

## 7. Band Edge and Emission Mask

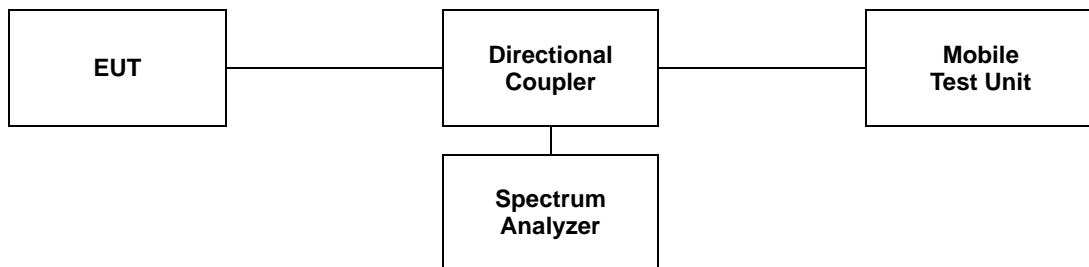
### 7.1. Limit

- §22.917(a), the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10\log(P)$  dB.
- §24.238(a), the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB.
- §27.53(g), the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least  $43 + 10 \log (P)$  dB.
- §27.53(h)(1), for operations in the 1 695-1 710 MHz, 1 710-1 755 MHz, 1 755-1 780 MHz, 1 915-1 920 MHz, 1 995-2 000 MHz, 2 000-2 020 MHz, 2 110-2 155 MHz, 2 155-2 180 MHz, and 2 180-2 200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least  $43 + 10 \log_{10} (P)$  dB.
- §27.53(m)(4), for mobile digital stations, the attenuation factor shall be not less than  $40 + 10 \log_{10} (P)$  dB on all frequencies between the channel edge and 5 megahertz from the channel edge,  $43 + 10 \log_{10} (P)$  dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and  $55 + 10 \log_{10} (P)$  dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that  $43 + 10 \log_{10} (P)$  dB on all frequencies between 2490.5 MHz and 2496 MHz and  $55 + 10 \log_{10} (P)$  dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.
- §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  $116 \text{ Log}_{10} (f / 6.1)$  decibels or  $50 + 10 \text{ Log}_{10} (P)$  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 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  $43 + 10 \text{ Log}_{10} (P)$  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.

## 7.2. Test Procedure

The test follows section 5.7 of ANSI C63.26-2015.

- a. Span was set large enough so as to capture all out of band emissions near the band edge.
- b.  $RBW \geq 1\%$  of OBW
- c.  $VBW \geq 3 \times RBW$ .
- d. Detector = RMS.
- e. Trace mode = Average.
- f. Sweep time = Auto.
- g. The trace was allowed to stabilize.
- h. All path loss of frequency range was investigated and compensated to spectrum analyzer as TDF function.

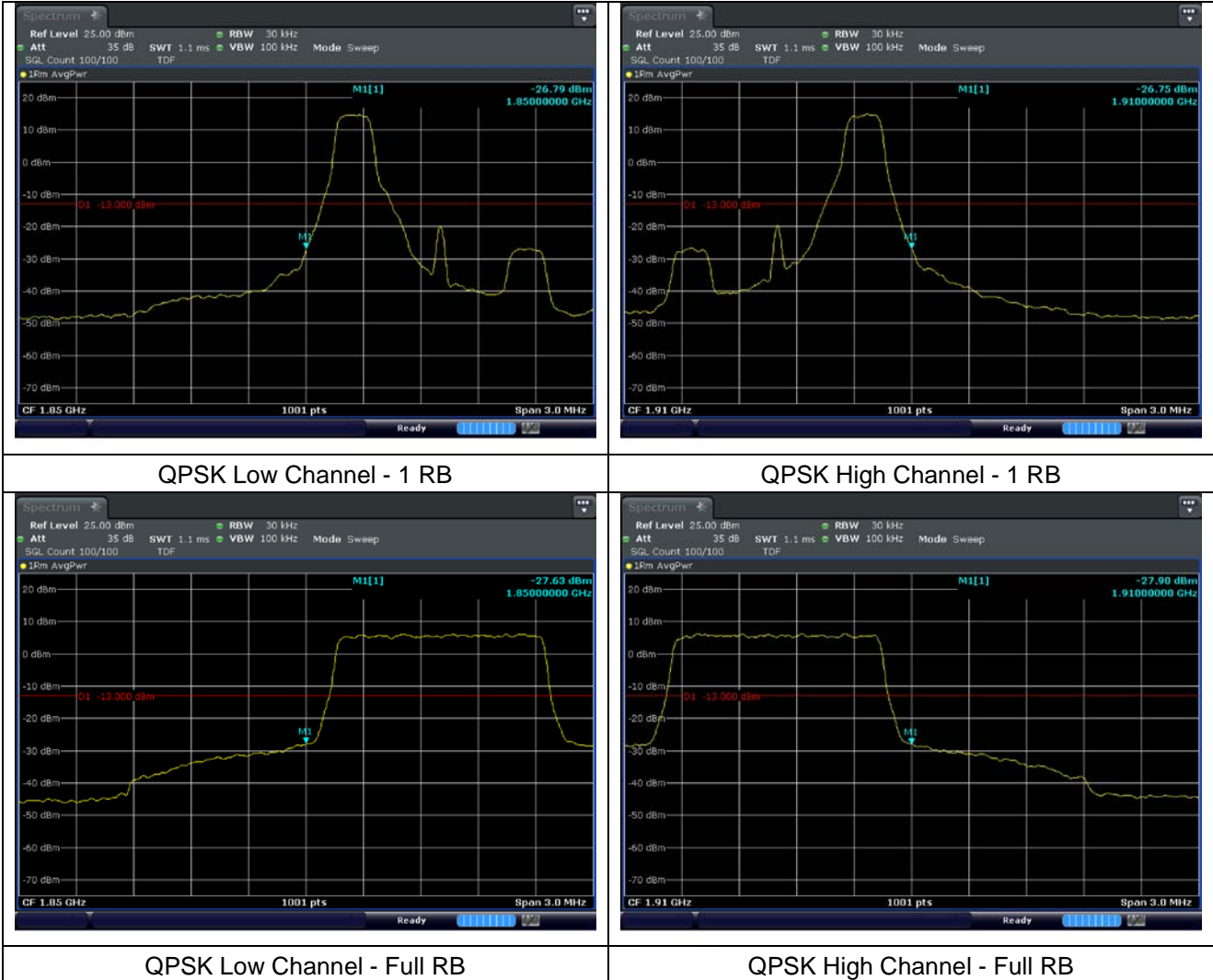


### 7.3. Test Results

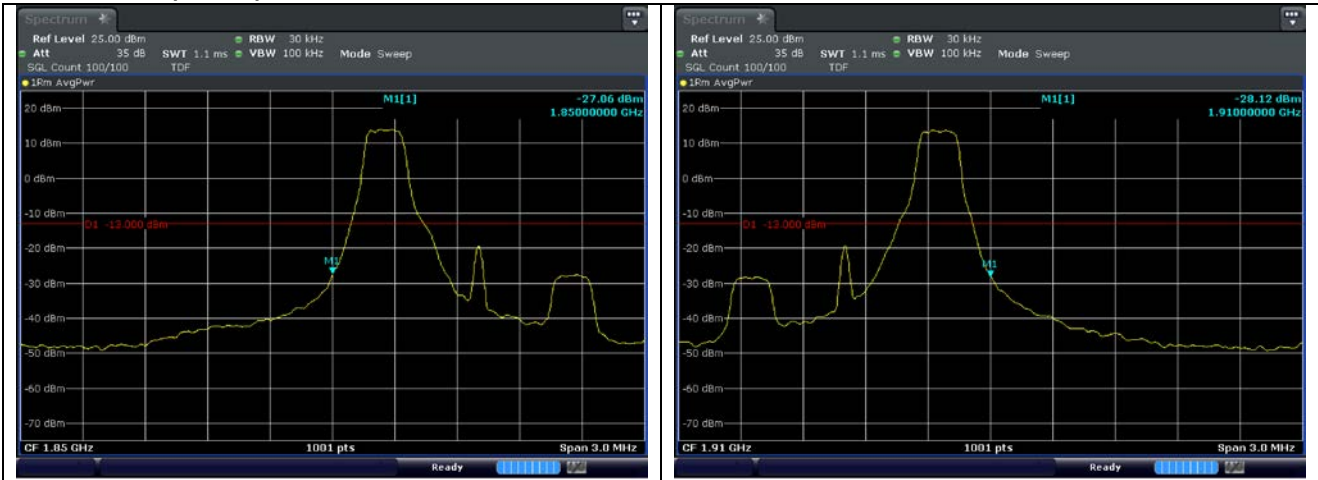
Ambient temperature : (23 ± 1) °C  
 Relative humidity : 47 % R.H.

#### - Test plots

#### LTE band 2 (1.4 MHz)

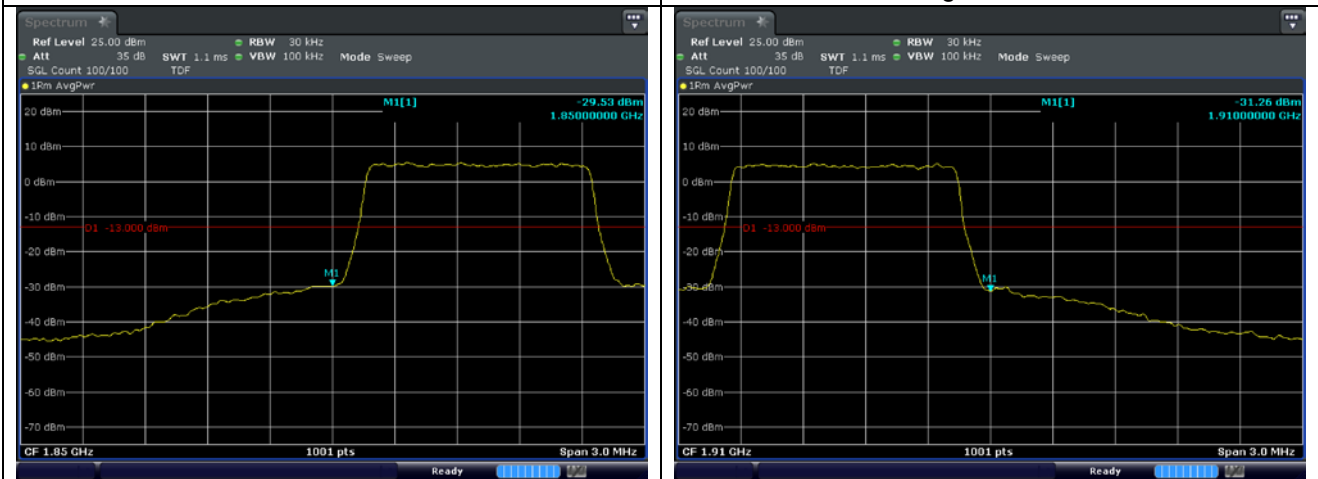


**LTE band 2 (1.4 MHz)**



16QAM Low Channel - 1 RB

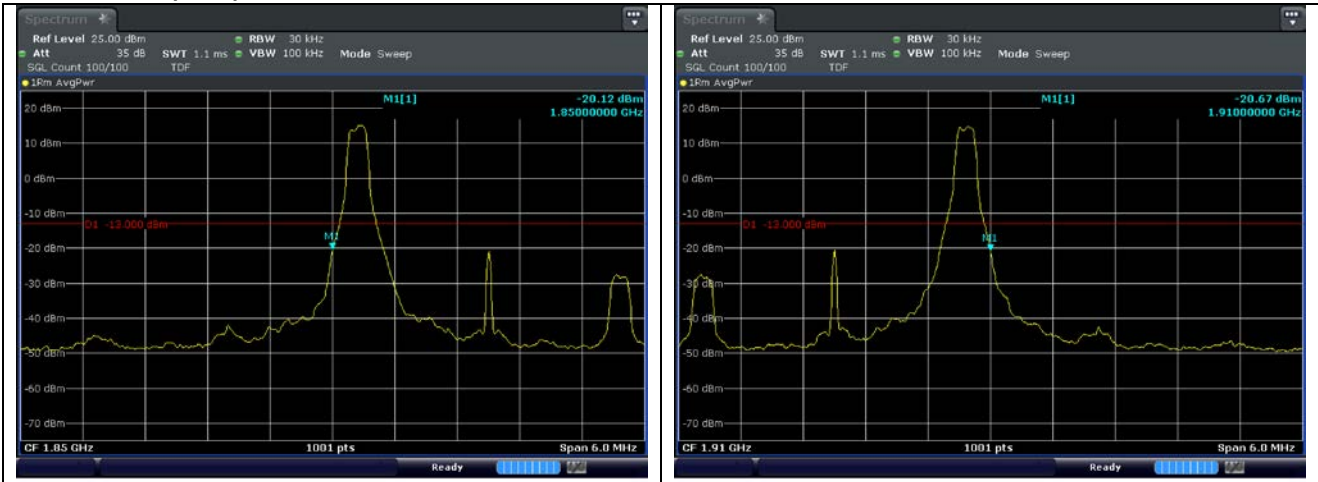
16QAM High Channel - 1 RB



16QAM Low Channel - Full RB

16QAM High Channel - Full RB

**LTE band 2 (3 MHz)**



QPSK Low Channel - 1 RB

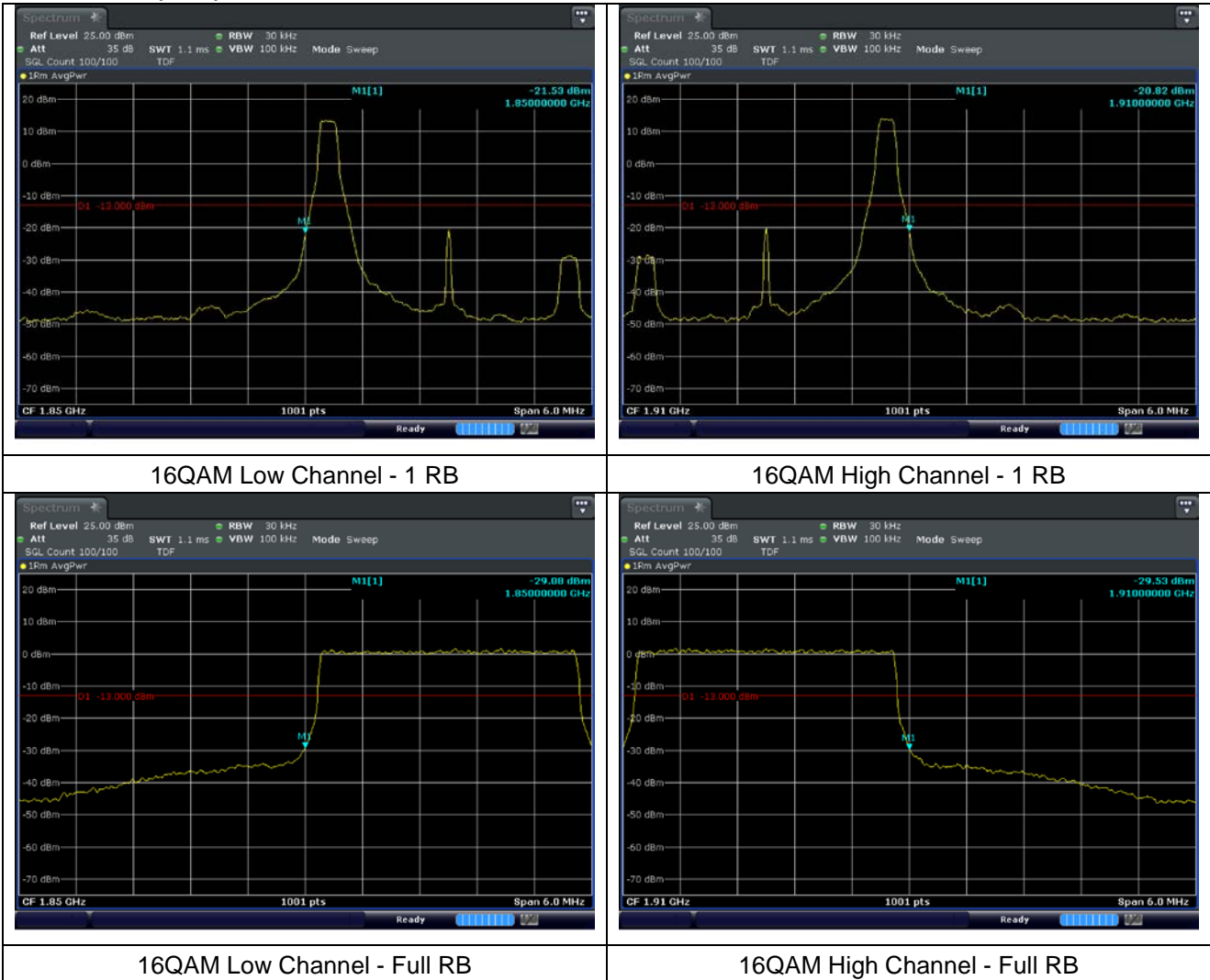
QPSK High Channel - 1 RB



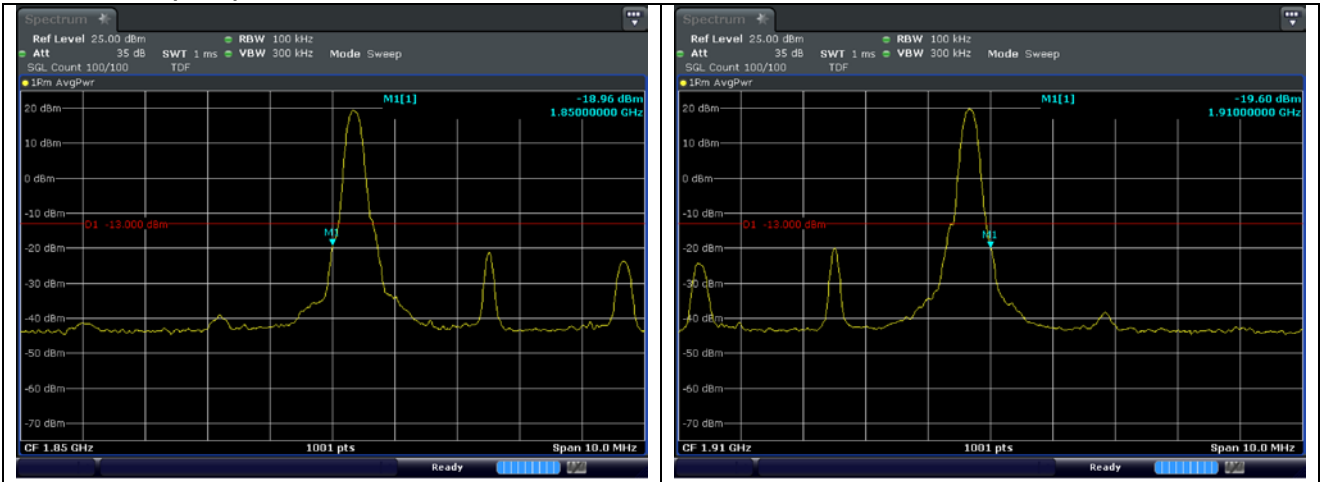
QPSK Low Channel - Full RB

QPSK High Channel - Full RB

**LTE band 2 (3 MHz)**

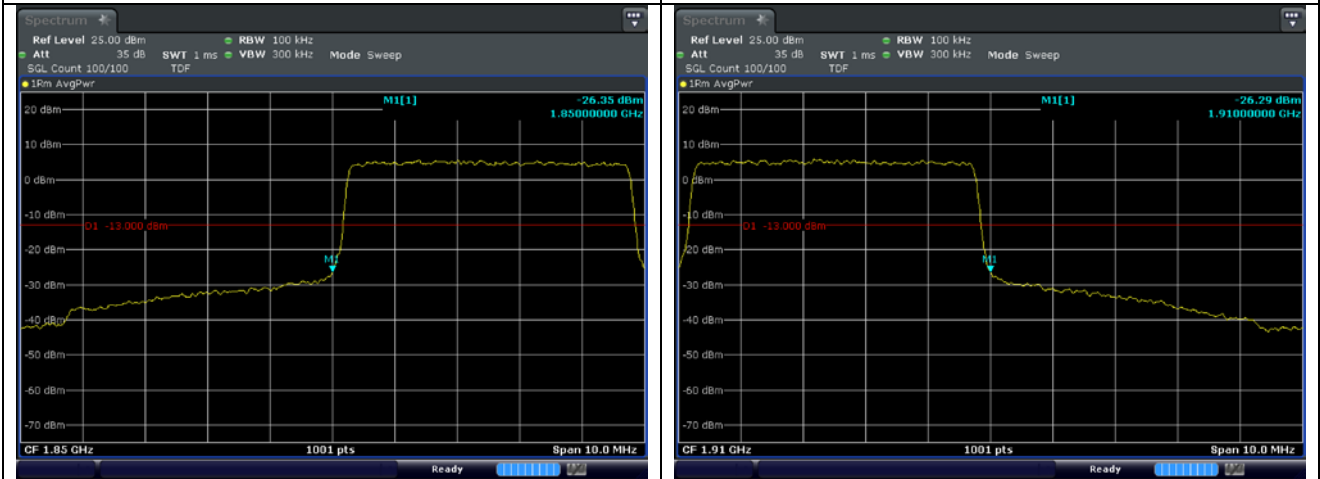


**LTE band 2 (5 MHz)**



QPSK Low Channel - 1 RB

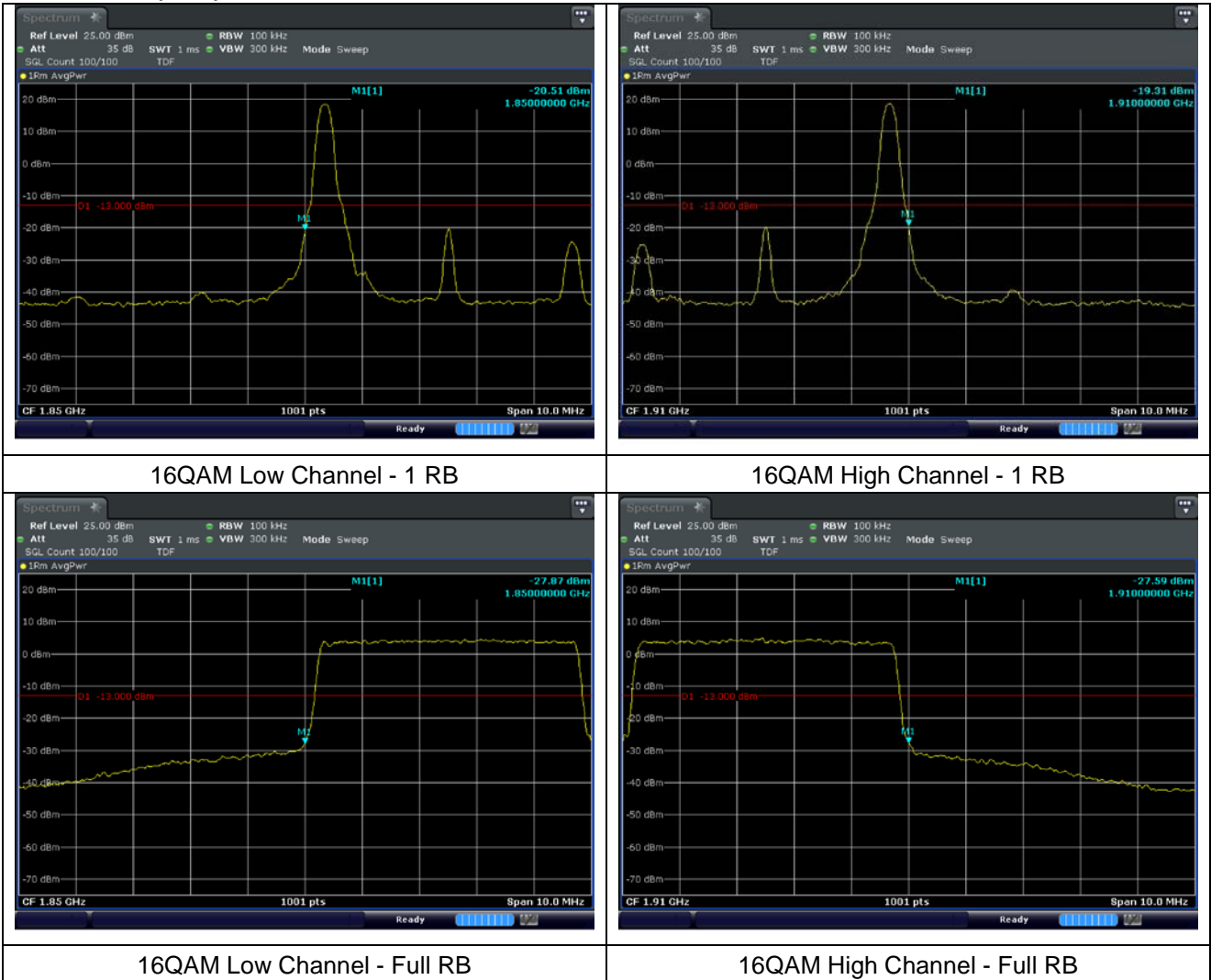
QPSK High Channel - 1 RB



QPSK Low Channel - Full RB

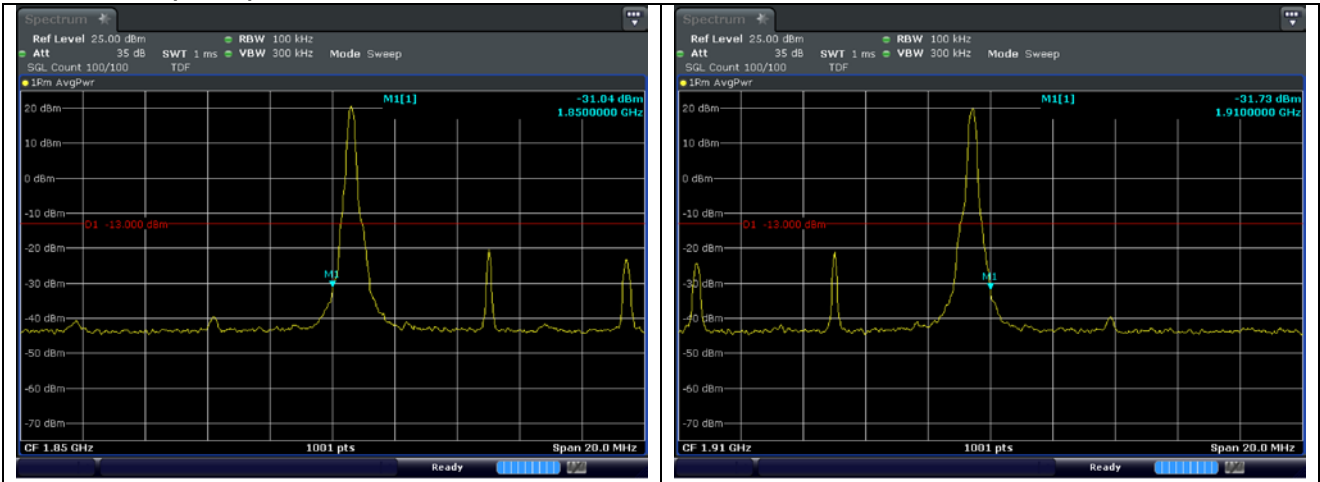
QPSK High Channel - Full RB

**LTE band 2 (5 MHz)**



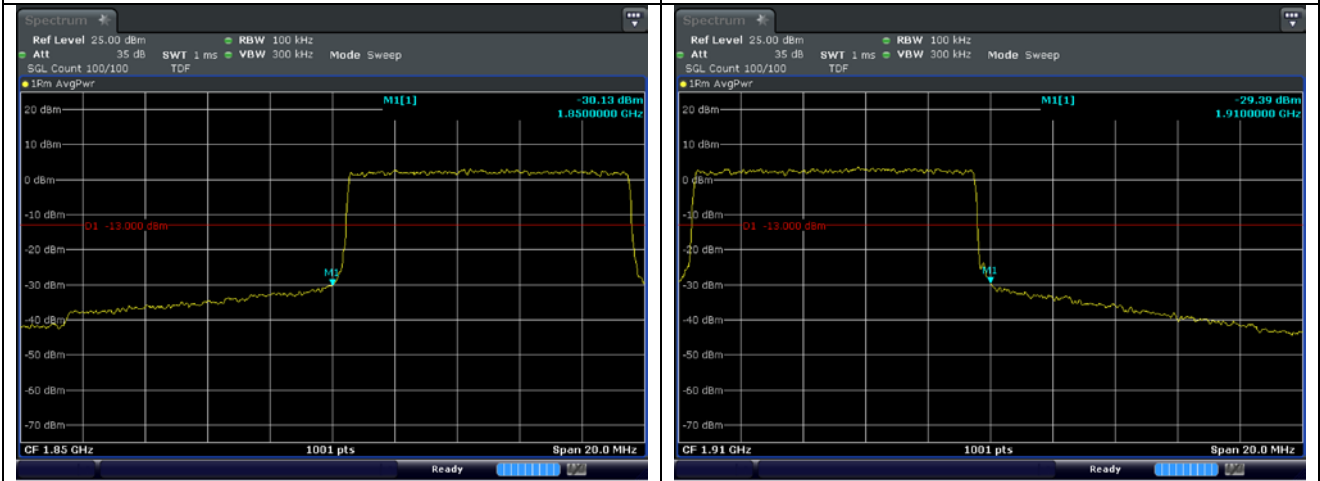


**LTE band 2 (10 MHz)**



QPSK Low Channel - 1 RB

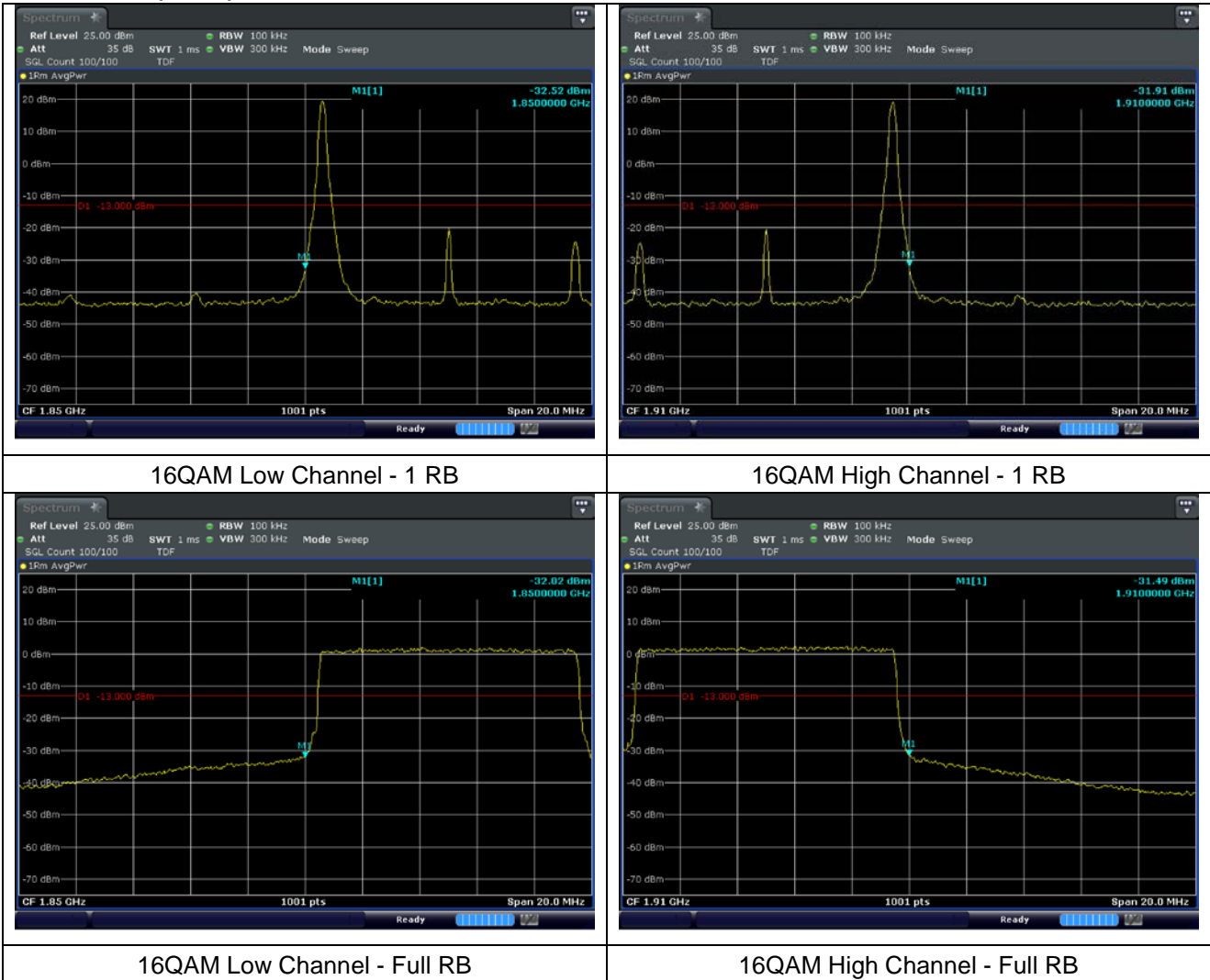
QPSK High Channel - 1 RB



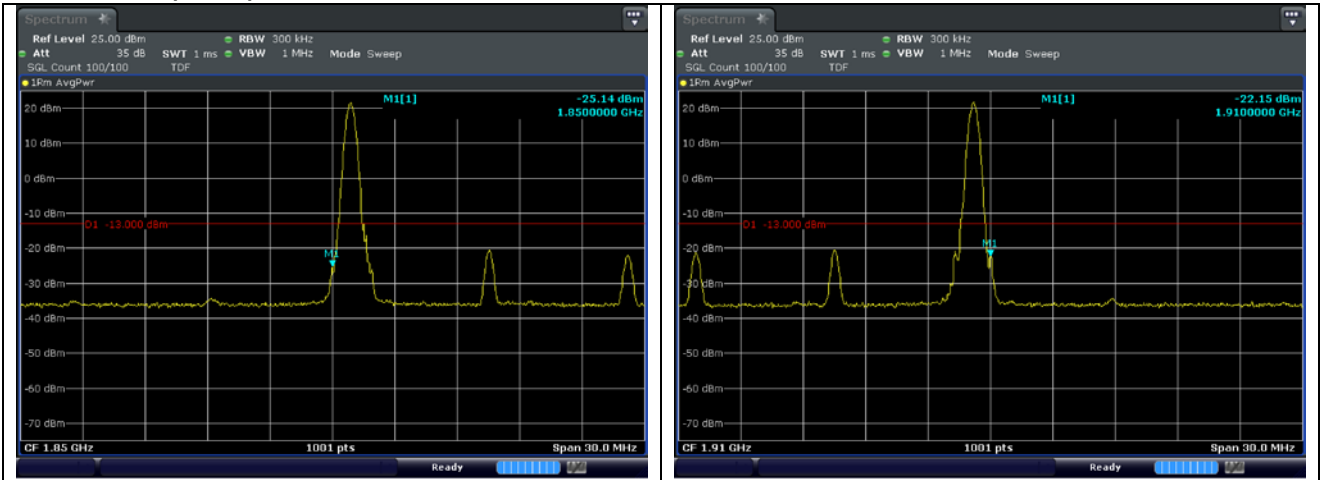
QPSK Low Channel - Full RB

QPSK High Channel - Full RB

**LTE band 2 (10 MHz)**

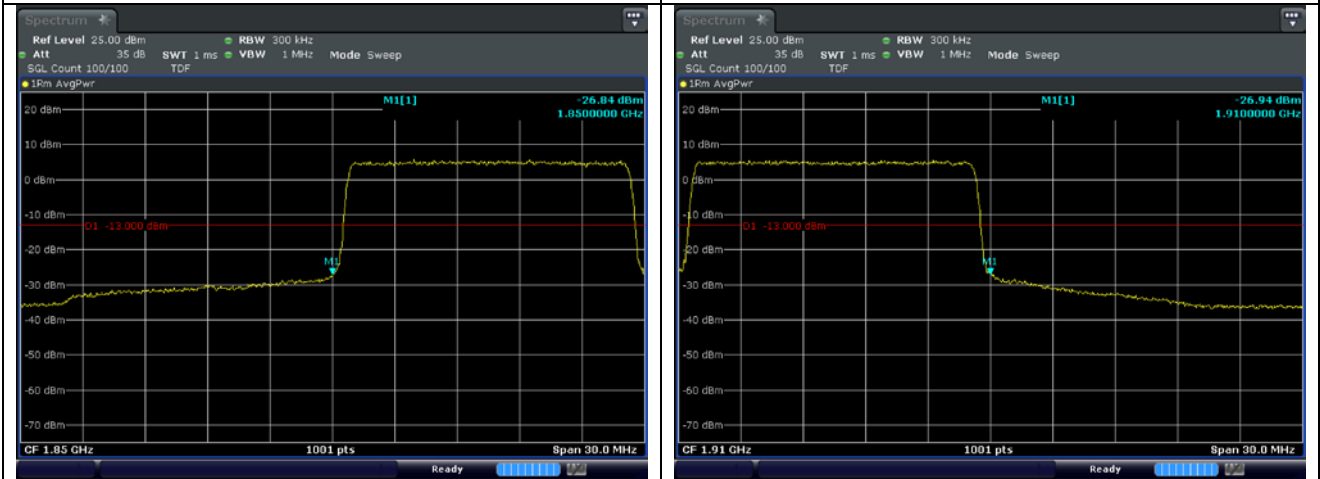


**LTE band 2 (15 MHz)**



QPSK Low Channel - 1 RB

QPSK High Channel - 1 RB



QPSK Low Channel - Full RB

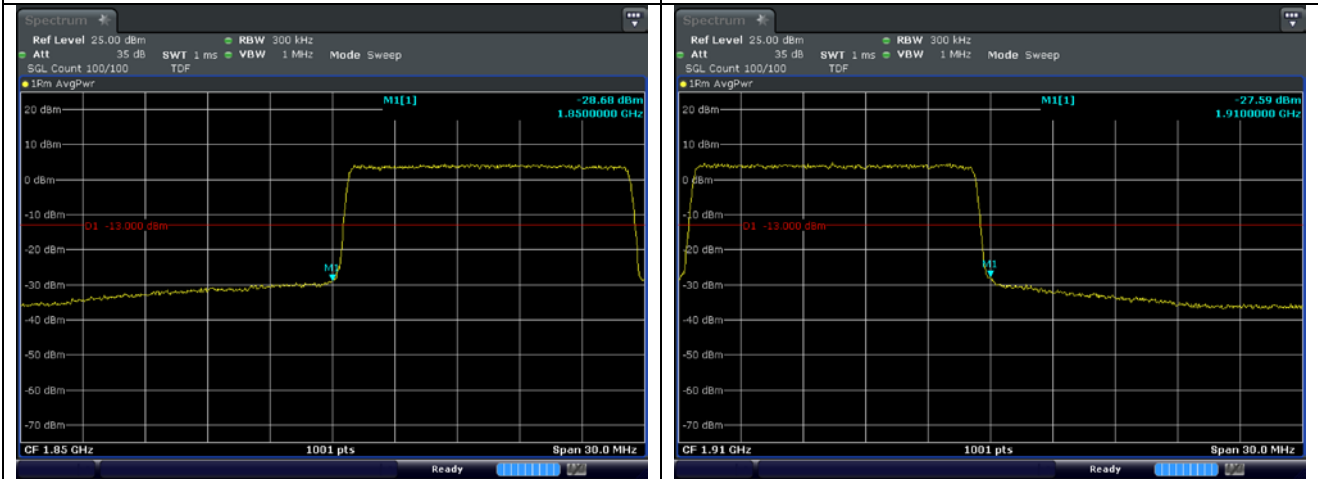
QPSK High Channel - Full RB

**LTE band 2 (15 MHz)**



16QAM Low Channel - 1 RB

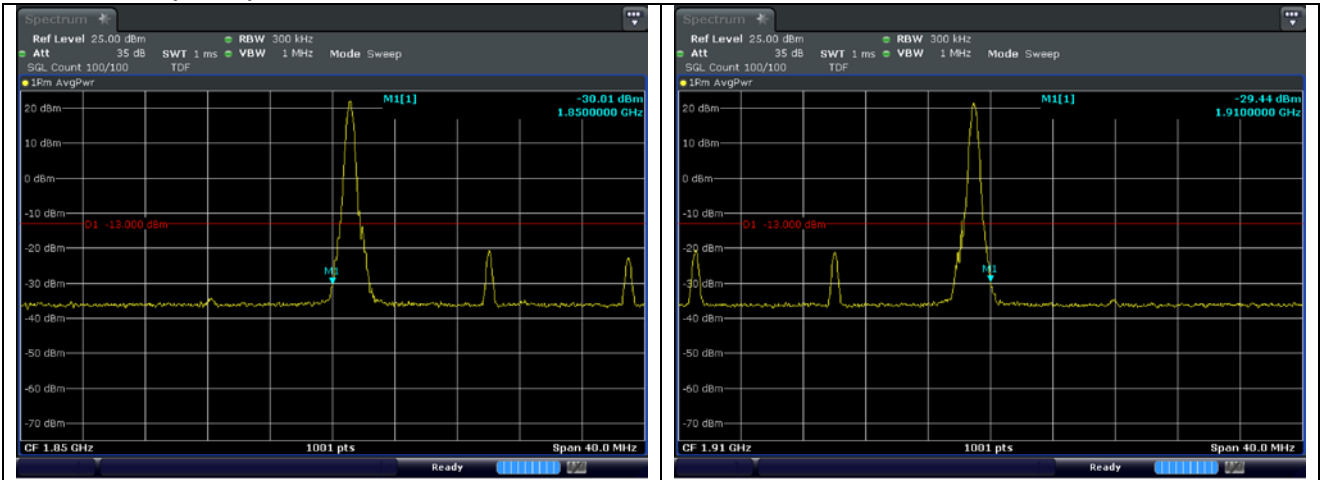
16QAM High Channel - 1 RB



16QAM Low Channel - Full RB

16QAM High Channel - Full RB

**LTE band 2 (20 MHz)**



QPSK Low Channel - 1 RB

QPSK High Channel - 1 RB



QPSK Low Channel - Full RB

QPSK High Channel - Full RB

**LTE band 2 (20 MHz)**

