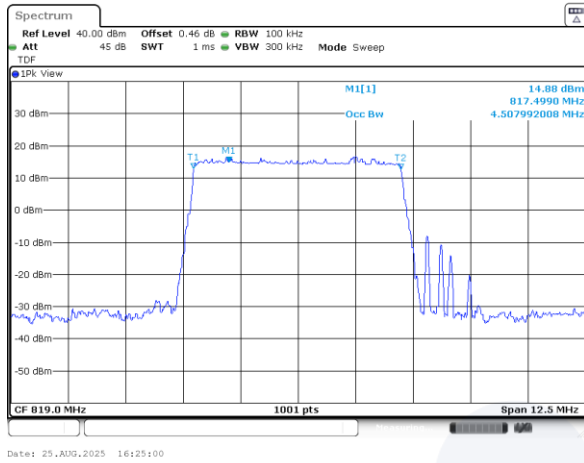
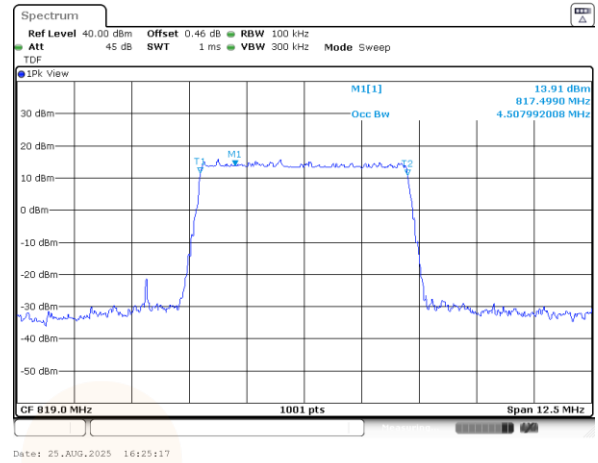


Test mode: 5G NR n26 DFT-s OFDM

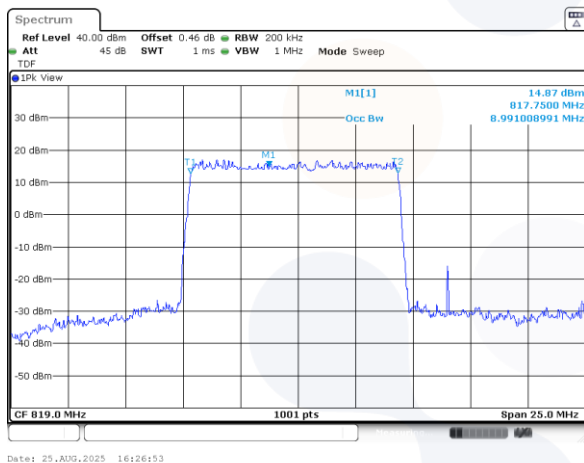
5M BW QPSK Middle channel



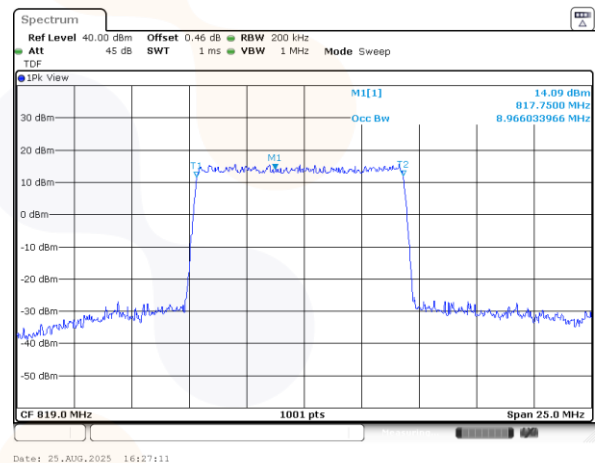
5M BW 16QAM Middle channel



10M BW QPSK Middle channel



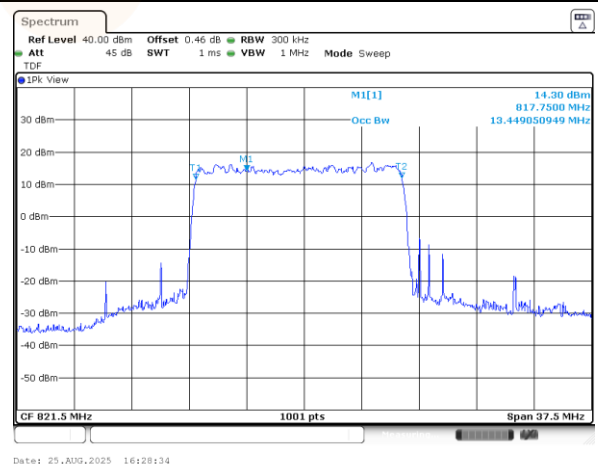
10M BW 16QAM Middle channel



15M BW QPSK Middle channel

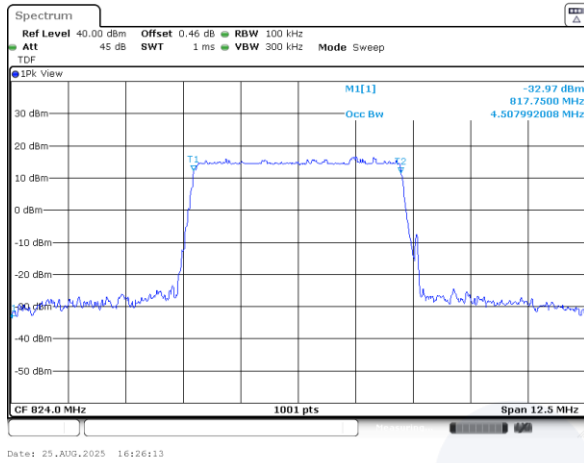


15M BW 16QAM Middle channel

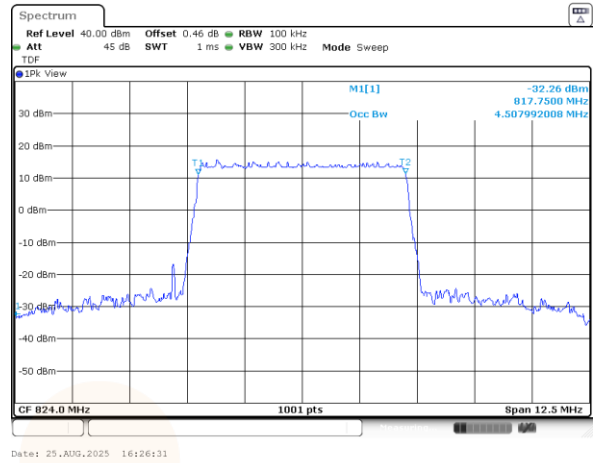


5G NR n26 DFT-s OFDM (Straddle channel)

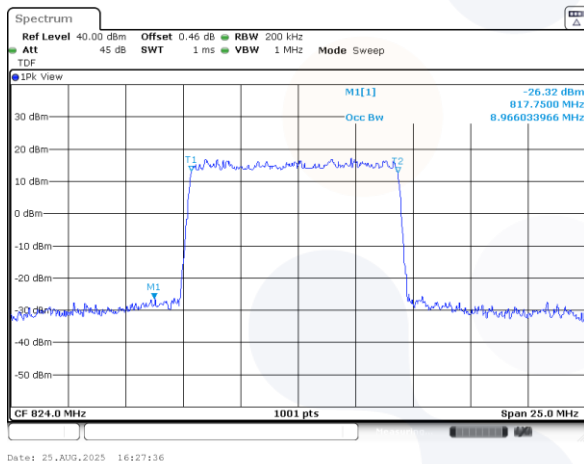
5M BW QPSK



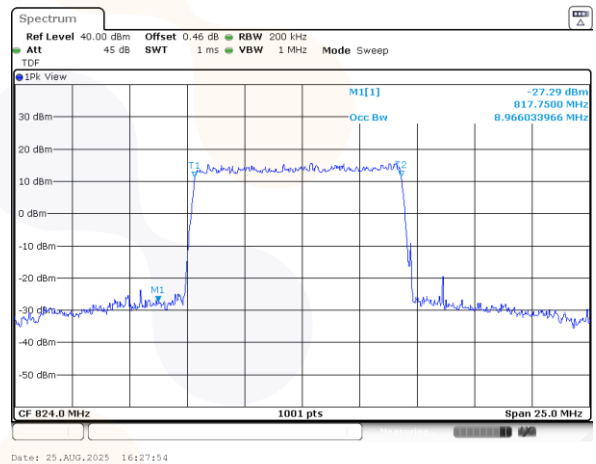
5M BW 16QAM



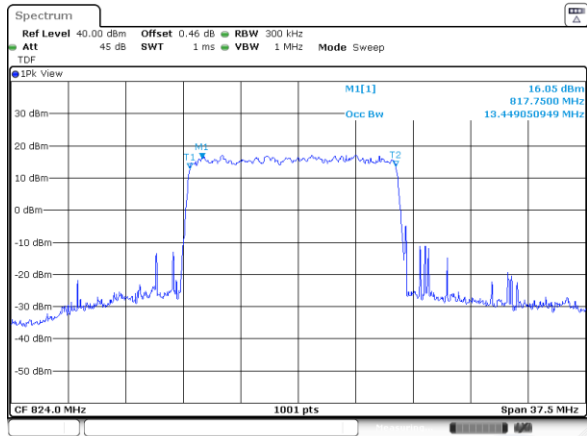
10M BW QPSK



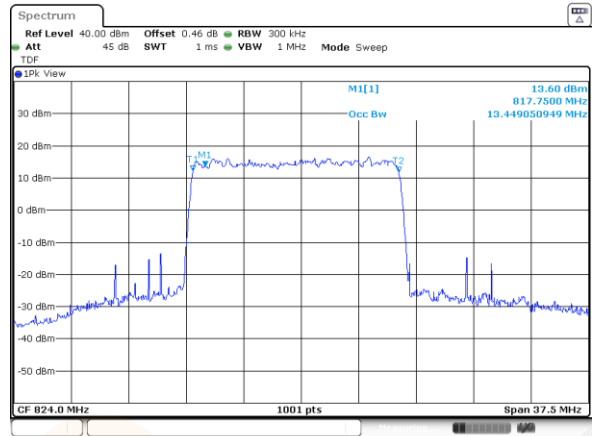
10M BW 16QAM



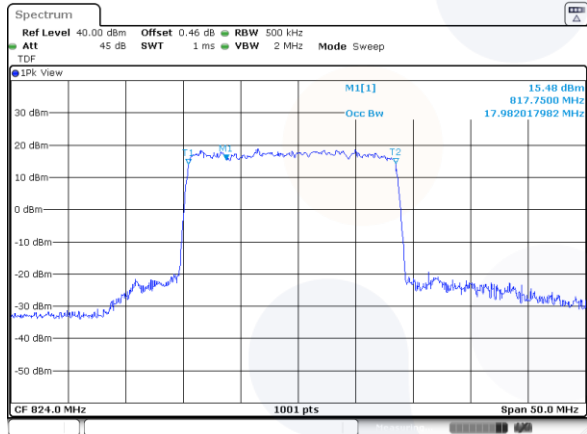
15M BW QPSK



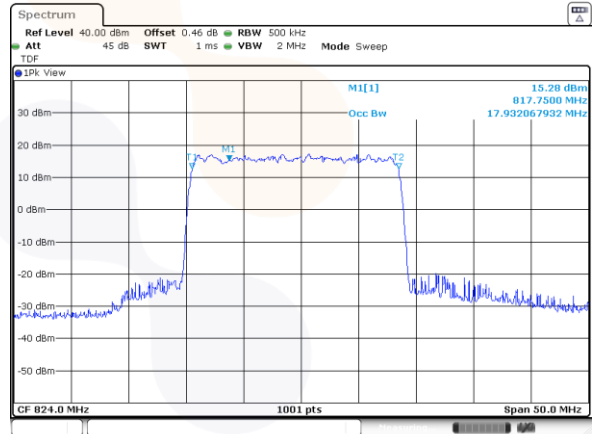
15M BW 16QAM



20M BW QPSK

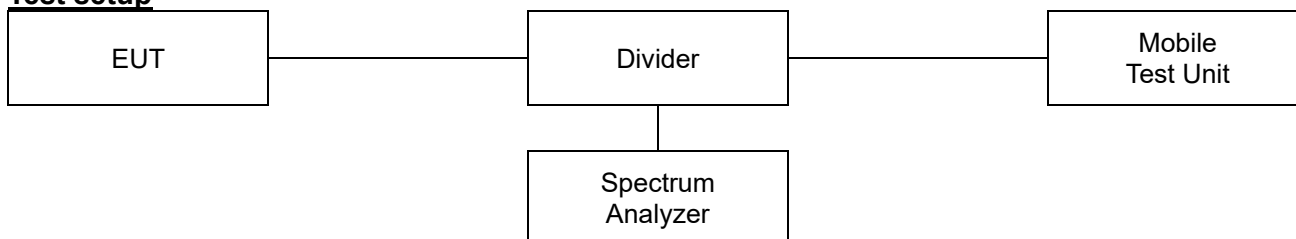


20M BW 16QAM



7.3. Band Edge Emissions at Antenna Terminal

Test setup



Limit

According to §90.691(a),

Out-of-band emission requirement shall apply only to the “outer” channels Included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees. The emission limits are as follows:

(1) For any frequency removed from the EA licensee’s frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $116 \log_{10}(f/6.1)$ decibels or $50 + 10\log_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz where f is greater than 12.5 kHz.

(2) For any frequency removed from the EA licensee’s frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $43 + 10\log_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

Test procedure

971168 D01 v03r01 - Section 6

971168 D02 v02r02 – Section VIII

ANSI C63.26-2015 – Section 5.7

Test settings

- 1) Start and stop frequency were set such that the band edge would be placed in the center of the plot
- 2) Span was set large enough so as to capture all out of band emissions near the band edge.
- 3) Set the RBW > 1% of the emission bandwidth.
- 4) Set the VBW $\geq 3 \times$ RBW.
- 5) Set the number of sweep points $\geq 2 \times$ Span/RBW
- 6) Detector = RMS
- 7) Trace mode = trace average
- 8) Sweep time should be auto for peak detection. For RMS detection the sweep time should be set as follows:
 - If the device can be configured to transmit continuously (duty cycle $\geq 98\%$), set the (sweep time) > (number of points in sweep) x (symbol period) (e.g., by a factor of 10 x symbol period x number of points) Increasing the sweep time (i.e., slowing the sweep speed) will allow for averaging over multiple symbols.
 - If the device cannot transmit continuously (duty cycle < 98%), a gated sweep shall be used when possible (i.e., gate triggered such that the analyzer only sweeps when the device is transmitting at full power), set the sweep time > (number of points in sweep) x

(symbol period) but the sweep time shall always be maintained at a value that is less than or equal to the minimum transmission time

- If the device cannot be configured to transmit continuously (duty cycle > 98%), and a free-running sweep must be used, set the sweep time so that the averaging is performed over multiple on/off cycles by setting the sweep time > (number of points in sweep) × (transmitter period) (i.e., the transmit on-time + the off-time). The spectrum analyzer readings shall subsequently be corrected by [10 log (1/duty cycle)]. This assumes that the transmission period and duty cycle is relatively constant (duty cycle variation ≤ ±2%).
- If the device cannot be configured to transmit continuously and a free-running sweep must be used, and if the transmissions exhibit a non-constant duty cycle (duty cycle variations > ±2%), set the sweep time so that the averaging is performed over the on-period by setting the sweep time > (symbol period) × (number of points), while also maintaining the sweep time < (transmitter on-time). The trace mode shall be set to max hold, since not every display point will be averaged only over just the on-time. Thus, multiple sweeps (e.g., 100) in maximum hold are necessary to ensure that the maximum power is measured.

9) Allow trace to fully stabilize.

Notes:

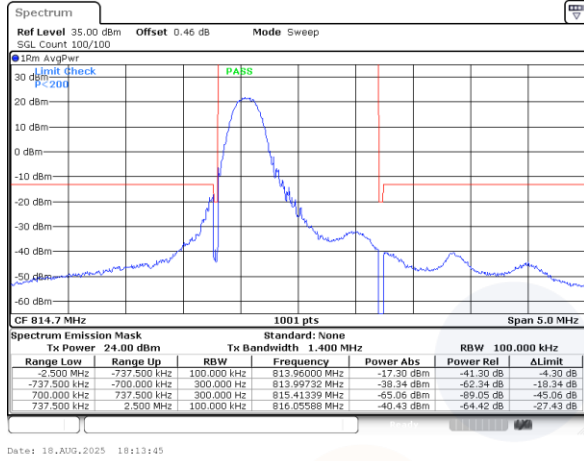
1. For Section 90.691(a) compliance testing, use RBW = 300 Hz for offsets less than 37.5 kHz from a channel edge; RBW = 100 kHz for offsets greater than 37.5 kHz is allowed.
2. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.
3. The EUT was setup to maximum output power as its lowest and highest channel with all bandwidth, modulation and RB configurations.

Test results

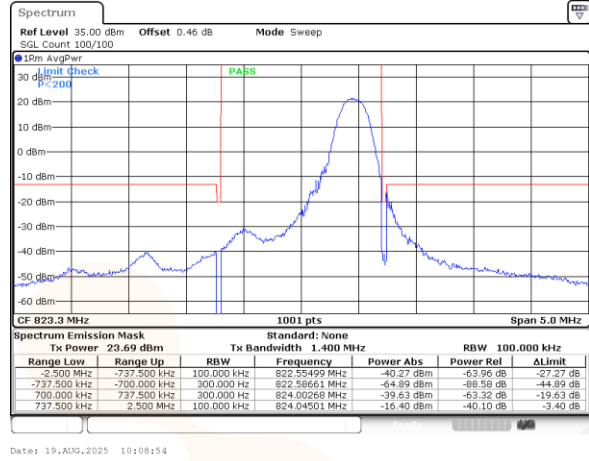
Test mode: LTE B26

1.4M BW QPSK

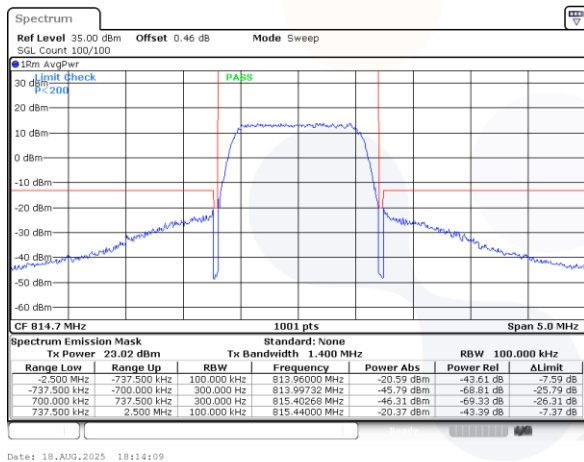
Low channel 1RB



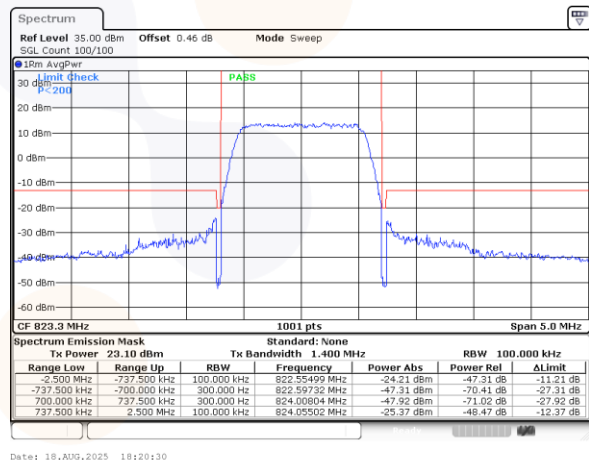
High channel 1RB



Low channel FRB

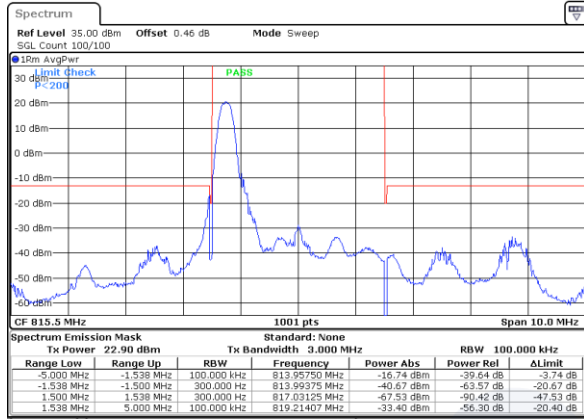


High channel FRB

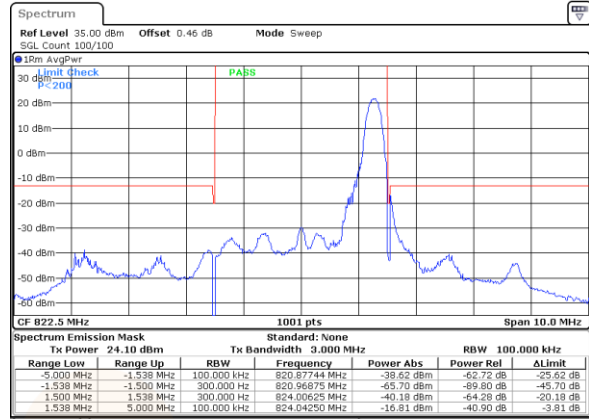


3M BW QPSK

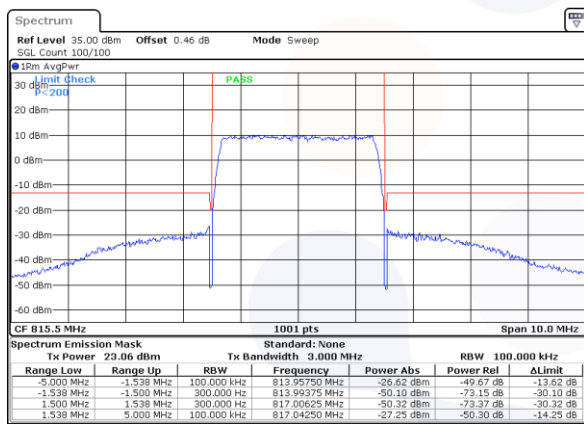
Low channel 1RB



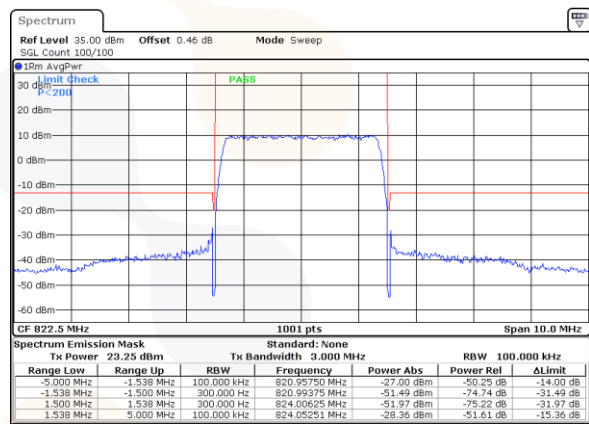
High channel 1RB



Low channel FRB

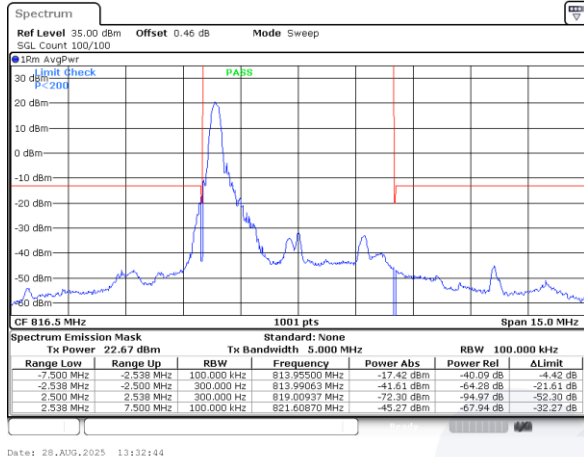


High channel FRB

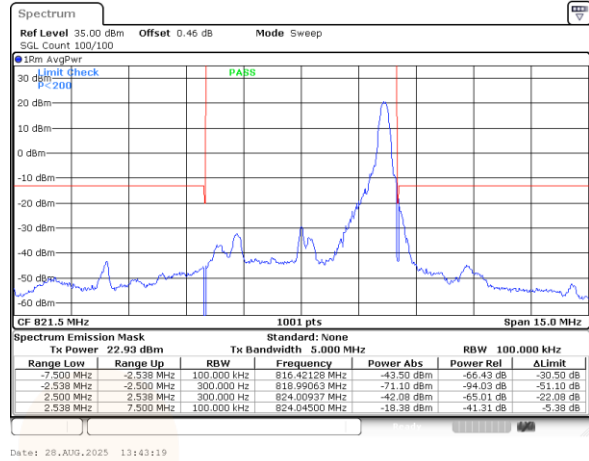


5M BW QPSK

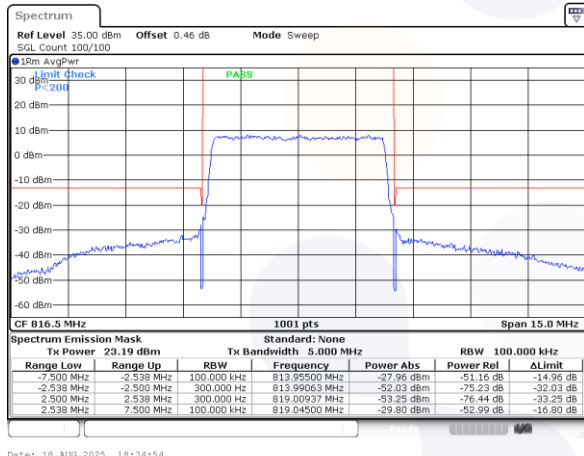
Low channel 1RB



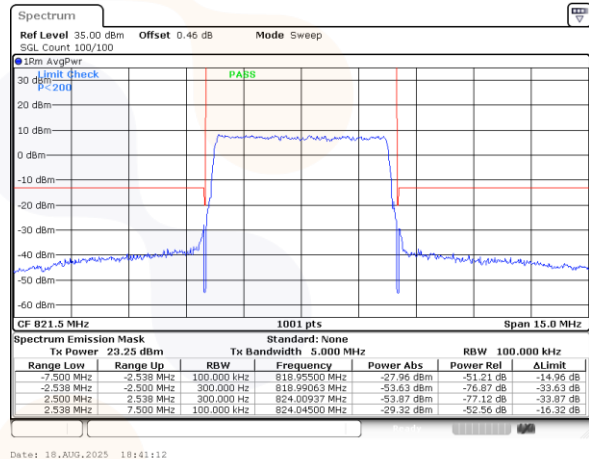
High channel 1RB



Low channel FRB

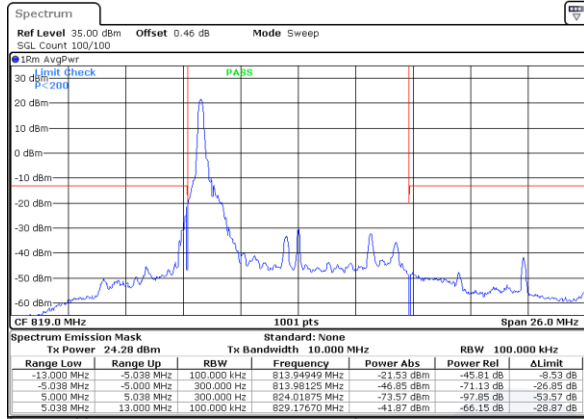


High channel FRB



10M BW QPSK

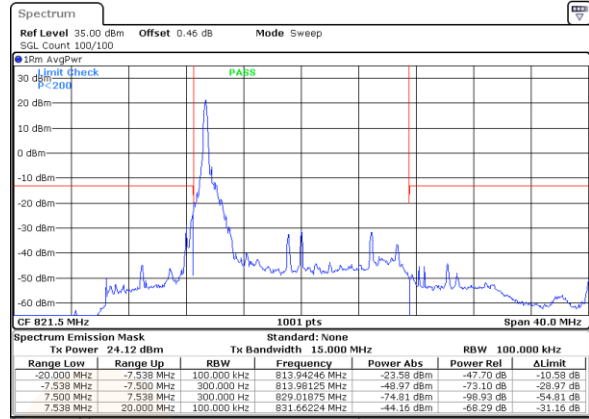
Middle channel Lower 1RB



Date: 18.AUG.2025 18:44:51

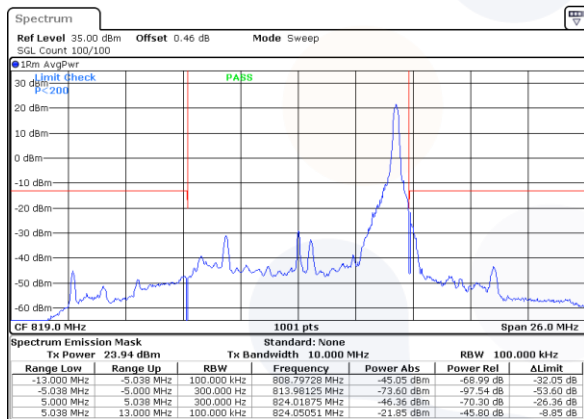
15M BW QPSK

Middle channel Lower 1RB



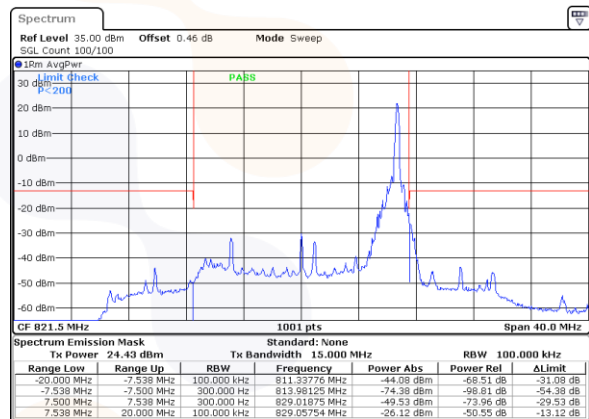
Date: 18.AUG.2025 18:50:31

Middle channel Upper 1RB



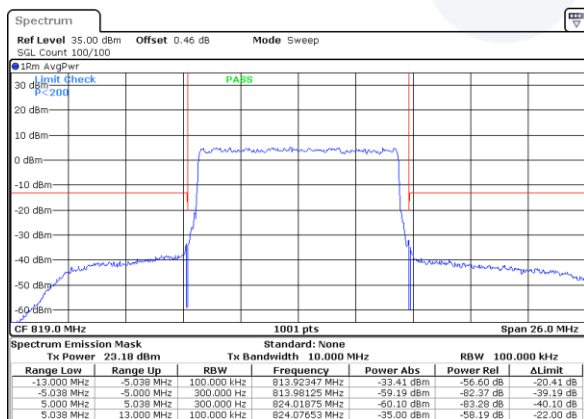
Date: 18.AUG.2025 18:45:15

Middle channel Upper 1RB



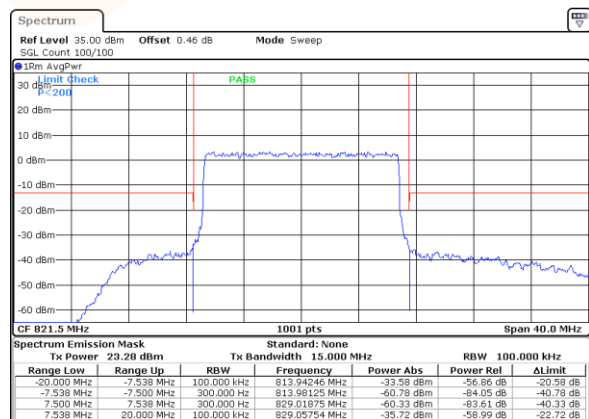
Date: 18.AUG.2025 18:50:56

Middle channel FRB



Date: 18.AUG.2025 18:46:04

Middle channel FRB

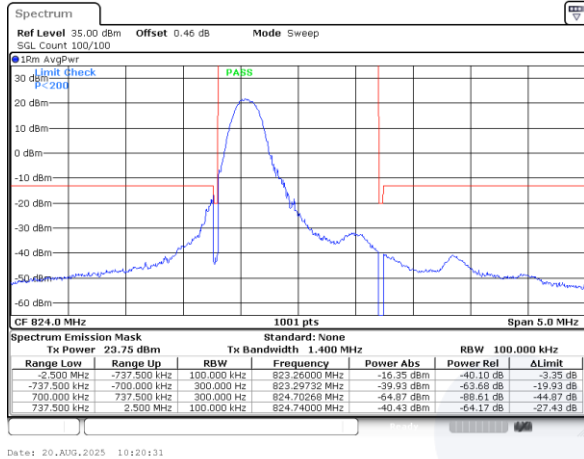


Date: 18.AUG.2025 18:51:23

LTE B26 (Straddle channel)

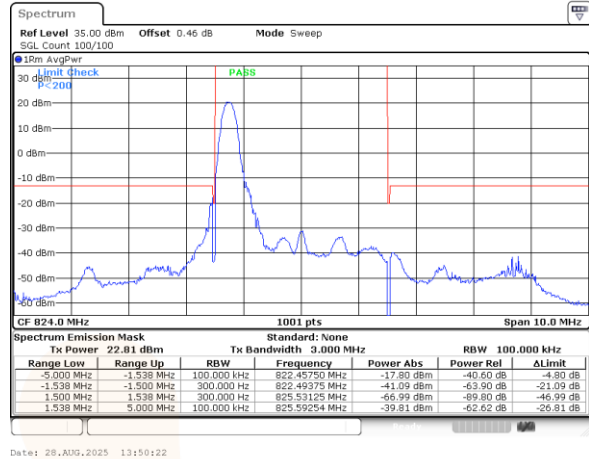
1.4M BW QPSK

Middle channel Lower 1RB

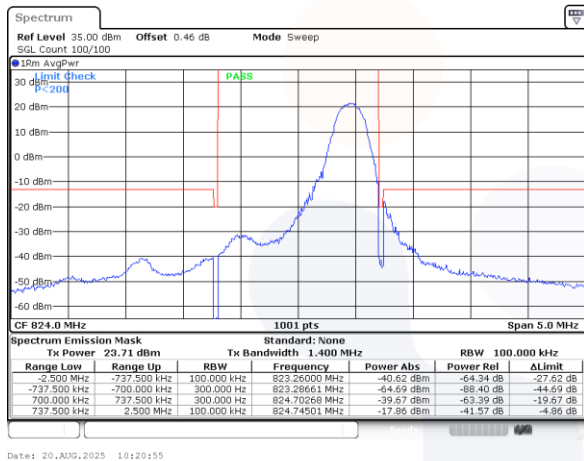


3M BW QPSK

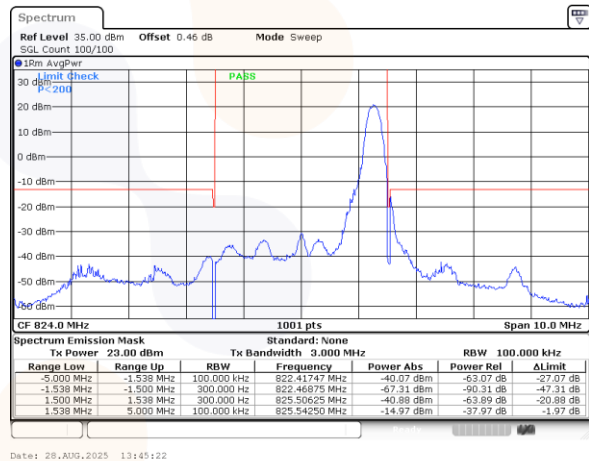
Middle channel Lower 1RB



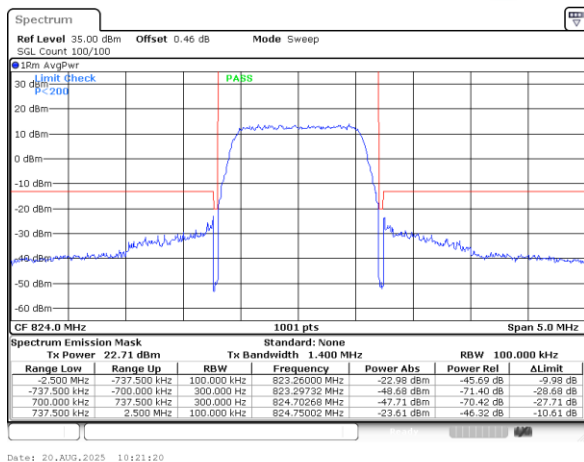
Middle channel Upper 1RB



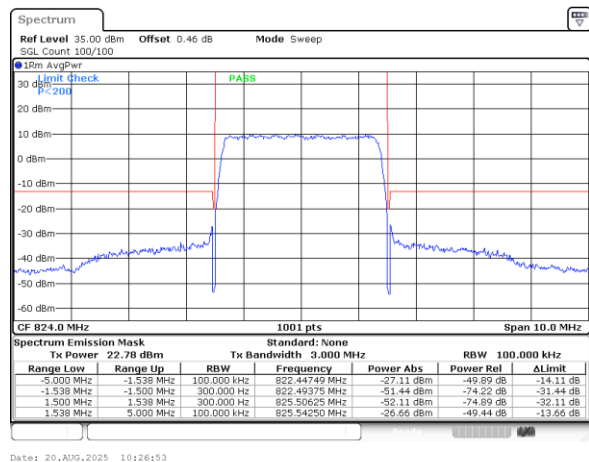
Middle channel Upper 1RB



Middle channel FRB

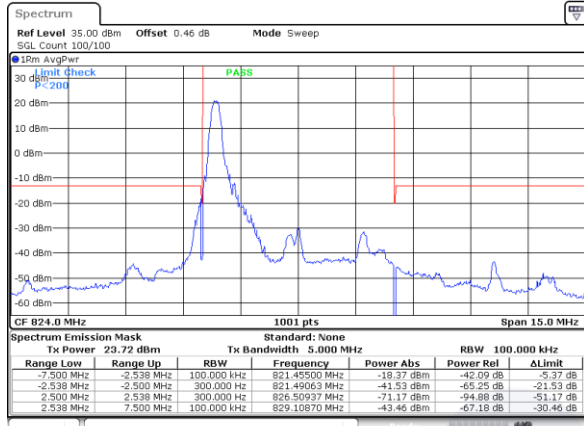


Middle channel FRB



5M BW QPSK

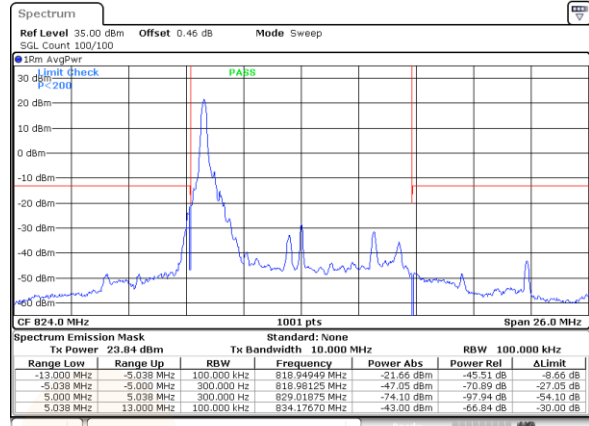
Middle channel Lower 1RB



Date: 20.AUG.2025 10:31:26

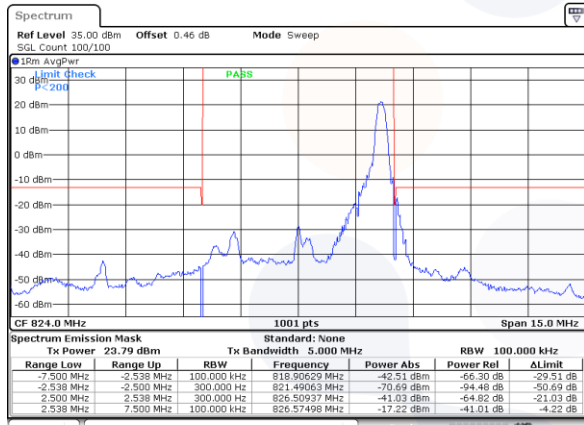
10M BW QPSK

Middle channel Lower 1RB



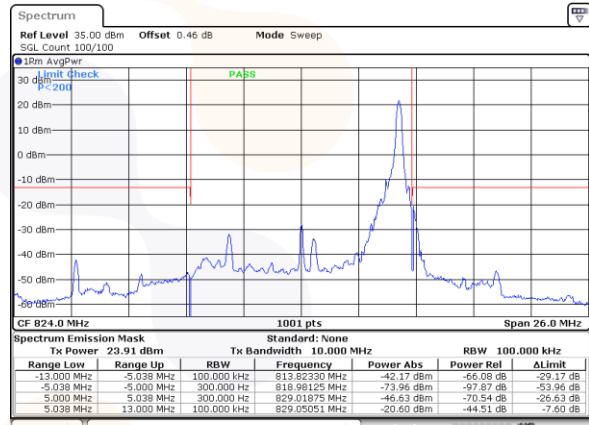
Date: 20.AUG.2025 10:37:17

Middle channel Upper 1RB



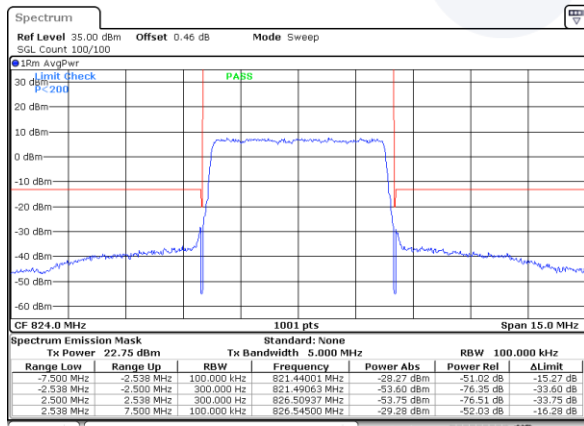
Date: 20.AUG.2025 10:31:50

Middle channel Upper 1RB



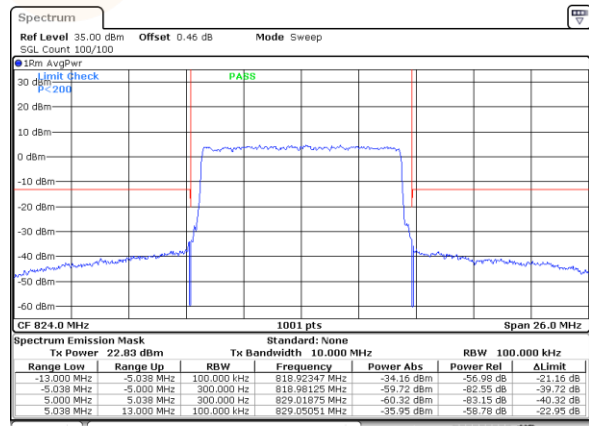
Date: 20.AUG.2025 10:37:41

Middle channel FRB



Date: 20.AUG.2025 10:32:40

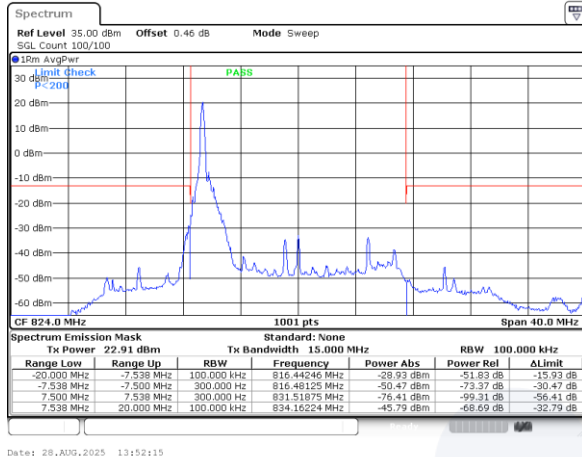
Middle channel FRB



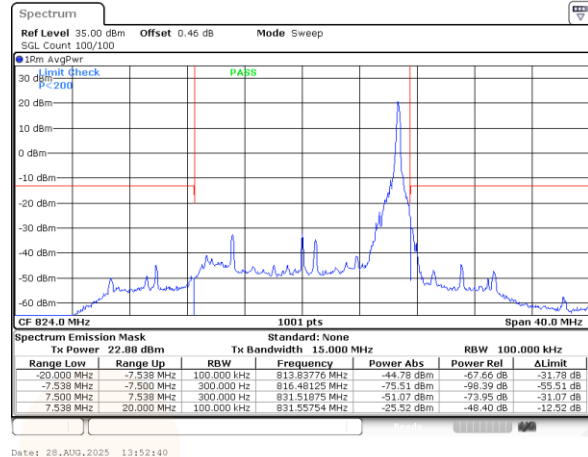
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15M BW QPSK

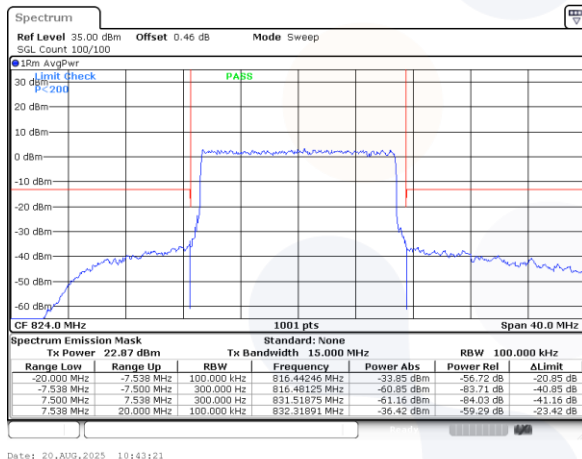
Middle channel Lower 1RB



Middle channel Upper 1RB



Middle channel FRB

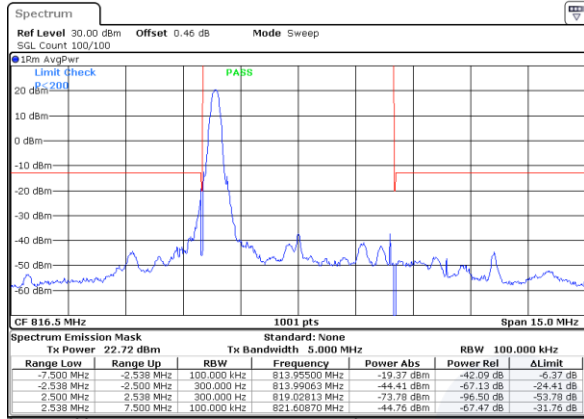


Blank

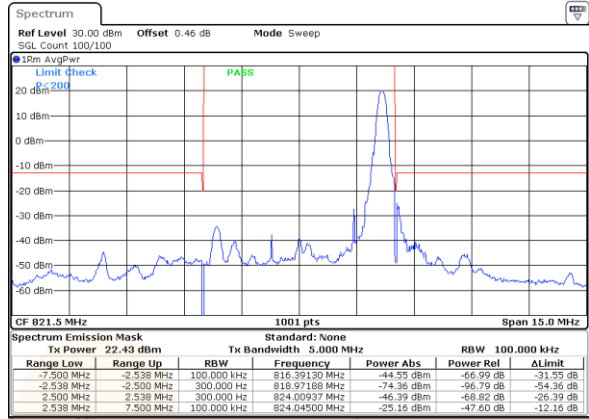
Test mode: 5G NR n26 DFT-s OFDM

5M BW QPSK

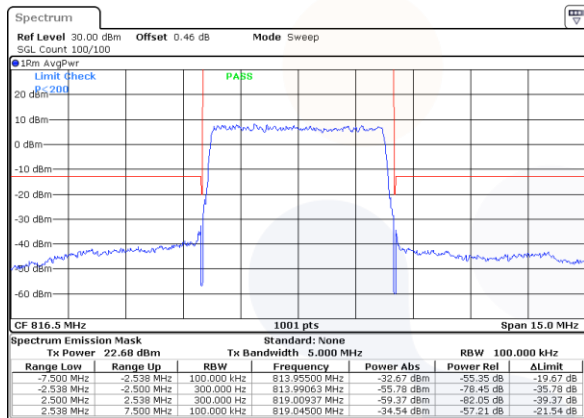
Low channel 1RB



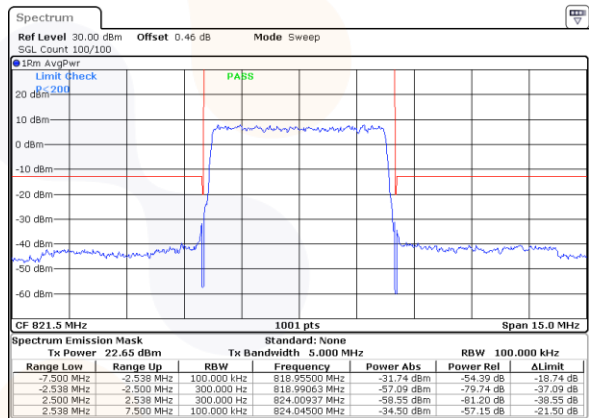
High channel 1RB



Low channel FRB

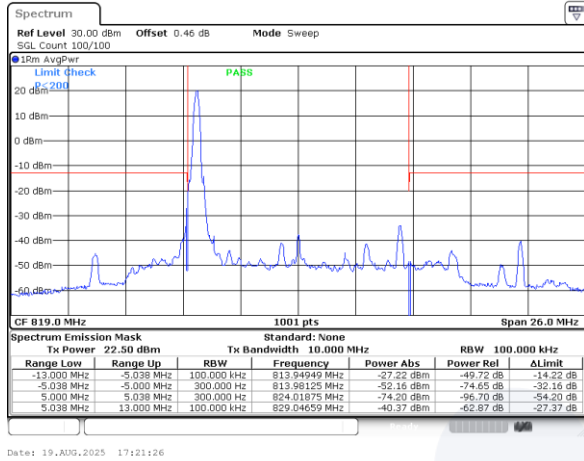


High channel FRB



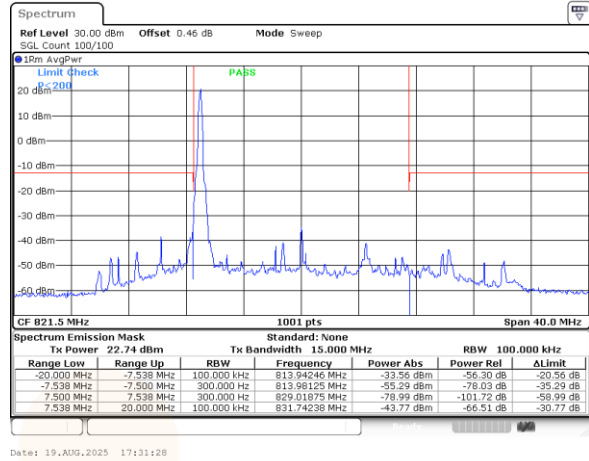
10M BW QPSK

Middle channel Lower 1RB

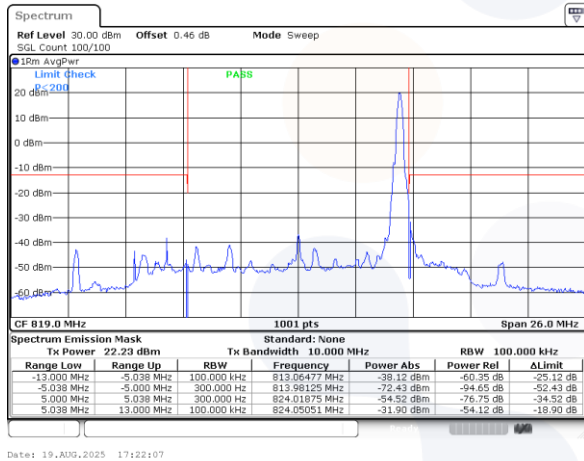


15M BW QPSK

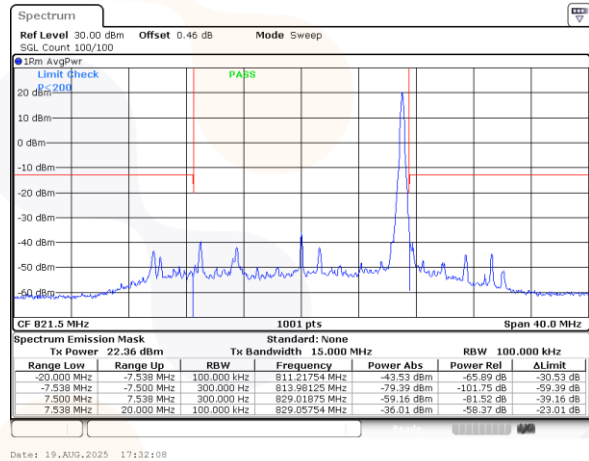
Middle channel Lower 1RB



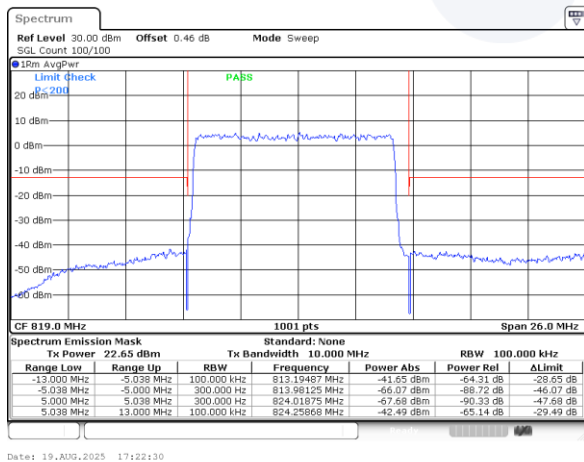
Middle channel Upper 1RB



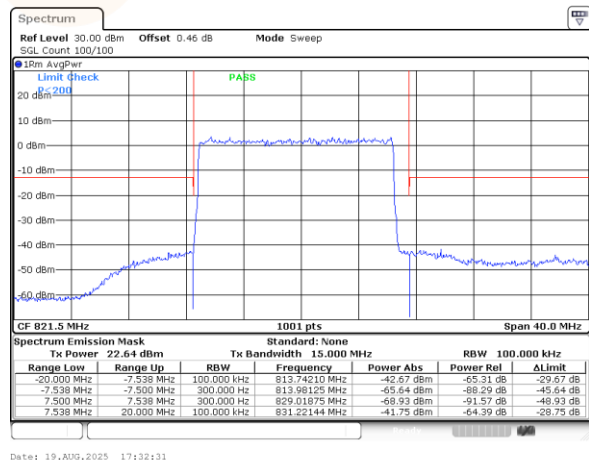
Middle channel Upper 1RB



Middle channel FRB



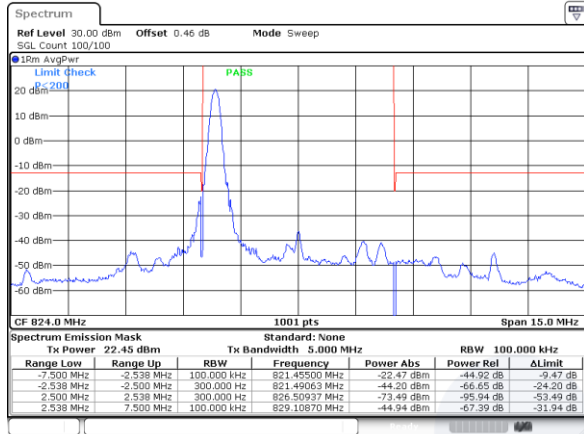
Middle channel FRB



5G NR n26 DFT-s OFDM (Straddle channel)

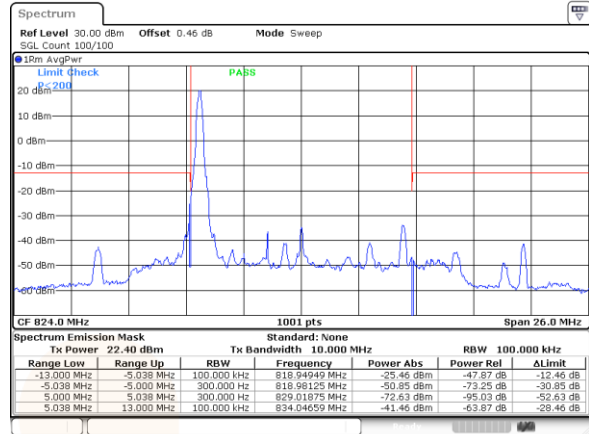
5M BW QPSK

Middle channel Lower 1RB

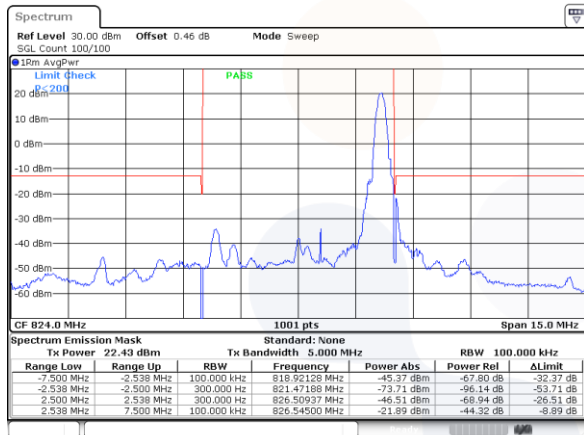


10M BW QPSK

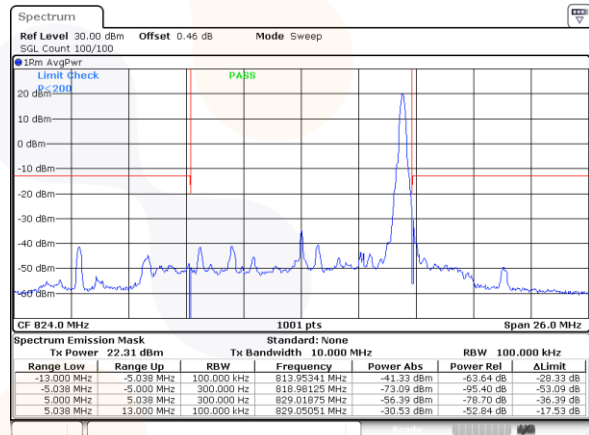
Middle channel Lower 1RB



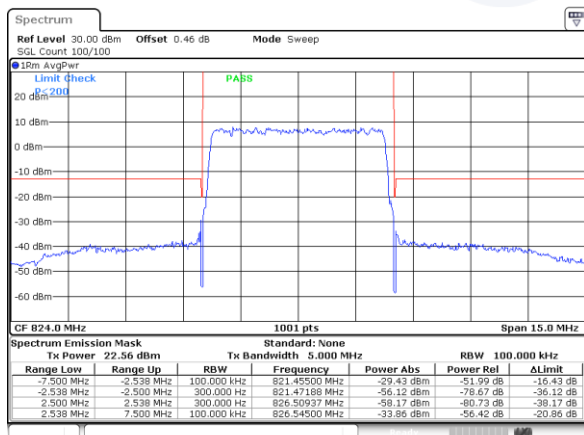
Middle channel Upper 1RB



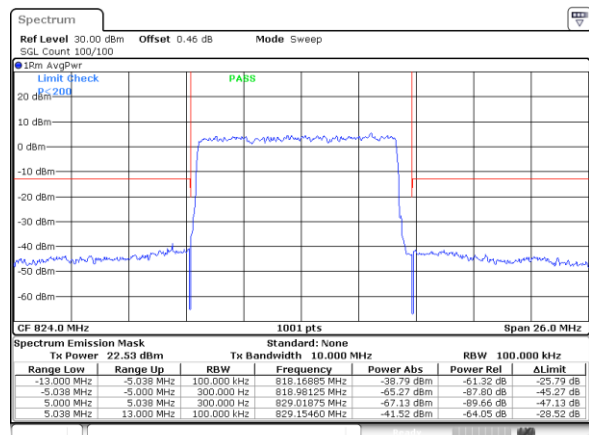
Middle channel Upper 1RB



Middle channel FRB

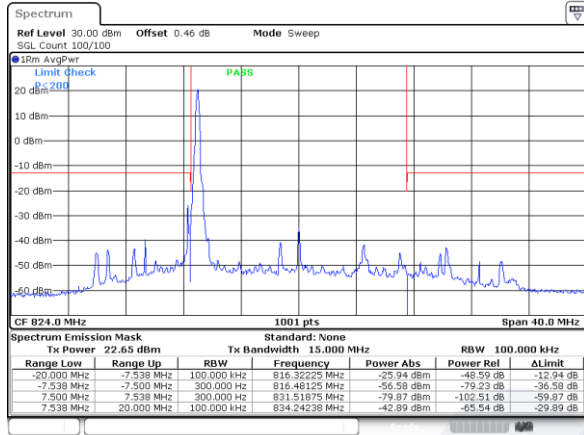


Middle channel FRB



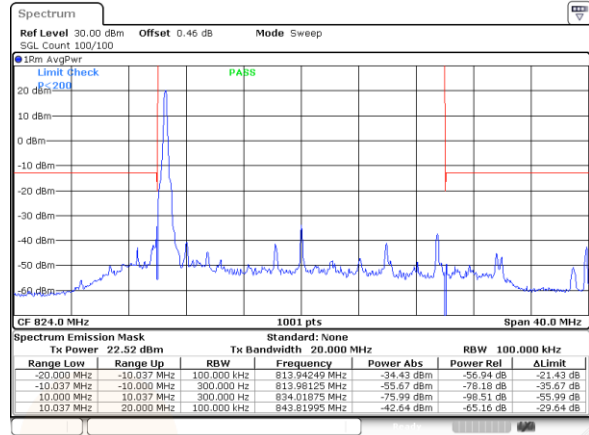
15M BW QPSK

Middle channel Lower 1RB

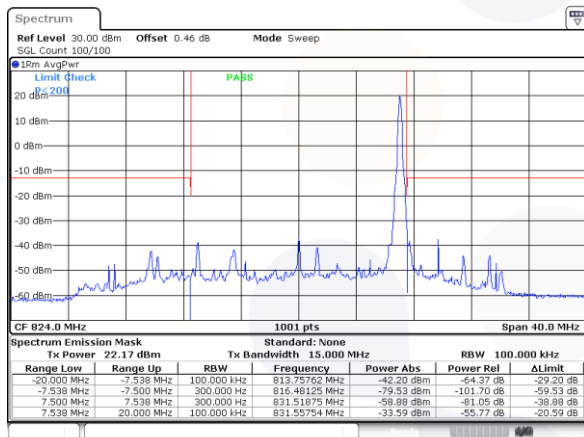


20M BW QPSK

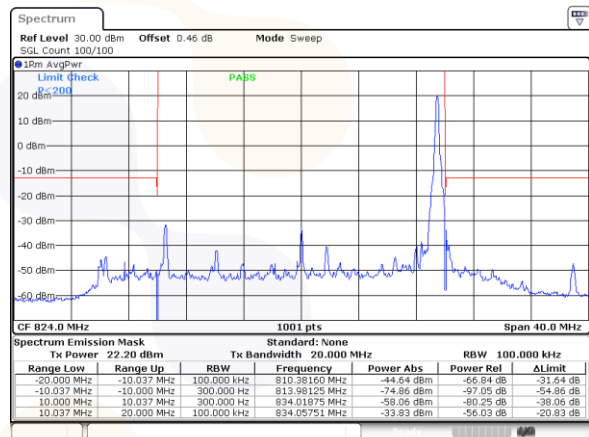
Middle channel Lower 1RB



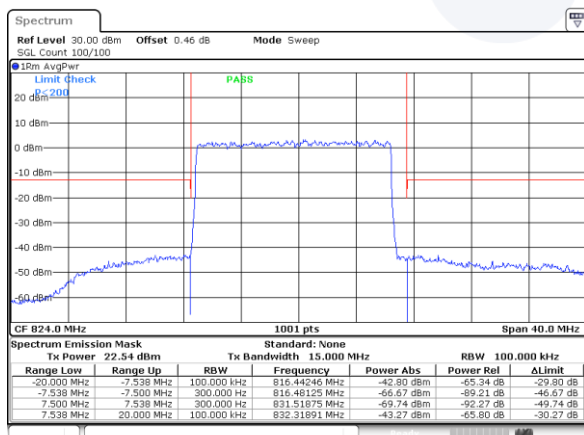
Middle channel Upper 1RB



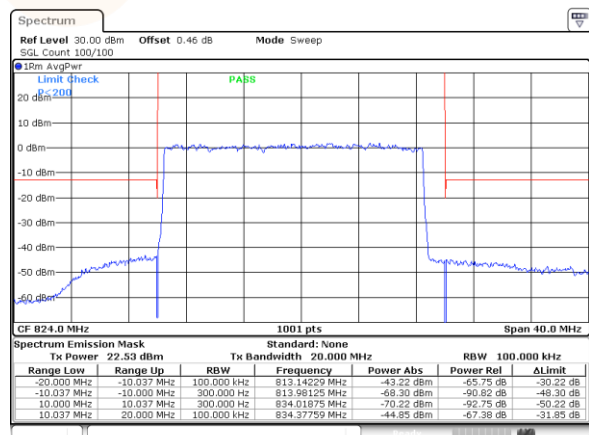
Middle channel Upper 1RB



Middle channel FRB

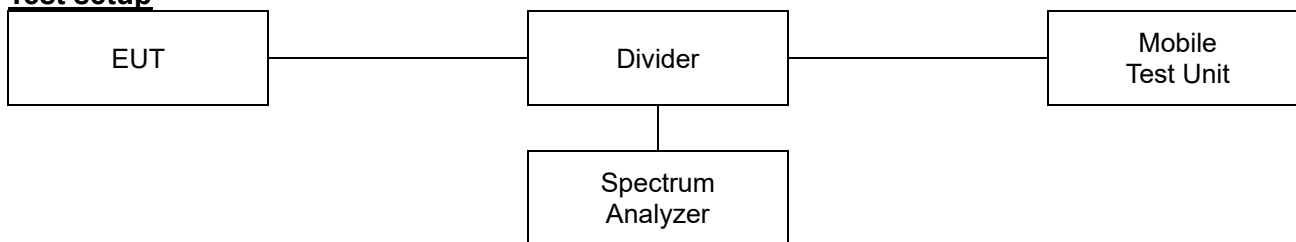


Middle channel FRB



7.4. Spurious Emissions at Antenna Terminal

Test setup



Limit

According to §90.691(a),

Out-of-band emission requirement shall apply only to the “outer” channels Included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees. The emission limits are as follows:

(1) For any frequency removed from the EA licensee’s frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $116 \log_{10}(f/6.1)$ decibels or $50 + 10\log_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz where f is greater than 12.5 kHz.

(2) For any frequency removed from the EA licensee’s frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $43 + 10\log_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

Test procedure

971168 D01 v03r01 - Section 6
 ANSI 63.26-2015 – Section 5.7

Test settings

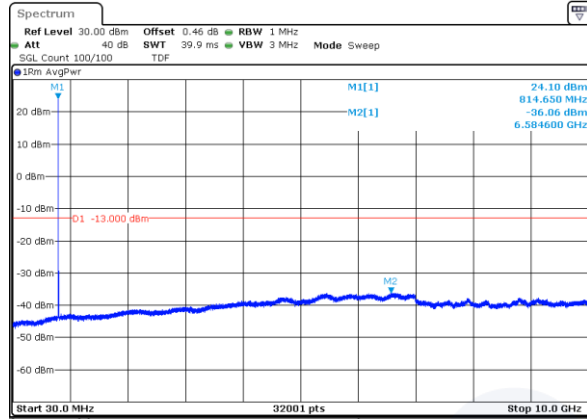
- 1) Start frequency was set to 30 MHz and stop frequency was set to at least 10th the fundamental frequency.
- 2) Detector = RMS
- 3) Sweep time = auto couple.
- 4) Trace mode = trace average
- 5) Allow trace to fully stabilize.
- 6) Please see test notes below RBW and VBW settings.

Notes:

1. In the 1 MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy, provided that the measured power is integrated over the full required reference bandwidth (i.e., 100 kHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.
2. All modes of operation were investigated and the worst-case configuration results are reported.

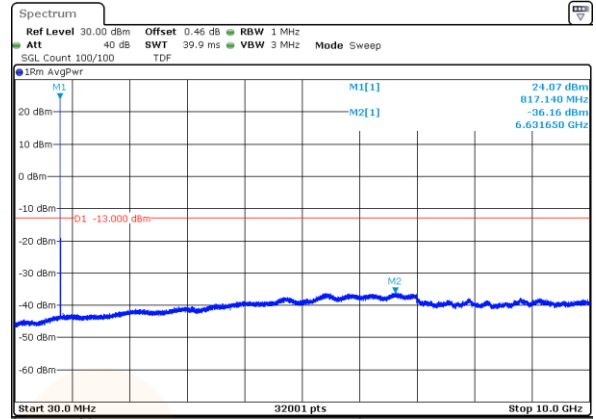
5M BW QPSK

Low channel (30 MHz ~ 10 GHz)



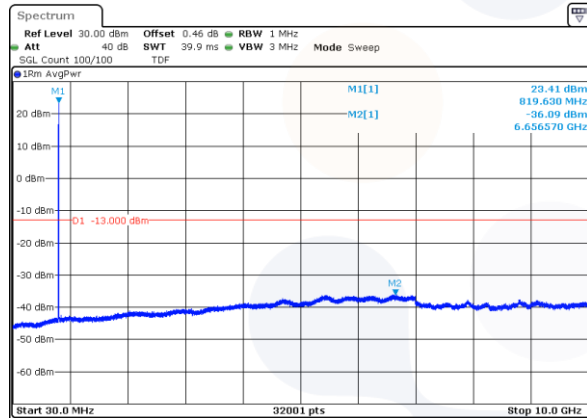
Date: 18.AUG.2025 18:34:06

Middle channel (30 MHz ~ 10 GHz)



Date: 18.AUG.2025 18:38:02

High channel (30 MHz ~ 10 GHz)

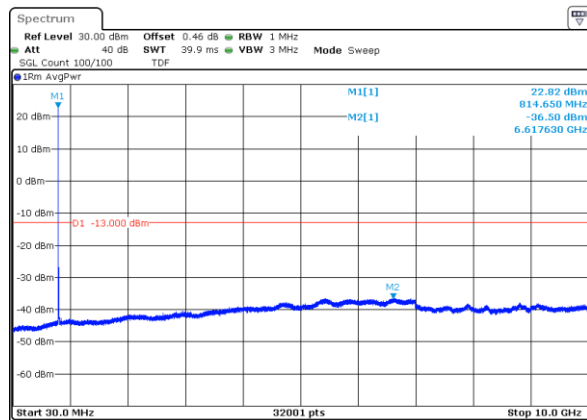


Date: 18.AUG.2025 18:40:21

Blank

10M BW QPSK

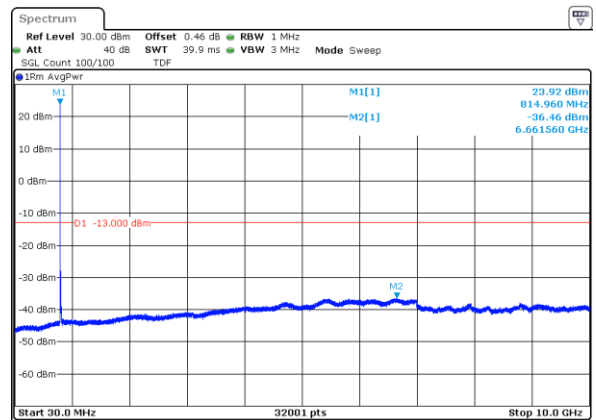
Middle channel (30 MHz ~ 10 GHz)



Date: 19.AUG.2025 10:15:16

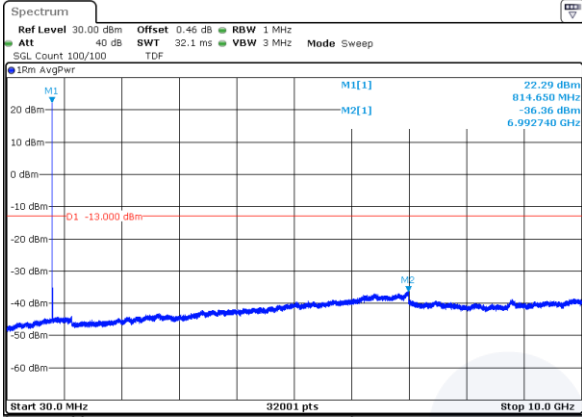
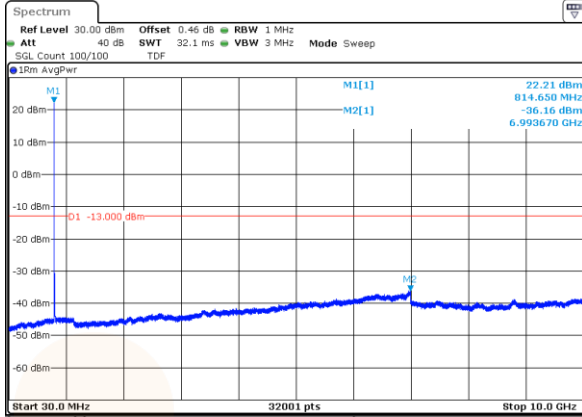
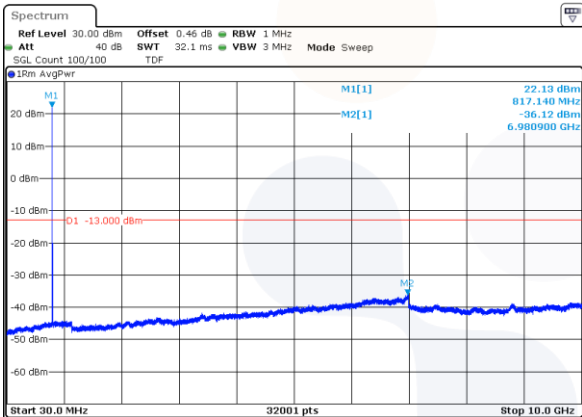
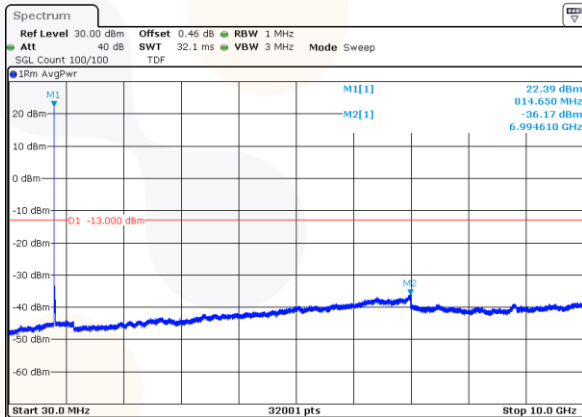
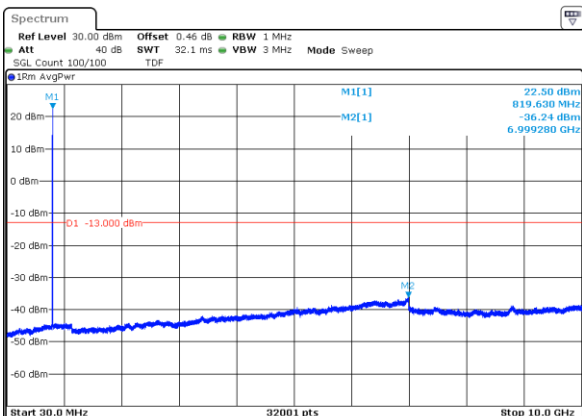
15M BW QPSK

Middle channel (30 MHz ~ 10 GHz)



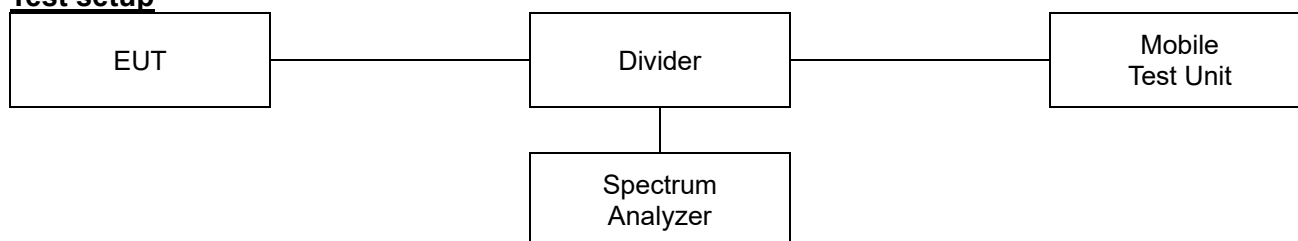
Date: 19.AUG.2025 10:44:42

Test mode: 5G NR n26 DFT-s OFDM

5M BW QPSK	10M BW QPSK
Low channel (30 MHz ~ 10 GHz)	Middle channel (30 MHz ~ 10 GHz)
	
5M BW QPSK	15M BW QPSK
Middle channel (30 MHz ~ 10 GHz)	Middle channel (30 MHz ~ 10 GHz)
	
5M BW QPSK	-
High channel (30 MHz ~ 10 GHz)	-
	Blank

7.5. Peak to Average Power Ratio (PAPR)

Test setup



Test procedure

971168 D01 v03r01 - Section 5.7.2

971168 D02 v02r02 – Section VII

ANSI 63.26-2015 – Section 5.2.3.4

Test settings

5.2.3.4 Measurement of peak power in a broadband noise-like signal using CCDF

- 1) Set resolution/measurement bandwidth $\geq$ OBW or specified reference bandwidth
- 2) Set the number of counts to a value that stabilizes the measured CCDF curve.
- 3) Set the measurement interval as follows:
 - a) For continuous transmissions, set to the greater of $[10 \times (\text{number of points in sweep}) \times (\text{transmission symbol period})]$ or 1 ms.
 - b) For burst transmissions, employ an external trigger that is synchronized with the EUT burst timing sequence, or use the internal burst trigger with a trigger level that allows the burst to stabilize. Set the measurement interval to a time that is less than or equal to the burst duration.
 - c) If there are several carriers in a single antenna port, the peak power shall be determined for each individual carrier (by disabling the other carriers while measuring the required carrier) and the total peak power calculated from the sum of the individual carrier peak powers.
- 4) Record the maximum PAPR level associated with a probability of 0.1%

5.2.6 Peak-to-average power ratio

Use one of the procedures presented in 5.2(ANSI C63.26-2015) to measure the total peak power and record as P_{PK} .

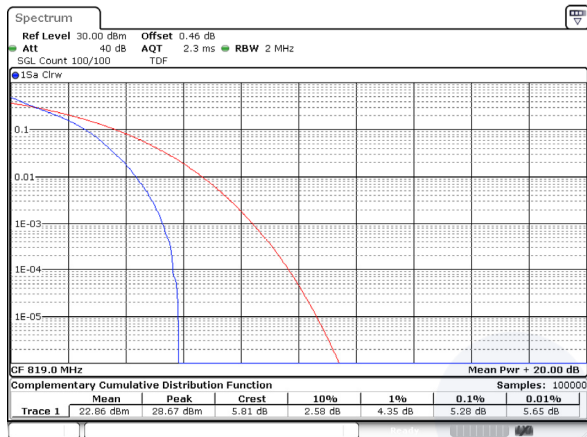
Use one of the applicable procedure presented 5.2(ANSI C63.26-2015) to measure the total average power and record as P_{AG} . Determine the P.A.P.R from:

$$PAPR(dB) = P_{PK}(dBm \text{ or } dBW) - P_{AG}(dBm \text{ or } dBW)$$

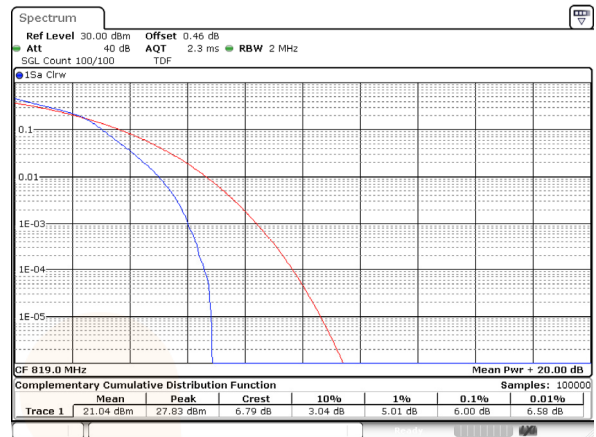
Test results

Test mode: LTE B26

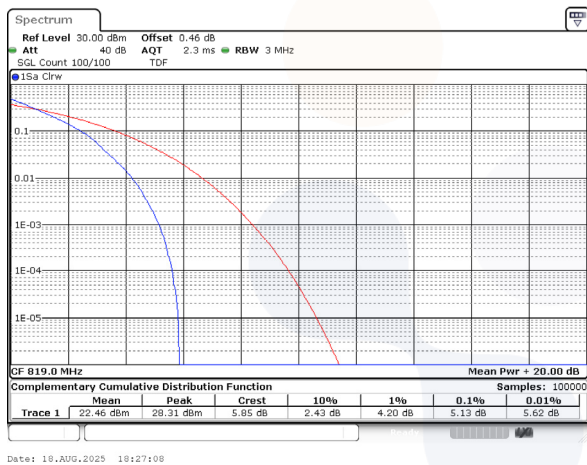
1.4M BW QPSK Middle channel



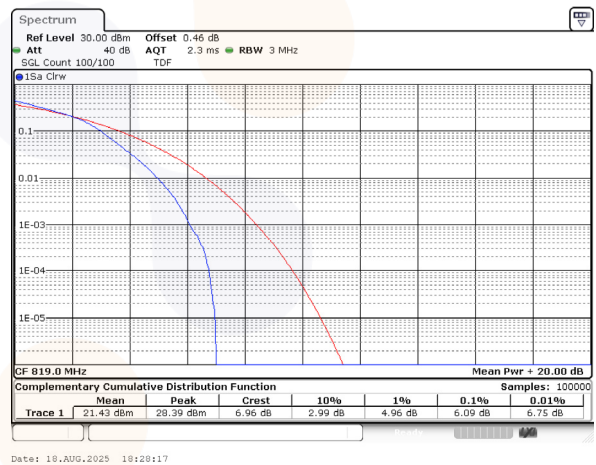
1.4M BW 16QAM Middle channel



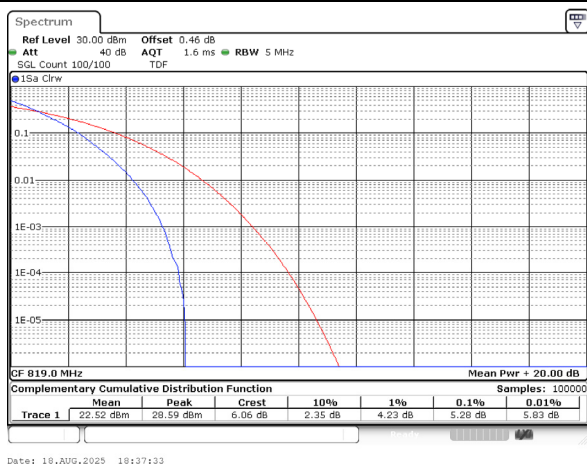
3M BW QPSK Middle channel



3M BW 16QAM Middle channel



5M BW QPSK Middle channel



5M BW 16QAM Middle channel

