



Nemko Italy S.p.A.  
Via del Carroccio 4, 20046, Biassono, Italy.

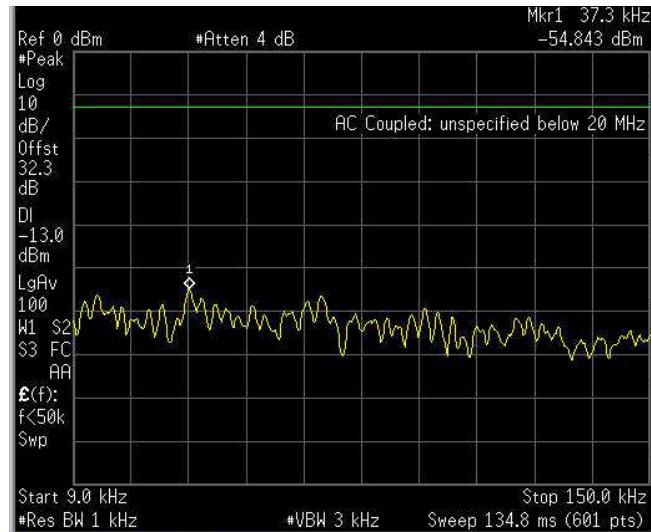
Appendix A: Test results

Report number: 210165-3TRFWL

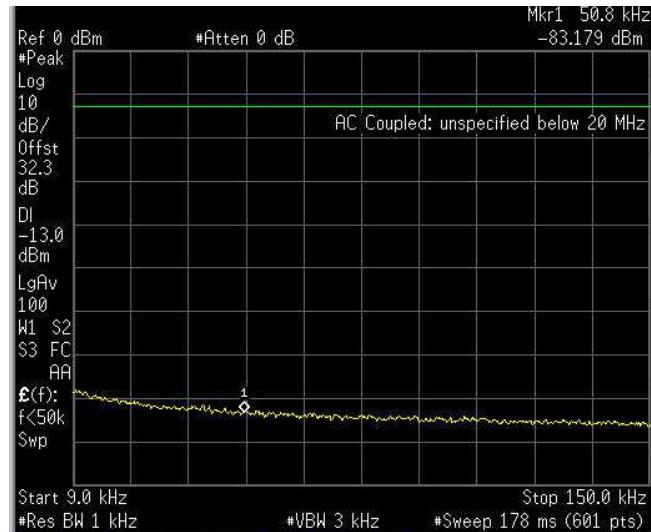
Specification: FCC 22 Subpart H

## Test Data – Spurious Emissions at Antenna Terminals

Spurs – EDGE – Downlink 9 – 150 kHz



Spurs – EDGE – Uplink 9 – 150 kHz





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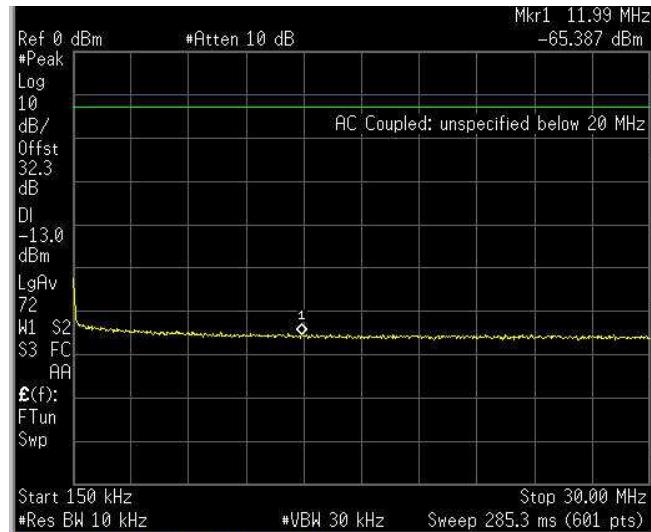
Appendix A: Test results

Report number: 210165-3TRFWL

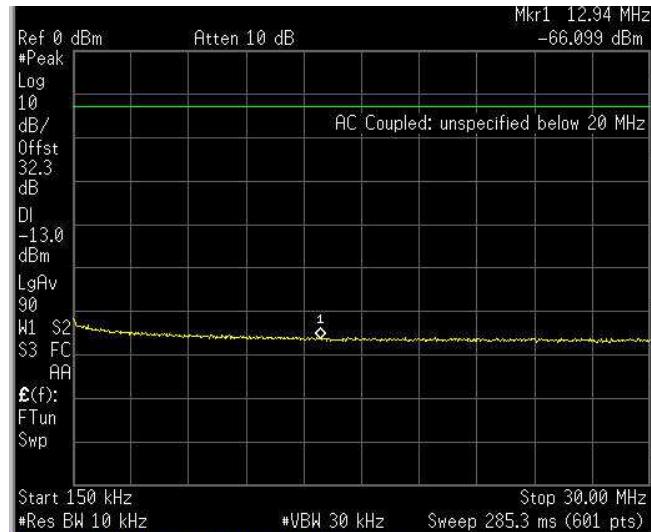
Specification: FCC 22 Subpart H

## Test Data – Spurious Emissions at Antenna Terminals

Spurs – EDGE – Downlink 150 kHz – 30 MHz



Spurs – EDGE – Uplink 150 kHz – 30 MHz





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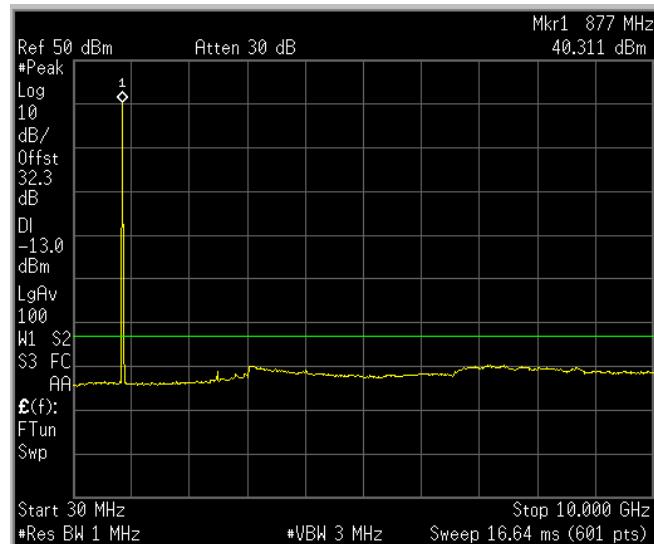
Appendix A: Test results

Report number: 210165-3TRFWL

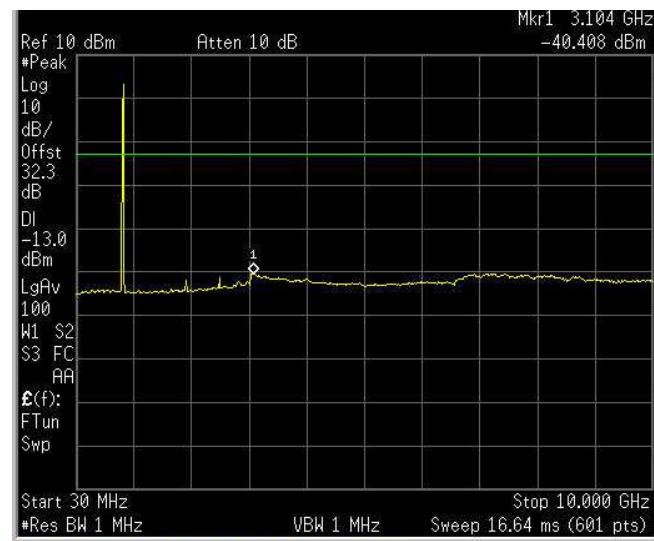
Specification: FCC 22 Subpart H

## Test Data – Spurious Emissions at Antenna Terminals

Spurs – EDGE – Downlink 30 MHz – 10 GHz



Spurs – EDGE – Uplink 30 MHz – 10 GHz





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Appendix A: Test results

Report number: 210165-3TRFWL

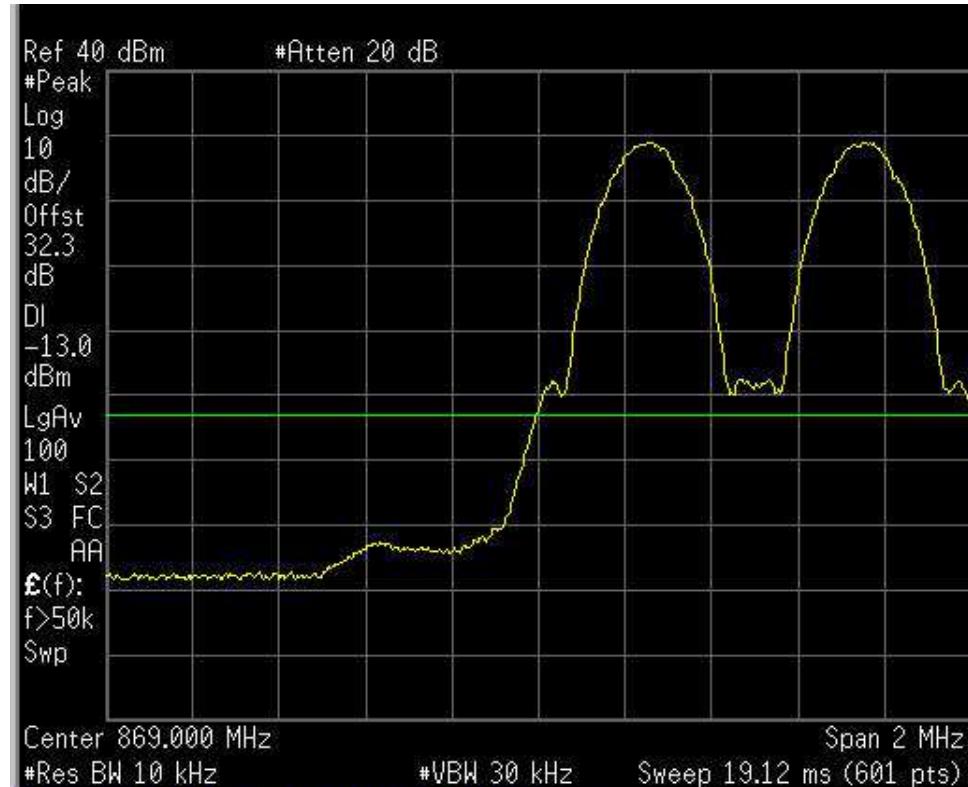
Specification: FCC 22 Subpart H

## Test Data – Spurious Emissions at Antenna Terminals

Lower Bandedge Intermodulation

GSM

Downlink





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Appendix A: Test results

Report number: 210165-3TRFWL

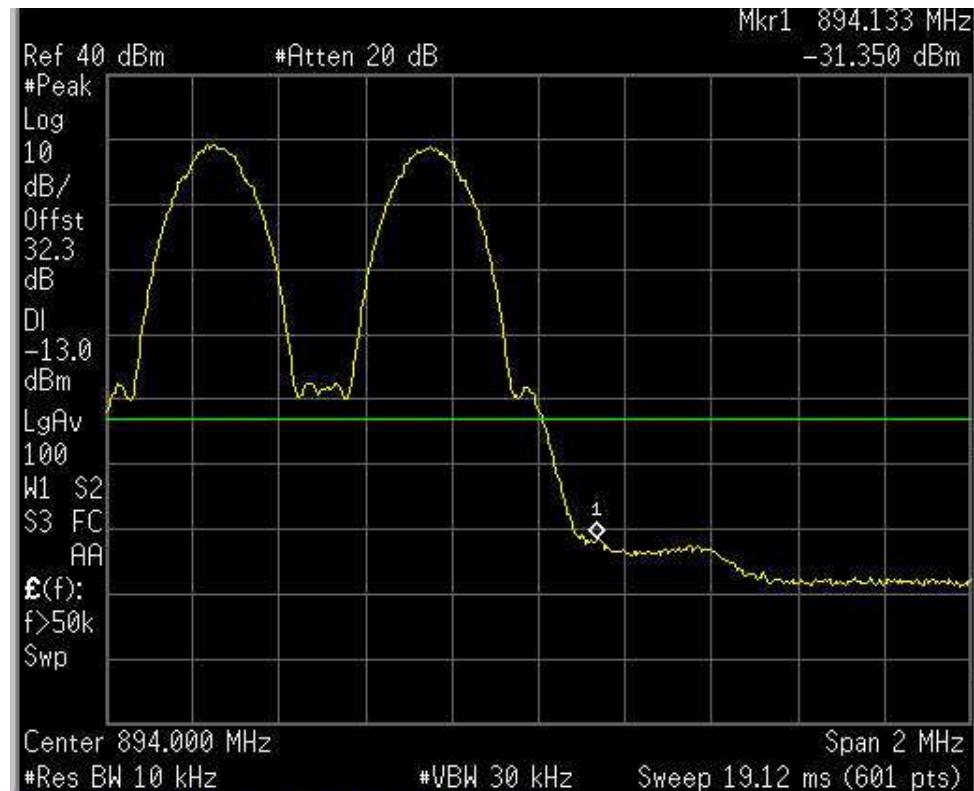
Specification: FCC 22 Subpart H

## Test Data – Spurious Emissions at Antenna Terminals

Upper Bandedge Intermodulation

GSM

Downlink





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Appendix A: Test results

Report number: 210165-3TRFWL

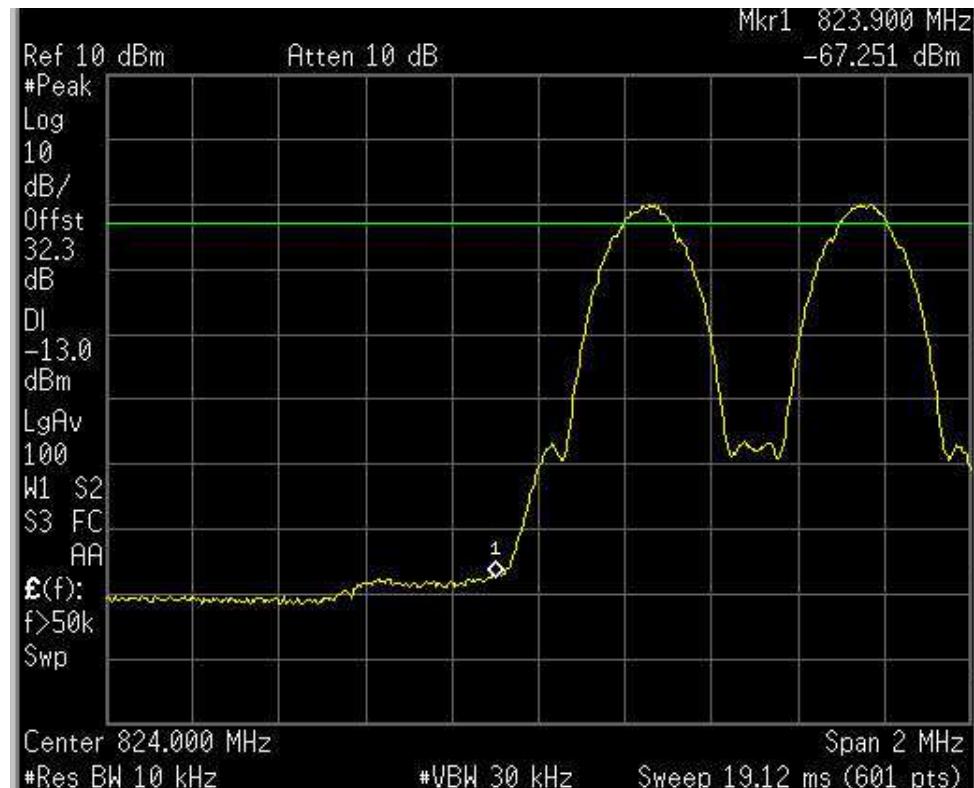
Specification: FCC 22 Subpart H

## Test Data – Spurious Emissions at Antenna Terminals

Lower Bandedge Intermodulation

GSM

Uplink





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Appendix A: Test results

Report number: 210165-3TRFWL

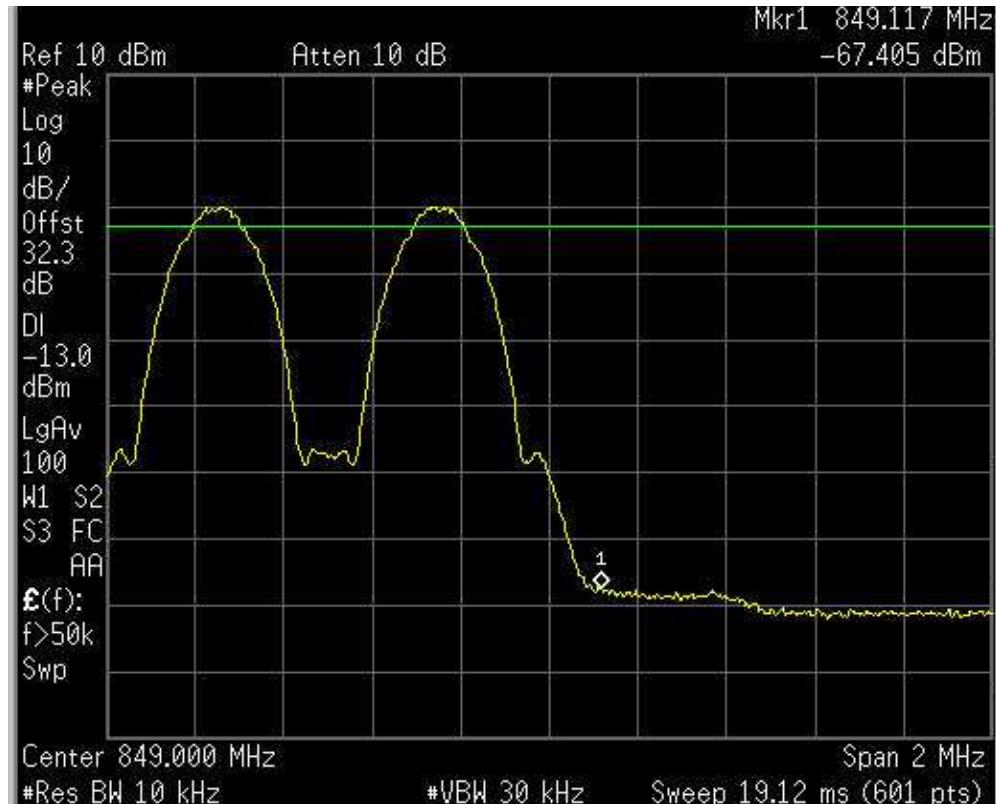
Specification: FCC 22 Subpart H

## Test Data – Spurious Emissions at Antenna Terminals

Upper Bandedge Intermodulation

GSM

Uplink





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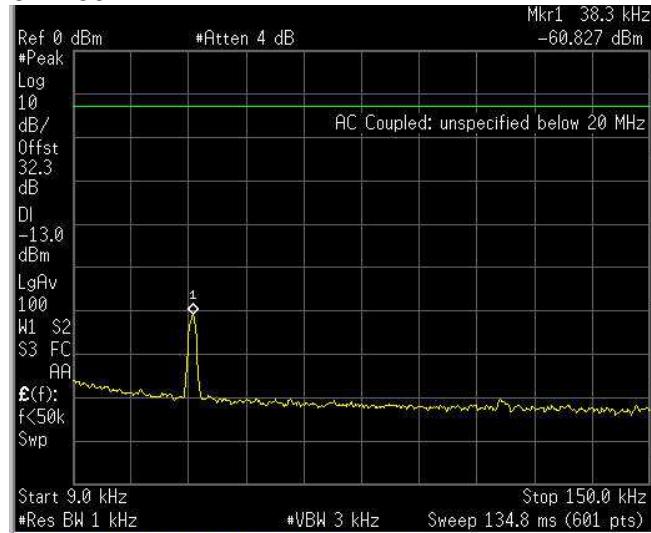
Appendix A: Test results

Report number: 210165-3TRFWL

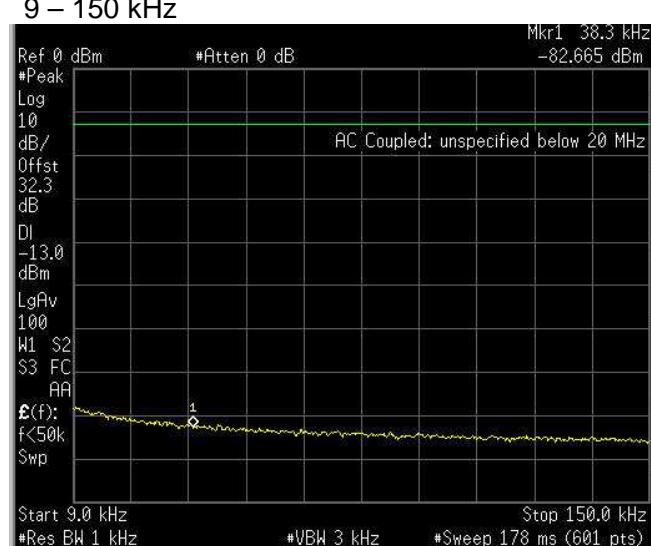
Specification: FCC 22 Subpart H

## Test Data – Spurious Emissions at Antenna Terminals

Spurs – GSM – Downlink 9 – 150 kHz



Spurs – GSM – Uplink





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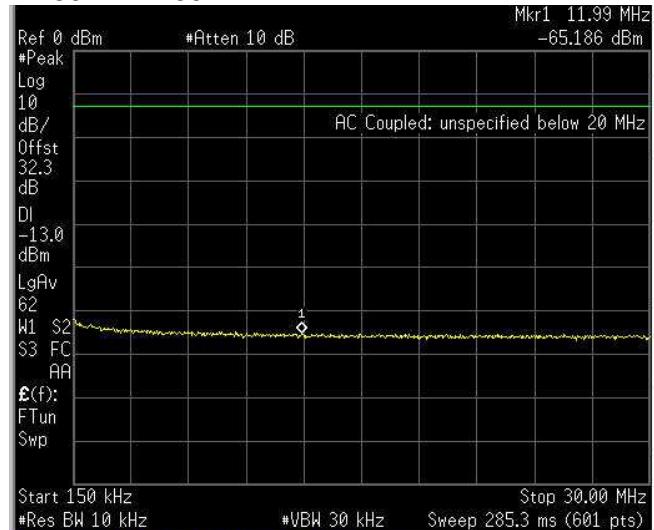
Appendix A: Test results

Report number: 210165-3TRFWL

Specification: FCC 22 Subpart H

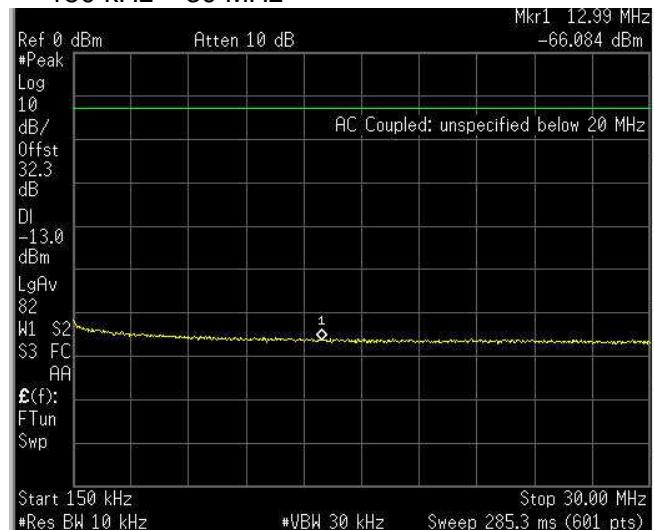
## Test Data – Spurious Emissions at Antenna Terminals

Spurs – GSM – Downlink 150 kHz – 30 MHz



Spurs – GSM – Uplink

150 kHz – 30 MHz





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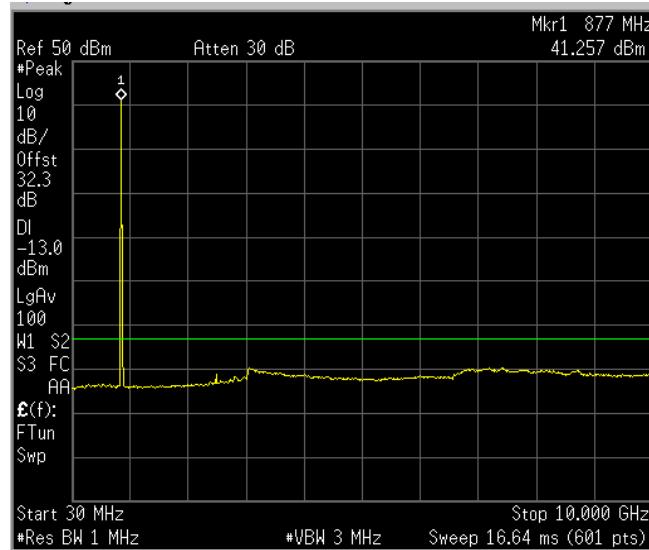
Appendix A: Test results

Report number: 210165-3TRFWL

Specification: FCC 22 Subpart H

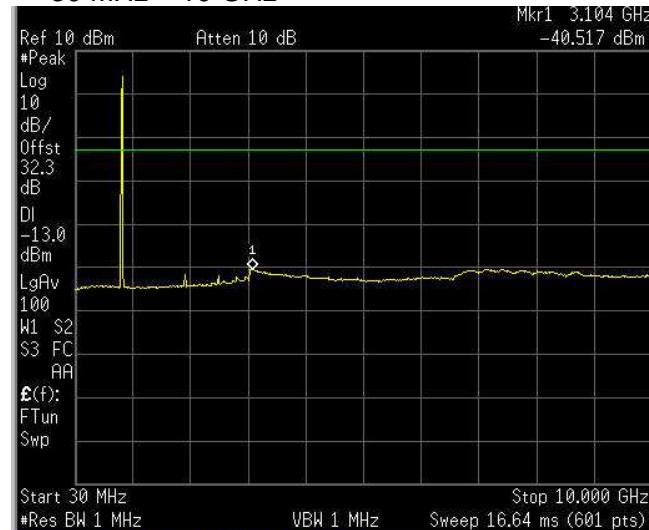
## Test Data – Spurious Emissions at Antenna Terminals

Spurs – GSM – Downlink 30 MHz – 10 GHz



Spurs – GSM – Uplink

30 MHz – 10 GHz





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Appendix A: Test results

Report number: 210165-3TRFWL

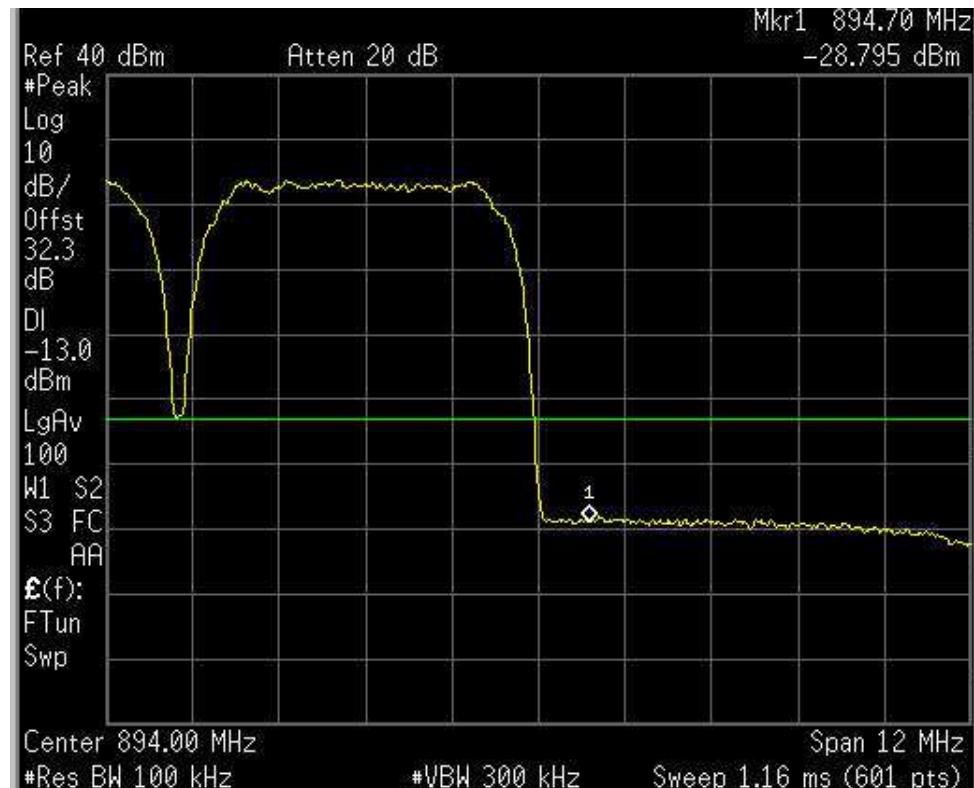
Specification: FCC 22 Subpart H

## Test Data – Spurious Emissions at Antenna Terminals

Lower Bandedge Intermodulation

W-CDMA

Downlink





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Appendix A: Test results

Report number: 210165-3TRFWL

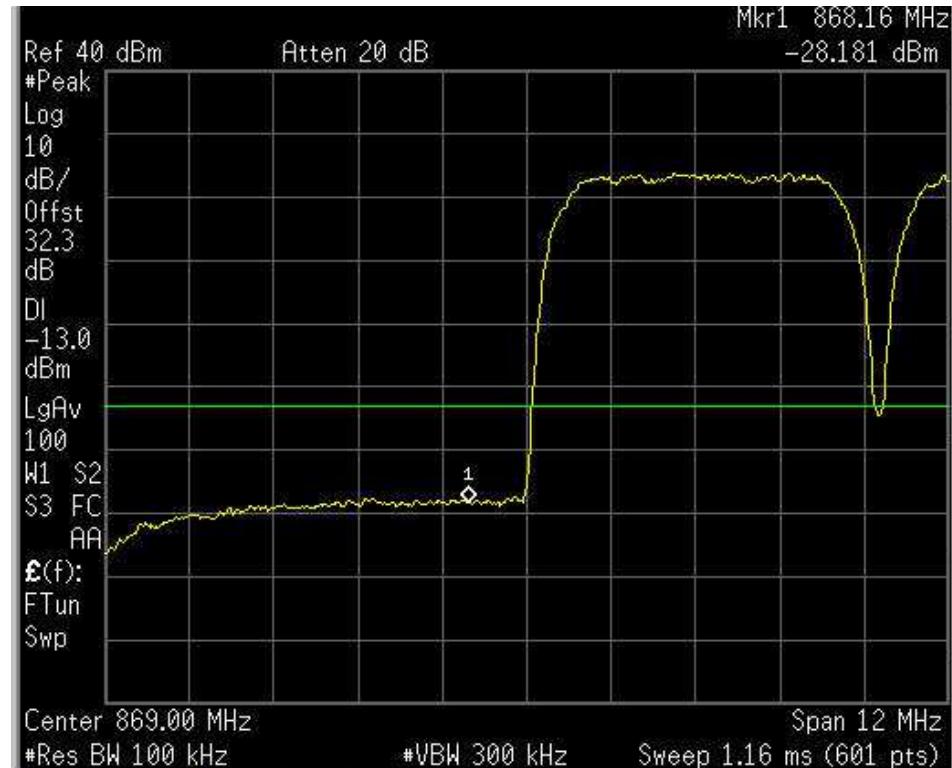
Specification: FCC 22 Subpart H

## Test Data – Spurious Emissions at Antenna Terminals

Upper Bandedge Intermodulation

W-CDMA

Downlink





Nemko Italy S.p.A.  
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Appendix A: Test results

Report number: 210165-3TRFWL

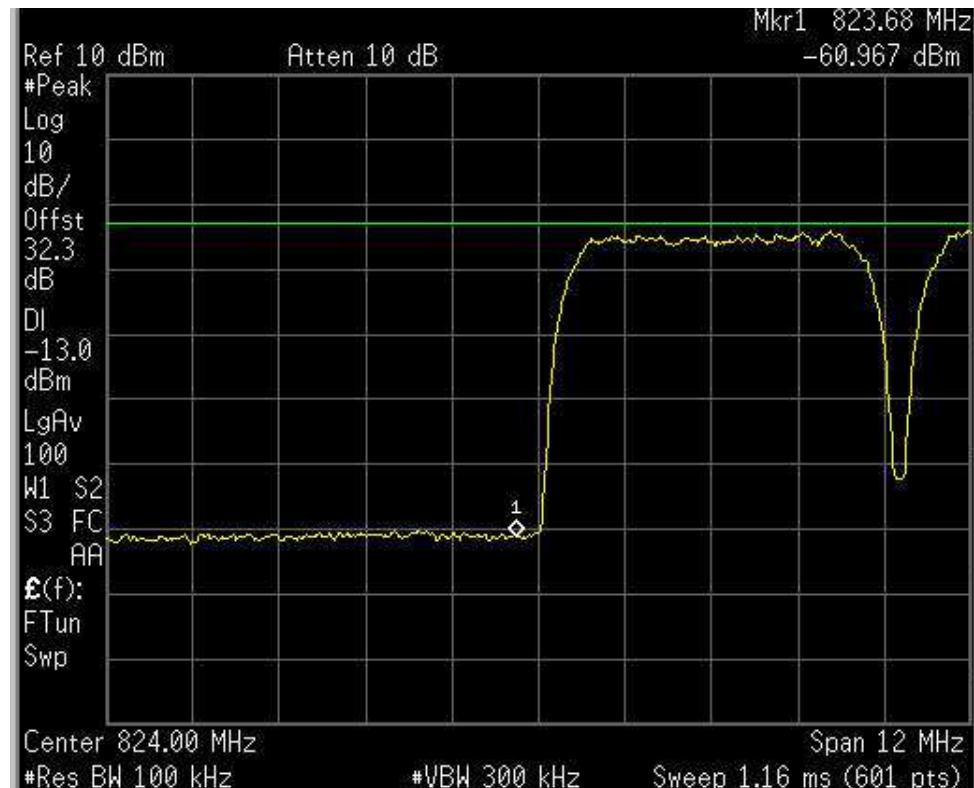
Specification: FCC 22 Subpart H

## Test Data – Spurious Emissions at Antenna Terminals

Lower Bandedge Intermodulation

W-CDMA

Uplink





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Appendix A: Test results

Report number: 210165-3TRFWL

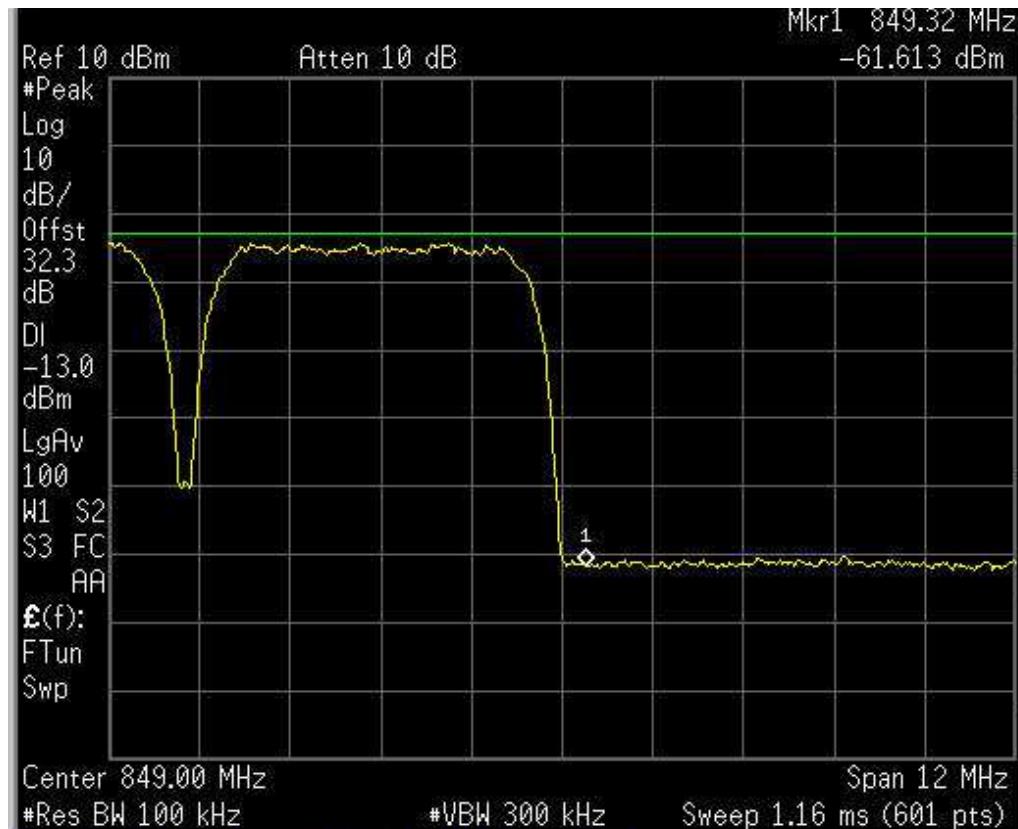
Specification: FCC 22 Subpart H

## Test Data – Spurious Emissions at Antenna Terminals

Upper Bandedge Intermodulation

W-CDMA

Uplink





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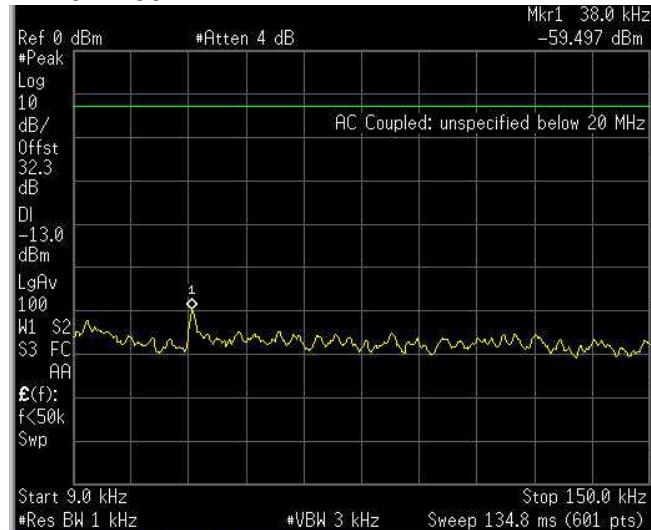
Appendix A: Test results

Report number: 210165-3TRFWL

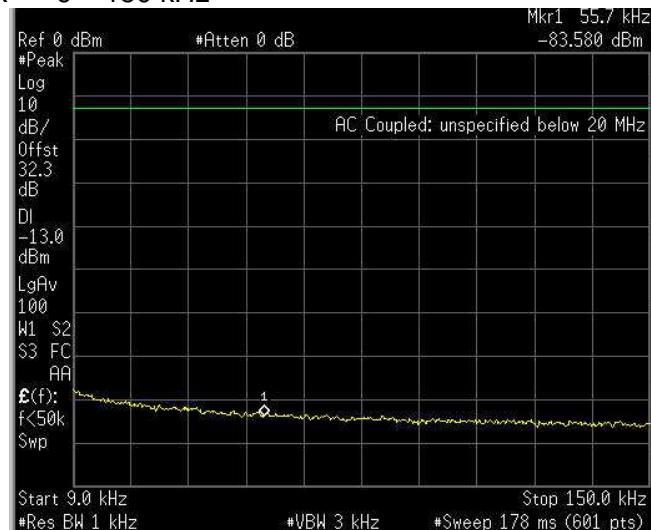
Specification: FCC 22 Subpart H

## Test Data – Spurious Emissions at Antenna Terminals

Spurs – W-CDMA – Downlink 9 – 150 kHz



Spurs – W-CDMA – Uplink 9 – 150 kHz





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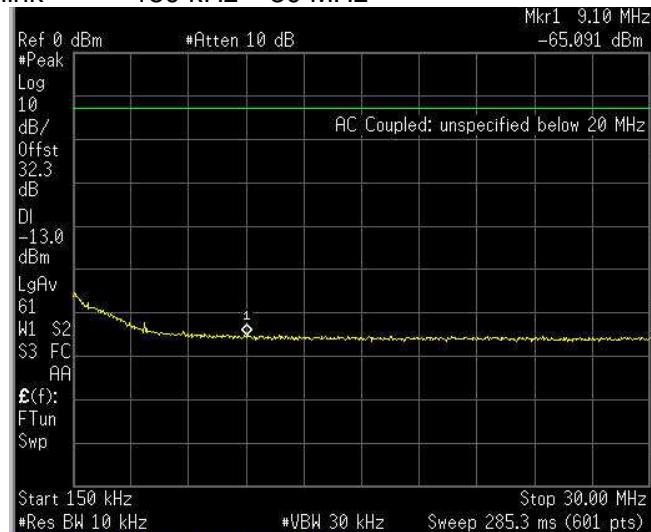
Appendix A: Test results

Report number: 210165-3TRFWL

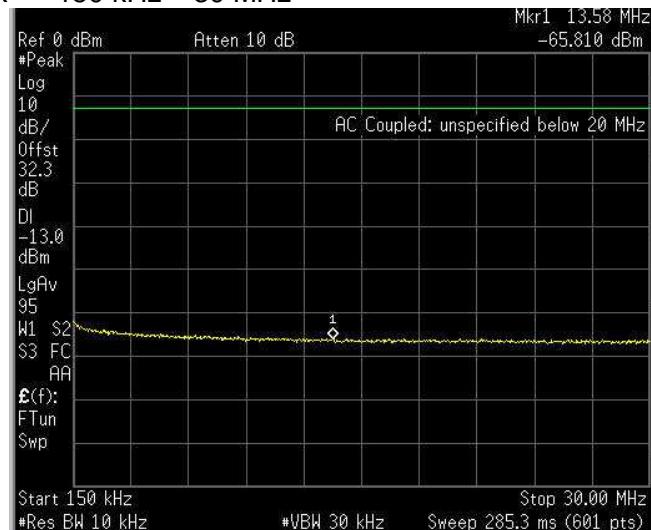
Specification: FCC 22 Subpart H

## Test Data – Spurious Emissions at Antenna Terminals

Spurs – W-CDMA – Downlink 150 kHz – 30 MHz



Spurs – W-CDMA – Uplink 150 kHz – 30 MHz





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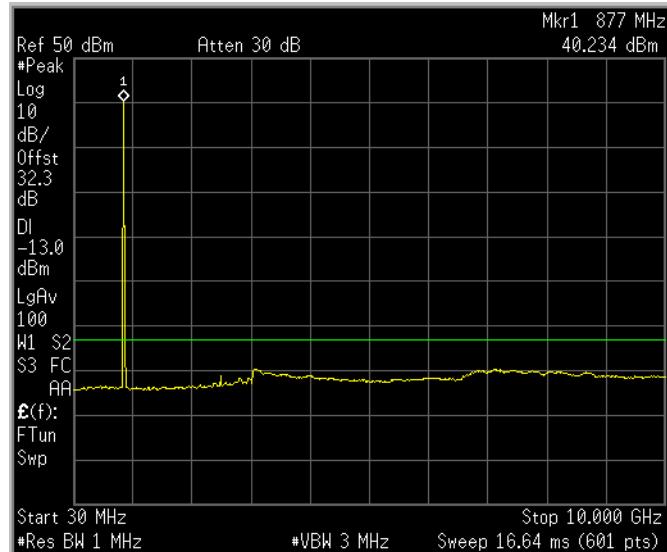
Appendix A: Test results

Report number: 210165-3TRFWL

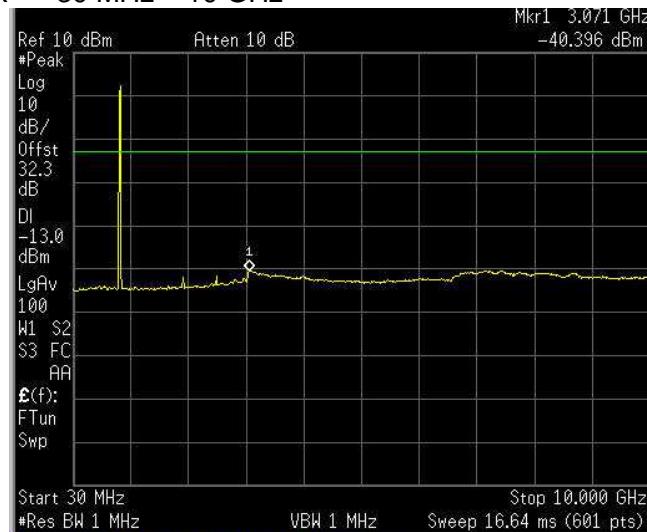
Specification: FCC 22 Subpart H

## Test Data – Spurious Emissions at Antenna Terminals

Spurs – W-CDMA – Downlink 30 MHz – 10 GHz



Spurs – W-CDMA – Uplink 30 MHz – 10 GHz





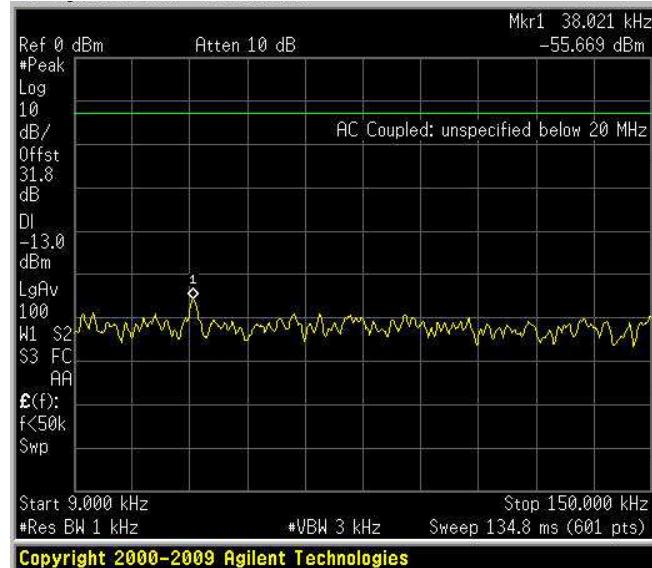
Nemko Italy S.p.A.  
Via del Carroccio 4, 20046, Biassono, Italy.

Appendix A: Test results

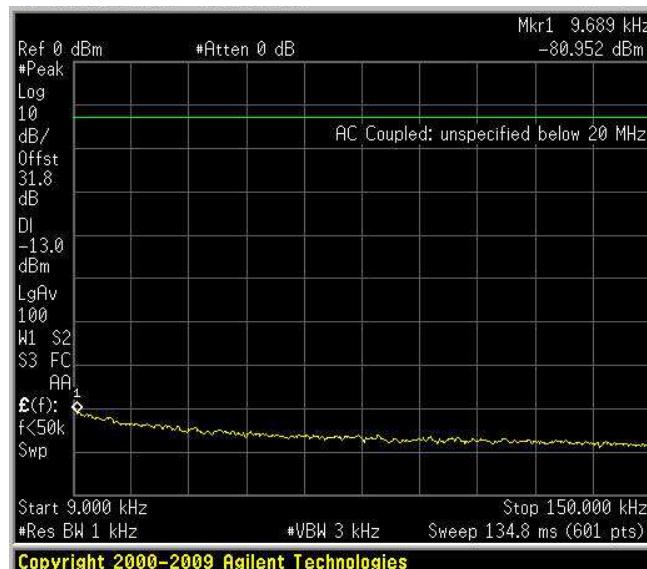
Report number: 210165-3TRFWL

Specification: FCC 22 Subpart H

Downlink – 1,4 QAM  
9 kHz – 150 kHz



Uplink – 1,4 QAM  
9 kHz – 150 kHz



Only 1,4 QAM 9kHz-150kHz spurious emission plots are included here, other modulations spurious emission plots are negligible and the same.



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Appendix A: Test results

Report number: 210165-3TRFWL

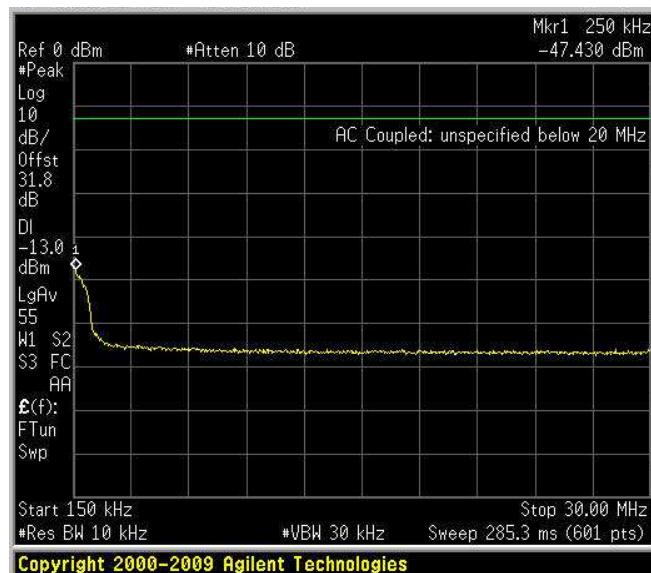
Specification: FCC 22 Subpart H

### Test data continued

#### Spurious Emissions at Antenna Terminals

Downlink – 1,4 QAM

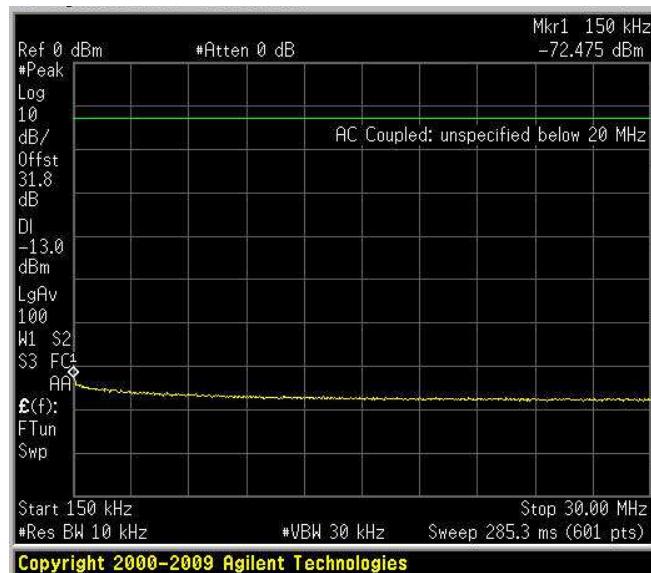
150 kHz – 30MHz



#### Spurious Emissions at Antenna Terminals

Uplink – 1,4 QAM

150 kHz – 30MHz



Only 1,4 QAM 150kHz-30MHz spurious emission plots are included here, other modulations spurious emission plots are negligible and the same.



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Appendix A: Test results

Report number: 210165-3TRFWL

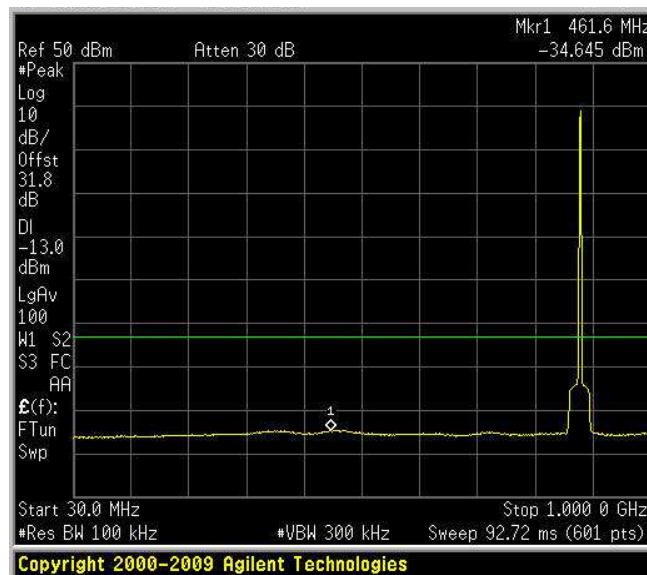
Specification: FCC 22 Subpart H

### Test data continued

#### Spurious Emissions at Antenna Terminals

Downlink – 1,4 QAM

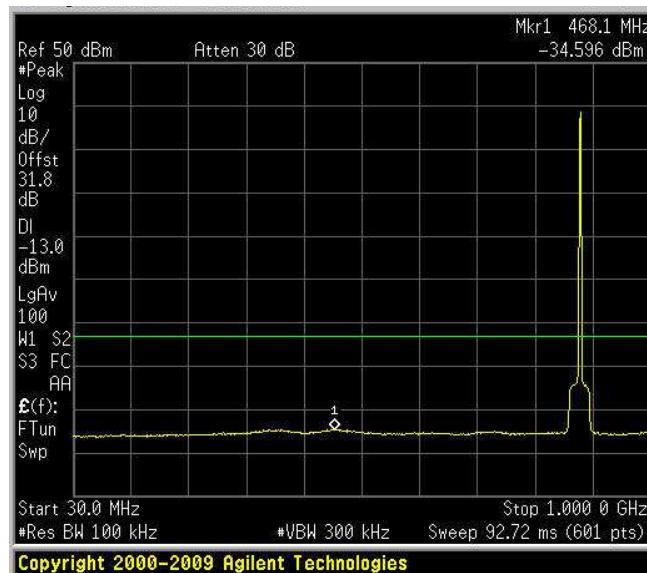
30MHz – 1 GHz



#### Spurious Emissions at Antenna Terminals

Downlink – 1,4 QPSK

30MHz – 1 GHz





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Appendix A: Test results

Report number: 210165-3TRFWL

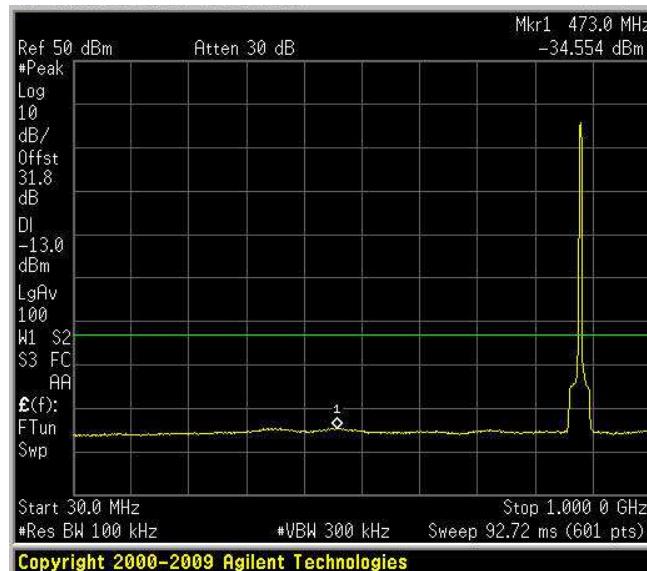
Specification: FCC 22 Subpart H

### Test data continued

#### Spurious Emissions at Antenna Terminals

Downlink – 3 QAM

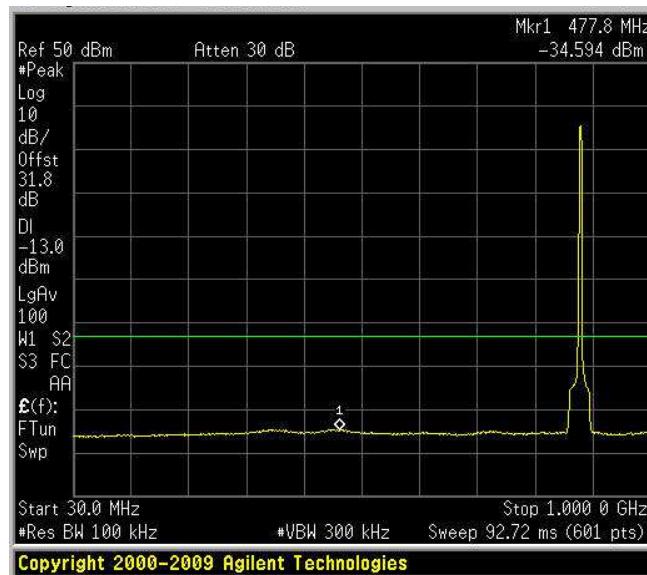
30MHz – 1 GHz



#### Spurious Emissions at Antenna Terminals

Downlink – 3 QPSK

30MHz – 1 GHz





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Appendix A: Test results

Report number: 210165-3TRFWL

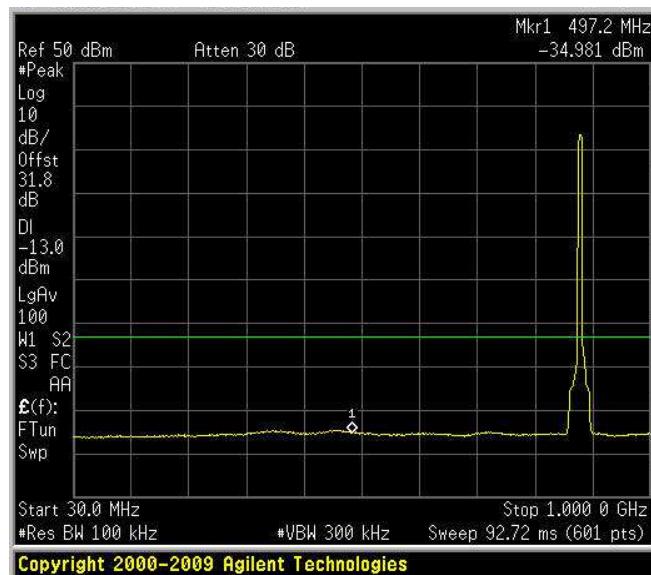
Specification: FCC 22 Subpart H

### Test data continued

#### Spurious Emissions at Antenna Terminals

Downlink – 5 QAM

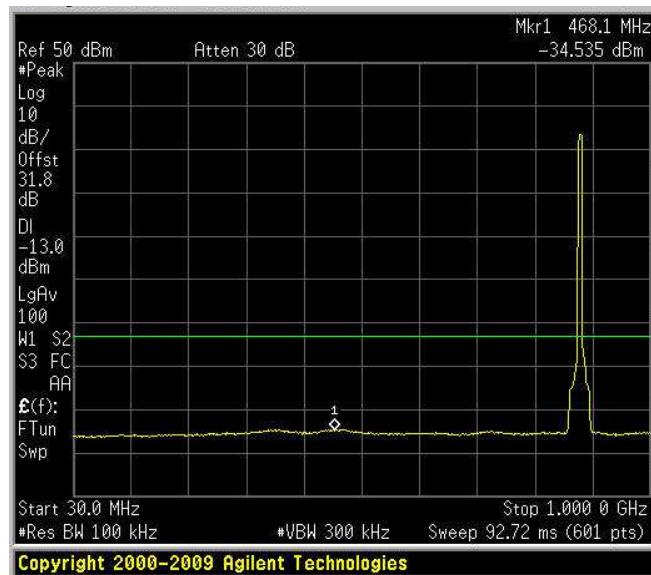
30MHz – 1 GHz



#### Spurious Emissions at Antenna Terminals

Downlink – 5 QPSK

30MHz – 1 GHz





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Appendix A: Test results

Report number: 210165-3TRFWL

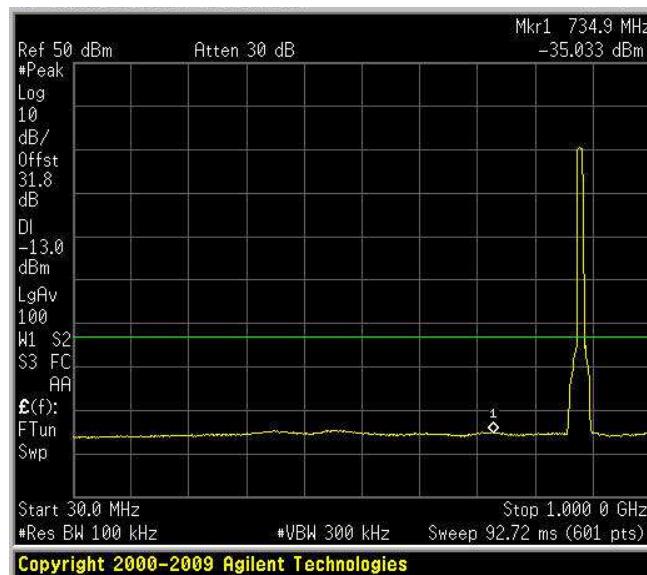
Specification: FCC 22 Subpart H

### Test data continued

#### Spurious Emissions at Antenna Terminals

Downlink – 10 QAM

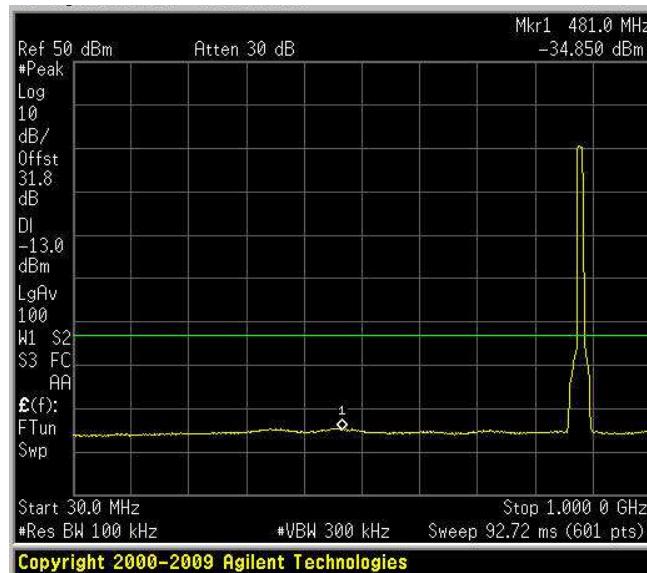
30MHz – 1 GHz



#### Spurious Emissions at Antenna Terminals

Downlink – 10 QPSK

30MHz – 1 GHz





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Appendix A: Test results

Report number: 210165-3TRFWL

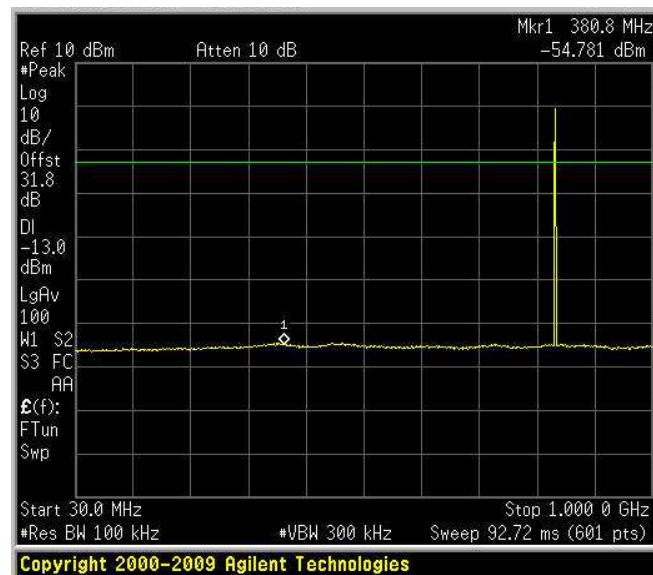
Specification: FCC 22 Subpart H

### Test data continued

#### Spurious Emissions at Antenna Terminals

Uplink – 1,4 QAM

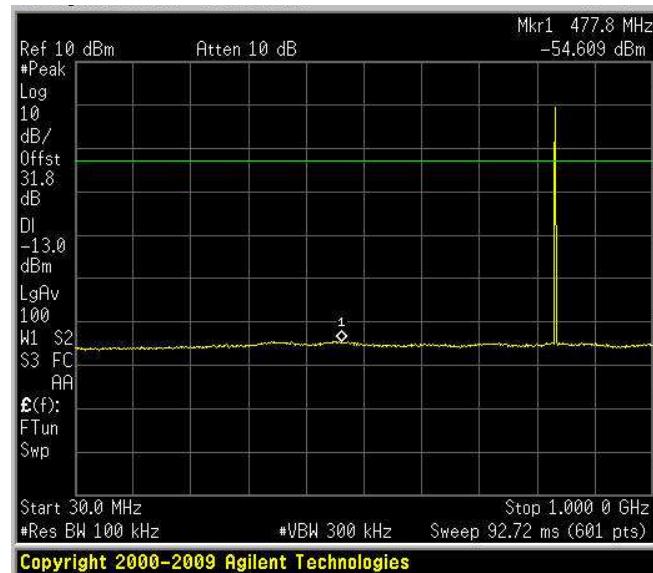
30MHz – 1 GHz



#### Spurious Emissions at Antenna Terminals

Uplink – 1,4 QPSK

30MHz – 1 GHz





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Appendix A: Test results

Report number: 210165-3TRFWL

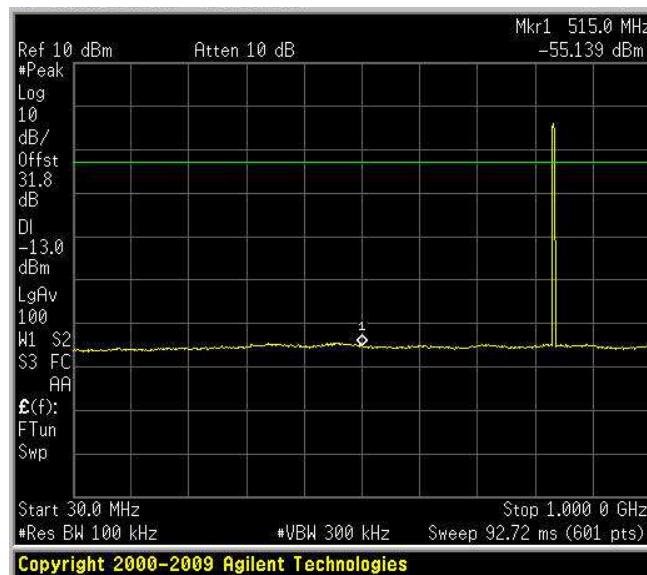
Specification: FCC 22 Subpart H

### Test data continued

#### Spurious Emissions at Antenna Terminals

Uplink – 3 QAM

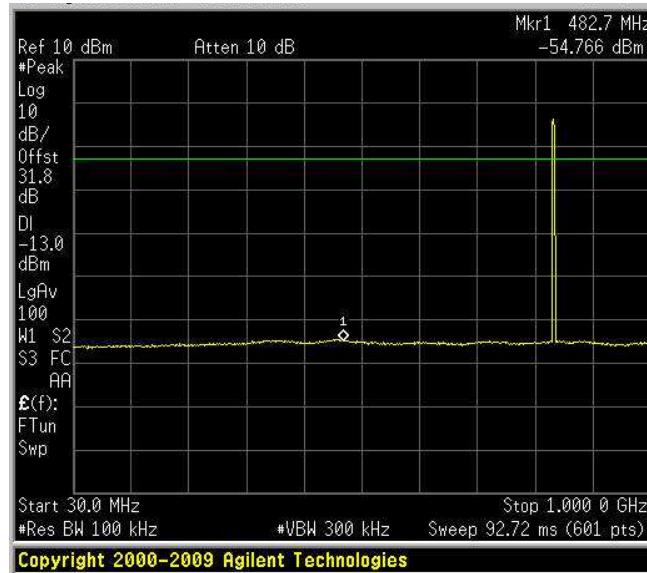
30MHz – 1 GHz



#### Spurious Emissions at Antenna Terminals

Uplink – 3 QPSK

30MHz – 1 GHz





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Appendix A: Test results

Report number: 210165-3TRFWL

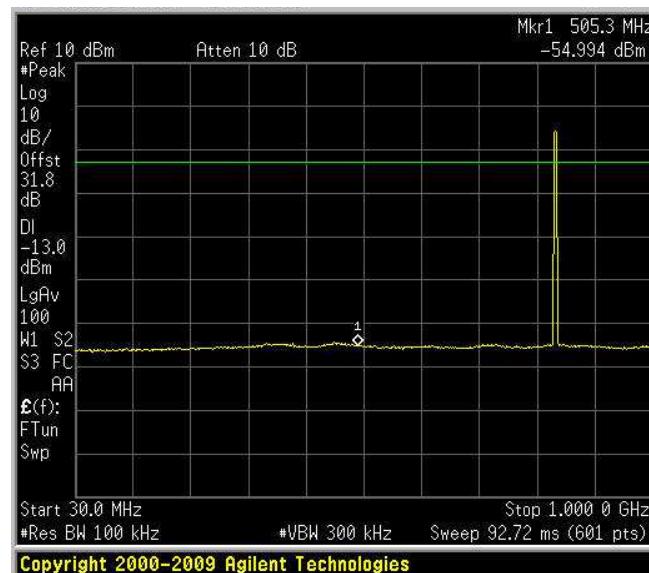
Specification: FCC 22 Subpart H

### Test data continued

#### Spurious Emissions at Antenna Terminals

Uplink – 5 QAM

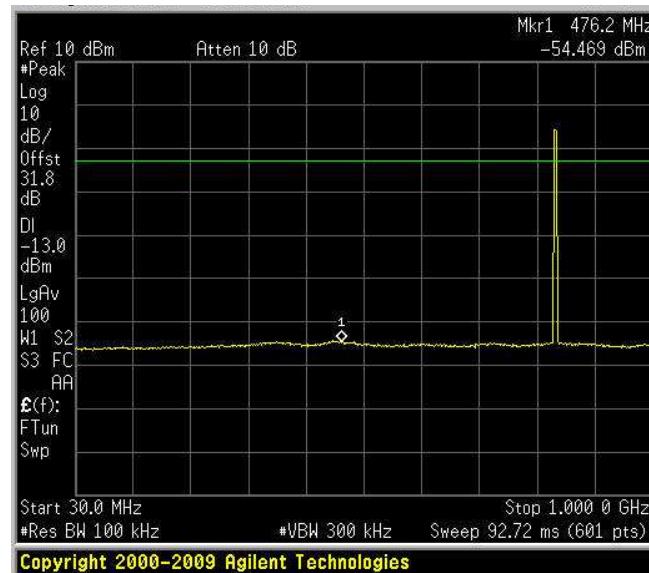
30MHz – 1 GHz



#### Spurious Emissions at Antenna Terminals

Uplink – 5 QPSK

30MHz – 1 GHz





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Appendix A: Test results

Report number: 210165-3TRFWL

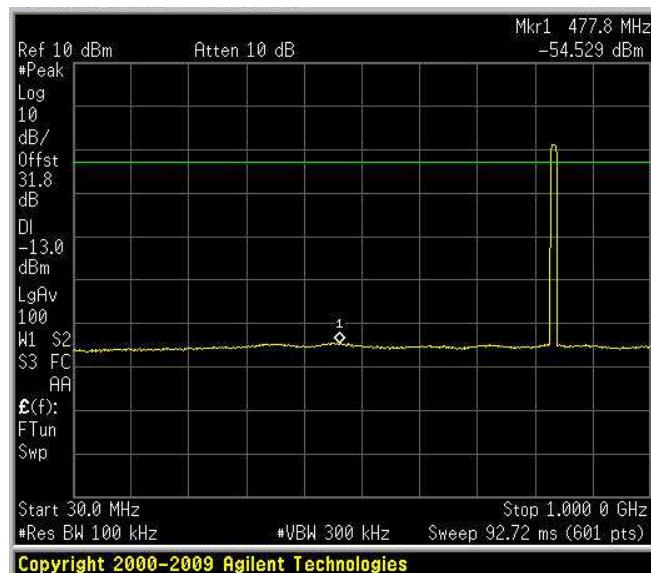
Specification: FCC 22 Subpart H

### Test data continued

#### Spurious Emissions at Antenna Terminals

Uplink – 10 QAM

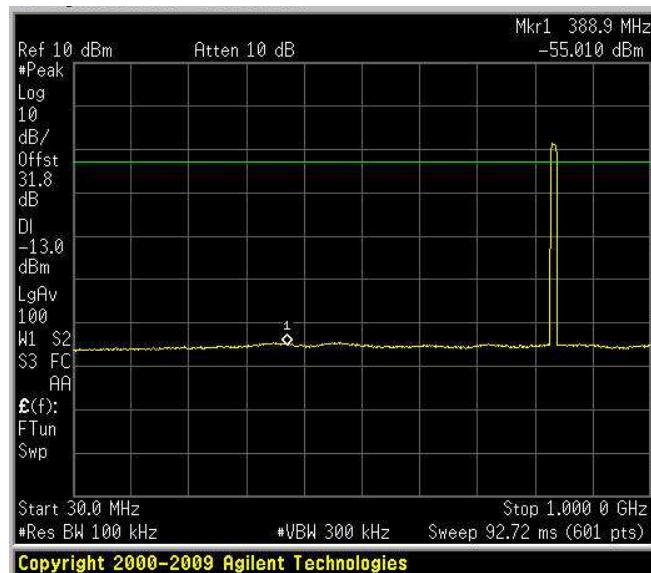
30MHz – 1 GHz



#### Spurious Emissions at Antenna Terminals

Uplink – 10 QPSK

30MHz – 1 GHz





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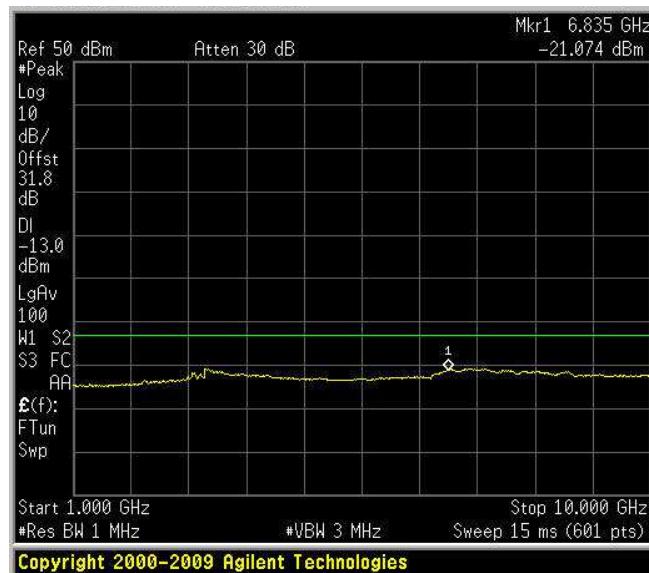
Appendix A: Test results

Report number: 210165-3TRFWL

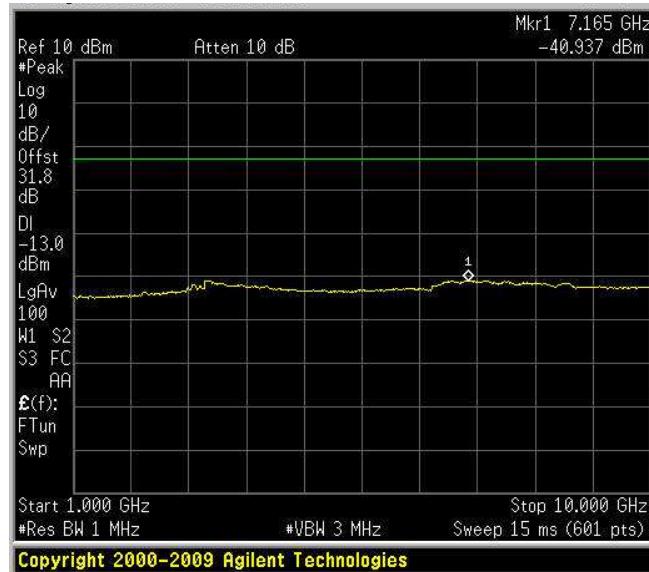
Specification: FCC 22 Subpart H

## Test data continued

Downlink – 1,4 QAM  
1 GHz – 10 GHz



Uplink – 1,4 QAM  
1 GHz – 10 GHz



Only 1,4 QAM 1GHz-10GHz spurious emission plots are included here, other modulations spurious emission plots are negligible and the same.



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Appendix A: Test results

Report number: 210165-3TRFWL

Specification: FCC 22 Subpart H

### Clause 22.917(a) Out of band spurious emissions at antenna terminal

#### Clause 22.917 Field strength of emissions

(a) Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB.

(b) Measurement procedure. Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 100 kHz or 1 percent of emission bandwidth, as specified).

Test date: 2012-06-04

Test results: Pass

#### Special notes

- The spectrum was searched from 30 MHz up to 10<sup>th</sup> harmonic
- The EUT was measured on three orthogonal axis.
- All measurements were performed at a distance of 3 m.
- Only the worst data presented in the test report.
- The EUT's antenna port was terminated with 50 Ω termination.

#### Method of Measurement

TIA/EIA-603-1992

The antenna substitution method is used to determine the equivalent radiated power at spurious frequencies. The spurious emissions are measured at a distance of 3 meters. The EUT is then replaced with a reference substitution antenna with a known gain referenced to a dipole. This antenna is fed with a signal at the spurious frequency. The level of the signal is adjusted to repeat the previously measured level. The resulting erp is the signal level fed to the reference antenna corrected for gain referenced to a dipole.

The calibration is carried out directly by dBm.

#### 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.



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Appendix A: Test results

Report number: **210165-3TRFWL**

Specification: FCC 22 Subpart H

**Test Data:**

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.



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Appendix A: Test results

Report number: 210165-3TRFWL

Specification: FCC 22 Subpart H

## Clause 22.355 Frequency tolerance

Except as otherwise provided in this part, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances as follows:

Base fixed station (ppm)	Mobile station (ppm)
1.5	2.5

Test date:

Test results:

## Special notes

The resolution bandwidth was set to 10 kHz, video bandwidth was set to 100 Hz

NOT APPLICABLE; E.U.T. does not contain modulation circuitry



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Appendix A: Test results

Report number: 210165-3TRFWL

Specification: FCC 22 Subpart H

## Clause 22.355 Frequency tolerance, continued

### Test data

Conditions	Frequency (Hz)	Offset (ppm)	Limit (ppm)	Margin (ppm)
+50 °C, Nominal power			1.5	
+40 °C, Nominal power			1.5	
+30 °C, Nominal power			1.5	
+20 °C, +10% power			1.5	
+20 °C, Nominal power		Reference	1.5	
+20 °C, -10% power			1.5	
+10 °C, Nominal power			1.5	
0 °C, Nominal power			1.5	
-10 °C, Nominal power			1.5	
-20 °C, Nominal power				

- Note: Offset calculation: 
$$\frac{F_{Measured} - F_{reference}}{F_{reference}} \times 1 \cdot 10^6$$
- Maximum frequency drift is 0 kHz



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Appendix A: Test results

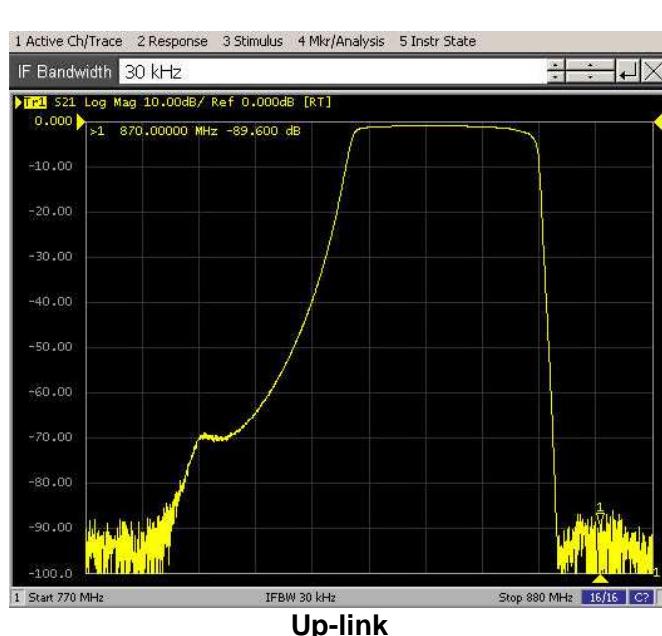
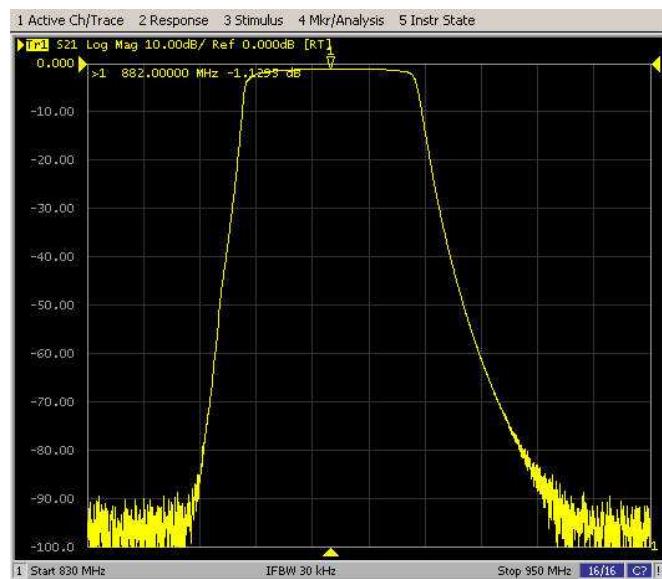
Report number: 210165-3TRFWL

Specification: FCC 22 Subpart H

## Filter Frequency Response

Test date: 2012-06-04

Test results: Pass





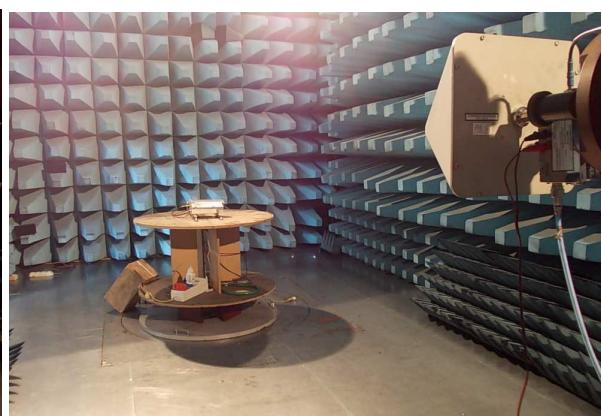
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Appendix A: Test results

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Specification: FCC 22 Subpart H

## Photo Set up





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Appendix A: Test results

Report number: **210165-3TRFWL**

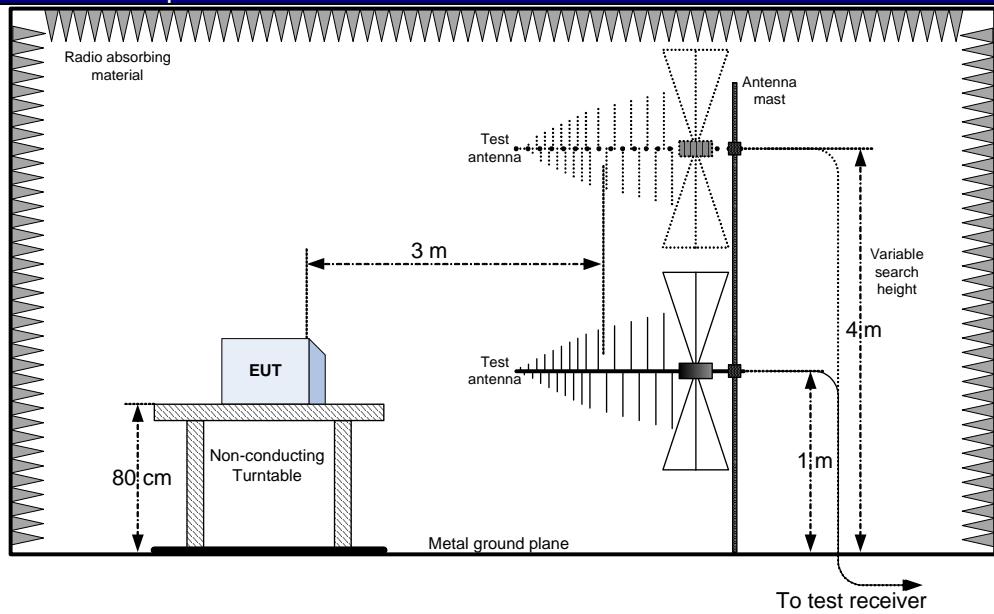
Specification: FCC 22 Subpart H

**Photo EUT**



## Appendix B: Block diagrams of test set-ups

### Radiated emissions set-up



### Substitution method set-up

