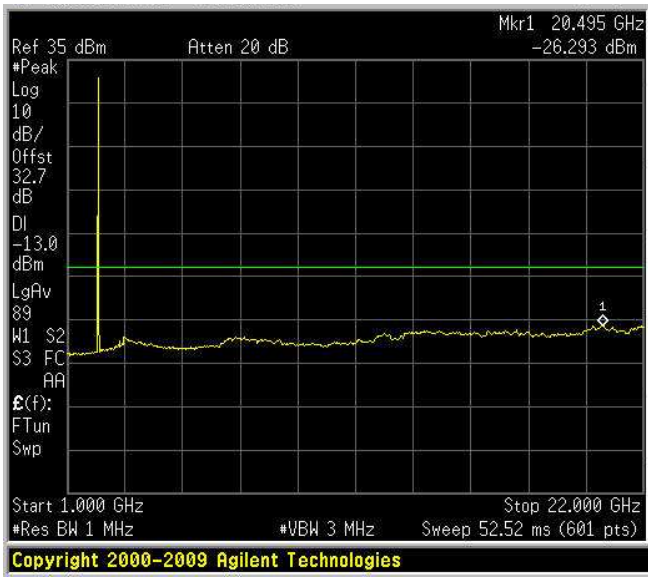
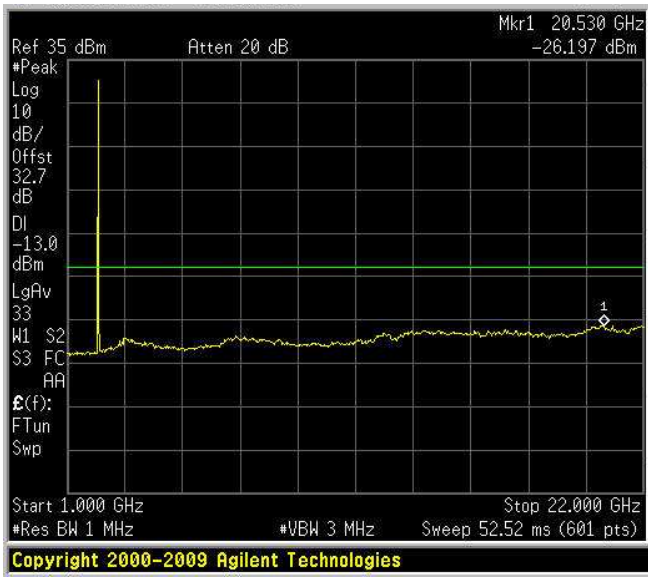
PART 2

Spurious Emissions at Antenna Terminals
Downlink – 1,4 QAM
1-22 GHz



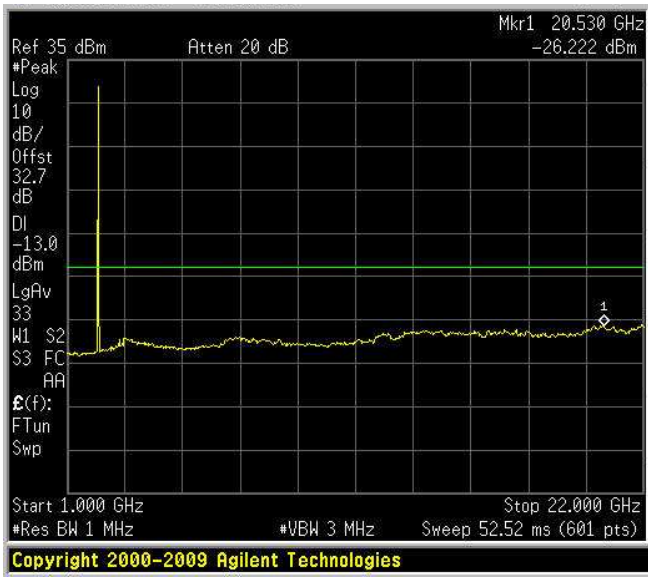
Spurious Emissions at Antenna Terminals
Downlink – 1,4 QPSK
1-22 GHz

Spurious Emissions at Antenna Terminals
Downlink – 3 QAM
1-22 GHz

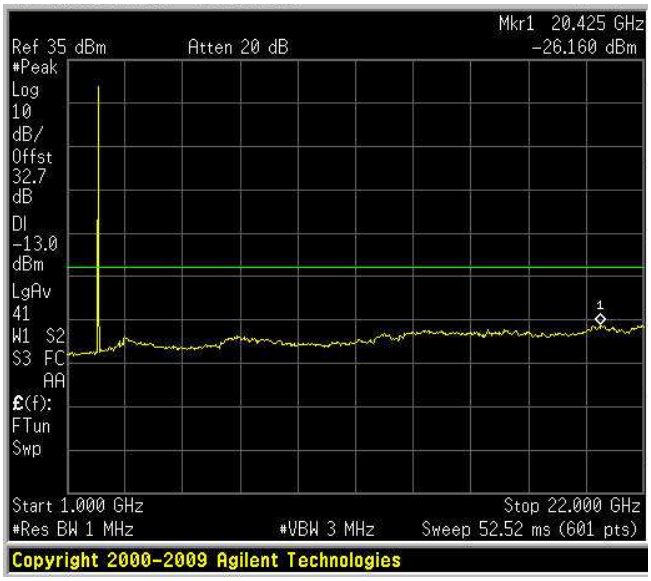


Spurious Emissions at Antenna Terminals
Downlink – 3 QPSK
1-22 GHz

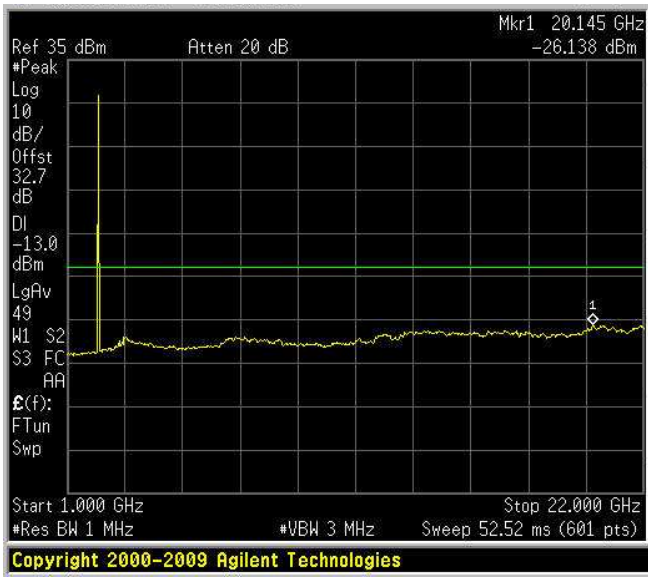
Spurious Emissions at Antenna Terminals
Downlink – 5 QAM
1-22 GHz



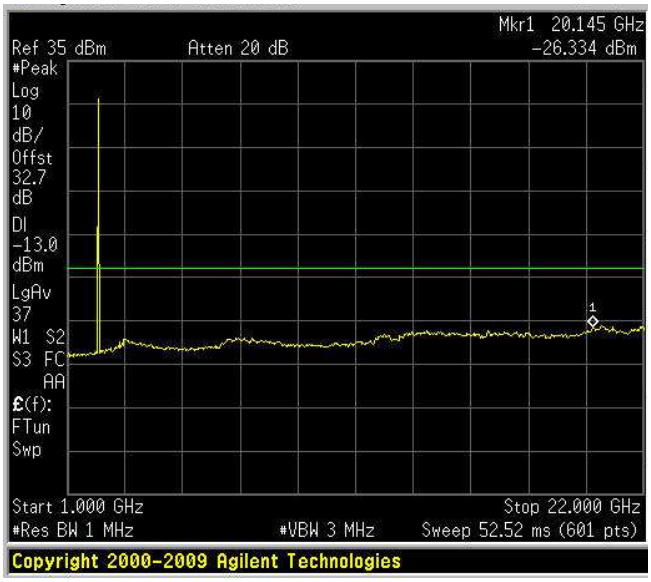
Spurious Emissions at Antenna Terminals
Downlink – 5 QPSK
1-20 GHz



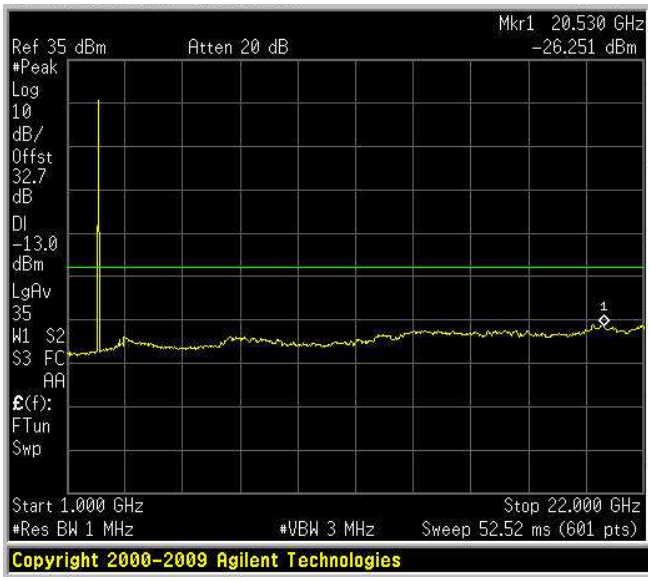
Spurious Emissions at Antenna Terminals
Downlink – 10 QAM
1-22 GHz



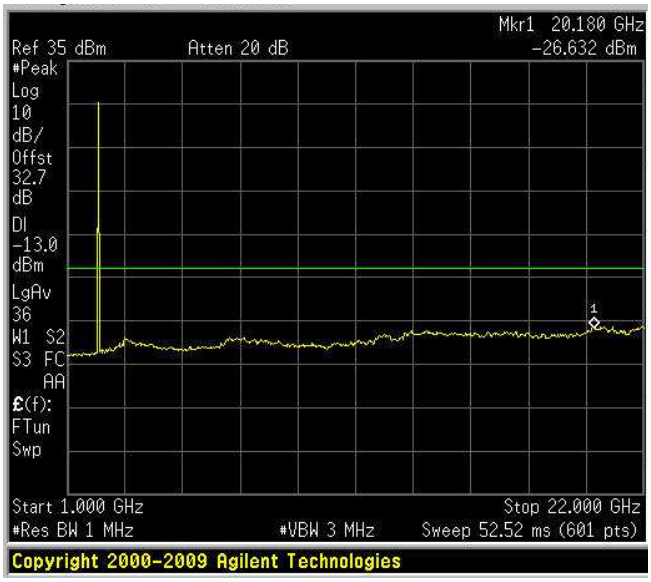
Spurious Emissions at Antenna Terminals
Downlink – 10 QPSK
1-22 GHz



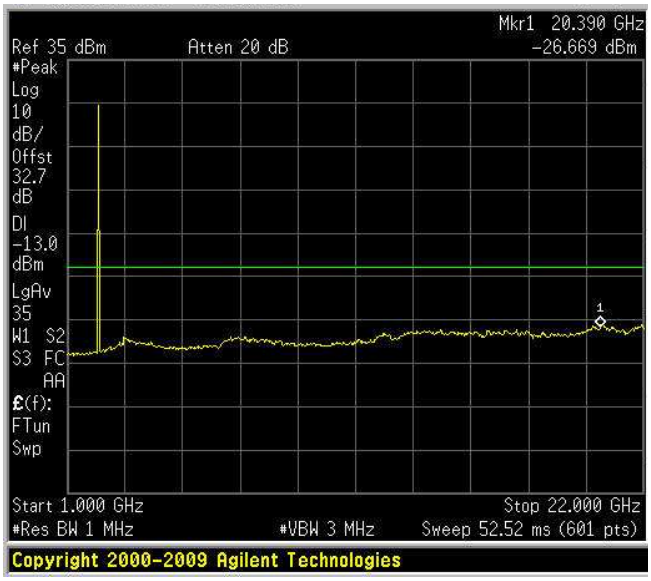
Spurious Emissions at Antenna Terminals
Downlink – 15 QAM
1-22GHz



Spurious Emissions at Antenna Terminals
Downlink – 15 QPSK
1-22GHz

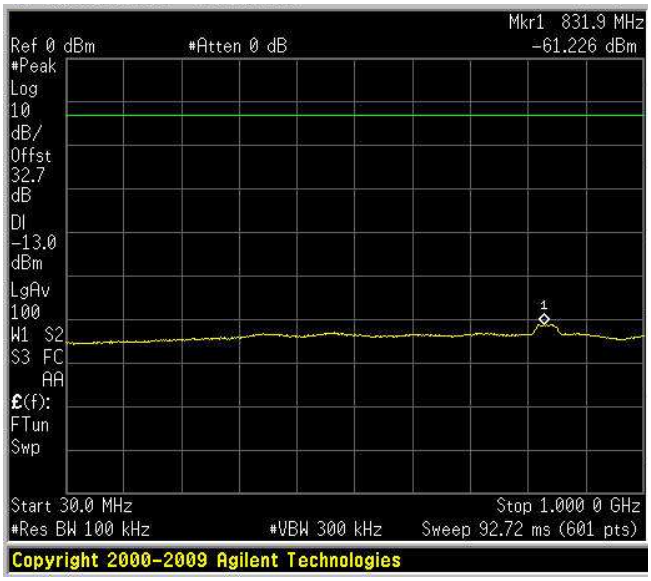


Spurious Emissions at Antenna Terminals
Downlink – 20 QAM
1-22GHz

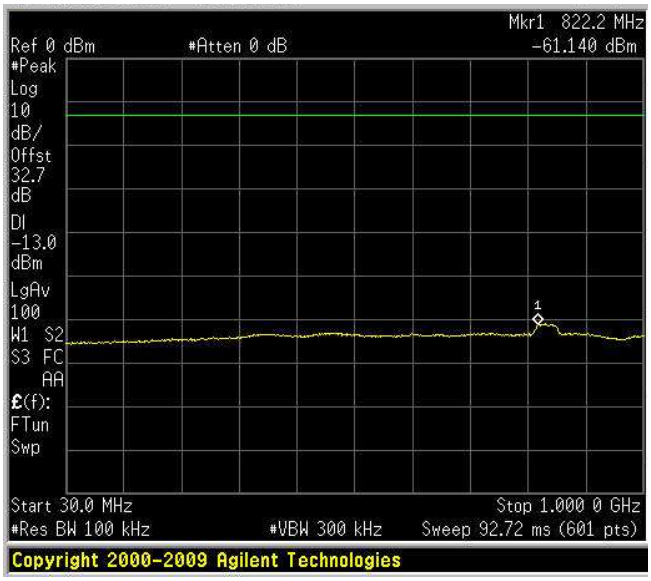


Spurious Emissions at Antenna Terminals
Downlink – 20 QPSK
1-22GHz

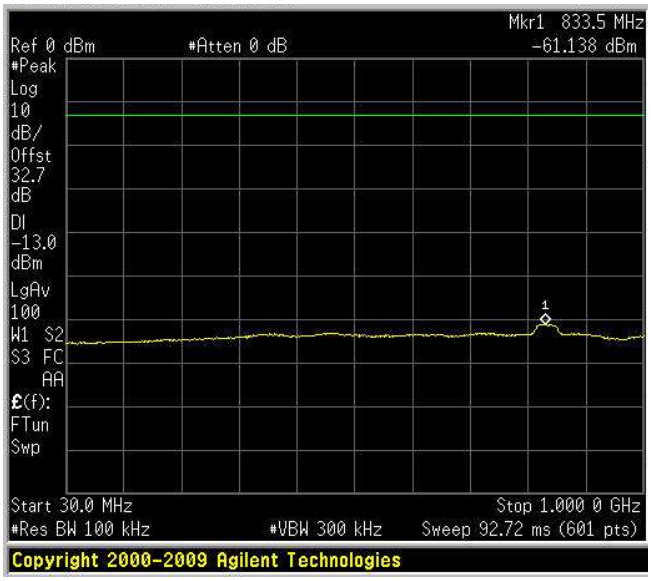
Spurious Emissions at Antenna Terminals
Uplink 1.4 QAM
30MHz – 1 GHz



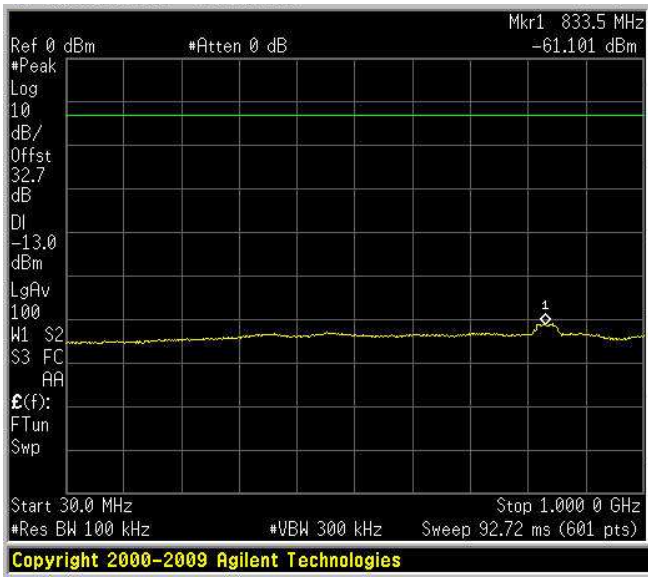
Spurious Emissions at Antenna Terminals
Uplink – 1,4 QPSK
30MHz – 1 GHz



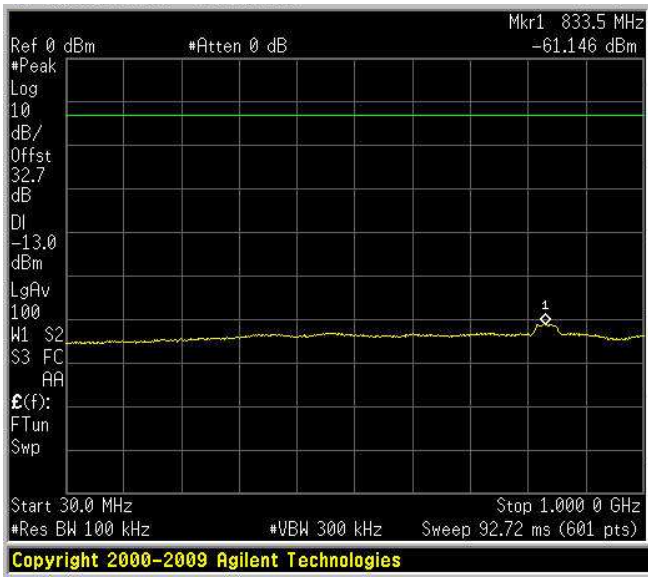
Spurious Emissions at Antenna Terminals
Uplink – 3 QAM
30MHz – 1 GHz



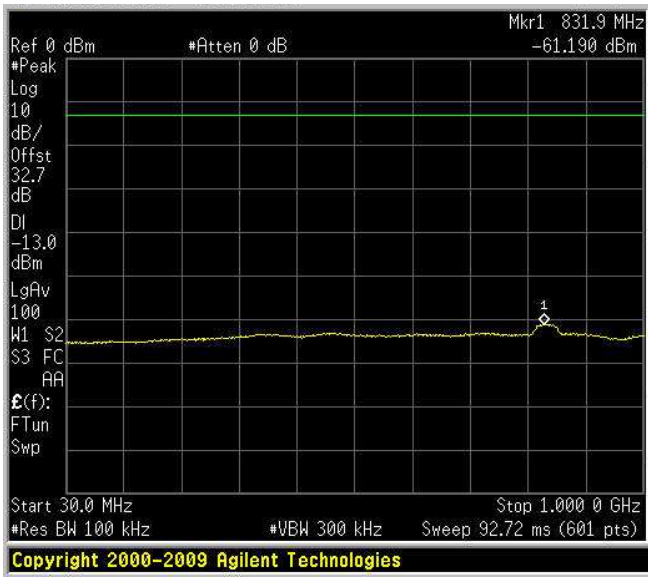
Spurious Emissions at Antenna Terminals
Uplink – 3 QPSK
30MHz – 1 GHz



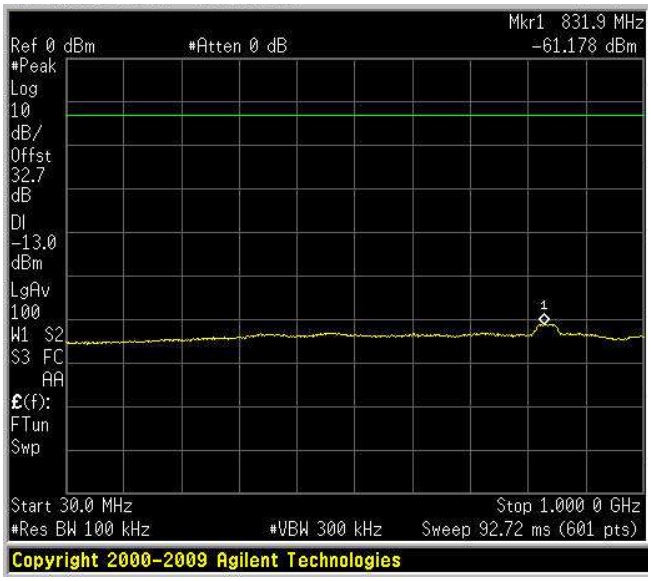
Spurious Emissions at Antenna Terminals
Uplink – 5 QAM
30MHz – 1 GHz



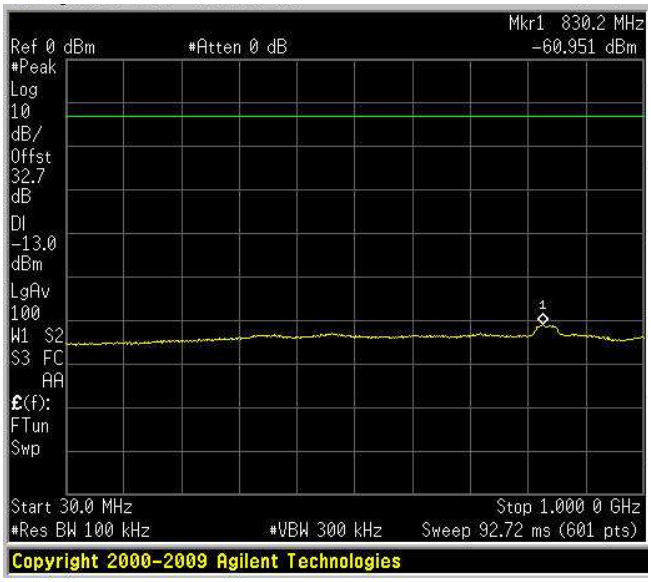
Spurious Emissions at Antenna Terminals
Uplink – 5 QPSK
30MHz – 1 GHz



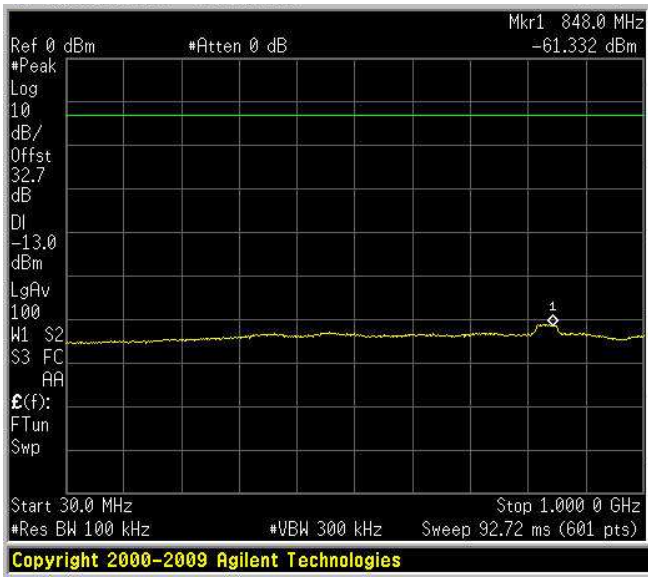
Spurious Emissions at Antenna Terminals
Uplink – 10 QAM
30MHz – 1 GHz



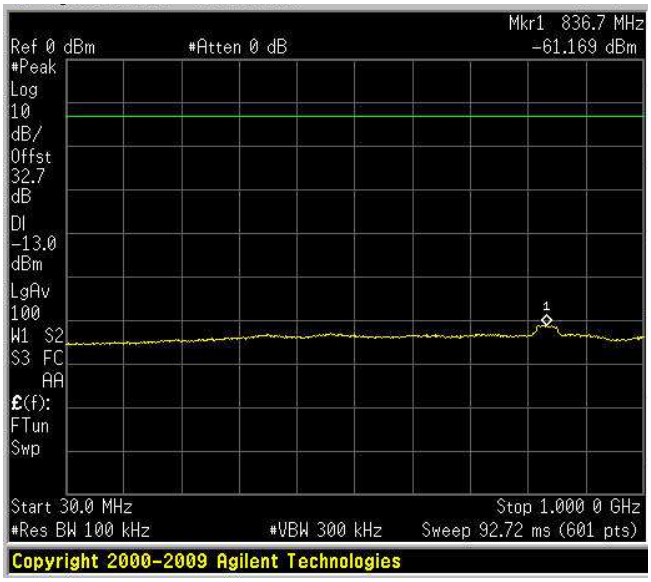
Spurious Emissions at Antenna Terminals
Uplink – 10 QPSK
30MHz – 1 GHz



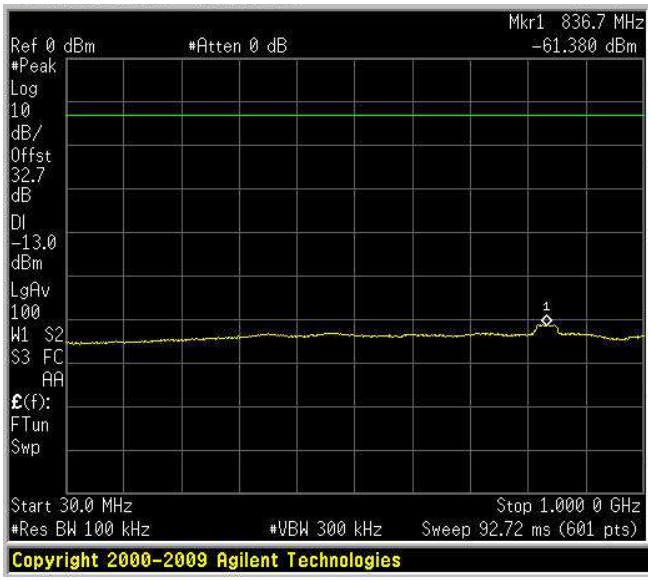
Spurious Emissions at Antenna Terminals
Uplink – 15 QAM
30MHz – 1 GHz



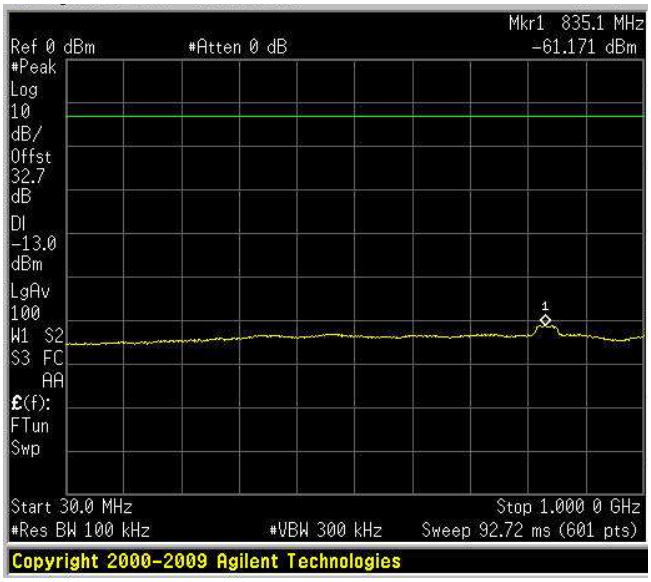
Spurious Emissions at Antenna Terminals
Uplink – 15 QPSK
30MHz – 1 GHz



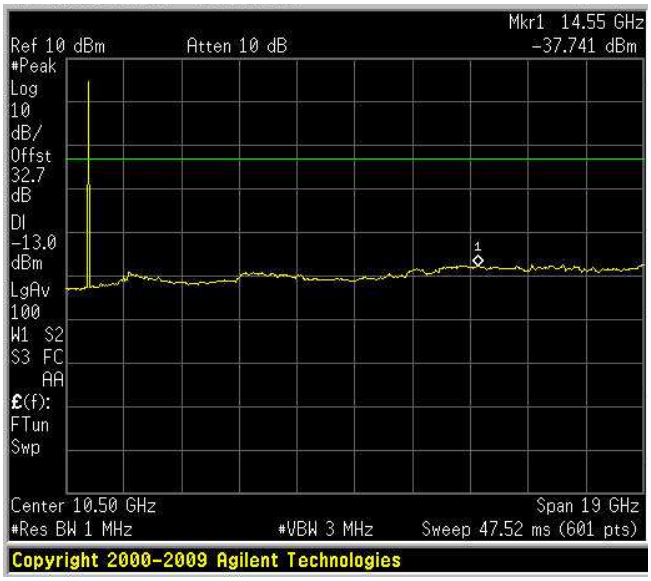
Spurious Emissions at Antenna Terminals
Uplink – 20 QAM
30MHz – 1 GHz



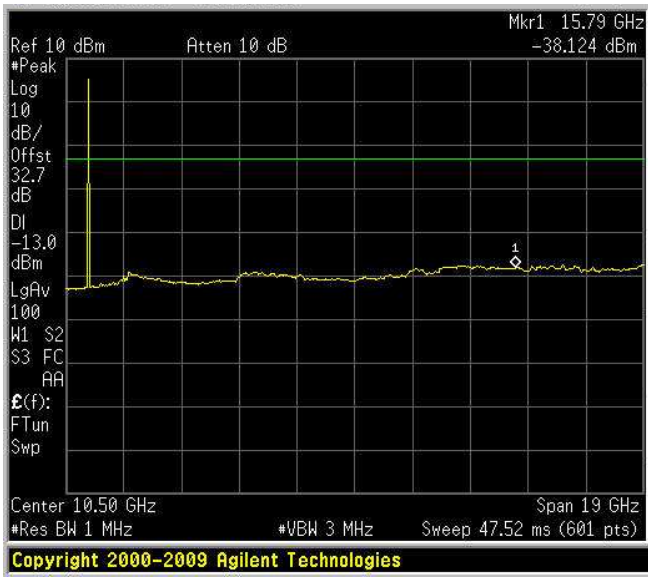
Spurious Emissions at Antenna Terminals
Uplink – 20 QPSK
30MHz – 1 GHz



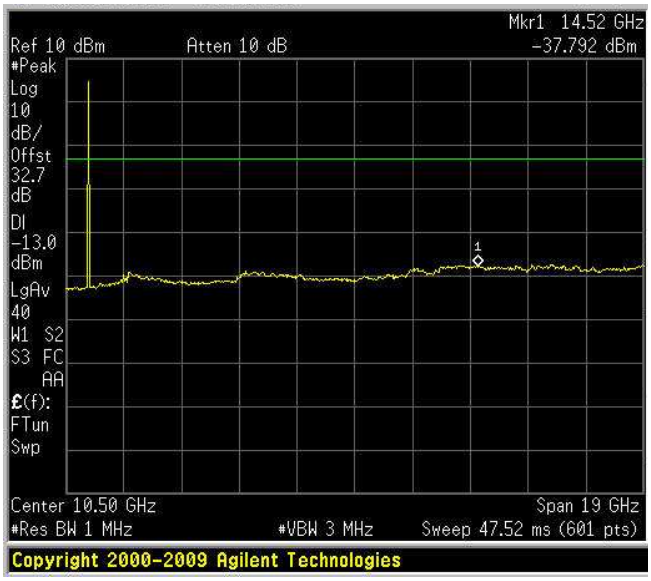
Spurious Emissions at Antenna Terminals
Uplink – 1,4 QAM
1-20 GHz



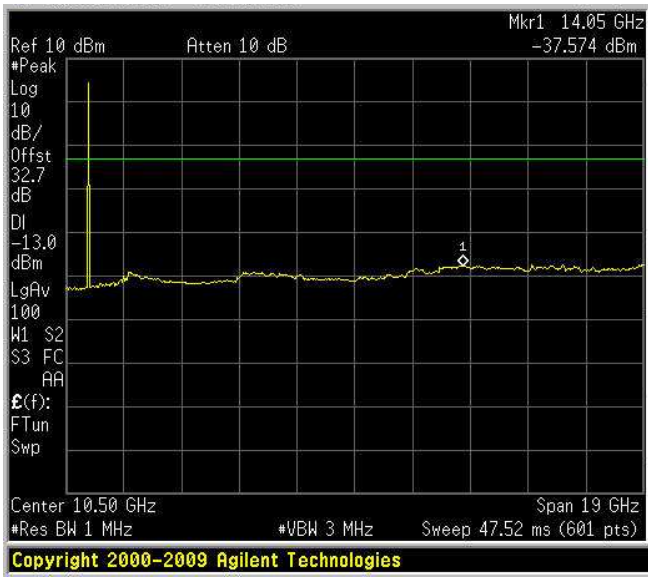
Spurious Emissions at Antenna Terminals
Uplink – 1,4 QPSK
1-20 GHz



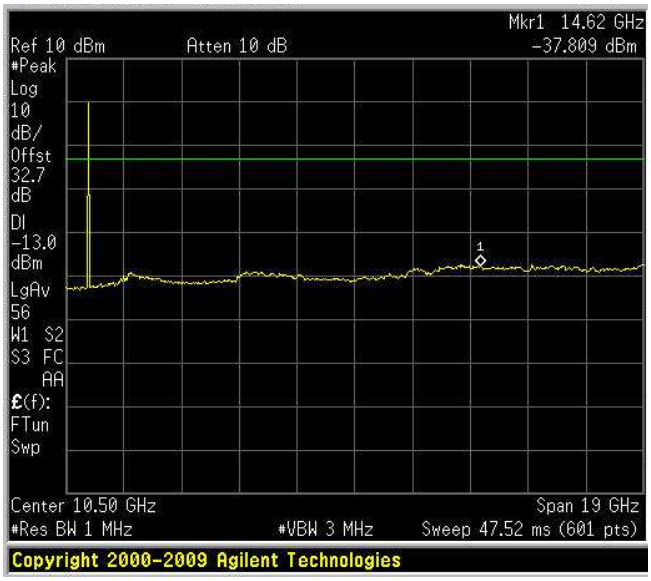
Spurious Emissions at Antenna Terminals
Uplink – 3 QAM
1-20 GHz



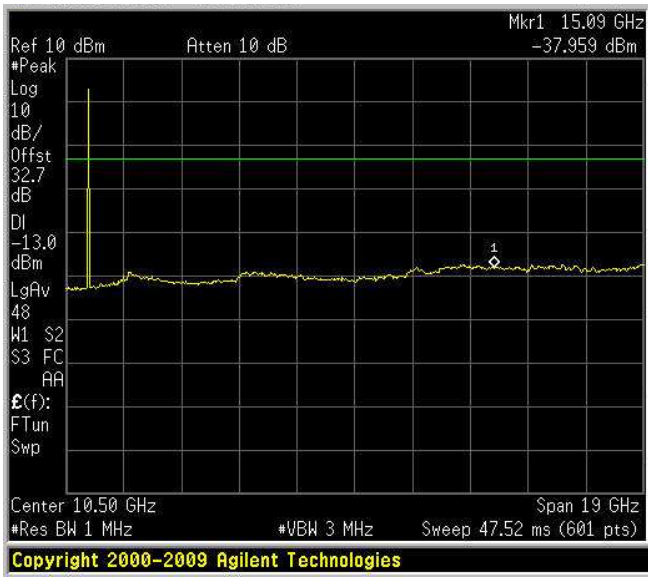
Spurious Emissions at Antenna Terminals
Uplink – 3 QPSK
1-20 GHz



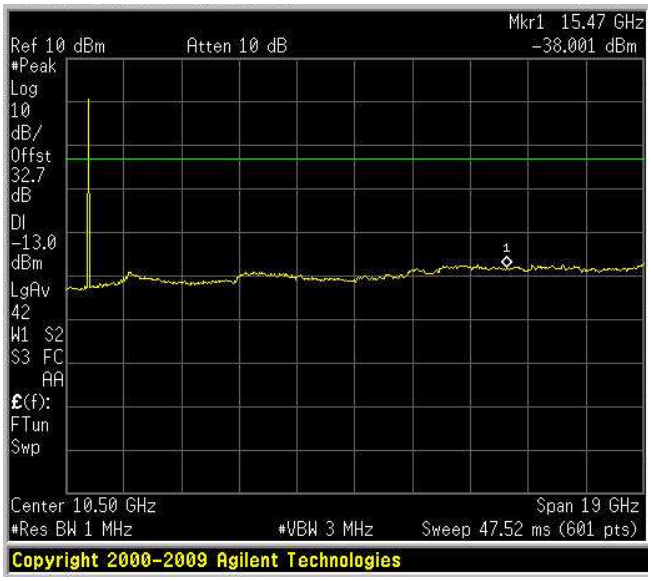
Spurious Emissions at Antenna Terminals
Uplink – 5 QAM
1-20 GHz



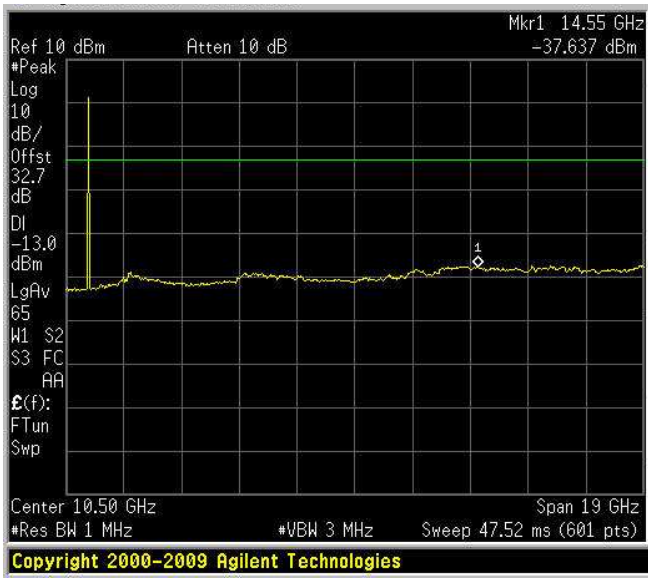
Spurious Emissions at Antenna Terminals
Uplink – 5 QPSK
1-20 GHz



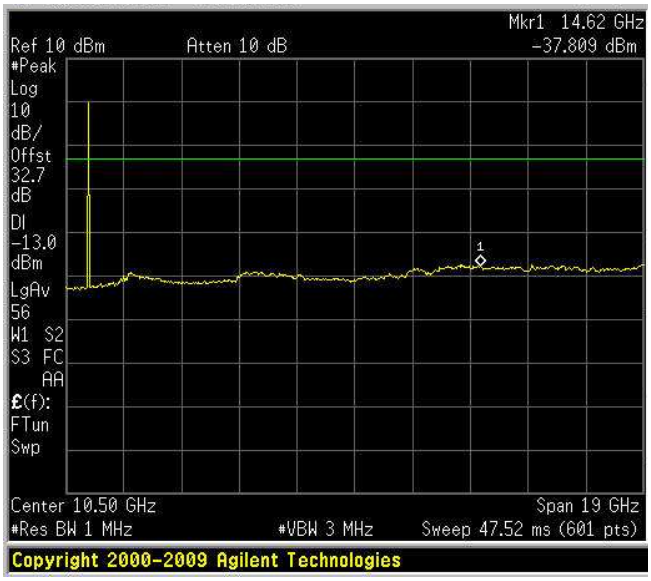
Spurious Emissions at Antenna Terminals
Uplink – 10 QAM
1-20 GHz



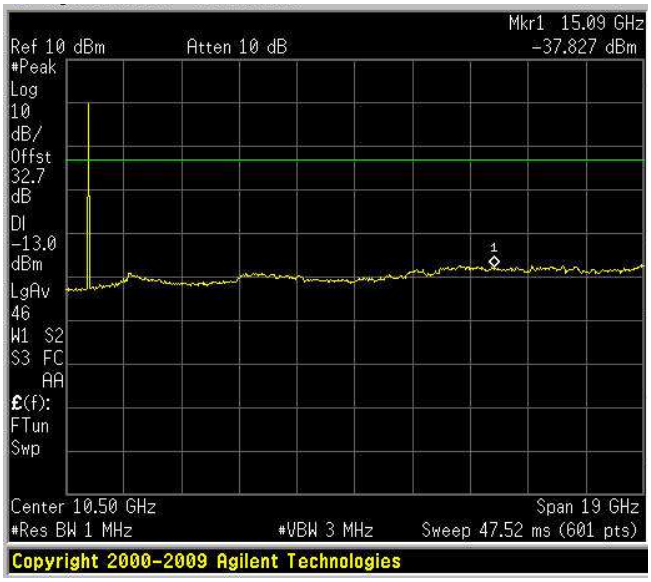
Spurious Emissions at Antenna Terminals
Uplink – 10 QPSK
1-20 GHz



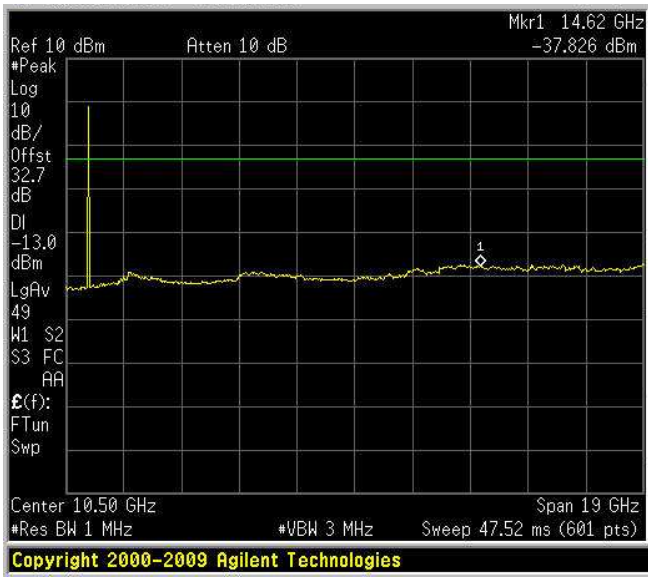
Spurious Emissions at Antenna Terminals
Uplink – 15 QAM
1-20 GHz



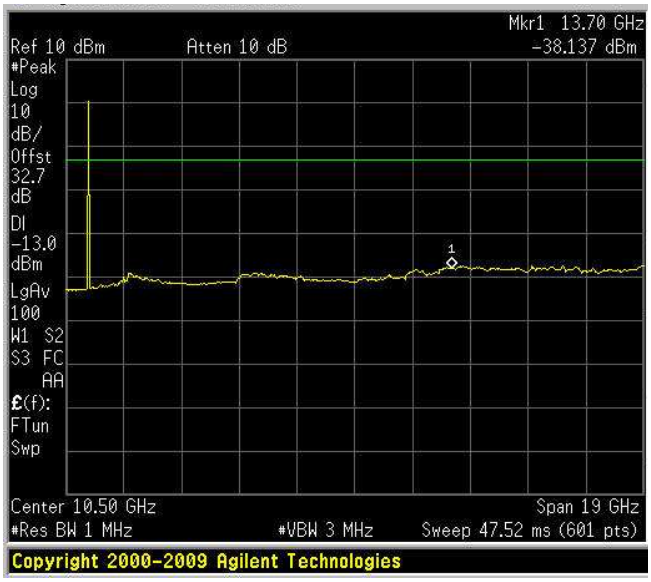
Spurious Emissions at Antenna Terminals
Uplink – 15 QPSK
1-20 GHz



Spurious Emissions at Antenna Terminals
Uplink – 20 QAM
1-20 GHz



Spurious Emissions at Antenna Terminals
Uplink – 20 QPSK
1-20 GHz



Nemko	**Section 8:** Testing data	**Product:** TRU8A19AWWL/AC-WS	
	Test name: Clause 27.53(h) Spurious emissions		
	Test date20-27 Sept 2010	**Test engineer:** G. Curioni	
	Verdict: Pass	**Supply input:** 100-240 Vac	
	Temperature: 25 ℃	**Air pressure:** 860-1060 hPa	**Relative humidity:** 50 %
	Specification: FCC Part 27		

8.1 Clause 27.53 (h) 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 log10 (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 10th 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.

Result: PASS, See test report 131640-3TRFEMC.

8.2 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 (dBµV/m)	Limit (dBµV/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 APPLICABICABLE: AWS band.

8.3 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.
– RBW was set to 300 Hz.

Test data

26 dBc points measurement:

Insert plots here

Frequency tolerance measurements:

Test conditions	Frequency (Hz)	Offset (Hz)
+50 ℃, Nominal		
+40 ℃, Nominal		
+30 ℃, Nominal		
+20 ℃, +15 %		
+20 ℃, Nominal		Reference
+20 ℃, -15 %		
+10 ℃, Nominal		
0 ℃, Nominal		
-10 ℃, Nominal		
-20 ℃, Nominal		
-30 ℃, Nominal		

Operating range including frequency drift measurements:

Assigned frequency (MHz)	Measured 26 dBc (MHz)	Frequency drift, (Hz)		25 dBc including drift (MHz)
		Negative	Positive	

NOT APPLICABICABLE; Frequency Stability testing was not performed since the E.U.T. does not contain modulation circuitry

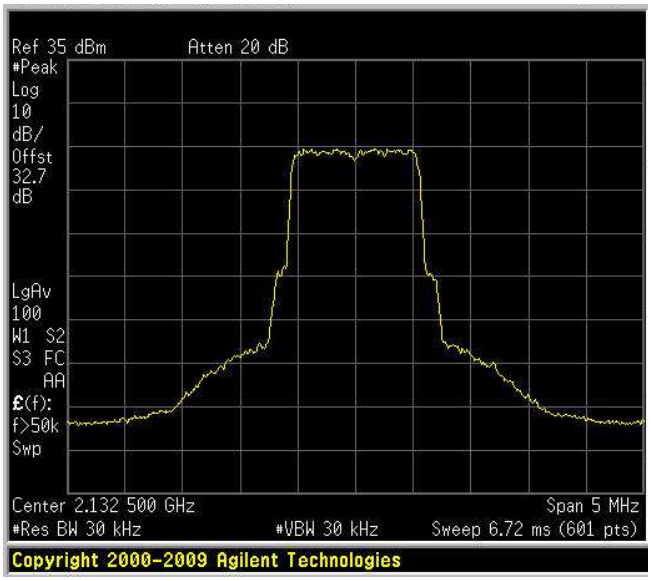
8.7 Clause 2.1049 Occupied bandwidth

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.

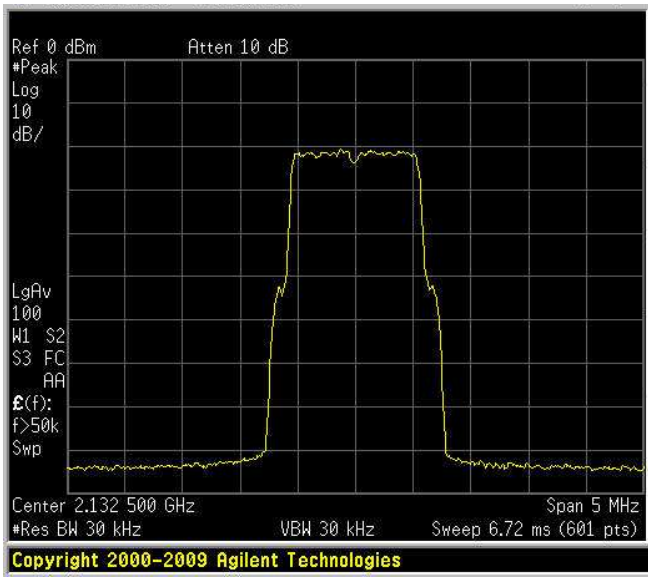
Special notes

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

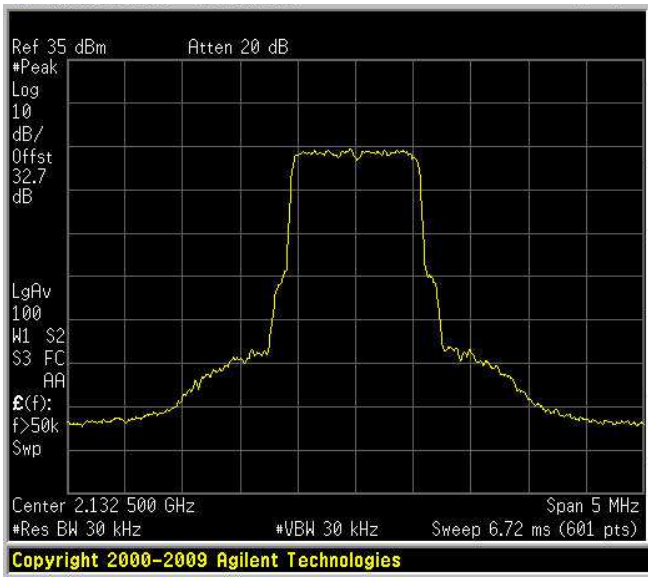
Occupied Bandwidth
Downlink – 1.4 QAM
OUTPUT



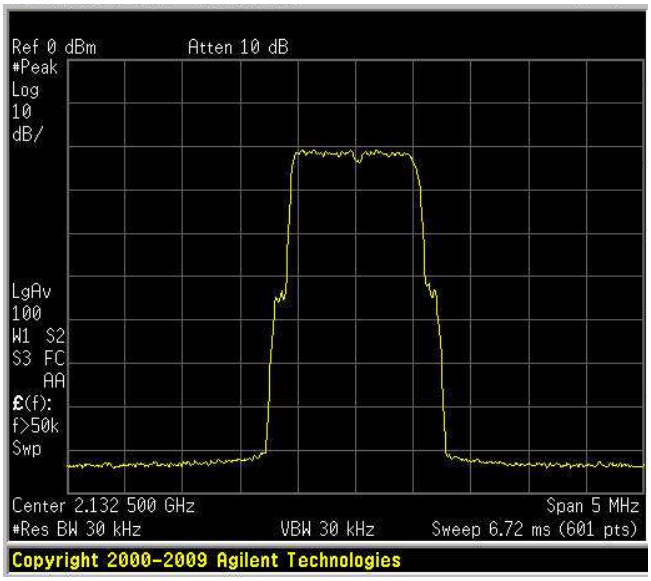
Occupied Bandwidth
Downlink – 1.4 QAM
INPUT



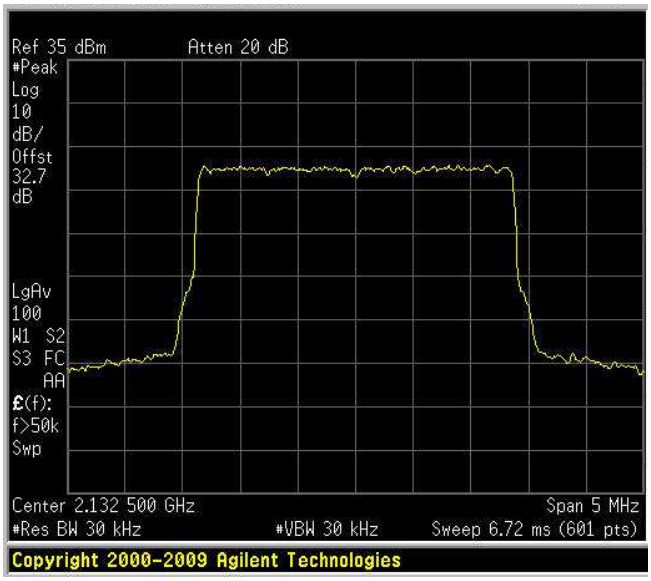
Occupied Bandwidth
Downlink – 1.4 QPSK
OUTPUT



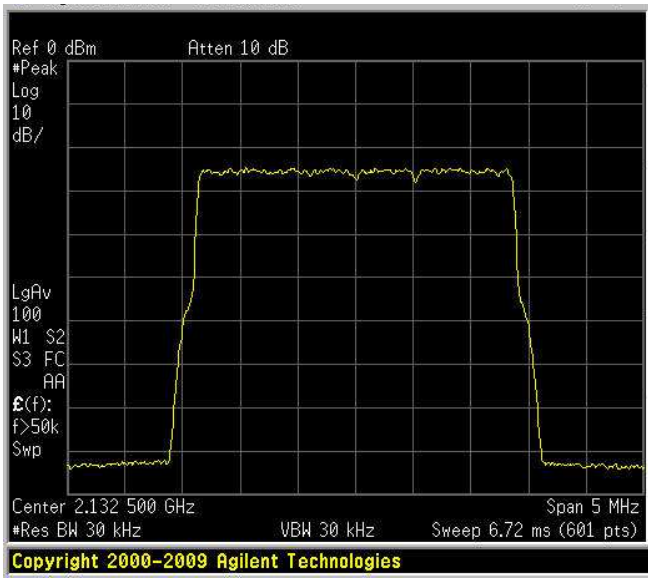
Occupied Bandwidth
Downlink – 1.4 QPSK
INPUT



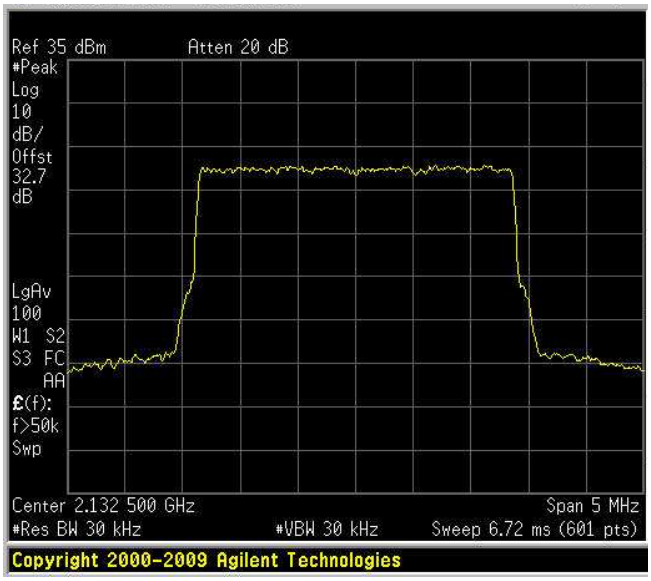
Occupied Bandwidth
Downlink – 3 QAM
OUTPUT



Occupied Bandwidth
Downlink – 3 QAM
INPUT



Occupied Bandwidth
Downlink – 3 QPSK
OUTPUT



Occupied Bandwidth
Downlink – 3 QPSK
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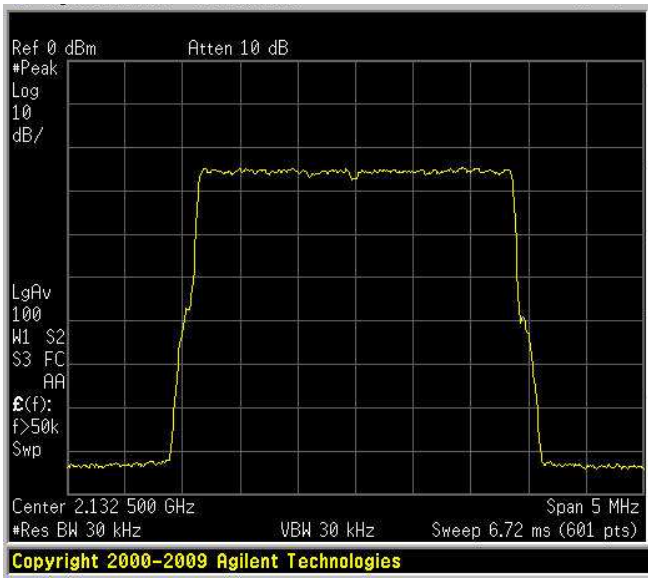
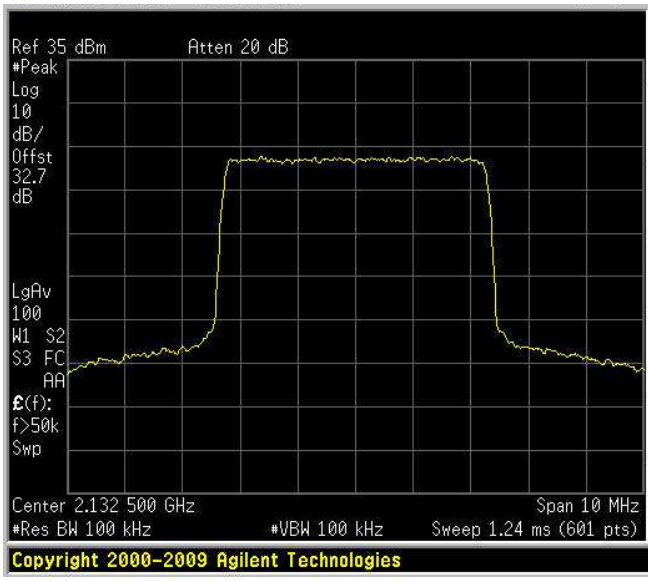
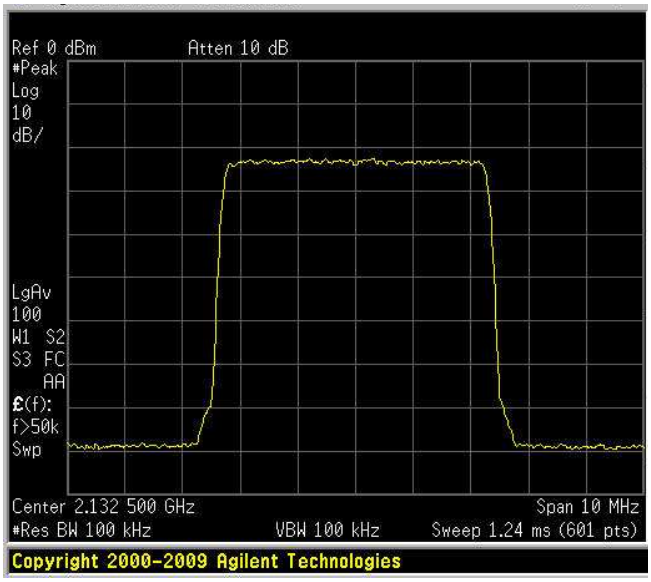


Occupied Bandwidth
Downlink – 5 QAM
OUTPUT



Occupied Bandwidth
Downlink – 5 QAM
INPUT



Occupied Bandwidth
Downlink – 5 QPSK
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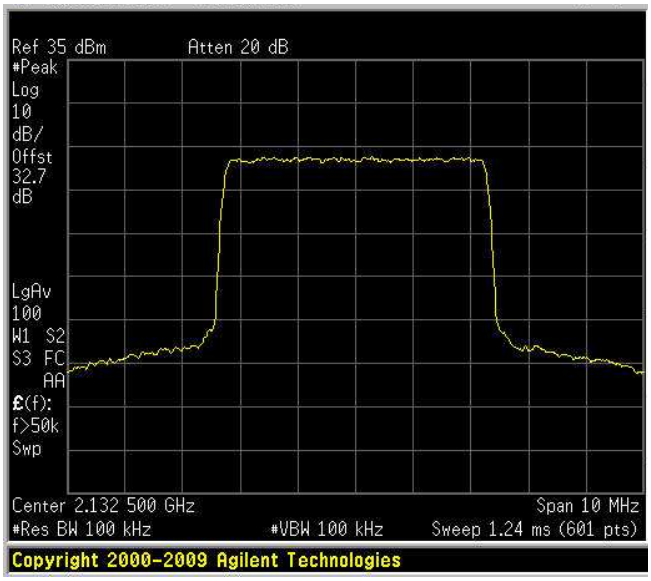

Occupied Bandwidth
Downlink – 5 QPSK
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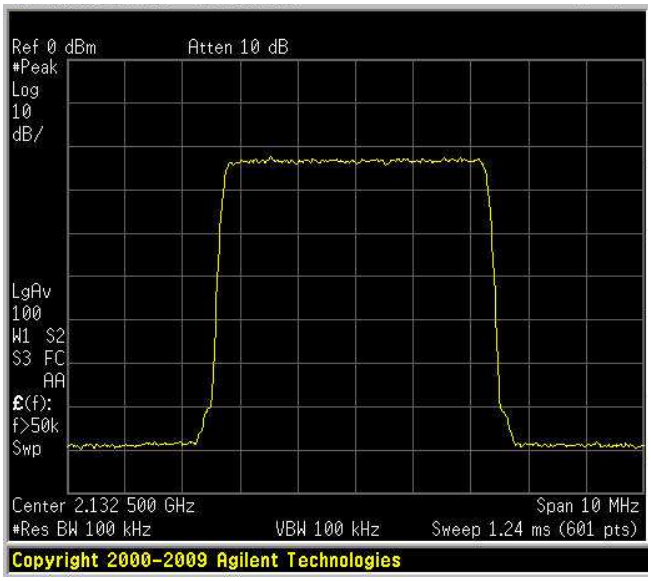

Occupied Bandwidth
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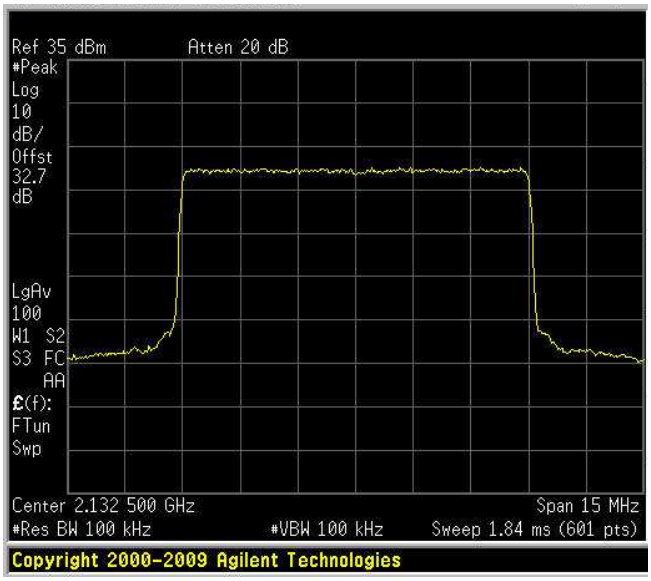

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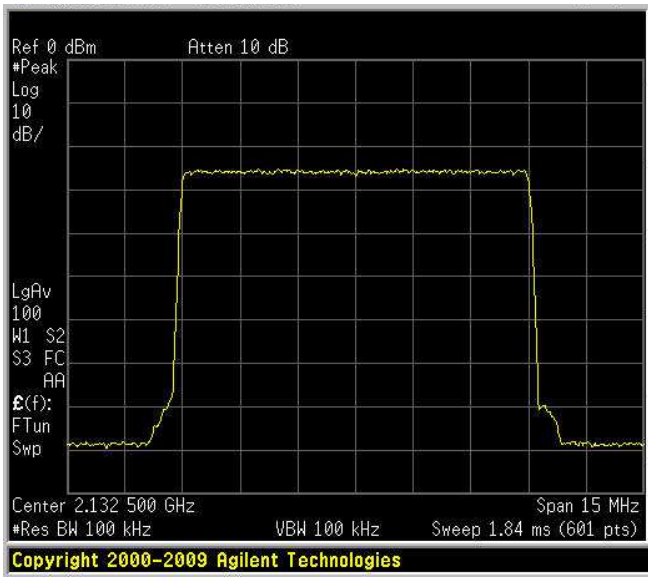

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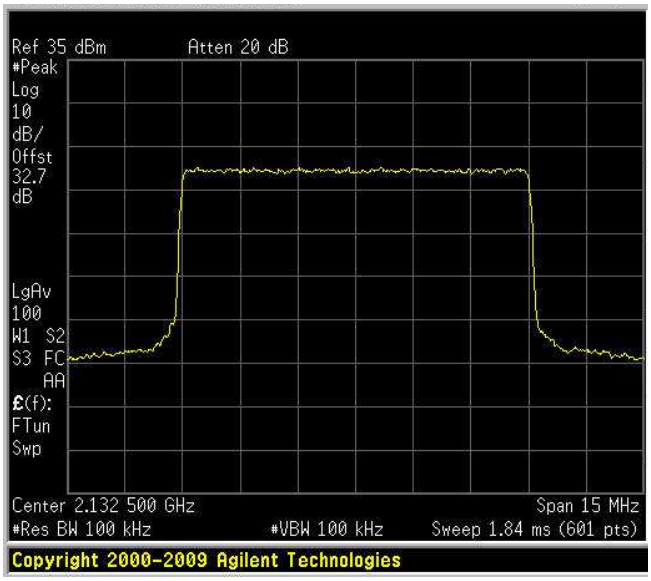

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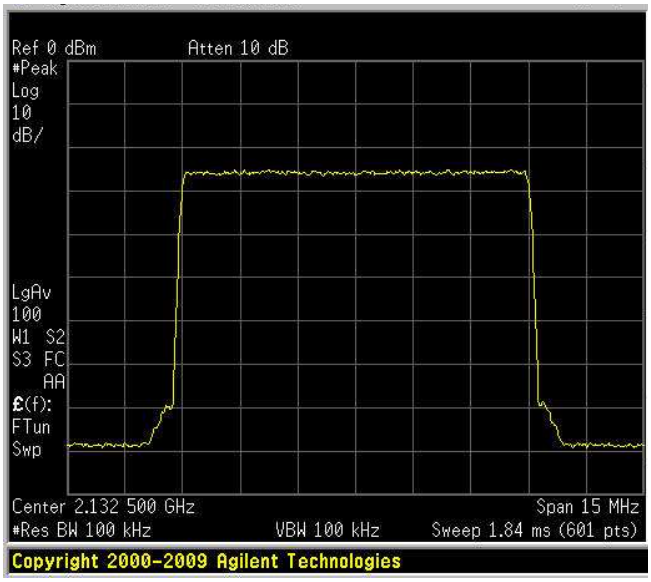

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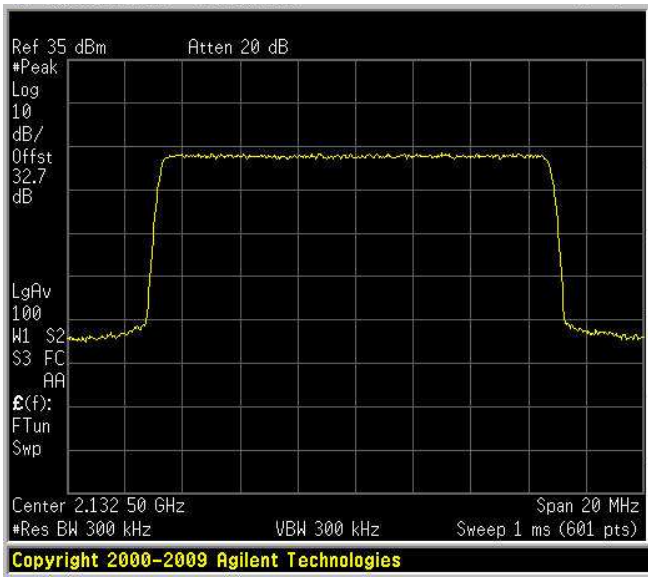

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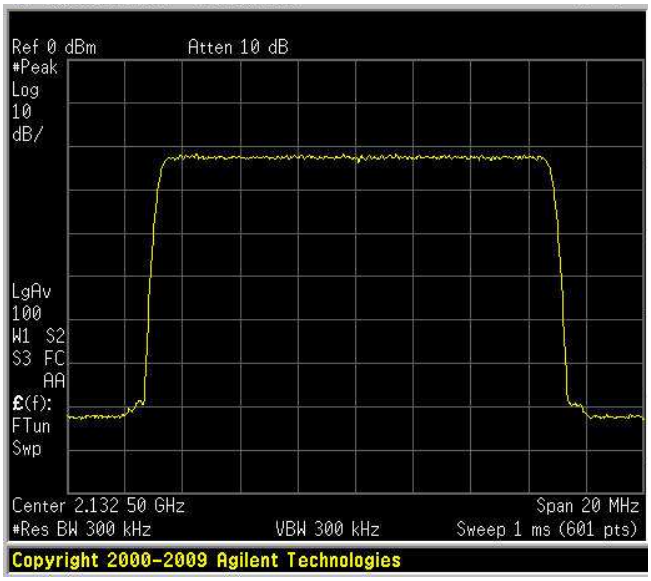

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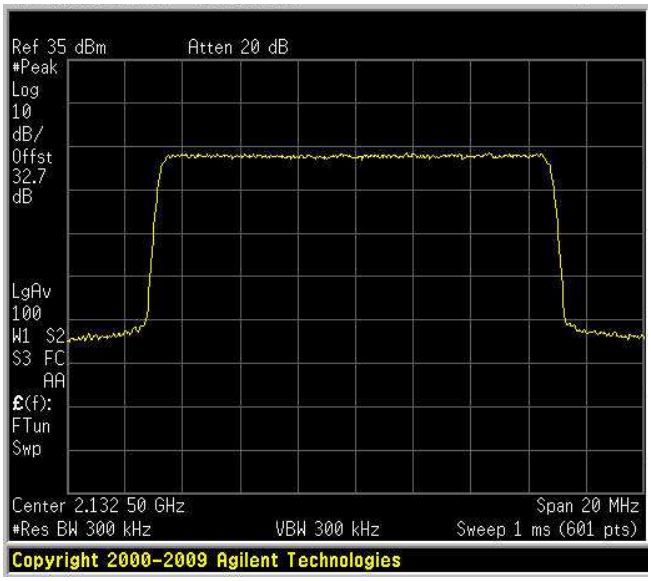

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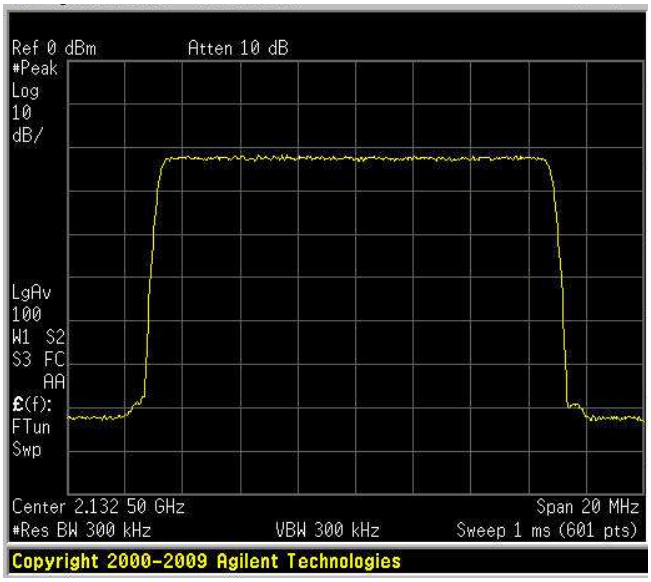

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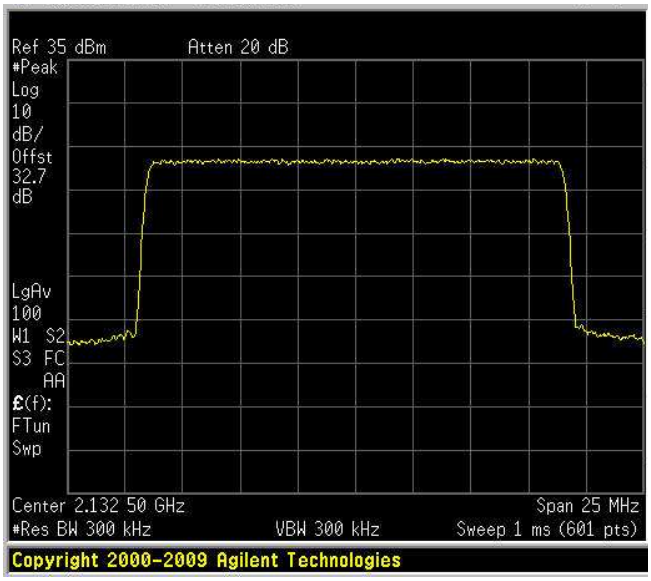

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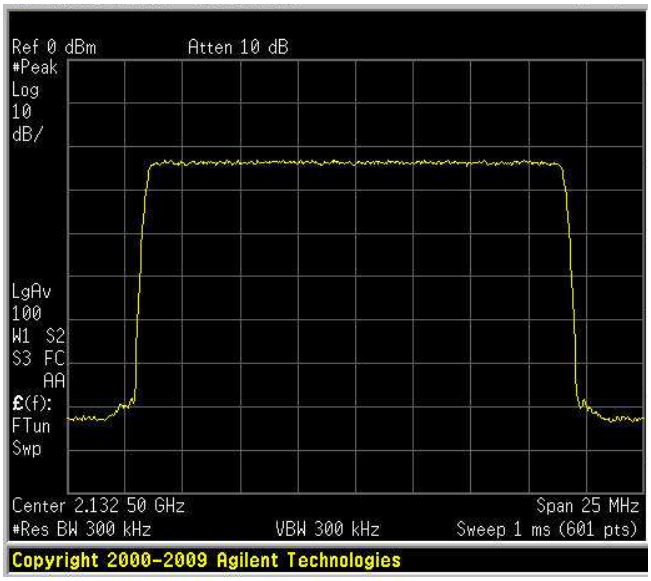

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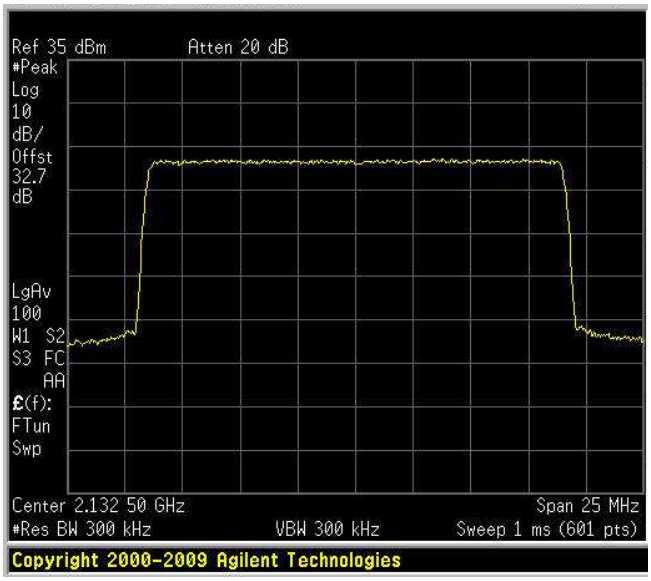

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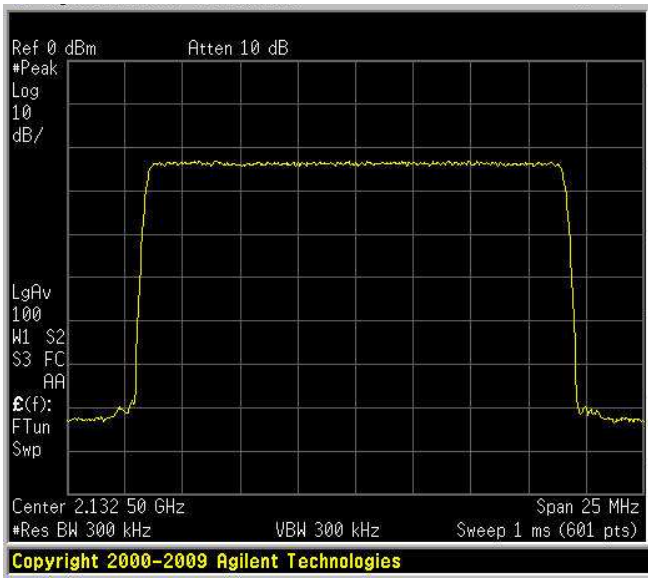

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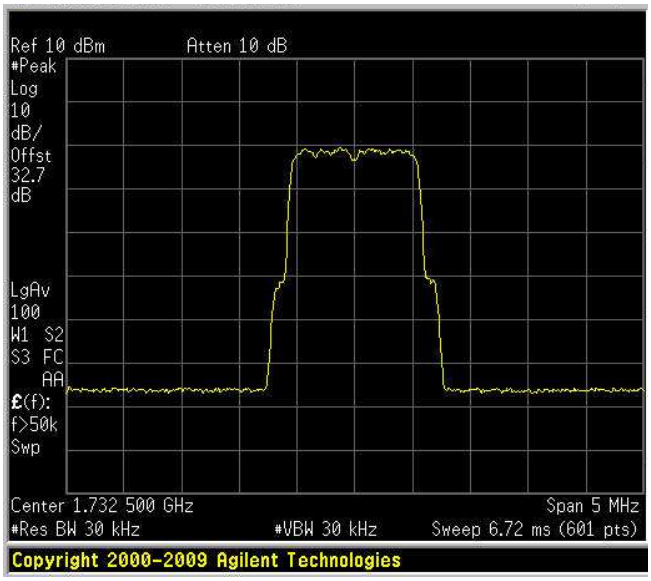

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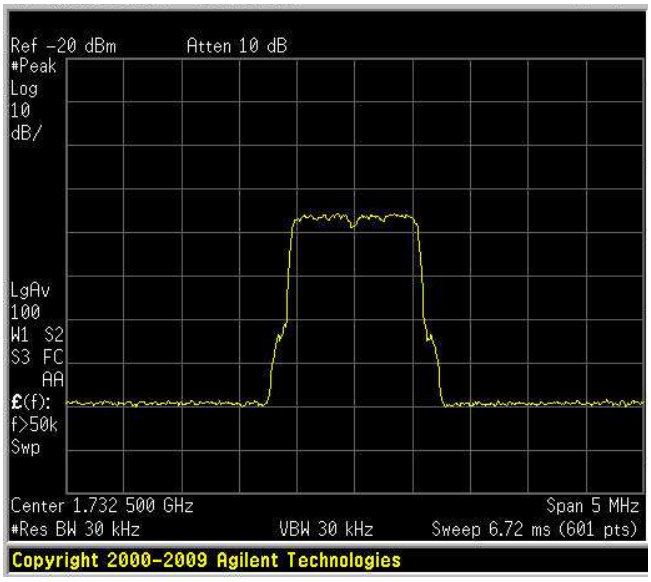

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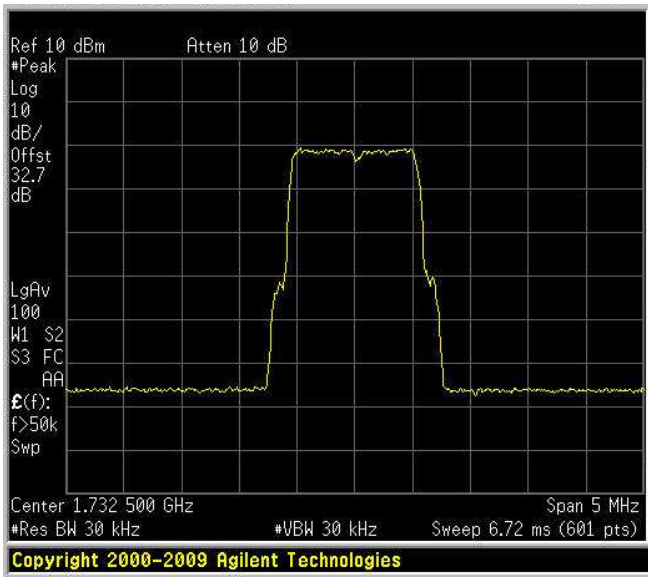

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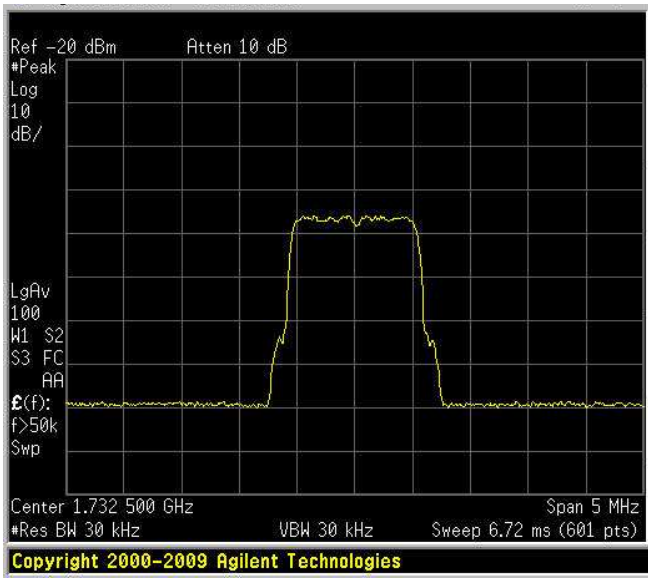

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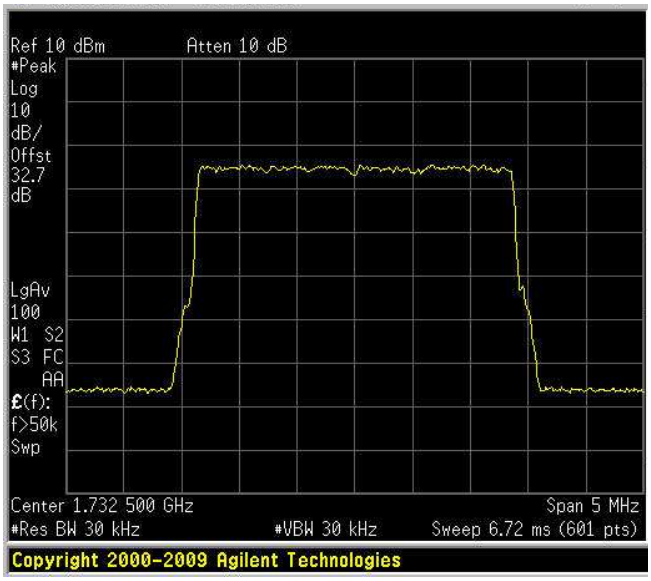

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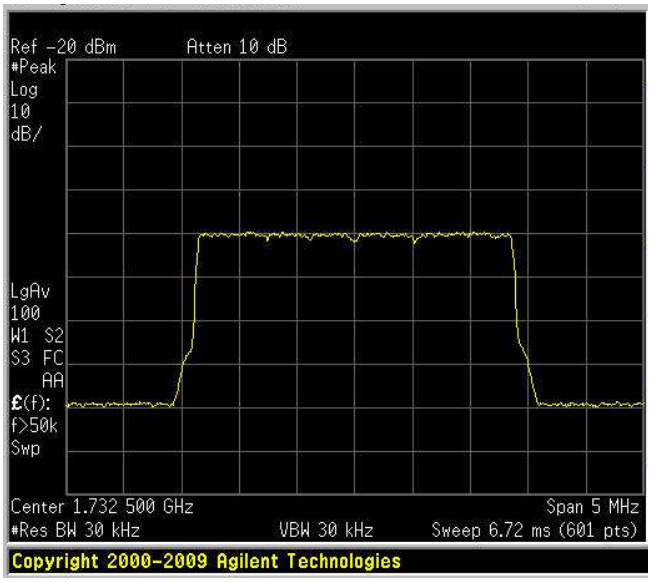

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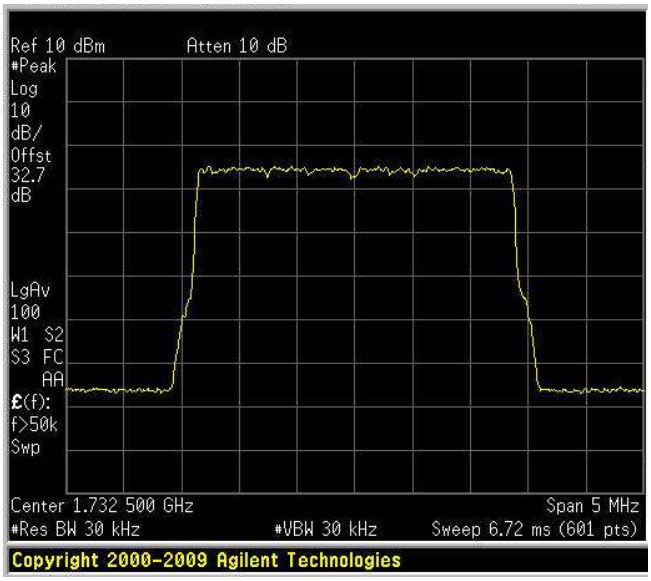

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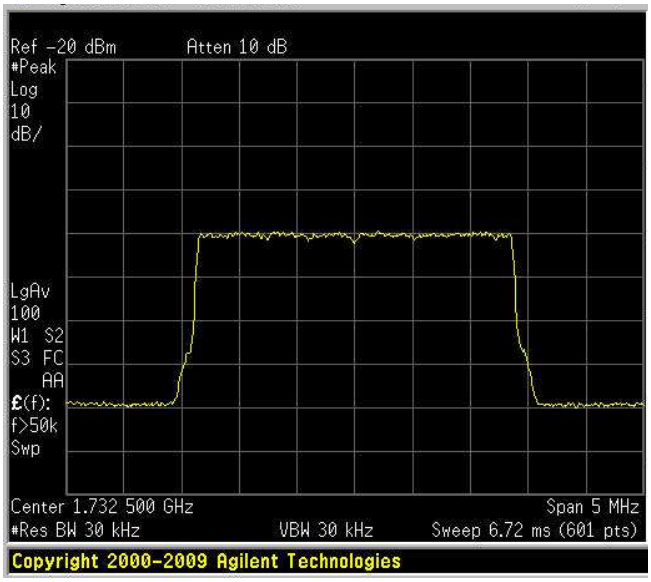

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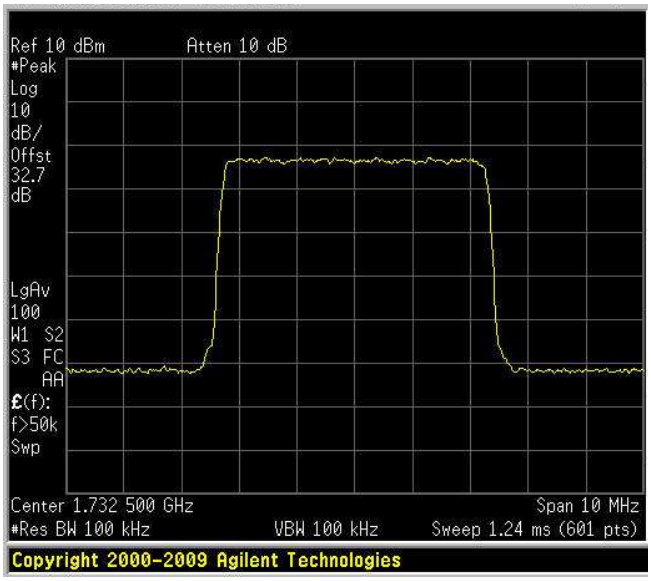

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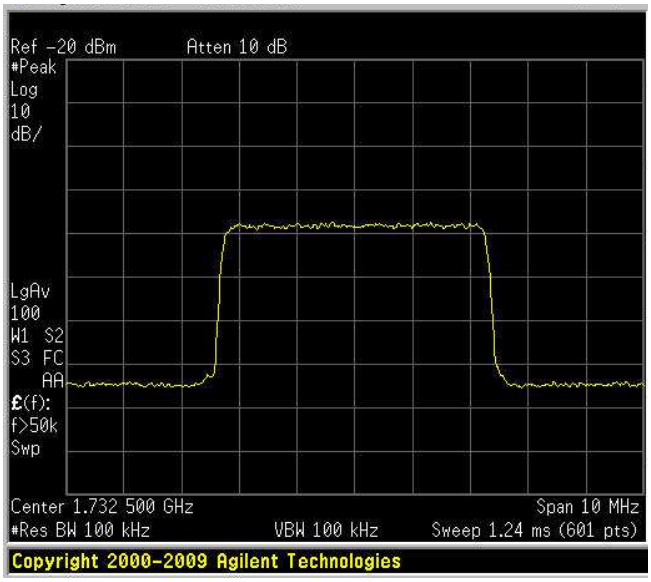

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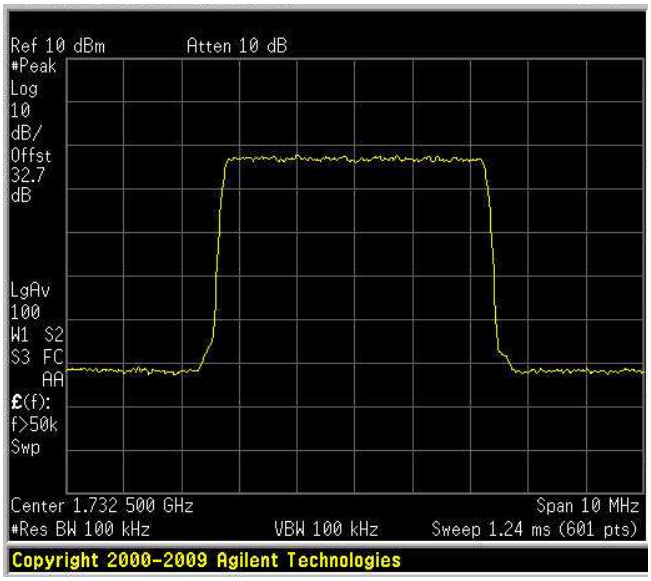

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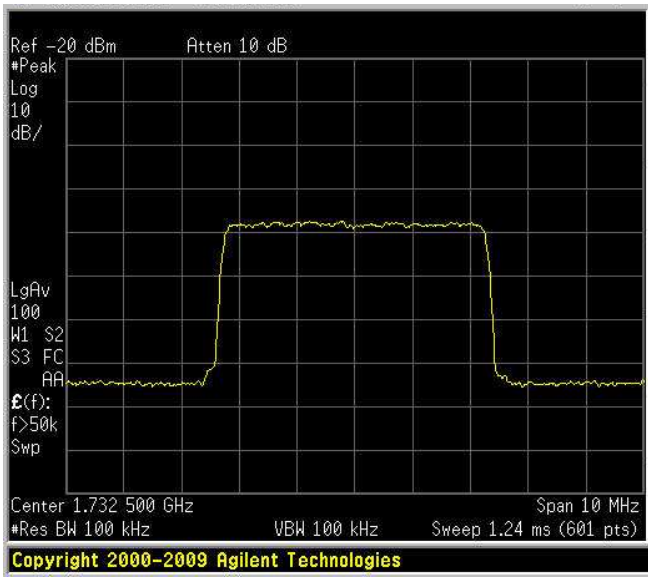

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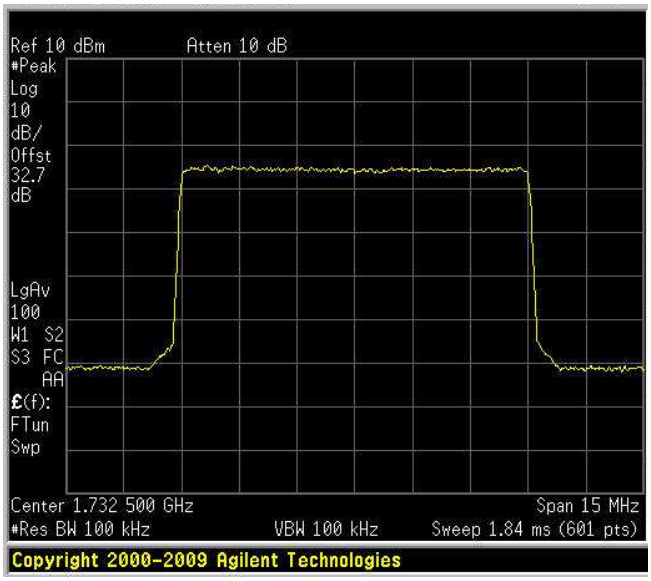

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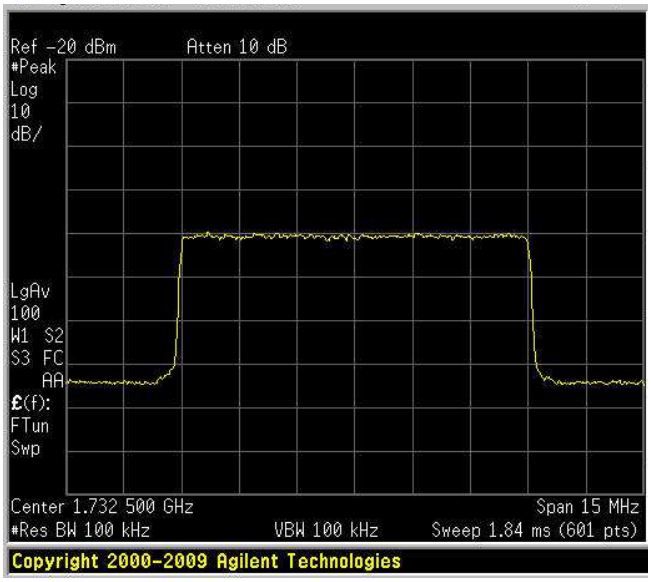

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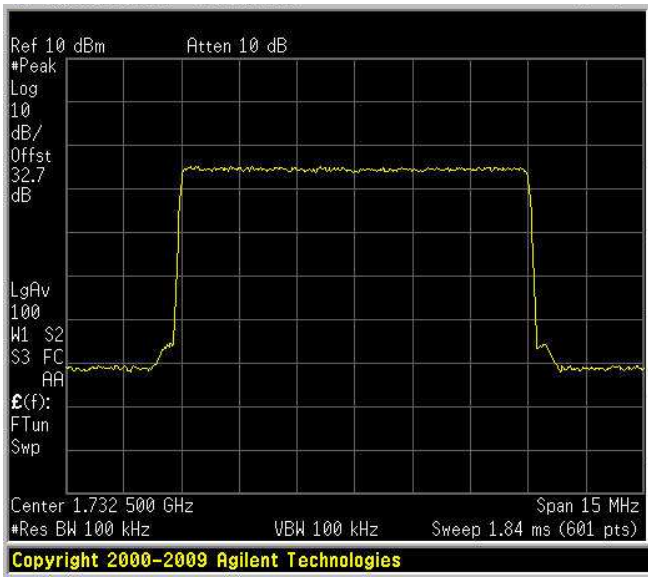

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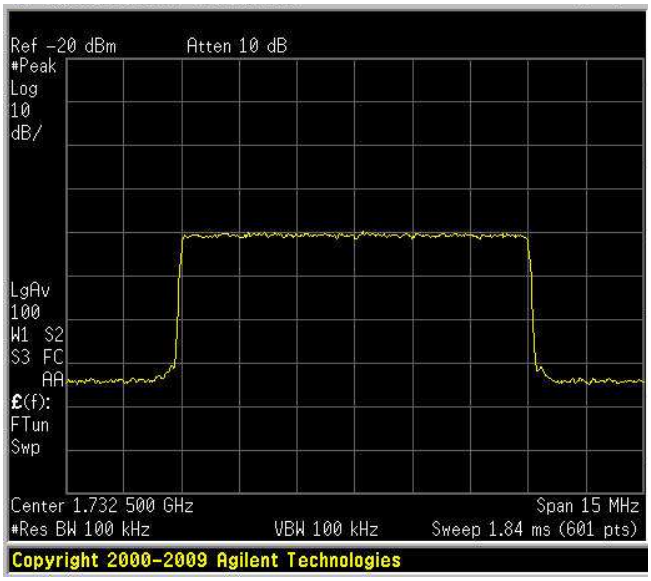

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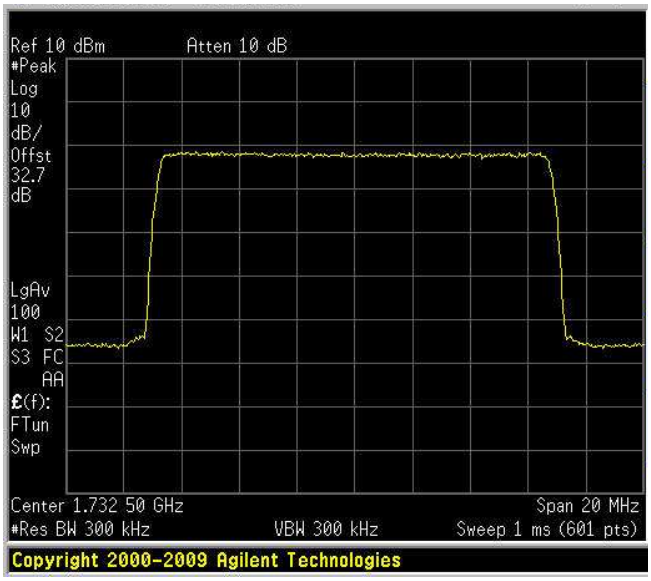

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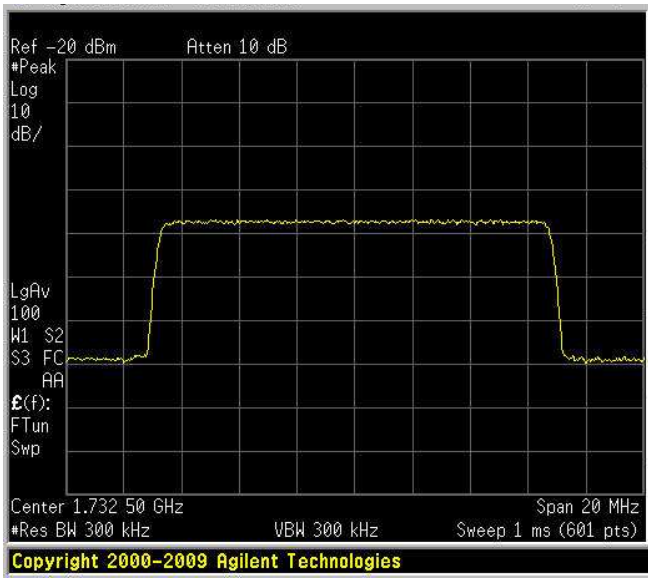

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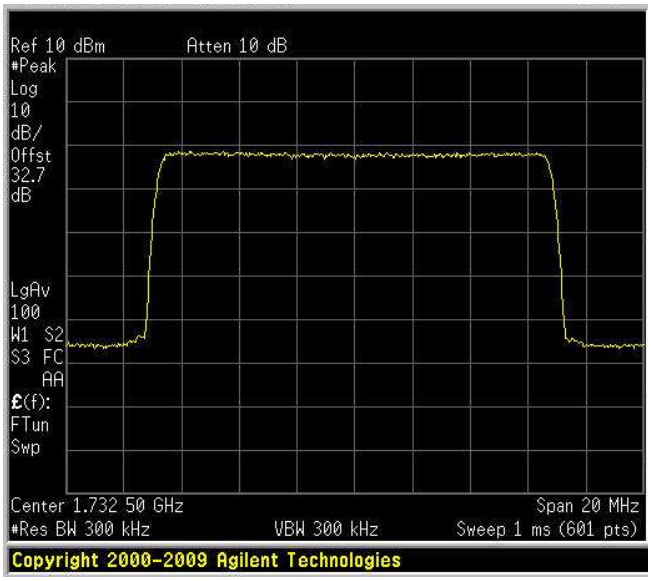

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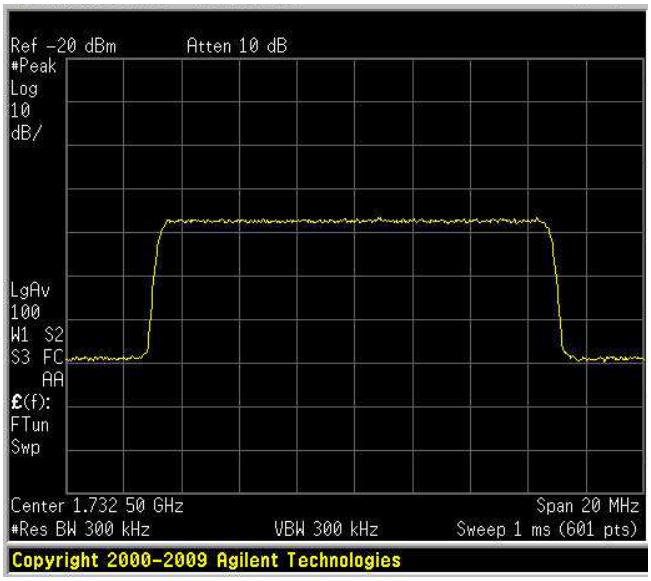

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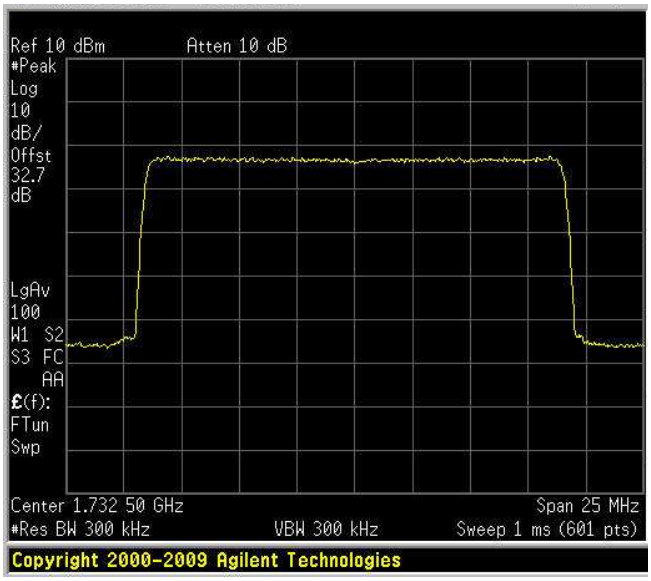

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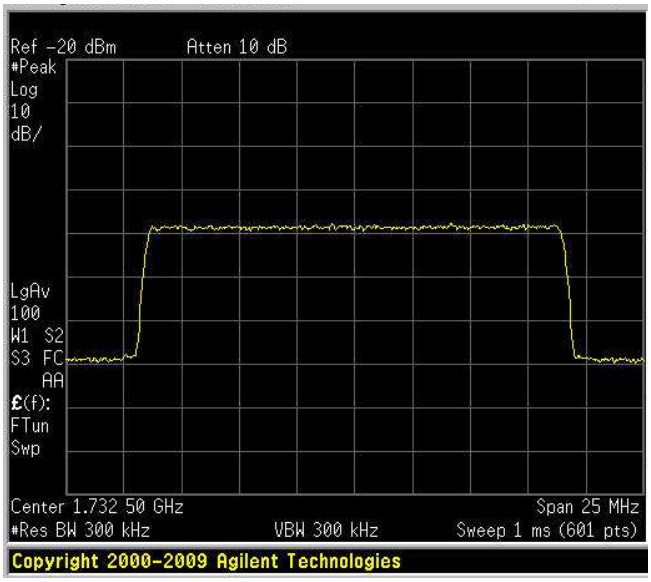

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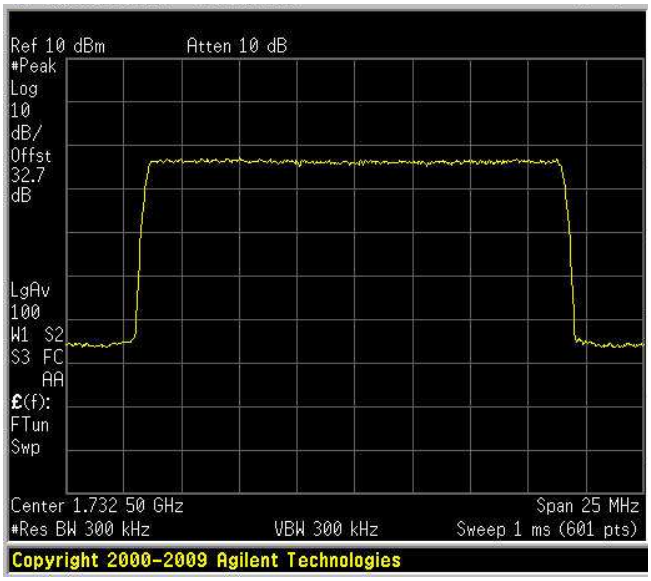

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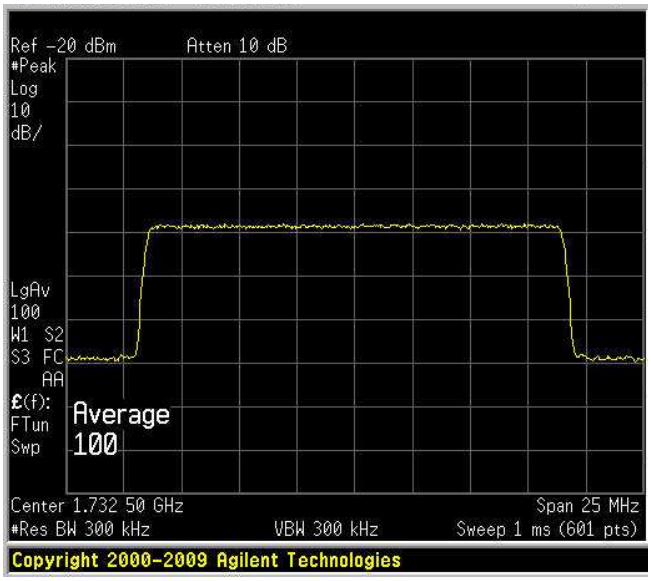
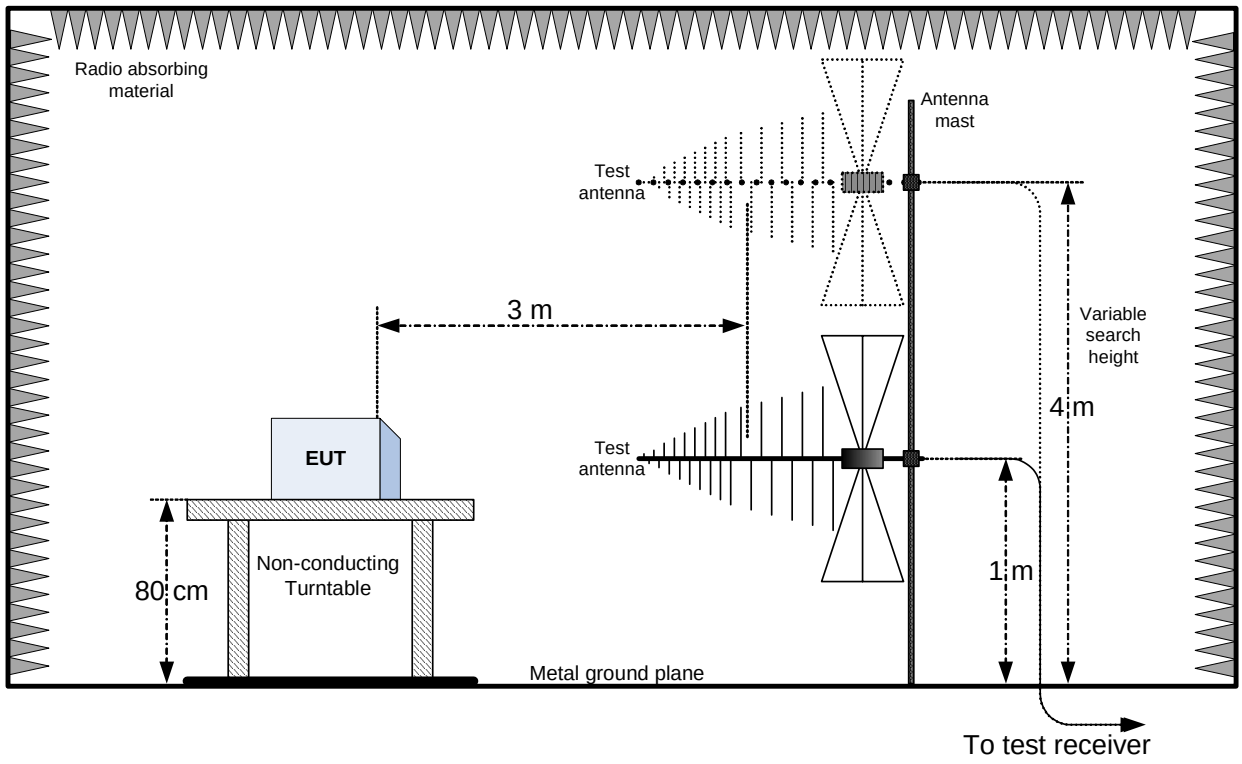


Section 9: Filter Frequency Response

Test date: 2009-09-28, t.r 131640-3TRFEMC.
Test results: Pass, see previous test report 131640-3TRFEMC

Section 10: Block diagrams of test set-ups

Radiated emissions set-up



Section 11: EUT photos

EUT

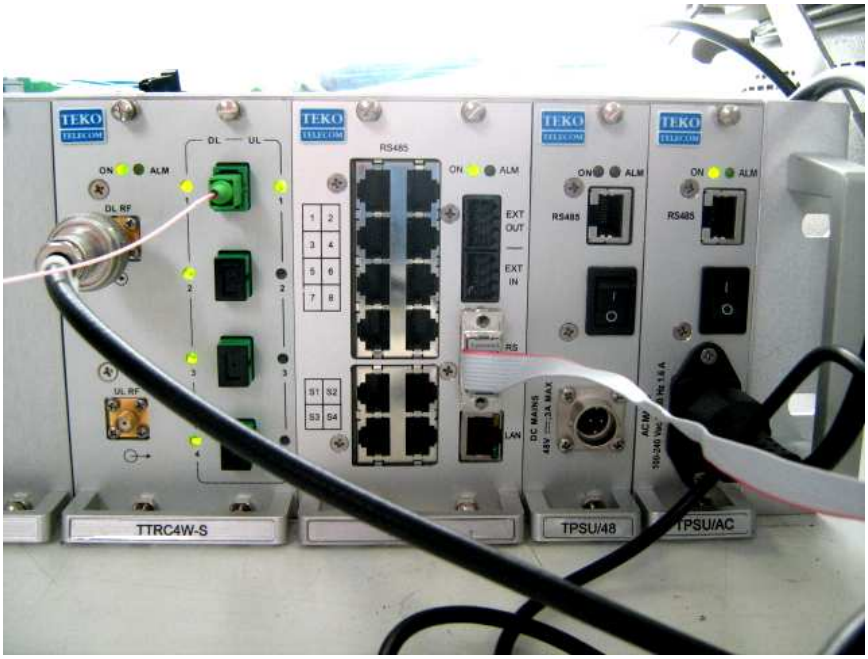
SETUP

Photo EUT

REMOTE

MASTER


28V ⎓ : 10A MAX
+ −
RS485


TEKO
TELECOM
ON
ALM
DL
UL
DL RF
UL RF
RS485
EXT OUT
EXT IN
LAN
TTRC4W-S
TPSU/48
TPSU/AC