



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

Report number: **156523-1TRFWL**

Apparatus: TRU8A19AWWL/AC-WS
(+ Master Unit composed of:
SUB-TRX+TPSU/AC+TPSU/48+TSPV-R+TTRC4W-S)

Applicant: TEKO Telecom S.p.A.
Via Meucci, 24/a
I-40024 Castel S. Pietro Terme (BO)

FCC ID: **XM2-LOWPOWER**

Test specification:

Title 47-Telecommunication

Chapter I – Federal Communications Commission

Subchapter A – General

Part 22 – Public Mobile Services

Subpart H – Cellular Radiotelephone Service

Reviewed by: *Barbieri* Post 2010/10/05
Signature P. Barbieri, Wireless/EMC Specialist Date

Tested by: *Curioni* Post 2010/10/05
Signature G. Curioni, Wireless/EMC Specialist Date

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Section 1: Report summary

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Section 1: Report summary

This report contains an assessment of apparatus against specifications based upon tests carried out on samples submitted at Nemko Italy SpA.

Test specification:

FCC Part 22 Subpart H, Cellular Radiotelephone Service

Compliance status:	Complies
Exclusions:	None
Non-compliances:	None
Report release history:	Original release
Test location:	Nemko Italy S.p.A. Via del Carroccio 4, 20046, Biassono, Italy.
Registration number:	481407 (10 m Semi anechoic chamber)

Note that the results contained in this report relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of the report.

This test report has been completed in accordance with the requirements of ISO/IEC 17025. All results contained in this report are within Nemko Italy's ISO/IEC 17025 accreditation.

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Section 2: Equipment under test

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Section 2: Equipment under test

2.1 Identification of equipment under test (EUT)

The following information identifies the EUT under test:

Type of equipment:	Optical System
Product marketing name:	Teko Telecom S.p.A.
Model number:	TRU8A19AWWL/AC-WS
Serial number:	090569002
Nemko sample number:	-----
FCC ID:	XM2-LOWPOWER
Date of receipt:	2010-09-13

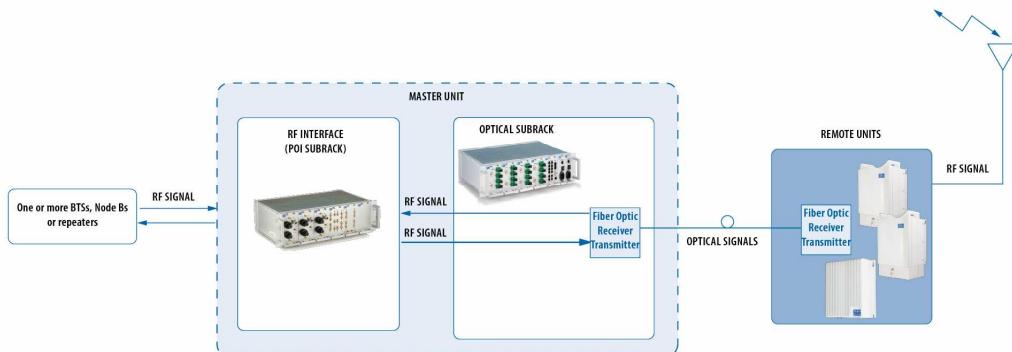
2.2 Accessories and support equipment

The following information identifies accessories used to exercise the EUT during testing:

Only setup See 3.4 test equipment and photo

Section 2: Equipment under test, continued

2.3 EUT description



2.4 Technical specifications of the EUT

Operating band:	Down Link 869-894 MHz; Up Link 824-849 MHz
Operating frequencies:	Wideband
Modulation type:	LTE (QAM and QPSK)
Occupied bandwidth:	1,4 MHz – 3 MHz – 5 MHz – 10MHz
Channel spacing:	Standard
Emission designator:	1M40D7W, 3M00D7W, 5M00D7W, 10M0D7W
RF Output	Down Link: 29dBm (0,8W) Up Link: 4dBm typical (0,0025W typical)
Gain	Down Link: 34dB Up Link: 47dB
Antenna data:	No antenna provided
Antenna type:	No antenna provided External Antenna (Equipment that has an external 50 Ω RF connector)
Power source	100-240 Vac external



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Section 2: Equipment under test

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Section 2: Equipment under test, continued

2.5 EUT setup diagram



2.6 Operation of the EUT during testing

Normal working at max gain with max RF power output (down-link and up-link)

2.7 Modifications incorporated in the EUT

None/Comments (Performed by: Client or Nemko)

There were no modifications performed to the EUT during this assessment.

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Section 3: Test conditions

3.1 Deviations from laboratory tests procedures

No deviations were made from laboratory test procedures.

3.2 Test conditions, power source and ambient temperatures

Normal temperature, humidity and air pressure test conditions	Temperature: 15–30 °C Relative humidity: 20–75 % Air pressure: 860–1060 hPa
Power supply range:	When it is impracticable to carry out tests under these conditions, a note to this effect stating the ambient temperature and relative humidity during the tests shall be recorded and stated.

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Section 3: Test conditions, continued

3.3 Measurement uncertainty

Nemko S.p.A. measurement uncertainty has been calculated using the standard CISPR 16-4-2 "Specification for radio disturbance and immunity measuring apparatus and methods – Part 4-2: Uncertainties, statistics and limit modeling – Uncertainty in EMC measurements". All calculations have been performed to provide a confidence level of 95 % and can be found in Nemko S.p.A. document WML1002.

3.4 Test equipment

<i>Identification number</i>	<i>Description</i>	<i>Manufacturer model</i>	<i>s/n</i>	<i>Cal. Due</i>
1	Vector Signal Generator	Agilent H.P. N5182A MXG	MY48180714	April 2011
2	Spectrum Analyzer	Agilent H.P. E4440A	US40420470	Jun 2011
3	Network Analyzer	Agilent H.P E5062A	MY44101829	November 2012
4	2xcables+directional coupler+dummyload	Teko Telecom	T003	No Cal. required

Client's property

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Section 4: Result summary

4.1 Test results

The apparatus was assessed against the following specifications:

FCC Part 2 Subpart J, Equipment Authorization Procedures
 FCC Part 22 Subpart H Cellular Radiotelephone Service

The column headed 'Required' indicates whether the associated clauses were invoked for the apparatus under test. The following abbreviations are used:

N	No : not applicable / not relevant.
Y	Yes : Mandatory i.e. the apparatus shall conform to these tests.
N/T	Not Tested, mandatory but not assessed. (See report summary)

Part	Test description	Required	Result
§22.913(a)	Effective radiated power limits (500 W erp)	Y	Pass
§2.1049	Occupied bandwidth (Input/Output)	Y	Pass
§22.917	Out of band emissions (antenna terminals)	Y	Pass
§22.917	Field Strength of Spurious Emissions	N/T	Pass*
§22.355	Frequency tolerance	N	**
----	Filter Frequency Response	N/T	Pass***

Notes:

- * See previous test report 131640-1TRFEMC
- ** Modulation & frequency conversion circuitry not in use
- *** See previous test report 131640-1TRFEMC



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Appendix A: Test results

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Appendix A: Test results

Clause 22.913(a) Effective radiated power limits

The effective radiated power (ERP) of transmitters in the Cellular Radiotelephone Service must not exceed the limits in this section.

(a) Maximum ERP. In general, the effective radiated power (ERP) of base transmitters and cellular repeaters must not exceed 500 Watts (57 dBm). However, for those systems operating in areas more than 72 km (45 miles) from international borders that:

- (1) Are located in counties with population densities of 100 persons or fewer per square mile, based upon the most recently available population statistics from the Bureau of the Census; or,
- (2) Extend coverage on a secondary basis into cellular unserved areas, as those areas are defined in §22.949, the ERP of base transmitters and cellular repeaters of such systems must not exceed 1000 Watts (60 dBm). The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts (38.45 dBm).

Test date: 2010-09-21

Test results: Pass

Special notes

Radiated measurements were performed:

- The EUT was measured on three orthogonal axis.
- All measurements were performed at a distance of 3 m.
- All measurements were performed:
 - using a peak detector with RBW wider than emission bandwidth
- Only the worst data presented in the test report.

Conducted measurement were performed:

- The power was measured using spectrum analyzer with RMS detector / average power meter.

Only conducted measurement at antenna connector was possible, no antenna provided by manufacturer



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Appendix A: Test results

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Clause 22.913(a) RF power output, continued

Test data

Conducted measurement

Test data

Direction	Modulation	Frequency (MHz)	RF output channel Power (dBm)	RF output channel Power (W)
Down-link	LTE (QAM, 1,4MHz)	881.5	28.94	0.783
Down-link	LTE (QPSK, 1,4MHz)	881.5	29.07	0.807
Down-link	LTE (QAM, 3MHz)	881.5	29.02	0.8
Down-link	LTE (QPSK, 3MHz)	881.5	29.09	0.810
Down-link	LTE (QAM, 5MHz)	881.5	29.07	0.807
Down-link	LTE (QPSK, 5MHz)	881.5	29.09	0.810
Down-link	LTE (QAM, 10MHz)	881.5	29.02	0.8
Down-link	LTE (QPSK, 10MHz)	881.5	29.07	0.807
Up-link	LTE (QAM, 1,4MHz)	836.5	4.06	2.546x10 ⁻³
Up-link	LTE (QPSK, 1,4MHz)	836.5	4.05	2.541x10 ⁻³
Up-link	LTE (QAM, 3MHz)	836.5	4.02	2.523x10 ⁻³
Up-link	LTE (QPSK, 3MHz)	836.5	4.01	2.517x10 ⁻³
Up-link	LTE (QAM, 5MHz)	836.5	4.06	2.546x10 ⁻³
Up-link	LTE (QPSK, 5MHz)	836.5	4.03	2.529x10 ⁻³
Up-link	LTE (QAM, 10MHz)	836.5	4.01	2.517x10 ⁻³
Up-link	LTE (QPSK, 10MHz)	836.5	4.02	2.523x10 ⁻³



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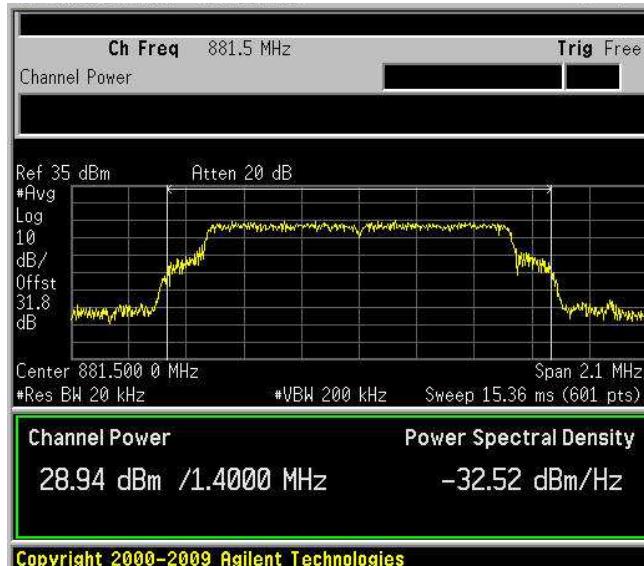
Appendix A: Test results

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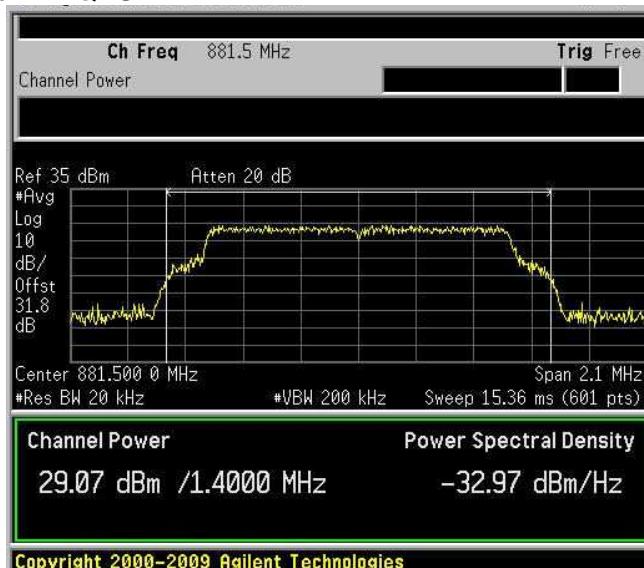
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Test data

RF Power Output D.L. mod. 1.4 QAM



RF Power Output D.L. mod. 1.4 QPSK





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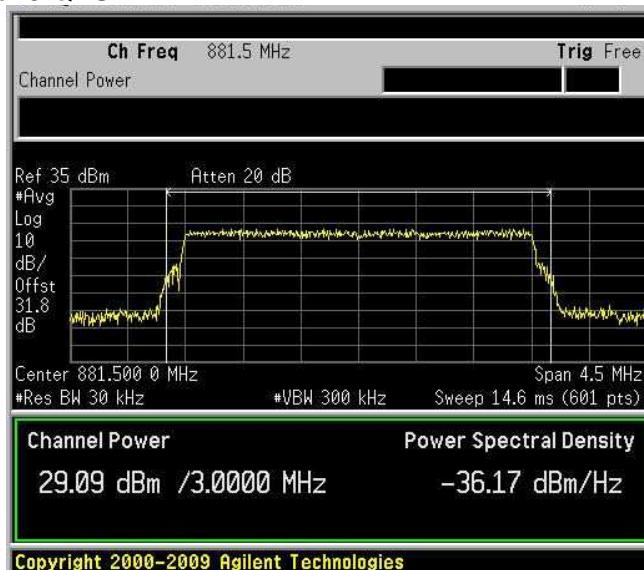
Specification: FCC 22 Subpart H

Test data

RF Power Output D.L. mod. 3 QAM



RF Power Output D.L. mod. 3 QPSK





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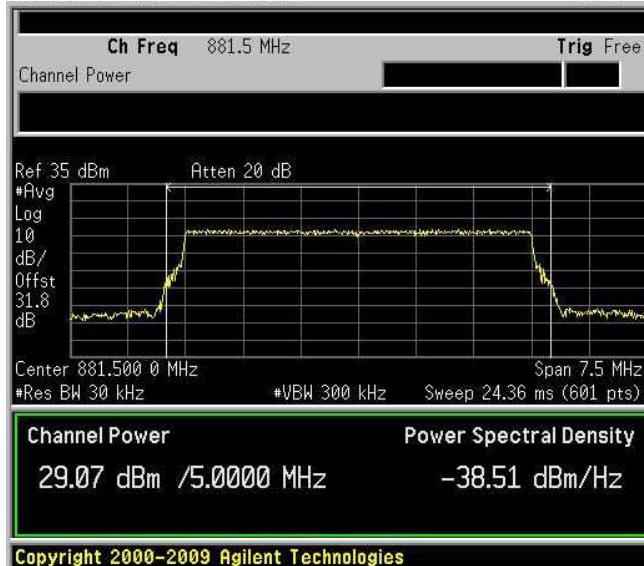
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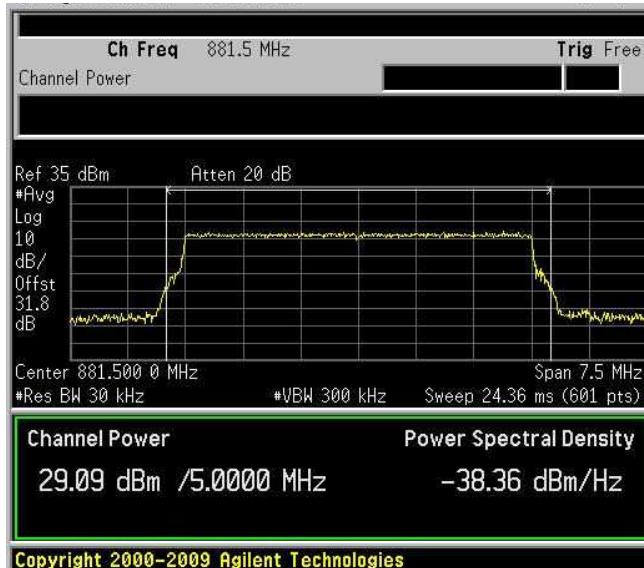
Specification: FCC 22 Subpart H

Test data

RF Power Output D.L. mod. 5 QAM



RF Power Output D.L. mod. 5 QPSK





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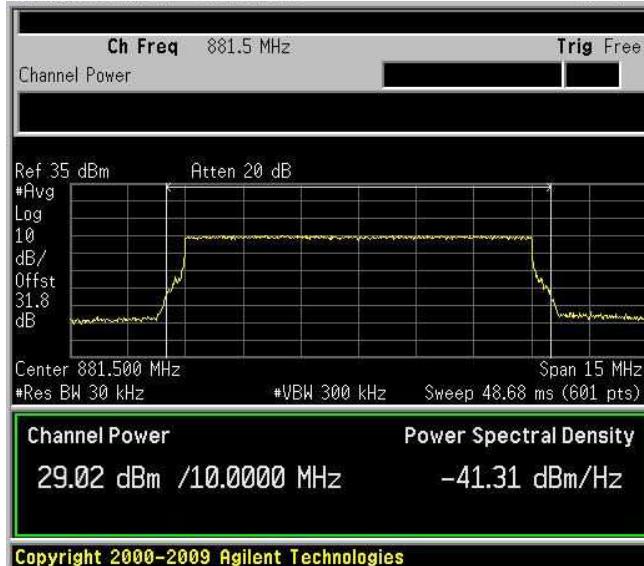
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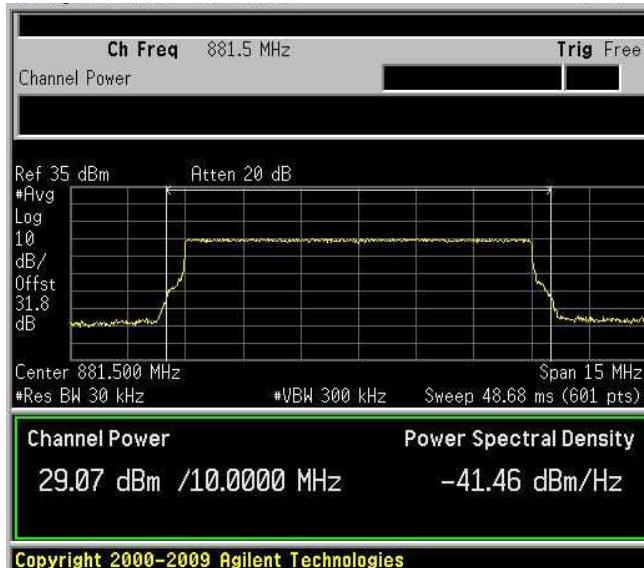
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Test data

RF Power Output D.L. mod. 10 QAM



RF Power Output D.L. mod. 10 QPSK





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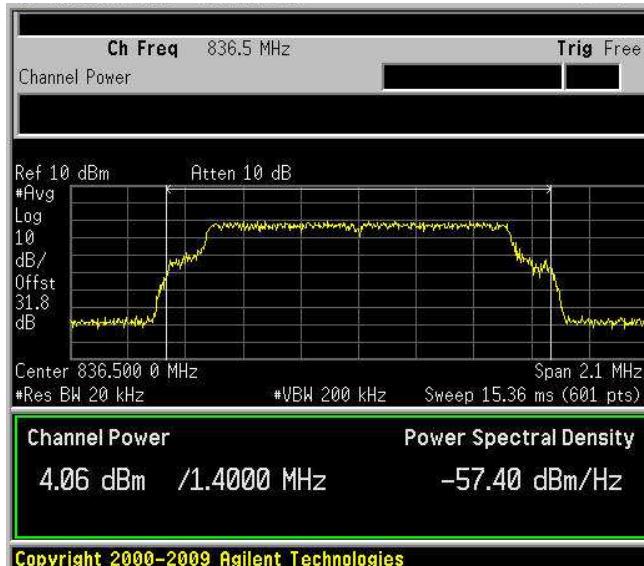
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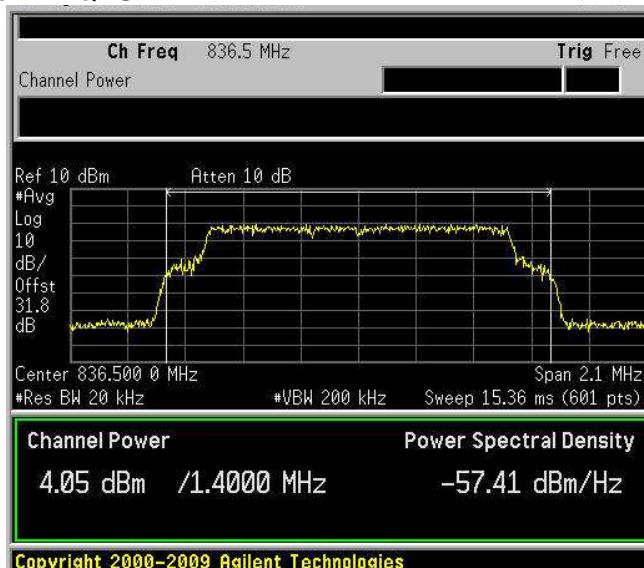
Specification: FCC 22 Subpart H

Test data

RF Power Output U.L. mod. 1.4 QAM



RF Power Output U.L. mod. 1.4 QPSK





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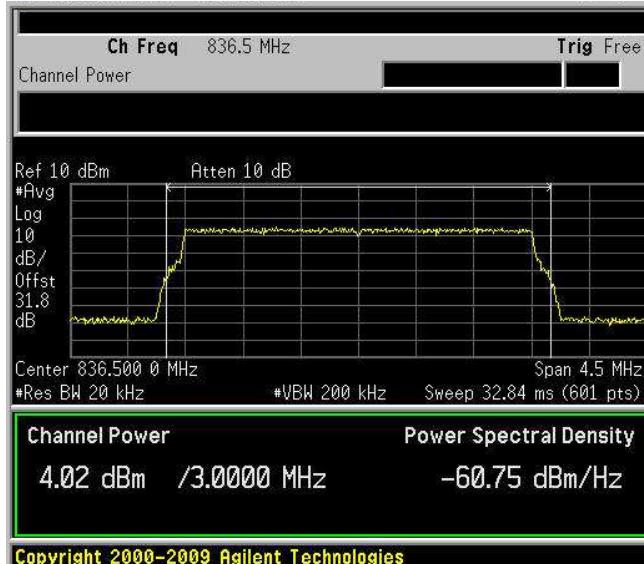
Appendix A: Test results

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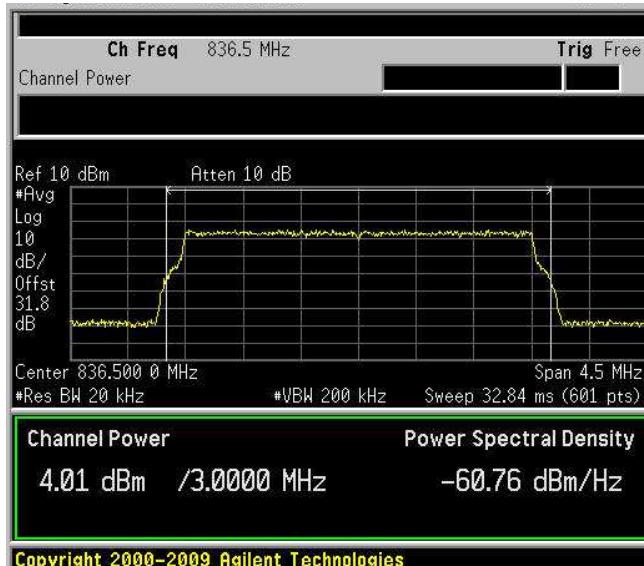
Specification: FCC 22 Subpart H

Test data

RF Power Output U.L. mod. 3 QAM



RF Power Output U.L. mod. 3 QPSK





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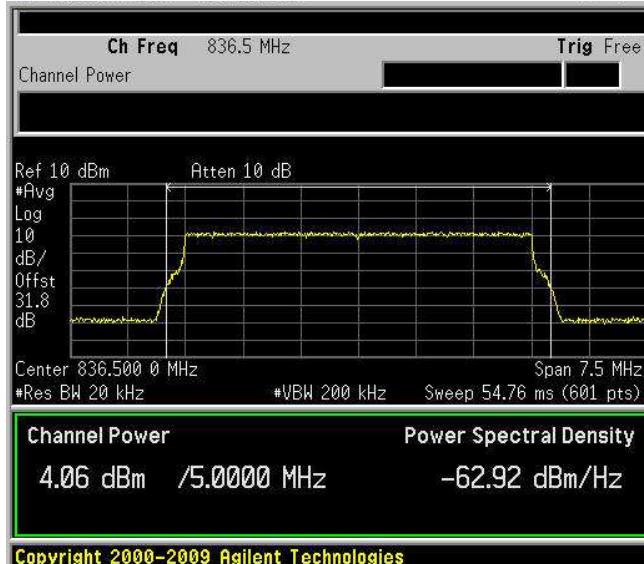
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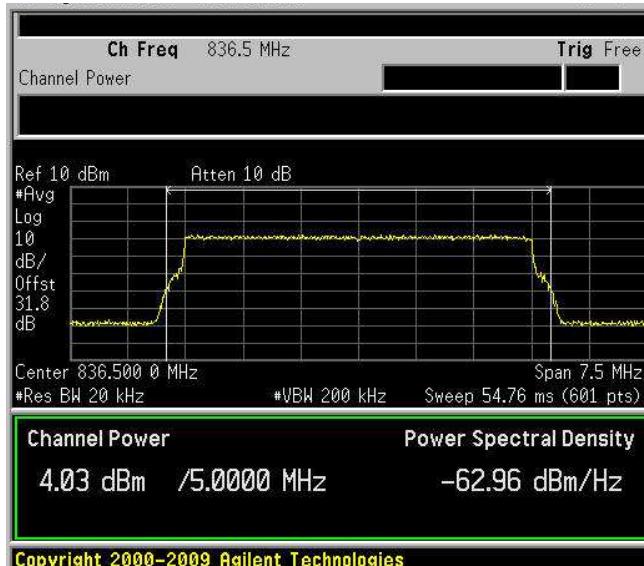
Specification: FCC 22 Subpart H

Test data

RF Power Output U.L. mod. 5 QAM



RF Power Output U.L. mod. 5 QPSK





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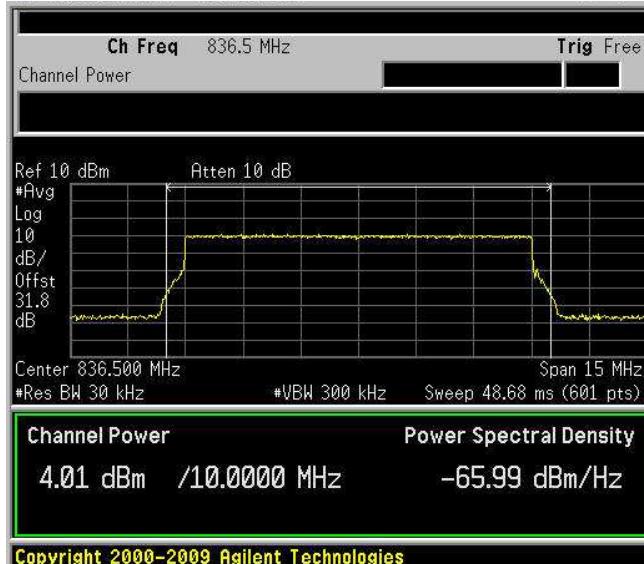
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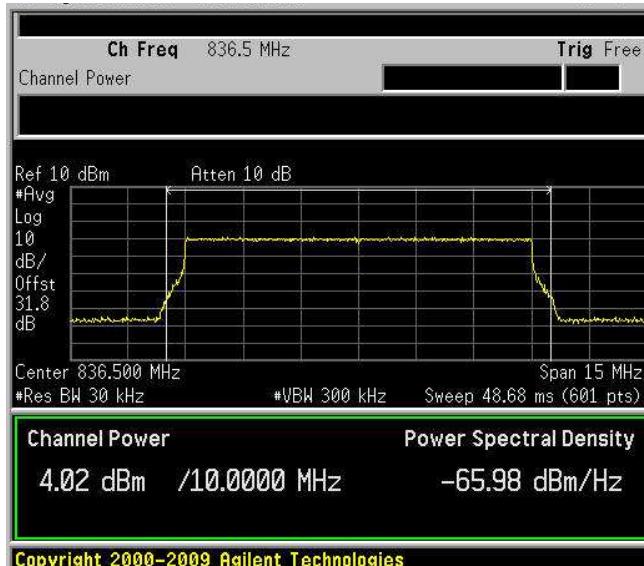
Specification: FCC 22 Subpart H

Test data

RF Power Output U.L. mod. 10 QAM



RF Power Output U.L. mod. 10 QPSK





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Appendix A: Test results

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Clause 2.1049 Occupied bandwidth (input/output)

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.

Test date: 2010-09-22

Test results: **Pass**

Special notes

Resolution bandwidth was set wider or equal than occupied bandwidth. Reference peak power was measured.



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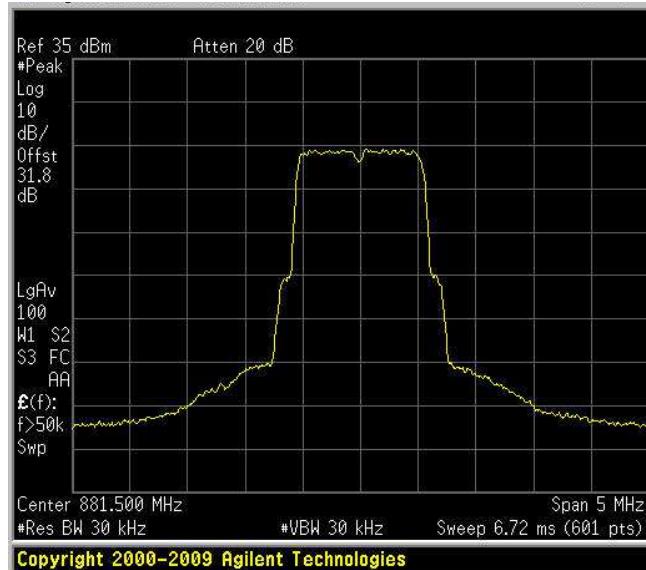
Appendix A: Test results

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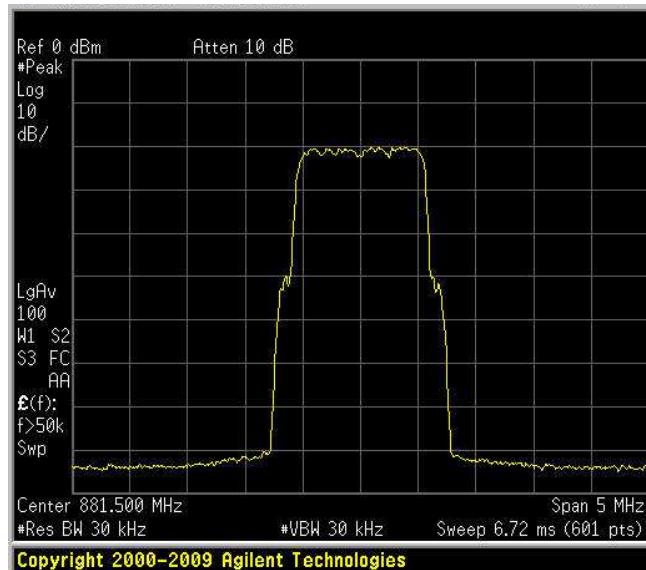
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Clause Occupied bandwidth (input/output), continued

Occupied Bandwidth
Downlink – 1.4 QAM
OUTPUT



Occupied Bandwidth
Downlink – 1.4 QAM
INPUT





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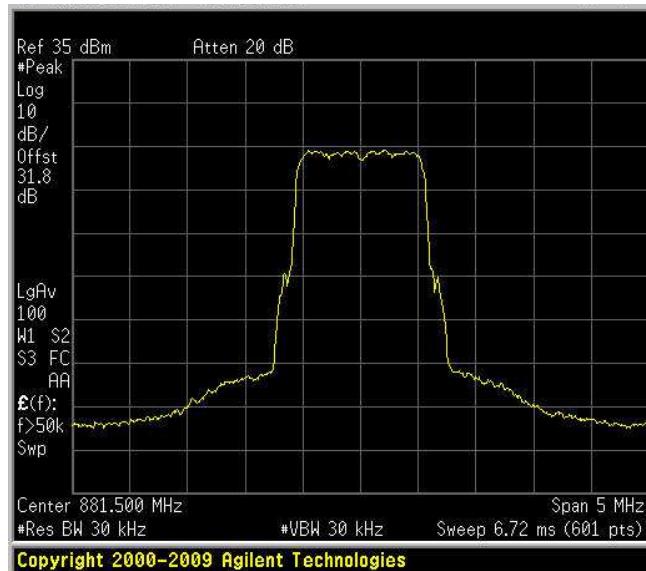
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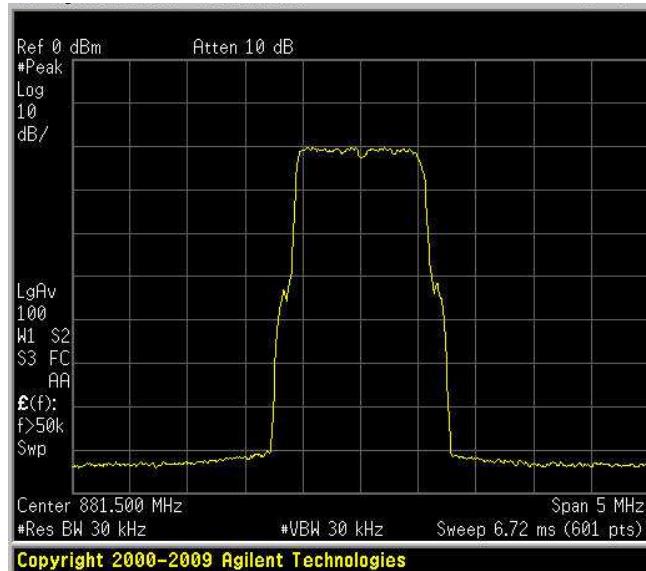
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Test data, continued

Occupied Bandwidth Downlink – 1.4 QPSK OUTPUT



Occupied Bandwidth Downlink – 1.4 QPSK INPUT





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Appendix A: Test results

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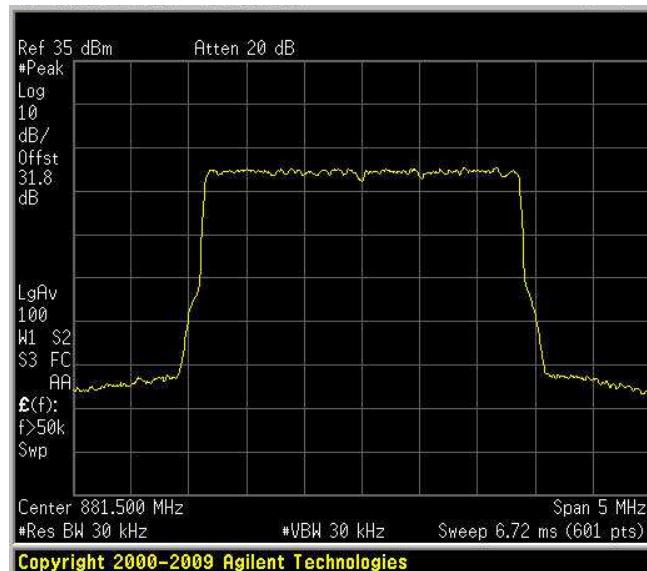
Specification: FCC 22 Subpart H

Test data

Occupied Bandwidth

Downlink – 3 QAM

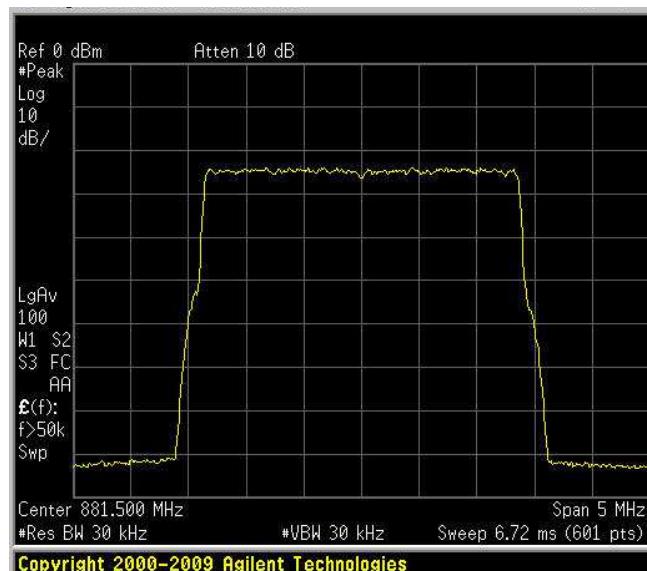
OUTPUT



Occupied Bandwidth

Downlink – 3 QAM

INPUT





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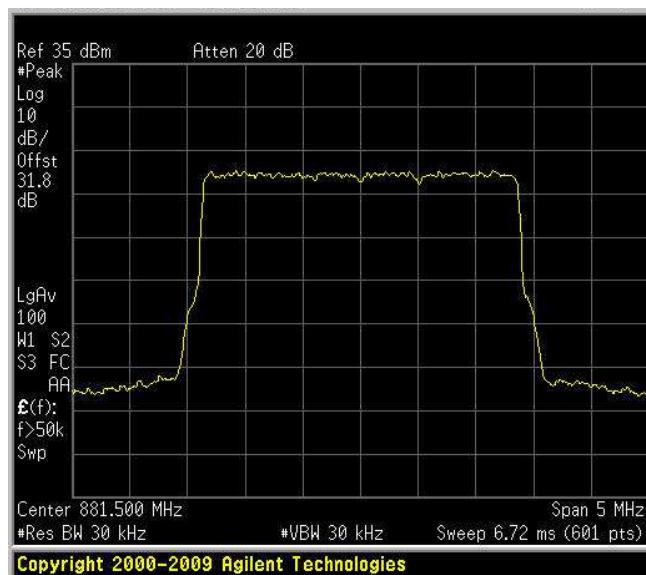
Specification: FCC 22 Subpart H

Test data

Occupied Bandwidth

Downlink – 3 QPSK

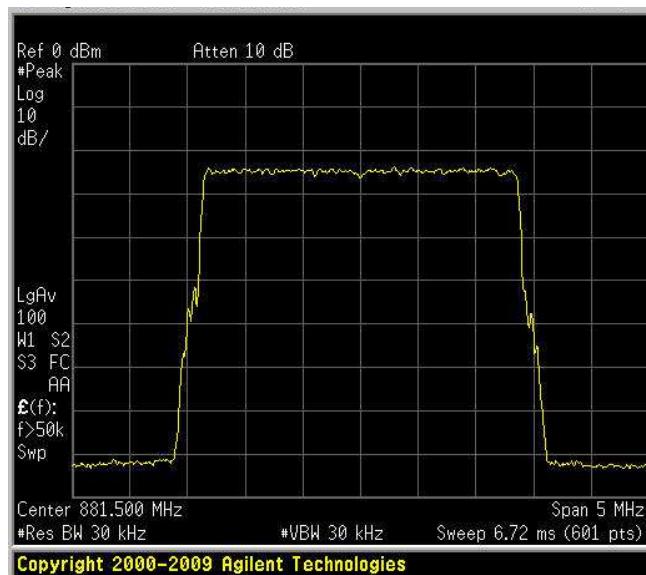
OUTPUT



Occupied Bandwidth

Downlink – 3 QPSK

INPUT





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Test data

Occupied Bandwidth

Downlink – 5 QAM

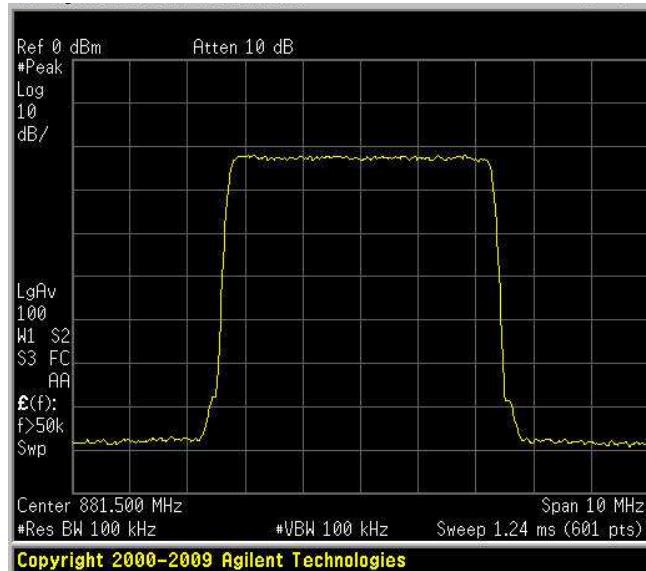
OUTPUT



Occupied Bandwidth

Downlink – 5 QAM

INPUT





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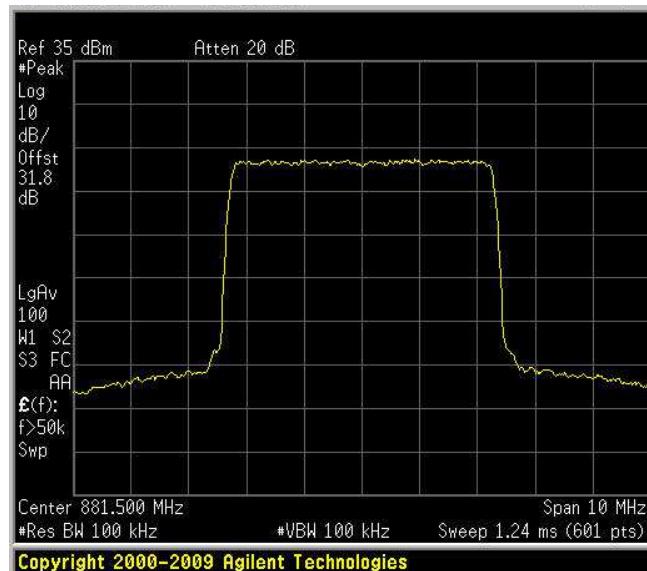
Specification: FCC 22 Subpart H

Test data

Occupied Bandwidth

Downlink – 5 QPSK

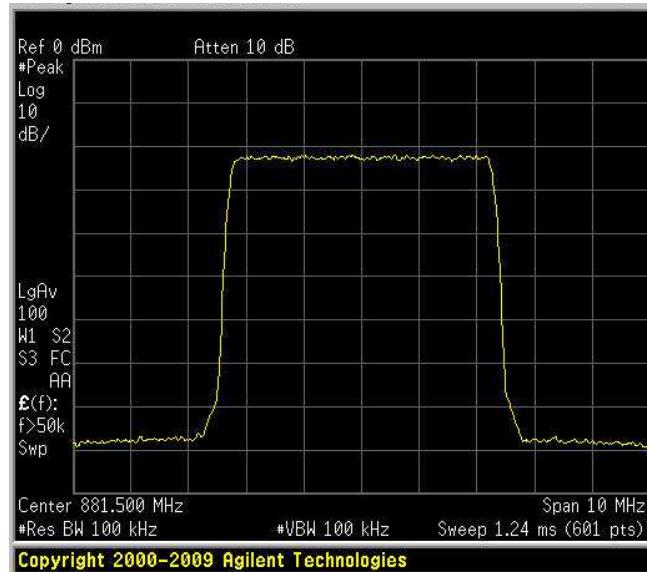
OUTPUT



Occupied Bandwidth

Downlink – 5 QPSK

INPUT





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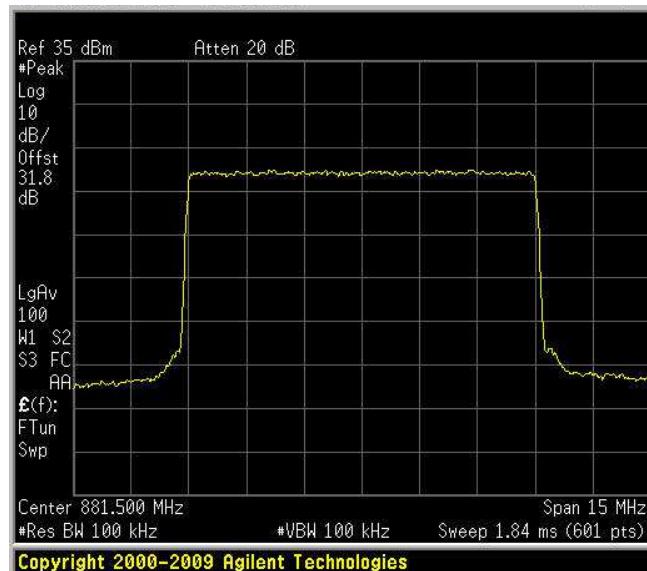
Specification: FCC 22 Subpart H

Test data

Occupied Bandwidth

Downlink – 10 QAM

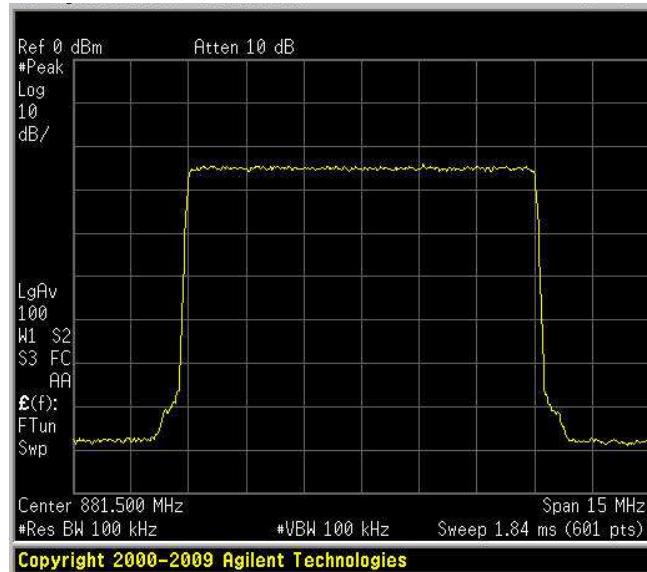
OUTPUT



Occupied Bandwidth

Downlink – 10 QAM

INPUT





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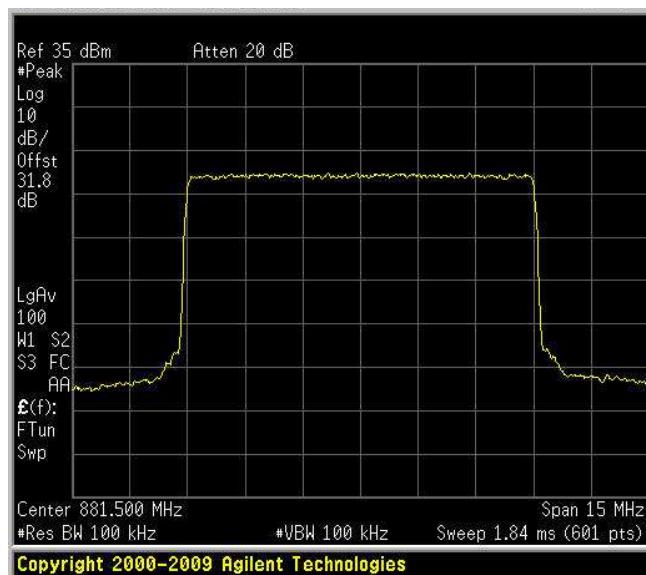
Specification: FCC 22 Subpart H

Test data

Occupied Bandwidth

Downlink – 10 QPSK

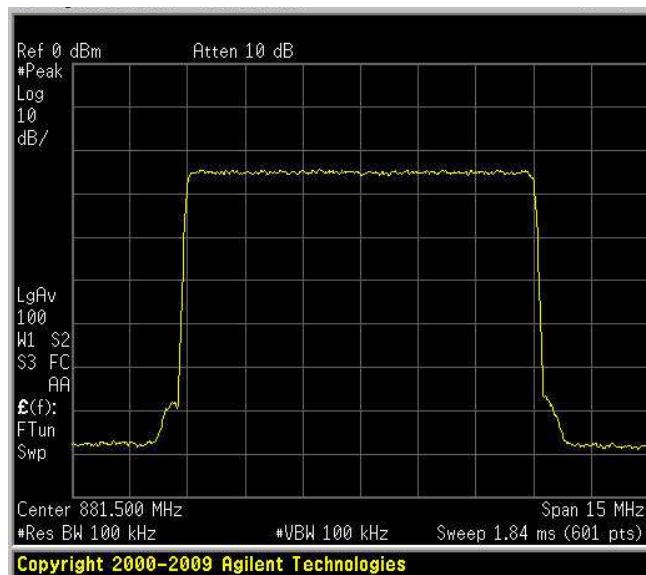
OUTPUT



Occupied Bandwidth

Downlink – 10 QPSK

INPUT





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Appendix A: Test results

Report number: 156523-1TRFWL

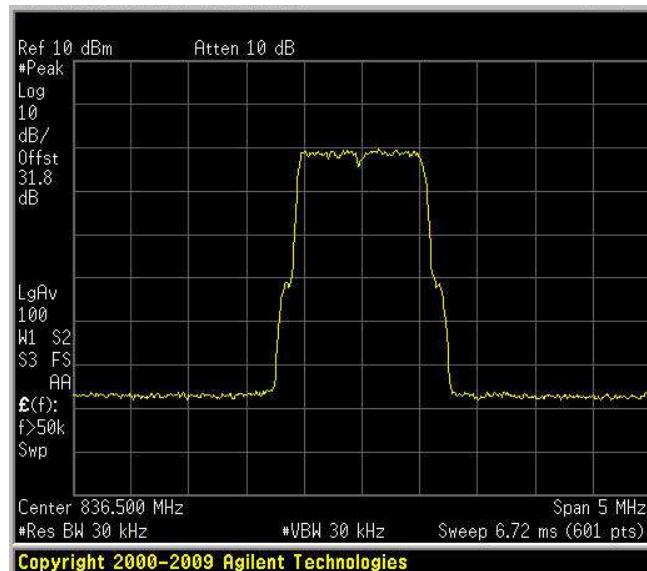
Specification: FCC 22 Subpart H

Test data

Occupied Bandwidth

Uplink – 1,4 QAM

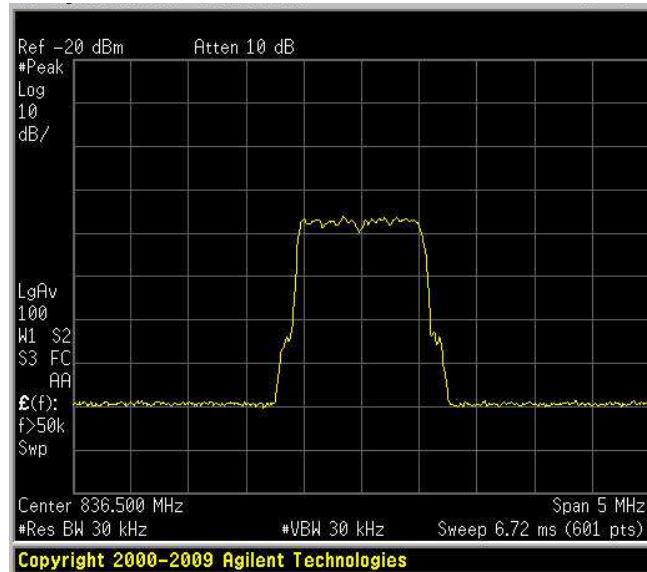
OUTPUT



Occupied Bandwidth

Uplink – 1,4 QAM

INPUT





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Appendix A: Test results

Report number: 156523-1TRFWL

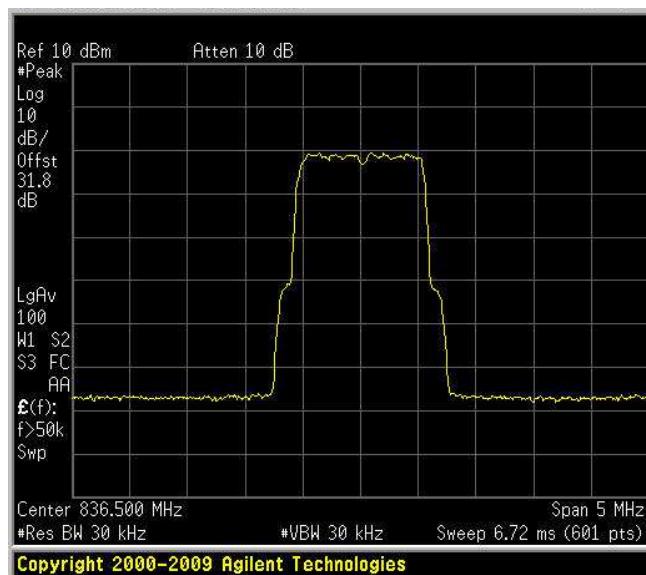
Specification: FCC 22 Subpart H

Test data

Occupied Bandwidth

Uplink – 1,4 QPSK

OUTPUT

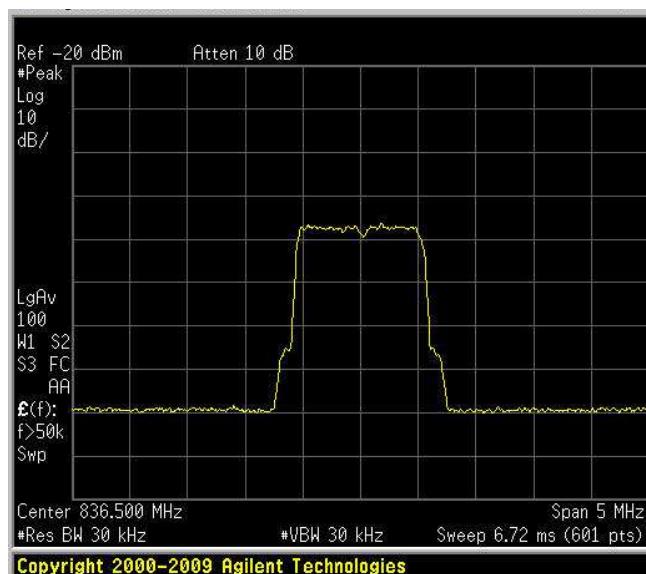


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Occupied Bandwidth

Uplink – 1,4 QPSK

INPUT



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Appendix A: Test results

Report number: 156523-1TRFWL

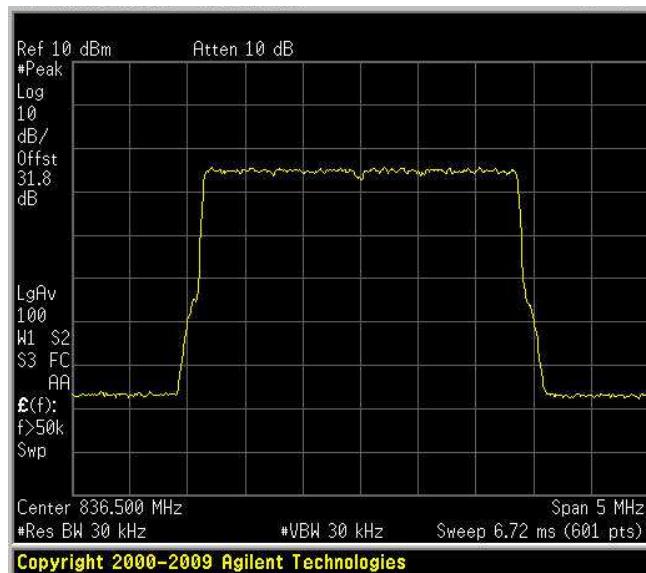
Specification: FCC 22 Subpart H

Test data

Occupied Bandwidth

Uplink – 3 QAM

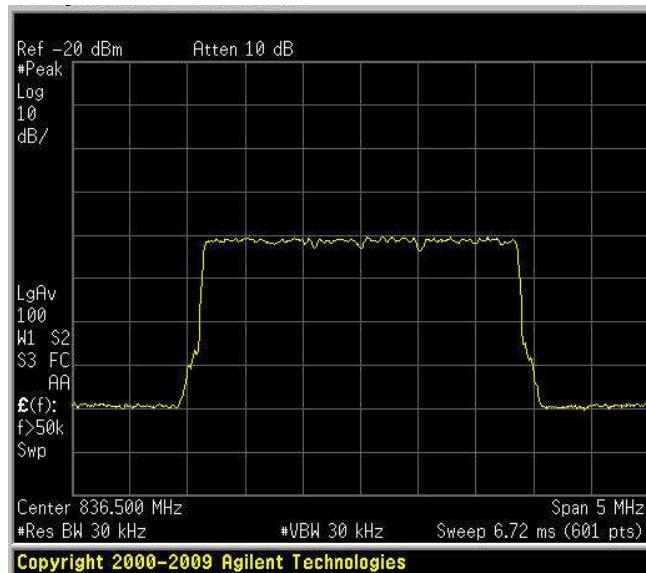
OUTPUT



Occupied Bandwidth

Uplink – 3 QAM

INPUT





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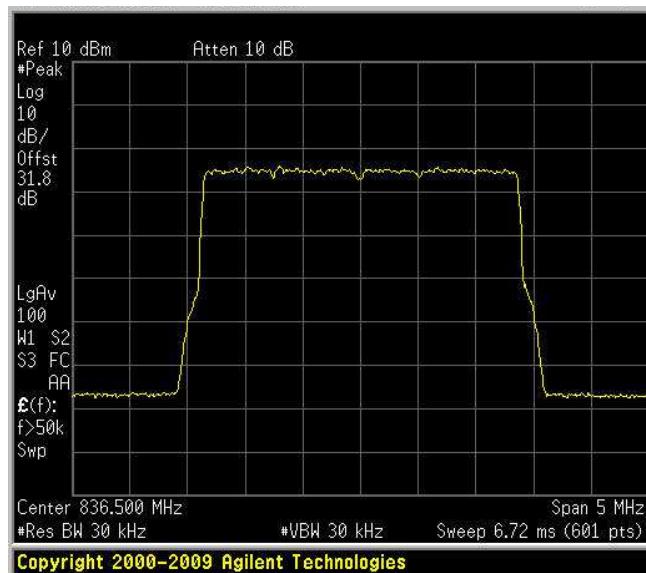
Appendix A: Test results

Report number: 156523-1TRFWL

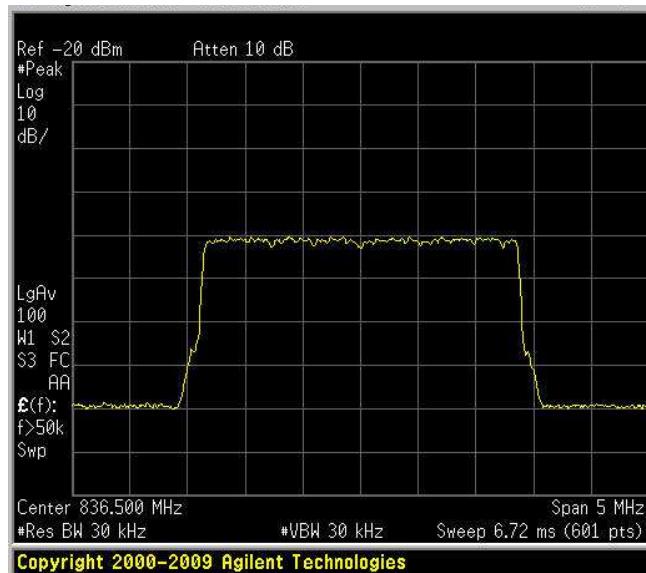
Specification: FCC 22 Subpart H

Test data

Occupied Bandwidth
Uplink – 3 QPSK
OUTPUT



Occupied Bandwidth
Uplink – 3 QPSK
INPUT





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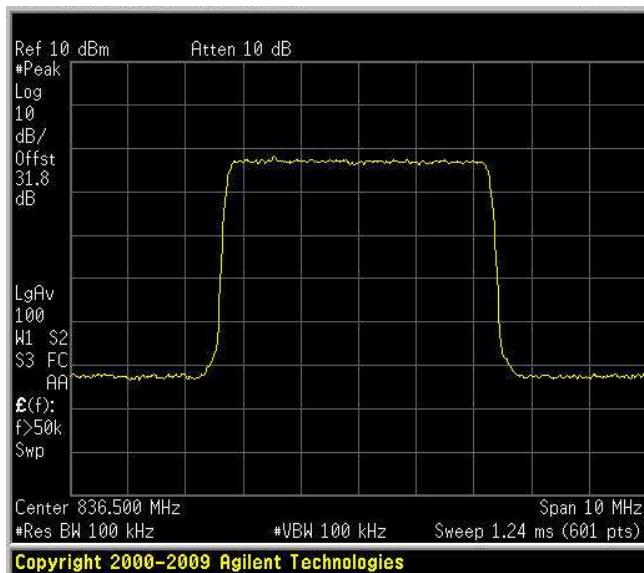
Appendix A: Test results

Report number: 156523-1TRFWL

Specification: FCC 22 Subpart H

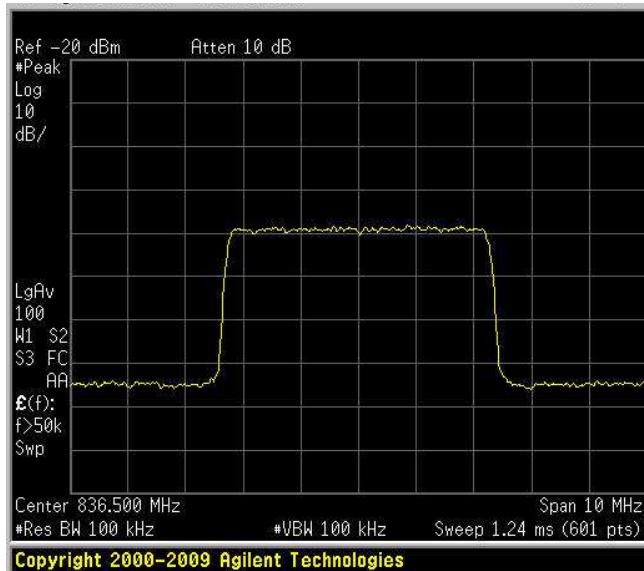
Test data

Occupied Bandwidth
Uplink – 5 QAM
OUTPUT



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Occupied Bandwidth
Uplink – 5 QAM
INPUT



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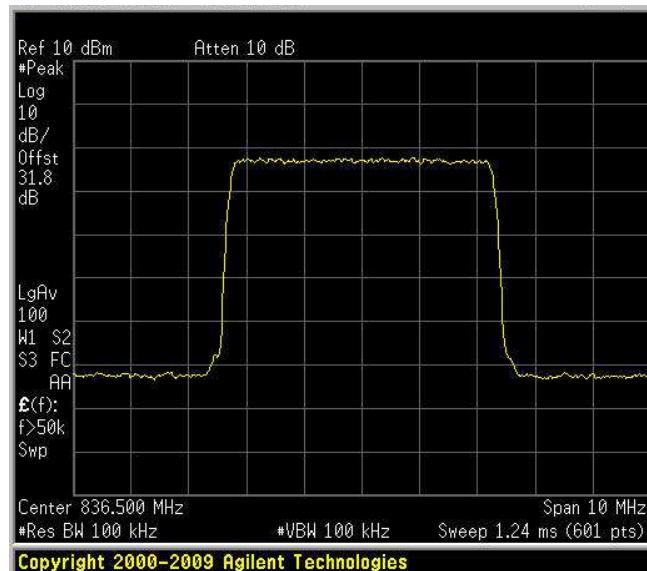
Appendix A: Test results

Report number: 156523-1TRFWL

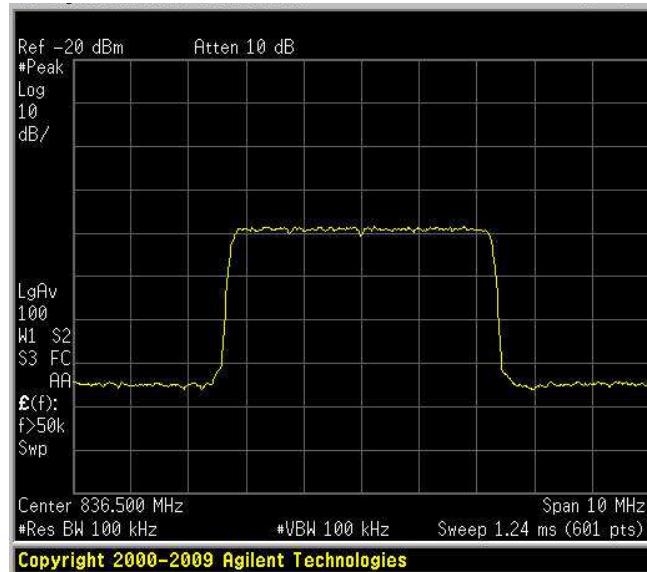
Specification: FCC 22 Subpart H

Test data

Occupied Bandwidth
Uplink – 5 QPSK
OUTPUT



Occupied Bandwidth
Uplink – 5 QPSK
INPUT





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Appendix A: Test results

Report number: 156523-1TRFWL

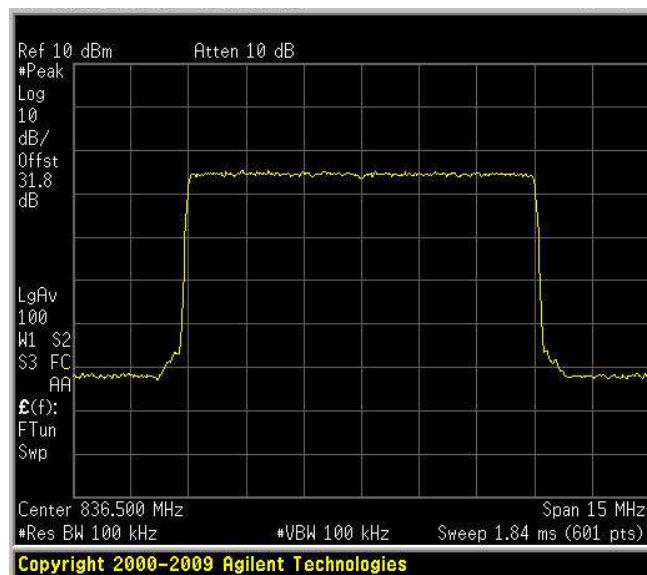
Specification: FCC 22 Subpart H

Test data

Occupied Bandwidth

Uplink – 10 QAM

OUTPUT

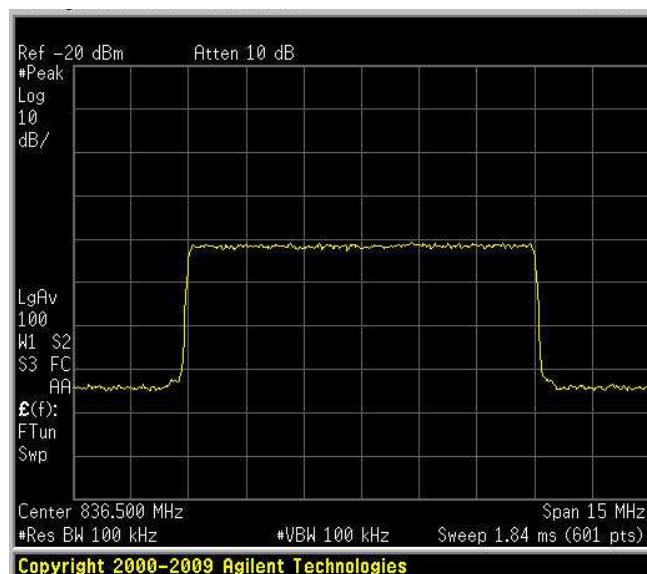


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Occupied Bandwidth

Uplink – 10 QAM

INPUT



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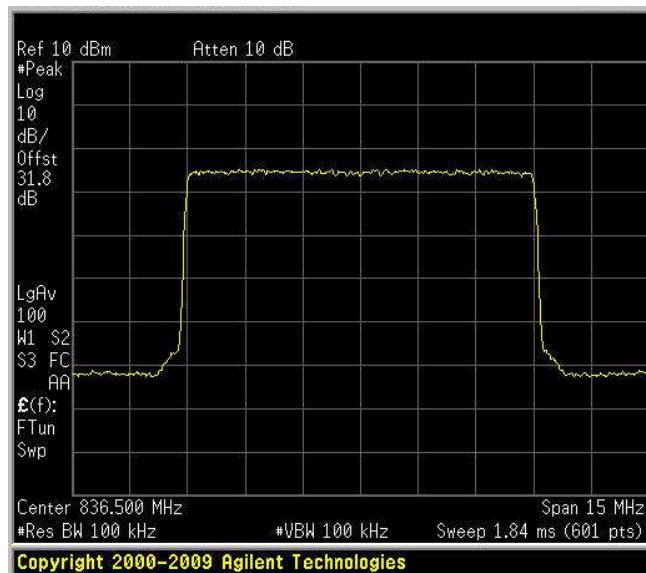
Appendix A: Test results

Report number: 156523-1TRFWL

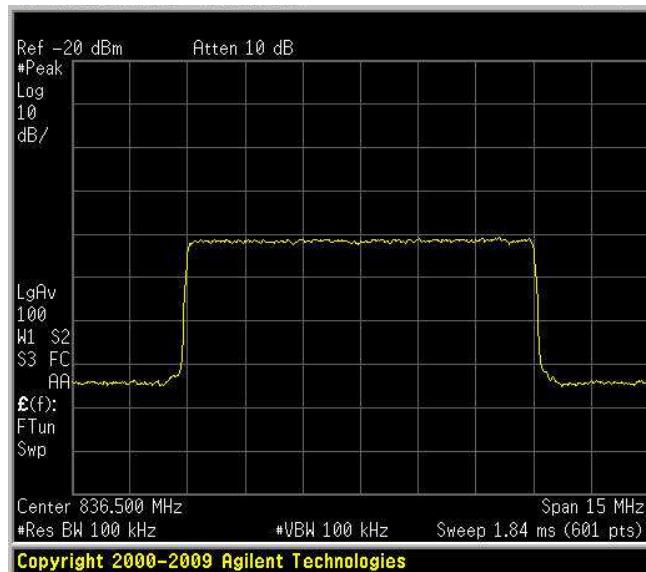
Specification: FCC 22 Subpart H

Test data

Occupied Bandwidth
Uplink – 10 QPSK
OUTPUT



Occupied Bandwidth
Uplink – 10 QPSK
INPUT





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Appendix A: Test results

Report number: 156523-1TRFWL

Specification: FCC 22 Subpart H

Clause 22.917 Out of band emissions at antenna terminal

- (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: 2010-09-22

Test results: Pass

Special notes

- The spectrum was searched from 30 MHz up to 10th harmonic
- Only the worst data presented in the test report.



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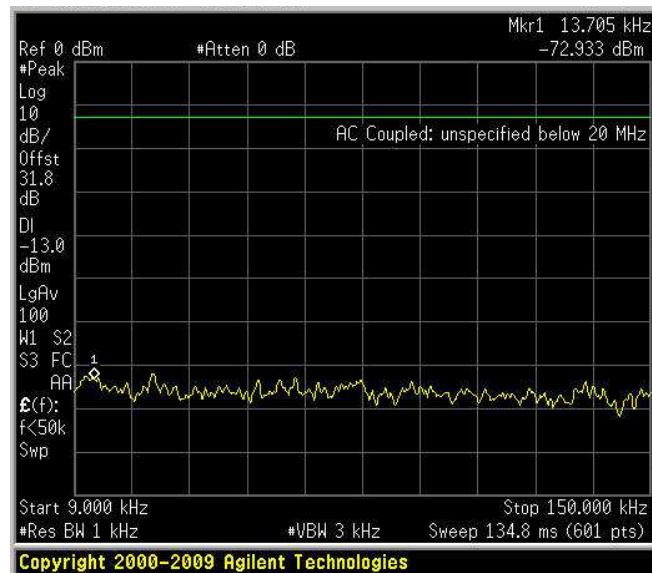
Appendix A: Test results

Report number: 156523-1TRFWL

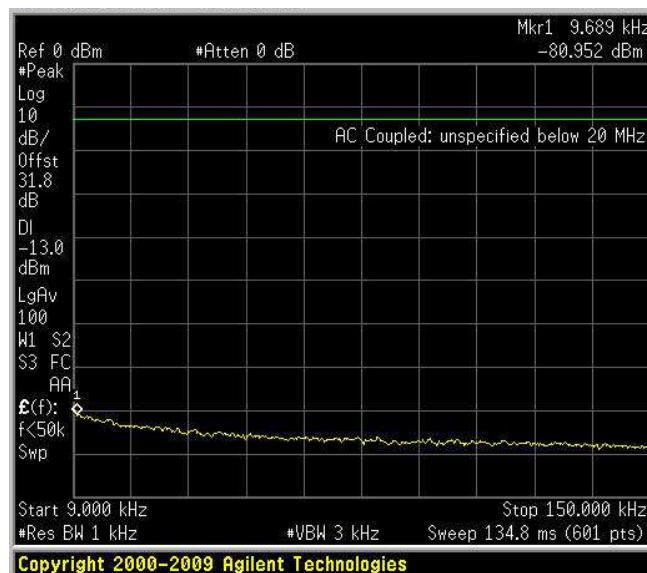
Specification: FCC 22 Subpart H

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

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: 156523-1TRFWL

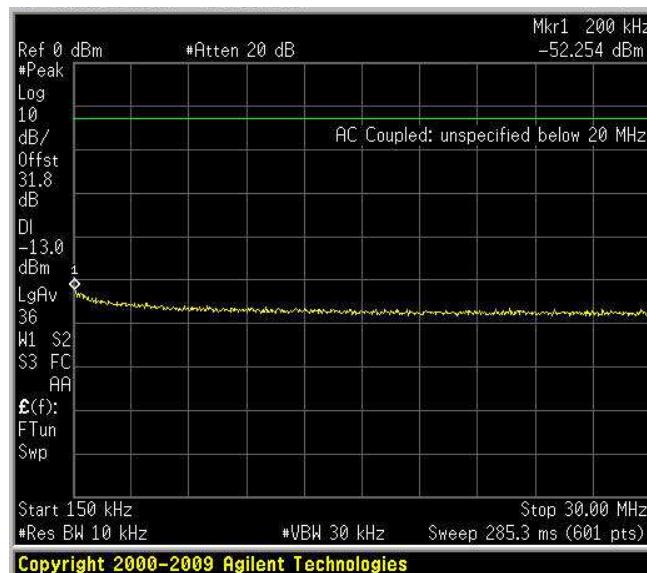
Specification: FCC 22 Subpart H

Test data continued

Spurious Emissions at Antenna Terminals

Downlink – 1,4 QAM

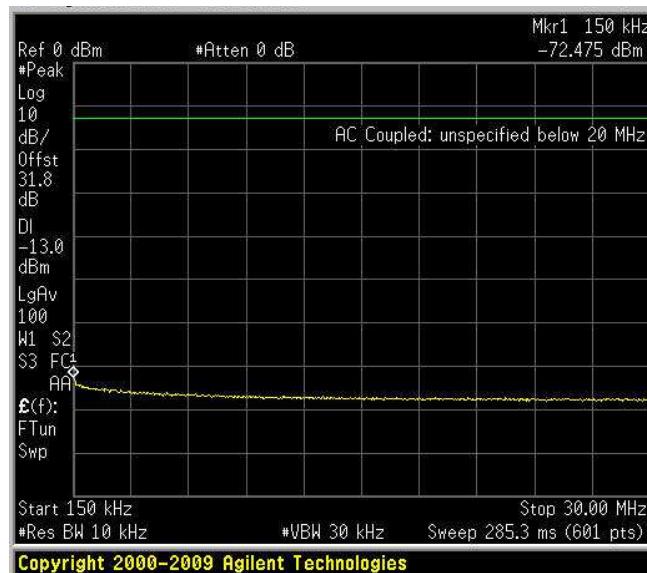
150 kHz – 30MHz



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: 156523-1TRFWL

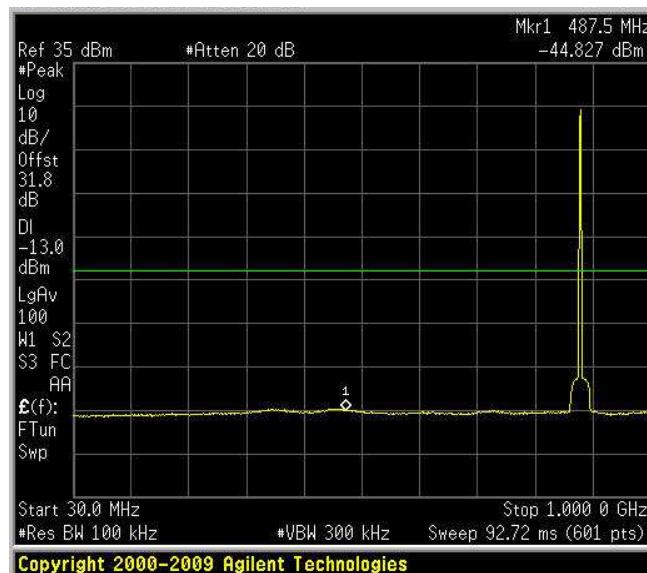
Specification: FCC 22 Subpart H

Test data continued

Spurious Emissions at Antenna Terminals

Downlink – 1,4 QAM

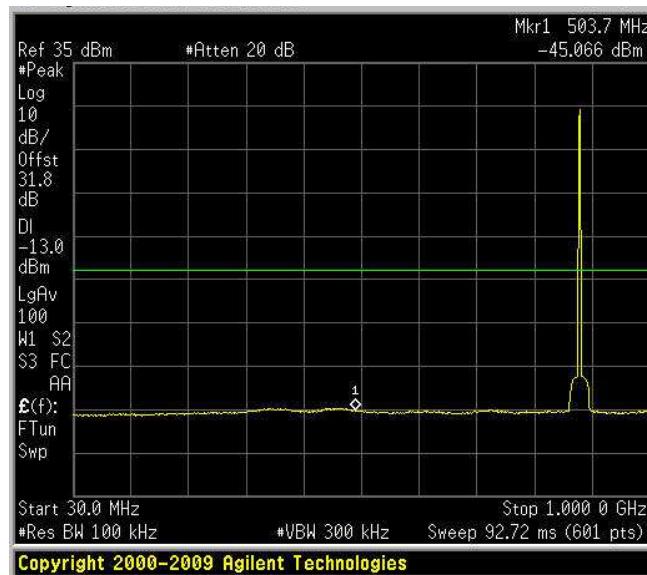
30MHz – 1 GHz



Spurious Emissions at Antenna Terminals

Downlink – 1,4 QPSK

30MHz – 1 GHz





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Appendix A: Test results

Report number: 156523-1TRFWL

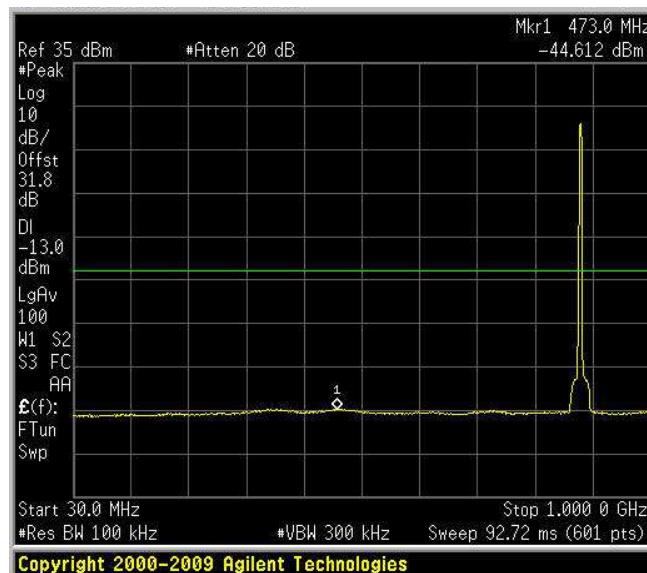
Specification: FCC 22 Subpart H

Test data continued

Spurious Emissions at Antenna Terminals

Downlink – 3 QAM

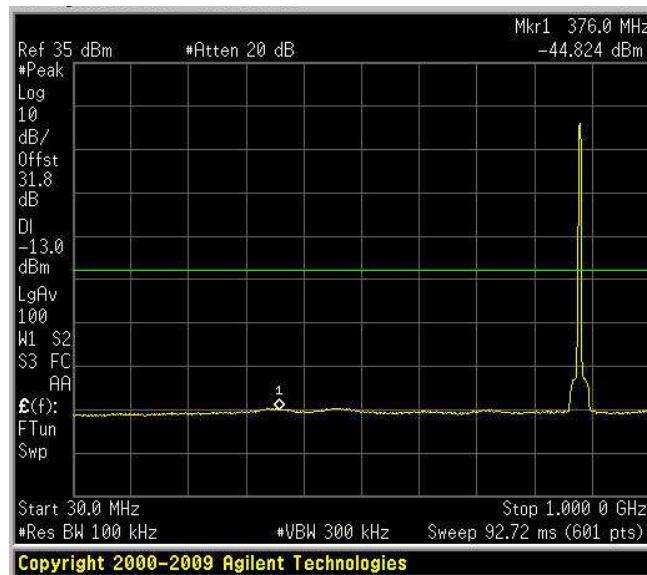
30MHz – 1 GHz



Spurious Emissions at Antenna Terminals

Downlink – 3 QPSK

30MHz – 1 GHz





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Appendix A: Test results

Report number: 156523-1TRFWL

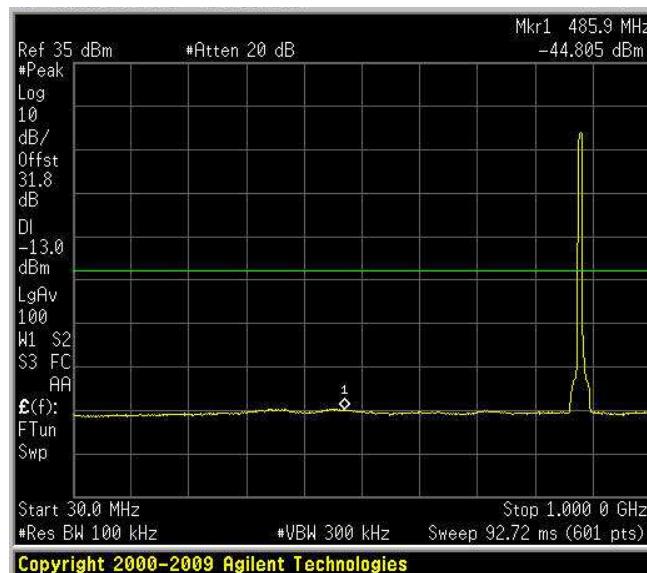
Specification: FCC 22 Subpart H

Test data continued

Spurious Emissions at Antenna Terminals

Downlink – 5 QAM

30MHz – 1 GHz

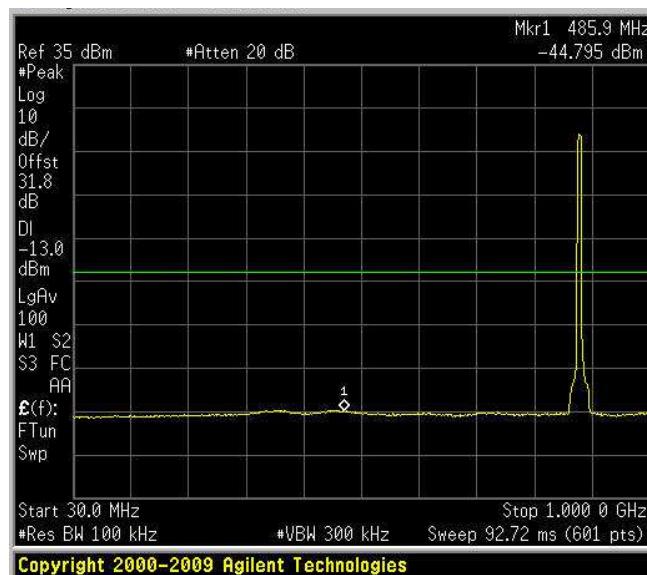


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Spurious Emissions at Antenna Terminals

Downlink – 5 QPSK

30MHz – 1 GHz



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Appendix A: Test results

Report number: 156523-1TRFWL

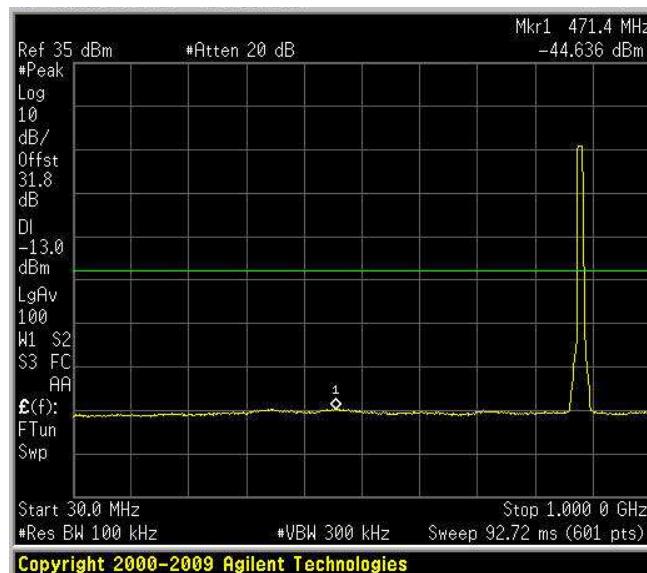
Specification: FCC 22 Subpart H

Test data continued

Spurious Emissions at Antenna Terminals

Downlink – 10 QAM

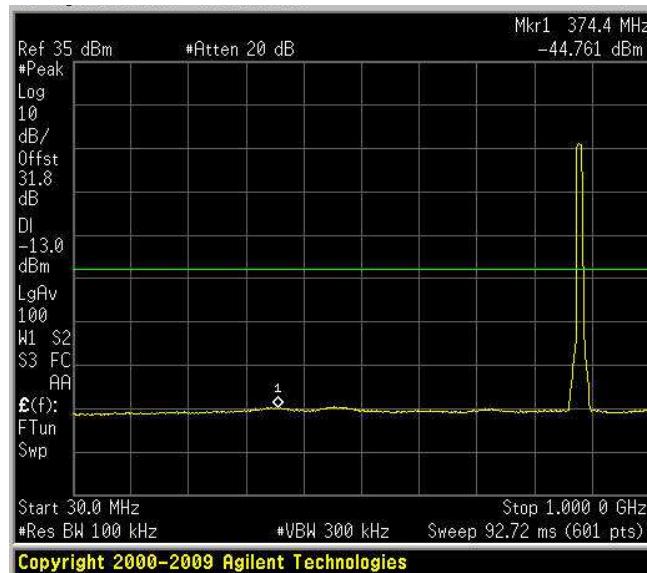
30MHz – 1 GHz



Spurious Emissions at Antenna Terminals

Downlink – 10 QPSK

30MHz – 1 GHz





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Appendix A: Test results

Report number: 156523-1TRFWL

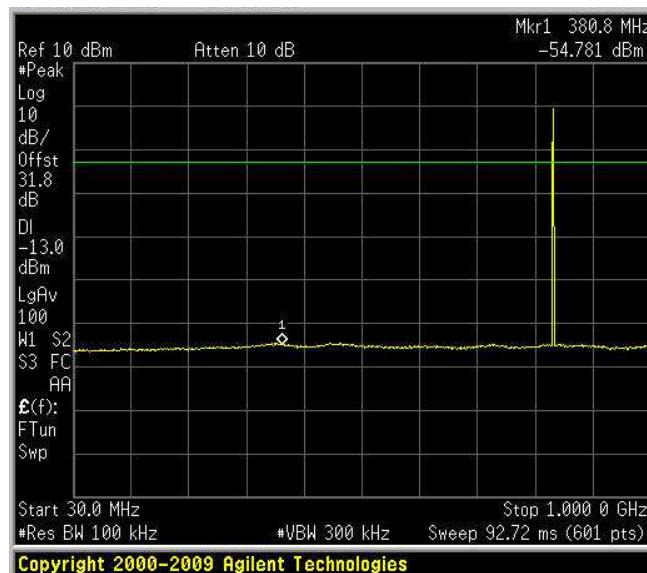
Specification: FCC 22 Subpart H

Test data continued

Spurious Emissions at Antenna Terminals

Uplink – 1,4 QAM

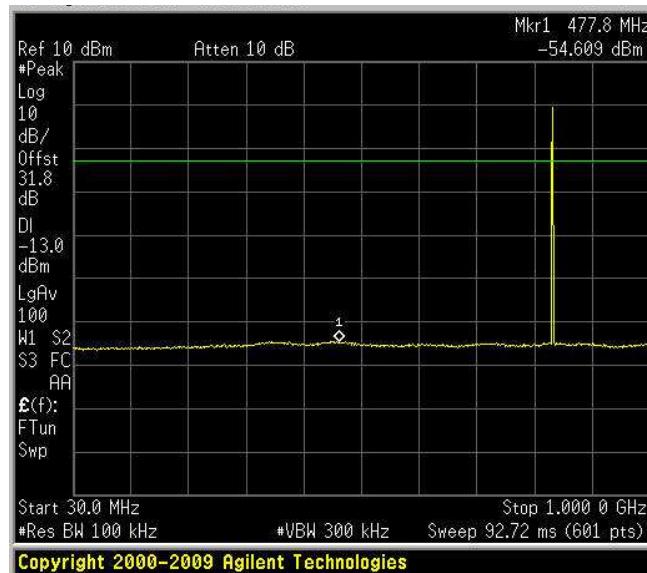
30MHz – 1 GHz



Spurious Emissions at Antenna Terminals

Uplink – 1,4 QPSK

30MHz – 1 GHz





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Appendix A: Test results

Report number: 156523-1TRFWL

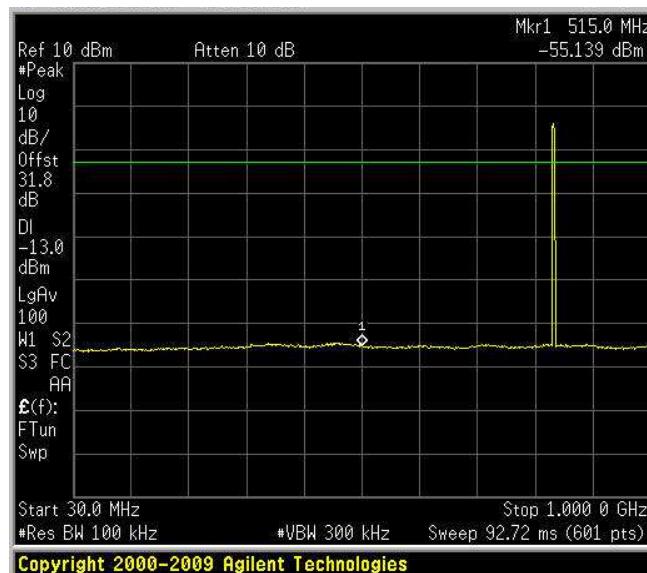
Specification: FCC 22 Subpart H

Test data continued

Spurious Emissions at Antenna Terminals

Uplink – 3 QAM

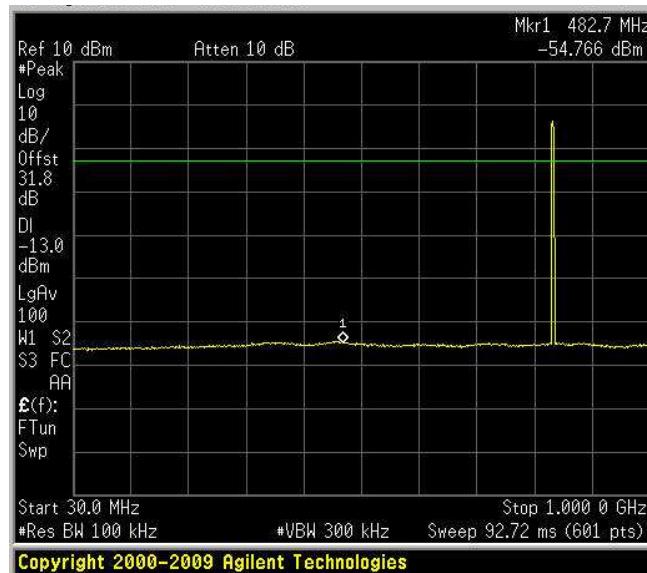
30MHz – 1 GHz



Spurious Emissions at Antenna Terminals

Uplink – 3 QPSK

30MHz – 1 GHz





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Appendix A: Test results

Report number: 156523-1TRFWL

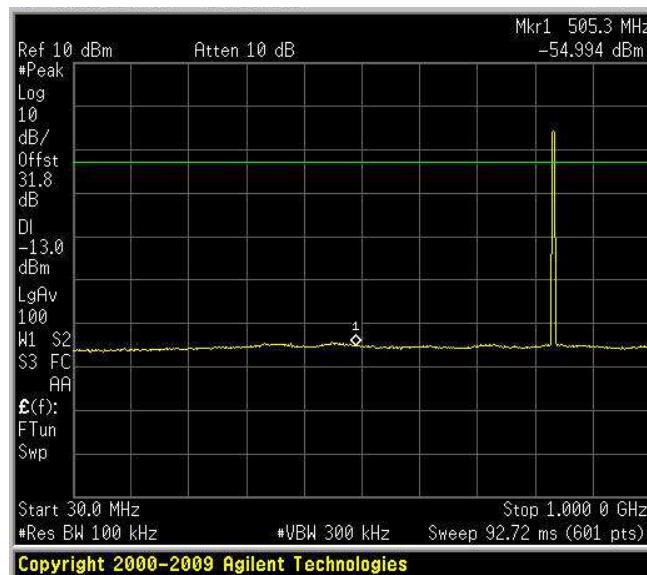
Specification: FCC 22 Subpart H

Test data continued

Spurious Emissions at Antenna Terminals

Uplink – 5 QAM

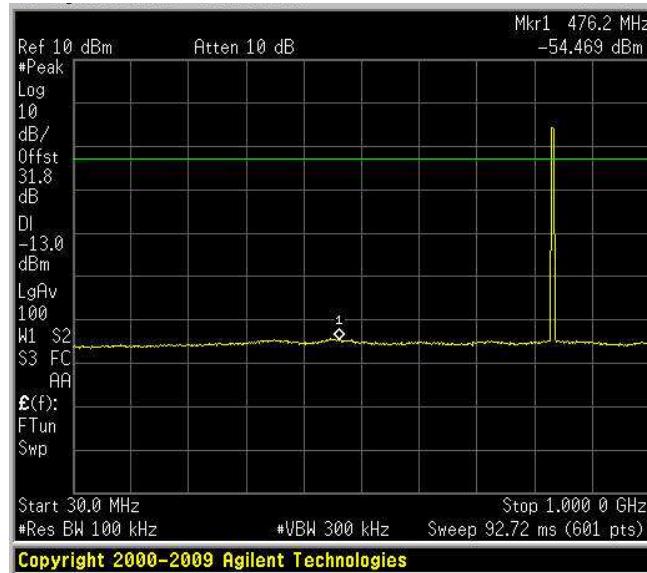
30MHz – 1 GHz



Spurious Emissions at Antenna Terminals

Uplink – 5 QPSK

30MHz – 1 GHz





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Appendix A: Test results

Report number: 156523-1TRFWL

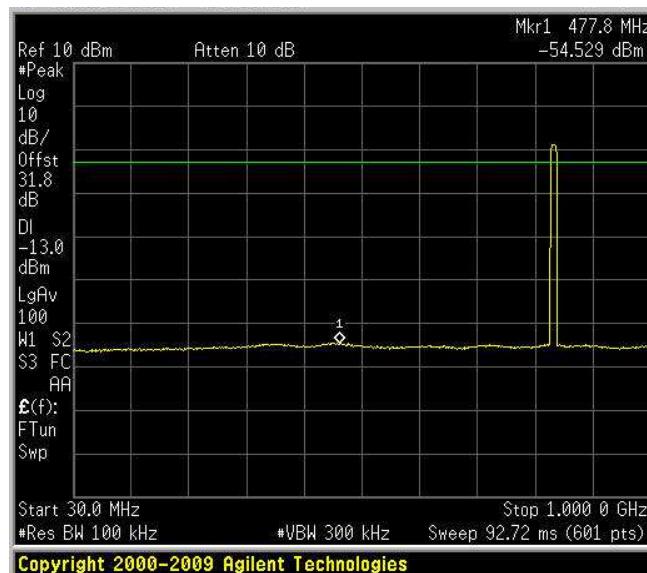
Specification: FCC 22 Subpart H

Test data continued

Spurious Emissions at Antenna Terminals

Uplink – 10 QAM

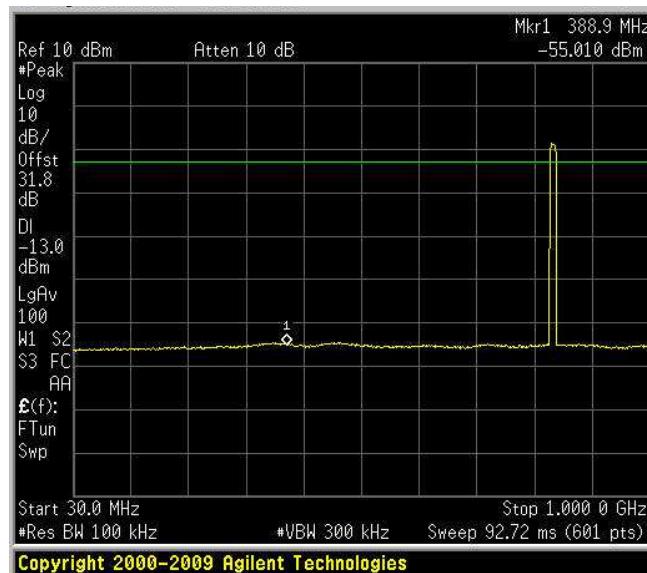
30MHz – 1 GHz



Spurious Emissions at Antenna Terminals

Uplink – 10 QPSK

30MHz – 1 GHz





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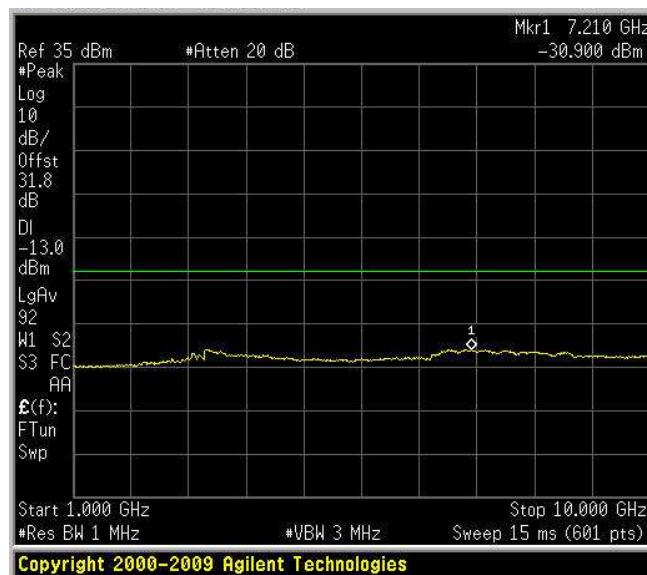
Appendix A: Test results

Report number: 156523-1TRFWL

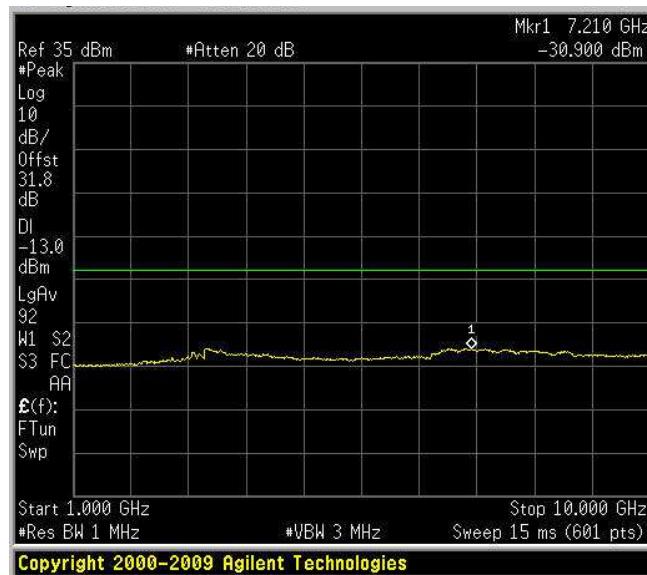
Specification: FCC 22 Subpart H

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: 156523-1TRFWL

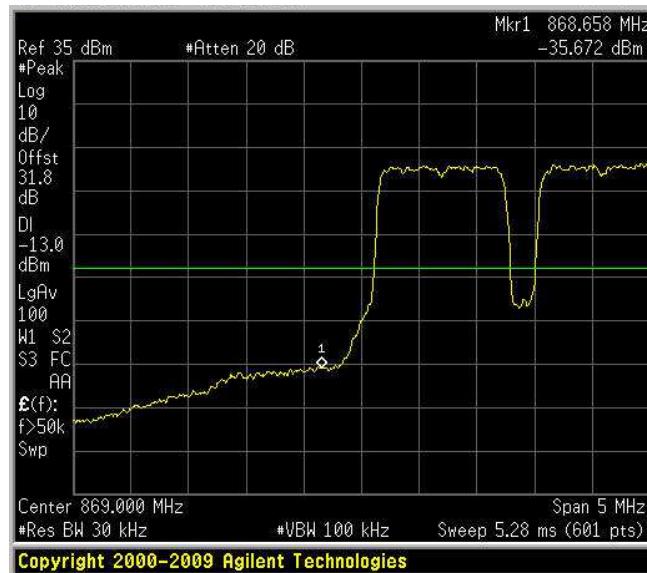
Specification: FCC 22 Subpart H

Clause 22.917(a) Out of band emissions at antenna terminal, continued

Test data, continued band edges Inter modulation

Downlink – 1.4 QAM

LOW BAND EDGE



Downlink – 1.4 QAM

HIGH BAND EDGE





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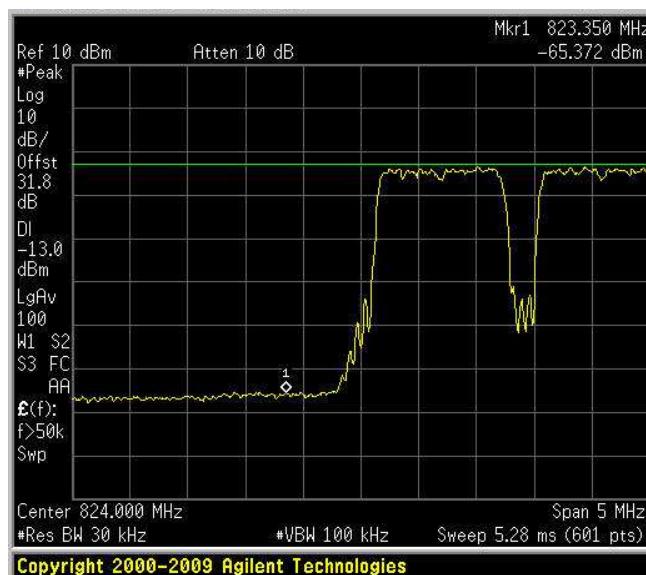
Appendix A: Test results

Report number: 156523-1TRFWL

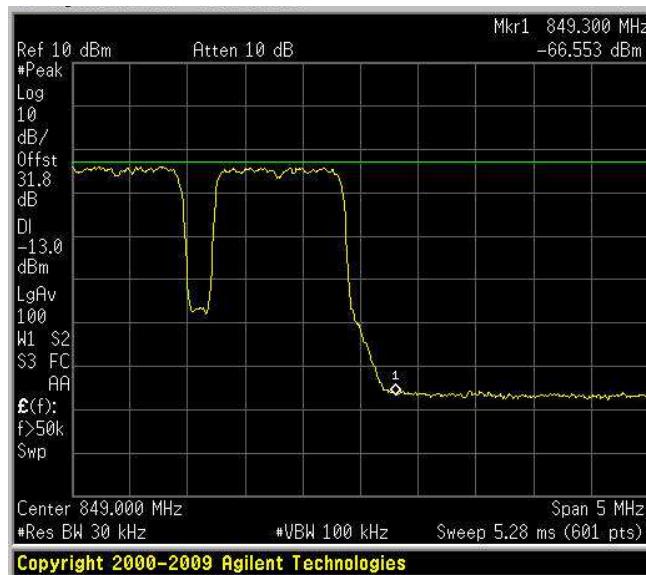
Specification: FCC 22 Subpart H

Test data, continued band edges:

Uplink – 1.4 QAM
LOW BAND EDGE



Uplink – 1.4 QAM
HIGH BAND EDGE





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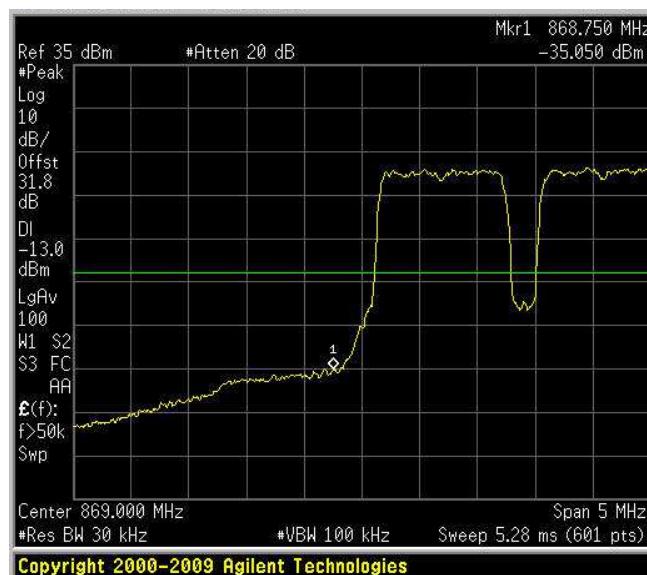
Appendix A: Test results

Report number: 156523-1TRFWL

Specification: FCC 22 Subpart H

Test data, continued band edges:

Downlink – 1.4 QPSK
LOW BAND EDGE



Downlink – 1.4 QPSK
HIGH BAND EDGE





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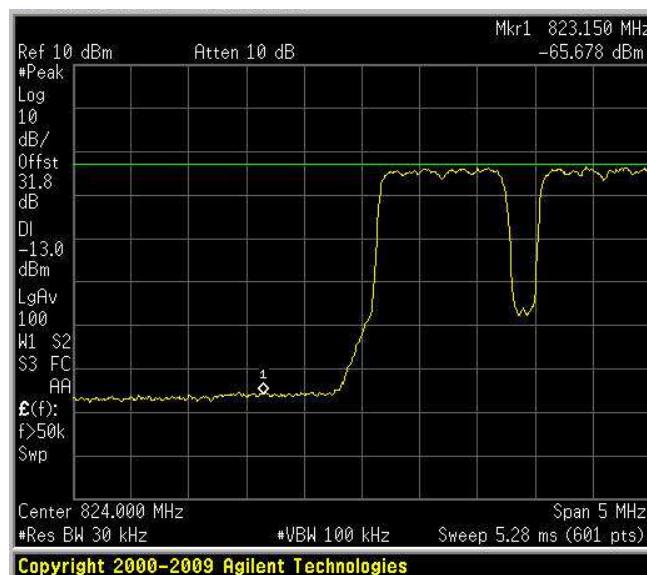
Appendix A: Test results

Report number: 156523-1TRFWL

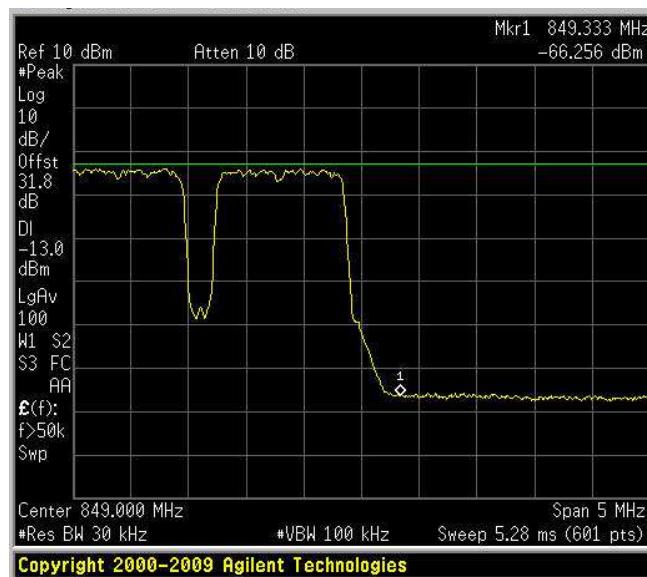
Specification: FCC 22 Subpart H

Test data, continued band edges:

Uplink – 1.4 QPSK
LOW BAND EDGE



Uplink – 1.4 QPSK
HIGH BAND EDGE





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Appendix A: Test results

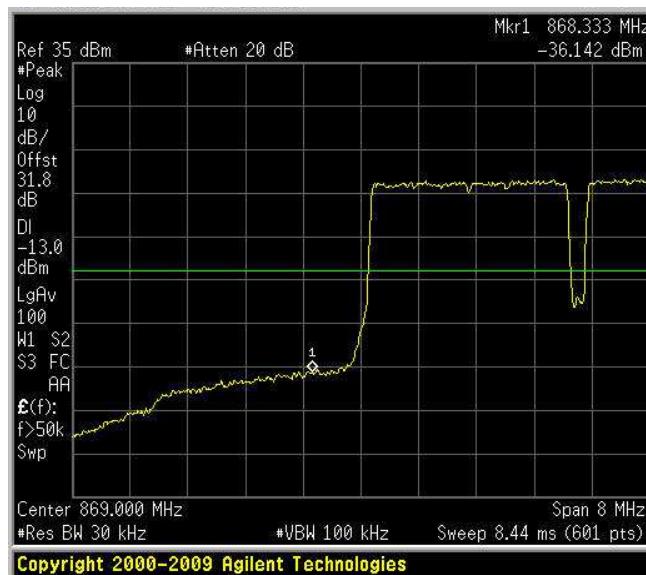
Report number: 156523-1TRFWL

Specification: FCC 22 Subpart H

Test data, continued band edges:

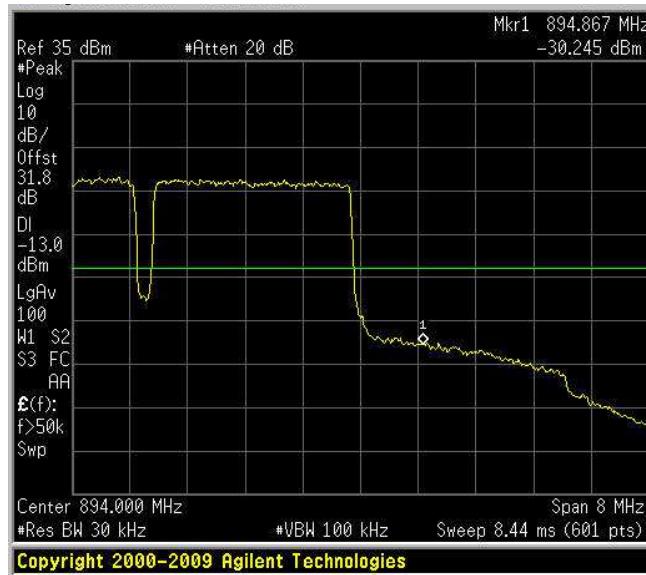
Downlink – 3 QAM

LOW BAND EDGE



Downlink – 3 QAM

HIGH BAND EDGE





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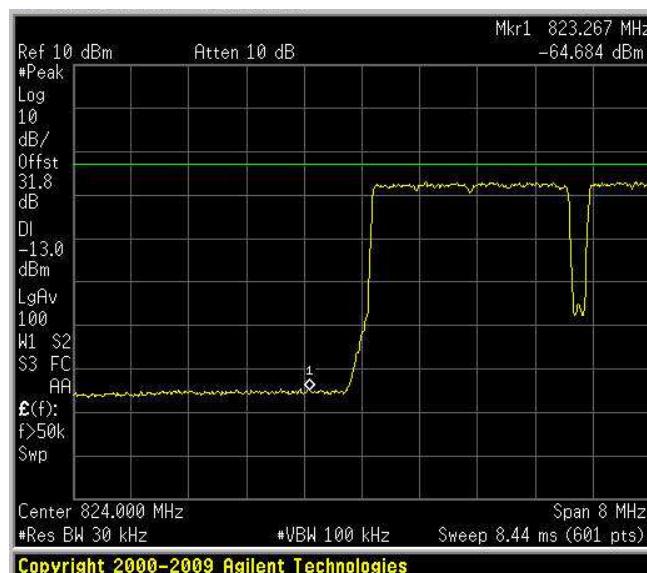
Appendix A: Test results

Report number: 156523-1TRFWL

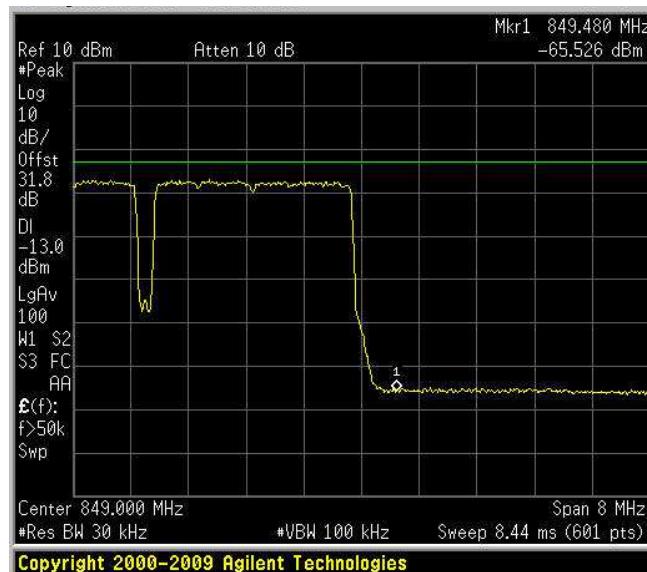
Specification: FCC 22 Subpart H

Test data, continued band edges:

Uplink – 3 QAM
LOW BAND EDGE



Uplink – 3 QAM
HIGH BAND EDGE





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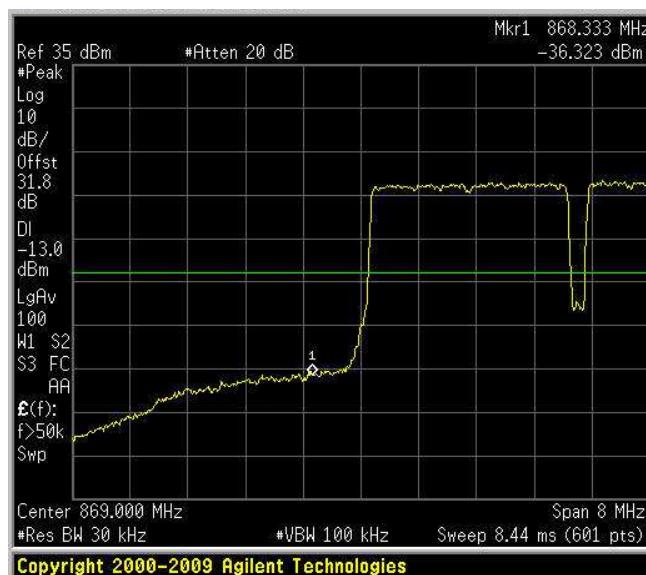
Appendix A: Test results

Report number: 156523-1TRFWL

Specification: FCC 22 Subpart H

Test data, continued band edges:

Downlink – 3 QPSK
LOW BAND EDGE



Downlink – 3 QPSK
HIGH BAND EDGE





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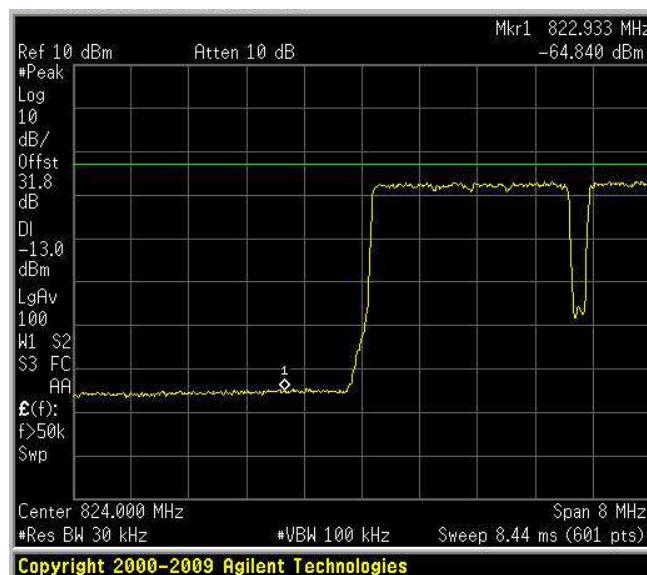
Appendix A: Test results

Report number: 156523-1TRFWL

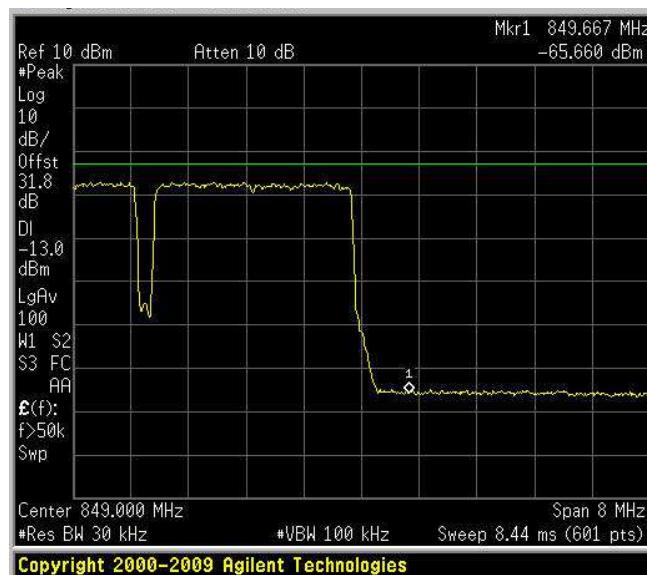
Specification: FCC 22 Subpart H

Test data, continued band edges:

Uplink – 3 QPSK
LOW BAND EDGE



Uplink – 3 QPSK
HIGH BAND EDGE





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Appendix A: Test results

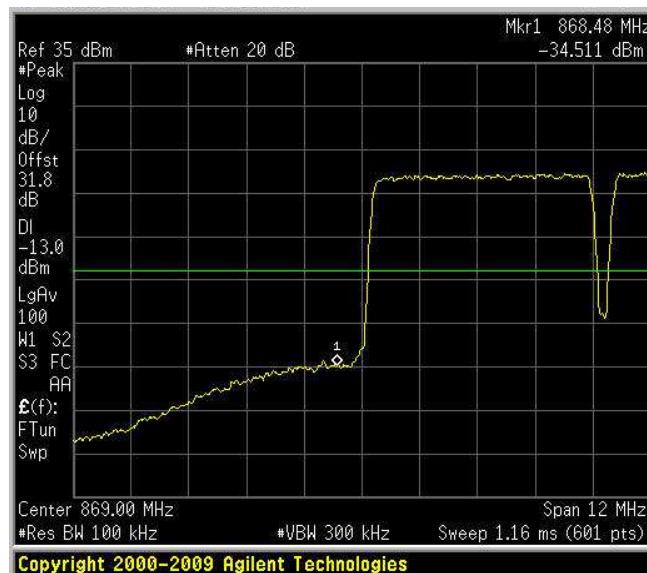
Report number: 156523-1TRFWL

Specification: FCC 22 Subpart H

Test data, continued band edges:

Downlink – 5 QAM

LOW BAND EDGE



Downlink – 5 QAM

HIGH BAND EDGE





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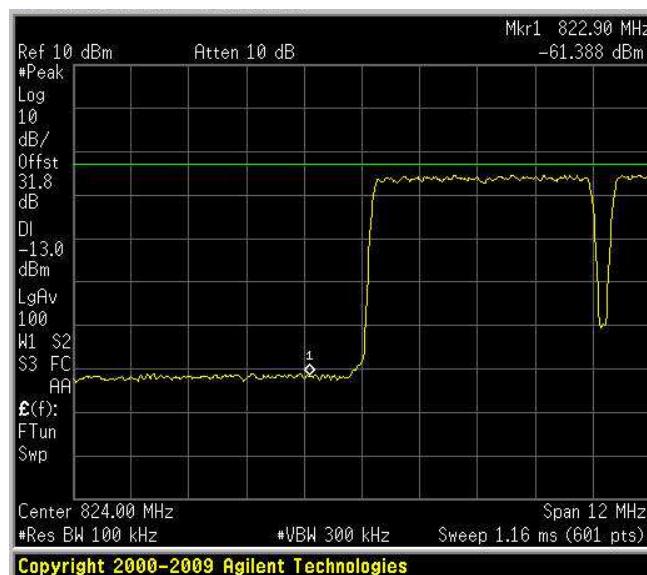
Appendix A: Test results

Report number: 156523-1TRFWL

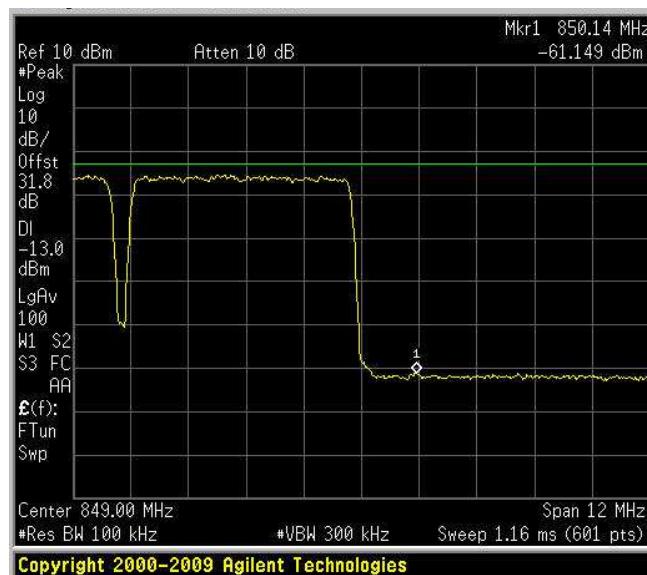
Specification: FCC 22 Subpart H

Test data, continued band edges:

Uplink – 5 QAM
LOW BAND EDGE



Uplink – 5 QAM
HIGH BAND EDGE





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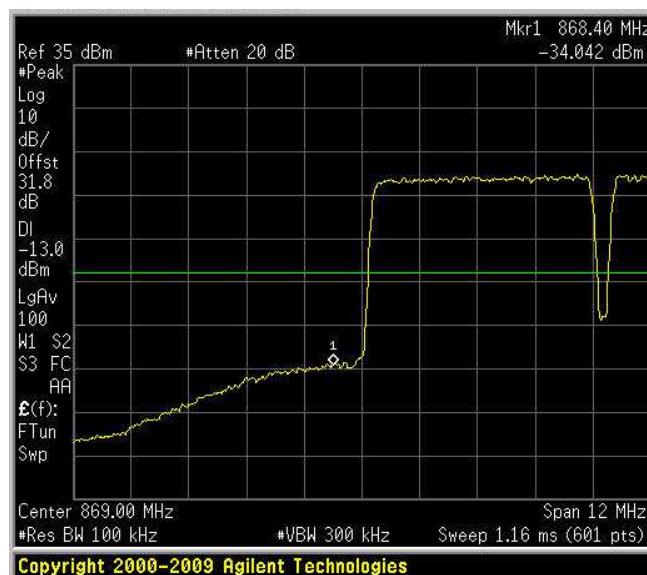
Appendix A: Test results

Report number: 156523-1TRFWL

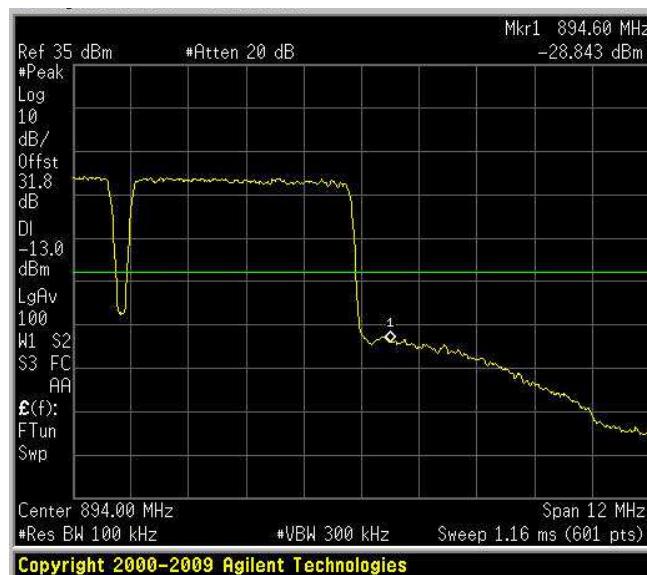
Specification: FCC 22 Subpart H

Test data, continued band edges:

Downlink – 5 QPSK
LOW BAND EDGE



Downlink – 5 QPSK
HIGH BAND EDGE





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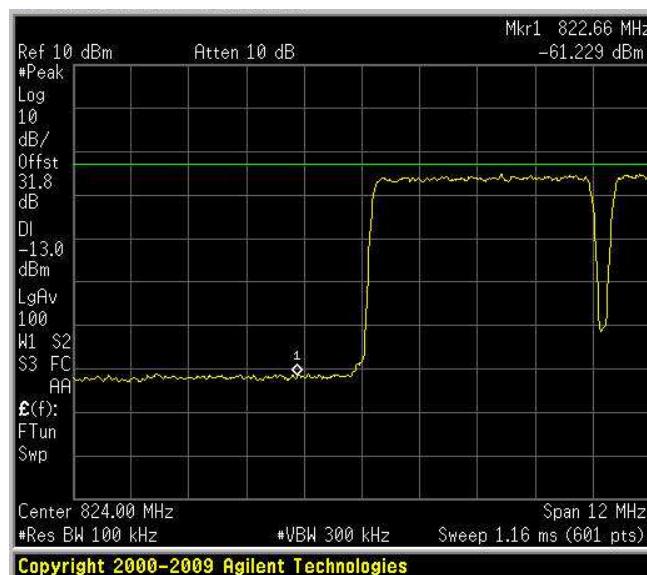
Appendix A: Test results

Report number: 156523-1TRFWL

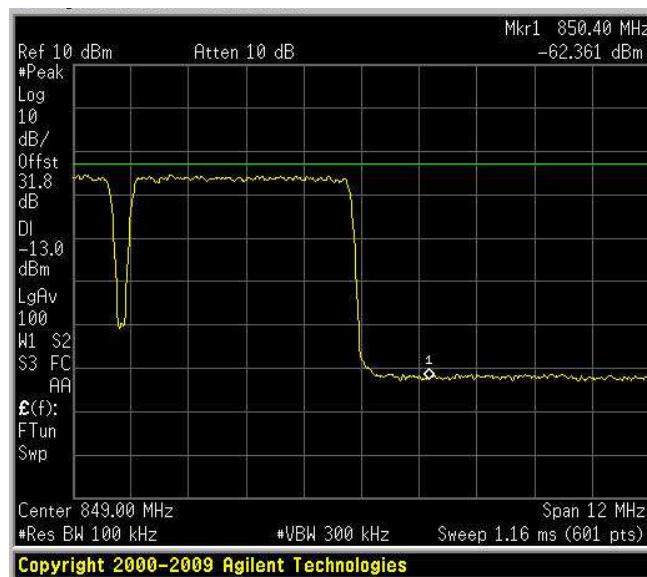
Specification: FCC 22 Subpart H

Test data, continued band edges:

Uplink – 5 QPSK
LOW BAND EDGE



Uplink – 5 QPSK
HIGH BAND EDGE





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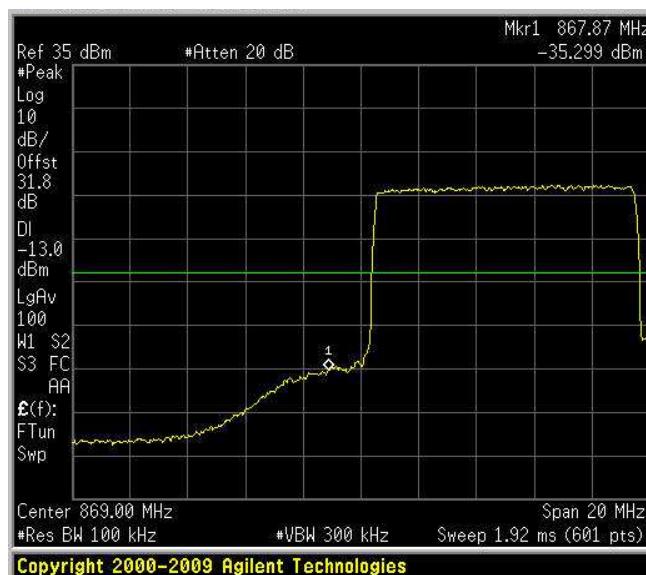
Appendix A: Test results

Report number: 156523-1TRFWL

Specification: FCC 22 Subpart H

Test data, continued band edges:

Downlink – 10 QAM
LOW BAND EDGE



Downlink – 10 QAM
HIGH BAND EDGE





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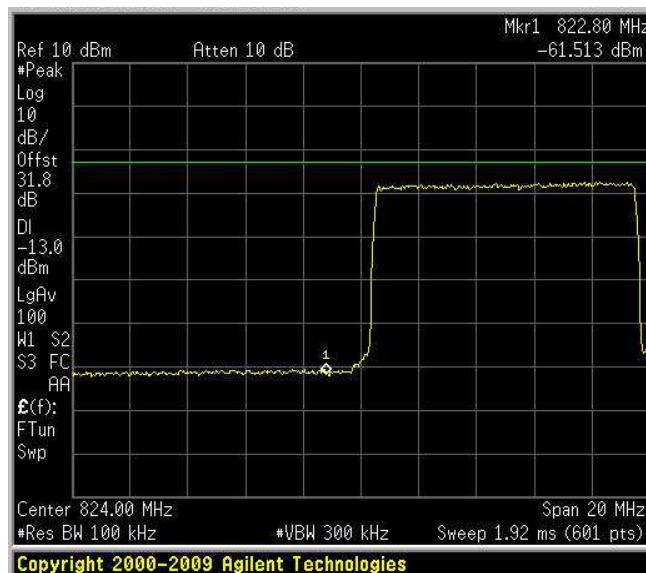
Appendix A: Test results

Report number: 156523-1TRFWL

Specification: FCC 22 Subpart H

Test data, continued band edges:

Uplink – 10 QAM
LOW BAND EDGE



Uplink – 10 QAM
HIGH BAND EDGE





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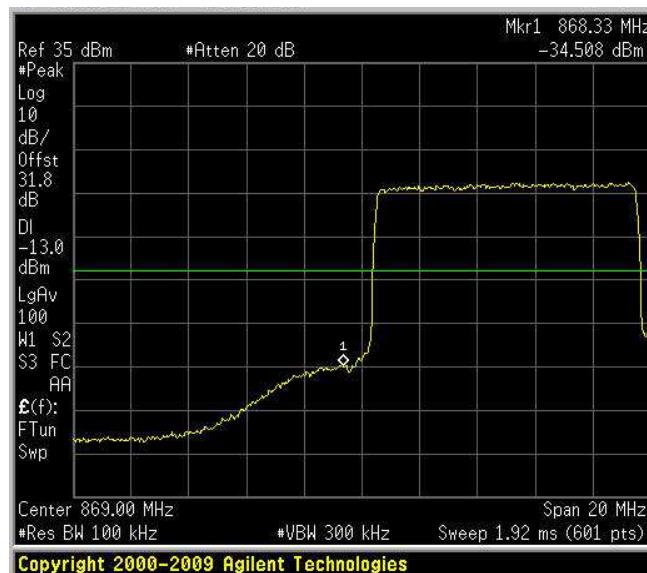
Appendix A: Test results

Report number: 156523-1TRFWL

Specification: FCC 22 Subpart H

Test data, continued band edges:

Downlink – 10 QPSK
LOW BAND EDGE



Downlink – 10 QPSK
HIGH BAND EDGE





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Appendix A: Test results

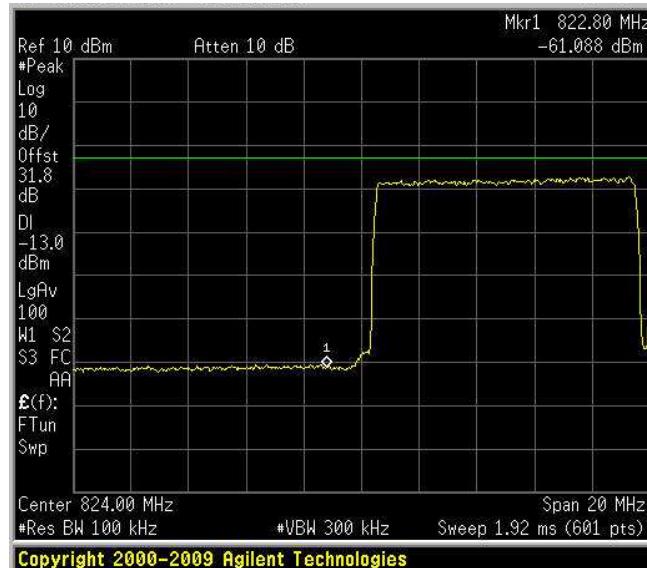
Report number: 156523-1TRFWL

Specification: FCC 22 Subpart H

Test data, continued band edges:

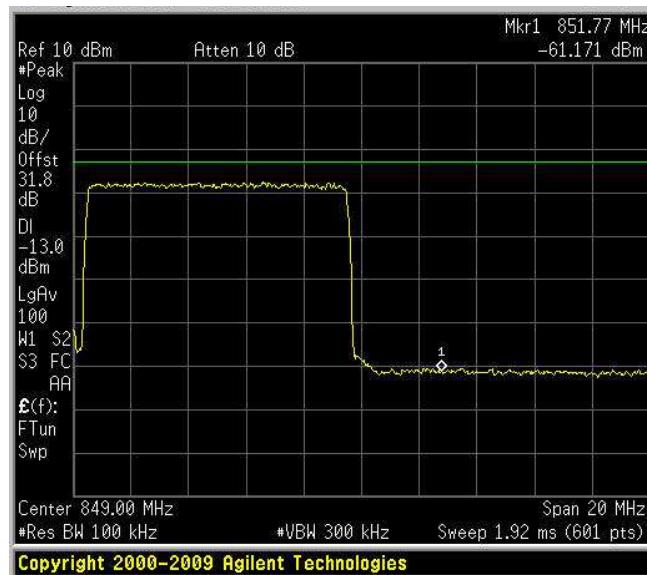
Uplink – 10 QPSK

LOW BAND EDGE



Uplink – 10 QPSK

HIGH BAND EDGE





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Appendix A: Test results

Report number: 156523-1TRFWL

Specification: FCC 22 Subpart H

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: 2009-09-28, t.r 131640-1TRFEMC.

Test results: [Pass, see previous test report 131640-1TRFEMC](#)

Special notes

- The spectrum was searched from 30 MHz up to 10th 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 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.



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Appendix A: Test results

Report number: **156523-1TRFWL**

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: NOT APPLICABLE (Modulation & frequency conversion circuitry not in use)

Special notes

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



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Appendix A: Test results

Report number: 156523-1TRFWL

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			1.5/2.5	
+40 °C, Nominal power			1.5/2.5	
+30 °C, Nominal power			1.5/2.5	
+20 °C, +10% power			1.5/2.5	
+20 °C, Nominal power		Reference	1.5/2.5	
+20 °C, -10% power			1.5/2.5	
+10 °C, Nominal power			1.5/2.5	
0 °C, Nominal power			1.5/2.5	
-10 °C, Nominal power			1.5/2.5	
-20 °C, Nominal power			1.5/2.5	

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



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Appendix A: Test results

Report number: **156523-1TRFWL**

Specification: FCC 22 Subpart H

Filter Frequency Response

Test date: 2009-09-28, t.r 131640-1TRFEMC.

Test results: **Pass, see previous test report 131640-1TRFEMC**



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Appendix A: Test results

Report number: **156523-1TRFWL**

Specification: FCC 22 Subpart H

Photo Set up





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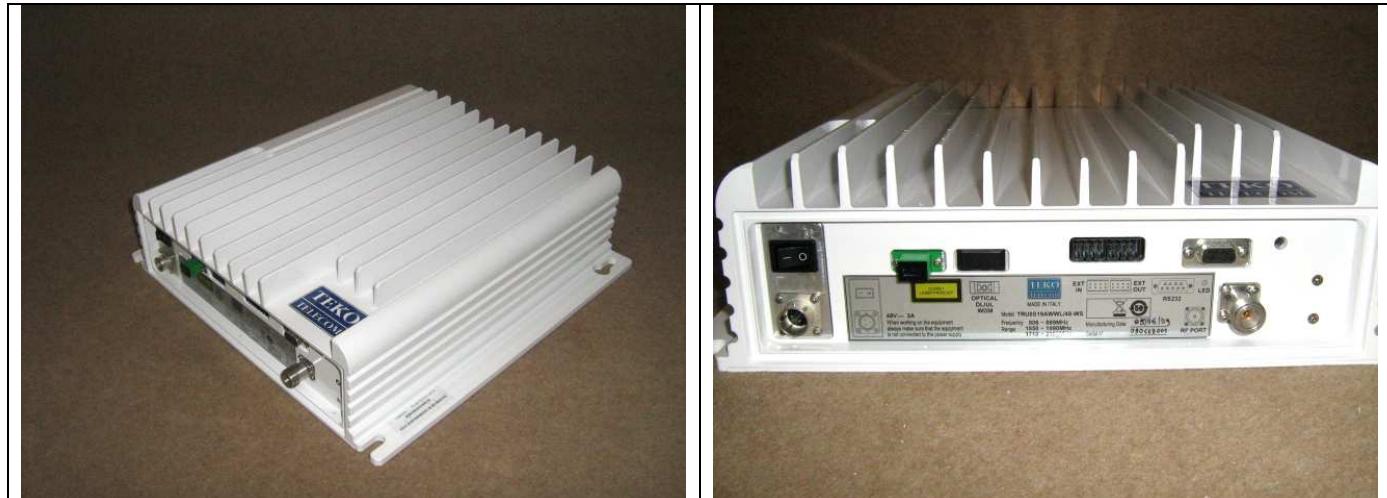
Appendix A: Test results

Report number: 156523-1TRFWL

Specification: FCC 22 Subpart H

Photo EUT

REMOTE





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Appendix A: Test results

Report number: **156523-1TRFWL**

Specification: FCC 22 Subpart H

MASTER



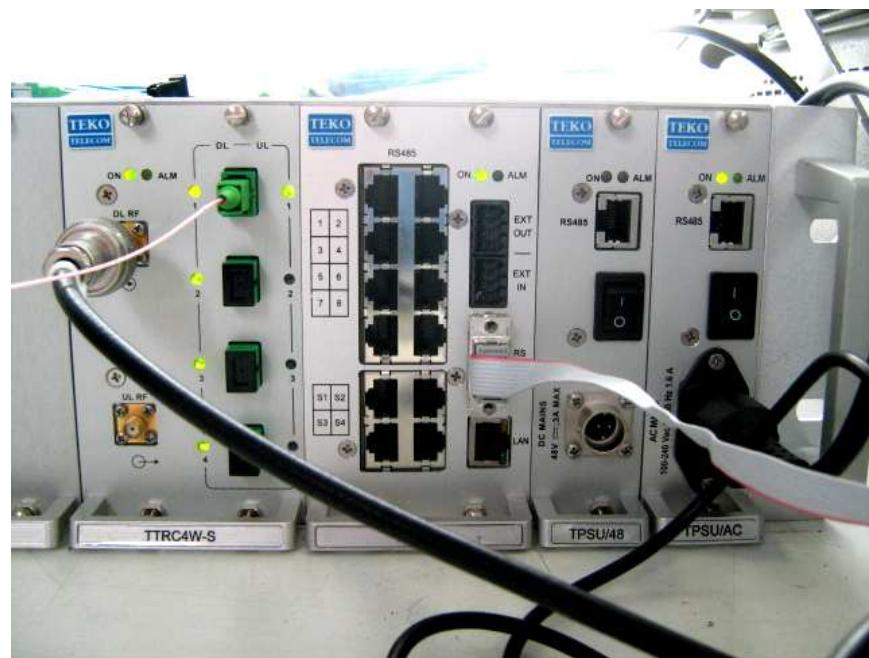


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Appendix A: Test results

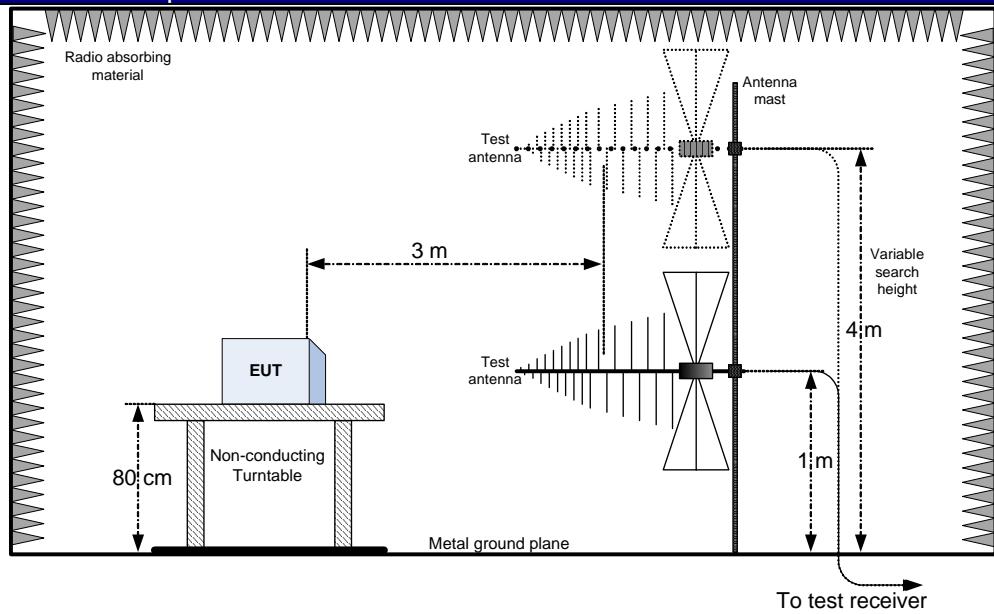
Report number: 156523-1TRFWL

Specification: FCC 22 Subpart H



Appendix B: Block diagrams of test set-ups

Radiated emissions set-up



Substitution method set-up

