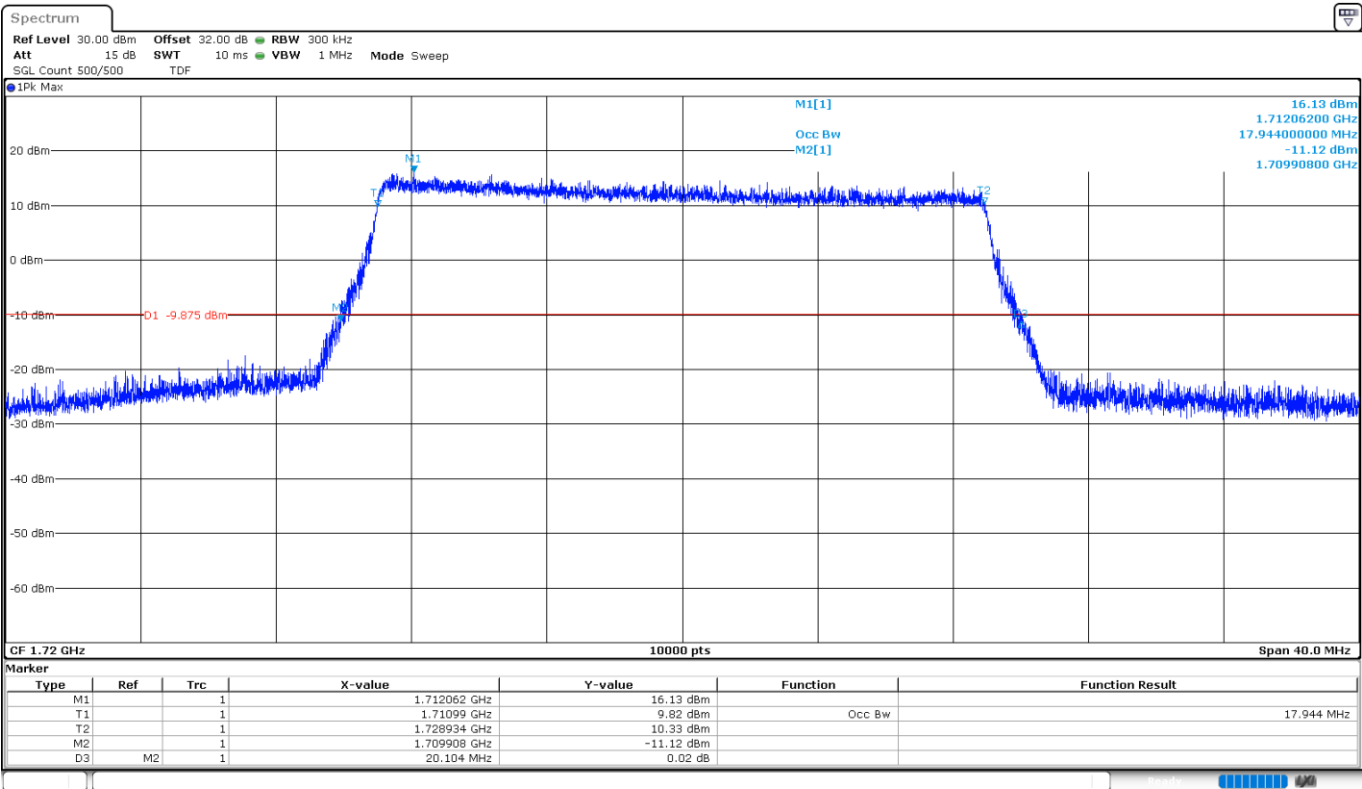
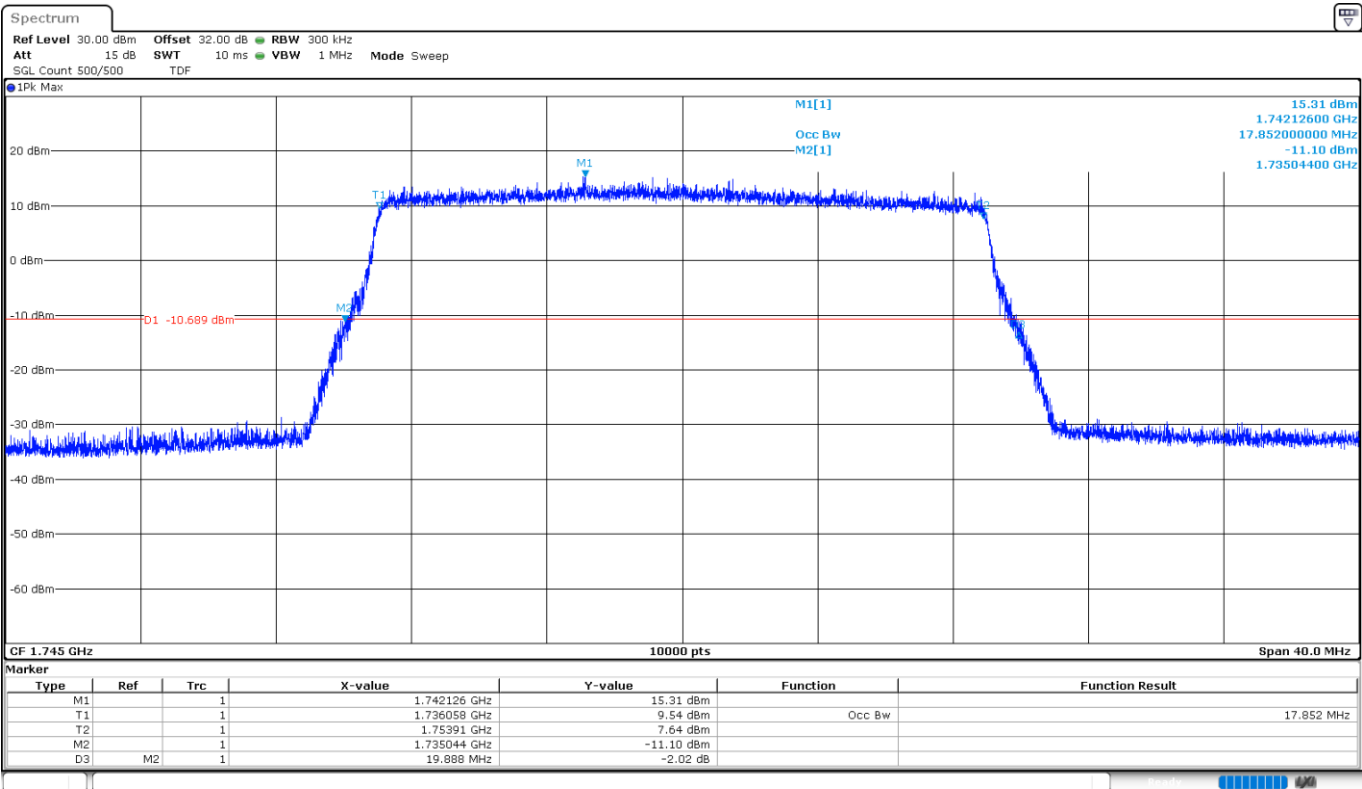


LTE Cat 1bis Band 66. BW=20 MHz. QPSK. RB Size 6.

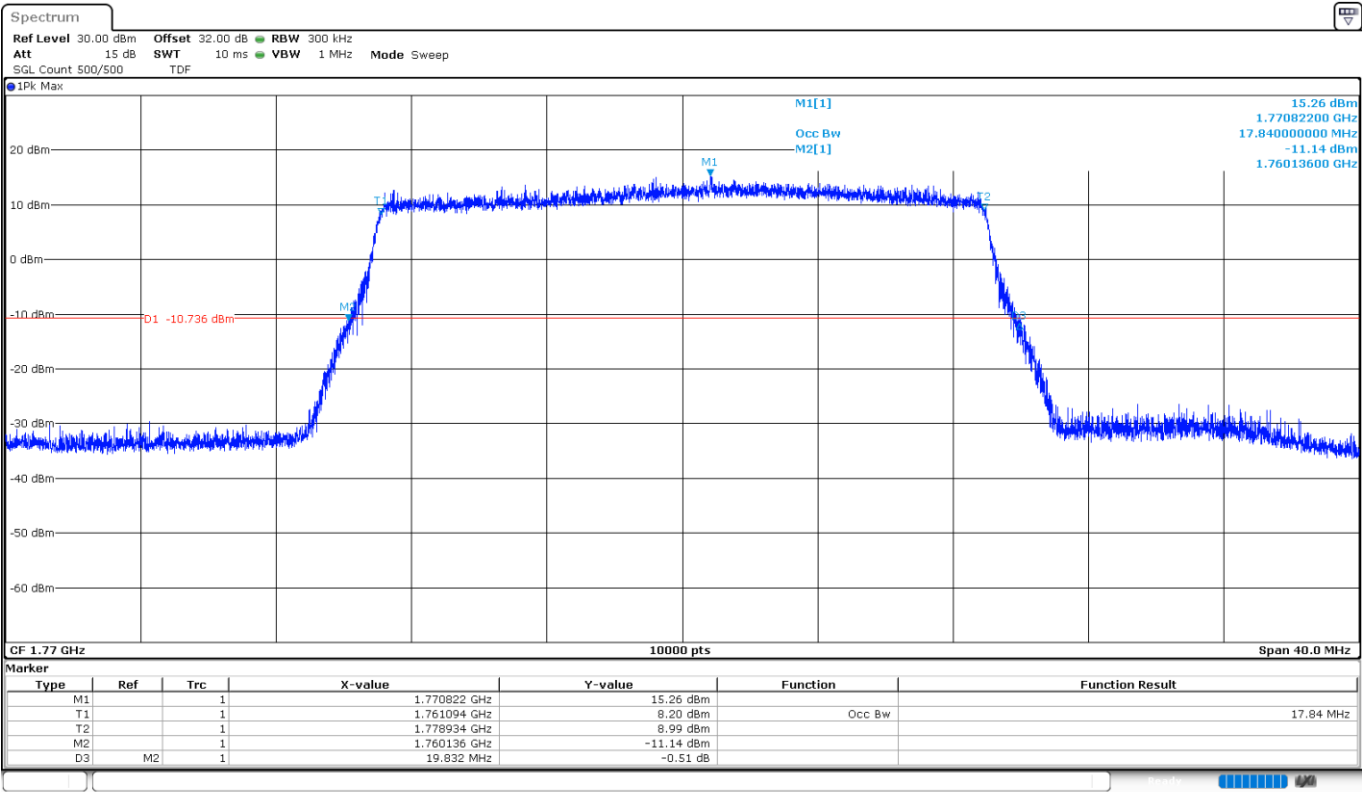
Low Channel:



Middle Channel:

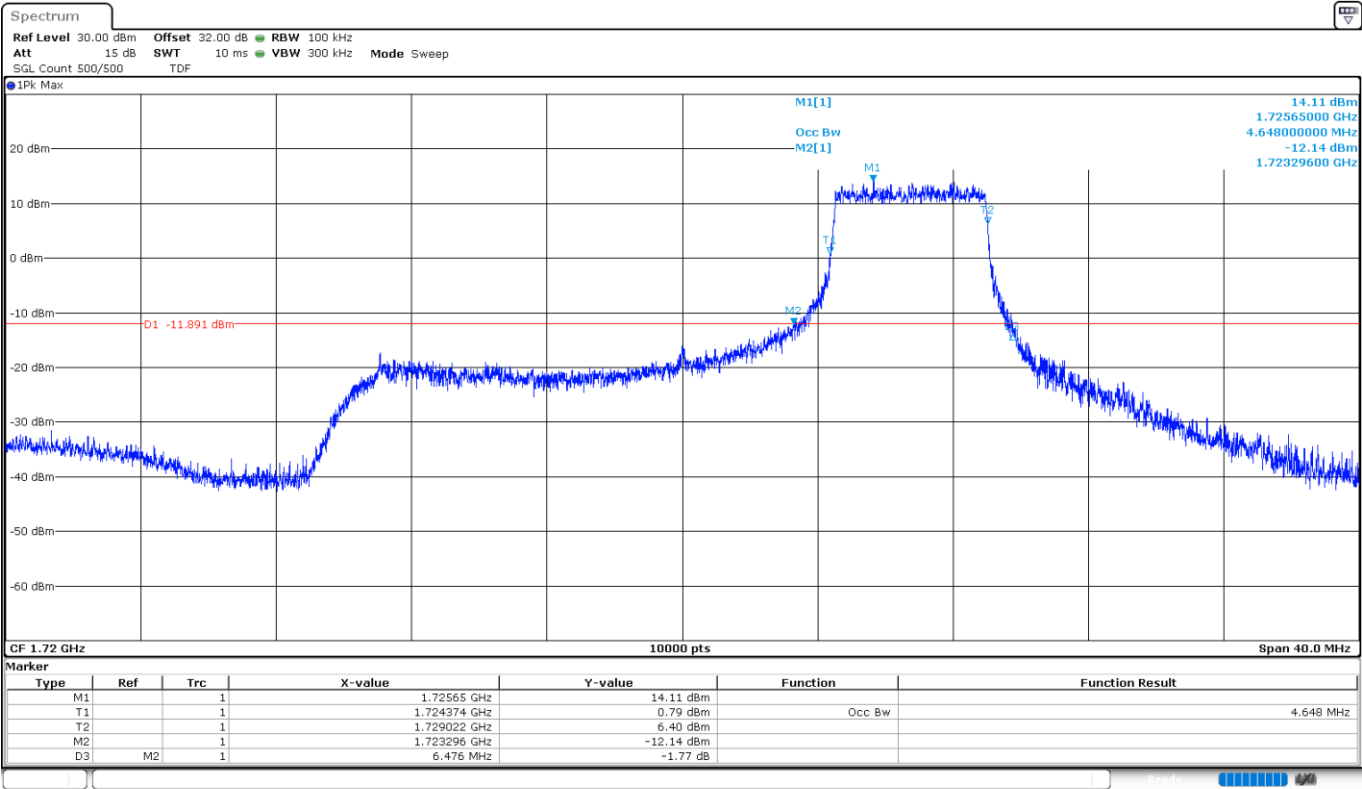


High Channel:

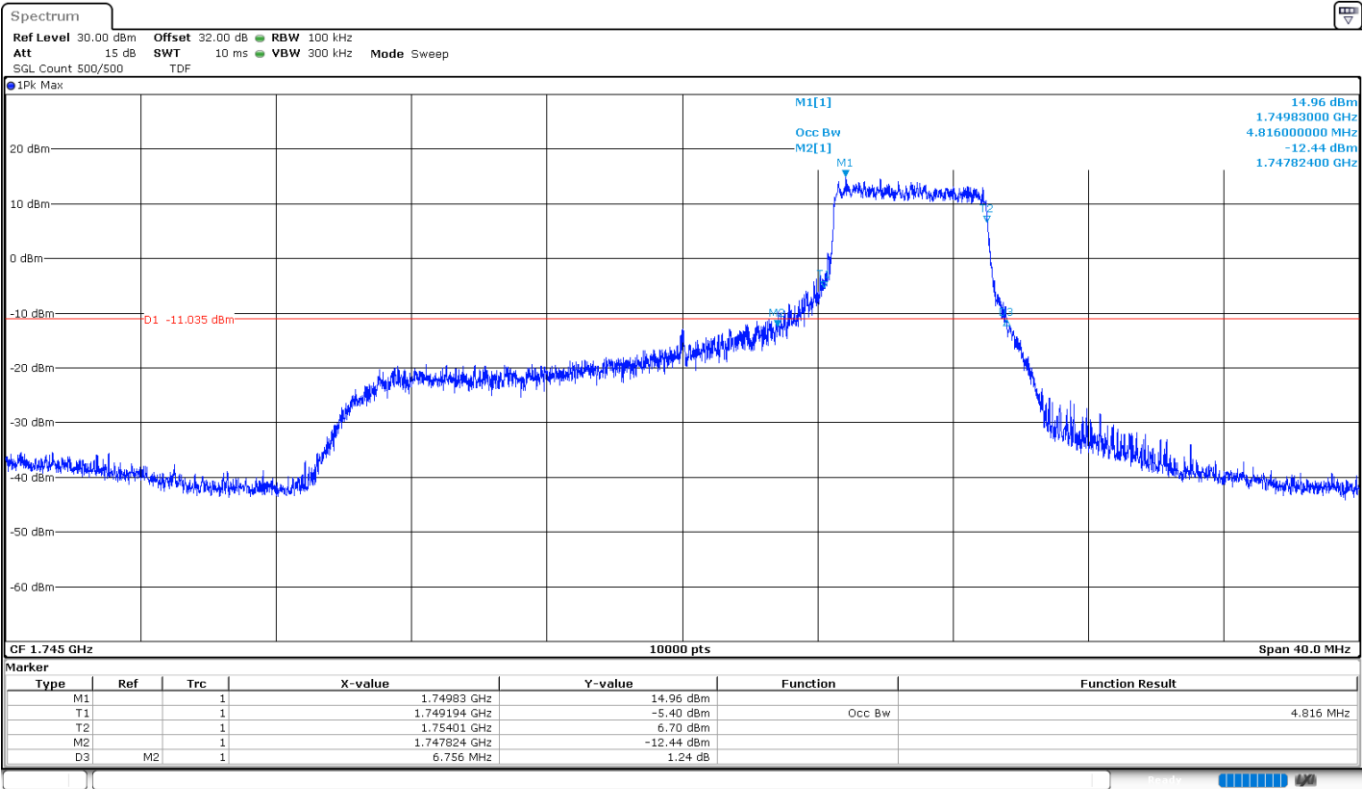


LTE Cat 1bis Band 66. BW=20 MHz. 16QAM. RB Size 5.

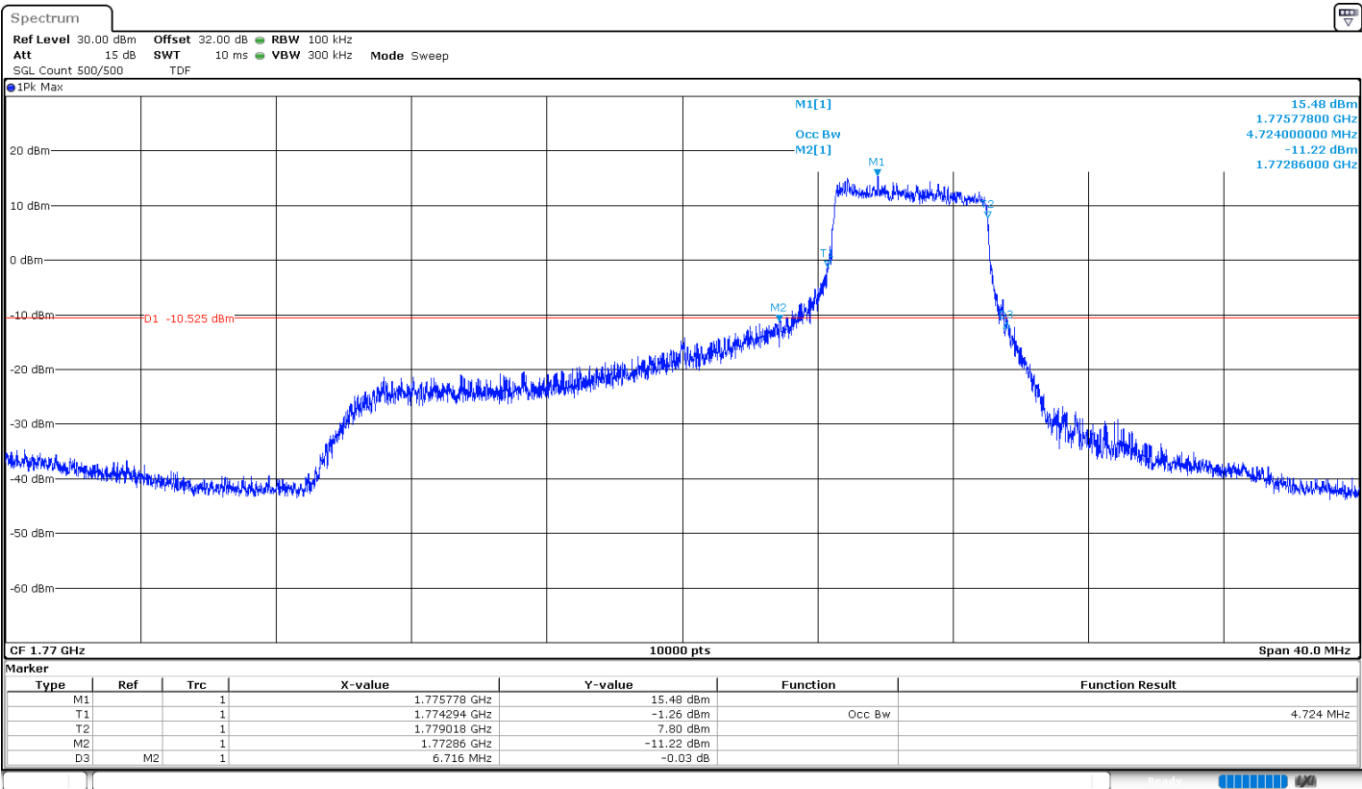
Low Channel:



Middle Channel:



High Channel:



Spurious Emissions at Antenna Terminals

Limits

1. LTE Cat 1bis Band 12, 17. FCC §27.53 (g) / RSS-130 Clause 4.7.

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. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

RSS-130 Clause 4.7:

4.7.1 General unwanted emissions limits

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 $43 + 10 \log_{10} p$ (watts), dB. However, in the 100 kHz band immediately outside of the equipment's frequency block range, a resolution bandwidth of 30 kHz may be employed.

2. LTE Cat 1bis Band 13. FCC §27.53 (c) / RSS-130 Clause 4.7.

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:

4.7.1 General unwanted emissions limits:

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 $43 + 10 \log_{10} p$ (watts), dB. However, in the 100 kHz band immediately outside of the equipment's frequency block range, a resolution bandwidth of 30 kHz may be employed.

4.7.2 Additional unwanted emissions limits:

In addition to the limit outlined in section 4.7.1 above, equipment operating in the frequency bands 746-756 MHz and 777-787 MHz shall also comply with the following restrictions:

a. 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:

- i. $76 + 10 \log_{10} p$ (watts), dB, for base and fixed equipment and
- ii. $65 + 10 \log_{10} p$ (watts), dB, for mobile and portable equipment

b. the e.i.r.p. in the band 1559-1610 MHz shall not exceed -70 dBW/MHz for wideband signal and -80 dBW for discrete emission with bandwidth less than 700 Hz.

3. LTE Cat 1bis Band 4, 66. FCC §27.53 (h) / RSS-139 5.6.

FCC §27.53 (h) / RSS-139 5.6:

Unwanted emissions shall be measured in terms of average values.

For all equipment, the TRP or total conducted power (sum of conducted power across all antenna connectors) of the unwanted emissions outside the frequency block or frequency block group shall not exceed the limits shown in table 6.

Table 6: Unwanted emission limits	
Offset from the edge of the frequency block or frequency block group	Unwanted emission limits
1 MHz	-13 dBm/(1% of OB*)
>1 MHz	-13 dBm/MHz

*OB is the occupied bandwidth.

In addition to complying with the above limits, equipment operating in the band 2180-2200 MHz may require additional filtering (see SRSP-519).

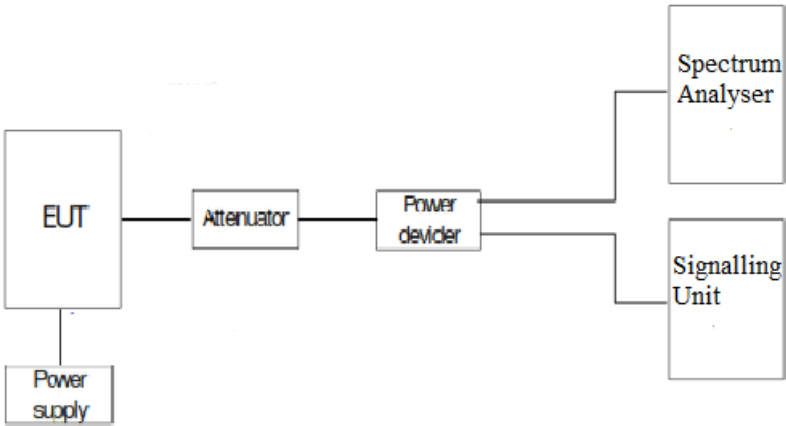
Method

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 divider.

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.

The configuration of Resource Blocks and modulation which is the worst case for conducted power was used.

Test Setup



Results

<u>LTE Cat 1bis Band 12:</u>	BW=5 MHz. QPSK. RB Size 1. RB Offset 12.
- Low Channel:	No spurious frequencies at less than 20 dB below the limit.
- Middle Channel:	No spurious frequencies at less than 20 dB below the limit.
- High Channel:	No spurious frequencies at less than 20 dB below the limit.

<u>LTE Cat 1bis Band 13:</u>	BW=5 MHz. QPSK. RB Size 1. RB Offset 2.
- Low Channel:	No spurious frequencies at less than 20 dB below the limit.
- High Channel:	No spurious frequencies at less than 20 dB below the limit.

<u>LTE Cat 1bis Band 66:</u>	BW=15 MHz. QPSK. RB Size 1. RB Offset 37.
- Low Channel:	No spurious frequencies at less than 20 dB below the limit.
- Middle Channel:	No spurious frequencies at less than 20 dB below the limit.
- High Channel:	No spurious frequencies at less than 20 dB below the limit.

Measurement uncertainty (dB): $\leq \pm 2.76$

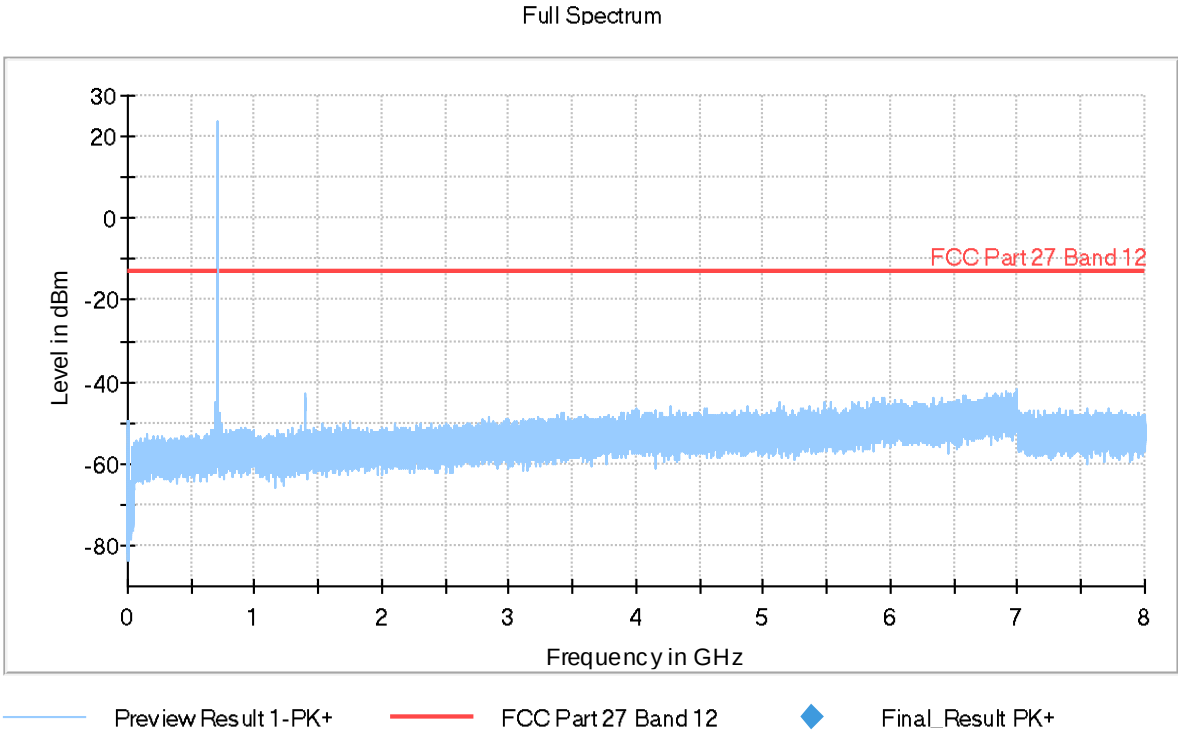
Verdict

PASS

Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamp
9 kHz - 150 kHz	14.1 Hz	PK+	300 Hz	Coupled	0 dB
150 kHz - 30 MHz	932.812 Hz	PK+	10 kHz	Coupled	0 dB
30 MHz - 1 GHz	30.312 kHz	PK+	100 kHz	Coupled	0 dB
1 GHz - 2 GHz	31.25 kHz	PK+	100 kHz	Coupled	0 dB
2 GHz - 3 GHz	31.25 kHz	PK+	100 kHz	Coupled	0 dB
3 GHz - 4 GHz	31.25 kHz	PK+	100 kHz	Coupled	0 dB
4 GHz - 5 GHz	31.25 kHz	PK+	100 kHz	Coupled	0 dB
5 GHz - 6 GHz	31.25 kHz	PK+	100 kHz	Coupled	0 dB
6 GHz - 7 GHz	31.25 kHz	PK+	100 kHz	Coupled	0 dB
7 GHz - 8 GHz	31.25 kHz	PK+	100 kHz	Coupled	0 dB
8 GHz - 9 GHz	31.25 kHz	PK+	100 kHz	Coupled	0 dB
9 GHz - 10 GHz	31.25 kHz	PK+	100 kHz	Coupled	0 dB

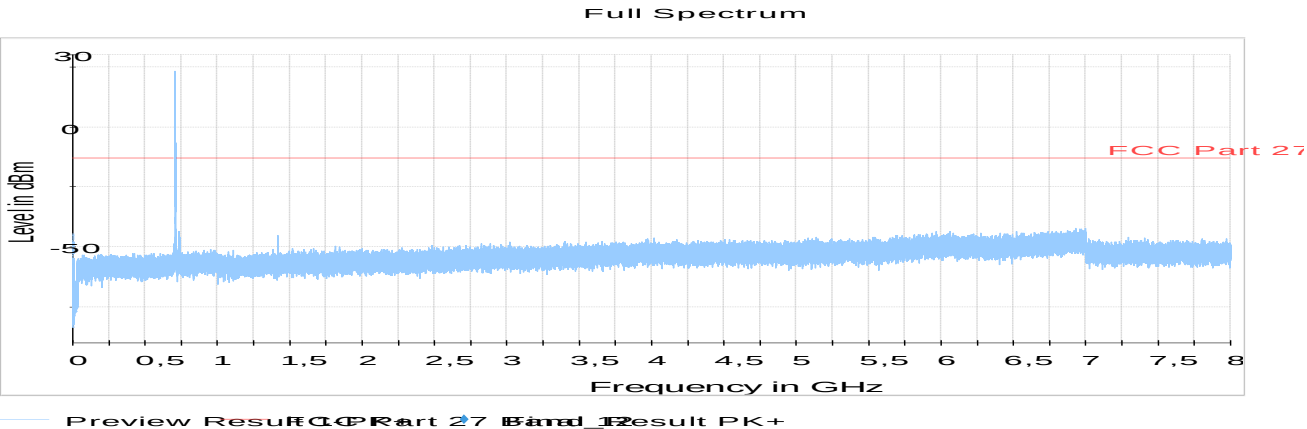
LTE Cat 1bis Band 12:

Low Channel:



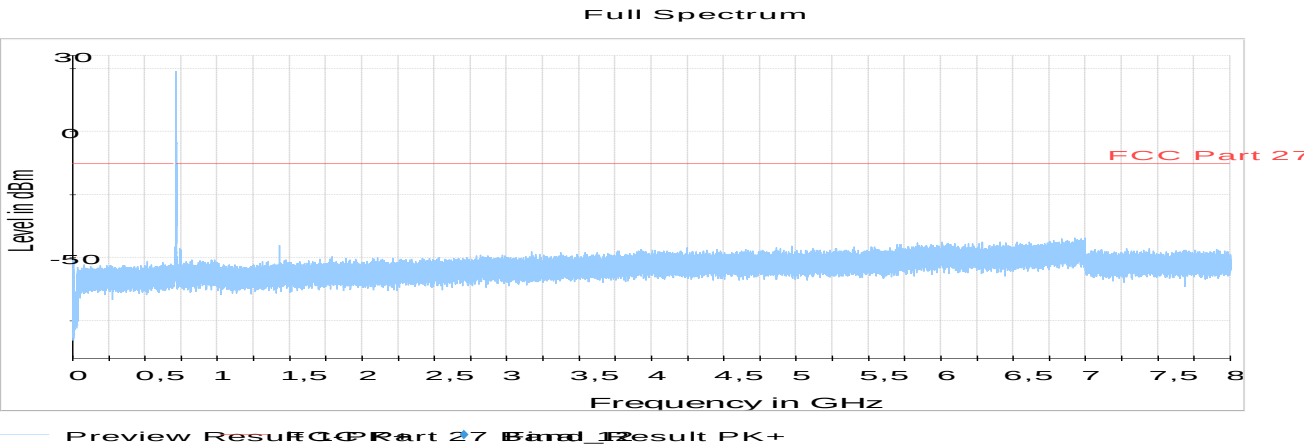
The peak above the limit is the carrier frequency.
The highest peak next to the carrier is the Downlink frequency.

Middle Channel:



The peak above the limit is the carrier frequency.
The highest peak next to the carrier is the Downlink frequency.

High Channel:



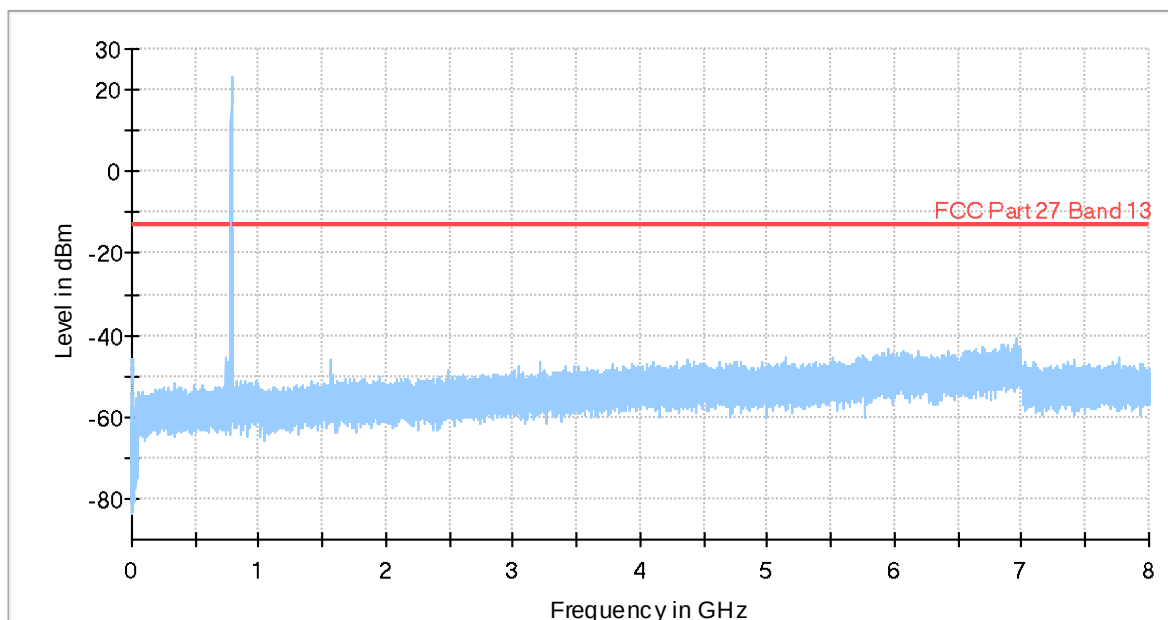
The peak above the limit is the carrier frequency.
The highest peak next to the carrier is the Downlink frequency.

LTE Cat 1bis Band 13:

Low Channel:

- Frequency range 9 kHz – 8 GHz:

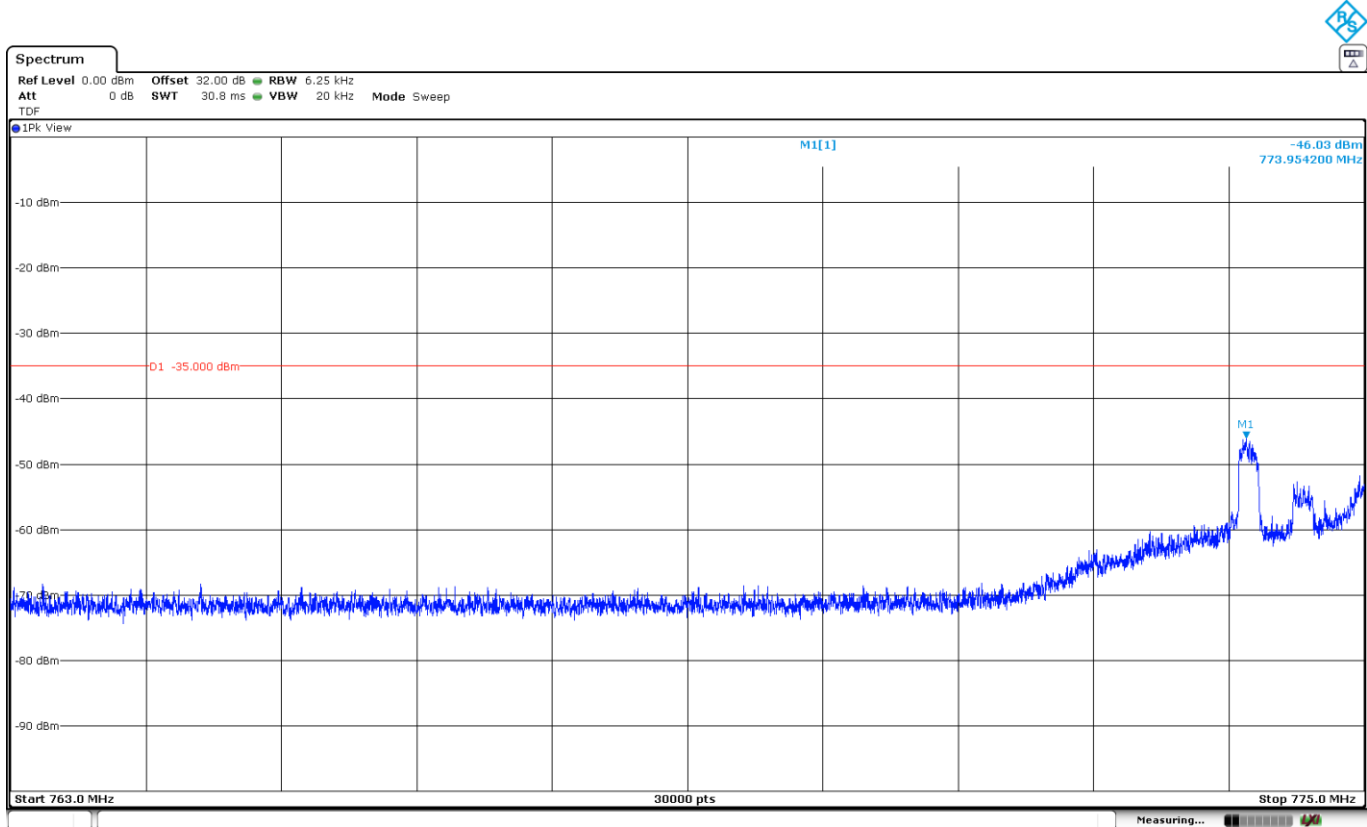
Full Spectrum



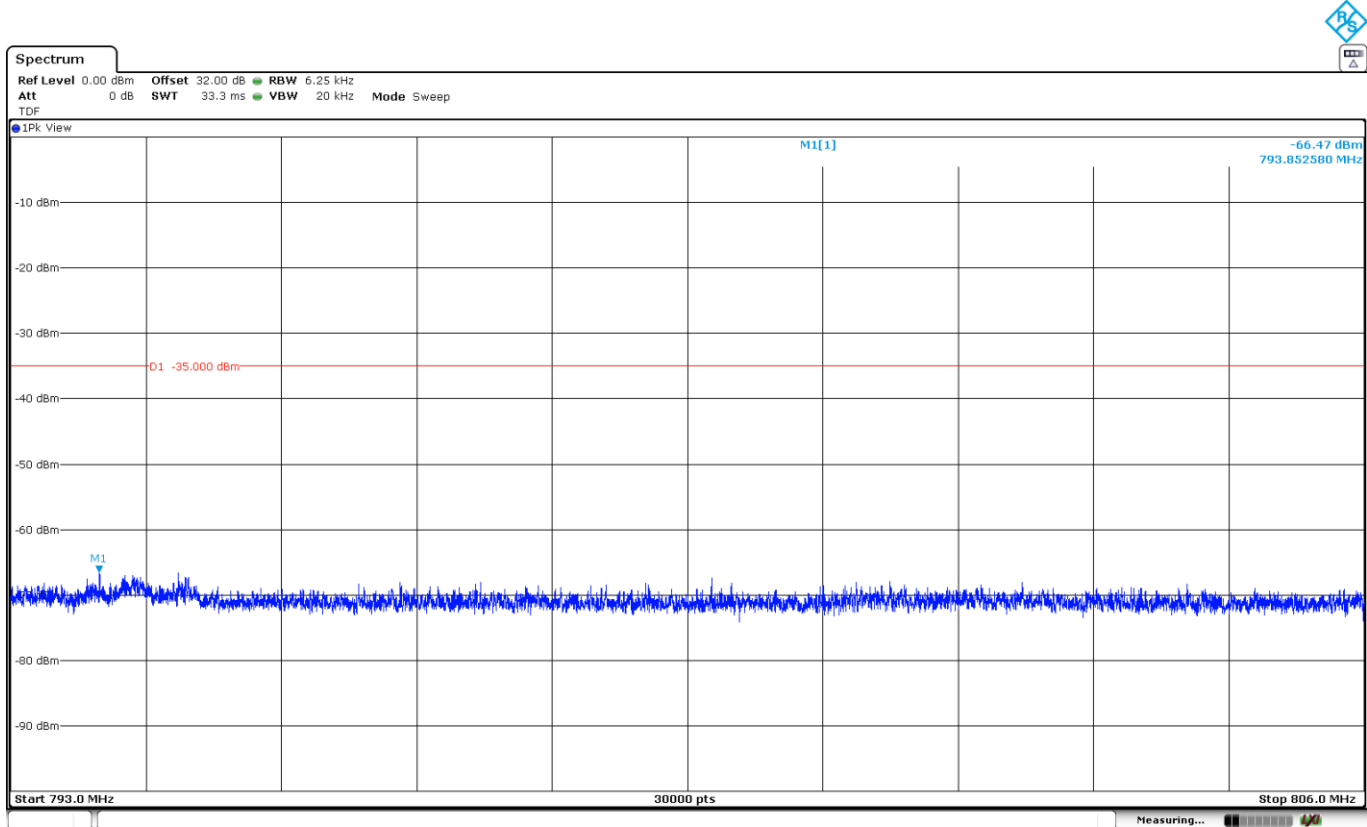
Preview Result 1-PK+ FCC Part 27 Band 13 Final Result PK+

The peak above the limit is the carrier frequency.
 The highest peak next to the carrier is the Downlink frequency.

- Frequency range 763 MHz – 775 MHz:



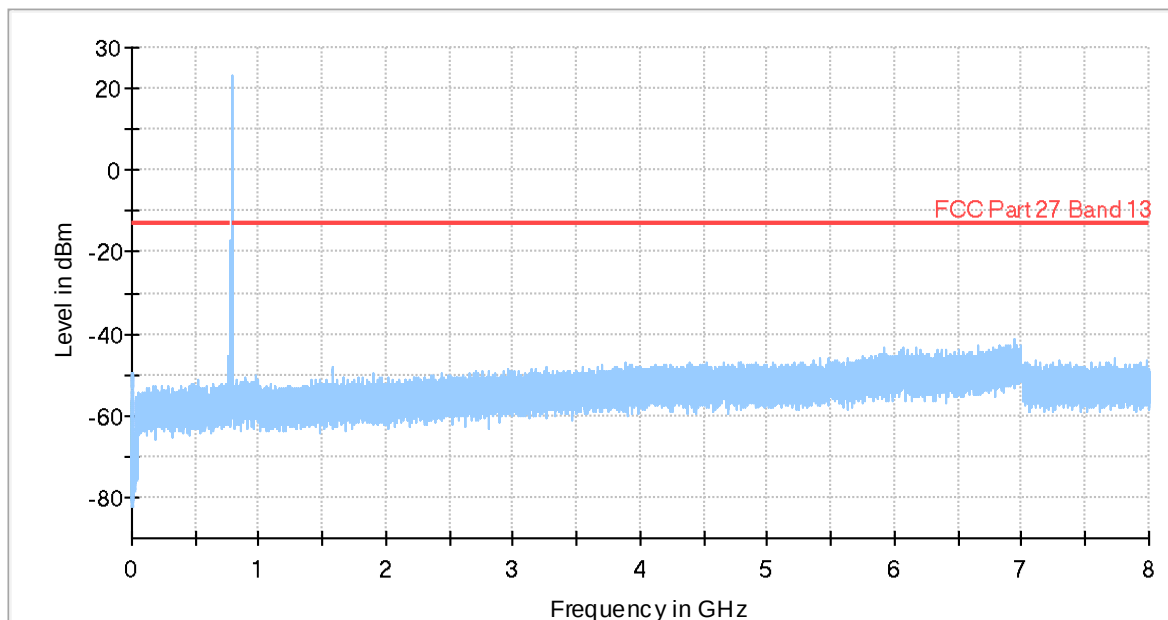
- Frequency range 793 MHz – 806 MHz:



High Channel:

- Frequency range 9 kHz – 8 GHz:

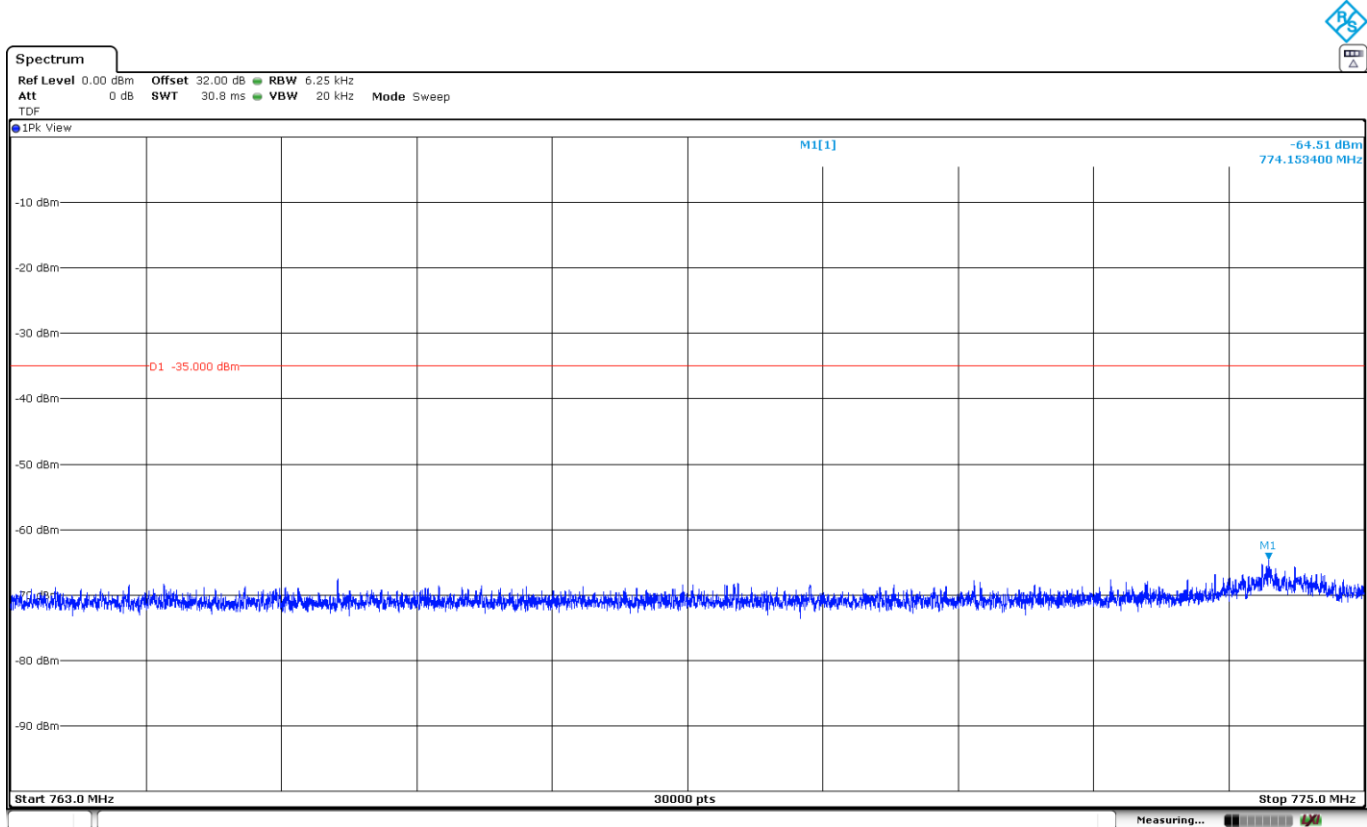
Full Spectrum



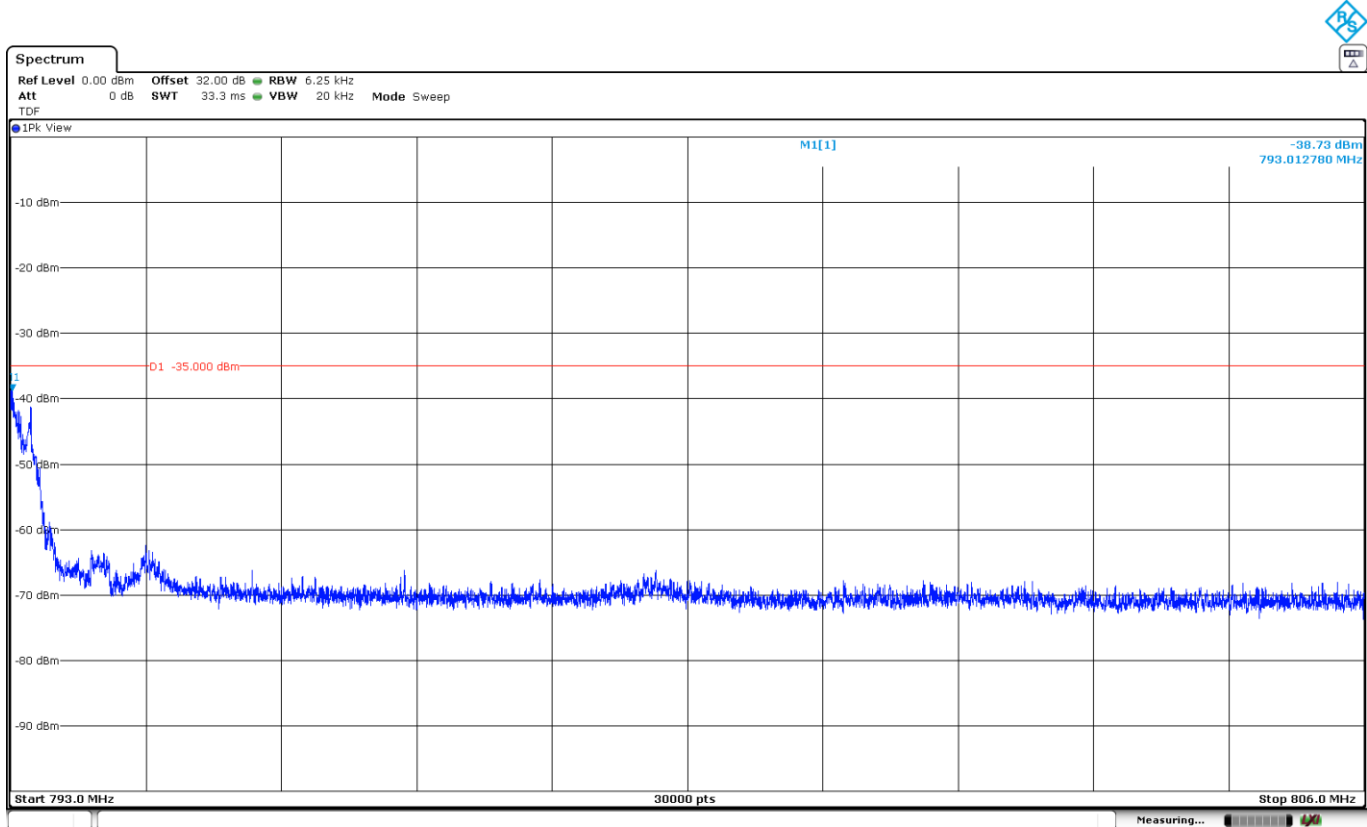
Preview Result 1-PK+ FCC Part 27 Band 13 Final Result PK+

The peak above the limit is the carrier frequency.
 The highest peak next to the carrier is the Downlink frequency.

- Frequency range 763 MHz – 775 MHz:



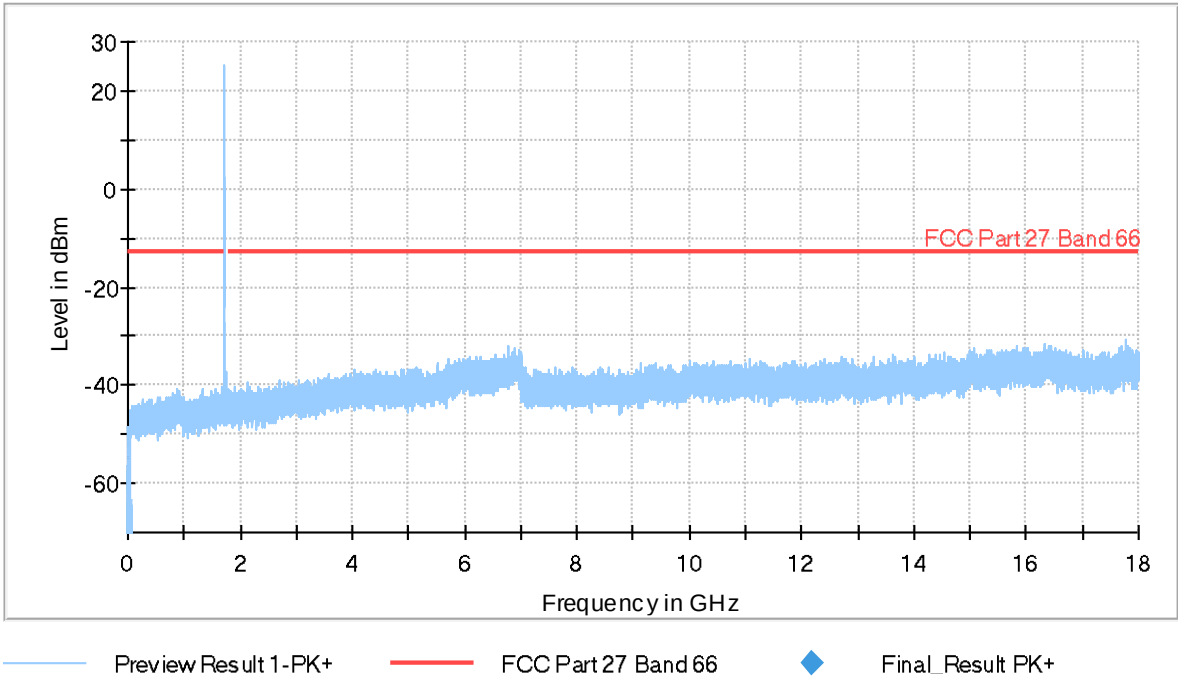
- Frequency range 793 MHz – 806 MHz:



LTE Cat 1bis Band 66:

Low Channel:

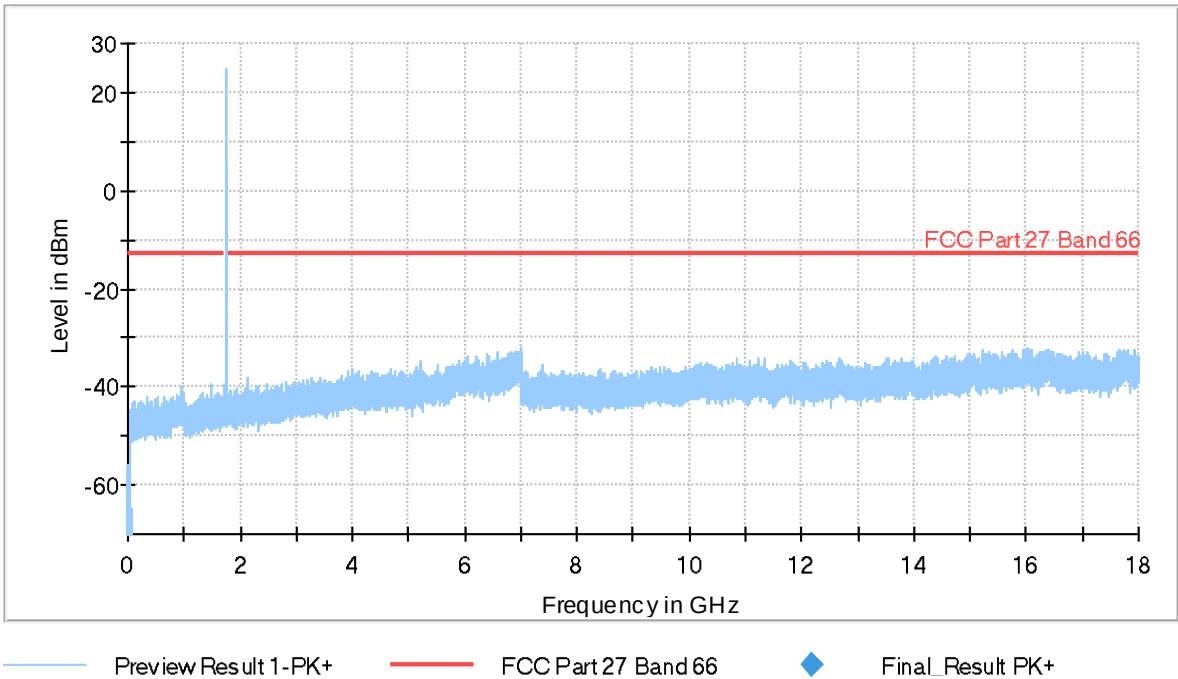
Full Spectrum



The peak above the limit is the carrier frequency.
The highest peak next to the carrier is the Downlink frequency.

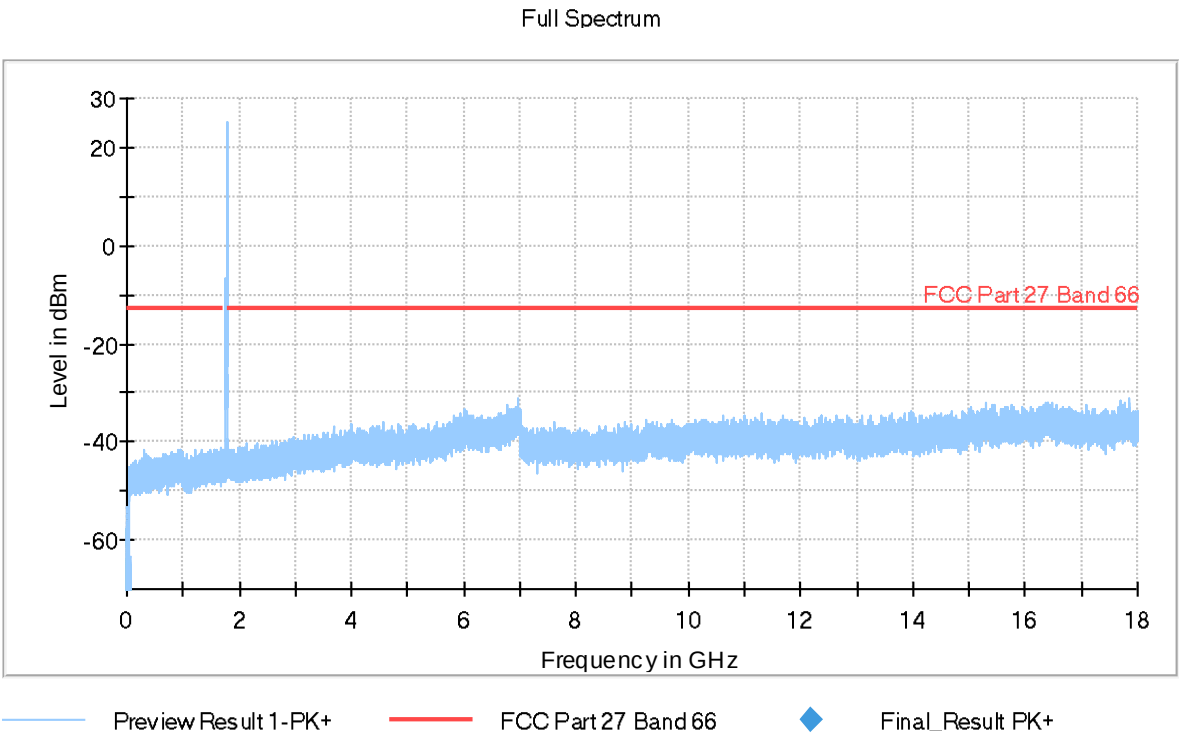
Middle Channel:

Full Spectrum



The peak above the limit is the carrier frequency.
The highest peak next to the carrier is the Downlink frequency.

High Channel:



The peak above the limit is the carrier frequency.
The highest peak next to the carrier is the Downlink frequency.

Spurious Emissions at Antenna Terminals at Block Edges

Limits

1. LTE Cat 1bis Band 12, 17. FCC §27.53 (g) / RSS-130 Clause 4.7.

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. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

RSS-130 Clause 4.7:

4.7.1 General unwanted emissions limits

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 $43 + 10 \log_{10} p$ (watts), dB. However, in the 100 kHz band immediately outside of the equipment's frequency block range, a resolution bandwidth of 30 kHz may be employed.

2. LTE Cat 1bis Band 13. FCC §27.53 (c) / RSS-130 Clause 4.7.

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:

4.7.1 General unwanted emissions limits:

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 $43 + 10 \log_{10} p$ (watts), dB. However, in the 100 kHz band immediately outside of the equipment's frequency block range, a resolution bandwidth of 30 kHz may be employed.

4.7.2 Additional unwanted emissions limits:

In addition to the limit outlined in section 4.7.1 above, equipment operating in the frequency bands 746-756 MHz and 777-787 MHz shall also comply with the following restrictions:

a. 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:

- i. $76 + 10 \log_{10} p$ (watts), dB, for base and fixed equipment and
- ii. $65 + 10 \log_{10} p$ (watts), dB, for mobile and portable equipment

b. the e.i.r.p. in the band 1559-1610 MHz shall not exceed -70 dBW/MHz for wideband signal and -80 dBW for discrete emission with bandwidth less than 700 Hz.

3. LTE Cat 1bis Band 4, 66. FCC §27.53 (h) / RSS-139 5.6.

FCC §27.53 (h) / RSS-139 5.6:

Unwanted emissions shall be measured in terms of average values.

For all equipment, the TRP or total conducted power (sum of conducted power across all antenna connectors) of the unwanted emissions outside the frequency block or frequency block group shall not exceed the limits shown in table 6.

Table 6: Unwanted emission limits	
Offset from the edge of the frequency block or frequency block group	Unwanted emission limits
1 MHz	-13 dBm/(1% of OB*)
>1 MHz	-13 dBm/MHz

*OB is the occupied bandwidth.

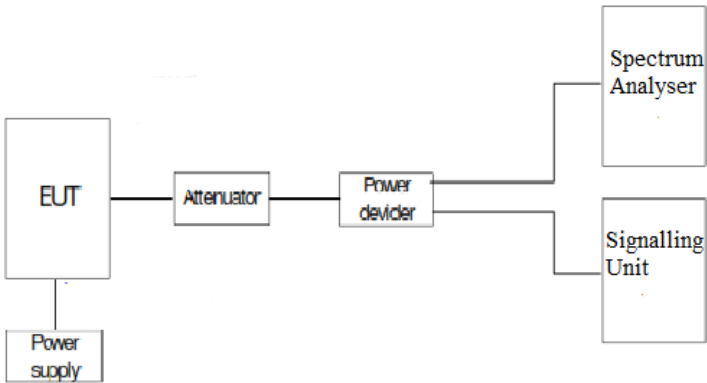
In addition to complying with the above limits, equipment operating in the band 2180-2200 MHz may require additional filtering (see SRSP-519).

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 1bis Band 4:

Preliminary measurements determined QPSK. BW=5 MHz as the worst-case modulation in terms of band edge results. The next results are for this worst-case configuration.

Low Block Edge.

Note: Low Block Edge for LTE Cat 1bis Band 4 is the same as for LTE Cat 1bis Band 66.

High Block Edge.

LTE Cat 1bis Band 4. QPSK:	RB=1. Offset=Max. BW = 1.4 MHz	RB=1. Offset=Max. BW = 3 MHz	RB=1. Offset=Max. BW = 5 MHz	RB=1. Offset=Max. BW = 10 MHz	RB=1. Offset=Max. BW = 15 MHz	RB=1. Offset=Max. BW = 20 MHz
Maximum measured level at <u>High Block Edge</u> at antenna port (dBm)			-21.54	-24.77	-29.55	-33.72

LTE Cat 1bis Band 4. QPSK:	RB=ALL. Offset=0. BW = 1.4 MHz	RB=All. Offset=0. BW = 3 MHz	RB = All. Offset = 0. BW = 5 MHz	RB = All. Offset = 0. BW = 10 MHz	RB = All. Offset = 0. BW = 15 MHz	RB = All. Offset = 0. BW = 20 MHz
Maximum measured level at <u>High Block Edge</u> at antenna port (dBm)			-25.47	-25.42	-31.28	-34.04

Measurement uncertainty: $\leq \pm 2.76$ dB

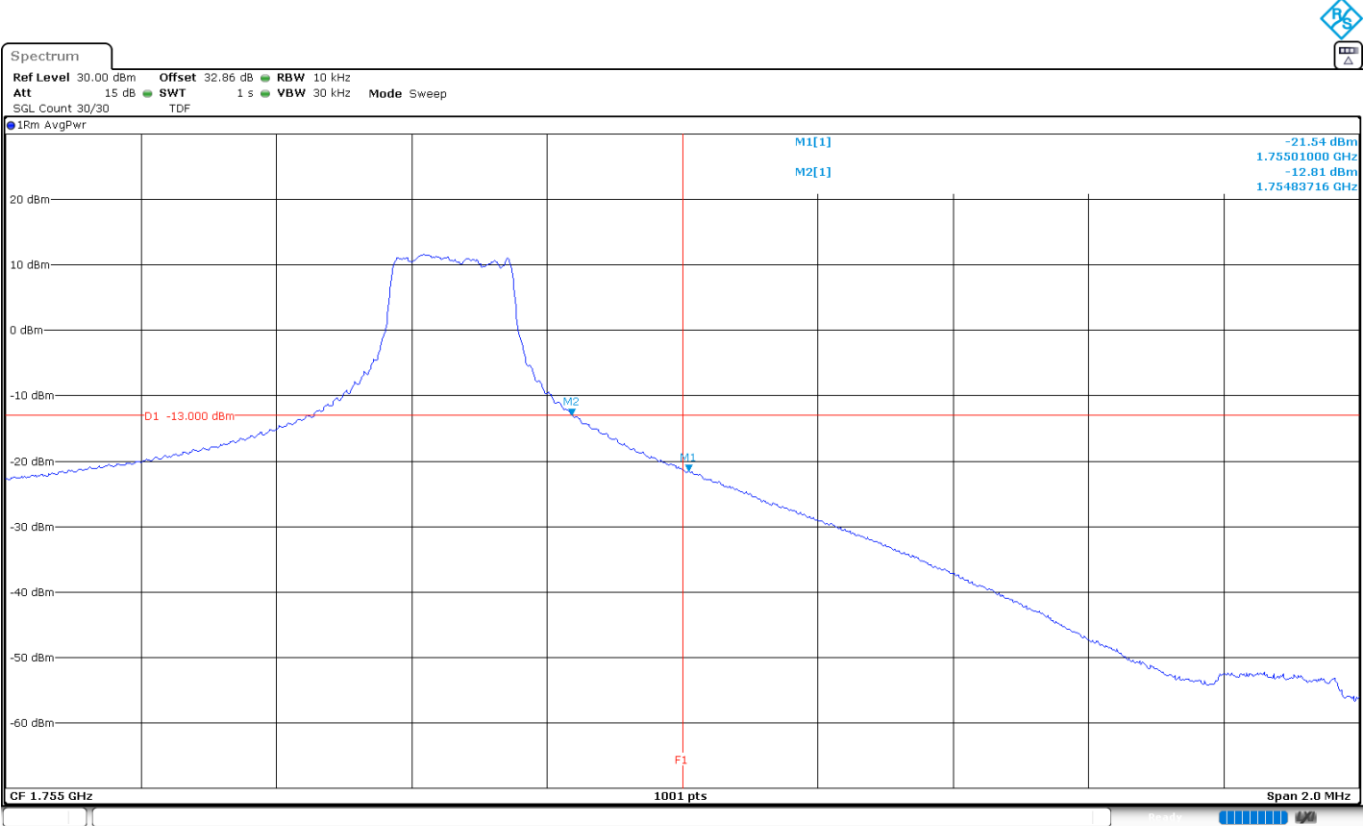
Verdict

PASS

The plots below are for the worst case configuration specified before.

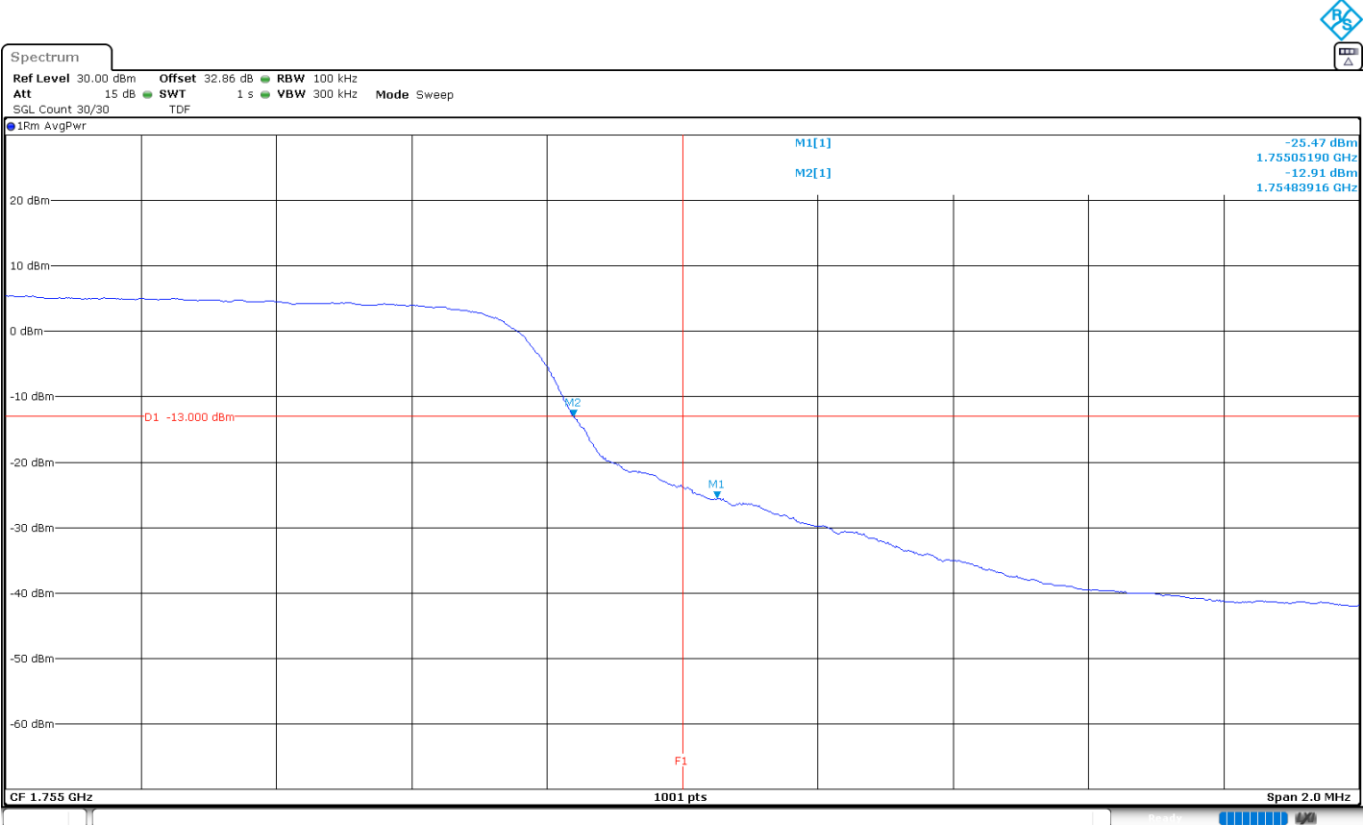
LTE Cat 1bis Band 4:

LTE Cat 1bis Band 4. BW=5 MHz. QPSK. RB=1. Offset=Max. High Block Edge:



The equipment transmits at the maximum output power

LTE Cat 1bis Band 4. BW=5 MHz. QPSK. RB=All. Offset=0. High Block Edge:



The equipment transmits at the maximum output power

LTE Cat 1bis Band 12:

Preliminary measurements determined QPSK. BW=5 MHz as the worst-case modulation in terms of band edge results. The next results are for this worst-case configuration.

Low Block Edge.

LTE Cat 1bis Band 12. QPSK:	RB=1. Offset = 0. BW = 1.4 MHz	RB=1. Offset = 0. BW = 3 MHz	RB=1. Offset = 0. BW = 5 MHz	RB=1. Offset = 0. BW = 10 MHz
Maximum measured level at <u>Low Block Edge</u> at antenna port (dBm)			-37.39	-33.03

LTE Cat 1bis Band 12. QPSK:	RB = All. Offset = 0. BW = 1.4 MHz	RB = All. Offset = 0. BW = 3 MHz	RB = All. Offset = 0. BW = 5 MHz	RB = All. Offset = 0. BW = 10 MHz
Maximum measured level at <u>Low Block Edge</u> at antenna port (dBm)			-36.7	-36.93

High Block Edge.

LTE Cat 1bis Band 12. QPSK:	RB=1. Offset=Max. BW = 1.4 MHz	RB=1. Offset=Max. BW = 3 MHz	RB=1. Offset=Max. BW = 5 MHz	RB=1. Offset=Max. BW = 10 MHz
Maximum measured level at <u>High Block Edge</u> at antenna port (dBm)			-15.8	-16.78

LTE Cat 1bis Band 12. QPSK:	RB = All. Offset = 0. BW = 1.4 MHz	RB = All. Offset = 0. BW = 3 MHz	RB = All. Offset = 0. BW = 5 MHz	RB = All. Offset = 0. BW = 10 MHz
Maximum measured level at <u>High Block Edge</u> at antenna port (dBm)			-27.44	-28.94

Measurement uncertainty: <±2.76 dB

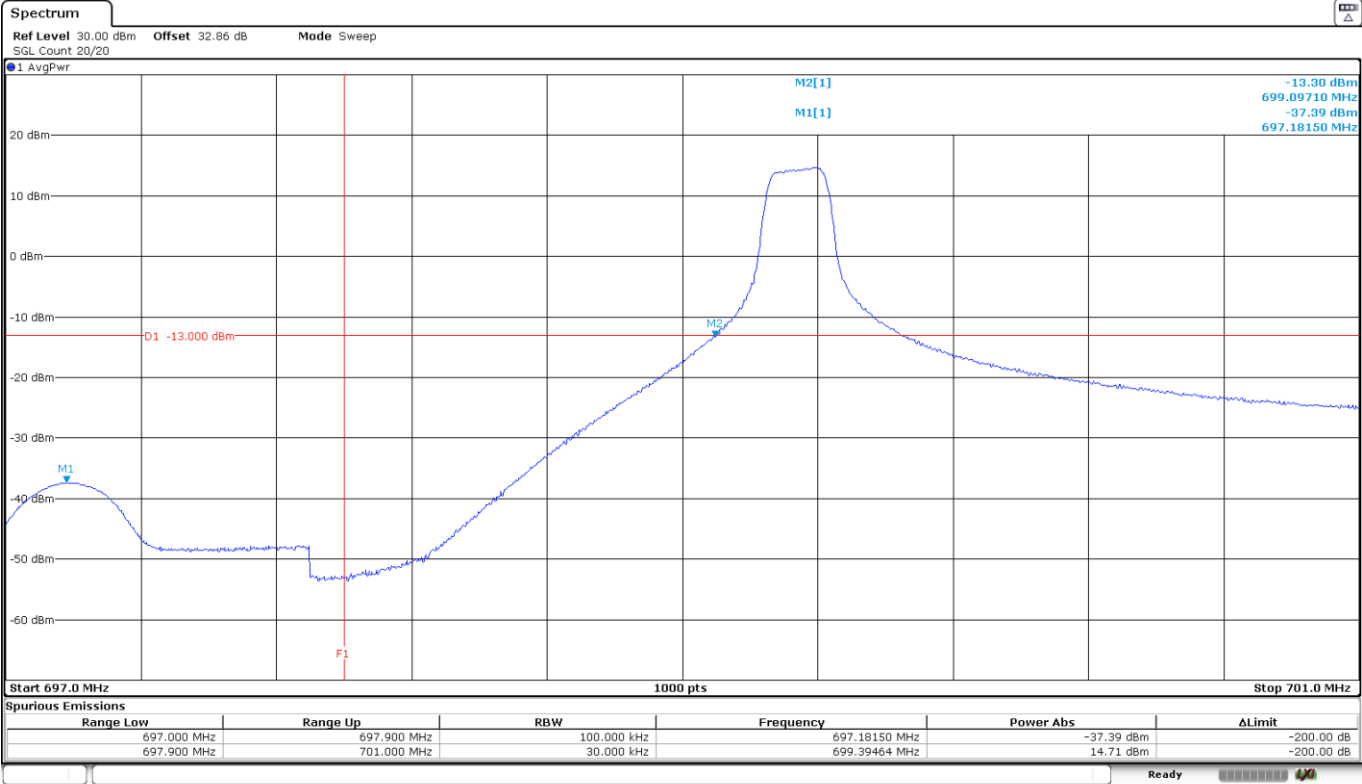
Verdict

PASS

The plots below are for the worst case configuration specified before.

LTE Cat 1bis Band 12:

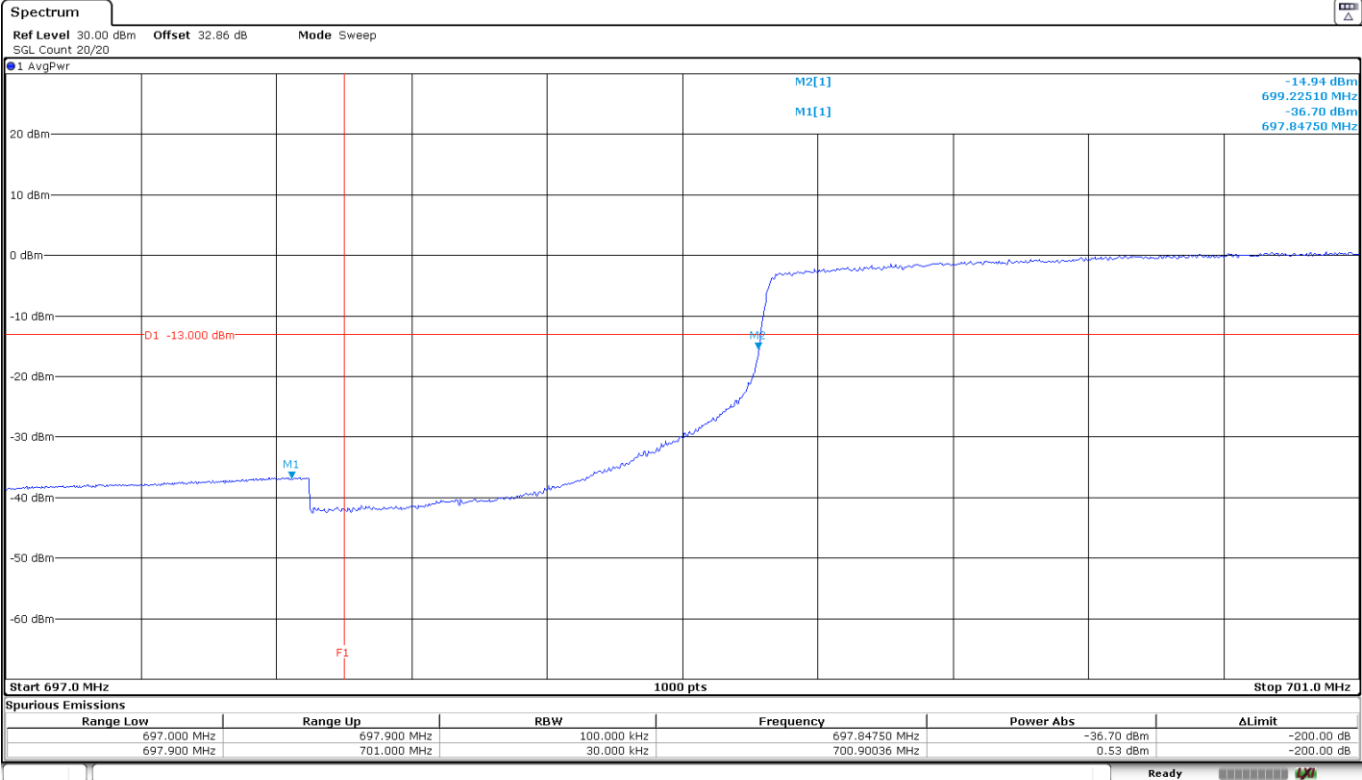
LTE Cat 1bis Band 12. BW=5 MHz. QPSK. RB=1. Offset=0. Low Block Edge:



Date: 17.DEC.2025 08:07:11

The equipment transmits at the maximum output power

LTE Cat 1bis Band 12. BW=5 MHz. QPSK. RB=All. Offset=0. Low Block Edge:



Date: 17.DEC.2025 08:09:01

The equipment transmits at the maximum output power

Spectrum
 Ref Level 30.00 dBm Offset 32.86 dB Mode Sweep
 SGL Count 20/20

1 AvgPwr

M2[1] -13.04 dBm
 M1[1] -15.80 dBm
 716.10320 MHz

O1 -13.000 dBm

F1

1000 pts

Start 714.0 MHz Stop 718.0 MHz

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
714.000 MHz	716.100 MHz	30.000 kHz	715.64550 MHz	14.86 dBm	-200.00 dB
716.100 MHz	718.000 MHz	100.000 kHz	716.10317 MHz	-15.80 dBm	-200.00 dB

Date: 17-DEC-2025 09:40:21

Spectrum
 Ref Level 30.00 dBm Offset 32.86 dB Mode Sweep
 SGL Count 20/20

1 AvgPwr

M2[1] -15.53 dBm
 M1[1] -27.44 dBm
 716.10320 MHz

O1 -13.000 dBm

F1

Start 714.0 MHz Stop 718.0 MHz
 1000 pts

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
714.000 MHz	716.100 MHz	30.000 kHz	714.01050 MHz	0.69 dBm	-200.00 dB
716.100 MHz	718.000 MHz	100.000 kHz	716.10317 MHz	-27.44 dBm	-200.00 dB

Date: 17.DEC.2025 09:38:52

2026-03-10

LTE Cat 1bis Band 13:

Preliminary measurements determined QPSK. BW=5 MHz as the worst-case modulation in terms of band edge results. The next results are for this worst-case configuration.

Low Block Edge.

LTE Cat 1bis Band 13. QPSK:	RB=1. Offset = 0. BW = 5 MHz	RB=1. Offset = 0. BW = 10 MHz
Maximum measured level at <u>Low Block Edge</u> at antenna port (dBm)	-15.69	-17.72

LTE Cat 1bis Band 13. QPSK:	RB = All. Offset = 0. BW = 5 MHz	RB = All. Offset = 0. BW = 10 MHz
Maximum measured level at <u>Low Block Edge</u> at antenna port (dBm)	-25.98	-28.14

High Block Edge.

LTE Cat 1bis Band 13. QPSK:	RB=1. Offset=Max. BW = 5 MHz	RB=1. Offset=Max. BW = 10 MHz
Maximum measured level at <u>High Block Edge</u> at antenna port (dBm)	-15.78	-17.02

LTE Cat 1bis Band 13. QPSK:	RB = All. Offset = 0. BW = 5 MHz	RB = All. Offset = 0. BW = 10 MHz
Maximum measured level at <u>High Block Edge</u> at antenna port (dBm)	-25.97	-26.61

Measurement uncertainty: <±2.76 dB

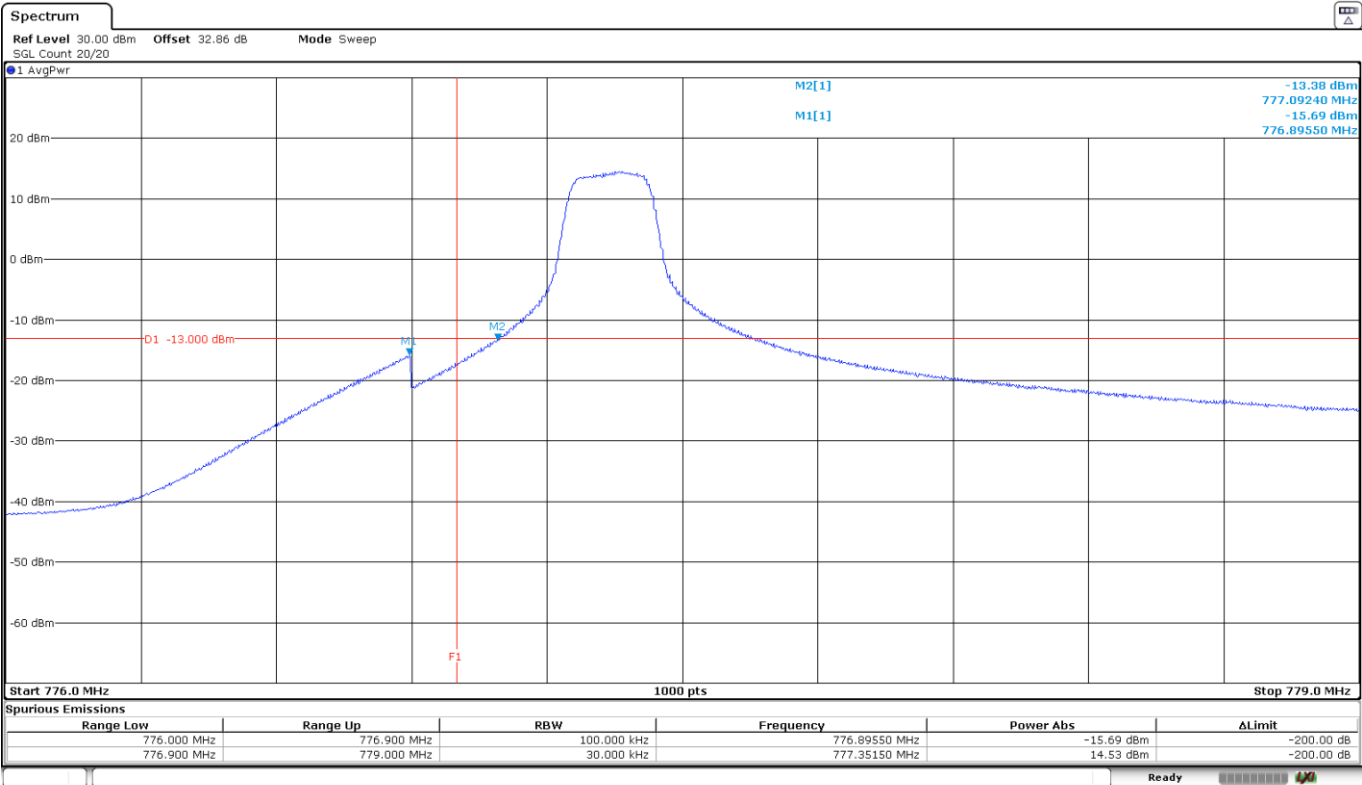
Verdict

PASS

The plots below are for the worst case configuration specified before.

LTE Cat 1bis Band 13:

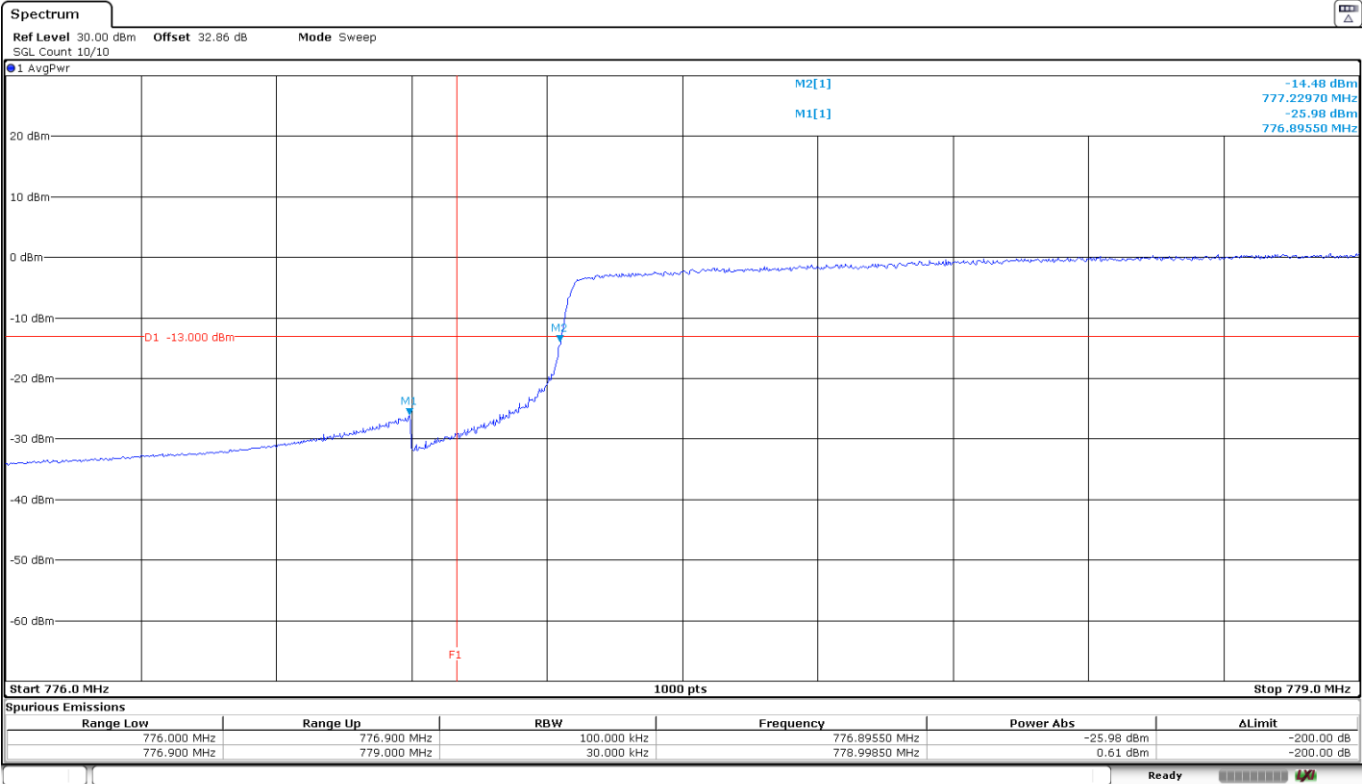
LTE Cat 1bis Band 13. BW=5 MHz. QPSK. RB=1. Offset=0. Low Block Edge:



Date: 17.DEC.2025 09:57:06

The equipment transmits at the maximum output power

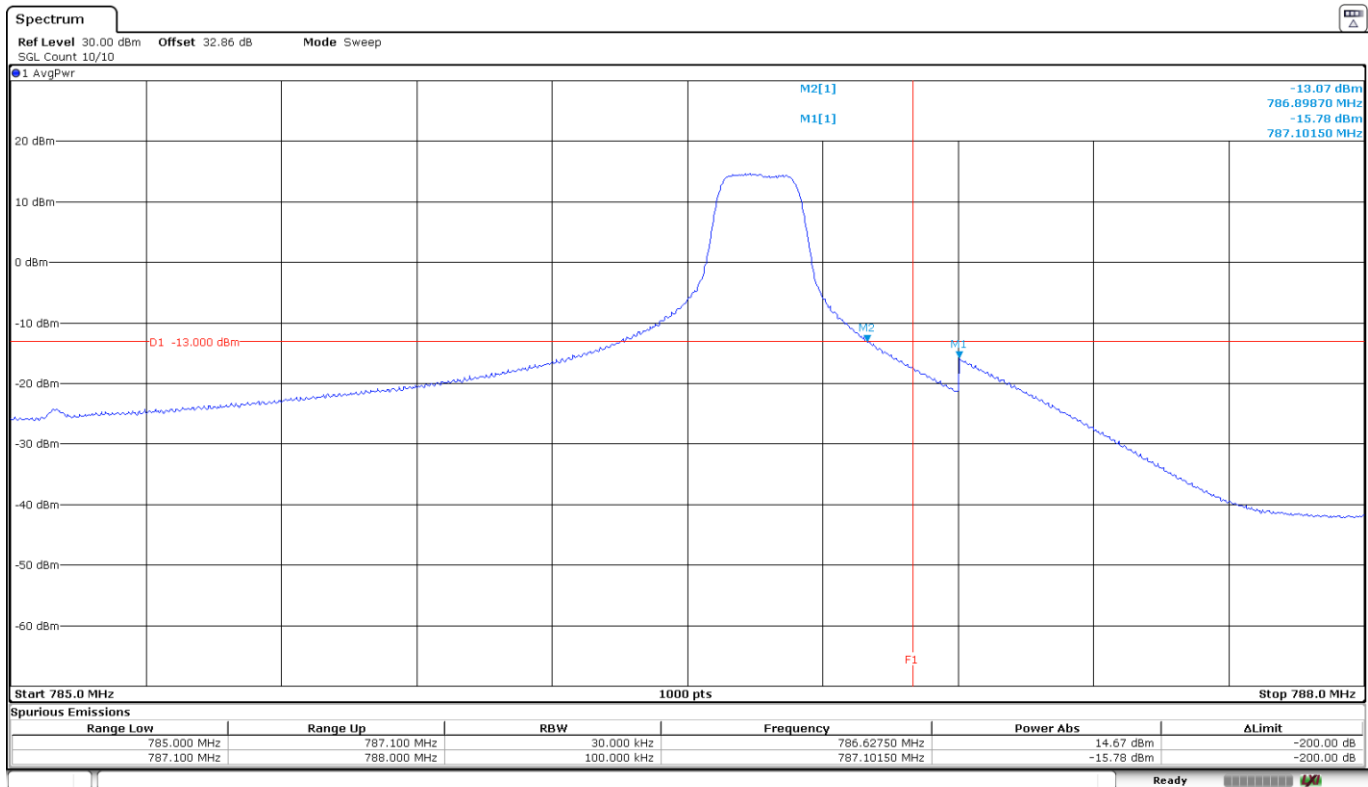
LTE Cat 1bis Band 13. BW=5 MHz. QPSK. RB=All. Offset=0. Low Block Edge:



Date: 17.DEC.2025 09:55:04

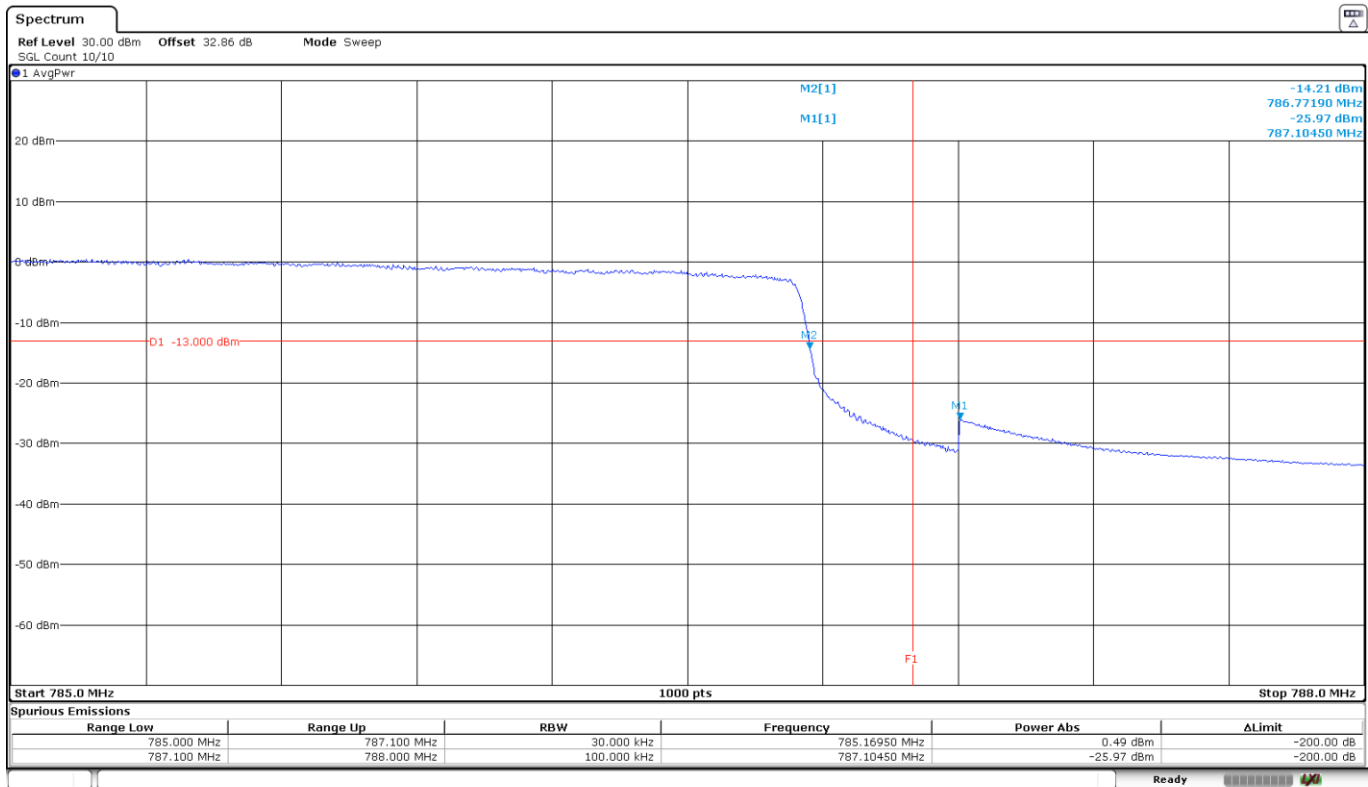
The equipment transmits at the maximum output power

LTE Cat 1bis Band 13. BW=5 MHz. QPSK. RB=1. Offset=Max. High Block Edge:



The equipment transmits at the maximum output power

LTE Cat 1bis Band 13. BW=5 MHz. QPSK. RB=All. Offset=0. High Block Edge:



The equipment transmits at the maximum output power

LTE Cat 1bis Band 66:

Preliminary measurements determined QPSK. BW=5 MHz as the worst-case modulation in terms of band edge results. The next results are for this worst-case configuration.

Low Block Edge.

LTE Cat 1bis Band 66. QPSK:	RB=1. Offset = 0. BW = 1.4 MHz	RB=1. Offset = 0. BW = 3 MHz	RB=1. Offset = 0. BW = 5 MHz	RB=1. Offset = 0. BW = 10 MHz	RB=1. Offset = 0. BW = 15 MHz	RB=1. Offset = 0. BW = 20 MHz
Maximum measured level at <u>Low Block Edge</u> at antenna port (dBm)			-20.6	-24.1	-28.74	-32.69

LTE Cat 1bis Band 66. QPSK:	RB = 6. Offset = 0. BW = 1.4 MHz	RB = 6. Offset = 0. BW = 3 MHz	RB = 6. Offset = 0. BW = 5 MHz	RB = 6. Offset = 0. BW = 10 MHz	RB = 6. Offset = 0. BW = 15 MHz	RB = 6. Offset = 0. BW = 20 MHz
Maximum measured level at <u>Low Block Edge</u> at antenna port (dBm)			-23.42	-23.12	-27.07	-28.07

High Block Edge.

LTE Cat 1bis Band 66. QPSK:	RB=1. Offset=Max. BW = 1.4 MHz	RB=1. Offset=Max. BW = 3 MHz	RB=1. Offset=Max. BW = 5 MHz	RB=1. Offset=Max. BW = 10 MHz	RB=1. Offset=Max. BW = 15 MHz	RB=1. Offset=Max. BW = 20 MHz
Maximum measured level at <u>High Block Edge</u> at antenna port (dBm)			-20.82	-24.51	-29.58	-33.68

LTE Cat 1bis Band 66. QPSK:	RB = 6. Offset =0. BW = 1.4 MHz	RB = 6. Offset =0. BW = 3 MHz	RB = 6. Offset =0. BW = 5 MHz	RB = 6. Offset =0. BW = 10 MHz	RB = 6. Offset =0. BW = 15 MHz	RB = 6. Offset =0. BW = 20 MHz
Maximum measured level at <u>High Block Edge</u> at antenna port (dBm)			-25.3	-26.18	-32.01	-33.96

Measurement uncertainty: <±2.76 dB

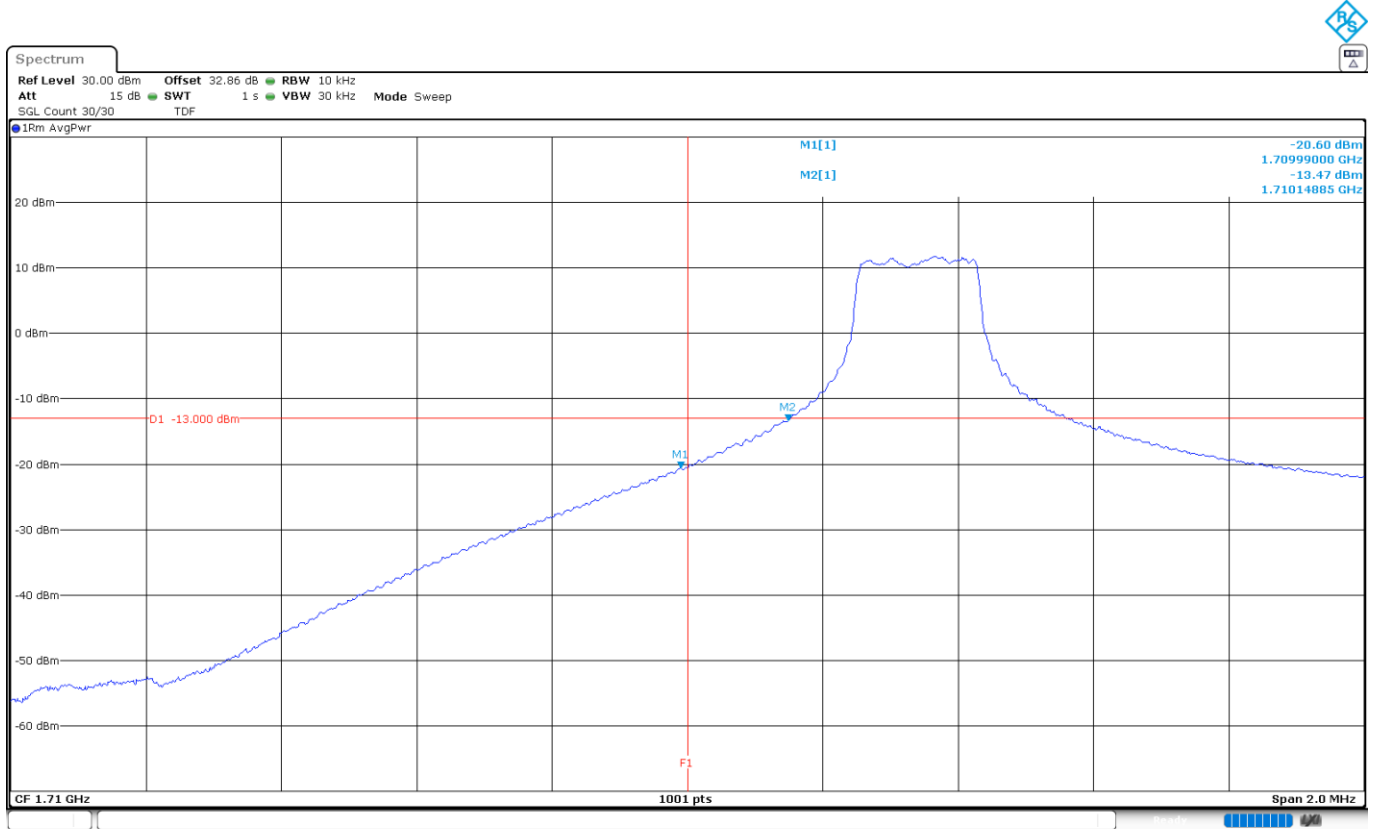
Verdict

PASS

The plots below are for the worst case configuration specified before.

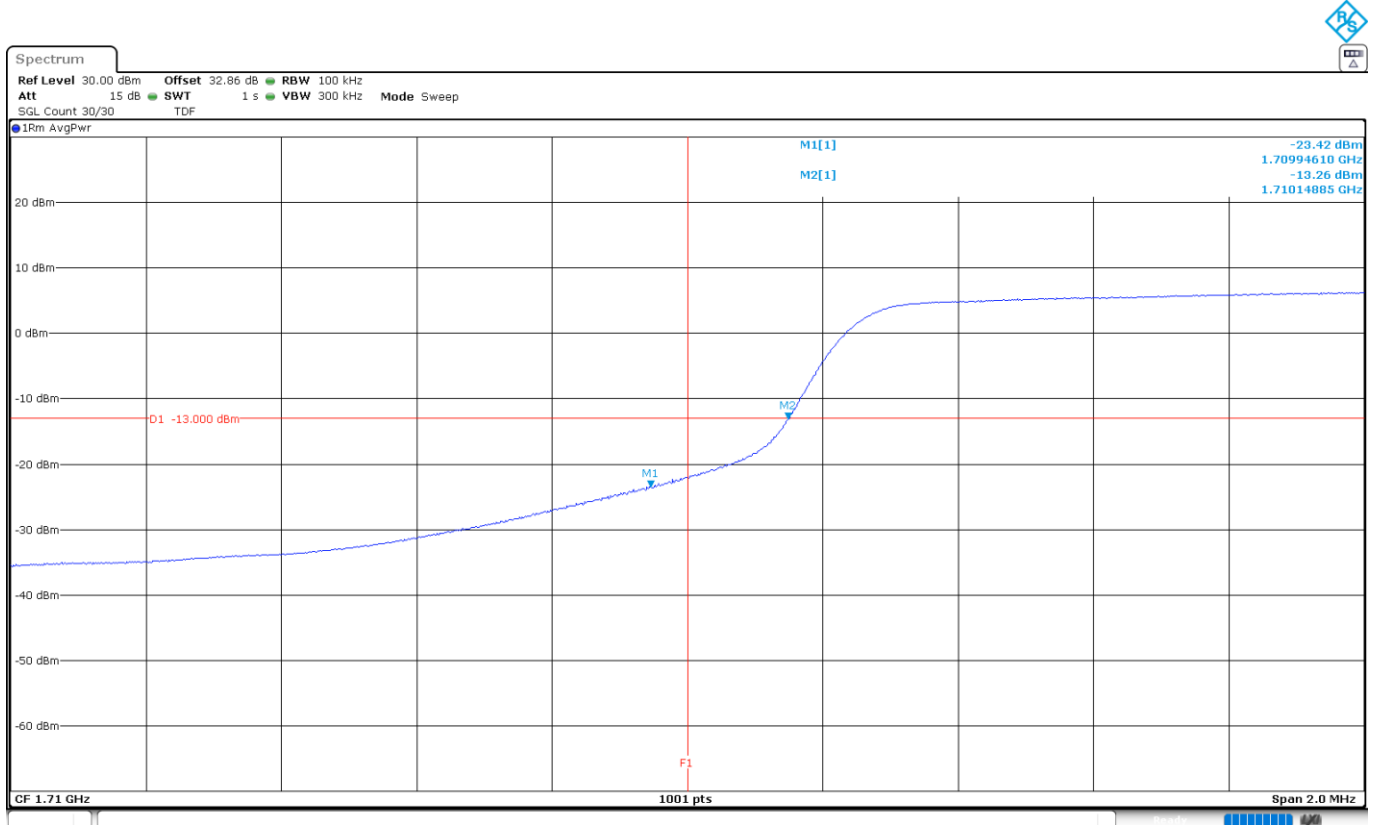
LTE Cat 1bis Band 66:

LTE Cat 1bis Band 66. BW=5 MHz. QPSK. RB=1. Offset=0. Low Block Edge:



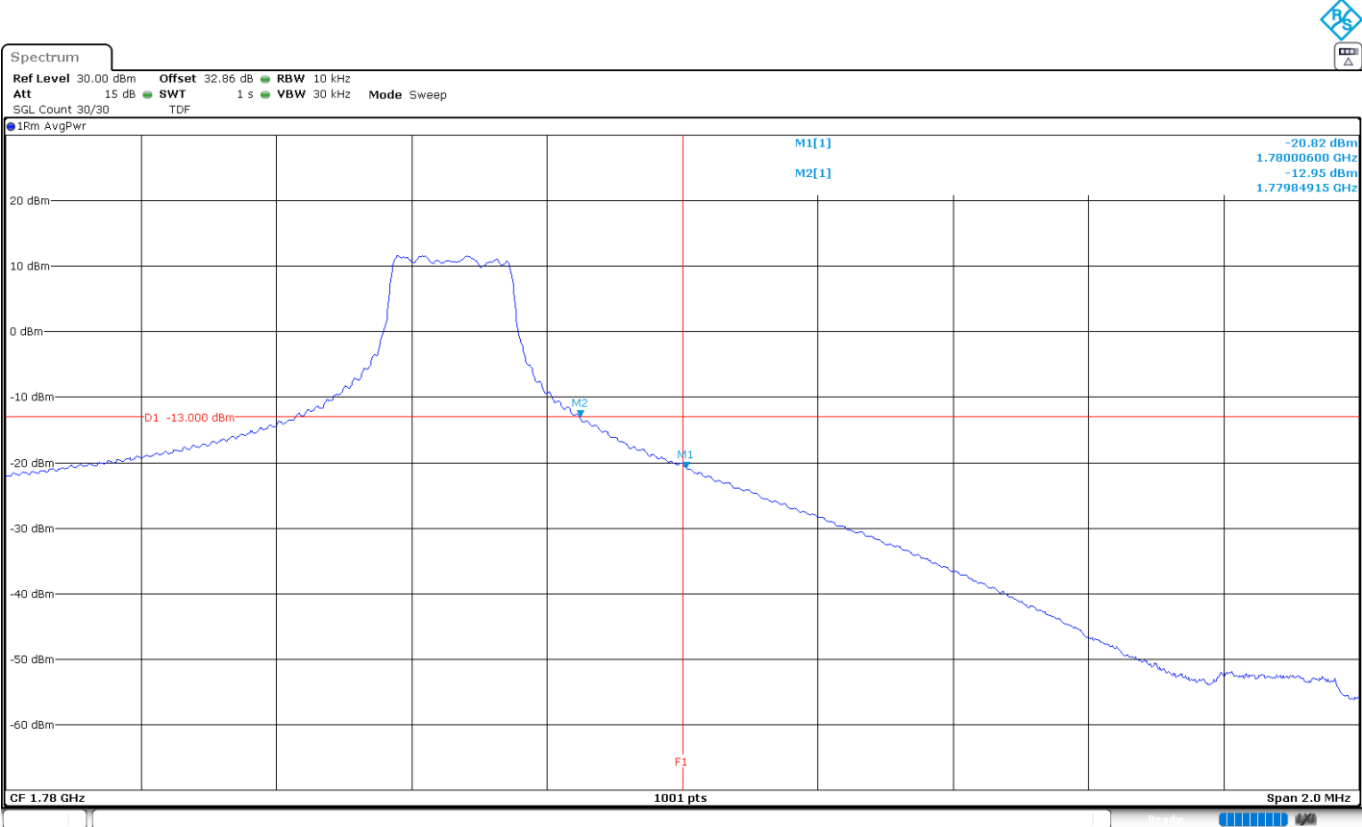
The equipment transmits at the maximum output power.

LTE Cat 1bis Band 66. BW=5 MHz. QPSK. RB=All. Offset=0. Low Block Edge:



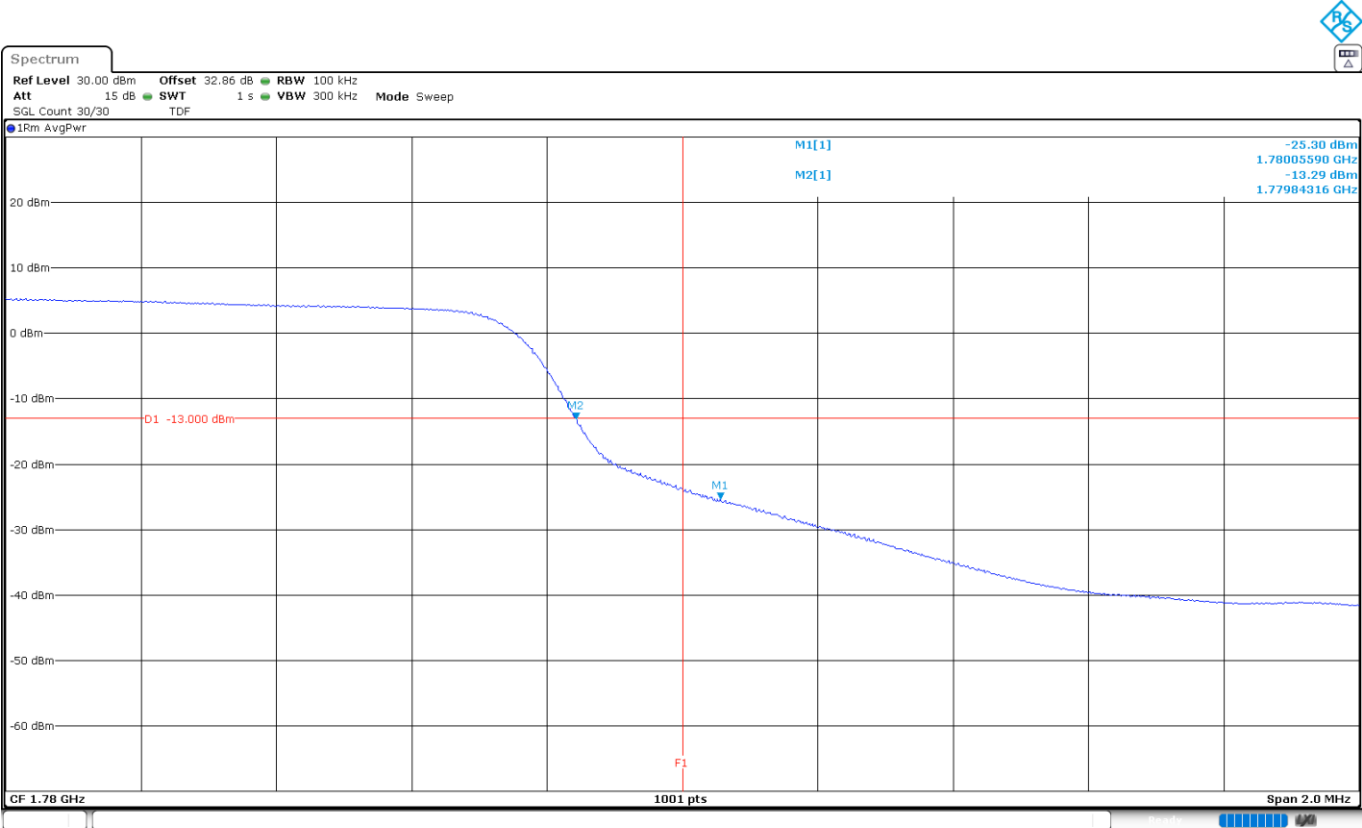
The equipment transmits at the maximum output power.

LTE Cat 1bis Band 66. BW=5 MHz. QPSK. RB=1. Offset=Max. High Block Edge:



The equipment transmits at the maximum output power.

LTE Cat 1bis Band 66. BW=5 MHz. QPSK. RB=All. Offset=0. High Block Edge:



The equipment transmits at the maximum output power.

Radiated Emissions

Limits

1. LTE Cat 1bis Band 12, 17. FCC §27.53 (g) / RSS-130 Clause 4.7.

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. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

RSS-130 Clause 4.7:

4.7.1 General unwanted emissions limits

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 $43 + 10 \log_{10} p$ (watts), dB. However, in the 100 kHz band immediately outside of the equipment's frequency block range, a resolution bandwidth of 30 kHz may be employed.

2. LTE Cat 1bis Band 13. FCC §27.53 (c) / RSS-130 Clause 4.7.

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:

4.7.1 General unwanted emissions limits:

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 $43 + 10 \log_{10} p$ (watts), dB. However, in the 100 kHz band immediately outside of the equipment's frequency block range, a resolution bandwidth of 30 kHz may be employed.

4.7.2 Additional unwanted emissions limits:

In addition to the limit outlined in section 4.7.1 above, equipment operating in the frequency bands 746-756 MHz and 777-787 MHz shall also comply with the following restrictions:

a. 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:

- i. $76 + 10 \log_{10} p$ (watts), dB, for base and fixed equipment and
- ii. $65 + 10 \log_{10} p$ (watts), dB, for mobile and portable equipment

b. the e.i.r.p. in the band 1559-1610 MHz shall not exceed -70 dBW/MHz for wideband signal and -80 dBW for discrete emission with bandwidth less than 700 Hz.

3. LTE Cat 1bis Band 66. FCC §27.53 (h) / RSS-139 5.6.

FCC §27.53 (h) / RSS-139 5.6:

Unwanted emissions shall be measured in terms of average values.

For all equipment, the TRP or total conducted power (sum of conducted power across all antenna connectors) of the unwanted emissions outside the frequency block or frequency block group shall not exceed the limits shown in table 6.

Table 6: Unwanted emission limits	
Offset from the edge of the frequency block or frequency block group	Unwanted emission limits
1 MHz	-13 dBm/(1% of OB*)
>1 MHz	-13 dBm/MHz

*OB is the occupied bandwidth.

In addition to complying with the above limits, equipment operating in the band 2180-2200 MHz may require additional filtering (see SRSP-519).

Method

The measurement was performed with the EUT inside an anechoic chamber. The spectrum was scanned from 30 MHz to at least the 10th harmonic of the High frequency generated within the equipment.

The EUT was placed on a non-conductive stand at 3-meter distance from the measuring antenna for measurements up to 17 GHz. Measurements above 17 GHz require the distance to be reduced to 1.5 meters.

Detected emissions were maximized at each frequency by rotating the EUT and adjusting the height and polarization of the measuring antenna. The maximum meter reading was recorded.

Measurement Limits:

At P_o transmitting power. the specified minimum attenuation $43 + 10 \log_{10} p$ (watts) becomes:

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

At P_o transmitting power. the specified minimum attenuation $65 + 10 \log_{10} p$ (watts) becomes:

$$P_o \text{ (dBm)} - [65 + 10 \log (P_o \text{ in mwatts}) - 30] = -35 \text{ dBm}$$

For operation in band 13. the e.i.r.p. in the band 1559-1610 MHz shall not exceed -70 dBW (-40 dBm) per MHz for wideband signals. and -80 dBW (-50 dBm) for discrete emissions of less than 700 Hz bandwidth.

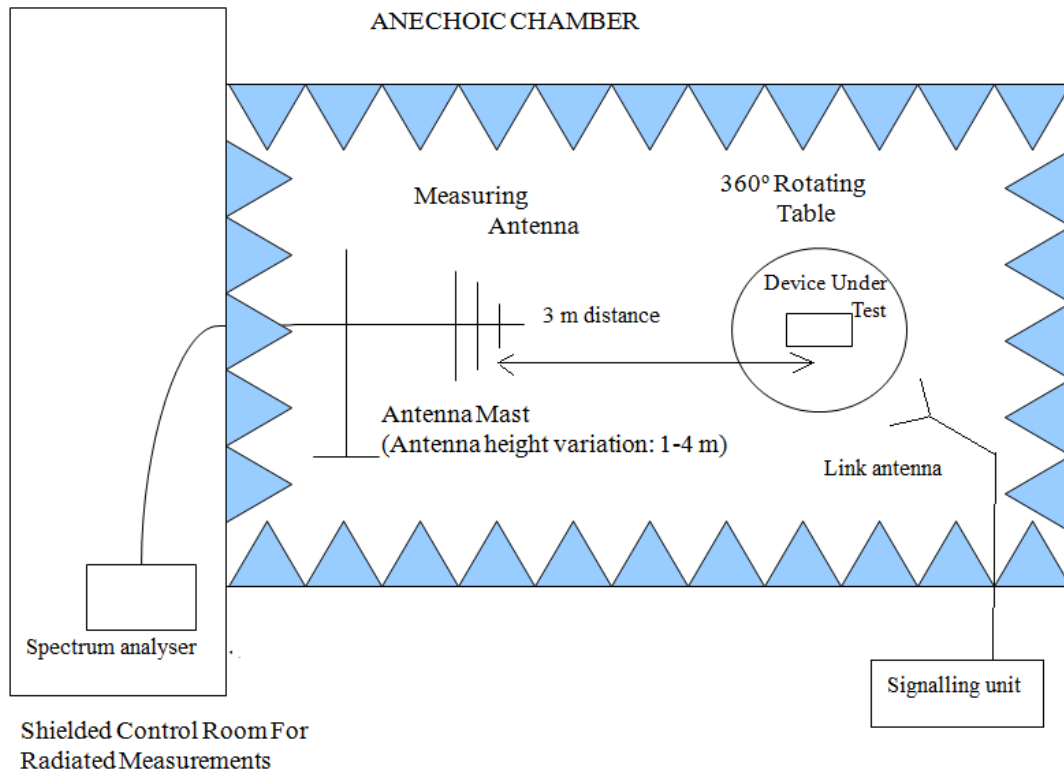
The maximum field strength (dBμV/m) of each detected emission at less than 20 dB respect to the limit is converted to an equivalent EIRP level (dBm) according to ANSI C63.26 with the formula:

$$\text{EIRP (dBm)} = E \text{ (dBμV/m)} + 20 \log(D) - 104.8;$$

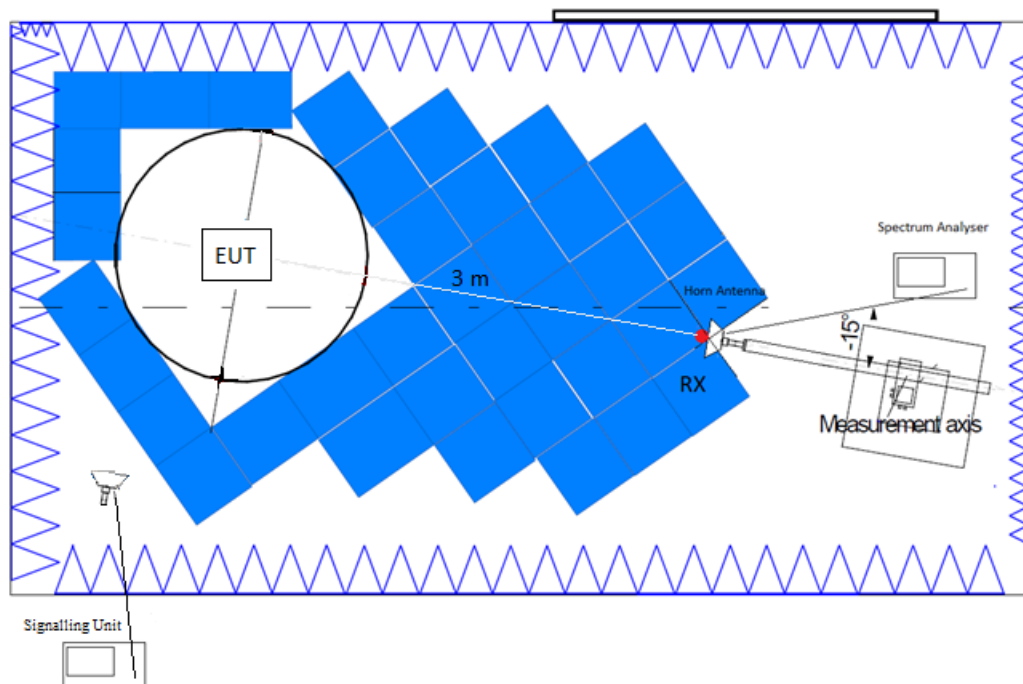
where D is the measurement distance (in the far field region) in m. $D = 3\text{m}$.

Test Setup

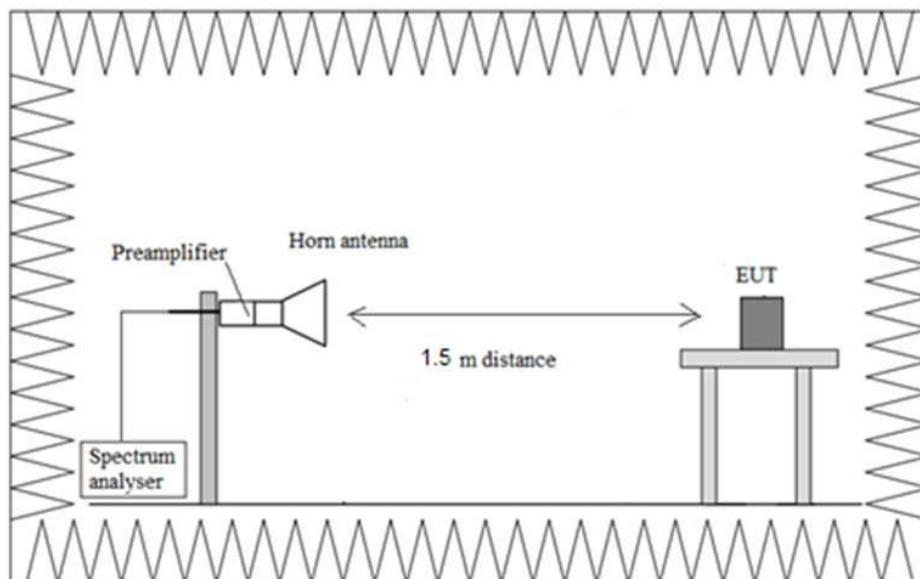
Radiated measurements setup from 30 MHz to 1 GHz:



Radiated measurements setup from 1 GHz to 17 GHz:



Radiated measurements above 17 GHz:



Results

Test was performed on worst-case channel in terms of radiated spurious emissions. determined by a preliminary scan for each band.

LTE Cat 1bis Band 12:

INTERNAL ANTENNA:

A preliminary scan determined the BW=5 MHz, QPSK, RB Size 1, RB Offset 12 as the worst case. The next results are for this worst-case configuration.

Frequency range 30 MHz - 1 GHz:

- Low Channel:

No spurious frequencies at less than 20 dB below the limit.

- Middle Channel:

No spurious frequencies at less than 20 dB below the limit.

- High Channel:

No spurious frequencies at less than 20 dB below the limit.

Frequency range 1 - 8 GHz:

- Low Channel:

No spurious frequencies at less than 20 dB below the limit.

- Middle Channel:

Spurious frequencies at less than 20 dB below the limit:

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Pol
1419.466667	-28.15	-13.00	15.15	H

- High Channel:

Spurious frequencies at less than 20 dB below the limit:

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Pol
1195.133333	-29.73	-13.00	16.73	H

Measurement uncertainty (dB) $< \pm 5.35$ for $f < 1$ GHz
 $< \pm 4.32$ for $f \geq 1$ GHz up to 8 GHz

Verdict

Pass

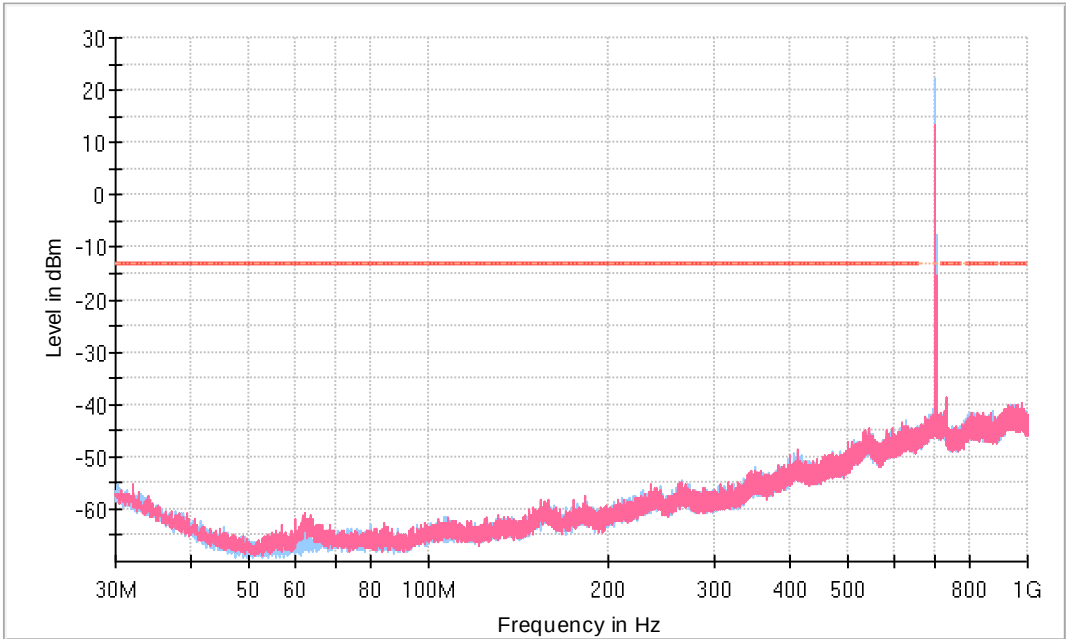
Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamp
30 MHz - 1 GHz	30.312 kHz	PK+	100 kHz	Coupled	0 dB
1 GHz - 10 GHz	281.25 kHz	PK+	100 kHz	1 s	0 dB

LTE Cat 1bis Band 12:

FREQUENCY RANGE 30 MHz - 1 GHz:

- Low Channel:

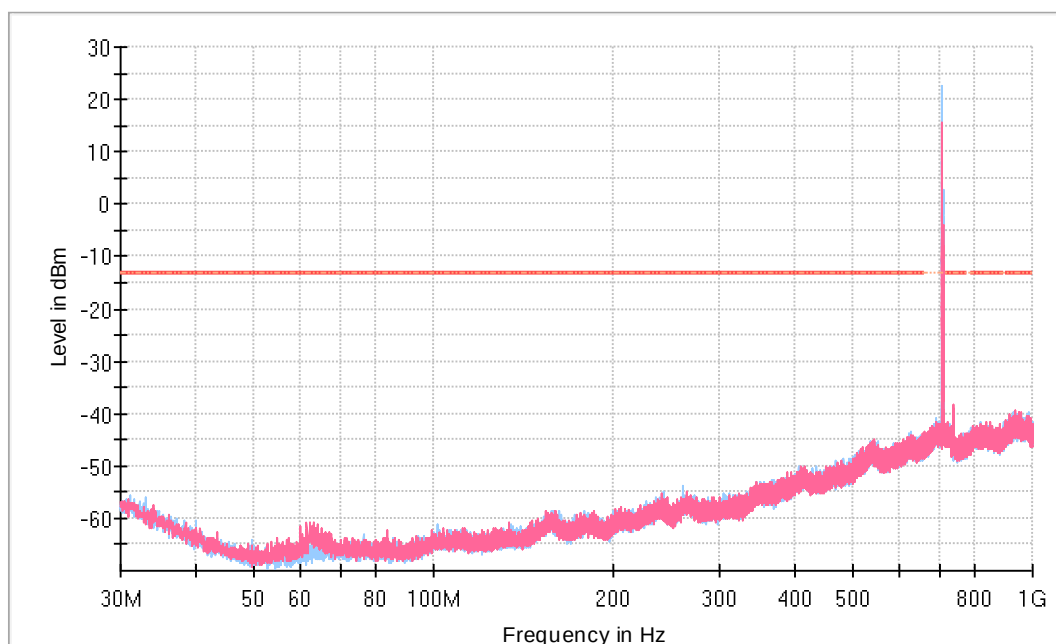
Full Spectrum



The peak above the limit is the LTE Cat 1bis Band 12 carrier frequency.

- Middle Channel:

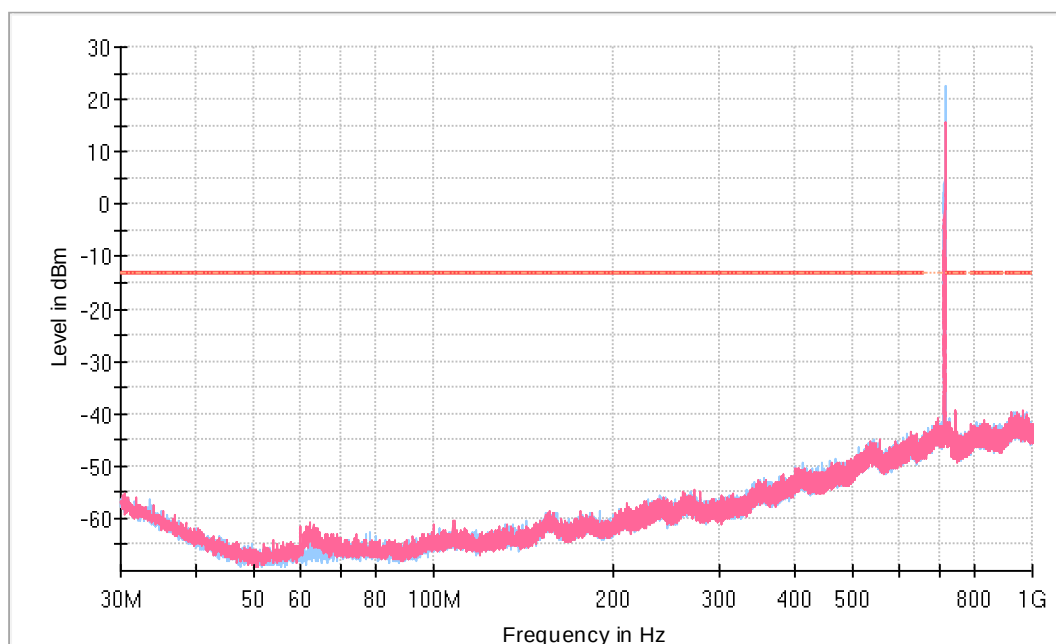
Full Spectrum



The peak above the limit is the LTE Cat 1bis Band 12 carrier frequency.

- High Channel:

Full Spectrum

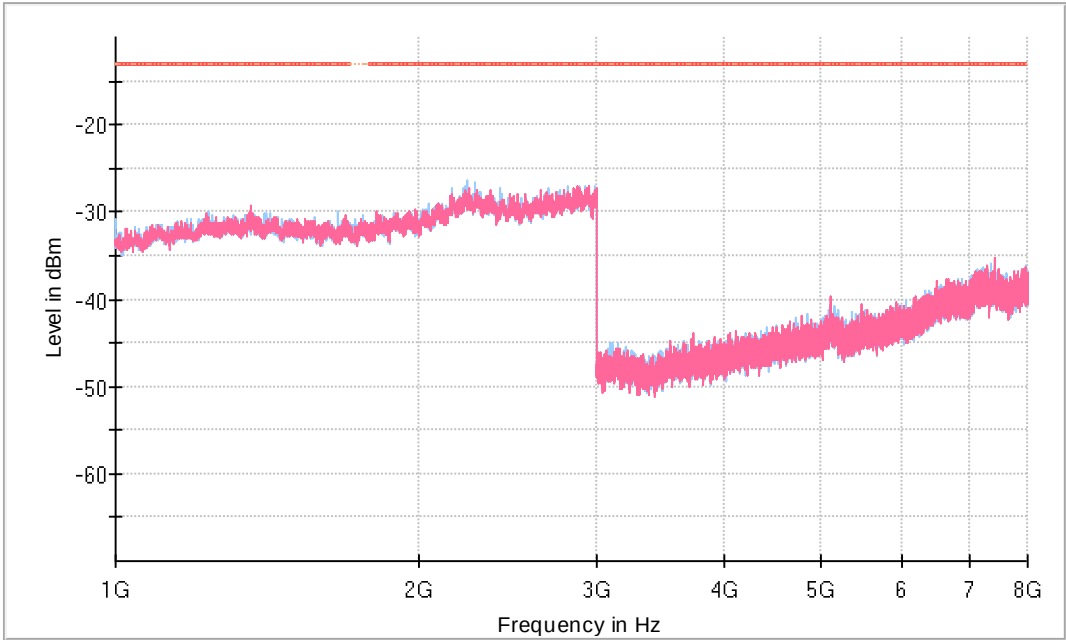


The peak above the limit is the LTE Cat 1bis Band 12 carrier frequency.

FREQUENCY RANGE 1 GHz - 8 GHz

- Low Channel:

Full Spectrum



- Middle Channel:

