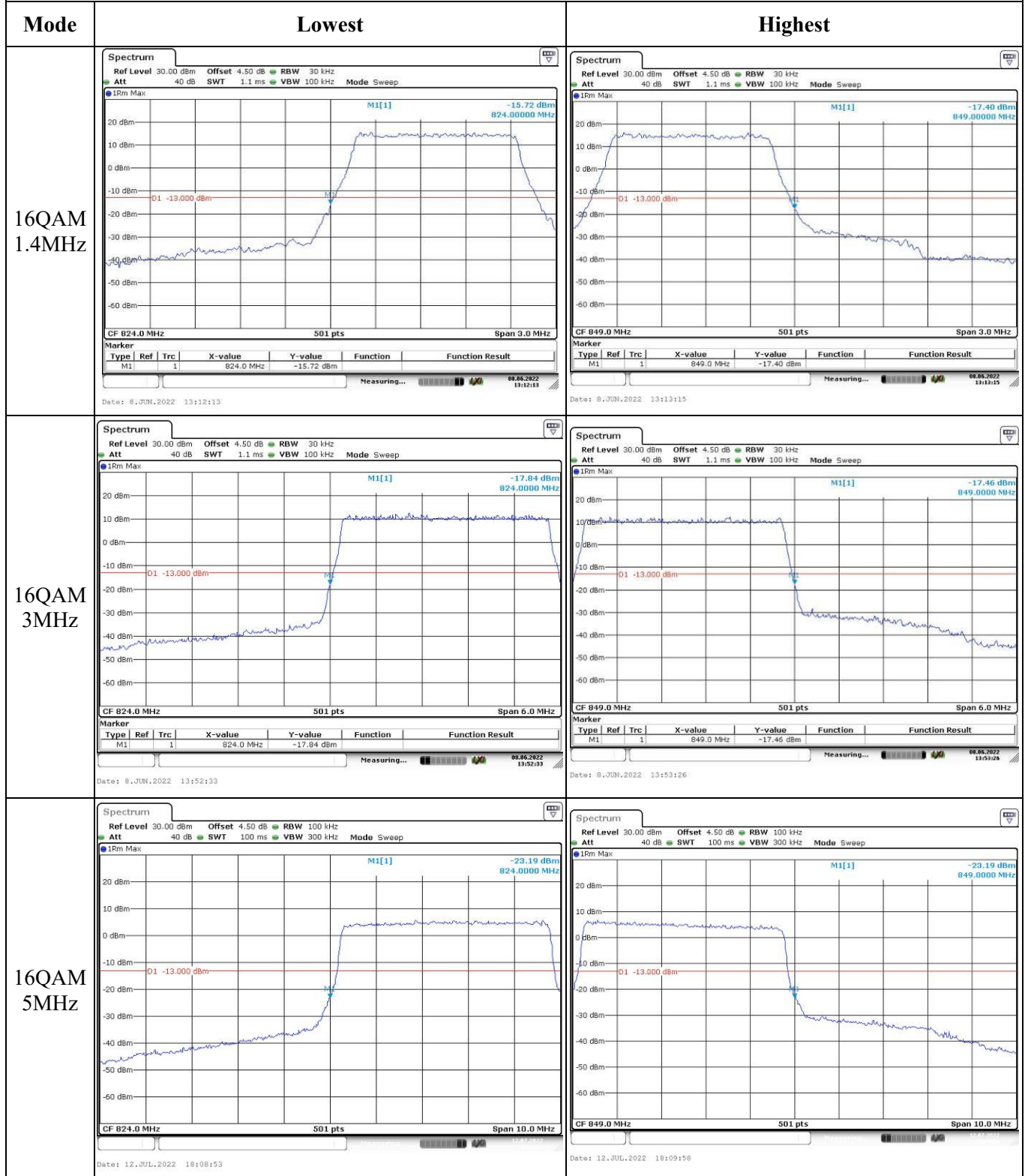
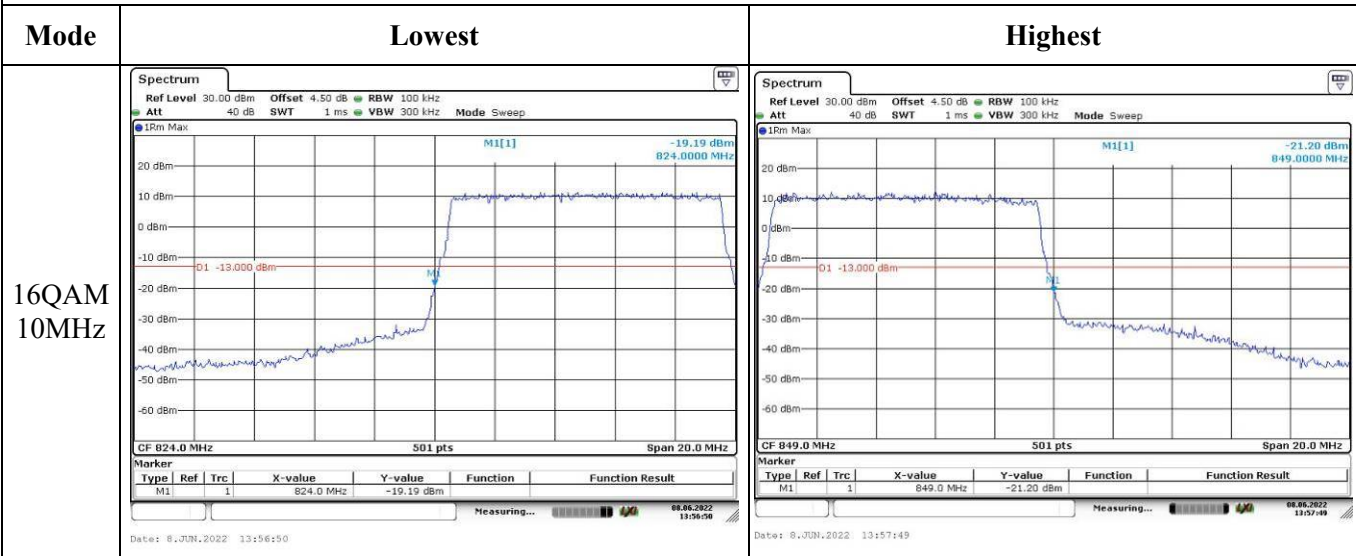


## Out of band emission, Band Edge



Out of band emission, Band Edge



**4.7 Antenna Port Test Data and Results for LTE Band 12:**

|                |                  |              |                       |
|----------------|------------------|--------------|-----------------------|
| Serial Number: | CR22050037-RF-S1 | Test Date:   | 2022-06-02~2022-07-12 |
| Test Site:     | RF               | Test Mode:   | Transmitting          |
| Tester:        | Rinka Li         | Test Result: | Pass                  |

**Environmental Conditions:**

|                      |         |                              |    |                           |             |
|----------------------|---------|------------------------------|----|---------------------------|-------------|
| Temperature:<br>(°C) | 25.9~26 | Relative<br>Humidity:<br>(%) | 67 | ATM<br>Pressure:<br>(kPa) | 100.0~100.1 |
|----------------------|---------|------------------------------|----|---------------------------|-------------|

**Test Equipment List and Details:**

| Manufacturer  | Description                         | Model     | Serial Number | Calibration Date | Calibration Due Date |
|---------------|-------------------------------------|-----------|---------------|------------------|----------------------|
| R&S           | Spectrum Analyzer                   | FSV40     | 101474        | 2021-07-22       | 2022-07-21           |
| zhuoxiang     | Coaxial Cable                       | SMA-178   | 211002        | Each time        | N/A                  |
| Mini-Circuits | DC Block                            | BLK-18-S+ | 1554404       | Each time        | N/A                  |
| R&S           | Wideband Radio Communication Tester | CMW500    | 149218        | 2021-07-22       | 2022-07-21           |
| UNI-T         | Multimeter                          | UT39A+    | C210582554    | 2021-09-30       | 2022-09-29           |
| Weinschel     | Coaxial Attenuator                  | 53-20-34  | LN751         | Each time        | N/A                  |
| BACL          | TEMP&HUMI Test Chamber              | BTH-150   | 30026         | 2021-07-22       | 2022-07-21           |
| UNI-T         | Multimeter                          | UT39A+    | C210582554    | 2021-07-22       | 2022-07-21           |
| E-Microwave   | Two-way Splitter                    | ODP-1-6   | OE0120176     | Each Time        | N/A                  |

\* Statement of Traceability: China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

**EUT Information@ LTE Band 12▲:**

|                                      |      |                        |       |                     |    |
|--------------------------------------|------|------------------------|-------|---------------------|----|
| Antenna Gain<br>(dBi):               | -0.7 | Antenna Gain<br>(dBd): | -2.85 | Cable Loss<br>(dB): | 0  |
| Operation Voltage(V <sub>DC</sub> ): |      |                        |       |                     |    |
| Lowest:                              | 10.8 | Normal:                | 13.8  | Highest:            | 36 |

**Test Frequency For Each Mode:**

| Operation Bandwidth | Lowest Frequency (MHz) | Middle Frequency (MHz) | Highest Frequency (MHz) |
|---------------------|------------------------|------------------------|-------------------------|
| 1.4MHz              | 699.7                  | 707.5                  | 715.3                   |
| 3MHz                | 700.5                  | 707.5                  | 714.5                   |
| 5MHz                | 701.5                  | 707.5                  | 713.5                   |
| 10MHz               | 704                    | 707.5                  | 711                     |

**Test Data:****FCC§2.1046;§ 27.50(c) (10)****RF Output Power:**

| Test Bandwidth & Modulation | Resource Block & RB offset | Conducted Average Output Power(dBm) |                |                 | Maximum ERP (dBm) | ERP Limit (dBm) |
|-----------------------------|----------------------------|-------------------------------------|----------------|-----------------|-------------------|-----------------|
|                             |                            | Lowest Channel                      | Middle Channel | Highest Channel |                   |                 |
| 1.4MHz QPSK                 | RB1#0                      | 23.61                               | 23.51          | 23.79           | 21.13             | 34.77           |
|                             | RB1#3                      | 23.86                               | 23.76          | 23.98           |                   |                 |
|                             | RB1#5                      | 23.64                               | 23.63          | 23.9            |                   |                 |
|                             | RB3#0                      | 23.54                               | 23.65          | 23.66           |                   |                 |
|                             | RB3#3                      | 23.58                               | 23.68          | 23.72           |                   |                 |
|                             | RB6#0                      | 22.64                               | 22.73          | 22.77           |                   |                 |
| 1.4MHz 16QAM                | RB1#0                      | 22.56                               | 22.56          | 22.77           | 20.17             | 34.77           |
|                             | RB1#3                      | 22.82                               | 22.69          | 23.02           |                   |                 |
|                             | RB1#5                      | 22.62                               | 22.52          | 22.85           |                   |                 |
|                             | RB3#0                      | 22.47                               | 22.73          | 22.63           |                   |                 |
|                             | RB3#3                      | 22.65                               | 22.71          | 22.74           |                   |                 |
|                             | RB6#0                      | 21.64                               | 21.58          | 21.61           |                   |                 |
| 3MHz QPSK                   | RB1#0                      | 23.57                               | 23.64          | 23.24           | 20.87             | 34.77           |
|                             | RB1#8                      | 23.62                               | 23.72          | 22.99           |                   |                 |
|                             | RB1#14                     | 23.63                               | 23.7           | 23.08           |                   |                 |
|                             | RB6#0                      | 22.67                               | 22.66          | 22.21           |                   |                 |
|                             | RB6#9                      | 22.63                               | 22.77          | 22.17           |                   |                 |
|                             | RB15#0                     | 22.62                               | 22.7           | 22.19           |                   |                 |
| 3MHz 16QAM                  | RB1#0                      | 22.45                               | 22.54          | 22.04           | 19.99             | 34.77           |
|                             | RB1#8                      | 22.6                                | 22.6           | 21.93           |                   |                 |
|                             | RB1#14                     | 22.32                               | 22.84          | 22.09           |                   |                 |
|                             | RB6#0                      | 21.6                                | 21.51          | 21.19           |                   |                 |
|                             | RB6#9                      | 21.6                                | 21.77          | 21.03           |                   |                 |
|                             | RB15#0                     | 21.62                               | 21.66          | 21.16           |                   |                 |
| 5MHz QPSK                   | RB1#0                      | 22.98                               | 22.95          | 23.31           | 20.46             | 34.77           |
|                             | RB1#13                     | 23.05                               | 23.18          | 23.02           |                   |                 |
|                             | RB1#24                     | 22.82                               | 23.2           | 23.05           |                   |                 |
|                             | RB15#0                     | 22.21                               | 22.14          | 22.26           |                   |                 |
|                             | RB15#10                    | 22.09                               | 22.27          | 22.1            |                   |                 |
|                             | RB25#0                     | 22.18                               | 22.12          | 22.14           |                   |                 |
| 5MHz 16QAM                  | RB1#0                      | 22.09                               | 22.15          | 22.45           | 19.6              | 34.77           |
|                             | RB1#13                     | 22.08                               | 22.14          | 22.17           |                   |                 |
|                             | RB1#24                     | 21.89                               | 22.2           | 22.14           |                   |                 |
|                             | RB15#0                     | 21.26                               | 21.09          | 21.26           |                   |                 |

|             |         |       |       |       |       |       |
|-------------|---------|-------|-------|-------|-------|-------|
|             | RB15#10 | 21.1  | 21.21 | 21.09 |       |       |
|             | RB25#0  | 21.13 | 21.11 | 21.08 |       |       |
| 10MHz QPSK  | RB1#0   | 23.23 | 22.92 | 23.15 | 20.59 | 34.77 |
|             | RB1#25  | 23.13 | 23.26 | 23.44 |       |       |
|             | RB1#49  | 23.36 | 23.2  | 23.11 |       |       |
|             | RB25#0  | 22.16 | 22.1  | 22.32 |       |       |
|             | RB25#25 | 22.1  | 22.25 | 22.22 |       |       |
|             | RB50#0  | 22.2  | 22.14 | 22.2  |       |       |
| 10MHz 16QAM | RB1#0   | 22.16 | 21.88 | 22.28 | 19.61 | 34.77 |
|             | RB1#25  | 21.93 | 22.4  | 22.46 |       |       |
|             | RB1#49  | 22.12 | 22.22 | 22.11 |       |       |
|             | RB25#0  | 21.12 | 21.13 | 21.26 |       |       |
|             | RB25#25 | 21.08 | 21.28 | 21.16 |       |       |
|             | RB50#0  | 21.17 | 21.11 | 21.13 |       |       |

Note: ERP=Conducted Power(dBm) - Cable loss(dB) + Antenna Gain(dBd)

Result:

Pass

### Peak-to-average Ratio(PAR)

| Test Bandwidth & Modulation | Resource Block & RB offset | Peak-to-average Ratio(dB) |                |                 | Limit (dB) |
|-----------------------------|----------------------------|---------------------------|----------------|-----------------|------------|
|                             |                            | Lowest Channel            | Middle Channel | Highest Channel |            |
| 10MHz QPSK                  | RB1#0                      | 4.41                      | 4.49           | 4.46            | 13         |
|                             | RB50#0                     | 5.22                      | 4.96           | 4.67            | 13         |
| 10MHz 16QAM                 | RB1#0                      | 5.48                      | 5.33           | 5.62            | 13         |
|                             | RB50#0                     | 6.03                      | 5.97           | 5.88            | 13         |
| Result:                     |                            |                           |                |                 | Pass       |

### FCC §2.1049, §27.53:Occupied Bandwidth

| Operation Mode | 99% Occupied Bandwidth (MHz) |                |              | 26 dB Occupied Bandwidth (MHz) |                |              |
|----------------|------------------------------|----------------|--------------|--------------------------------|----------------|--------------|
|                | Low Channel                  | Middle channel | High Channel | Low Channel                    | Middle Channel | High Channel |
| 1.4MHz QPSK    | 1.102                        | 1.102          | 1.102        | 1.302                          | 1.32           | 1.308        |
| 1.4MHz 16QAM   | 1.102                        | 1.096          | 1.108        | 1.314                          | 1.308          | 1.332        |
| 3MHz QPSK      | 2.683                        | 2.695          | 2.695        | 2.94                           | 2.976          | 2.964        |
| 3MHz 16QAM     | 2.683                        | 2.695          | 2.707        | 2.964                          | 2.976          | 2.976        |
| 5MHz QPSK      | 4.511                        | 4.531          | 4.531        | 4.96                           | 5.02           | 5.02         |
| 5MHz 16QAM     | 4.511                        | 4.511          | 4.531        | 4.96                           | 5.02           | 5.02         |
| 10MHz QPSK     | 9.022                        | 8.901          | 8.942        | 9.8                            | 9.72           | 9.68         |
| 10MHz 16QAM    | 8.981                        | 8.942          | 8.901        | 9.84                           | 9.72           | 9.6          |

Note: The test plots please refer to the Plots of Occupied Bandwidth

**FCC §2.1051, §27.53:Spurious Emissions at Antenna Terminal**

|                |                                                                                        |
|----------------|----------------------------------------------------------------------------------------|
| <b>Result:</b> | <b>Pass, Please refer to the test plots of Spurious Emissions at Antenna Terminal.</b> |
|----------------|----------------------------------------------------------------------------------------|

**FCC §2.1051, §27.53:Out of band emission, Band Edge**

|                |                                                                                 |
|----------------|---------------------------------------------------------------------------------|
| <b>Result:</b> | <b>Pass, Please refer to the test plots of Out of band emission, Band Edge.</b> |
|----------------|---------------------------------------------------------------------------------|

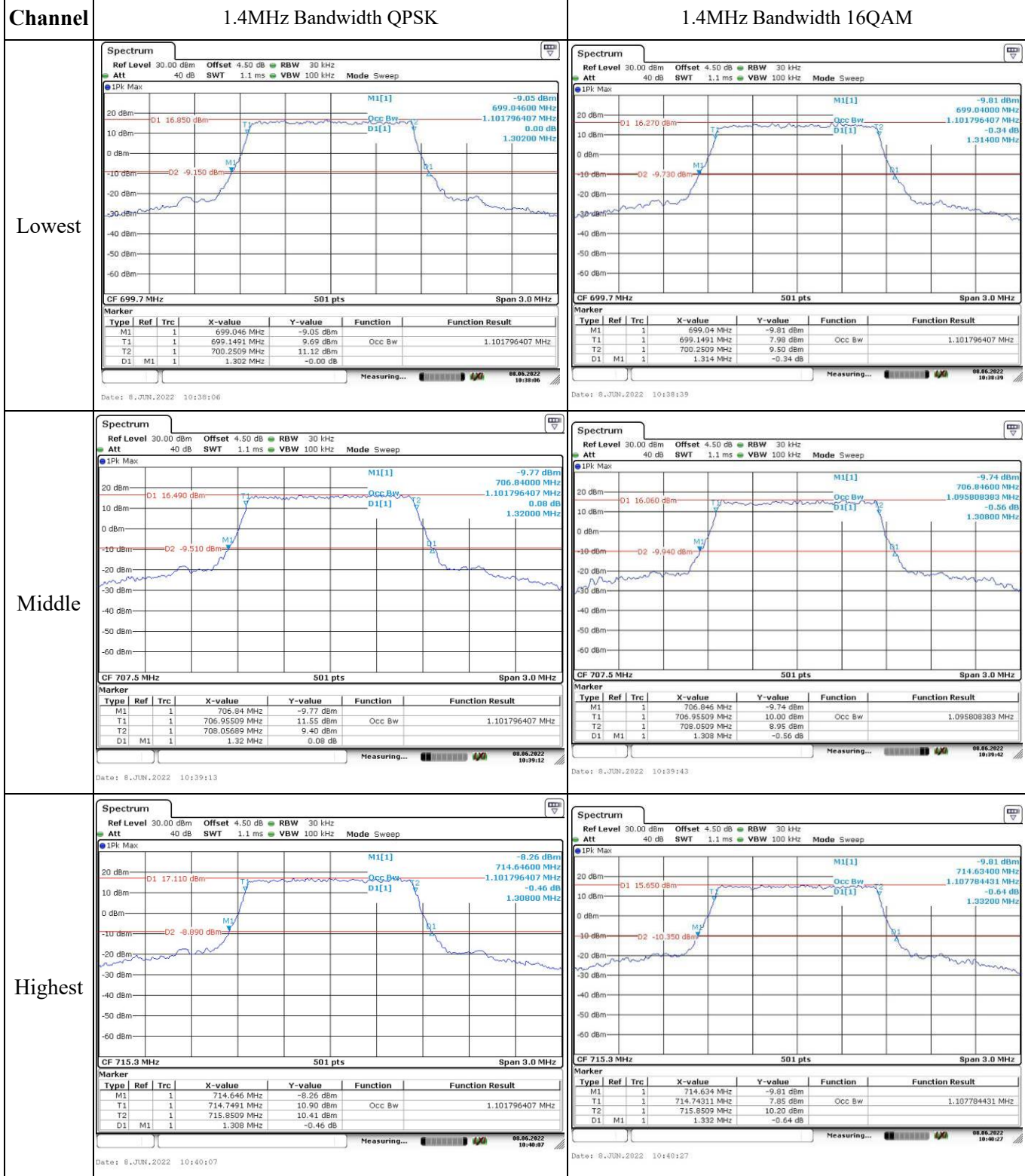
**FCC §2.1055, §27.54: Frequency Stability**

| Test Mode:                          | 10M QPSK         | Test Channel: Lowest for Lower Edge,Highest for Upper Edge |                  |        |                  |             |
|-------------------------------------|------------------|------------------------------------------------------------|------------------|--------|------------------|-------------|
| Test Item                           | Temperature (°C) | Voltage (V <sub>DC</sub> )                                 | Lower Edge (MHz) |        | Upper Edge (MHz) |             |
|                                     |                  |                                                            | Result           | Limit  | Result           | Limit       |
| Frequency Stability vs. Temperature | -30              | 13.8                                                       | 699.537          | 699.00 | 715.469          | 716.00      |
|                                     | -20              | 13.8                                                       | 699.536          | 699.00 | 715.463          | 716.00      |
|                                     | -10              | 13.8                                                       | 699.533          | 699.00 | 715.465          | 716.00      |
|                                     | 0                | 13.8                                                       | 699.527          | 699.00 | 715.467          | 716.00      |
|                                     | 10               | 13.8                                                       | 699.518          | 699.00 | 715.467          | 716.00      |
|                                     | 20               | 13.8                                                       | 699.514          | 699.00 | 715.457          | 716.00      |
|                                     | 30               | 13.8                                                       | 699.514          | 699.00 | 715.461          | 716.00      |
|                                     | 40               | 13.8                                                       | 699.516          | 699.00 | 715.464          | 716.00      |
|                                     | 50               | 13.8                                                       | 699.517          | 699.00 | 715.459          | 716.00      |
| Frequency Stability vs. Voltage     | 20               | 10.8                                                       | 699.526          | 699.00 | 715.469          | 716.00      |
|                                     | 20               | 36                                                         | 699.528          | 699.00 | 715.468          | 716.00      |
|                                     |                  |                                                            |                  |        | <b>Result:</b>   | <b>Pass</b> |

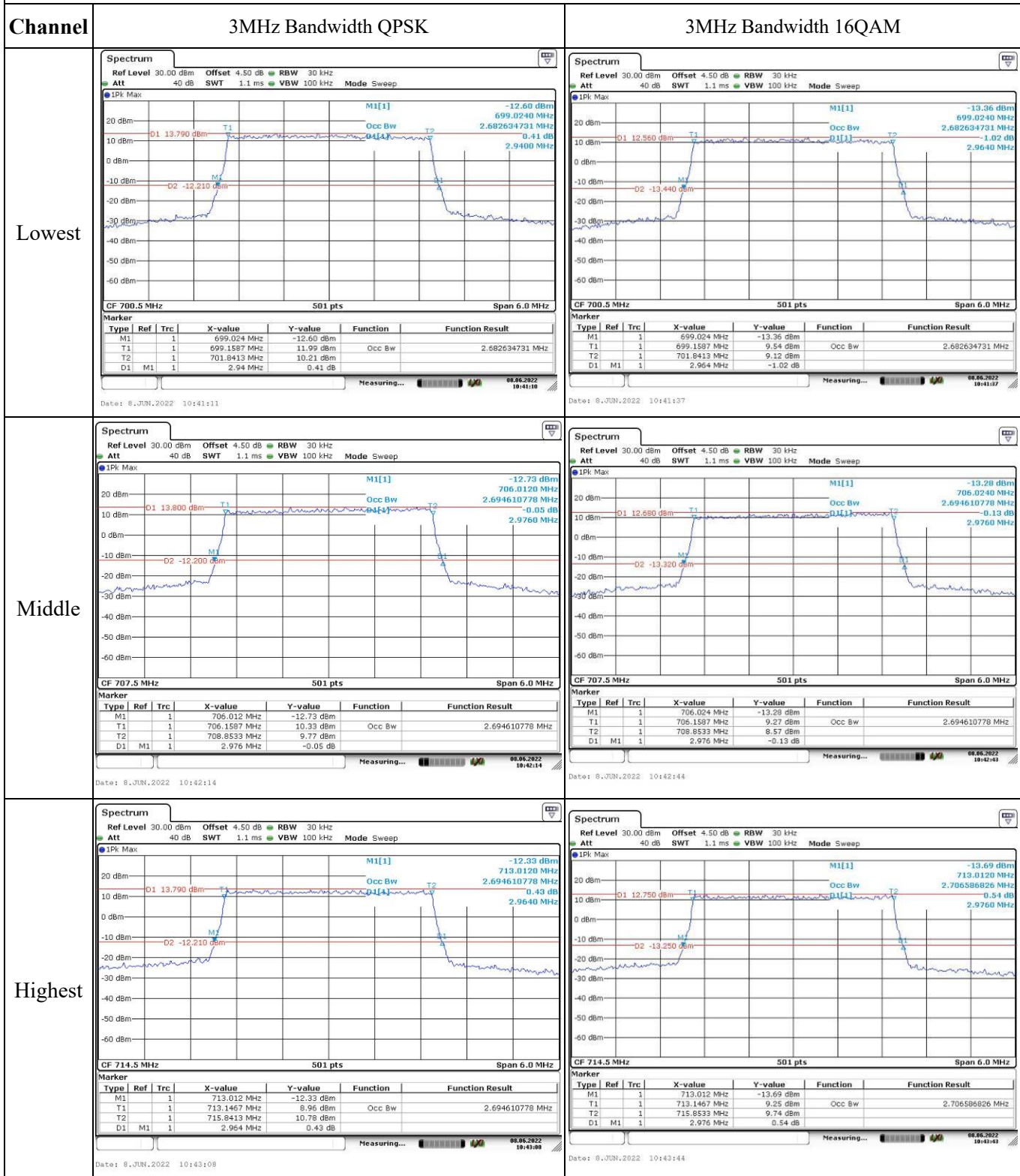
| Test Mode:                          | 10M 16QAM        | Test Channel: Lowest for Lower Edge,Highest for Upper Edge |                  |        |                  |             |
|-------------------------------------|------------------|------------------------------------------------------------|------------------|--------|------------------|-------------|
| Test Item                           | Temperature (°C) | Voltage (V <sub>DC</sub> )                                 | Lower Edge (MHz) |        | Upper Edge (MHz) |             |
|                                     |                  |                                                            | Result           | Limit  | Result           | Limit       |
| Frequency Stability vs. Temperature | -30              | 13.8                                                       | 699.548          | 699.00 | 715.460          | 716.00      |
|                                     | -20              | 13.8                                                       | 699.543          | 699.00 | 715.465          | 716.00      |
|                                     | -10              | 13.8                                                       | 699.541          | 699.00 | 715.468          | 716.00      |
|                                     | 0                | 13.8                                                       | 699.528          | 699.00 | 715.470          | 716.00      |
|                                     | 10               | 13.8                                                       | 699.514          | 699.00 | 715.458          | 716.00      |
|                                     | 20               | 13.8                                                       | 699.514          | 699.00 | 715.457          | 716.00      |
|                                     | 30               | 13.8                                                       | 699.516          | 699.00 | 715.462          | 716.00      |
|                                     | 40               | 13.8                                                       | 699.520          | 699.00 | 715.457          | 716.00      |
|                                     | 50               | 13.8                                                       | 699.525          | 699.00 | 715.460          | 716.00      |
| Frequency Stability vs. Voltage     | 20               | 10.8                                                       | 699.526          | 699.00 | 715.469          | 716.00      |
|                                     | 20               | 36                                                         | 699.536          | 699.00 | 715.460          | 716.00      |
|                                     |                  |                                                            |                  |        | <b>Result:</b>   | <b>Pass</b> |

## Test Plots:

## Occupied Bandwidth



## Occupied Bandwidth



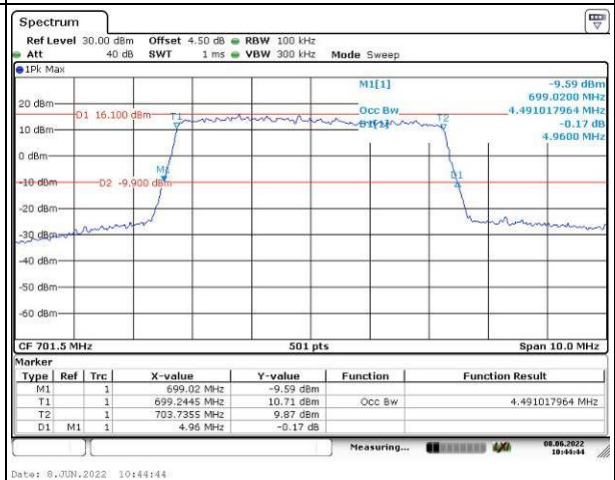
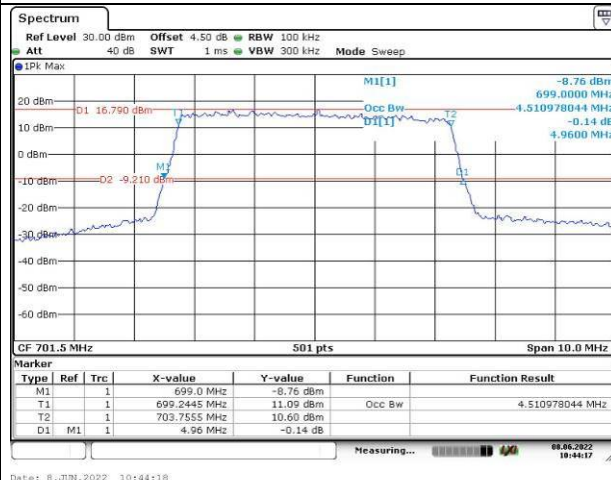
## Occupied Bandwidth

Channel

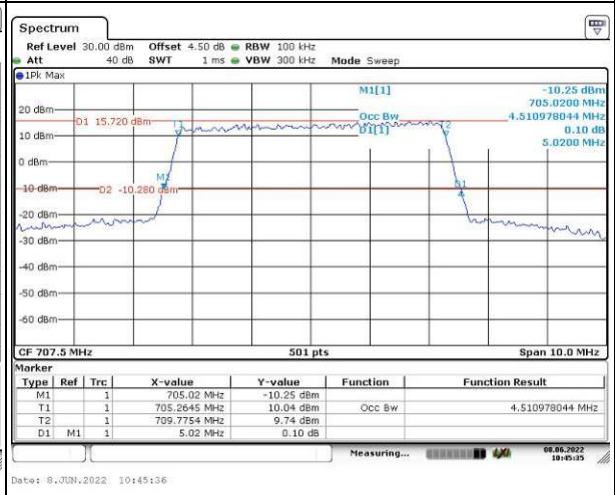
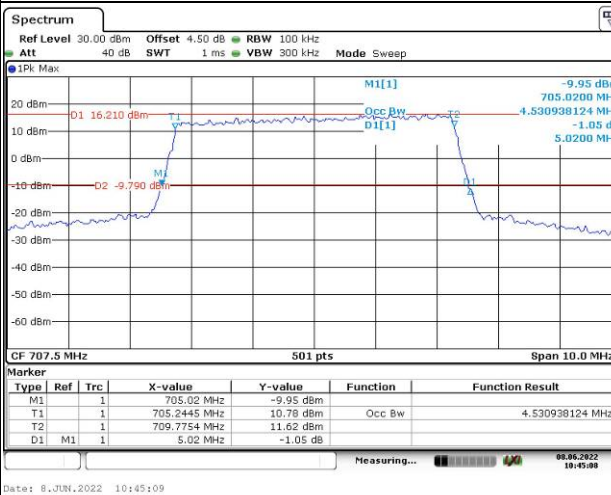
5MHz Bandwidth QPSK

5MHz Bandwidth 16QAM

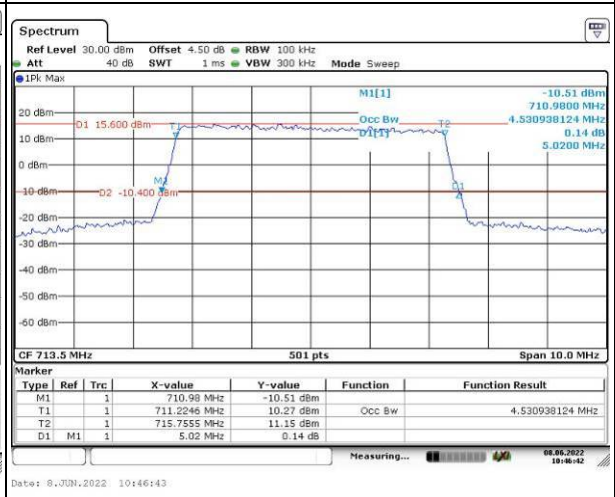
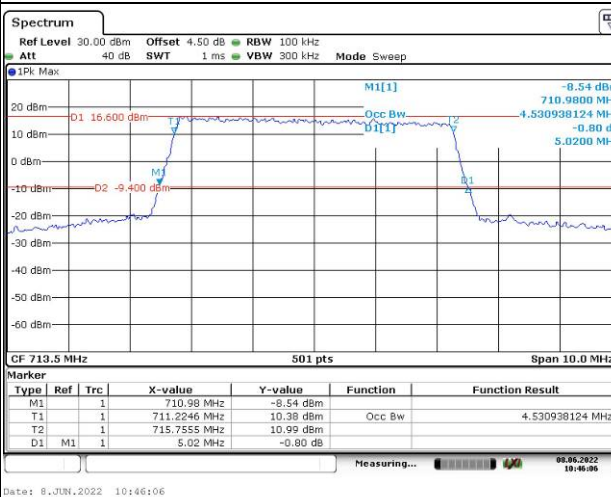
Lowest



Middle



Highest



**Channel**

10MHz Bandwidth 16QAM

**Spectrum**

Ref Level 30.00 dBm Offset 4.50 dB RBW 100 kHz  
 Att 40 dB SWT 1 ms VBW 300 kHz Mode Sweep

• IPl Max

20 dBm  
 10 dBm  
 0 dBm  
 -10 dBm  
 -20 dBm  
 -30 dBm  
 -40 dBm  
 -50 dBm  
 -60 dBm

M1[1] -12.35 dBm  
 699.1200 MHz  
 9.021956088 MHz  
 -0.05 dB  
 9.0000 MHz

D1 13.610 dBm  
 D2 -12.390 dBm

CF 704.0 MHz 501 pts Span 20.0 MHz

Marker

| Type | Ref | Trc | X-value     | Y-value    | Function | Function Result |
|------|-----|-----|-------------|------------|----------|-----------------|
| M1   |     | 1   | 699.12 MHz  | -12.35 dBm |          |                 |
| T1   |     | 1   | 699.489 MHz | 9.40 dBm   | Occ Bw   | 9.021956088 MHz |
| T2   |     | 1   | 708.511 MHz | 9.11 dBm   |          |                 |
| D1   | M1  | 1   | 9.8 MHz     | -0.05 dB   |          |                 |

Measuring... 09.06.2022 10:47:24

Date: 09.06.2022 10:47:24

**Spectrum**

Ref Level 30.00 dBm Offset 4.50 dB RBW 100 kHz  
 Att 40 dB SWT 1 ms VBW 300 kHz Mode Sweep

1 IPK Max

M1[1] -14.31 dBm  
 699.0000 MHz  
 Occ BW 8.982035928 MHz  
 0.50 dB  
 9.8400 MHz

D1[1] 9.8400 MHz  
 0.50 dB

CF 704.0 MHz 501 pts Span 20.0 MHz

| Marker | Type | Ref | Trc | X-value      | Y-value    | Function | Function Result |
|--------|------|-----|-----|--------------|------------|----------|-----------------|
| M1     | 1    |     |     | 699.08 MHz   | -14.31 dBm |          |                 |
| T1     | 1    |     |     | 699.5209 MHz | 9.96 dBm   | Occ BW   | 8.982035928 MHz |
| T2     | 1    |     |     | 708.511 MHz  | 8.01 dBm   |          |                 |
| D1     | M1   | 1   |     | 9.84 MHz     | 0.50 dB    |          |                 |

Measuring... 06.06.2022 10:48:04

Date: 6 JUN 2022 10:48:04

**Spectrum**

Ref Level 30.00 dBm Offset 4.50 dB RBW 100 kHz  
Att 40 dB SWT 1 ms VBW 300 kHz Mode Sweep

• 1PK Max

M1[1] -11.50 dB  
702.6600 MHz  
Occ Bw 8.902195609 MHz  
-1.88 dB  
9.7200 MHz

D1 13.960 dBm  
T1  
M1  
T2  
D1 -12.040 dBm

CF 707.5 MHz 501 pts Span 20.0 MHz

| Marker | Type | Ref | Trc | X-value      | Y-value    | Function | Function Result |
|--------|------|-----|-----|--------------|------------|----------|-----------------|
| M1     | 1    |     |     | 702.56 MHz   | -11.50 dBm |          |                 |
| T1     | 1    |     |     | 703.0609 MHz | 9.63 dBm   |          |                 |
| T2     | 1    |     |     | 711.9711 MHz | 10.54 dBm  |          |                 |
| D1     | M1   | 1   |     | 9.72 MHz     | -1.88 dB   | Occ Bw   | 8.902195609 MHz |

Measuring... 09.06.2022 10:48:35

Date: 8 JUN 2022 10:48:36

**Spectrum**

Ref Level 30.00 dBm Offset 4.50 dB RBW 100 kHz  
 Att 40 dB SWT 1 ms VBW 300 kHz Mode Sweep

1PK Max

MI[1] -13.33 dBm  
 702.6600 MHz  
 8.942115768 MHz  
 0.24 dB  
 9.7200 MHz

O1 12.650 dBm  
 O2 -13.350 dBm

Occ Sw

CF 707.5 MHz 501 pts Span 20.0 MHz

**Marker**

| Type | Ref | Trc | X-value      | Y-value    | Function | Function Result |
|------|-----|-----|--------------|------------|----------|-----------------|
| M1   | 1   |     | 702.56 MHz   | -13.33 dBm |          |                 |
| T1   | 1   |     | 703.0699 MHz | 7.78 dBm   | Occ Sw   | 8.942115768 MHz |
| T2   | 1   |     | 712.011 MHz  | 7.95 dBm   |          |                 |
| D1   | M1  | 1   | 9.72 MHz     | 0.24 dB    |          |                 |

Measuring... 68.06.2022 10:10:31

Date: 8 JUN 2022 10:49:04

**Spectrum**

Ref Level 30.00 dBm Offset 4.50 dB RBW 100 kHz  
 Att 40 dB SWT 1 ms VBW 300 kHz Mode Sweep

1Pk Max

20 dBm  
 10 dBm  
 0 dBm  
 -10 dBm  
 -20 dBm  
 -30 dBm  
 -40 dBm  
 -50 dBm  
 -60 dBm

CF 711.0 MHz 501 pts Span 20.0 MHz

Markers:

| Marker | Type | Ref | Trc | X-value      | Y-value    | Function | Function Result |
|--------|------|-----|-----|--------------|------------|----------|-----------------|
| M1     | 1    |     | 1   | 706.16 MHz   | -11.59 dBm |          |                 |
| T1     | 1    |     | 1   | 706.5289 MHz | 10.36 dBm  | Occ BW   | 8.942115768 MHz |
| T2     | 1    |     | 1   | 715.4711 MHz | 8.42 dBm   |          |                 |
| D1     | M1   | 1   |     | 9.58 MHz     | -1.01 dB   |          |                 |

Additional data from the plot:

- O1 13.730 dBm
- O2 -12.270 dBm
- M1[1] -11.59 dBm
- 706.1600 MHz
- 8.942115768 MHz
- 1.01 dB
- 9.6800 MHz

Measuring...

Date: 8/JUN/2022 10:49:35

09.06.2022 10:49:35

**Spectrum**

Ref Level 30.00 dBm Offset 4.50 dB RBW 100 kHz  
Att 40 dB SWT 1 ms VDW 300 kHz Mode Sweep

10% Max

20 dBm

10 dBm

0 dBm

-10 dBm

-20 dBm

-30 dBm

-40 dBm

-50 dBm

-60 dBm

M1[1] -11.36 dBm  
706.2000 MHz  
8.902195609 MHz  
-0.46 dB  
9.6000 MHz

O1 14.250 dBm

O2 -11.750 dBm

Occ Bw

CF 711.0 MHz 501 pts Span 20.0 MHz

**Marker**

| Type | Ref | Trc | X-value      | Y-value    | Function | Function Result |
|------|-----|-----|--------------|------------|----------|-----------------|
| M1   | 1   | 1   | 706.2 MHz    | -11.36 dBm |          |                 |
| T1   | 1   | 1   | 706.5609 MHz | 7.87 dBm   | Occ Bw   | 8.902195609 MHz |
| T2   | 1   | 1   | 715.4711 MHz | 8.78 dBm   |          |                 |
| D1   | M1  | 1   | 9.6 MHz      | -0.46 dB   |          |                 |

Measuring... 08.06.2022 10:50:49

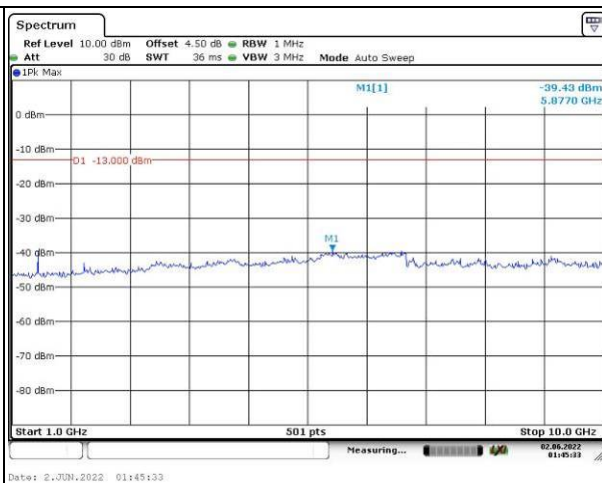
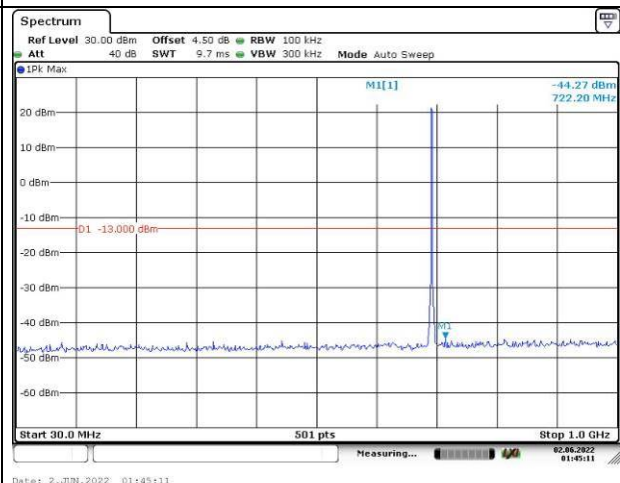
Date: 8.JUN.2022 10:50:09

## Spurious Emissions at Antenna Terminal

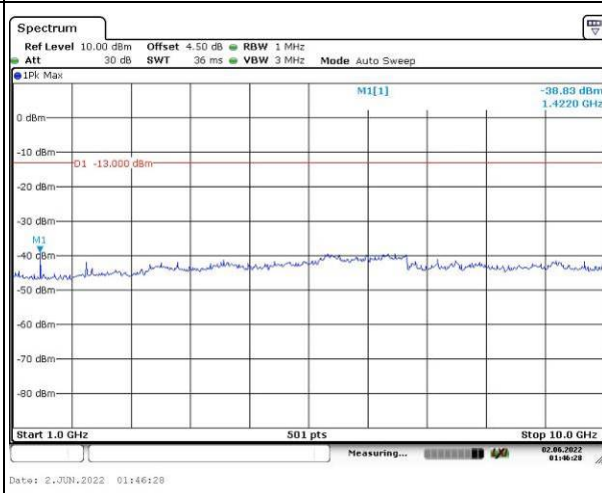
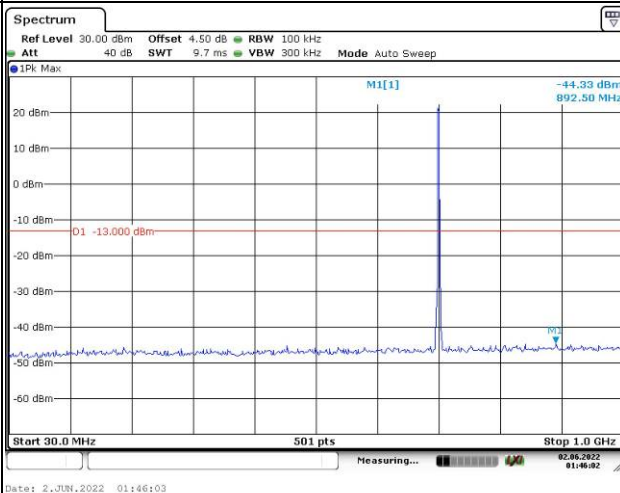
Channel

1.4MHz Bandwidth QPSK

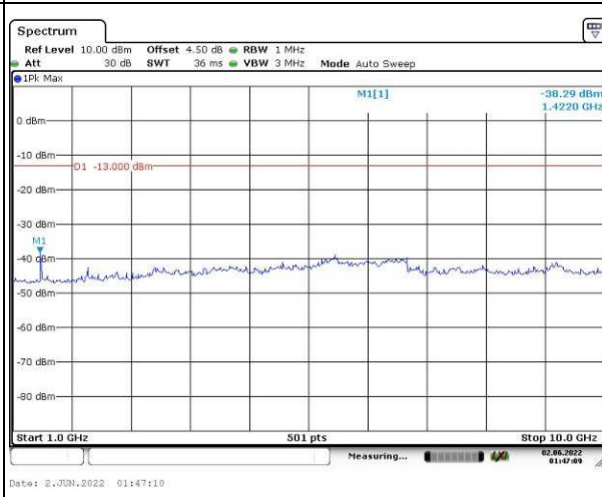
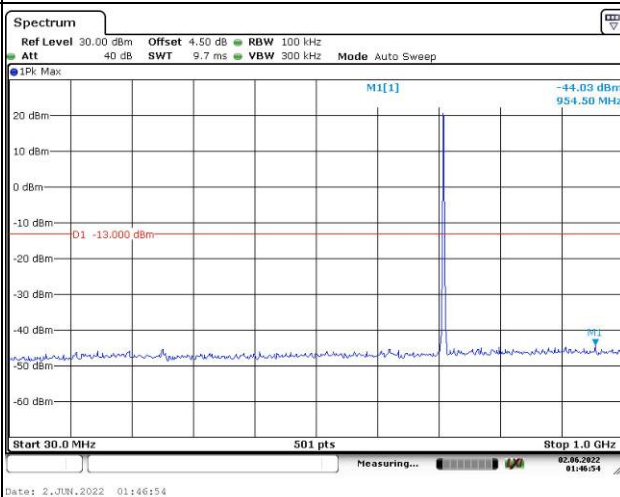
Lowest



Middle



Highest

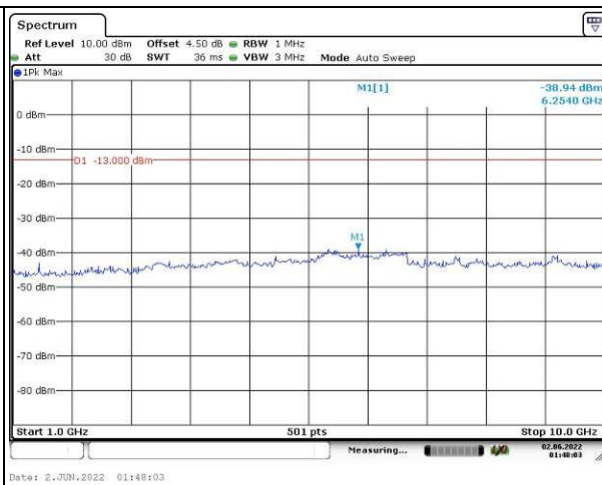
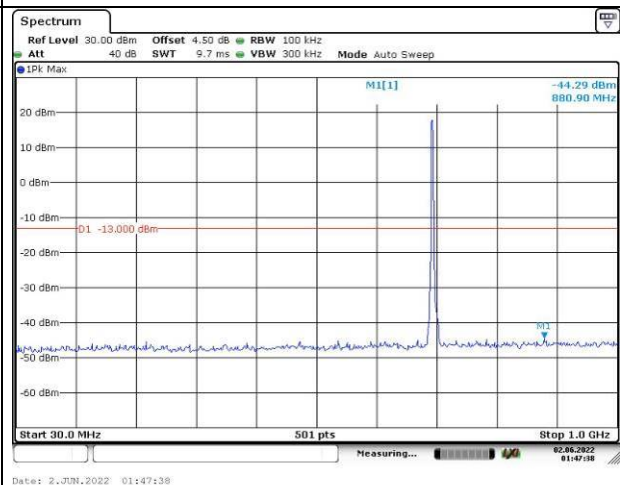


## Spurious Emissions at Antenna Terminal

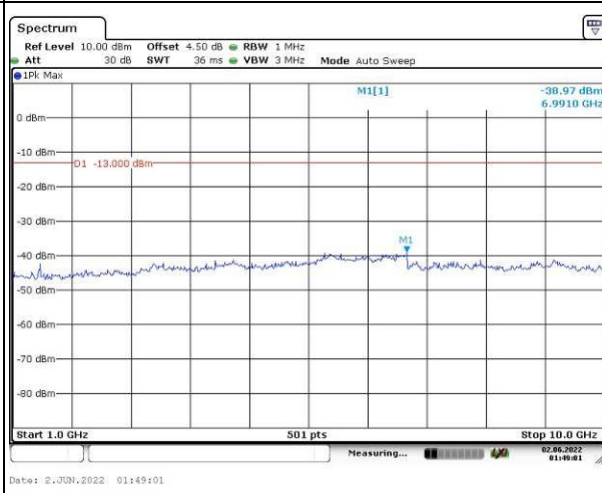
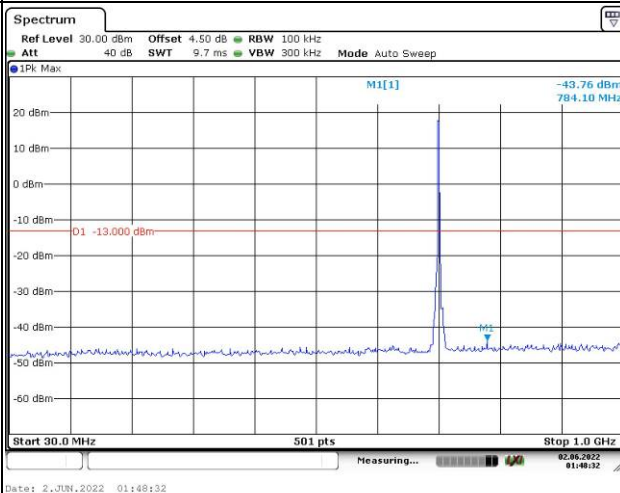
Channel

3MHz Bandwidth QPSK

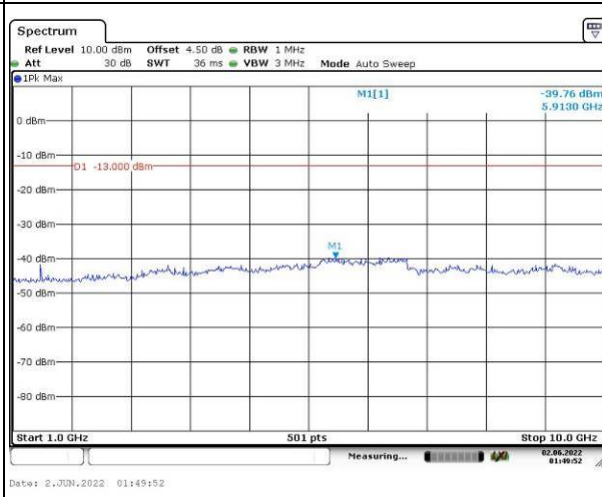
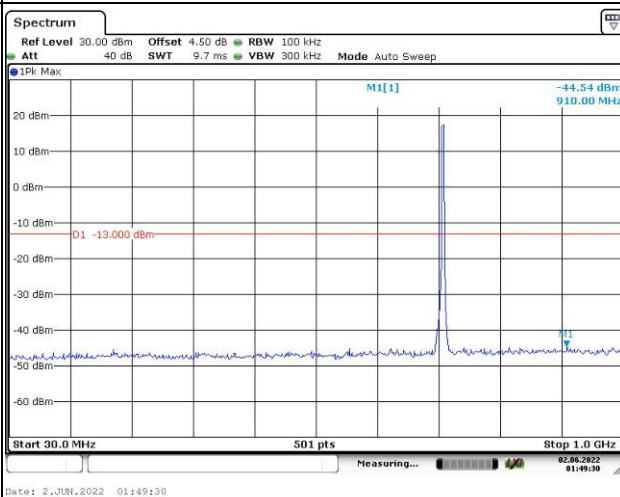
Lowest



Middle



Highest

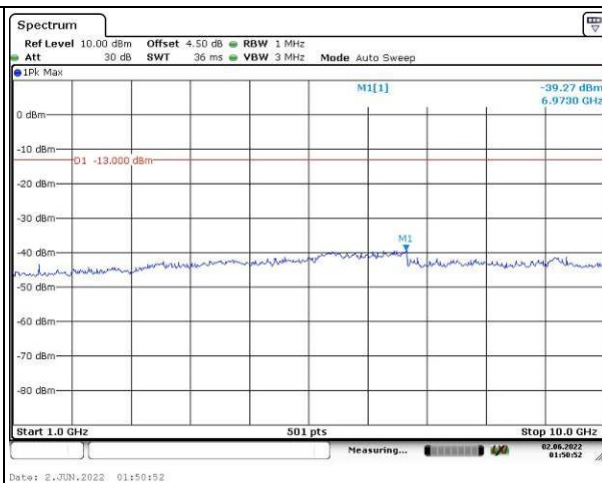
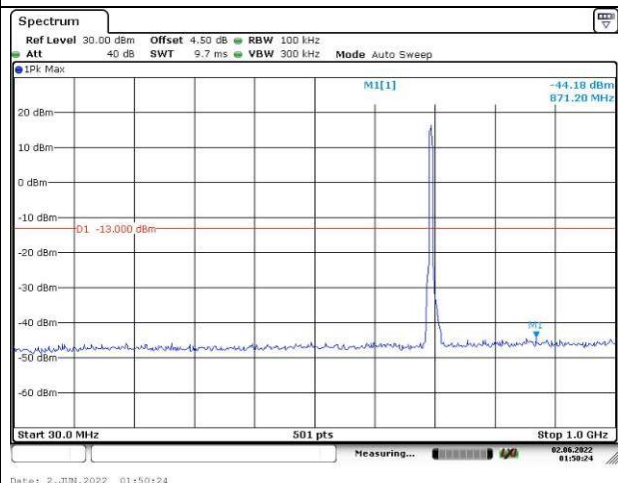


## Spurious Emissions at Antenna Terminal

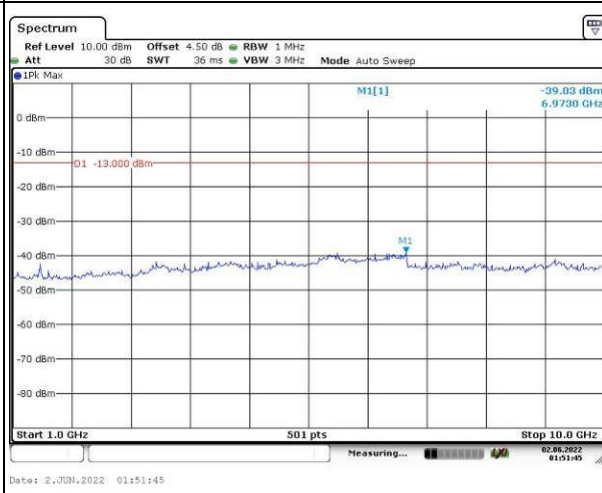
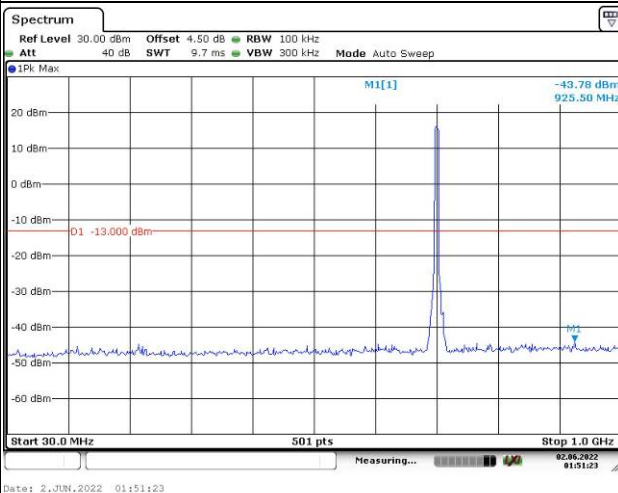
Channel

5MHz Bandwidth QPSK

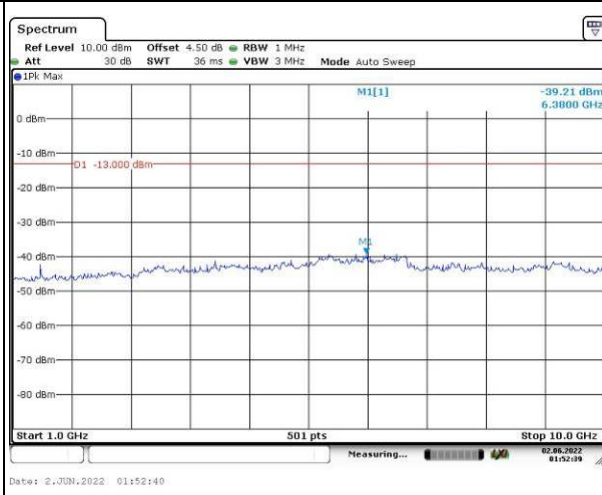
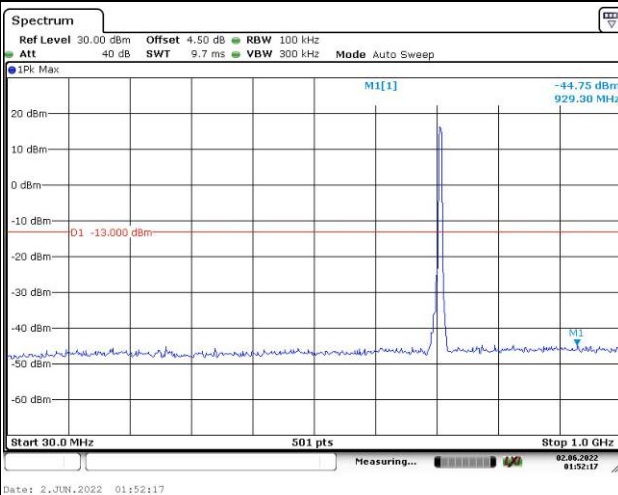
Lowest



Middle



Highest

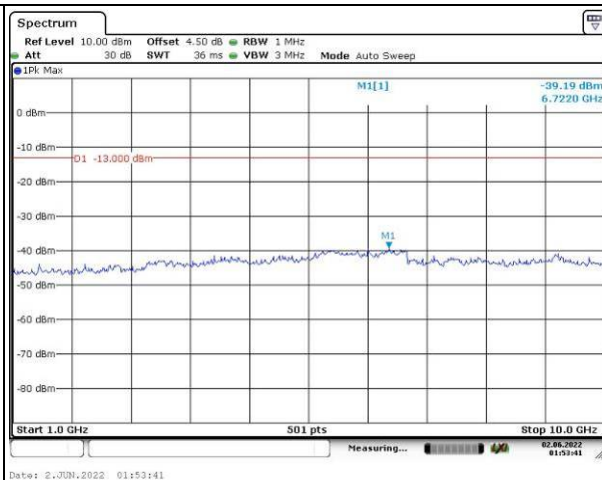
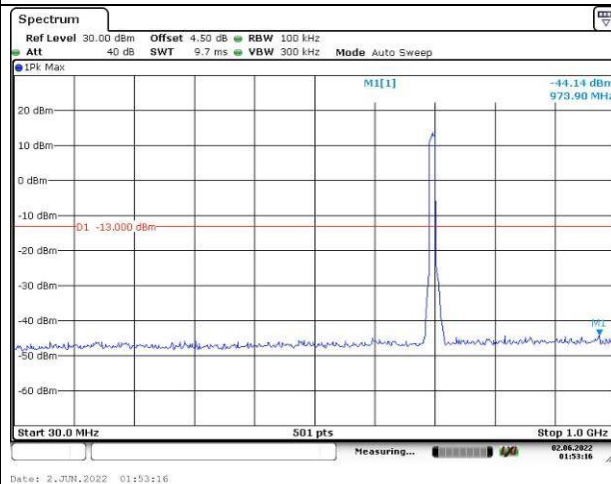


## Spurious Emissions at Antenna Terminal

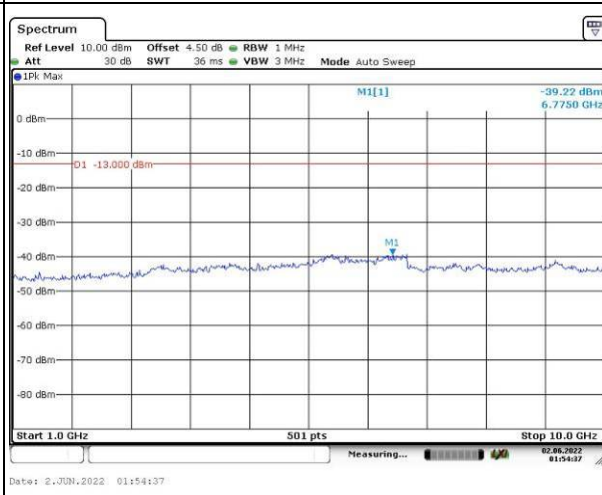
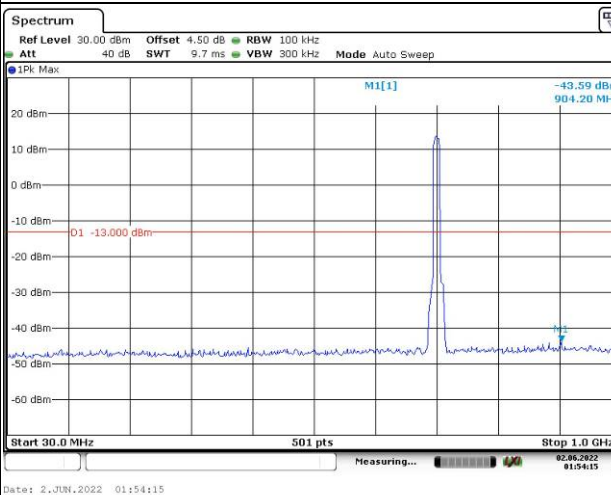
Channel

10MHz Bandwidth QPSK

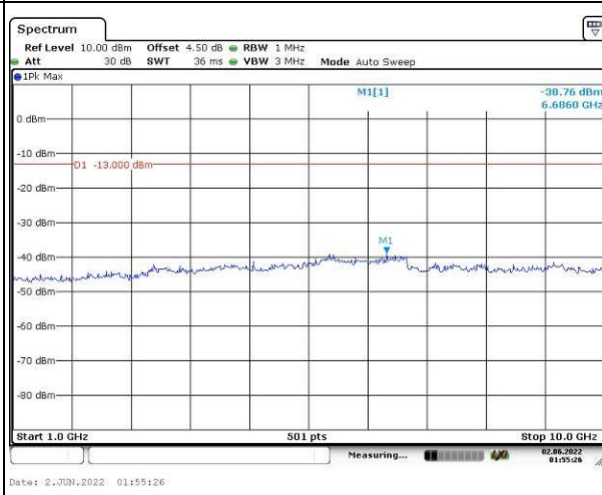
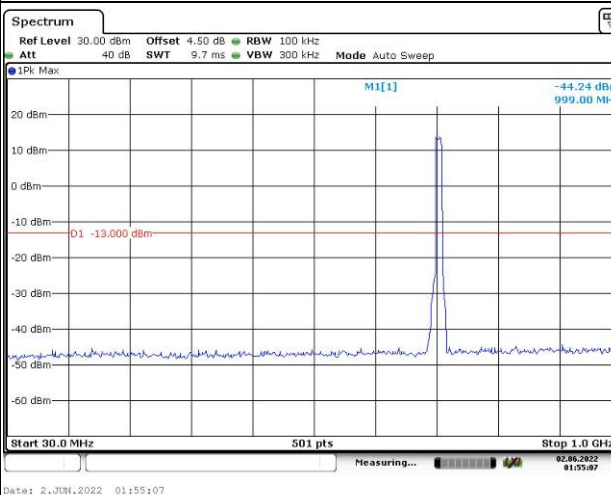
Lowest



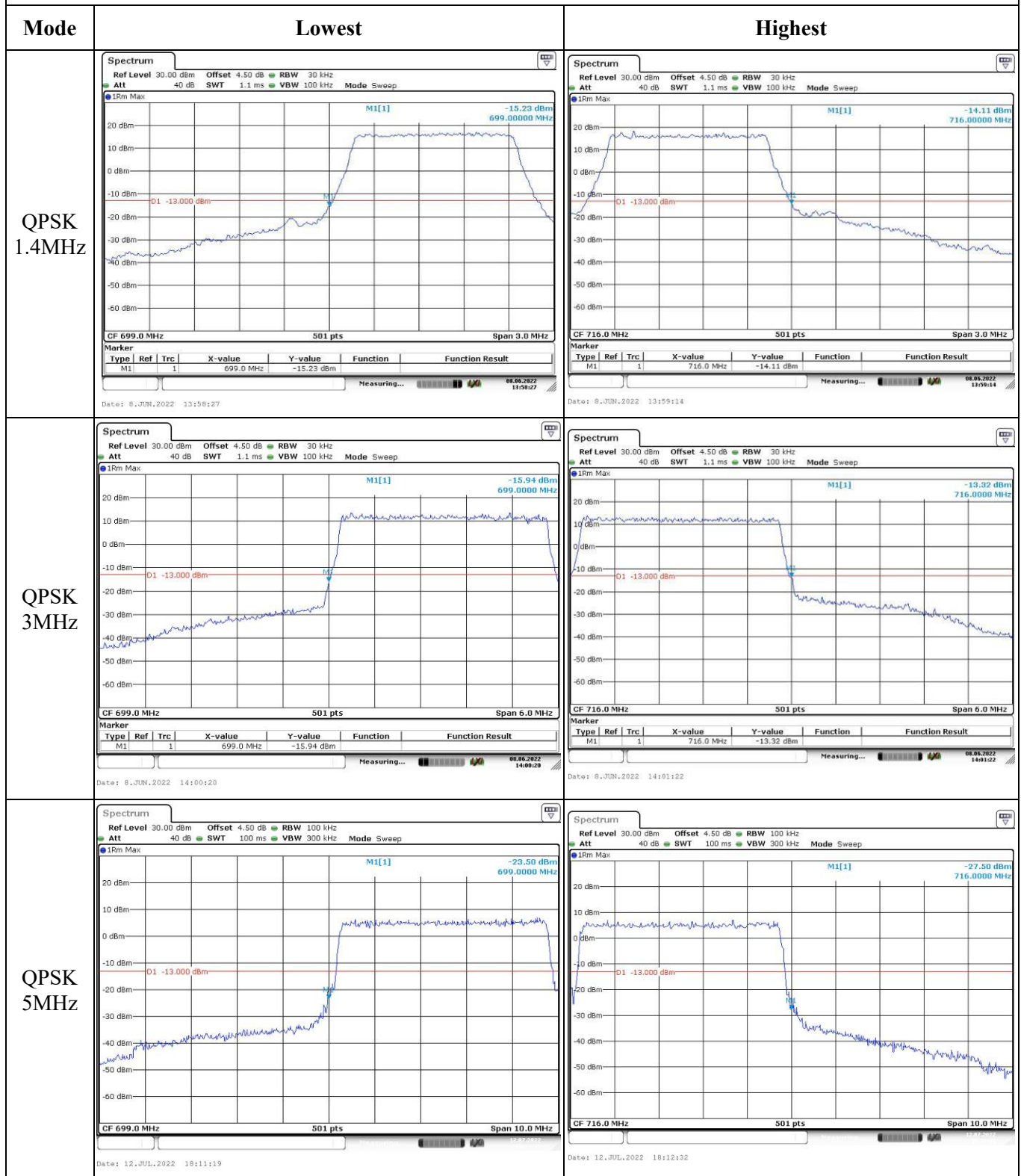
Middle



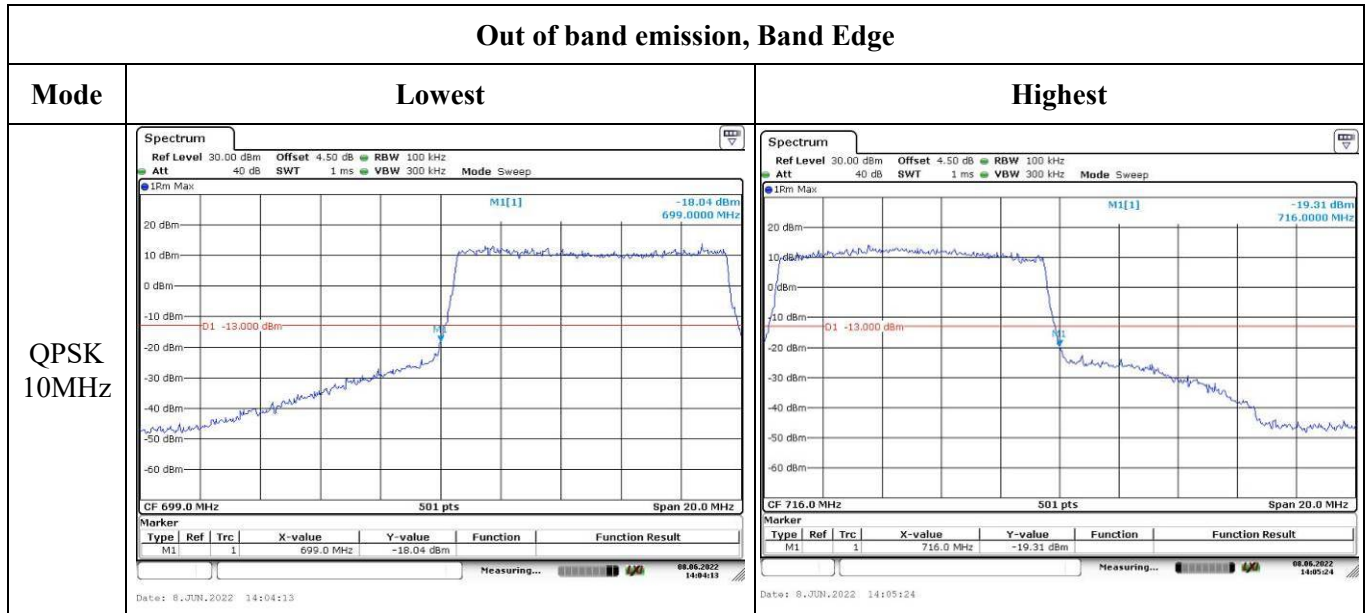
Highest



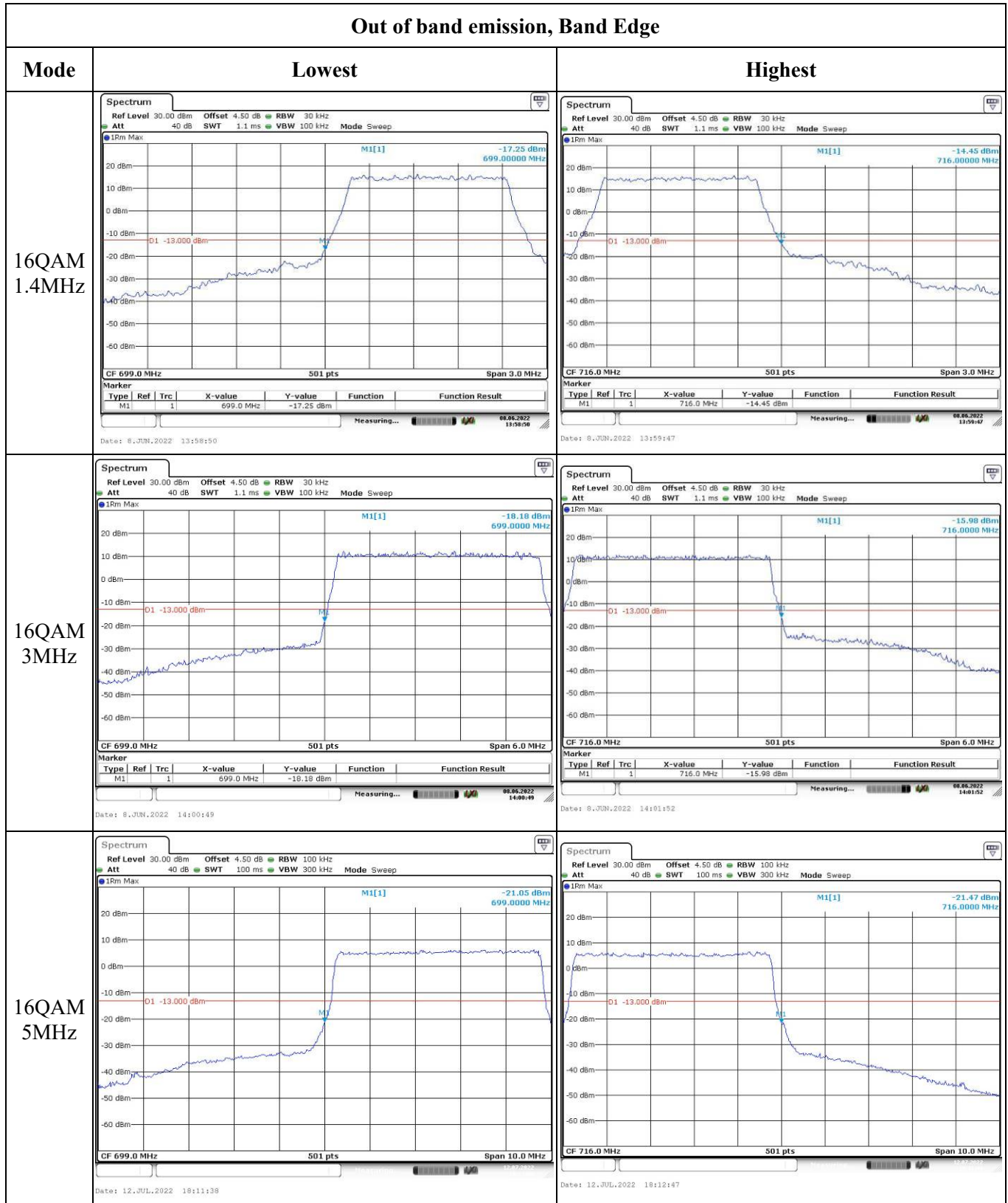
## Out of band emission, Band Edge



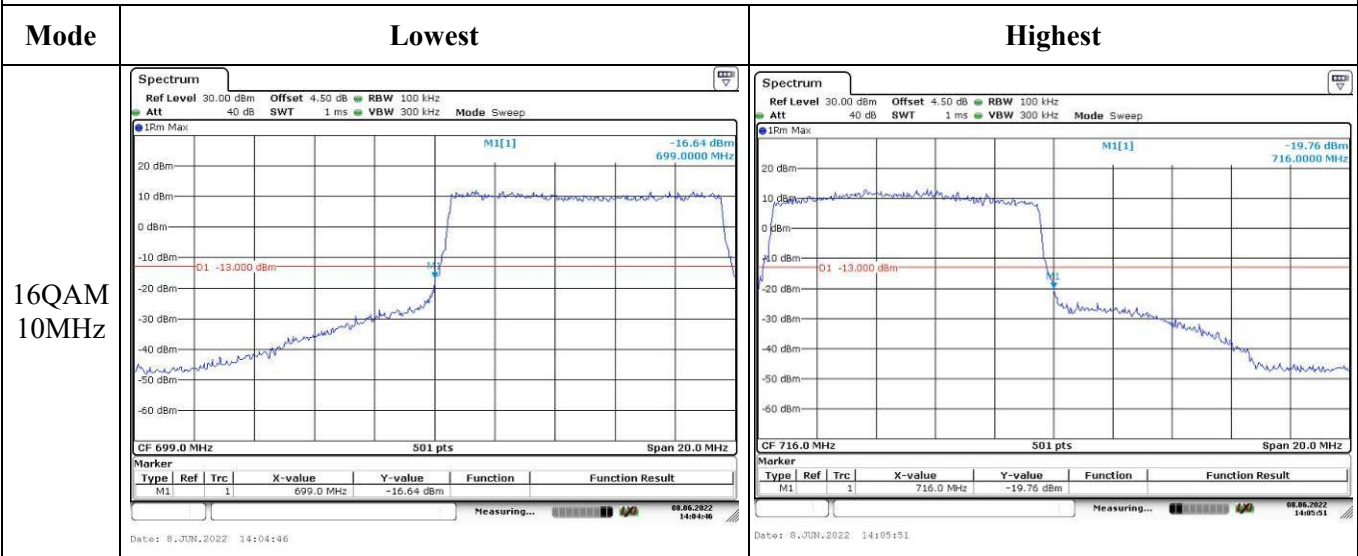
## Out of band emission, Band Edge



## Out of band emission, Band Edge



Out of band emission, Band Edge



**4.8 Antenna Port Test Data and Results for LTE Band 13:**

|                |                  |              |                       |
|----------------|------------------|--------------|-----------------------|
| Serial Number: | CR22050037-RF-S1 | Test Date:   | 2022-06-02~2022-06-08 |
| Test Site:     | RF               | Test Mode:   | Transmitting          |
| Tester:        | Rinka Li         | Test Result: | Pass                  |

**Environmental Conditions:**

|                      |         |                              |    |                           |             |
|----------------------|---------|------------------------------|----|---------------------------|-------------|
| Temperature:<br>(°C) | 25.9~26 | Relative<br>Humidity:<br>(%) | 67 | ATM<br>Pressure:<br>(kPa) | 100.0~100.1 |
|----------------------|---------|------------------------------|----|---------------------------|-------------|

**Test Equipment List and Details:**

| Manufacturer  | Description                         | Model     | Serial Number | Calibration Date | Calibration Due Date |
|---------------|-------------------------------------|-----------|---------------|------------------|----------------------|
| R&S           | Spectrum Analyzer                   | FSV40     | 101474        | 2021-07-22       | 2022-07-21           |
| zhuoxiang     | Coaxial Cable                       | SMA-178   | 211002        | Each time        | N/A                  |
| Mini-Circuits | DC Block                            | BLK-18-S+ | 1554404       | Each time        | N/A                  |
| R&S           | Wideband Radio Communication Tester | CMW500    | 149218        | 2021-07-22       | 2022-07-21           |
| UNI-T         | Multimeter                          | UT39A+    | C210582554    | 2021-09-30       | 2022-09-29           |
| Weinschel     | Coaxial Attenuator                  | 53-20-34  | LN751         | Each time        | N/A                  |
| BACL          | TEMP&HUMI Test Chamber              | BTH-150   | 30026         | 2021-07-22       | 2022-07-21           |
| UNI-T         | Multimeter                          | UT39A+    | C210582554    | 2021-07-22       | 2022-07-21           |
| E-Microwave   | Two-way Splitter                    | ODP-1-6   | OE0120176     | Each Time        | N/A                  |

\* Statement of Traceability: China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

**EUT Information@LTE Band 13▲:**

|                                      |      |                        |       |                     |    |
|--------------------------------------|------|------------------------|-------|---------------------|----|
| Antenna Gain<br>(dBi):               | 0.31 | Antenna Gain<br>(dBd): | -1.84 | Cable Loss<br>(dB): | 0  |
| Operation Voltage(V <sub>DC</sub> ): |      |                        |       |                     |    |
| Lowest:                              | 10.8 | Normal:                | 13.8  | Highest:            | 36 |

**Test Frequency For Each Mode:**

| Operation Bandwidth | Lowest Frequency (MHz) | Middle Frequency (MHz) | Highest Frequency (MHz) |
|---------------------|------------------------|------------------------|-------------------------|
| 5MHz                | 779.5                  | /                      | 784.5                   |
| 10MHz               | /                      | 782                    | /                       |

**Test Data:****FCC§2.1046;§ 27.50(c) (10)****RF Output Power:**

| Test Bandwidth & Modulation | Resource Block & RB offset | Conducted Average Output Power(dBm) |                |                 | Maximum ERP(dBm) | ERP Limit(dBm) |
|-----------------------------|----------------------------|-------------------------------------|----------------|-----------------|------------------|----------------|
|                             |                            | Lowest Channel                      | Middle Channel | Highest Channel |                  |                |
| 5MHz QPSK                   | RB1#0                      | 23.35                               | /              | 23.27           | 21.61            | 34.77          |
|                             | RB1#13                     | 23.25                               | /              | 23.21           |                  |                |
|                             | RB1#24                     | 23.28                               | /              | 23.45           |                  |                |
|                             | RB15#0                     | 22.48                               | /              | 22.44           |                  |                |
|                             | RB15#10                    | 22.49                               | /              | 22.4            |                  |                |
|                             | RB25#0                     | 22.46                               | /              | 22.42           |                  |                |
| 5MHz 16QAM                  | RB1#0                      | 22.44                               | /              | 22.41           | 20.77            | 34.77          |
|                             | RB1#13                     | 22.21                               | /              | 22.35           |                  |                |
|                             | RB1#24                     | 22.42                               | /              | 22.61           |                  |                |
|                             | RB15#0                     | 21.45                               | /              | 21.44           |                  |                |
|                             | RB15#10                    | 21.44                               | /              | 21.35           |                  |                |
|                             | RB25#0                     | 21.41                               | /              | 21.38           |                  |                |
| 10MHz QPSK                  | RB1#0                      | /                                   | 23.45          | /               | 21.7             | 34.77          |
|                             | RB1#25                     | /                                   | 23.46          | /               |                  |                |
|                             | RB1#49                     | /                                   | 23.54          | /               |                  |                |
|                             | RB25#0                     | /                                   | 22.41          | /               |                  |                |
|                             | RB25#25                    | /                                   | 22.35          | /               |                  |                |
|                             | RB50#0                     | /                                   | 22.4           | /               |                  |                |
| 10MHz 16QAM                 | RB1#0                      | /                                   | 22.22          | /               | 20.54            | 34.77          |
|                             | RB1#25                     | /                                   | 22.38          | /               |                  |                |
|                             | RB1#49                     | /                                   | 22.32          | /               |                  |                |
|                             | RB25#0                     | /                                   | 21.43          | /               |                  |                |
|                             | RB25#25                    | /                                   | 21.36          | /               |                  |                |
|                             | RB50#0                     | /                                   | 21.4           | /               |                  |                |

Note: ERP=Conducted Power(dBm) - Cable loss(dB) + Antenna Gain(dBd)

**Result:****Pass**

| <b>Peak-to-average Ratio(PAR)</b> |                            |                           |                |                 |             |
|-----------------------------------|----------------------------|---------------------------|----------------|-----------------|-------------|
| Test Bandwidth & Modulation       | Resource Block & RB offset | Peak-to-average Ratio(dB) |                |                 | Limit (dB)  |
|                                   |                            | Lowest Channel            | Middle Channel | Highest Channel |             |
| 10MHz QPSK                        | RB1#0                      | /                         | 4.20           | /               | 13          |
|                                   | RB50#0                     | /                         | 4.46           | /               | 13          |
| 10MHz 16QAM                       | RB1#0                      | /                         | 5.22           | /               | 13          |
|                                   | RB50#0                     | /                         | 5.57           | /               | 13          |
|                                   |                            |                           |                | <b>Result:</b>  | <b>Pass</b> |

| <b>FCC §2.1049, §27.53:Occupied Bandwidth</b>                        |                              |                |              |                                |                |              |
|----------------------------------------------------------------------|------------------------------|----------------|--------------|--------------------------------|----------------|--------------|
| Operation Mode                                                       | 99% Occupied Bandwidth (MHz) |                |              | 26 dB Occupied Bandwidth (MHz) |                |              |
|                                                                      | Low Channel                  | Middle channel | High Channel | Low Channel                    | Middle Channel | High Channel |
| 5MHz QPSK                                                            | 4.53                         | /              | 4.51         | 5.02                           | /              | 5.04         |
| 5MHz 16QAM                                                           | 4.51                         | /              | 4.51         | 5                              | /              | 5.02         |
| 10MHz QPSK                                                           | /                            | 8.94           | /            | /                              | 9.6            | /            |
| 10MHz 16QAM                                                          | /                            | 8.94           | /            | /                              | 9.72           | /            |
| Note: The test plots please refer to the Plots of Occupied Bandwidth |                              |                |              |                                |                |              |

| <b>FCC §2.1051, §27.53:Spurious Emissions at Antenna Terminal</b> |                                                                                 |
|-------------------------------------------------------------------|---------------------------------------------------------------------------------|
| <b>Result:</b>                                                    | Pass, Please refer to the test plots of Spurious Emissions at Antenna Terminal. |

| <b>FCC §2.1051, §27.53:Out of band emission, Band Edge</b> |                                                                          |
|------------------------------------------------------------|--------------------------------------------------------------------------|
| <b>Result:</b>                                             | Pass, Please refer to the test plots of Out of band emission, Band Edge. |

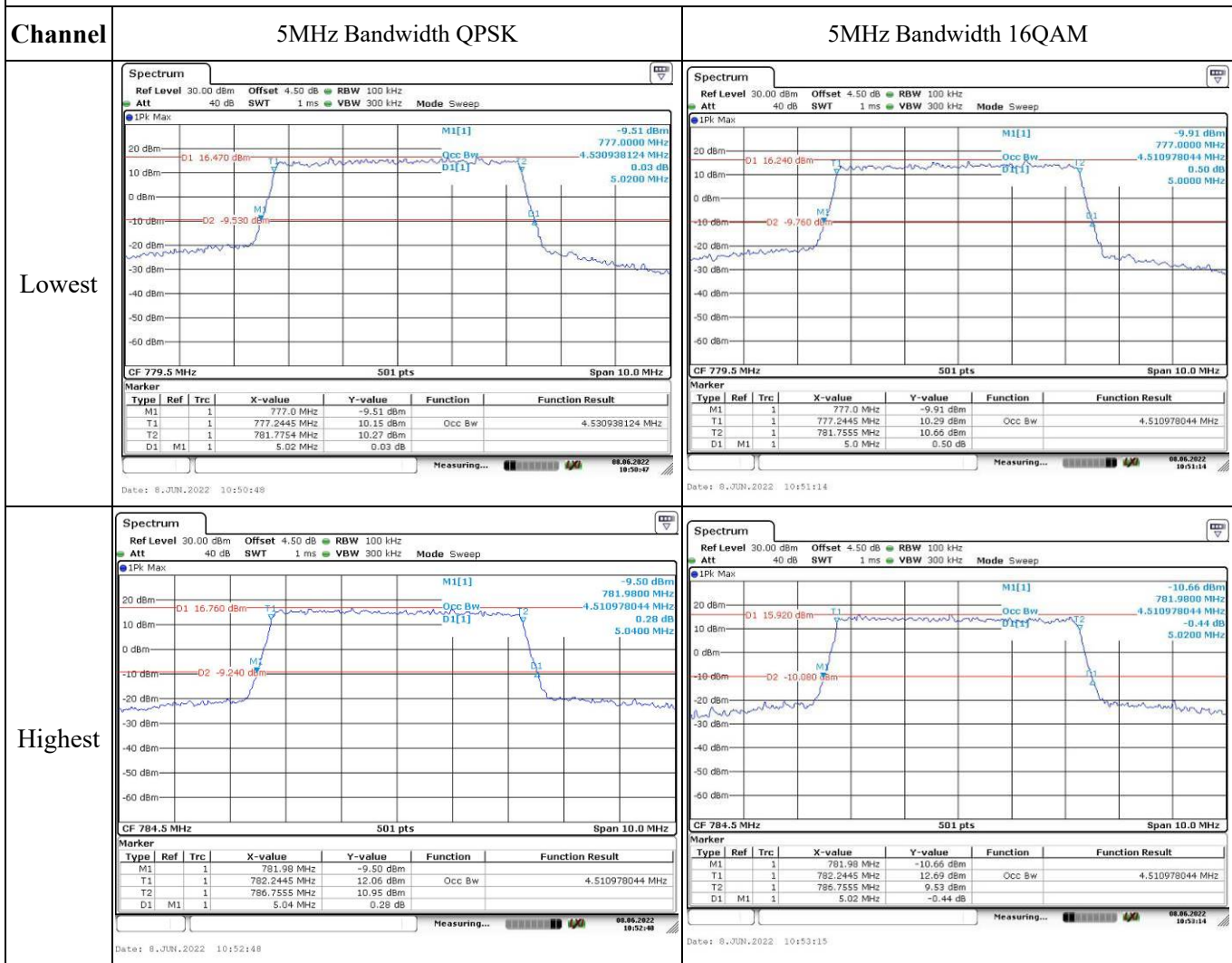
**FCC §2.1055, §27.54: Frequency Stability**

| Test Mode:                          | 10M QPSK         | Test Channel: Middle channel |                  |        |                  |             |
|-------------------------------------|------------------|------------------------------|------------------|--------|------------------|-------------|
| Test Item                           | Temperature (°C) | Voltage (V <sub>DC</sub> )   | Lower Edge (MHz) |        | Upper Edge (MHz) |             |
|                                     |                  |                              | Result           | Limit  | Result           | Limit       |
| Frequency Stability vs. Temperature | -30              | 13.8                         | 777.536          | 777.00 | 786.484          | 787.00      |
|                                     | -20              | 13.8                         | 777.534          | 777.00 | 786.474          | 787.00      |
|                                     | -10              | 13.8                         | 777.538          | 777.00 | 786.477          | 787.00      |
|                                     | 0                | 13.8                         | 777.542          | 777.00 | 786.485          | 787.00      |
|                                     | 10               | 13.8                         | 777.529          | 777.00 | 786.477          | 787.00      |
|                                     | 20               | 13.8                         | 777.529          | 777.00 | 786.471          | 787.00      |
|                                     | 30               | 13.8                         | 777.543          | 777.00 | 786.473          | 787.00      |
|                                     | 40               | 13.8                         | 777.539          | 777.00 | 786.476          | 787.00      |
|                                     | 50               | 13.8                         | 777.538          | 777.00 | 786.483          | 787.00      |
| Frequency Stability vs. Voltage     | 20               | 10.8                         | 777.535          | 777.00 | 786.476          | 787.00      |
|                                     | 20               | 36                           | 777.536          | 777.00 | 786.484          | 787.00      |
|                                     |                  |                              |                  |        | <b>Result:</b>   | <b>Pass</b> |

| Test Mode:                          | 10M 16QAM        | Test Channel: Middle channel |                  |        |                  |             |
|-------------------------------------|------------------|------------------------------|------------------|--------|------------------|-------------|
| Test Item                           | Temperature (°C) | Voltage (V <sub>DC</sub> )   | Lower Edge (MHz) |        | Upper Edge (MHz) |             |
|                                     |                  |                              | Result           | Limit  | Result           | Limit       |
| Frequency Stability vs. Temperature | -30              | 13.8                         | 777.538          | 777.00 | 786.484          | 787.00      |
|                                     | -20              | 13.8                         | 777.536          | 777.00 | 786.478          | 787.00      |
|                                     | -10              | 13.8                         | 777.541          | 777.00 | 786.483          | 787.00      |
|                                     | 0                | 13.8                         | 777.539          | 777.00 | 786.478          | 787.00      |
|                                     | 10               | 13.8                         | 777.535          | 777.00 | 786.483          | 787.00      |
|                                     | 20               | 13.8                         | 777.529          | 777.00 | 786.471          | 787.00      |
|                                     | 30               | 13.8                         | 777.532          | 777.00 | 786.477          | 787.00      |
|                                     | 40               | 13.8                         | 777.537          | 777.00 | 786.485          | 787.00      |
|                                     | 50               | 13.8                         | 777.537          | 777.00 | 786.485          | 787.00      |
| Frequency Stability vs. Voltage     | 20               | 10.8                         | 777.530          | 777.00 | 786.482          | 787.00      |
|                                     | 20               | 36                           | 777.541          | 777.00 | 786.481          | 787.00      |
|                                     |                  |                              |                  |        | <b>Result:</b>   | <b>Pass</b> |

## Test Plots:

## Occupied Bandwidth



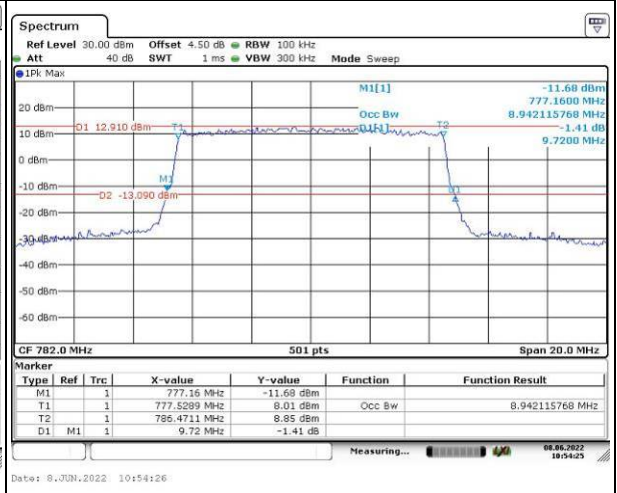
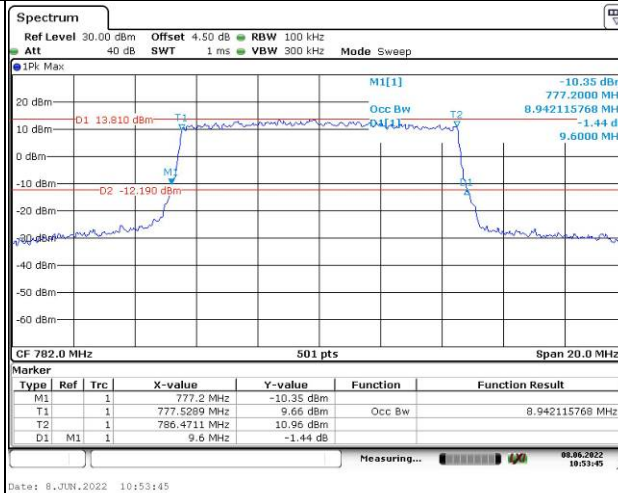
## Occupied Bandwidth

Channel

10MHz Bandwidth QPSK

10MHz Bandwidth 16QAM

Middle

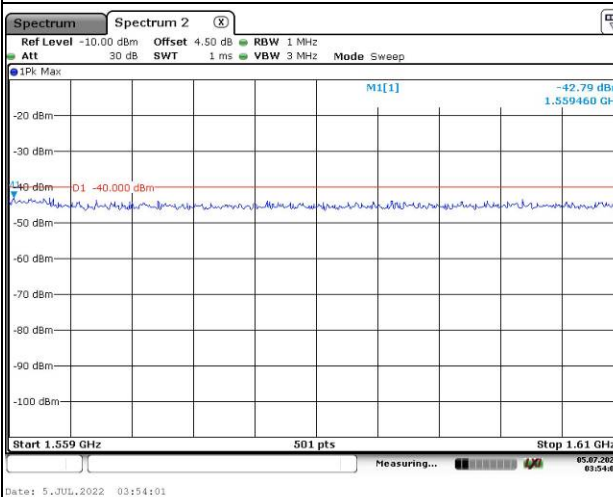
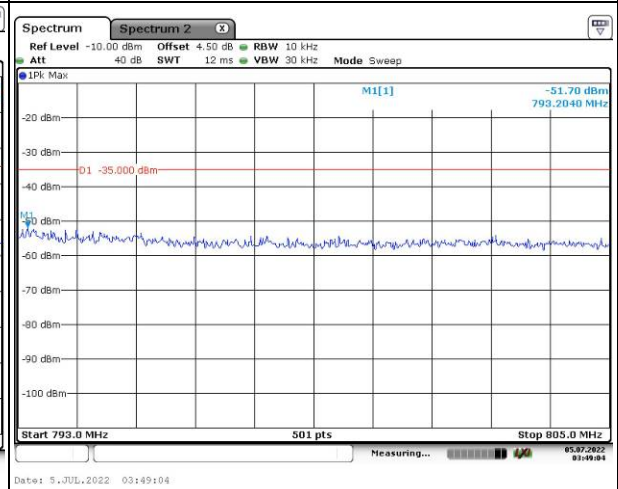
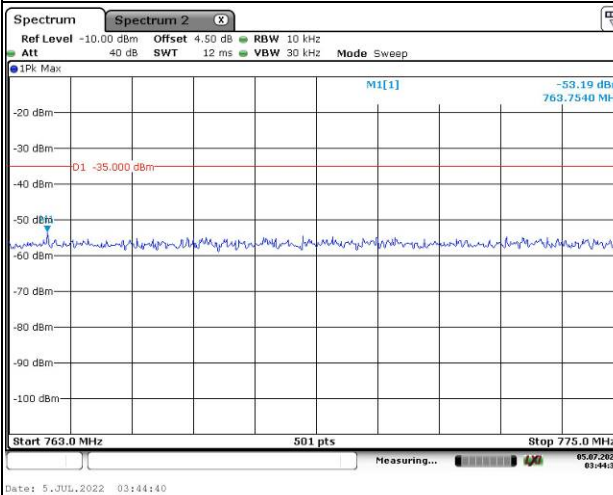
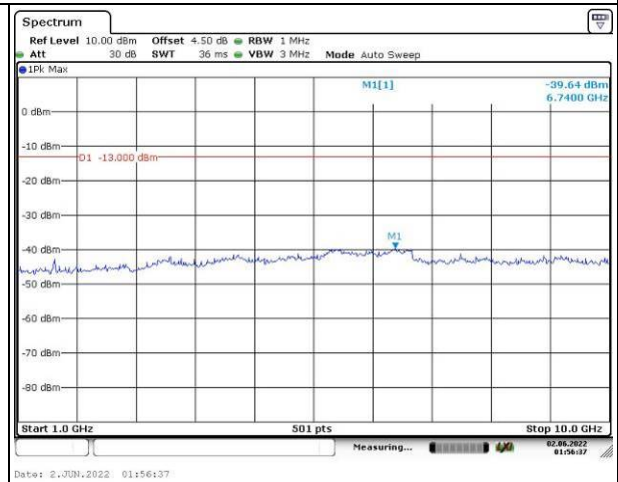
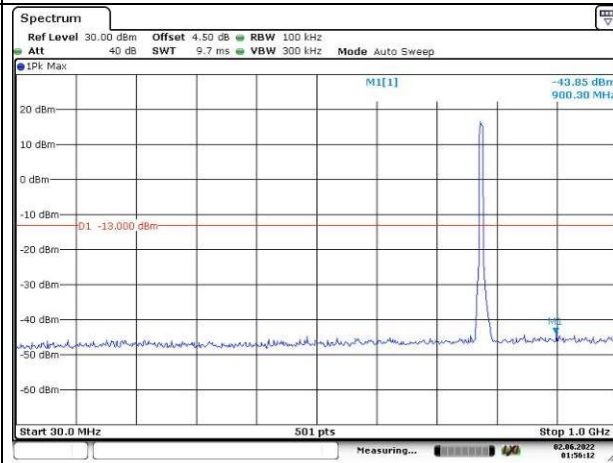


## Spurious Emissions at Antenna Terminal

Channel

5MHz Bandwidth QPSK

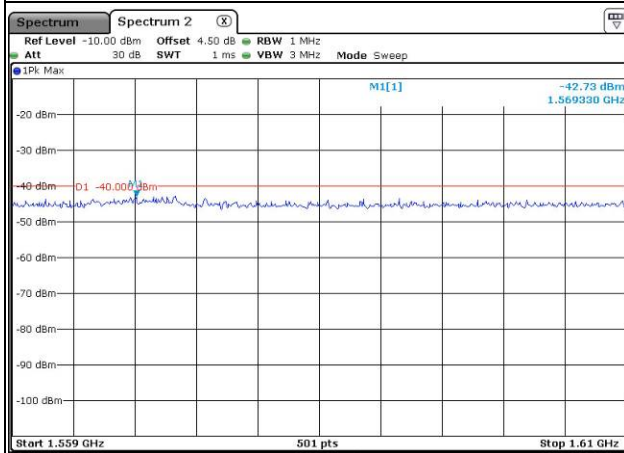
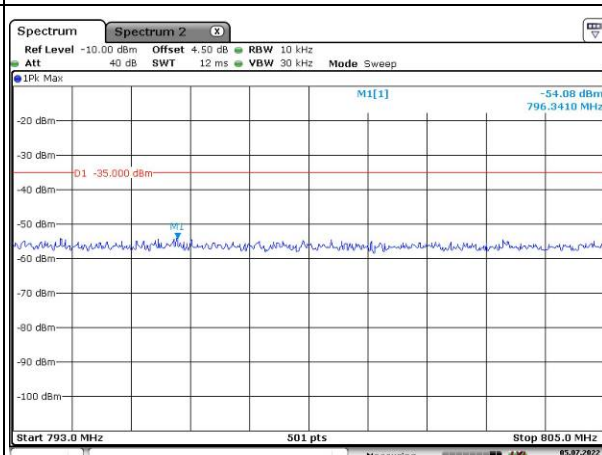
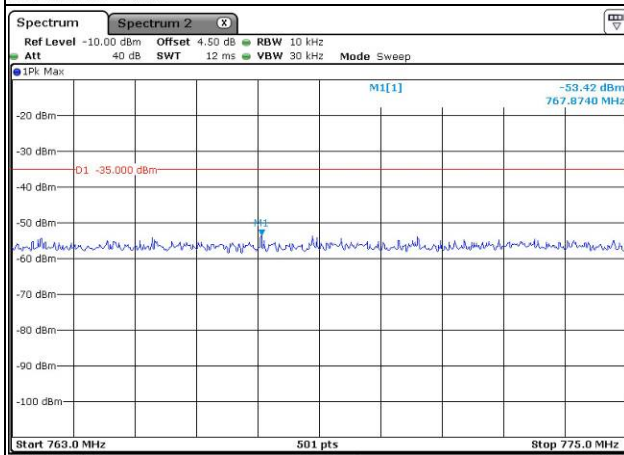
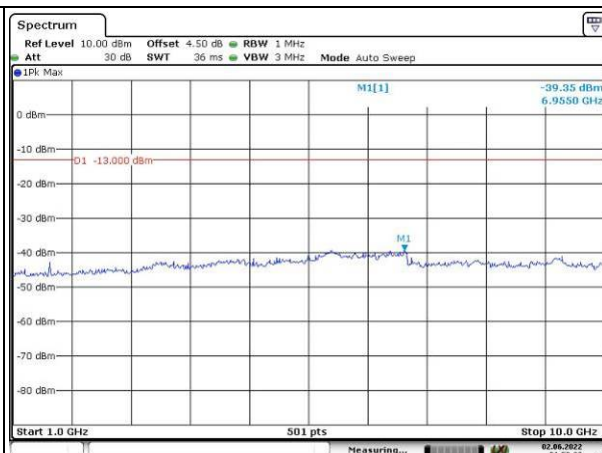
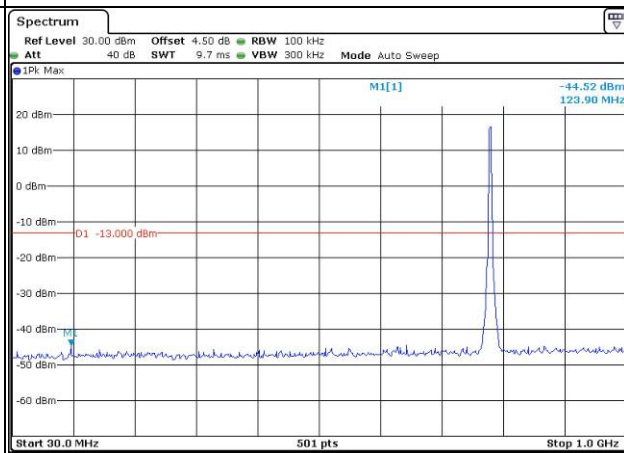
Lowest



## Spurious Emissions at Antenna Terminal

Channel

5MHz Bandwidth QPSK



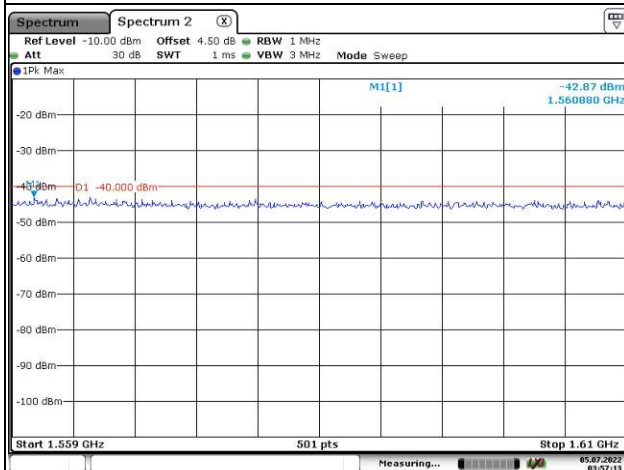
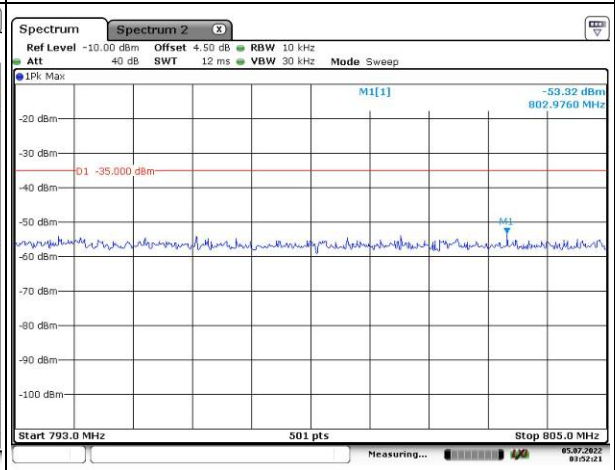
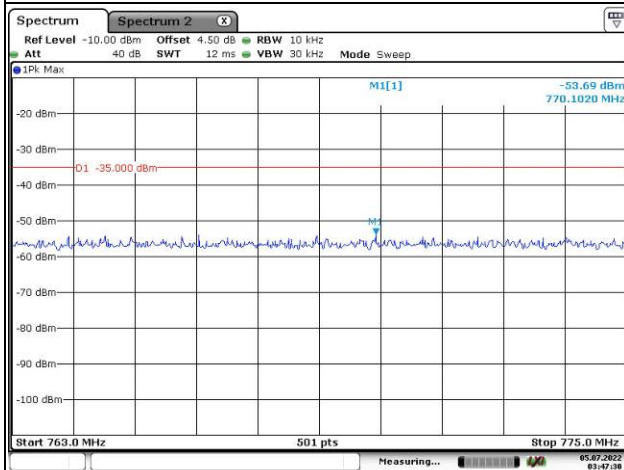
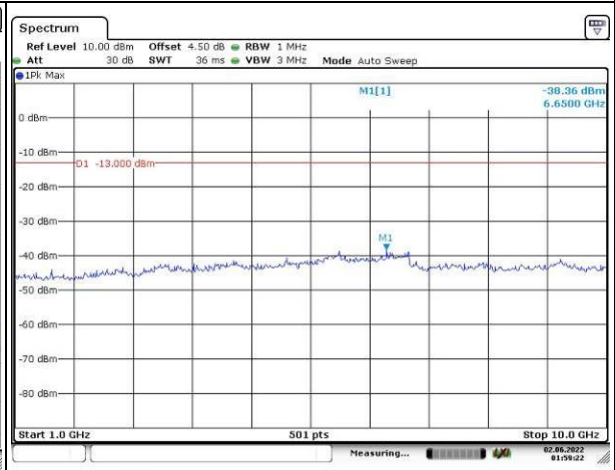
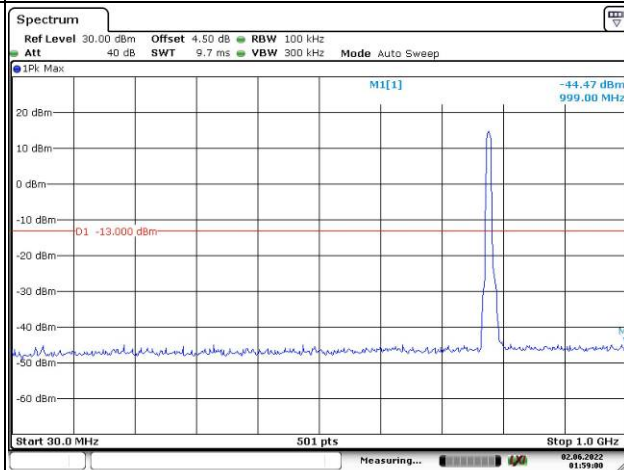
Highest

## Spurious Emissions at Antenna Terminal

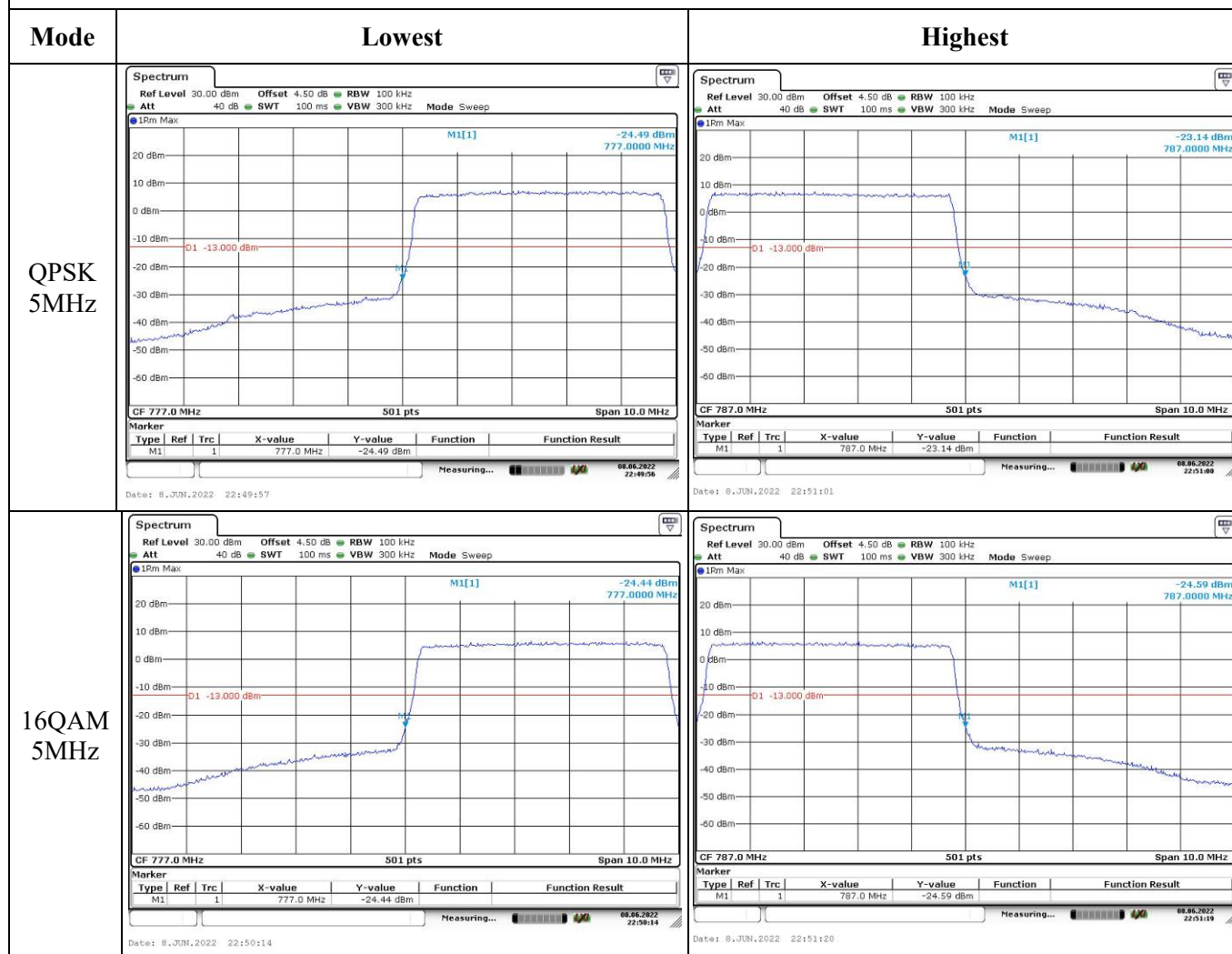
Channel

10MHz Bandwidth QPSK

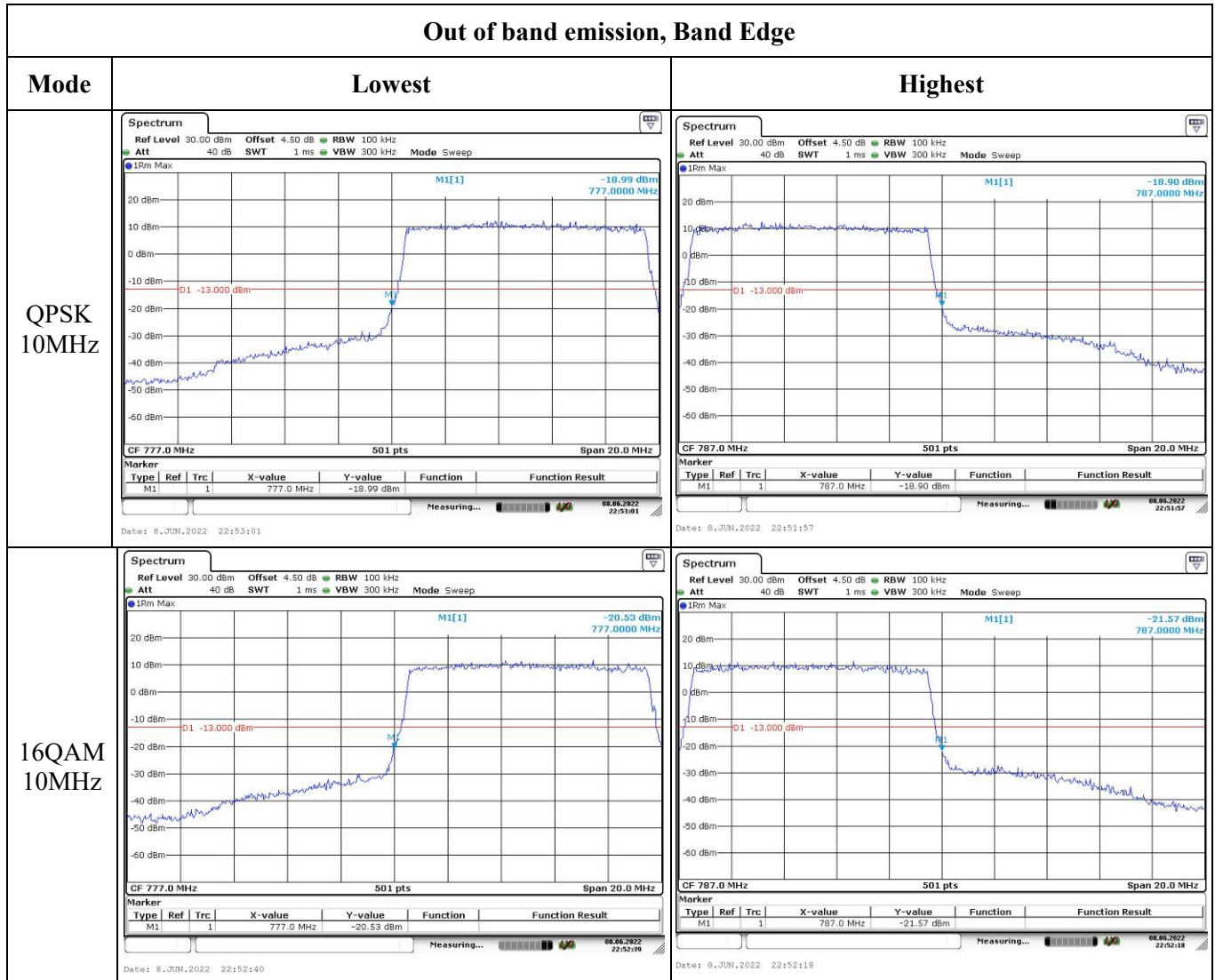
Middle



## Out of band emission, Band Edge



## Out of band emission, Band Edge



**4.9 Antenna Port Test Data and Results for LTE Band 14:**

|                |                  |              |                       |
|----------------|------------------|--------------|-----------------------|
| Serial Number: | CR22050037-RF-S1 | Test Date:   | 2022-06-02~2022-08-22 |
| Test Site:     | RF               | Test Mode:   | Transmitting          |
| Tester:        | Rinka Li         | Test Result: | Pass                  |

**Environmental Conditions:**

|                      |         |                              |       |                           |             |
|----------------------|---------|------------------------------|-------|---------------------------|-------------|
| Temperature:<br>(°C) | 25.9~26 | Relative<br>Humidity:<br>(%) | 67~68 | ATM<br>Pressure:<br>(kPa) | 100.0~100.1 |
|----------------------|---------|------------------------------|-------|---------------------------|-------------|

**Test Equipment List and Details:**

| Manufacturer  | Description                         | Model      | Serial Number | Calibration Date | Calibration Due Date |
|---------------|-------------------------------------|------------|---------------|------------------|----------------------|
| R&S           | Spectrum Analyzer                   | FSV40      | 101474        | 2021-07-22       | 2022-07-21           |
| R&S           | Spectrum Analyzer                   | FSV40      | 101474        | 2022-07-15       | 2023-07-14           |
| zhuoxiang     | Coaxial Cable                       | SMA-178    | 211002        | Each time        | N/A                  |
| Mini-Circuits | DC Block                            | BLK-18-S+  | 1554404       | Each time        | N/A                  |
| R&S           | Wideband Radio Communication Tester | CMW500     | 149218        | 2021-07-22       | 2022-07-21           |
| R&S           | Wideband Radio Communication Tester | CMW500     | 149218        | 2022-07-15       | 2023-07-14           |
| UNI-T         | Multimeter                          | UT39A+     | C210582554    | 2021-09-30       | 2022-09-29           |
| Weinschel     | Coaxial Attenuator                  | 53-20-34   | LN751         | Each time        | N/A                  |
| BACL          | TEMP&HUMI Test Chamber              | BTH-150-40 | 30174         | 2022-04-06       | 2023-04-05           |
| UNI-T         | Multimeter                          | UT39A+     | C210582554    | 2021-09-30       | 2022-09-29           |
| E-Microwave   | Two-way Splitter                    | ODP-1-6    | OE0120176     | Each Time        | N/A                  |

\* Statement of Traceability: China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

**EUT Information@LTE Band 14▲:**

|                                      |       |                           |       |                     |    |
|--------------------------------------|-------|---------------------------|-------|---------------------|----|
| Antenna Gain<br>(dBi):               | -0.29 | Antenna<br>Gain<br>(dBd): | -2.44 | Cable Loss<br>(dB): | 0  |
| Operation Voltage(V <sub>DC</sub> ): |       |                           |       |                     |    |
| Lowest:                              | 10.8  | Normal:                   | 13.8  | Highest:            | 36 |

**Test Frequency For Each Mode:**

| Operation Bandwidth | Lowest Frequency (MHz) | Middle Frequency (MHz) | Highest Frequency (MHz) |
|---------------------|------------------------|------------------------|-------------------------|
| 5MHz                | 790.5                  | /                      | 795.5                   |
| 10MHz               | /                      | 793                    | /                       |

**Test Data:****FCC§2.1046;§ 27.50(c) (10)****RF Output Power:**

| Test Bandwidth & Modulation | Resource Block & RB offset | Conducted Average Output Power(dBm) |                |                 | Maximum ERP(dBm) | ERP Limit(dBm) |
|-----------------------------|----------------------------|-------------------------------------|----------------|-----------------|------------------|----------------|
|                             |                            | Lowest Channel                      | Middle Channel | Highest Channel |                  |                |
| 5MHz QPSK                   | RB1#0                      | 23.28                               | /              | 23.42           | 21.1             | 34.77          |
|                             | RB1#13                     | 23.43                               | /              | 23.39           |                  |                |
|                             | RB1#24                     | 23.43                               | /              | 23.54           |                  |                |
|                             | RB15#0                     | 22.44                               | /              | 22.42           |                  |                |
|                             | RB15#10                    | 22.45                               | /              | 22.49           |                  |                |
|                             | RB25#0                     | 22.54                               | /              | 22.4            |                  |                |
| 5MHz 16QAM                  | RB1#0                      | 22.39                               | /              | 22.5            | 20.12            | 34.77          |
|                             | RB1#13                     | 22.47                               | /              | 22.56           |                  |                |
|                             | RB1#24                     | 22.47                               | /              | 22.41           |                  |                |
|                             | RB15#0                     | 21.34                               | /              | 21.32           |                  |                |
|                             | RB15#10                    | 21.35                               | /              | 21.3            |                  |                |
|                             | RB25#0                     | 21.35                               | /              | 21.3            |                  |                |
| 10MHz QPSK                  | RB1#0                      | /                                   | 23.43          | /               | 21.13            | 34.77          |
|                             | RB1#25                     | /                                   | 23.57          | /               |                  |                |
|                             | RB1#49                     | /                                   | 23.54          | /               |                  |                |
|                             | RB25#0                     | /                                   | 22.52          | /               |                  |                |
|                             | RB25#25                    | /                                   | 22.41          | /               |                  |                |
|                             | RB50#0                     | /                                   | 22.48          | /               |                  |                |
| 10MHz 16QAM                 | RB1#0                      | /                                   | 22.26          | /               | 19.9             | 34.77          |
|                             | RB1#25                     | /                                   | 22.34          | /               |                  |                |
|                             | RB1#49                     | /                                   | 22.28          | /               |                  |                |
|                             | RB25#0                     | /                                   | 21.37          | /               |                  |                |
|                             | RB25#25                    | /                                   | 21.32          | /               |                  |                |
|                             | RB50#0                     | /                                   | 21.33          | /               |                  |                |

Note: ERP=Conducted Power(dBm) - Cable loss(dB) + Antenna Gain(dBd)

**Result:****Pass**

| <b>Peak-to-average Ratio(PAR)</b> |                            |                           |                |                 |             |
|-----------------------------------|----------------------------|---------------------------|----------------|-----------------|-------------|
| Test Bandwidth & Modulation       | Resource Block & RB offset | Peak-to-average Ratio(dB) |                |                 | Limit (dB)  |
|                                   |                            | Lowest Channel            | Middle Channel | Highest Channel |             |
| 10MHz QPSK                        | RB1#0                      | /                         | 4.03           | /               | 13          |
|                                   | RB50#0                     | /                         | 4.75           | /               | 13          |
| 10MHz 16QAM                       | RB1#0                      | /                         | 5.22           | /               | 13          |
|                                   | RB50#0                     | /                         | 5.80           | /               | 13          |
|                                   |                            |                           |                | <b>Result:</b>  | <b>Pass</b> |

| <b>FCC §2.1049, §27.53:Occupied Bandwidth</b>                        |                              |                |              |                                |                |              |
|----------------------------------------------------------------------|------------------------------|----------------|--------------|--------------------------------|----------------|--------------|
| Operation Mode                                                       | 99% Occupied Bandwidth (MHz) |                |              | 26 dB Occupied Bandwidth (MHz) |                |              |
|                                                                      | Low Channel                  | Middle channel | High Channel | Low Channel                    | Middle Channel | High Channel |
| 5MHz QPSK                                                            | 4.53                         | /              | 4.51         | 5.00                           | /              | 5.00         |
| 5MHz 16QAM                                                           | 4.51                         | /              | 4.51         | 5.00                           | /              | 5.02         |
| 10MHz QPSK                                                           | /                            | 8.94           | /            | /                              | 9.80           | /            |
| 10MHz 16QAM                                                          | /                            | 8.94           | /            | /                              | 9.80           | /            |
| Note: The test plots please refer to the Plots of Occupied Bandwidth |                              |                |              |                                |                |              |

| <b>FCC §2.1051, §27.53:Spurious Emissions at Antenna Terminal</b> |                                                                                 |
|-------------------------------------------------------------------|---------------------------------------------------------------------------------|
| <b>Result:</b>                                                    | Pass, Please refer to the test plots of Spurious Emissions at Antenna Terminal. |

| <b>FCC §2.1051, §27.53:Out of band emission, Band Edge</b> |                                                                          |
|------------------------------------------------------------|--------------------------------------------------------------------------|
| <b>Result:</b>                                             | Pass, Please refer to the test plots of Out of band emission, Band Edge. |

| <b>FCC §2.1055, §90.213: Frequency Stability</b> |                     |                               |                 |                |             |
|--------------------------------------------------|---------------------|-------------------------------|-----------------|----------------|-------------|
| Test Mode:                                       | 10 MHz QPSK         |                               | Test Channel:   | 793            | MHz         |
| Test Item                                        | Temperature<br>(°C) | Voltage<br>(V <sub>DC</sub> ) | Frequency Error |                | Limit       |
|                                                  |                     |                               | (Hz)            | (ppm)          | (ppm)       |
| Frequency<br>Stability vs.<br>Temperature        | -30                 | 13.8                          | 1               | 0.001          | 2.5         |
|                                                  | -20                 | 13.8                          | 5.66            | 0.007          | 2.5         |
|                                                  | -10                 | 13.8                          | -7.99           | -0.010         | 2.5         |
|                                                  | 0                   | 13.8                          | 9.99            | 0.013          | 2.5         |
|                                                  | 10                  | 13.8                          | 6.7             | 0.008          | 2.5         |
|                                                  | 20                  | 13.8                          | -9.52           | -0.012         | 2.5         |
|                                                  | 30                  | 13.8                          | -9.31           | -0.012         | 2.5         |
|                                                  | 40                  | 13.8                          | -7.45           | -0.009         | 2.5         |
|                                                  | 50                  | 13.8                          | 7.71            | 0.010          | 2.5         |
| Frequency<br>Stability vs.<br>Voltage            | 20                  | 10.8                          | -8.94           | -0.011         | 2.5         |
|                                                  | 20                  | 36                            | 9.64            | 0.012          | 2.5         |
|                                                  |                     |                               |                 | <b>Result:</b> | <b>Pass</b> |

| Test Mode:                                | 10 MHz 16QAM        |                               | Test Channel:   | 793            | MHz         |
|-------------------------------------------|---------------------|-------------------------------|-----------------|----------------|-------------|
| Test Item                                 | Temperature<br>(°C) | Voltage<br>(V <sub>DC</sub> ) | Frequency Error |                | Limit       |
|                                           |                     |                               | (Hz)            | (ppm)          | (ppm)       |
| Frequency<br>Stability vs.<br>Temperature | -30                 | 13.8                          | -1.27           | -0.002         | 2.5         |
|                                           | -20                 | 13.8                          | -8.93           | -0.011         | 2.5         |
|                                           | -10                 | 13.8                          | 9.6             | 0.012          | 2.5         |
|                                           | 0                   | 13.8                          | -8.02           | -0.010         | 2.5         |
|                                           | 10                  | 13.8                          | -9.97           | -0.013         | 2.5         |
|                                           | 20                  | 13.8                          | -6.87           | -0.009         | 2.5         |
|                                           | 30                  | 13.8                          | 6.69            | 0.008          | 2.5         |
|                                           | 40                  | 13.8                          | 5.19            | 0.007          | 2.5         |
|                                           | 50                  | 13.8                          | -9.53           | -0.012         | 2.5         |
| Frequency<br>Stability vs.<br>Voltage     | 20                  | 10.8                          | -8.75           | -0.011         | 2.5         |
|                                           | 20                  | 36                            | 6.25            | 0.008          | 2.5         |
|                                           |                     |                               |                 | <b>Result:</b> | <b>Pass</b> |

## Test Plots:

## Occupied Bandwidth

