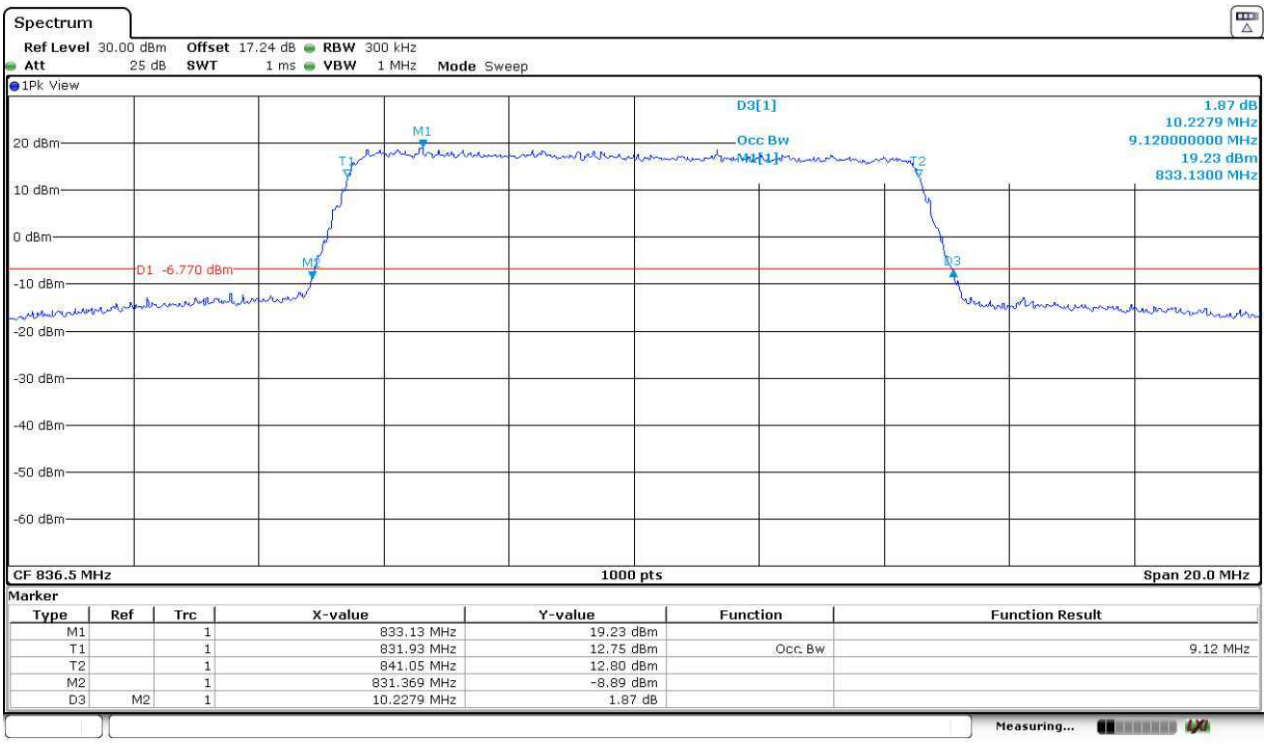
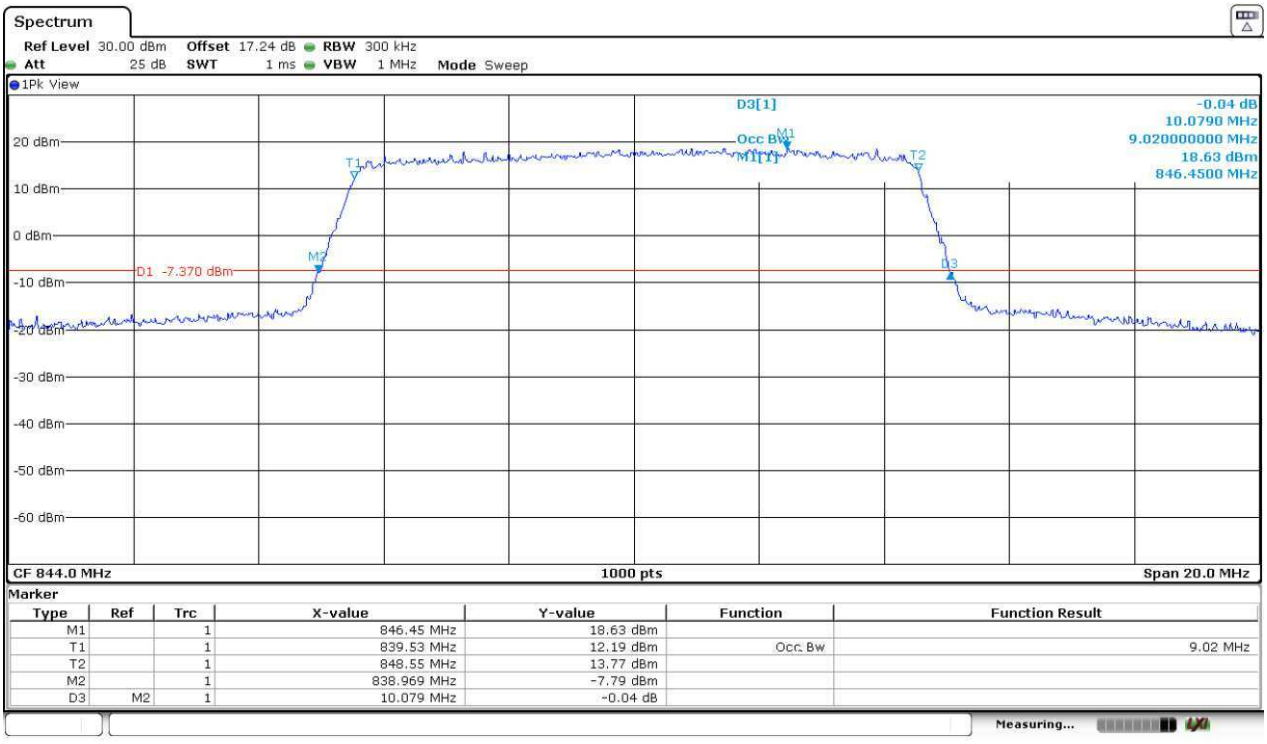
Middle Channel:



High Channel:



Spurious emissions at antenna terminals

SPECIFICATION:

FCC §2.1051 and §22.917

RSS-132. Clause 5.5.

The power of emissions shall be attenuated below the transmitter power (P) by a factor of at least 43 + 10 log (P) dB. P in watts.

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 spectrum was investigated from 9 kHz to 10 GHz.

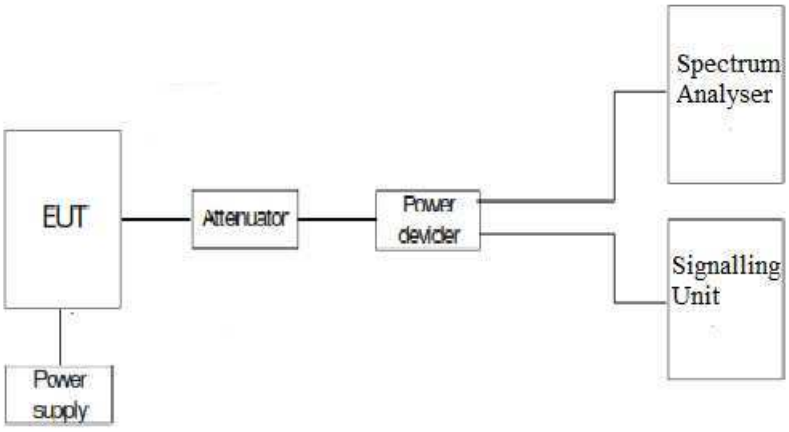
The reading of the spectrum analyser is corrected with the attenuation loss of connection between output terminal of EUT and input of the spectrum analyser.

Measurement Limit:

According to specification. the power of emissions shall be attenuated below the transmitter power (P) by a factor of at least 43 + 10 log (P) dB. P in watts.
At Po transmitting power. the specified minimum attenuation becomes 43+10log (Po) and the level in dBm relative Po becomes:

Po (dBm) – [43 + 10 log (Po in mwatts) - 30] = - 13 dBm

TEST SETUP:



RESULTS:

2G Band 850 MHz. GPRS MODULATION.

- Lowest Channel: Spurious frequencies at less than 20 dB below the limit:

Frequency (MHz)	Level (dBm)	Measurement uncertainty (dB)
1648.359	-25.82	< ± 2.77
2473.059	-28.03	< ± 2.77

- Middle Channel: Spurious frequencies at less than 20 dB below the limit:

Frequency (MHz)	Level (dBm)	Measurement uncertainty (dB)
1673.259	-25.48	< ± 2.77
2510.259	-27.93	< ± 2.77

- Highest Channel: Spurious frequencies at less than 20 dB below the limit:

Frequency (MHz)	Level (dBm)	Measurement uncertainty (dB)
1697.859	-25.31	< ± 2.77
2546.559	-27.87	< ± 2.77

2G Band 850 MHz. EDGE MODULATION.

- Lowest Channel: Spurious frequencies at less than 20 dB below the limit:

Frequency (MHz)	Level (dBm)	Measurement uncertainty (dB)
1648.659	-25.85	< ± 2.77
2472.459	-27.48	< ± 2.77

- Middle Channel: Spurious frequencies at less than 20 dB below the limit:

Frequency (MHz)	Level (dBm)	Measurement uncertainty (dB)
1673.259	-25.6	< ± 2.77
2509.959	-28.38	< ± 2.77

- Highest Channel: Spurious frequencies at less than 20 dB below the limit:

Frequency (MHz)	Level (dBm)	Measurement uncertainty (dB)
1697.559	-25.37	< ± 2.77
2546.559	-29.05	< ± 2.77

Verdict: PASS

3G Band V. WCDMA MODULATION.

- Lowest 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.
- Highest Channel: No spurious frequencies at less than 20 dB below the limit.

3G Band V. HSUPA MODULATION.

- Lowest 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.
- Highest Channel: No spurious frequencies at less than 20 dB below the limit.

LTE Band 5. BW=1.4 MHz. QPSK MODULATION.

- Lowest 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.
- Highest Channel: No spurious frequencies at less than 20 dB below the limit.

LTE Band 5. BW=3 MHz. QPSK MODULATION.

- Lowest 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.
- Highest Channel: No spurious frequencies at less than 20 dB below the limit.

LTE Band 5. BW=5 MHz. QPSK MODULATION.

- Lowest 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.
- Highest Channel: No spurious frequencies at less than 20 dB below the limit.

LTE Band 5. BW=10 MHz. QPSK MODULATION.

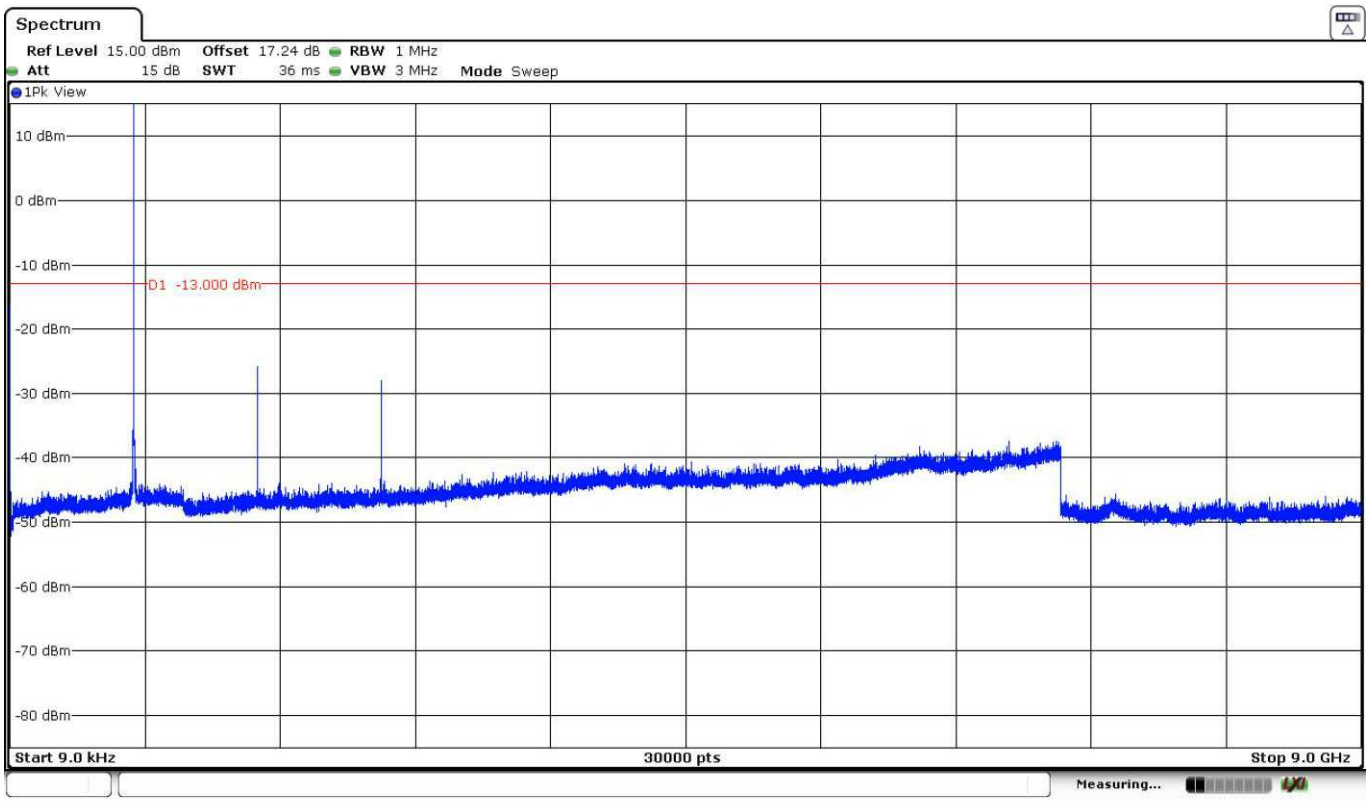
- Lowest Channel: No spurious frequencies at less than 20 dB below the limit.
- Middle Channel: No spurious frequencies at less than 20 dB below the limit.
- Highest Channel: No spurious frequencies at less than 20 dB below the limit.

Measurement uncertainty (dB): < ± 2.77

Verdict: PASS

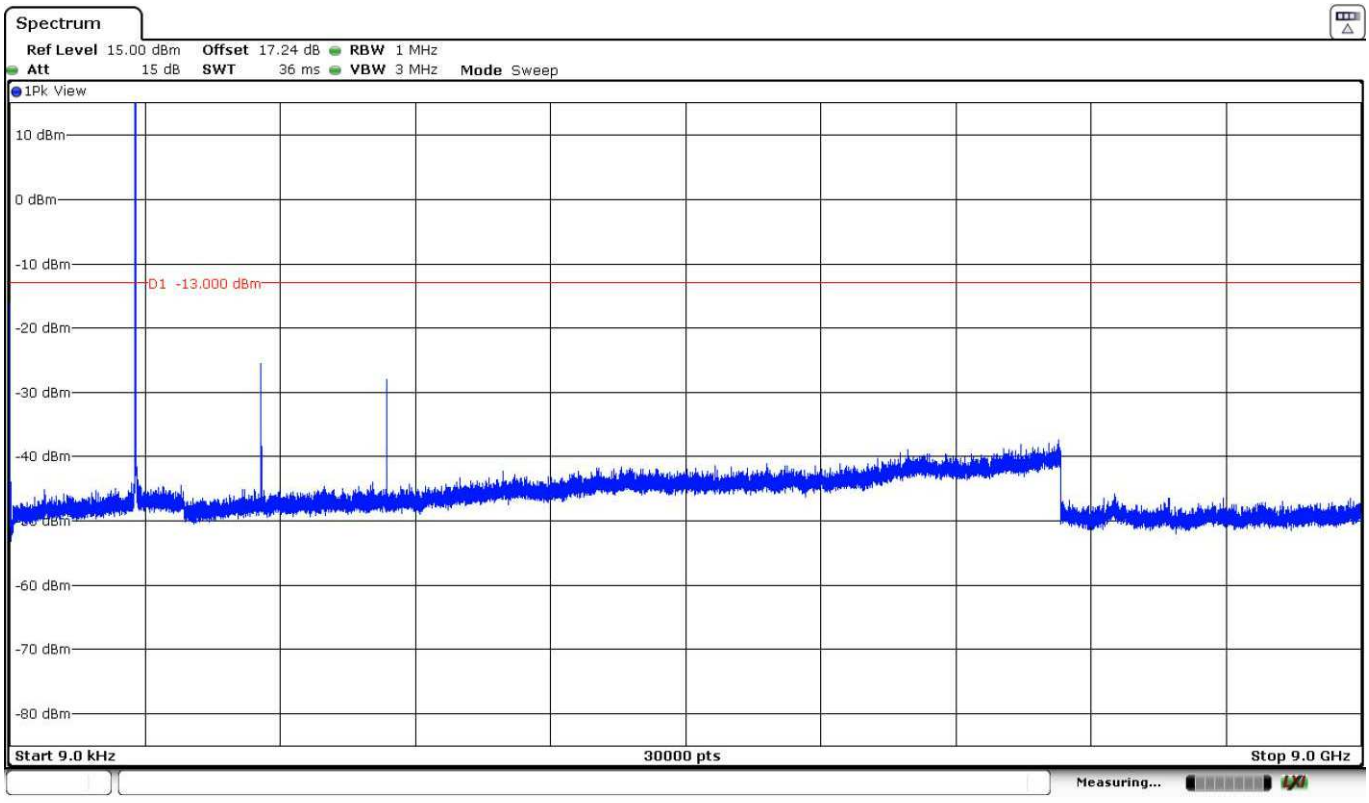
2G Band 850 MHz. GPRS MODULATION.

Lowest Channel:



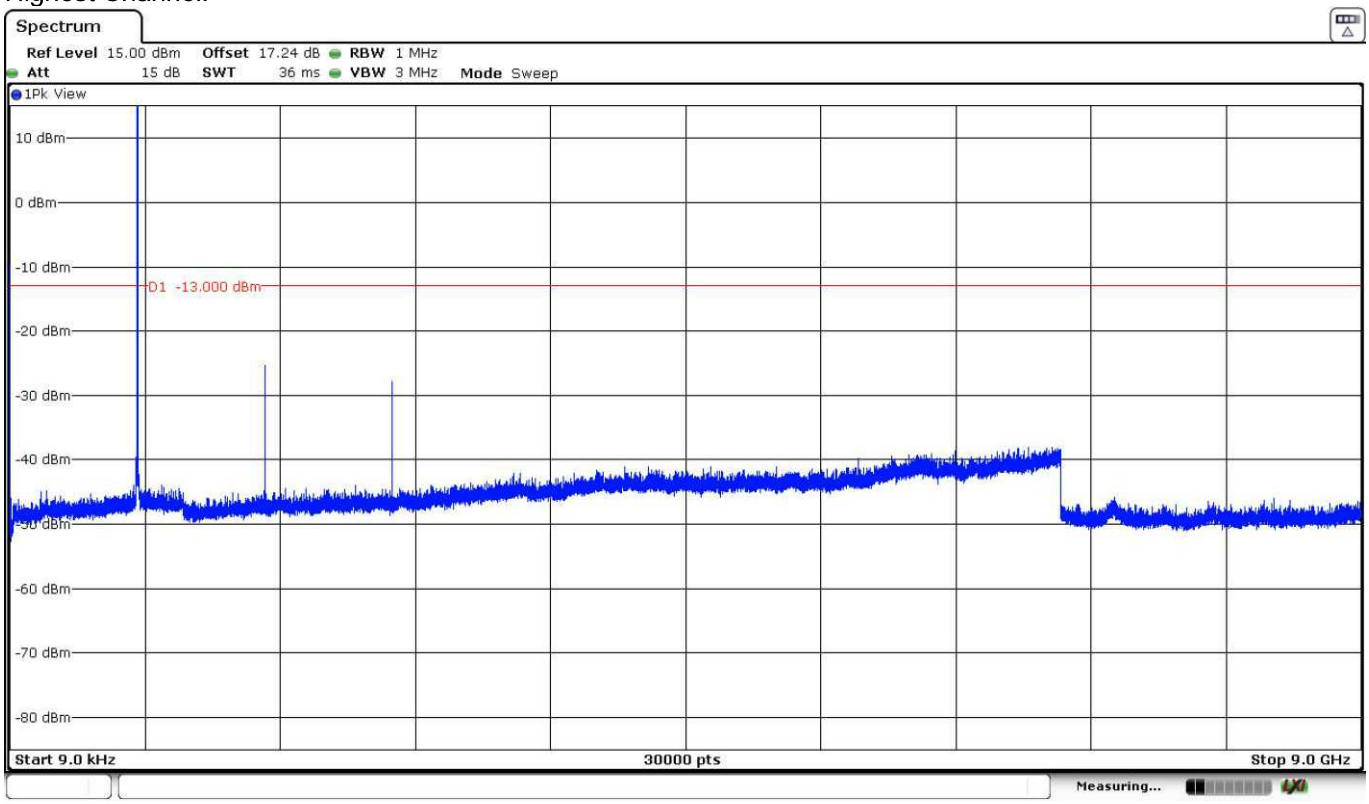
The peak above the limit is the carrier frequency.

Middle Channel:



The peak above the limit is the carrier frequency.

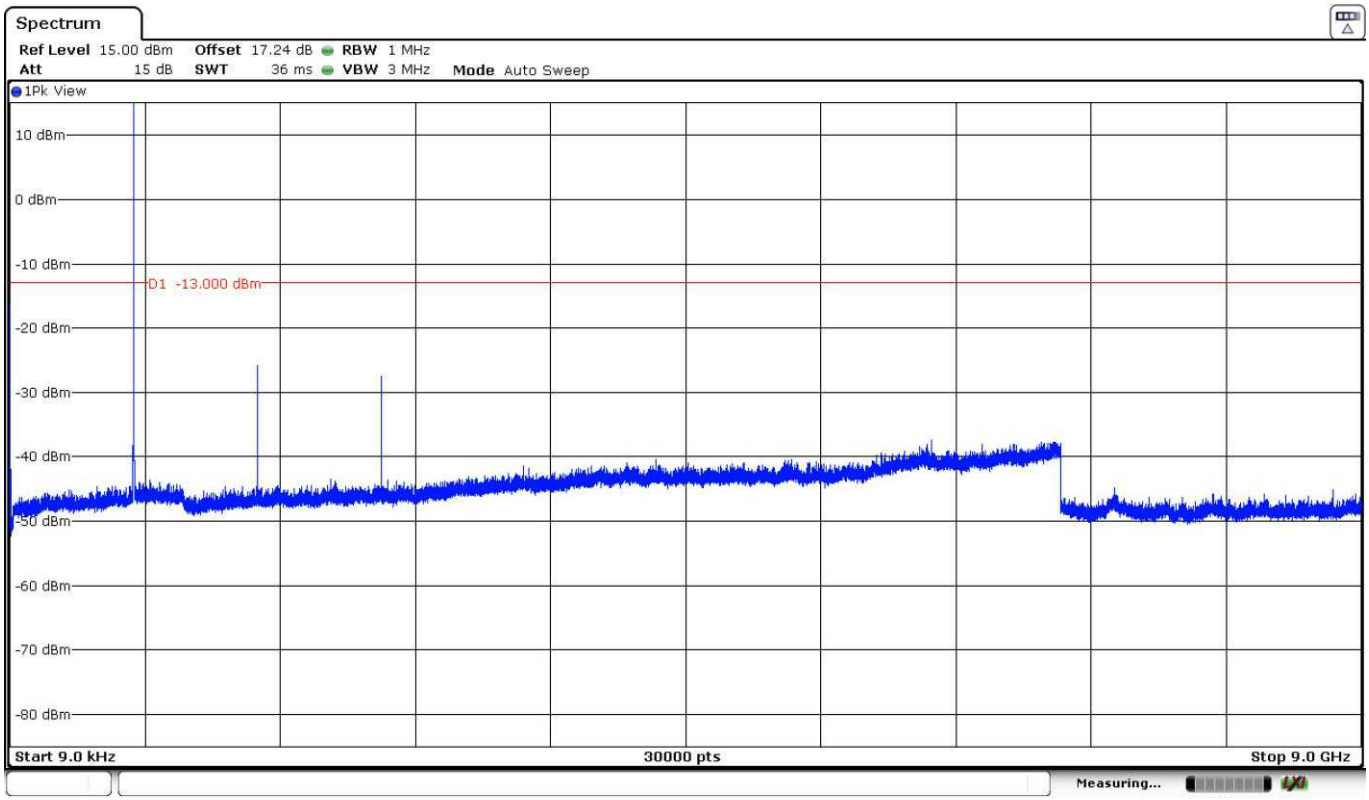
Highest Channel:



The peak above the limit is the carrier frequency.

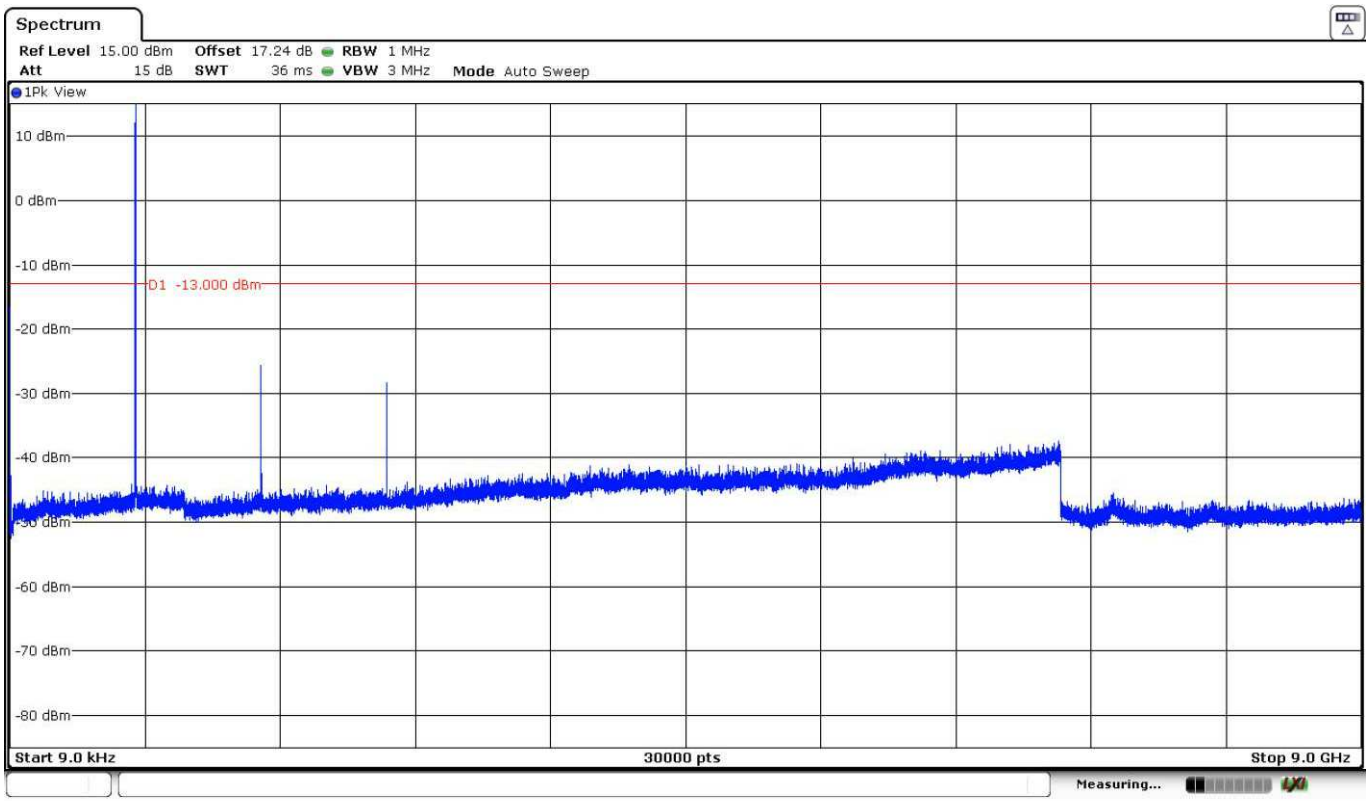
2G Band 850 MHz. EDGE MODULATION.

Lowest Channel:



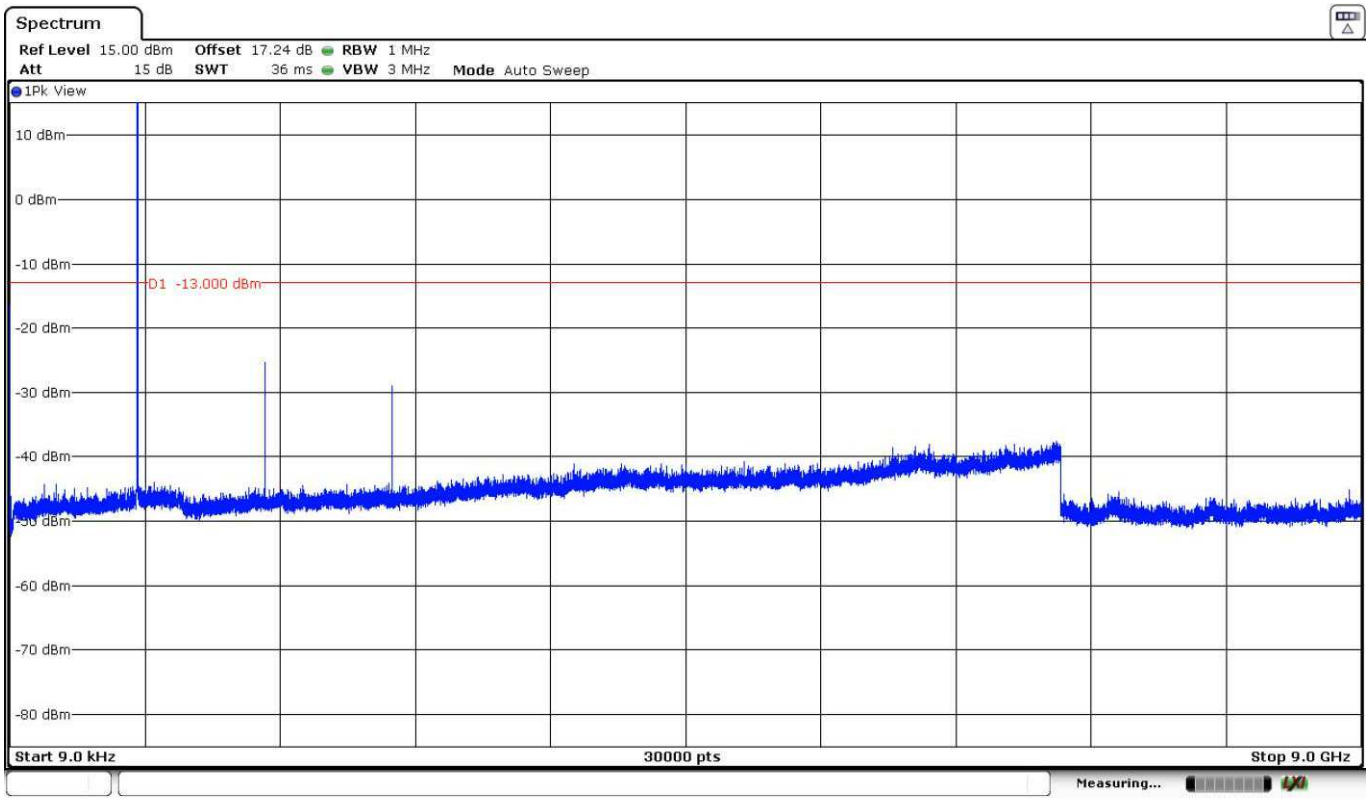
The peak above the limit is the carrier frequency.

Middle Channel:



The peak above the limit is the carrier frequency.

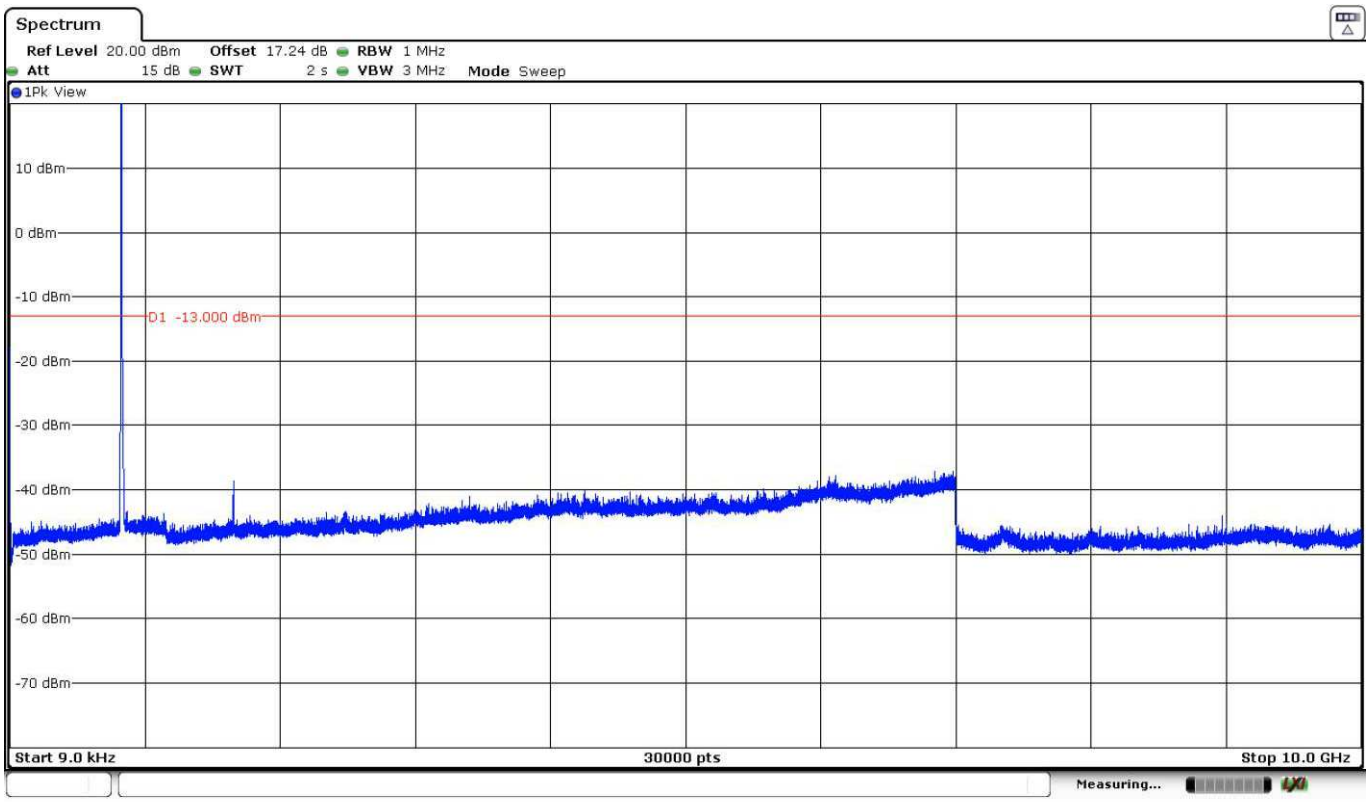
Highest Channel:



The peak above the limit is the carrier frequency.

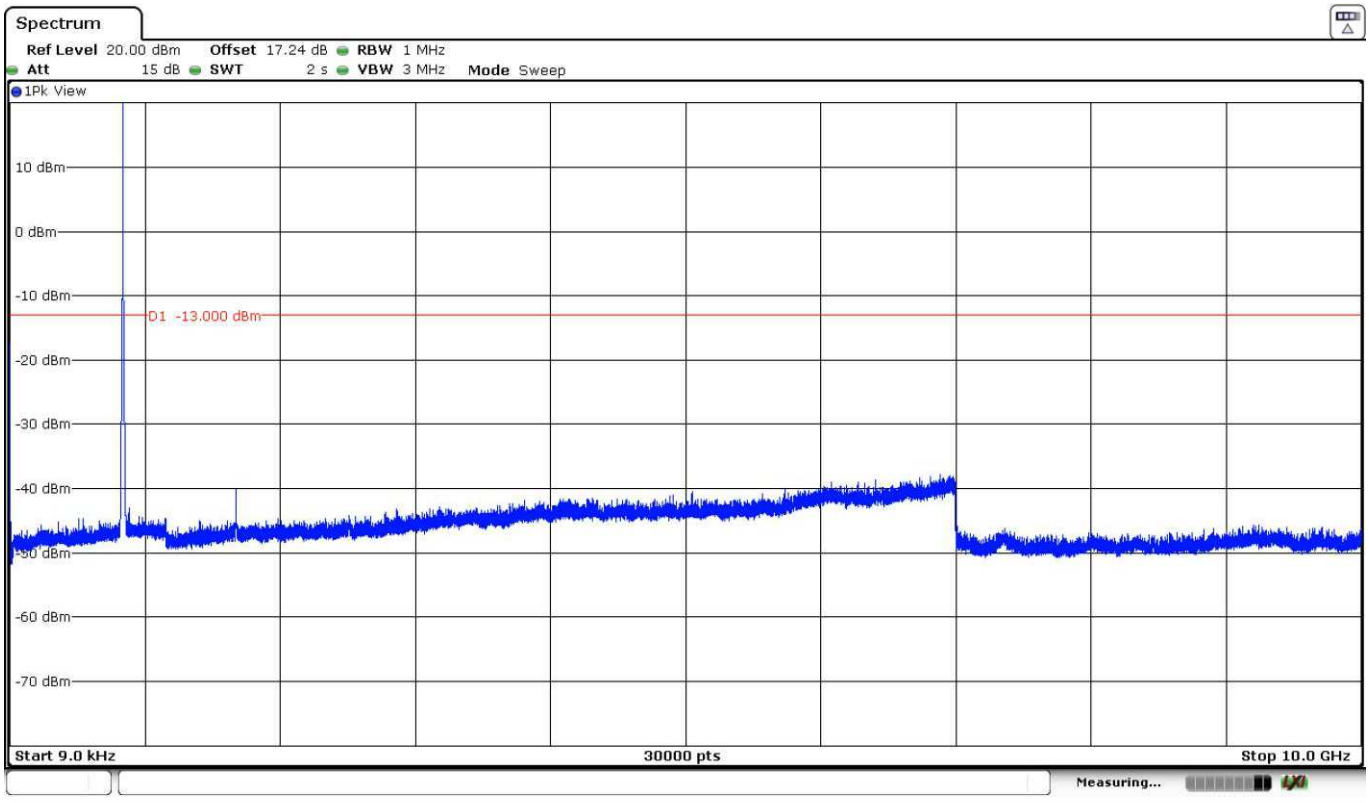
3G Band V. WCDMA MODULATION.

Lowest Channel:



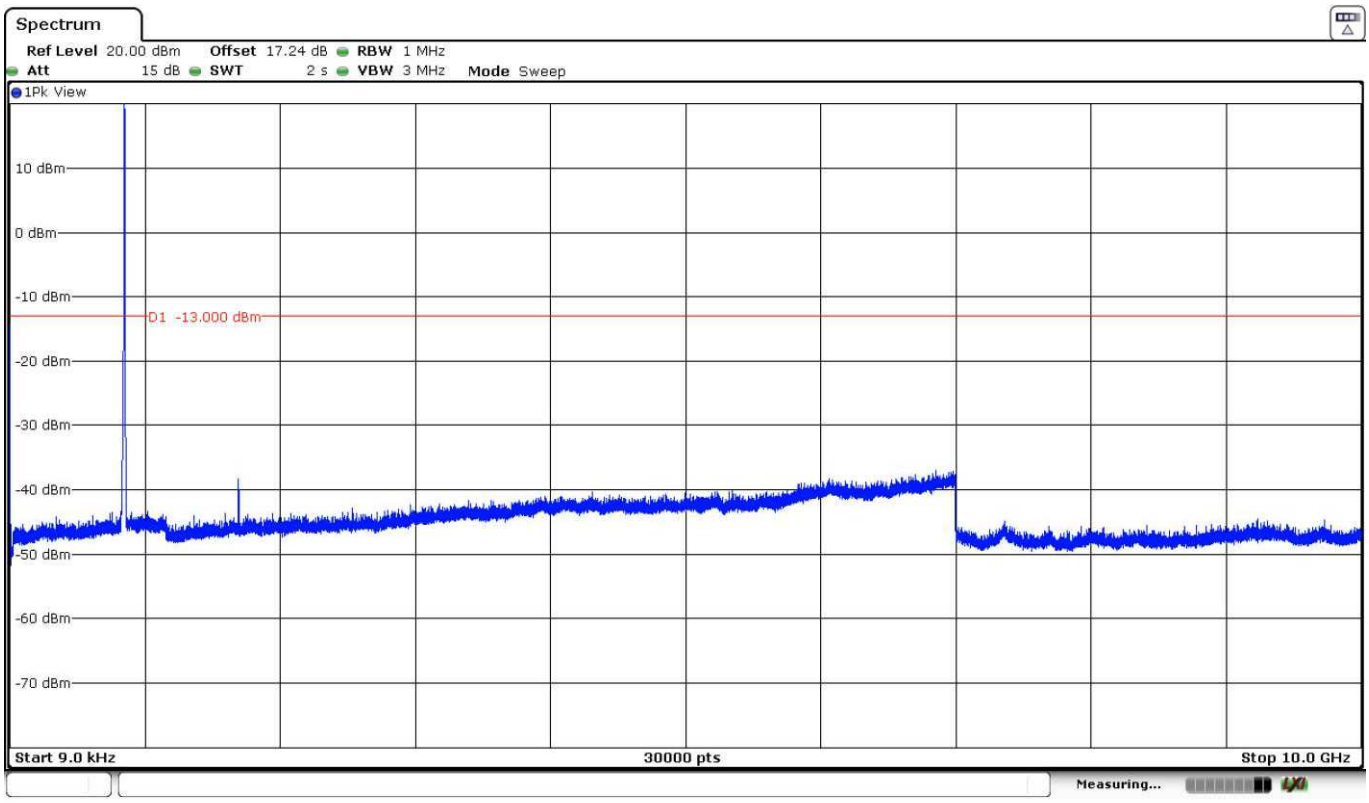
The peak above the limit is the carrier frequency.

Middle Channel:



The peak above the limit is the carrier frequency.

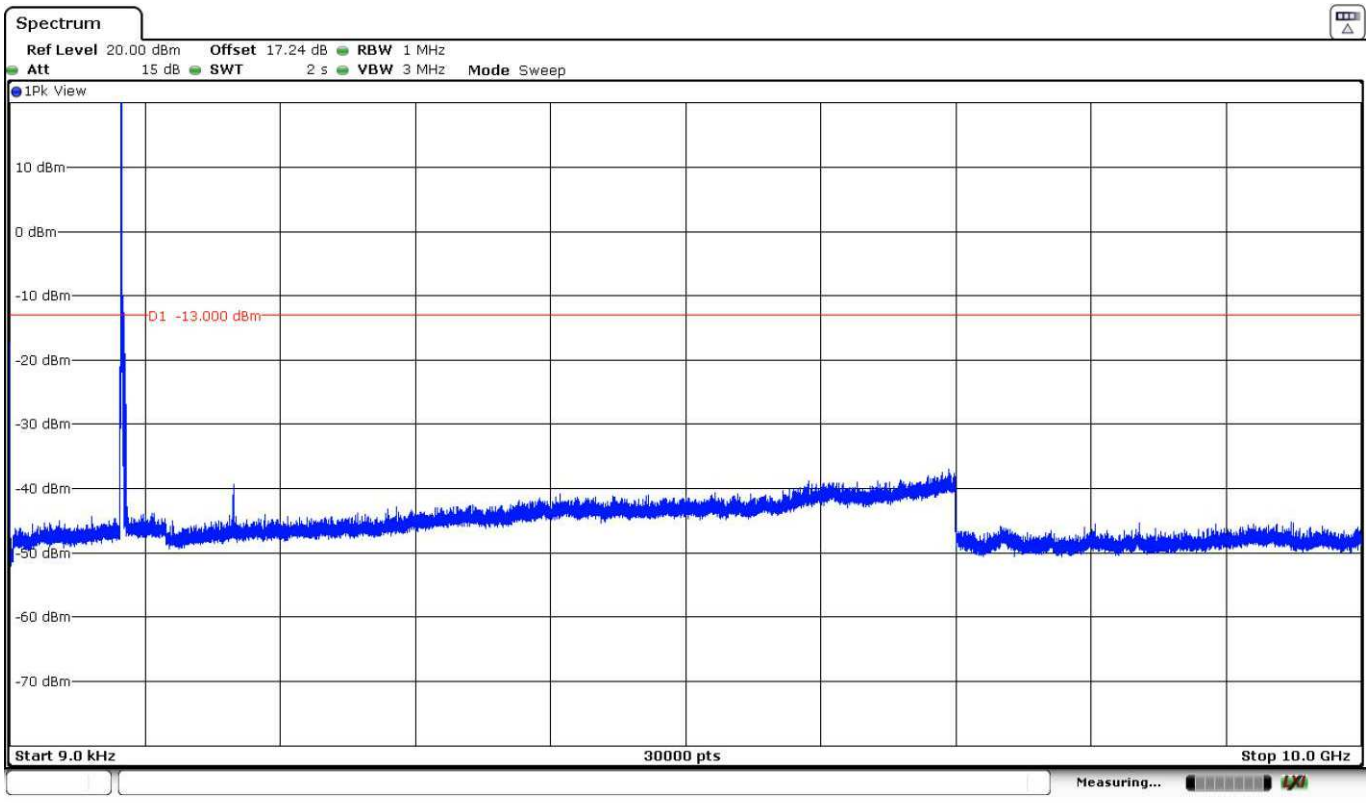
Highest Channel:



The peak above the limit is the carrier frequency.

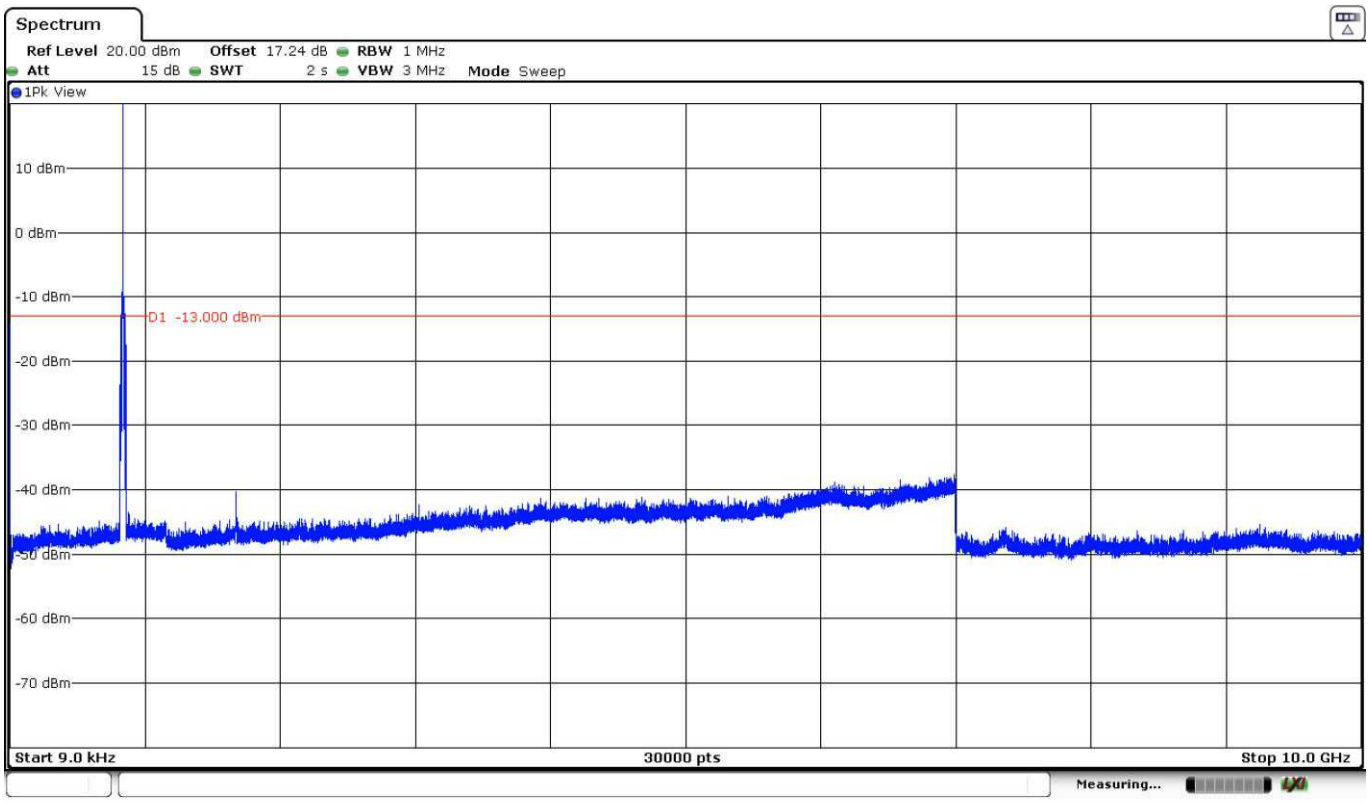
3G Band V. HSUPA MODULATION.

Lowest Channel:



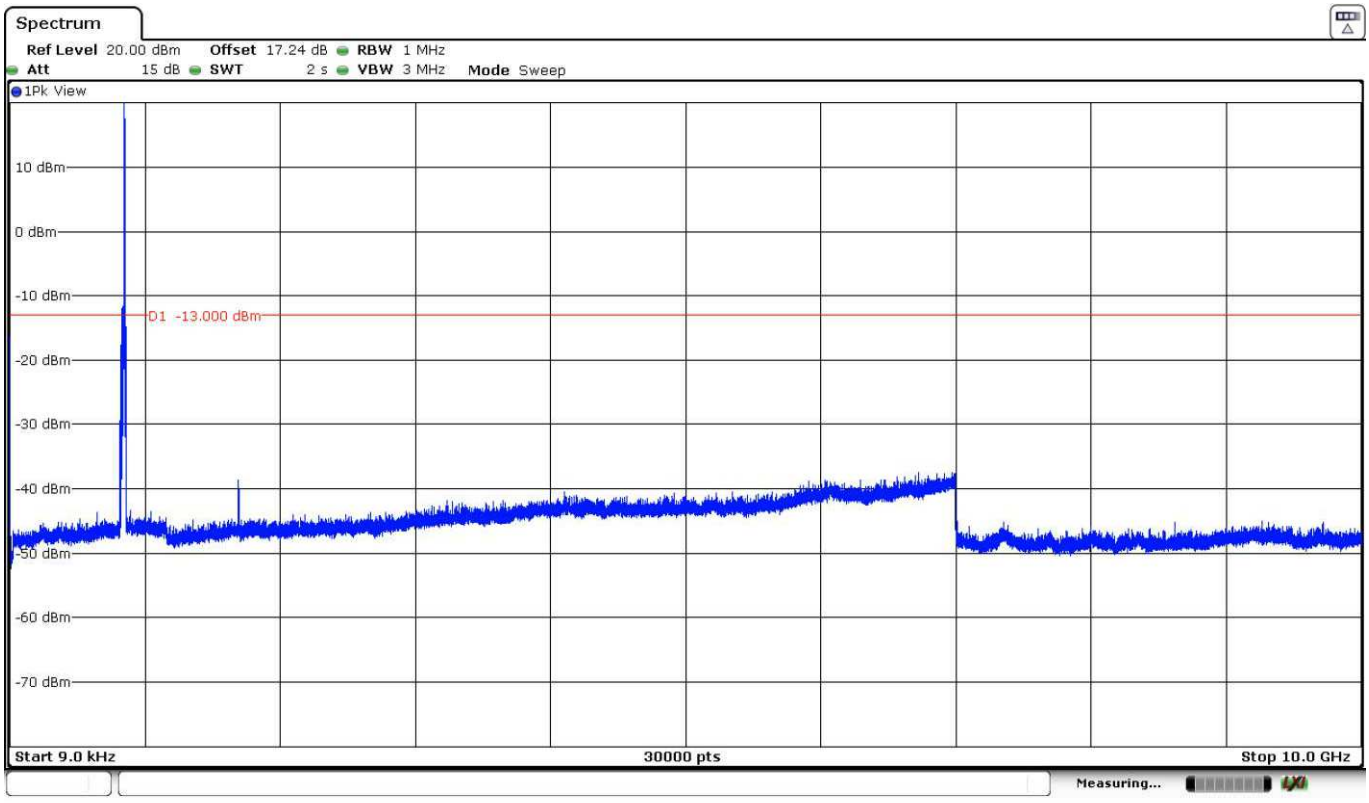
The peak above the limit is the carrier frequency.

Middle Channel:



The peak above the limit is the carrier frequency.

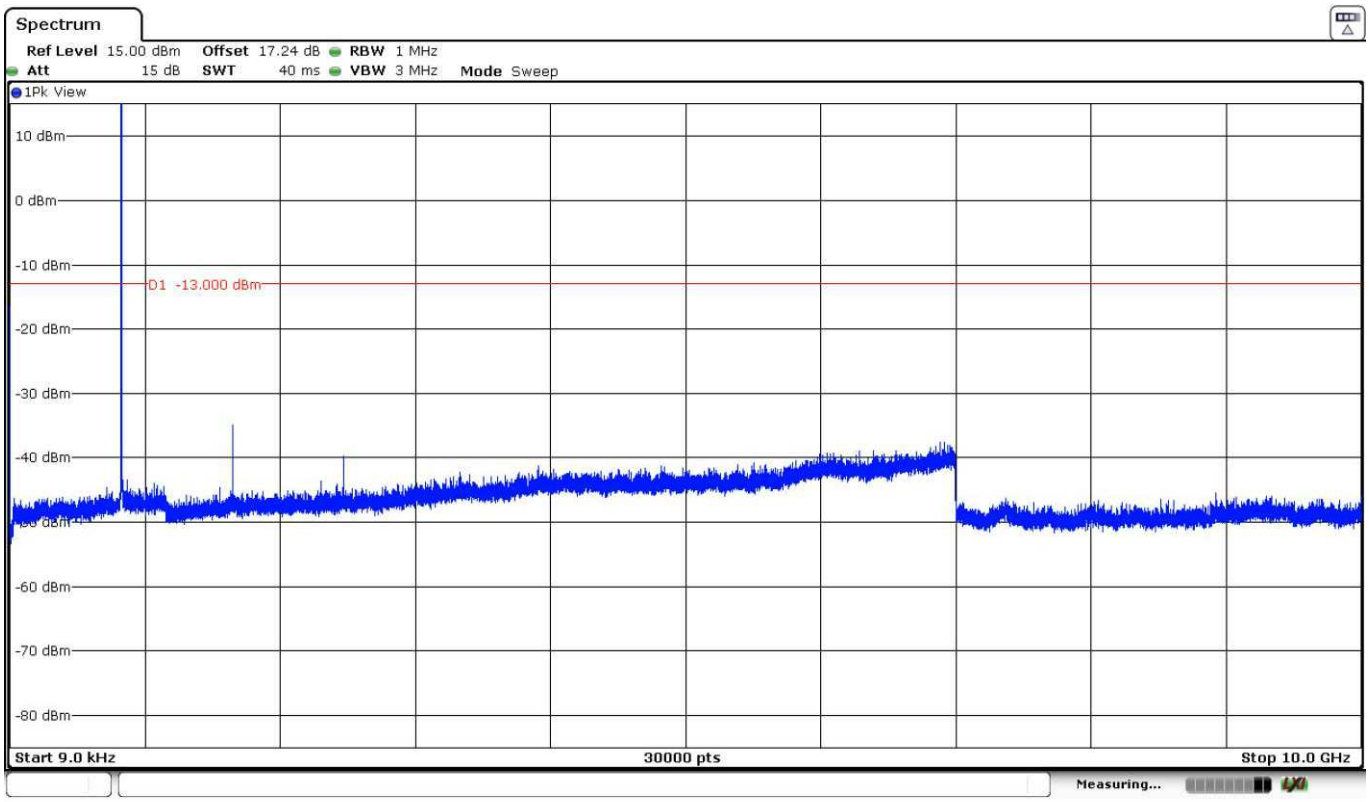
Highest Channel:



The peak above the limit is the carrier frequency.

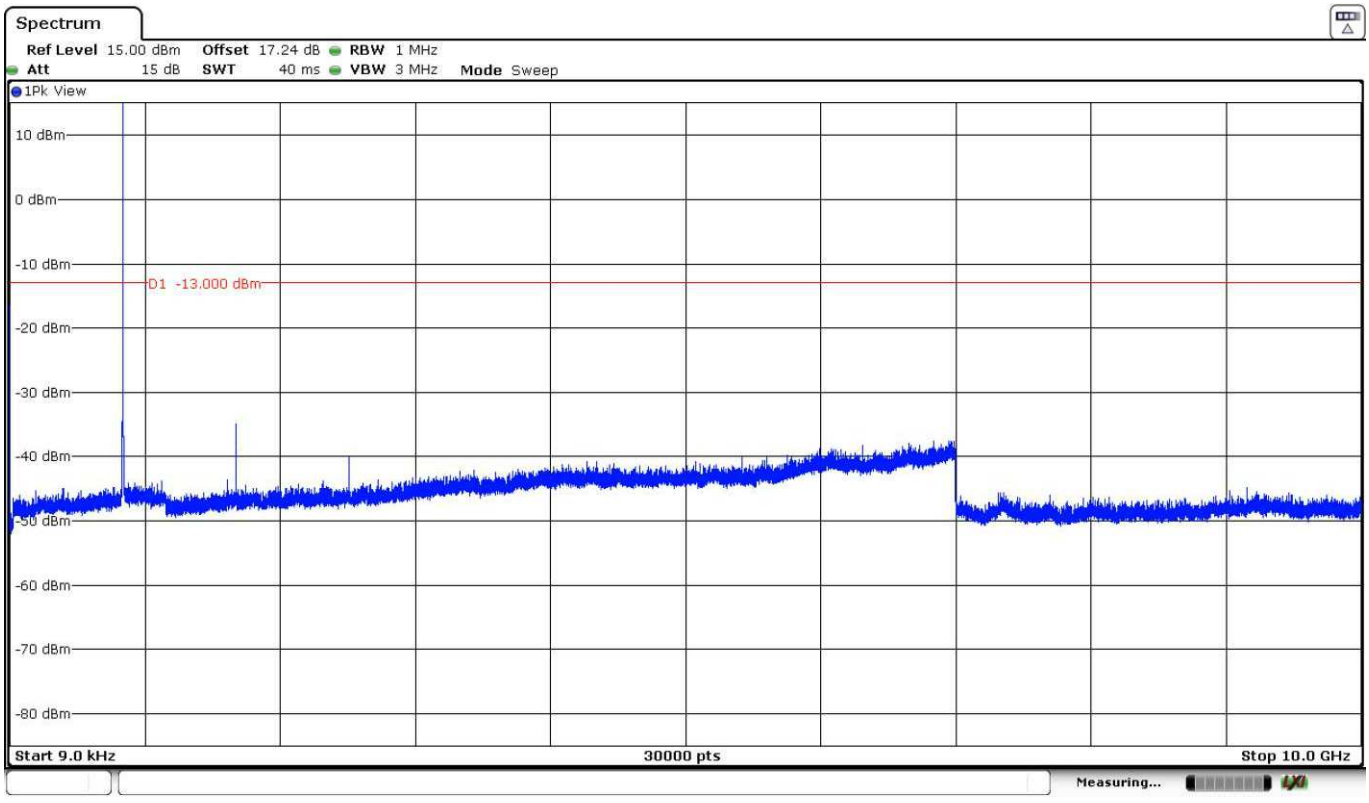
LTE Band 5. BW=1.4 MHz. QPSK MODULATION.

Low Channel:



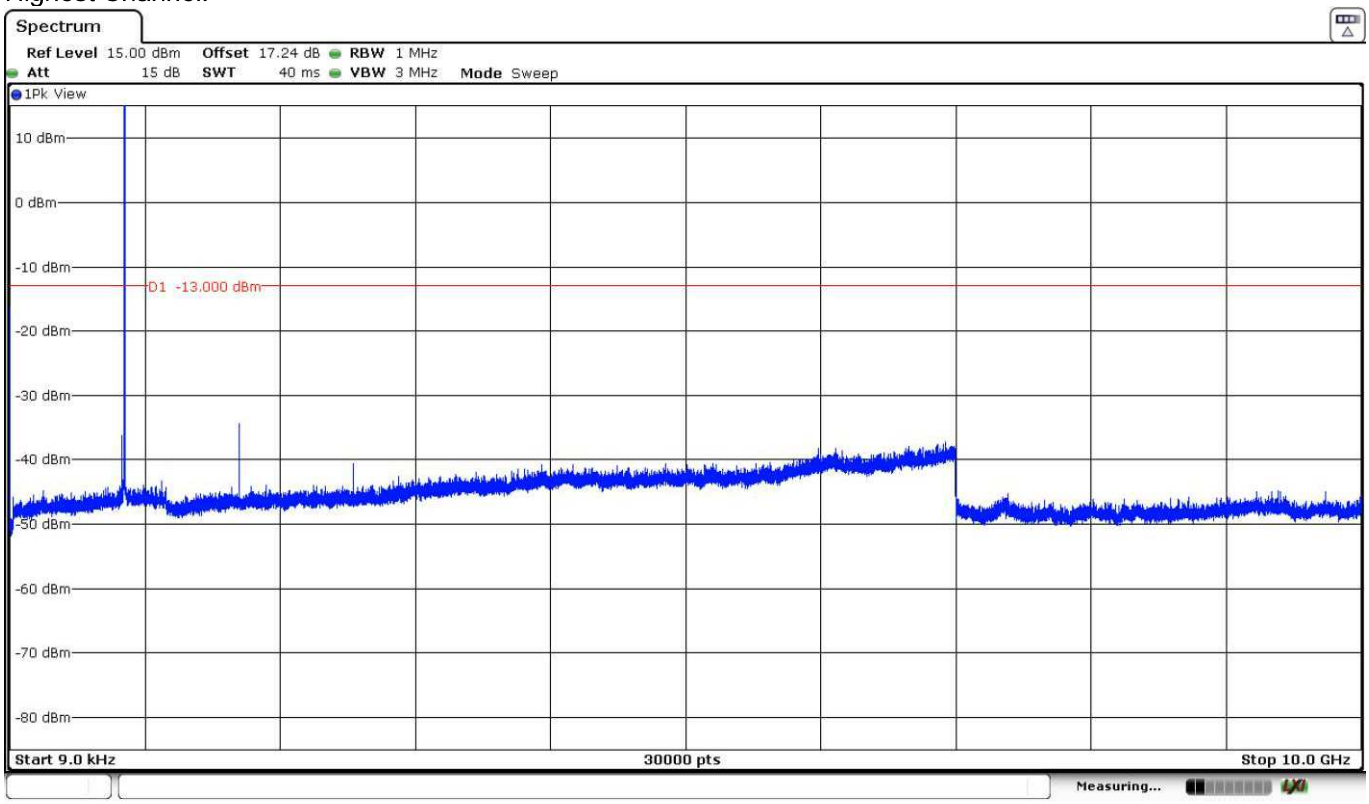
The peak above the limit is the carrier frequency.

Middle Channel:



The peak above the limit is the carrier frequency.

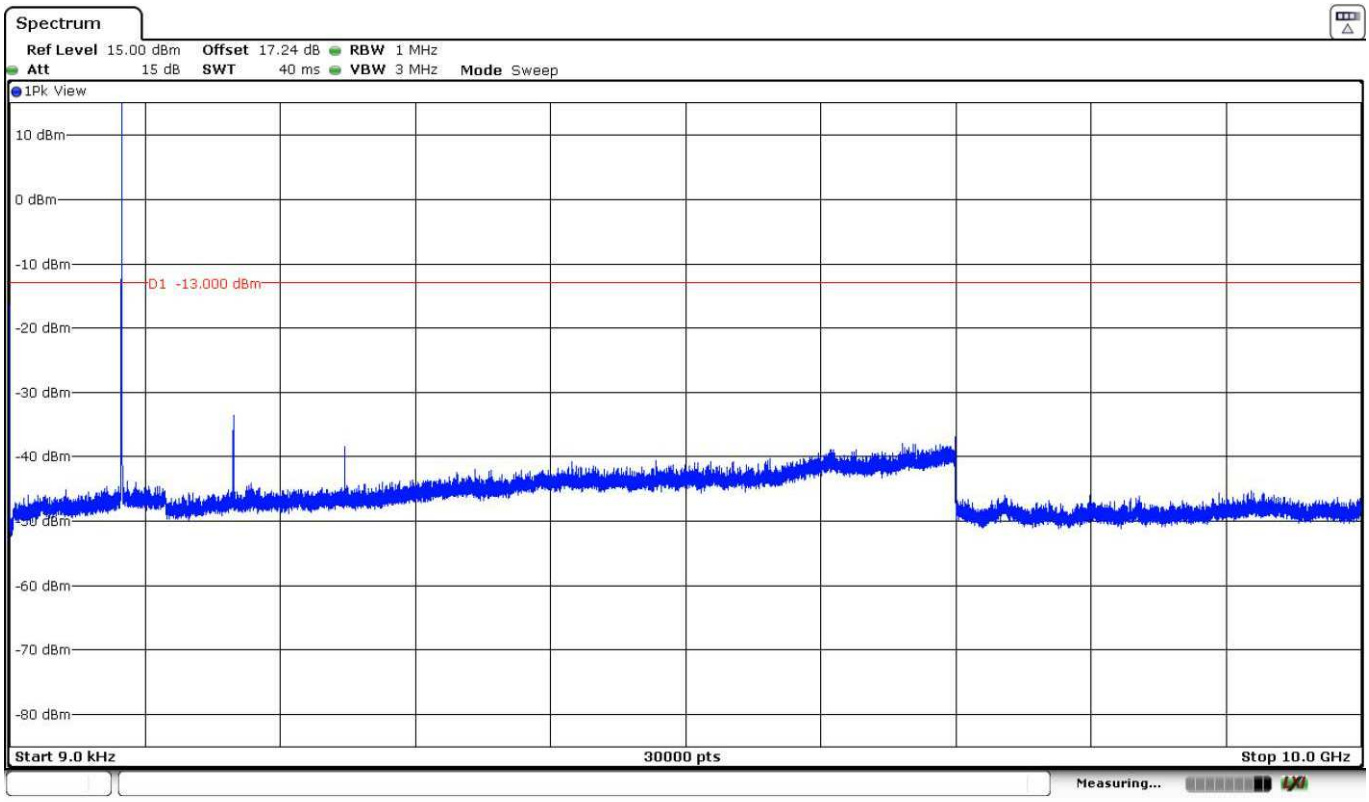
Highest Channel:



The peak above the limit is the carrier frequency.

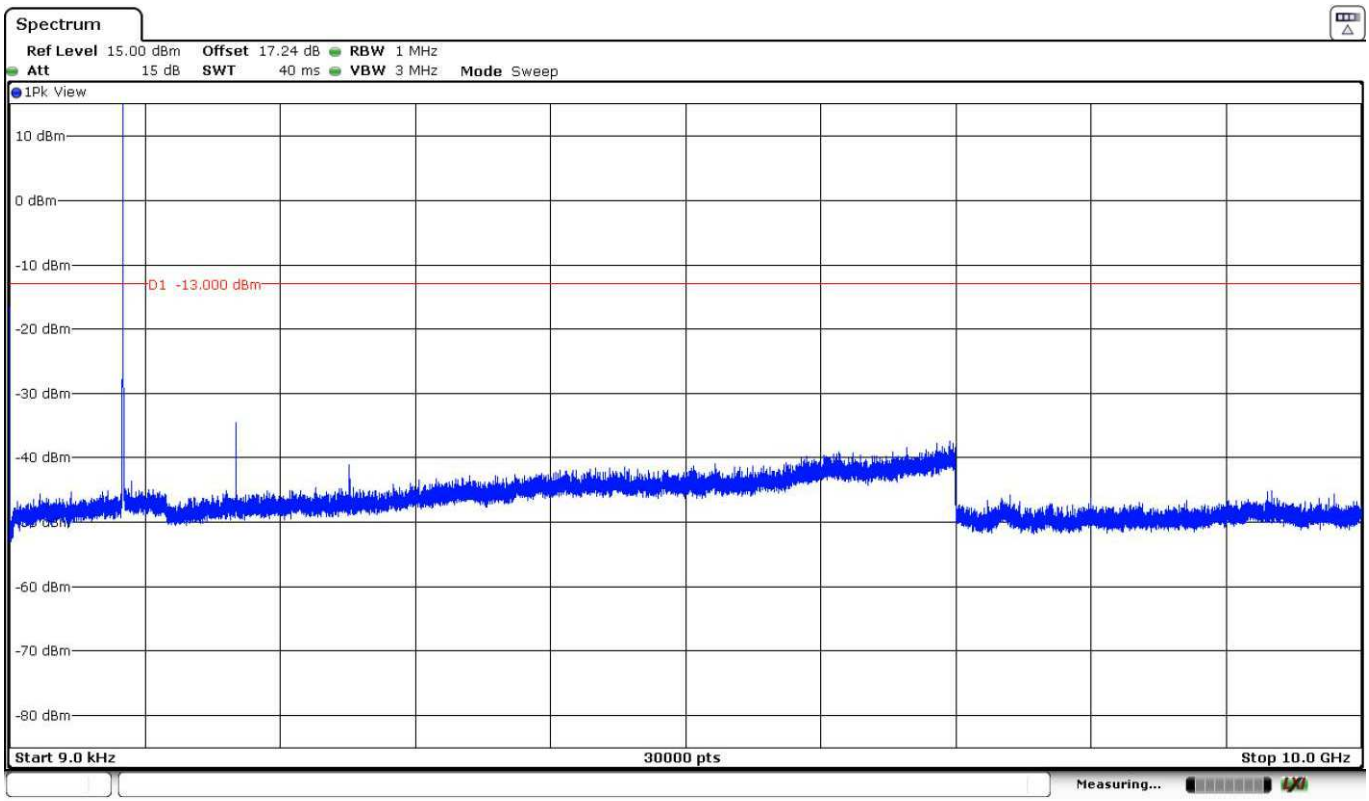
LTE Band 5. BW=3 MHz. QPSK MODULATION.

Lowest Channel:



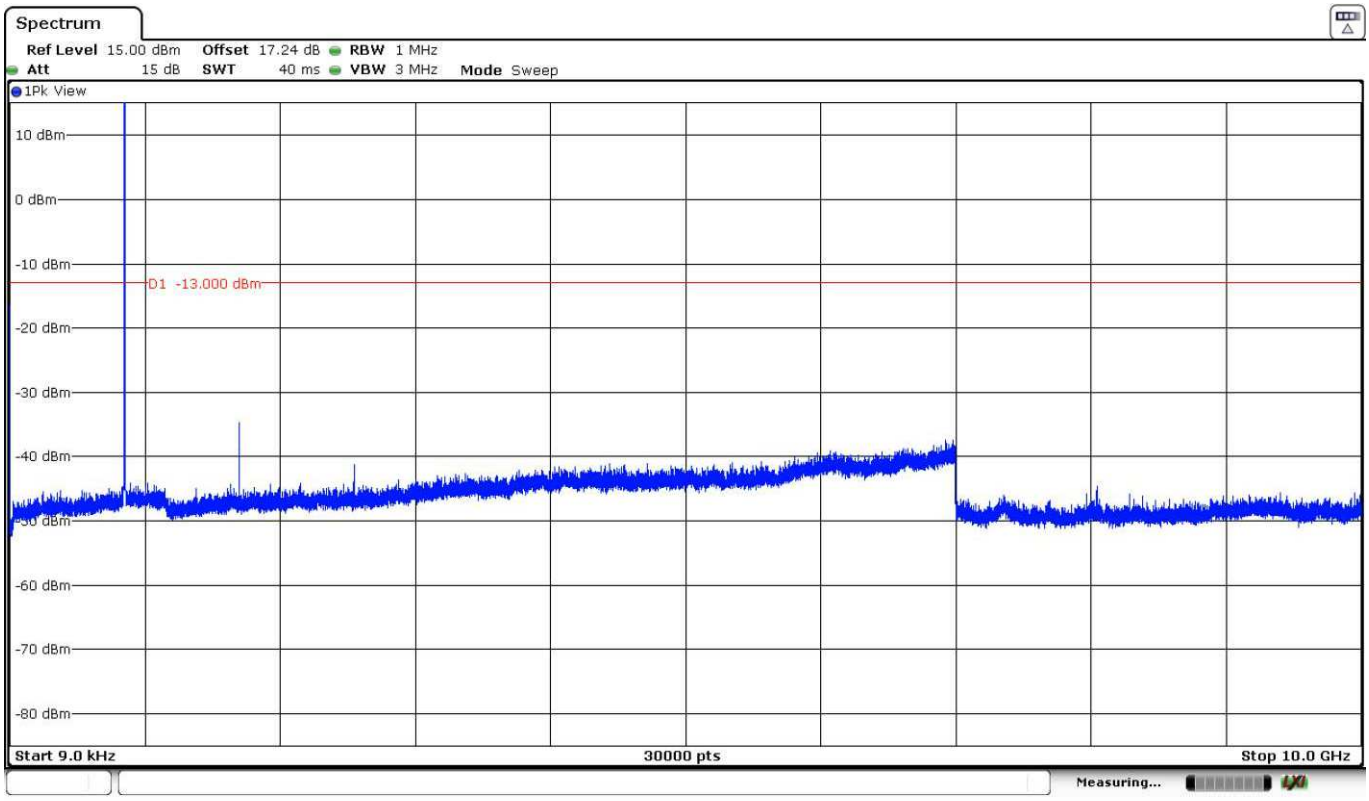
The peak above the limit is the carrier frequency.

Middle Channel:



The peak above the limit is the carrier frequency.

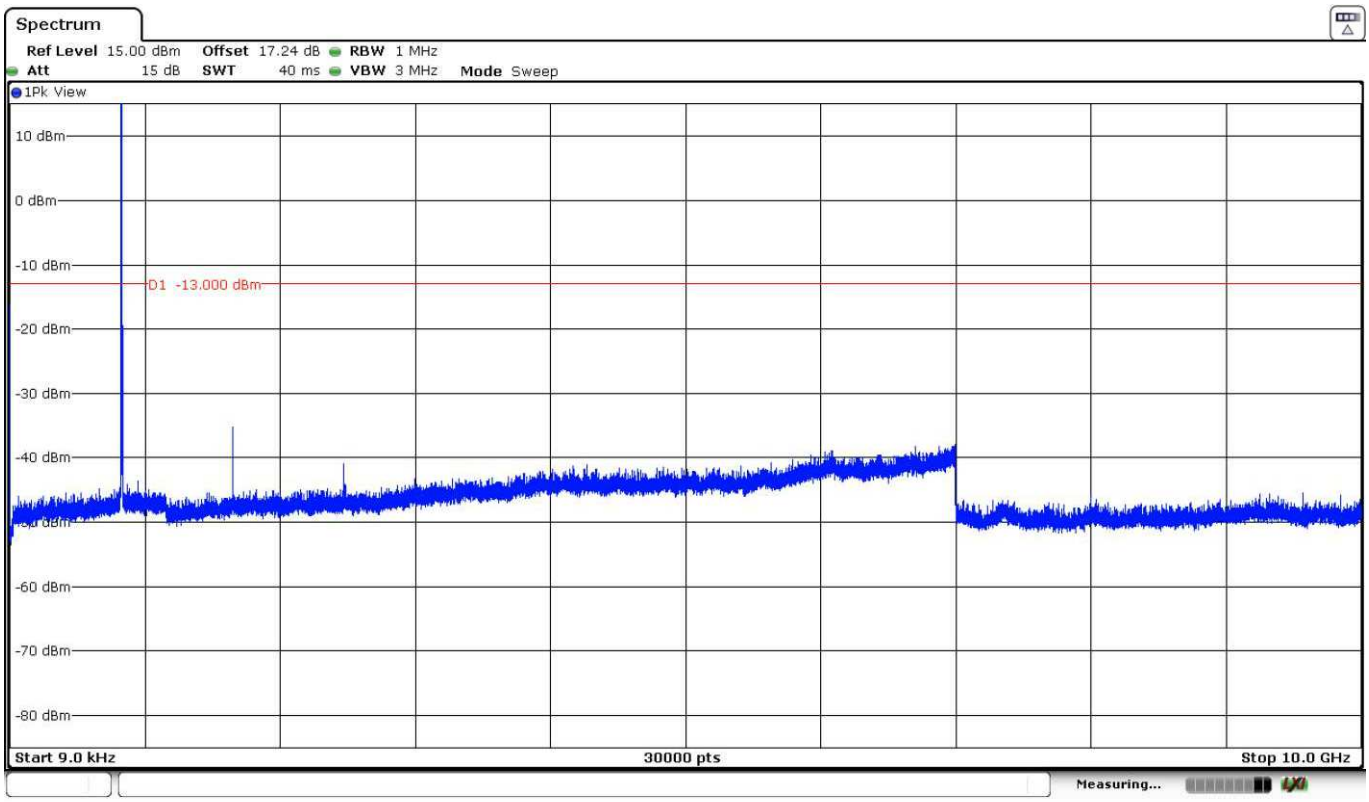
Highest Channel:



The peak above the limit is the carrier frequency.

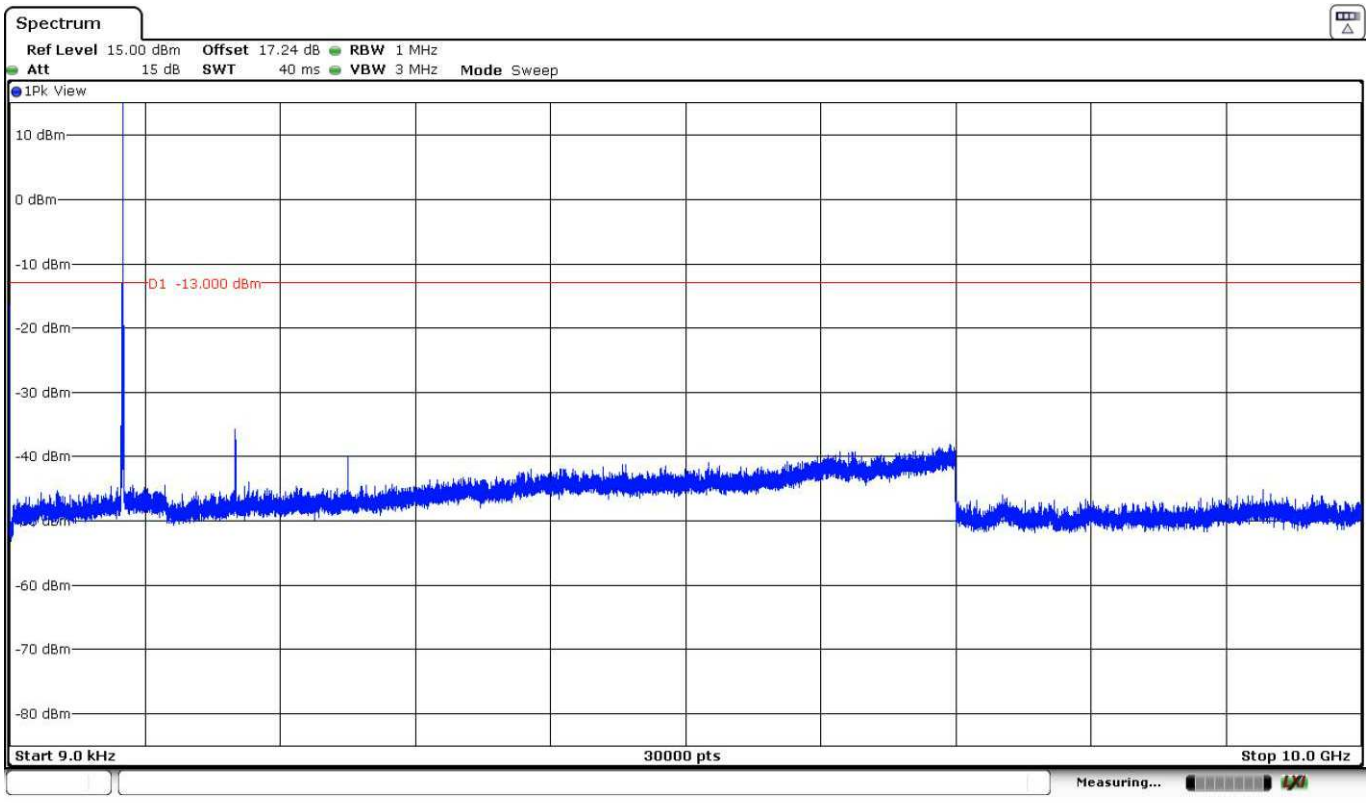
LTE Band 5. BW=5 MHz. QPSK MODULATION.

Lowest Channel:



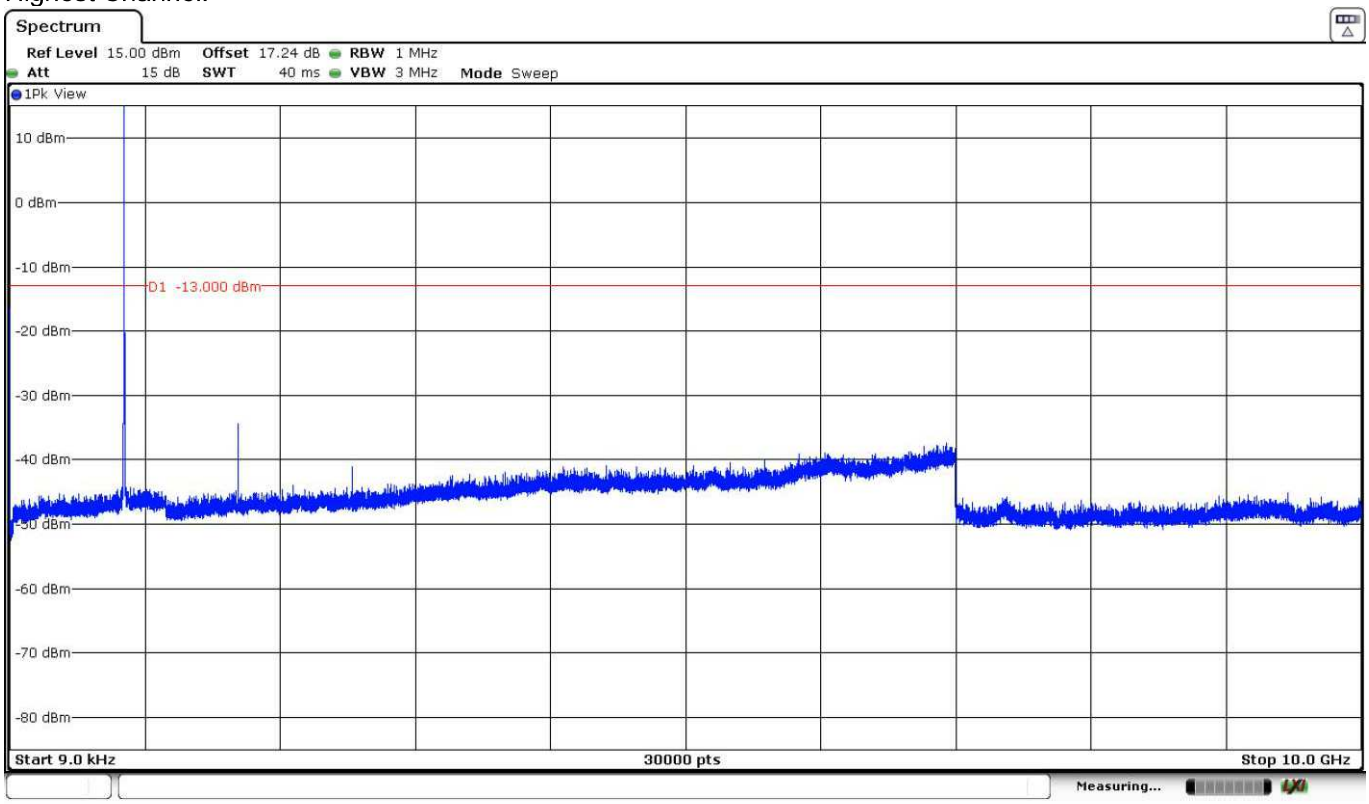
The peak above the limit is the carrier frequency.

Middle Channel:



The peak above the limit is the carrier frequency.

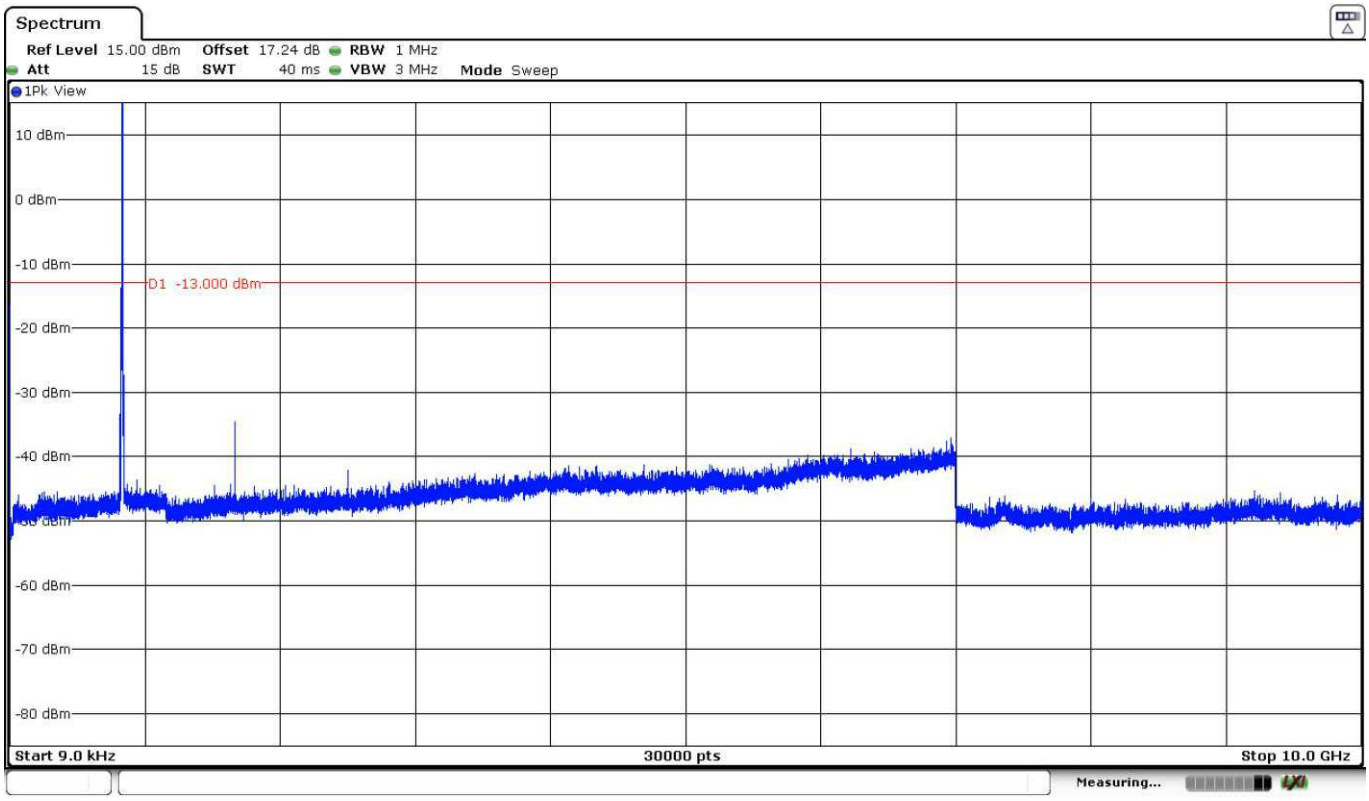
Highest Channel:



The peak above the limit is the carrier frequency.

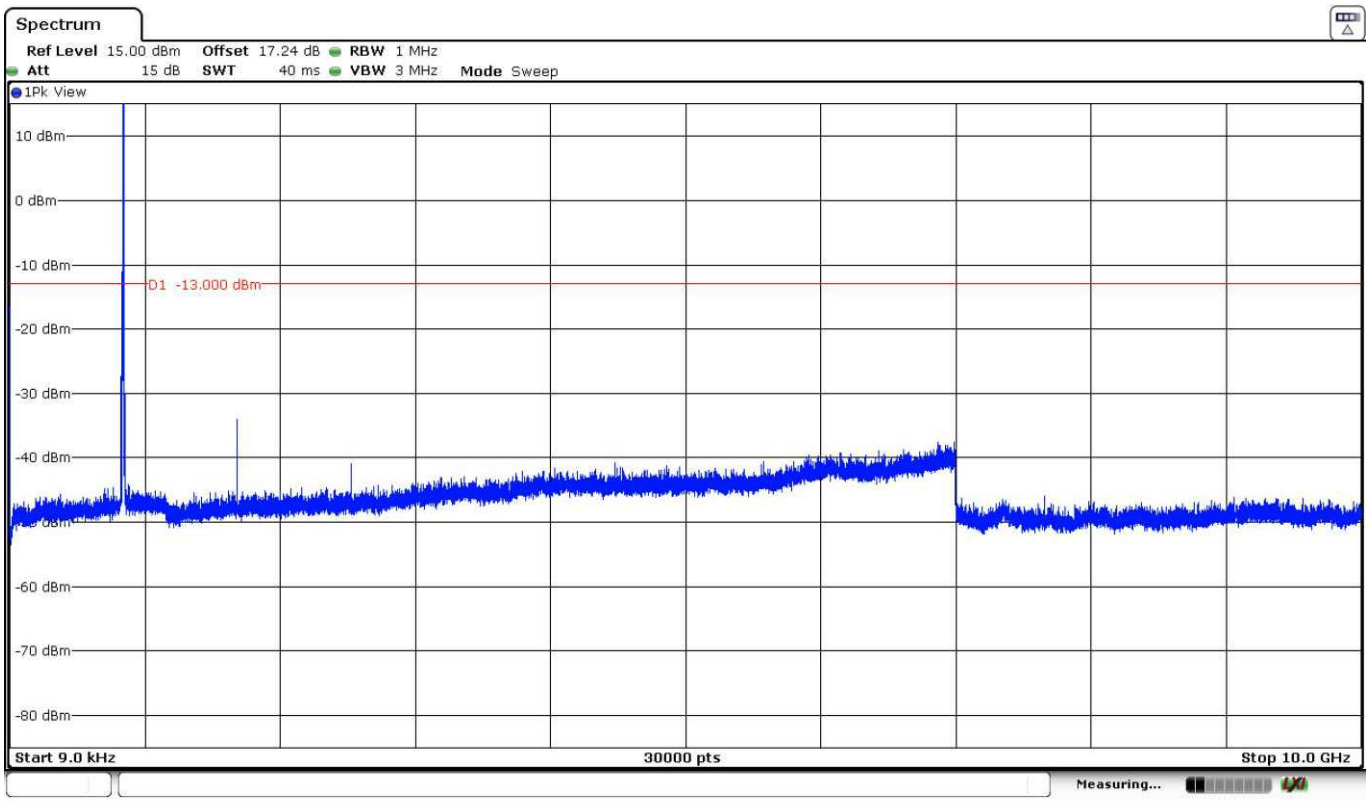
LTE Band 5. BW=10 MHz. QPSK MODULATION.

Lowest Channel:



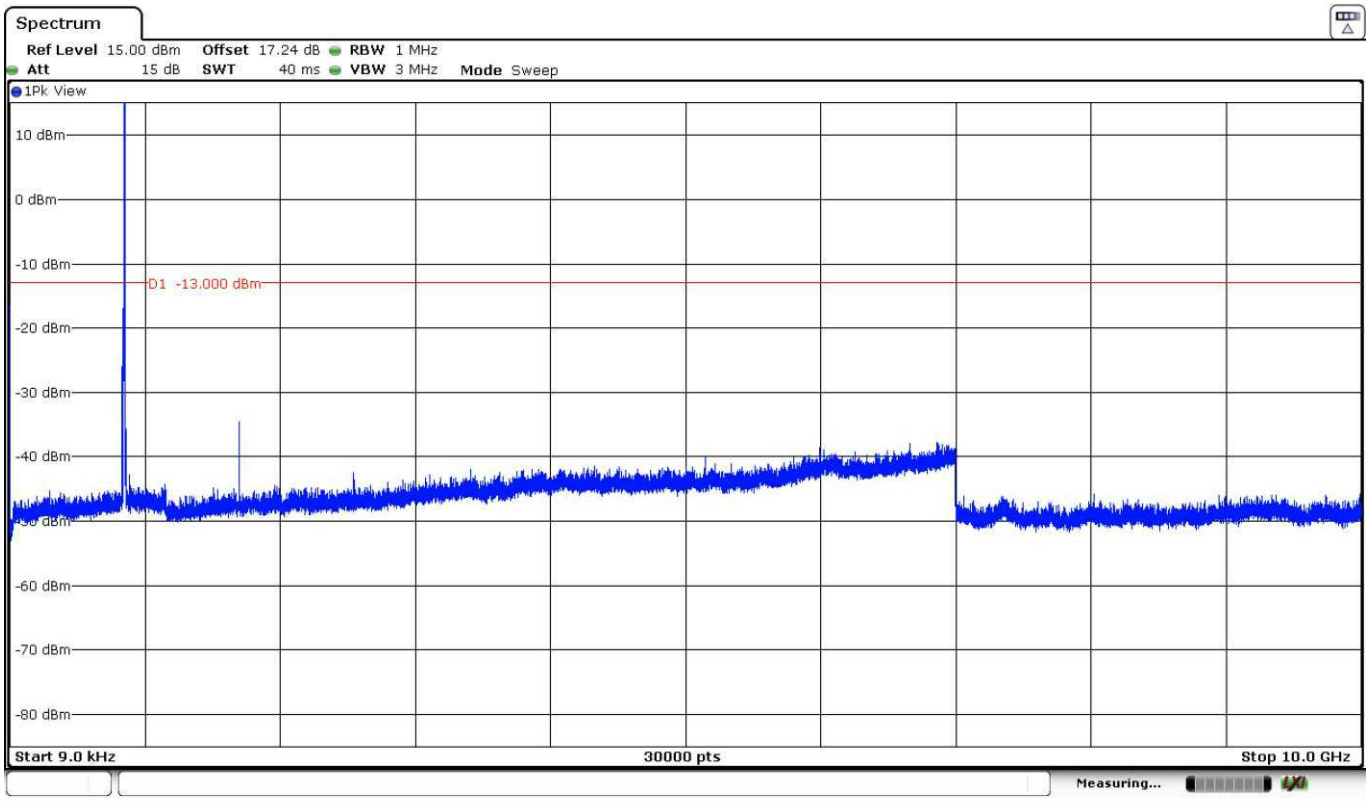
The peak above the limit is the carrier frequency.

Middle Channel:



The peak above the limit is the carrier frequency.

Highest Channel:



The peak above the limit is the carrier frequency.

Spurious emissions at antenna terminals at Block Edges

SPECIFICATION:

FCC §2.1051 and §22.917
RSS-132. Clause 5.5.

The power of emissions shall be attenuated below the transmitter power (P) by a factor of at least 43 + 10 log (P) dB. P in watts.

METHOD:

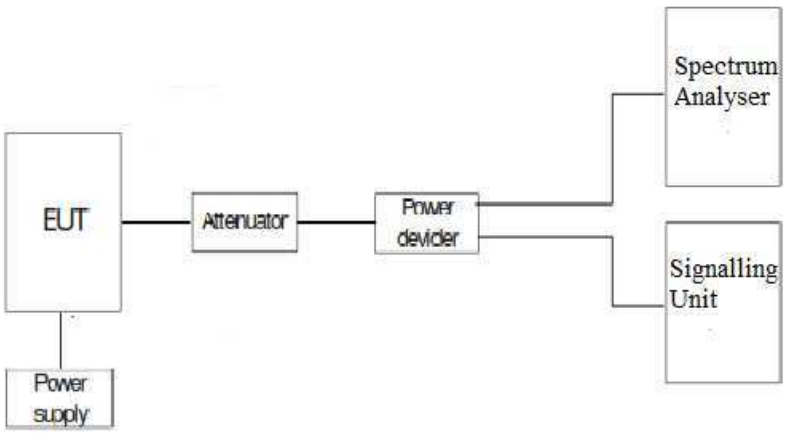
The EUT RF output connector was connected to a spectrum analyser and to the Universal Radio Communication tester R&S CMW500 (selecting maximum transmission power of the EUT and different modes of modulation) using a 50 ohm attenuator and a power splitter.

As indicated in FCC part 22, in the 1 MHz bands immediately outside and adjacent to the frequency block or band a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

Measurement Limit:
According to specification. the power of emissions shall be attenuated below the transmitter power (P) by a factor of at least 43 + 10 log (P) dB. P in watts.
At Po transmitting power. the specified minimum attenuation becomes 43+10log (Po). and the level in dBm relative Po becomes:

Po (dBm) – [43 + 10 log (Po in mwatts) - 30] = - 13 dBm

TEST SETUP:



RESULTS:

2G Band 850 MHz.

2G Band 850 MHz	GPRS	EDGE
Maximum measured level at Lowest Block Edge at antenna port (dBm)	-18.95	-25.22

2G Band 850 MHz	GPRS	EDGE
Maximum measured level at Highest Block Edge at antenna port (dBm)	-21.63	-22.54

3G Band V.

3G Band V	WCDMA	HSUPA
Maximum measured level at Lowest Block Edge at antenna port (dBm)	-27.78	-28.08

3G Band V	WCDMA	HSUPA
Maximum measured level at Highest Block Edge at antenna port (dBm)	-27.94	-28.58

LTE Band 5.

LTE Band 5. QPSK MODULATION.	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 Lowest Block Edge at antenna port (dBm)	-22.66	-19.55	-20.7	-30.03

LTE Band 5. QPSK MODULATION.	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 Lowest Block Edge at antenna port (dBm)	-25.45	-24.33	-24.6	-26.27

LTE Band 5. QPSK MODULATION.	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 Highest Block Edge at antenna port (dBm)	-23.6	-19.41	-21.78	-30.72

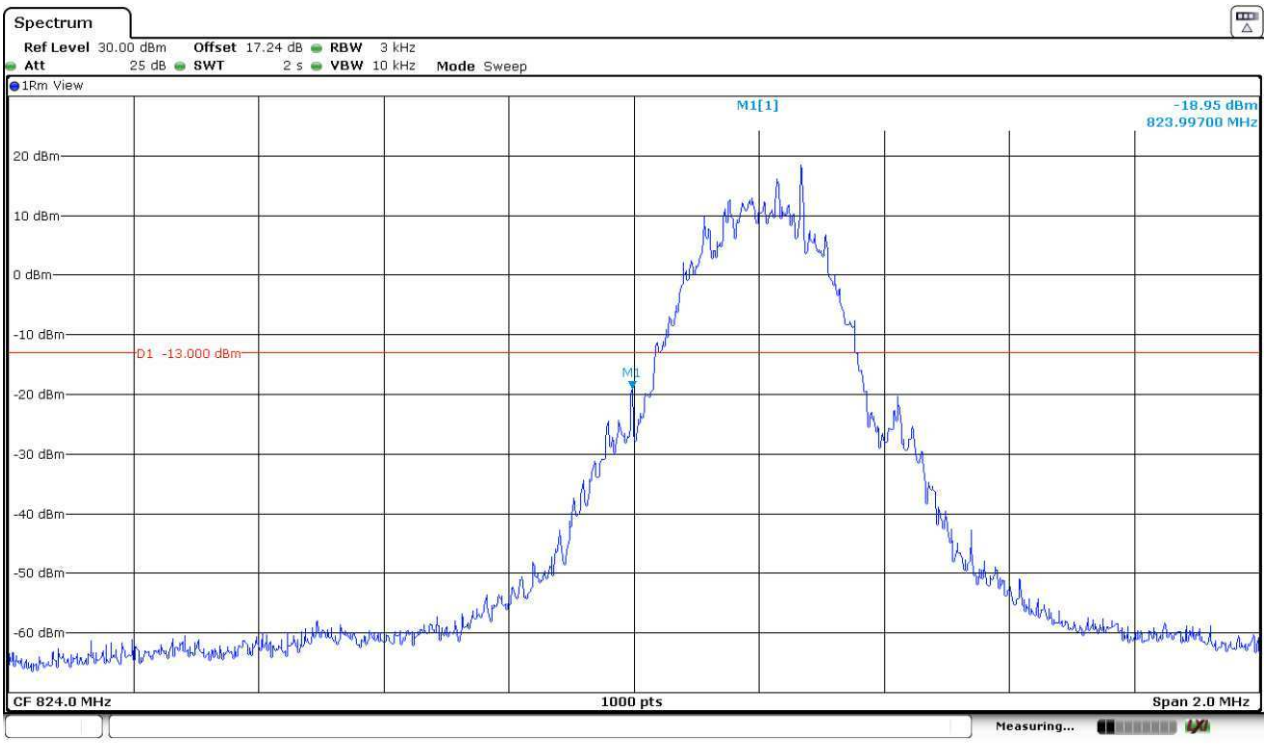
LTE Band 5. QPSK MODULATION.	RB=All. Offset=0. BW=1.4 MHz	RB=All. Offset=0. BW = 3 MHz	RB=All. Offset=0. BW=5 MHz	RB=All. Offset=0. BW=10 MHz
Maximum measured level at Highest Block Edge at antenna port (dBm)	-25.38	-24.81	-24.78	-25.05

Measurement uncertainty: <± 1.57 dB

Verdict: PASS

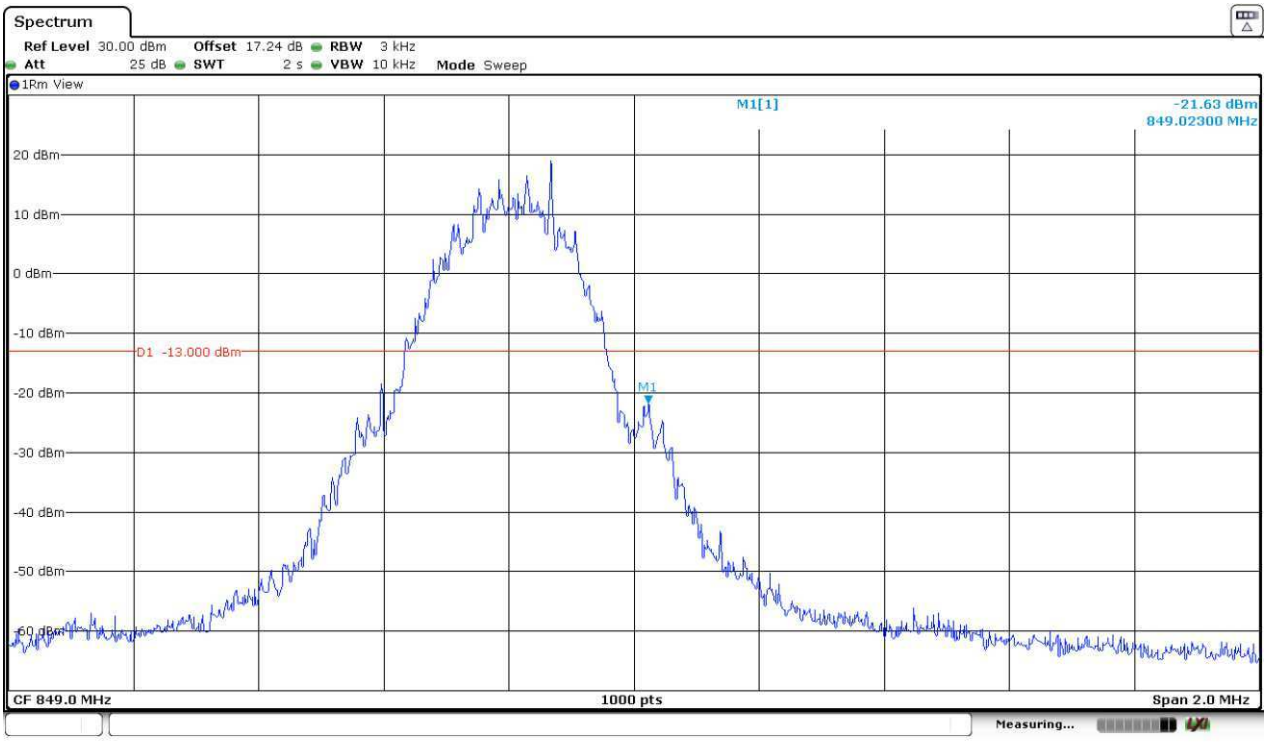
2G Band 850 MHz. GPRS MODULATION.

Lowest Channel:



The equipment transmits at the maximum output power

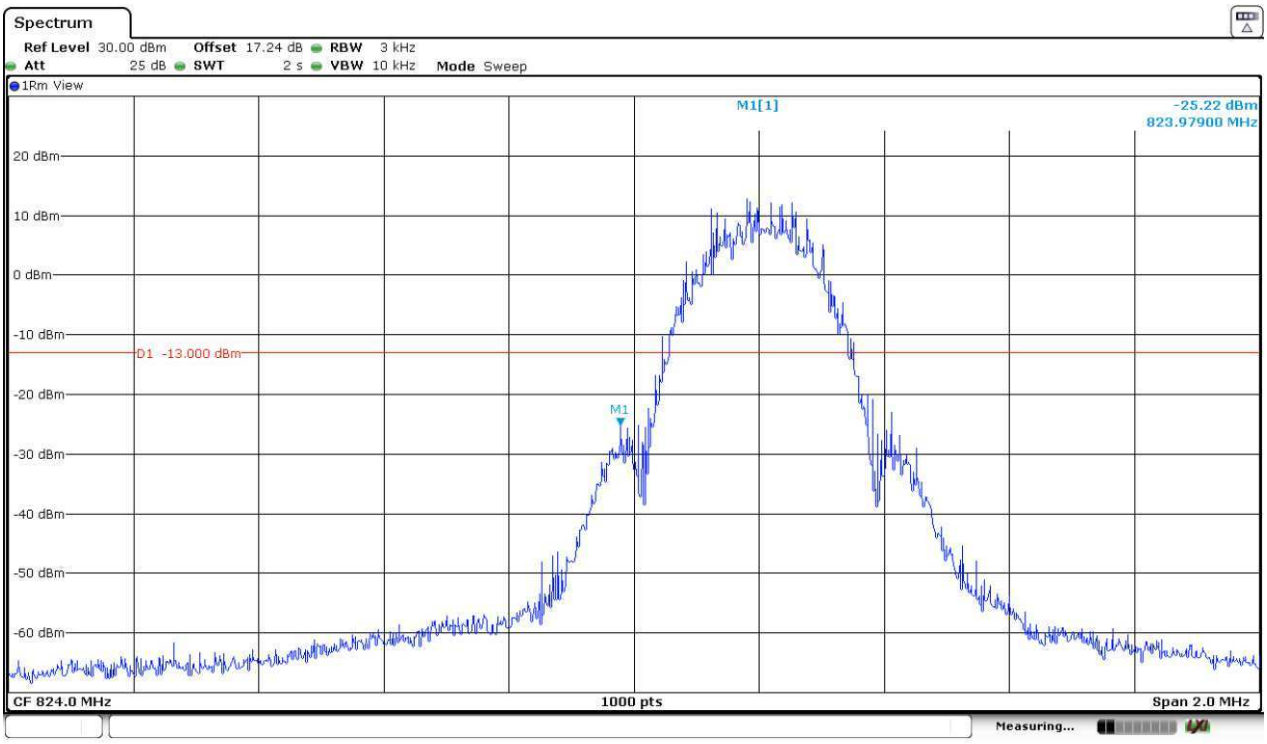
Highest Channel:



The equipment transmits at the maximum output power

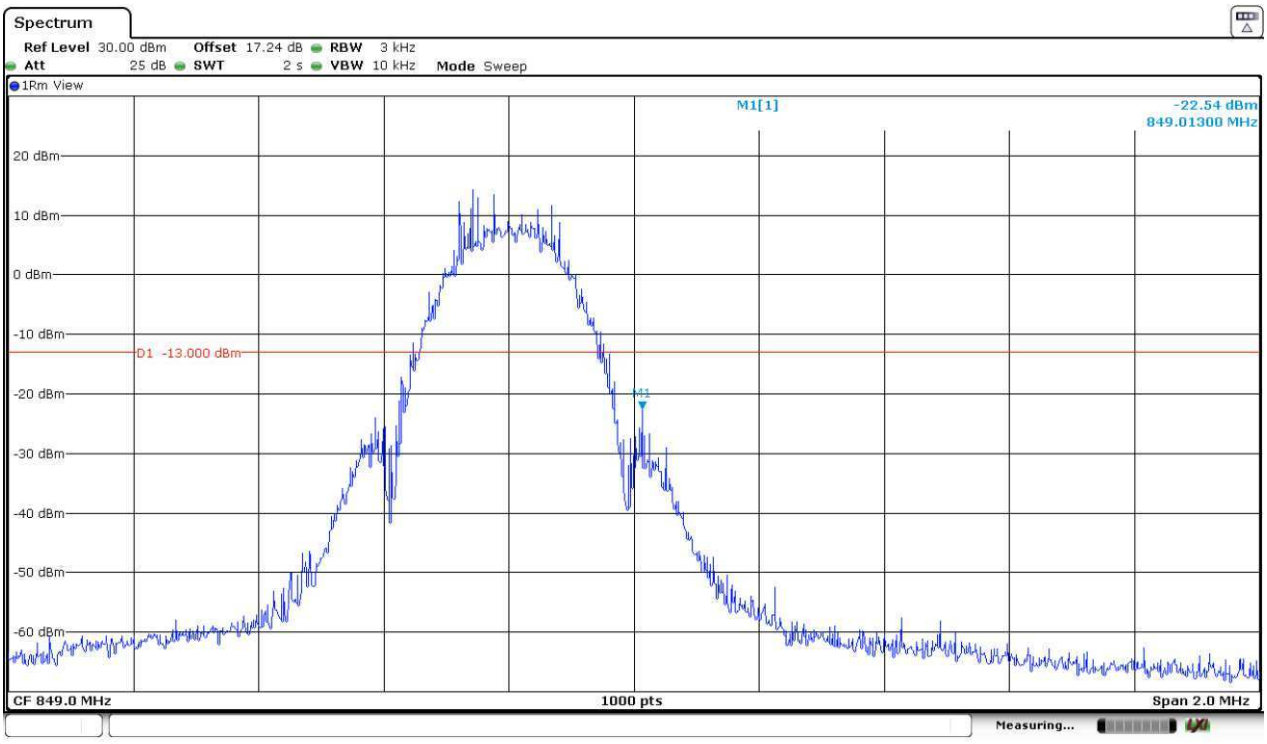
2G Band 850 MHz. EDGE MODULATION.

Lowest Channel:



The equipment transmits at the maximum output power

Highest Channel:



The equipment transmits at the maximum output power