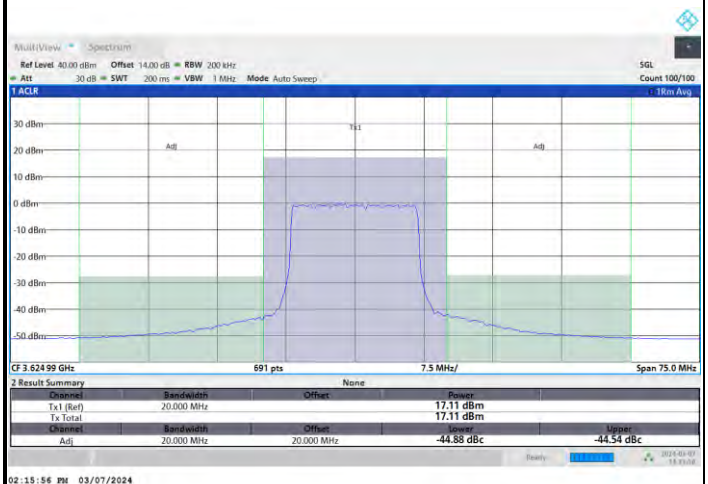
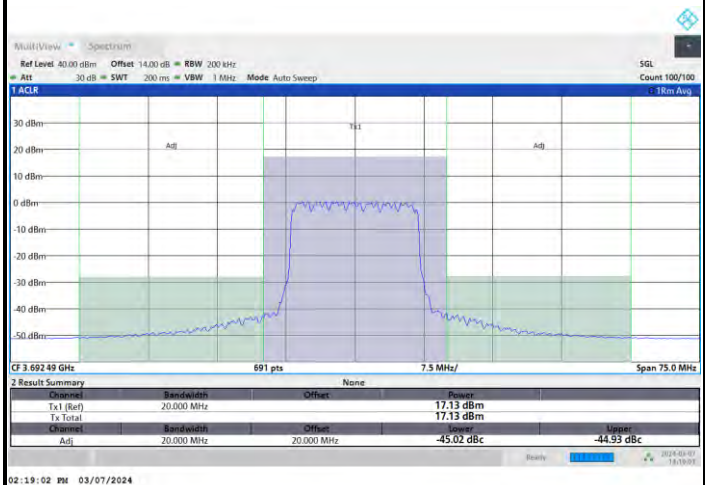
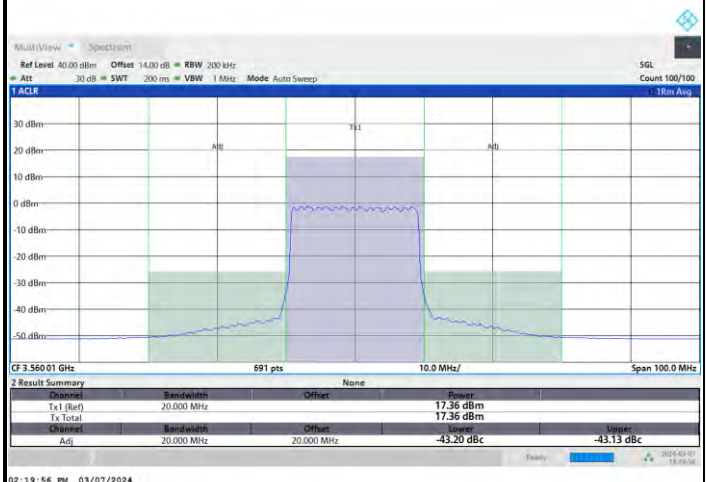
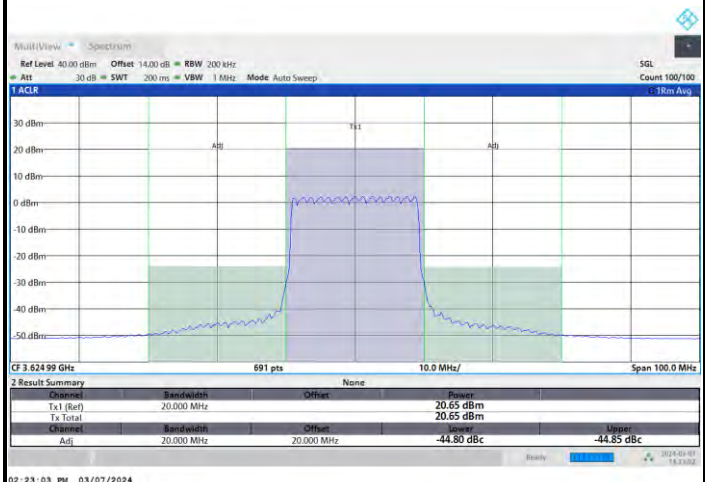
| FR1 n48 / 15MHz / CP OFDM / 256QAM | |
|---|---|
| Middle Channel | |
| Full RB | |
|  | |

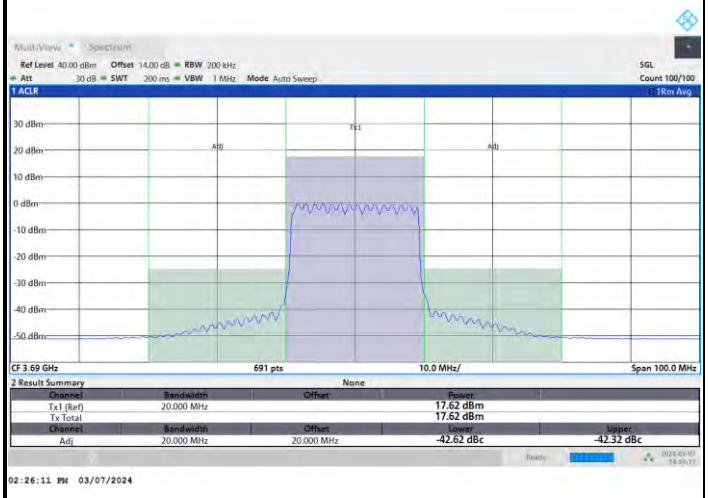


| FR1 n48 / 15MHz / CP OFDM / 256QAM | |
|---|---|
| Highest Channel | |
| Full RB | |
|  | |

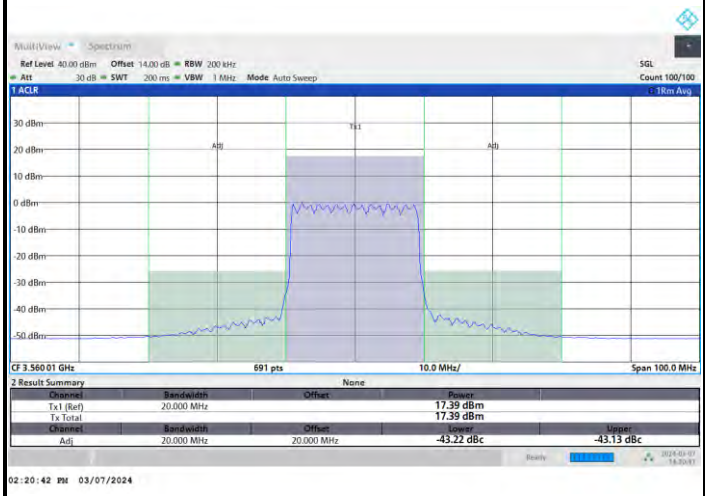
| FR1 n48 / 20MHz / CP OFDM / QPSK | |
|---|---|
| Lowest Channel | |
| Full RB | |
|  | |

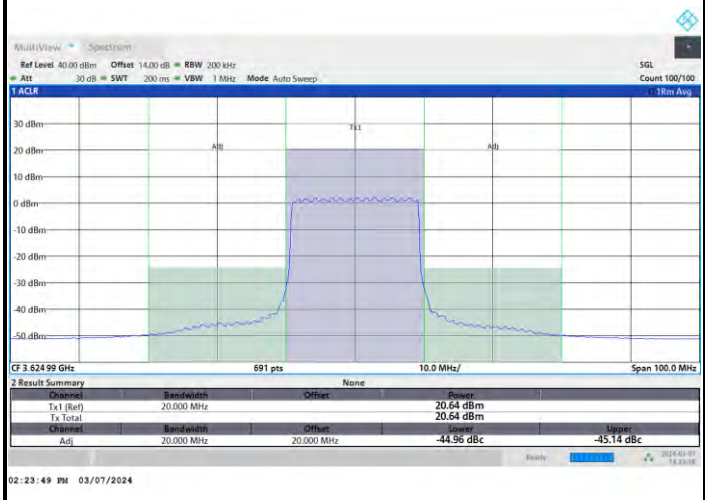


| FR1 n48 / 20MHz / CP OFDM / QPSK | |
|---|---|
| Middle Channel | |
| Full RB | |
|  | |

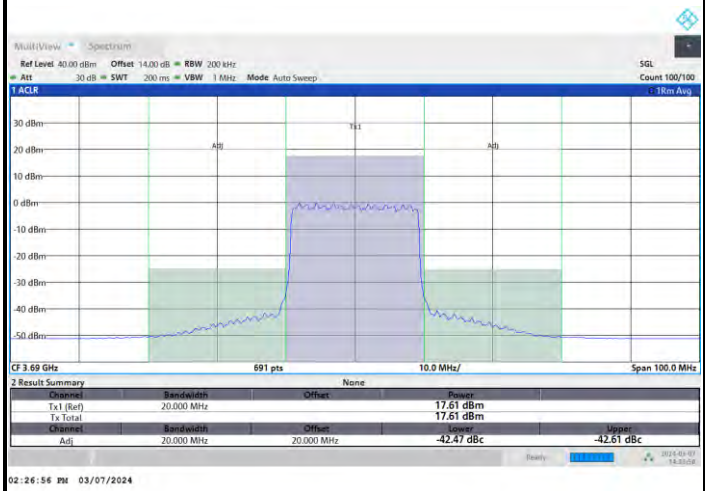
| FR1 n48 / 20MHz / CP OFDM / QPSK | |
|---|---|
| Highest Channel | |
| Full RB | |
|  | |

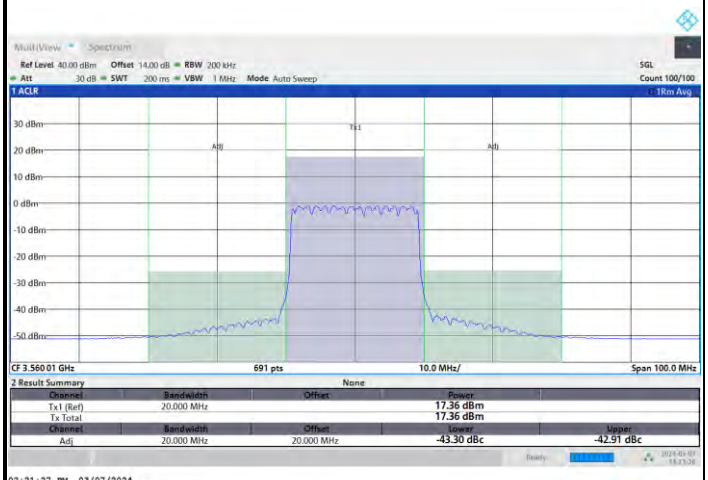


| FR1 n48 / 20MHz / CP OFDM / 16QAM | |
|---|---|
| Lowest Channel | |
| Full RB | |
|  | |

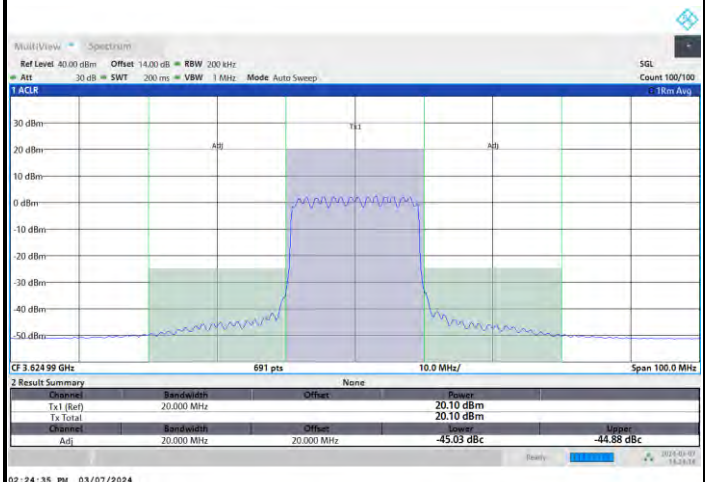
| FR1 n48 / 20MHz / CP OFDM / 16QAM | |
|---|---|
| Middle Channel | |
| Full RB | |
|  | |

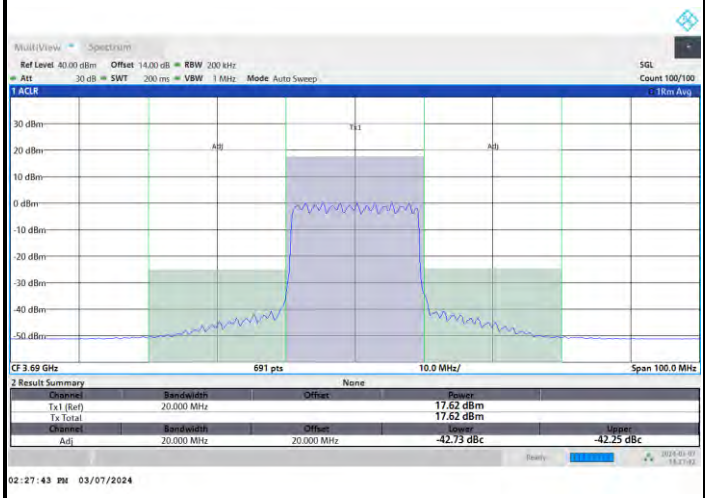


| FR1 n48 / 20MHz / CP OFDM / 16QAM | |
|---|---|
| Highest Channel | |
| Full RB | |
|  | |

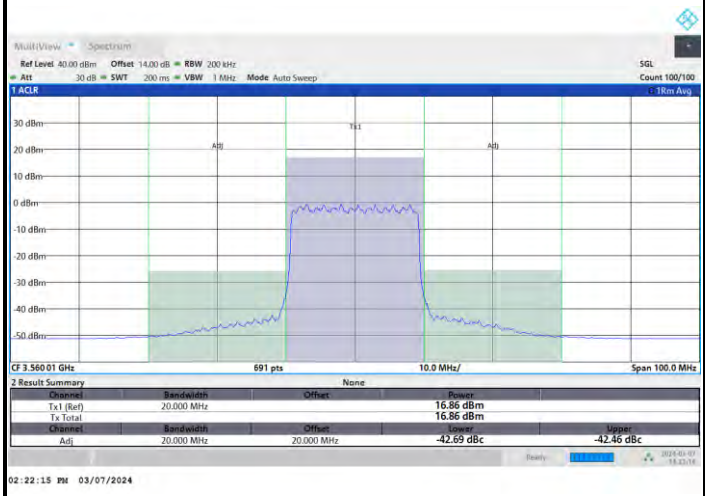
| FR1 n48 / 20MHz / CP OFDM / 64QAM | |
|---|---|
| Lowest Channel | |
| Full RB | |
|  | |

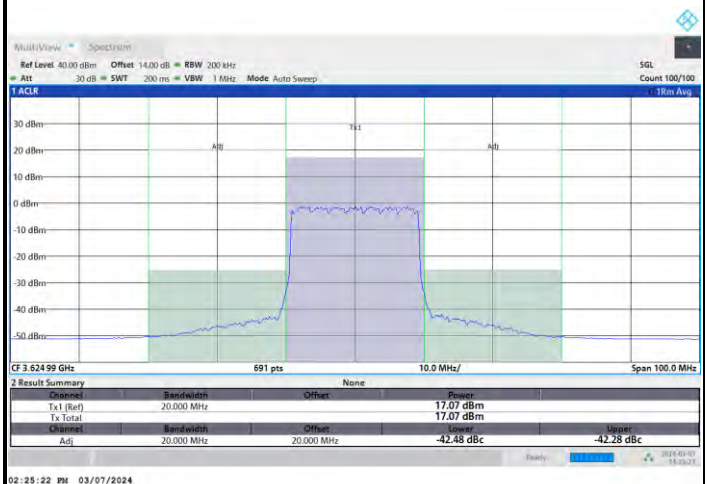


| FR1 n48 / 20MHz / CP OFDM / 64QAM | |
|---|---|
| Middle Channel | |
| Full RB | |
|  | |

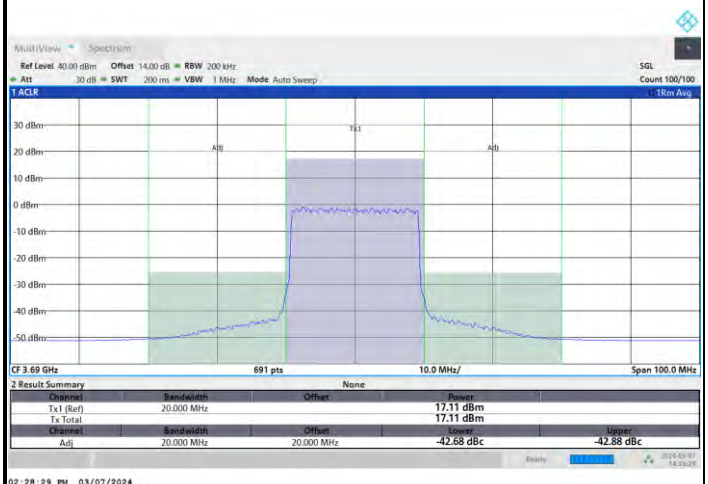
| FR1 n48 / 20MHz / CP OFDM / 64QAM | |
|---|---|
| Highest Channel | |
| Full RB | |
|  | |

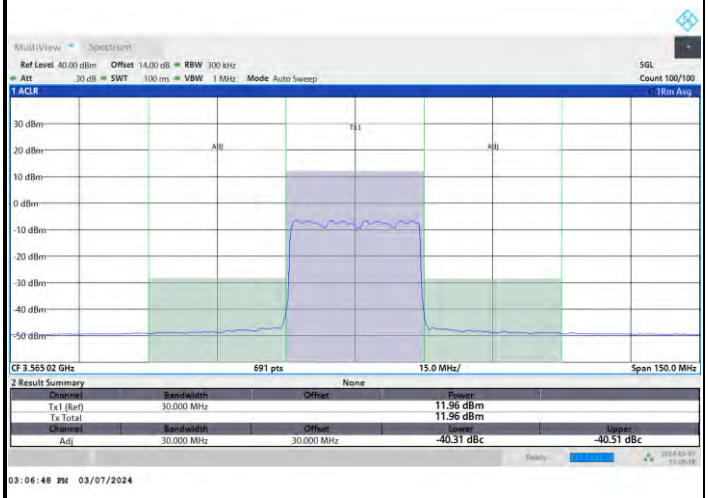


| FR1 n48 / 20MHz / CP OFDM / 256QAM | |
|---|---|
| Lowest Channel | |
| Full RB | |
|  | |

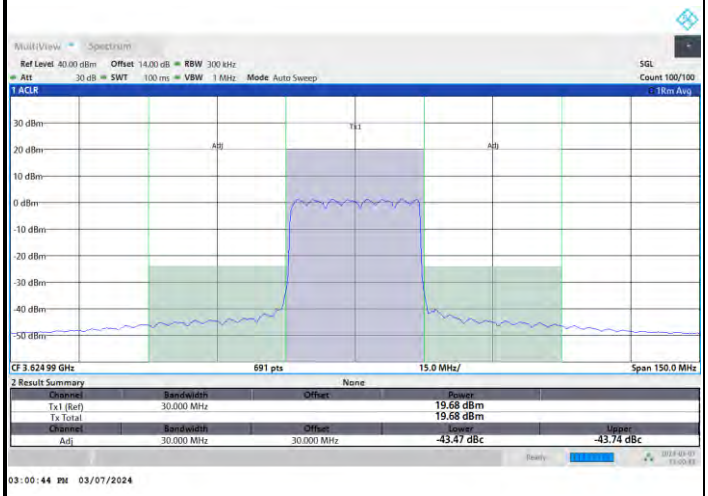
| FR1 n48 / 20MHz / CP OFDM / 256QAM | |
|---|---|
| Middle Channel | |
| Full RB | |
|  | |

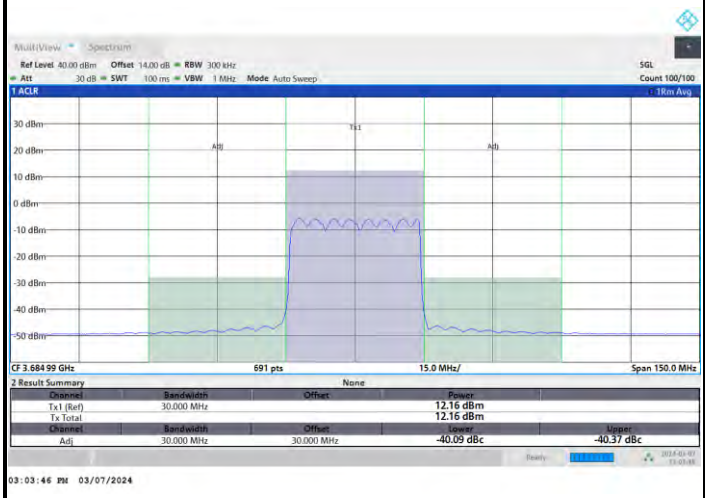


| FR1 n48 / 20MHz / CP OFDM / 256QAM | |
|---|---|
| Highest Channel | |
| Full RB | |
|  | |

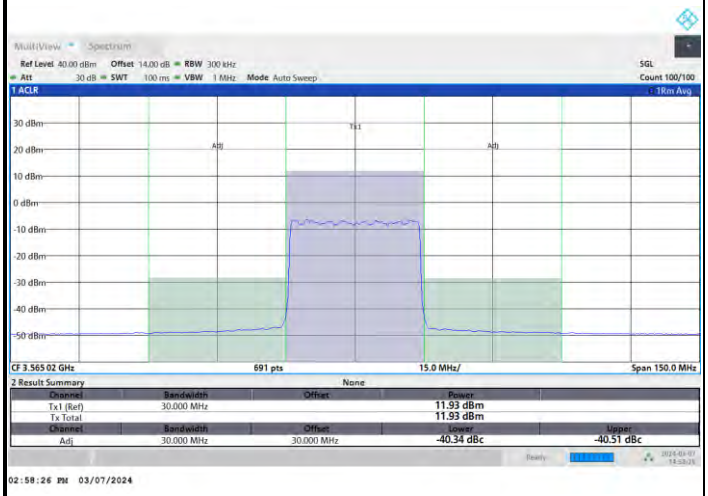
| FR1 n48 / 30MHz / CP OFDM / QPSK | |
|---|---|
| **Lowest Channel** | |
| **Full RB** | |
|  | |

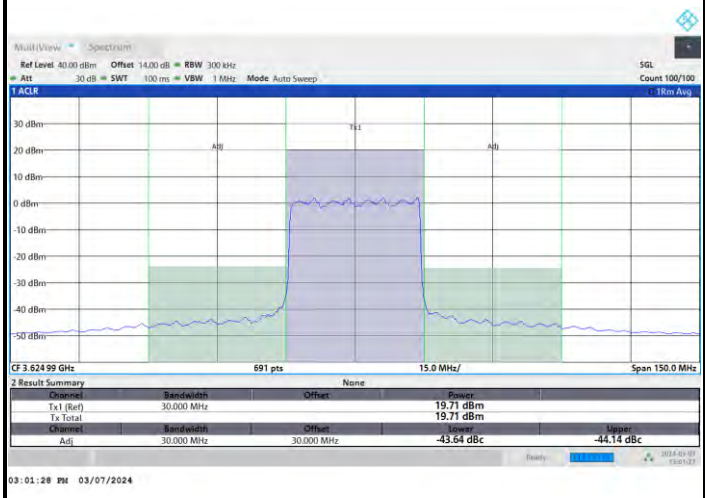


| FR1 n48 / 30MHz / CP OFDM / QPSK | |
|---|---|
| **Middle Channel** | |
| **Full RB** | |
|  | |

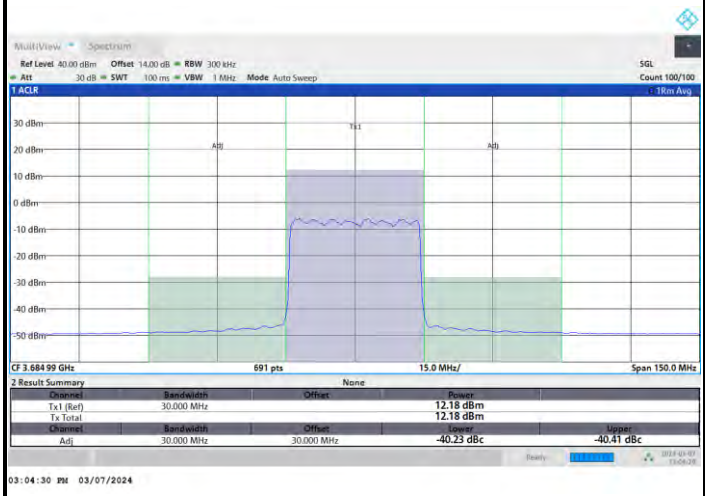
| FR1 n48 / 30MHz / CP OFDM / QPSK | |
|---|---|
| Highest Channel | |
| Full RB | |
|  | |

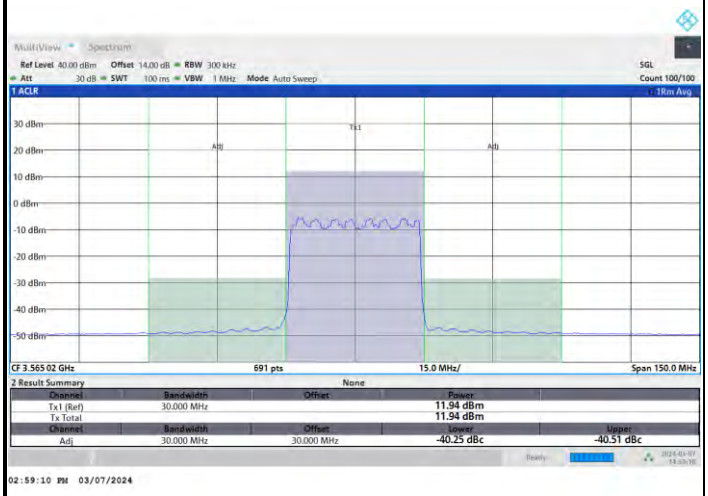


| FR1 n48 / 30MHz / CP OFDM / 16QAM | |
|---|---|
| Lowest Channel | |
| Full RB | |
|  | |

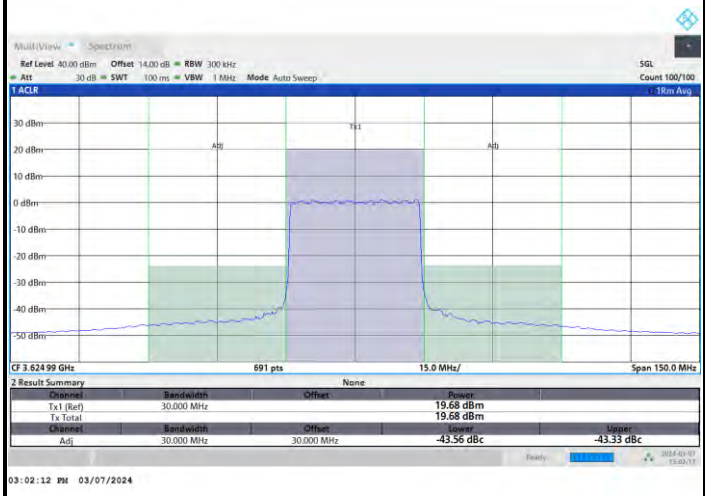
| FR1 n48 / 30MHz / CP OFDM / 16QAM | |
|---|---|
| Middle Channel | |
| Full RB | |
|  | |

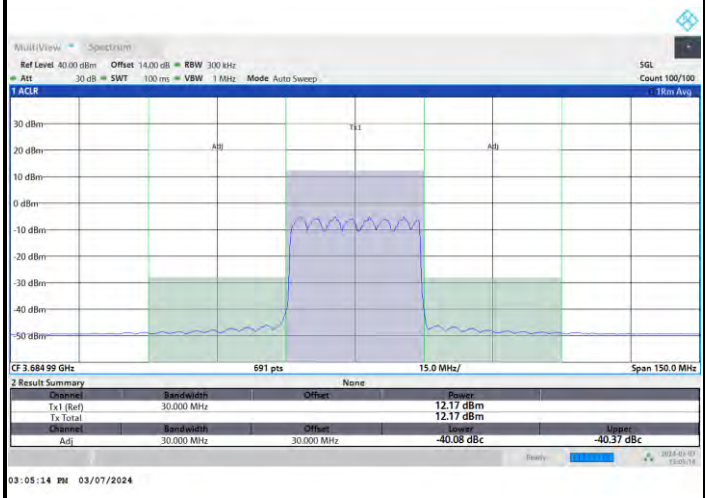


| FR1 n48 / 30MHz / CP OFDM / 16QAM | |
|---|---|
| Highest Channel | |
| Full RB | |
|  | |

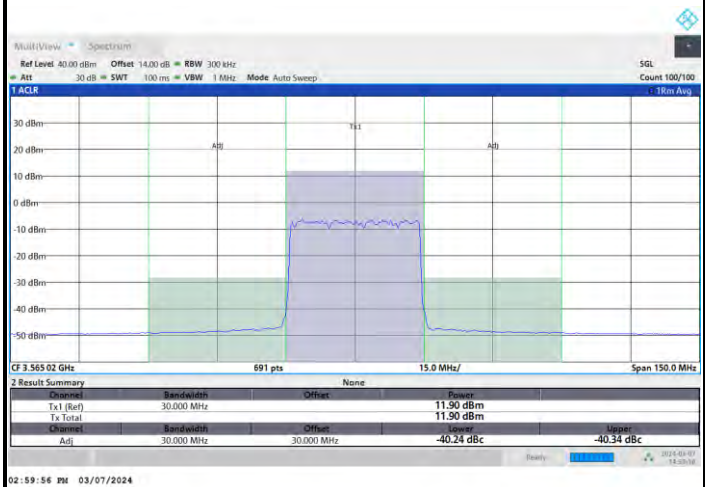
| FR1 n48 / 30MHz / CP OFDM / 64QAM | |
|---|---|
| **Lowest Channel** | |
| **Full RB** | |
|  | |

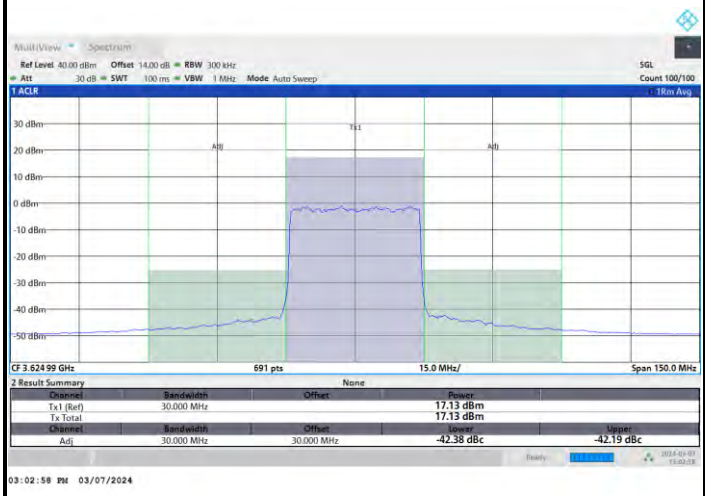


| FR1 n48 / 30MHz / CP OFDM / 64QAM | |
|---|---|
| **Middle Channel** | |
| **Full RB** | |
|  | |

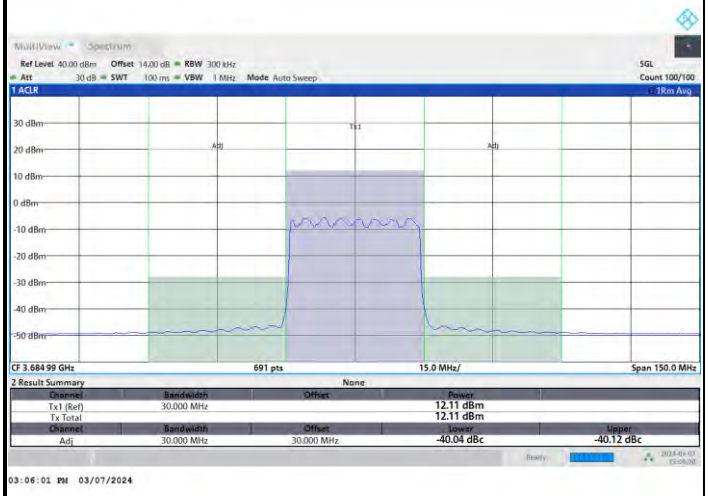
| FR1 n48 / 30MHz / CP OFDM / 64QAM | |
|---|---|
| Highest Channel | |
| Full RB | |
|  | |

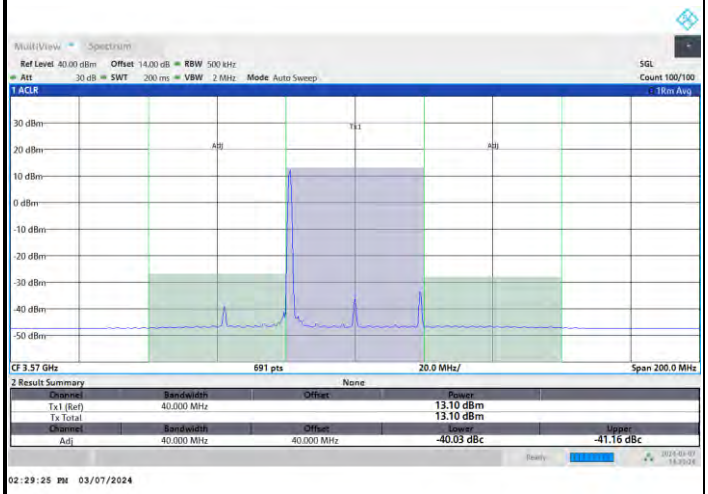
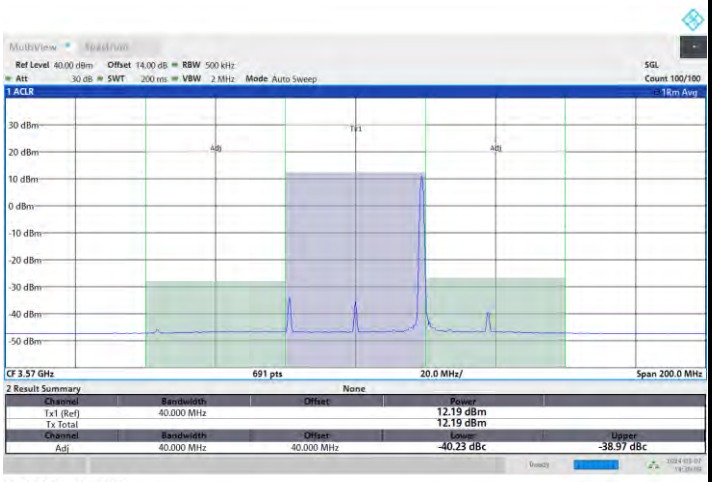
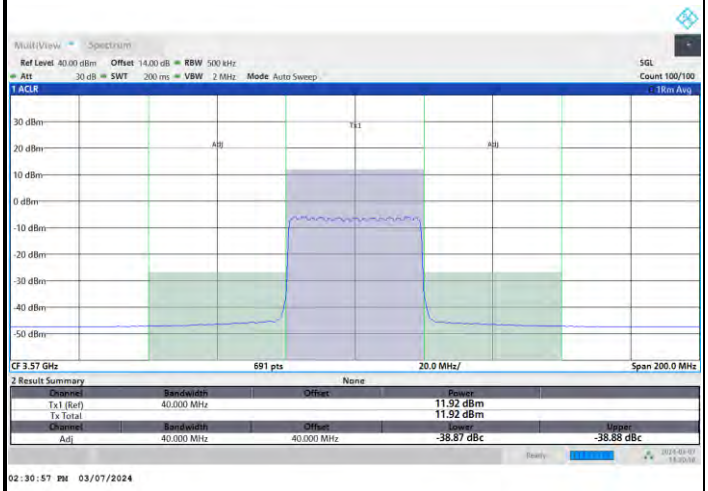


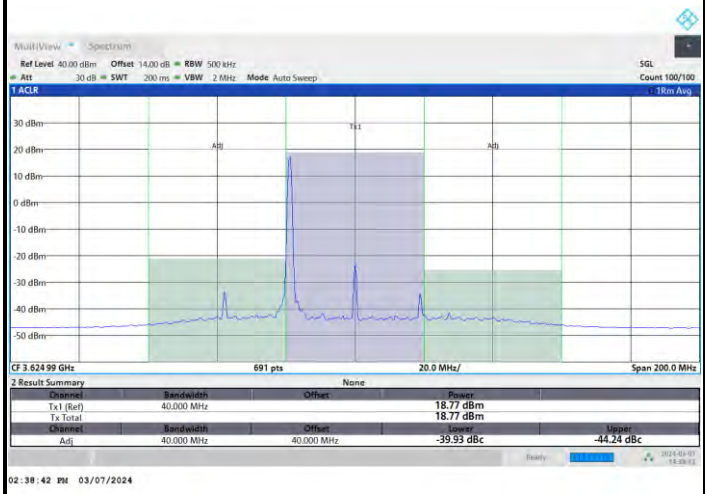
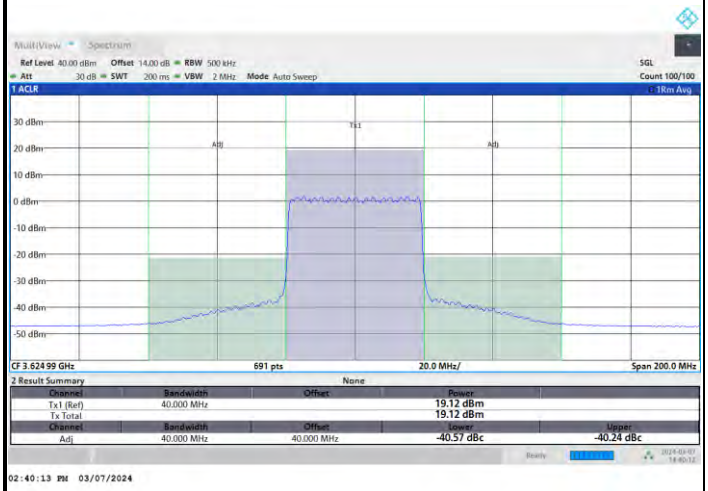
| FR1 n48 / 30MHz / CP OFDM / 256QAM | |
|---|---|
| Lowest Channel | |
| Full RB | |
|  | |

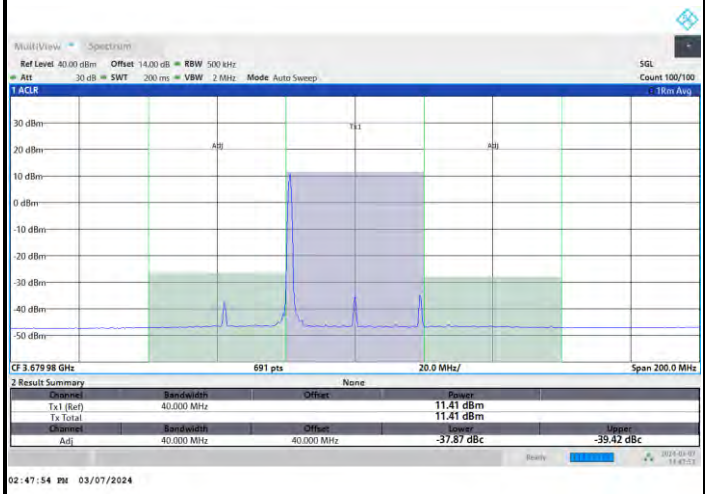
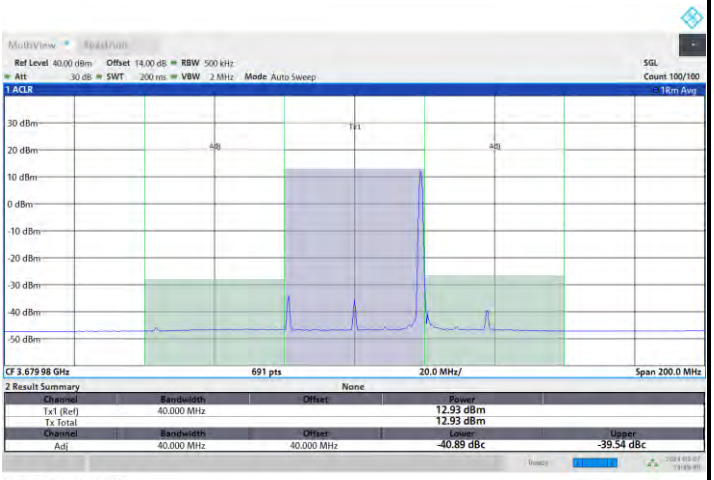
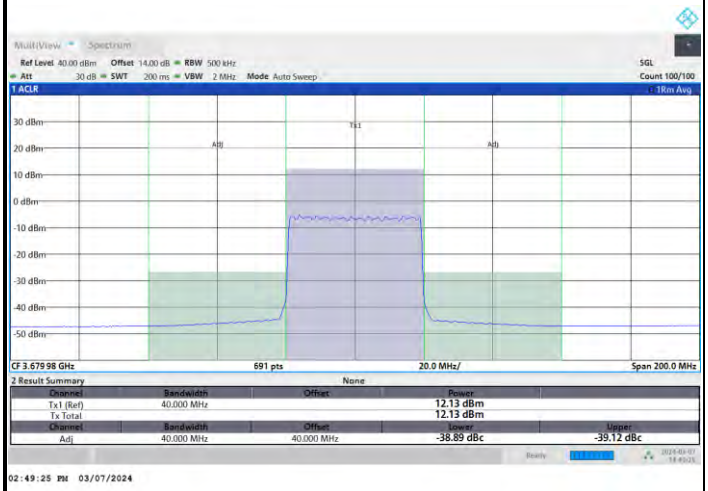
| FR1 n48 / 30MHz / CP OFDM / 256QAM | |
|---|---|
| Middle Channel | |
| Full RB | |
|  | |

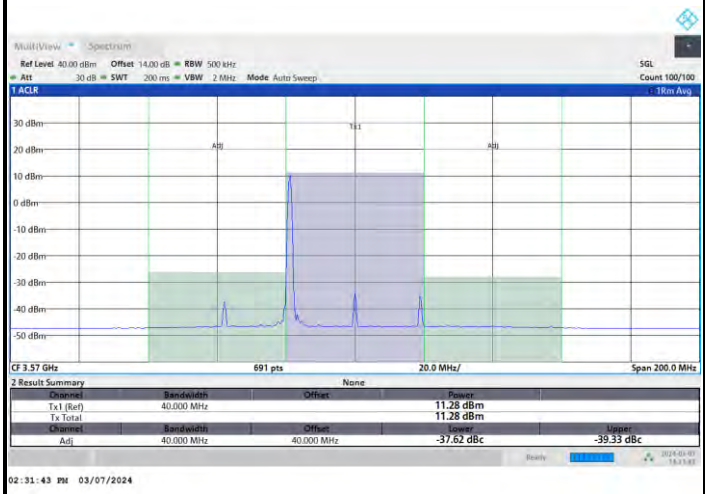
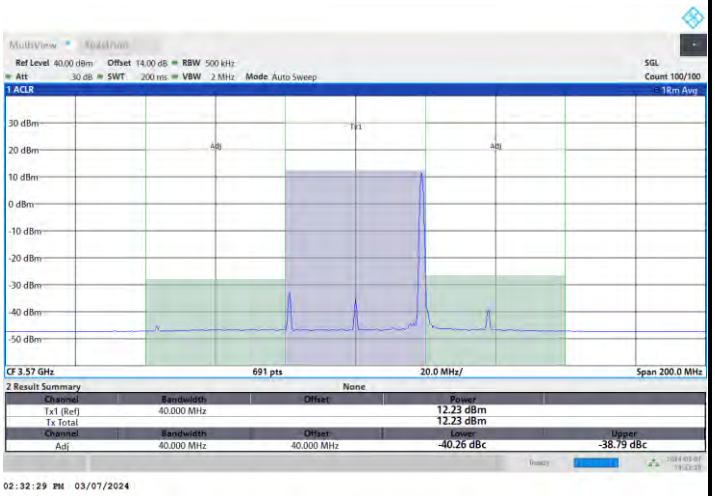
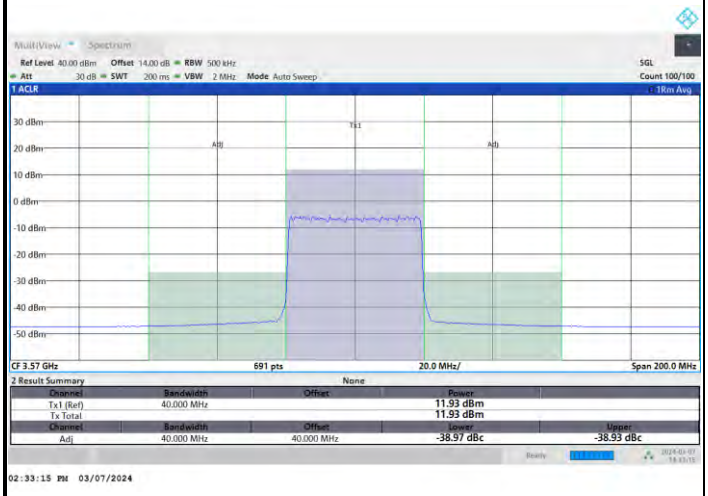


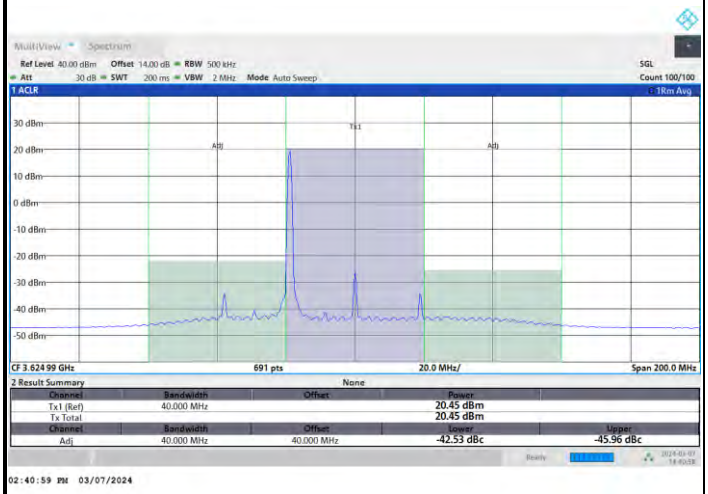
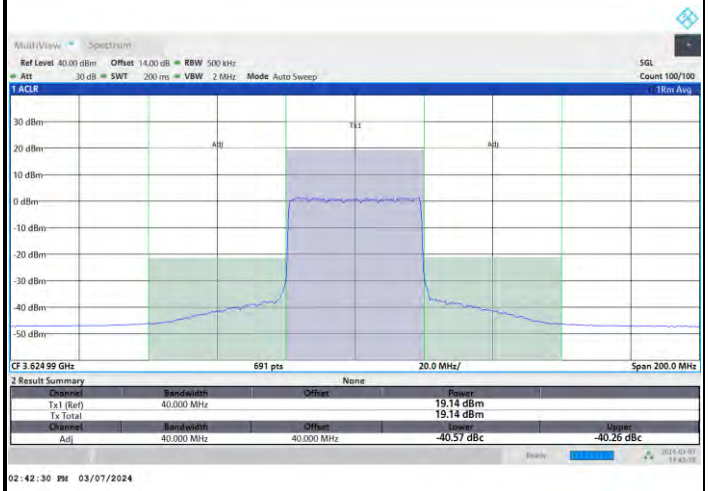
| FR1 n48 / 30MHz / CP OFDM / 256QAM | |
|---|---|
| Highest Channel | |
| Full RB | |
|  | |

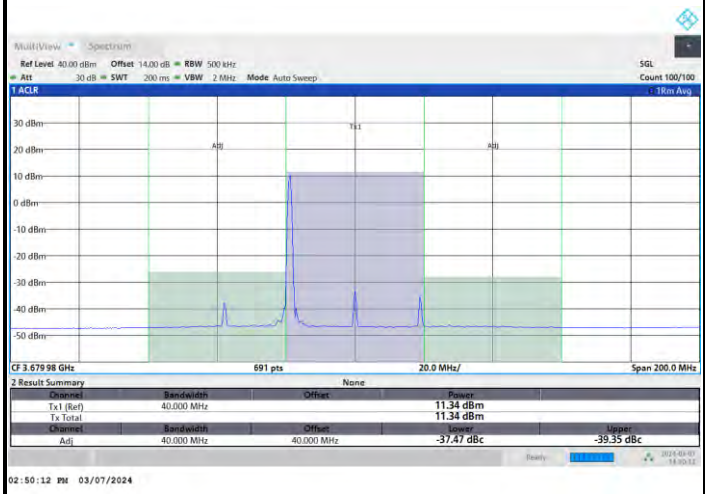
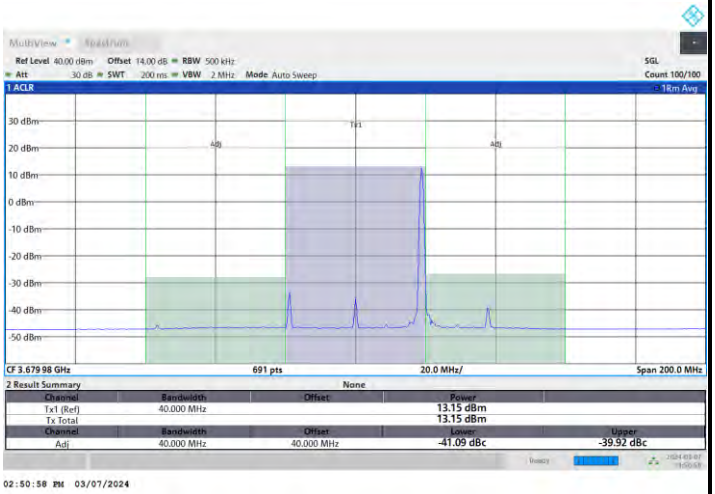
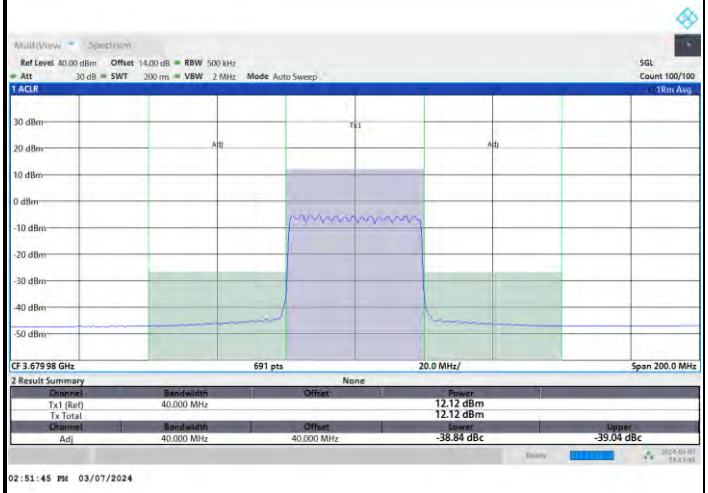
| FR1 n48 / 40MHz / CP OFDM / QPSK | |
|---|---|
| Lowest Channel | |
| 1RB0 | 1RBmax |
|  |  |
| Full RB | |
|  | |

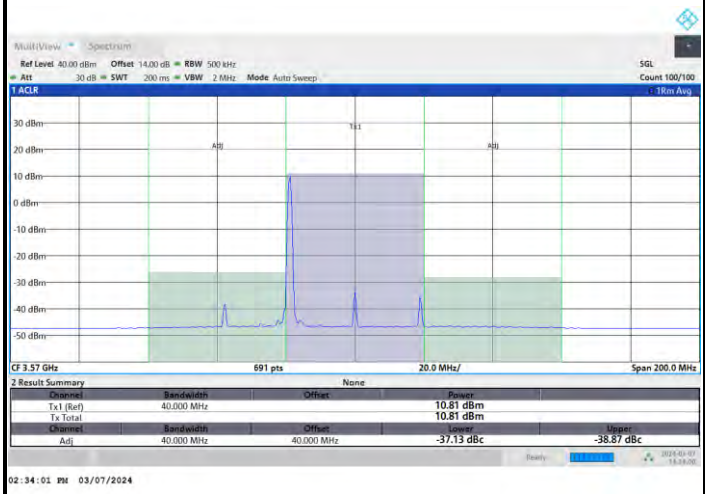
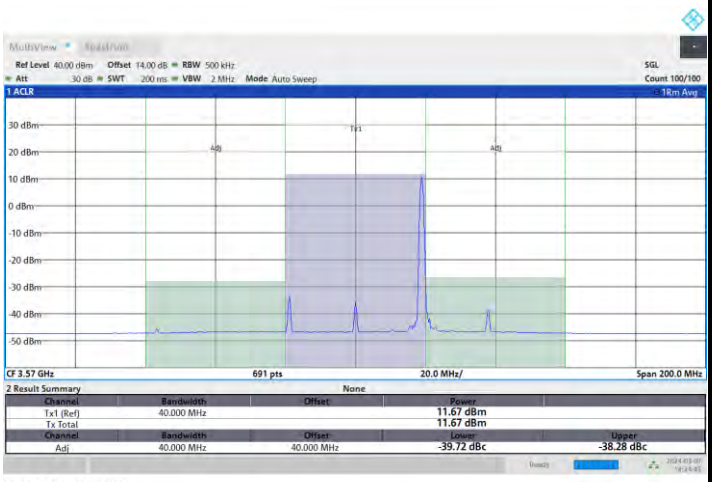
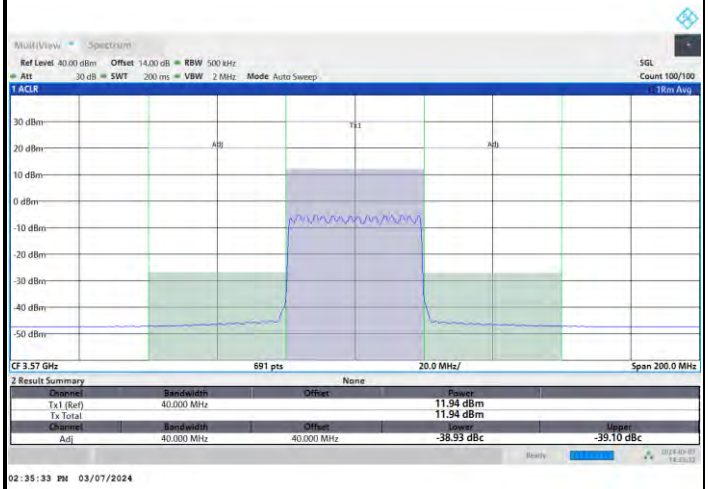
| FR1 n48 / 40MHz / CP OFDM / QPSK | |
|---|---|
| **Middle Channel** | |
| **1RB0** | **1RBmax** |
|  |  |
| **Full RB** | |
|  | |

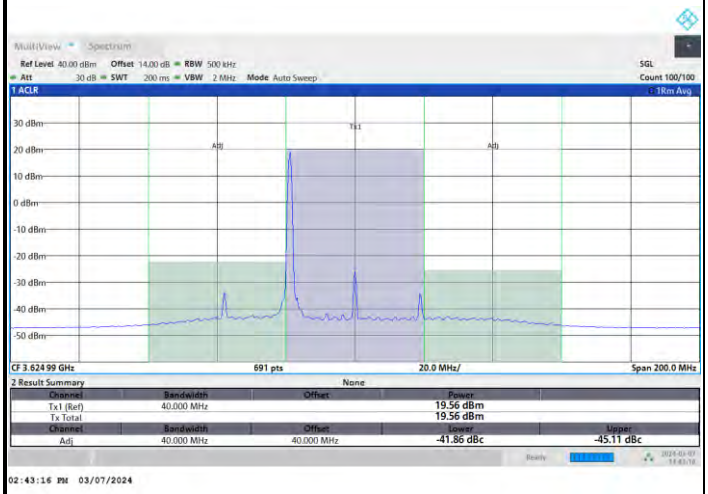
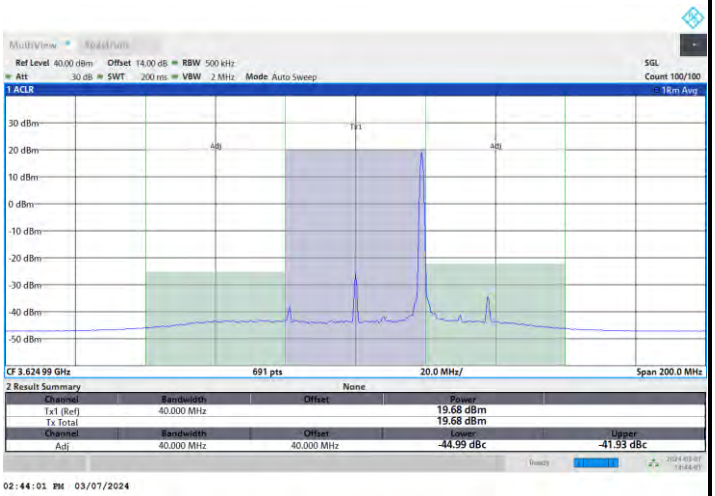
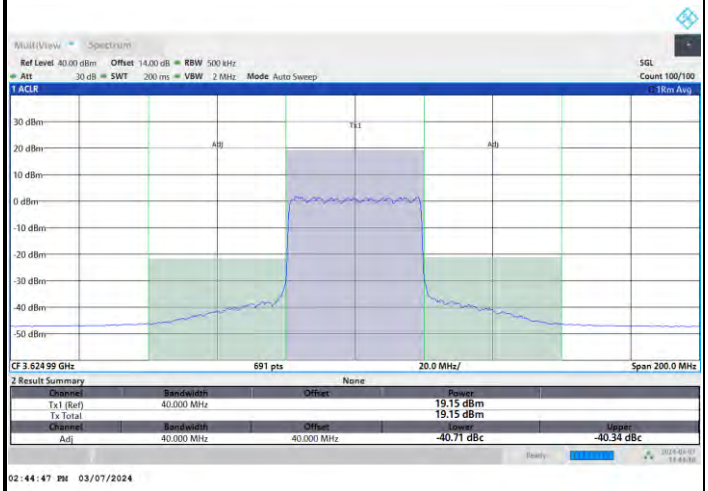
| FR1 n48 / 40MHz / CP OFDM / QPSK | |
|---|---|
| Highest Channel | |
| 1RB0 | 1RBmax |
|  |  |
| Full RB | |
|  | |

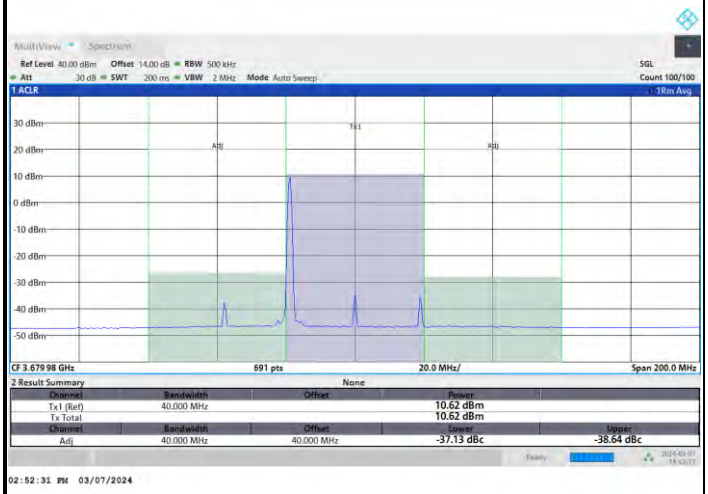
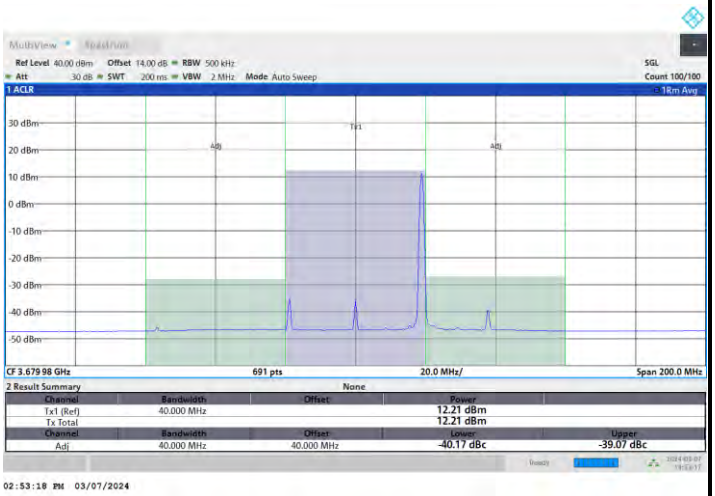
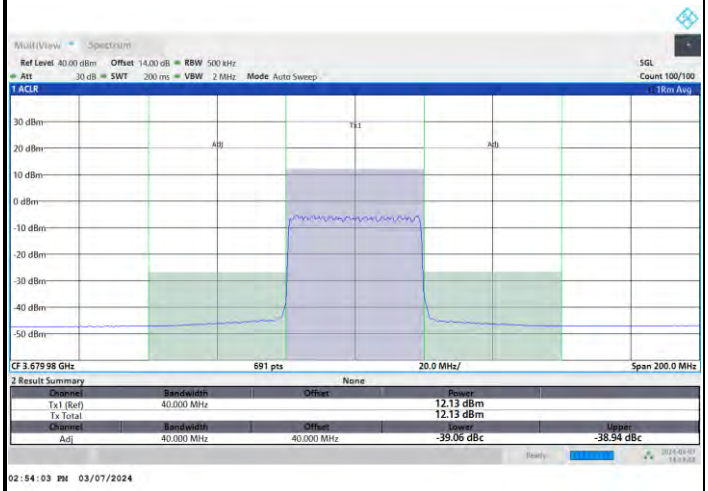
| FR1 n48 / 40MHz / CP OFDM / 16QAM | |
|---|---|
| Lowest Channel | |
| 1RB0 | 1RBmax |
|  |  |
| Full RB | |
|  | |

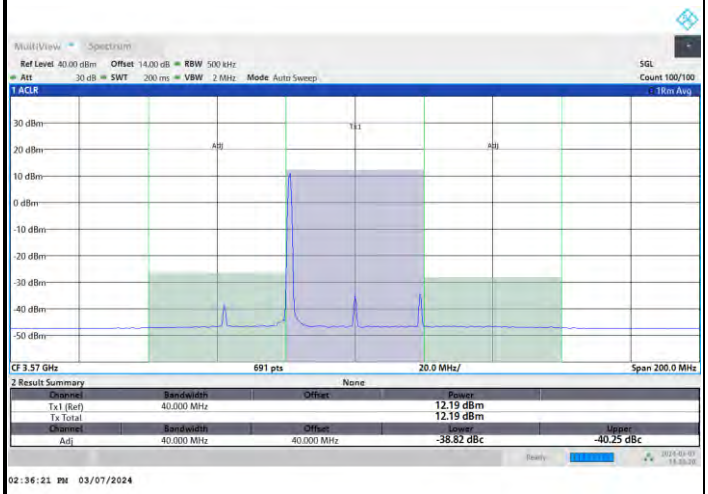
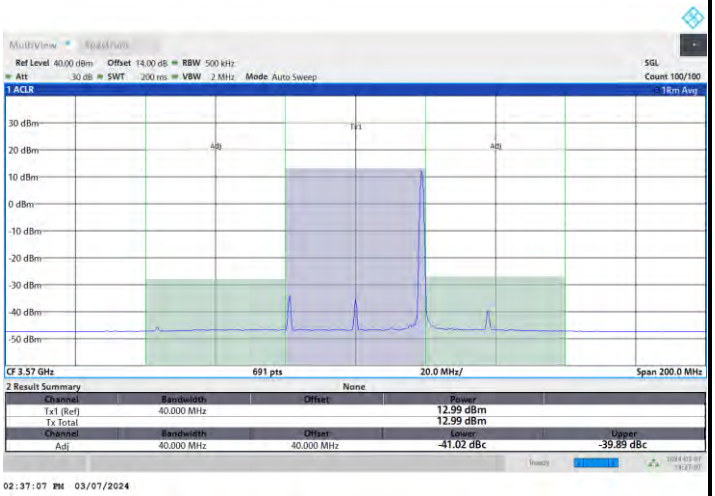
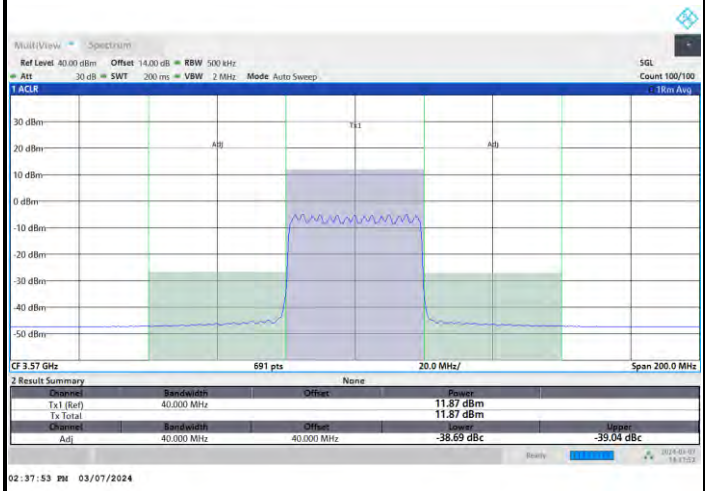
| FR1 n48 / 40MHz / CP OFDM / 16QAM | |
|---|---|
| **Middle Channel** | |
| **1RB0** | **1RBmax** |
|  |  |
| **Full RB** | |
|  | |

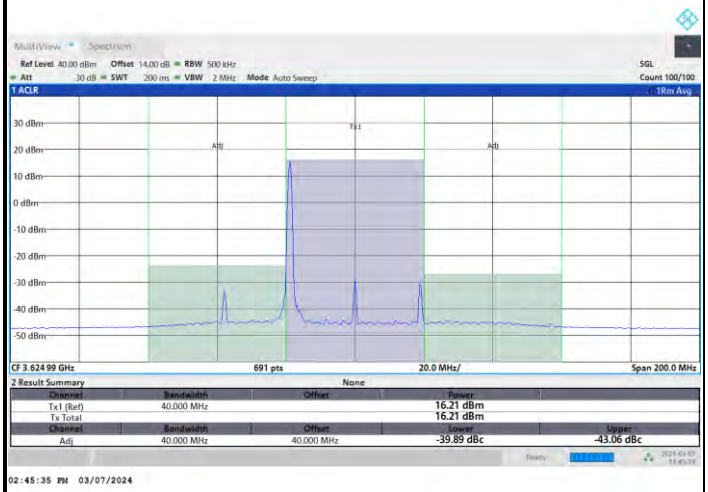
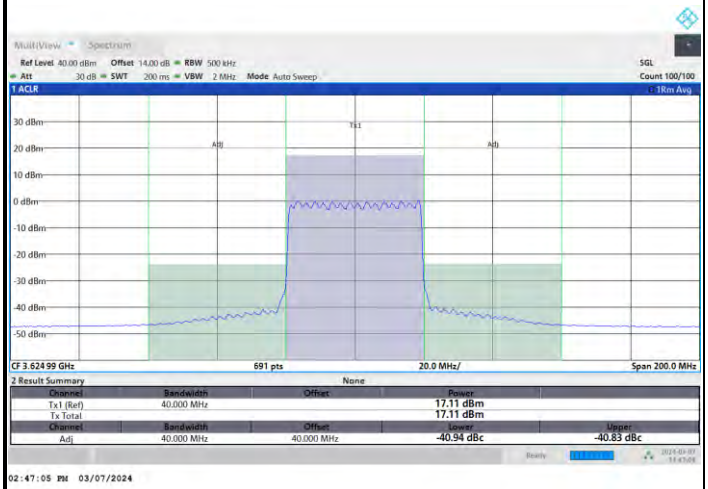
| FR1 n48 / 40MHz / CP OFDM / 16QAM | |
|---|---|
| Highest Channel | |
| 1RB0 | 1RBmax |
|  |  |
| Full RB | |
|  | |

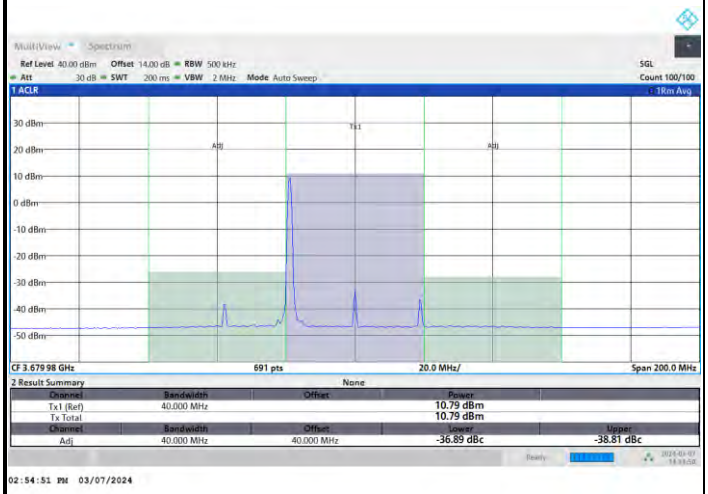
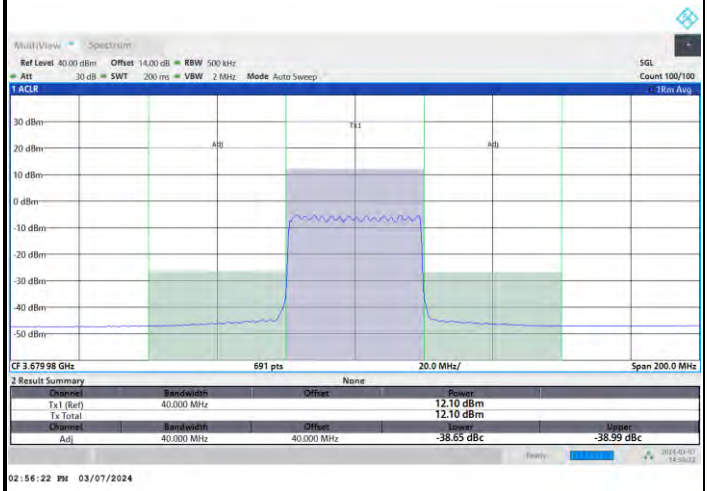
| FR1 n48 / 40MHz / CP OFDM / 64QAM | |
|---|---|
| Lowest Channel | |
| 1RB0 | 1RBmax |
|  |  |
| Full RB | |
|  | |

| FR1 n48 / 40MHz / CP OFDM / 64QAM | |
|---|---|
| **Middle Channel** | |
| **1RB0** | **1RBmax** |
|  |  |
| **Full RB** | |
|  | |

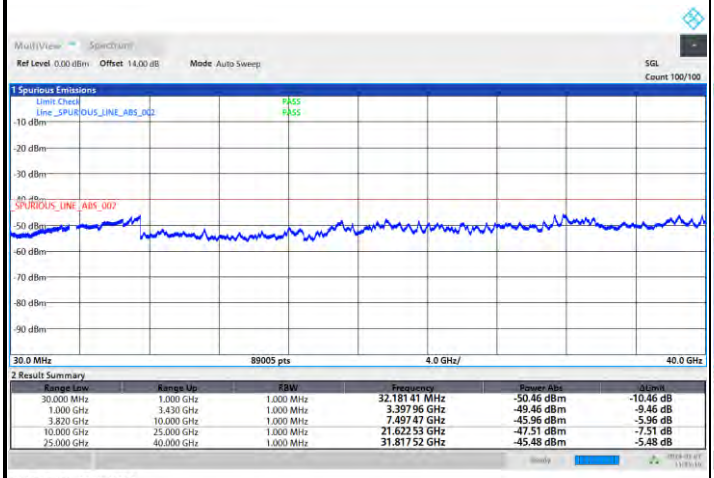
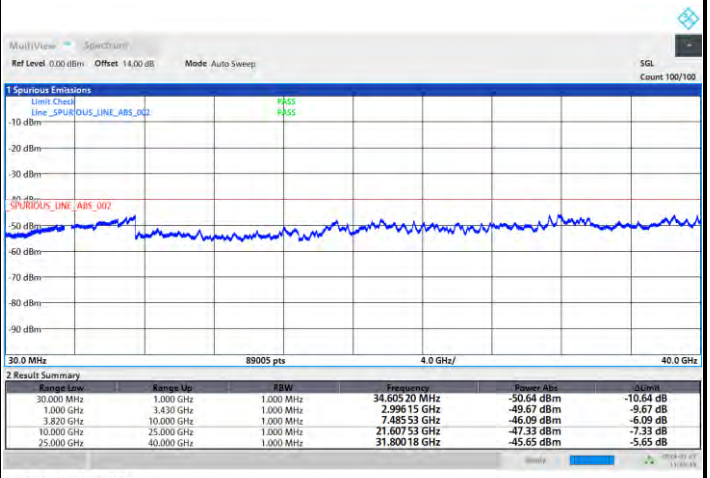
| FR1 n48 / 40MHz / CP OFDM / 64QAM | |
|---|---|
| Highest Channel | |
| 1RB0 | 1RBmax |
|  |  |
| Full RB | |
|  | |

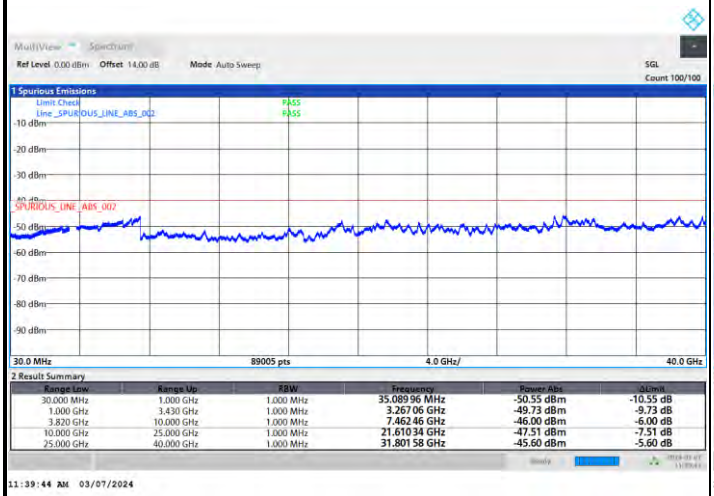
| FR1 n48 / 40MHz / CP OFDM / 256QAM | |
|---|---|
| Lowest Channel | |
| 1RB0 | 1RBmax |
|  |  |
| Full RB | |
|  | |

| FR1 n48 / 40MHz / CP OFDM / 256QAM | |
|---|---|
| Middle Channel | |
| 1RB0 | 1RBmax |
|  |  |
| Full RB | |
|  | |

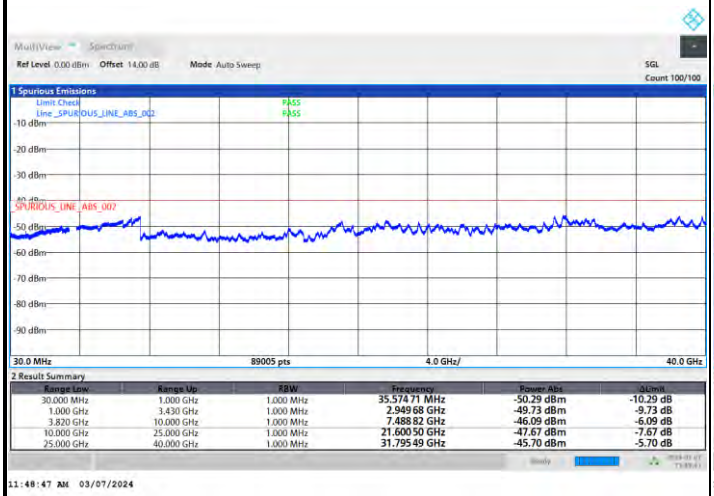
| FR1 n48 / 40MHz / CP OFDM / 256QAM | |
|---|---|
| Highest Channel | |
| 1RB0 | 1RBmax |
|  |  |
| Full RB | |
|  | |

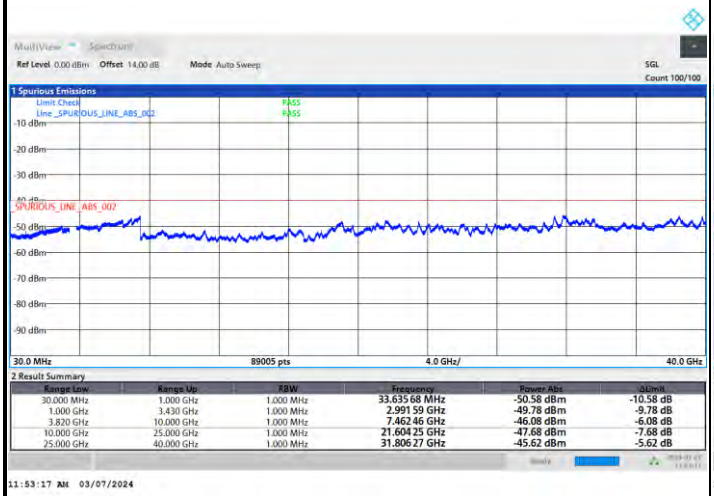
# Conducted Spurious Emission

| FR1 n48 / 10MHz / CP OFDM / QPSK / 1RB1 | |
|---|---|
| **Lowest Channel** | **Middle Channel** |
|  |  |
| **Highest Channel** | |
|  | |

| FR1 n48 / 15MHz / CP OFDM / QPSK / 1RB1 | |
|---|---|
| **Lowest Channel** | **Middle Channel** |
|  |  |
| **Highest Channel** | |
|  | |

| FR1 n48 / 20MHz / CP OFDM / QPSK / 1RB1 | |
|---|---|
| **Lowest Channel** | **Middle Channel** |
|  |  |
| **Highest Channel** | |
|  | |

| FR1 n48 / 30MHz / CP OFDM / QPSK / 1RB1 | |
|---|---|
| **Lowest Channel** | **Middle Channel** |
|  |  |
| **Highest Channel** | |
|  | |

| FR1 n48 / 40MHz / CP OFDM / QPSK / 1RB1 | |
|---|---|
| **Lowest Channel** | **Middle Channel** |
|  |  |
| **Highest Channel** | |
|  | |

# Frequency Stability

| Test Conditions | | FR1 n48 (QPSK) / Middle Channel | Limit |
|---|---|---|---|
| Temperature (°C) | Voltage (Volt) | BW 20MHz | Note 2. |
| | | Deviation (ppm) | Result |
| 50 | Normal Voltage | 0.0014 | PASS |
| 40 | Normal Voltage | 0.0015 | |
| 30 | Normal Voltage | 0.0057 | |
| 20(Ref.) | Normal Voltage | 0.0000 | |
| 10 | Normal Voltage | 0.0064 | |
| 0 | Normal Voltage | 0.0051 | |
| -10 | Normal Voltage | 0.0024 | |
| -20 | Normal Voltage | 0.0000 | |
| -30 | Normal Voltage | 0.0007 | |
| 20 | Maximum Voltage | 0.0043 | |
| 20 | Normal Voltage | 0.0000 | |
| 20 | Battery End Point | 0.0022 | |

**Note:**

1. Normal Voltage = 3.89 V.；Battery End Point (BEP) = 3.6 V.；Maximum Voltage = 4.4 V.
2. The frequency fundamental emissions stay within the authorized frequency block.

**MIMO <Ant. 1>**

# Peak-to-Average Ratio

| Mode | FR1 n48 / 20MHz / CP OFDM | | | | |
|---|---|---|---|---|---|
| Mod. | QPSK | 16QAM | 64QAM | 256QAM | Limit: 13dB |
| RB Size | Full RB | Full RB | Full RB | Full RB | Result |
| Middle CH | 8.08 | 8.18 | 7.96 | 8.20 | PASS |

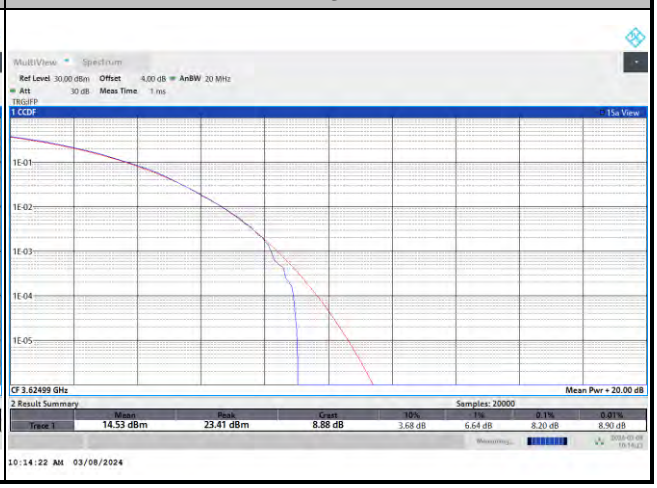
**FR1 n48 / 20MHz / CP OFDM / Middle Channel / Full RB**

**QPSK**


**16QAM**

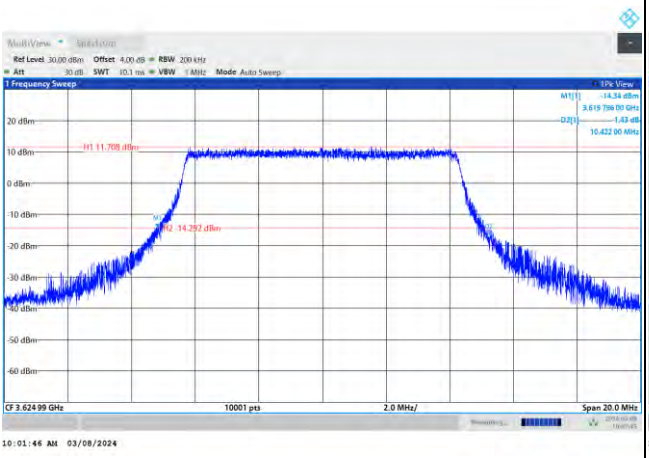
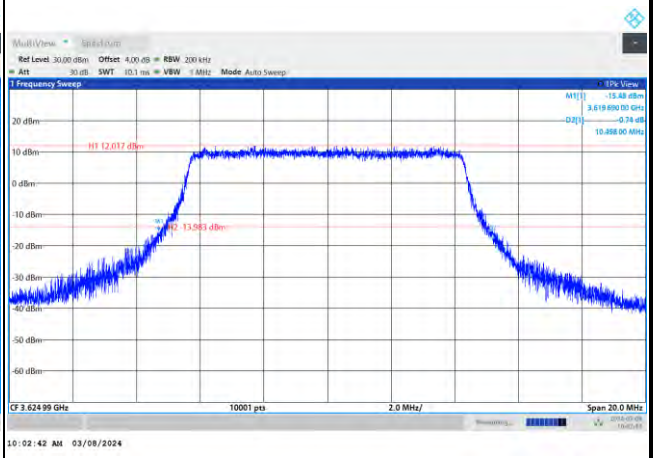
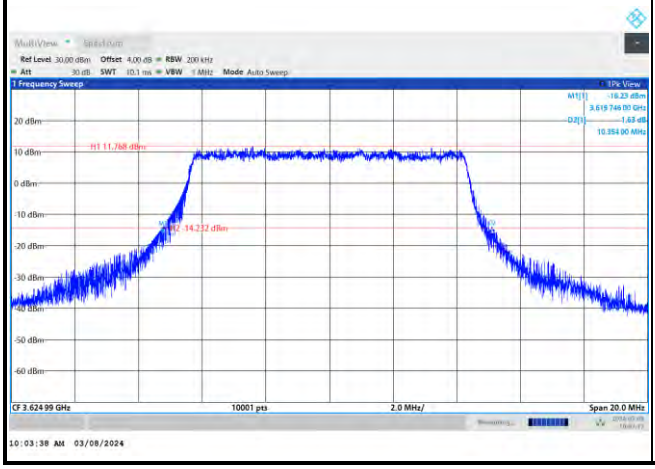
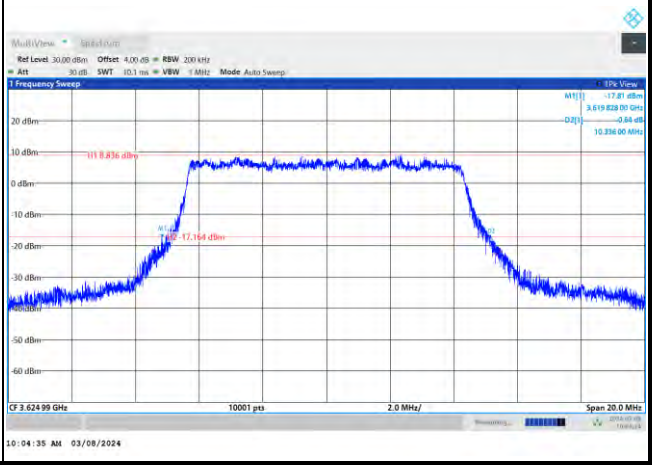

**64QAM**

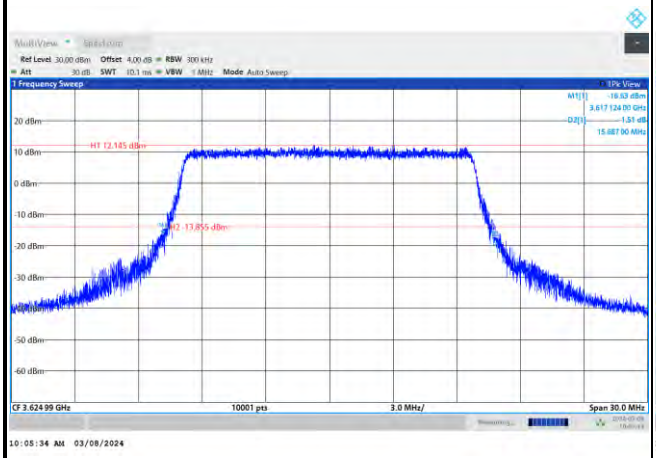
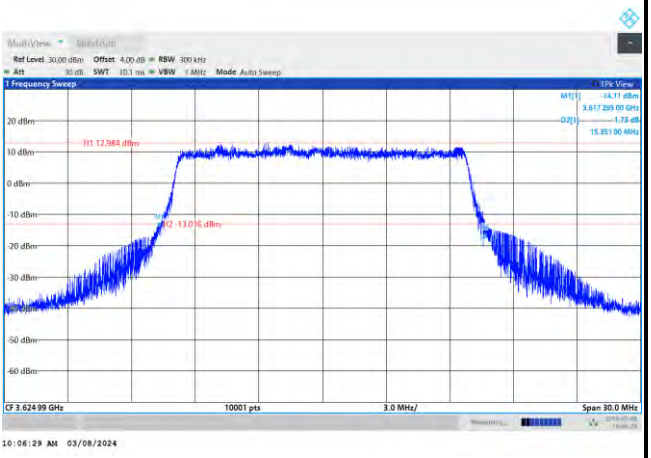
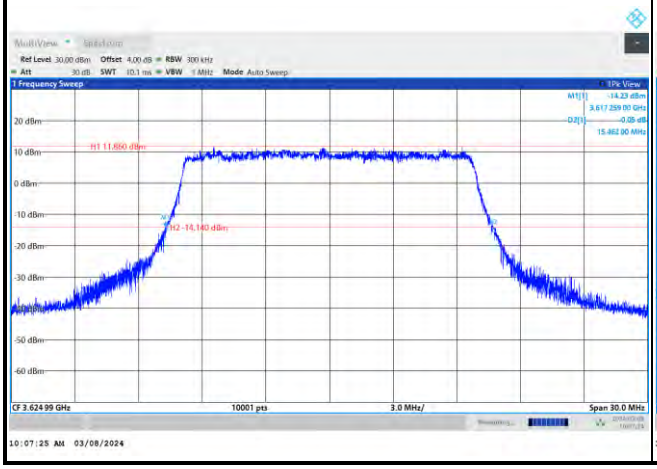
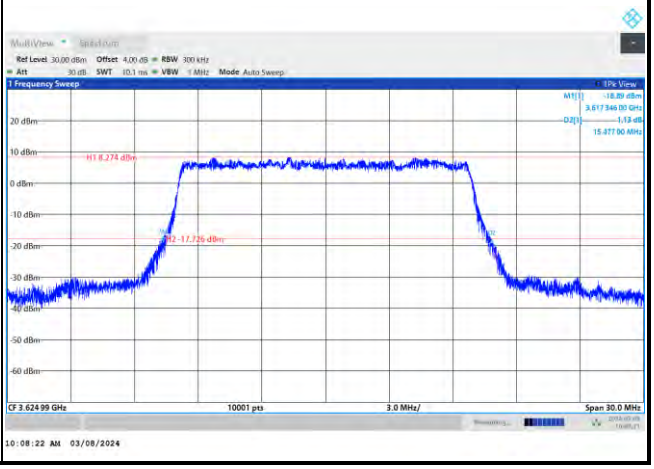

**256QAM**

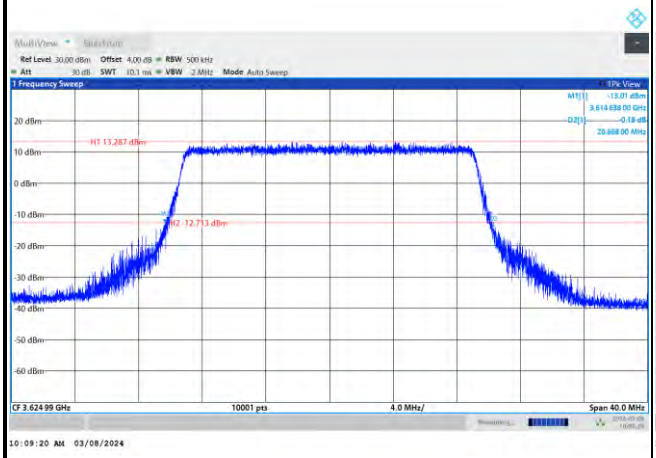
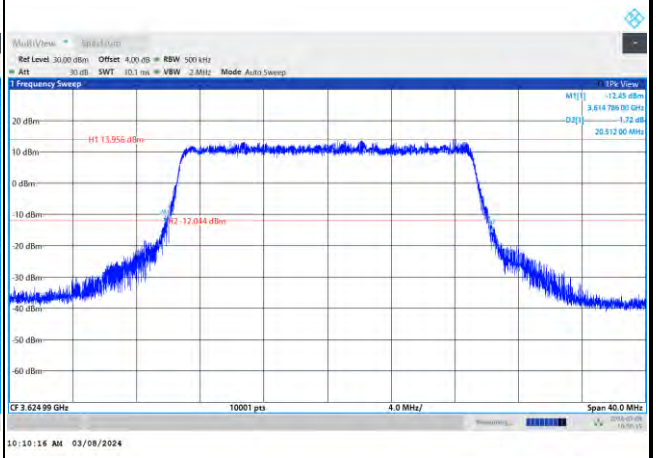
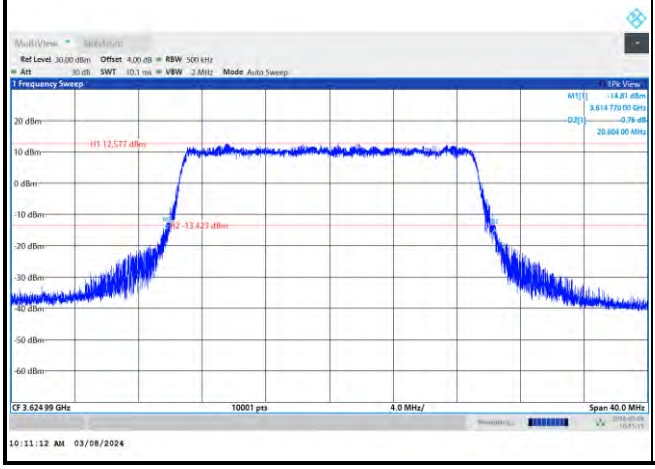
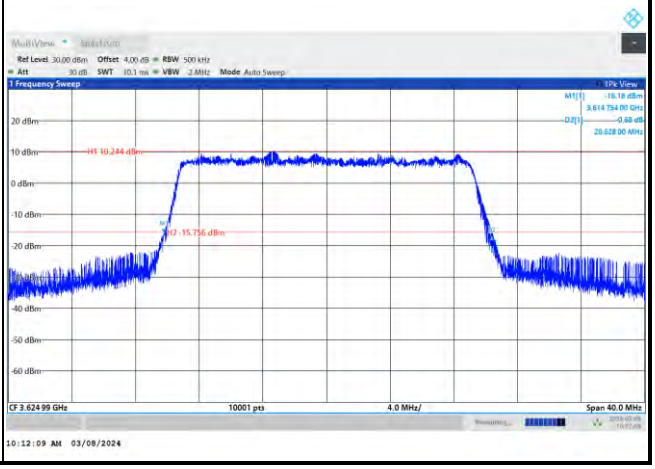


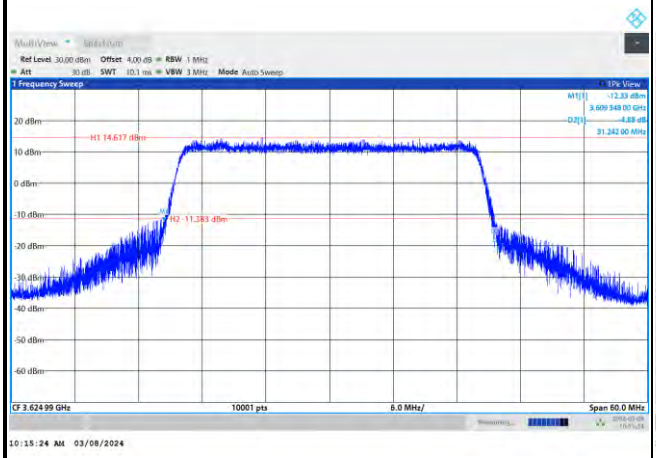
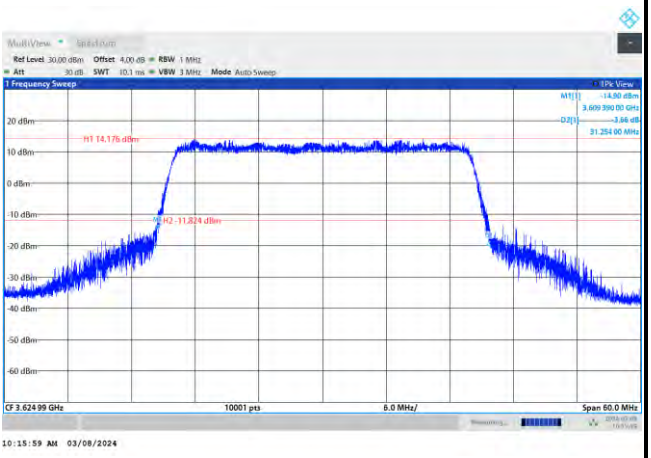
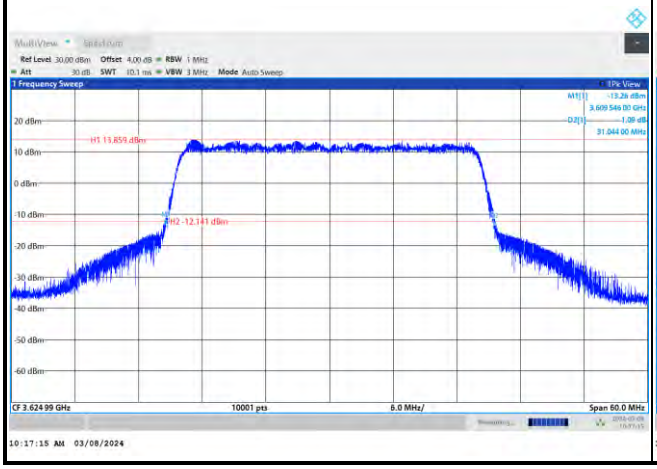
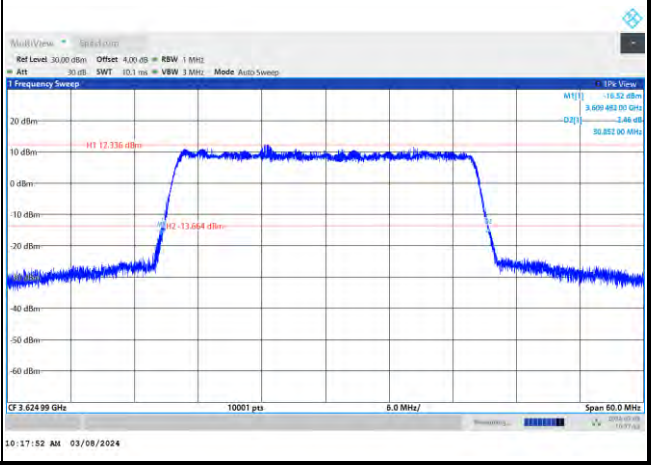
# 26dB Bandwidth

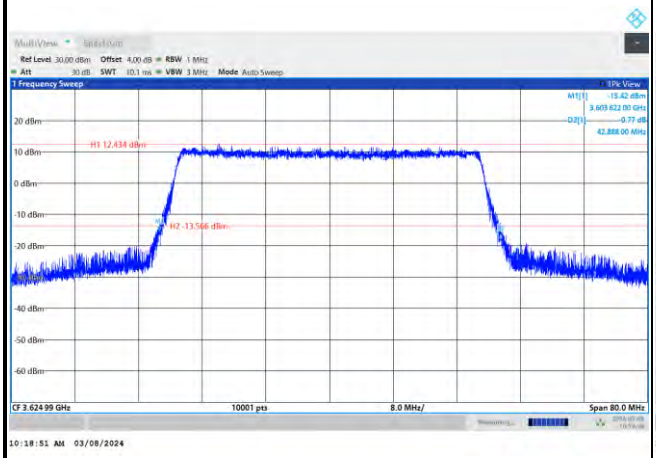
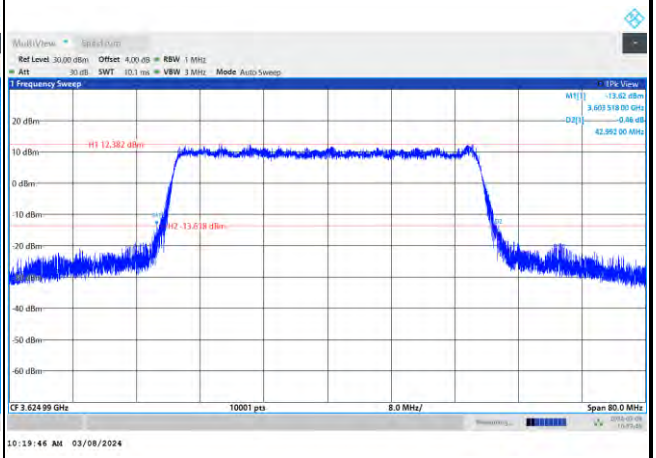
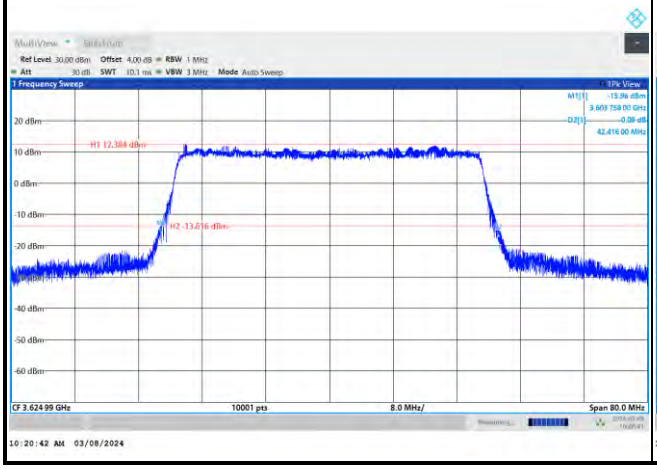
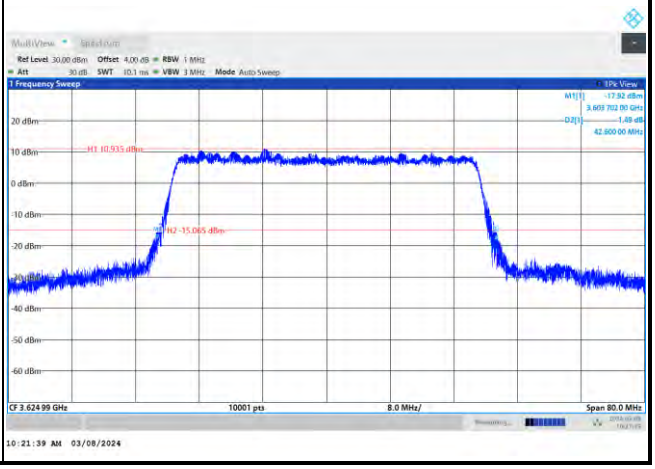
| Mode | FR1 n48 : 26dB BW(MHz) / CP OFDM | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| BW | 10MHz | | 15MHz | | 20MHz | | 25MHz | |
| Mod. | QPSK | 16QAM | QPSK | 16QAM | QPSK | 16QAM | QPSK | 16QAM |
| Middle CH | 10.42 | 10.50 | 15.69 | 15.35 | 20.67 | 20.51 | - | - |
| Mod. | 64QAM | 256QAM | 64QAM | 256QAM | 64QAM | 256QAM | 64QAM | 256QAM |
| Middle CH | 10.35 | 10.34 | 15.46 | 15.48 | 20.60 | 20.63 | - | - |
| BW | 30MHz | | 40MHz | | 50MHz | | 60MHz | |
| Mod. | QPSK | 16QAM | QPSK | 16QAM | QPSK | 16QAM | QPSK | 16QAM |
| Middle CH | 31.24 | 31.25 | 42.89 | 42.99 | - | - | - | - |
| Mod. | 64QAM | 256QAM | 64QAM | 256QAM | 64QAM | 256QAM | 64QAM | 256QAM |
| Middle CH | 31.04 | 30.85 | 42.41 | 42.60 | - | - | - | - |
| BW | 70MHz | | 80MHz | | 90MHz | | 100MHz | |
| Mod. | QPSK | 16QAM | QPSK | 16QAM | QPSK | 16QAM | QPSK | 16QAM |
| Middle CH | - | - | - | - | - | - | - | - |
| Mod. | 64QAM | 256QAM | 64QAM | 256QAM | 64QAM | 256QAM | 64QAM | 256QAM |
| Middle CH | - | - | - | - | - | - | - | - |

| FR1 n48 / 10MHz / CP OFDM / Middle Channel / Full RB | |
|---|---|
| QPSK | 16QAM |
|  |  |
| 64QAM | 256QAM |
|  |  |

| FR1 n48 / 15MHz / CP OFDM / Middle Channel / Full RB | |
|---|---|
| QPSK | 16QAM |
|  |  |
| 64QAM | 256QAM |
|  |  |

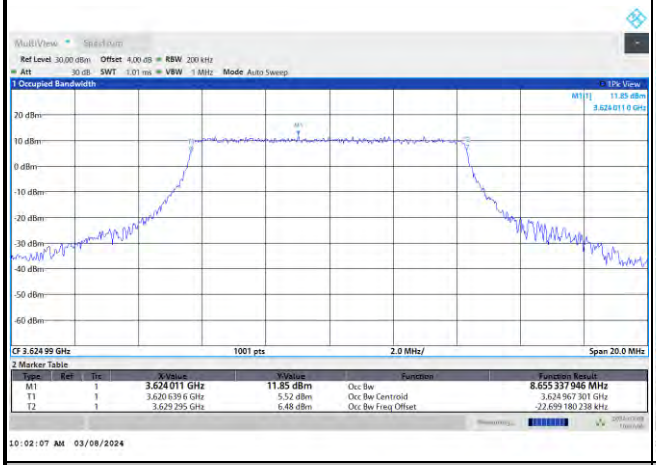
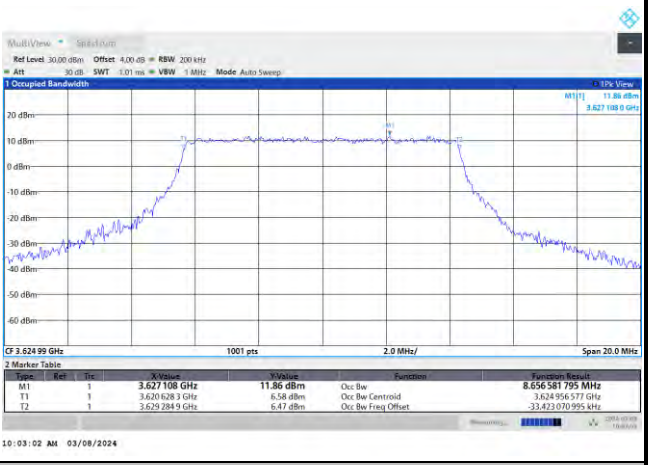
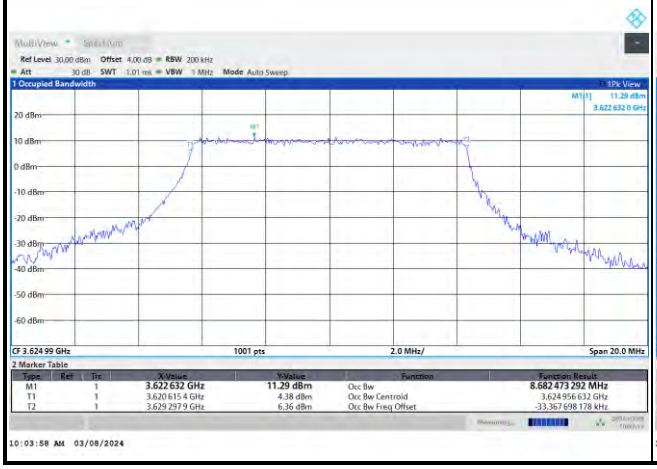
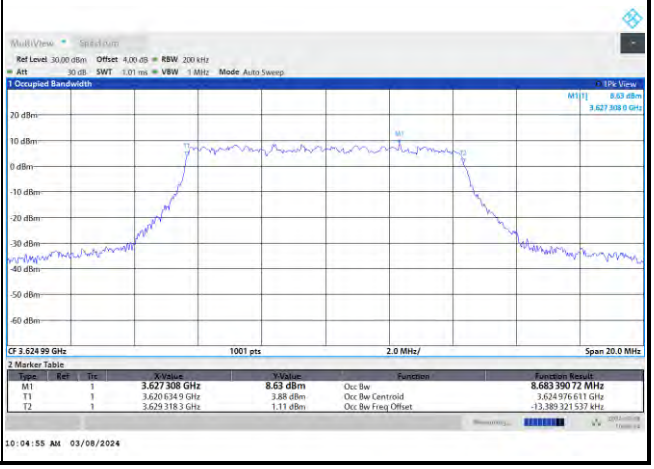
| FR1 n48 / 20MHz / CP OFDM / Middle Channel / Full RB | |
|---|---|
| QPSK | 16QAM |
|  |  |
| 64QAM | 256QAM |
|  |  |

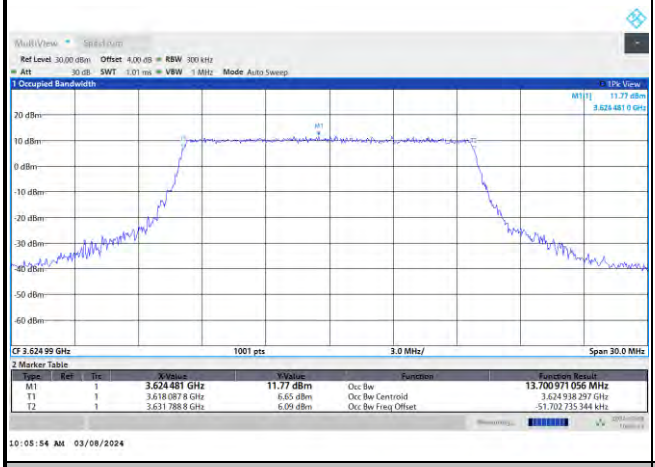
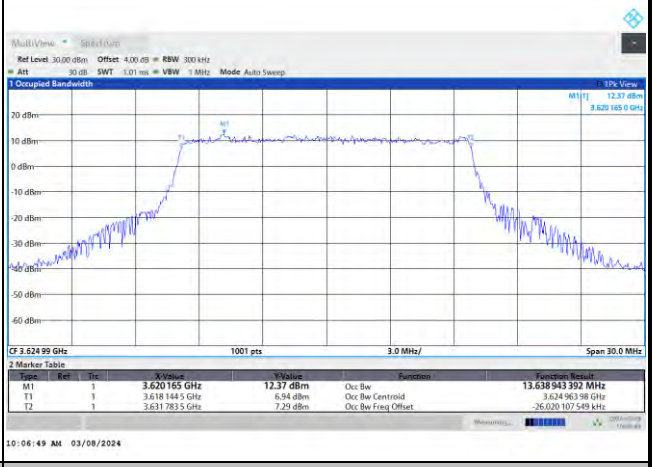
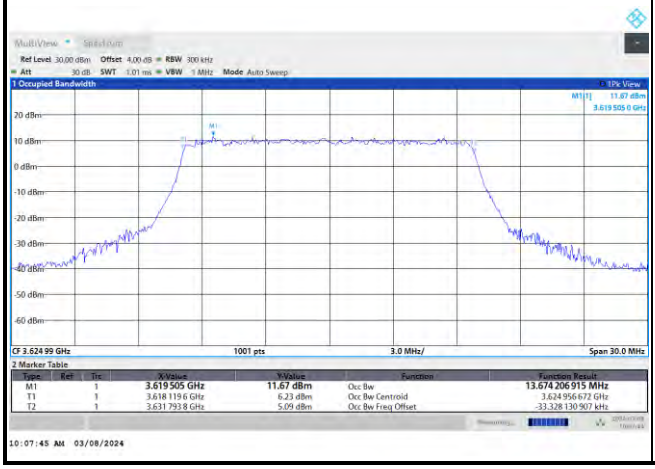
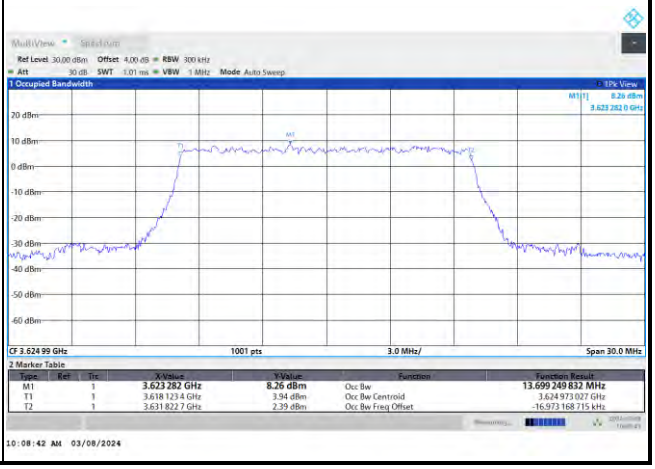
| FR1 n48 / 30MHz / CP OFDM / Middle Channel / Full RB | |
|---|---|
| QPSK | 16QAM |
|  |  |
| 64QAM | 256QAM |
|  |  |

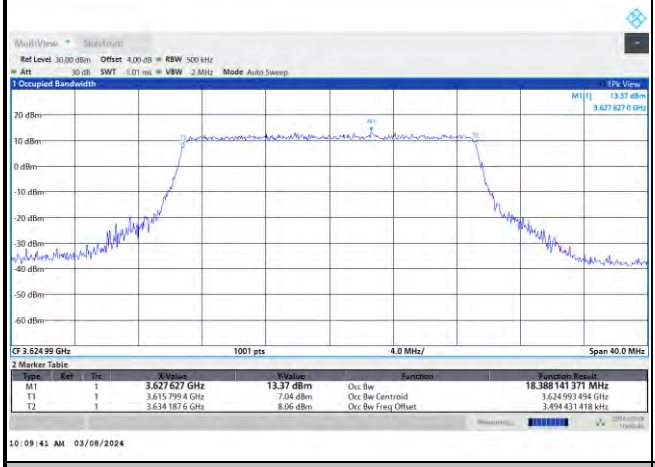
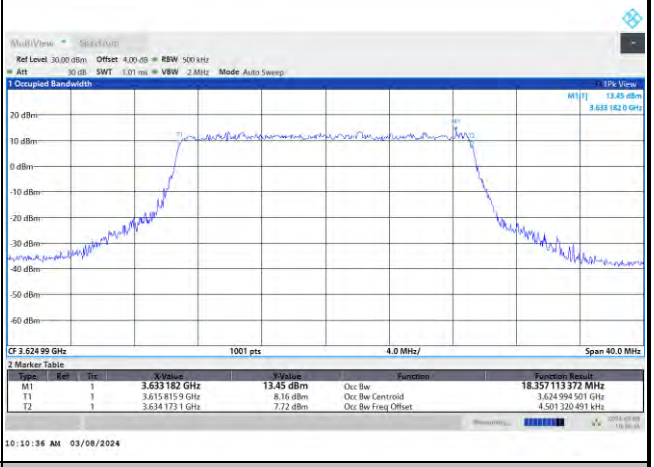
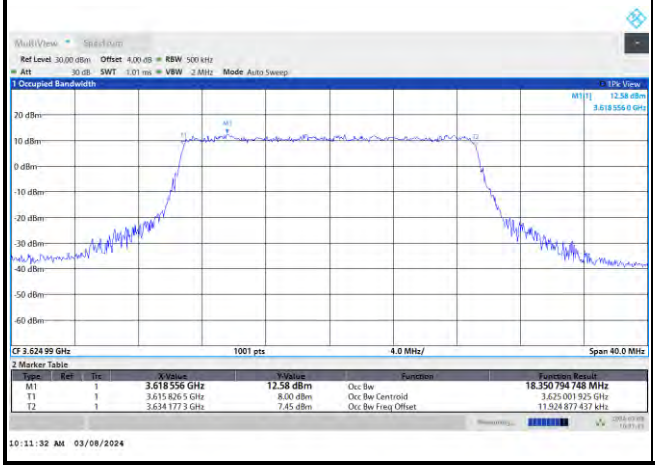
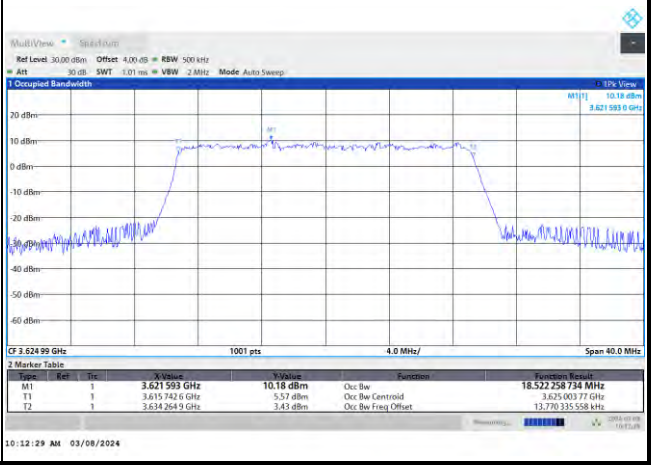
| FR1 n48 / 40MHz / CP OFDM / Middle Channel / Full RB | |
|---|---|
| QPSK | 16QAM |
|  |  |
| 64QAM | 256QAM |
|  |  |

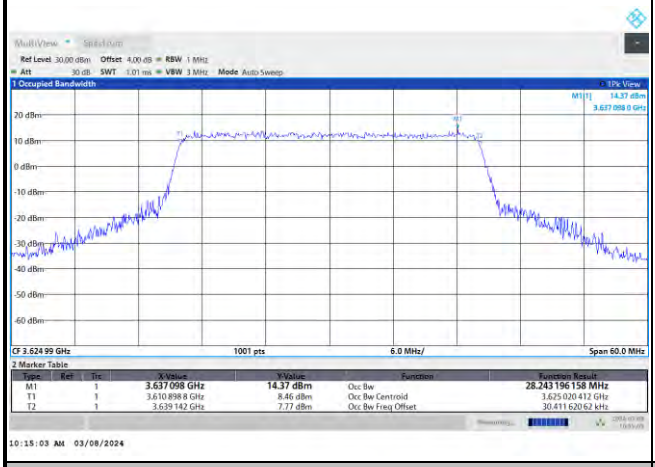
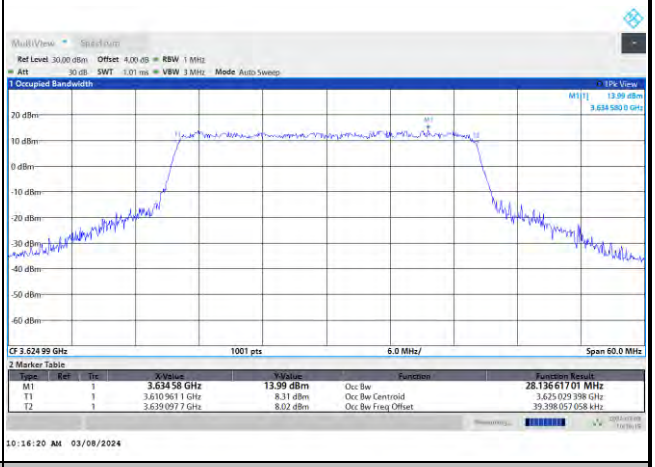
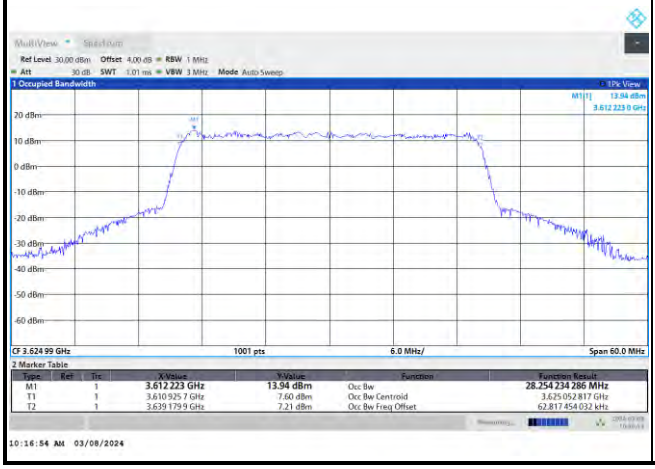
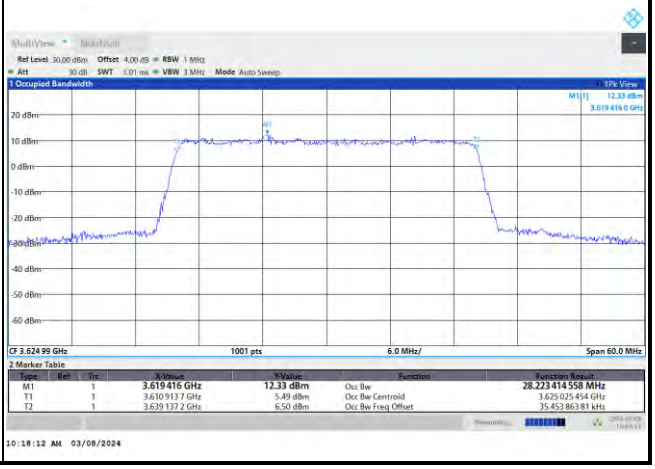
# Occupied Bandwidth

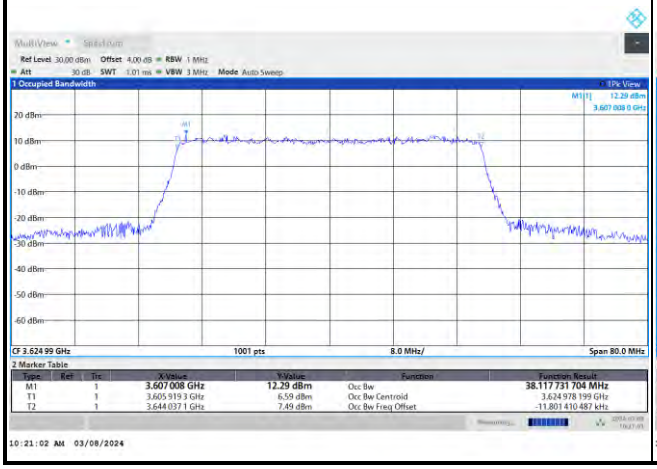
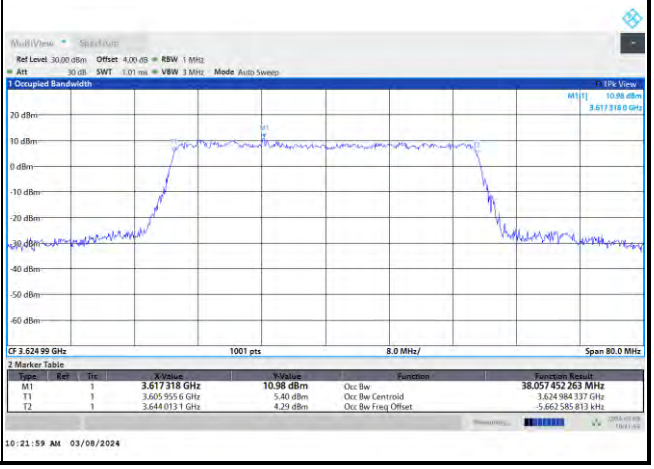
| Mode | FR1 n48 : OB BW(MHz) / CP OFDM | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| BW | 10MHz | | 15MHz | | 20MHz | | 25MHz | |
| Mod. | QPSK | 16QAM | QPSK | 16QAM | QPSK | 16QAM | QPSK | 16QAM |
| Middle CH | 8.65 | 8.65 | 13.70 | 13.63 | 18.38 | 18.35 | - | - |
| Mod. | 64QAM | 256QAM | 64QAM | 256QAM | 64QAM | 256QAM | 64QAM | 256QAM |
| Middle CH | 8.68 | 8.68 | 13.67 | 13.69 | 18.35 | 18.52 | - | - |
| BW | 30MHz | | 40MHz | | 50MHz | | 60MHz | |
| Mod. | QPSK | 16QAM | QPSK | 16QAM | QPSK | 16QAM | QPSK | 16QAM |
| Middle CH | 28.24 | 28.13 | 38.27 | 38.13 | - | - | - | - |
| Mod. | 64QAM | 256QAM | 64QAM | 256QAM | 64QAM | 256QAM | 64QAM | 256QAM |
| Middle CH | 28.25 | 28.22 | 38.11 | 38.05 | - | - | - | - |
| BW | 70MHz | | 80MHz | | 90MHz | | 100MHz | |
| Mod. | QPSK | 16QAM | QPSK | 16QAM | QPSK | 16QAM | QPSK | 16QAM |
| Middle CH | - | - | - | - | - | - | - | - |
| Mod. | 64QAM | 256QAM | 64QAM | 256QAM | 64QAM | 256QAM | 64QAM | 256QAM |
| Middle CH | - | - | - | - | - | - | - | - |

| FR1 n48 / 10MHz / CP OFDM / Middle Channel / Full RB | |
|---|---|
| QPSK | 16QAM |
|  |  |
| 64QAM | 256QAM |
|  |  |

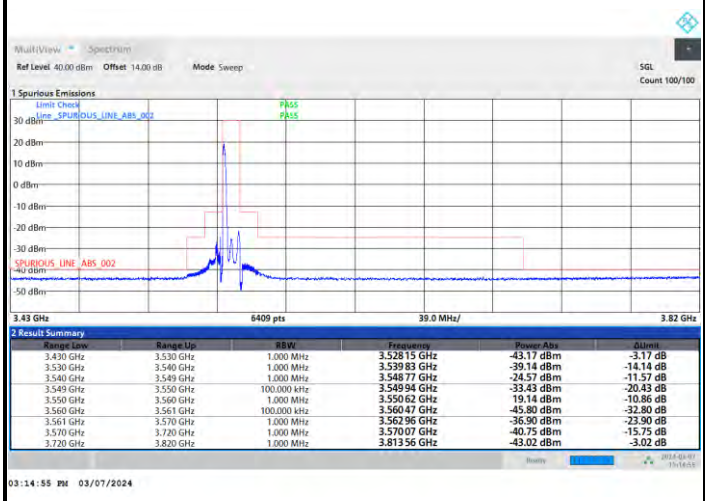
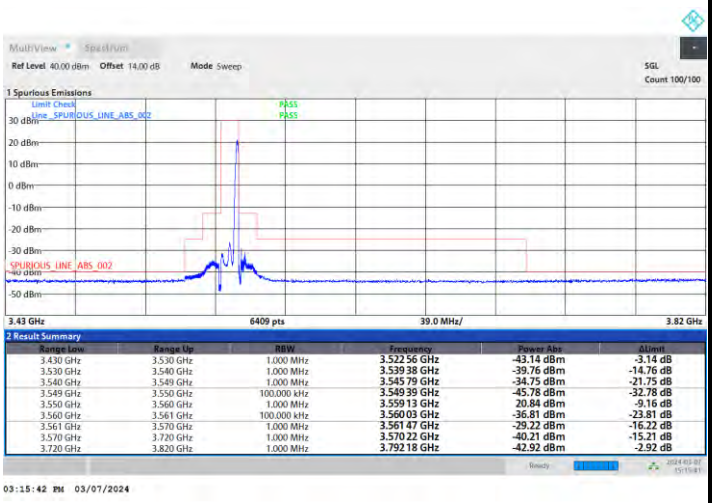
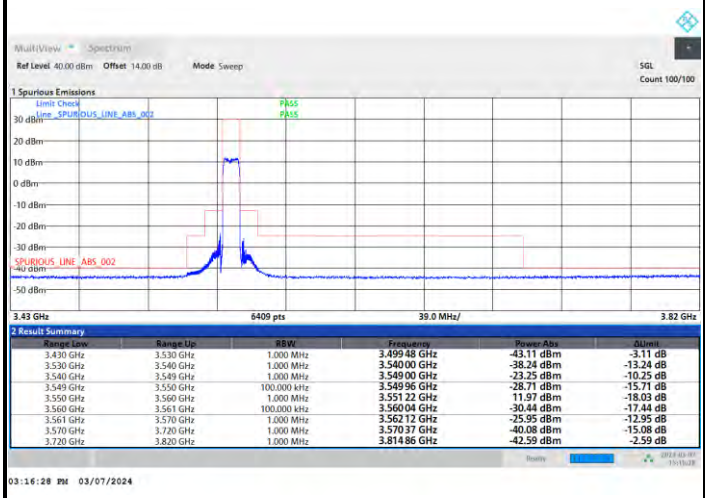
| FR1 n48 / 15MHz / CP OFDM / Middle Channel / Full RB | |
|---|---|
| QPSK | 16QAM |
|  |  |
| 64QAM | 256QAM |
|  |  |

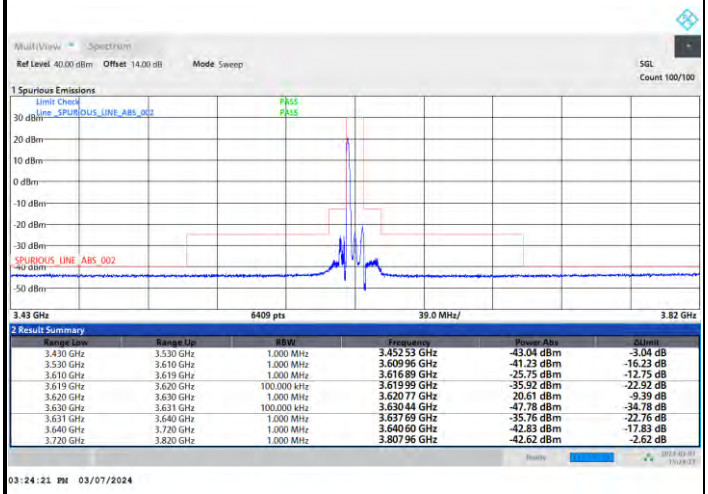
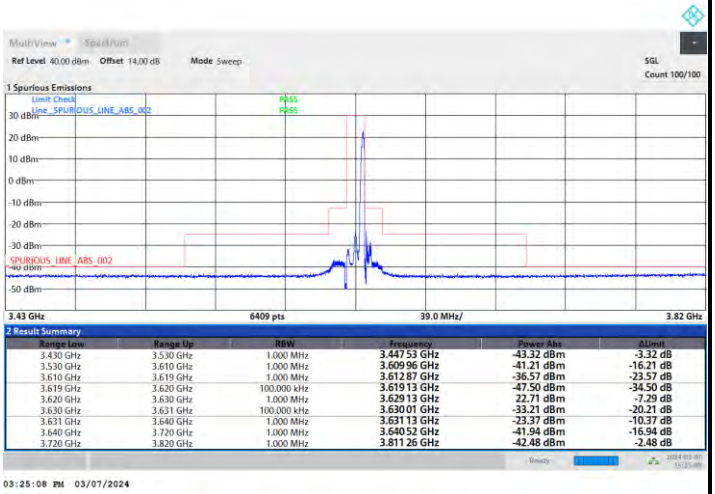
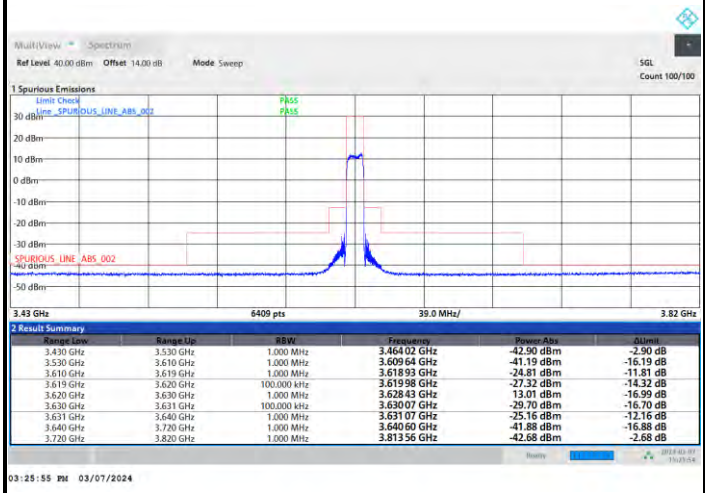
| FR1 n48 / 20MHz / CP OFDM / Middle Channel / Full RB | |
|---|---|
| QPSK | 16QAM |
|  |  |
| 64QAM | 256QAM |
|  |  |

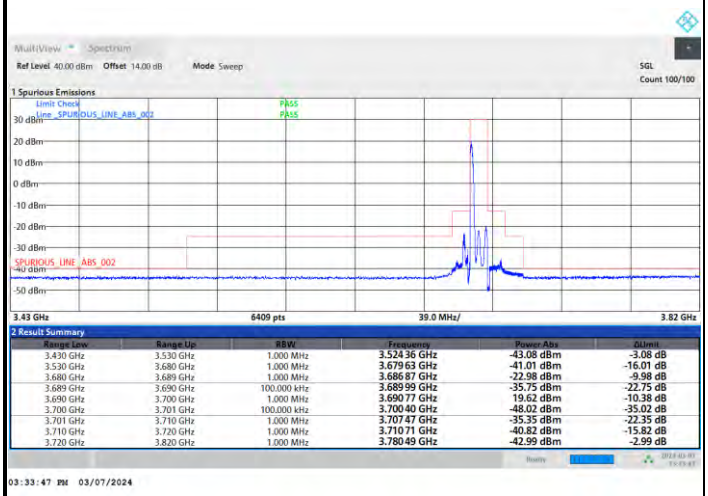
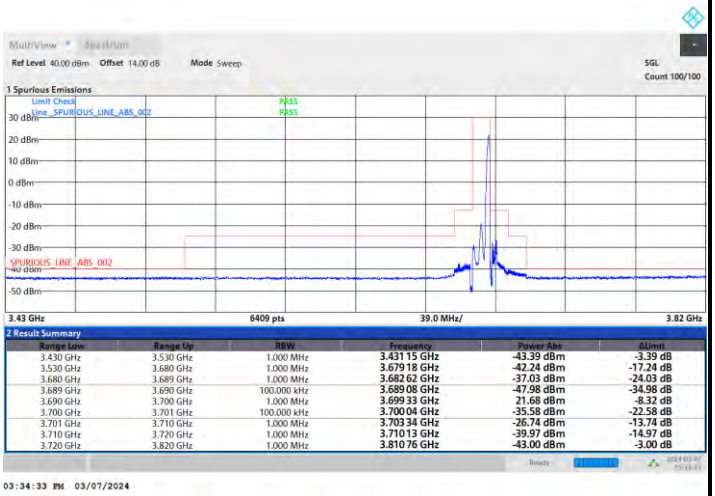
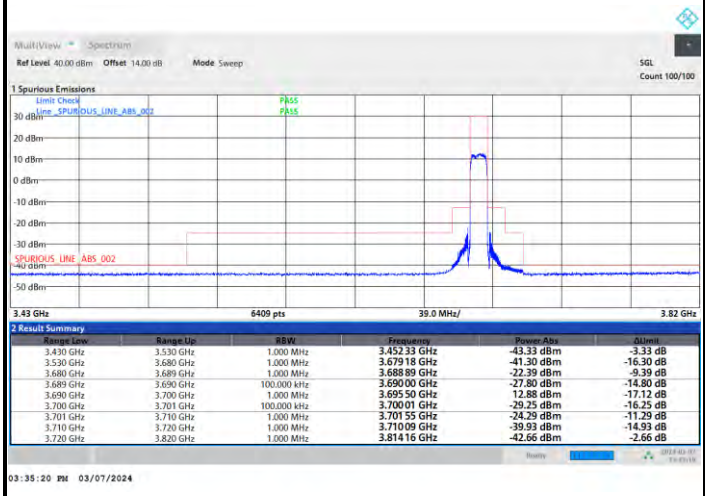
| FR1 n48 / 30MHz / CP OFDM / Middle Channel / Full RB | |
|---|---|
| QPSK | 16QAM |
|  |  |
| 64QAM | 256QAM |
|  |  |

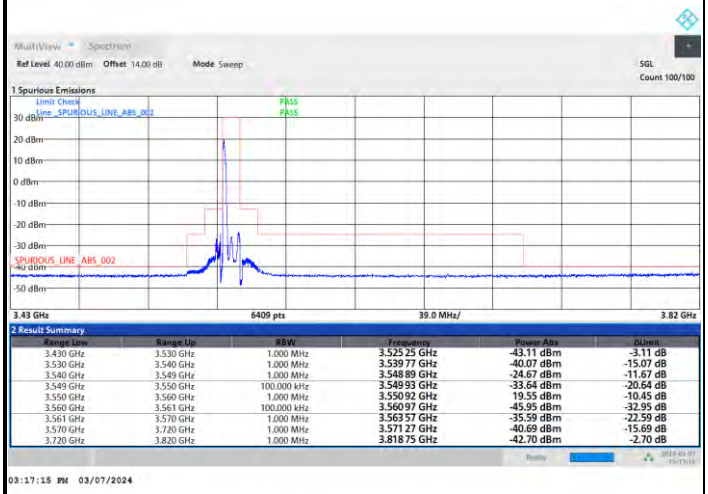
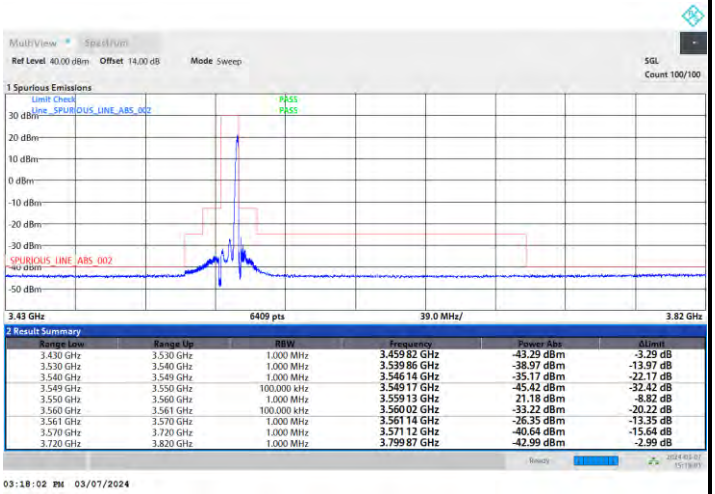
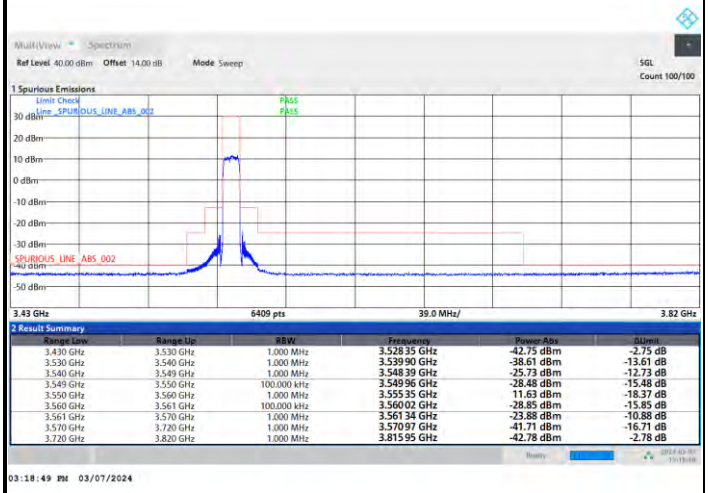
| FR1 n48 / 40MHz / CP OFDM / Middle Channel / Full RB | |
|---|---|
| QPSK | 16QAM |
|  |  |
| 64QAM | 256QAM |
|  |  |

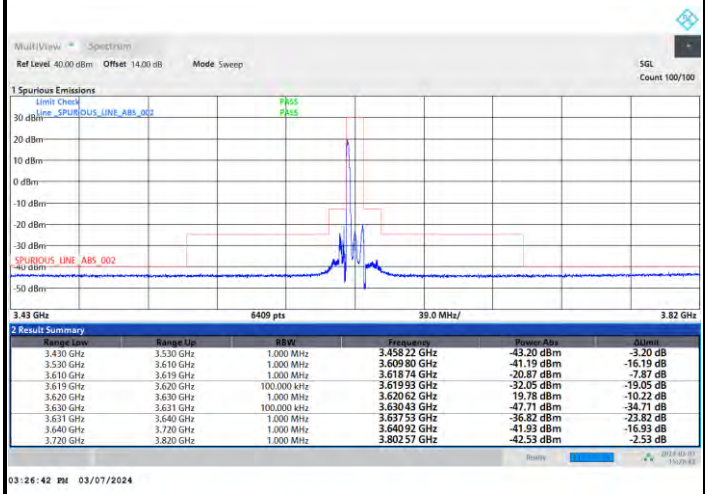
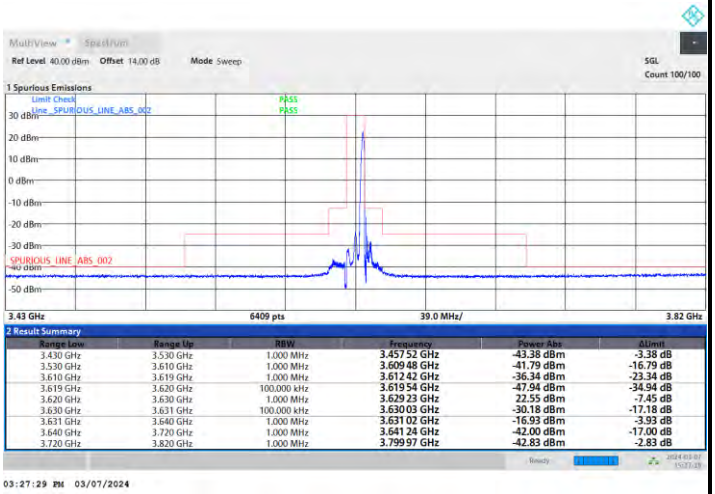
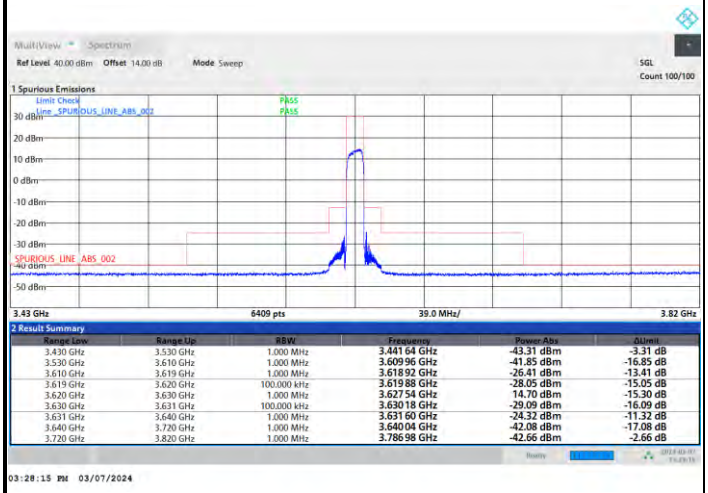
# Unwanted Emission (MASK)

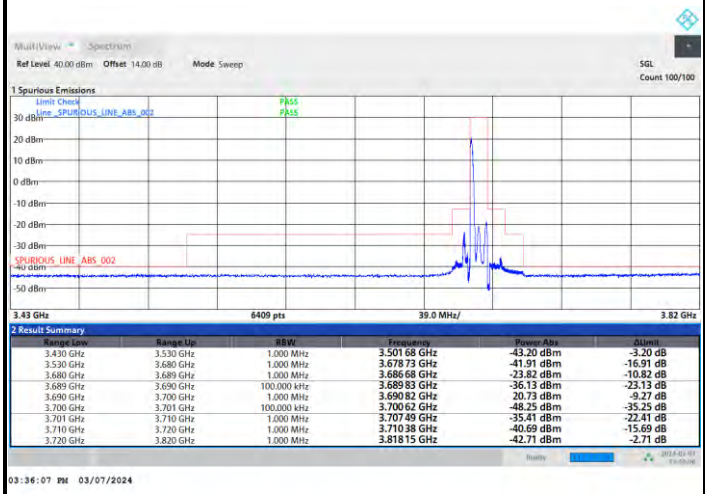
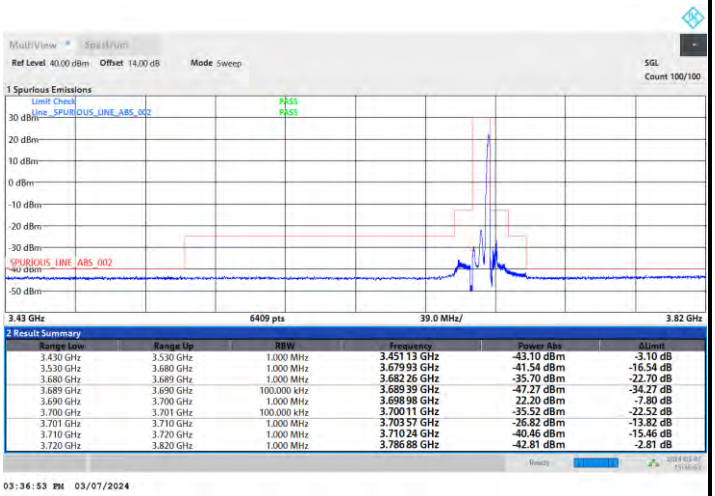
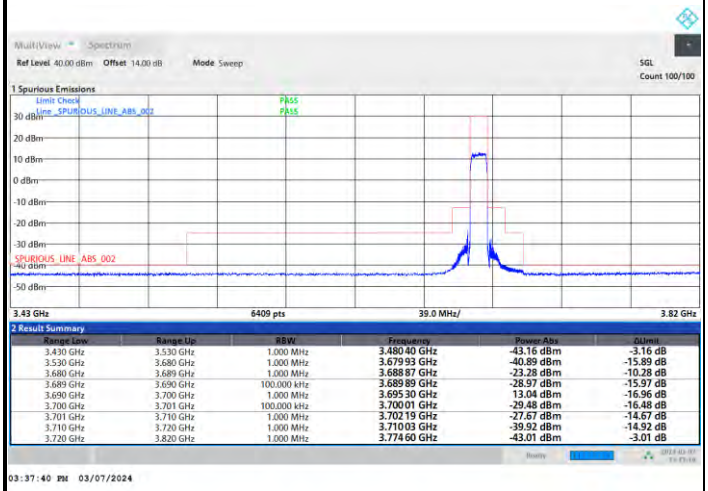
| FR1 n48 / 10MHz / CP OFDM / QPSK | |
|---|---|
| Lowest Channel | |
| 1RB0 | 1RBmax |
|  |  |
| Full RB | |
|  | |

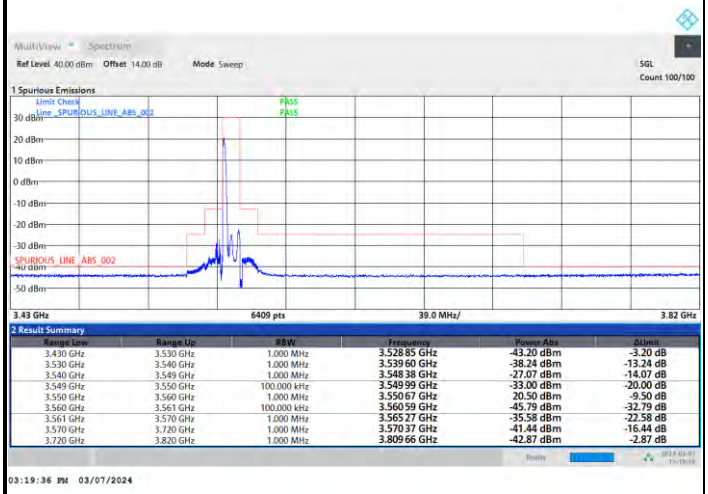
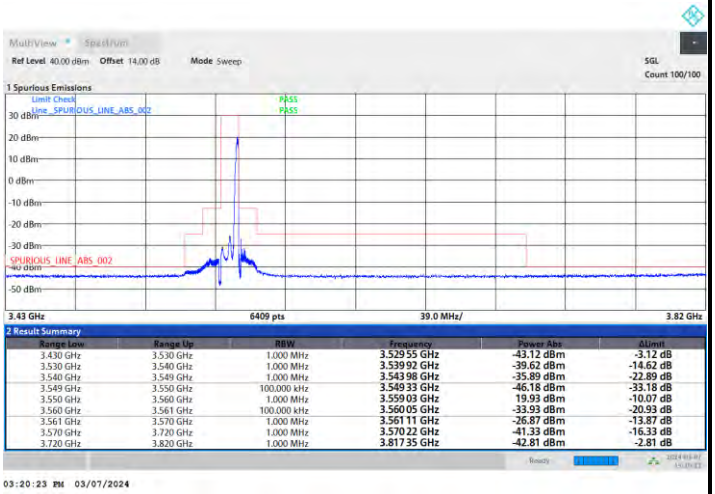
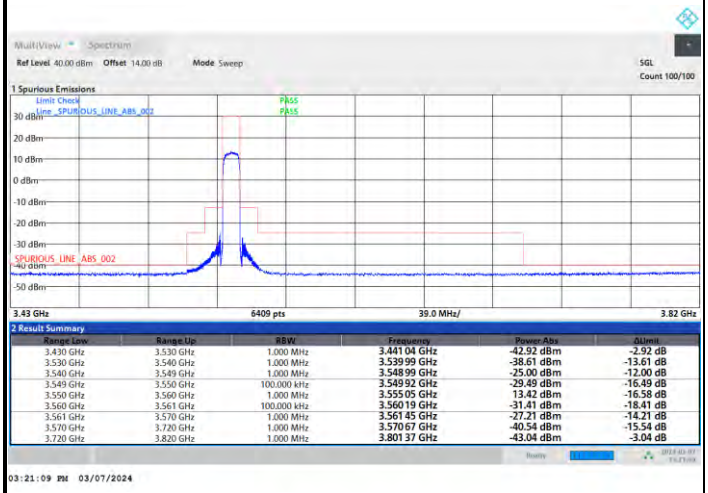
| FR1 n48 / 10MHz / CP OFDM / QPSK | |
|---|---|
| **Middle Channel** | |
| **1RB0** | **1RBmax** |
|  |  |
| **Full RB** | |
|  | |

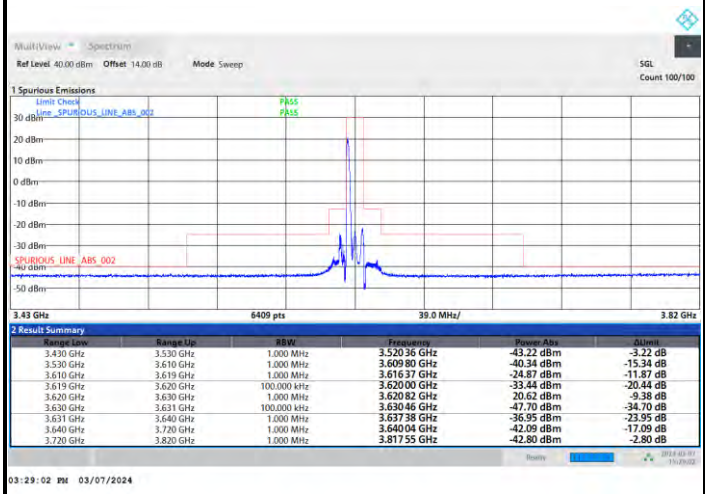
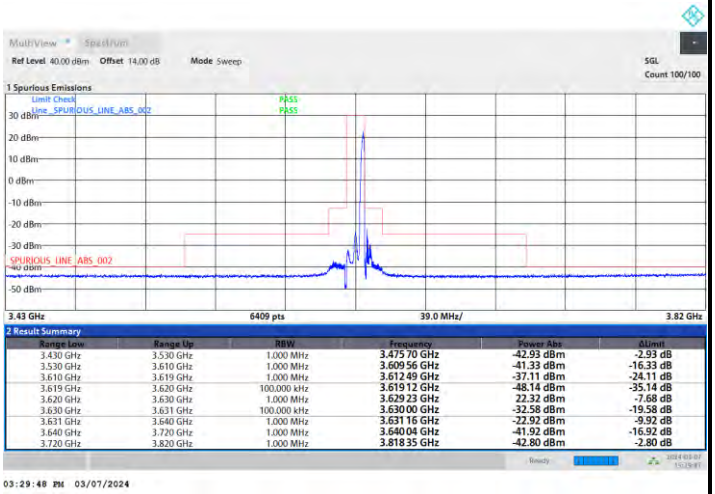
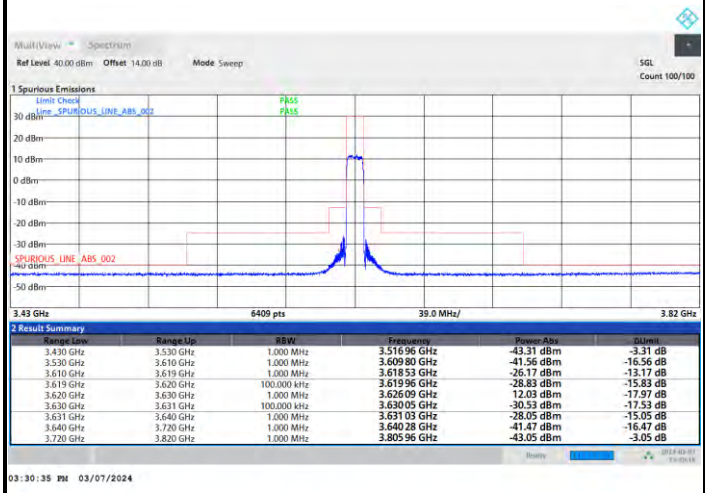
| FR1 n48 / 10MHz / CP OFDM / QPSK | |
|---|---|
| **Highest Channel** | |
| **1RB0** | **1RBmax** |
|  |  |
| **Full RB** | |
|  | |

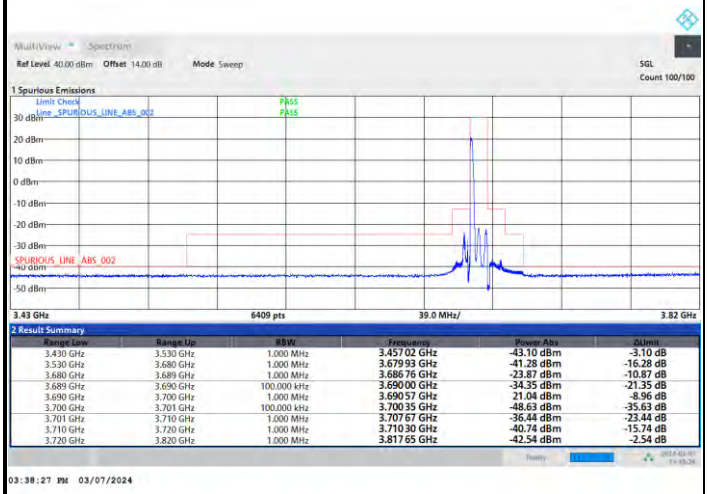
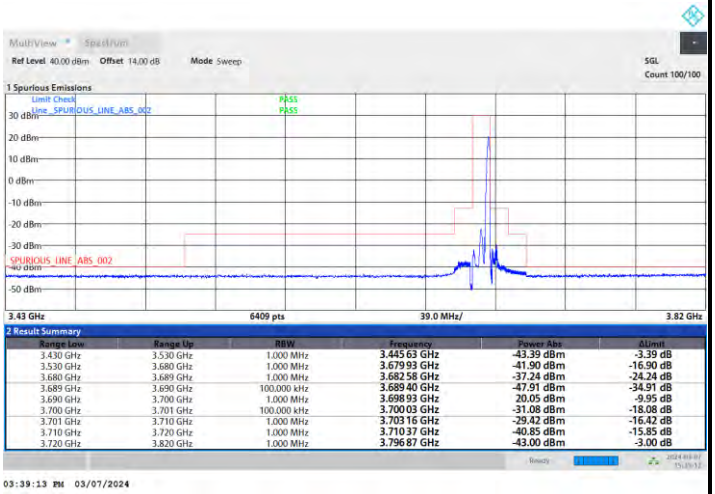
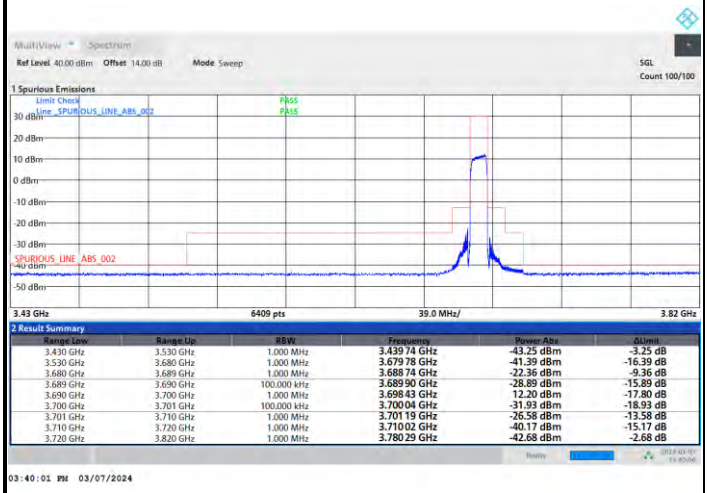
| FR1 n48 / 10MHz / CP OFDM / 16QAM | |
|---|---|
| **Lowest Channel** | |
| **1RB0** | **1RBmax** |
|  |  |
| **Full RB** | |
|  | |

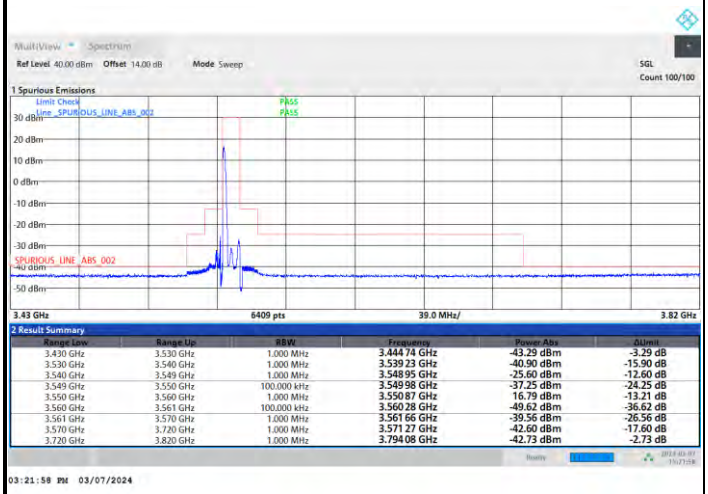
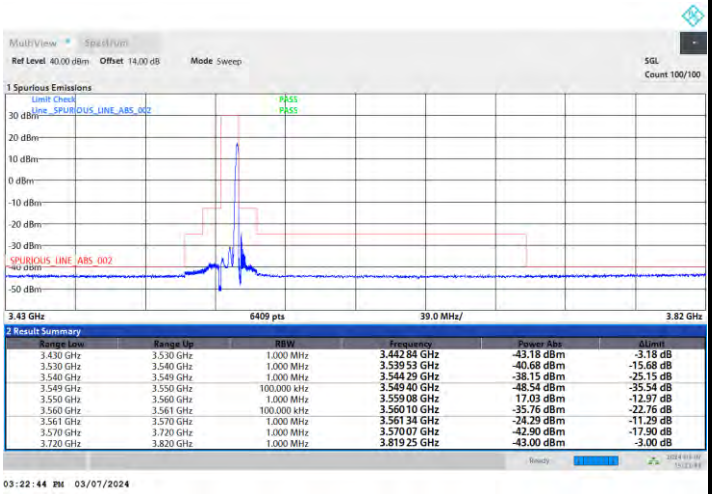
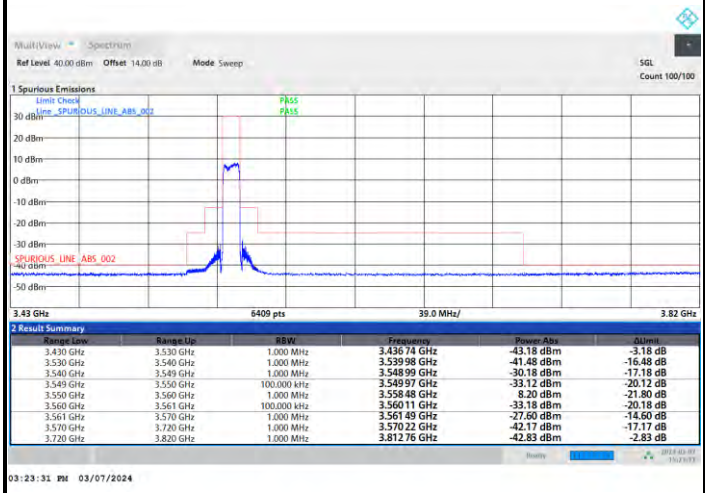
| FR1 n48 / 10MHz / CP OFDM / 16QAM | |
|---|---|
| **Middle Channel** | |
| **1RB0** | **1RBmax** |
|  |  |
| **Full RB** | |
|  | |

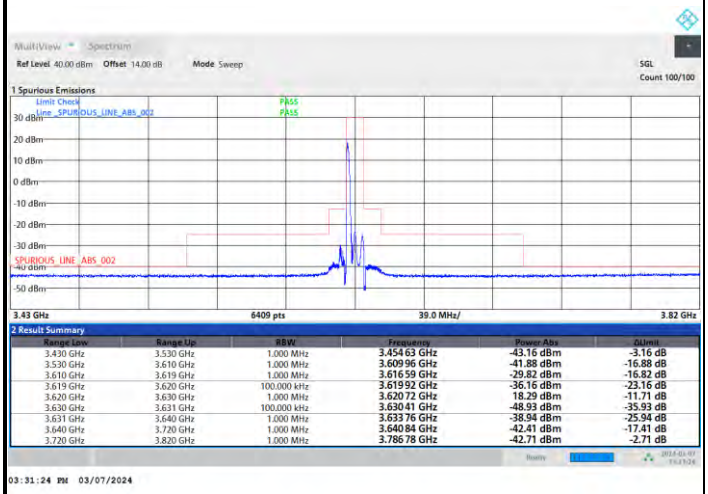
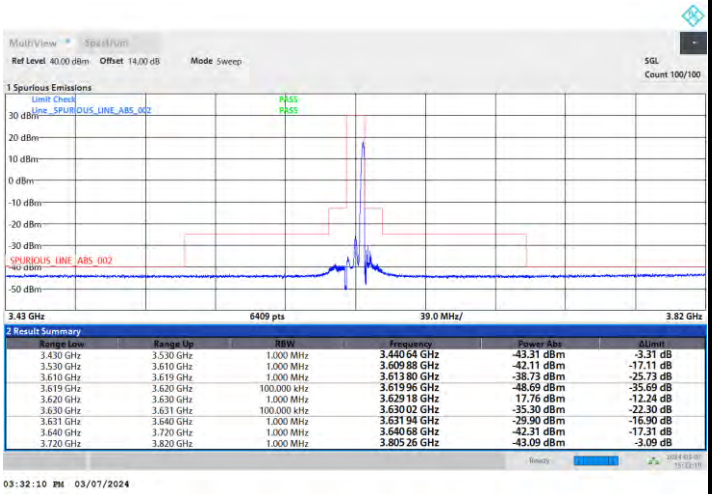
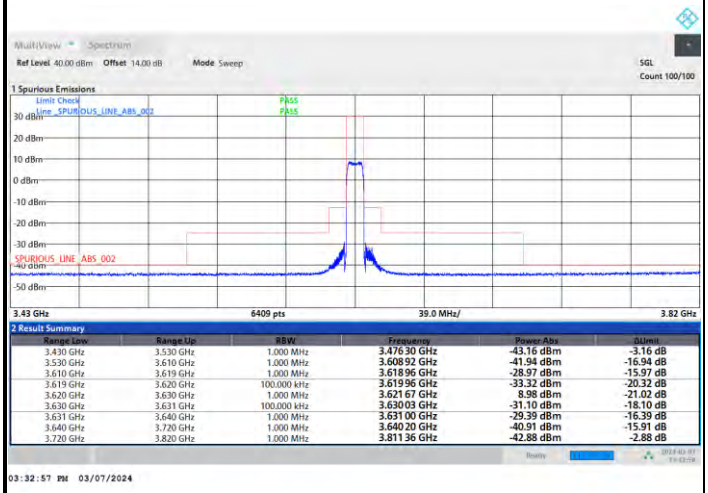
| FR1 n48 / 10MHz / CP OFDM / 16QAM | |
|---|---|
| **Highest Channel** | |
| **1RB0** | **1RBmax** |
|  |  |
| **Full RB** | |
|  | |

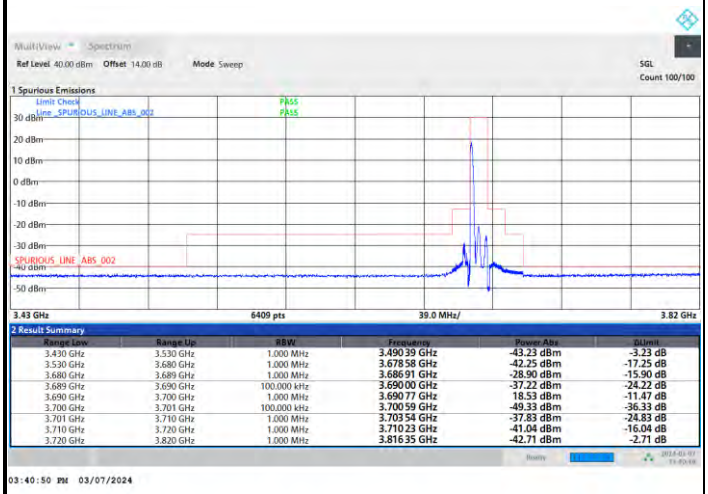
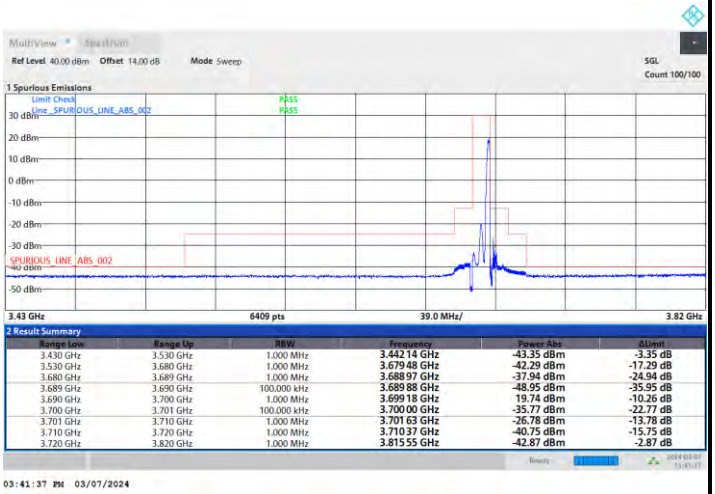
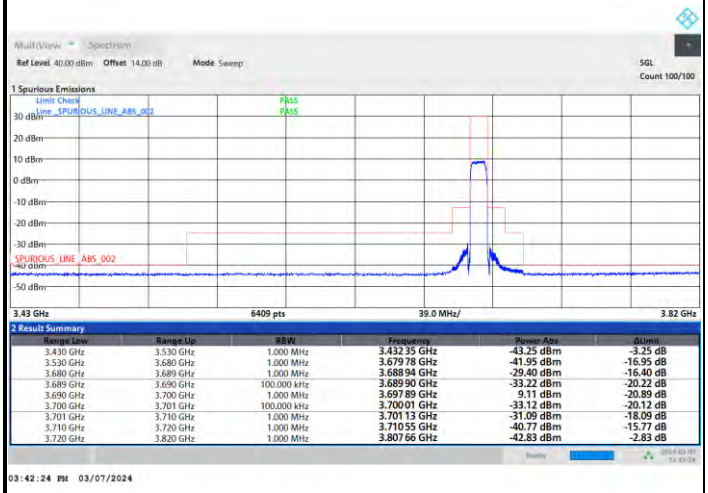
| FR1 n48 / 10MHz / CP OFDM / 64QAM | |
|---|---|
| **Lowest Channel** | |
| **1RB0** | **1RBmax** |
|  |  |
| **Full RB** | |
|  | |

| FR1 n48 / 10MHz / CP OFDM / 64QAM | |
|---|---|
| Middle Channel | |
| 1RB0 | 1RBmax |
|  |  |
| Full RB | |
|  | |

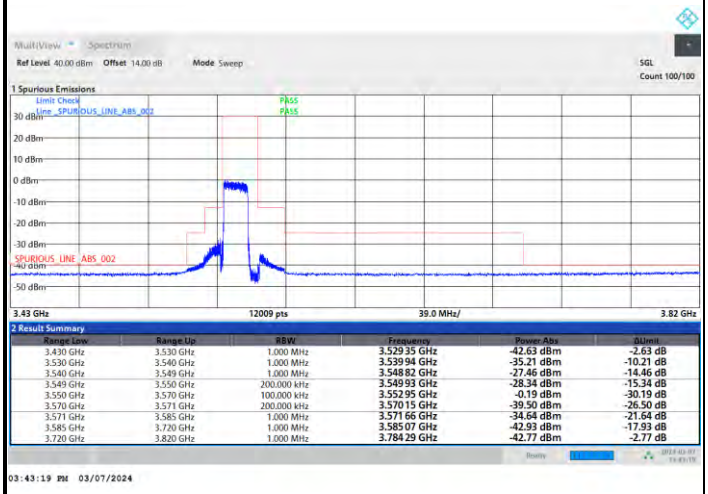
| FR1 n48 / 10MHz / CP OFDM / 64QAM | |
|---|---|
| **Highest Channel** | |
| **1RB0** | **1RBmax** |
|  |  |
| **Full RB** | |
|  | |

| FR1 n48 / 10MHz / CP OFDM / 256QAM | |
|---|---|
| **Lowest Channel** | |
| **1RB0** | **1RBmax** |
|  |  |
| **Full RB** | |
|  | |

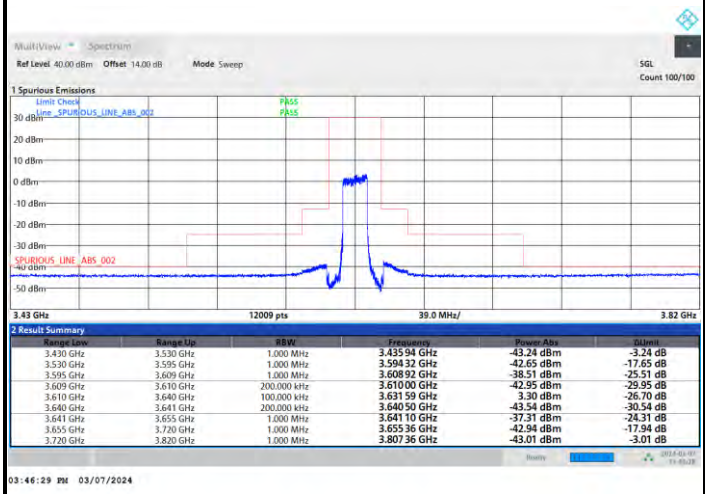
| FR1 n48 / 10MHz / CP OFDM / 256QAM | |
|---|---|
| **Middle Channel** | |
| **1RB0** | **1RBmax** |
|  |  |
| **Full RB** | |
|  | |

| FR1 n48 / 10MHz / CP OFDM / 256QAM | |
|---|---|
| Highest Channel | |
| 1RB0 | 1RBmax |
|  |  |
| Full RB | |
|  | |

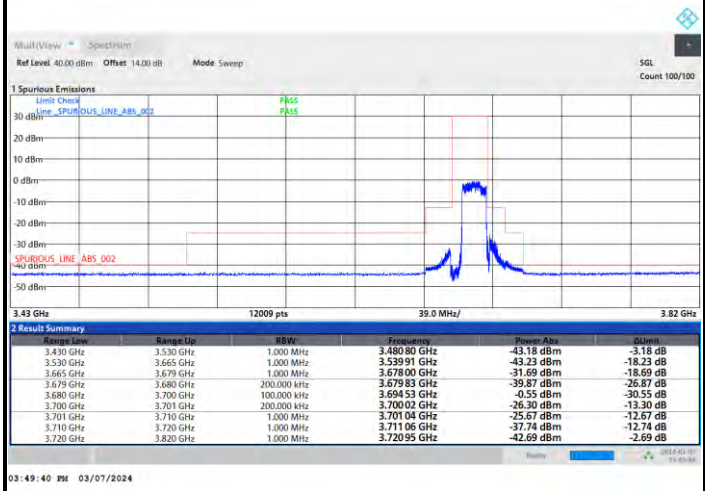
| FR1 n48 / 15MHz / CP OFDM / QPSK | |
|---|---|
| **Lowest Channel** | |
| **Full RB** | |



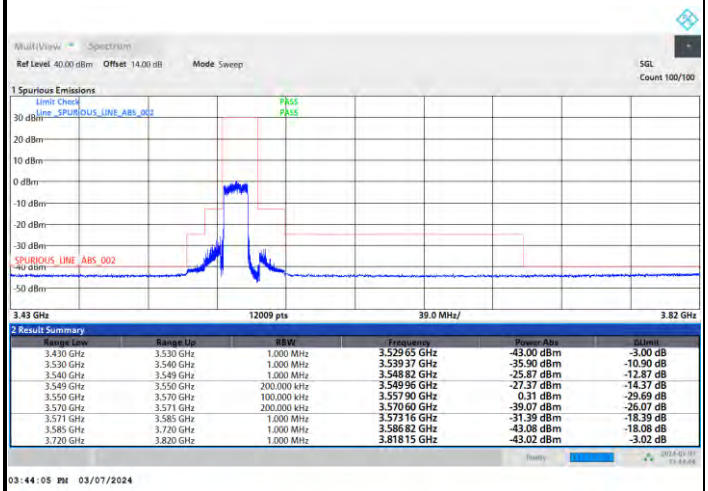

| FR1 n48 / 15MHz / CP OFDM / QPSK | |
|---|---|
| **Middle Channel** | |
| **Full RB** | |



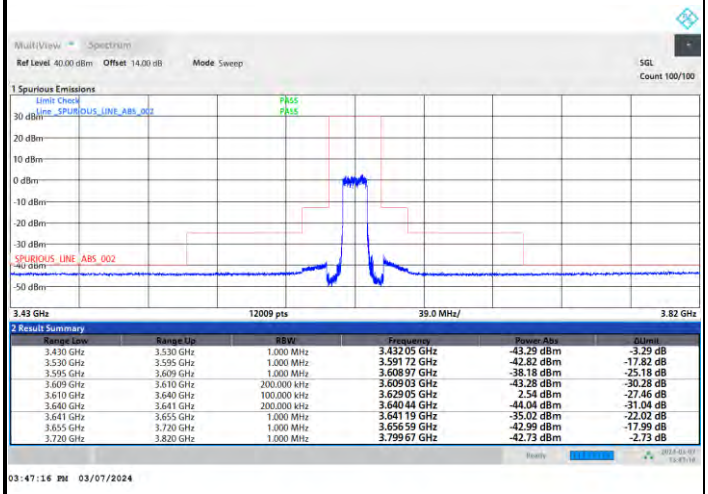
| FR1 n48 / 15MHz / CP OFDM / QPSK | |
|---|---|
| Highest Channel | |
| Full RB | |



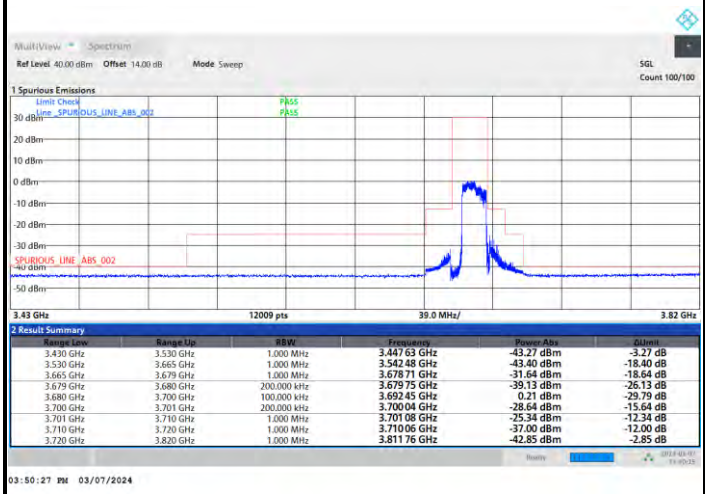

| FR1 n48 / 15MHz / CP OFDM / 16QAM | |
|---|---|
| Lowest Channel | |
| Full RB | |



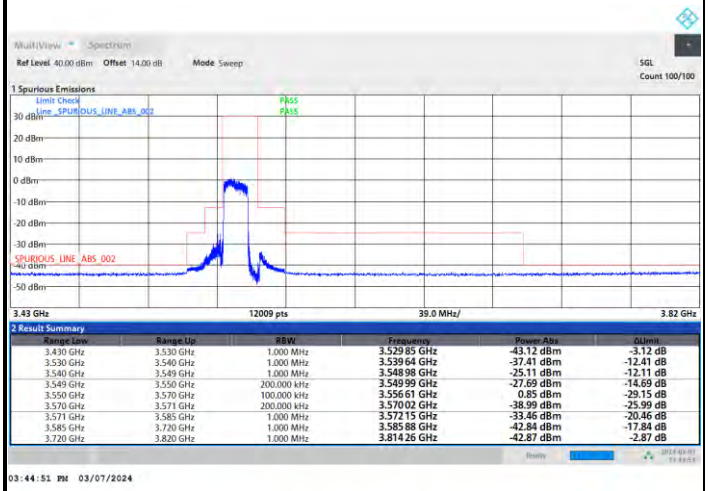
| FR1 n48 / 15MHz / CP OFDM / 16QAM | |
|---|---|
| Middle Channel | |
| Full RB | |



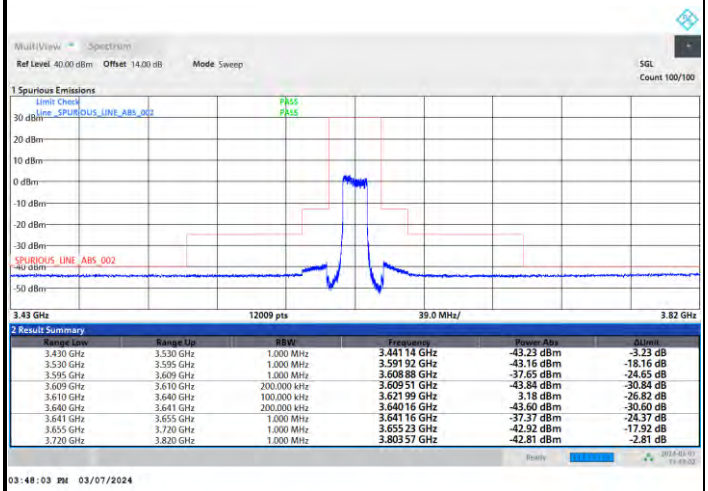

| FR1 n48 / 15MHz / CP OFDM / 16QAM | |
|---|---|
| Highest Channel | |
| Full RB | |

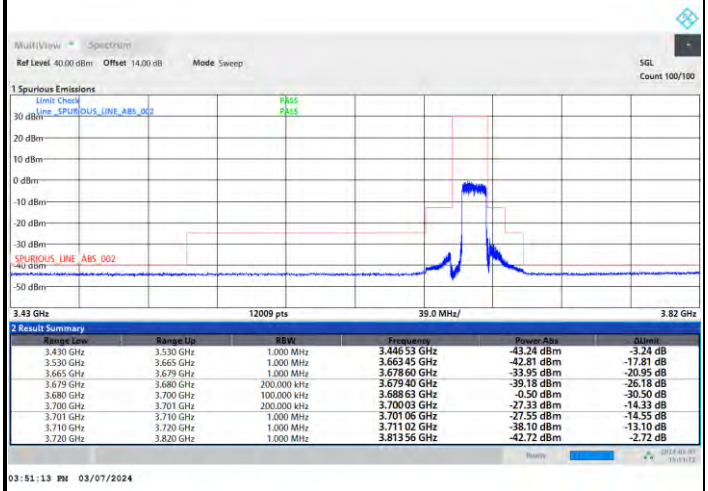


| FR1 n48 / 15MHz / CP OFDM / 64QAM | |
|---|---|
| Lowest Channel | |
| Full RB | |

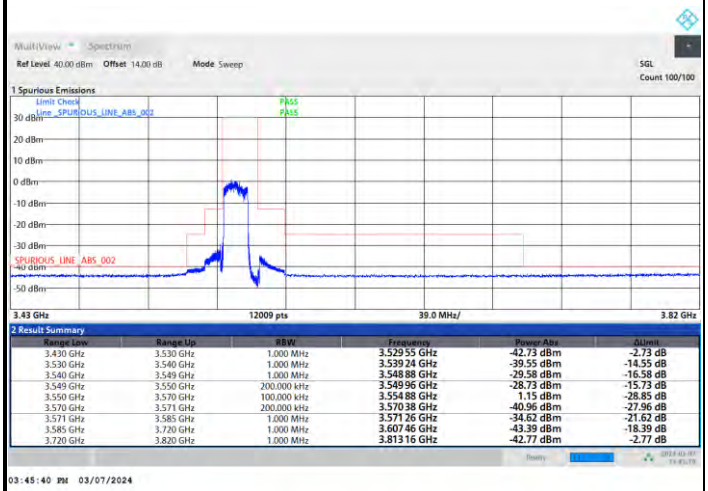



| FR1 n48 / 15MHz / CP OFDM / 64QAM | |
|---|---|
| Middle Channel | |
| Full RB | |

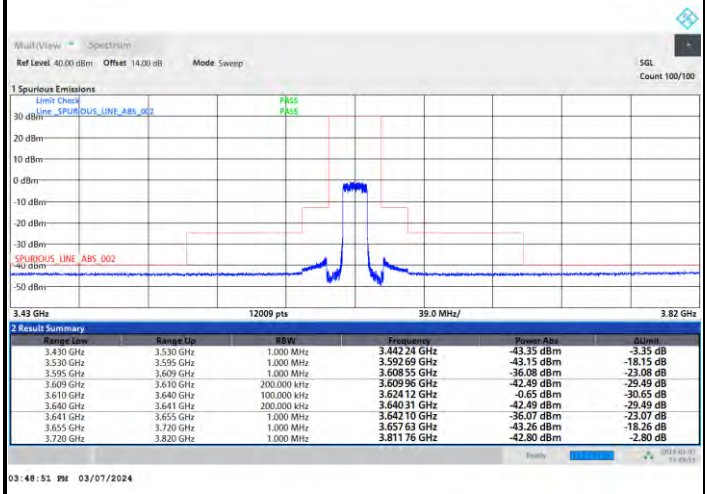


| FR1 n48 / 15MHz / CP OFDM / 64QAM | |
|---|---|
| Highest Channel | |
| Full RB | |
|  | |

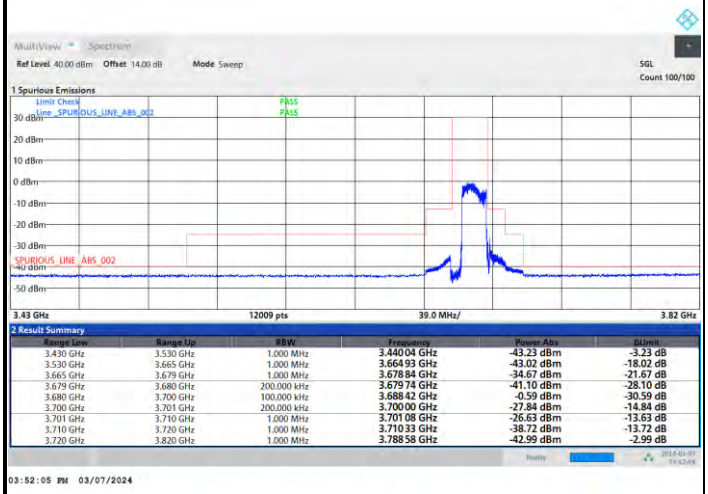


| FR1 n48 / 15MHz / CP OFDM / 256QAM | |
|---|---|
| Lowest Channel | |
| Full RB | |
|  | |

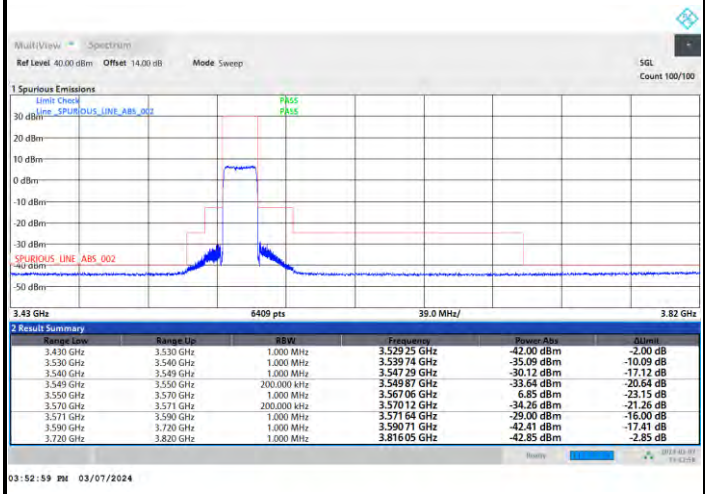
| FR1 n48 / 15MHz / CP OFDM / 256QAM | |
|---|---|
| Middle Channel | |
| Full RB | |



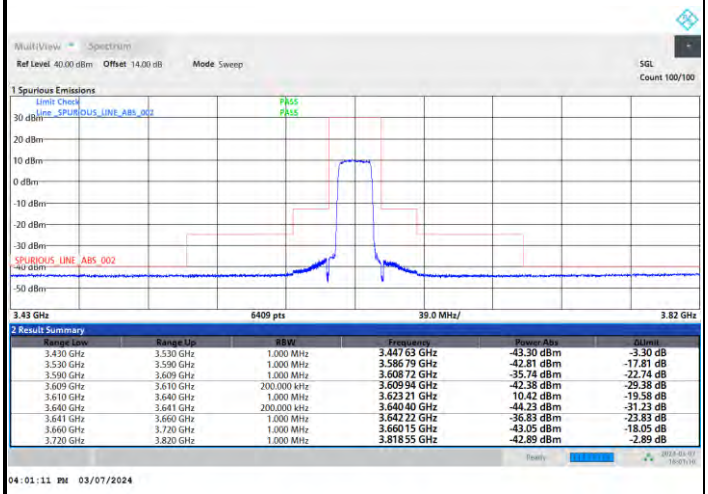

| FR1 n48 / 15MHz / CP OFDM / 256QAM | |
|---|---|
| Highest Channel | |
| Full RB | |



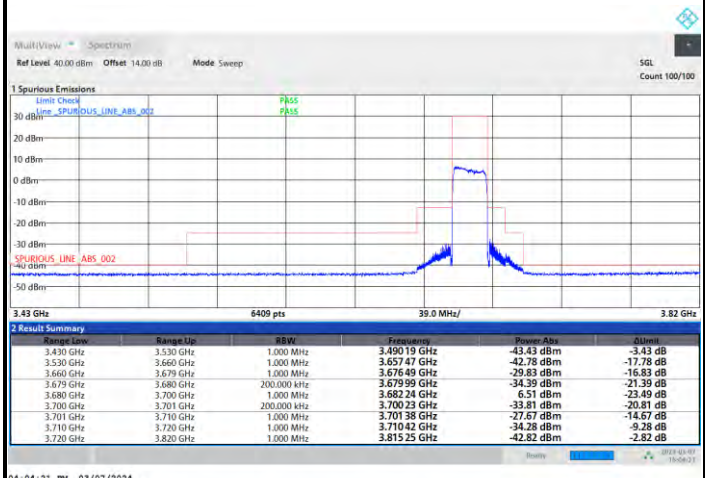
| FR1 n48 / 20MHz / CP OFDM / QPSK | |
|---|---|
| Lowest Channel | |
| Full RB | |



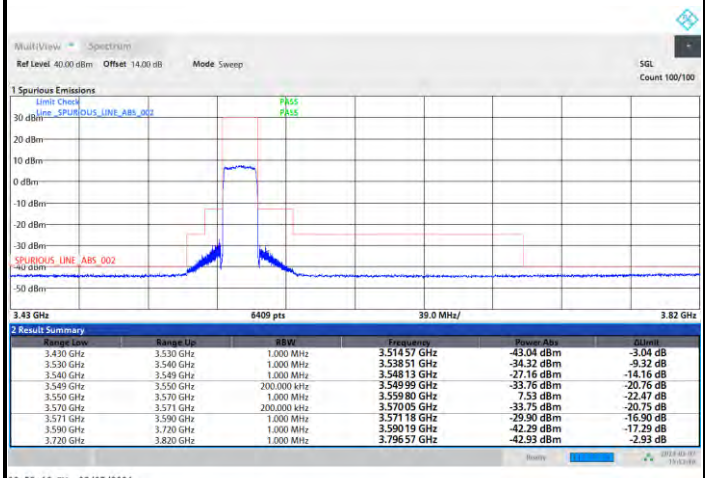

| FR1 n48 / 20MHz / CP OFDM / QPSK | |
|---|---|
| Middle Channel | |
| Full RB | |



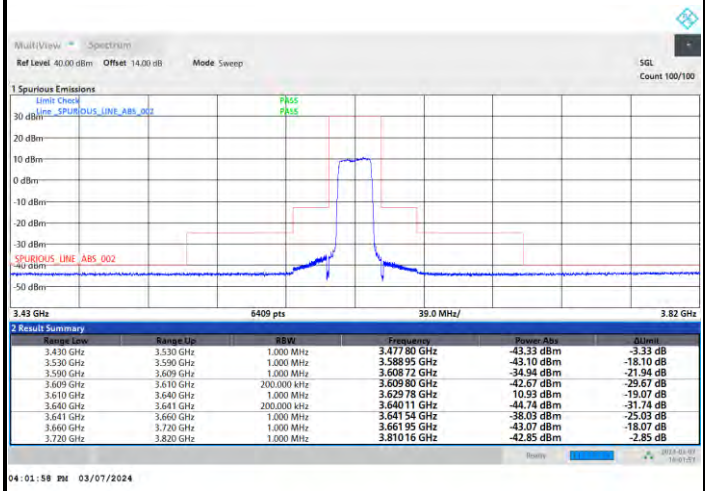
| FR1 n48 / 20MHz / CP OFDM / QPSK | |
|---|---|
| Highest Channel | |
| Full RB | |



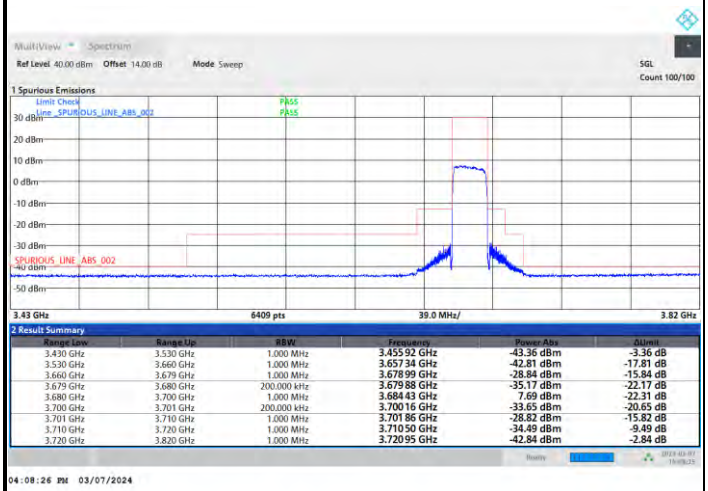

| FR1 n48 / 20MHz / CP OFDM / 16QAM | |
|---|---|
| Lowest Channel | |
| Full RB | |



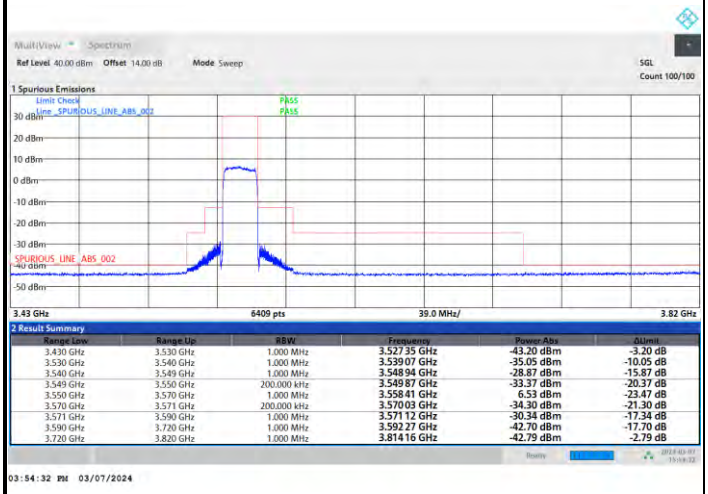
| FR1 n48 / 20MHz / CP OFDM / 16QAM | |
|---|---|
| Middle Channel | |
| Full RB | |



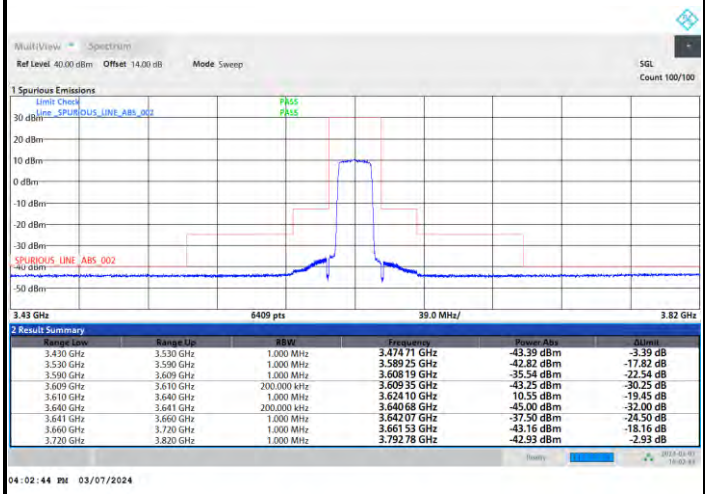

| FR1 n48 / 20MHz / CP OFDM / 16QAM | |
|---|---|
| Highest Channel | |
| Full RB | |

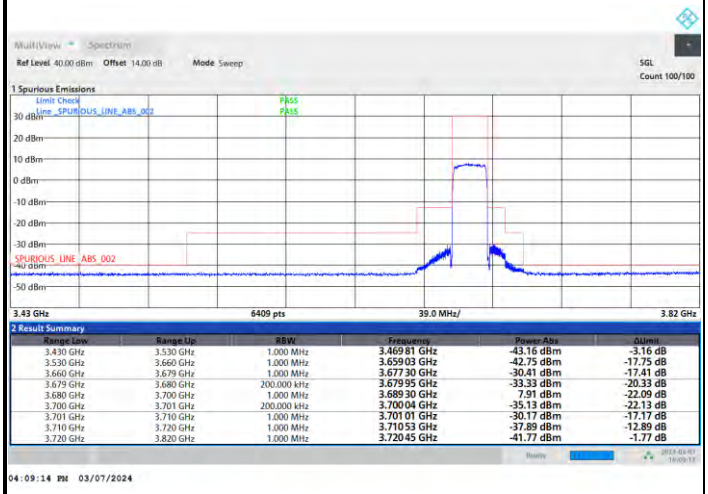


| FR1 n48 / 20MHz / CP OFDM / 64QAM | |
|---|---|
| Lowest Channel | |
| Full RB | |

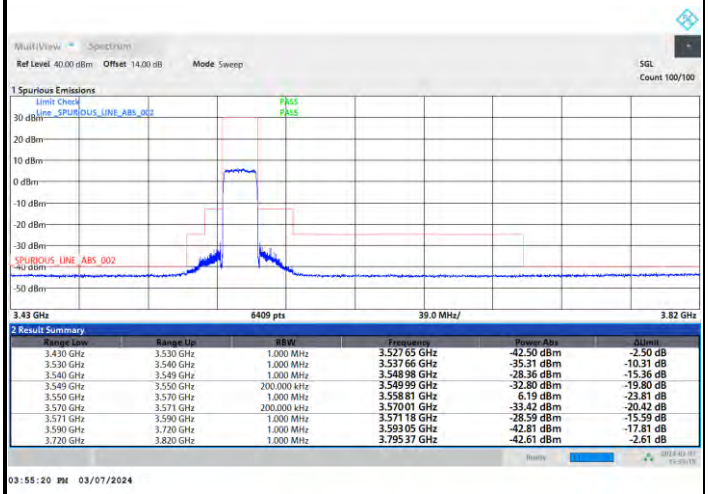



| FR1 n48 / 20MHz / CP OFDM / 64QAM | |
|---|---|
| Middle Channel | |
| Full RB | |

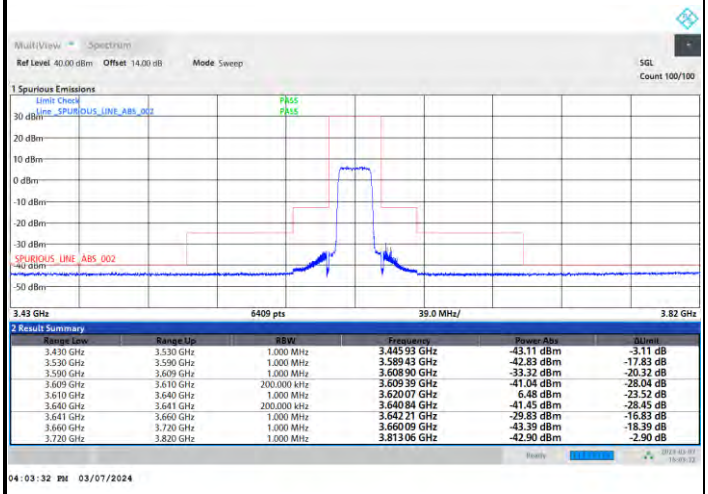


| FR1 n48 / 20MHz / CP OFDM / 64QAM | |
|---|---|
| Highest Channel | |
| Full RB | |
|  | |

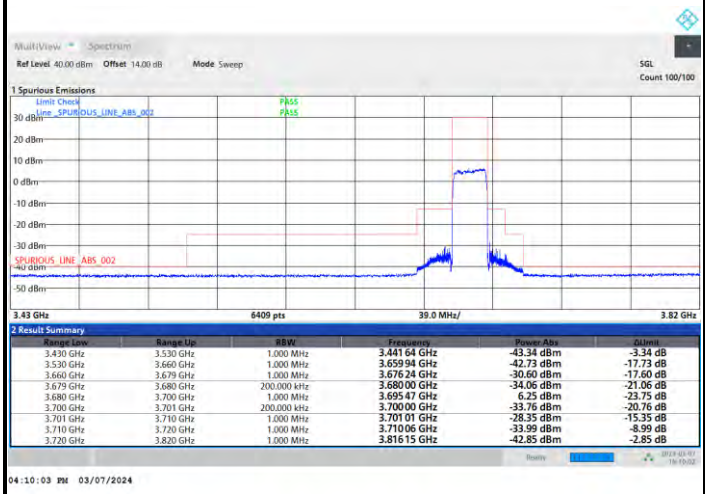


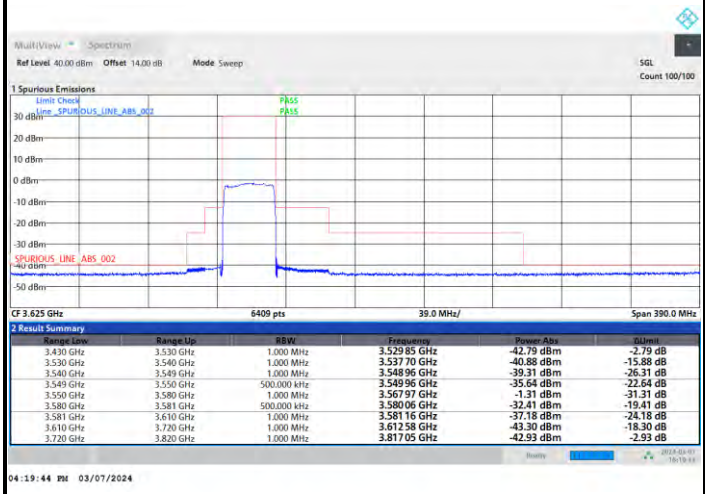
| FR1 n48 / 20MHz / CP OFDM / 256QAM | |
|---|---|
| Lowest Channel | |
| Full RB | |
|  | |

| FR1 n48 / 20MHz / CP OFDM / 256QAM | |
|---|---|
| Middle Channel | |
| Full RB | |

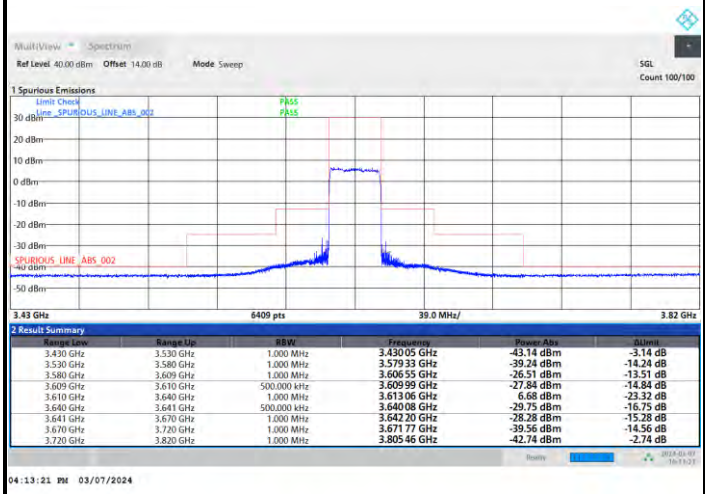



| FR1 n48 / 20MHz / CP OFDM / 256QAM | |
|---|---|
| Highest Channel | |
| Full RB | |

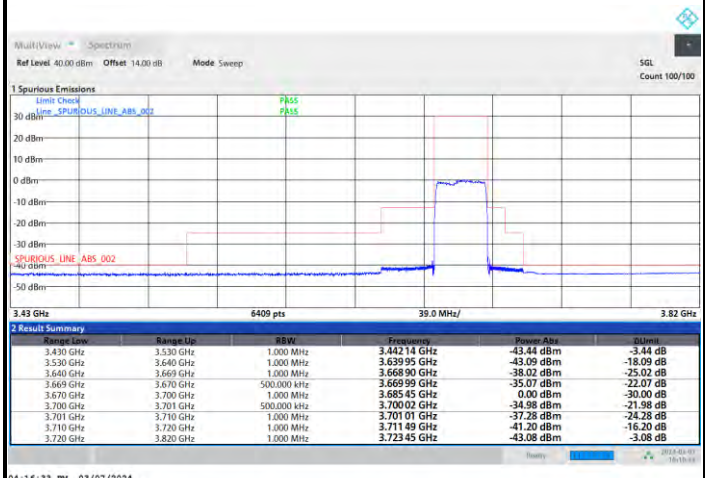


| FR1 n48 / 30MHz / CP OFDM / QPSK | |
|---|---|
| **Lowest Channel** | |
| **Full RB** | |
|  | |

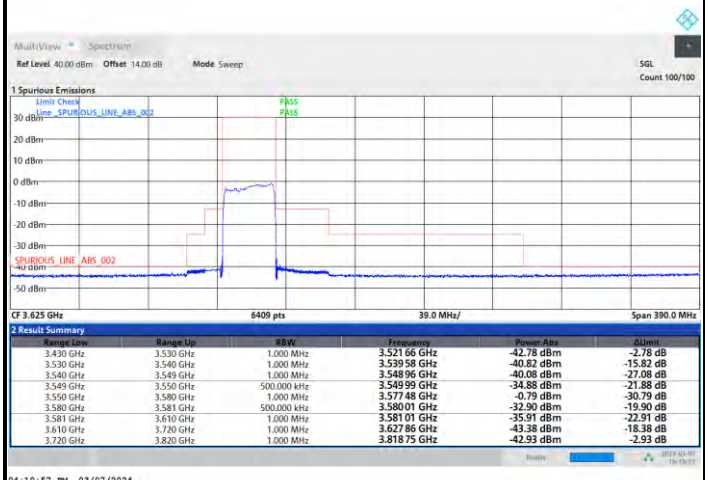


| FR1 n48 / 30MHz / CP OFDM / QPSK | |
|---|---|
| **Middle Channel** | |
| **Full RB** | |
|  | |

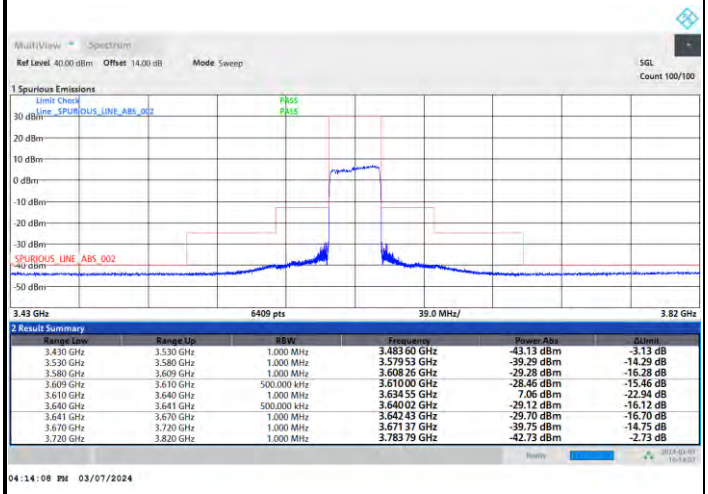
| FR1 n48 / 30MHz / CP OFDM / QPSK | |
|---|---|
| Highest Channel | |
| Full RB | |



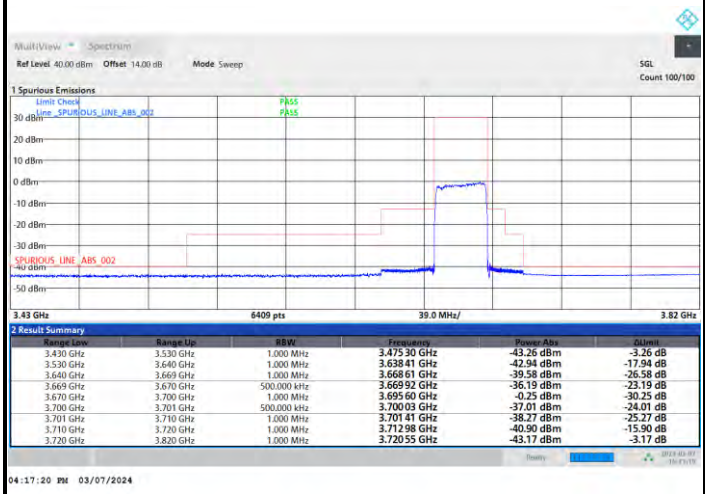

| FR1 n48 / 30MHz / CP OFDM / 16QAM | |
|---|---|
| Lowest Channel | |
| Full RB | |

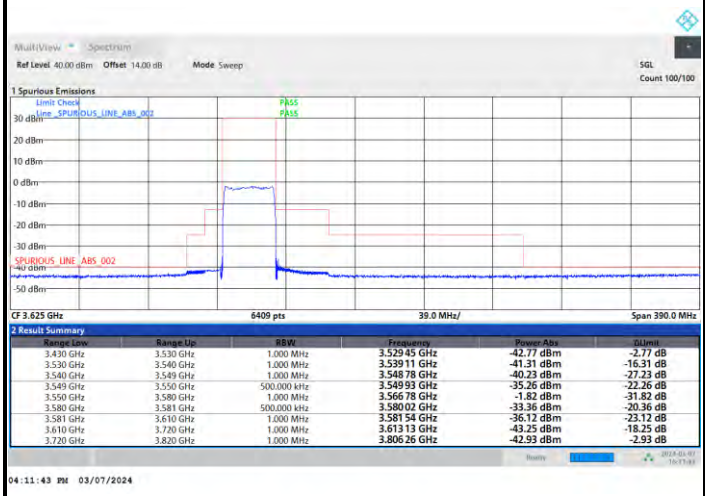


| FR1 n48 / 30MHz / CP OFDM / 16QAM | |
|---|---|
| Middle Channel | |
| Full RB | |

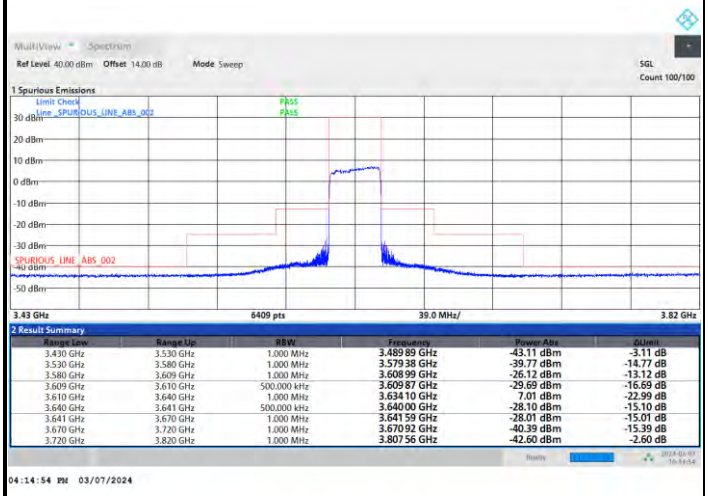


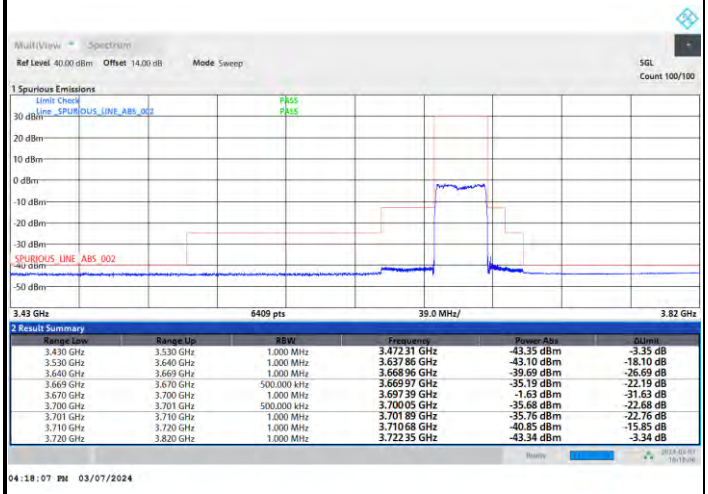

| FR1 n48 / 30MHz / CP OFDM / 16QAM | |
|---|---|
| Highest Channel | |
| Full RB | |



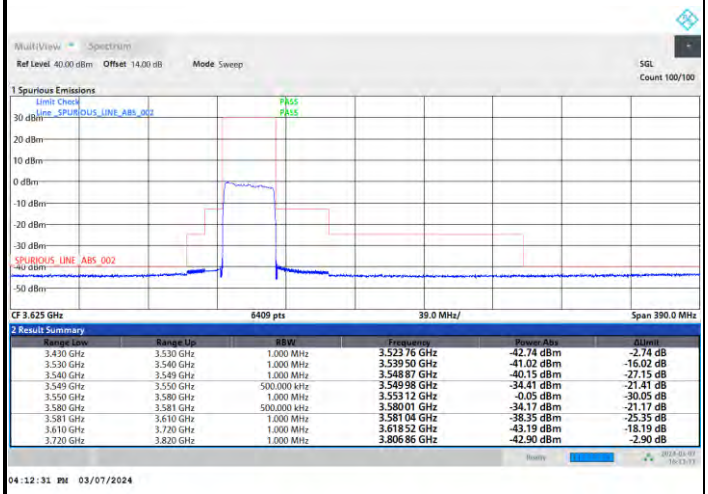
| FR1 n48 / 30MHz / CP OFDM / 64QAM | |
|---|---|
| **Lowest Channel** | |
| **Full RB** | |
|  | |



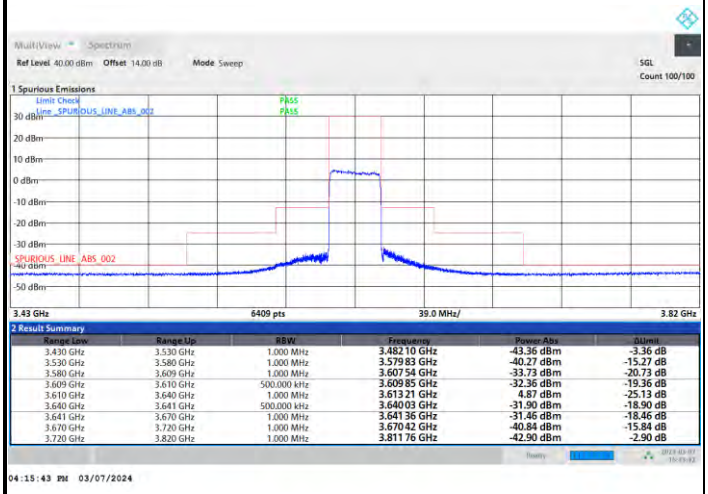
| FR1 n48 / 30MHz / CP OFDM / 64QAM | |
|---|---|
| **Middle Channel** | |
| **Full RB** | |
|  | |

| FR1 n48 / 30MHz / CP OFDM / 64QAM | |
|---|---|
| Highest Channel | |
| Full RB | |
|  | |

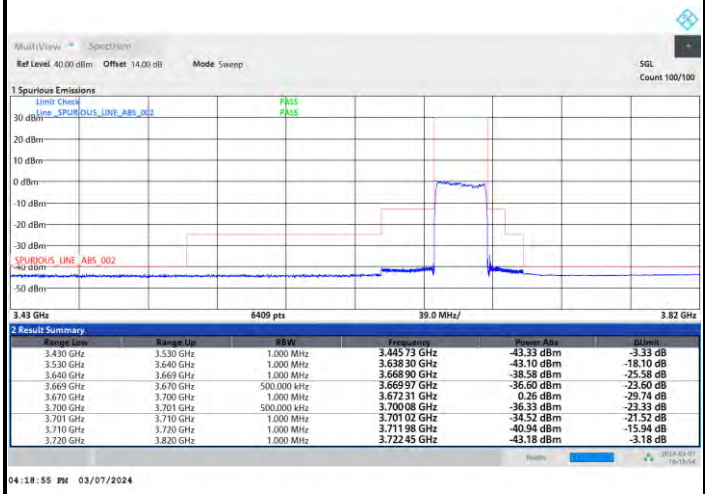


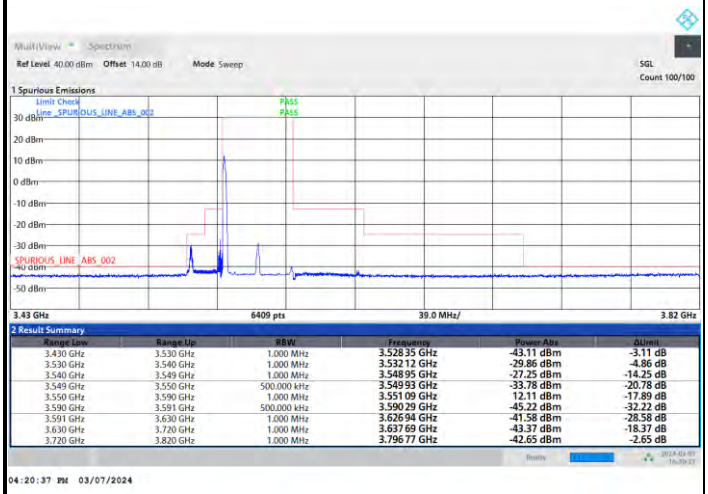
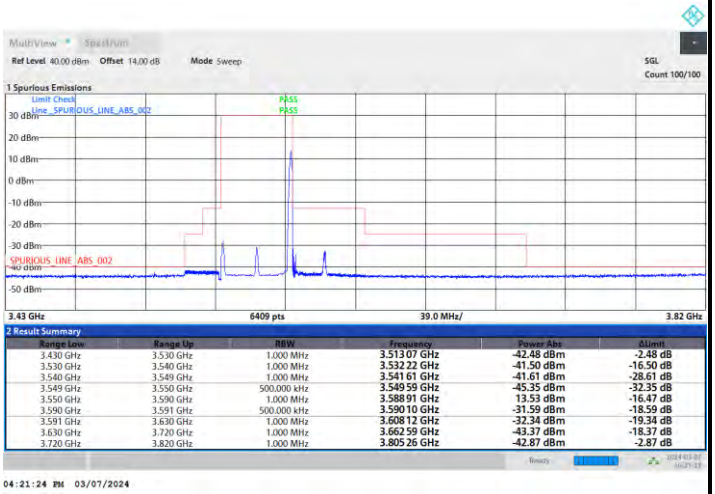
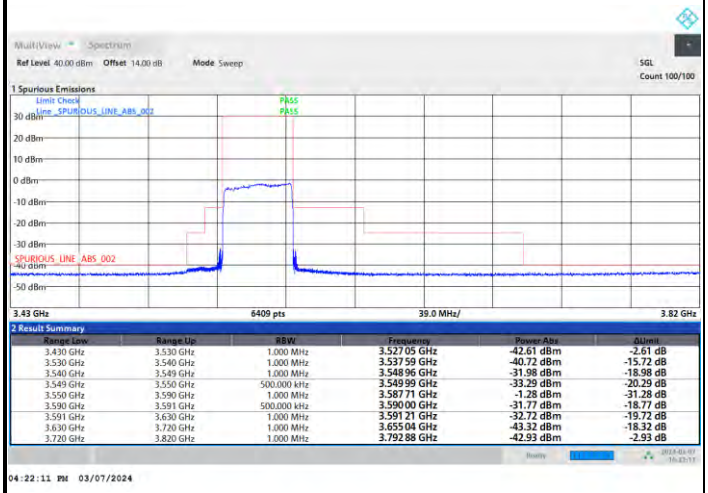
| FR1 n48 / 30MHz / CP OFDM / 256QAM | |
|---|---|
| Lowest Channel | |
| Full RB | |
|  | |

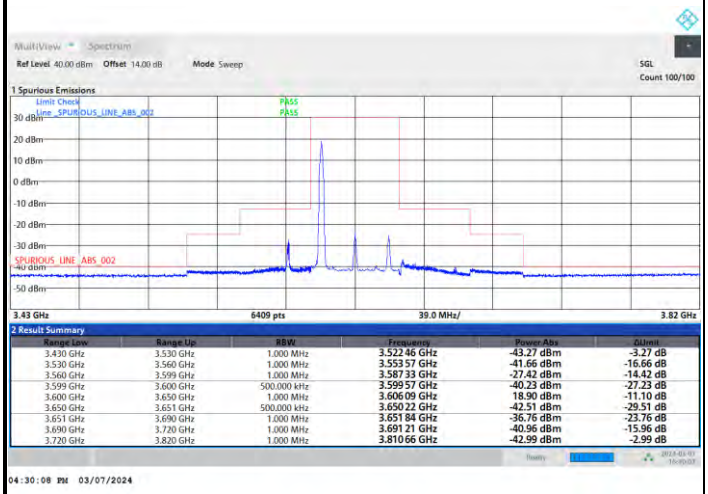
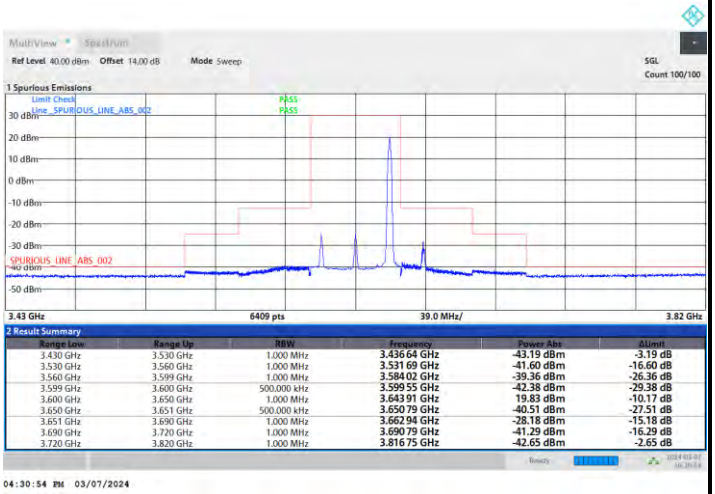
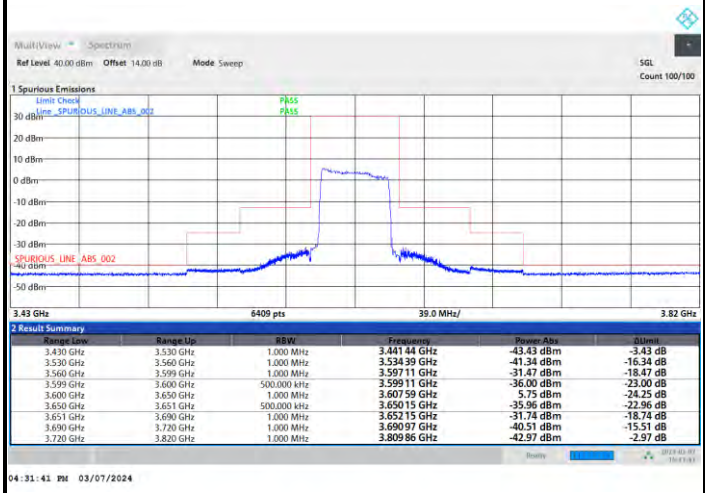
| FR1 n48 / 30MHz / CP OFDM / 256QAM | |
|---|---|
| Middle Channel | |
| Full RB | |

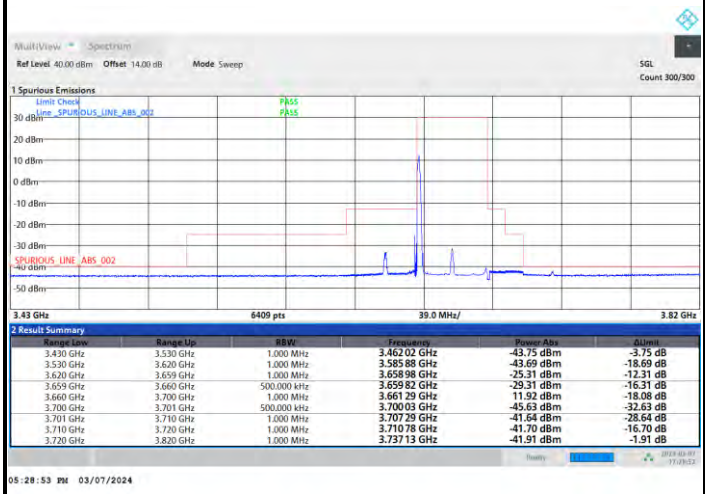
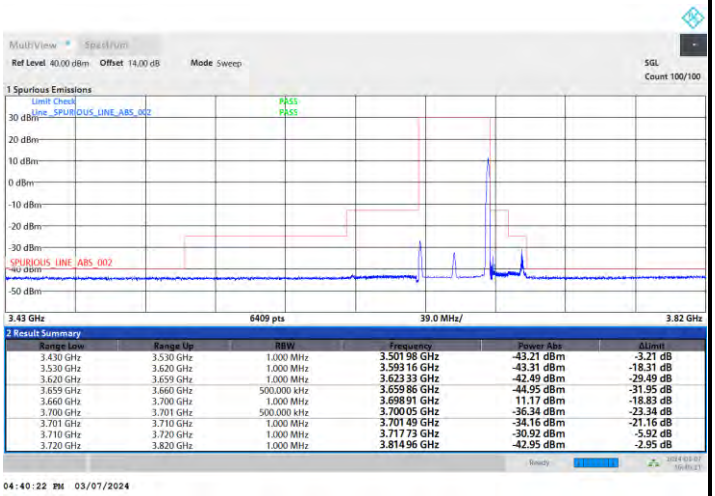
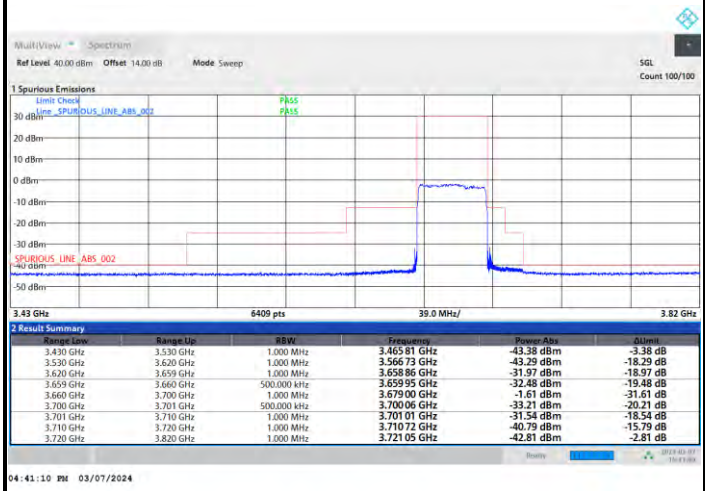


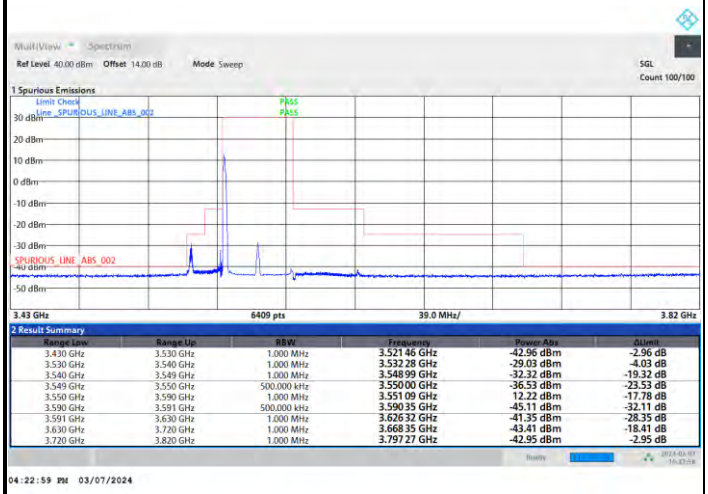
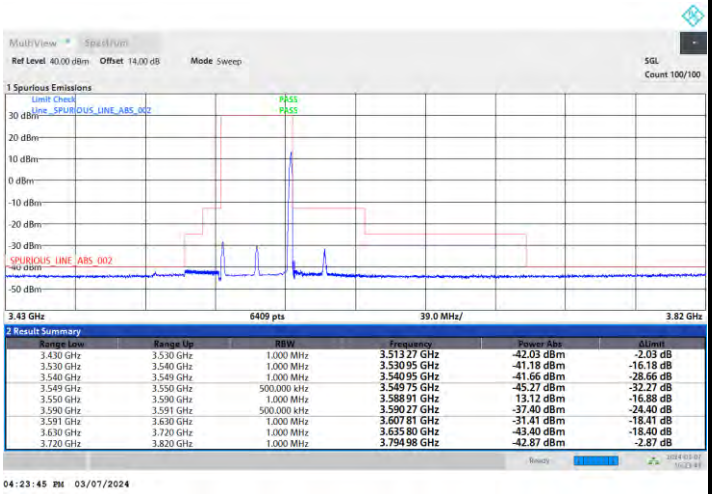
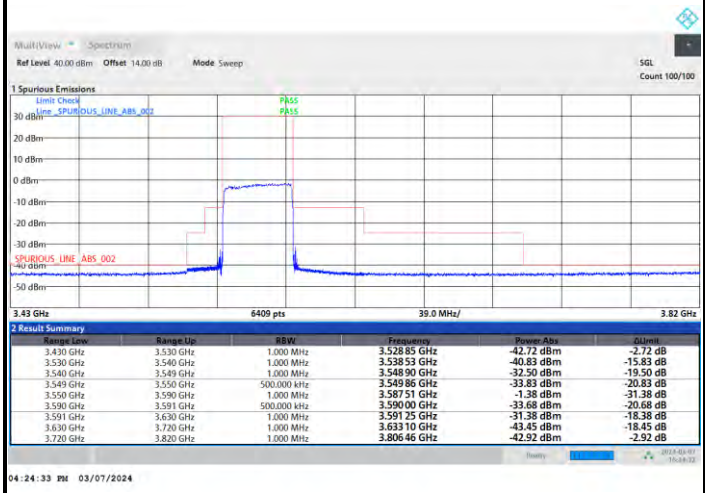

| FR1 n48 / 30MHz / CP OFDM / 256QAM | |
|---|---|
| Highest Channel | |
| Full RB | |



| FR1 n48 / 40MHz / CP OFDM / QPSK | |
|---|---|
| **Lowest Channel** | |
| **1RB0** | **1RBmax** |
|  |  |
| **Full RB** | |
|  | |

| FR1 n48 / 40MHz / CP OFDM / QPSK | |
|---|---|
| **Middle Channel** | |
| **1RB0** | **1RBmax** |
|  |  |
| **Full RB** | |
|  | |

| FR1 n48 / 40MHz / CP OFDM / QPSK | |
|---|---|
| **Highest Channel** | |
| **1RB0** | **1RBmax** |
|  |  |
| **Full RB** | |
|  | |

| FR1 n48 / 40MHz / CP OFDM / 16QAM | |
|---|---|
| **Lowest Channel** | |
| **1RB0** | **1RBmax** |
|  |  |
| **Full RB** | |
|  | |