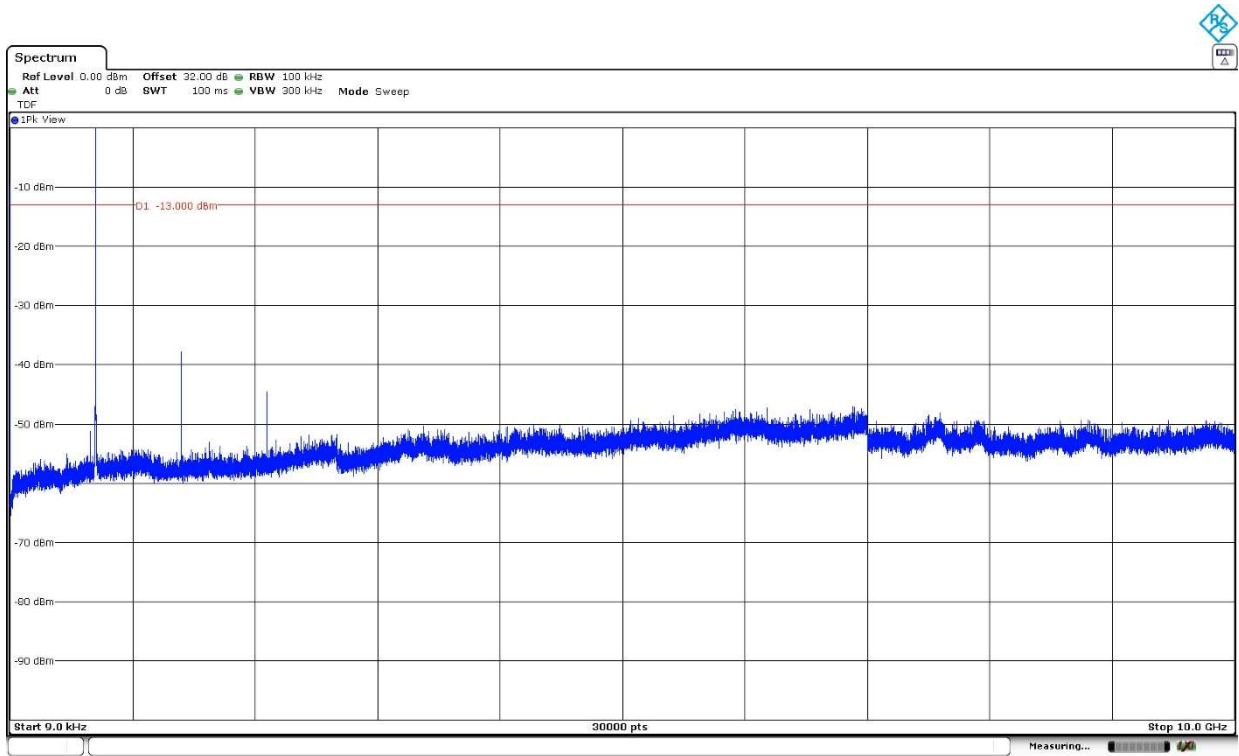


High Channel:

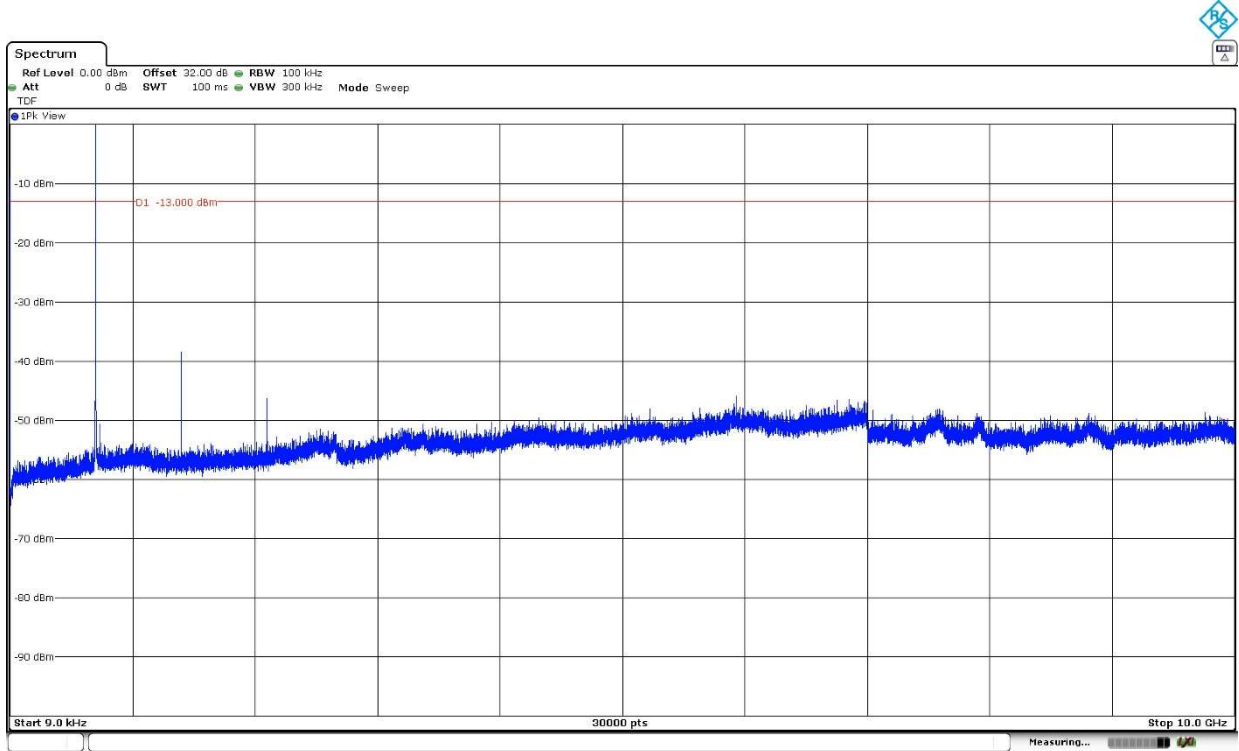


The peak above the limit is the carrier frequency.

**LTE Cat-NB1 Band 85:**

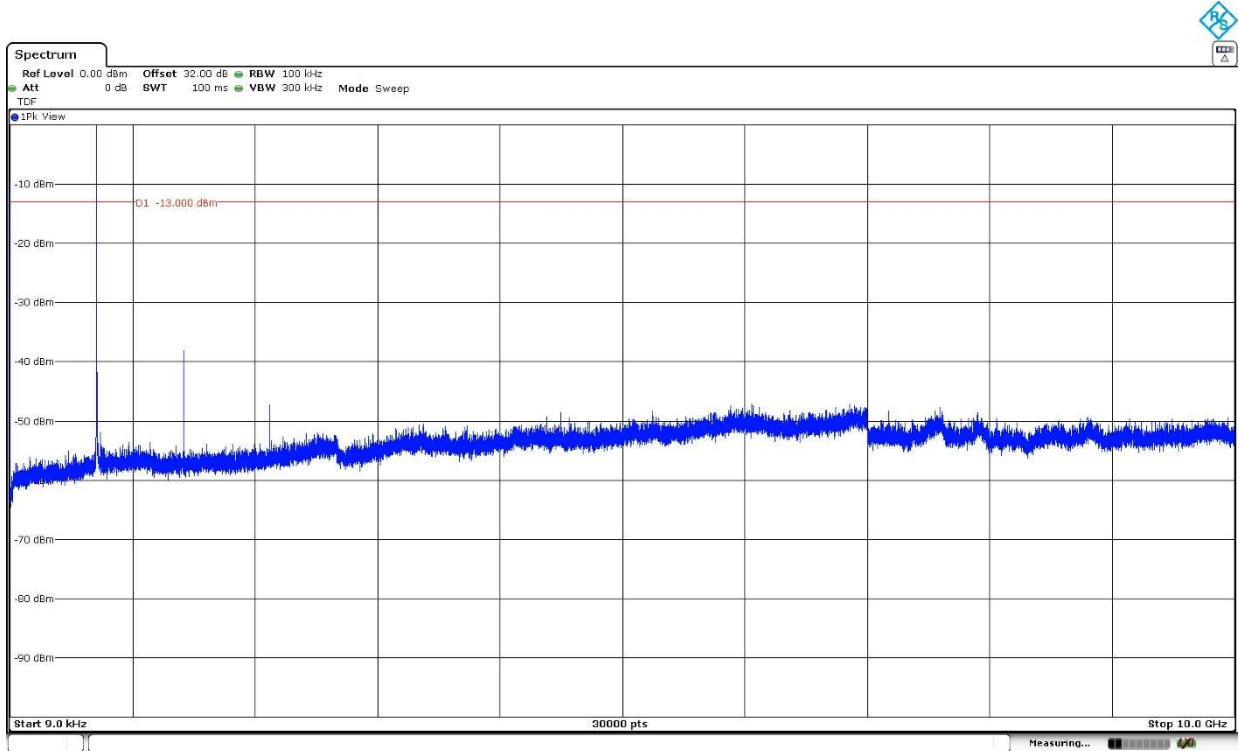
Pi/2-BPSK. BW=3.75 kHz. Tone Number=1. Tone Offset=47. MSC/TBS=0.

Low Channel:



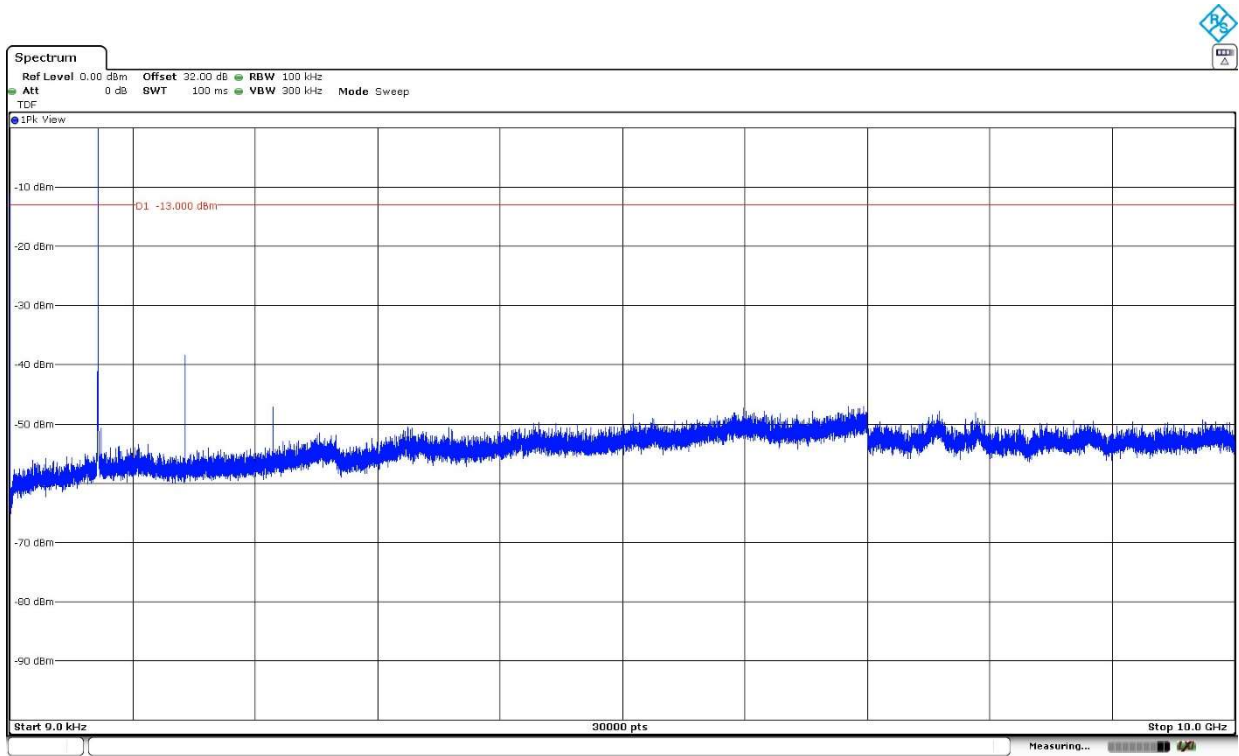
The peak above the limit is the carrier frequency.

Middle Channel:



The peak above the limit is the carrier frequency.

High Channel:



The peak above the limit is the carrier frequency.

## Spurious emissions at antenna terminals at Block Edges

### Limits

#### 1. LTE Cat NB1 Band 8. FCC §27.1509 (a).

FCC §27.1509 (a):

The power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) in watts by at least the following amounts:

- (a) For 900 MHz broadband operations in 897.5–900.5 MHz band by at least  $43 + 10 \log (P)$  dB.

#### 2. LTE Cat NB1 Band 13.

FCC §27.53 (c):

On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least  $43 + 10 \log (P)$  dB. Compliance is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater.

On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than  $65 + 10 \log (P)$  dB in a 6.25 kHz band segment, for mobile and portable stations. Compliance is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.

RSS-130, Clause 4.7.2:

The power of any unwanted emissions in any 6.25 kHz bandwidth for all frequencies between 763-775 MHz and 793-806 MHz shall be attenuated below the transmitter power, P (dBW), by at least  $65 + 10 \log_{10} p(\text{watts})$ , dB, for mobile and portable equipment.

#### 3. LTE Cat NB1 Band 66.

FCC §27.53 (h), RSS-139, Clause 6.6:

According to specification, for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 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. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater.

#### 4. LTE Cat NB1 Band 71 & LTE Cat NB1 Band 85.

FCC §27.53 (g):

For operations in the 600 MHz band and the 698-746 MHz band, 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. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater.

RSS-130, Clause 4.7.1:

The unwanted emissions in any 100 kHz bandwidth on any frequency outside the low frequency edge and the high frequency edge of each frequency block range(s), shall be attenuated below the transmitter power, P (dBW), by at least  $43 + 10 \log_{10} p(\text{watts})$ , dB.

At  $P_o$  transmitting power, the specified minimum attenuation becomes  $43+10 \log (P_o)$ , and the level in dBm relative to  $P_o$  becomes:

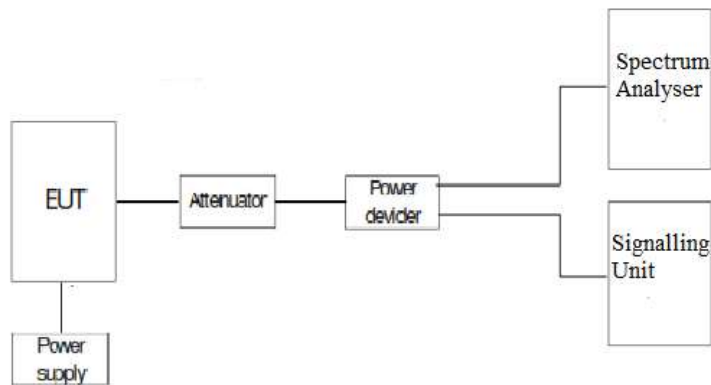
$$P_o \text{ (dBm)} - [43 + 10 \log (P_o \text{ in mW}) - 30] = -13 \text{ dBm}$$

### Method

The EUT RF output connector was connected to a spectrum analyser and to the Universal Radio Communication tester R&S CMW500 (selecting maximum transmission power of the EUT and different modes of modulation) using a 50-Ohm attenuator and a power splitter.

The reading of the spectrum analyser is corrected with the attenuation loss of connection between output terminal of EUT and input of the spectrum analyser.

### Test Setup



**Results**

**LTE Cat NB1 Band 8:**

Preliminary measurements determined the worst-case. Results attached are for this worst-case configuration.

LTE Cat NB1 Band 8	Pi/2-BPSK BW=3.75 kHz Tone Number=1 Tone Offset=0 MSC/TBS=0	Pi/2-BPSK BW=15 kHz Tone Number=1 Tone Offset=0 MSC/TBS=0	QPSK BW=15 kHz Tone Number=12 Tone Offset=0 MSC/TBS=5
Maximum measured level at <u>Low Block Edge</u> at antenna port (dBm)	-19.08	-23.3	-23.12

LTE Cat NB1 Band 8	Pi/2-BPSK BW=3.75 kHz Tone Number=1 Tone Offset=47 MSC/TBS=0	Pi/2-BPSK BW=15 kHz Tone Number=1 Tone Offset=11 MSC/TBS=0	QPSK BW=15 kHz Tone Number=12 Tone Offset=0 MSC/TBS=5
Maximum measured level at <u>High Block Edge</u> at antenna port (dBm)	-16.46	-24.77	-19.4

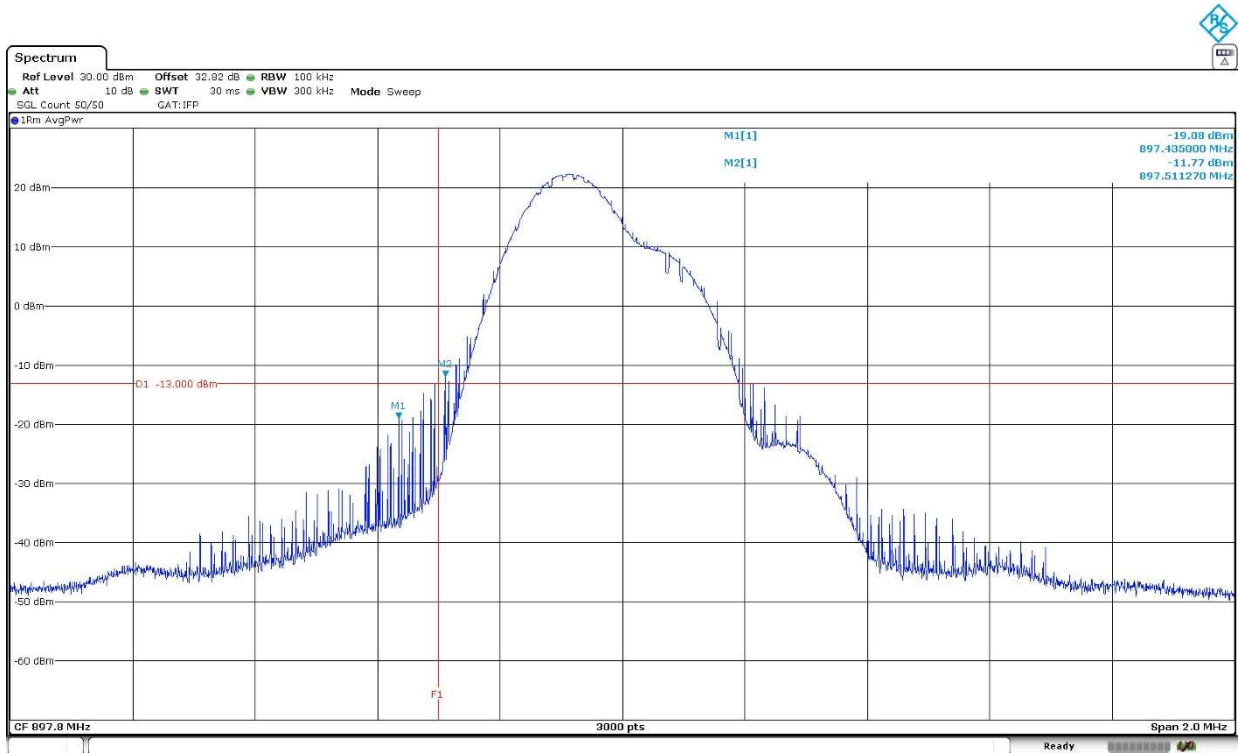
Measurement uncertainty (dB): <math>\pm 2.76</math>

**Verdict**

Pass

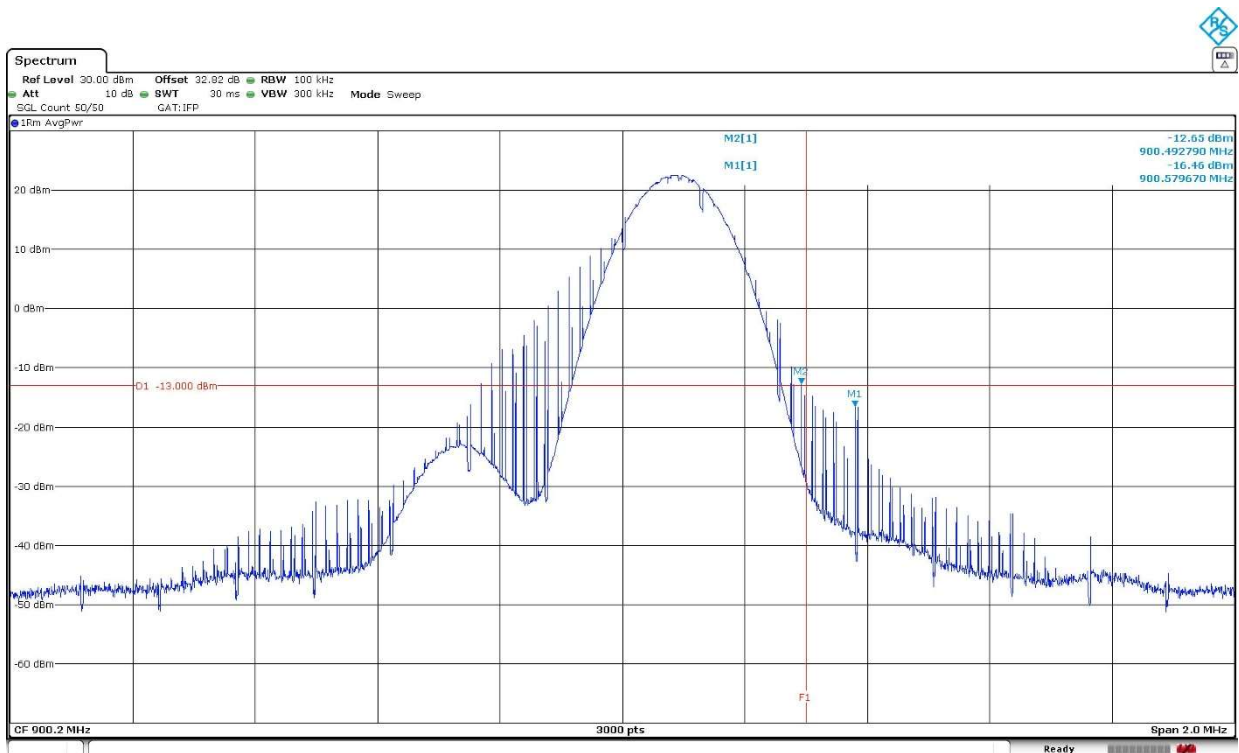
**LTE Cat NB1 Band 8:**

LTE Cat NB1 Band 8. Pi/2-BPSK. BW=3.75 kHz. Tone Number=1. Tone Offset=0. MSC/TBS=0. Low Channel:



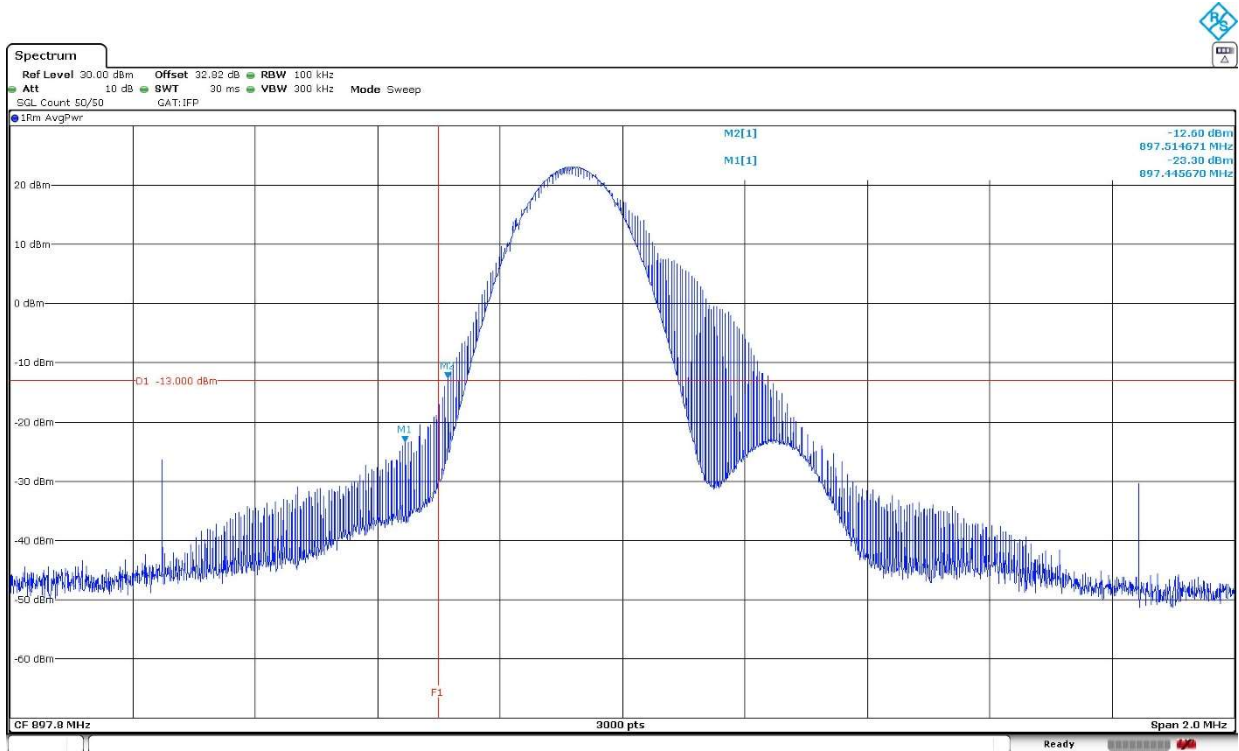
The equipment transmits at the maximum output power

LTE Cat NB1 Band 8. Pi/2-BPSK. BW=3.75 kHz. Tone Number=1. Tone Offset=47. MSC/TBS=0. High Channel:



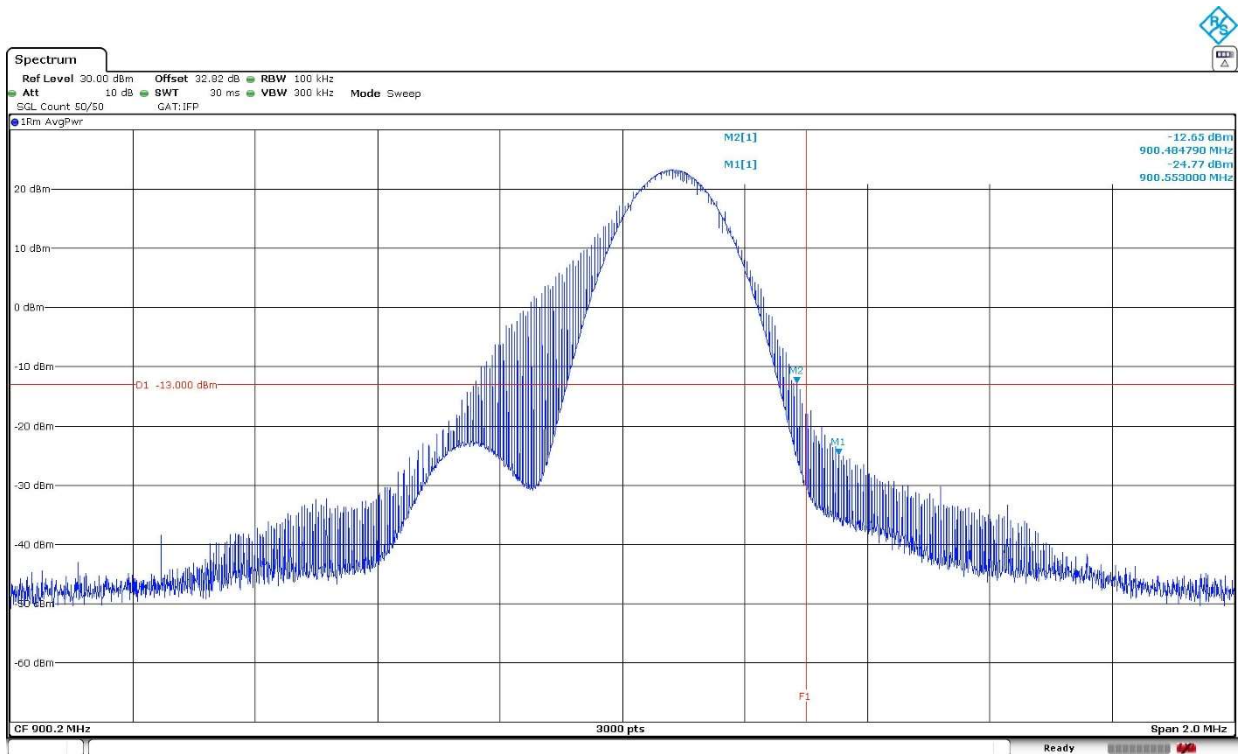
The equipment transmits at the maximum output power

LTE Cat NB1 Band 8. Pi/2-BPSK. BW=15 kHz. Tone Number=1. Tone Offset=0. MSC/TBS=0. Low Channel:



The equipment transmits at the maximum output power

LTE Cat NB1 Band 8. Pi/2-BPSK. BW=15 kHz. Tone Number=1. Tone Offset=11. MSC/TBS=0. High Channel:



The equipment transmits at the maximum output power