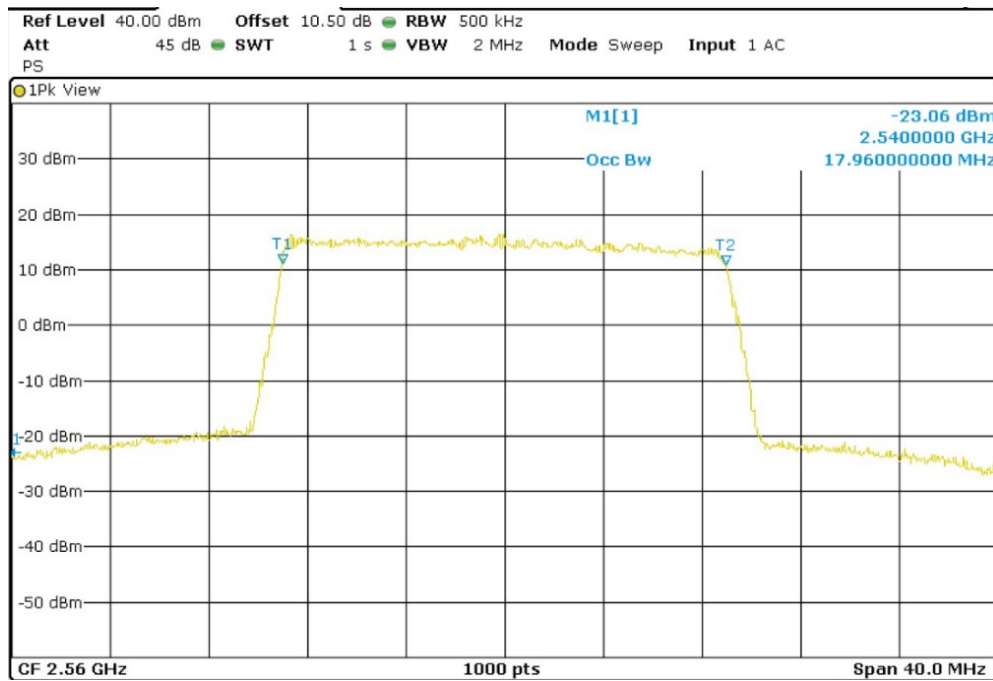
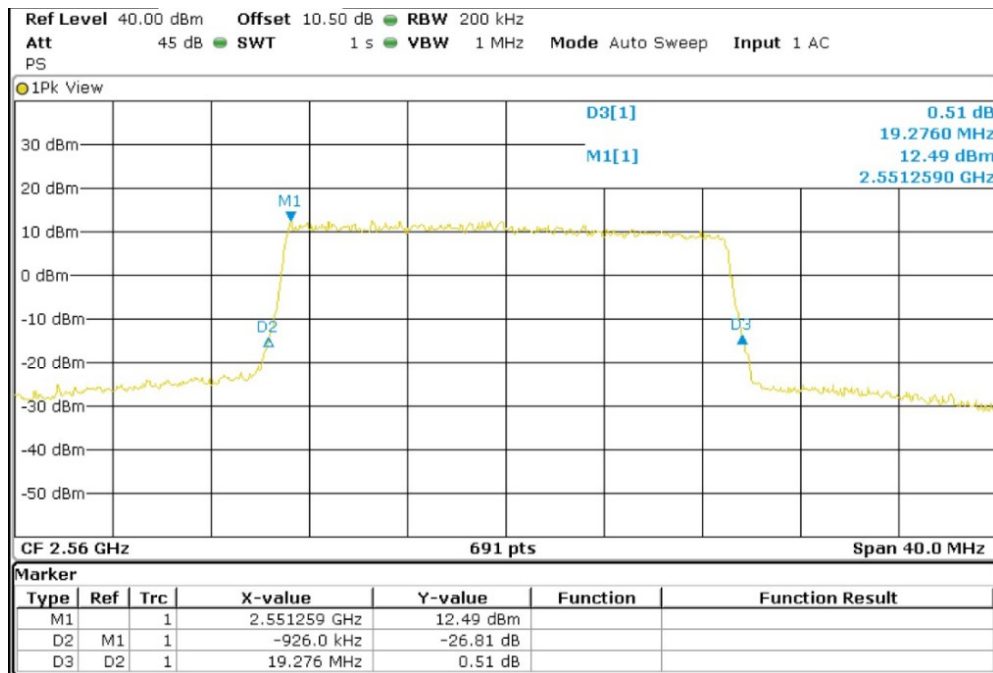


## TEST RESULTS (Cont):

### Highest Channel 99% Occupied Bandwidth



### Highest Channel 26dBc Bandwidth kHz



## TEST A.5: SPURIOUS EMISSIONS AT ANTENNA TERMINALS

<b>LIMITS:</b>	Product standard:	FCC Part 27 / IC RSS-199
	Test standard:	FCC §2.1051 and § 27.53 / RSS-199 Clause 4.5

### LIMITS

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  $P_o$  transmitting power of 2 watts (33 dBm), the specified minimum attenuation becomes  $43+10\log (P_o)$ . and the level in dBm relative to  $P_o$  becomes:

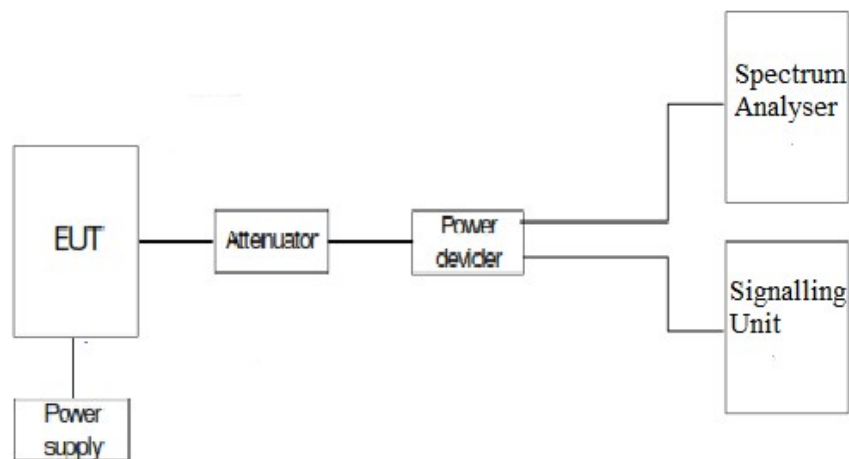
$$P_o \text{ (dBm)} - [43 + 10 \log (P_o \text{ in watts})] = -13 \text{ dBm}$$

### TEST SETUP

The EUT RF output connector was connected to a spectrum analyzer 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 analyzer is corrected with the attenuation loss of connection between output terminal of EUT and input of the spectrum analyzer.

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

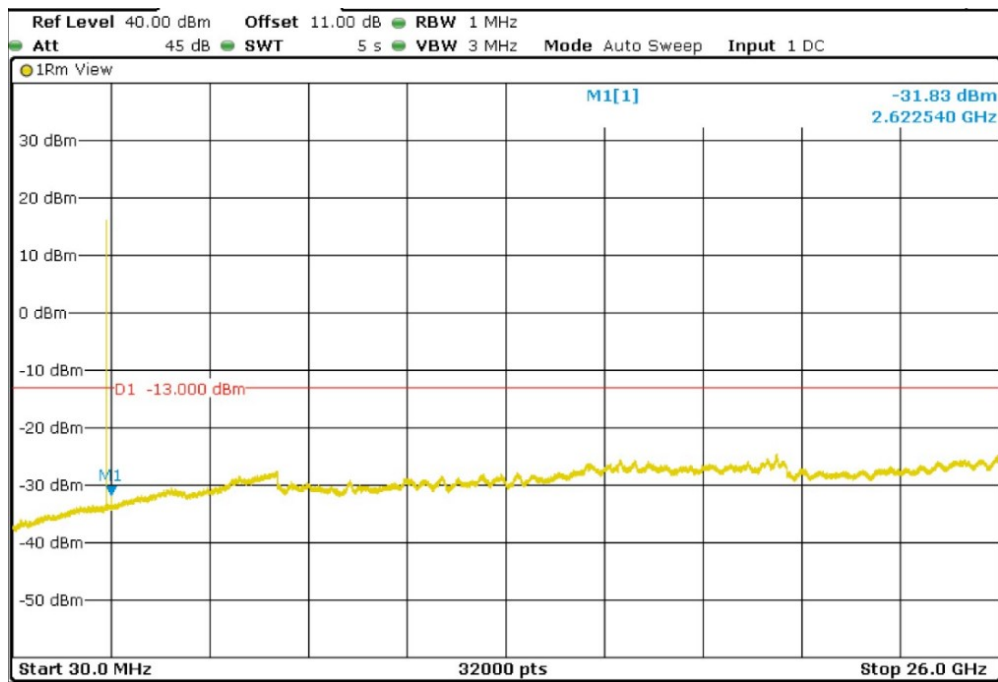


<b>TESTED SAMPLES:</b>	S/01
<b>TESTED CONDITIONS MODES:</b>	TC#01
<b>TEST RESULTS:</b>	PASS
<p><u>Frequency range 30 MHz – 26 GHz</u></p> <p>LTE QPSK MODULATION. BW = 5 MHz</p> <p>Lowest Channel The spurious signals were detected more than 10 dB below the limit in the frequency range.</p> <p>Middle Channel The spurious signals were detected more than 10 dB below the limit in the frequency range.</p> <p>Highest Channel The spurious signals were detected more than 10 dB below the limit in the frequency range.</p> <p>LTE QPSK MODULATION. BW = 10 MHz</p> <p>Lowest Channel The spurious signals were detected more than 10 dB below the limit in the frequency range.</p> <p>Middle Channel The spurious signals were detected more than 10 dB below the limit in the frequency range.</p> <p>Highest Channel The spurious signals were detected more than 10 dB below the limit in the frequency range.</p> <p>LTE QPSK MODULATION. BW = 15 MHz</p> <p>Lowest Channel The spurious signals were detected more than 10 dB below the limit in the frequency range.</p> <p>Middle Channel The spurious signals were detected more than 10 dB below the limit in the frequency range.</p> <p>Highest Channel The spurious signals were detected more than 10 dB below the limit in the frequency range.</p> <p>LTE QPSK MODULATION. BW = 20 MHz</p> <p>Lowest Channel The spurious signals were detected more than 10 dB below the limit in the frequency range.</p> <p>Middle Channel The spurious signals were detected more than 10 dB below the limit in the frequency range.</p> <p>Highest Channel The spurious signals were detected more than 10 dB below the limit in the frequency range.</p>	

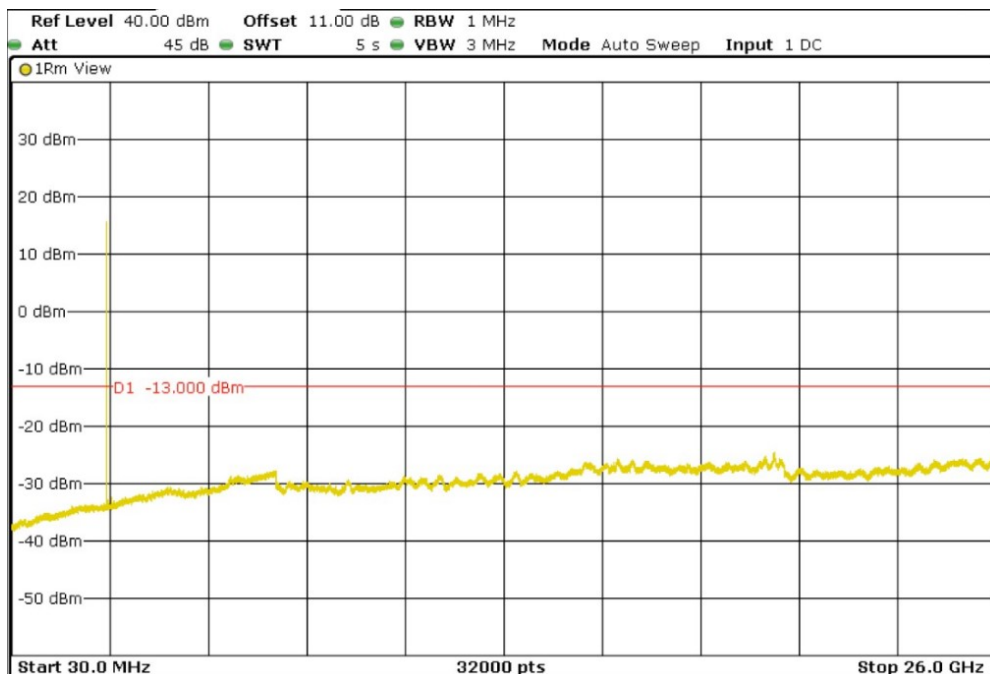
## TEST RESULTS (Cont.):

LTE QPSK MODULATION. BW = 5MHz

Lowest Channel

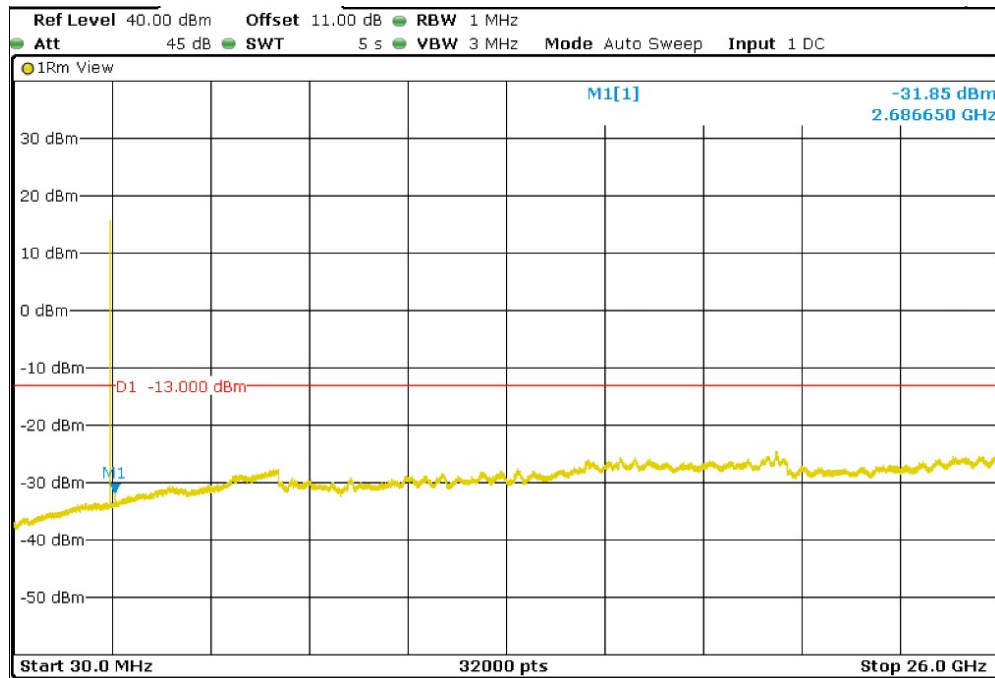


Middle Channel



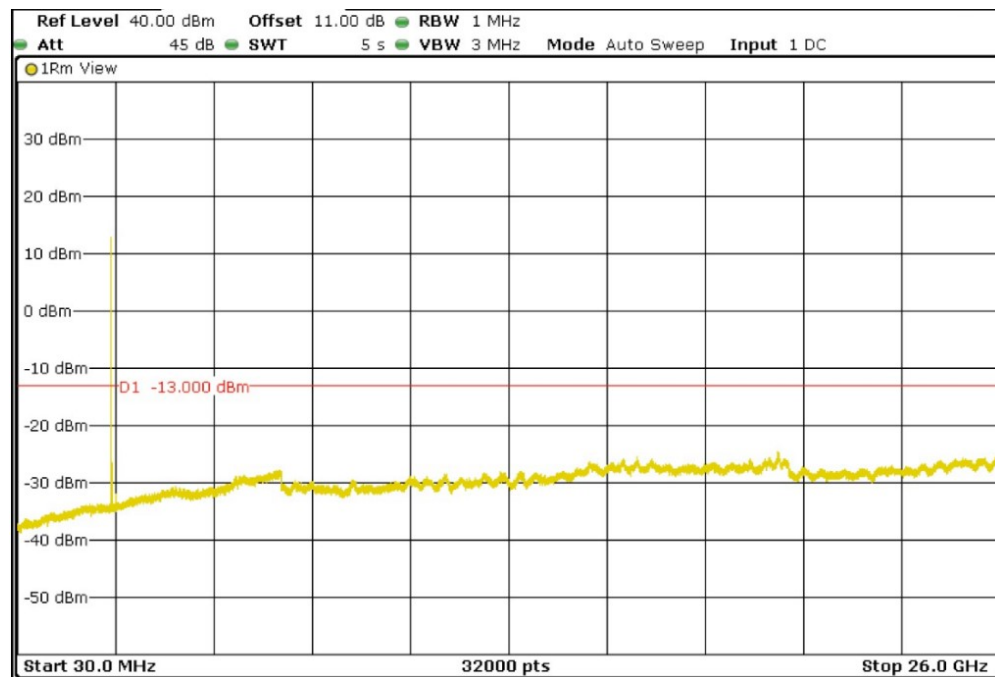
## TEST RESULTS (Cont):

Highest Channel



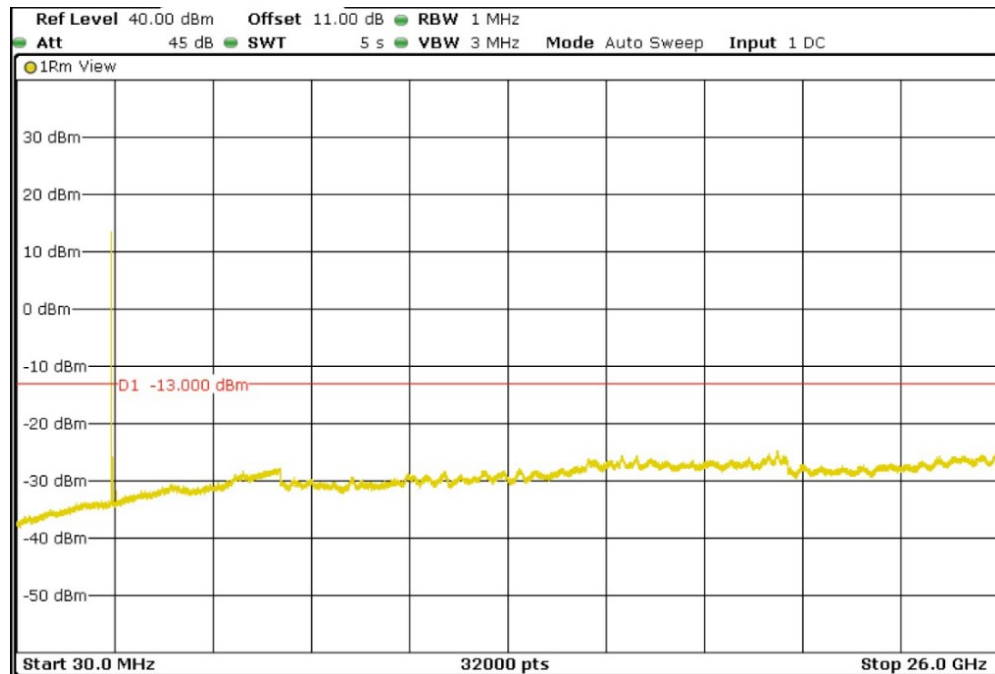
LTE QPSK MODULATION. BW = 10 MHz

Lowest Channel

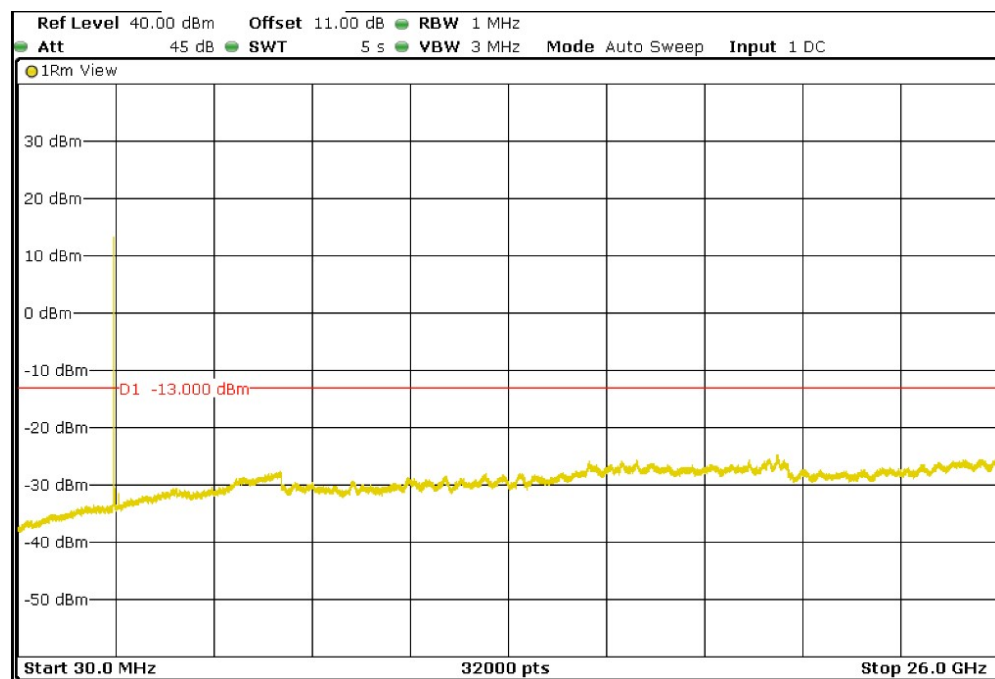


**TEST RESULTS (Cont):**

**Middle Channel**



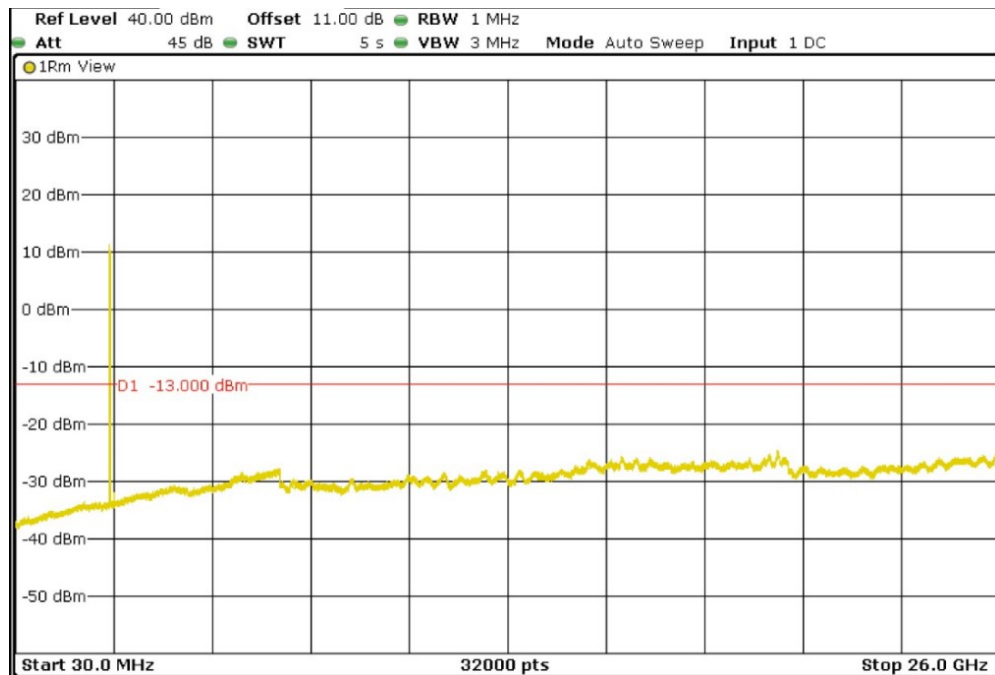
**Highest Channel**



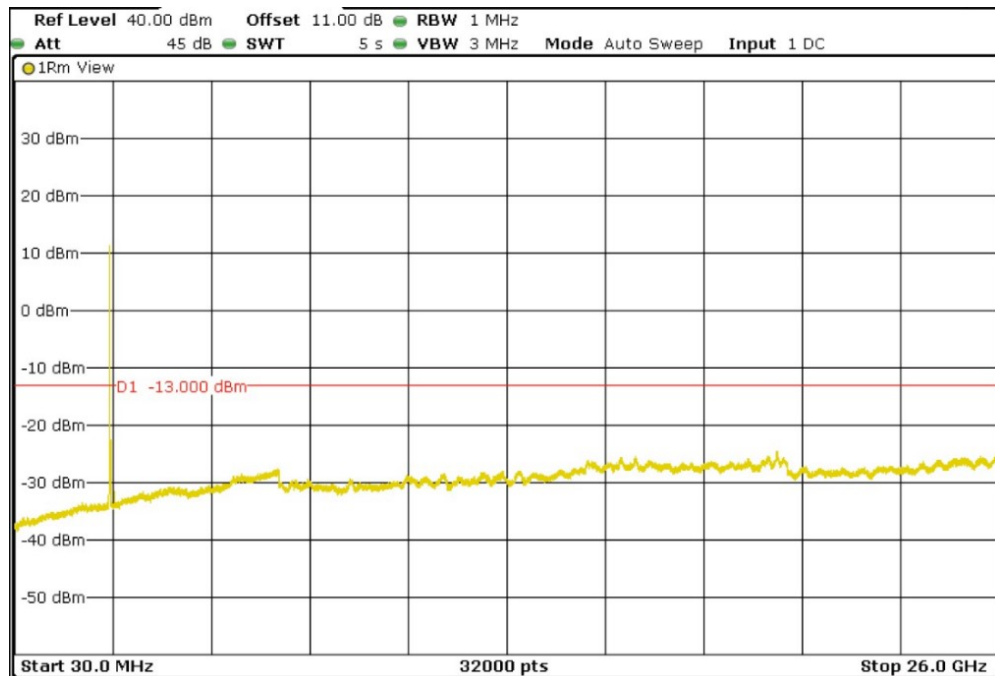
## TEST RESULTS (Cont):

LTE QPSK MODULATION. BW = 15 MHz

Lowest Channel

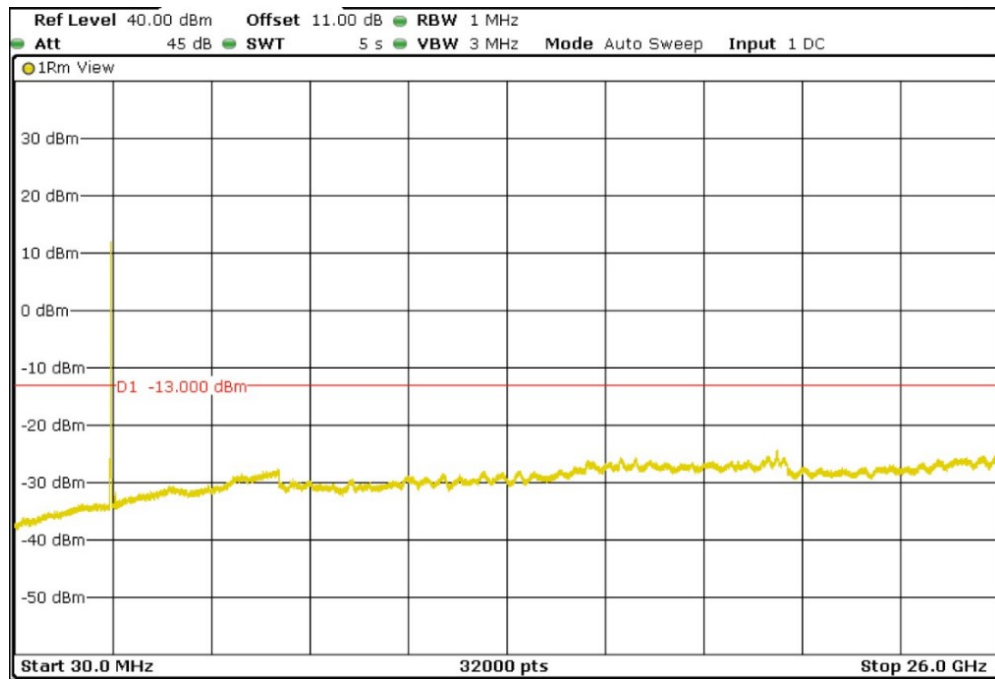


Middle Channel



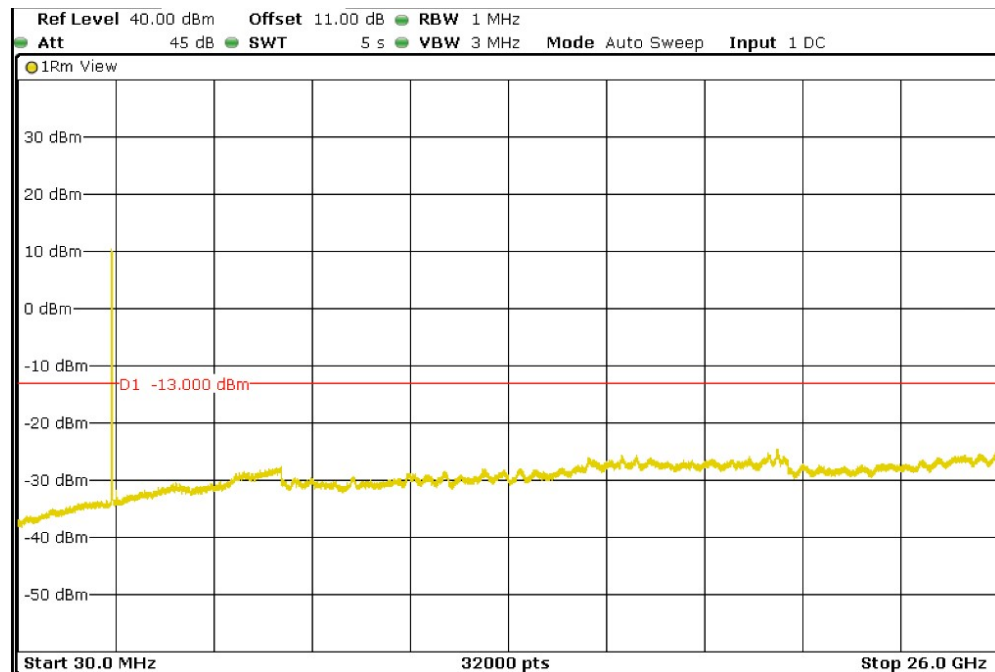
**TEST RESULTS (Cont):**

Highest Channel



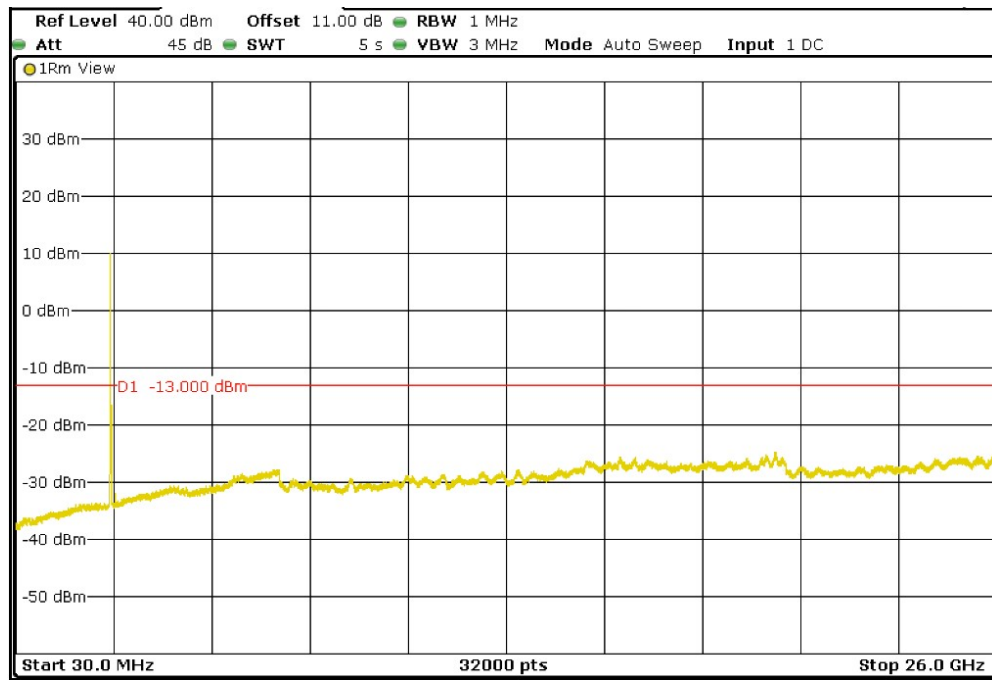
LTE QPSK MODULATION. BW = 20 MHz

Lowest Channel

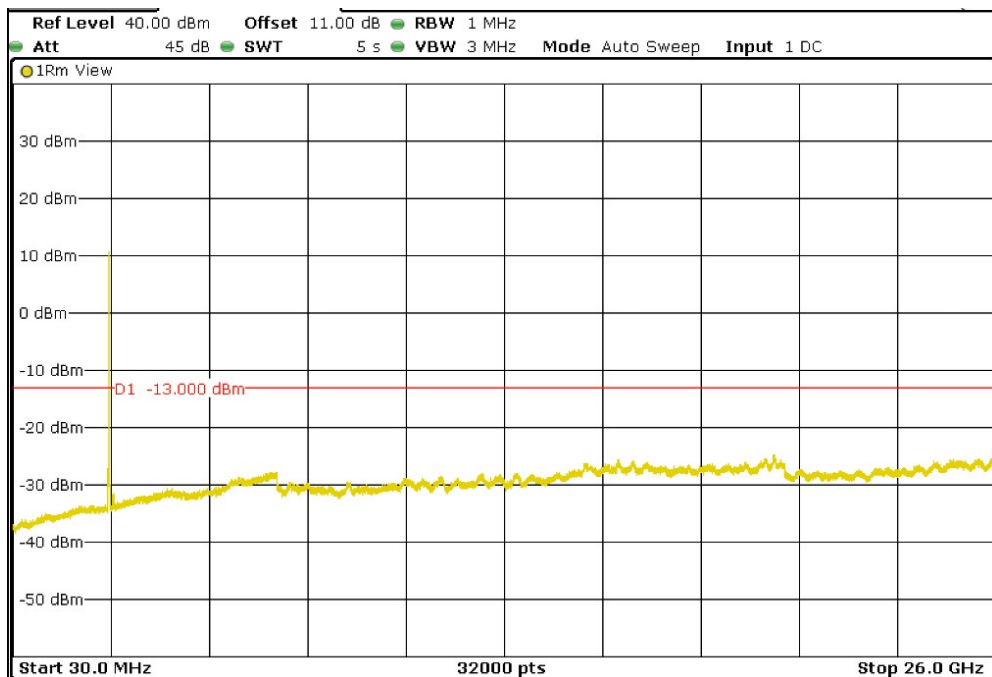


## TEST RESULTS (Cont):

### Middle Channel



### Highest Channel



## TEST A.6: SPURIOUS EMISSIONS AT ANTENNA TERMINALS AT BLOCK EDGES

<b>LIMITS:</b>	Product standard:	FCC Part 27 / IC RSS-199
	Test standard:	FCC § 27.53 / RSS- Clause 4.5

### LIMITS

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  $P_o$  transmitting power of 2 watts (33 dBm), the specified minimum attenuation becomes  $43+10\log (P_o)$ . and the level in dBm relative to  $P_o$  becomes:

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

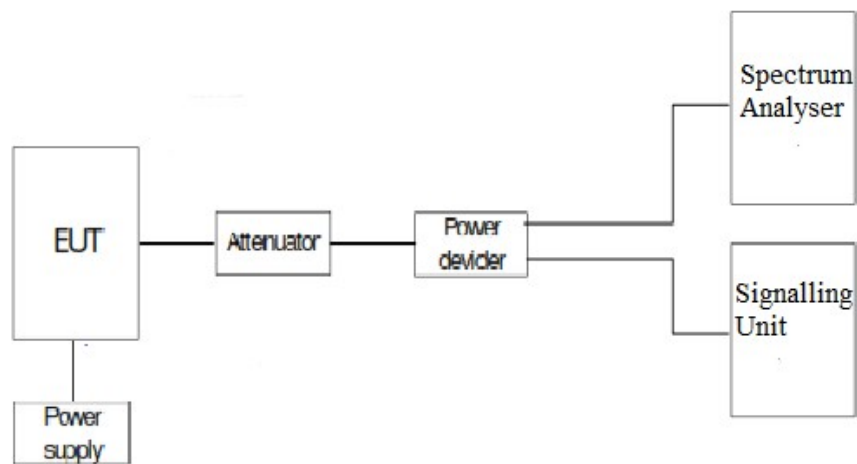
### TEST SETUP

The EUT RF output connector was connected to a spectrum analyzer 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 analyzer is corrected with the attenuation loss of connection between output terminal of EUT and input of the spectrum analyzer.

For LTE mode the configuration of modulation which is the worst case for conducted power was used.

As indicated in FCC part 27.53 (h) (3), in the 1 MHz bands immediately outside and adjacent to the licensee's 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.



<b>TESTED SAMPLES:</b>	S/01
<b>TESTED CONDITIONS MODES:</b>	TC#01
<b>TEST RESULTS:</b>	PASS

## RESULTS

LTE QPSK MODULATION	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 lowest Block Edge at antenna port (dBm)	-20.94	-32.65	-23.07	-21.32

LTE QPSK MODULATION	RB=25 Offset =0 BW = 5 MHz	RB=50 Offset =0 BW = 10 MHz	RB=75 Offset =0 BW = 15 MHz	RB=100 Offset =0 BW = 20 MHz
Maximum measured level at lowest Block Edge at antenna port (dBm)	-26.19	-31.71	-23.91	-22.7

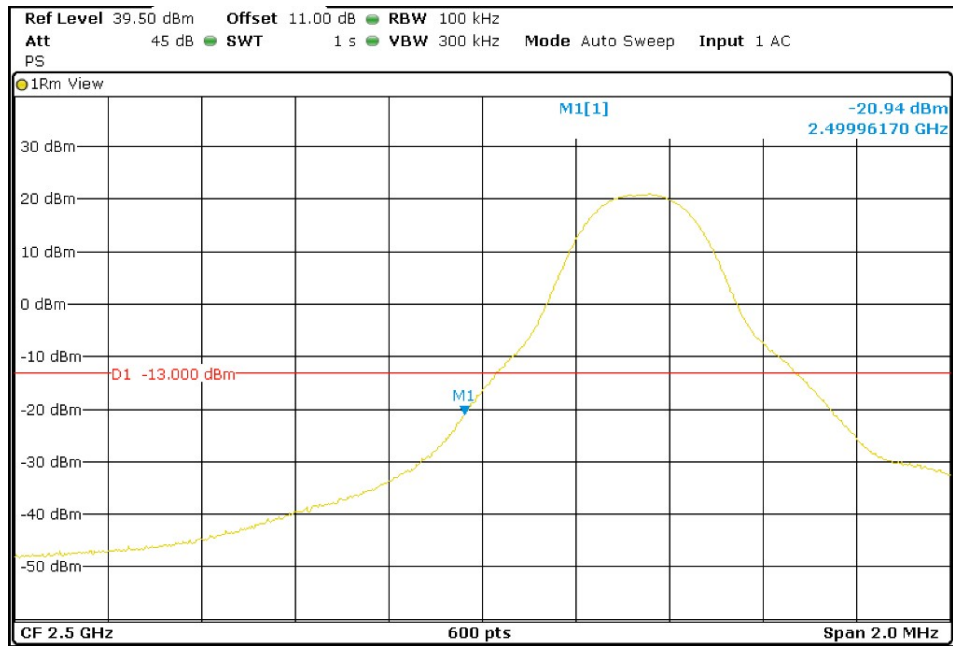
LTE QPSK MODULATION	RB=1 Offset =0 BW = 5 MHz	RB=1 Offset =0 BW = 10 MHz	RB=1 Offset =0 BW = 15 MHz	RB=1 Offset =0 BW = 20 MHz
Maximum measured level at Highest Block Edge at antenna port (dBm)	-29.15	-33.12	-29.73	-33.09

LTE QPSK MODULATION	RB=25 Offset =0 BW = 5 MHz	RB=50 Offset =0 BW = 10 MHz	RB=75 Offset =0 BW = 15 MHz	RB=100 Offset =0 BW = 20 MHz
Maximum measured level at Highest Block Edge at antenna port (dBm)	-28.95	-31.45	-30.32	-31.93

## TEST RESULTS (Cont):

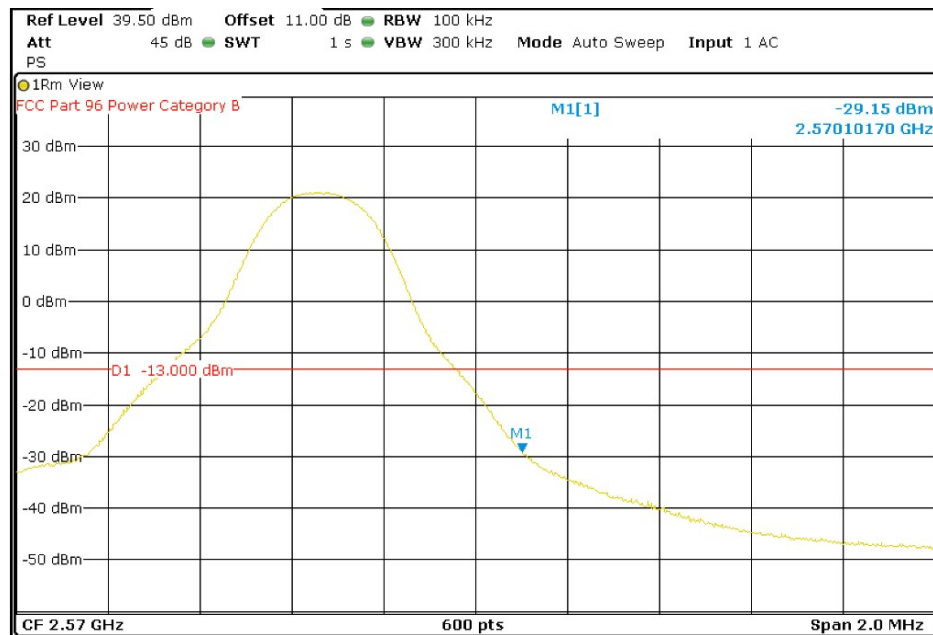
LTE QPSK MODULATION. RB = 1. Offset = 0. BW = 5 MHz

Lowest Channel



LTE QPSK MODULATION. RB = 1. Offset = Max. BW = 5 MHz

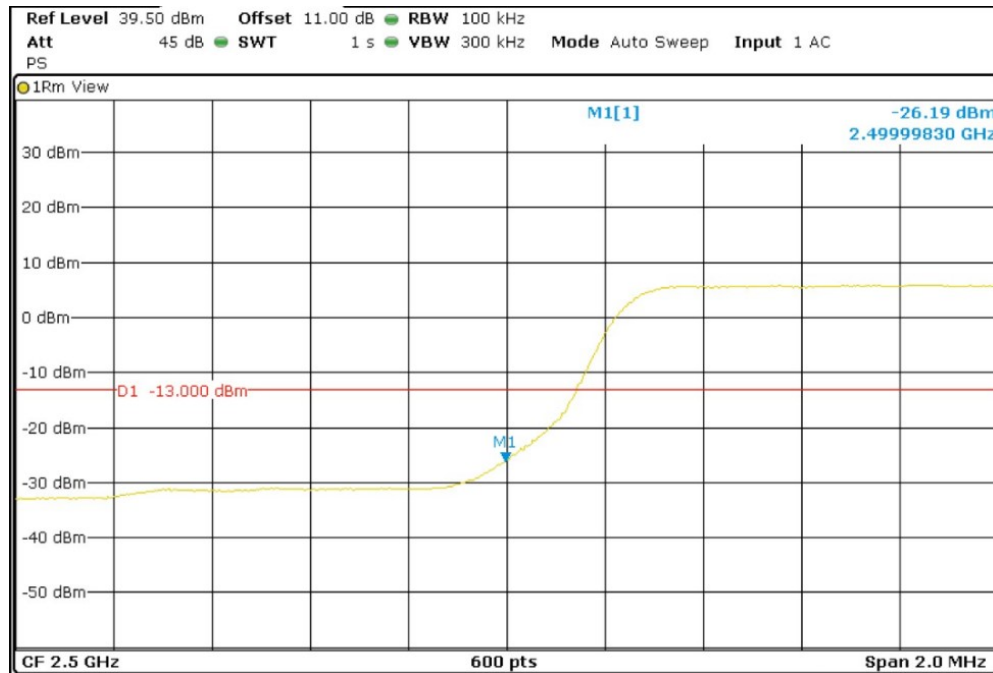
Highest Channel



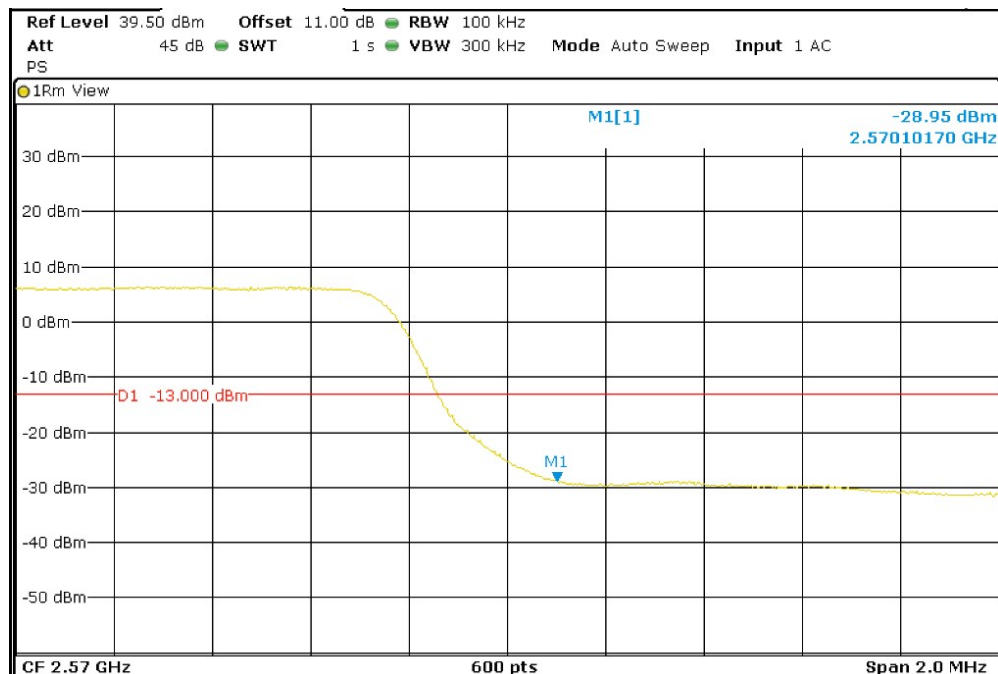
## TEST RESULTS (Cont):

LTE QPSK MODULATION. RB = 25. Offset = 0. BW = 5 MHz

Lowest Channel



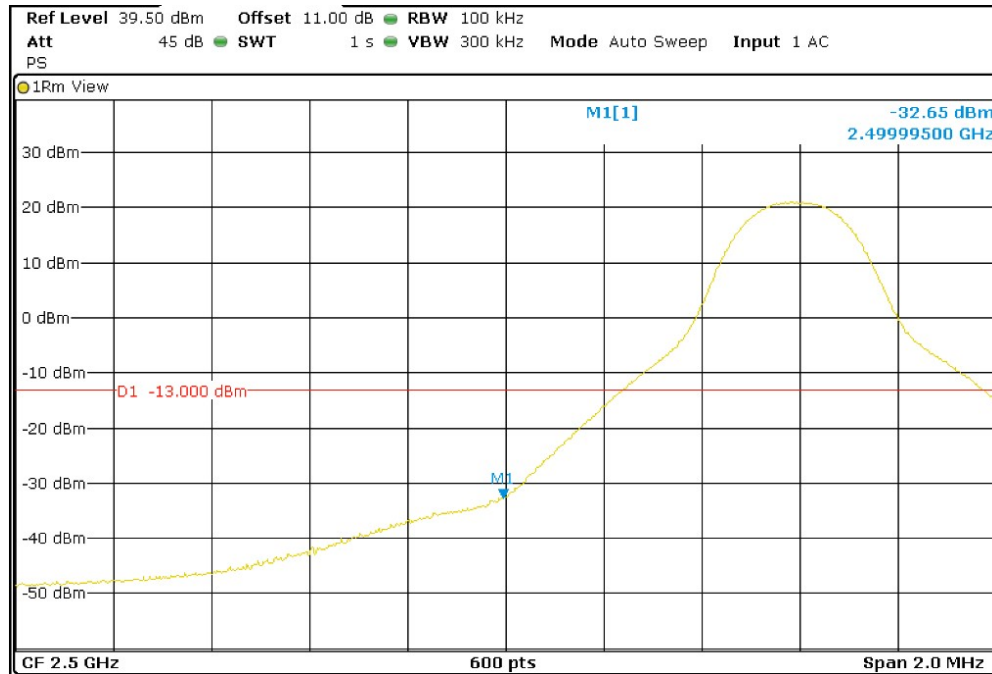
Highest Channel



## TEST RESULTS (Cont):

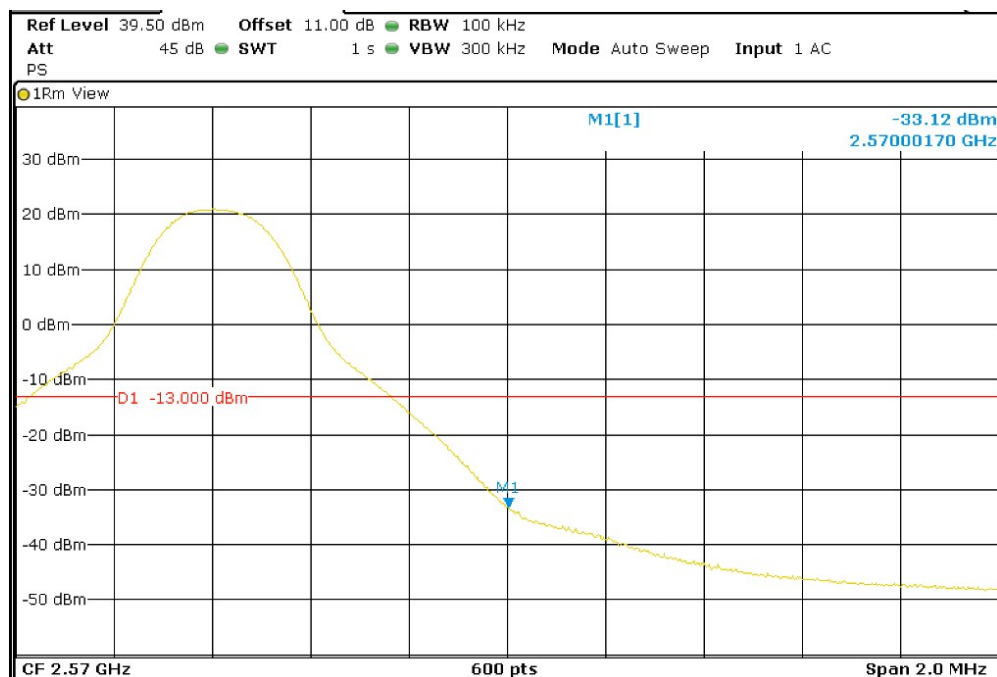
LTE QPSK MODULATION. RB = 1. Offset = 0. BW = 10 MHz

Lowest Channel



LTE QPSK MODULATION. RB = 1. Offset = Max. BW = 10 MHz

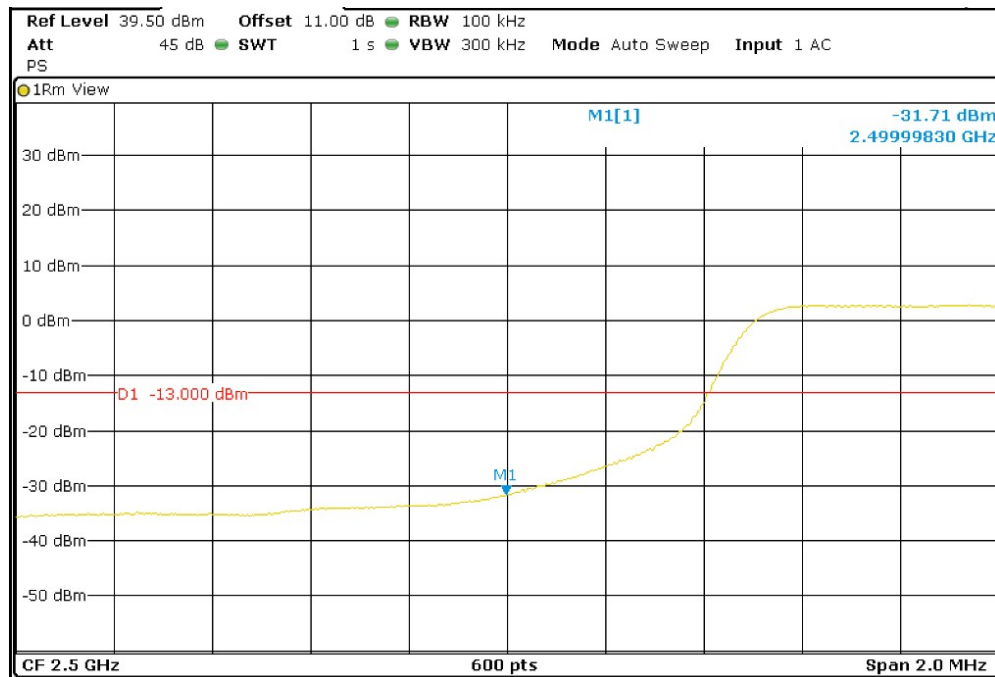
Highest Channel



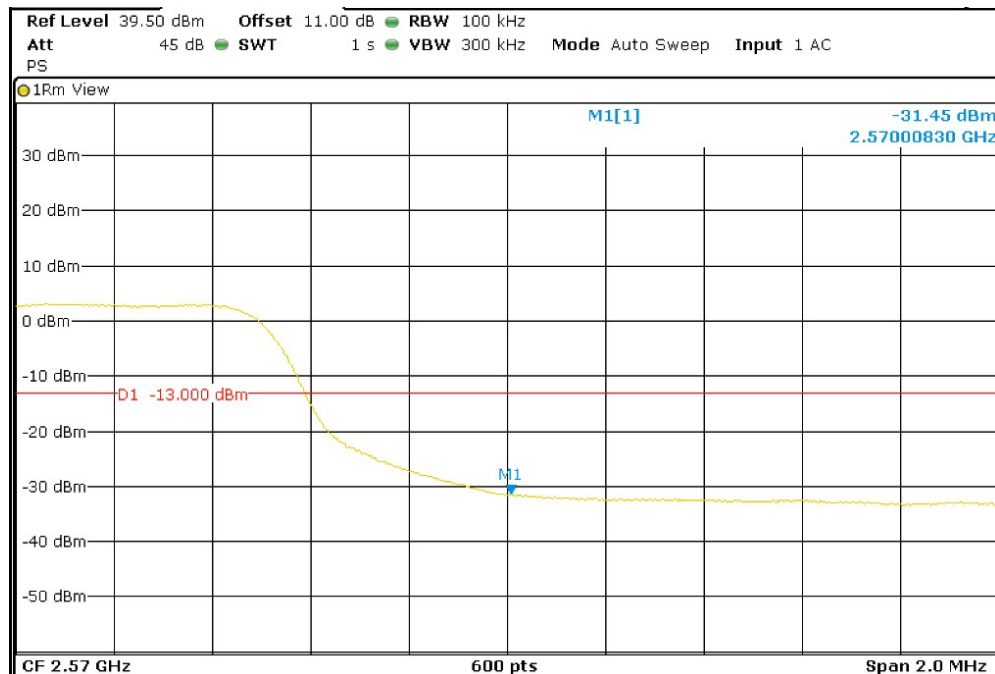
# TEST RESULTS (Cont):

LTE QPSK MODULATION. RB = 50. Offset = 0. BW = 10 MHz

Lowest Channel



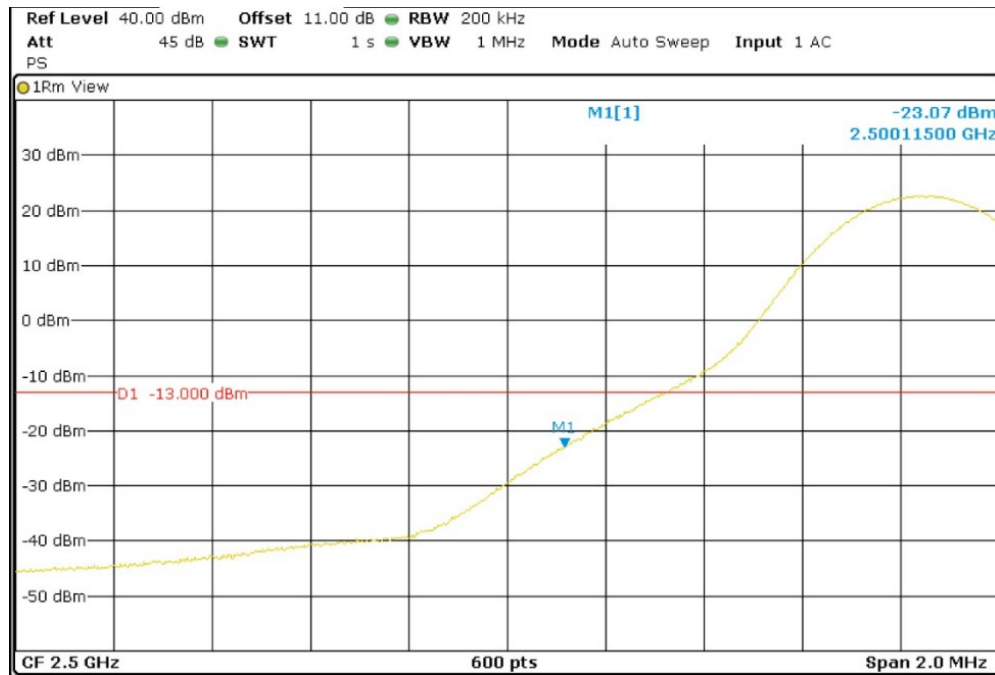
Highest Channel



## TEST RESULTS (Cont):

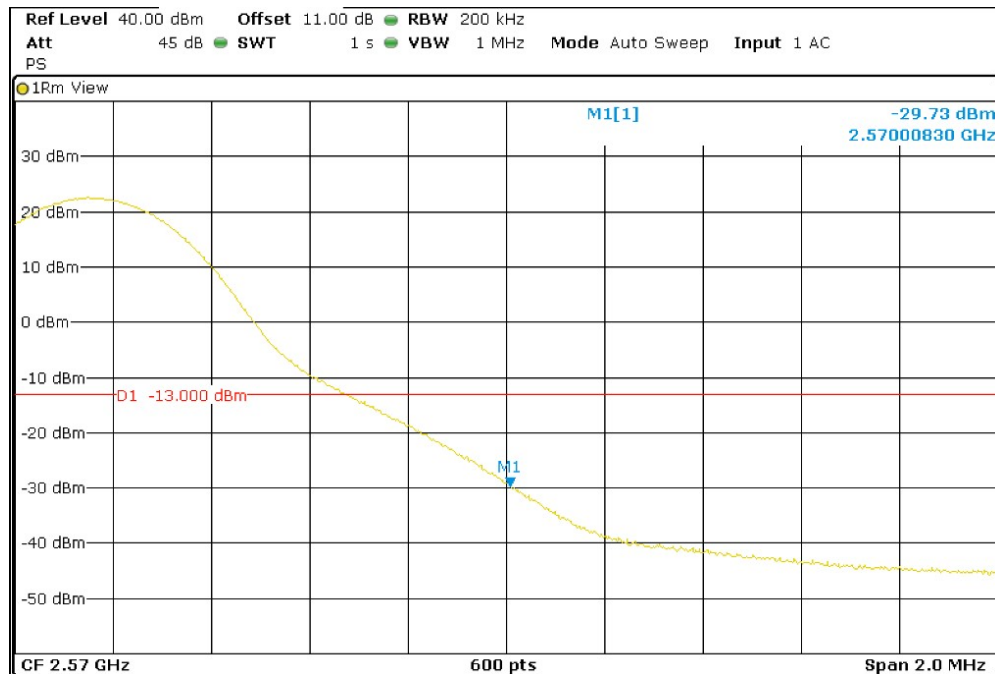
LTE QPSK MODULATION. RB = 1. Offset = 0. BW = 15 MHz

Lowest Channel



LTE QPSK MODULATION. RB = 1. Offset = Max. BW = 15 MHz

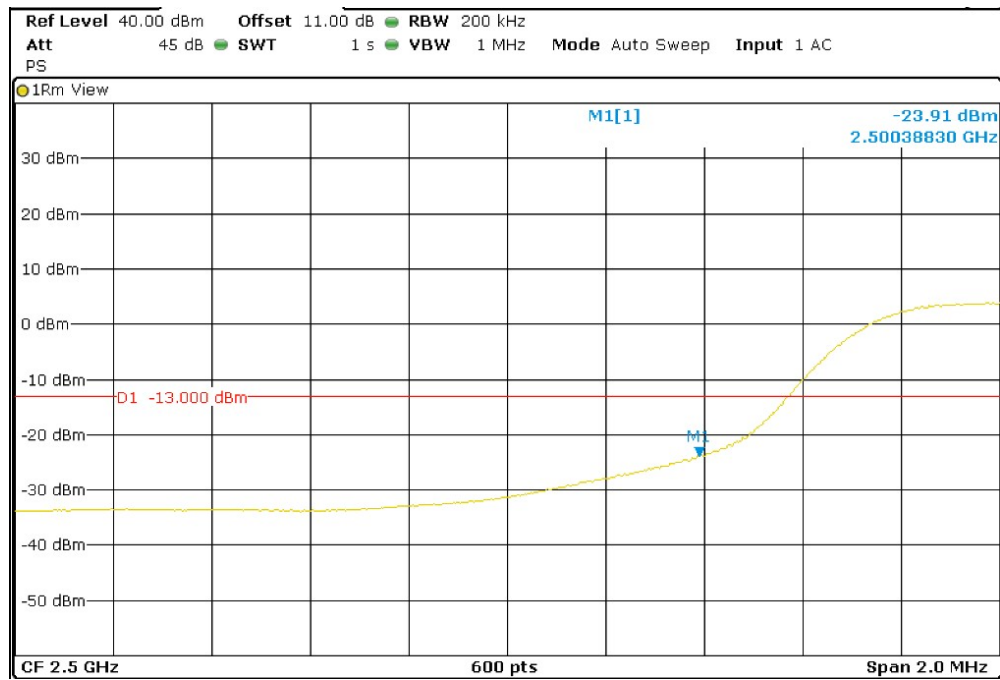
Highest Channel



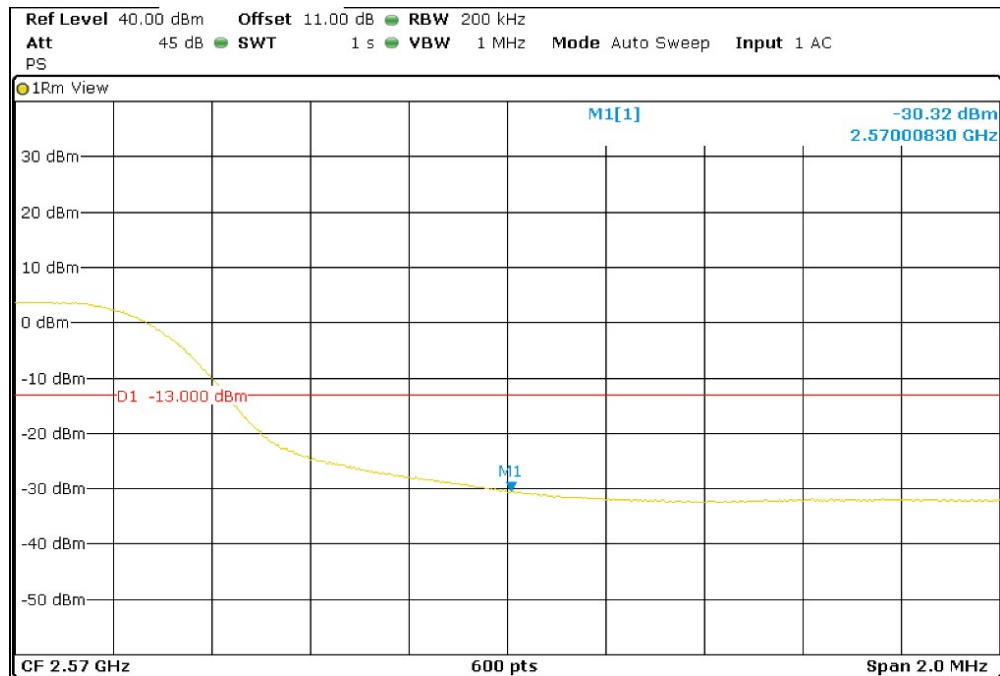
## TEST RESULTS (Cont):

LTE QPSK MODULATION. RB = 75. Offset = 0. BW = 15 MHz

Lowest Channel



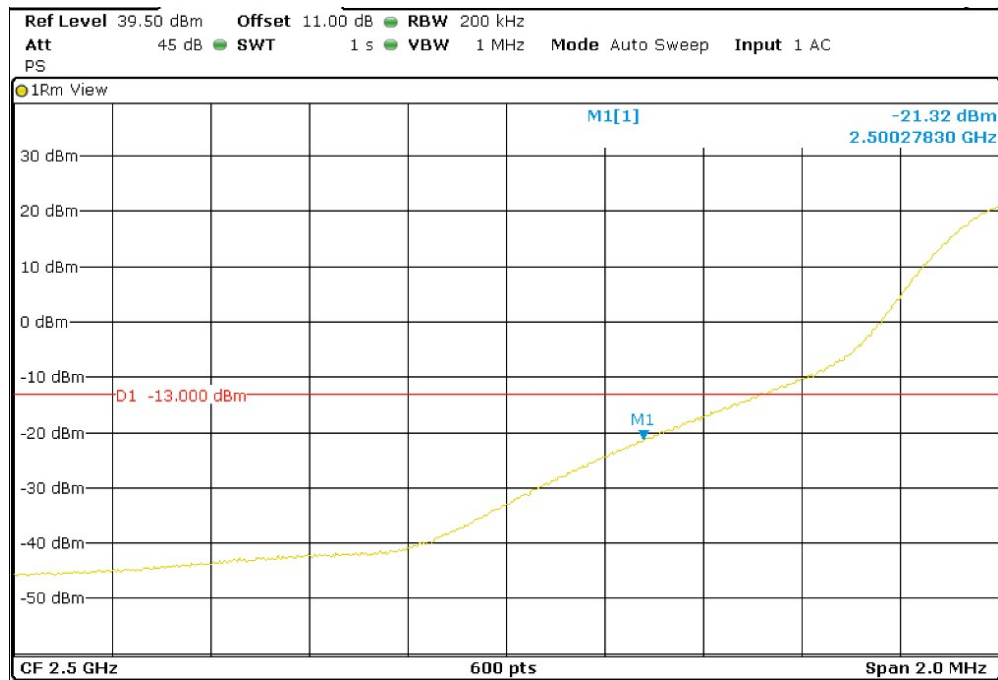
Highest Channel



## TEST RESULTS (Cont):

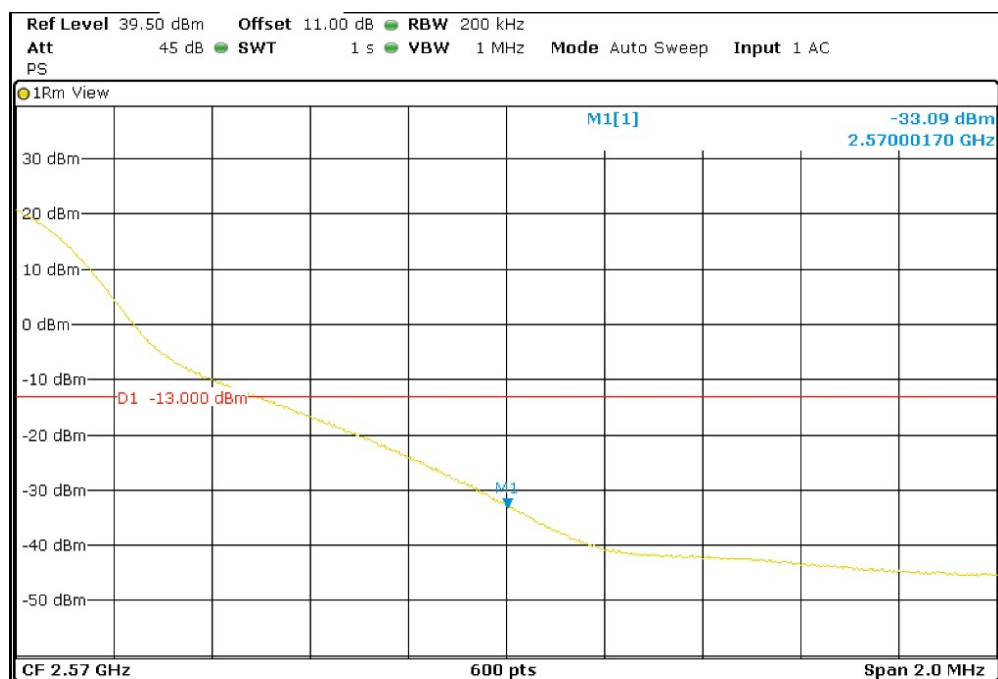
LTE QPSK MODULATION. RB = 1. Offset = 0. BW = 20 MHz

Lowest Channel



LTE QPSK MODULATION. RB = 1. Offset = Max. BW = 20 MHz

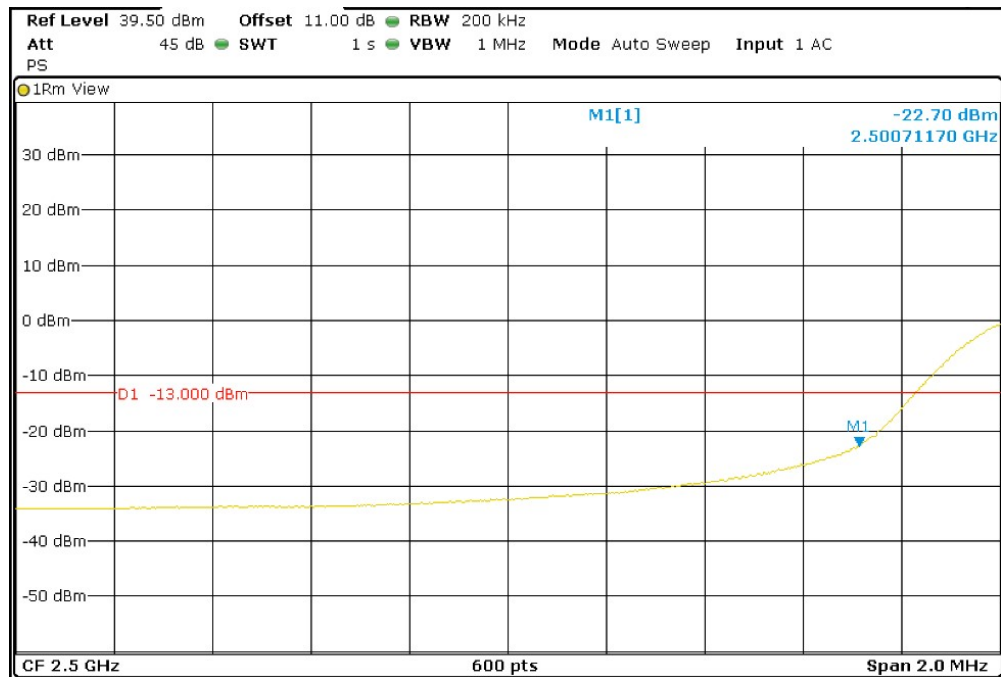
Highest Channel



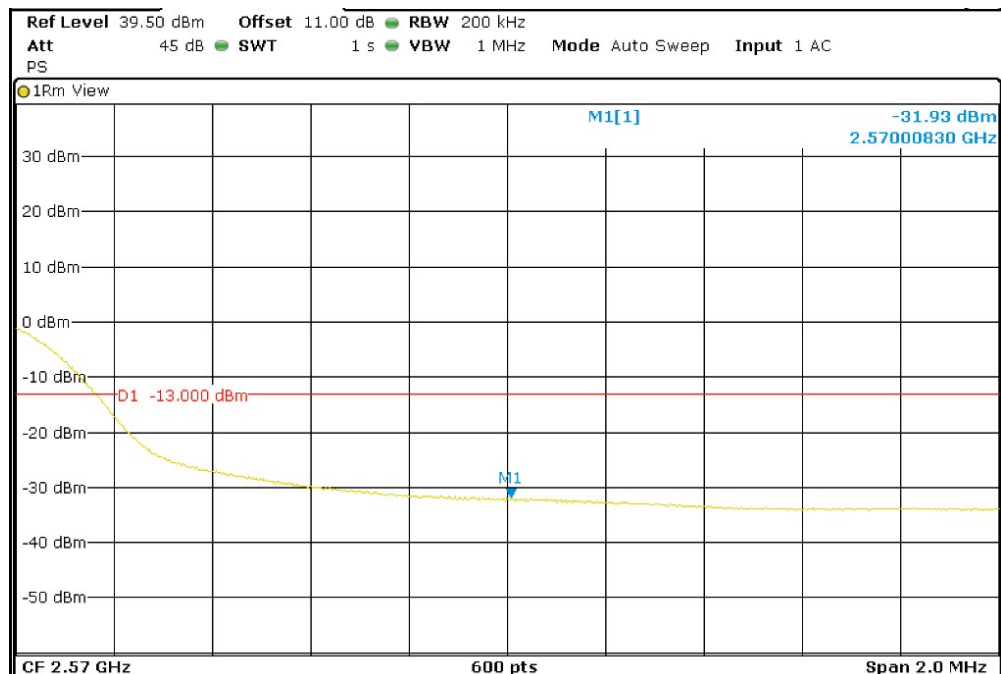
## TEST RESULTS (Cont):

LTE QPSK MODULATION. RB = 100. Offset = 0. BW = 20 MHz

Lowest Channel



Highest Channel



## TEST A.7: RADIATED EMISSIONS

<b>LIMITS:</b>	Product standard:	FCC Part 27 / IC RSS-199
	Test standard:	FCC §2.1053 and §27.53 / RSS-199 Clause 4.5

### LIMITS

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  $P_o$  transmitting power of 2 watts (33 dBm), the specified minimum attenuation becomes  $43 + 10 \log(P_o)$ . and the level in dBm relative to  $P_o$  becomes:

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

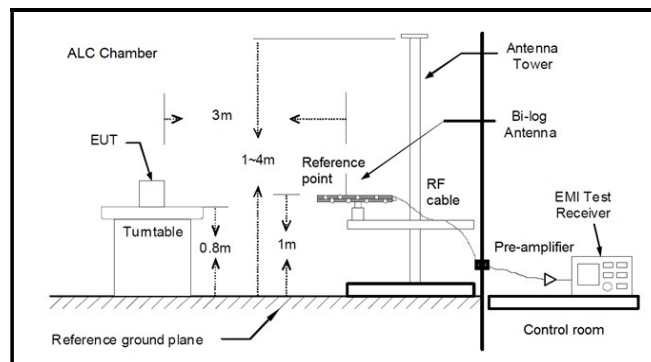
### TEST SETUP

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 highest frequency generated within the equipment.

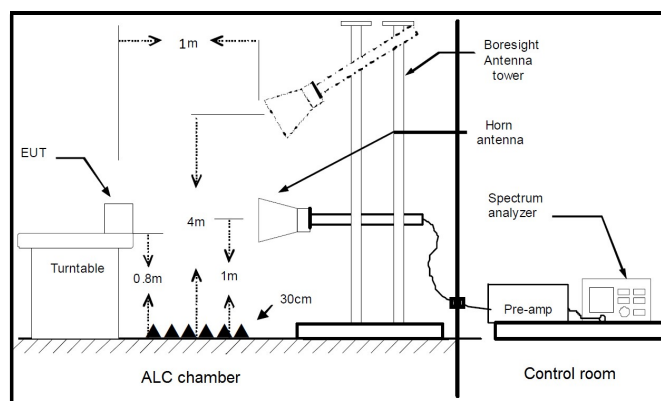
The EUT was placed on a non-conductive stand at a 3-meter distance from the measuring antenna for measurements below 1 GHz and at 1-meter distance for measurements above 1 GHz.

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

Radiated measurements < 1GHz



Radiated measurements > 1GHz



<b>TESTED SAMPLES:</b>	S/01
<b>TESTED CONDITIONS MODES:</b>	TC#01
<b>TEST RESULTS:</b>	PASS

## RESULTS

A preliminary scan determined the QPSK 20 MHz bandwidth as the worst case. The configuration of Resource Blocks which is the worst case for conducted power was used.

The following plots show the results for this configuration.

No spurious signal was found at less than 20dB respect to the limit in all the frequency ranges.

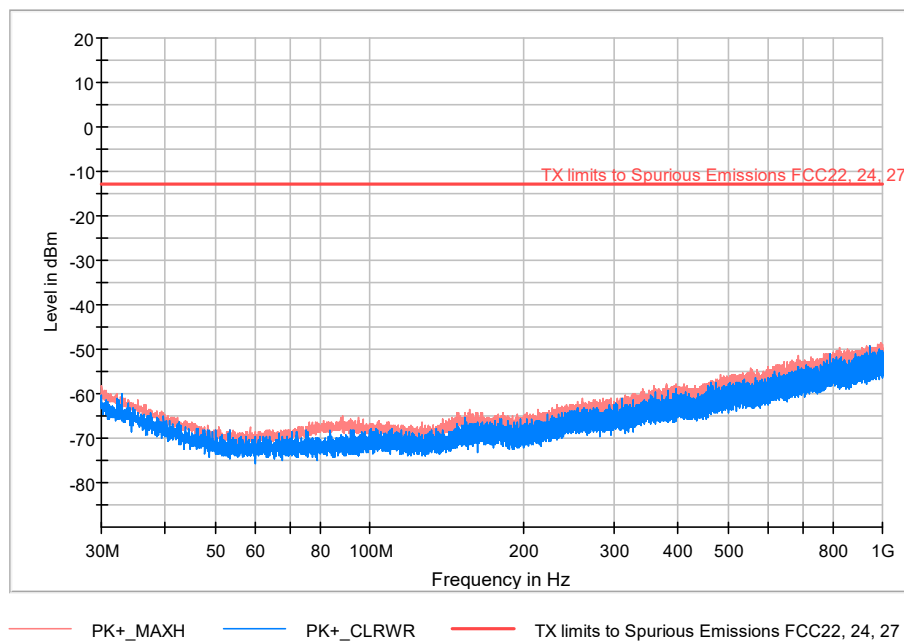
LTE QPSK MODULATION.

<b>TEST RESULTS (Cont):</b>	Lowest Channel
-----------------------------	----------------

Lowest Channel. RB = 1. Offset = 0. BW = 15 MHz

FREQUENCY RANGE: 30-1000 MHz

Frequency (MHz)	PK+_CLRWR (dBm)	PK+_MAXH (dBm)
30.097000	-63.23	-58.36
991.302333	-53.07	-48.45

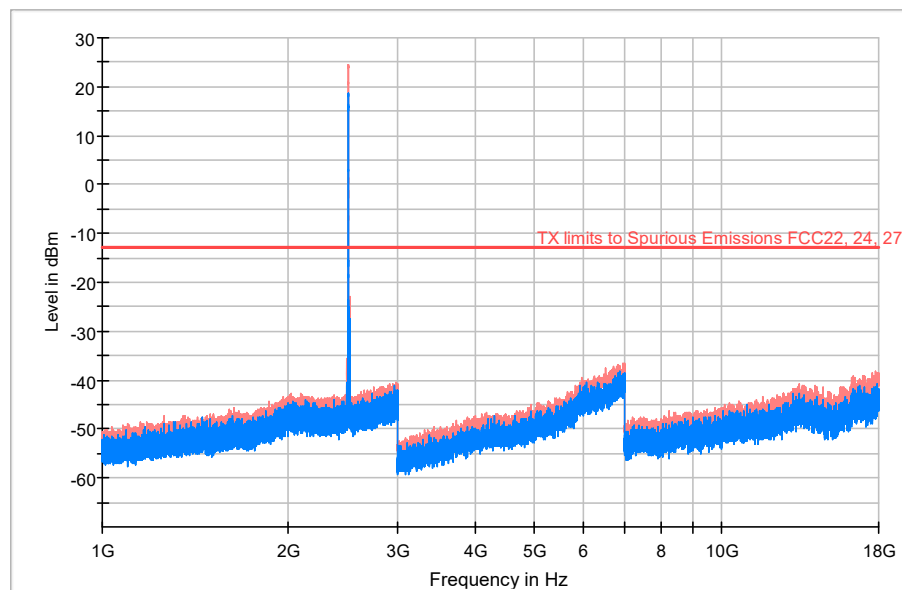


**TEST RESULTS (Cont):**

Lowest Channel

FREQUENCY RANGE: 1-18 GHz

Frequency (MHz)	PK+_CLRWR (dBm)	PK+_MAXH (dBm)	Comment
2500.866667	18.79	24.51	Fundamental
6969.000000	-40.19	-36.46	
12310.500000	-49.21	-42.96	
13369.000000	-46.05	-40.71	
17776.000000	-44.89	-38.14	

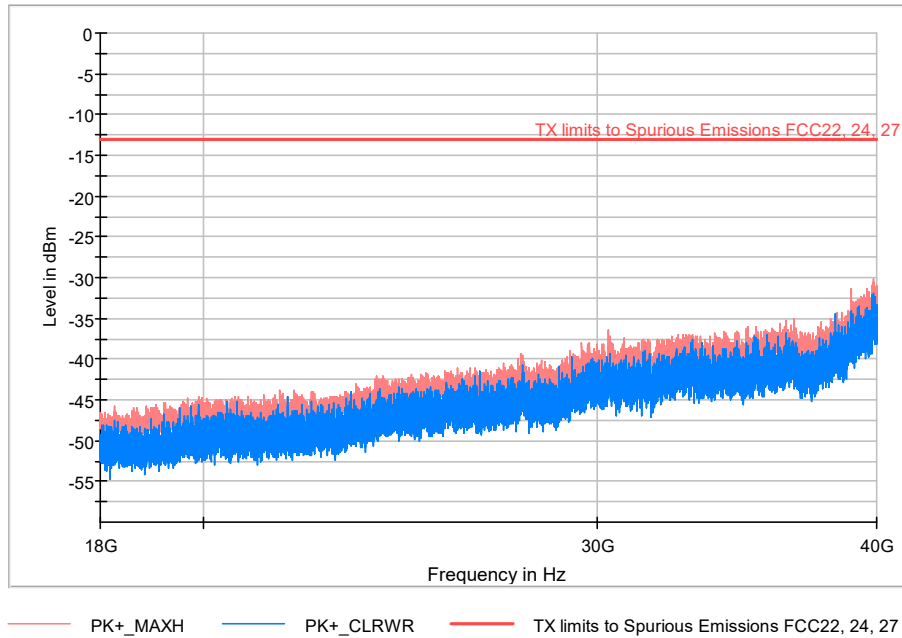


PK+\_MAXH    PK+\_CLRWR    TX limits to Spurious Emissions FCC22, 24, 27

**TEST RESULTS (Cont):**

Lowest Channel

FREQUENCY RANGE: 18-40 GHz



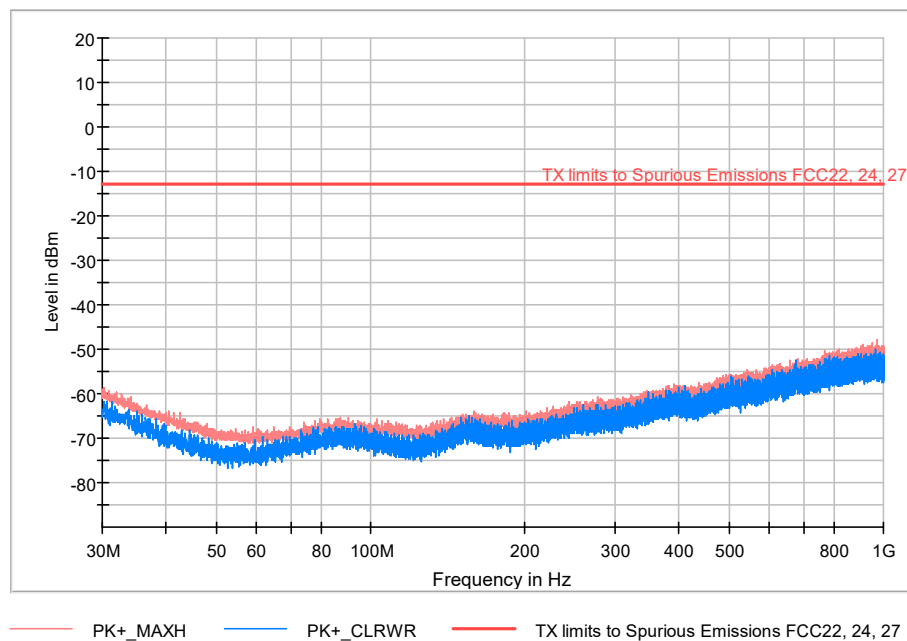
**TEST RESULTS (Cont):**

Middle Channel

Middle Channel RB = 1. Offset = 0. BW = 15 MHz

FREQUENCY RANGE: 30-1000 MHz

Frequency (MHz)	PK+_CLRWR (dBm)	PK+_MAXH (dBm)
30.291000	-63.50	-58.57
968.669000	-54.18	-47.80

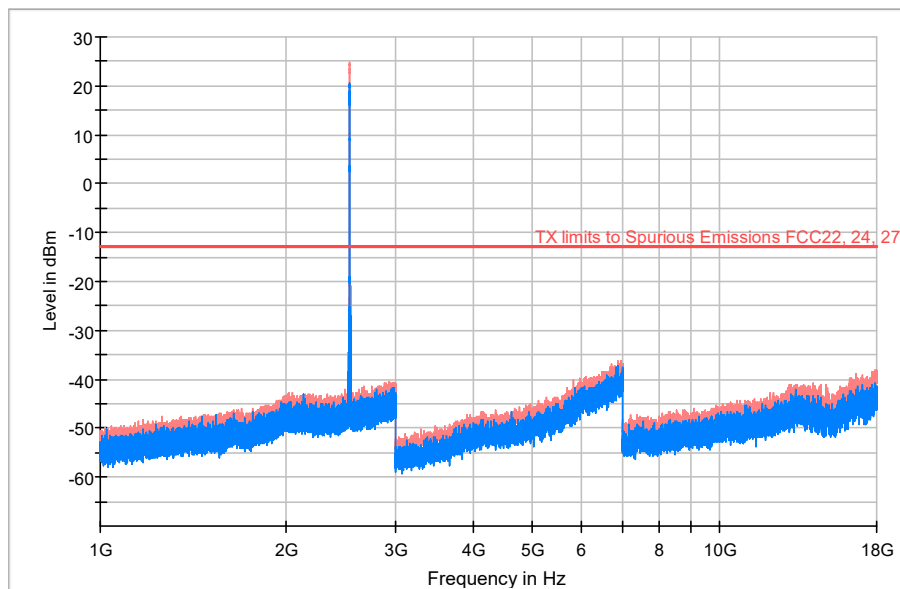


**TEST RESULTS (Cont):**

Middle Channel

FREQUENCY RANGE: 1-18 GHz

Frequency (MHz)	PK+_CLRWR (dBm)	PK+_MAXH (dBm)	Comment
1711.400000	-42.1	-36.3	
2536.133333	22.2	23.1	Fundamental

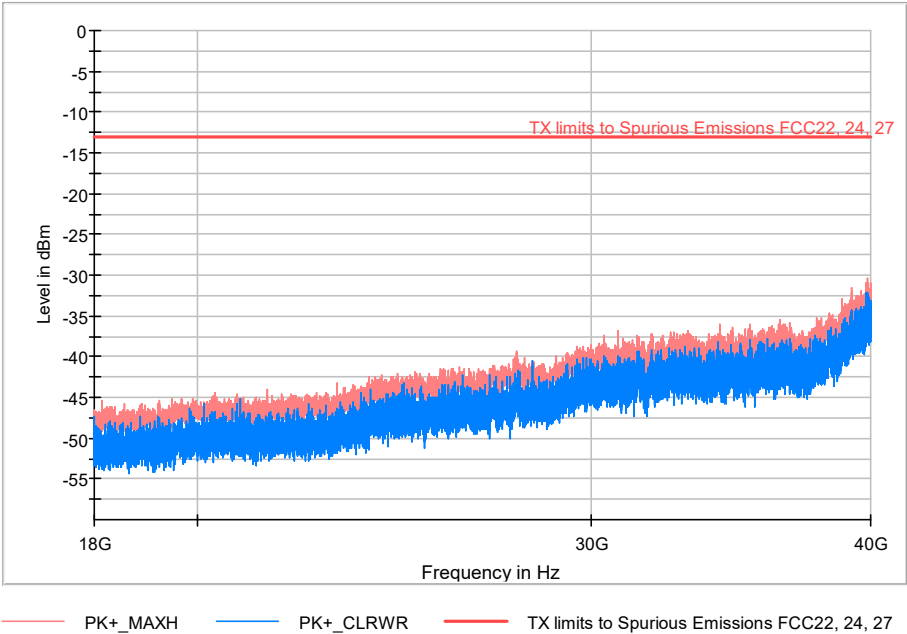


— PK+\_MAXH — PK+\_CLRWR — TX limits to Spurious Emissions FCC22, 24, 27

TEST RESULTS (Cont):

Middle Channel

FREQUENCY RANGE: 18-40 GHz



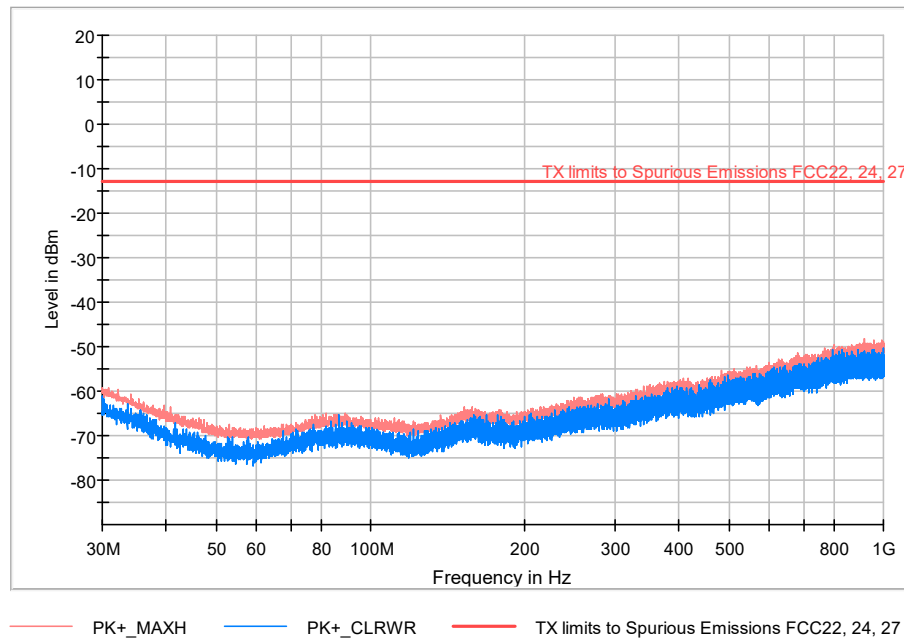
**TEST RESULTS (Cont):**

Highest Channel

Highest Channel RB = 1. Offset = 0. BW = 15 MHz

FREQUENCY RANGE: 30MHz-1 GHz

Frequency (MHz)	PK+ _CLRWR (dBm)	PK+ _MAXH (dBm)
30.032333	-64.74	-59.21
916.418333	-54.29	-48.39



**TEST RESULTS (Cont):**

High Channel

FREQUENCY RANGE: 1-18 GHz

Frequency (MHz)	PK+ _CLRWR (dBm)	PK+ _MAXH (dBm)	Comment
2565.866667	18.47	24.78	Fundamental
6854.500000	-41.28	-36.03	
11715.000000	-49.34	-43.27	
14244.500000	-45.84	-40.67	
17694.000000	-43.50	-37.57	

