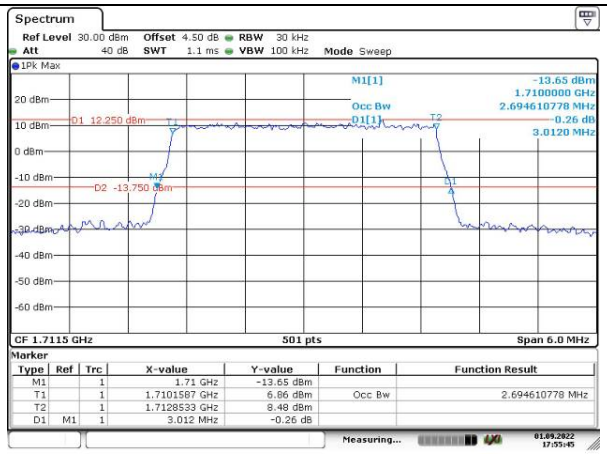
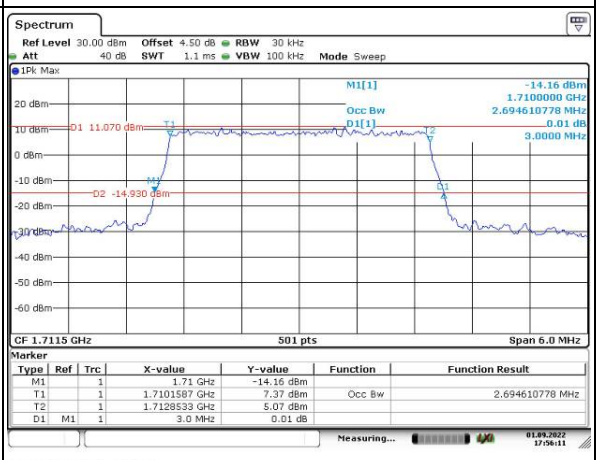
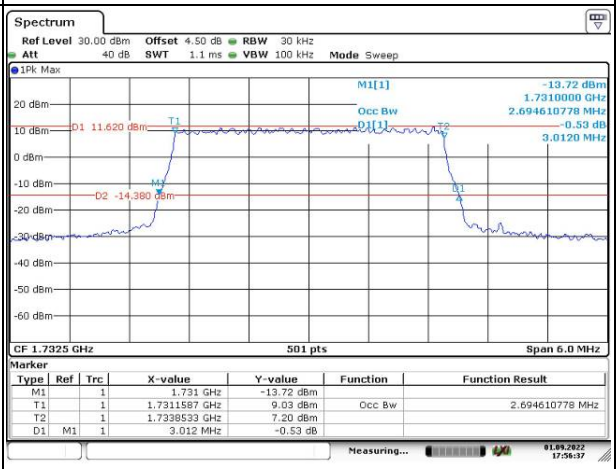
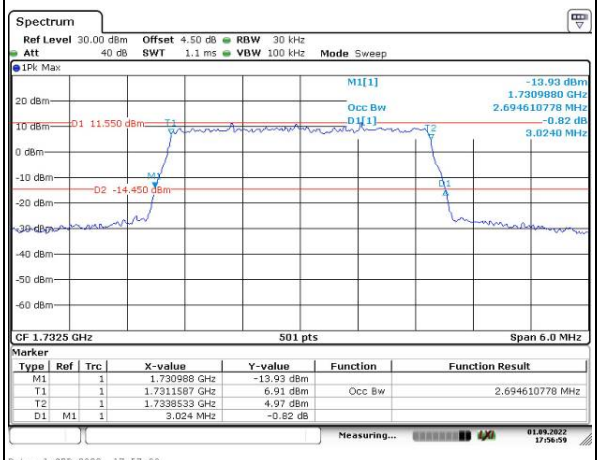
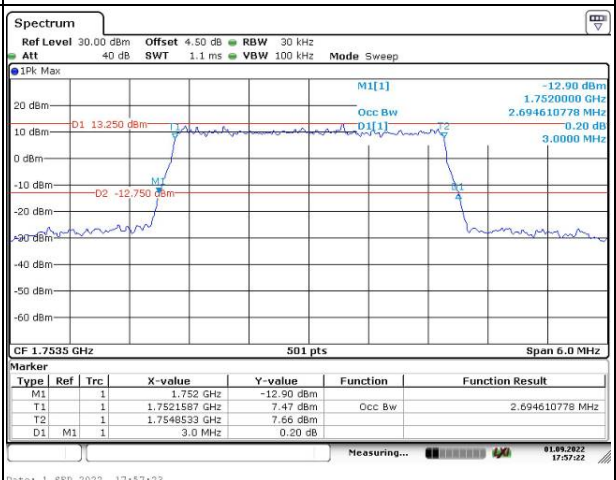
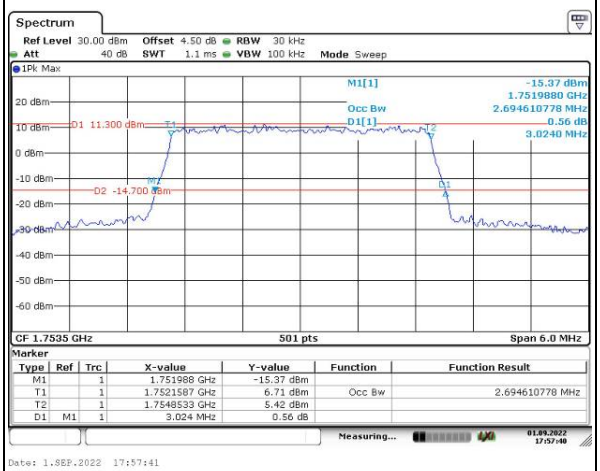
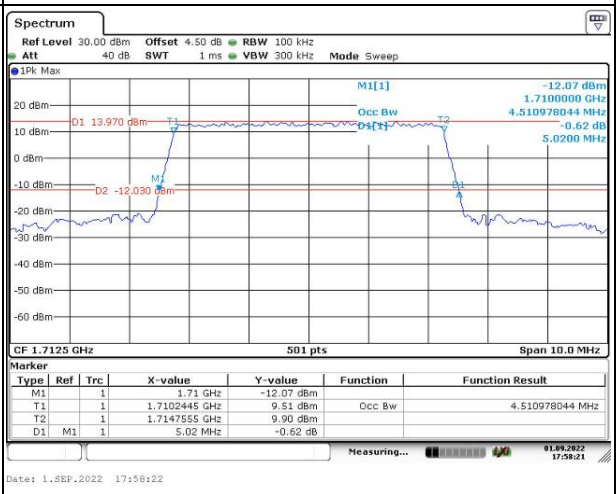
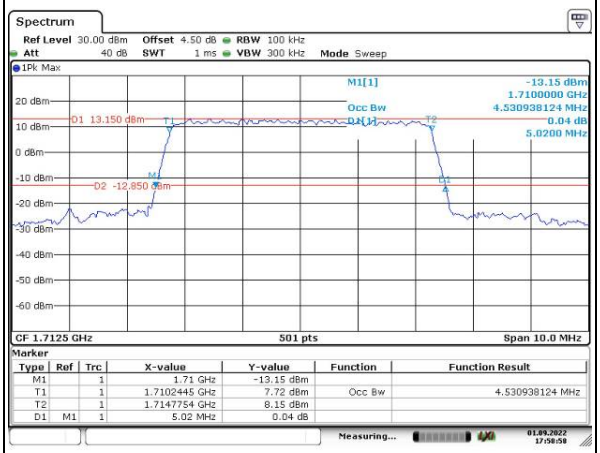
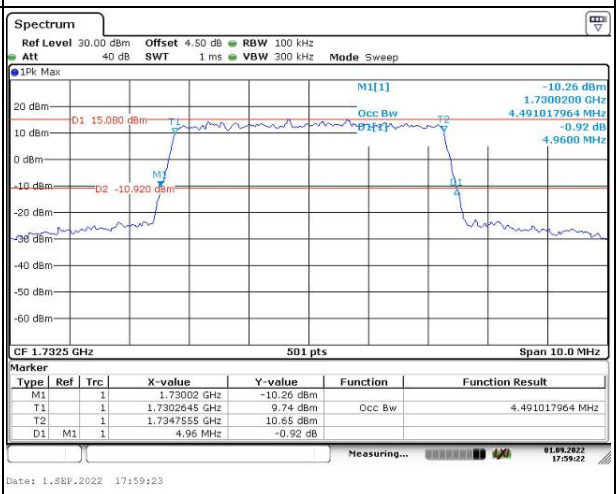
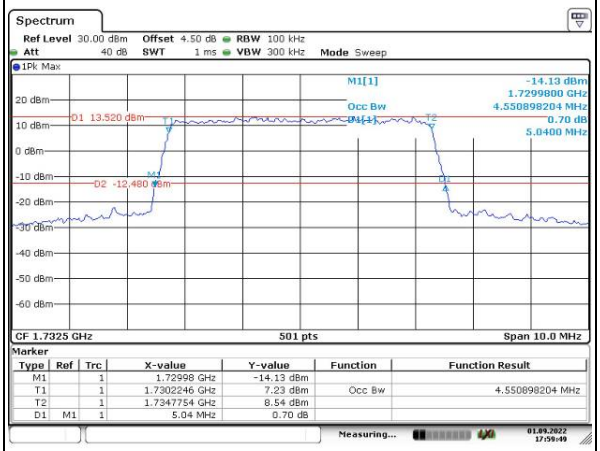
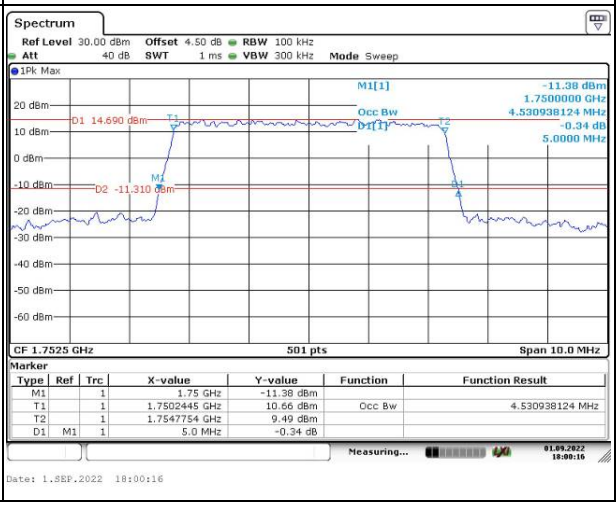
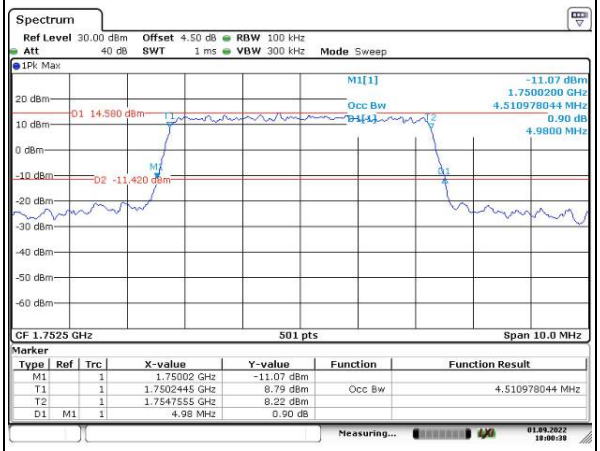
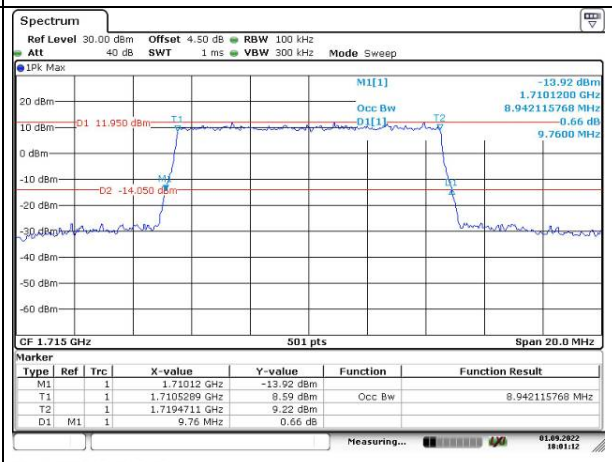
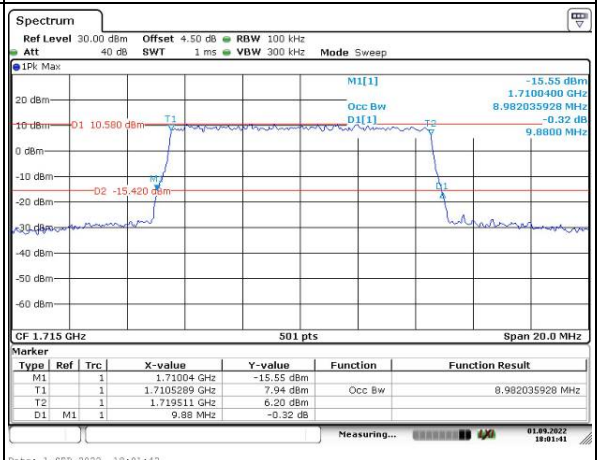
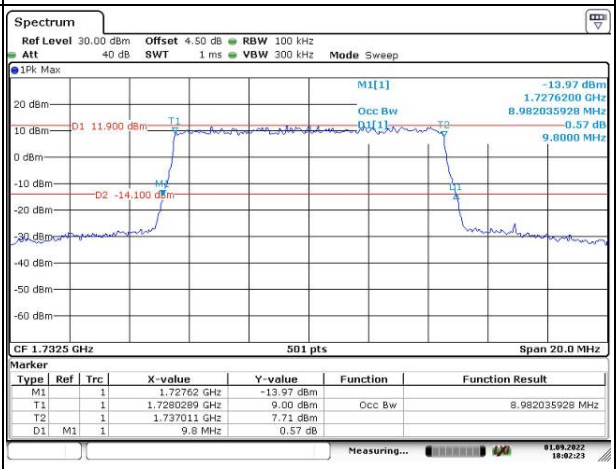
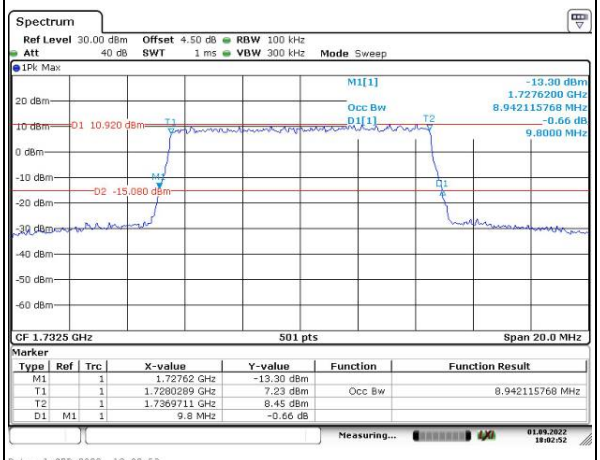
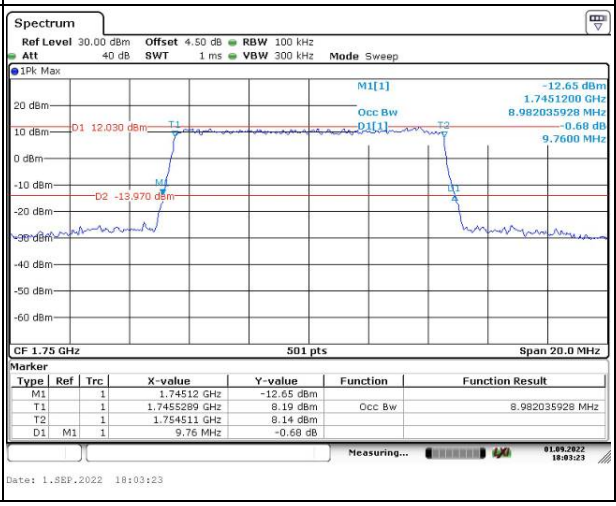
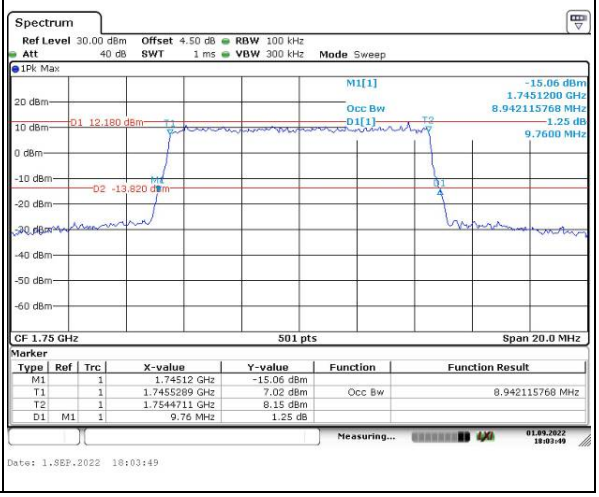
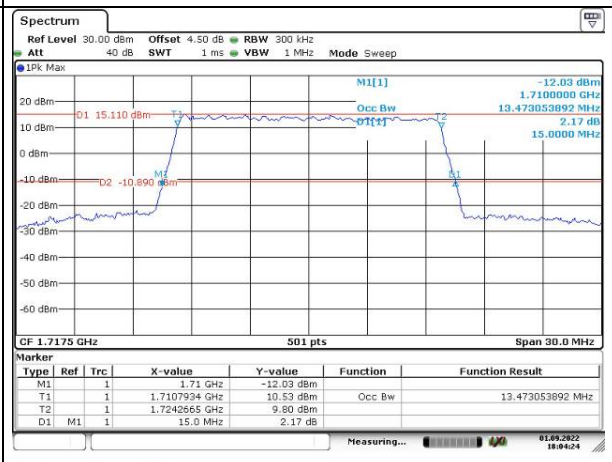
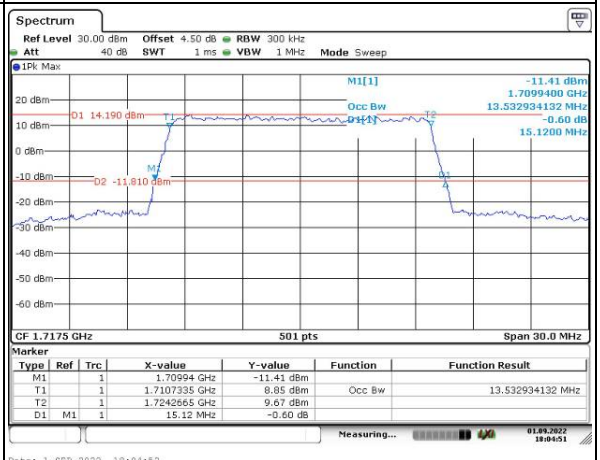
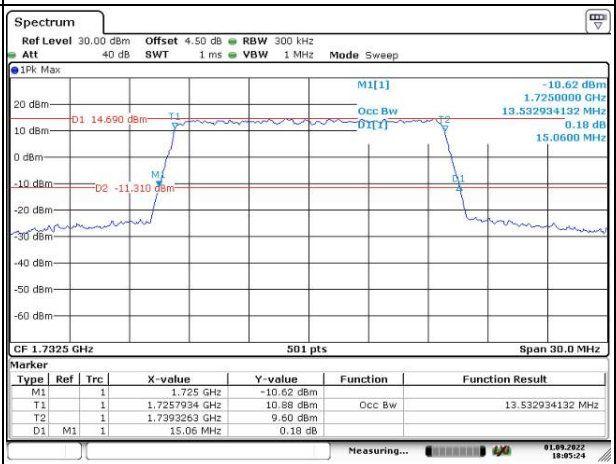
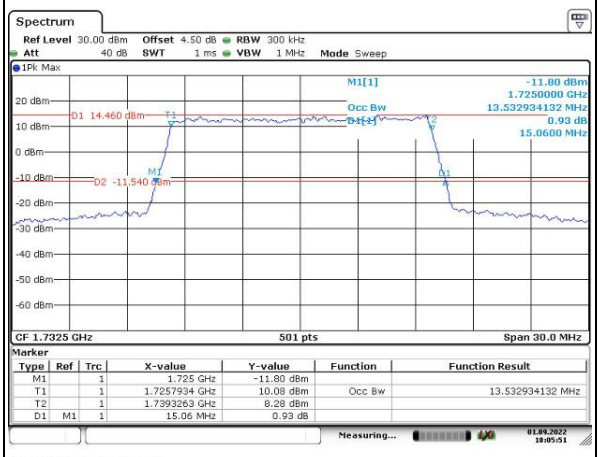
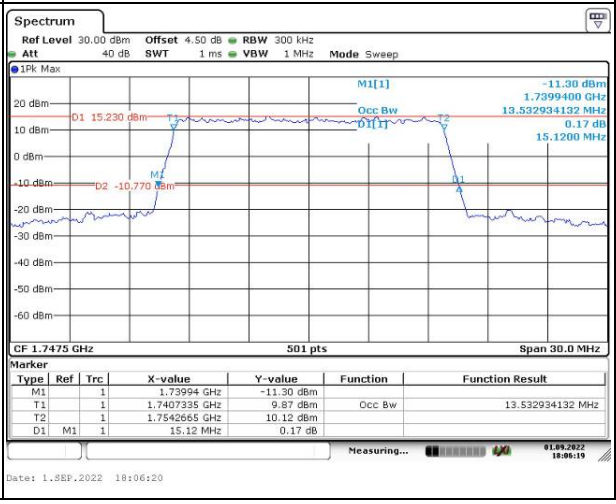
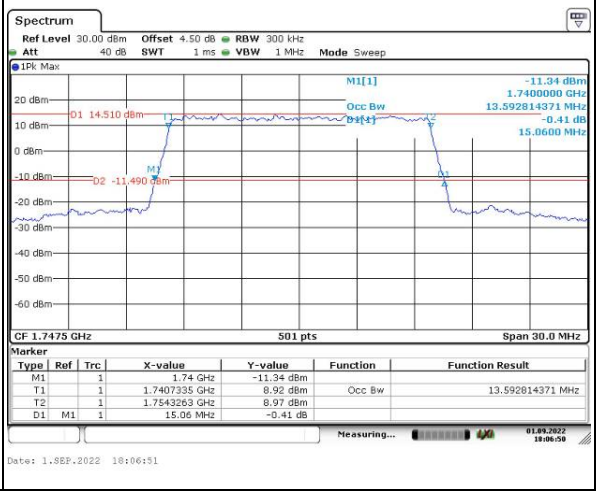
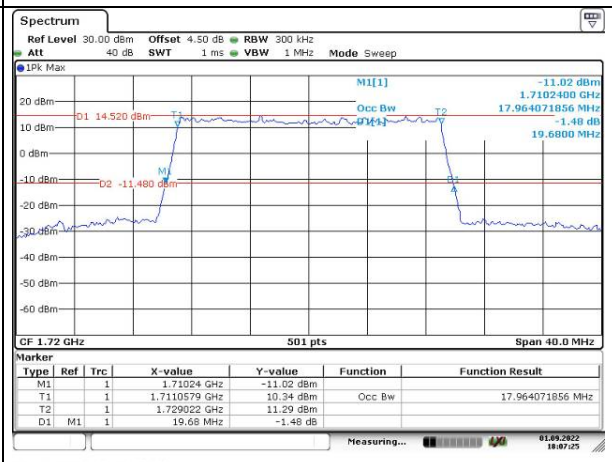
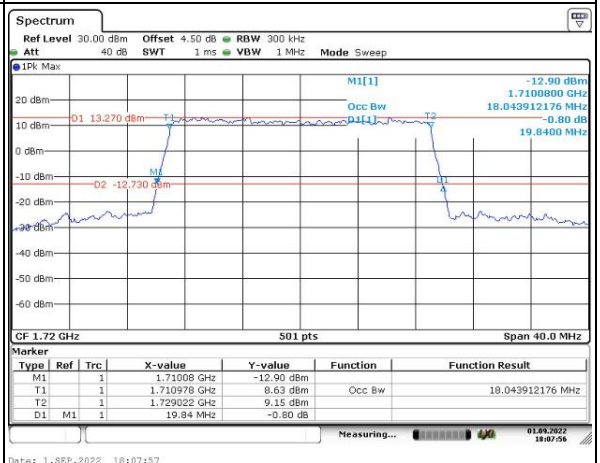
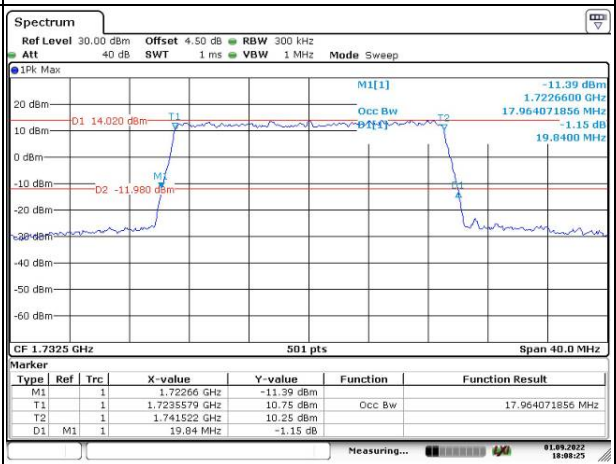
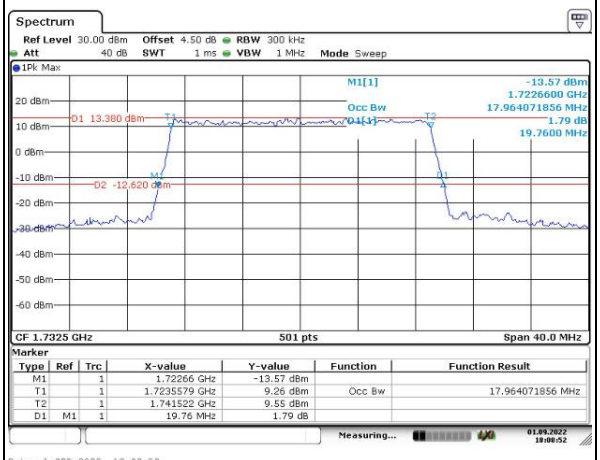
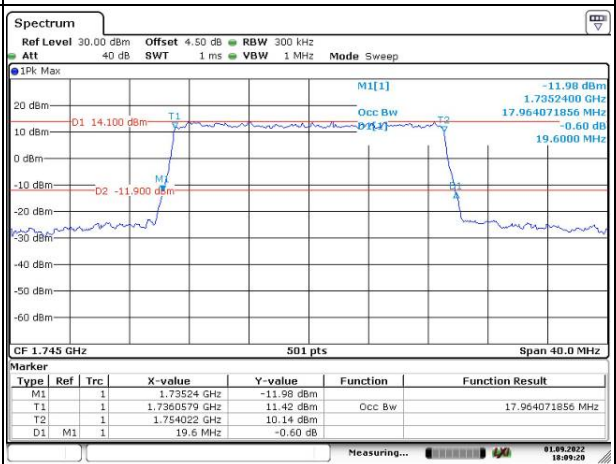
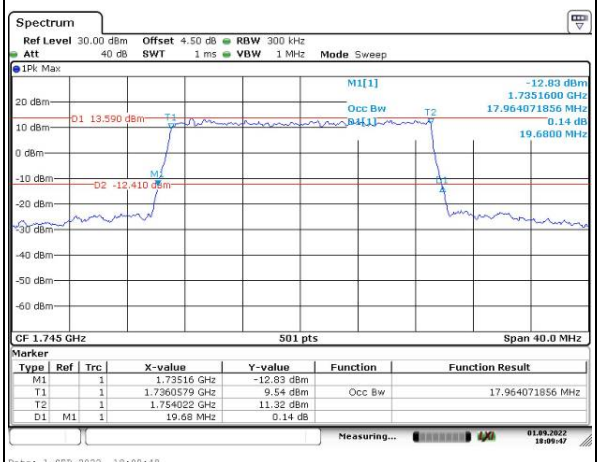
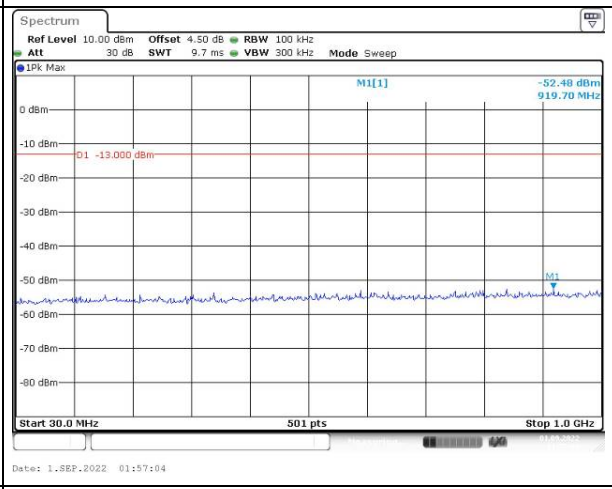
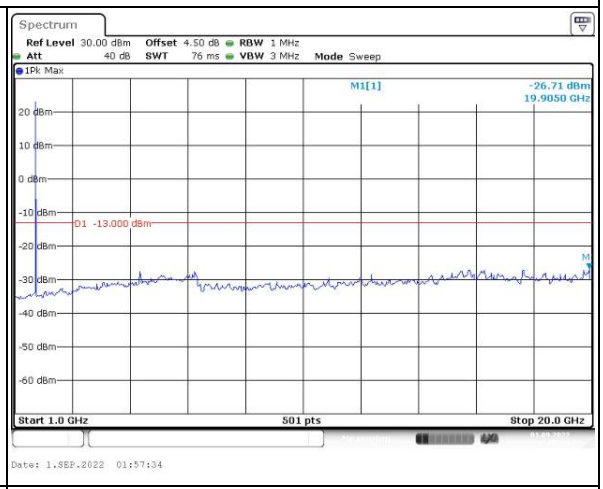
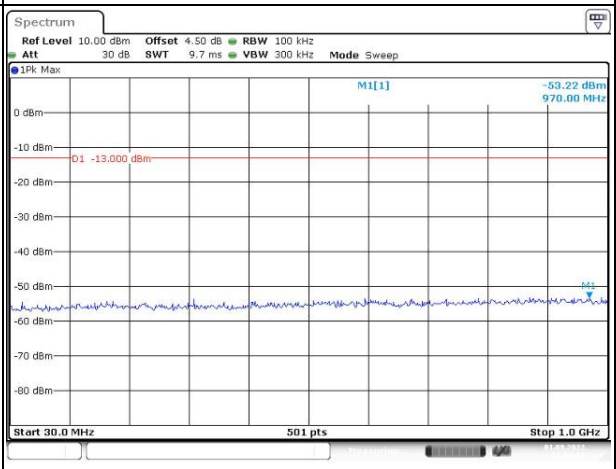
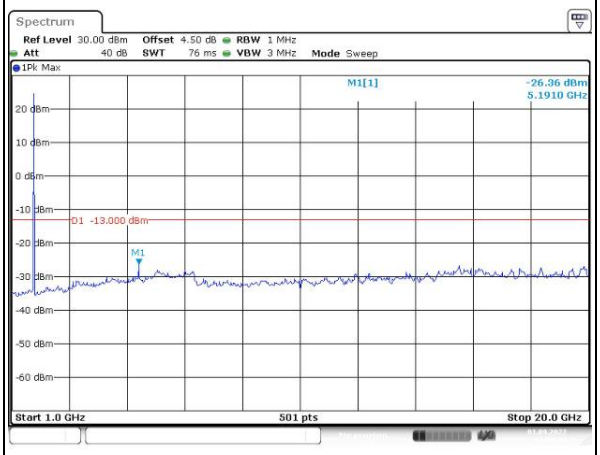
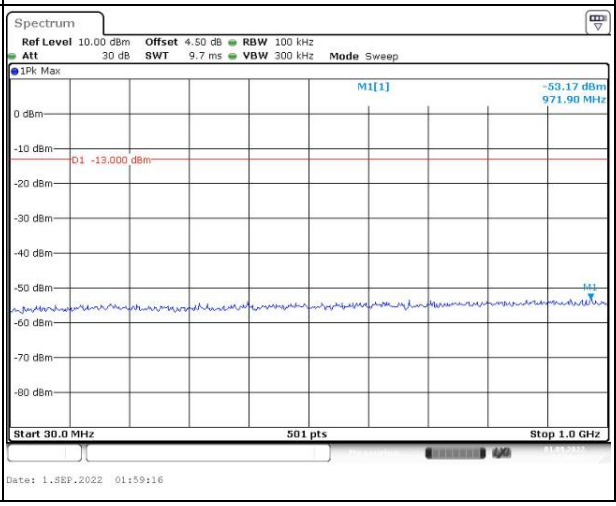
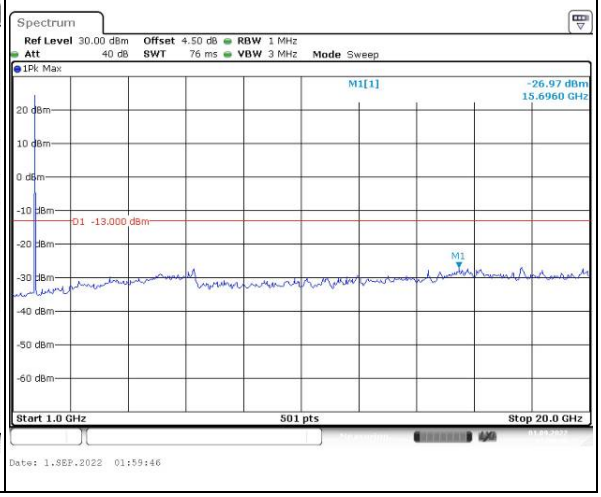
| Occupied Bandwidth | | |
|---|---|---|
| **Channel** | 3MHz Bandwidth QPSK | 3MHz Bandwidth 16QAM |
| Lowest |  |  |
| Middle |  |  |
| Highest |  |  |

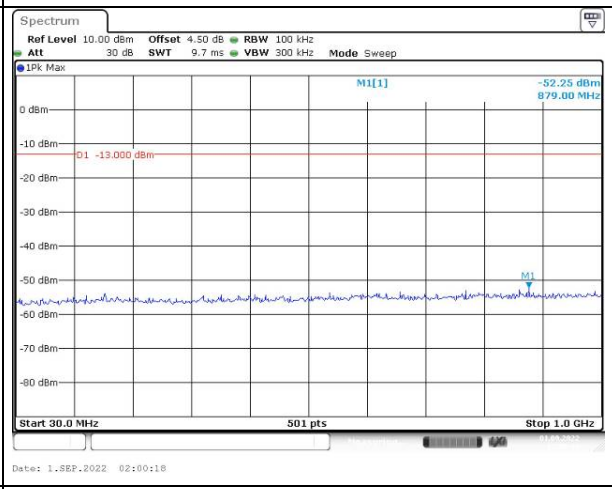
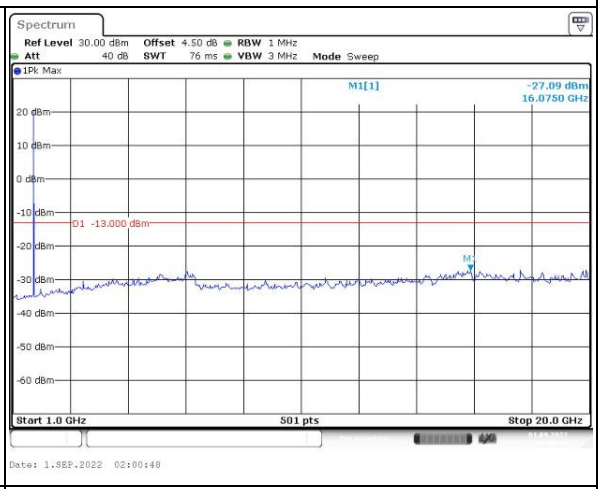
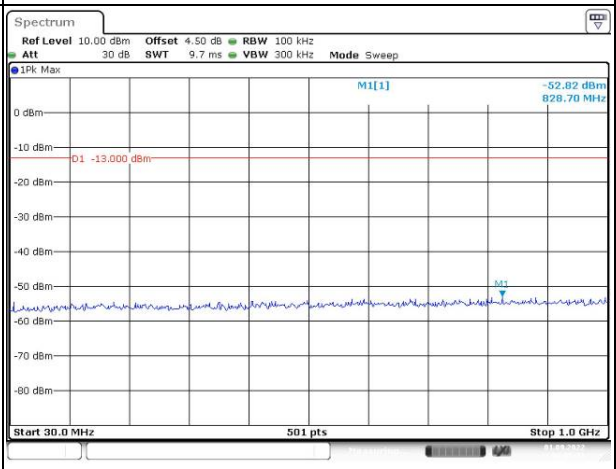
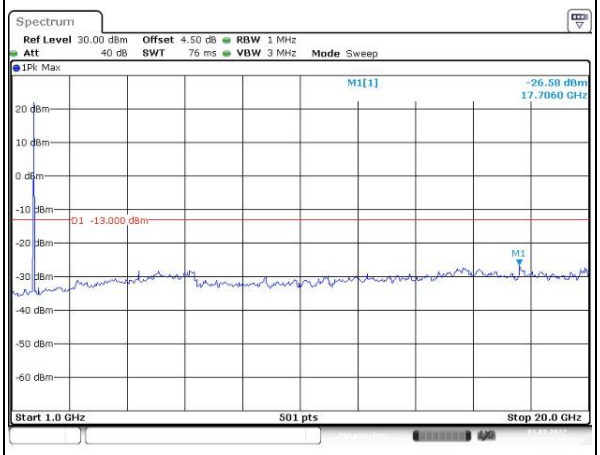
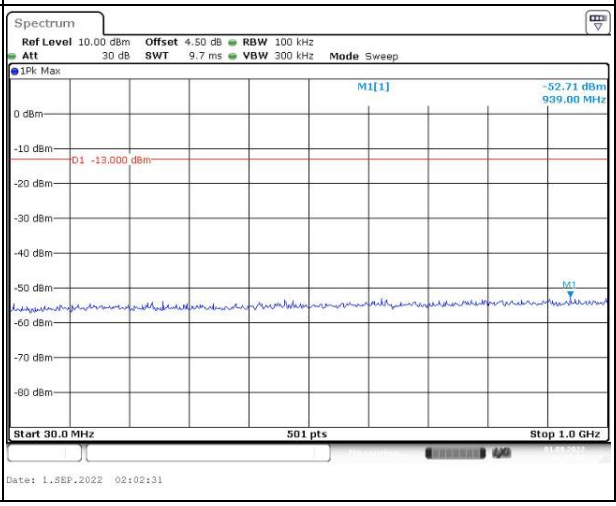
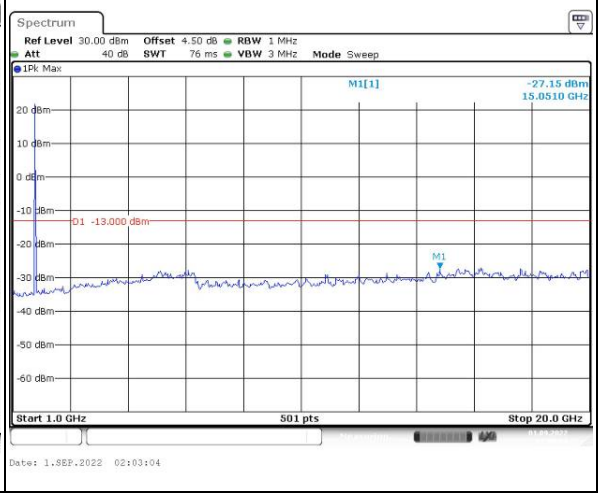
| Occupied Bandwidth | | |
|---|---|---|
| **Channel** | 5MHz Bandwidth QPSK | 5MHz Bandwidth 16QAM |
| Lowest |  |  |
| Middle |  |  |
| Highest |  |  |

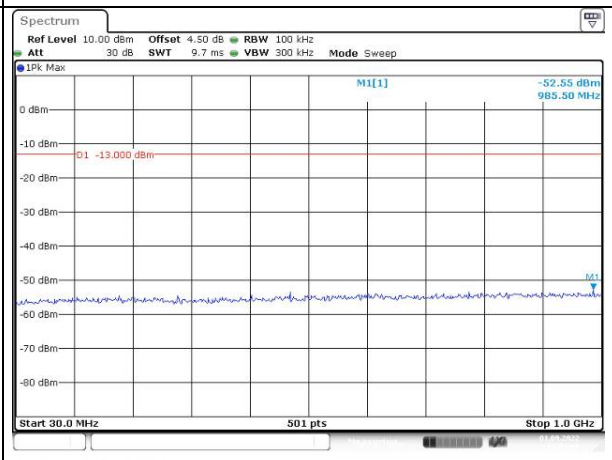
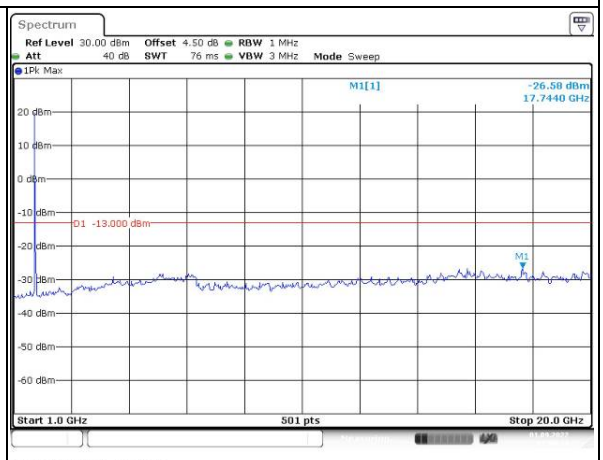
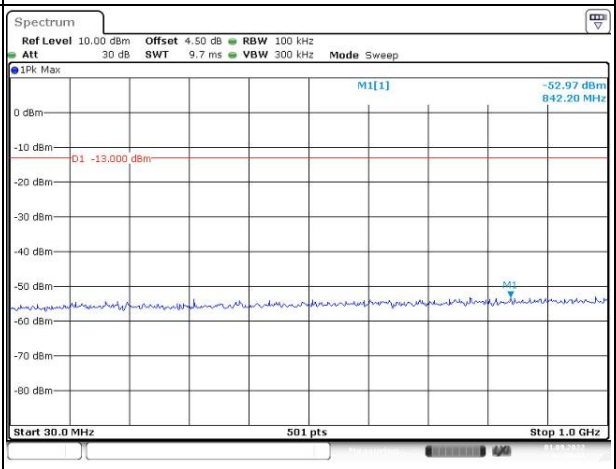
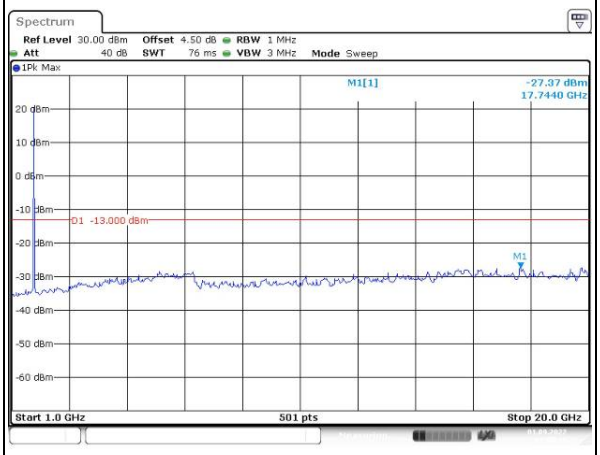
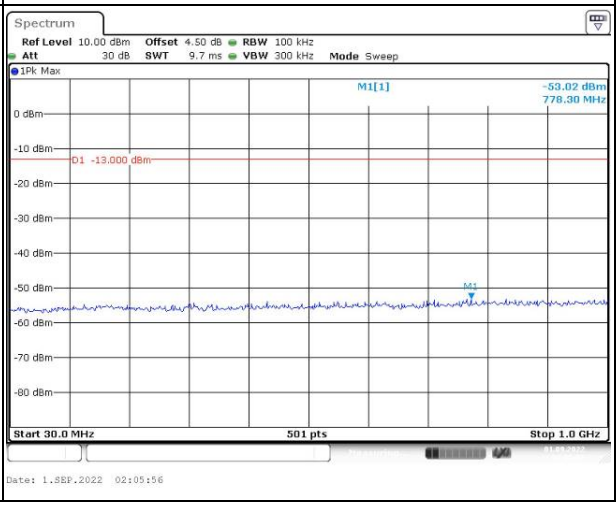
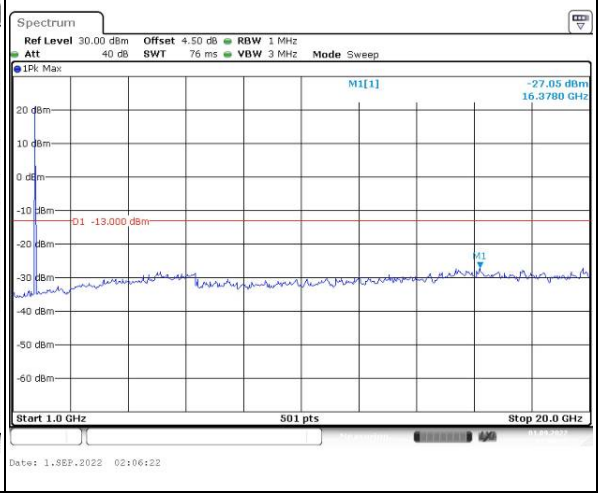
| Occupied Bandwidth | | |
|---|---|---|
| **Channel** | 10MHz Bandwidth QPSK | 10MHz Bandwidth 16QAM |
| Lowest |  |  |
| Middle |  |  |
| Highest |  |  |

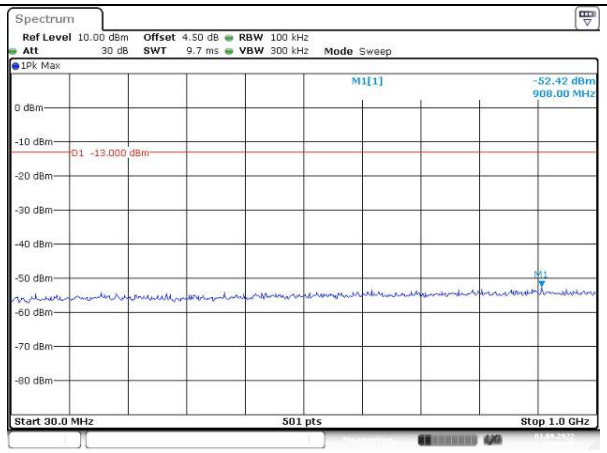
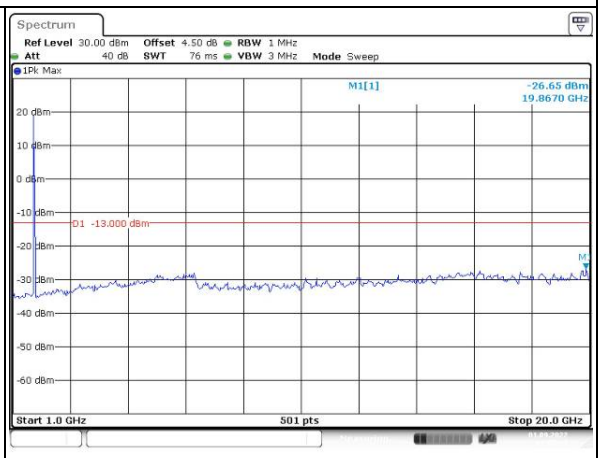
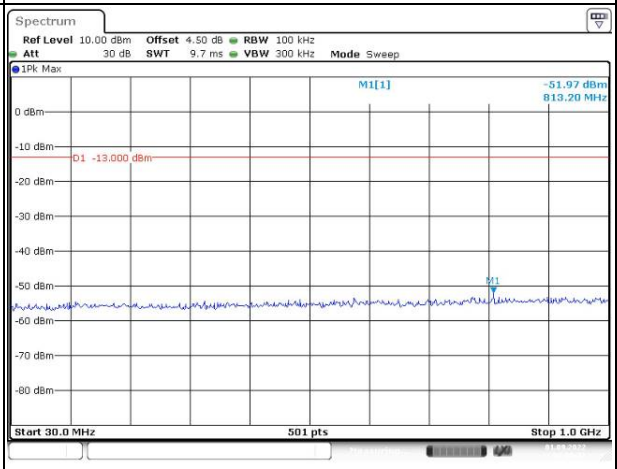
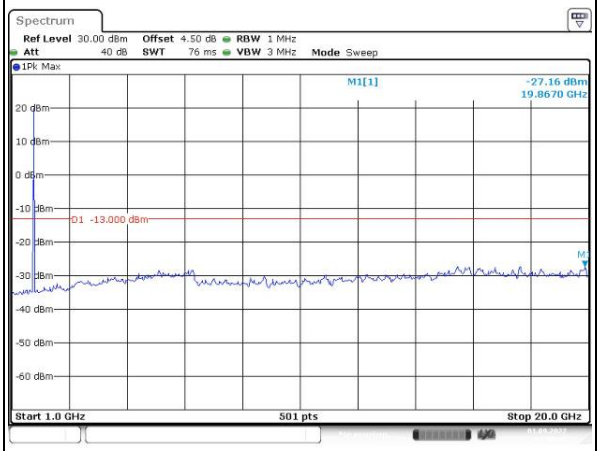
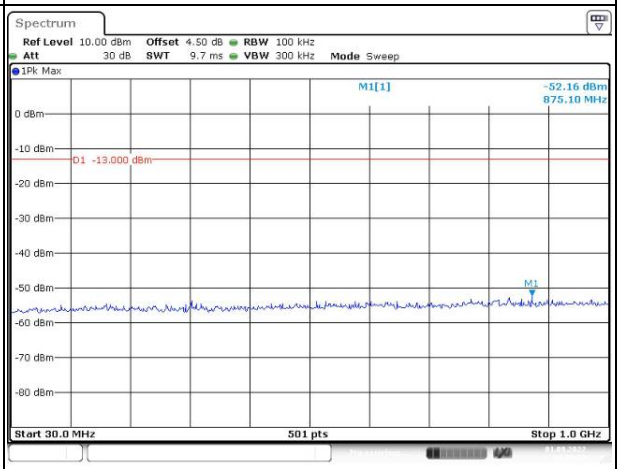
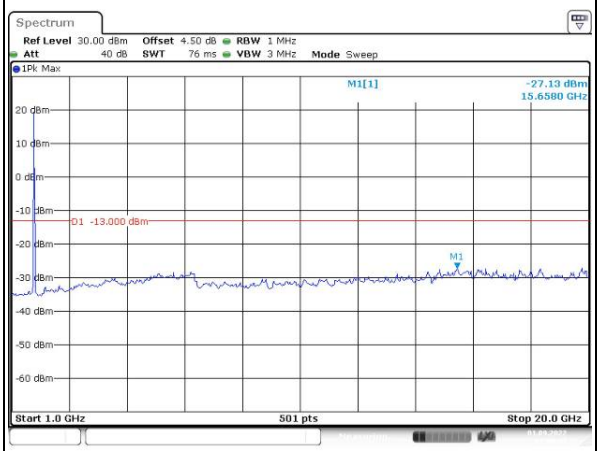
| Occupied Bandwidth | | |
|---|---|---|
| **Channel** | 15MHz Bandwidth QPSK | 15MHz Bandwidth 16QAM |
| Lowest |  |  |
| Middle |  |  |
| Highest |  |  |

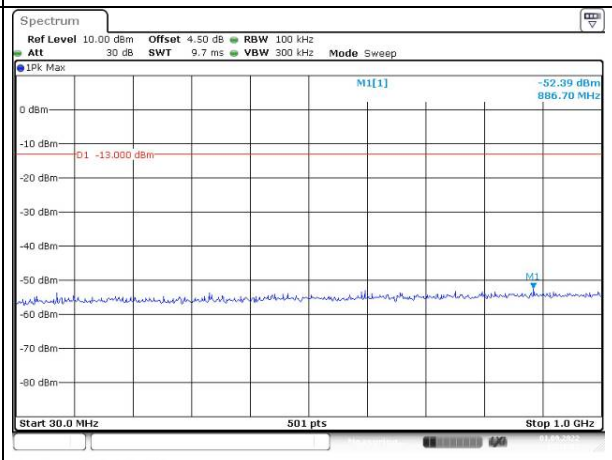
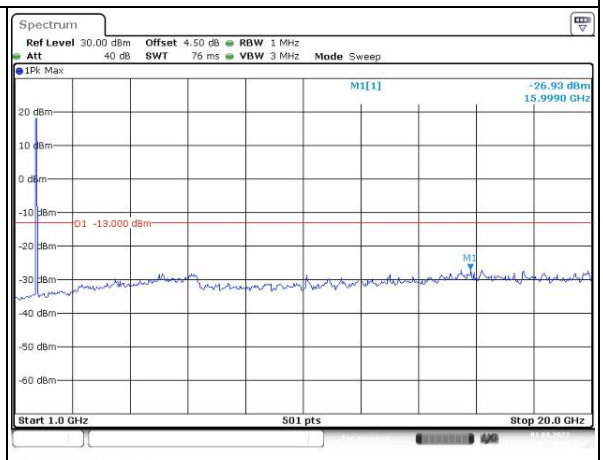
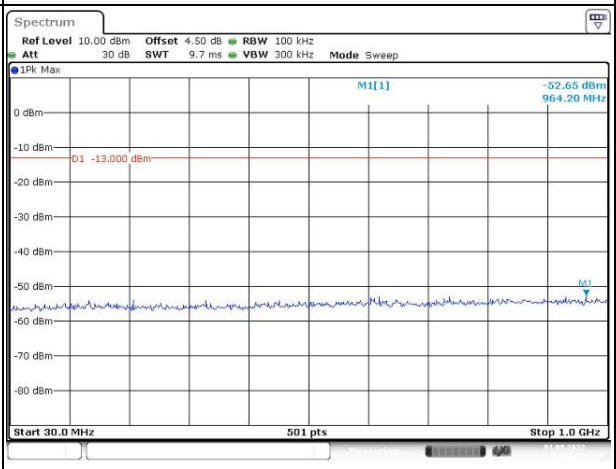
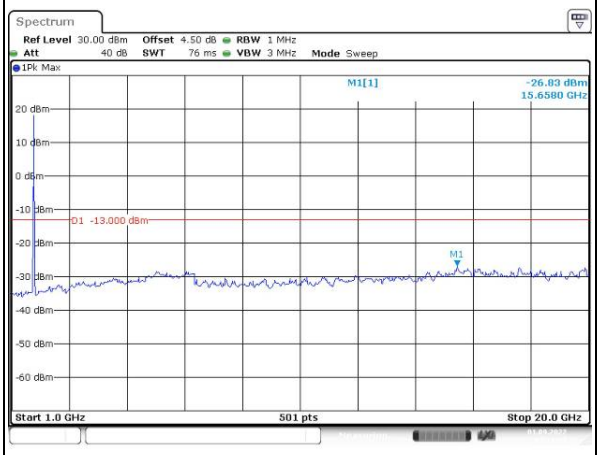
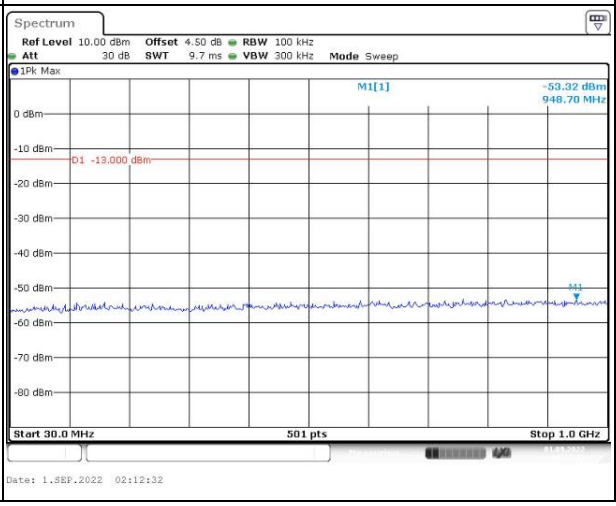
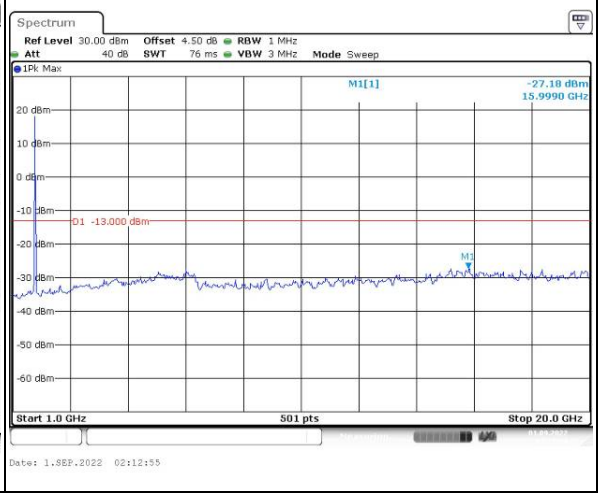
| Occupied Bandwidth | | |
|---|---|---|
| **Channel** | 20MHz Bandwidth QPSK | 20MHz Bandwidth 16QAM |
| Lowest |  |  |
| Middle |  |  |
| Highest |  |  |

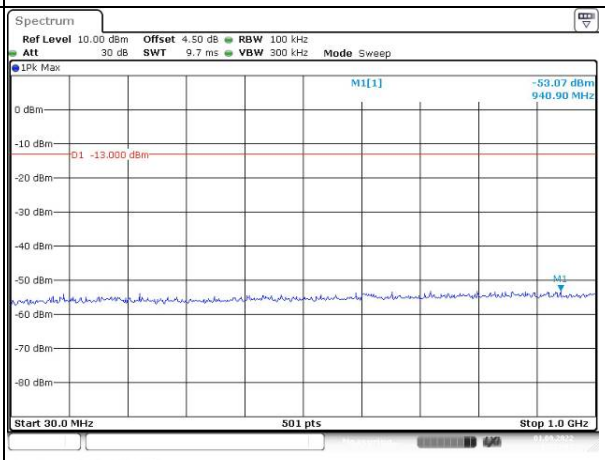
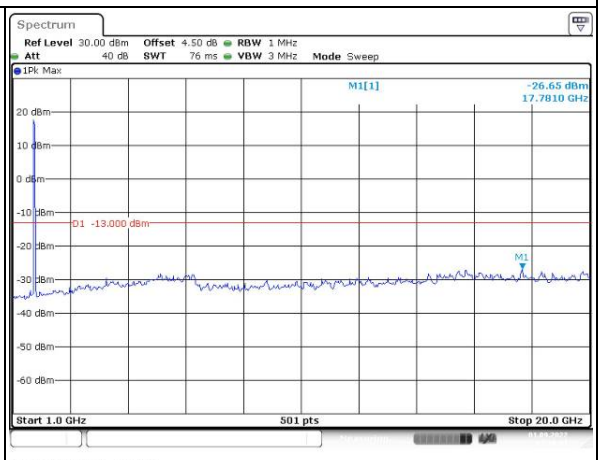
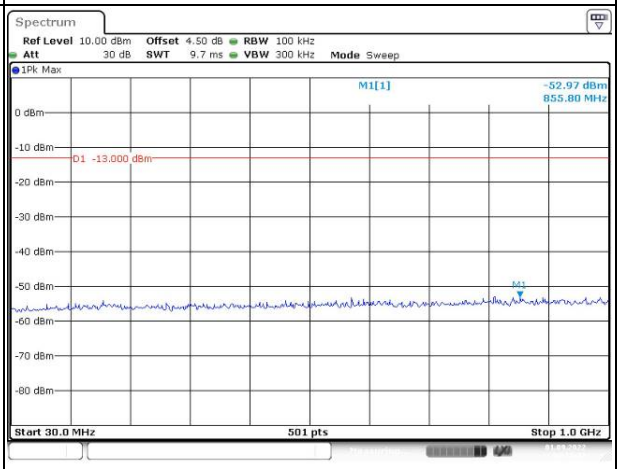
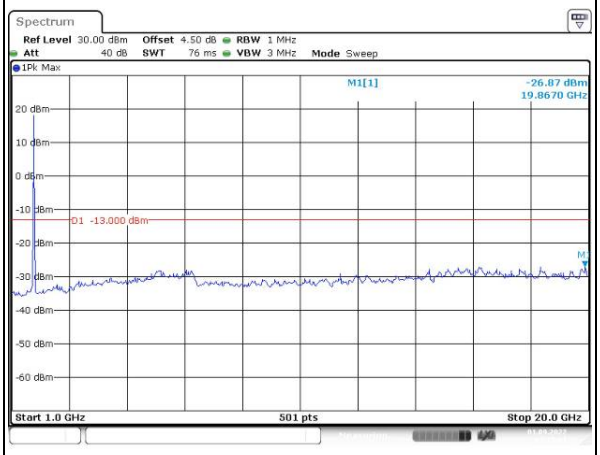
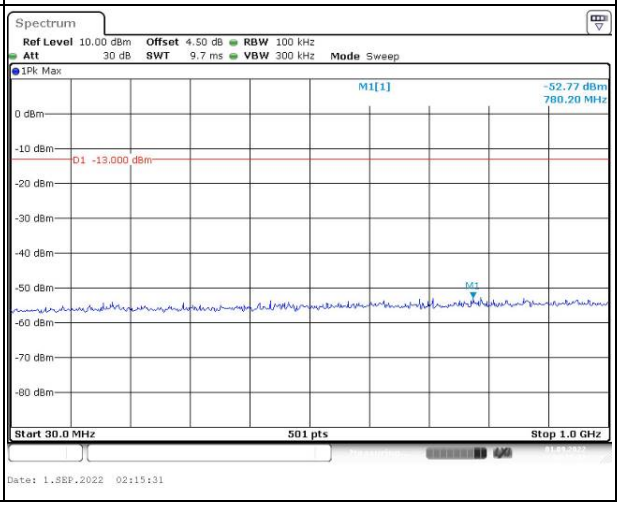
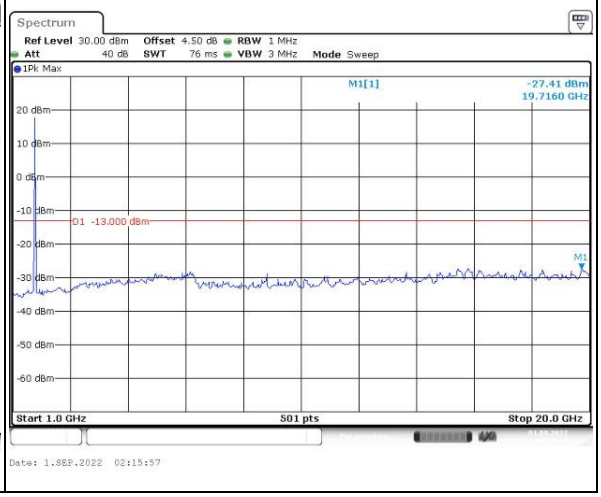
| Spurious Emissions at Antenna Terminal | | |
|---|---|---|
| **Channel** | **1.4MHz Bandwidth QPSK** | |
| Lowest |  |  |
| Middle |  |  |
| Highest |  |  |

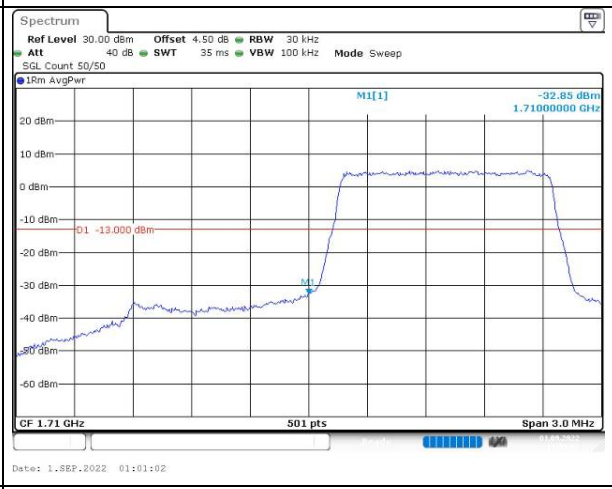
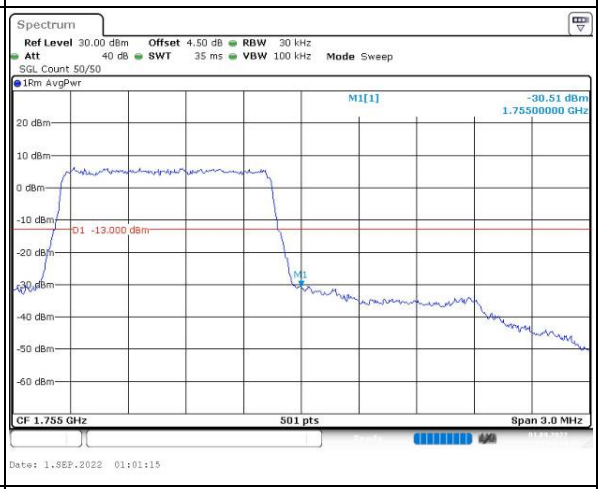
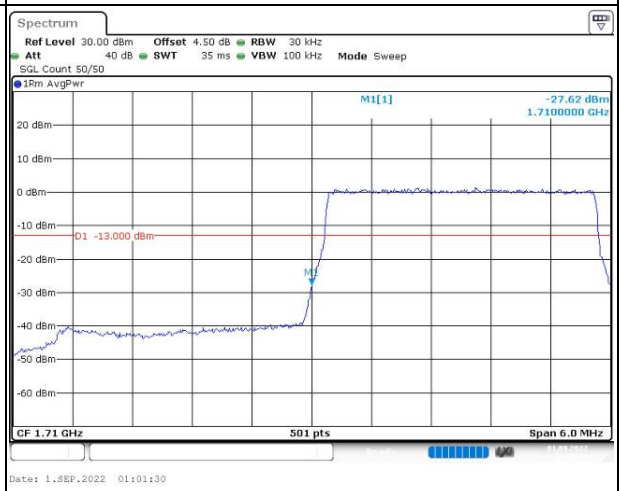
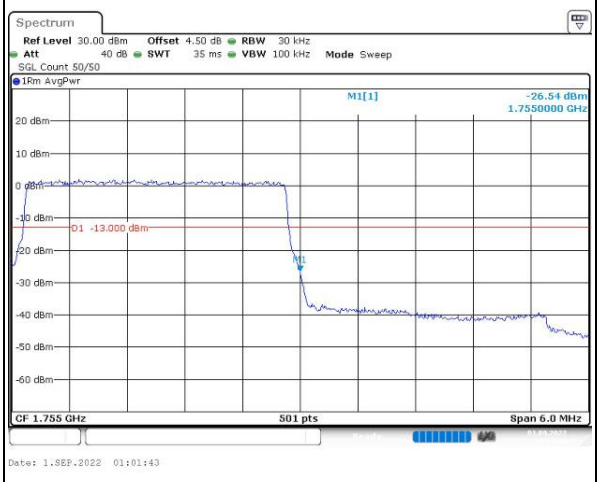
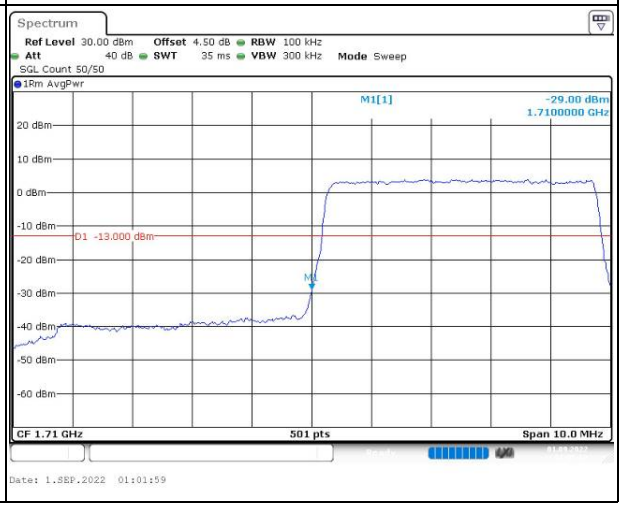
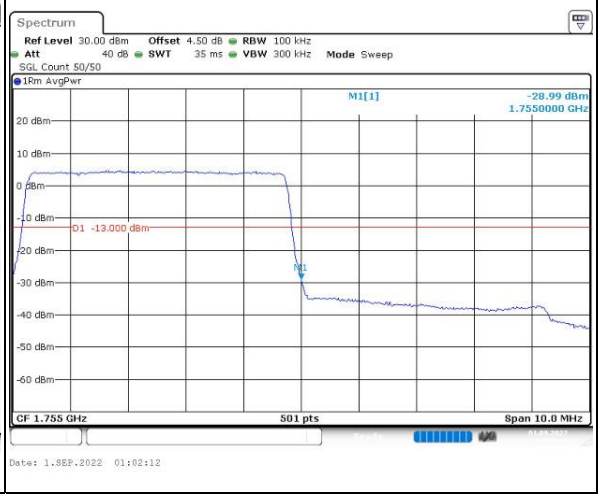
| Spurious Emissions at Antenna Terminal | | |
|---|---|---|
| **Channel** | **3MHz Bandwidth QPSK** | |
| Lowest |  |  |
| Middle |  |  |
| Highest |  |  |

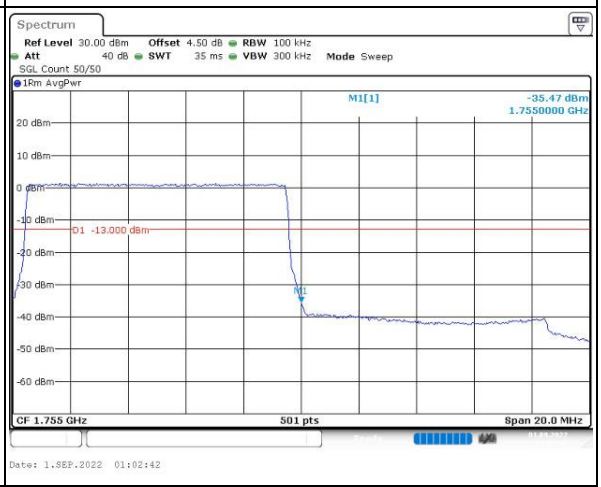
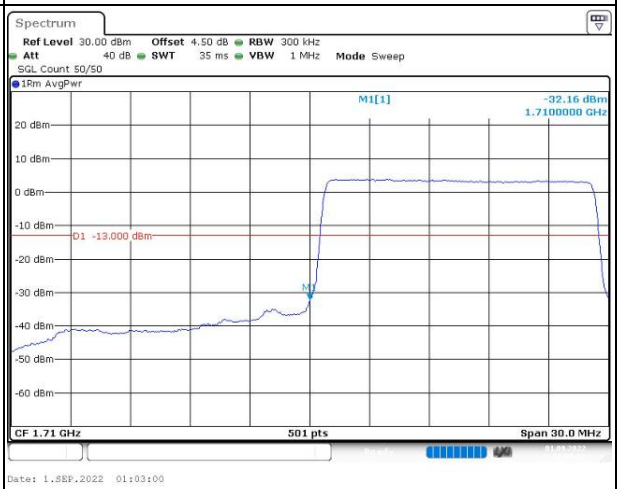
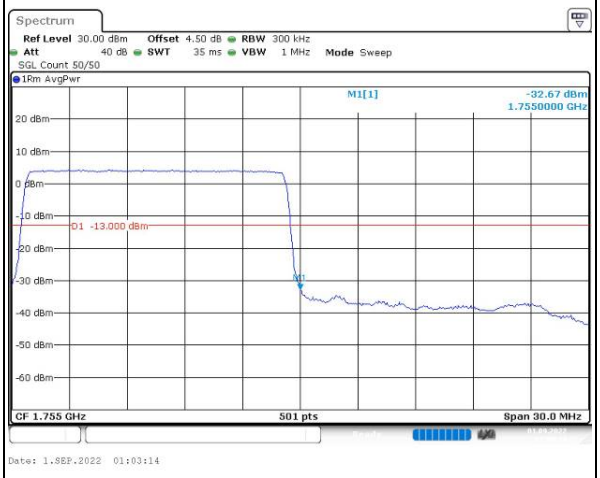
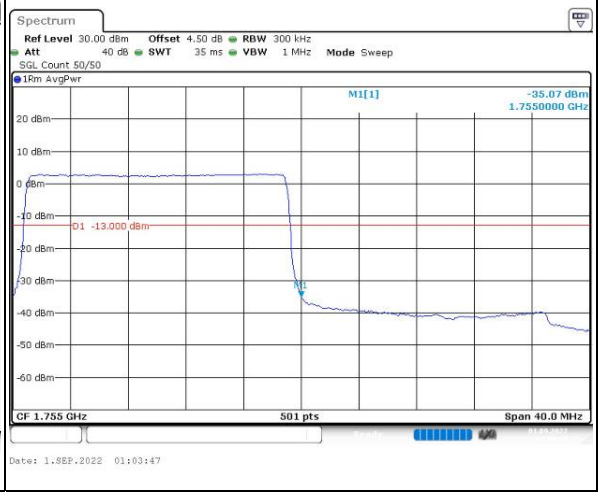
| Spurious Emissions at Antenna Terminal | | |
|---|---|---|
| **Channel** | **5MHz Bandwidth QPSK** | |
| Lowest |  |  |
| Middle |  |  |
| Highest |  |  |

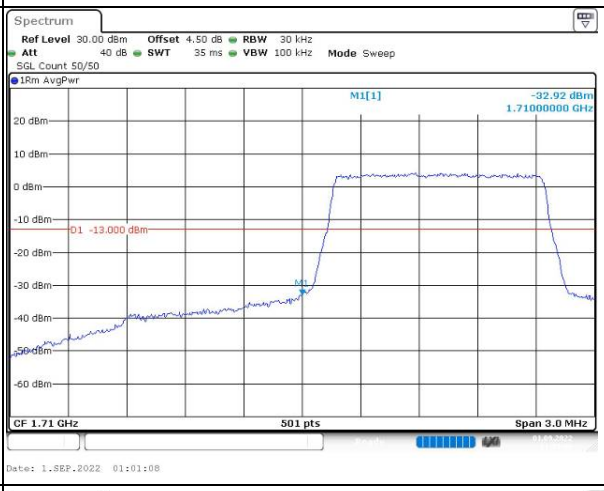
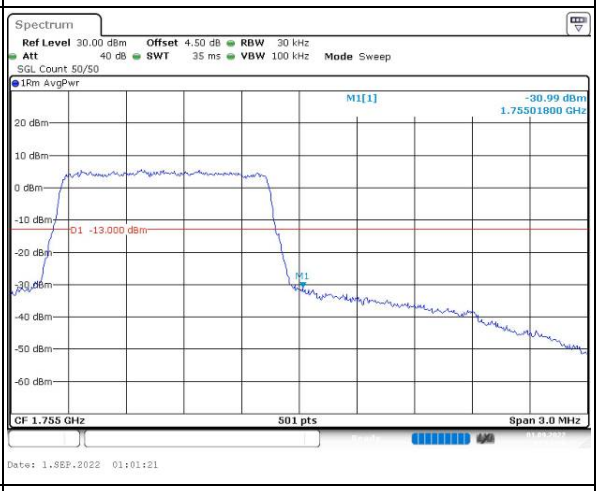
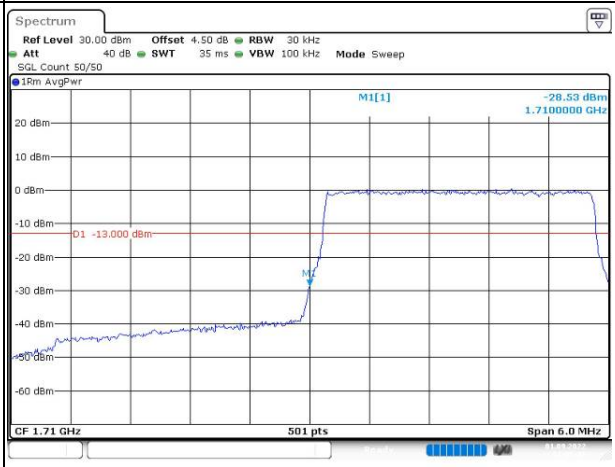
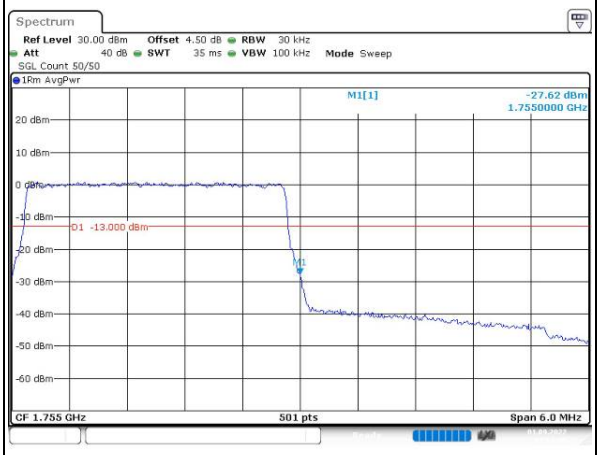
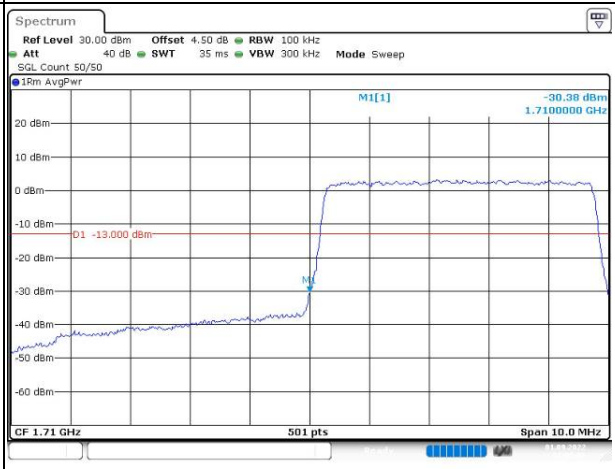
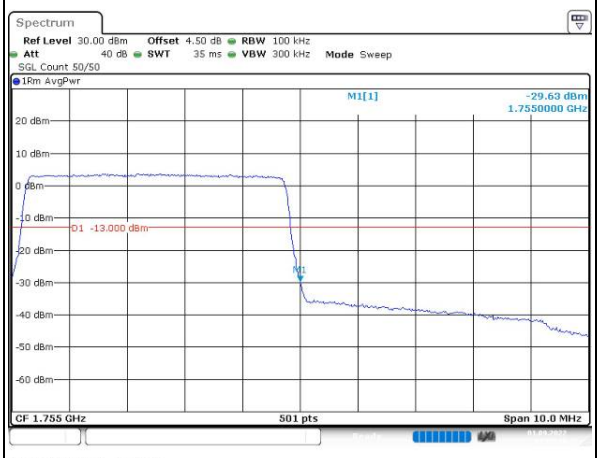
| Spurious Emissions at Antenna Terminal | | |
|---|---|---|
| **Channel** | **10MHz Bandwidth QPSK** | |
| Lowest |  |  |
| Middle |  |  |
| Highest |  |  |

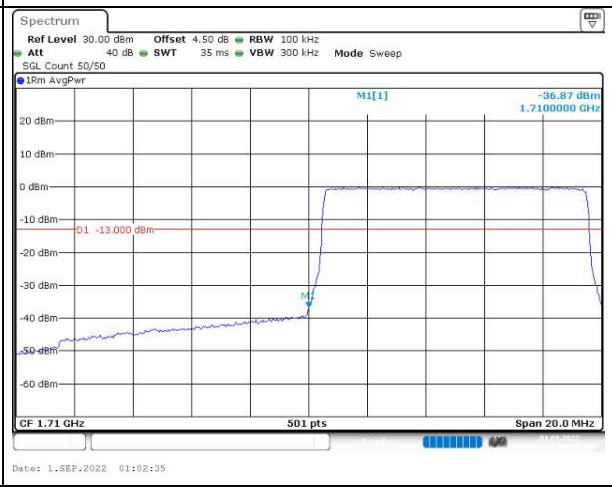
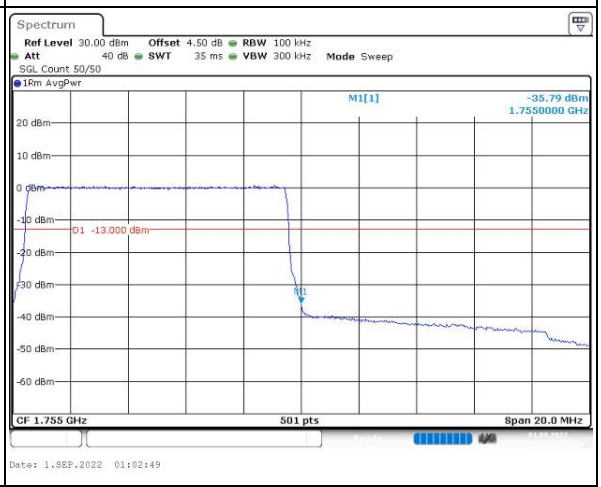
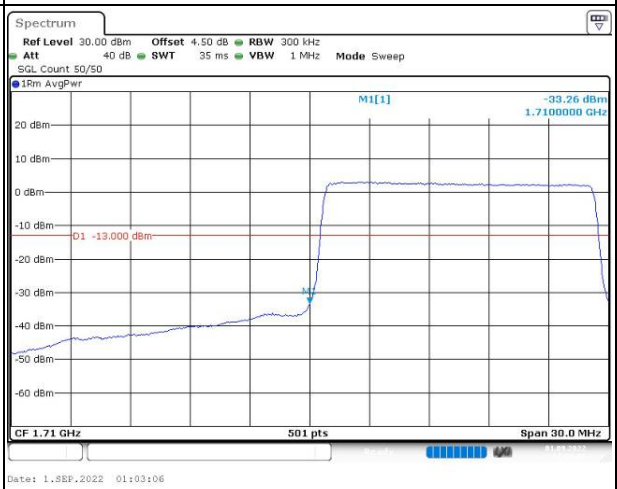
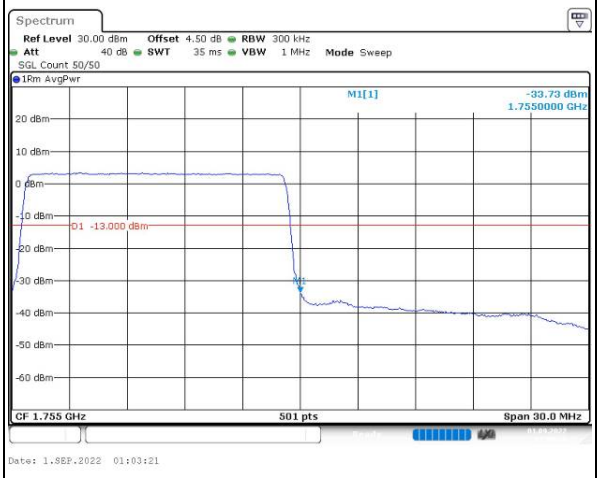
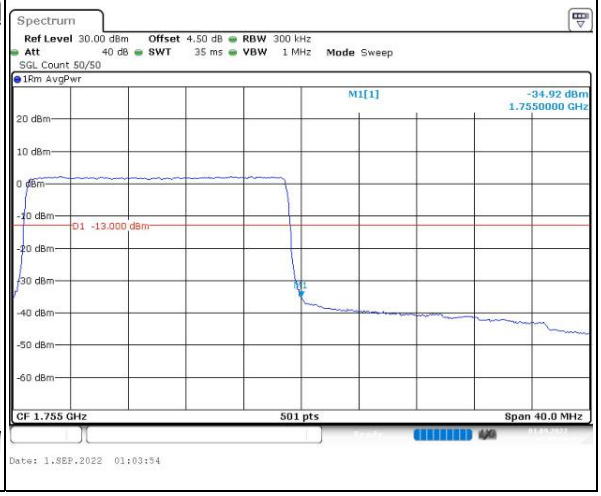
| Spurious Emissions at Antenna Terminal | | |
|---|---|---|
| **Channel** | **15MHz Bandwidth QPSK** | |
| Lowest |  |  |
| Middle |  |  |
| Highest |  |  |

| Spurious Emissions at Antenna Terminal | | |
|---|---|---|
| **Channel** | **20MHz Bandwidth QPSK** | |
| Lowest |  |  |
| Middle |  |  |
| Highest |  |  |

| Out of band emission, Band Edge | | |
|---|---|---|
| **Mode** | **Lowest** | **Highest** |
| QPSK 1.4MHz |  |  |
| QPSK 3MHz |  |  |
| QPSK 5MHz |  |  |

| Out of band emission, Band Edge | | |
|---|---|---|
| **Mode** | **Lowest** | **Highest** |
| QPSK 10MHz |  |  |
| QPSK 15MHz |  |  |
| QPSK 20MHz |  |  |

| Out of band emission, Band Edge | | |
|---|---|---|
| **Mode** | **Lowest** | **Highest** |
| 16QAM 1.4MHz |  |  |
| 16QAM 3MHz |  |  |
| 16QAM 5MHz |  |  |

| Out of band emission, Band Edge | | |
|---|---|---|
| **Mode** | **Lowest** | **Highest** |
| 16QAM 10MHz |  |  |
| 16QAM 15MHz |  |  |
| 16QAM 20MHz |  |  |

## 4.8 Antenna Port Test Data and Results for LTE Band 5

| | | | |
|---|---|---|---|
| Serial Number: | CR22080045-RF-S1 | Test Date: | 2022-08-31~2022-09-02 |
| Test Site: | RF | Test Mode: | Transmitting |
| Tester: | George Chen | Test Result: | **Pass** |

| **Environmental Conditions:** | | | | | |
|---|---|---|---|---|---|
| Temperature: (℃) | 25.2~25.9 | Relative Humidity: (%) | 53~61 | ATM Pressure: (kPa) | 100.1~100.6 |

**Test Equipment List and Details:**

| Manufacturer | Description | Model | Serial Number | Calibration Date | Calibration Due Date |
|---|---|---|---|---|---|
| R&S | Spectrum Analyzer | FSV40 | 101474 | 2022-07-15 | 2023-07-14 |
| zhuoxiang | Coaxial Cable | SMA-178 | 211001 | Each time | N/A |
| Unknown | Coaxial tee connector | Unknown | 2204004 | Each time | N/A |
| YINSAIGE | Coaxial Cable | SS402 | SJ0100001 | Each time | N/A |
| Mini-Circuits | DC Block | BLK-18-S+ | 1554403 | Each time | N/A |
| R&S | Wideband Radio Communication Tester | CMW500 | 149218 | 2022-07-15 | 2023-07-14 |
| 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 |
| ZHAOXIN | DC Power Supply | RXN-6010D | 21R6010D0912386 | N/A | 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 5▲:** | | | | | |
|---|---|---|---|---|---|
| Antenna Gain (dBi): | 0.43 | Antenna Gain (dBd): | -1.72 | Path Loss $L_C$ (dB): | 0.2 |
| Operation Voltage($V_{DC}$): | | | | | |
| Lowest: | 3.5 | Normal: | 3.8 | Highest: | 4.35 |

**Test Frequency For Each Mode:**

| Operation Bandwidth | Lowest Frequency (MHz) | Middle Frequency (MHz) | Highest Frequency (MHz) |
|---|---|---|---|
| 1.4MHz | 824.7 | 836.5 | 848.3 |
| 3MHz | 825.5 | 836.5 | 847.5 |
| 5MHz | 826.5 | 836.5 | 846.5 |
| 10MHz | 829 | 836.5 | 844 |

**Test Data:**

**FCC§2.1046;§ 22.913 (a)**

**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 | 22.89 | 22.87 | 23.03 | 21.12 | 38.45 |
| | RB1#3 | 22.89 | 22.98 | 23.02 | | |
| | RB1#5 | 22.88 | 22.94 | 23.04 | | |
| | RB3#0 | 22.98 | 22.86 | 22.99 | | |
| | RB3#3 | 23 | 22.94 | 22.99 | | |
| | RB6#0 | 21.85 | 21.69 | 21.89 | | |
| 1.4MHz 16QAM | RB1#0 | 22.52 | 21.2 | 22.65 | 20.73 | 38.45 |
| | RB1#3 | 22.48 | 21.34 | 22.36 | | |
| | RB1#5 | 22.45 | 21.28 | 22.37 | | |
| | RB3#0 | 21.93 | 21.85 | 22.17 | | |
| | RB3#3 | 21.83 | 21.74 | 21.88 | | |
| | RB6#0 | 20.69 | 21.44 | 21.09 | | |
| 3MHz QPSK | RB1#0 | 22.93 | 22.92 | 22.95 | 21.29 | 38.45 |
| | RB1#8 | 22.75 | 23.04 | 23.19 | | |
| | RB1#14 | 22.88 | 23.03 | 23.21 | | |
| | RB6#0 | 22.02 | 21.87 | 22.08 | | |
| | RB6#9 | 21.9 | 21.93 | 22.07 | | |
| | RB15#0 | 21.7 | 21.92 | 22.14 | | |
| 3MHz 16QAM | RB1#0 | 22.64 | 21.48 | 22.25 | 20.72 | 38.45 |
| | RB1#8 | 22.39 | 21.49 | 22.46 | | |
| | RB1#14 | 22.43 | 21.45 | 22.35 | | |
| | RB6#0 | 20.76 | 21.09 | 21.05 | | |
| | RB6#9 | 21.1 | 21.59 | 21.12 | | |
| | RB15#0 | 20.69 | 21.48 | 21.22 | | |
| 5MHz QPSK | RB1#0 | 22.9 | 22.92 | 22.9 | 21.25 | 38.45 |
| | RB1#13 | 22.91 | 22.96 | 22.93 | | |
| | RB1#24 | 22.91 | 23.04 | 23.17 | | |
| | RB15#0 | 21.87 | 21.87 | 22 | | |
| | RB15#10 | 21.57 | 22.01 | 22.08 | | |
| | RB25#0 | 21.67 | 22.02 | 22.04 | | |
| 5MHz 16QAM | RB1#0 | 21.97 | 21.55 | 21.03 | 20.05 | 38.45 |
| | RB1#13 | 21.88 | 21.54 | 21.13 | | |
| | RB1#24 | 21.95 | 21.72 | 21.23 | | |
| | RB15#0 | 20.43 | 20.89 | 21.05 | | |
| | RB15#10 | 20.75 | 21.43 | 21.24 | | |
| | RB25#0 | 21.02 | 21.29 | 21.1 | | |
| 10MHz QPSK | RB1#0 | 23.08 | 22.81 | 22.9 | 21.18 | 38.45 |
| | RB1#25 | 23 | 23.1 | 22.99 | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | RB1#49 | 23.05 | 22.99 | 23.06 | | |
| | RB25#0 | 21.8 | 22.05 | 21.91 | | |
| | RB25#25 | 22.03 | 21.93 | 22.04 | | |
| | RB50#0 | 21.75 | 21.96 | 22.19 | | |
| 10MHz 16QAM | RB1#0 | 22.04 | 21.24 | 22.1 | 20.23 | 38.45 |
| | RB1#25 | 22.06 | 21.44 | 22.15 | | |
| | RB1#49 | 22.14 | 21.48 | 22.13 | | |
| | RB25#0 | 21.12 | 21.15 | 20.95 | | |
| | RB25#25 | 21.07 | 21.05 | 20.97 | | |
| | RB50#0 | 20.89 | 21.56 | 21.59 | | |
| 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 | 4.78 | 5.25 | 5.1 | 13 |
| | RB50#0 | 5.36 | 5.36 | 5.51 | 13 |
| 10MHz 16QAM | RB1#0 | 5.97 | 5.74 | 5.88 | 13 |
| | RB50#0 | 6.2 | 6 | 6.32 | 13 |
| | | | | **Result:** | **Pass** |

**FCC §2.1049, §22.905: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 | 1.096 | 1.26 | 1.254 | 1.26 |
| 1.4MHz 16QAM | 1.09 | 1.102 | 1.102 | 1.248 | 1.254 | 1.26 |
| 3MHz QPSK | 2.695 | 2.683 | 2.695 | 2.988 | 3.012 | 2.988 |
| 3MHz 16QAM | 2.683 | 2.683 | 2.695 | 3 | 3.024 | 3.012 |
| 5MHz QPSK | 4.511 | 4.511 | 4.531 | 5.02 | 4.98 | 5 |
| 5MHz 16QAM | 4.531 | 4.551 | 4.511 | 5 | 5.02 | 5 |
| 10MHz QPSK | 8.942 | 8.942 | 8.982 | 9.8 | 9.8 | 9.8 |
| 10MHz 16QAM | 8.982 | 8.942 | 8.942 | 9.84 | 9.8 | 9.76 |
| Note: The test plots please refer to the Plots of Occupied Bandwidth | | | | | | |

| FCC §2.1051, §22.917(a):Spurious Emissions at Antenna Terminal | |
|---|---|
| **Result:** | **Pass, Please refer to the test plots of Spurious Emissions at Antenna Terminal.** |

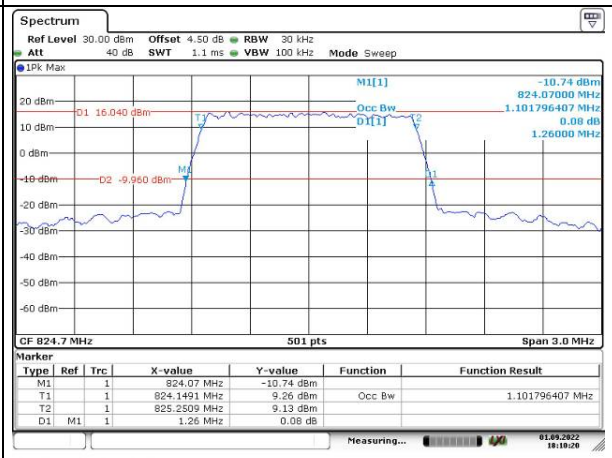
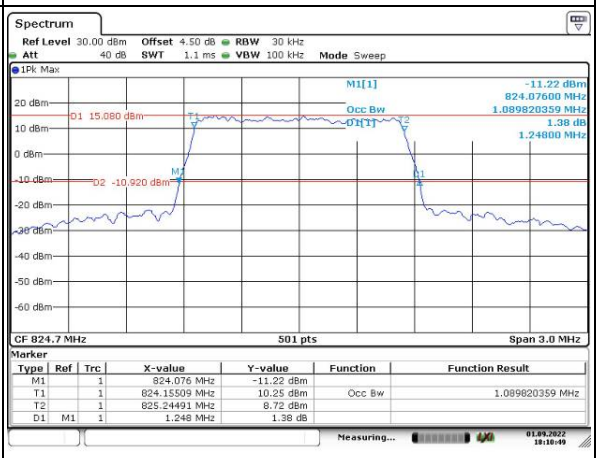
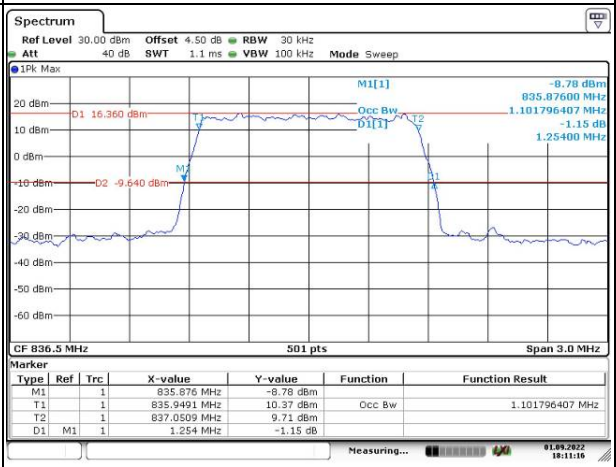
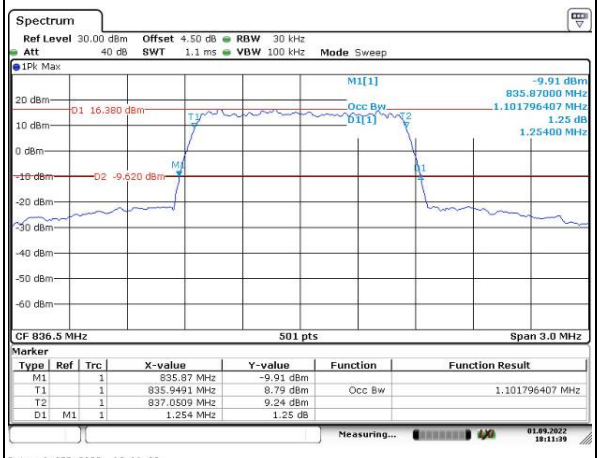
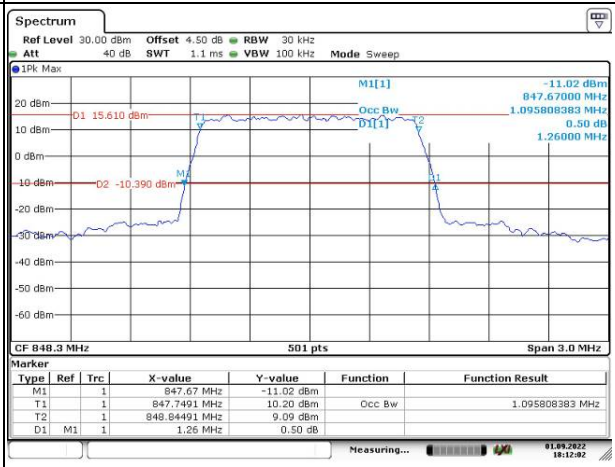
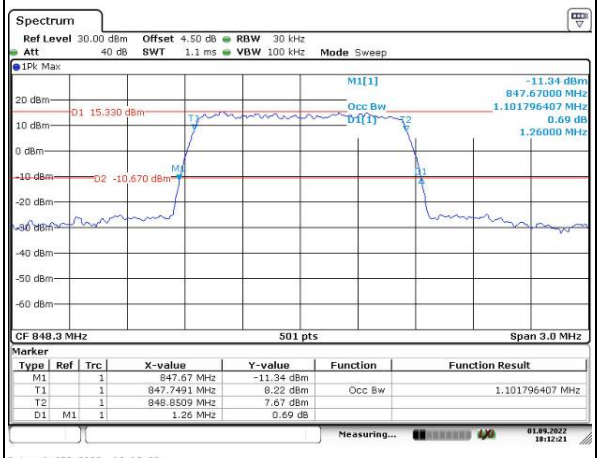
| FCC §2.1051, §22.917(a):Out of band emission, Band Edge | |
|---|---|
| **Result:** | **Pass, Please refer to the test plots of Out of band emission, Band Edge.** |

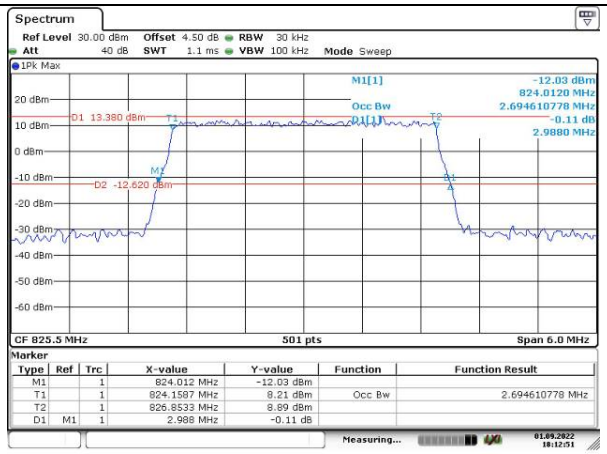
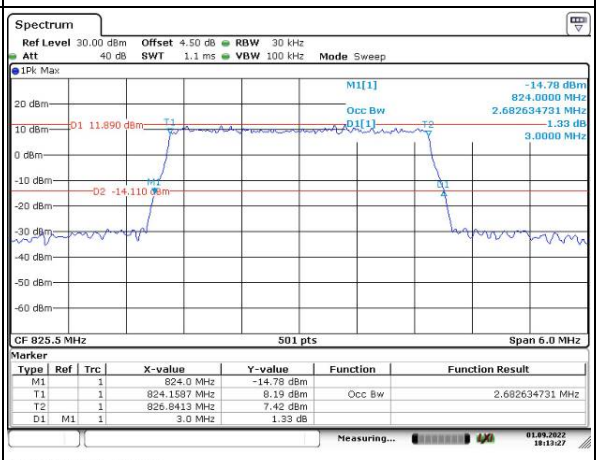
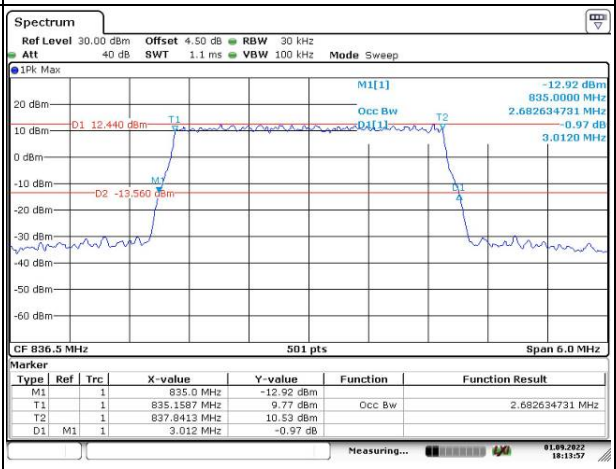
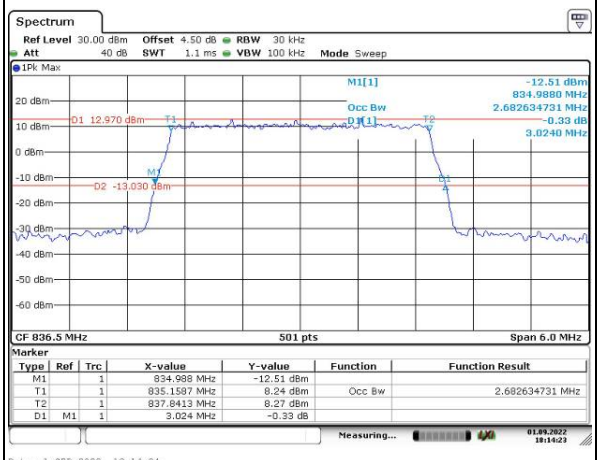
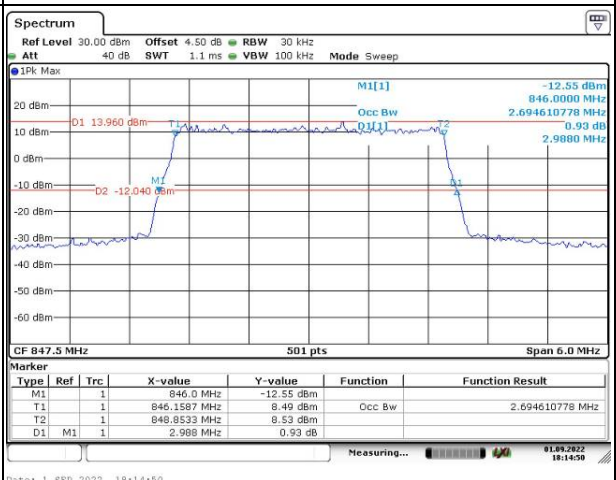
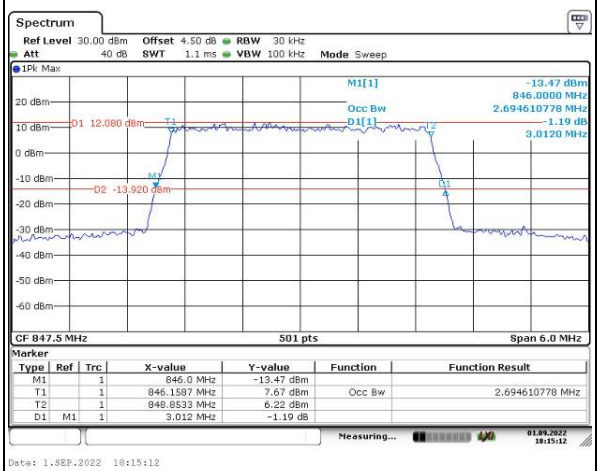
**FCC §2.1055, §22.355: Frequency Stability**

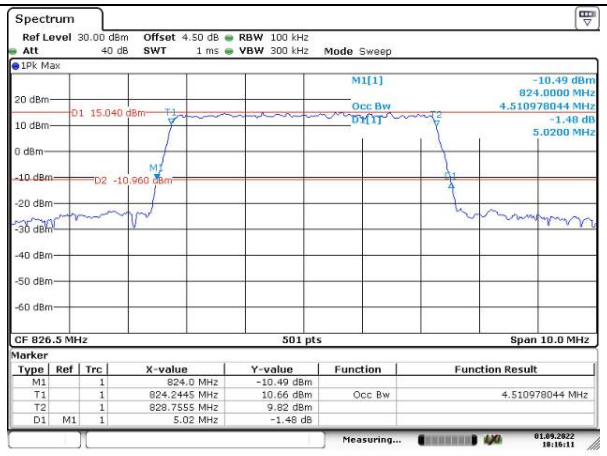
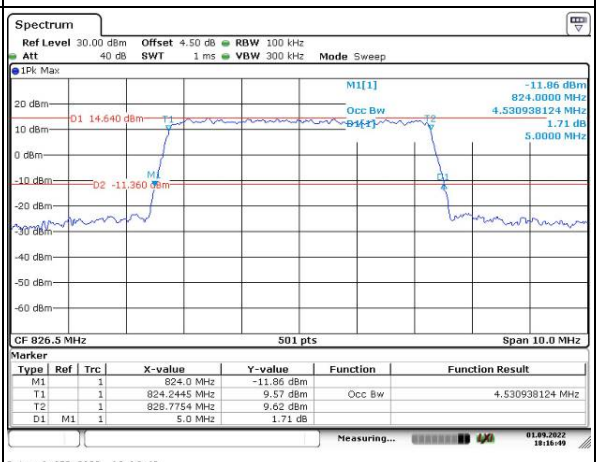
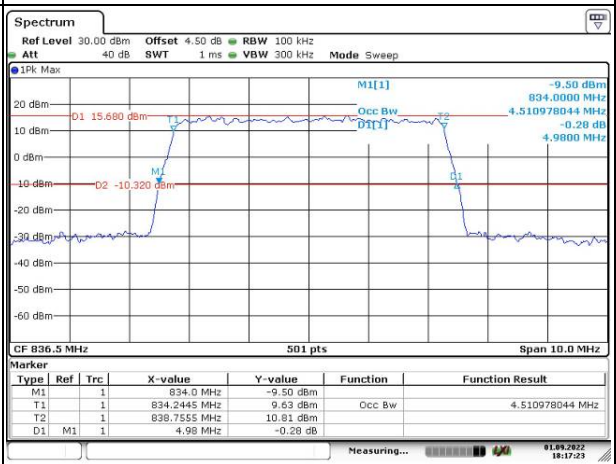
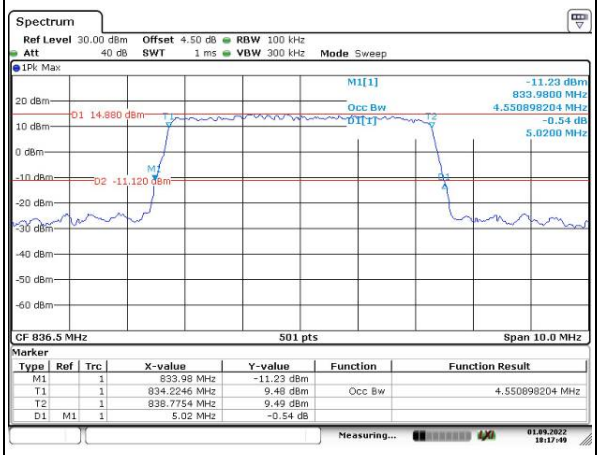
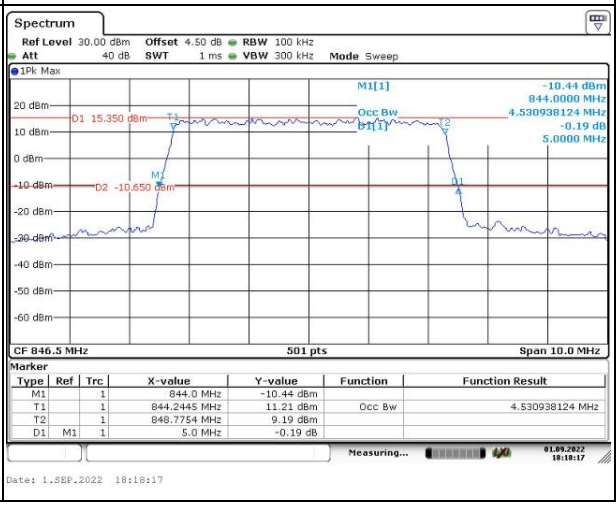
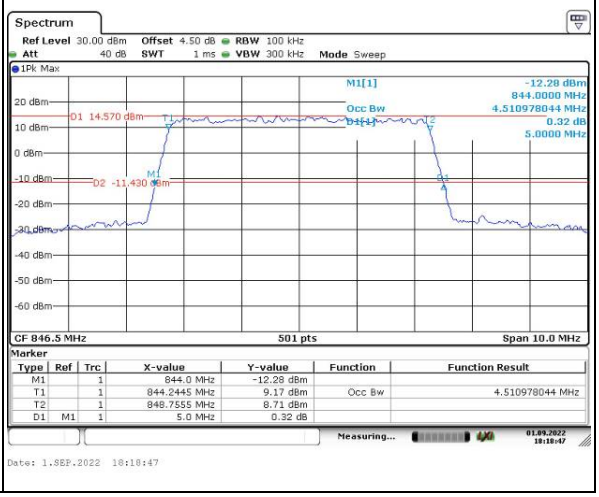
| Test Mode: | 10 MHz QPSK | | Test Channel: | 836.5 | MHz |
|---|---|---|---|---|---|
| Test Item | Temperature (℃) | Voltage ($V_{DC}$) | Frequency Error | | Limit |
| | | | (Hz) | (ppm) | (ppm) |
| Frequency Stability vs. Temperature | -30 | 3.8 | -6.49 | -0.008 | 2.5 |
| | -20 | 3.8 | -6.97 | -0.008 | 2.5 |
| | -10 | 3.8 | -5.5 | -0.007 | 2.5 |
| | 0 | 3.8 | 6.06 | 0.007 | 2.5 |
| | 10 | 3.8 | 9.8 | 0.012 | 2.5 |
| | 20 | 3.8 | 5.03 | 0.006 | 2.5 |
| | 30 | 3.8 | -6.62 | -0.008 | 2.5 |
| | 40 | 3.8 | -8.73 | -0.010 | 2.5 |
| | 50 | 3.8 | -7.05 | -0.008 | 2.5 |
| Frequency Stability vs. Voltage | 20 | 3.5 | 8.99 | 0.011 | 2.5 |
| | 20 | 4.35 | -7.17 | -0.009 | 2.5 |
| | | | | **Result:** | **Pass** |

| Test Mode: | 10 MHz 16QAM | | Test Channel: | 836.5 | MHz |
|---|---|---|---|---|---|
| Test Item | Temperature (℃) | Voltage ($V_{DC}$) | Frequency Error | | Limit |
| | | | (Hz) | (ppm) | (ppm) |
| Frequency Stability vs. Temperature | -30 | 3.8 | -15.18 | -0.018 | 2.5 |
| | -20 | 3.8 | 8.1 | 0.010 | 2.5 |
| | -10 | 3.8 | -8.59 | -0.010 | 2.5 |
| | 0 | 3.8 | 9.33 | 0.011 | 2.5 |
| | 10 | 3.8 | -6.94 | -0.008 | 2.5 |
| | 20 | 3.8 | 7.54 | 0.009 | 2.5 |
| | 30 | 3.8 | 6.43 | 0.008 | 2.5 |
| | 40 | 3.8 | -6.17 | -0.007 | 2.5 |
| | 50 | 3.8 | -6.44 | -0.008 | 2.5 |
| Frequency Stability vs. Voltage | 20 | 3.5 | 6.34 | 0.008 | 2.5 |
| | 20 | 4.35 | -6.89 | -0.008 | 2.5 |
| | | | | **Result:** | **Pass** |

**Test Plots:**

| Occupied Bandwidth | | |
|---|---|---|
| **Channel** | 1.4MHz Bandwidth QPSK | 1.4MHz Bandwidth 16QAM |
| Lowest |  |  |
| Middle |  |  |
| Highest |  |  |

| Occupied Bandwidth | | |
|---|---|---|
| **Channel** | 3MHz Bandwidth QPSK | 3MHz Bandwidth 16QAM |
| Lowest |  |  |
| Middle |  |  |
| Highest |  |  |

| Occupied Bandwidth | | |
|---|---|---|
| **Channel** | 5MHz Bandwidth QPSK | 5MHz Bandwidth 16QAM |
| Lowest |  |  |
| Middle |  |  |
| Highest |  |  |