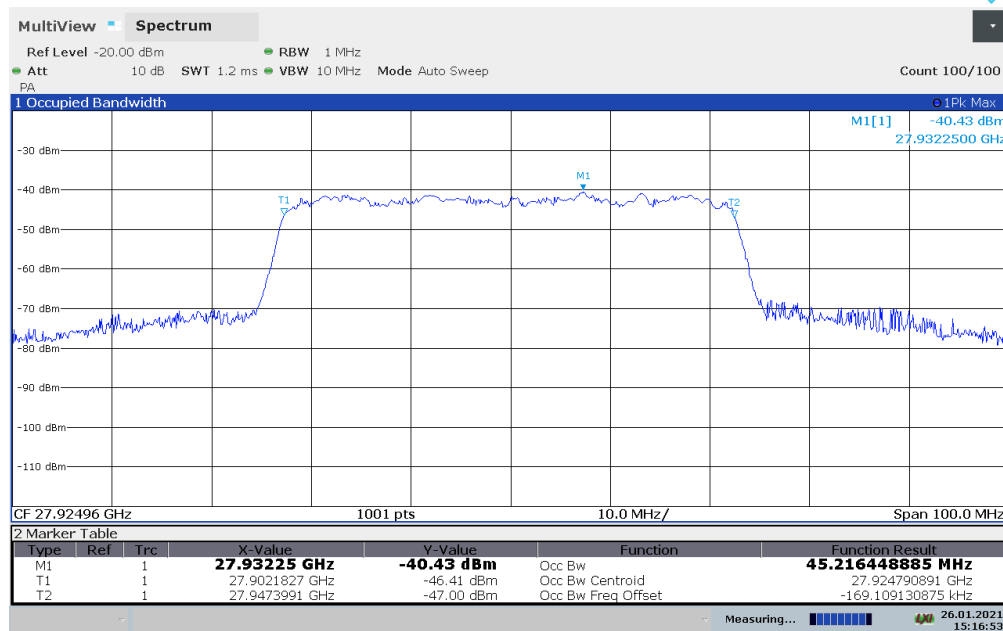
ACLRRResults



15:16:24 26.01.2021

Plot 7-3. Ant 1 Occupied Bandwidth Plot (50MHz-1CC – 16QAM – Mid Channel)

ACLRRResults

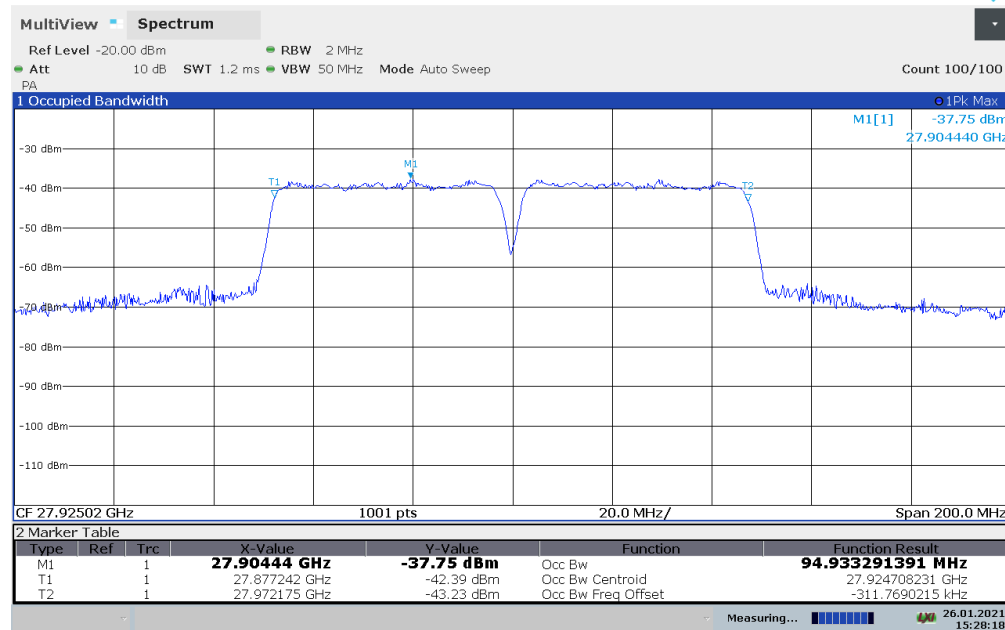


15:16:54 26.01.2021

Plot 7-4. Ant 1 Occupied Bandwidth Plot (50MHz-1CC – 64QAM – Mid Channel)

|                                            |                                              |                                       |                |                                   |
|--------------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMA426U                         | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021         | EUT Type:<br>Portable Handset         |                | Page 16 of 99                     |

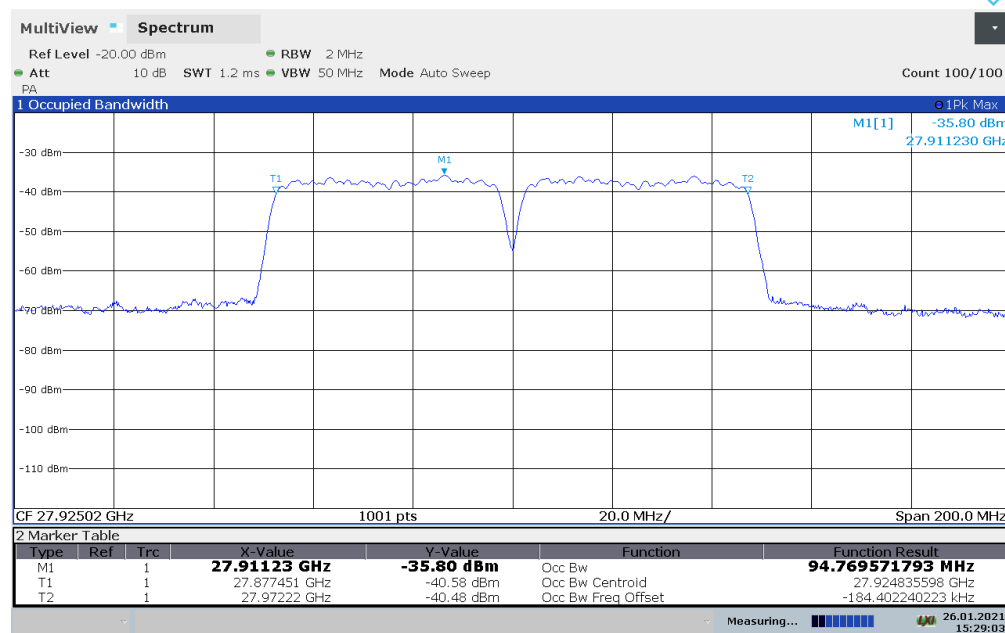
ACLRRResults



15:28:19 26.01.2021

Plot 7-5. Ant 1 Occupied Bandwidth Plot (50MHz-2CC – QPSK – Mid Channel)

ACLRRResults

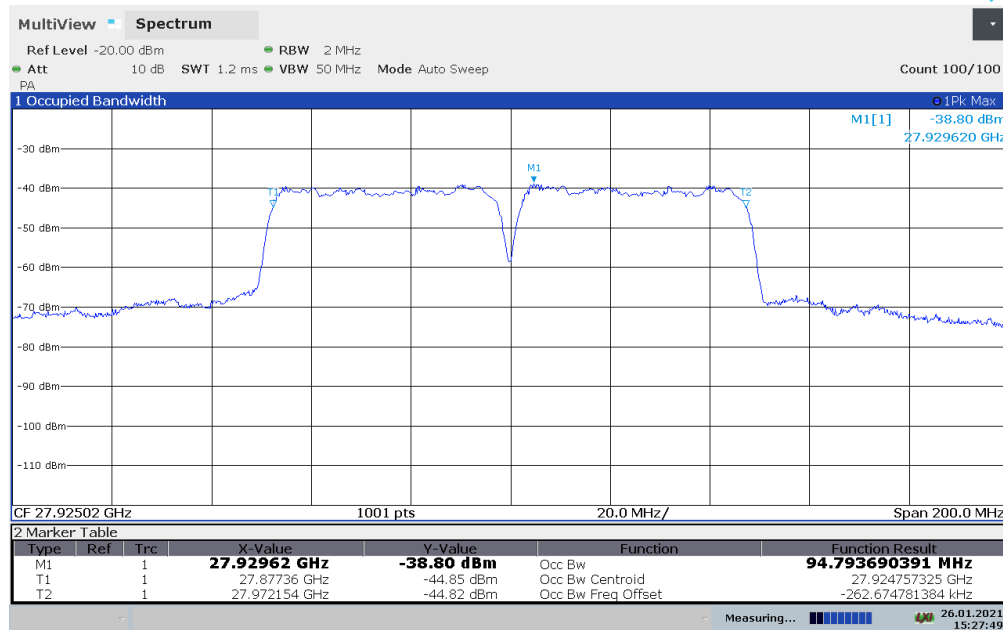


15:29:04 26.01.2021

Plot 7-6. Ant 1 Occupied Bandwidth Plot (50MHz-2CC – pi/2-BPSK – Mid Channel)

|                                            |                                              |                                       |                |                                   |
|--------------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMA426U                         | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021         | EUT Type:<br>Portable Handset         |                | Page 17 of 99                     |

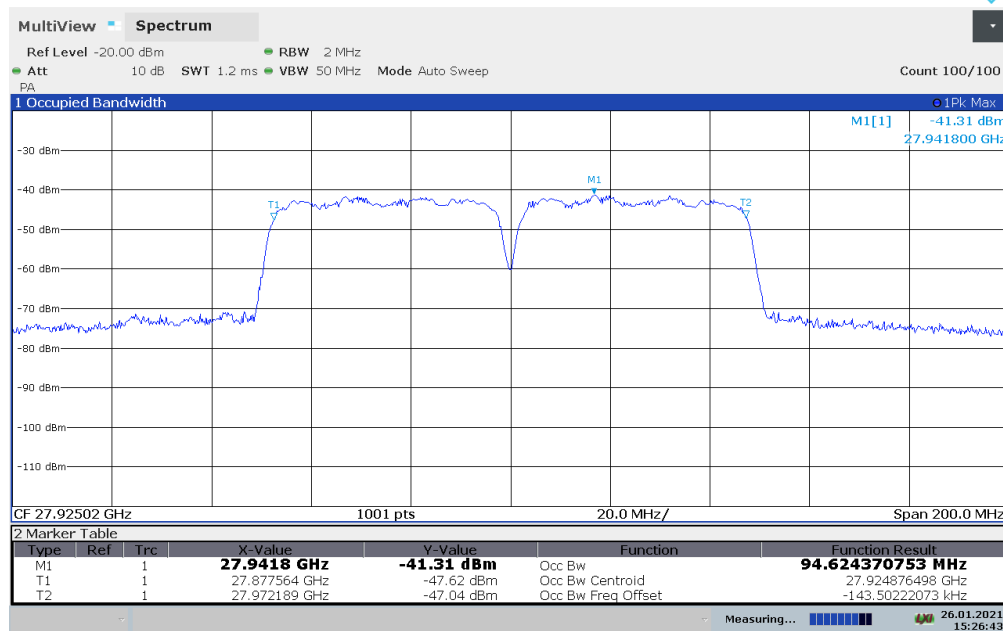
ACLRRResults



15:27:50 26.01.2021

Plot 7-7. Ant 1 Occupied Bandwidth Plot (50MHz-2CC – 16QAM – Mid Channel)

ACLRRResults

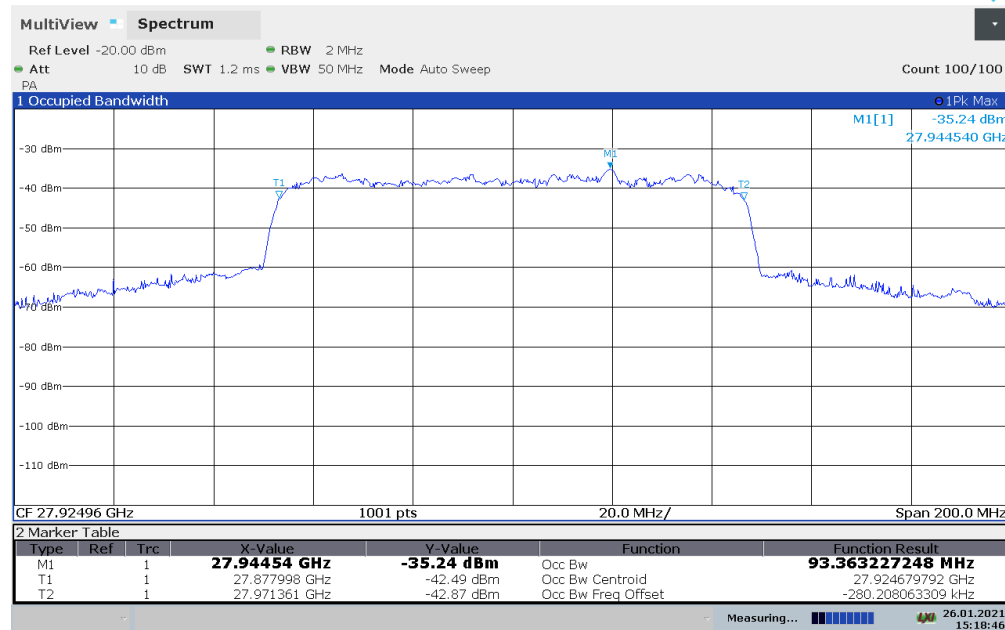


15:26:44 26.01.2021

Plot 7-8. Ant 1 Occupied Bandwidth Plot (50MHz-2CC – 64QAM – Mid Channel)

|                                            |                                              |                                       |                |                                   |
|--------------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMA426U                         | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021         | EUT Type:<br>Portable Handset         |                | Page 18 of 99                     |

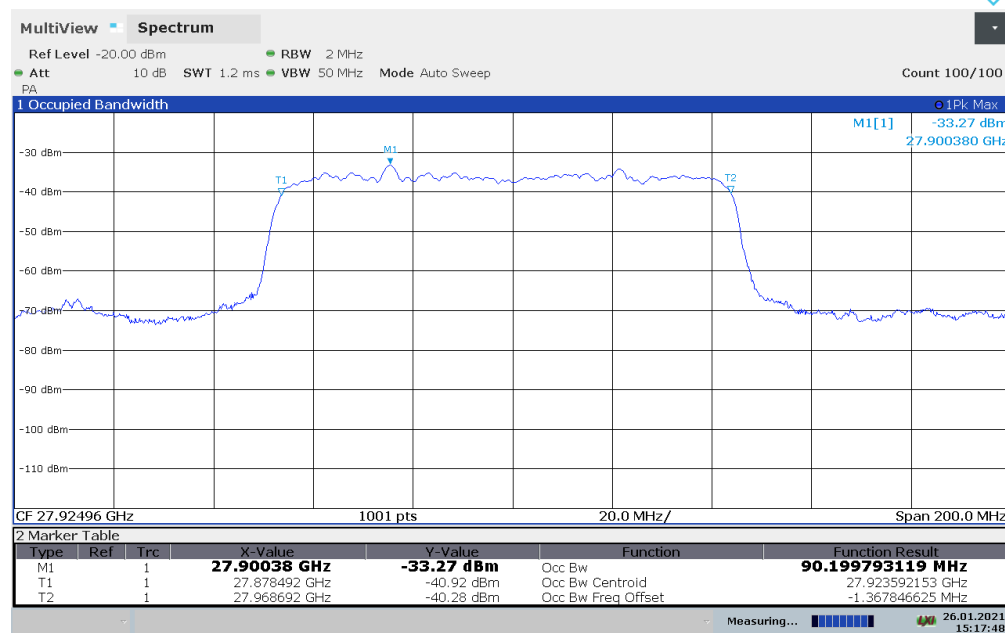
ACLRRResults



15:18:47 26.01.2021

Plot 7-9. Ant 1 Occupied Bandwidth Plot (100MHz-1CC – QPSK – Mid Channel)

ACLRRResults

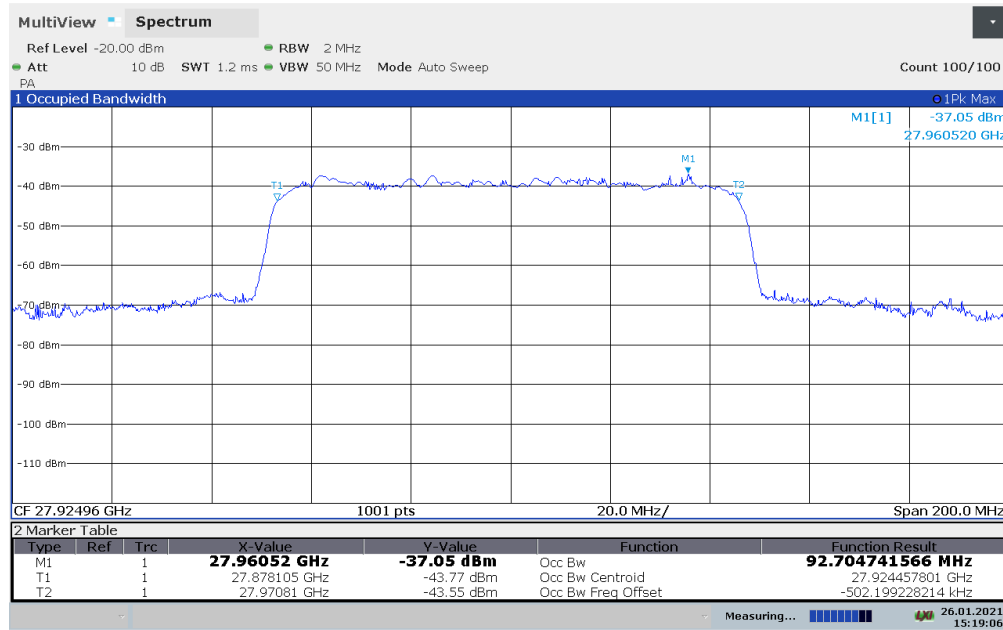


15:17:48 26.01.2021

Plot 7-10. Ant 1 Occupied Bandwidth Plot (100MHz-1CC – pi/2-BPSK – Mid Channel)

|                                            |                                              |                                       |                |                                   |
|--------------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMA426U                         | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021         | EUT Type:<br>Portable Handset         |                | Page 19 of 99                     |

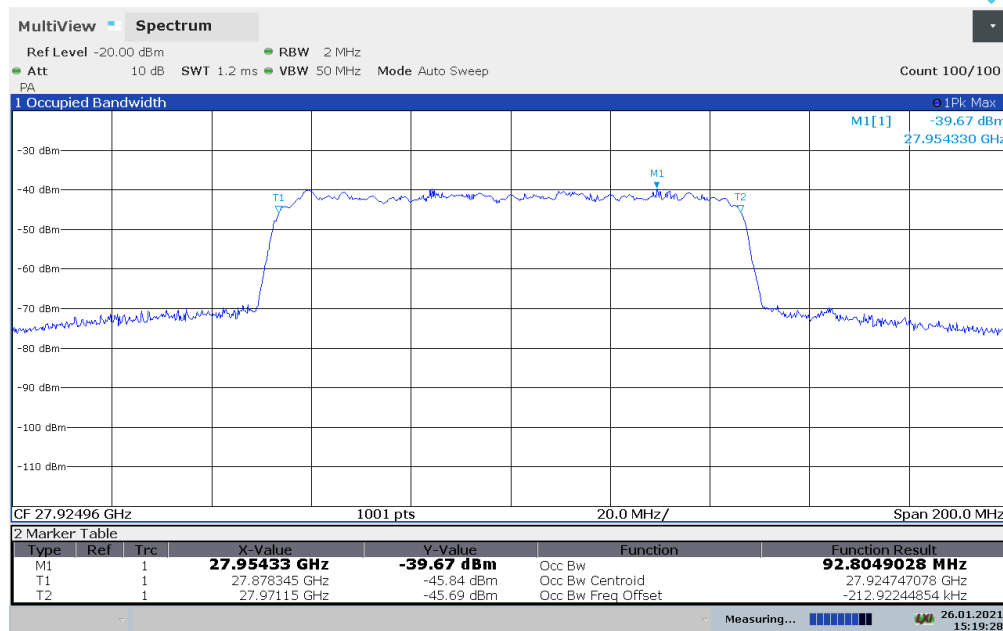
ACLRRResults



15:19:07 26.01.2021

Plot 7-11. Ant 1 Occupied Bandwidth Plot (100MHz-1CC – 16QAM – Mid Channel)

ACLRRResults

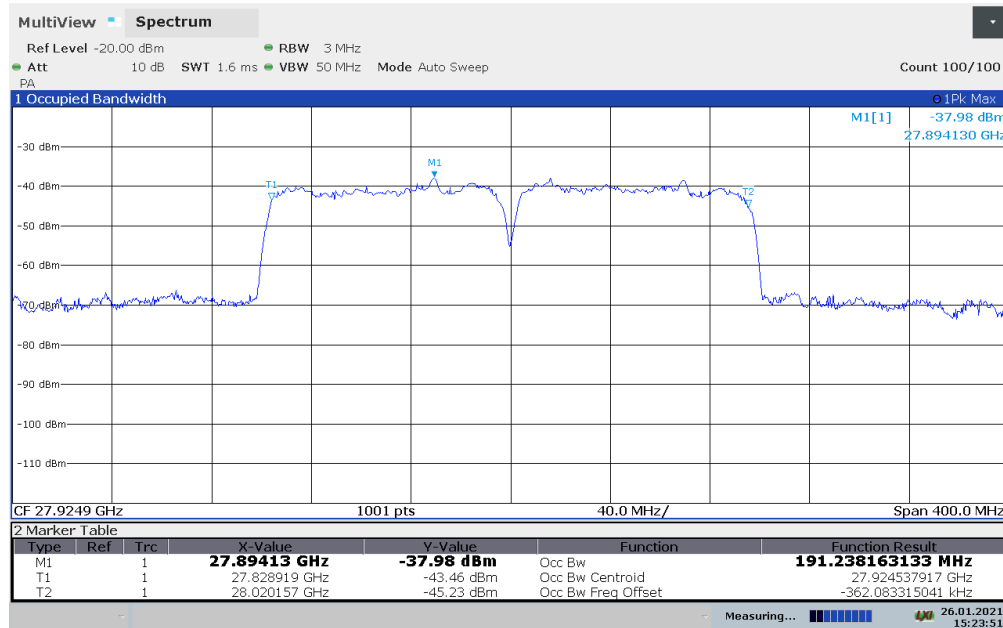


15:19:29 26.01.2021

Plot 7-12. Ant 1 Occupied Bandwidth Plot (100MHz-1CC – 64QAM – Mid Channel)

|                                            |                                              |                                       |                |                                   |
|--------------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMA426U                         | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021         | EUT Type:<br>Portable Handset         |                | Page 20 of 99                     |

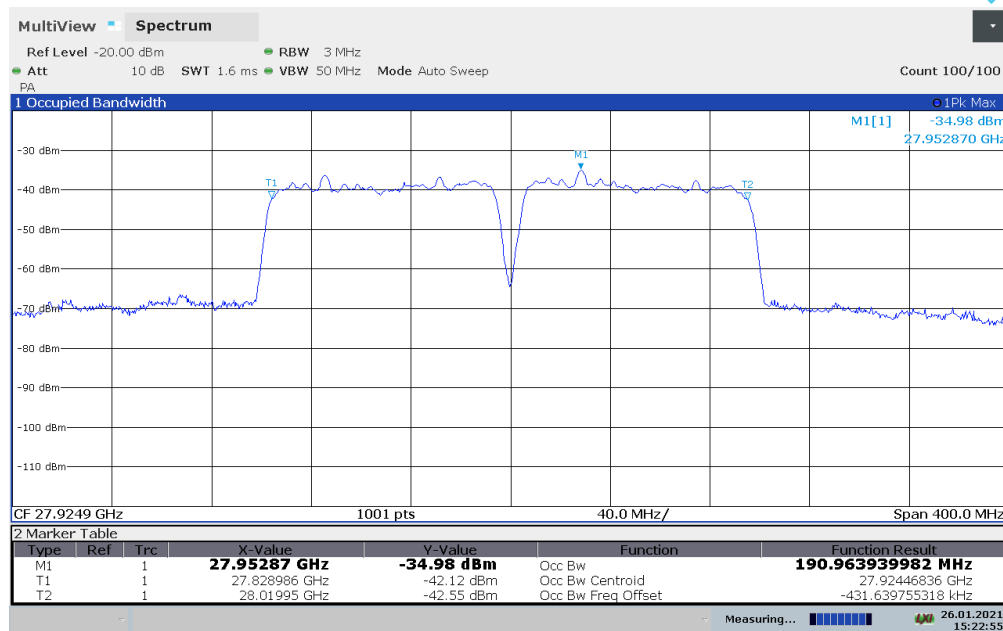
ACLRRResults



15:23:52 26.01.2021

Plot 7-13. Ant 1 Occupied Bandwidth Plot (100MHz-2CC – QPSK – Mid Channel)

ACLRRResults

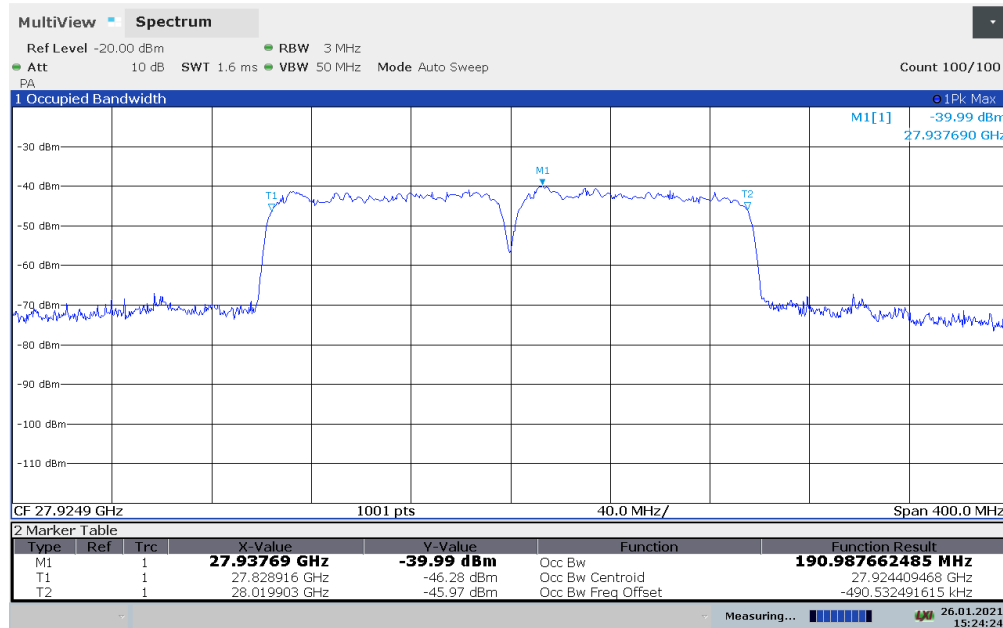


15:22:56 26.01.2021

Plot 7-14. Ant 1 Occupied Bandwidth Plot (100MHz-2CC – pi/2-BPSK – Mid Channel)

|                                            |                                              |                                       |                |                                   |
|--------------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMA426U                         | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021         | EUT Type:<br>Portable Handset         |                | Page 21 of 99                     |

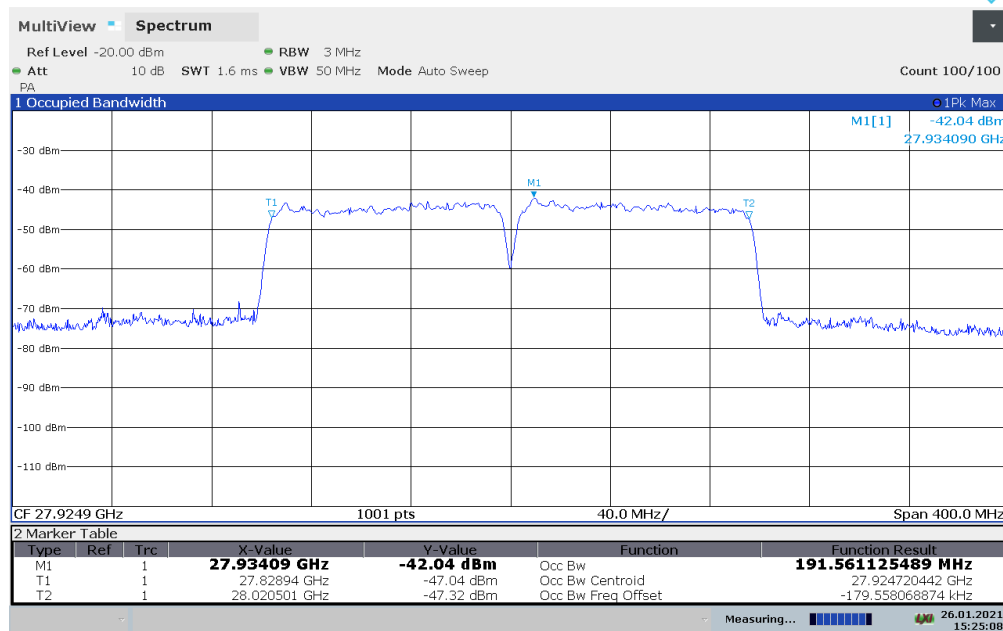
ACLRRResults



15:24:25 26.01.2021

Plot 7-15. Ant 1 Occupied Bandwidth Plot (100MHz-2CC – 16QAM – Mid Channel)

ACLRRResults



15:25:09 26.01.2021

Plot 7-16. Ant 1 Occupied Bandwidth Plot (100MHz-2CC – 64QAM – Mid Channel)

|                                            |                                              |                                       |                |                                   |
|--------------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMA426U                         | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021         | EUT Type:<br>Portable Handset         |                | Page 22 of 99                     |

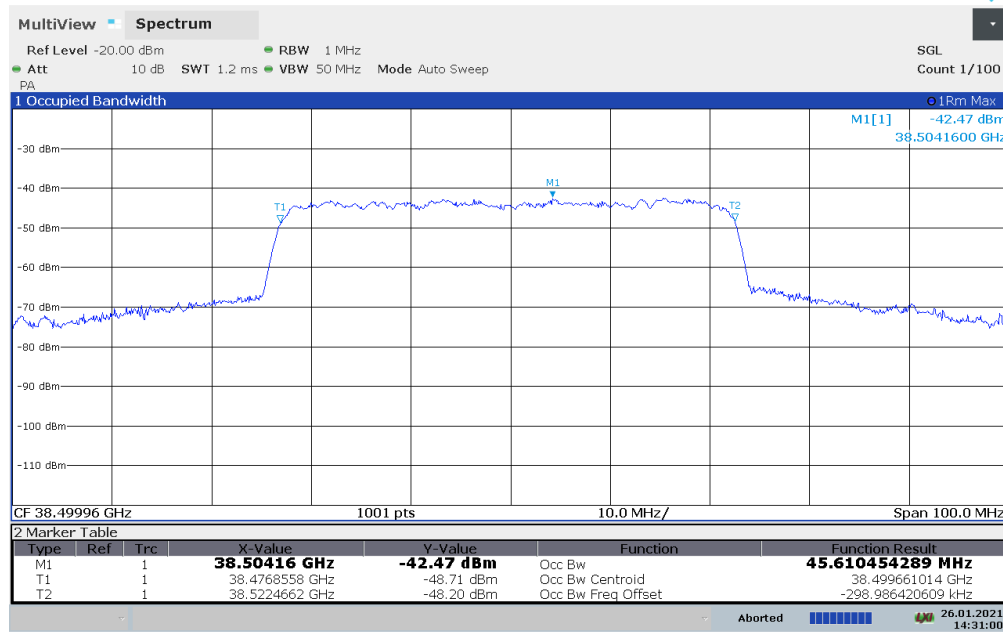
## Band n260

| Channel | Bandwidth | CCs Active | Transmission Scheme | Modulation | OBW [MHz] |
|---------|-----------|------------|---------------------|------------|-----------|
| Mid     | 50        | 1          | CP-OFDM             | QPSK       | 45.61     |
|         |           |            | DFT-s-OFDM          | pi/2-BPSK  | 45.47     |
|         |           |            | CP-OFDM             | 16QAM      | 45.34     |
|         |           |            | CP-OFDM             | 64QAM      | 45.29     |
|         |           | 2          | CP-OFDM             | QPSK       | 95.14     |
|         |           |            | DFT-s-OFDM          | pi/2-BPSK  | 94.88     |
|         |           |            | CP-OFDM             | 16QAM      | 94.95     |
|         |           |            | CP-OFDM             | 64QAM      | 95.13     |
|         | 100       | 1          | CP-OFDM             | QPSK       | 93.41     |
|         |           |            | DFT-s-OFDM          | pi/2-BPSK  | 90.80     |
|         |           |            | CP-OFDM             | 16QAM      | 93.39     |
|         |           |            | CP-OFDM             | 64QAM      | 93.16     |
|         |           | 2          | CP-OFDM             | QPSK       | 191.14    |
|         |           |            | DFT-s-OFDM          | pi/2-BPSK  | 190.93    |
|         |           |            | CP-OFDM             | 16QAM      | 191.27    |
|         |           |            | CP-OFDM             | 64QAM      | 191.53    |

Table 7-3. Summary of Ant 1 Occupied Bandwidths (n260 L Patch)

|                                            |                                                                                                                            |                                       |                                                                                       |                                   |
|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------|
| FCC ID: A3LSMA426U                         |  PCTEST®<br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021                                                                                       | EUT Type:<br>Portable Handset         |                                                                                       | Page 23 of 99                     |

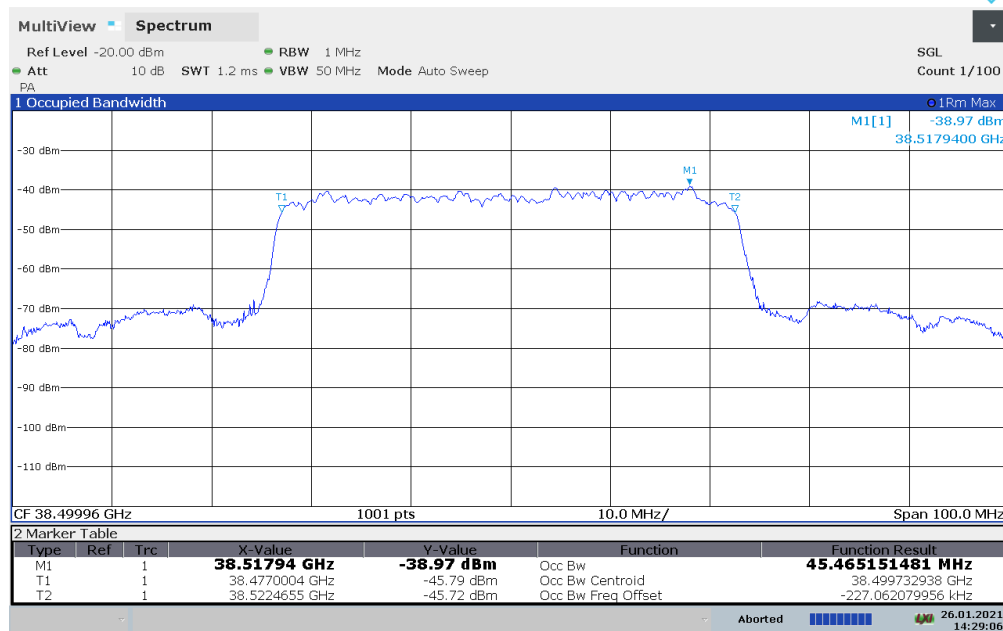
ACLRRResults



14:31:01 26.01.2021

Plot 7-17. Ant 1 Occupied Bandwidth Plot (50MHz-1CC – QPSK – Mid Channel)

ACLRRResults

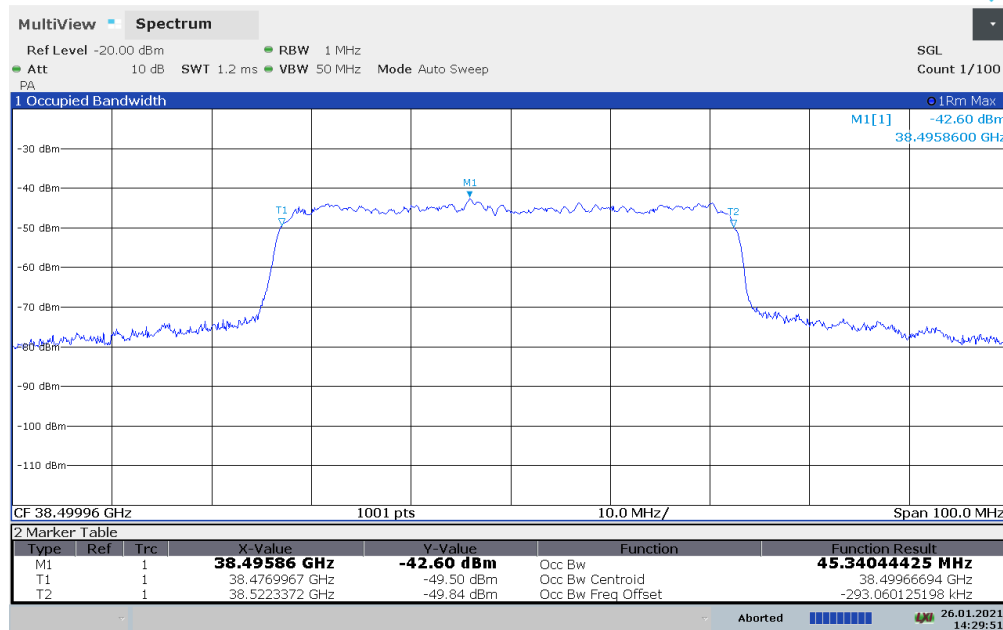


14:29:07 26.01.2021

Plot 7-18. Ant 1 Occupied Bandwidth Plot (50MHz-1CC – pi/2-BPSK – Mid Channel)

|                                            |                                              |                                       |                |                                   |
|--------------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMA426U                         | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021         | EUT Type:<br>Portable Handset         |                | Page 24 of 99                     |

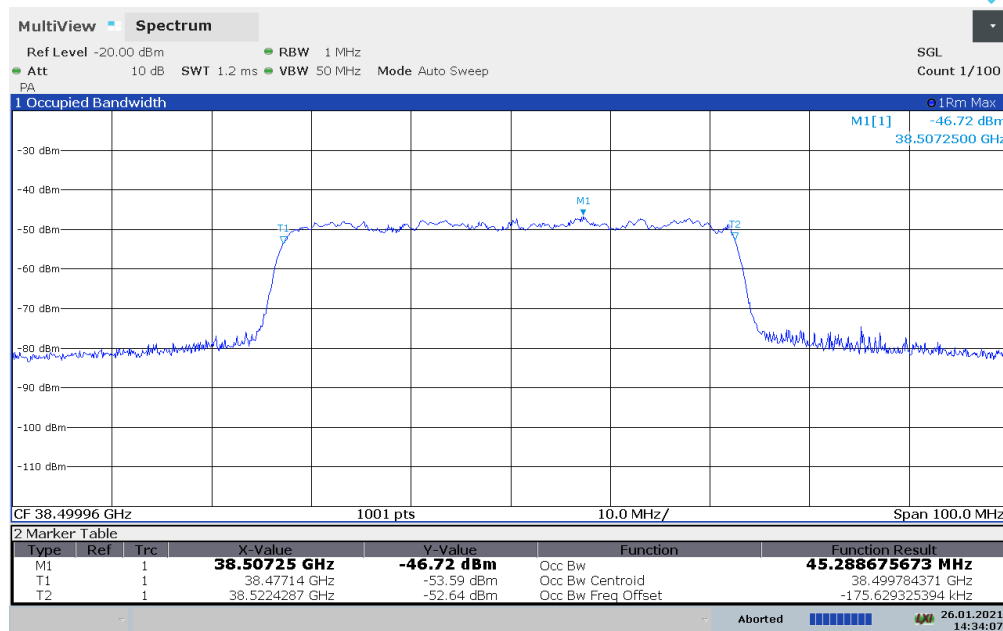
ACLRRResults



14:29:52 26.01.2021

Plot 7-19. Ant 1 Occupied Bandwidth Plot (50MHz-1CC – 16QAM – Mid Channel)

ACLRRResults

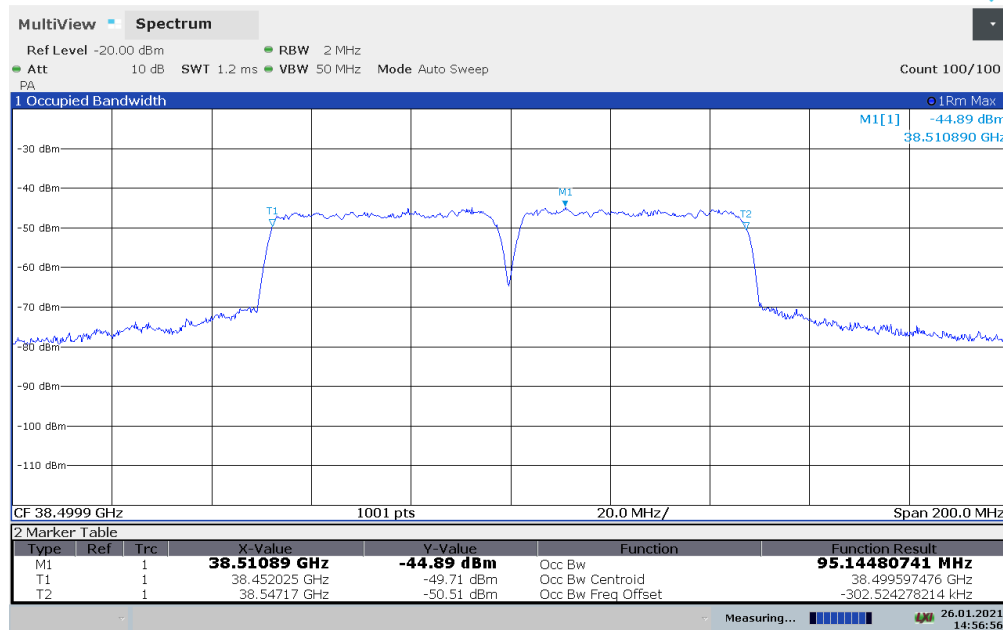


14:34:07 26.01.2021

Plot 7-20. Ant 1 Occupied Bandwidth Plot (50MHz-1CC – 64QAM – Mid Channel)

|                                            |                                              |                                       |                |                                   |
|--------------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMA426U                         | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021         | EUT Type:<br>Portable Handset         |                | Page 25 of 99                     |

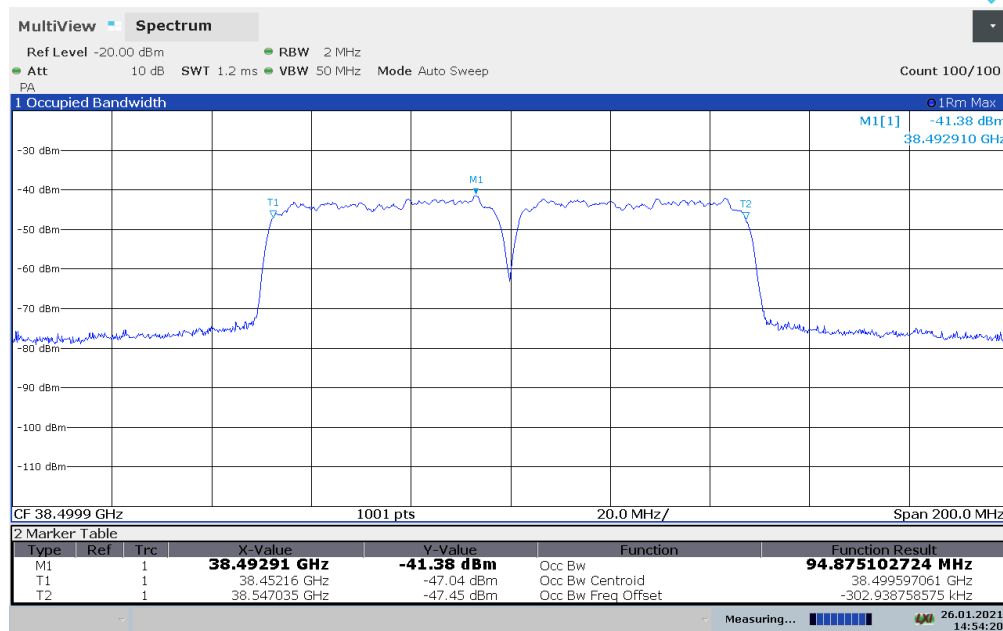
ACLRRResults



14:56:56 26.01.2021

Plot 7-21. Ant 1 Occupied Bandwidth Plot (50MHz-2CC – QPSK – Mid Channel)

ACLRRResults

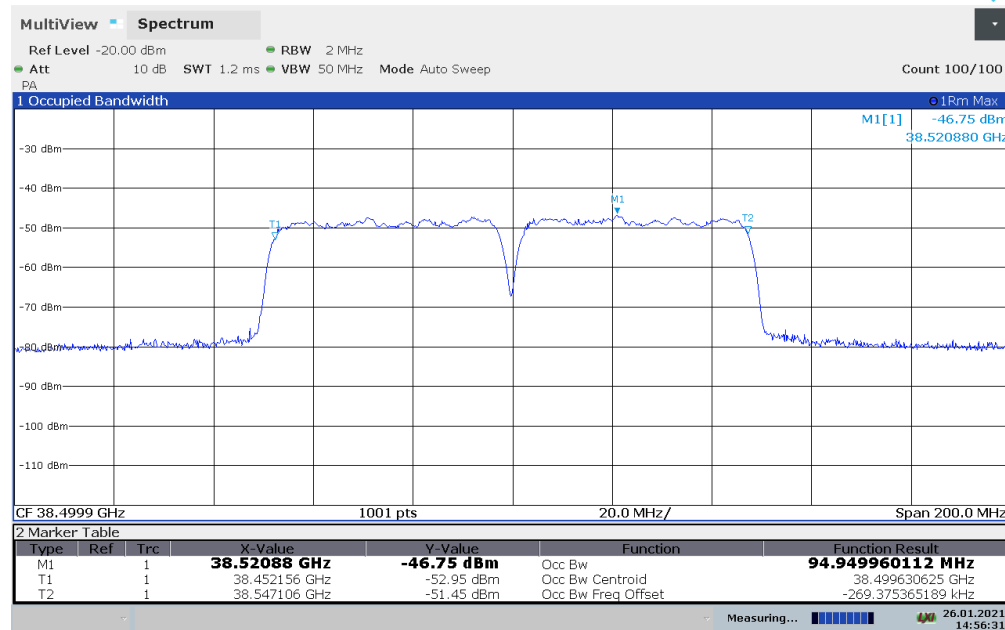


14:54:21 26.01.2021

Plot 7-22. Ant 1 Occupied Bandwidth Plot (50MHz-2CC – pi/2-BPSK – Mid Channel)

|                                            |                                              |                                       |                |                                   |
|--------------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMA426U                         | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021         | EUT Type:<br>Portable Handset         |                | Page 26 of 99                     |

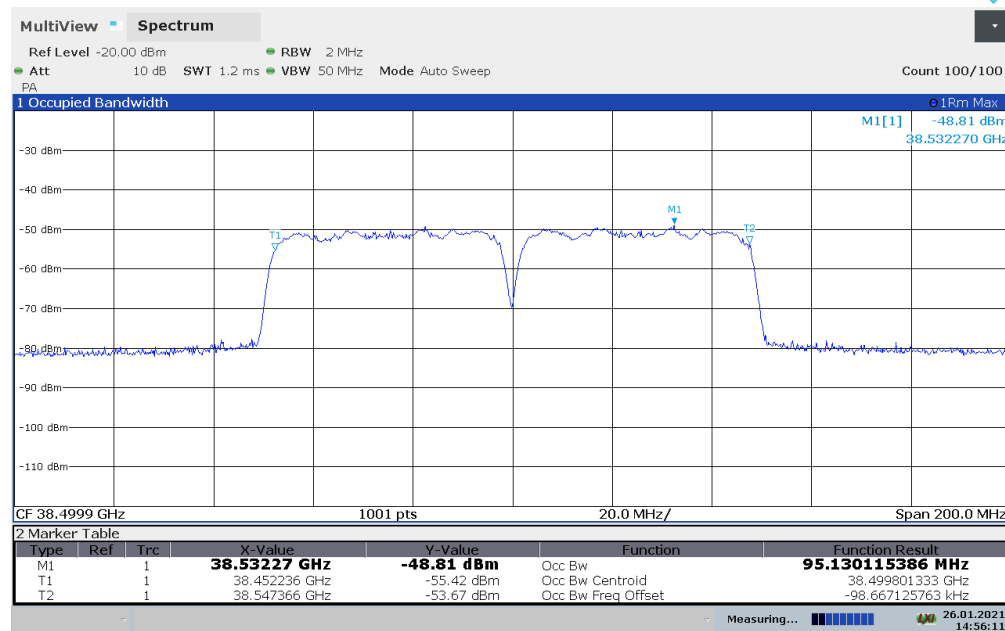
ACLRRResults



14:56:31 26.01.2021

Plot 7-23. Ant 1 Occupied Bandwidth Plot (50MHz-2CC – 16QAM – Mid Channel)

ACLRRResults

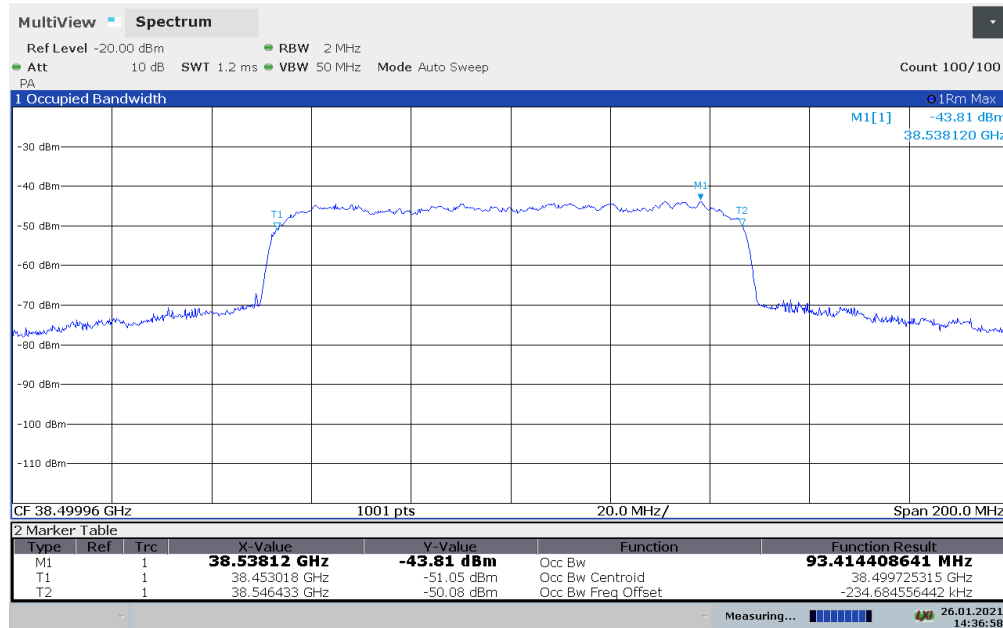


14:56:11 26.01.2021

Plot 7-24. Ant 1 Occupied Bandwidth Plot (50MHz-2CC – 64QAM – Mid Channel)

|                                            |                                              |                                       |                |                                   |
|--------------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMA426U                         | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021         | EUT Type:<br>Portable Handset         |                | Page 27 of 99                     |

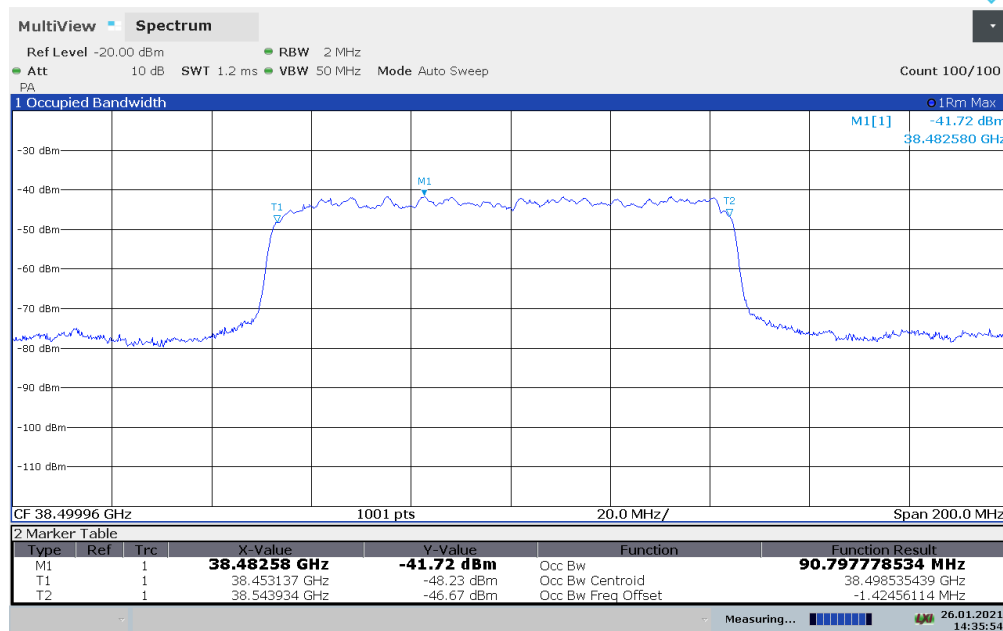
ACLRRResults



14:36:59 26.01.2021

Plot 7-25. Ant 1 Occupied Bandwidth Plot (100MHz-1CC – QPSK – Mid Channel)

ACLRRResults

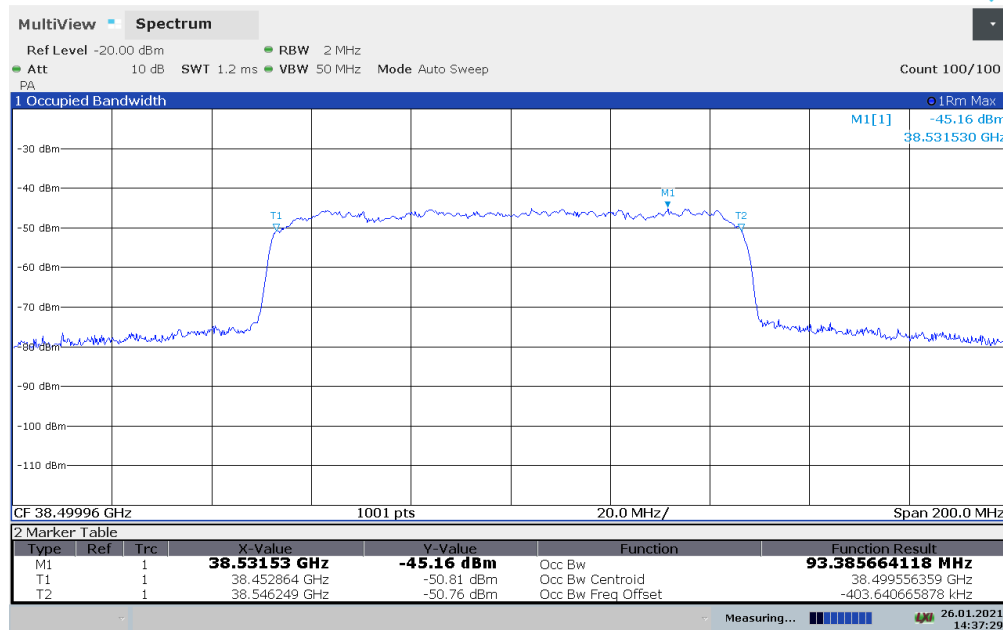


14:35:55 26.01.2021

Plot 7-26. Ant 1 Occupied Bandwidth Plot (100MHz-1CC – pi/2-BPSK – Mid Channel)

|                                            |                                              |                                       |                |                                   |
|--------------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMA426U                         | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021         | EUT Type:<br>Portable Handset         |                | Page 28 of 99                     |

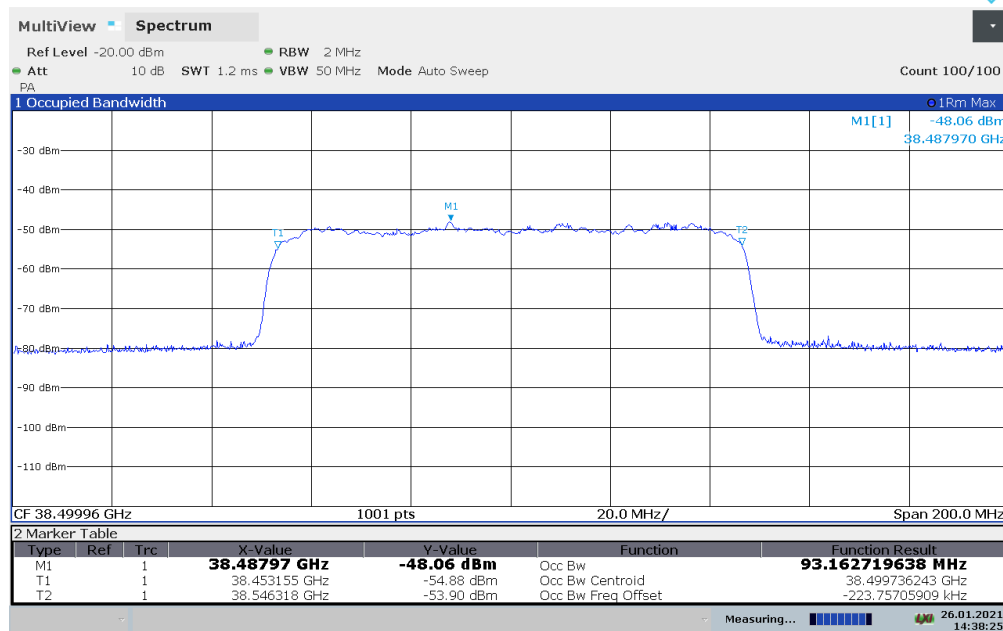
ACLRRResults



14:37:30 26.01.2021

Plot 7-27. Ant 1 Occupied Bandwidth Plot (100MHz-1CC – 16QAM – Mid Channel)

ACLRRResults

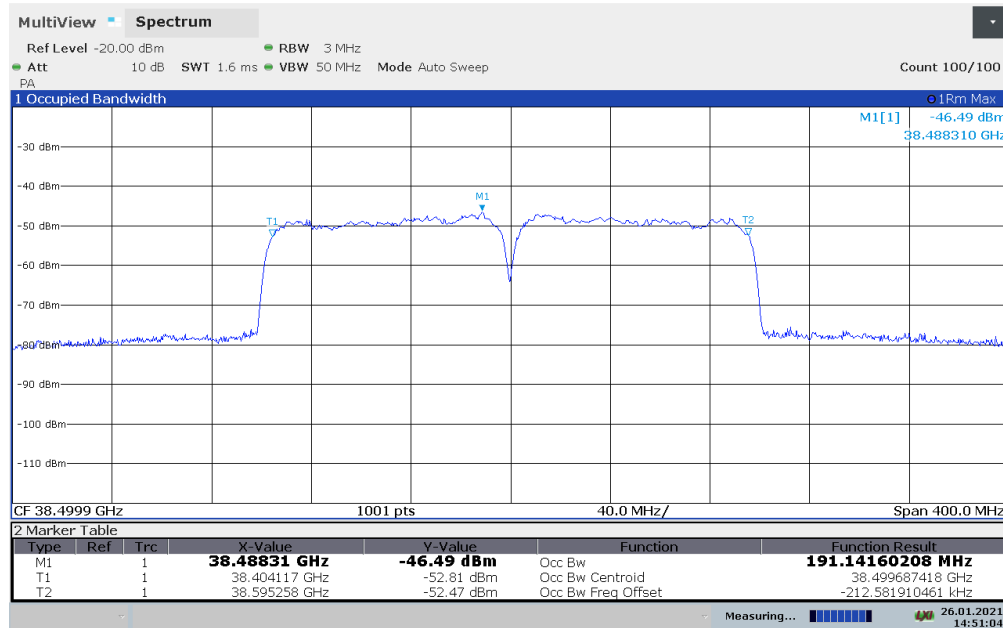


14:38:25 26.01.2021

Plot 7-28. Ant 1 Occupied Bandwidth Plot (100MHz-1CC – 64QAM – Mid Channel)

|                                            |                                              |                                       |                |                                   |
|--------------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMA426U                         | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021         | EUT Type:<br>Portable Handset         |                | Page 29 of 99                     |

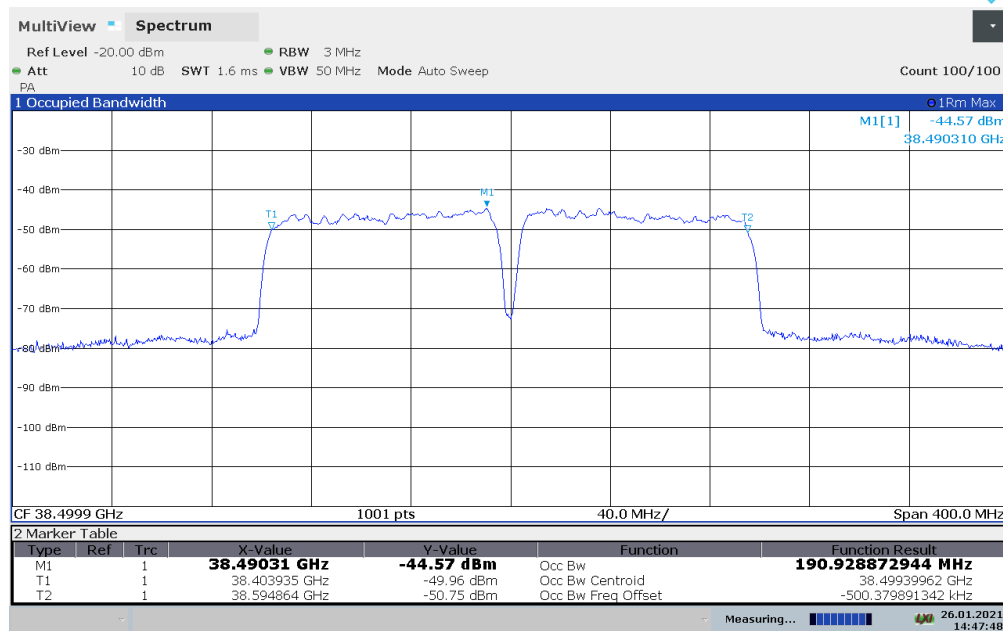
ACLRRResults



14:51:04 26.01.2021

Plot 7-2. Ant 1 Occupied Bandwidth Plot (100MHz-2CC – QPSK – Mid Channel)

ACLRRResults

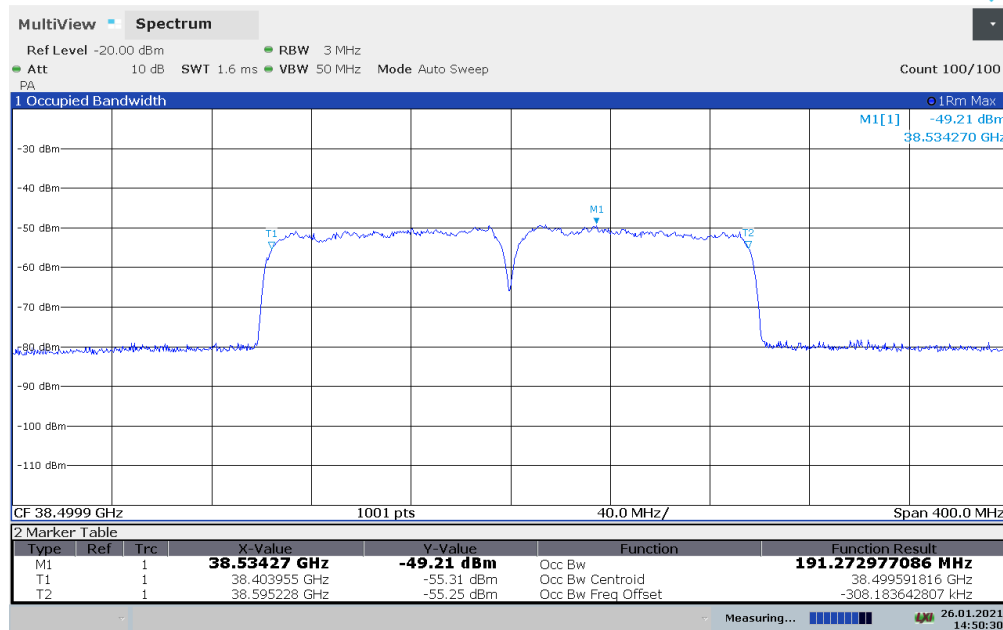


14:47:49 26.01.2021

Plot 7-30. Ant 1 Occupied Bandwidth Plot (100MHz-2CC – pi/2-BPSK – Mid Channel)

|                                            |                                              |                                       |                |                                   |
|--------------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMA426U                         | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021         | EUT Type:<br>Portable Handset         |                | Page 30 of 99                     |

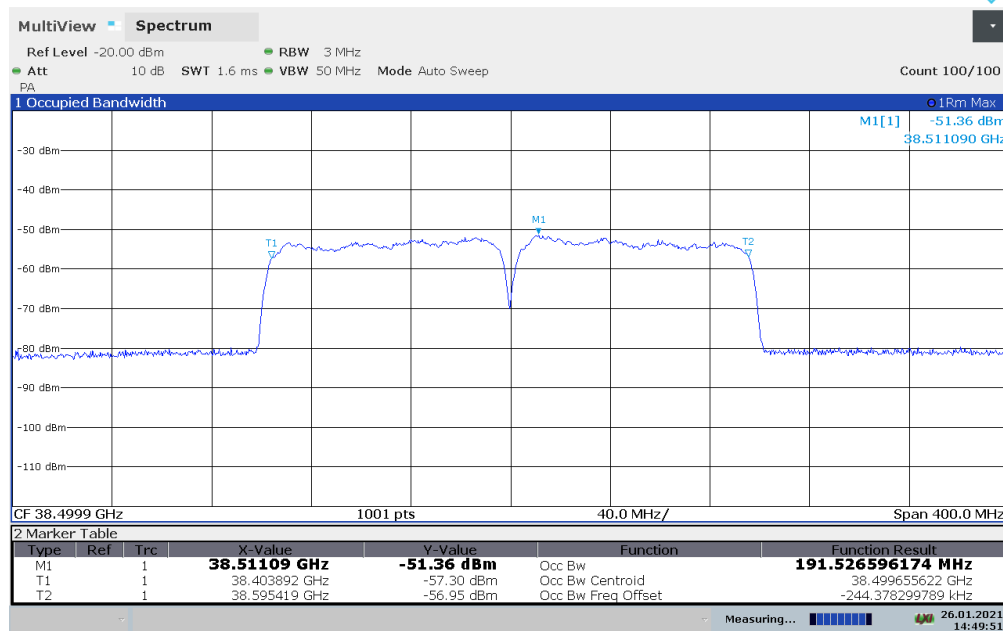
ACLRRResults



14:50:31 26.01.2021

Plot 7-31. Ant 1 Occupied Bandwidth Plot (100MHz-2CC – 16QAM – Mid Channel)

ACLRRResults



14:49:51 26.01.2021

Plot 7-32. Ant 1 Occupied Bandwidth Plot (100MHz-2CC – 64QAM – Mid Channel)

|                                            |                                              |                                       |                |                                   |
|--------------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMA426U                         | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021         | EUT Type:<br>Portable Handset         |                | Page 31 of 99                     |

## 7.3 Equivalent Isotropic Radiated Power

### §2.1046, §30.202

#### Test Overview

Equivalent Isotropic Radiated Power (EIRP) measurements are performed using broadband horn antennas. All measurements are performed as RMS average measurements while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

***The average power of the sum of all antenna elements is limited to a maximum EIRP of +43 dBm.***

#### Test Procedures Used

ANSI C63.26-2015 Section 5.2.4.4.1  
 KDB 842590 D01 v01r01 Section 4.2

#### Test Settings

1. Radiated power measurements are performed using the signal analyzer's "channel power" measurement capability for signals with continuous operation.
2. RBW = 1 – 5% of the expected OBW, not to exceed 1MHz
3. VBW  $\geq 3 \times$  RBW
4. Span = 2x to 3x the OBW
5. No. of sweep points  $\geq 2 \times$  span / RBW
6. Detector = RMS
7. The integration bandwidth was roughly set equal to the measured OBW of the signal for signals with continuous operation.
8. Trace mode = trace averaging (RMS) over 100 sweeps
9. The trace was allowed to stabilize

|                                            |                                                                                                                                                                                                              |                                       |                                                                                       |                                   |
|--------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------|
| FCC ID: A3LSMA426U                         |  <b>PCTEST</b><br>Proud to be part of  | MEASUREMENT REPORT<br>(CERTIFICATION) |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021                                                                                                                                                                         | EUT Type:<br>Portable Handset         |                                                                                       | Page 32 of 99                     |

## Test Notes

- 1) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below. Both H-Beam and V-Beam were investigated and the worst-case measurements were reported below.
- 2) Elements within the same antenna array are correlated to produce beamforming array gain. Antenna arrays cannot be correlated with another antenna array. During testing, only one antenna array was active.
- 3) EIRP measurements were taken at 1m test distance.
- 4) The average EIRP reported below is calculated per section 5.2.7 of ANSI C63.26-2015 which states: EIRP (dBm) = E (dBμV/m) + 20log(D) – 104.8; where D is the measurement distance (in the far field region) in m. The field strength E is calculated E (dBμV/m) = Spectrum Analyzer Channel Power Level (dBm) + Antenna Factor (dB/m) + Cable Loss (dB) + 107.
- 5) Radiated power levels are investigated while the receive antenna was rotated through all angles to determine the worst case polarization/positioning.
- 6) This device supports transmission of H-polarized and V-polarized beams from the antenna array in both CP-OFDM and DFT-s-OFDM transmission schemes. SISO and MIMO operation is also supported for some configurations. As part of the testing, all modes are investigated fully on the channel showing the highest simulated EIRP using QPSK modulation. The configuration that shows the highest measured EIRP was then used to determine the EIRP for the low and high channels and for the additional modulations.

|                                            |                                                                                                                            |                                       |                                                                                       |                                   |
|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------|
| FCC ID: A3LSMA426U                         |  PCTEST®<br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021                                                                                       | EUT Type:<br>Portable Handset         |                                                                                       | Page 33 of 99                     |

## Band n261 Beam ID Configurations

| Mode | Channel | Beam Polarization | Beam ID | Beam ID Pair |
|------|---------|-------------------|---------|--------------|
| SISO | Low     | H                 | 151     | -            |
|      |         | V                 | 15      | -            |
|      | Mid     | H                 | 151     | -            |
|      |         | V                 | 15      | -            |
|      | High    | H                 | 151     | -            |
|      |         | V                 | 15      | -            |
| MIMO | Low     | MIMO              | 15      | 143          |
|      | Mid     | MIMO              | 25      | 153          |
|      | High    | MIMO              | 15      | 143          |

Table 7-4. Ant 1 (L Patch) Worst Case Beam ID

| Mode | Channel | Beam Polarization | Beam ID | Beam ID Pair |
|------|---------|-------------------|---------|--------------|
| SISO | Low     | H                 | 149     | -            |
|      |         | V                 | 29      | -            |
|      | Mid     | H                 | 149     | -            |
|      |         | V                 | 28      | -            |
|      | High    | H                 | 148     | -            |
|      |         | V                 | 20      | -            |
| MIMO | Low     | MIMO              | 20      | 148          |
|      | Mid     | MIMO              | 20      | 148          |
|      | High    | MIMO              | 28      | 156          |

Table 7-5. Ant 2 (R Patch) Worst Case Beam ID

|                                            |                                                                                                                            |                                       |                                                                                       |                                   |
|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------|
| FCC ID: A3LSMA426U                         |  PCTEST®<br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021                                                                                       | EUT Type:<br>Portable Handset         | Page 34 of 99                                                                         |                                   |

## Band n261

| CCs Active | Channel | Frequency [MHz] | Transmission Scheme | Modulation   | BeamID   | Beam Pol. | Ant. Div. | Ant. Pol. [H/V] | Turntable Azimuth [degrees] | Positioner Azimuth [degrees] | RB Size/Offset | EIRP [dBm] |
|------------|---------|-----------------|---------------------|--------------|----------|-----------|-----------|-----------------|-----------------------------|------------------------------|----------------|------------|
| 1          | Low     | 27525.00        | DFT-s-OFDM          | QPSK         | 151      | H         | SISO      | H               | 332                         | 347                          | 1 / 21         | 24.77      |
|            | Low     | 27525.00        | DFT-s-OFDM          | QPSK         | 15       | V         | SISO      | V               | 11                          | 6                            | 1 / 21         | 26.88      |
|            | Low     | 27525.00        | DFT-s-OFDM          | QPSK         | 15 + 143 | H + V     | 2Tx       | H               | 12                          | 299                          | 1 / 21         | 29.91      |
|            | Low     | 27525.00        | CP-OFDM             | QPSK         | 151      | H         | SISO      | H               | 332                         | 347                          | 1 / 21         | 21.92      |
|            | Low     | 27525.00        | CP-OFDM             | QPSK         | 15       | V         | SISO      | V               | 11                          | 6                            | 1 / 21         | 24.27      |
|            | Low     | 27525.00        | CP-OFDM             | QPSK         | 15 + 143 | H + V     | MIMO      | H               | 12                          | 299                          | 1 / 21         | 25.59      |
|            | Mid     | 27924.96        | DFT-s-OFDM          | QPSK         | 25 + 153 | H + V     | 2Tx       | H               | 20                          | 25                           | 1 / 21         | 27.52      |
|            | High    | 28324.92        | DFT-s-OFDM          | QPSK         | 15 + 143 | H + V     | 2Tx       | H               | 12                          | 42                           | 1 / 11         | 28.51      |
|            | Low     | 27525.00        | DFT-s-OFDM          | $\pi/2$ BPSK | 15 + 143 | H + V     | 2Tx       | H               | 12                          | 299                          | 1 / 21         | 29.92      |
|            | Low     | 27525.00        | DFT-s-OFDM          | 16QAM        | 15 + 143 | H + V     | 2Tx       | H               | 12                          | 299                          | 1 / 21         | 28.21      |
|            | Low     | 27525.00        | DFT-s-OFDM          | 64QAM        | 15 + 143 | H + V     | 2Tx       | H               | 12                          | 299                          | 1 / 21         | 26.08      |

Table 7-6. Ant 1 EIRP Data (Band n261 - 50MHz-1CC)

| CCs Active | Channel | Frequency [MHz] | Transmission Scheme | Modulation   | BeamID   | Beam Pol. | Ant. Div. | Ant. Pol. [H/V] | Turntable Azimuth [degrees] | Positioner Azimuth [degrees] | RB Size/Offset | EIRP [dBm] |
|------------|---------|-----------------|---------------------|--------------|----------|-----------|-----------|-----------------|-----------------------------|------------------------------|----------------|------------|
| 2          | Low     | 27525.00        | DFT-s-OFDM          | QPSK         | 15 + 143 | H + V     | 2Tx       | H               | 12                          | 299                          | 32 / 0         | 27.03      |
|            | Low     | 27525.00        | DFT-s-OFDM          | $\pi/2$ BPSK | 15 + 143 | H + V     | 2Tx       | H               | 12                          | 299                          | 32 / 0         | 27.01      |
|            | Low     | 27525.00        | DFT-s-OFDM          | 16QAM        | 15 + 143 | H + V     | 2Tx       | H               | 12                          | 299                          | 32 / 0         | 25.58      |
|            | Low     | 27525.00        | DFT-s-OFDM          | 64QAM        | 15 + 143 | H + V     | 2Tx       | H               | 12                          | 299                          | 32 / 0         | 23.46      |

Table 7-7. Ant 1 EIRP Data (Band n261 - 50MHz-2CC)

| CCs Active | Channel | Frequency [MHz] | Transmission Scheme | Modulation   | BeamID   | Beam Pol. | Ant. Div. | Ant. Pol. [H/V] | Turntable Azimuth [degrees] | Positioner Azimuth [degrees] | RB Size/Offset | EIRP [dBm] |
|------------|---------|-----------------|---------------------|--------------|----------|-----------|-----------|-----------------|-----------------------------|------------------------------|----------------|------------|
| 1          | Low     | 27550.08        | DFT-s-OFDM          | QPSK         | 151      | H         | SISO      | H               | 332                         | 347                          | 1 / 43         | 24.72      |
|            | Low     | 27550.08        | DFT-s-OFDM          | QPSK         | 15       | V         | SISO      | V               | 11                          | 6                            | 1 / 43         | 27.03      |
|            | Low     | 27550.08        | DFT-s-OFDM          | QPSK         | 15 + 143 | H + V     | 2Tx       | H               | 12                          | 299                          | 1 / 43         | 29.93      |
|            | Low     | 27550.08        | CP-OFDM             | QPSK         | 151      | H         | SISO      | H               | 332                         | 347                          | 1 / 33         | 21.84      |
|            | Low     | 27550.08        | CP-OFDM             | QPSK         | 15       | V         | SISO      | V               | 11                          | 6                            | 1 / 43         | 24.52      |
|            | Low     | 27550.08        | CP-OFDM             | QPSK         | 15 + 143 | H + V     | MIMO      | H               | 12                          | 299                          | 1 / 43         | 25.59      |
|            | Mid     | 27924.96        | DFT-s-OFDM          | QPSK         | 25 + 153 | H + V     | 2Tx       | H               | 21                          | 40                           | 1 / 22         | 27.63      |
|            | High    | 28299.96        | DFT-s-OFDM          | QPSK         | 15 + 153 | H + V     | 2Tx       | H               | 12                          | 43                           | 1 / 22         | 28.57      |
|            | Low     | 27550.08        | DFT-s-OFDM          | $\pi/2$ BPSK | 15 + 143 | H + V     | 2Tx       | H               | 12                          | 299                          | 1 / 43         | 29.96      |
|            | Low     | 27550.08        | DFT-s-OFDM          | 16QAM        | 15 + 143 | H + V     | 2Tx       | H               | 12                          | 299                          | 1 / 43         | 28.13      |
|            | Low     | 27550.08        | DFT-s-OFDM          | 64QAM        | 15 + 143 | H + V     | 2Tx       | H               | 12                          | 299                          | 1 / 43         | 26.02      |

Table 7-8. Ant 1 EIRP Data (Band n261 - 100MHz-1CC)

| CCs Active | Channel | Frequency [MHz] | Transmission Scheme | Modulation   | BeamID   | Beam Pol. | Ant. Div. | Ant. Pol. [H/V] | Turntable Azimuth [degrees] | Positioner Azimuth [degrees] | RB Size/Offset | EIRP [dBm] |
|------------|---------|-----------------|---------------------|--------------|----------|-----------|-----------|-----------------|-----------------------------|------------------------------|----------------|------------|
| 2          | Low     | 27550.08        | DFT-s-OFDM          | QPSK         | 15 + 143 | H + V     | 2Tx       | H               | 12                          | 299                          | 64 / 0         | 27.06      |
|            | Low     | 27550.08        | DFT-s-OFDM          | $\pi/2$ BPSK | 15 + 143 | H + V     | 2Tx       | H               | 12                          | 299                          | 64 / 0         | 27.07      |
|            | Low     | 27550.08        | DFT-s-OFDM          | 16QAM        | 15 + 143 | H + V     | 2Tx       | H               | 12                          | 299                          | 64 / 0         | 25.51      |
|            | Low     | 27550.08        | DFT-s-OFDM          | 64QAM        | 15 + 143 | H + V     | 2Tx       | H               | 12                          | 299                          | 64 / 0         | 23.46      |

Table 7-9. Ant 1 EIRP Data (Band n261 - 100MHz-2CC)

|                                            |                                                                                                                           |                                                                                       |                                   |
|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------|
| FCC ID: A3LSMA426U                         |  MEASUREMENT REPORT<br>(CERTIFICATION) |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021                                                                                      | EUT Type:<br>Portable Handset                                                         | Page 35 of 99                     |

| CCs Active | Channel | Frequency [MHz] | Transmission Scheme | Modulation   | BeamID   | Beam Pol. | Ant. Div. | Ant. Pol. [H/V] | Turntable Azimuth [degrees] | Positioner Azimuth [degrees] | RB Size/Offset | EIRP [dBm] |
|------------|---------|-----------------|---------------------|--------------|----------|-----------|-----------|-----------------|-----------------------------|------------------------------|----------------|------------|
| 1          | Low     | 27525.00        | DFT-s-OFDM          | QPSK         | 149      | H         | SiSO      | V               | 332                         | 263                          | 1 / 16         | 26.10      |
|            | Low     | 27525.00        | DFT-s-OFDM          | QPSK         | 29       | V         | SiSO      | H               | 330                         | 262                          | 1 / 16         | 28.22      |
|            | Low     | 27525.00        | DFT-s-OFDM          | QPSK         | 20 + 148 | H + V     | 2Tx       | H               | 27                          | 85                           | 1 / 11         | 30.32      |
|            | Low     | 27525.00        | CP-OFDM             | QPSK         | 149      | H         | SiSO      | V               | 332                         | 263                          | 1 / 21         | 21.75      |
|            | Low     | 27525.00        | CP-OFDM             | QPSK         | 29       | V         | SiSO      | H               | 330                         | 262                          | 1 / 11         | 23.94      |
|            | Low     | 27525.00        | CP-OFDM             | QPSK         | 20 + 148 | H + V     | MIMO      | H               | 27                          | 85                           | 1 / 16         | 26.84      |
|            | Mid     | 27924.96        | DFT-s-OFDM          | QPSK         | 20 + 148 | H + V     | 2Tx       | H               | 332                         | 261                          | 1 / 21         | 29.85      |
|            | High    | 28324.92        | DFT-s-OFDM          | QPSK         | 28 + 156 | H + V     | 2Tx       | H               | 333                         | 261                          | 1 / 16         | 27.90      |
|            | Low     | 27525.00        | DFT-s-OFDM          | $\pi/2$ BPSK | 20 + 148 | H + V     | 2Tx       | H               | 27                          | 85                           | 1 / 11         | 30.49      |
|            | Low     | 27525.00        | DFT-s-OFDM          | 16QAM        | 20 + 148 | H + V     | 2Tx       | H               | 27                          | 85                           | 1 / 11         | 28.62      |
|            | Low     | 27525.00        | DFT-s-OFDM          | 64QAM        | 20 + 148 | H + V     | 2Tx       | H               | 27                          | 85                           | 1 / 11         | 26.62      |

Table 7-10. Ant 2 EIRP Data (Band n261 - 50MHz-1CC)

| CCs Active | Channel | Frequency [MHz] | Transmission Scheme | Modulation   | BeamID   | Beam Pol. | Ant. Div. | Ant. Pol. [H/V] | Turntable Azimuth [degrees] | Positioner Azimuth [degrees] | RB Size/Offset | EIRP [dBm] |
|------------|---------|-----------------|---------------------|--------------|----------|-----------|-----------|-----------------|-----------------------------|------------------------------|----------------|------------|
| 2          | Low     | 27525.00        | DFT-s-OFDM          | QPSK         | 20 + 148 | H + V     | 2Tx       | H               | 27                          | 85                           | 32 / 0         | 27.06      |
|            | Low     | 27525.00        | DFT-s-OFDM          | $\pi/2$ BPSK | 20 + 148 | H + V     | 2Tx       | H               | 27                          | 85                           | 32 / 0         | 27.03      |
|            | Low     | 27525.00        | DFT-s-OFDM          | 16QAM        | 20 + 148 | H + V     | 2Tx       | H               | 27                          | 85                           | 32 / 0         | 25.52      |
|            | Low     | 27525.00        | DFT-s-OFDM          | 64QAM        | 20 + 148 | H + V     | 2Tx       | H               | 27                          | 85                           | 32 / 0         | 23.47      |

Table 7-11. Ant 2 EIRP Data (Band n261 - 50MHz-2CC)

| CCs Active | Channel | Frequency [MHz] | Transmission Scheme | Modulation   | BeamID   | Beam Pol. | Ant. Div. | Ant. Pol. [H/V] | Turntable Azimuth [degrees] | Positioner Azimuth [degrees] | RB Size/Offset | EIRP [dBm] |
|------------|---------|-----------------|---------------------|--------------|----------|-----------|-----------|-----------------|-----------------------------|------------------------------|----------------|------------|
| 1          | Low     | 27550.08        | DFT-s-OFDM          | QPSK         | 149      | H         | SiSO      | V               | 330                         | 262                          | 1 / 33         | 26.28      |
|            | Low     | 27550.08        | DFT-s-OFDM          | QPSK         | 29       | V         | SiSO      | H               | 330                         | 263                          | 1 / 33         | 28.34      |
|            | Low     | 27550.08        | DFT-s-OFDM          | QPSK         | 20 + 148 | H + V     | 2Tx       | H               | 27                          | 86                           | 1 / 22         | 30.24      |
|            | Low     | 27550.08        | CP-OFDM             | QPSK         | 149      | H         | SiSO      | V               | 330                         | 262                          | 1 / 33         | 21.92      |
|            | Low     | 27550.08        | CP-OFDM             | QPSK         | 29       | V         | SiSO      | H               | 330                         | 263                          | 1 / 33         | 24.11      |
|            | Low     | 27550.08        | CP-OFDM             | QPSK         | 20 + 148 | H + V     | MIMO      | H               | 27                          | 86                           | 1 / 33         | 27.02      |
|            | Mid     | 27924.96        | DFT-s-OFDM          | QPSK         | 20 + 148 | H + V     | 2Tx       | H               | 332                         | 260                          | 1 / 43         | 29.87      |
|            | High    | 28299.96        | DFT-s-OFDM          | QPSK         | 28 + 156 | H + V     | 2Tx       | H               | 330                         | 261                          | 1 / 33         | 28.06      |
|            | Low     | 27550.08        | DFT-s-OFDM          | $\pi/2$ BPSK | 20 + 148 | H + V     | 2Tx       | H               | 27                          | 86                           | 1 / 33         | 30.47      |
|            | Low     | 27550.08        | DFT-s-OFDM          | 16QAM        | 20 + 148 | H + V     | 2Tx       | H               | 27                          | 86                           | 1 / 43         | 28.65      |
|            | Low     | 27550.08        | DFT-s-OFDM          | 64QAM        | 20 + 148 | H + V     | 2Tx       | H               | 27                          | 86                           | 1 / 33         | 26.41      |

Table 7-12. Ant 2 EIRP Data (Band n261 - 100MHz-1CC)

| CCs Active | Channel | Frequency [MHz] | Transmission Scheme | Modulation   | BeamID   | Beam Pol. | Ant. Div. | Ant. Pol. [H/V] | Turntable Azimuth [degrees] | Positioner Azimuth [degrees] | RB Size/Offset | EIRP [dBm] |
|------------|---------|-----------------|---------------------|--------------|----------|-----------|-----------|-----------------|-----------------------------|------------------------------|----------------|------------|
| 2          | Low     | 27550.08        | DFT-s-OFDM          | QPSK         | 20 + 148 | H + V     | 2Tx       | H               | 27                          | 85                           | 64 / 0         | 27.24      |
|            | Low     | 27550.08        | DFT-s-OFDM          | $\pi/2$ BPSK | 20 + 148 | H + V     | 2Tx       | H               | 27                          | 85                           | 64 / 0         | 27.26      |
|            | Low     | 27550.08        | DFT-s-OFDM          | 16QAM        | 20 + 148 | H + V     | 2Tx       | H               | 27                          | 85                           | 64 / 0         | 25.77      |
|            | Low     | 27550.08        | DFT-s-OFDM          | 64QAM        | 20 + 148 | H + V     | 2Tx       | H               | 27                          | 85                           | 64 / 0         | 23.58      |

Table 7-13. Ant 2 EIRP Data (Band n261 - 100MHz-2CC)

|                                            |                                                                                                                                        |                                       |                                                                                       |                                   |
|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------|
| FCC ID: A3LSMA426U                         |  PCTEST <sup>®</sup><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021                                                                                                   | EUT Type:<br>Portable Handset         | Page 36 of 99                                                                         |                                   |

## Band n260 Beam ID Configurations

| Mode | Channel | Beam Polarization | Beam ID | Beam ID Pair |
|------|---------|-------------------|---------|--------------|
| SISO | Low     | H                 | 144     | -            |
|      |         | V                 | 25      | -            |
|      | Mid     | H                 | 144     | -            |
|      |         | V                 | 25      | -            |
|      | High    | H                 | 144     | -            |
|      |         | V                 | 14      | -            |
| MIMO | Low     | MIMO              | 16      | 144          |
|      | Mid     | MIMO              | 25      | 153          |
|      | High    | MIMO              | 25      | 153          |

Table 7-14. Ant 1 (L Patch) Worst Case Beam ID

| Mode | Channel | Beam Polarization | Beam ID | Beam ID Pair |
|------|---------|-------------------|---------|--------------|
| SISO | Low     | H                 | 157     | -            |
|      |         | V                 | 30      | -            |
|      | Mid     | H                 | 157     | -            |
|      |         | V                 | 30      | -            |
|      | High    | H                 | 149     | -            |
|      |         | V                 | 21      | -            |
| MIMO | Low     | MIMO              | 29      | 157          |
|      | Mid     | MIMO              | 29      | 157          |
|      | High    | MIMO              | 21      | 149          |

Table 7-15. Ant 2 (R Patch) Worst Case Beam ID

|                                            |                                                                                                                            |                                       |                                                                                       |                                   |
|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------|
| FCC ID: A3LSMA426U                         |  PCTEST®<br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021                                                                                       | EUT Type:<br>Portable Handset         | Page 37 of 99                                                                         |                                   |

## Band n260

| CCs Active | Channel | Frequency [MHz] | Transmission Scheme | Modulation   | BeamID   | Beam Pol. | Ant. Div. | Ant. Pol. [H/V] | Turntable Azimuth [degrees] | Positioner Azimuth [degrees] | RB Size/Offset | EIRP [dBm] |
|------------|---------|-----------------|---------------------|--------------|----------|-----------|-----------|-----------------|-----------------------------|------------------------------|----------------|------------|
| 1          | High    | 39975.00        | DFT-s-OFDM          | QPSK         | 144      | H         | SISO      | H               | 9                           | 345                          | 1 / 16         | 23.09      |
|            | High    | 39975.00        | DFT-s-OFDM          | QPSK         | 14       | V         | SISO      | V               | 113                         | 332                          | 1 / 11         | 23.67      |
|            | High    | 39975.00        | DFT-s-OFDM          | QPSK         | 25 + 153 | H + V     | 2Tx       | V               | 331                         | 287                          | 1 / 16         | 27.31      |
|            | High    | 39975.00        | CP-OFDM             | QPSK         | 144      | H         | SISO      | H               | 9                           | 345                          | 1 / 11         | 19.46      |
|            | High    | 39975.00        | CP-OFDM             | QPSK         | 14       | V         | SISO      | V               | 113                         | 332                          | 1 / 11         | 20.19      |
|            | High    | 39975.00        | CP-OFDM             | QPSK         | 25 + 153 | H + V     | MIMO      | V               | 331                         | 287                          | 1 / 16         | 22.61      |
|            | Low     | 37025.04        | DFT-s-OFDM          | QPSK         | 16 + 144 | H + V     | 2Tx       | V               | 332                         | 288                          | 1 / 21         | 25.46      |
|            | Mid     | 38499.96        | DFT-s-OFDM          | QPSK         | 25 + 153 | H + V     | 2Tx       | V               | 331                         | 287                          | 1 / 21         | 26.36      |
|            | Mid     | 38499.96        | DFT-s-OFDM          | QPSK         | 144      | H         | SISO      | H               | 10                          | 341                          | 1 / 16         | 24.17      |
|            | Mid     | 38499.96        | DFT-s-OFDM          | QPSK         | 25       | V         | SISO      | V               | 336                         | 32                           | 1 / 16         | 25.27      |
|            | Mid     | 38499.96        | CP-OFDM             | QPSK         | 25 + 153 | H + V     | MIMO      | V               | 331                         | 287                          | 1 / 21         | 23.61      |
|            | Mid     | 38499.96        | CP-OFDM             | QPSK         | 144      | H         | SISO      | H               | 10                          | 341                          | 1 / 21         | 20.81      |
|            | Mid     | 38499.96        | CP-OFDM             | QPSK         | 25       | V         | SISO      | V               | 336                         | 32                           | 1 / 21         | 22.56      |
|            | High    | 39975.00        | DFT-s-OFDM          | $\pi/2$ BPSK | 25 + 153 | H + V     | 2Tx       | V               | 331                         | 287                          | 1 / 16         | 27.34      |
|            | High    | 39975.00        | DFT-s-OFDM          | 16QAM        | 25 + 153 | H + V     | 2Tx       | V               | 331                         | 287                          | 1 / 16         | 25.35      |
|            | High    | 39975.00        | DFT-s-OFDM          | 64QAM        | 25 + 153 | H + V     | 2Tx       | V               | 331                         | 287                          | 1 / 16         | 23.17      |

Table 7-16. Ant 1 EIRP Data (Band n260 - 50MHz-1CC)

| CCs Active | Channel | Frequency [MHz] | Transmission Scheme | Modulation   | BeamID   | Beam Pol. | Ant. Div. | Ant. Pol. [H/V] | Turntable Azimuth [degrees] | Positioner Azimuth [degrees] | RB Size/Offset | EIRP [dBm] |
|------------|---------|-----------------|---------------------|--------------|----------|-----------|-----------|-----------------|-----------------------------|------------------------------|----------------|------------|
| 2          | High    | 39975.00        | DFT-s-OFDM          | QPSK         | 25 + 153 | H + V     | 2Tx       | V               | 332                         | 287                          | 32 / 0         | 24.48      |
|            | High    | 39975.00        | DFT-s-OFDM          | $\pi/2$ BPSK | 25 + 153 | H + V     | 2Tx       | V               | 332                         | 287                          | 32 / 0         | 24.48      |
|            | High    | 39975.00        | DFT-s-OFDM          | 16QAM        | 25 + 153 | H + V     | 2Tx       | V               | 332                         | 287                          | 32 / 0         | 23.01      |
|            | High    | 39975.00        | DFT-s-OFDM          | 64QAM        | 25 + 153 | H + V     | 2Tx       | V               | 332                         | 287                          | 32 / 0         | 20.49      |

Table 7-17. Ant 1 EIRP Data (Band n260 - 50MHz-2CC)

| CCs Active | Channel | Frequency [MHz] | Transmission Scheme | Modulation   | BeamID   | Beam Pol. | Ant. Div. | Ant. Pol. [H/V] | Turntable Azimuth [degrees] | Positioner Azimuth [degrees] | RB Size/Offset | EIRP [dBm] |
|------------|---------|-----------------|---------------------|--------------|----------|-----------|-----------|-----------------|-----------------------------|------------------------------|----------------|------------|
| 1          | High    | 39949.92        | DFT-s-OFDM          | QPSK         | 144      | H         | SISO      | H               | 9                           | 343                          | 1 / 43         | 23.07      |
|            | High    | 39949.92        | DFT-s-OFDM          | QPSK         | 14       | V         | SISO      | V               | 113                         | 333                          | 1 / 22         | 23.72      |
|            | High    | 39949.92        | DFT-s-OFDM          | QPSK         | 25 + 153 | H + V     | 2Tx       | V               | 332                         | 286                          | 1 / 43         | 27.42      |
|            | High    | 39949.92        | CP-OFDM             | QPSK         | 144      | H         | SISO      | H               | 9                           | 343                          | 1 / 43         | 19.52      |
|            | High    | 39949.92        | CP-OFDM             | QPSK         | 14       | V         | SISO      | V               | 113                         | 333                          | 1 / 22         | 20.19      |
|            | High    | 39949.92        | CP-OFDM             | QPSK         | 25 + 153 | H + V     | MIMO      | V               | 332                         | 286                          | 1 / 33         | 22.49      |
|            | Low     | 37050.00        | DFT-s-OFDM          | QPSK         | 16 + 144 | H + V     | 2Tx       | V               | 333                         | 289                          | 1 / 33         | 25.53      |
|            | Mid     | 38499.96        | DFT-s-OFDM          | QPSK         | 25 + 153 | H + V     | 2Tx       | V               | 331                         | 287                          | 1 / 43         | 26.20      |
|            | Mid     | 38499.96        | DFT-s-OFDM          | QPSK         | 144      | H         | SISO      | H               | 10                          | 341                          | 1 / 43         | 23.88      |
|            | Mid     | 38499.96        | DFT-s-OFDM          | QPSK         | 25       | V         | SISO      | V               | 336                         | 33                           | 1 / 33         | 25.17      |
|            | Mid     | 38499.96        | CP-OFDM             | QPSK         | 25 + 453 | H + V     | MIMO      | V               | 331                         | 287                          | 1 / 43         | 23.65      |
|            | Mid     | 38499.96        | CP-OFDM             | QPSK         | 144      | H         | SISO      | H               | 10                          | 341                          | 1 / 33         | 20.36      |
|            | Mid     | 38499.96        | CP-OFDM             | QPSK         | 25       | V         | SISO      | V               | 336                         | 33                           | 1 / 33         | 22.38      |
|            | High    | 39949.92        | DFT-s-OFDM          | $\pi/2$ BPSK | 25 + 153 | H + V     | 2Tx       | V               | 332                         | 286                          | 1 / 43         | 27.00      |
|            | High    | 39949.92        | DFT-s-OFDM          | 16QAM        | 25 + 153 | H + V     | 2Tx       | V               | 332                         | 286                          | 1 / 43         | 24.64      |
|            | High    | 39949.92        | DFT-s-OFDM          | 64QAM        | 25 + 153 | H + V     | 2Tx       | V               | 332                         | 286                          | 1 / 43         | 22.93      |

Table 7-18. Ant 1 EIRP Data (Band n260 - 100MHz-1CC)

| CCs Active | Channel | Frequency [MHz] | Transmission Scheme | Modulation   | BeamID   | Beam Pol. | Ant. Div. | Ant. Pol. [H/V] | Turntable Azimuth [degrees] | Positioner Azimuth [degrees] | RB Size/Offset | EIRP [dBm] |
|------------|---------|-----------------|---------------------|--------------|----------|-----------|-----------|-----------------|-----------------------------|------------------------------|----------------|------------|
| 2          | High    | 39949.92        | DFT-s-OFDM          | QPSK         | 25 + 153 | H + V     | 2Tx       | V               | 335                         | 287                          | 64 / 0         | 24.19      |
|            | High    | 39949.92        | DFT-s-OFDM          | $\pi/2$ BPSK | 25 + 153 | H + V     | 2Tx       | V               | 335                         | 287                          | 64 / 0         | 24.16      |
|            | High    | 39949.92        | DFT-s-OFDM          | 16QAM        | 25 + 153 | H + V     | 2Tx       | V               | 335                         | 287                          | 64 / 0         | 22.65      |
|            | High    | 39949.92        | DFT-s-OFDM          | 64QAM        | 25 + 153 | H + V     | 2Tx       | V               | 335                         | 287                          | 64 / 0         | 20.44      |

Table 7-19. Ant 1 EIRP Data (Band n260 - 100MHz-2CC)

|                                            |                                                                                     |                                       |                                                                                       |                                   |
|--------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------|
| FCC ID: A3LSMA426U                         |  | MEASUREMENT REPORT<br>(CERTIFICATION) |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021                                                | EUT Type:<br>Portable Handset         | Page 38 of 99                                                                         |                                   |

| CCs Active | Channel | Frequency [MHz] | Transmission Scheme | Modulation   | BeamID   | Beam Pol. | Ant. Div. | Ant. Pol. [H/V] | Turntable Azimuth [degrees] | Positioner Azimuth [degrees] | RB Size/Offset | EIRP [dBm] |
|------------|---------|-----------------|---------------------|--------------|----------|-----------|-----------|-----------------|-----------------------------|------------------------------|----------------|------------|
| 1          | Mid     | 38499.96        | DFT-s-OFDM          | QPSK         | 157      | H         | SISO      | V               | 333                         | 264                          | 1 / 11         | 27.93      |
|            | Mid     | 38499.96        | DFT-s-OFDM          | QPSK         | 30       | V         | SISO      | H               | 28                          | 82                           | 1 / 16         | 26.16      |
|            | Mid     | 38499.96        | DFT-s-OFDM          | QPSK         | 29 + 157 | H + V     | 2Tx       | V               | 25                          | 81                           | 1 / 16         | 29.96      |
|            | Mid     | 38499.96        | CP-OFDM             | QPSK         | 157      | H         | SISO      | V               | 333                         | 264                          | 1 / 11         | 24.53      |
|            | Mid     | 38499.96        | CP-OFDM             | QPSK         | 30       | V         | SISO      | H               | 28                          | 82                           | 1 / 11         | 23.10      |
|            | Mid     | 38499.96        | CP-OFDM             | QPSK         | 29 + 157 | H + V     | MIMO      | V               | 25                          | 81                           | 1 / 16         | 25.45      |
|            | Low     | 37025.04        | DFT-s-OFDM          | QPSK         | 29 + 157 | H + V     | 2Tx       | V               | 24                          | 82                           | 1 / 21         | 29.62      |
|            | High    | 39975.00        | DFT-s-OFDM          | QPSK         | 21 + 149 | H + V     | 2Tx       | V               | 25                          | 78                           | 1 / 21         | 29.52      |
|            | Mid     | 38499.96        | DFT-s-OFDM          | $\pi/2$ BPSK | 29 + 157 | H + V     | 2Tx       | V               | 25                          | 81                           | 1 / 16         | 29.80      |
|            | Mid     | 38499.96        | DFT-s-OFDM          | 16QAM        | 29 + 157 | H + V     | 2Tx       | V               | 25                          | 81                           | 1 / 16         | 28.01      |
|            | Mid     | 38499.96        | DFT-s-OFDM          | 64QAM        | 29 + 157 | H + V     | 2Tx       | V               | 25                          | 81                           | 1 / 16         | 25.79      |

Table 7-20. Ant 2 EIRP Data (Band n260 - 50MHz-1CC)

| CCs Active | Channel | Frequency [MHz] | Transmission Scheme | Modulation   | BeamID   | Beam Pol. | Ant. Div. | Ant. Pol. [H/V] | Turntable Azimuth [degrees] | Positioner Azimuth [degrees] | RB Size/Offset | EIRP [dBm] |
|------------|---------|-----------------|---------------------|--------------|----------|-----------|-----------|-----------------|-----------------------------|------------------------------|----------------|------------|
| 2          | Mid     | 38499.96        | DFT-s-OFDM          | QPSK         | 29 + 157 | H + V     | 2Tx       | V               | 28                          | 84                           | 32 / 0         | 26.94      |
|            | Mid     | 38499.96        | DFT-s-OFDM          | $\pi/2$ BPSK | 29 + 157 | H + V     | 2Tx       | V               | 28                          | 84                           | 32 / 0         | 26.96      |
|            | Mid     | 38499.96        | DFT-s-OFDM          | 16QAM        | 29 + 157 | H + V     | 2Tx       | V               | 28                          | 84                           | 32 / 0         | 25.37      |
|            | Mid     | 38499.96        | DFT-s-OFDM          | 64QAM        | 29 + 157 | H + V     | 2Tx       | V               | 28                          | 84                           | 32 / 0         | 22.74      |

Table 7-21. Ant 2 EIRP Data (Band n260 - 50MHz-2CC)

| CCs Active | Channel | Frequency [MHz] | Transmission Scheme | Modulation   | BeamID   | Beam Pol. | Ant. Div. | Ant. Pol. [H/V] | Turntable Azimuth [degrees] | Positioner Azimuth [degrees] | RB Size/Offset | EIRP [dBm] |
|------------|---------|-----------------|---------------------|--------------|----------|-----------|-----------|-----------------|-----------------------------|------------------------------|----------------|------------|
| 1          | Mid     | 38499.96        | DFT-s-OFDM          | QPSK         | 157      | H         | SISO      | V               | 333                         | 263                          | 1 / 22         | 27.97      |
|            | Mid     | 38499.96        | DFT-s-OFDM          | QPSK         | 30       | V         | SISO      | H               | 28                          | 83                           | 1 / 22         | 26.22      |
|            | Mid     | 38499.96        | DFT-s-OFDM          | QPSK         | 29 + 157 | H + V     | 2Tx       | V               | 23                          | 86                           | 1 / 33         | 29.91      |
|            | Mid     | 38499.96        | CP-OFDM             | QPSK         | 157      | H         | SISO      | V               | 333                         | 263                          | 1 / 22         | 24.57      |
|            | Mid     | 38499.96        | CP-OFDM             | QPSK         | 30       | V         | SISO      | H               | 28                          | 83                           | 1 / 22         | 23.11      |
|            | Mid     | 38499.96        | CP-OFDM             | QPSK         | 29 + 157 | H + V     | MIMO      | V               | 23                          | 86                           | 1 / 43         | 25.96      |
|            | Low     | 37050.00        | DFT-s-OFDM          | QPSK         | 29 + 157 | H + V     | 2Tx       | V               | 25                          | 81                           | 1 / 33         | 29.38      |
|            | High    | 39949.92        | DFT-s-OFDM          | QPSK         | 21 + 149 | H + V     | 2Tx       | V               | 25                          | 82                           | 1 / 22         | 29.79      |
|            | Mid     | 38499.96        | DFT-s-OFDM          | $\pi/2$ BPSK | 29 + 157 | H + V     | 2Tx       | V               | 23                          | 86                           | 1 / 33         | 29.88      |
|            | Mid     | 38499.96        | DFT-s-OFDM          | 16QAM        | 29 + 157 | H + V     | 2Tx       | V               | 23                          | 86                           | 1 / 33         | 27.91      |
|            | Mid     | 38499.96        | DFT-s-OFDM          | 64QAM        | 29 + 157 | H + V     | 2Tx       | V               | 23                          | 86                           | 1 / 33         | 25.93      |

Table 7-22. Ant 2 EIRP Data (Band n260 - 100MHz-1CC)

| CCs Active | Channel | Frequency [MHz] | Transmission Scheme | Modulation   | BeamID   | Beam Pol. | Ant. Div. | Ant. Pol. [H/V] | Turntable Azimuth [degrees] | Positioner Azimuth [degrees] | RB Size/Offset | EIRP [dBm] |
|------------|---------|-----------------|---------------------|--------------|----------|-----------|-----------|-----------------|-----------------------------|------------------------------|----------------|------------|
| 2          | Mid     | 38499.96        | DFT-s-OFDM          | QPSK         | 29 + 157 | H + V     | 2Tx       | V               | 28                          | 84                           | 64 / 0         | 26.98      |
|            | Mid     | 38499.96        | DFT-s-OFDM          | $\pi/2$ BPSK | 29 + 157 | H + V     | 2Tx       | V               | 28                          | 84                           | 64 / 0         | 27.03      |
|            | Mid     | 38499.96        | DFT-s-OFDM          | 16QAM        | 29 + 157 | H + V     | 2Tx       | V               | 28                          | 84                           | 64 / 0         | 25.51      |
|            | Mid     | 38499.96        | DFT-s-OFDM          | 64QAM        | 29 + 157 | H + V     | 2Tx       | V               | 28                          | 84                           | 64 / 0         | 22.72      |

Table 7-23. Ant 2 EIRP Data (Band n260 - 100MHz-2CC)

|                                            |                                                                                                                            |                                       |                                                                                       |                                   |
|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------|
| FCC ID: A3LSMA426U                         |  PCTEST®<br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021                                                                                       | EUT Type:<br>Portable Handset         | Page 39 of 99                                                                         |                                   |

## 7.4 Radiated Spurious and Harmonic Emissions

§2.1051, §30.203

### Test Overview

The spectrum is scanned from 30MHz to 100GHz for n261 and from 30MHz to 200GHz for n260. All out of band emissions are measured in a radiated test setup while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All modulations were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

***The conductive power or total radiated power of any emissions outside a licensee's frequency block shall be -13dBm/1MHz.***

### Test Procedure Used

ANSI C63.26-2015 Section 5.7.4

KDB 842590 D01 v01r01 Section 4.4.2 and Section 4.4.3

### Test Settings

1. Start frequency was set to 30MHz and stop frequency was set to 100 GHz for n261 and 200GHz for n260. Several plots are used to show investigations in this entire span.
2. Detector = RMS
3. Trace mode = trace average
4. Sweep time = auto couple
5. Number of sweep points  $\geq 2 \times \text{Span/RBW}$
6. The trace was allowed to stabilize
7. RBW = 1MHz, VBW = 3MHz

### Test Notes

- 1) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below.
- 2) All radiated spurious emissions were measured as EIRP to compare with the §30.203 TRP limits.
- 3) Elements within the same antenna array are correlated to produce beamforming array gain. Antenna arrays cannot be correlated with another antenna array. During testing, only one antenna array was active.
- 4) The plots from 1-200GHz show corrected average EIRP levels. The average EIRP reported below is calculated per section 5.2.7 of ANSI C63.26-2015 which states:  $\text{EIRP (dBm)} = E \text{ (dB}\mu\text{V/m)} + 20\log(D) - 104.8$ ; where D is the measurement distance (in the far field region) in m. The field strength E is calculated  $E \text{ (dB}\mu\text{V/m)} = \text{Spectrum Analyzer Level (dBm)} + \text{Antenna Factor (dB/m)} + \text{Cable Loss (dB)} + \text{Harmonic Mixer Conversion Loss (dB)} + 107$ . All appropriate Antenna Factor and Cable Loss have been applied in the spectrum analyzer for each measurement. For measurements > 40GHz, Harmonic Mixer Conversion Loss was also applied to the spectrum analyzer.

|                                            |                                                                                                                                                                                                |                                       |                                                                                       |                                   |
|--------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------|
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| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021                                                                                                                                                           | EUT Type:<br>Portable Handset         |                                                                                       | Page 40 of 99                     |

- 5) Emissions below 18GHz were measured at a 3 meter test distance, while emissions above 18GHz were measured at the appropriate far field distance. The far field of the mmWave signal is based on formula:  $R > 2D^2/\text{wavelength}$ , where D is the larger between the dimension of the measurement antenna and the transmitting antenna of the EUT. In this case, D is the largest dimension of the measurement antenna.

| Frequency Range (GHz) | Wavelength(cm) | Far Field Distance (m) | Measurement Distance (m) |
|-----------------------|----------------|------------------------|--------------------------|
| 18-40                 | 0.749          | 0.54                   | 1.00                     |
| 40-60                 | 0.500          | 1.39                   | 1.50                     |
| 60-90                 | 0.333          | 0.91                   | 1.00                     |
| 90-140                | 0.214          | 0.58                   | 1.00                     |
| 140-200               | 0.150          | 0.39                   | 1.00                     |

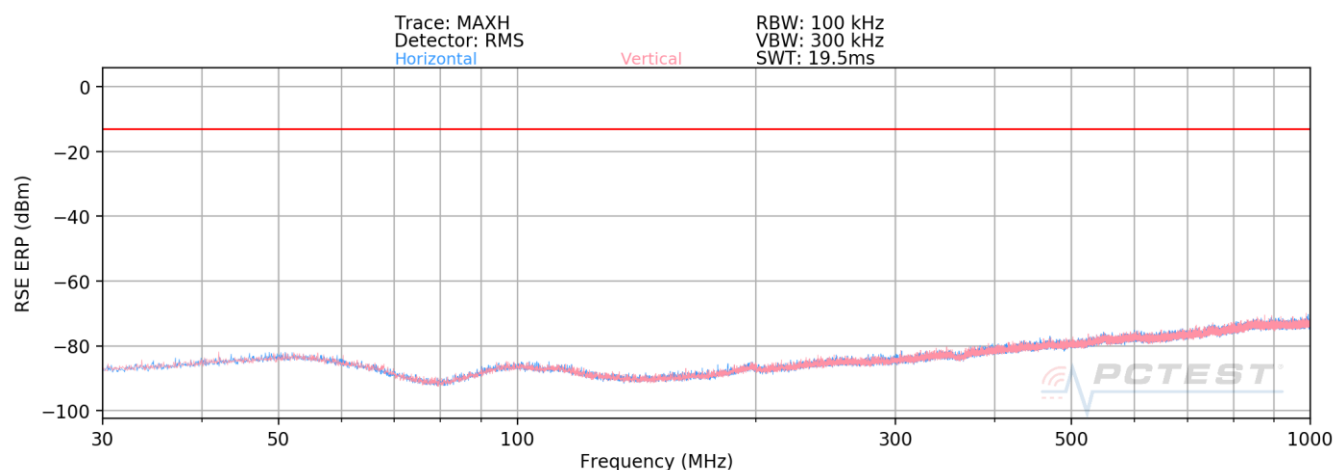
**Table 7-24. Far-Field Distance & Measurement Distance per Frequency Range**

- 6) All emissions from 30MHz - 40GHz were measured using a spectrum analyzer with an internal preamplifier. Emissions >40GHz were measured using a harmonic mixer with the spectrum analyzer.
- 7) All RSE's were measured with 1CC. It was determined that adding more CC's causes the overall amplitude of just 1CC to decrease, therefore, 1CC is the worst case for the purposes of spurious emissions measurements.
- 8) The "-" shown in the following RSE tables are used to denote a noise floor measurement.
- 9) All RSE's were investigated in EN-DC mode and with 802.11 chipset active. It was determined that there is no new emission introduced by EN-DC mode, or the 802.11 chipset. For EN-DC mode, n261 uses LTE B2, B5, B13, B48 and B66, and n260 uses LTE B2, B5, B13, B48 and B66.
- 10) There was no discernible difference in the spurious emission levels when using different LTE anchor bands. Thus, LTE Band 2 was used as a representative anchor band for EN-DC investigations.

|                                            |                                                                                                                                                                                                              |                                       |                                                                                       |                                   |
|--------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------|
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| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021                                                                                                                                                                         | EUT Type:<br>Portable Handset         |                                                                                       | Page 41 of 99                     |

## Band n261 – Ant 1

### 30MHz - 1GHz



Plot 7-33. Ant 1- n261 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx – EN-DC Anchor Band 2)

### Spurious Emissions ERP Sample Calculation (n261)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE ERP level is calculated by applying the additional factors shown below for a test distance of 3 meter.

$$\text{RSE ERP (dBm)} = \text{Analyzer Level (dBm)} + 107 + \text{AFCL (dB/m)} + 20\text{Log(Dm)} - 104.8 - 2.15 \text{ (dB)}$$

| Frequency [MHz] | Channel | Bandwidth (MHz) | EUT Beam Pol. | Modulation | Antenna Polarization [H/V] | Turntable Azimuth [degrees] | Antenna Height [cm] | Spurious Emission Level [dBm] | Limit [dBm] | Margin [dB] |
|-----------------|---------|-----------------|---------------|------------|----------------------------|-----------------------------|---------------------|-------------------------------|-------------|-------------|
| 457.80          | Mid     | 50              | 2Tx           | QPSK       | H                          | -                           | -                   | -78.16                        | -13.00      | -65.16      |
| 852.03          | Mid     | 50              | 2Tx           | QPSK       | H                          | -                           | -                   | -72.40                        | -13.00      | -59.40      |
| 994.43          | Mid     | 50              | 2Tx           | QPSK       | H                          | -                           | -                   | -71.54                        | -13.00      | -58.54      |

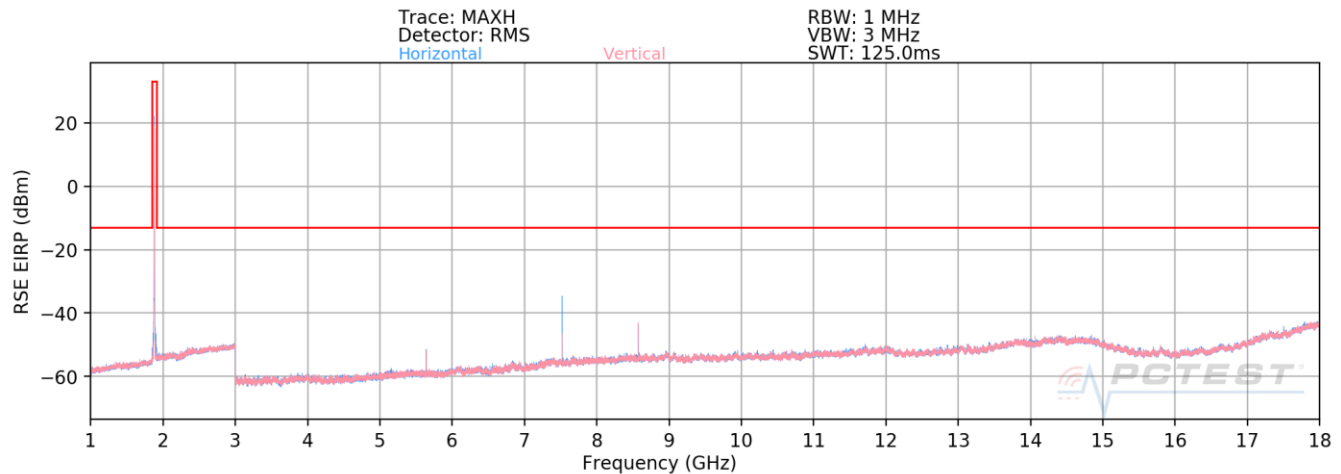
Table 7-25. Ant 1 – 2Tx - Spurious Emissions Table (30MHz - 1GHz)

### Notes

The RSE ERP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, and cable losses. Measurements were performed at a distance of 3 meter.

|                                            |                                                                                     |                                       |                                                                                       |                                   |
|--------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------|
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| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021                                                | EUT Type:<br>Portable Handset         |                                                                                       | Page 42 of 99                     |

## 1GHz - 18GHz



**Plot 7-34. Ant 1-n261 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx – EN-DC Anchor Band 2)**

## Spurious Emissions EIRP Sample Calculation (n261)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 3 meter.

$$\text{RSE EIRP (dBm)} = \text{Analyzer Level (dBm)} + 107 + \text{AFCL (dB/m)} + 20\text{Log(Dm)} - 104.8$$

| Frequency [MHz] | Channel | Bandwidth (MHz) | EUT Beam Pol. | Modulation | Antenna Polarization [H/V] | Turntable Azimuth [degrees] | Antenna Height [cm] | Spurious Emission Level [dBm] | Limit [dBm] | Margin [dB] |
|-----------------|---------|-----------------|---------------|------------|----------------------------|-----------------------------|---------------------|-------------------------------|-------------|-------------|
| 8811.95         | Low     | 50              | 2Tx           | QPSK       | H                          | 303                         | 288                 | -43.81                        | -13.00      | -30.81      |
| 5640.00         | Mid     | 50              | 2Tx           | QPSK       | H                          | 342                         | 247                 | -53.28                        | -13.00      | -40.28      |
| 7520.00         | Mid     | 50              | 2Tx           | QPSK       | H                          | 45                          | 148                 | -37.09                        | -13.00      | -24.09      |
| 8571.91         | Mid     | 50              | 2Tx           | QPSK       | H                          | 298                         | 363                 | -43.31                        | -13.00      | -30.31      |
| 8971.92         | High    | 50              | 2Tx           | QPSK       | H                          | 303                         | 364                 | -42.66                        | -13.00      | -29.66      |

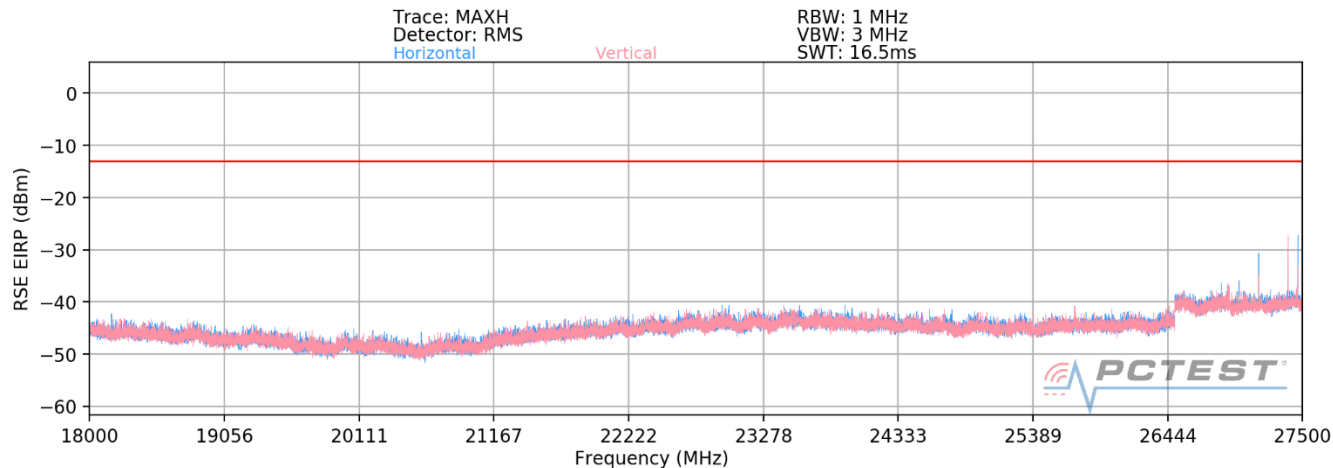
**Table 7-26. Ant 1 - 2Tx - Spurious Emissions Table (1GHz - 18GHz)**

## Notes

The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, and cable losses. Measurements were performed at a distance of 3 meter.

|                                            |                                              |                                       |                |                                   |
|--------------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
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| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021         | EUT Type:<br>Portable Handset         |                | Page 43 of 99                     |

## 18GHz - 27.5GHz



**Plot 7-35. Ant 1-n261 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx – EN-DC Anchor B2)**

## Spurious Emissions EIRP Sample Calculation (n261)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1 meter.

$$\text{RSE EIRP (dBm)} = \text{Analyzer Level (dBm)} + 107 + \text{AFCL (dB/m)} + 20\text{Log(Dm)} - 104.8$$

| Frequency [MHz] | Channel | Bandwidth (MHz) | EUT Beam Pol. | Modulation | Antenna Polarization [H/V] | Turntable Azimuth [degrees] | Positioner Azimuth [degrees] | Spurious Emission Level [dBm] | Limit [dBm] | Margin [dB] |
|-----------------|---------|-----------------|---------------|------------|----------------------------|-----------------------------|------------------------------|-------------------------------|-------------|-------------|
| 27064.63        | Low     | 50              | 2Tx           | QPSK       | V                          | 15                          | 72                           | -24.83                        | -13.00      | -11.83      |
| 27218.33        | Low     | 50              | 2Tx           | QPSK       | V                          | 14                          | 69                           | -21.21                        | -13.00      | -8.21       |
| 27371.84        | Low     | 50              | 2Tx           | QPSK       | V                          | 17                          | 74                           | -24.48                        | -13.00      | -11.48      |
| 27157.21        | Mid     | 50              | 2Tx           | QPSK       | V                          | 28                          | 62                           | -30.45                        | -13.00      | -17.45      |
| 27387.72        | Mid     | 50              | 2Tx           | QPSK       | V                          | 23                          | 49                           | -28.99                        | -13.00      | -15.99      |
| 24464.60        | Mid     | 50              | 2Tx           | QPSK       | V                          | 33                          | 64                           | -27.91                        | -13.00      | -14.91      |
| 27096.75        | High    | 50              | 2Tx           | QPSK       | V                          | 15                          | 71                           | -35.43                        | -13.00      | -22.43      |
| 27250.33        | High    | 50              | 2Tx           | QPSK       | V                          | 13                          | 62                           | -32.05                        | -13.00      | -19.05      |
| 27327.21        | High    | 50              | 2Tx           | QPSK       | V                          | 13                          | 53                           | -28.87                        | -13.00      | -15.87      |

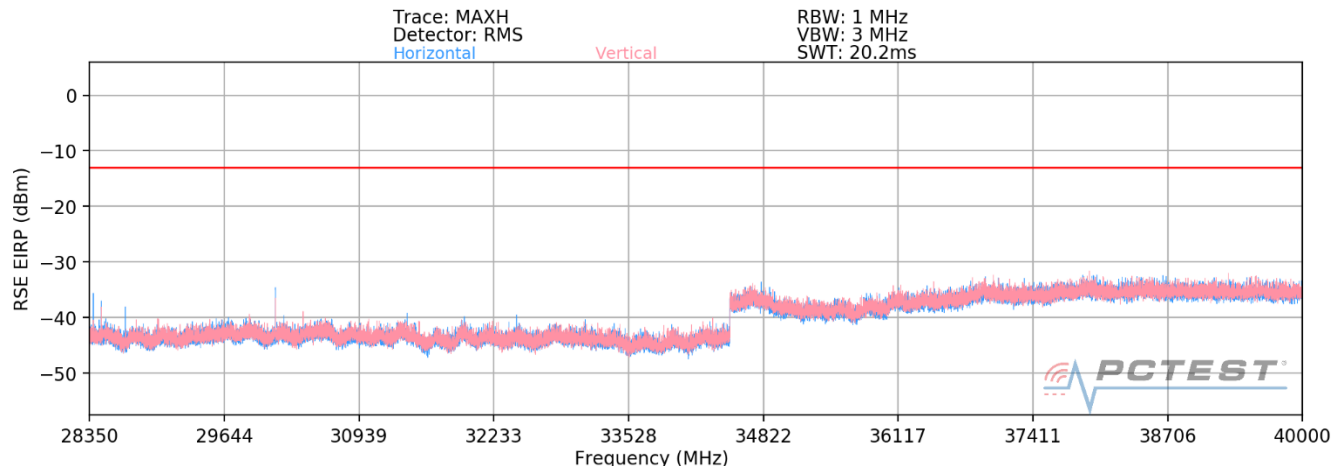
**Table 7-27. Ant 1 - 2Tx - Spurious Emissions Table (18GHz - 27.5GHz)**

## Notes

The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, and cable losses. Measurements were performed at a distance of 1 meter.

|                                            |                                                                                     |                                       |                                                                                       |                                   |
|--------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------|
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| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021                                                | EUT Type:<br>Portable Handset         |                                                                                       | Page 44 of 99                     |

## 28.35GHz - 40GHz



Plot 7-36. Ant 1-n261 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx – EN-DC Anchor B2)

### Spurious Emissions EIRP Sample Calculation (n261)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1 meter.

$$\text{RSE EIRP (dBm)} = \text{Analyzer Level (dBm)} + 107 + \text{AFCL (dB/m)} + 20\text{Log(Dm)} - 104.8$$

| Frequency [MHz] | Channel | Bandwidth (MHz) | EUT Beam Pol. | Modulation | Antenna Polarization [H/V] | Turntable Azimuth [degrees] | Positioner Azimuth [degrees] | Spurious Emission Level [dBm] | Limit [dBm] | Margin [dB] |
|-----------------|---------|-----------------|---------------|------------|----------------------------|-----------------------------|------------------------------|-------------------------------|-------------|-------------|
| 28523.90        | Low     | 50              | 2Tx           | QPSK       | V                          | 16                          | 74                           | -39.22                        | -13.00      | -26.22      |
| 28615.08        | Low     | 50              | 2Tx           | QPSK       | V                          | 16                          | 75                           | -26.91                        | -13.00      | -13.91      |
| 28697.55        | Low     | 50              | 2Tx           | QPSK       | V                          | 17                          | 72                           | -40.72                        | -13.00      | -27.72      |
| 28386.30        | Mid     | 50              | 2Tx           | QPSK       | V                          | 38                          | 63                           | -32.51                        | -13.00      | -19.51      |
| 28463.03        | Mid     | 50              | 2Tx           | QPSK       | V                          | 29                          | 41                           | -34.06                        | -13.00      | -21.06      |
| 28693.60        | Mid     | 50              | 2Tx           | QPSK       | V                          | 28                          | 61                           | -35.50                        | -13.00      | -22.50      |
| 30135.01        | Mid     | 50              | 2Tx           | QPSK       | V                          | 15                          | 74                           | -30.21                        | -13.00      | -17.21      |
| 28478.94        | High    | 50              | 2Tx           | QPSK       | V                          | 16                          | 73                           | -29.78                        | -13.00      | -16.78      |
| 28632.57        | High    | 50              | 2Tx           | QPSK       | V                          | 17                          | 74                           | -31.96                        | -13.00      | -18.96      |
| 28863.00        | High    | 50              | 2Tx           | QPSK       | V                          | 17                          | 75                           | -33.69                        | -13.00      | -20.69      |

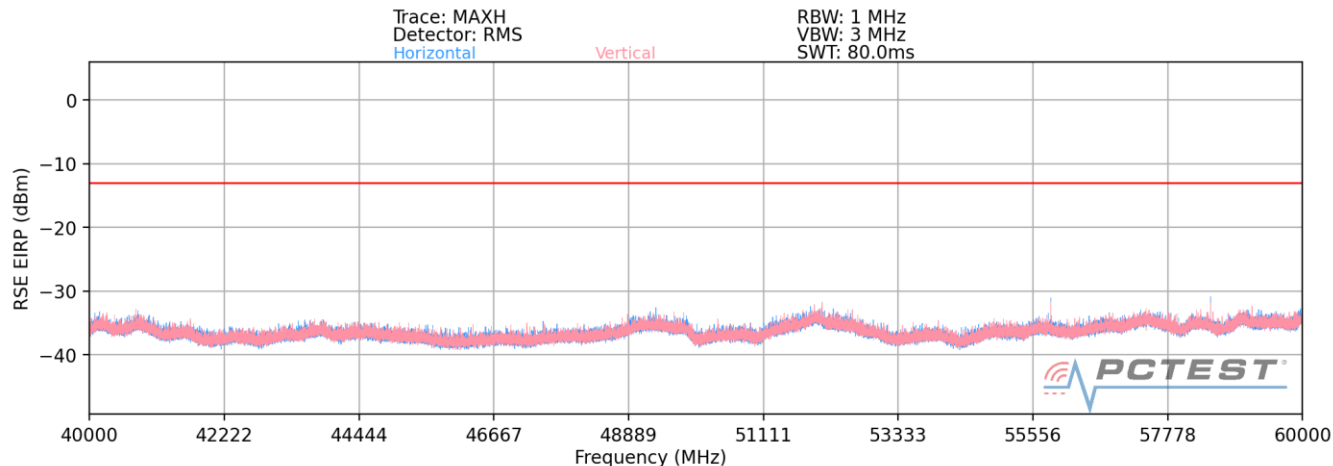
Table 7-28. Ant 1 - 2Tx - Spurious Emissions Table (28.35GHz - 40GHz)

### Notes

The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, and cable losses. Measurements were performed at a distance of 1 meter.

|                                            |                                                                                                                        |                                                                                       |                                   |
|--------------------------------------------|------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------|
| FCC ID: A3LSMA426U                         |  MEASUREMENT REPORT (CERTIFICATION) |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021                                                                                   | EUT Type:<br>Portable Handset                                                         | Page 45 of 99                     |

## 40GHz - 60GHz



Plot 7-37. Ant 1-n261 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx – EN-DC Anchor B2)

### Spurious Emissions EIRP Sample Calculation (n261)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1.5 meter.

**RSE EIRP (dBm) = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) – 104.8 + Harmonic Mixer Conversion Loss [dB]**

| Frequency [MHz] | Channel | Bandwidth (MHz) | EUT Beam Pol. | Modulation | Antenna Polarization [H/V] | Turntable Azimuth [degrees] | Positioner Azimuth [degrees] | Spurious Emission Level [dBm] | Limit [dBm] | Margin [dB] |
|-----------------|---------|-----------------|---------------|------------|----------------------------|-----------------------------|------------------------------|-------------------------------|-------------|-------------|
| 55041.02        | Low     | 50              | 2Tx           | QPSK       | V                          | 92                          | 14                           | -38.35                        | -13.00      | -25.35      |
| 55851.03        | Mid     | 50              | 2Tx           | QPSK       | V                          | 50                          | 10                           | -36.26                        | -13.00      | -23.26      |
| 56650.83        | High    | 50              | 2Tx           | QPSK       | V                          | 37                          | 359                          | -38.20                        | -13.00      | -25.20      |

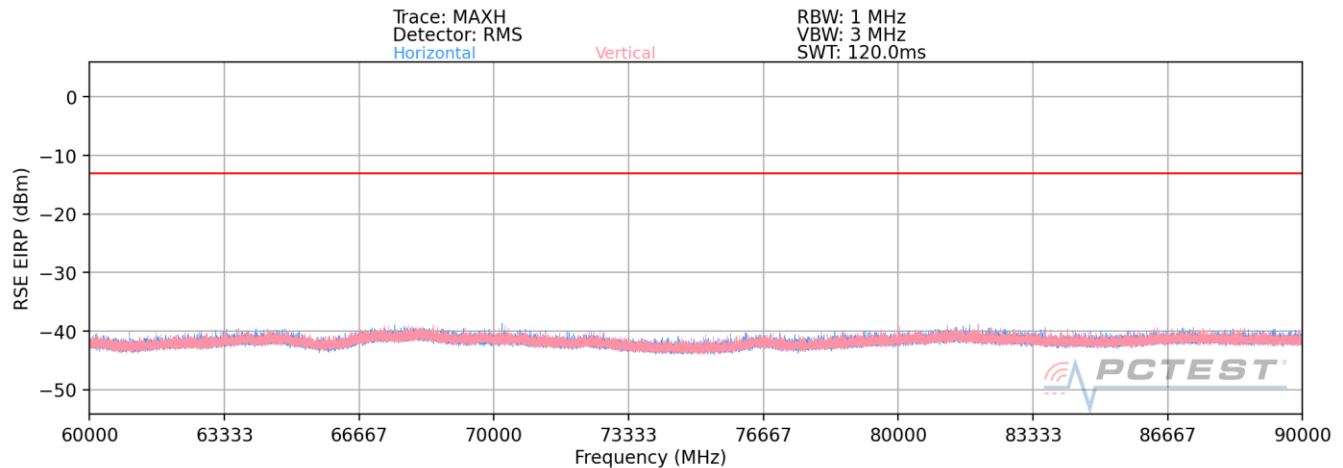
Table 7-29. Ant 1 - 2Tx - Spurious Emissions Table (40GHz - 60GHz)

### Notes

The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, cable losses, and harmonic mixer conversion losses. Measurements were performed at a distance of 1.5 meter.

|                                            |                                                                                                                            |                                       |                                                                                       |                                   |
|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------|
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| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021                                                                                       | EUT Type:<br>Portable Handset         |                                                                                       | Page 46 of 99                     |

## 60GHz - 90GHz



Plot 7-38. Ant 1-n261 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx – EN-DC Anchor B2)

### Spurious Emissions EIRP Sample Calculation (n261)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1 meter.

**RSE EIRP (dBm) = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) – 104.8 + Harmonic Mixer Conversion Loss [dB]**

| Frequency [MHz] | Channel | Bandwidth (MHz) | EUT Beam Pol. | Modulation | Antenna Polarization [H/V] | Turntable Azimuth [degrees] | Positioner Azimuth [degrees] | Spurious Emission Level [dBm] | Limit [dBm] | Margin [dB] |
|-----------------|---------|-----------------|---------------|------------|----------------------------|-----------------------------|------------------------------|-------------------------------|-------------|-------------|
| 82576.17        | Low     | 50              | 2Tx           | QPSK       | V                          | 291                         | 357                          | -41.72                        | -13.00      | -28.72      |
| 85210.25        | Low     | 50              | 2Tx           | QPSK       | V                          | 289                         | 358                          | -42.85                        | -13.00      | -29.85      |
| 83776.13        | Mid     | 50              | 2Tx           | QPSK       | H                          | 254                         | 357                          | -41.31                        | -13.00      | -28.31      |
| 86410.12        | Mid     | 50              | 2Tx           | QPSK       | H                          | 256                         | 1                            | -41.62                        | -13.00      | -28.62      |
| 84975.90        | High    | 50              | 2Tx           | QPSK       | V                          | 48                          | 0                            | -41.11                        | -13.00      | -28.11      |
| 87610.68        | High    | 50              | 2Tx           | QPSK       | V                          | 358                         | 288                          | -42.20                        | -13.00      | -29.20      |

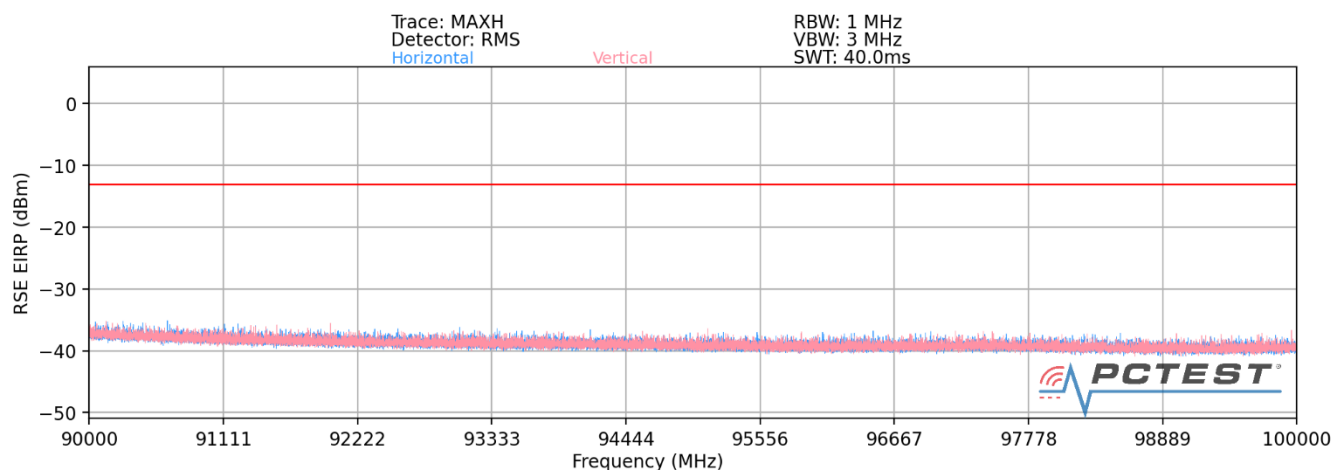
Table 7-30. Ant 1 - 2Tx - Spurious Emissions Table (60GHz - 90GHz)

### Notes

The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, cable losses, and harmonic mixer conversion losses. Measurements were performed at a distance of 1 meter.

|                                            |                                                                                     |                                       |                                                                                       |                                   |
|--------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------|
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| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021                                                | EUT Type:<br>Portable Handset         |                                                                                       | Page 47 of 99                     |

## 90GHz - 100GHz



**Plot 7-39. Ant 1-n261 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx – EN-DC Anchor B2)**

## Spurious Emissions EIRP Sample Calculation (n261)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1 meter.

**RSE EIRP (dBm) = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) – 104.8 + Harmonic Mixer Conversion Loss [dB]**

| Frequency [MHz] | Channel | Bandwidth (MHz) | EUT Beam Pol. | Modulation | Antenna Polarization [H/V] | Turntable Azimuth [degrees] | Positioner Azimuth [degrees] | Spurious Emission Level [dBm] | Limit [dBm] | Margin [dB] |
|-----------------|---------|-----------------|---------------|------------|----------------------------|-----------------------------|------------------------------|-------------------------------|-------------|-------------|
| 90915.18        | Low     | 50              | 2Tx           | QPSK       | V                          | -                           | -                            | -41.75                        | -13.00      | -28.75      |
| 90943.23        | Mid     | 50              | 2Tx           | QPSK       | V                          | -                           | -                            | -42.08                        | -13.00      | -29.08      |
| 91021.28        | High    | 50              | 2Tx           | QPSK       | V                          | -                           | -                            | -40.85                        | -13.00      | -27.85      |

**Table 7-31. Ant 1 - 2Tx - Spurious Emissions Table (90GHz - 100GHz)**

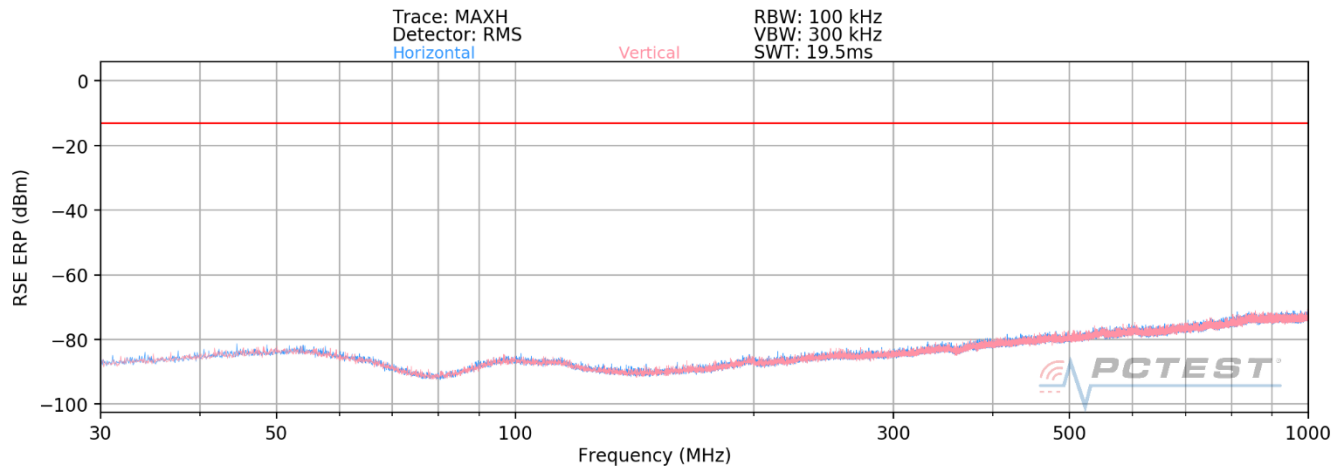
## Notes

The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, cable losses, and harmonic mixer conversion losses. Measurements were performed at a distance of 1 meter.

|                                            |                                                                                                                                  |                                                                                       |                                   |
|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------|
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| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021                                                                                             | EUT Type:<br>Portable Handset                                                         | Page 48 of 99                     |

## Band n261 – Ant 2

### 30MHz - 1GHz



Plot 7-40. Ant 2-n261 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx – EN-DC Anchor Band 2)

### Spurious Emissions ERP Sample Calculation (n261)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE ERP level is calculated by applying the additional factors shown below for a test distance of 3 meter.

$$\text{RSE ERP (dBm)} = \text{Analyzer Level (dBm)} + 107 + \text{AFCL (dB/m)} + 20\text{Log(Dm)} - 104.8 - 2.15 \text{ (dB)}$$

| Frequency [MHz] | Channel | Bandwidth (MHz) | EUT Beam Pol. | Modulation | Antenna Polarization [H/V] | Turntable Azimuth [degrees] | Antenna Height [cm] | Spurious Emission Level [dBm] | Limit [dBm] | Margin [dB] |
|-----------------|---------|-----------------|---------------|------------|----------------------------|-----------------------------|---------------------|-------------------------------|-------------|-------------|
| 771.54          | Mid     | 50              | 2Tx           | QPSK       | V                          | -                           | -                   | -73.93                        | -13.00      | -60.93      |
| 867.03          | Mid     | 50              | 2Tx           | QPSK       | V                          | -                           | -                   | -72.16                        | -13.00      | -59.16      |
| 995.33          | Mid     | 50              | 2Tx           | QPSK       | V                          | -                           | -                   | -71.47                        | -13.00      | -58.47      |

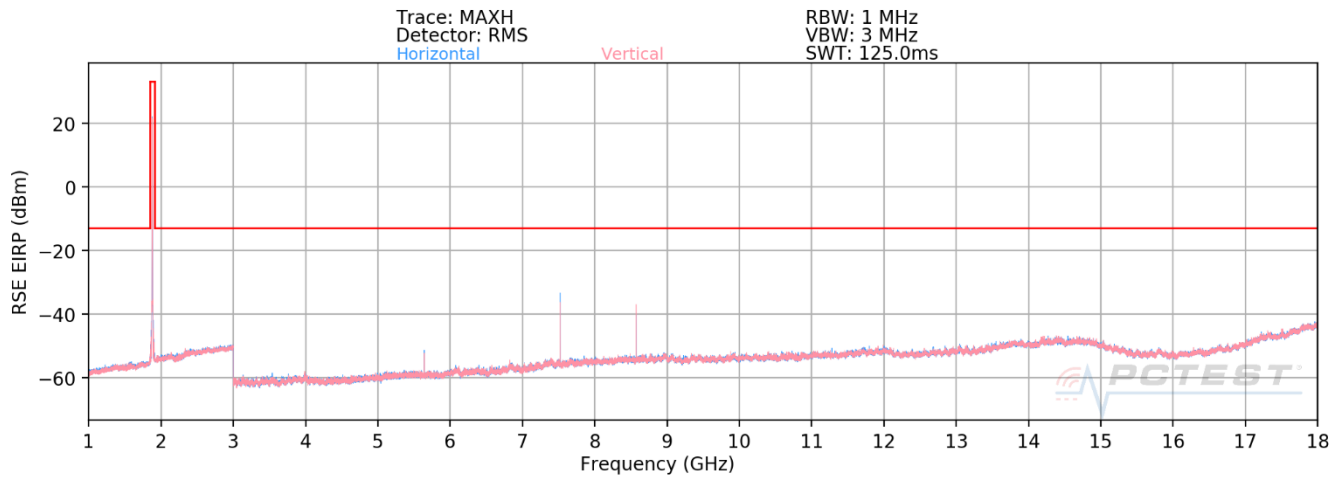
Table 7-32. Ant 2 - 2Tx - Spurious Emissions Table (30MHz - 1GHz)

### Notes

The RSE ERP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, and cable losses. Measurements were performed at a distance of 3 meter.

|                                            |                                              |                                       |                |                                   |
|--------------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMA426U                         | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021         | EUT Type:<br>Portable Handset         |                | Page 49 of 99                     |

## 1GHz - 18GHz



Plot 7-41. Ant 2-n261 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx – EN-DC Anchor Band 2)

## Spurious Emissions EIRP Sample Calculation (n261)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 3 meter.

$$\text{RSE EIRP (dBm)} = \text{Analyzer Level (dBm)} + 107 + \text{AFCL (dB/m)} + 20\text{Log(Dm)} - 104.8$$

| Frequency [MHz] | Channel | Bandwidth (MHz) | EUT Beam Pol. | Modulation | Antenna Polarization [H/V] | Turntable Azimuth [degrees] | Antenna Height [cm] | Spurious Emission Level [dBm] | Limit [dBm] | Margin [dB] |
|-----------------|---------|-----------------|---------------|------------|----------------------------|-----------------------------|---------------------|-------------------------------|-------------|-------------|
| 8812.05         | Low     | 50              | 2Tx           | QPSK       | V                          | 341                         | 213                 | -41.24                        | -13.00      | -28.24      |
| 5640.00         | Mid     | 50              | 2Tx           | QPSK       | V                          | 15                          | 142                 | -54.06                        | -13.00      | -41.06      |
| 7520.00         | Mid     | 50              | 2Tx           | QPSK       | H                          | 340                         | 126                 | -37.08                        | -13.00      | -24.08      |
| 8572.11         | Mid     | 50              | 2Tx           | QPSK       | V                          | 15                          | 140                 | -41.99                        | -13.00      | -28.99      |
| 8971.92         | High    | 50              | 2Tx           | QPSK       | V                          | 4                           | 160                 | -41.15                        | -13.00      | -28.15      |

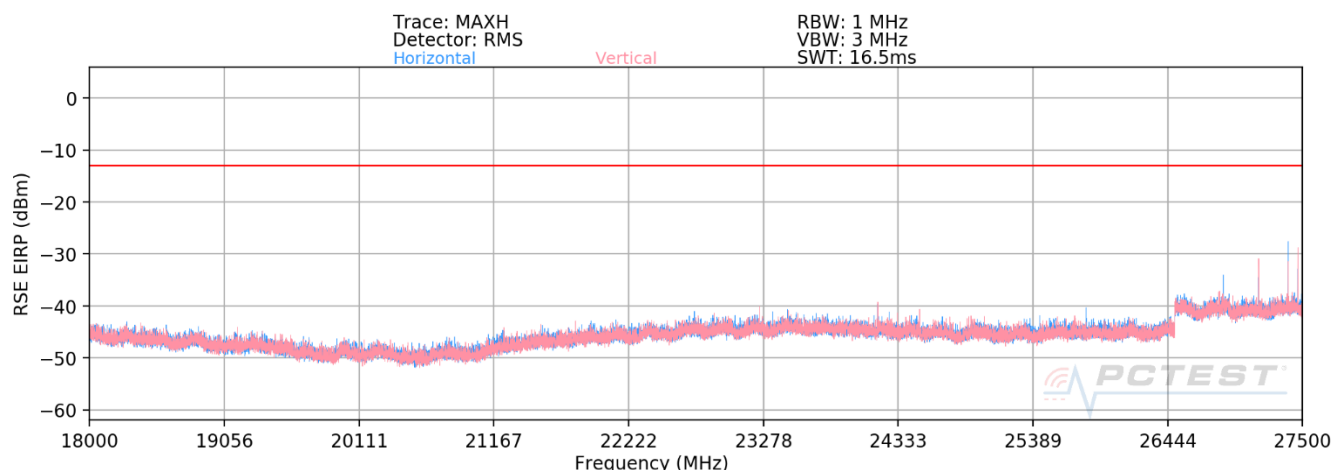
Table 7-33. Ant 2 - 2Tx - Spurious Emissions Table (1GHz - 18GHz)

## Notes

The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, and cable losses. Measurements were performed at a distance of 3 meter.

|                                            |                                              |                                       |                |                                   |
|--------------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMA426U                         | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021         | EUT Type:<br>Portable Handset         |                | Page 50 of 99                     |

## 18GHz - 27.5GHz



**Plot 7-42. Ant 2-n261 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx – EN-DC Anchor B2)**

## Spurious Emissions EIRP Sample Calculation (n261)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1 meter.

$$\text{RSE EIRP (dBm)} = \text{Analyzer Level (dBm)} + 107 + \text{AFCL (dB/m)} + 20\text{Log(Dm)} - 104.8$$

| Frequency [MHz] | Channel | Bandwidth (MHz) | EUT Beam Pol. | Modulation | Antenna Polarization [H/V] | Turntable Azimuth [degrees] | Positioner Azimuth [degrees] | Spurious Emission Level [dBm] | Limit [dBm] | Margin [dB] |
|-----------------|---------|-----------------|---------------|------------|----------------------------|-----------------------------|------------------------------|-------------------------------|-------------|-------------|
| 26975.12        | Low     | 50              | 2Tx           | QPSK       | H                          | 174                         | 345                          | -31.65                        | -13.00      | -18.65      |
| 27218.27        | Low     | 50              | 2Tx           | QPSK       | H                          | 178                         | 360                          | -23.97                        | -13.00      | -10.97      |
| 26371.94        | Low     | 50              | 2Tx           | QPSK       | H                          | 179                         | 4                            | -25.90                        | -13.00      | -12.90      |
| 26879.88        | Mid     | 50              | 2Tx           | QPSK       | H                          | 177                         | 278                          | -36.16                        | -13.00      | -23.16      |
| 27387.82        | Mid     | 50              | 2Tx           | QPSK       | H                          | 179                         | 288                          | -30.32                        | -13.00      | -17.32      |
| 27464.79        | Mid     | 50              | 2Tx           | QPSK       | H                          | 178                         | 358                          | -29.81                        | -13.00      | -16.81      |
| 26915.54        | High    | 50              | 2Tx           | QPSK       | H                          | 170                         | 29                           | -35.85                        | -13.00      | -22.85      |
| 27326.88        | High    | 50              | 2Tx           | QPSK       | H                          | 167                         | 14                           | -34.27                        | -13.00      | -21.27      |
| 27403.85        | High    | 50              | 2Tx           | QPSK       | H                          | 166                         | 10                           | -35.66                        | -13.00      | -22.66      |

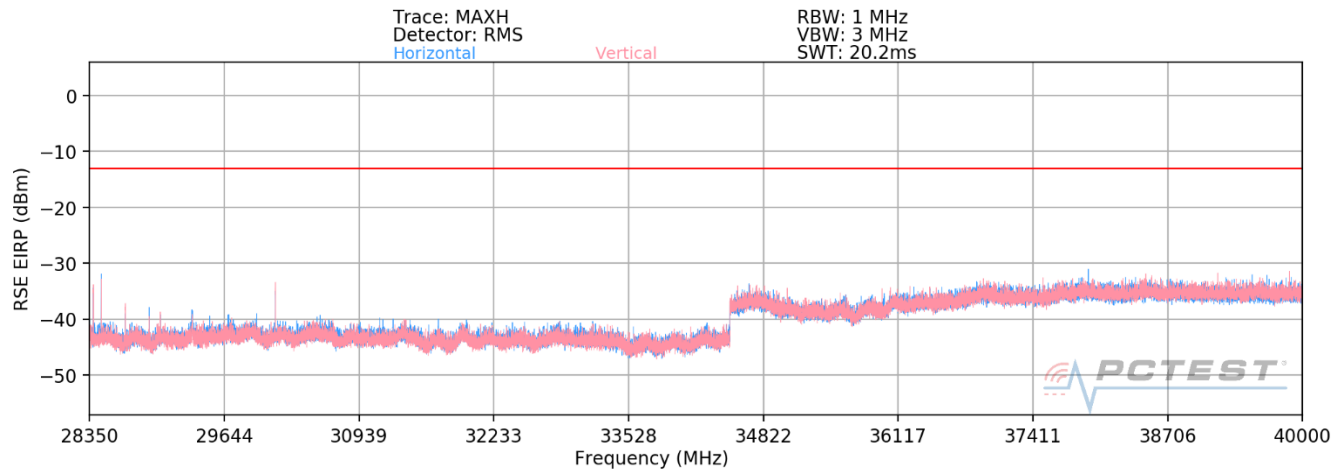
**Table 7-34. Ant 2 - 2Tx - Spurious Emissions Table (18GHz - 27.5GHz)**

## Notes

The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, and cable losses. Measurements were performed at a distance of 1 meter.

|                                            |                                                                                     |                                       |                                                                                       |                                   |
|--------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------|
| FCC ID: A3LSMA426U                         |  | MEASUREMENT REPORT<br>(CERTIFICATION) |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021                                                | EUT Type:<br>Portable Handset         |                                                                                       | Page 51 of 99                     |

## 28.35GHz - 40GHz



Plot 7-43. Ant 2-n261 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx – EN-DC Anchor B2)

### Spurious Emissions EIRP Sample Calculation (n261)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1 meter.

$$\text{RSE EIRP (dBm)} = \text{Analyzer Level (dBm)} + 107 + \text{AFCL (dB/m)} + 20\text{Log(Dm)} - 104.8$$

| Frequency [MHz] | Channel | Bandwidth (MHz) | EUT Beam Pol. | Modulation | Antenna Polarization [H/V] | Turntable Azimuth [degrees] | Positioner Azimuth [degrees] | Spurious Emission Level [dBm] | Limit [dBm] | Margin [dB] |
|-----------------|---------|-----------------|---------------|------------|----------------------------|-----------------------------|------------------------------|-------------------------------|-------------|-------------|
| 28524.02        | Low     | 50              | 2Tx           | QPSK       | H                          | 171                         | 106                          | -37.30                        | -13.00      | -24.30      |
| 28614.82        | Low     | 50              | 2Tx           | QPSK       | H                          | 176                         | 23                           | -23.43                        | -13.00      | -10.43      |
| 28697.46        | Low     | 50              | 2Tx           | QPSK       | H                          | 177                         | 138                          | -37.28                        | -13.00      | -24.28      |
| 28386.22        | Mid     | 50              | 2Tx           | QPSK       | H                          | 178                         | 351                          | -33.38                        | -13.00      | -20.38      |
| 28463.08        | Mid     | 50              | 2Tx           | QPSK       | H                          | 175                         | 336                          | -32.13                        | -13.00      | -19.13      |
| 28693.31        | Mid     | 50              | 2Tx           | QPSK       | H                          | 178                         | 4                            | -36.07                        | -13.00      | -23.07      |
| 30134.94        | Mid     | 50              | 2Tx           | QPSK       | H                          | 195                         | 9                            | -28.73                        | -13.00      | -15.73      |
| 28632.73        | High    | 50              | 2Tx           | QPSK       | H                          | 166                         | 10                           | -32.98                        | -13.00      | -19.98      |
| 28863.02        | High    | 50              | 2Tx           | QPSK       | H                          | 158                         | 356                          | -34.33                        | -13.00      | -21.33      |
| 29734.97        | High    | 50              | 2Tx           | QPSK       | H                          | 152                         | 11                           | -30.95                        | -13.00      | -17.95      |

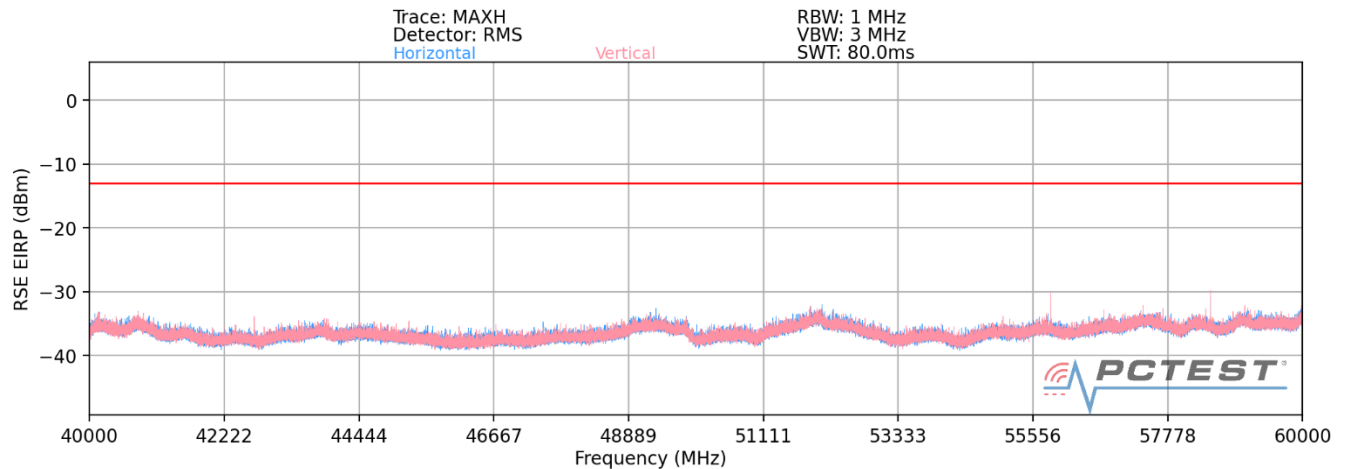
Table 7-35. Ant 2 - 2Tx - Spurious Emissions Table (28.35GHz - 40GHz)

### Notes

The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, and cable losses. Measurements were performed at a distance of 1 meter.

|                                            |                                                                                     |                                       |                                                                                       |                                   |
|--------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------|
| FCC ID: A3LSMA426U                         |  | MEASUREMENT REPORT<br>(CERTIFICATION) |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021                                                | EUT Type:<br>Portable Handset         |                                                                                       | Page 52 of 99                     |

## 40GHz - 60GHz



Plot 7-44. Ant 2-n261 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx – EN-DC Anchor B2)

## Spurious Emissions EIRP Sample Calculation (n261)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1.5 meter.

**RSE EIRP (dBm) = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) – 104.8 + Harmonic Mixer Conversion Loss [dB]**

| Frequency [MHz] | Channel | Bandwidth (MHz) | EUT Beam Pol. | Modulation | Antenna Polarization [H/V] | Turntable Azimuth [degrees] | Positioner Azimuth [degrees] | Spurious Emission Level [dBm] | Limit [dBm] | Margin [dB] |
|-----------------|---------|-----------------|---------------|------------|----------------------------|-----------------------------|------------------------------|-------------------------------|-------------|-------------|
| 55050.72        | Low     | 50              | 2Tx           | QPSK       | H                          | 238                         | 240                          | -37.42                        | -13.00      | -24.42      |
| 55850.79        | Mid     | 50              | 2Tx           | QPSK       | H                          | 103                         | 151                          | -33.94                        | -13.00      | -20.94      |
| 56670.74        | High    | 50              | 2Tx           | QPSK       | H                          | 48                          | 77                           | -33.67                        | -13.00      | -20.67      |

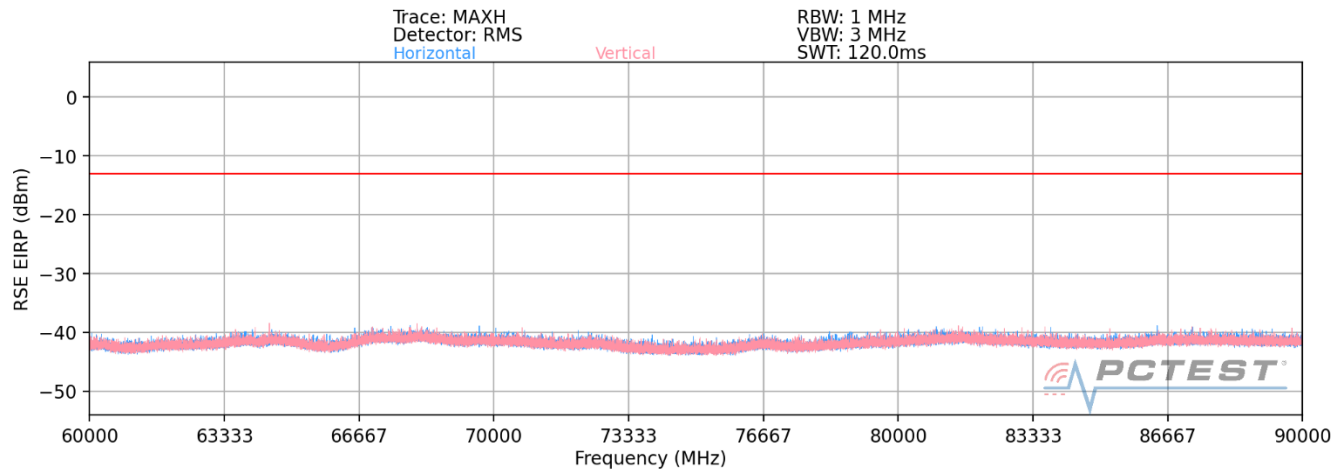
Table 7-36. Ant 2 - 2Tx - Spurious Emissions Table (40GHz - 60GHz)

## Notes

The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, cable losses, and harmonic mixer conversion losses. Measurements were performed at a distance of 1.5 meter.

|                                            |                                                                                                                        |                                                                                       |                                   |
|--------------------------------------------|------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------|
| FCC ID: A3LSMA426U                         |  MEASUREMENT REPORT (CERTIFICATION) |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021                                                                                   | EUT Type:<br>Portable Handset                                                         | Page 53 of 99                     |

## 60GHz - 90GHz



Plot 7-45. Ant 2-n261 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx – EN-DC Anchor B2)

## Spurious Emissions EIRP Sample Calculation (n261)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1 meter.

**RSE EIRP (dBm) = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) – 104.8 + Harmonic Mixer Conversion Loss [dB]**

| Frequency [MHz] | Channel | Bandwidth (MHz) | EUT Beam Pol. | Modulation | Antenna Polarization [H/V] | Turntable Azimuth [degrees] | Positioner Azimuth [degrees] | Spurious Emission Level [dBm] | Limit [dBm] | Margin [dB] |
|-----------------|---------|-----------------|---------------|------------|----------------------------|-----------------------------|------------------------------|-------------------------------|-------------|-------------|
| 82576.47        | Low     | 50              | 2Tx           | QPSK       | H                          | 259                         | 356                          | -45.41                        | -13.00      | -32.41      |
| 85210.30        | Low     | 50              | 2Tx           | QPSK       | H                          | 258                         | 358                          | -45.80                        | -13.00      | -32.80      |
| 83776.04        | Mid     | 50              | 2Tx           | QPSK       | H                          | 264                         | 357                          | -47.01                        | -13.00      | -34.01      |
| 86410.30        | Mid     | 50              | 2Tx           | QPSK       | H                          | 264                         | 7                            | -46.17                        | -13.00      | -33.17      |
| 84976.02        | High    | 50              | 2Tx           | QPSK       | H                          | 244                         | 238                          | -39.77                        | -13.00      | -26.77      |
| 87610.30        | High    | 50              | 2Tx           | QPSK       | H                          | 237                         | 268                          | -45.00                        | -13.00      | -32.00      |

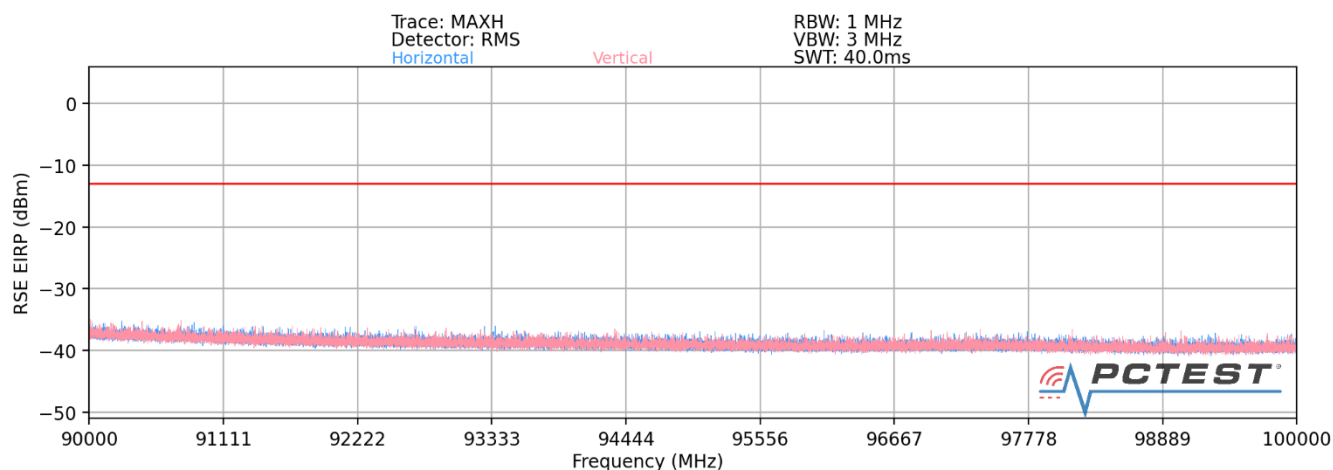
Table 7-37. Ant 2 - 2Tx - Spurious Emissions Table (60GHz - 90GHz)

## Notes

The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, cable losses, and harmonic mixer conversion losses. Measurements were performed at a distance of 1 meter.

|                                            |                                                                                     |                                       |                                                                                       |                                   |
|--------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------|
| FCC ID: A3LSMA426U                         |  | MEASUREMENT REPORT<br>(CERTIFICATION) |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021                                                | EUT Type:<br>Portable Handset         |                                                                                       | Page 54 of 99                     |

## 90GHz - 100GHz



**Plot 7-46. Ant 2-n261 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx – EN-DC Anchor B2)**

## Spurious Emissions EIRP Sample Calculation (n261)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1 meter.

**RSE EIRP (dBm) = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) – 104.8 + Harmonic Mixer Conversion Loss [dB]**

| Frequency [MHz] | Channel | Bandwidth (MHz) | EUT Beam Pol. | Modulation | Antenna Polarization [H/V] | Turntable Azimuth [degrees] | Positioner Azimuth [degrees] | Spurious Emission Level [dBm] | Limit [dBm] | Margin [dB] |
|-----------------|---------|-----------------|---------------|------------|----------------------------|-----------------------------|------------------------------|-------------------------------|-------------|-------------|
| 90908.51        | Low     | 50              | 2Tx           | QPSK       | H                          | -                           | -                            | -41.59                        | -13.00      | -28.59      |
| 91021.56        | Mid     | 50              | 2Tx           | QPSK       | H                          | -                           | -                            | -42.04                        | -13.00      | -29.04      |
| 90992.96        | High    | 50              | 2Tx           | QPSK       | H                          | -                           | -                            | -41.27                        | -13.00      | -28.27      |

**Table 7-38. Ant 2 - 2Tx - Spurious Emissions Table (90GHz - 100GHz)**

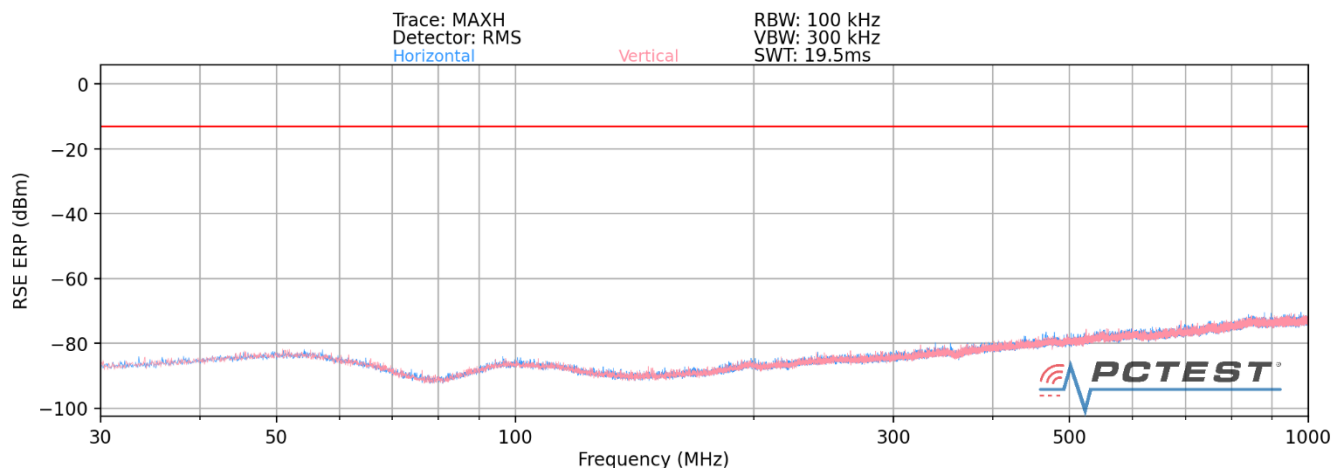
## Notes

The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, cable losses, and harmonic mixer conversion losses. Measurements were performed at a distance of 1 meter.

|                                            |                                                                                                                                  |                                                                                       |                                   |
|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------|
| FCC ID: A3LSMA426U                         |  <b>MEASUREMENT REPORT</b><br>(CERTIFICATION) |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021                                                                                             | EUT Type:<br>Portable Handset                                                         | Page 55 of 99                     |

## Band n260- Ant 1

### 30MHz - 1GHz



Plot 7-47. Ant 1-n260 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx – EN-DC Anchor Band 2)

### Spurious Emissions ERP Sample Calculation (n260)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE ERP level is calculated by applying the additional factors shown below for a test distance of 3 meter.

$$\text{RSE ERP (dBm)} = \text{Analyzer Level (dBm)} + 107 + \text{AFCL (dB/m)} + 20\text{Log(Dm)} - 104.8 - 2.15 \text{ (dB)}$$

| Frequency [MHz] | Channel | Bandwidth (MHz) | EUT Beam Pol. | Modulation | Antenna Polarization [H/V] | Turntable Azimuth [degrees] | Antenna Height [cm] | Spurious Emission Level [dBm] | Limit [dBm] | Margin [dB] |
|-----------------|---------|-----------------|---------------|------------|----------------------------|-----------------------------|---------------------|-------------------------------|-------------|-------------|
| 651.84          | Mid     | 50              | 2Tx           | QPSK       | H                          | -                           | -                   | -75.90                        | -13.00      | -62.90      |
| 897.53          | Mid     | 50              | 2Tx           | QPSK       | H                          | -                           | -                   | -70.70                        | -13.00      | -57.70      |
| 994.73          | Mid     | 50              | 2Tx           | QPSK       | H                          | -                           | -                   | -71.84                        | -13.00      | -58.84      |

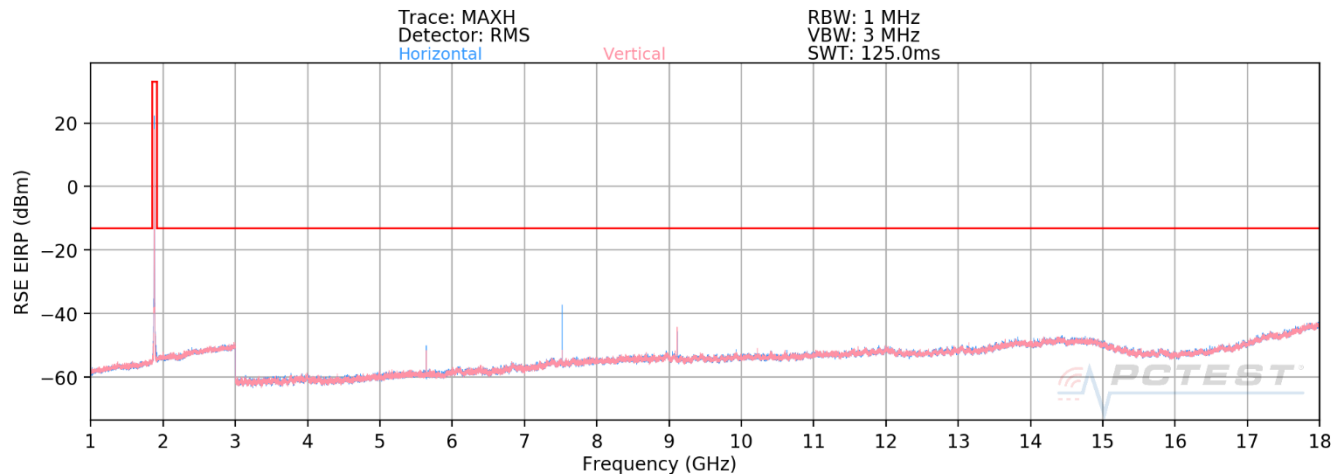
Table 7-39. Ant 1 - 2Tx - Spurious Emissions Table (30MHz - 1GHz)

### Notes

The RSE ERP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, and cable losses. Measurements were performed at a distance of 3 meter.

|                                            |                                                                                     |                                       |                                                                                       |                                   |
|--------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------|
| FCC ID: A3LSMA426U                         |  | MEASUREMENT REPORT<br>(CERTIFICATION) |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021                                                | EUT Type:<br>Portable Handset         |                                                                                       | Page 56 of 99                     |

## 1GHz - 18GHz



**Plot 7-48. Ant 1-n260 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx – EN-DC Anchor Band 2)**

## Spurious Emissions EIRP Sample Calculation (n260)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 3 meter.

$$\text{RSE EIRP (dBm)} = \text{Analyzer Level (dBm)} + 107 + \text{AFCL (dB/m)} + 20\text{Log(Dm)} - 104.8$$

| Frequency [MHz] | Channel | Bandwidth (MHz) | EUT Beam Pol. | Modulation | Antenna Polarization [H/V] | Turntable Azimuth [degrees] | Antenna Height [cm] | Spurious Emission Level [dBm] | Limit [dBm] | Margin [dB] |
|-----------------|---------|-----------------|---------------|------------|----------------------------|-----------------------------|---------------------|-------------------------------|-------------|-------------|
| 8404.79         | Low     | 50              | 2Tx           | QPSK       | H                          | 51                          | 242                 | -40.91                        | -13.00      | -27.91      |
| 5640.00         | Mid     | 50              | 2Tx           | QPSK       | H                          | 342                         | 153                 | -53.08                        | -13.00      | -40.08      |
| 7520.00         | Mid     | 50              | 2Tx           | QPSK       | H                          | 48                          | 127                 | -36.44                        | -13.00      | -23.44      |
| 9111.85         | Mid     | 50              | 2Tx           | QPSK       | H                          | 297                         | 264                 | -45.72                        | -13.00      | -32.72      |
| 9153.15         | High    | 50              | 2Tx           | QPSK       | H                          | 359                         | 120                 | -46.09                        | -13.00      | -33.09      |

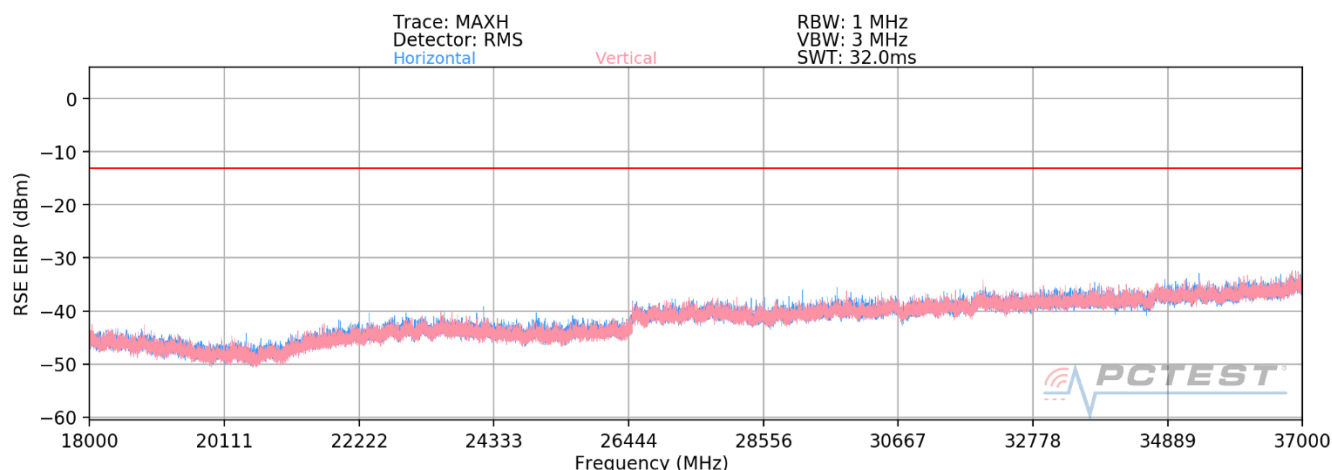
**Table 7-40. Ant 1 - 2Tx - Spurious Emissions Table (1GHz - 18GHz)**

## Notes

The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, and cable losses. Measurements were performed at a distance of 3 meter.

|                                            |                                              |                                       |                |                                   |
|--------------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMA426U                         | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021         | EUT Type:<br>Portable Handset         |                | Page 57 of 99                     |

## 18GHz – 37GHz



Plot 7-49. Ant 1-n260 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx – EN-DC Anchor Band 2)

## Spurious Emissions EIRP Sample Calculation (n260)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1 meter.

$$\text{RSE EIRP (dBm)} = \text{Analyzer Level (dBm)} + 107 + \text{AFCL (dB/m)} + 20\text{Log(Dm)} - 104.8$$

| Frequency [MHz] | Channel | Bandwidth (MHz) | EUT Beam Pol. | Modulation | Antenna Polarization [H/V] | Turntable Azimuth [degrees] | Positioner Azimuth [degrees] | Spurious Emission Level [dBm] | Limit [dBm] | Margin [dB] |
|-----------------|---------|-----------------|---------------|------------|----------------------------|-----------------------------|------------------------------|-------------------------------|-------------|-------------|
| 36718.18        | Low     | 50              | 2Tx           | QPSK       | H                          | 89                          | 19                           | -29.01                        | -13.00      | -16.01      |
| 36871.93        | Low     | 50              | 2Tx           | QPSK       | H                          | 89                          | 18                           | -28.67                        | -13.00      | -15.67      |
| 36504.05        | Mid     | 50              | 2Tx           | QPSK       | H                          | -                           | -                            | -41.76                        | -13.00      | -28.76      |
| 36874.28        | Mid     | 50              | 2Tx           | QPSK       | H                          | -                           | -                            | -41.89                        | -13.00      | -28.89      |
| 36921.23        | High    | 50              | 2Tx           | QPSK       | H                          | -                           | -                            | -41.91                        | -13.00      | -28.91      |

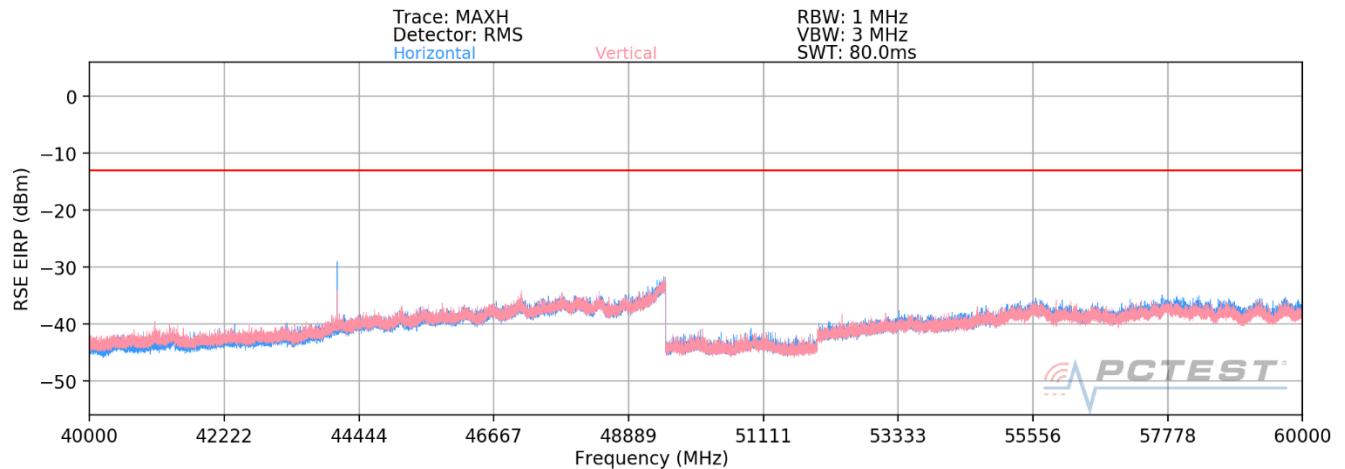
Table 7-41. Ant 1 - 2Tx - Spurious Emissions Table (18GHz – 37GHz)

## Notes

The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, and cable losses. Measurements were performed at a distance of 1 meter.

|                                            |                                                                                     |                                       |                                                                                       |                                   |
|--------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------|
| FCC ID: A3LSMA426U                         |  | MEASUREMENT REPORT<br>(CERTIFICATION) |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021                                                | EUT Type:<br>Portable Handset         |                                                                                       | Page 58 of 99                     |

## 40GHz - 60GHz



Plot 7-50. Ant 1-n260 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx – EN-DC Anchor Band 2)

## Spurious Emissions EIRP Sample Calculation (n260)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1.5 meter.

$$\text{RSE EIRP (dBm)} = \text{Analyzer Level (dBm)} + 107 + \text{AFCL (dB/m)} + 20\text{Log(Dm)} - 104.8$$

| Frequency [MHz] | Channel | Bandwidth (MHz) | EUT Beam Pol. | Modulation | Antenna Polarization [H/V] | Turntable Azimuth [degrees] | Positioner Azimuth [degrees] | Spurious Emission Level [dBm] | Limit [dBm] | Margin [dB] |
|-----------------|---------|-----------------|---------------|------------|----------------------------|-----------------------------|------------------------------|-------------------------------|-------------|-------------|
| 42930.90        | Low     | 50              | 2Tx           | QPSK       | H                          | 65                          | 17                           | -29.49                        | -13.00      | -16.49      |
| 44082.90        | Mid     | 50              | 2Tx           | QPSK       | H                          | 112                         | 19                           | -30.94                        | -13.00      | -17.94      |
| 46233.09        | High    | 50              | 2Tx           | QPSK       | H                          | 58                          | 4                            | -37.74                        | -13.00      | -24.74      |

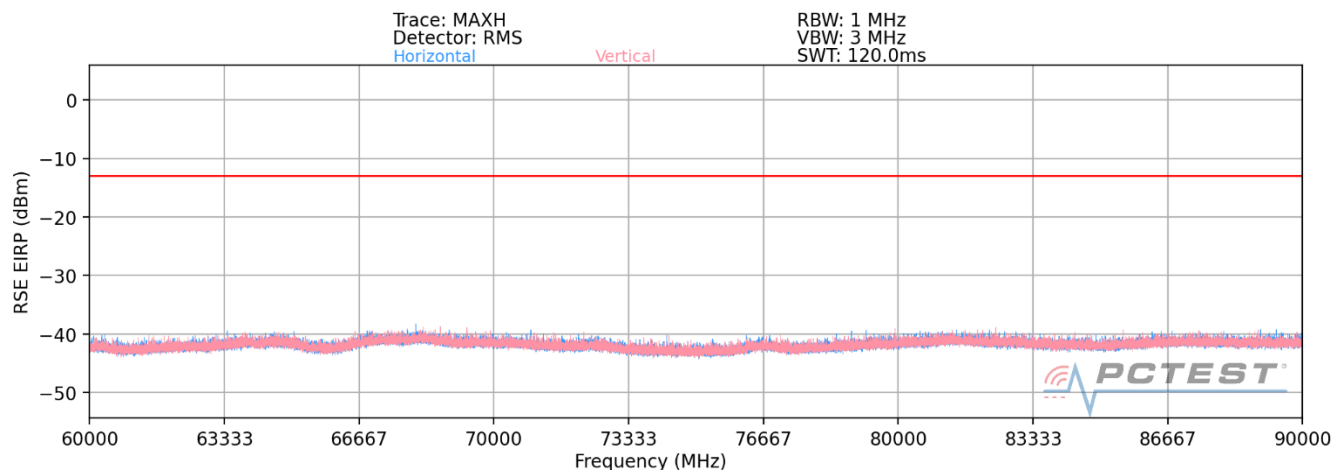
Table 7-42. Ant 1 - 2Tx - Spurious Emissions Table (40GHz - 60GHz)

## Notes

The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, and cable losses. Measurements were performed at a distance of 1.5 meter.

|                                            |                                              |                                       |                |                                   |
|--------------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMA426U                         | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021         | EUT Type:<br>Portable Handset         |                | Page 59 of 99                     |

## 60GHz - 90GHz



Plot 7-51. Ant 1-n260 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx – EN-DC Anchor Band 2)

## Spurious Emissions EIRP Sample Calculation (n260)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1 meter.

**RSE EIRP (dBm) = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) – 104.8 + Harmonic Mixer Conversion Loss [dB]**

| Frequency [MHz] | Channel | Bandwidth (MHz) | EUT Beam Pol. | Modulation | Antenna Polarization [H/V] | Turntable Azimuth [degrees] | Positioner Azimuth [degrees] | Spurious Emission Level [dBm] | Limit [dBm] | Margin [dB] |
|-----------------|---------|-----------------|---------------|------------|----------------------------|-----------------------------|------------------------------|-------------------------------|-------------|-------------|
| 74050.50        | Low     | 50              | 2Tx           | QPSK       | V                          | 91                          | 2                            | -38.57                        | -13.00      | -25.57      |
| 76684.63        | Low     | 50              | 2Tx           | QPSK       | V                          | 91                          | 357                          | -37.29                        | -13.00      | -24.29      |
| 77000.19        | Mid     | 50              | 2Tx           | QPSK       | V                          | 75                          | 342                          | -40.77                        | -13.00      | -27.77      |
| 79634.21        | Mid     | 50              | 2Tx           | QPSK       | V                          | 74                          | 336                          | -40.43                        | -13.00      | -27.43      |
| 79950.03        | High    | 50              | 2Tx           | QPSK       | V                          | 124                         | 9                            | -46.47                        | -13.00      | -33.47      |
| 82584.76        | High    | 50              | 2Tx           | QPSK       | V                          | 46                          | 247                          | -46.88                        | -13.00      | -33.88      |

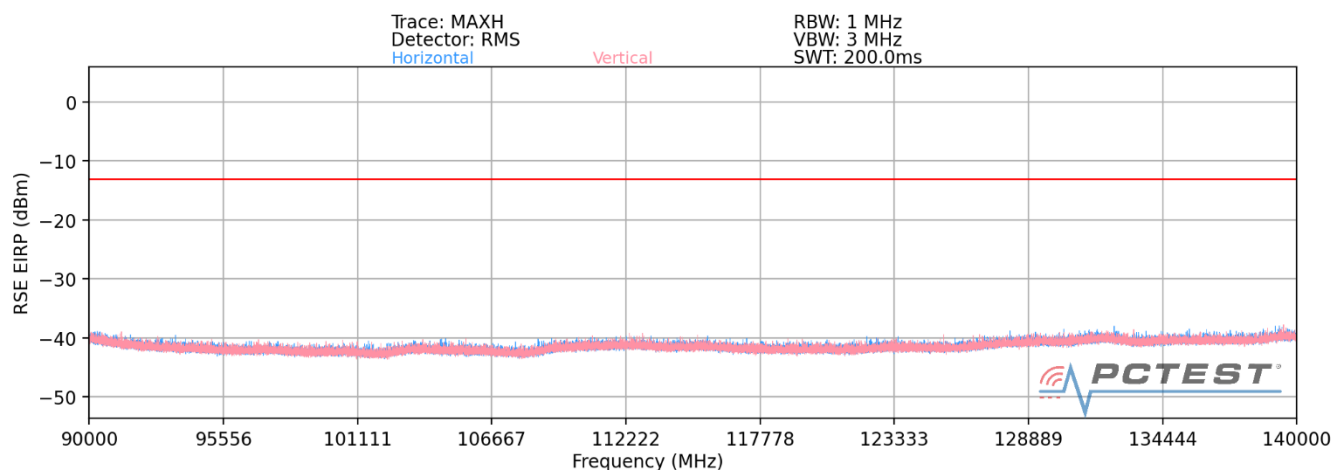
Table 7-43. Ant 1 - 2Tx - Spurious Emissions Table (60GHz - 90GHz)

## Notes

The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, cable losses, and harmonic mixer conversion losses. Measurements were performed at a distance of 1 meter.

|                                            |                                                                                                                        |                                                                                       |                                   |
|--------------------------------------------|------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------|
| FCC ID: A3LSMA426U                         |  MEASUREMENT REPORT (CERTIFICATION) |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021                                                                                   | EUT Type:<br>Portable Handset                                                         | Page 60 of 99                     |

## 90GHz - 140GHz



Plot 7-52. Ant 1-n260 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx – EN-DC Anchor Band 2)

## Spurious Emissions EIRP Sample Calculation (n260)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1 meter.

**RSE EIRP (dBm) = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) – 104.8 + Harmonic Mixer Conversion Loss [dB]**

| Frequency [MHz] | Channel | Bandwidth (MHz) | EUT Beam Pol. | Modulation | Antenna Polarization [H/V] | Turntable Azimuth [degrees] | Positioner Azimuth [degrees] | Spurious Emission Level [dBm] | Limit [dBm] | Margin [dB] |
|-----------------|---------|-----------------|---------------|------------|----------------------------|-----------------------------|------------------------------|-------------------------------|-------------|-------------|
| 111076.23       | Low     | 50              | 2Tx           | QPSK       | V                          | 120                         | 337                          | -31.94                        | -13.00      | -18.94      |
| 113709.75       | Low     | 50              | 2Tx           | QPSK       | V                          | 120                         | 339                          | -32.32                        | -13.00      | -19.32      |
| 115500.35       | Mid     | 50              | 2Tx           | QPSK       | V                          | 108                         | 4                            | -40.25                        | -13.00      | -27.25      |
| 118134.63       | Mid     | 50              | 2Tx           | QPSK       | V                          | 107                         | 2                            | -42.19                        | -13.00      | -29.19      |
| 119925.48       | High    | 50              | 2Tx           | QPSK       | V                          | 76                          | 9                            | -39.83                        | -13.00      | -26.83      |
| 122559.66       | High    | 50              | 2Tx           | QPSK       | V                          | 75                          | 7                            | -39.86                        | -13.00      | -26.86      |

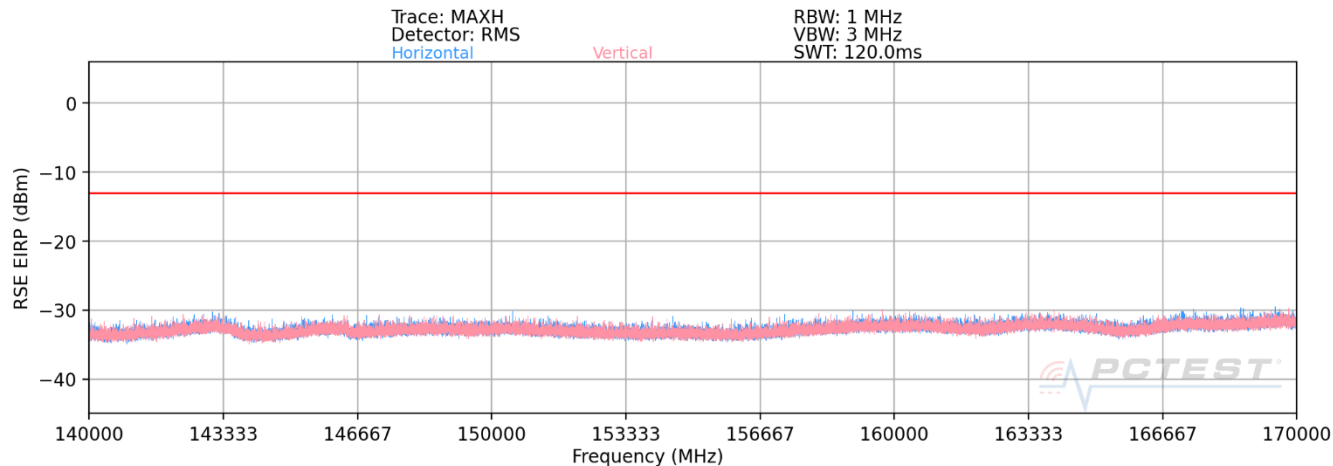
Table 7-44. Ant 1 - 2Tx - Spurious Emissions Table (90GHz - 140GHz)

## Notes

The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, cable losses, and harmonic mixer conversion losses. Measurements were performed at a distance of 1 meter.

|                                            |                                                                                                                                        |                                       |                                                                                       |                                   |
|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------|
| FCC ID: A3LSMA426U                         |  PCTEST <sup>®</sup><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021                                                                                                   | EUT Type:<br>Portable Handset         |                                                                                       | Page 61 of 99                     |

## 140GHz - 170GHz



**Plot 7-53. Ant 1-n260 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx – EN-DC Anchor Band 2)**

### Spurious Emissions EIRP Sample Calculation (n260)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1 meter.

**RSE EIRP (dBm)** = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) – 104.8 + Harmonic Mixer Conversion Loss [dB]

| Frequency [MHz] | Channel | Bandwidth (MHz) | EUT Beam Pol. | Modulation | Antenna Polarization [H/V] | Turntable Azimuth [degrees] | Positioner Azimuth [degrees] | Spurious Emission Level [dBm] | Limit [dBm] | Margin [dB] |
|-----------------|---------|-----------------|---------------|------------|----------------------------|-----------------------------|------------------------------|-------------------------------|-------------|-------------|
| 148098.31       | Low     | 50              | 2Tx           | QPSK       | V                          | -                           | -                            | -38.23                        | -13.00      | -25.23      |
| 154002.07       | Mid     | 50              | 2Tx           | QPSK       | V                          | -                           | -                            | -38.06                        | -13.00      | -25.06      |
| 159909.14       | High    | 50              | 2Tx           | QPSK       | V                          | -                           | -                            | -37.55                        | -13.00      | -24.55      |

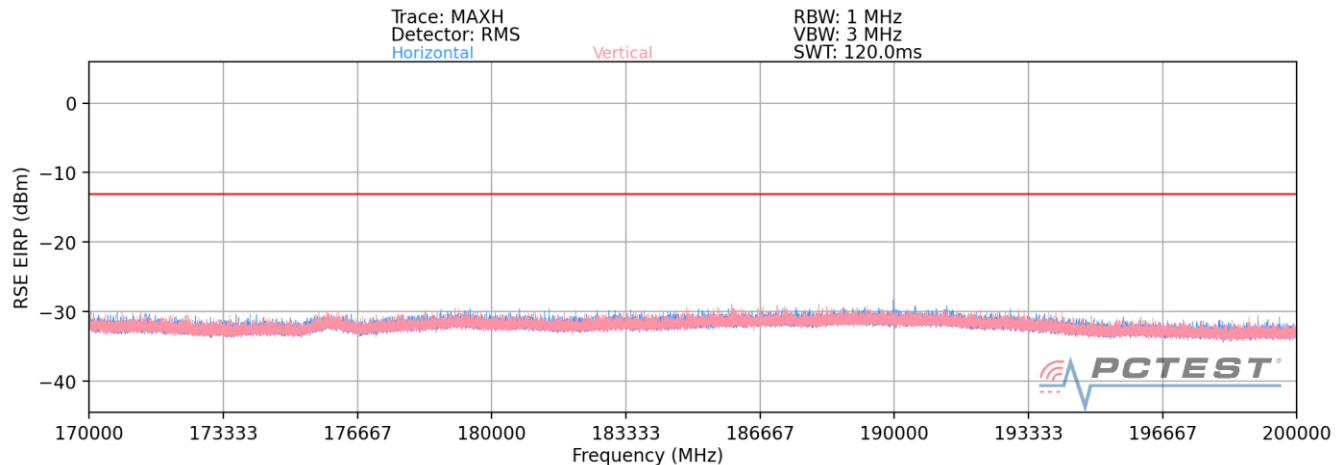
**Table 7-45. Ant 1 - 2Tx - Spurious Emissions Table (140GHz - 170GHz)**

### Notes

The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, cable losses, and harmonic mixer conversion losses. Measurements were performed at a distance of 1 meter.

|                                            |                                              |                                       |                |                                   |
|--------------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMA426U                         | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021         | EUT Type:<br>Portable Handset         |                | Page 62 of 99                     |

## 170GHz - 200GHz



Plot 7-54. Ant 1-n260 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx – EN-DC Anchor Band 2)

## Spurious Emissions EIRP Sample Calculation (n260)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1 meter.

**RSE EIRP (dBm) = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) – 104.8 + Harmonic Mixer Conversion Loss [dB]**

| Frequency [MHz] | Channel | Bandwidth (MHz) | EUT Beam Pol. | Modulation | Antenna Polarization [H/V] | Turntable Azimuth [degrees] | Positioner Azimuth [degrees] | Spurious Emission Level [dBm] | Limit [dBm] | Margin [dB] |
|-----------------|---------|-----------------|---------------|------------|----------------------------|-----------------------------|------------------------------|-------------------------------|-------------|-------------|
| 185119.99       | Low     | 50              | 2Tx           | QPSK       | V                          | -                           | -                            | -36.95                        | -13.00      | -23.95      |
| 192491.08       | Mid     | 50              | 2Tx           | QPSK       | V                          | -                           | -                            | -36.89                        | -13.00      | -23.89      |
| 199873.48       | High    | 50              | 2Tx           | QPSK       | V                          | -                           | -                            | -37.97                        | -13.00      | -24.97      |

Table 7-46. Ant 1 - 2Tx - Spurious Emissions Table (170GHz - 200GHz)

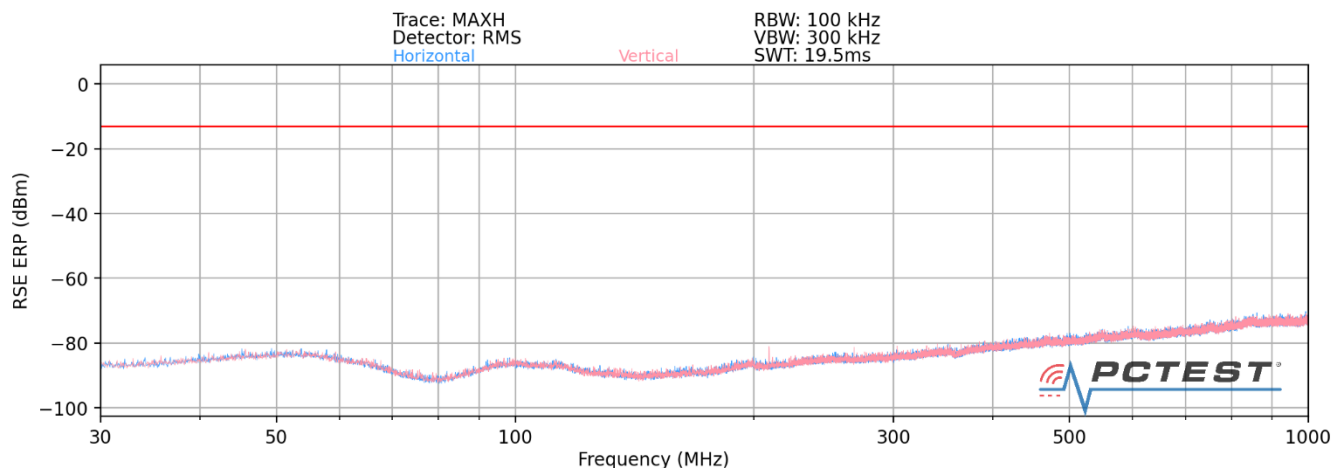
## Notes

The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, cable losses, and harmonic mixer conversion losses. Measurements were performed at a distance of 1 meter.

|                                            |                                                                                     |                                       |                                                                                       |                                   |
|--------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------|
| FCC ID: A3LSMA426U                         |  | MEASUREMENT REPORT<br>(CERTIFICATION) |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021                                                | EUT Type:<br>Portable Handset         |                                                                                       | Page 63 of 99                     |

## Band n260- Ant 2

### 30MHz - 1GHz



**Plot 7-55. Ant 2-n260 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx – EN-DC Anchor Band 2)**

### Spurious Emissions ERP Sample Calculation (n260)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE ERP level is calculated by applying the additional factors shown below for a test distance of 3 meter.

$$\text{RSE ERP (dBm)} = \text{Analyzer Level (dBm)} + 107 + \text{AFCL (dB/m)} + 20\text{Log(Dm)} - 104.8 - 2.15 \text{ (dB)}$$

| Frequency [MHz] | Channel | Bandwidth (MHz) | EUT Beam Pol. | Modulation | Antenna Polarization [H/V] | Turntable Azimuth [degrees] | Antenna Height [cm] | Spurious Emission Level [dBm] | Limit [dBm] | Margin [dB] |
|-----------------|---------|-----------------|---------------|------------|----------------------------|-----------------------------|---------------------|-------------------------------|-------------|-------------|
| 601.75          | Mid     | 50              | 2Tx           | QPSK       | H                          | -                           | -                   | -75.92                        | -13.00      | -62.92      |
| 854.63          | Mid     | 50              | 2Tx           | QPSK       | H                          | -                           | -                   | -72.14                        | -13.00      | -59.14      |
| 992.73          | Mid     | 50              | 2Tx           | QPSK       | H                          | -                           | -                   | -70.28                        | -13.00      | -57.28      |

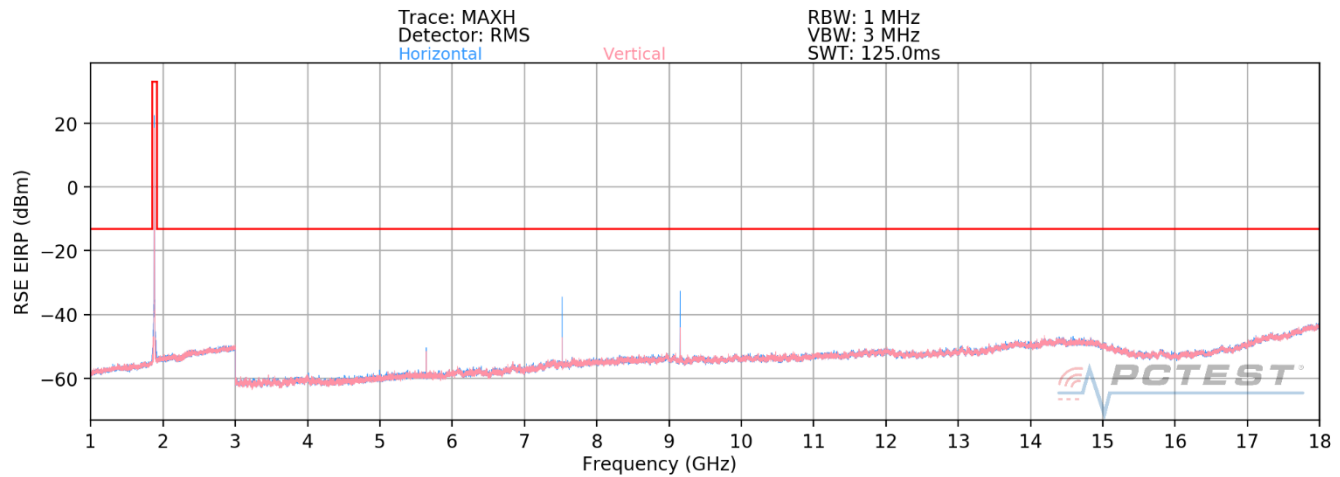
**Table 7-47. Ant 2 - 2Tx - Spurious Emissions Table (30MHz - 1GHz)**

### Notes

The RSE ERP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, and cable losses. Measurements were performed at a distance of 3 meter.

|                                                   |                                              |                                               |                |                                          |
|---------------------------------------------------|----------------------------------------------|-----------------------------------------------|----------------|------------------------------------------|
| FCC ID: A3LSMA426U                                | <b>PCTEST</b><br>Proud to be part of element | <b>MEASUREMENT REPORT<br/>(CERTIFICATION)</b> | <b>SAMSUNG</b> | <b>Approved by:</b><br>Technical Manager |
| <b>Test Report S/N:</b><br>1M2101040001-06-R1.A3L | <b>Test Dates:</b><br>01/15/2021-02/24/2021  | <b>EUT Type:</b><br>Portable Handset          |                | Page 64 of 99                            |

## 1GHz - 18GHz



Plot 7-56. Ant 2-n260 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx – EN-DC Anchor Band 2)

## Spurious Emissions EIRP Sample Calculation (n260)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 3 meter.

$$\text{RSE EIRP (dBm)} = \text{Analyzer Level (dBm)} + 107 + \text{AFCL (dB/m)} + 20\text{Log(Dm)} - 104.8$$

| Frequency [MHz] | Channel | Bandwidth (MHz) | EUT Beam Pol. | Modulation | Antenna Polarization [H/V] | Turntable Azimuth [degrees] | Antenna Height [cm] | Spurious Emission Level [dBm] | Limit [dBm] | Margin [dB] |
|-----------------|---------|-----------------|---------------|------------|----------------------------|-----------------------------|---------------------|-------------------------------|-------------|-------------|
| 8404.84         | Low     | 50              | 2Tx           | QPSK       | H                          | 348                         | 236                 | -32.87                        | -13.00      | -19.87      |
| 5640.00         | Mid     | 50              | 2Tx           | QPSK       | H                          | 346                         | 269                 | -52.67                        | -13.00      | -39.67      |
| 7520.00         | Mid     | 50              | 2Tx           | QPSK       | H                          | 342                         | 131                 | -38.38                        | -13.00      | -25.38      |
| 9111.80         | Mid     | 50              | 2Tx           | QPSK       | H                          | 345                         | 193                 | -34.46                        | -13.00      | -21.46      |
| 9153.20         | High    | 50              | 2Tx           | QPSK       | H                          | 336                         | 202                 | -30.03                        | -13.00      | -17.03      |

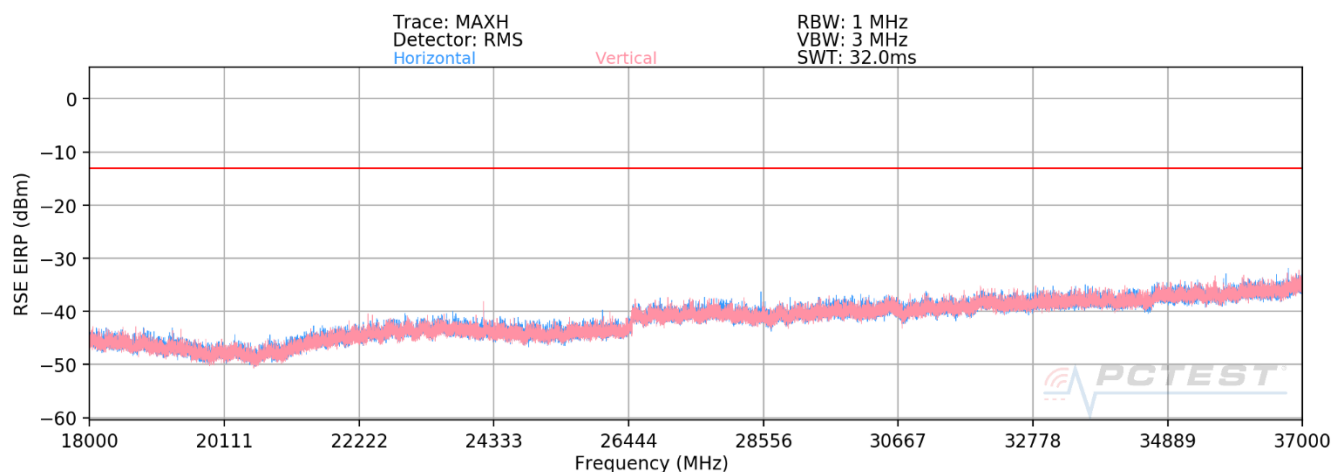
Table 7-48. Ant 2 - 2Tx - Spurious Emissions Table (1GHz - 18GHz)

## Notes

The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, and cable losses. Measurements were performed at a distance of 3 meter.

|                                            |                                              |                                       |                |                                   |
|--------------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMA426U                         | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021         | EUT Type:<br>Portable Handset         |                | Page 65 of 99                     |

## 18GHz – 37GHz



Plot 7-57. Ant 2-n260 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx– EN-DC Anchor Band 2)

## Spurious Emissions EIRP Sample Calculation (n260)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1 meter.

$$\text{RSE EIRP (dBm)} = \text{Analyzer Level (dBm)} + 107 + \text{AFCL (dB/m)} + 20\text{Log(Dm)} - 104.8$$

| Frequency [MHz] | Channel | Bandwidth (MHz) | EUT Beam Pol. | Modulation | Antenna Polarization [H/V] | Turntable Azimuth [degrees] | Positioner Azimuth [degrees] | Spurious Emission Level [dBm] | Limit [dBm] | Margin [dB] |
|-----------------|---------|-----------------|---------------|------------|----------------------------|-----------------------------|------------------------------|-------------------------------|-------------|-------------|
| 36718.06        | Low     | 50              | 2Tx           | QPSK       | H                          | 271                         | 349                          | -28.66                        | -13.00      | -15.66      |
| 36871.73        | Low     | 50              | 2Tx           | QPSK       | H                          | 272                         | 353                          | -27.90                        | -13.00      | -14.90      |
| 36503.43        | Mid     | 50              | 2Tx           | QPSK       | H                          | 273                         | 358                          | -41.31                        | -13.00      | -28.31      |
| 36908.84        | Mid     | 50              | 2Tx           | QPSK       | H                          | 272                         | 10                           | -41.23                        | -13.00      | -28.23      |
| 36884.59        | High    | 50              | 2Tx           | QPSK       | H                          | -                           | -                            | -41.79                        | -13.00      | -28.79      |

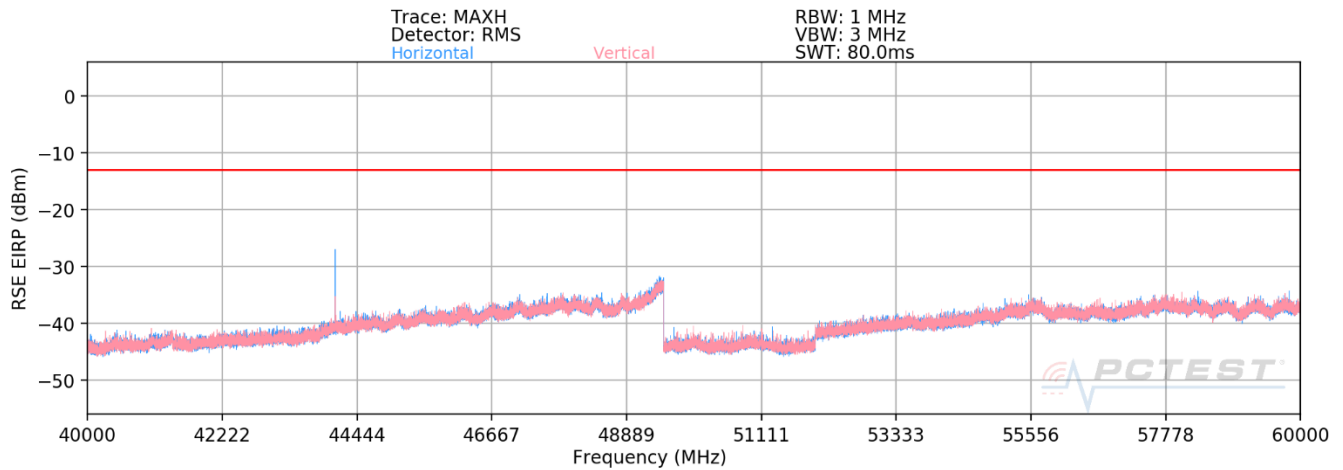
Table 7-49. Ant 2 - 2Tx - Spurious Emissions Table (18GHz – 37GHz)

## Notes

The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, cable losses. Measurements were performed at a distance of 1 meter.

|                                            |                                                                                                                                                                                                              |                                       |                                                                                       |                                   |
|--------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------|
| FCC ID: A3LSMA426U                         |  <b>PCTEST</b><br>Proud to be part of  | MEASUREMENT REPORT<br>(CERTIFICATION) |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021                                                                                                                                                                         | EUT Type:<br>Portable Handset         |                                                                                       | Page 66 of 99                     |

## 40GHz - 60GHz



Plot 7-58. Ant 2-n260 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx – EN-DC Anchor Band 2)

## Spurious Emissions EIRP Sample Calculation (n260)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1.5 meter.

$$\text{RSE EIRP (dBm)} = \text{Analyzer Level (dBm)} + 107 + \text{AFCL (dB/m)} + 20\text{Log(Dm)} - 104.8$$

| Frequency [MHz] | Channel | Bandwidth (MHz) | EUT Beam Pol. | Modulation | Antenna Polarization [H/V] | Turntable Azimuth [degrees] | Positioner Azimuth [degrees] | Spurious Emission Level [dBm] | Limit [dBm] | Margin [dB] |
|-----------------|---------|-----------------|---------------|------------|----------------------------|-----------------------------|------------------------------|-------------------------------|-------------|-------------|
| 42930.90        | Low     | 50              | 2Tx           | QPSK       | H                          | 264                         | 349                          | -26.87                        | -13.00      | -13.87      |
| 44082.99        | Mid     | 50              | 2Tx           | QPSK       | H                          | 256                         | 2                            | -27.13                        | -13.00      | -14.13      |
| 46233.24        | High    | 50              | 2Tx           | QPSK       | H                          | 246                         | 351                          | -33.83                        | -13.00      | -20.83      |

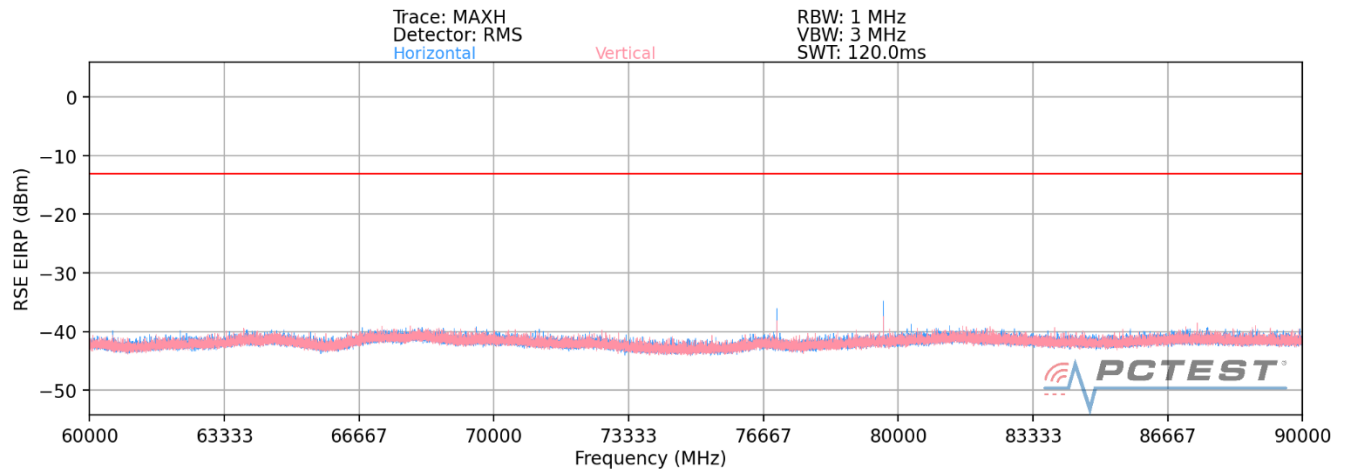
Table 7-50. Ant 2 - 2Tx - Spurious Emissions Table (40GHz - 60GHz)

## Notes

The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, cable losses. Measurements were performed at a distance of 1.5 meter.

|                                            |                                              |                                       |                |                                   |
|--------------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMA426U                         | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021         | EUT Type:<br>Portable Handset         |                | Page 67 of 99                     |

## 60GHz - 90GHz



Plot 7-59. Ant 2-n260 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx – EN-DC Anchor Band 2)

## Spurious Emissions EIRP Sample Calculation (n260)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1 meter.

**RSE EIRP (dBm) = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) – 104.8 + Harmonic Mixer Conversion Loss [dB]**

| Frequency [MHz] | Channel | Bandwidth (MHz) | EUT Beam Pol. | Modulation | Antenna Polarization [H/V] | Turntable Azimuth [degrees] | Positioner Azimuth [degrees] | Spurious Emission Level [dBm] | Limit [dBm] | Margin [dB] |
|-----------------|---------|-----------------|---------------|------------|----------------------------|-----------------------------|------------------------------|-------------------------------|-------------|-------------|
| 74050.65        | Low     | 50              | 2Tx           | QPSK       | H                          | 268                         | 353                          | -41.14                        | -13.00      | -28.14      |
| 76684.45        | Low     | 50              | 2Tx           | QPSK       | H                          | 268                         | 349                          | -40.85                        | -13.00      | -27.85      |
| 77000.16        | Mid     | 50              | 2Tx           | QPSK       | H                          | 234                         | 349                          | -37.62                        | -13.00      | -24.62      |
| 79634.24        | Mid     | 50              | 2Tx           | QPSK       | H                          | 235                         | 352                          | -37.21                        | -13.00      | -24.21      |
| 79950.60        | High    | 50              | 2Tx           | QPSK       | H                          | 225                         | 349                          | -42.01                        | -13.00      | -29.01      |
| 82584.84        | High    | 50              | 2Tx           | QPSK       | H                          | 224                         | 351                          | -42.87                        | -13.00      | -29.87      |

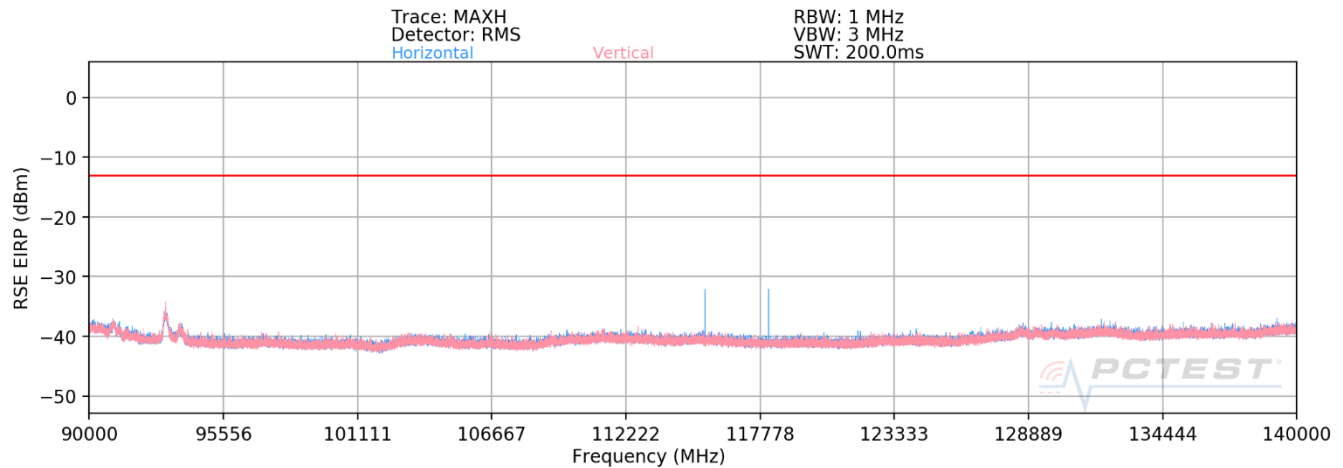
Table 7-51. Ant 2 - 2Tx -S purious Emissions Table (60GHz - 90GHz)

## Notes

The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, cable losses, and harmonic mixer conversion losses. Measurements were performed at a distance of 1 meter.

|                                            |                                                                                                                            |                                       |                                                                                       |                                   |
|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------|
| FCC ID: A3LSMA426U                         |  PCTEST®<br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) |  | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021                                                                                       | EUT Type:<br>Portable Handset         |                                                                                       | Page 68 of 99                     |

## 90GHz - 140GHz



Plot 7-60. Ant 2-n260 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx – EN-DC Anchor Band 2)

### Spurious Emissions EIRP Sample Calculation (n260)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1 meter.

**RSE EIRP (dBm)** = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) – 104.8 + Harmonic Mixer Conversion Loss [dB]

| Frequency [MHz] | Channel | Bandwidth (MHz) | EUT Beam Pol. | Modulation | Antenna Polarization [H/V] | Turntable Azimuth [degrees] | Positioner Azimuth [degrees] | Spurious Emission Level [dBm] | Limit [dBm] | Margin [dB] |
|-----------------|---------|-----------------|---------------|------------|----------------------------|-----------------------------|------------------------------|-------------------------------|-------------|-------------|
| 111076.08       | Low     | 50              | 2Tx           | QPSK       | H                          | 295                         | 358                          | -37.33                        | -13.00      | -24.33      |
| 113710.11       | Low     | 50              | 2Tx           | QPSK       | H                          | 396                         | 359                          | -37.91                        | -13.00      | -24.91      |
| 115500.92       | Mid     | 50              | 2Tx           | QPSK       | H                          | 237                         | 8                            | -32.70                        | -13.00      | -19.70      |
| 118134.21       | Mid     | 50              | 2Tx           | QPSK       | H                          | 238                         | 4                            | -33.58                        | -13.00      | -20.58      |
| 119926.23       | High    | 50              | 2Tx           | QPSK       | H                          | 284                         | 359                          | -37.36                        | -13.00      | -24.36      |
| 122559.99       | High    | 50              | 2Tx           | QPSK       | H                          | 285                         | 356                          | -36.98                        | -13.00      | -23.98      |

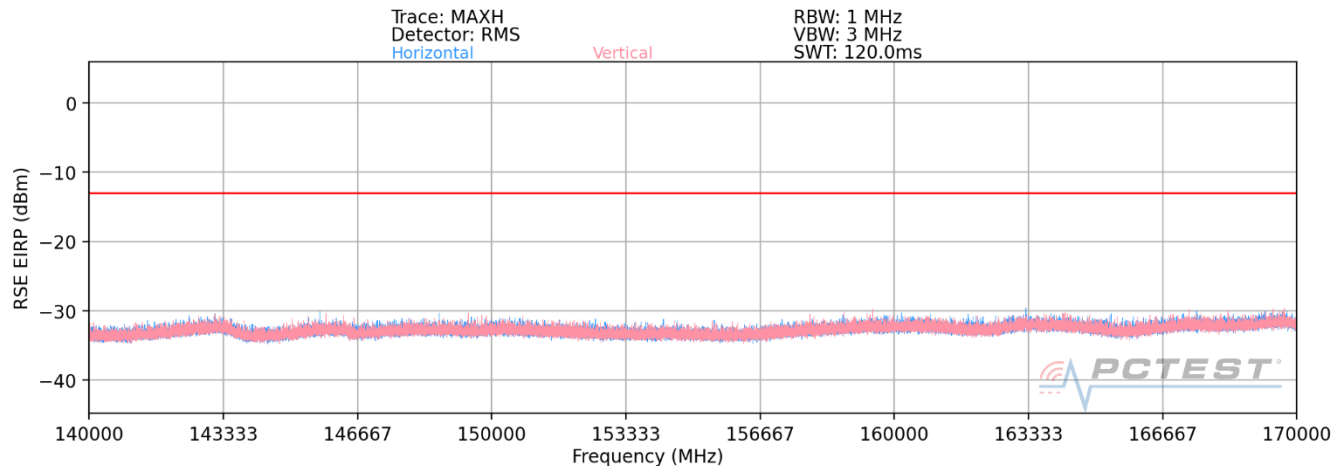
Table 7-52. Ant2 -2Tx - Spurious Emissions Table (90GHz - 140GHz)

### Notes

The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, cable losses, and harmonic mixer conversion losses. Measurements were performed at a distance of 1 meter.

|                                            |                                                                                     |                                       |                                                                                       |                                   |
|--------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------|
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| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021                                                | EUT Type:<br>Portable Handset         |                                                                                       | Page 69 of 99                     |

## 140GHz - 170GHz



Plot 7-61. Ant 2-n260 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx – EN-DC Anchor Band 2)

## Spurious Emissions EIRP Sample Calculation (n260)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1 meter.

**RSE EIRP (dBm)** = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) – 104.8 + Harmonic Mixer Conversion Loss [dB]

| Frequency [MHz] | Channel | Bandwidth (MHz) | EUT Beam Pol. | Modulation | Antenna Polarization [H/V] | Turntable Azimuth [degrees] | Positioner Azimuth [degrees] | Spurious Emission Level [dBm] | Limit [dBm] | Margin [dB] |
|-----------------|---------|-----------------|---------------|------------|----------------------------|-----------------------------|------------------------------|-------------------------------|-------------|-------------|
| 148092.17       | Low     | 50              | 2Tx           | QPSK       | H                          | -                           | -                            | -37.35                        | -13.00      | -24.35      |
| 154014.38       | Mid     | 50              | 2Tx           | QPSK       | H                          | -                           | -                            | -38.05                        | -13.00      | -25.05      |
| 159914.63       | High    | 50              | 2Tx           | QPSK       | H                          | -                           | -                            | -37.41                        | -13.00      | -24.41      |

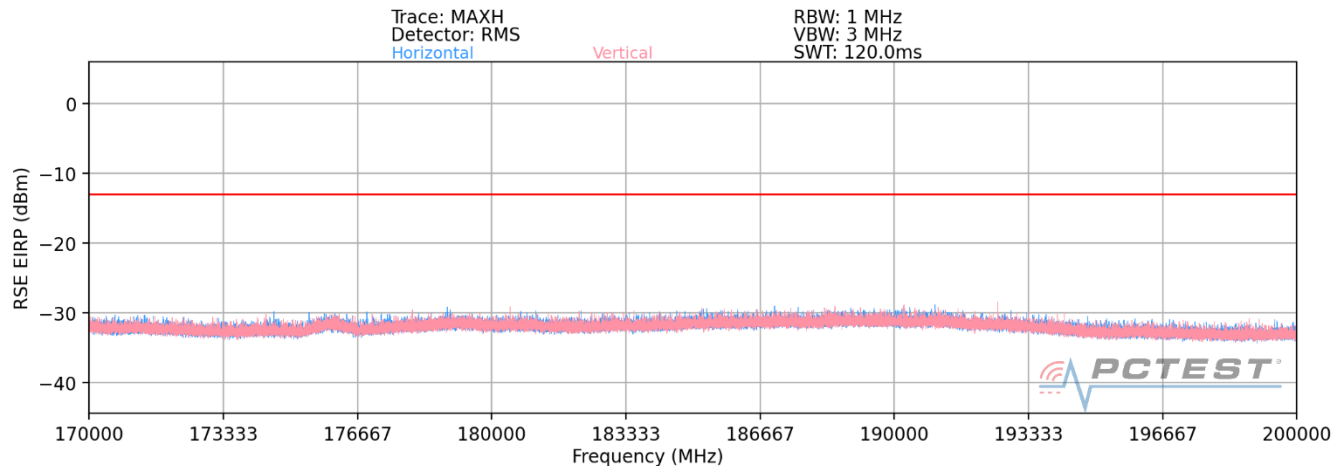
Table 7-53. Ant 2 - 2Tx - Spurious Emissions Table (140GHz - 170GHz)

## Notes

The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, cable losses, and harmonic mixer conversion losses. Measurements were performed at a distance of 1 meter.

|                                            |                                                                                                                            |                                       |                                                                                       |                                   |
|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------|
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| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021                                                                                       | EUT Type:<br>Portable Handset         |                                                                                       | Page 70 of 99                     |

## 170GHz - 200GHz



Plot 7-62. Ant 2-n260 Radiated Spurious Plot (1CC QPSK Mid Channel 2Tx – EN-DC Anchor Band 2)

## Spurious Emissions EIRP Sample Calculation (n260)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1 meter.

**RSE EIRP (dBm)** = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) – 104.8 + Harmonic Mixer Conversion Loss [dB]

| Frequency [MHz] | Channel | Bandwidth (MHz) | EUT Beam Pol. | Modulation | Antenna Polarization [H/V] | Turntable Azimuth [degrees] | Positioner Azimuth [degrees] | Spurious Emission Level [dBm] | Limit [dBm] | Margin [dB] |
|-----------------|---------|-----------------|---------------|------------|----------------------------|-----------------------------|------------------------------|-------------------------------|-------------|-------------|
| 185115.26       | Low     | 50              | 2Tx           | QPSK       | H                          | -                           | -                            | -35.97                        | -13.00      | -22.97      |
| 192517.94       | Mid     | 50              | 2Tx           | QPSK       | H                          | -                           | -                            | -36.76                        | -13.00      | -23.76      |
| 199890.77       | High    | 50              | 2Tx           | QPSK       | H                          | -                           | -                            | -37.92                        | -13.00      | -24.92      |

Table 7-54. Ant 2 - 2Tx - Spurious Emissions Table (170GHz - 200GHz)

## Notes

The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, cable losses, and harmonic mixer conversion losses. Measurements were performed at a distance of 1 meter.

|                                            |                                                                                                                            |                                       |                                                                                       |                                   |
|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------|
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## 7.5 Band Edge Emissions

§2.1051, §30.203

### Test Overview

All out of band emissions are measured in a radiated setup while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All modulations were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

***The minimum permissible attenuation level of any spurious emission is -13dBm/1MHz. However, in the bands immediately outside and adjacent to the licensee's frequency block, having a bandwidth equal to 10 percent of the channel bandwidth, the conductive power or the total radiated power of any emission shall be -5 dBm/MHz or lower.***

### Test Procedure Used

ANSI C63.26-2015 Section 5 and ANSI C63.26-2015 Section 6.4  
 KDB 842590 D01 v01r01 Section 4.4.2.5 & 4.4.2.2

### Test Settings

1. Start and stop frequency were set such that both upper and lower band edges are measured.
2. Span was set large enough so as to capture all out of band emissions near the band edge
3. RBW = 1MHz
4. VBW  $\geq 3 \times$  RBW
5. Detector = RMS
6. Number of sweep points  $\geq 2 \times$  Span/RBW
7. Trace mode = trace average
8. Sweep time = auto couple
9. The trace was allowed to stabilize

### Test Notes

- 1) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning.
- 2) Band Edge emissions were measured at a 1 meter distance.
- 3) The spectrum analyzer for each measurement shows an offset value that was determined using the measurement antenna factor, cable loss, far field measurement distance. A sample calculation is shown on the following page.
- 4) This device supports transmission of H-polarized and V-polarized beams from the antenna array in both CP-OFDM and DFT-s-OFDM transmission schemes. SISO and MIMO operation is also supported for some configurations. As part of the testing, all modes were fully investigated and only the worst case has been included in this report.

|                                            |                                                                                                                                                                                                              |                                       |                                                                                       |                                   |
|--------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------|
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| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021                                                                                                                                                                         | EUT Type:<br>Portable Handset         |                                                                                       | Page 72 of 99                     |

- 5) All combinations of 1CC and 2CC were fully investigated, and only the worst case has been included in this report.
- 6) All 2CC cases were investigated with PCC prioritization feature, which was the higher PCC at the band edge for the worst case.
- 7) Since some of Band Edge EIRP exceed emission limit, the TRP measurement was performed as the alternative method. The plots measured as TRP are labeled as "TRP" in the captions.

#### **Sample Analyzer Offset Calculation (at 27.5GHz)**

Measurement Antenna Factor = 40.70dB/m

Cable Loss = 8.82dB

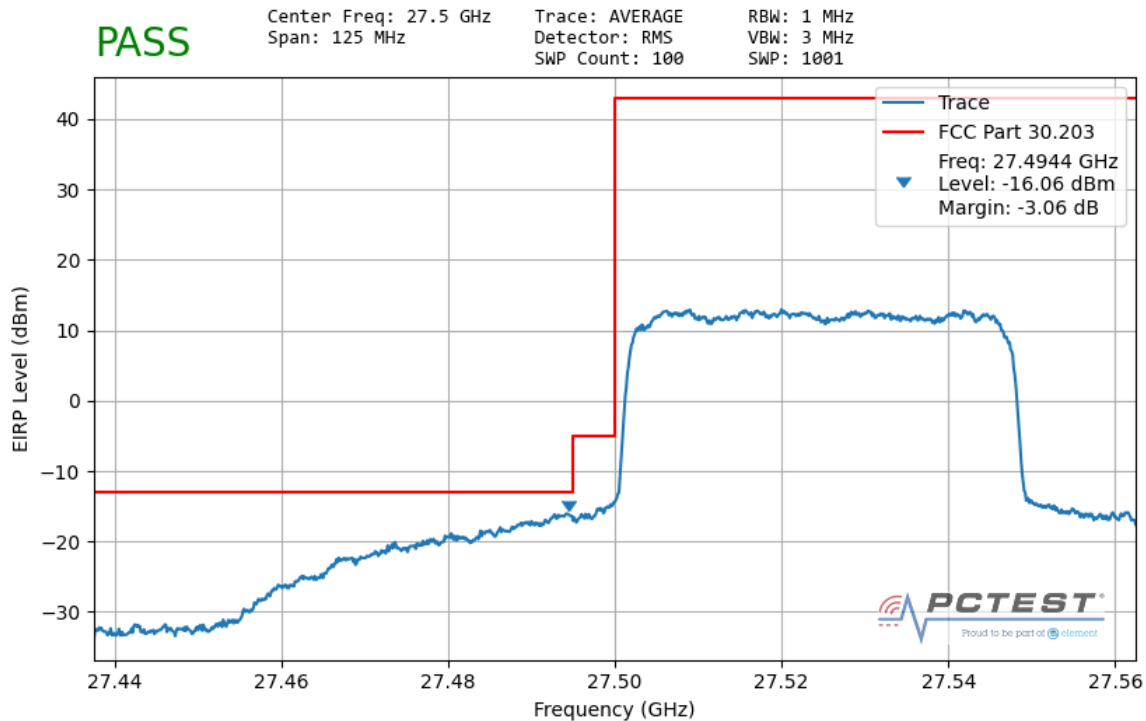
Analyzer Offset (dB) = AF (dB/m) + CL (dB) + 107 + 20log<sub>10</sub>(D) – 104.8dB, where D = 1m

$$= 40.70\text{dB/m} + 8.82\text{dB} + 107 + 20\log_{10}(1\text{m}) - 104.8\text{dB}$$

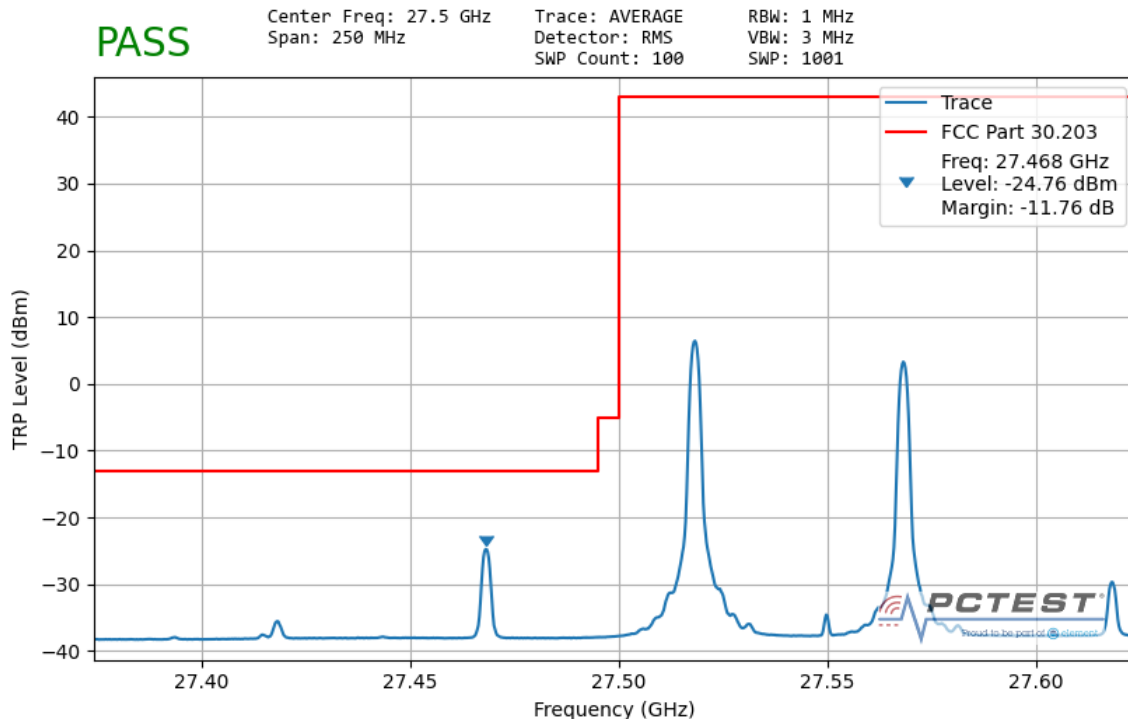
$$= 51.72\text{dB}$$

|                                            |                                                                                                                            |                                       |                                                                                       |                                   |
|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------|
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| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021                                                                                       | EUT Type:<br>Portable Handset         |                                                                                       | Page 73 of 99                     |

## Band n261 – Worst-Case

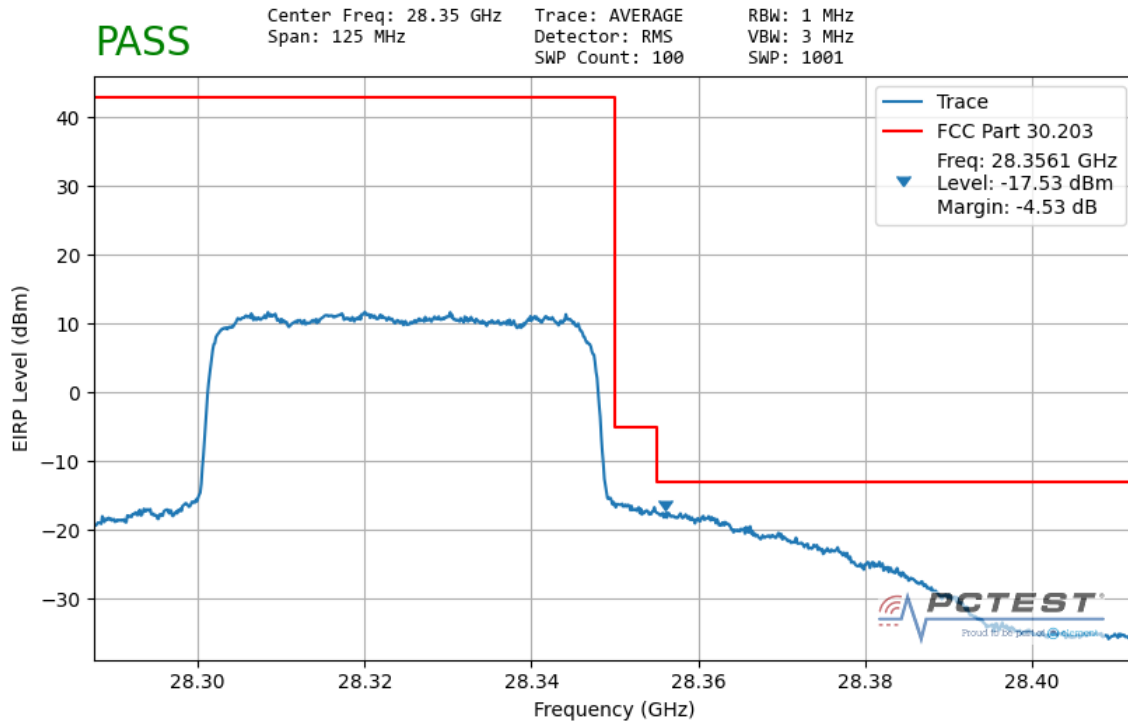


Plot 7-63. Ant 1 Lower Band Edge (50MHz-1CC – QPSK Full RB)

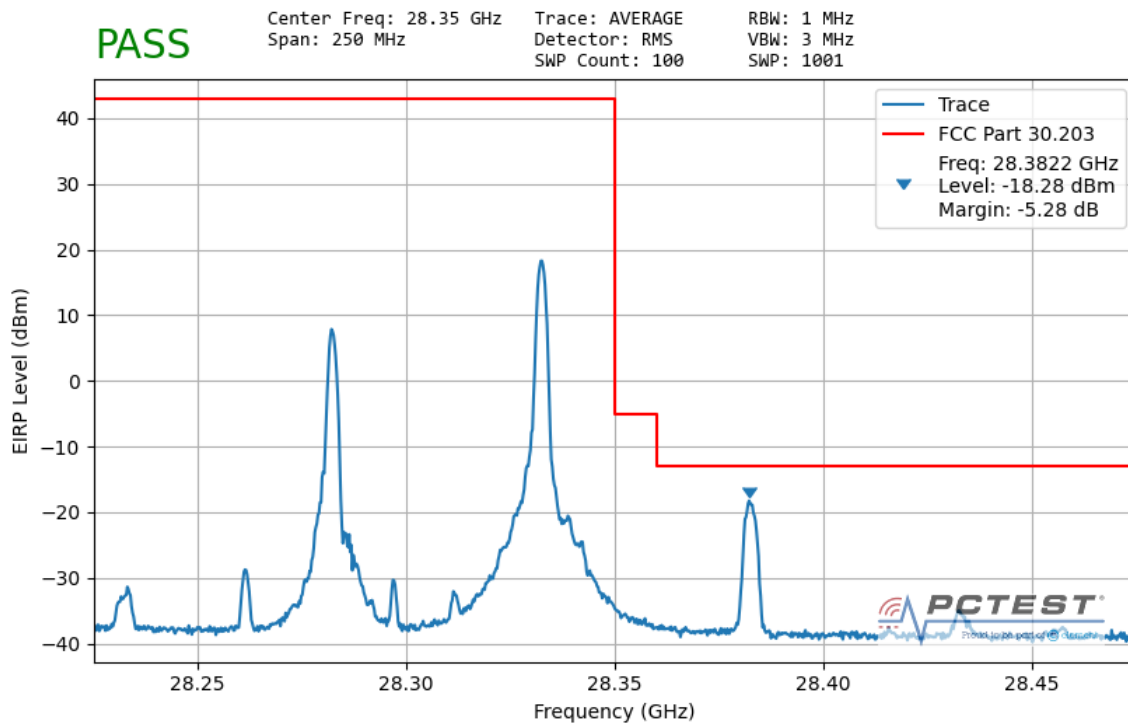


Plot 7-64. Ant 1 Lower Band Edge – TRP (50MHz-2CC – QPSK 1 RB)

|                                            |                                              |                                       |                |                                   |
|--------------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMA426U                         | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021         | EUT Type:<br>Portable Handset         |                | Page 74 of 99                     |



**Plot 7-65. Ant 1 Upper Band Edge (50MHz-1CC – QPSK Full RB)**



**Plot 7-66. Ant 1 Upper Band Edge (50MHz-2CC – QPSK 1 RB)**

|                                            |                                              |                                       |                |                                   |
|--------------------------------------------|----------------------------------------------|---------------------------------------|----------------|-----------------------------------|
| FCC ID: A3LSMA426U                         | <b>PCTEST</b><br>Proud to be part of element | MEASUREMENT REPORT<br>(CERTIFICATION) | <b>SAMSUNG</b> | Approved by:<br>Technical Manager |
| Test Report S/N:<br>1M2101040001-06-R1.A3L | Test Dates:<br>01/15/2021-02/24/2021         | EUT Type:<br>Portable Handset         |                | Page 75 of 99                     |