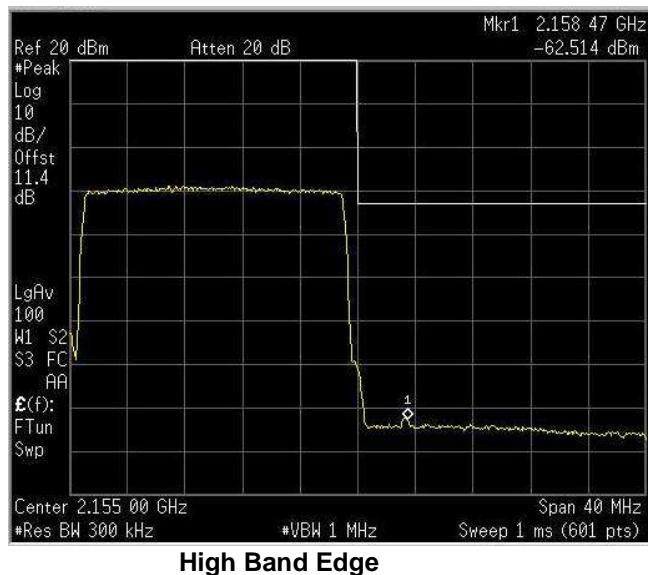
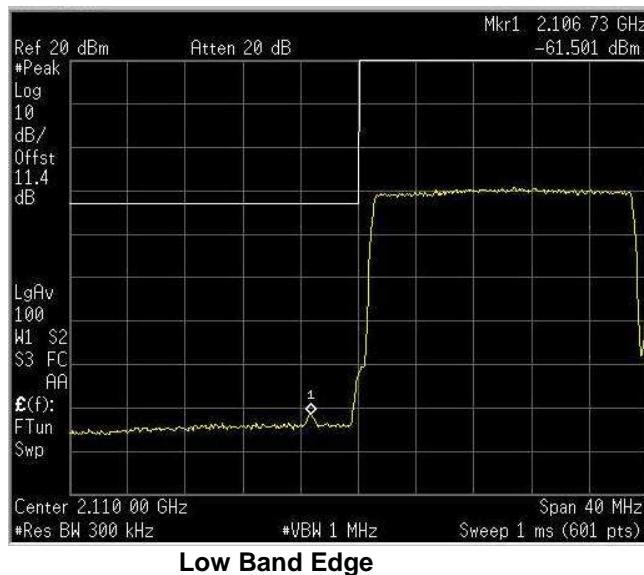
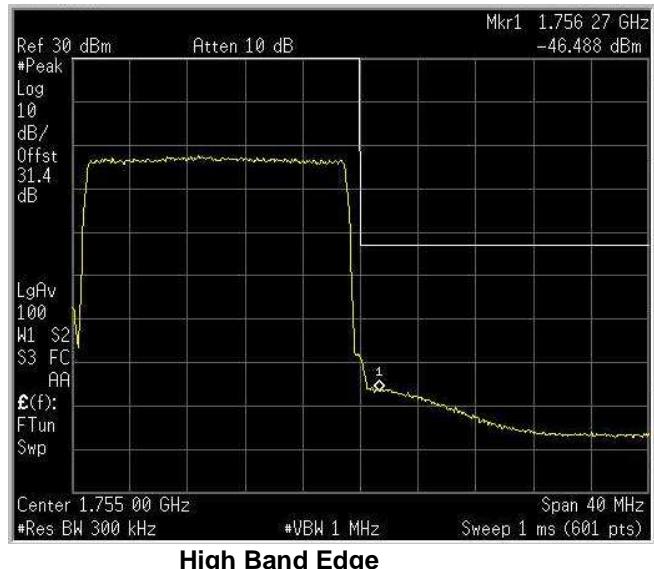
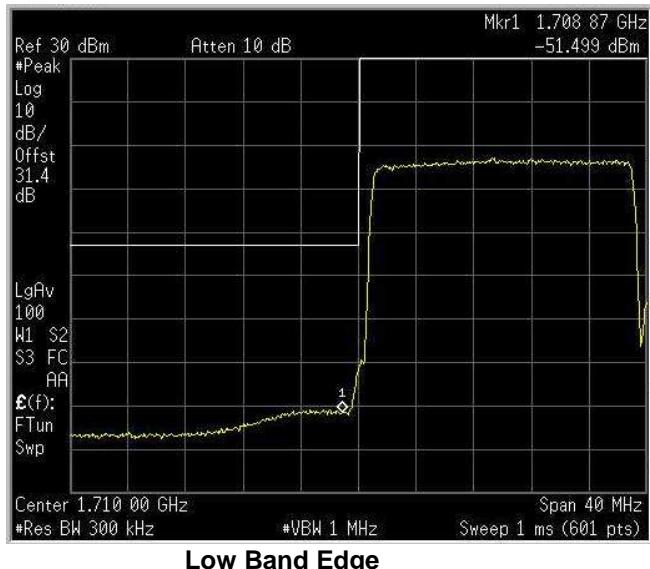


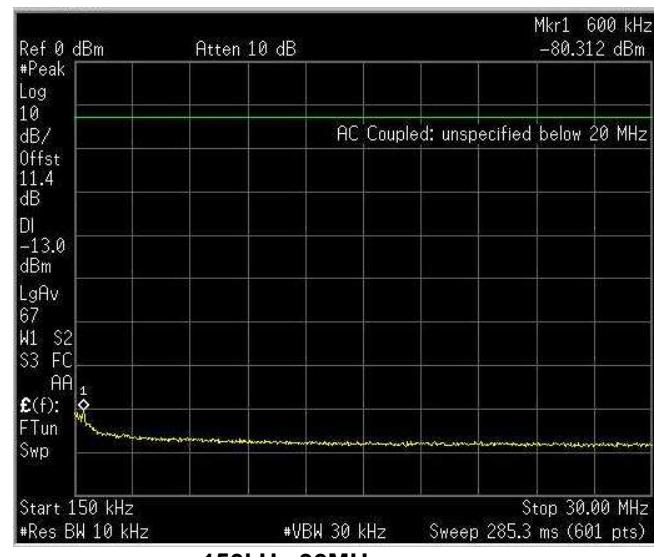
**Mod. LTE 20MHz (QPSK) (Down-link)**

**Mod. LTE 20MHz (QPSK) (Up-link)**


Clause 24.238 Spurious emissions at antenna terminal,

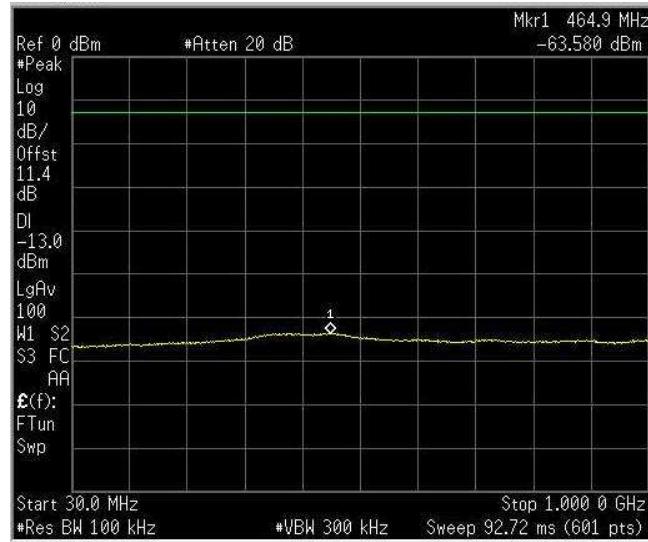
### Mod. CDMA (Down-link)



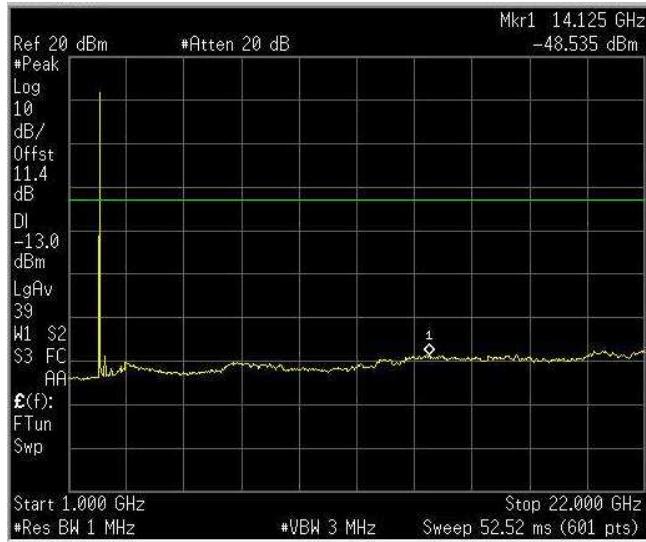
**9kHz-150kHz**



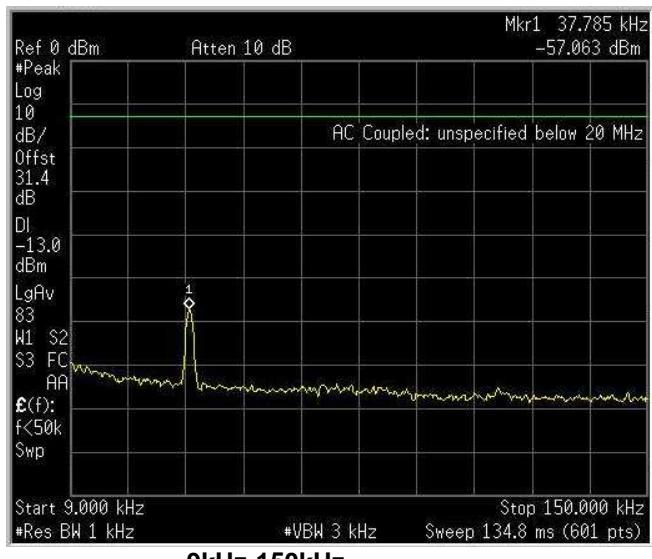
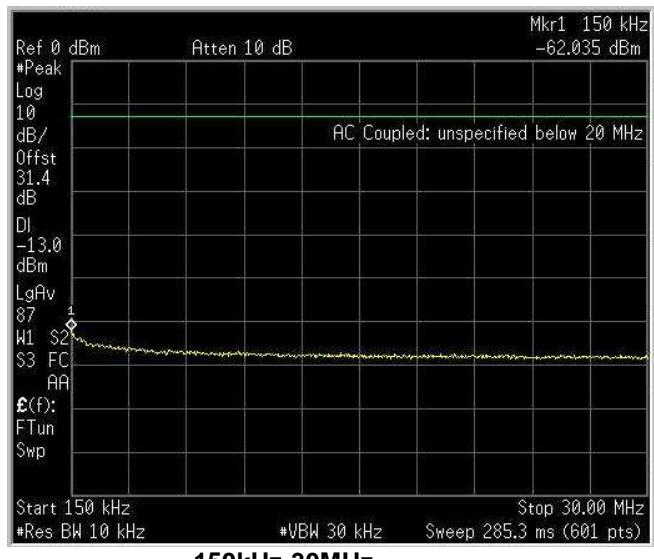
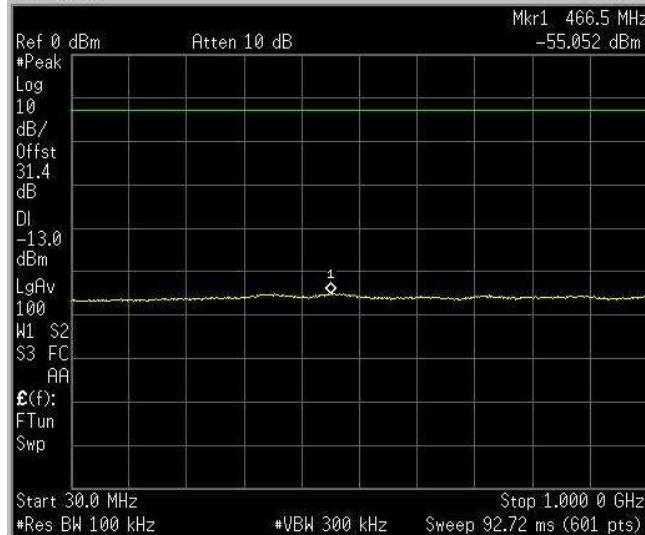
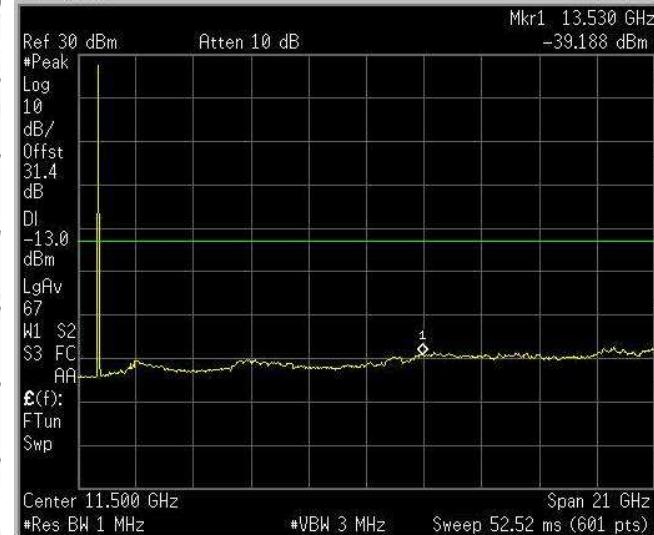
**150kHz-30MHz**

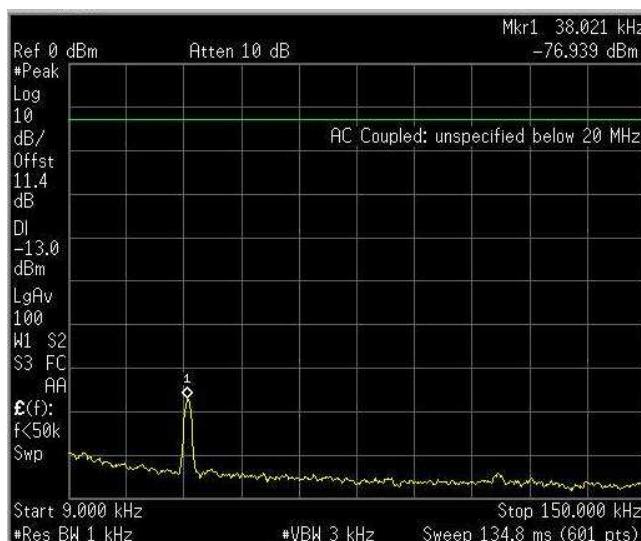
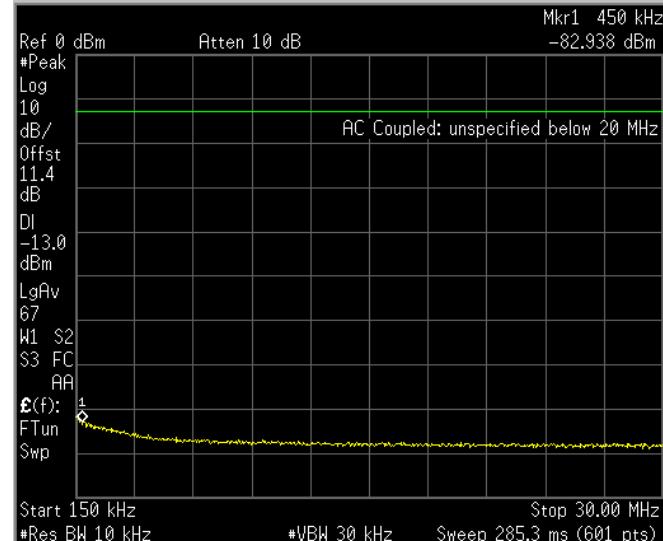
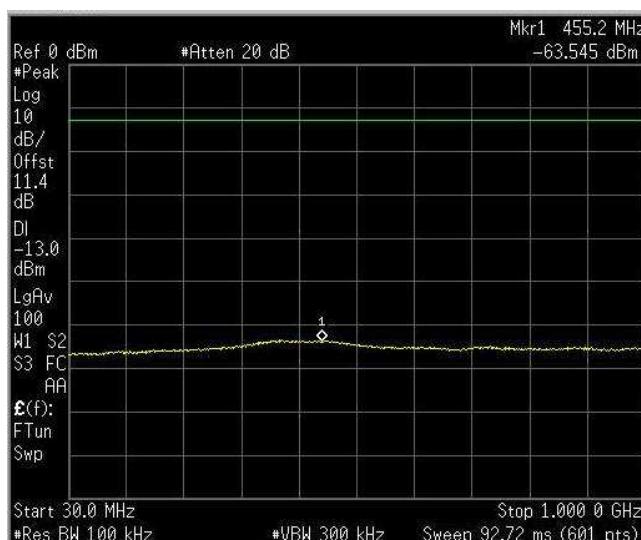


**30MHz-1GHz**

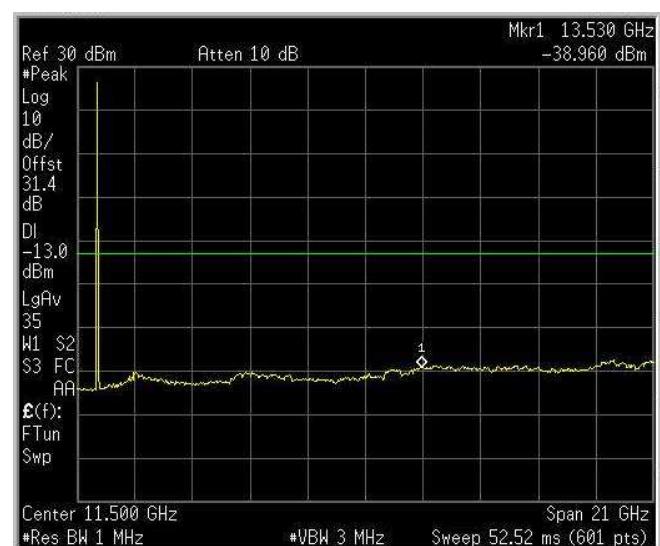
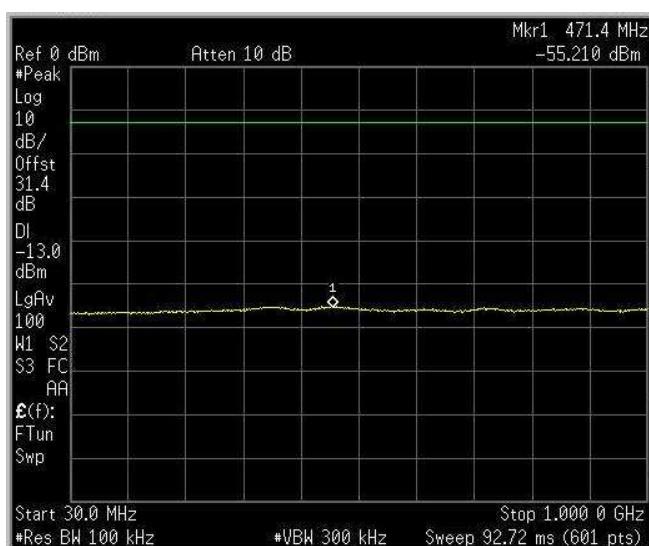
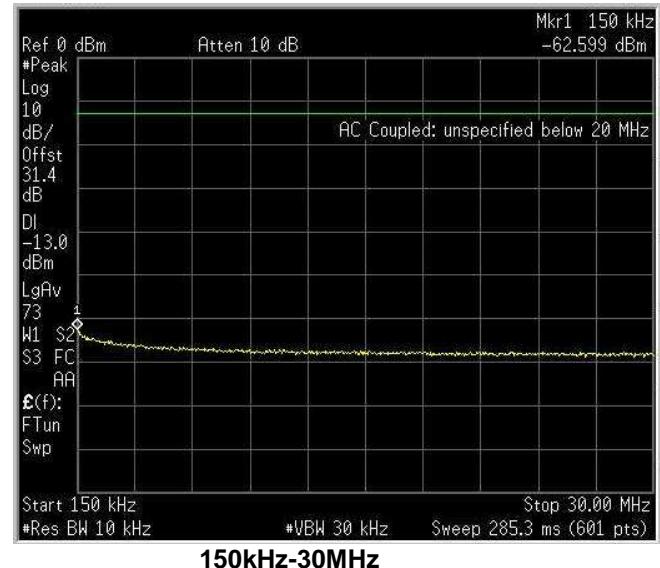
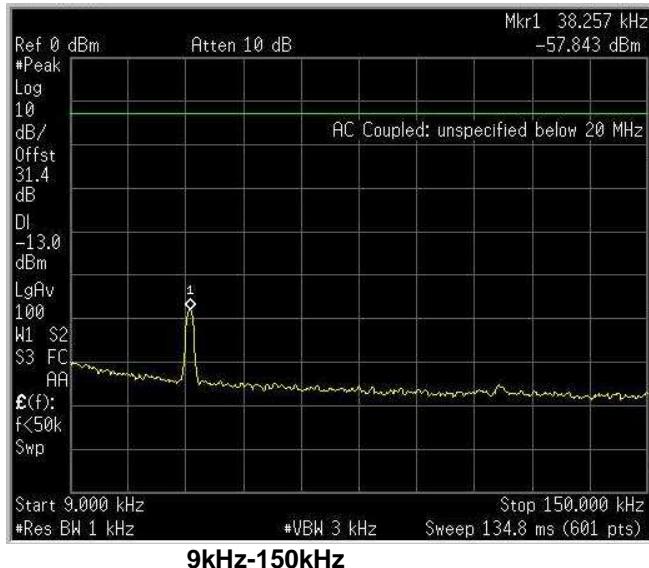


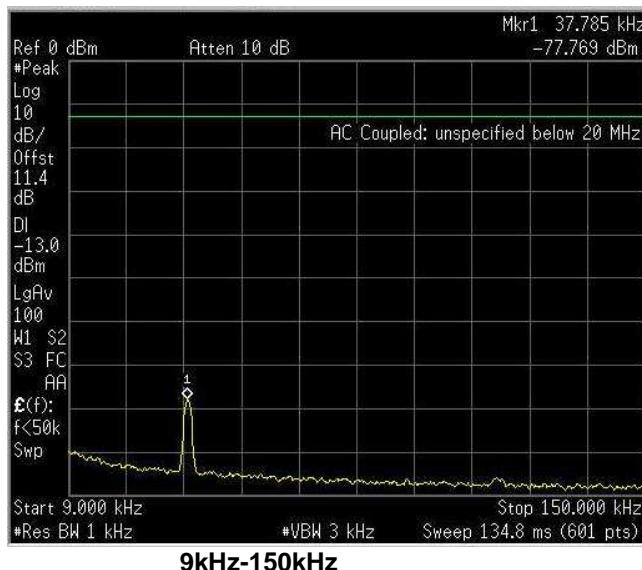
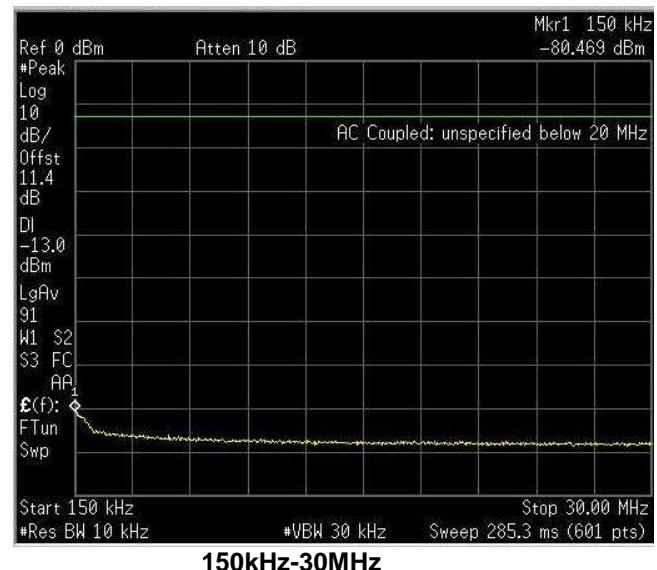
**1GHz-20GHz**

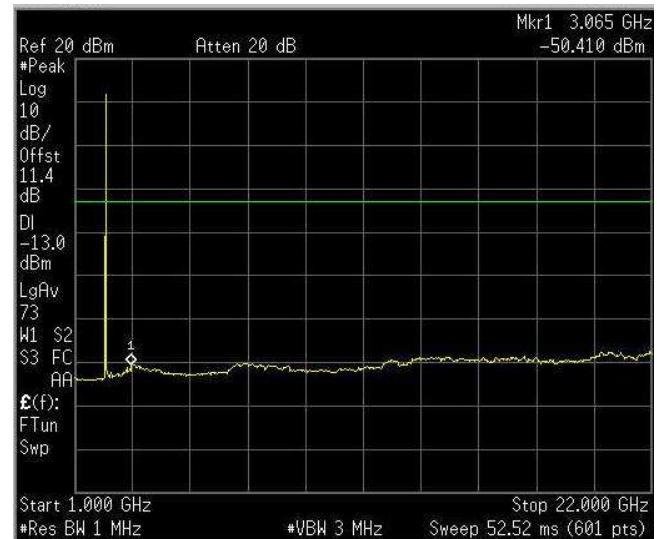
**Mod. CDMA (Up-link)**

**9kHz-150kHz**

**150kHz-30MHz**

**30MHz-1GHz**

**1GHz-20GHz**

**Mod. WCDMA (Down-link)**

**9kHz-150kHz**

**150kHz-30MHz**

**30MHz-1GHz**

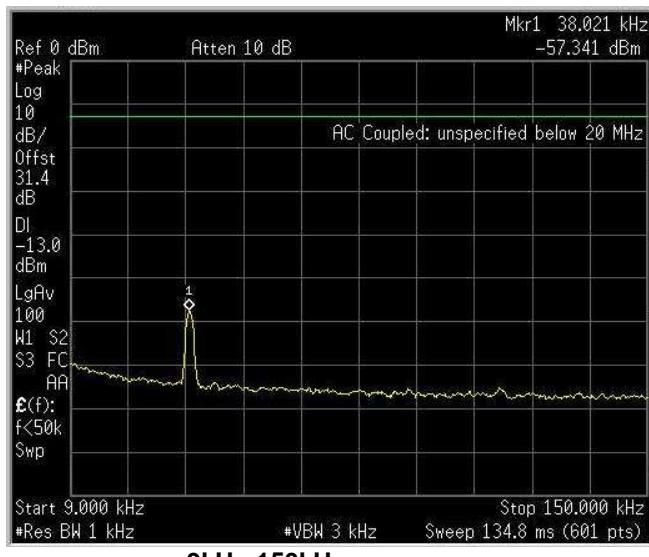
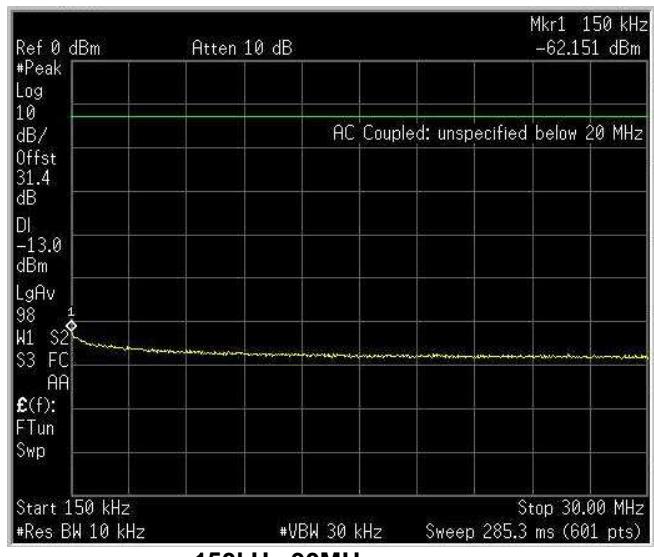
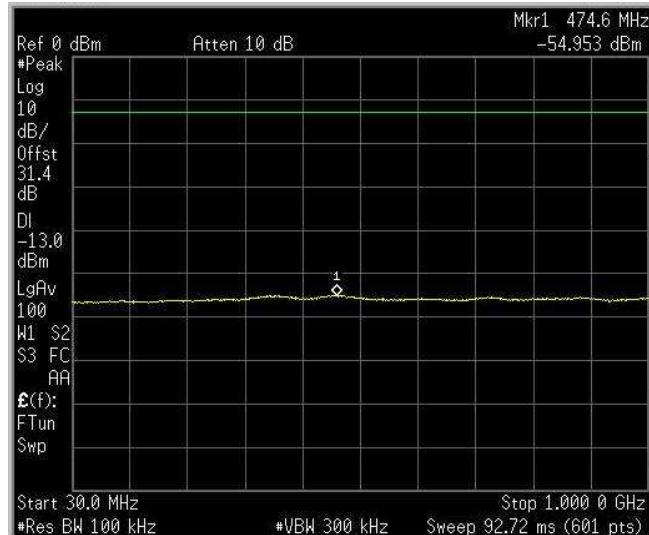
**1GHz-20GHz**

**Mod. WCDMA (Up-link)**


**Mod. LTE 1.4MHz (QAM) (Down-link)**

**9kHz-150kHz**

**150kHz-30MHz**

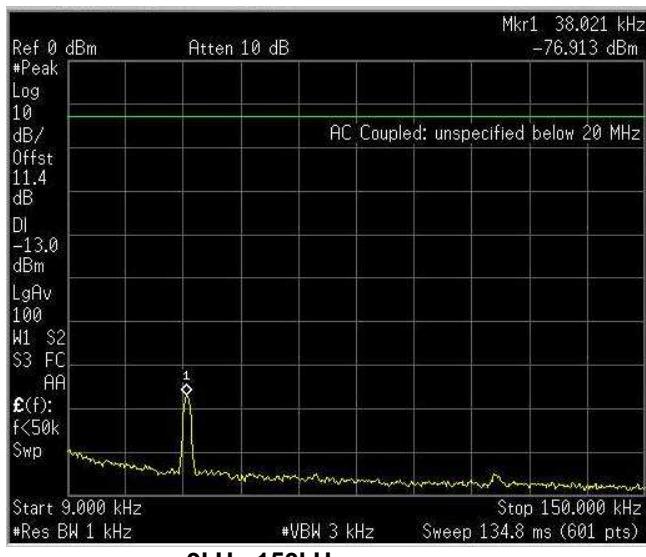
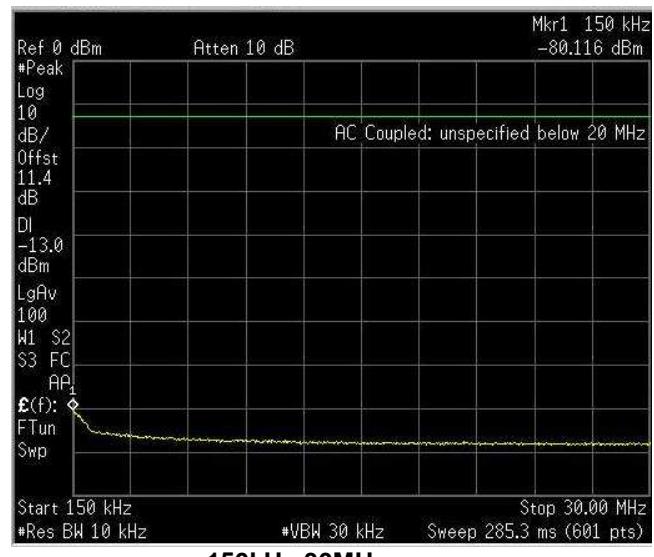
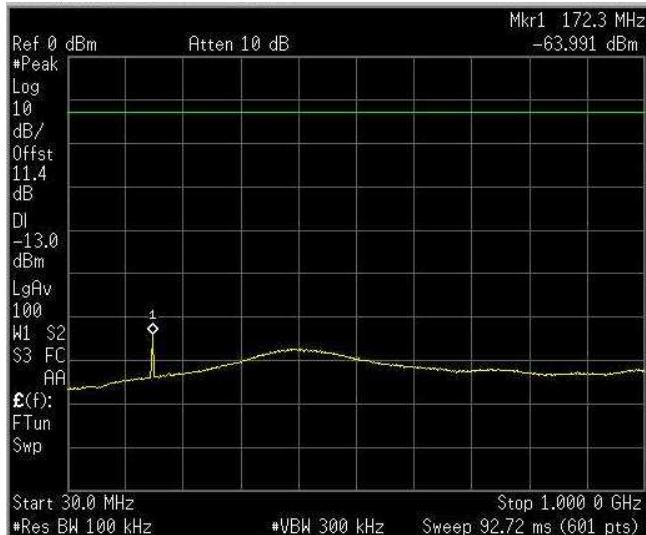
**30MHz-1GHz**

**1GHz-20GHz**

**Only 1,4 QAM (Down-link) spurious emission plots are included here, other modulations spurious emission plots are negligible and the same.**

**Mod. LTE 1.4MHz (QAM) (Up-link)**

**9kHz-150kHz**

**150kHz-30MHz**

**30MHz-1GHz**

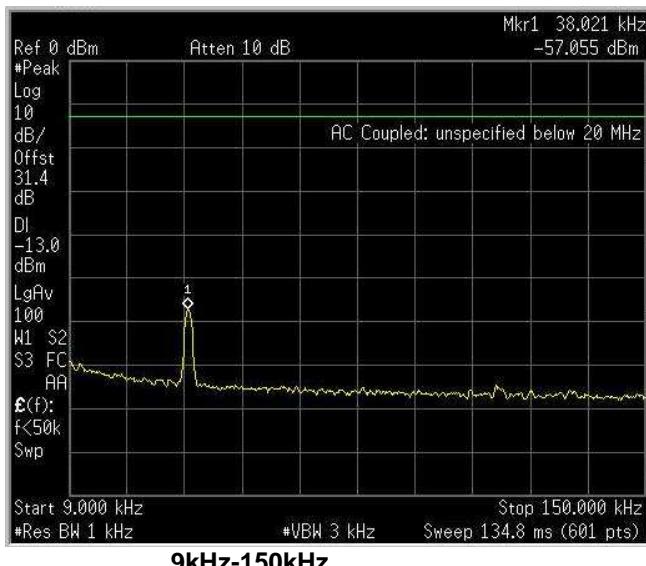
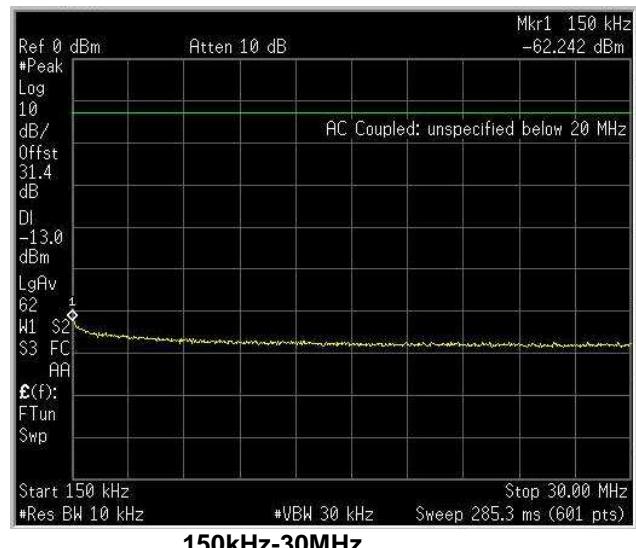
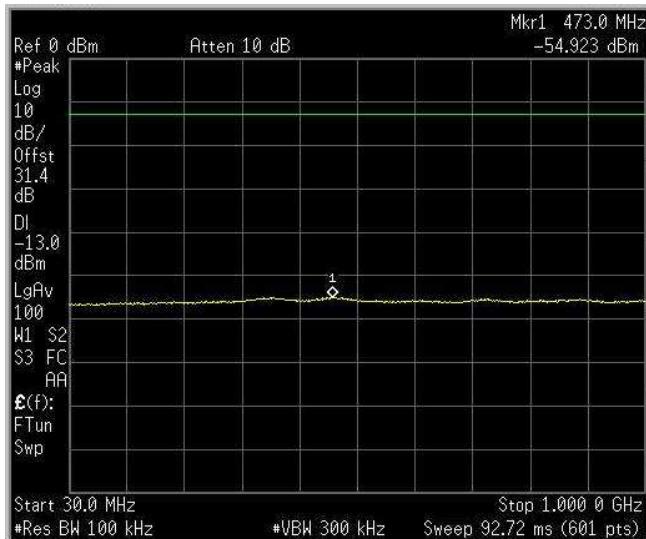
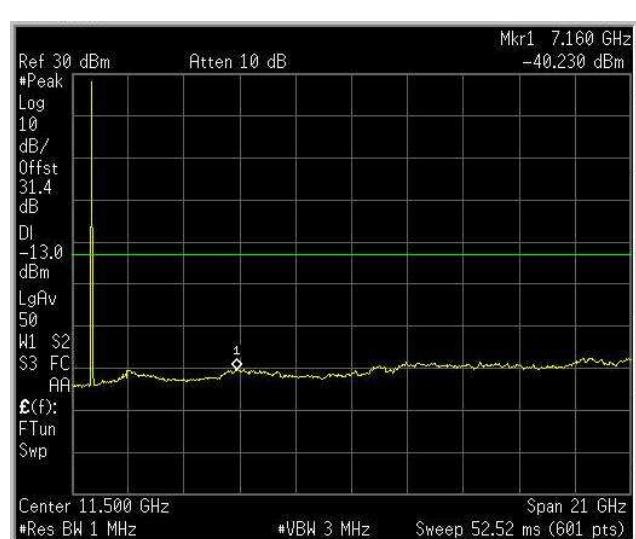
**1GHz-20GHz**

**Only 1,4 QAM (Up-link) spurious emission plots are included here, other modulations spurious emission plots are negligible and the same.**

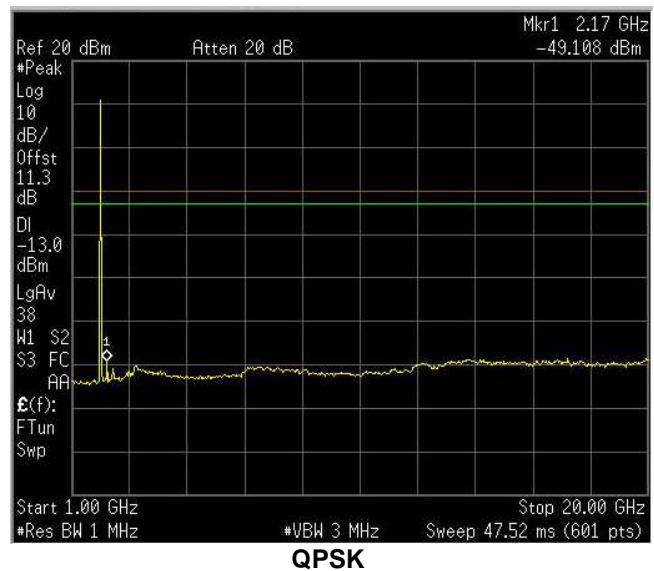
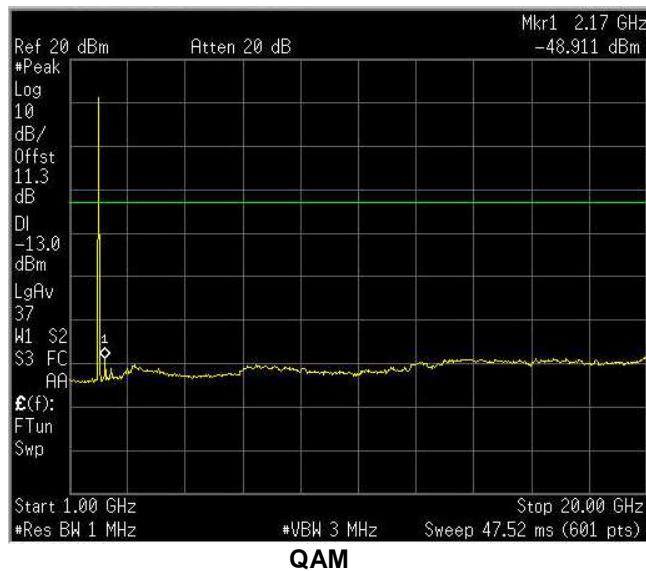
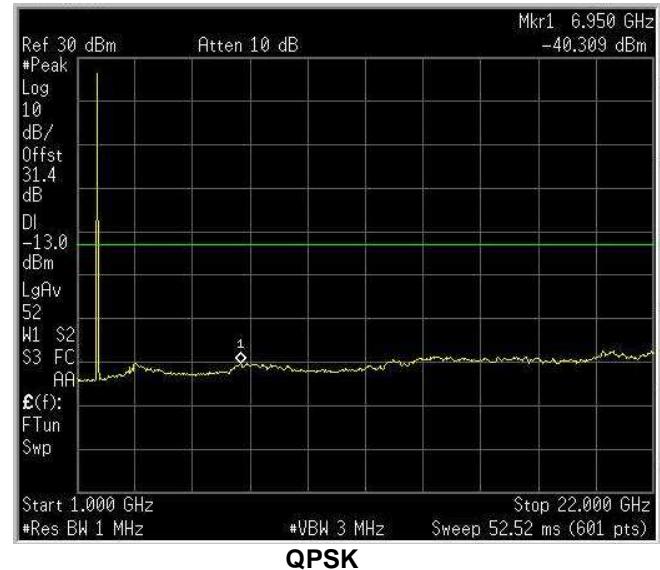
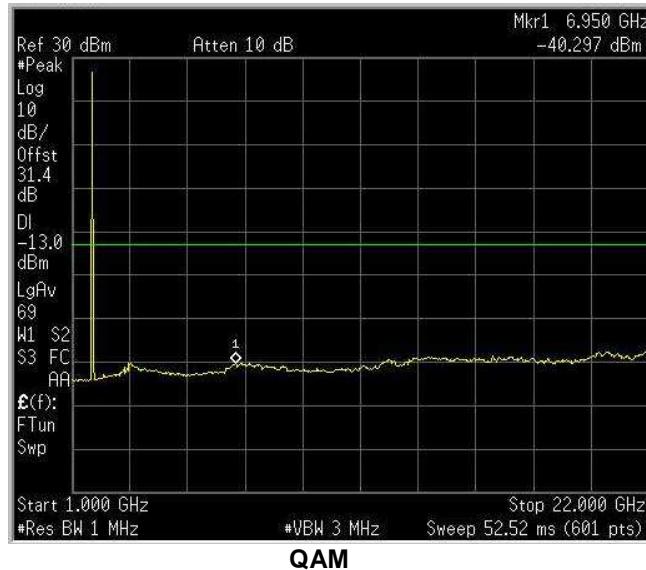
**Mod. LTE 1.4MHz (QPSK) (Down-link)**

**9kHz-150kHz**

**150kHz-30MHz**

**30MHz-1GHz**

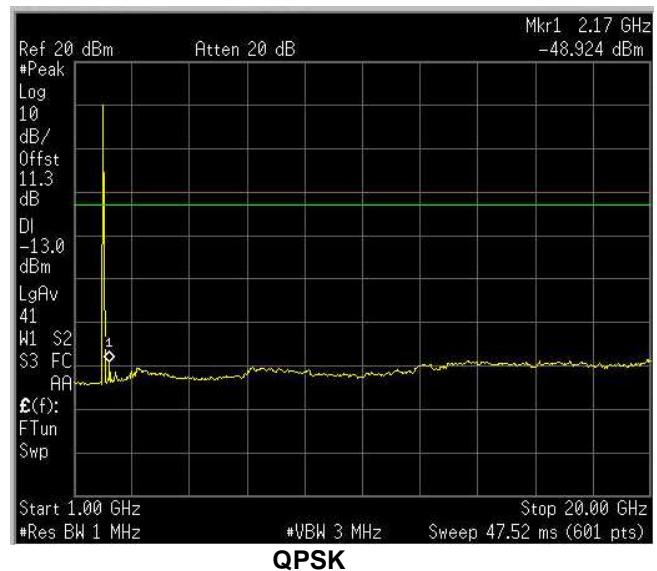
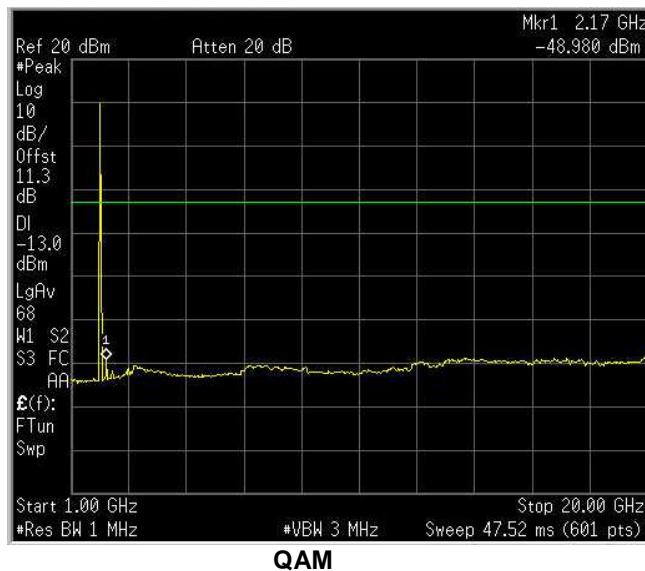
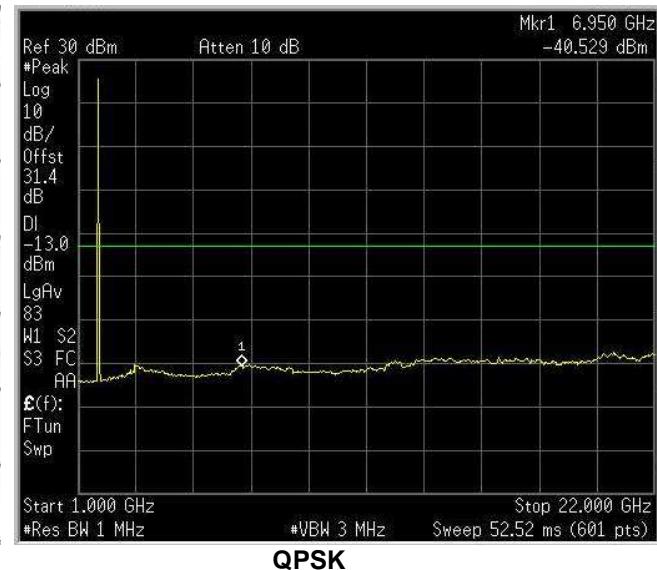
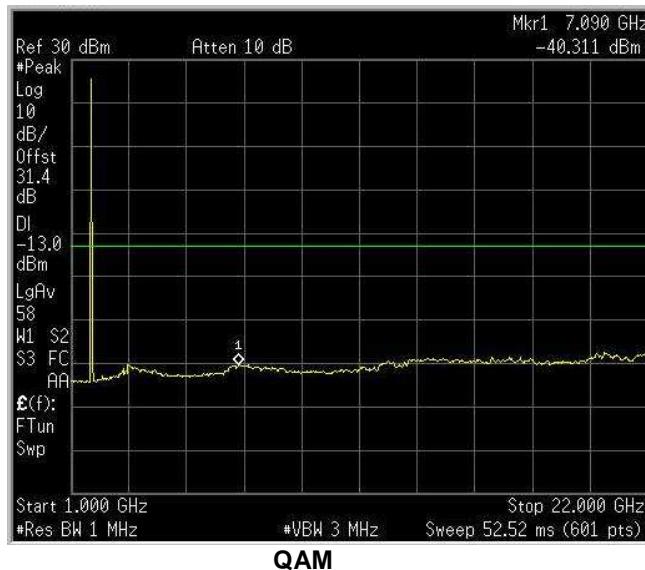
**1GHz-20GHz**

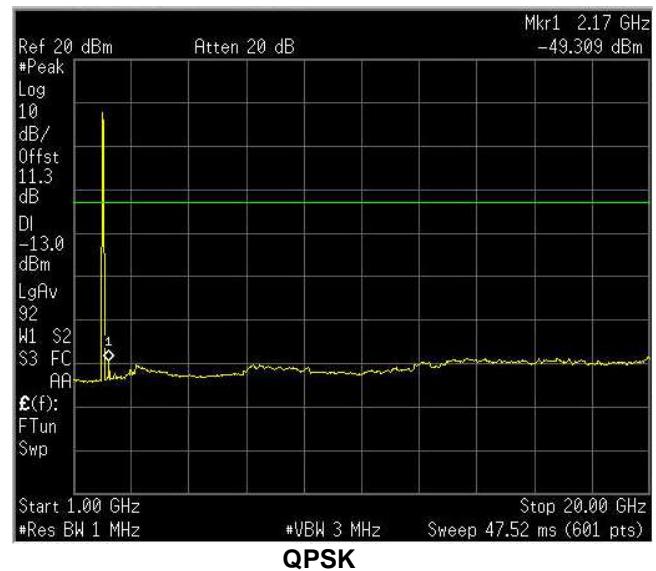
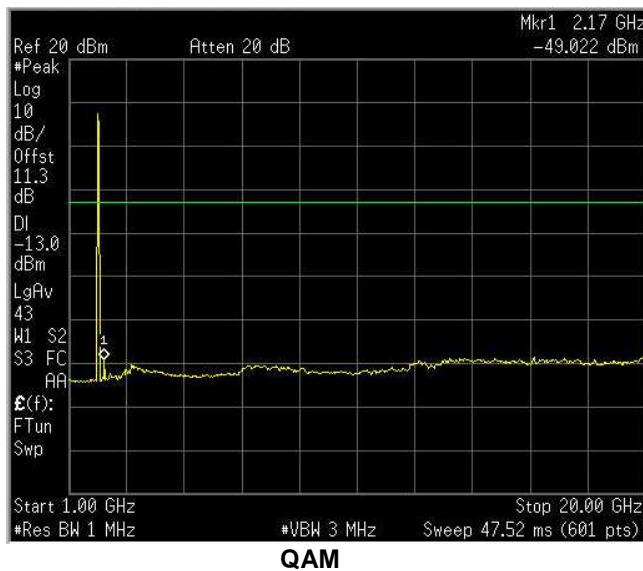
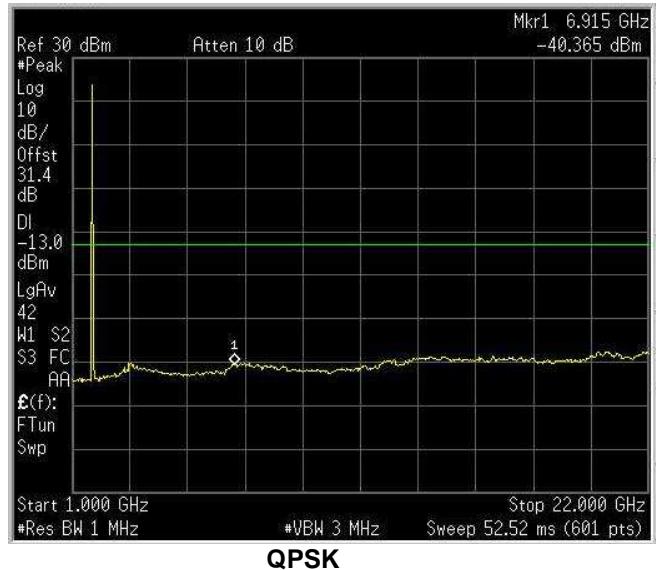
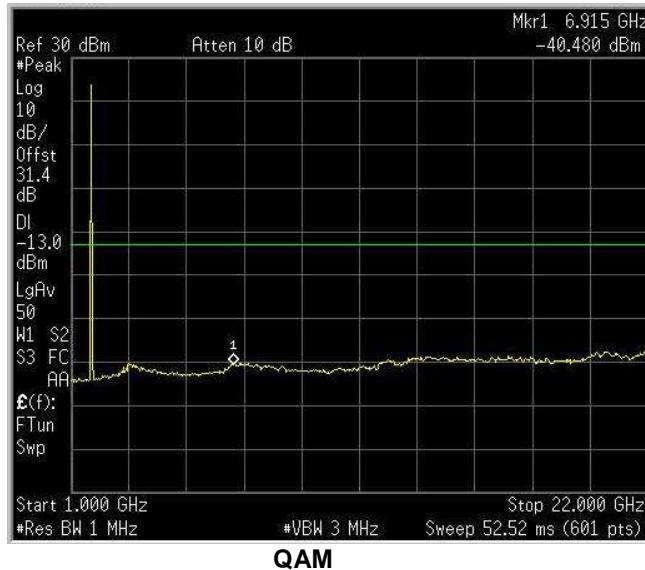
**Only 1,4 QPSK (Down-link) spurious emission plots are included here, other modulations spurious emission plots are negligible and the same.**

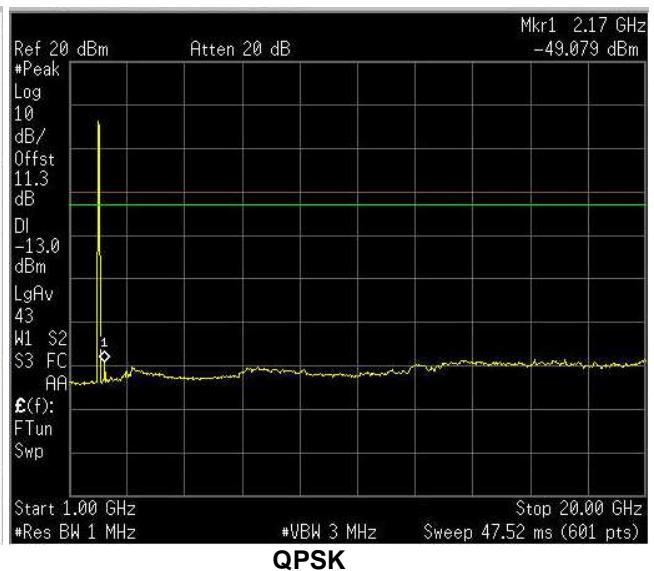
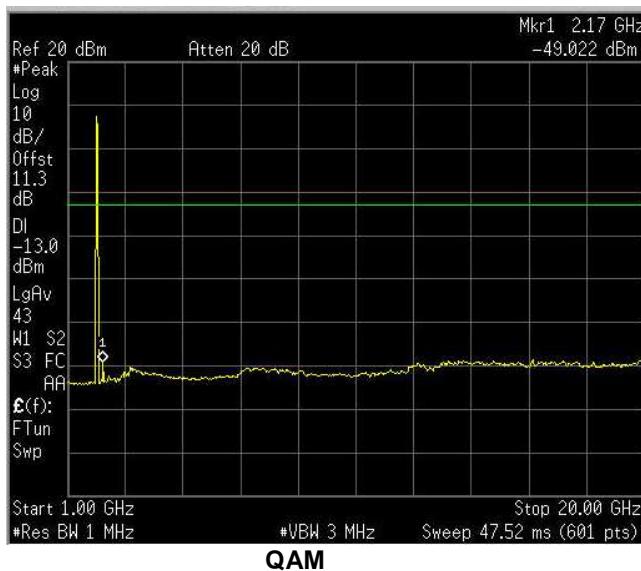
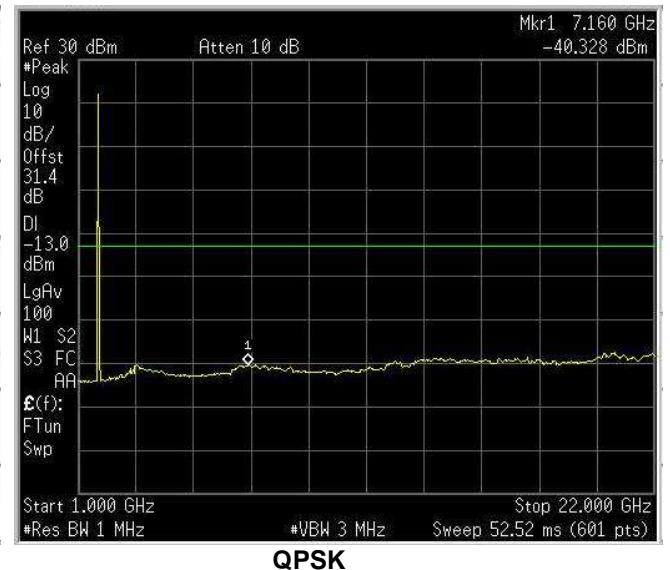
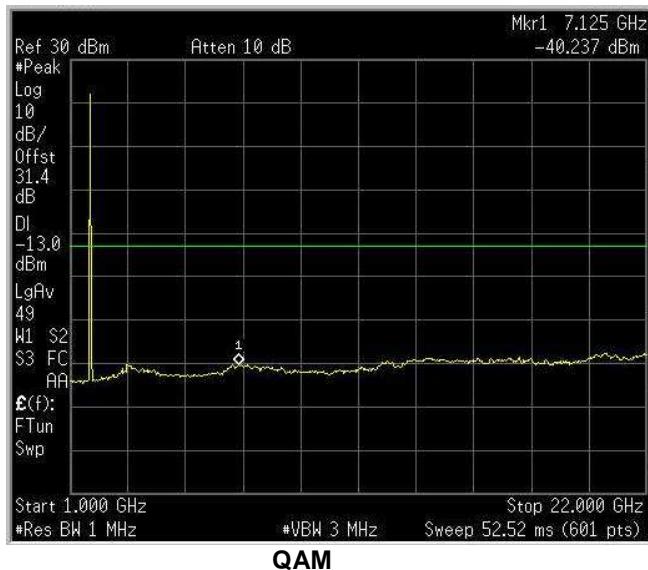
**Mod. LTE 1.4MHz (QPSK) (Up-link)**

**9kHz-150kHz**

**150kHz-30MHz**

**30MHz-1GHz**

**1GHz-20GHz**

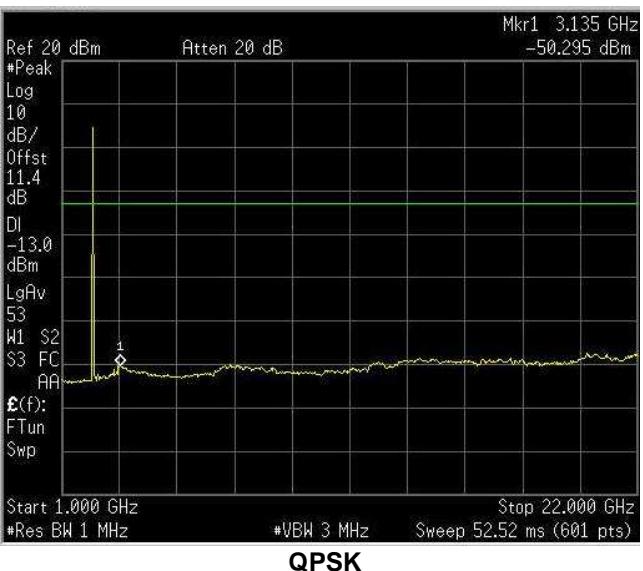
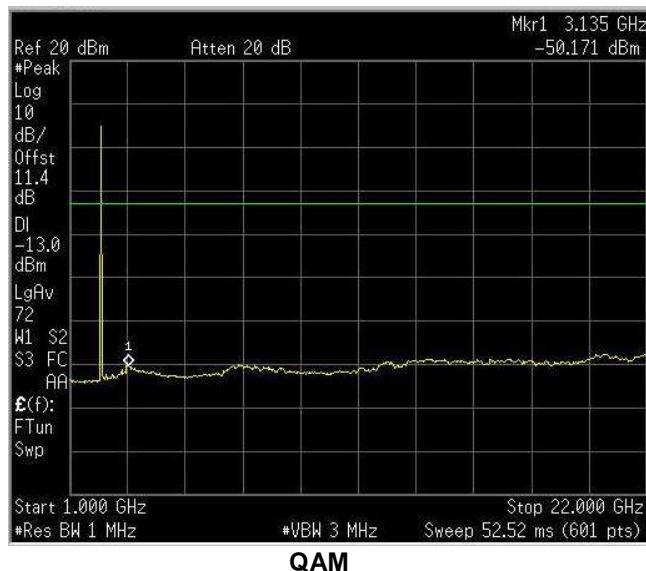
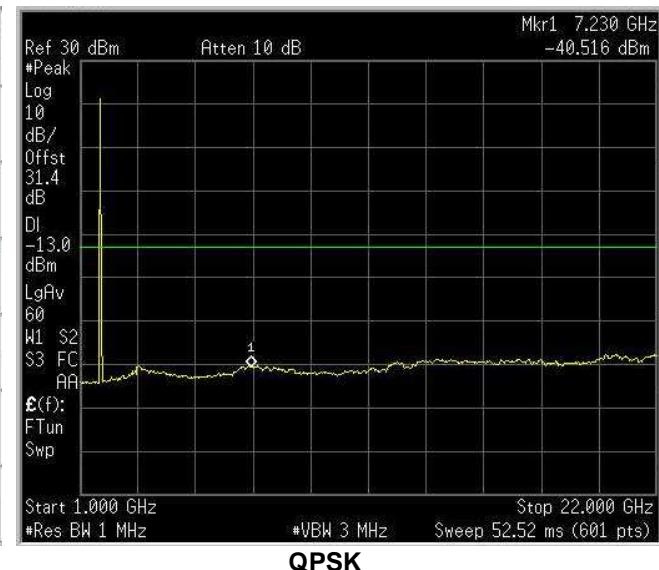
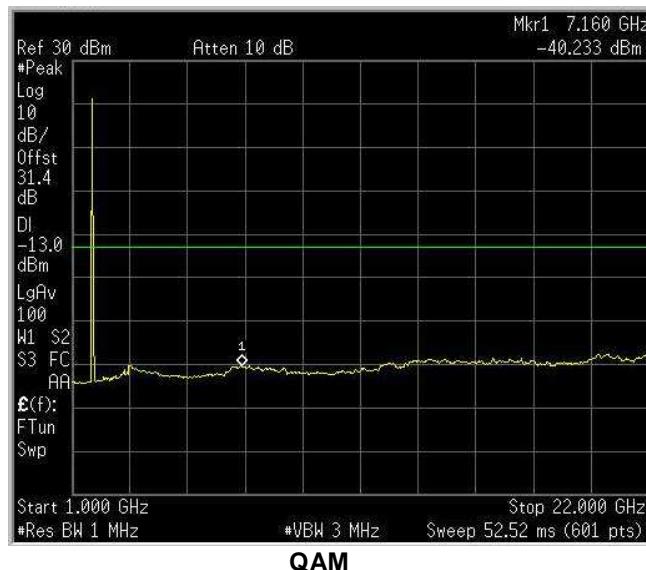
**Only 1,4 QPSK (Up-link) spurious emission plots are included here, other modulations spurious emission plots are negligible and the same.**

**Mod. LTE 3MHz, only 1G-20G plot (Down-link)**

**Mod. LTE 3MHz, only 1G-20G plot (Up-link)**


**Mod. LTE 5MHz, only 1G-20G plot (Down-link)**

**Mod. LTE 5MHz, only 1G-20G plot (Up-link)**


**Mod. LTE 10MHz, only 1G-20G plot (Down-link)**

**Mod. LTE 10MHz, only 1G-20G plot (Up-link)**


**Mod. LTE 15MHz, only 1G-20G plot (Down-link)**

**Mod. LTE 15MHz, only 1G-20G plot (Up-link)**


**Mod. LTE 20MHz, only 1G-20G plot (Down-link)**

**QAM**
**QPSK**
**Mod. LTE 20MHz, only 1G-20G plot (Up-link)**

**QAM**
**QPSK**



#### 8.4 Clause 27.53 (g) Radiated spurious emissions

For operations in the 1710-1755 MHz and 2110-2155 MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least  $43 + 10 \log_{10} (P)$  dB.

(1) Compliance with the provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

(2) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the licensee's frequency block edges, both upper and lower, as the design permits.

(3) The measurements of emission power can be expressed in peak or average values, provided they are expressed in the same parameters as the transmitter power.

#### Special notes

- The spectrum was searched from 30 MHz to the 10<sup>th</sup> harmonic.
- All measurements were performed using a peak detector.
- The measurements were performed at the distance of 3 m.
- RBW within 30–1000 MHz was 100 kHz and 1 MHz above 1 GHz. VBW was wider than RBW.



The D.U.T. was positioned according to the radiated emissions set-up

The D.U.T. antenna connector was terminated by a  $50 \Omega$  shielded dummy load.

The spectrum was searched from 30 MHz to 1 GHz (RBW 100 kHz) & 1 GHz (RBW 1 MHz) to the tenth harmonic of the carrier.

There were no emissions detected above the noise floor which was at least 20 dB below the specification limit.

## 8.5 Clause 27.53(f) Radiated spurious emissions within 1559–1610 MHz band

(f) For operations in the 746–763 MHz, 775–793 MHz, and 805–806 MHz bands, emissions in the band 1559–1610 MHz shall be limited to  $-70$  dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and  $-80$  dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

### Special notes

- The spectrum was searched from 1559–1610 MHz.
- All measurements were performed using a peak detector.
- The measurements were performed at the distance of 3 m.
- RBW was set to 1 MHz and VBW was wider than RBW.

### Test data

[Insert plots here](#)

#### Spurious emissions measurement results:

Frequency (MHz)	Polarization. V/H	Field strength (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
Low channel				
Mid channel				
High channel				

Note: Field strength includes correction factor of antenna, cable loss, amplifier, and attenuators where applicable.

[NOT APPLICABLE: AWS band.](#)

## 8.6 Clause 27.54 Frequency stability

The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

### Special notes

- 26 dBc points including frequency tolerance were assessed to remain within assigned band.  
The resolution bandwidth was set to 100 kHz, video bandwidth was set to 100 kHz

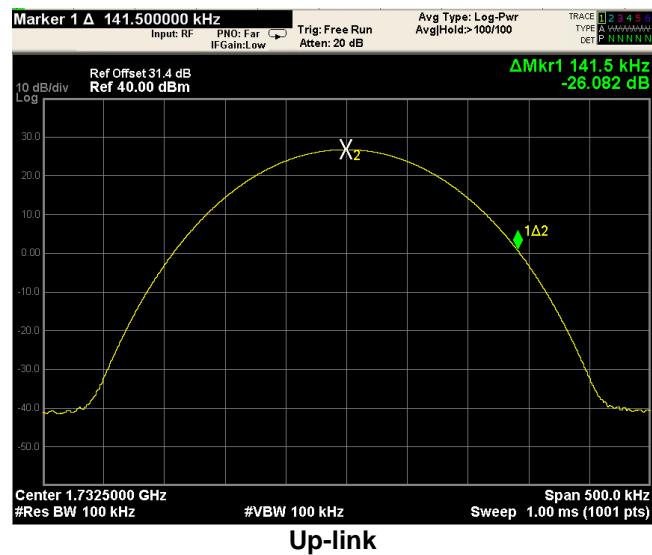
### Test data



**Down-link**

### Frequency tolerance measurements:

Test conditions	$\Delta$ Frequency (Hz)	Offset (Hz)
+50 °C, Nominal	142500	0
+40 °C, Nominal	142500	0
+30 °C, Nominal	142500	0
+20 °C, +15 %	142500	0
+20 °C, Nominal	142500	Reference
+20 °C, -15 %	142500	0
+10 °C, Nominal	142500	0
0 °C, Nominal	142500	0
-10 °C, Nominal	142500	0
-20 °C, Nominal	EUT doesn't work	
-30 °C, Nominal	EUT doesn't work	

**Test data**

**Frequency tolerance measurements:**

Test conditions	$\Delta$ Frequency (Hz)	Offset (Hz)
+50 °C, Nominal	141500	0
+40 °C, Nominal	141500	0
+30 °C, Nominal	141500	0
+20 °C, +15 %	141500	0
+20 °C, Nominal	141500	Reference
+20 °C, -15 %	141500	0
+10 °C, Nominal	141500	0
0 °C, Nominal	141500	0
-10 °C, Nominal	141500	0
-20 °C, Nominal	EUT doesn't work	
-30 °C, Nominal	EUT doesn't work	

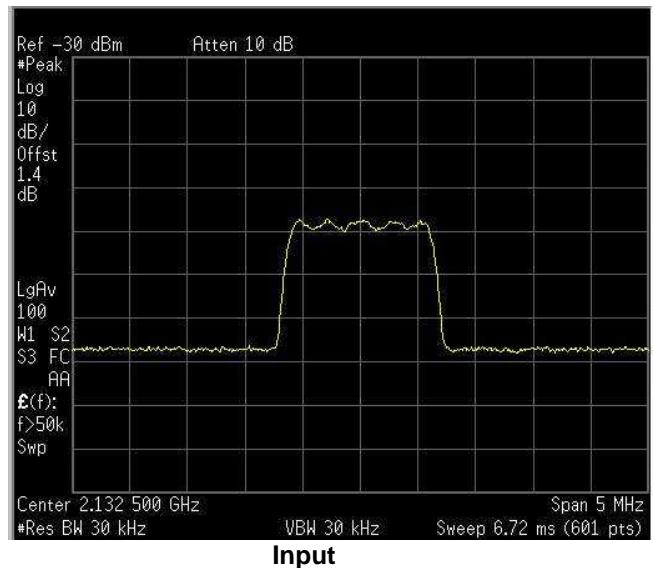
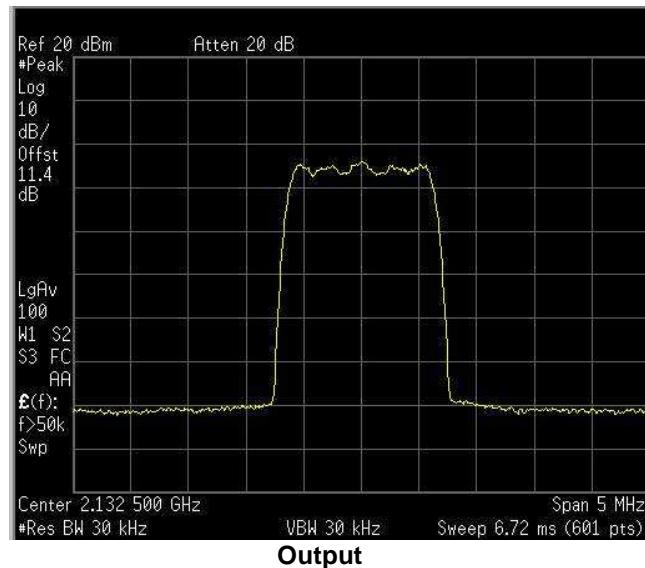
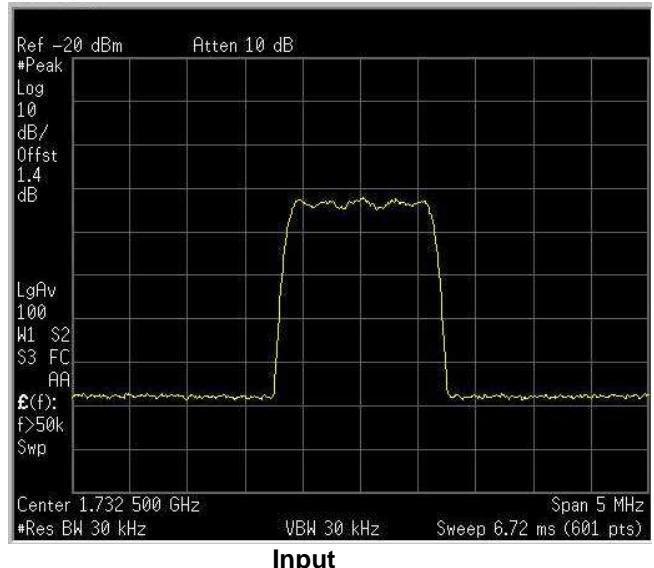
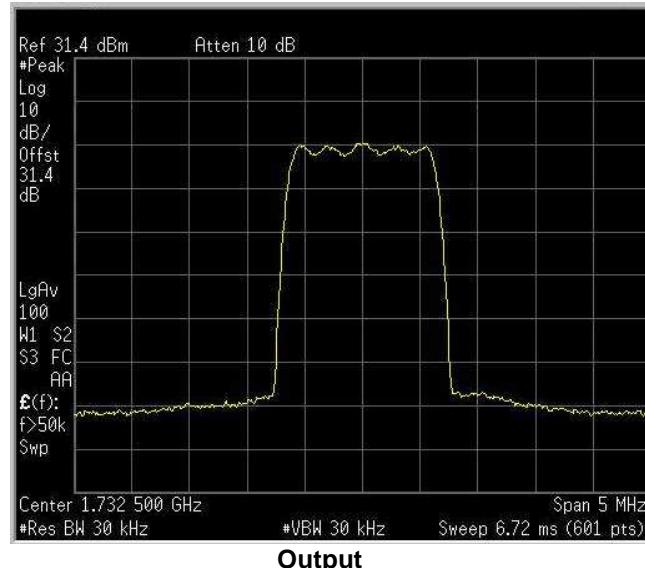


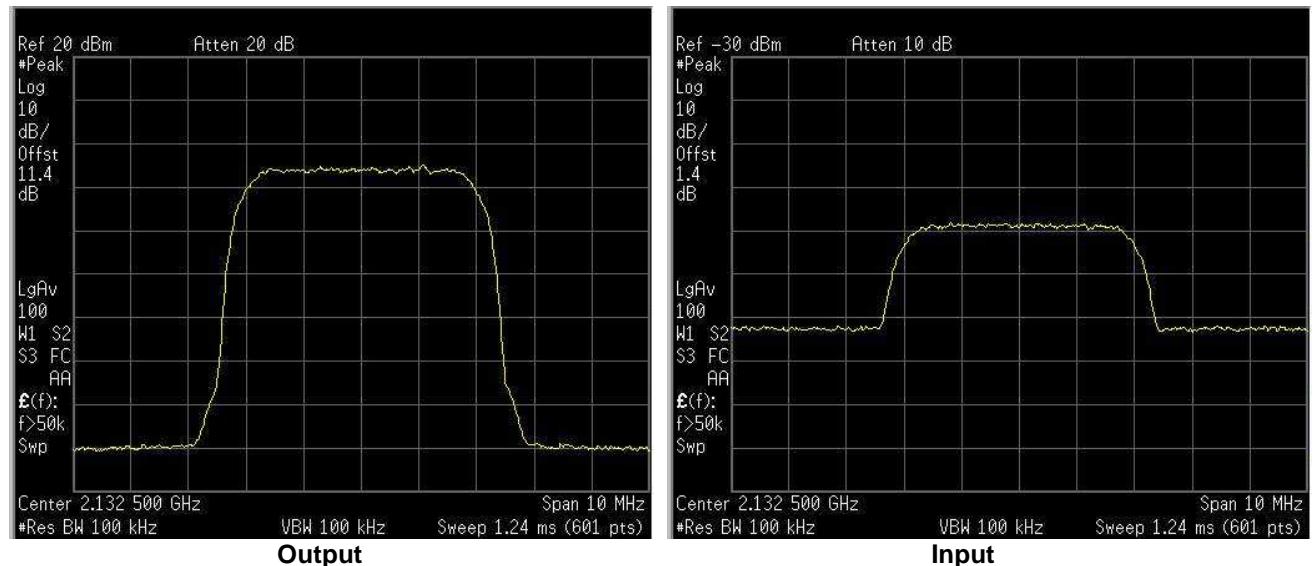
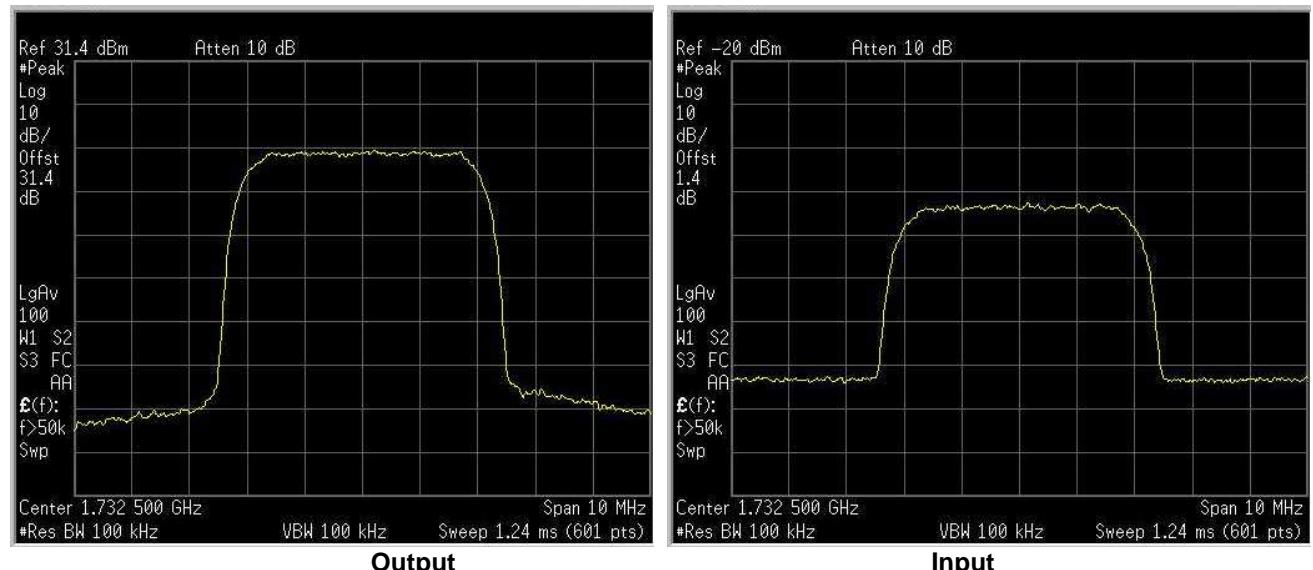
### 8.7 Clause 2.1049 Occupied bandwidth

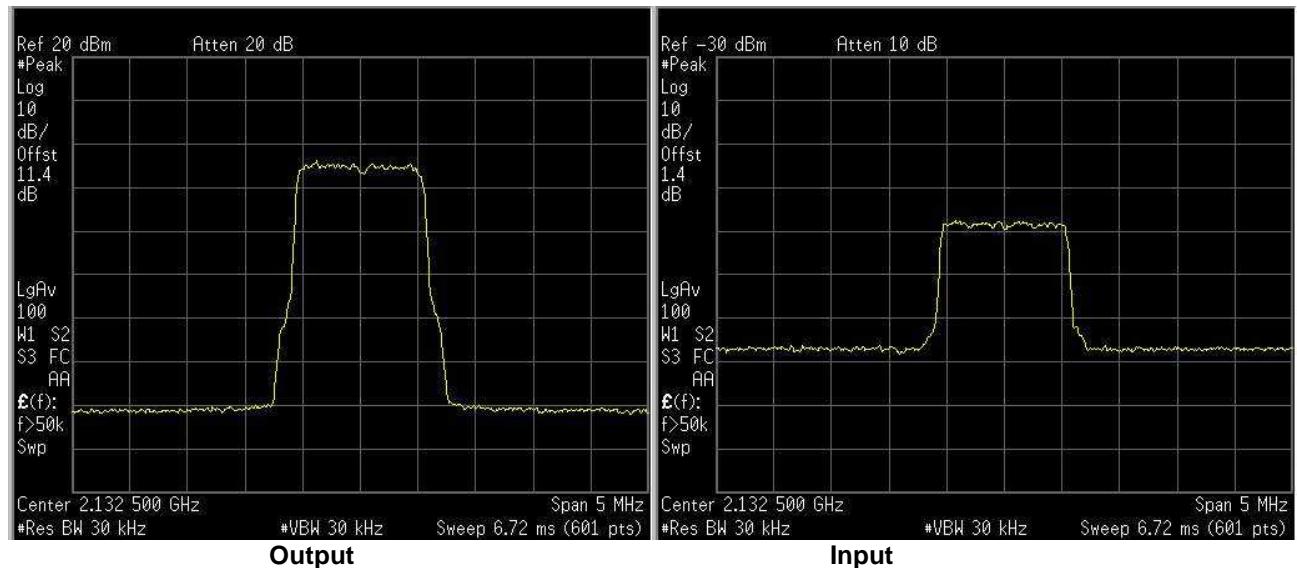
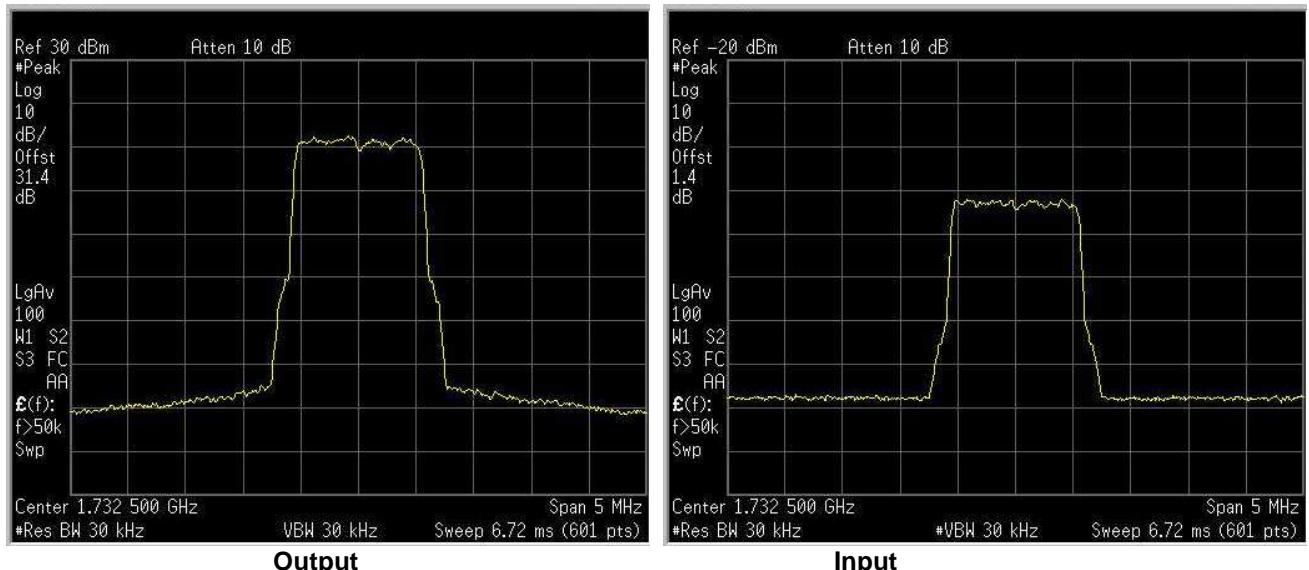
The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

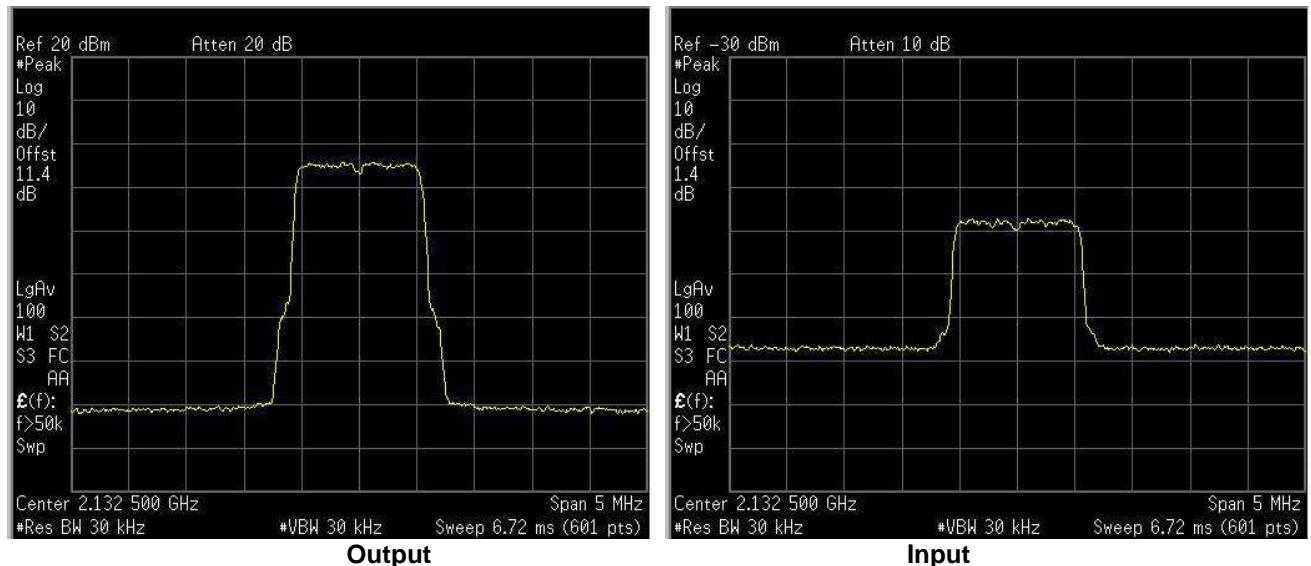
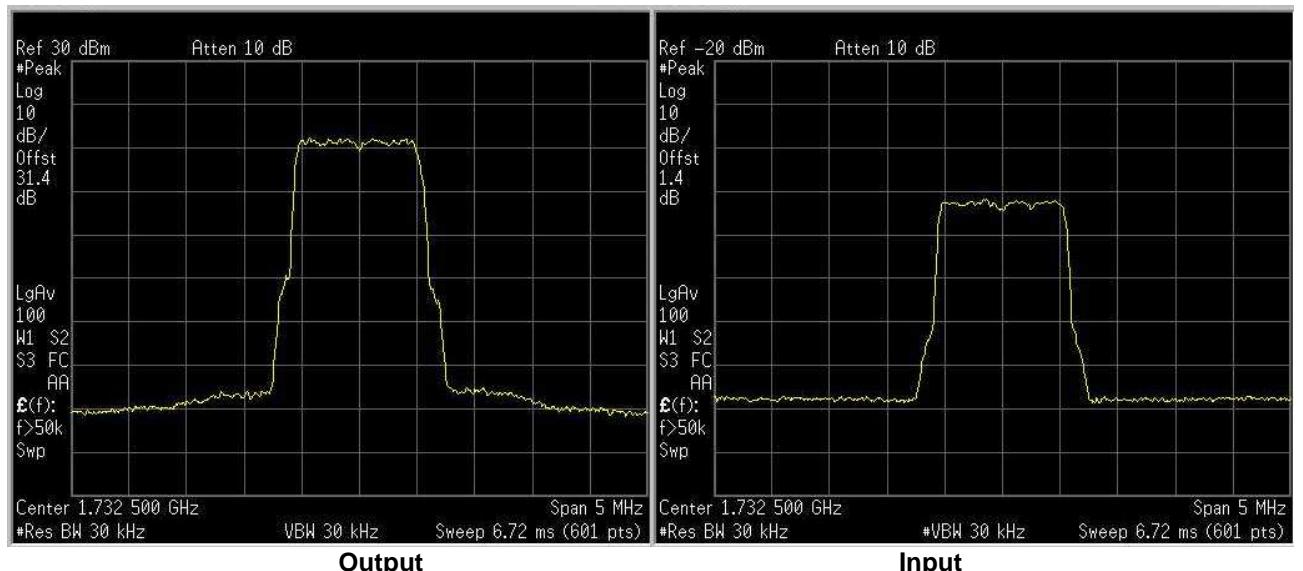
#### Special notes

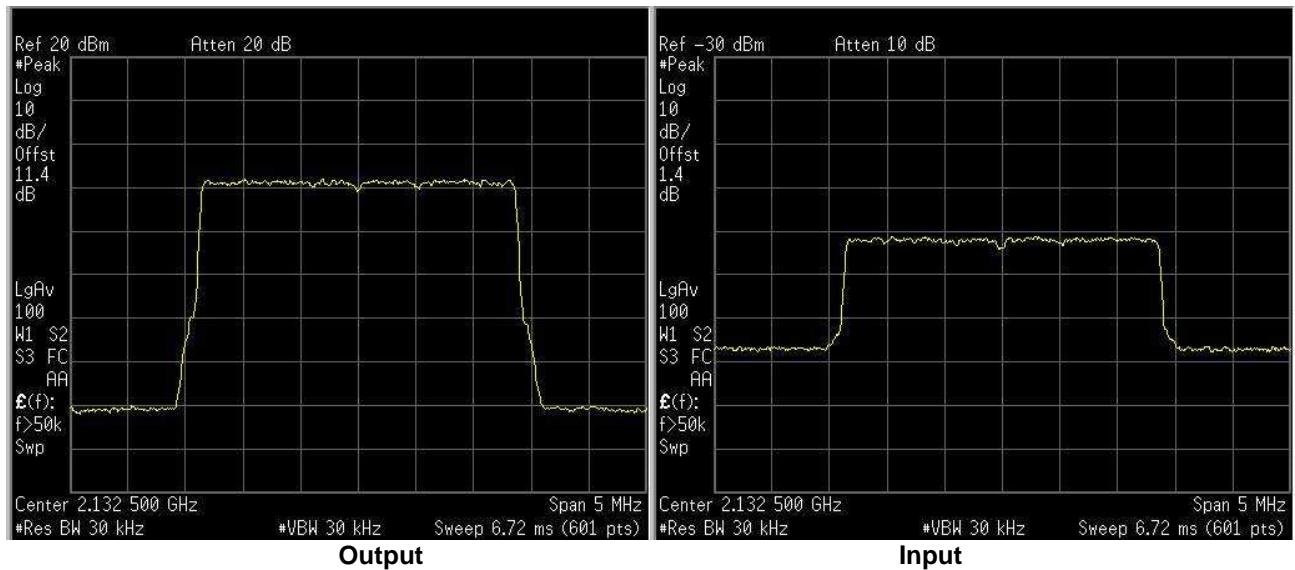
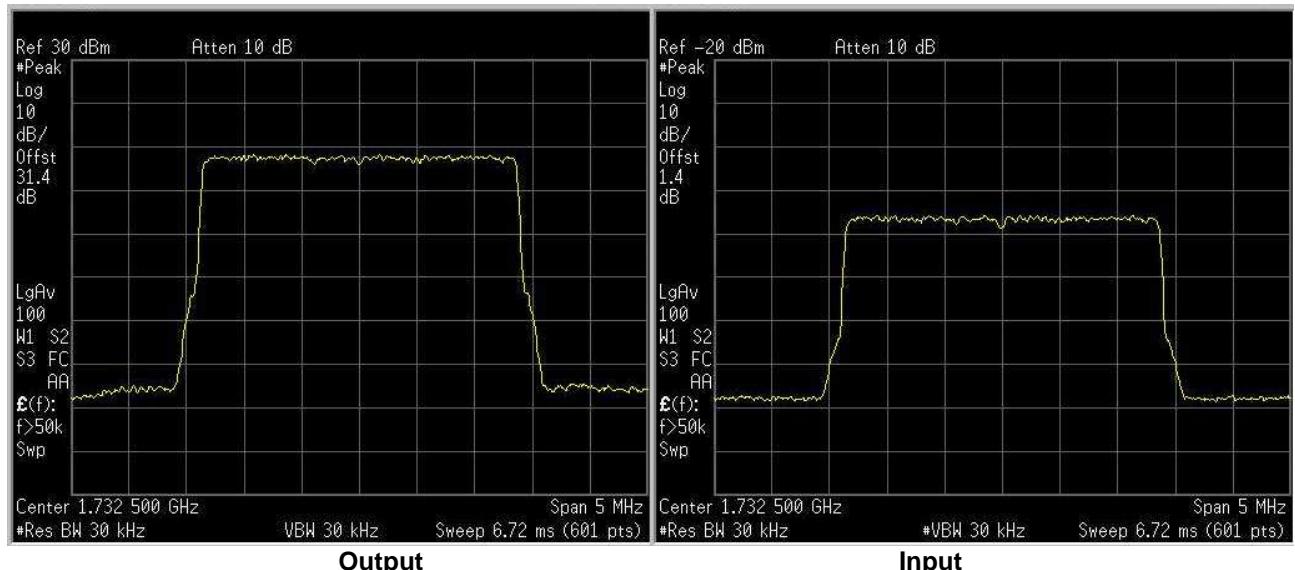
- 26 dBc points provided in terms of attenuation below unmodulated carrier.
- RBW was set to 1 % of emissions bandwidth.

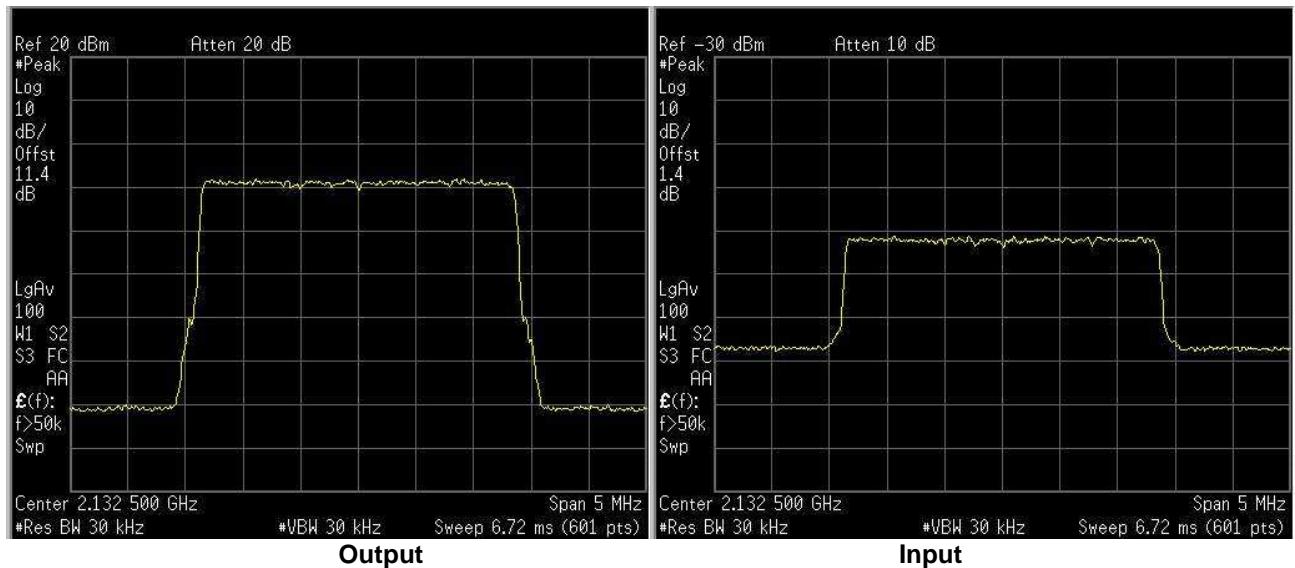
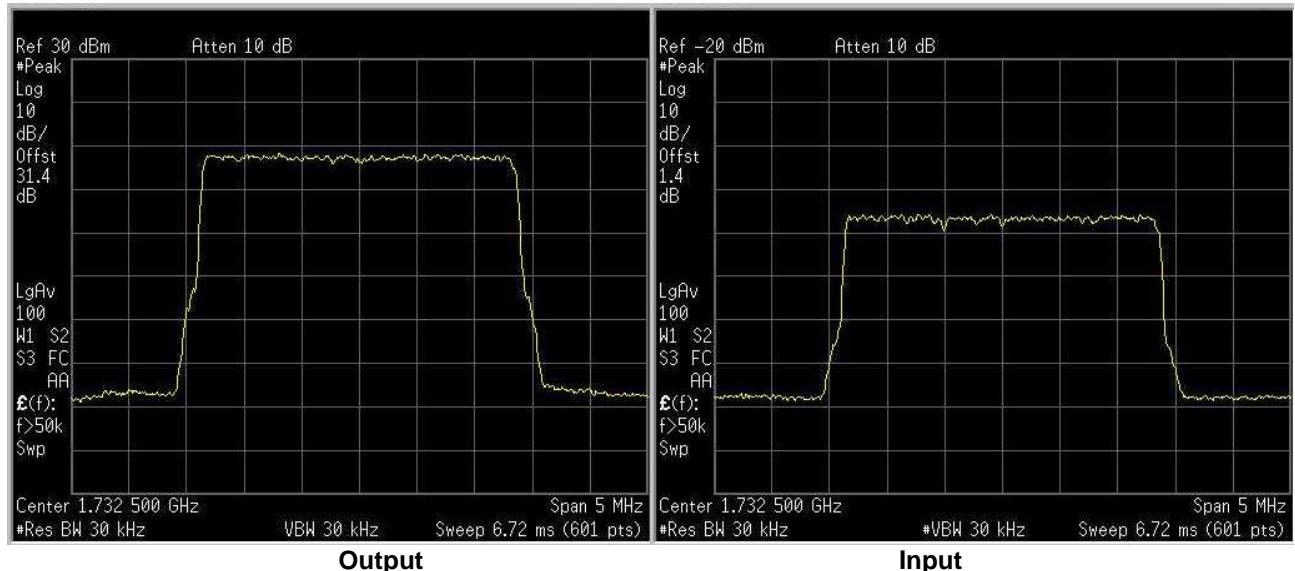
**Mod. CDMA (Down-link)**

**Mod. CDMA (Up-link)**


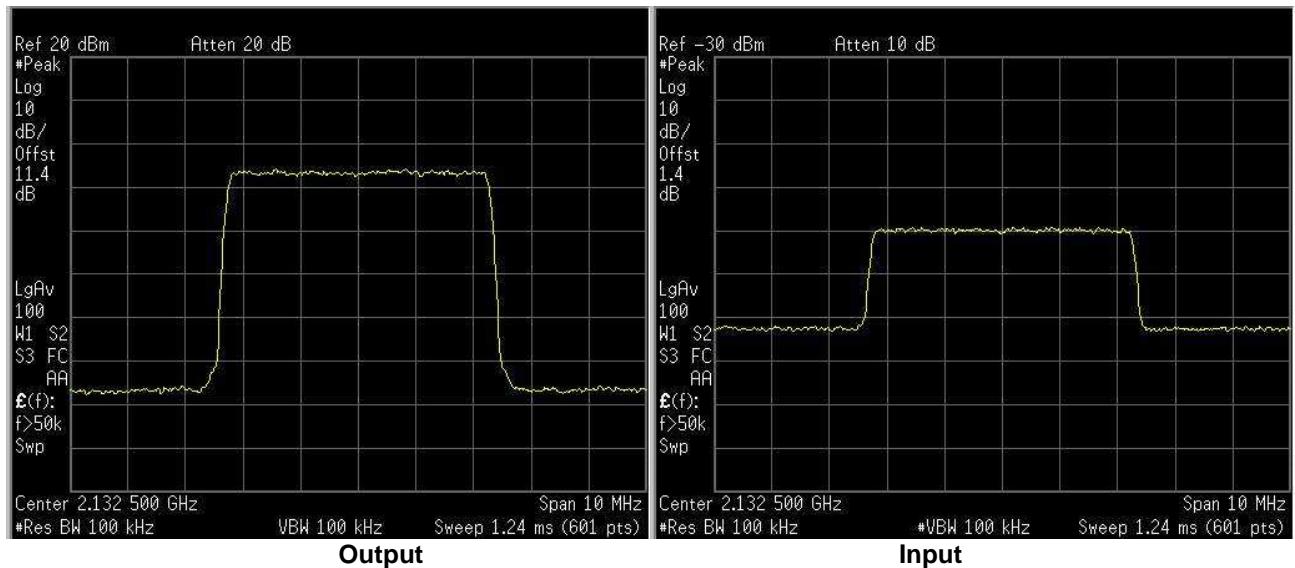
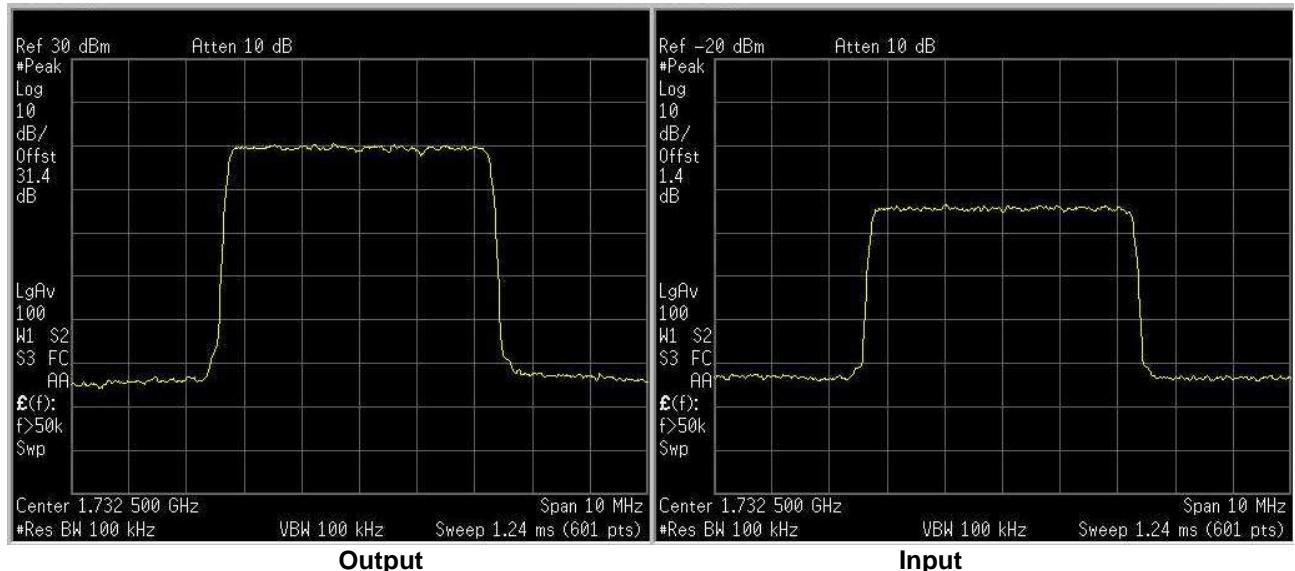
**Mod. WCDMA (Down-link)**

**Mod. WCDMA (Up-link)**


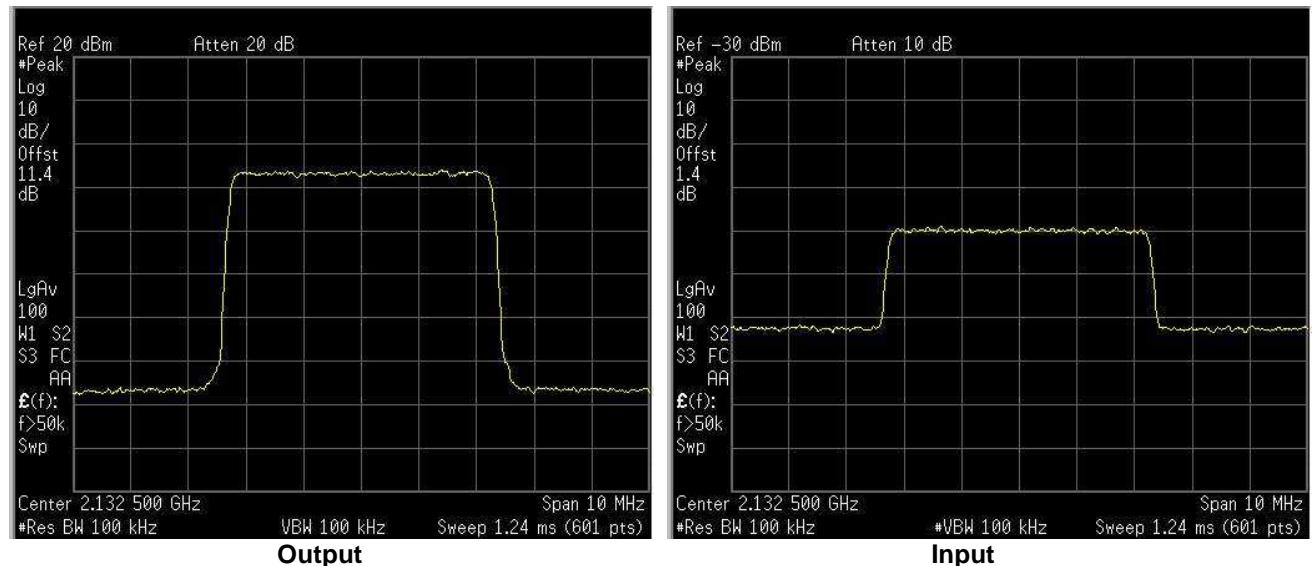
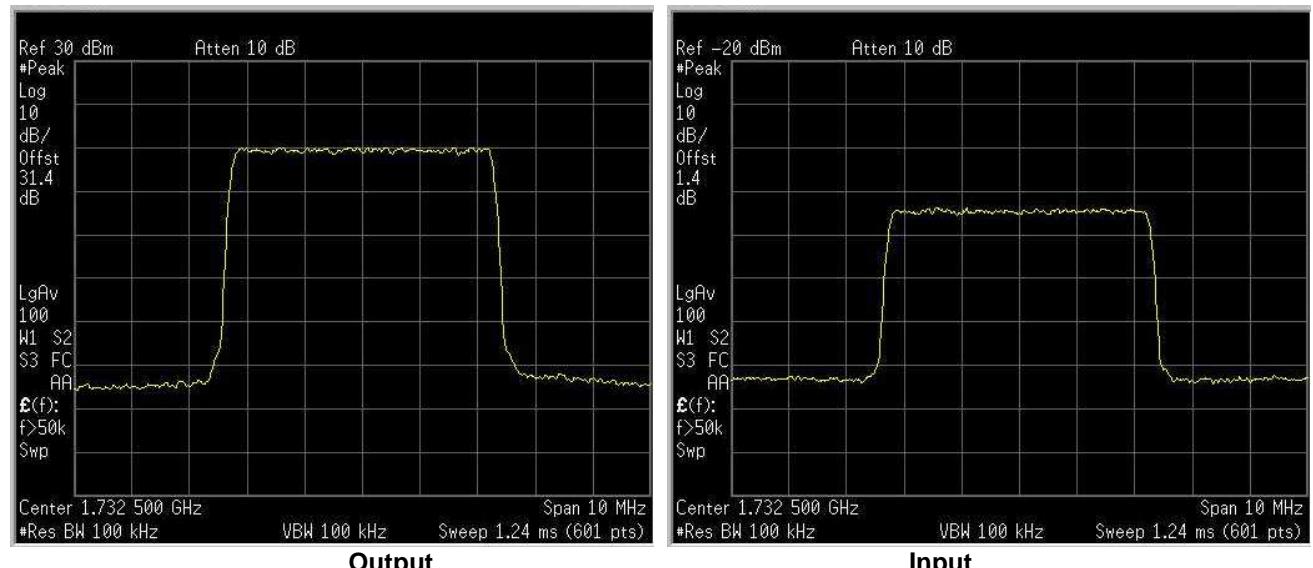
**Mod. LTE 1.4MHz (QAM) (Down-link)**

**Mod. LTE 1.4MHz (QAM) (Up-link)**


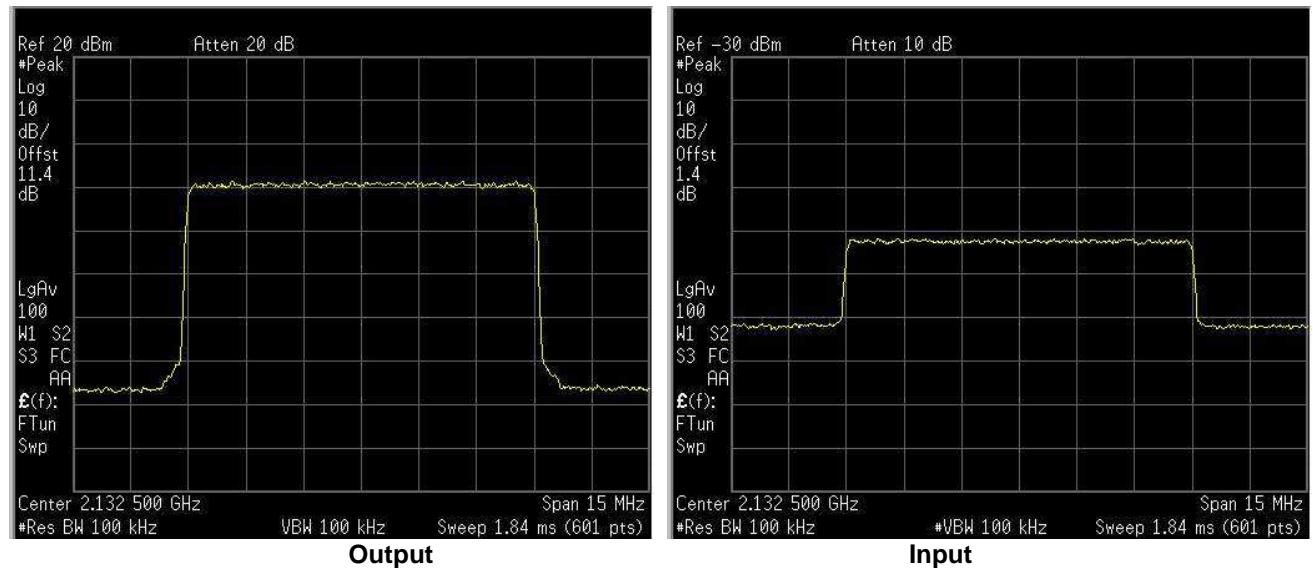
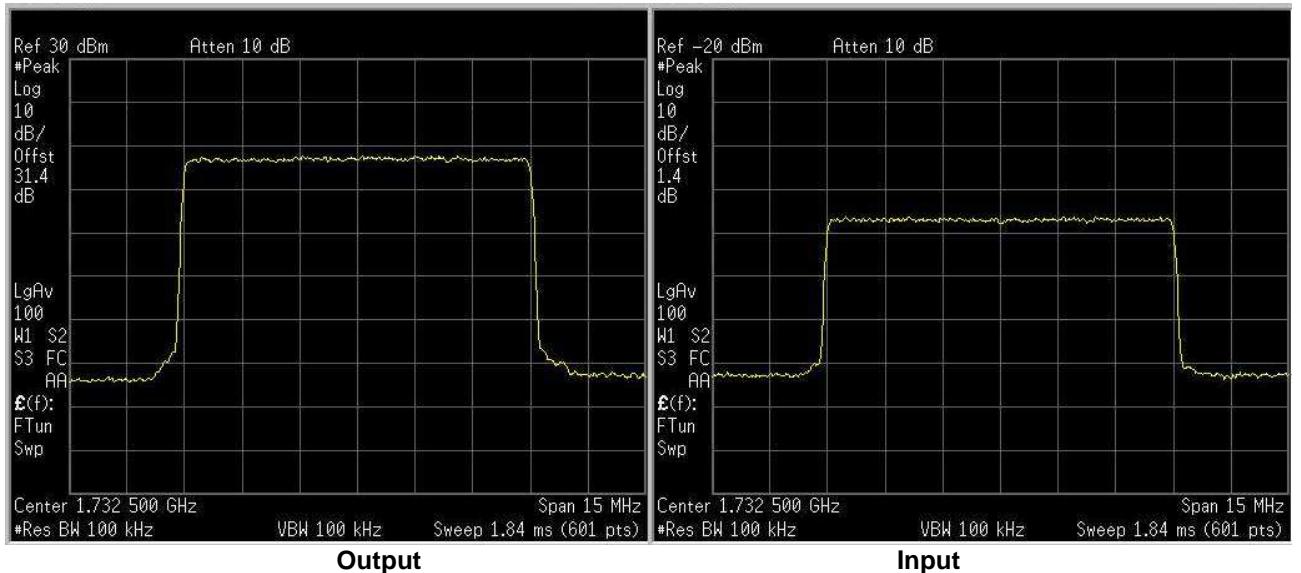
**Mod. LTE 1.4MHz (QPSK) (Down-link)**

**Mod. LTE 1.4MHz (QPSK) (Up-link)**


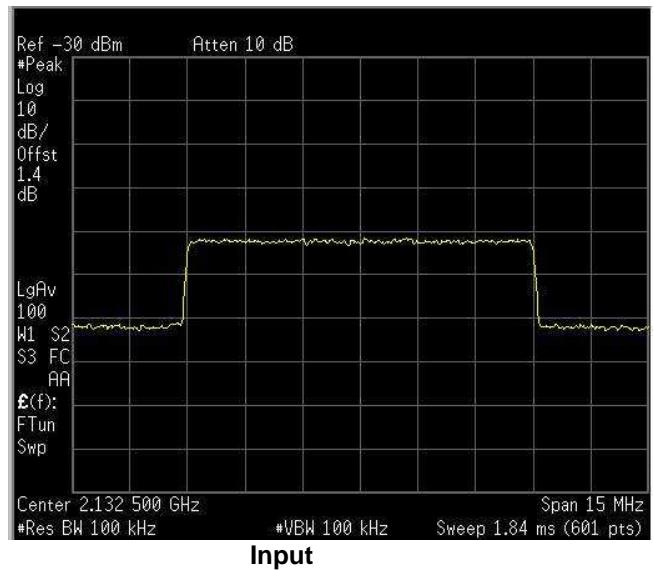
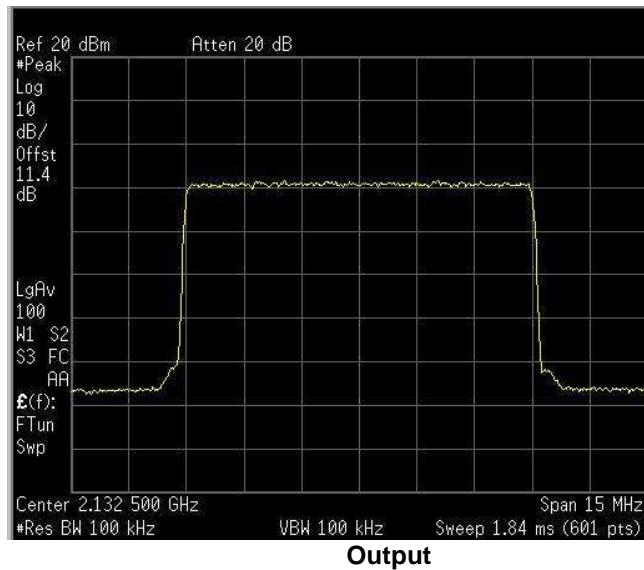
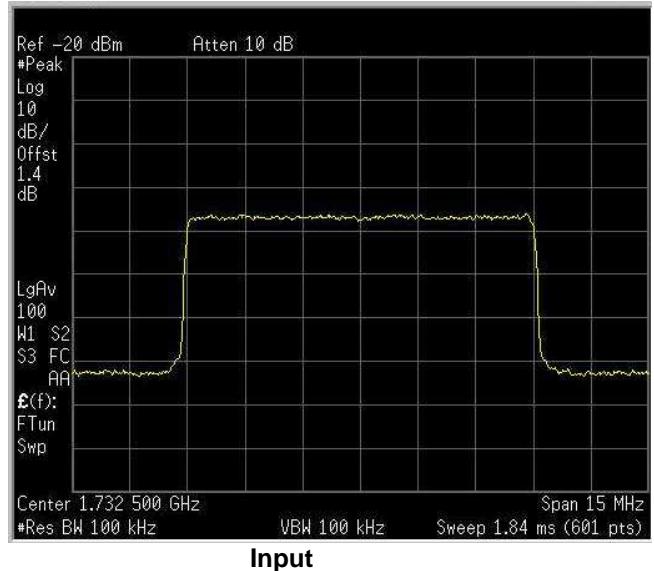
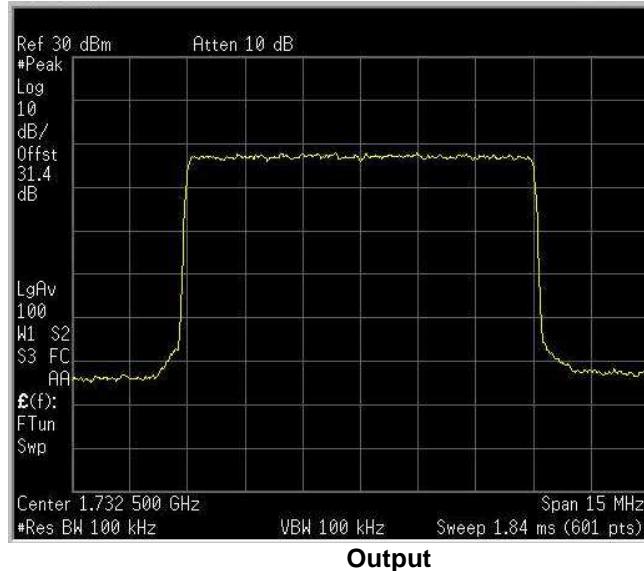
**Mod. LTE 3MHz (QAM) (Down-link)**

**Mod. LTE 3MHz (QAM) (Up-link)**


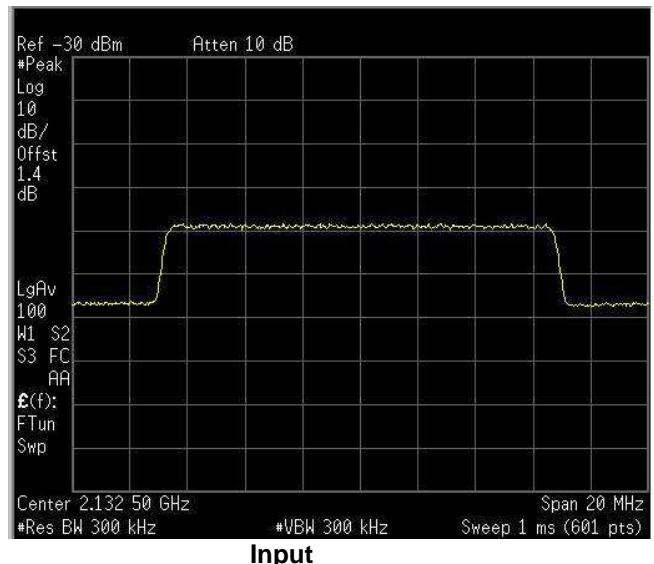
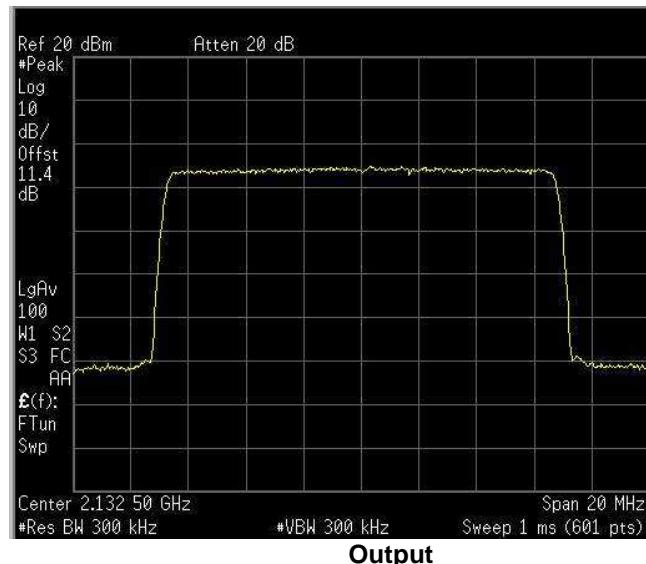
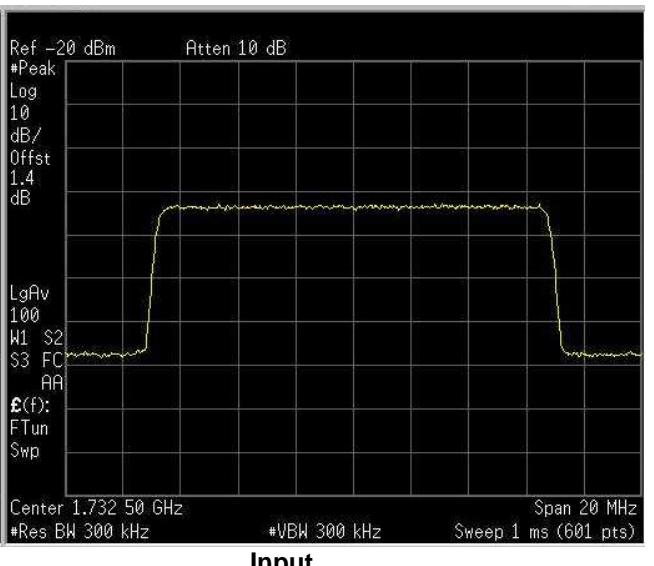
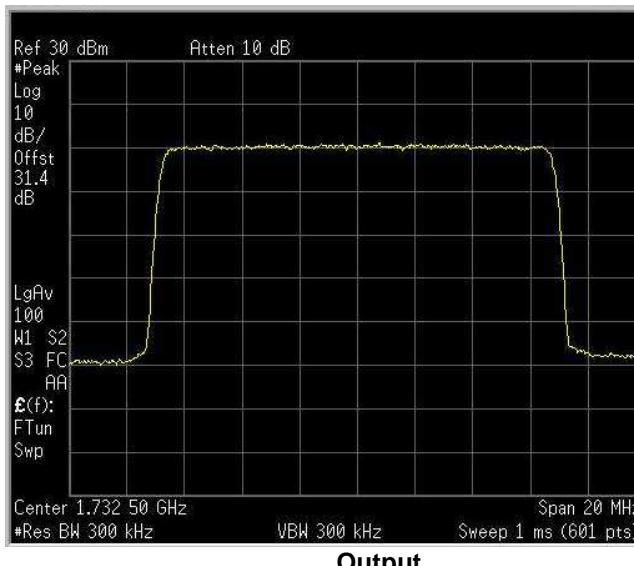
**Mod. LTE 3MHz (QPSK) (Down-link)**

**Mod. LTE 3MHz (QPSK) (Up-link)**


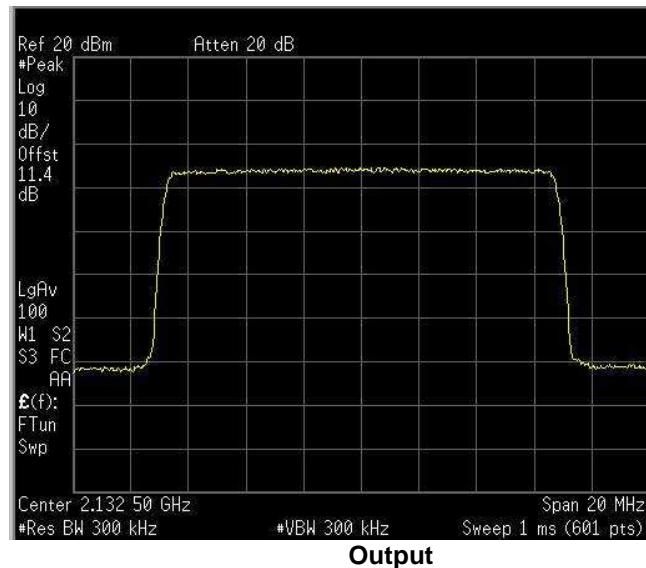
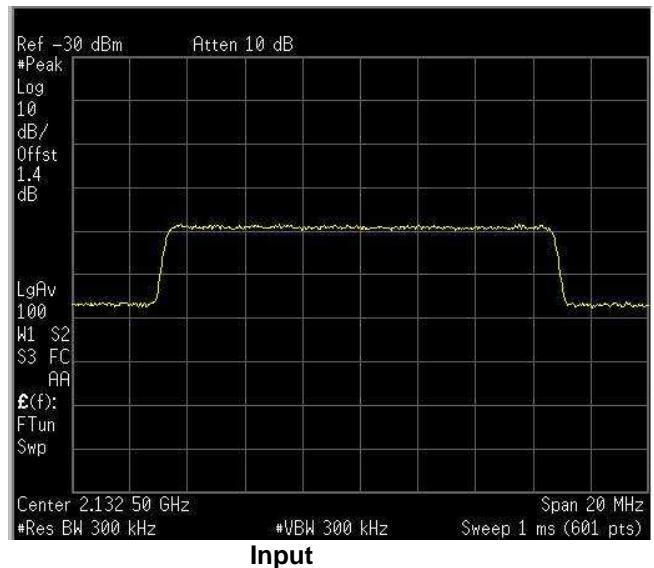
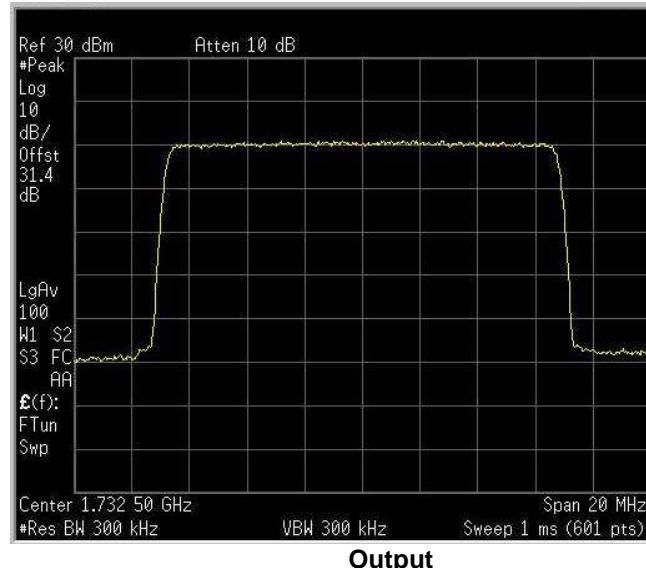
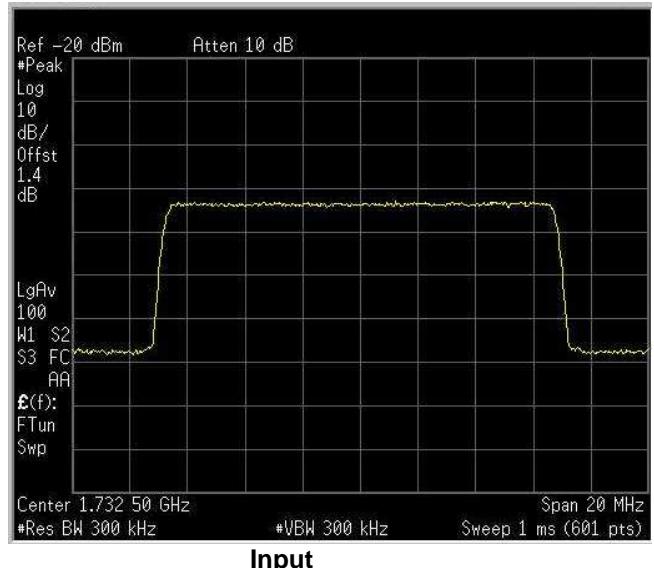
**Mod. LTE 5MHz (QAM) (Down-link)**

**Mod. LTE 5MHz (QAM) (Up-link)**


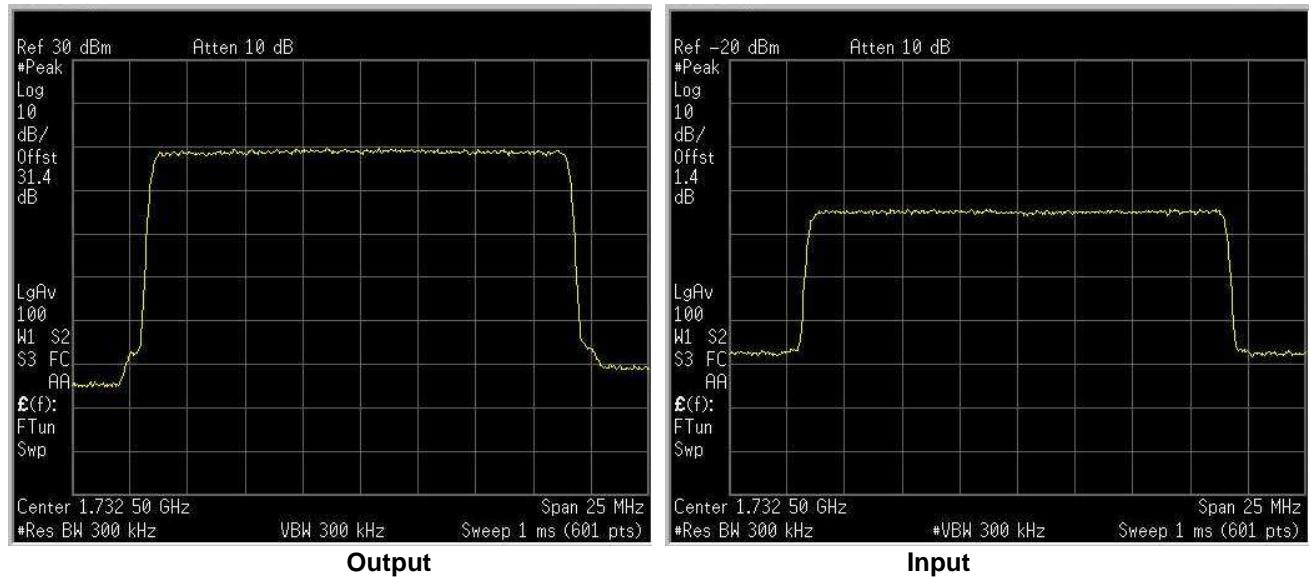
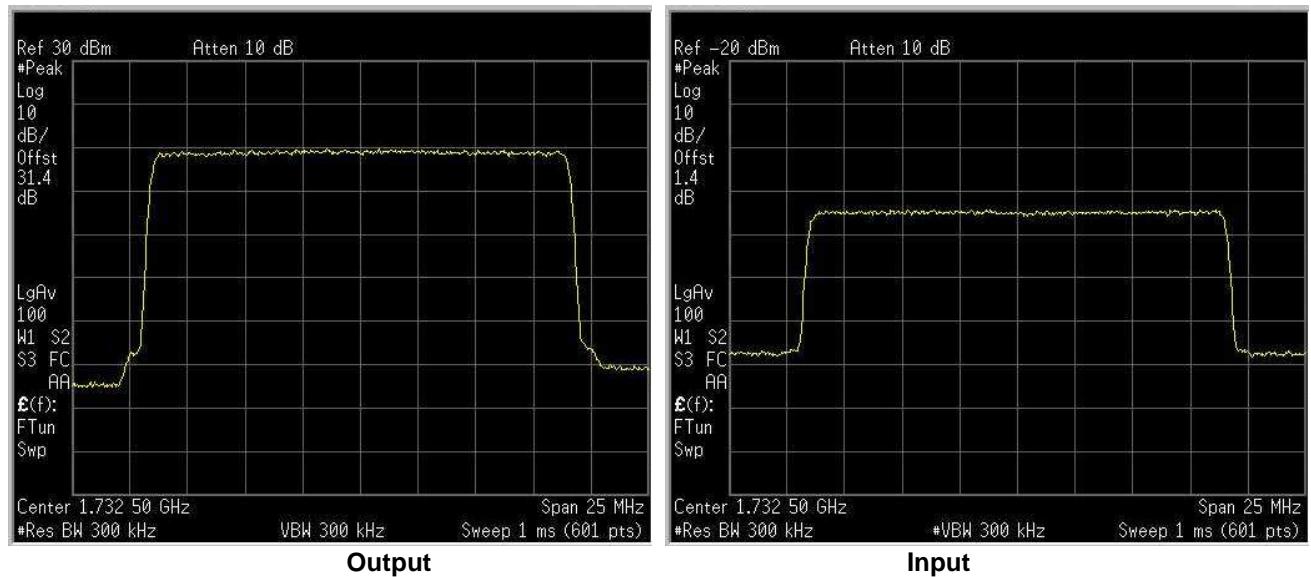
**Mod. LTE 5MHz (QPSK) (Down-link)**

**Mod. LTE 5MHz (QPSK) (Up-link)**


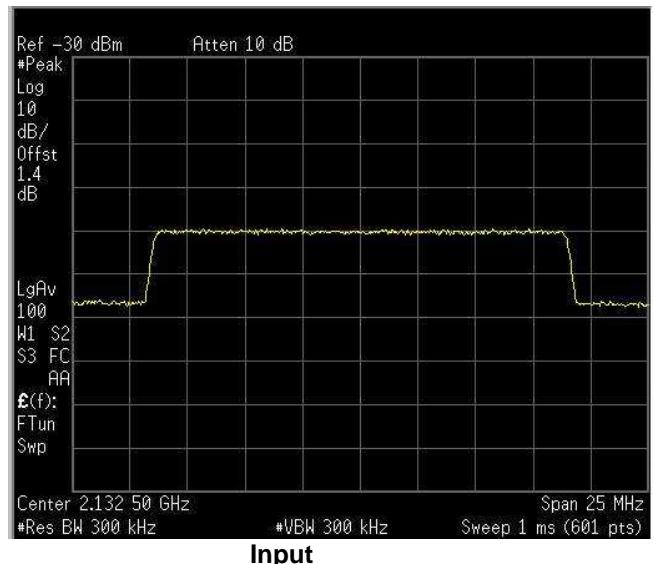
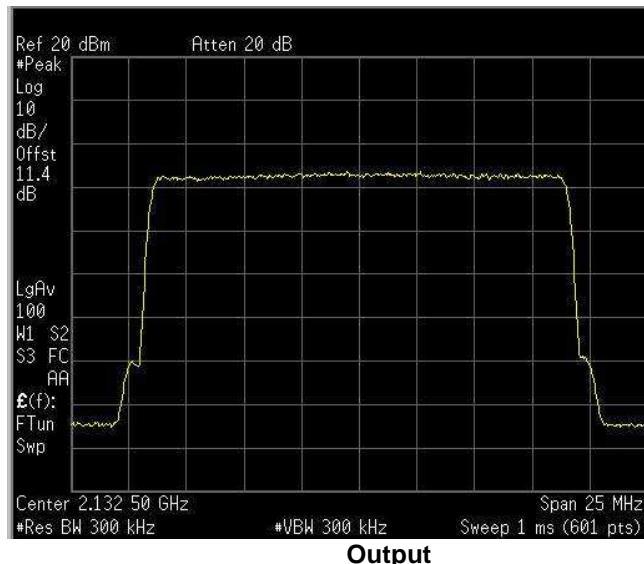
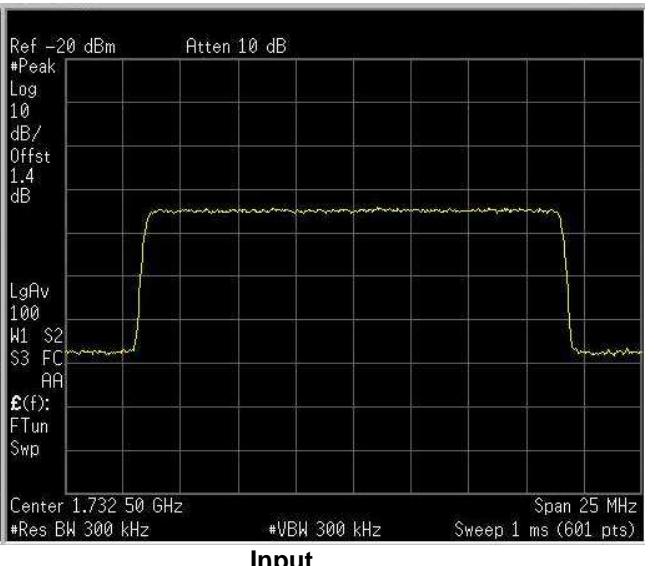
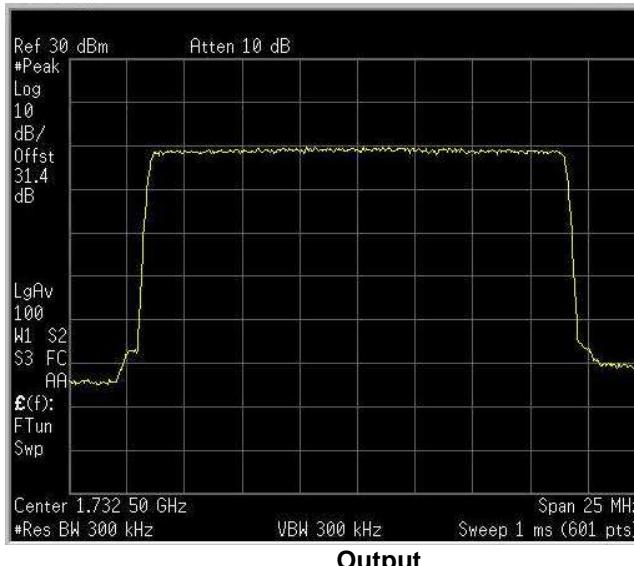
**Mod. LTE 10MHz (QAM) (Down-link)**

**Mod. LTE 10MHz (QAM) (Up-link)**


**Mod. LTE 10MHz (QPSK) (Down-link)**

**Mod. LTE 10MHz (QPSK) (Up-link)**


**Mod. LTE 15MHz (QAM) (Down-link)**

**Mod. LTE 15MHz (QAM) (Up-link)**


**Mod. LTE 15MHz (QPSK) (Down-link)**

**Output**

**Input**
**Mod. LTE 15MHz (QPSK) (Up-link)**

**Output**

**Input**

**Mod. LTE 20MHz (QAM) (Down-link)**

**Mod. LTE 20MHz (QAM) (Up-link)**


**Mod. LTE 20MHz (QPSK) (Down-link)**

**Mod. LTE 20MHz (QPSK) (Up-link)**


***To be continued***