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Report Reference ID:	148253-2TRFWL

Test specification:	Title 47 – Telecommunication Chapter I – Federal Communications Commission Subchapter B – Common carrier services – **Part 27 – Miscellaneous wireless communications services**

Applicant:	TEKO Telecom S.p.A. Via Meucci, 24/a I-40024 Castel S. Pietro Terme (BO) (Italy)
Apparatus:	Optical system
FCC ID:	XM2LOWPOWERL
Model:	TRU7S8AAWWL/AC-WS

Testing laboratory:	**Nemko Italy S.p.A.** Via Carroccio, 4 I-20046 Biassono (Italy)

	Name and title	**Date**
Tested by:	G. Curioni, Wireless/EMC Specialist	May 31, 2010
Reviewed by:	P. Barbieri, Wireless/EMC Specialist	May 31, 2010

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Section 1: Report summary

1.1 Test specification

Specifications	**Part 27 – Miscellaneous wireless communications services**

1.2 Statement of compliance

Compliance	In the configuration tested the EUT was found compliant Yes ☒ No ☐ This report contains an assessment of apparatus against specifications based upon tests carried out on samples submitted at Nemko Canada Inc. These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 27. Radiated tests were conducted in accordance with ANSI C63.4-2003.

1.3 Exclusions

Exclusions	None

1.4 Registration number

Registration number:	481407 (10 m Semi anechoic chamber)

1.5 Test report revision history

Revision #	Details of changes made to test report
TRF	Original report issued
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1.6 Limits of responsibility

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 contain in this report are within Nemko Canada's ISO/IEC 17025 accreditation.

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Section 2: Summary of test results

2.1 FCC Part 27, test results

Part	Test description	Verdict
§27.50(b)	Peak output power at RF antenna connector	Pass
§27.52	RF safety	N/A a)
§27.53(c)	Spurious emissions at RF antenna connector	Pass
§27.53(c)	Radiated spurious emissions	Pass
§27.53(f)	Radiated spurious emissions within 1559–1610 MHz band	Pass
§27.54	Frequency stability	N/A b)
§2.1049	Occupied bandwidth	Pass

Notes:

a) b) NO Antenna provided

b) Modulation & frequency conversion circuitry not in use.

Section 3: Equipment under test (EUT) and application details

3.1 Applicant details		
Applicant complete business name	Name:	Teko Telecom S.p.A.
	Federal Registration Number (FRN):	0018963462
	Grantee code	XM2
Mailing address	Address: City: Province/State: Post code: Country:	Via Meucci, 24/a Castel S. Pietro Terme Bologna 40024 Italy

3.2 Modular equipment	
a) Single modular approval	Single modular approval Yes ☐ No ☒
b) Limited single modular approval	Limited single modular approval Yes ☐ No ☒

3.3 Product details		
FCC ID	Grantee code:	XM2
	Product code:	LOWPOWERL
Equipment class	TNB	
Description of product as it is marketed	Optical System	
	Model name/number:	TRU7S8AAWWL/AC-WS
	Serial number:	100235001

3.4 Application purpose	
Type of application	☒ Original certification ☐ Change in identification of presently authorized equipment Original FCC ID: Grant date: ☐ Class II permissive change or modification of presently authorized equipment

3.5 Composite/related equipment	
a) Composite equipment	The EUT is a composite device subject to an additional equipment authorization Yes ☒ No ☐
b) Related equipment	The EUT is part of a system that operates with, or is marketed with, another device that requires an equipment authorization Yes ☒ No ☐
c) Related FCC ID	If either of the above is "yes": ☒ has been granted under the FCC ID(s) listed below: ☒ is in the process of being filled under the FCC ID(s) listed below: ☐ is pending with the FCC ID(s) listed below: ☐ has a mix of pending and granted statues under the FCC ID(s) listed below: i FCC ID: XM2-LOWPOWER ii FCC ID: XM2LOWPOWERL

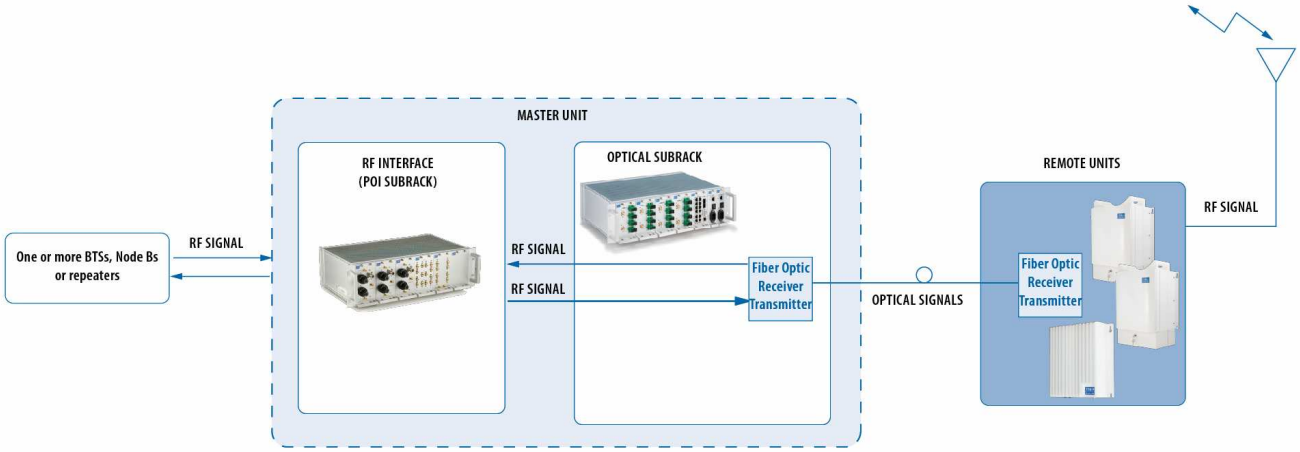
3.6 Sample information	
Receipt date:	May 5, 2010

Nemko sample ID number:	-----

3.7 EUT technical specifications	
Operating band:	Down Link 746–757 MHz, Up Link 776-787 MHz
Operating frequency:	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 type:	External Antenna is not provided, equipment that has an external 50 Ω RF connector
Power source:	100-240 Vac external

3.8 Operation of the EUT during testing	
Details:	Normal working at max gain with max RF power output

3.9 EUT setup diagram



Section 4: Engineering considerations

4.1 Modifications incorporated in the EUT

Modifications	Modifications performed to the EUT during this assessment None ☒ Yes ☐, performed by Client ☐ or Nemko ☐ Details:

4.2 Deviations from laboratory tests procedures

Deviations	Deviations from laboratory test procedures None ☒ Yes ☐ - details are listed below:

4.3 Technical judgment

Judgment	None

Section 5: Test conditions

5.1 Power source and ambient temperatures

Normal temperature, humidity and air pressure test conditions	Temperature: 15–30 ℃ Relative humidity: 20–75 % Air pressure: 860–1060 hPa 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.
Power supply range:	The normal test voltage for equipment to be connected to the mains shall be the nominal mains voltage. For the purpose of the present document, the nominal voltage shall be the declared voltage, or any of the declared voltages ±5 %, for which the equipment was designed.

Section 6: 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.

Section 7: Test equipment

Identification number	*Description*	*Manufacturer model*	*s/n*	*Cal. Due*
1a	Vector Signal Generator	Agilent H.P. E4438C ESG	MY45094485	July 2010
1b	Vector Signal Generator	Agilent H.P. N5182A MXG	MY48180714	April 2011
2	Spectrum Analyzer	Agilent H.P. E4445A	MY46181806	July 2010
3	Network Analyzer	Agilent H.P E5062A	MY44101829	November 2012
4	2xcables+directional coupler+dummyload			

Client's property

Identification number	*Equipment*	*Manufacturer*	*Model*	*Serial N°*	*Cal. due*
5	Trilog Broadband Antenna	Schwarzbeck	VULB 9163	VULB 9163-286	04/2011
6	Bilog antenna	Schwarzbeck	STLP 9148-123	123	09/2011
7	Broadband preamplifier	Schwarzbeck	BBV 9718	9718-137	05/2011
8	Spectrum Analyzer 9kHz-40GHz	R&S	FSEK	848255/005	09/2010
9	Controller	EMCO	2090	9511-1099	NSC
10	Antenna Tower	EMCO	2071-2	9601-1940	NSC
11	Turning table Controller	EMCO	1061-1.521	9012-1508	NSC
12	Semi-anechoic chamber	Nemko	3m semi-anechoic chamber	70	04/2011
13	Trilog Broadband Antenna	Siemens	3m control room	3	NSC

Property of Nemko Italy

Section 8: Testing data

8.1 Clause 27.50(b) Peak output power at RF antenna connector

§ 27.50(b) Operation within the bands: 746–763 MHz, 775–793 MHz and 805–806 MHz.

(1) Fixed and base stations transmitting a signal in the 757–758 and 775–776 MHz bands must not exceed an effective radiated power (ERP) of 1000 watts and an antenna height of 305 m height above average terrain (HAAT), except that antenna heights greater than 305 m HAAT are permitted if power levels are reduced below 1000 watts ERP in accordance with Table 1 of this section.

(2) Fixed and base stations transmitting a signal in the 746–757 MHz, 758–763 MHz, 776–787 MHz, and 788–793 MHz bands with an emission bandwidth of 1 MHz or less must not exceed an ERP of 1000 watts and an antenna height of 305 m HAAT, except that antenna heights greater than 305 m HAAT are permitted if power levels are reduced below 1000 watts ERP in accordance with Table 1 of this section.

(3) Fixed and base stations located in a county with population density of 100 or fewer persons per square mile, based upon the most recently available population statistics from the Bureau of the Census, and transmitting a signal in the 746–757 MHz, 758–763 MHz, 776–787 MHz, and 788–793 MHz bands with an emission bandwidth of 1 MHz or less must not exceed an ERP of 2000 watts and an antenna height of 305 m HAAT, except that antenna heights greater than 305 m HAAT are permitted if power levels are reduced below 2000 watts ERP in accordance with Table 2 of this section.

(4) Fixed and base stations transmitting a signal in the 746–757 MHz, 758–763 MHz, 776–787 MHz, and 788–793 MHz bands with an emission bandwidth greater than 1 MHz must not exceed an ERP of 1000 watts/MHz and an antenna height of 305 m HAAT, except that antenna heights greater than 305 m HAAT are permitted if power levels are reduced below 1000 watts/MHz ERP accordance with Table 3 of this section.

(5) Fixed and base stations located in a county with population density of 100 or fewer persons per square mile, based upon the most recently available population statistics from the Bureau of the Census, and transmitting a signal in the 746–757 MHz, 758–763 MHz, 776–787 MHz, and 788–793 MHz bands with an emission bandwidth greater than 1 MHz must not exceed an ERP of 2000 watts/MHz and an antenna height of 305 m HAAT, except that antenna heights greater than 305 m HAAT are permitted if power levels are reduced below 2000 watts/MHz ERP in accordance with Table 4 of this section.

(6) Licensees of fixed or base stations transmitting a signal in the 746–757 MHz, 758–763 MHz, 776–787 MHz, and 788–793 MHz bands at an ERP greater than 1000 watts must comply with the provisions set forth in paragraph (b)(8) of this section and §27.55(c).

(7) Licensees seeking to operate a fixed or base station located in a county with population density of 100 or fewer persons per square mile, based upon the most recently available population statistics from the Bureau of the Census, and transmitting a signal in the 746–757 MHz, 758–763 MHz, 776–787 MHz, and 788–793 MHz bands at an ERP greater than 1000 watts must:

(i) coordinate in advance with all licensees authorized to operate in the 698–763 MHz, 775–793, and 805–806 MHz bands within 120 kilometers (75 miles) of the base or fixed station

(ii) coordinate in advance with all regional planning committees, as identified in §90.527 of this chapter, with jurisdiction within 120 kilometers (75 miles) of the base or fixed station

(8) Licensees authorized to transmit in the 746–757 MHz, 758–763 MHz, 776–787 MHz, and 788–793 MHz bands and intending to operate a base or fixed station at a power level permitted under the provisions of paragraph (b)(6) of this section must provide advanced notice of such operation to the Commission and to licensees authorized in their area of operation. Licensees who must be notified are all licensees authorized to operate in the 763–775 MHz and 793–805 MHz bands under part 90 of this chapter within 75 km of the base or fixed station and all regional planning committees, as identified in §90.527 of this chapter, with jurisdiction within 75 km of the base or fixed station. Notifications must provide the location and operating parameters of the base or fixed station, including the station's ERP, antenna coordinates, antenna height above ground, and vertical antenna pattern, and such notifications must be provided at least 90 days prior to the commencement of station operation.

(9) Control stations and mobile stations transmitting in the 746–757 MHz, 758–763 MHz, 776–793 MHz, and 805–806 MHz bands and fixed stations transmitting in the 787–788 MHz and 805–806 MHz bands are limited to 30 watts ERP.

(10) Portable stations (hand-held devices) transmitting in the 746–757 MHz, 758–763 MHz, 776–793 MHz, and 805–806 MHz bands are limited to 3 watts ERP.

(11) For transmissions in the 757–758, 775–776, 787–788, and 805–806 MHz bands, maximum composite transmit power shall be measured over any interval of continuous transmission using instrumentation calibrated in terms of RMS-equivalent voltage. The measurement results shall be properly adjusted for any instrument limitations, such as detector response times, limited resolution bandwidth capability when compared to the emission bandwidth, etc., so as to obtain a true maximum composite measurement for the emission in question over the full bandwidth of the channel.

(12) For transmissions in the 746–757, 758–763, 776–787, and 788–793 MHz bands, licensees may employ equipment operating in compliance with either the measurement techniques described in paragraph (b)(11) of this section or a Commission-approved average power technique. In both instances, equipment employed must be authorized in accordance with the provisions of §27.51

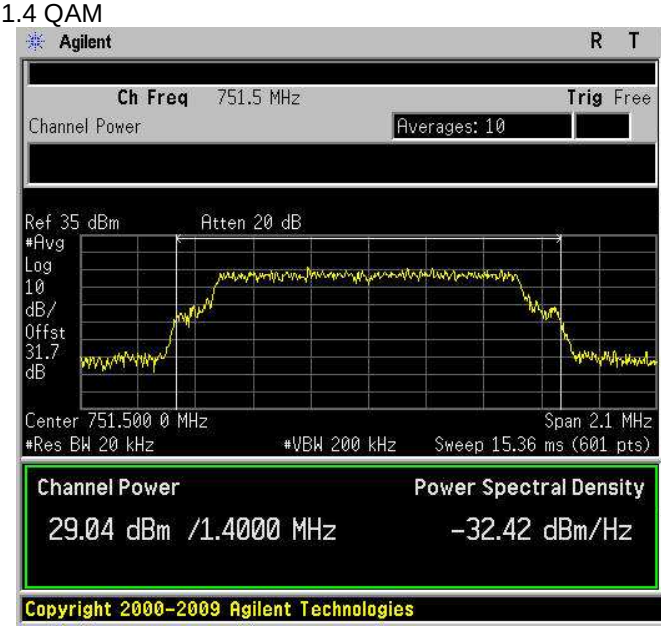
Special notes

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

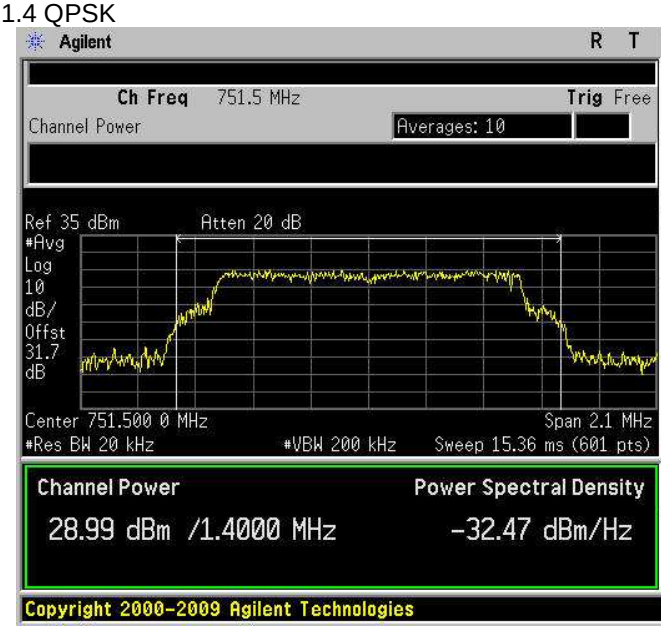
Test data

Direction	Modulation	Frequency (MHz)	RF output power (dBm)
Down-link	LTE (QAM, 1,4MHz)	751.5	29.04
Down-link	LTE (QPSK, 1,4MHz)	751.5	28.99
Down-link	LTE (QAM, 3MHz)	751.5	29.07
Down-link	LTE (QPSK, 3MHz)	751.5	29.09
Down-link	LTE (QAM, 5MHz)	751.5	29.08
Down-link	LTE (QPSK, 5MHz)	751.5	29.03
Down-link	LTE (QAM, 10MHz)	751.5	29.00
Down-link	LTE (QPSK, 10MHz)	751.5	28.99
Up-link	LTE (QAM, 1,4MHz)	781.5	4.04
Up-link	LTE (QPSK, 1,4MHz)	781.5	4.05
Up-link	LTE (QAM, 3MHz)	781.5	4.07
Up-link	LTE (QPSK, 3MHz)	781.5	4.11
Up-link	LTE (QAM, 5MHz)	781.5	4.05
Up-link	LTE (QPSK, 5MHz)	781.5	4.07
Up-link	LTE (QAM, 10MHz)	781.5	4.00
Up-link	LTE (QPSK, 10MHz)	781.5	4.04

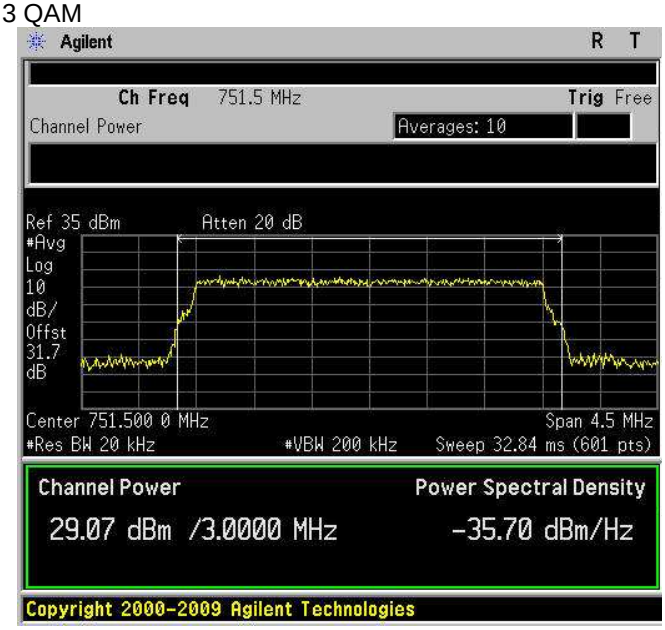
RF Power Output D.L. mod. 1.4 QAM



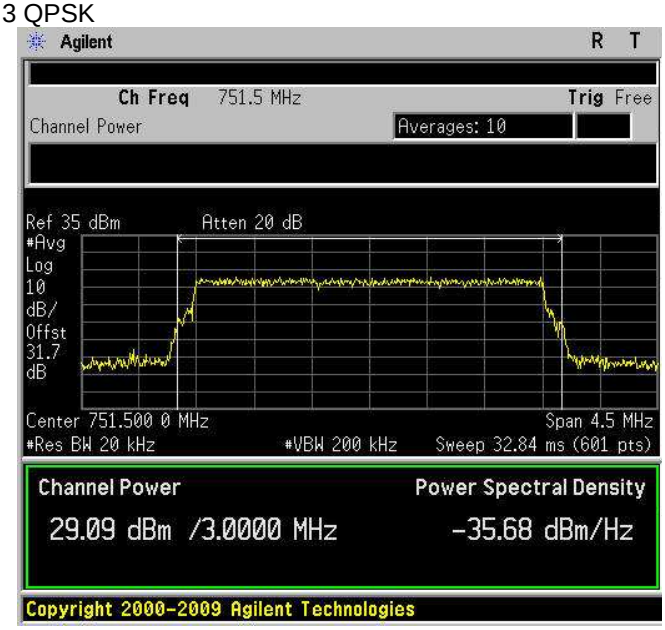
RF Power Output D.L. mod. 1.4 QPSK



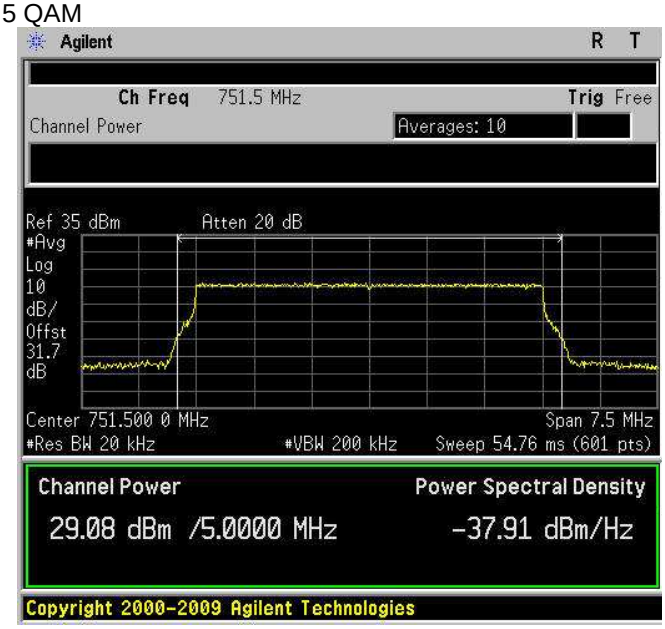
RF Power Output D.L. mod. 3 QAM



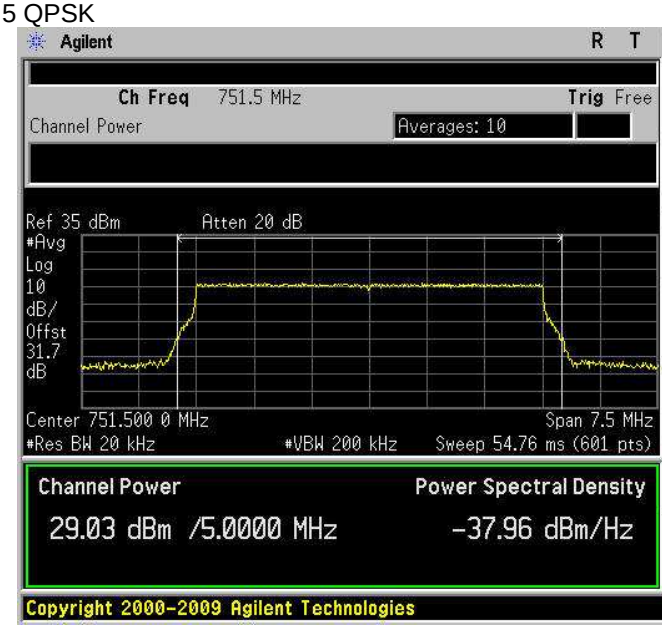
RF Power Output D.L. mod. 3 QPSK



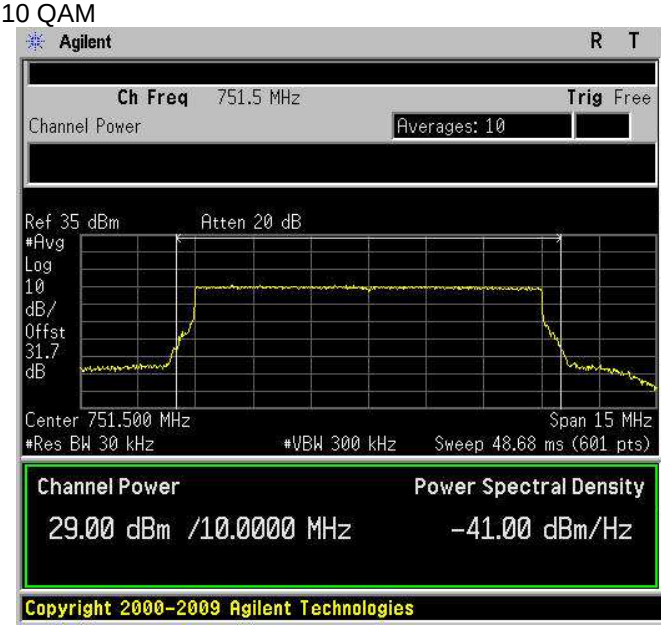
RF Power Output D.L. mod. 5 QAM



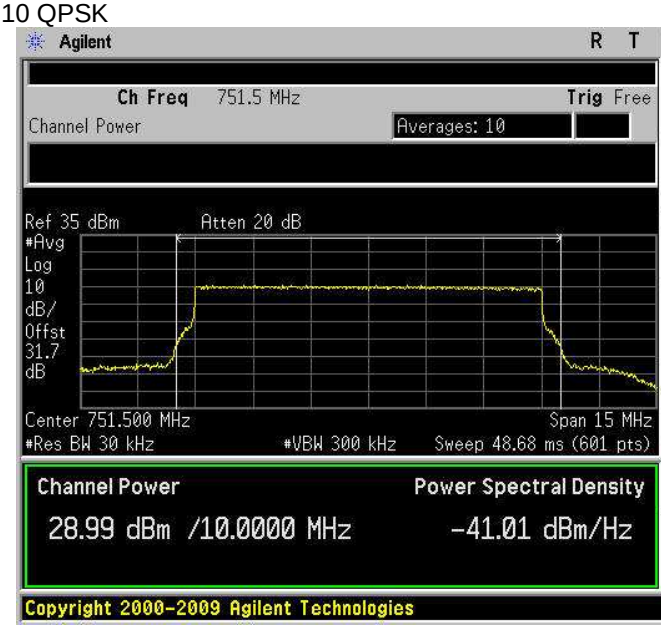
RF Power Output D.L. mod. 5 QPSK



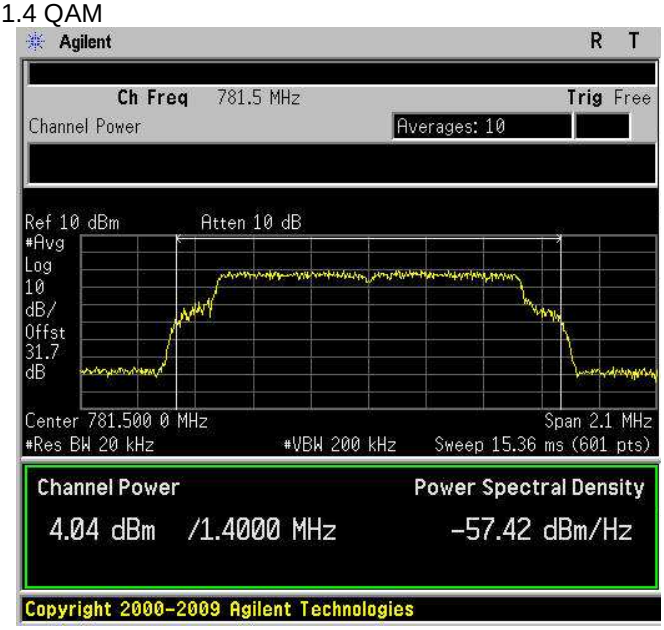
RF Power Output D.L. mod. 10 QAM



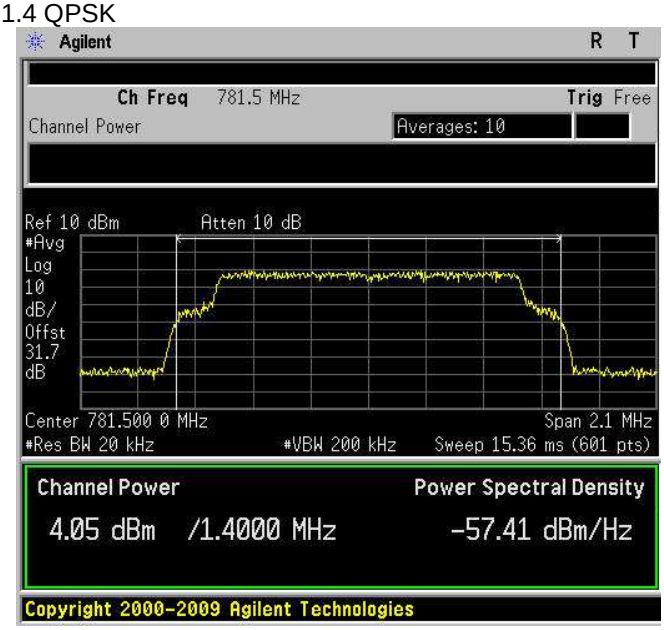
RF Power Output D.L. mod. 10 QPSK



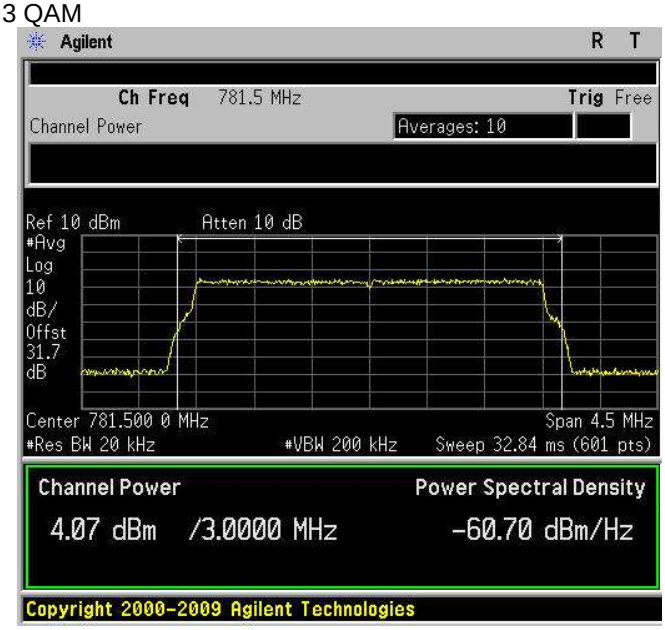
RF Power Output U.L. mod. 1.4 QAM



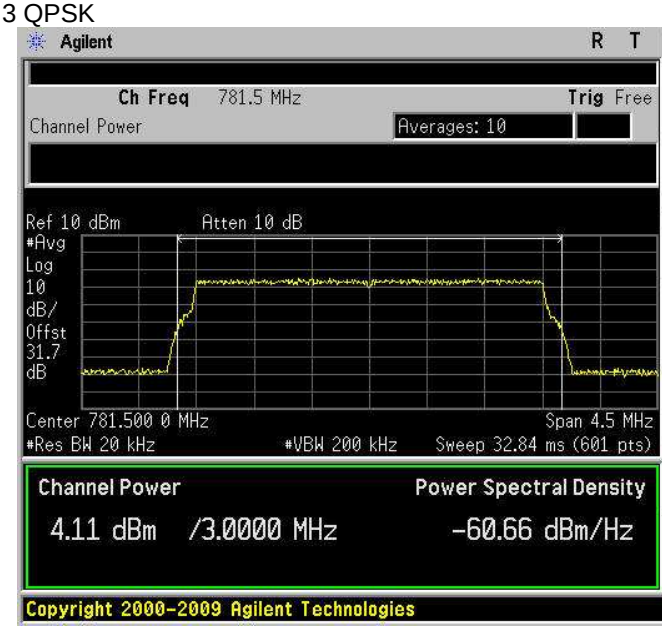
RF Power Output U.L. mod. 1.4 QPSK



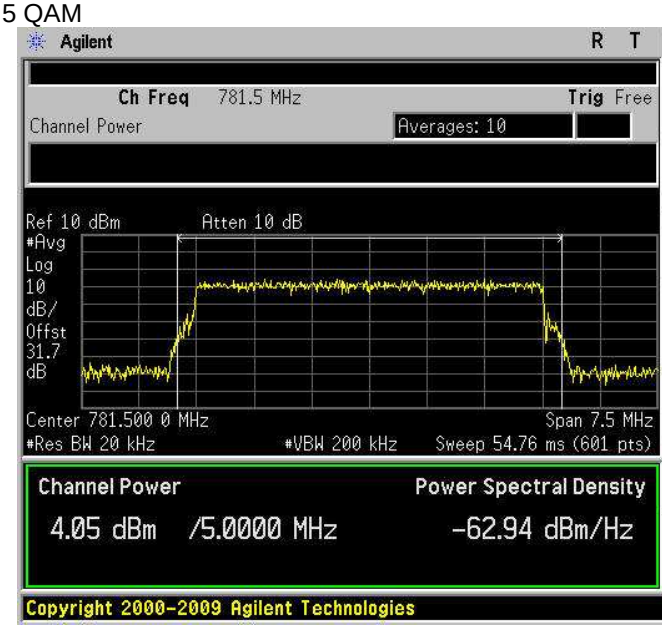
RF Power Output U.L. mod. 3 QAM



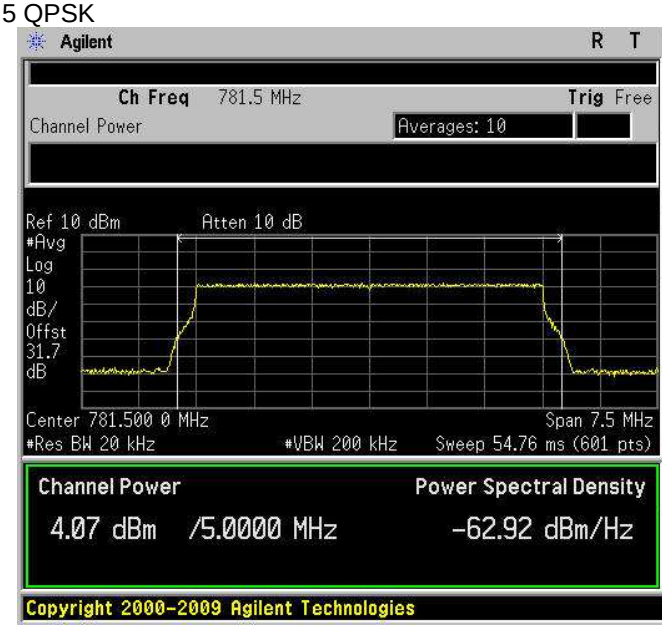
RF Power Output U.L. mod. 3 QPSK



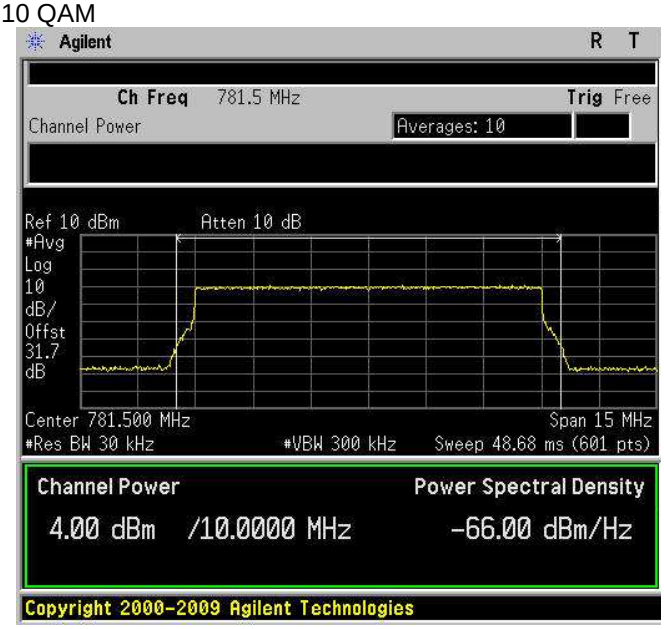
RF Power Output U.L. mod. 5 QAM



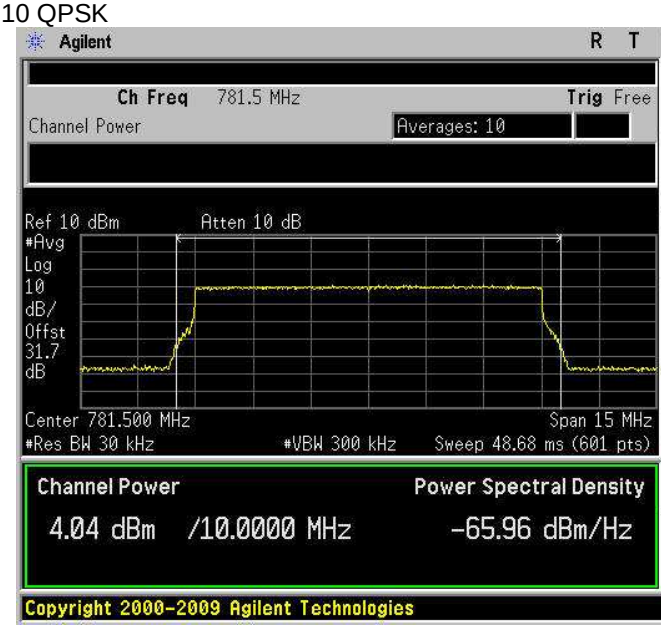
RF Power Output U.L. mod. 5 QPSK



RF Power Output U.L. mod. 10 QAM



RF Power Output U.L. mod. 10 QPSK



8.2 Clause 27.52 RF safety

Licensees and manufacturers are subject to the radio frequency radiation exposure requirements specified in sections 1.1307(b), 2.1091, and 2.1093 of this chapter, as appropriate. Applications for equipment authorization of mobile or portable devices operating under this section must contain a statement confirming compliance with these requirements for both fundamental emissions and unwanted emissions. Technical information showing the basis for this statement must be submitted to the Commission upon request.

Special notes

The test was performed using E-field probe slowly moving towards the EUT until E-field equivalent to the maximum permitted power density was measured

Equivalent power density was calculated from electric field strength as follows:

$$S_{[mW/cm^2]} = \frac{0.1 \times E^2_{[V/m]}}{120 \times \pi}$$ S[W/m^2] = E^2[V/m]/377[Ω]

where S is power density and E is electric field strength.

Test data

Test distance (cm)	Field strength (V/m)	Equivalent power density (mW/cm²)	Limit (mW/cm²)	Margin (mW/cm²)
300				
250				
200				
150				
100				
50				
30				
20				
10				
5				

NOT APPLICABICABLE; External Antenna is not provided.

8.3 Clause 27.53 (g) Spurious emissions at RF antenna connector

(g) For operations in the 698–746 MHz band and the 776–788 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log (P) dB.

Compliance with the provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed.

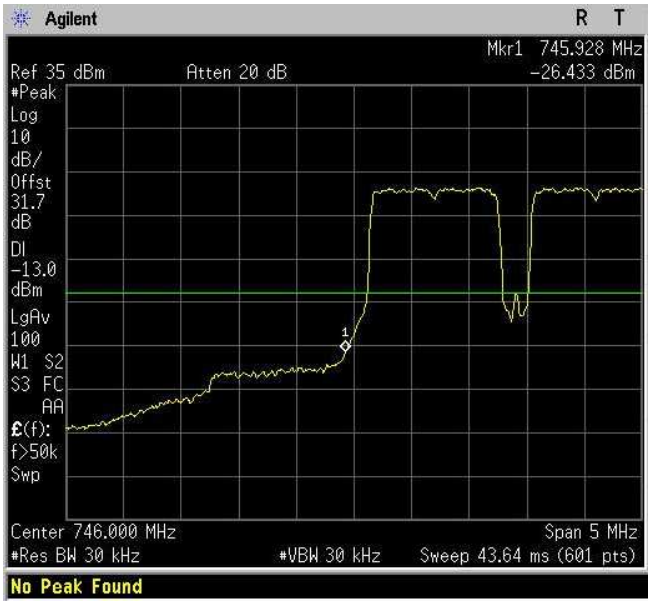
Special notes

- The spectrum was searched from 30 MHz to the 10th harmonic.
- All measurements were performed using a peak detector.
- RBW within 30–1000 MHz was 100 kHz and 30 kHz for bandedge; 1 MHz above 1 GHz. VBW was wider than RBW.

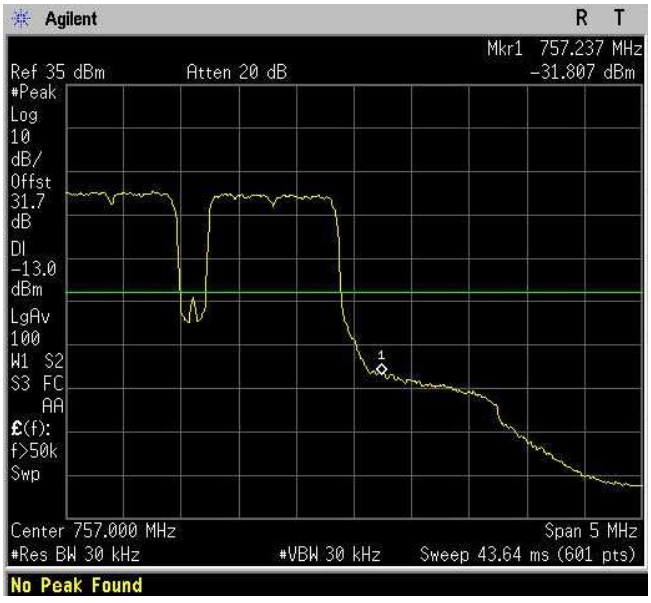
Test data			
Insert plots here			
Spurious emissions measurement results:			
Frequency (MHz)	Spurious emission (dBm)	Limit (dBm)	Margin (dB)
Low channel			
First channel Down-link	Negligible	-13	
First channel Up-link	Negligible	-13	
Mid channel			
751,5 MHz Down-link	Negligible	-13	
781,5 MHz Down-link	Negligible	-13	
High channel			
Last channel Down-link	Negligible	-13	
Last channel Up-link	Negligible	-13	

See Plots below

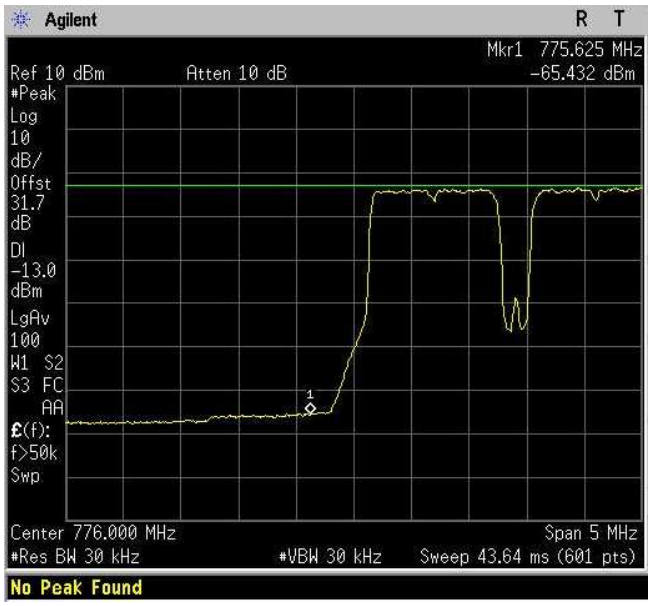
Spurious Emissions at Antenna Terminals
Downlink – 1.4 QAM
LOW BAND EDGE



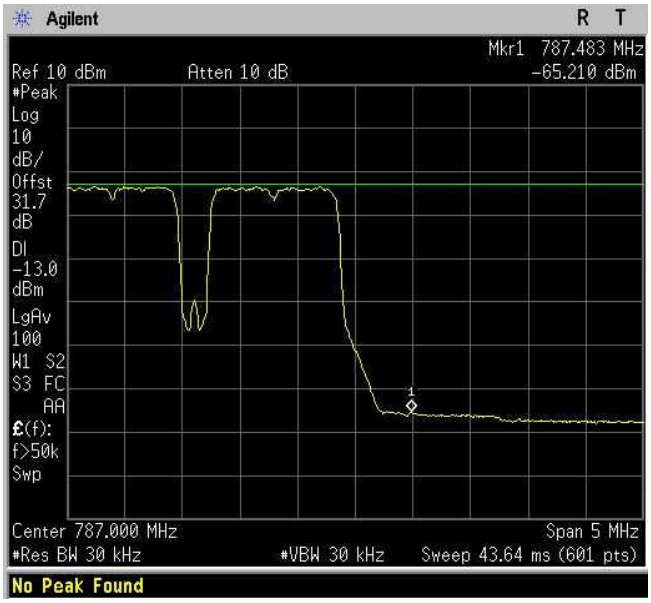
Spurious Emissions at Antenna Terminals
Downlink – 1.4 QAM
HIGH BAND EDGE



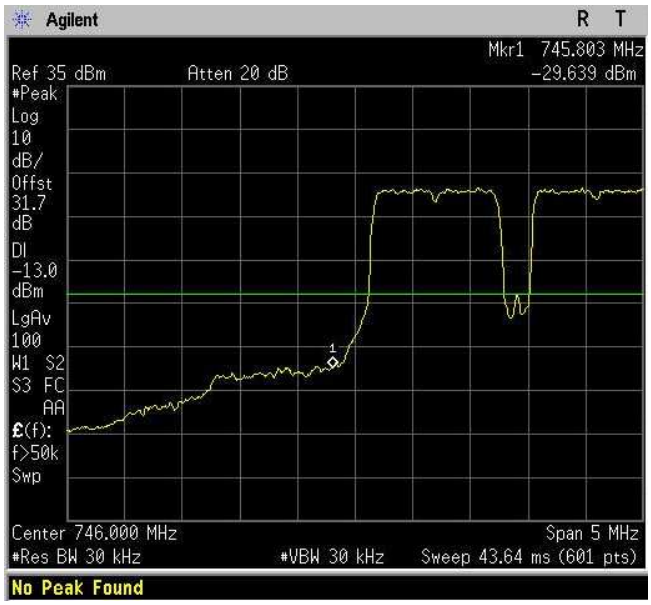
Spurious Emissions at Antenna Terminals
Uplink – 1.4 QAM
LOW BAND EDGE



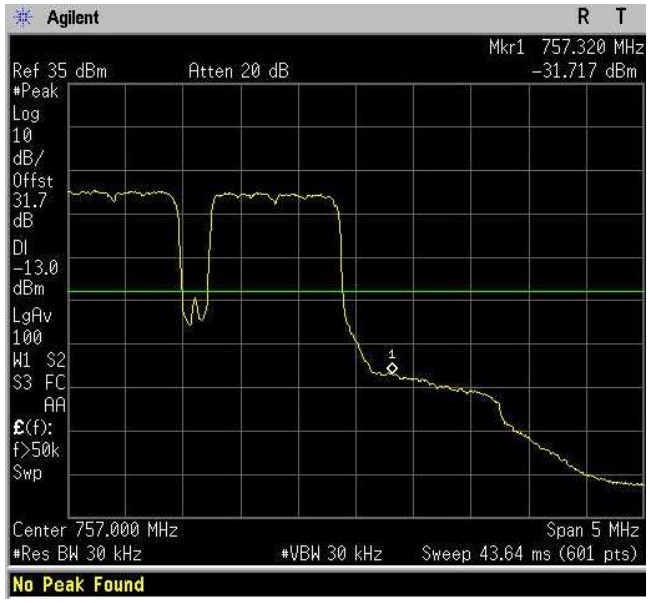
Spurious Emissions at Antenna Terminals
Uplink – 1.4 QAM
HIGH BAND EDGE



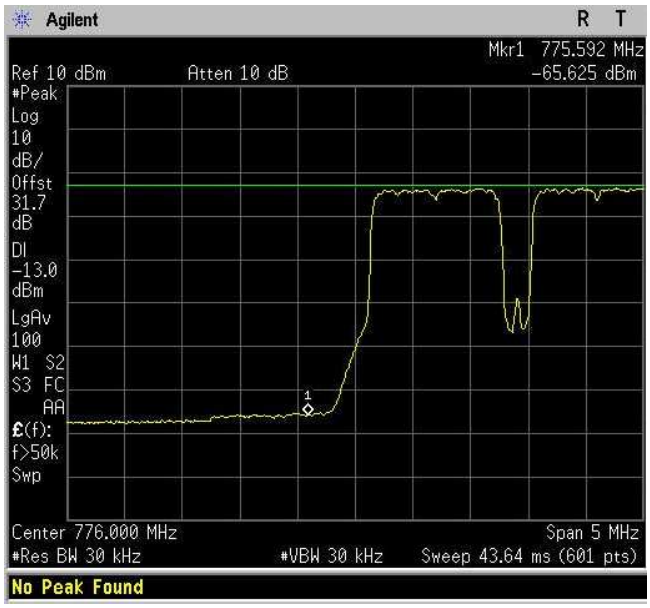
Spurious Emissions at Antenna Terminals
Downlink – 1.4 QPSK
LOW BAND EDGE



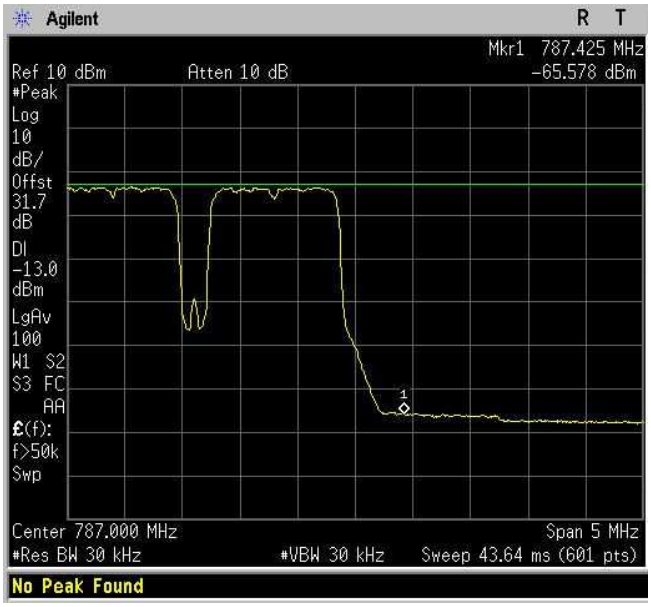
Spurious Emissions at Antenna Terminals
Downlink – 1.4 QPSK
HIGH BAND EDGE



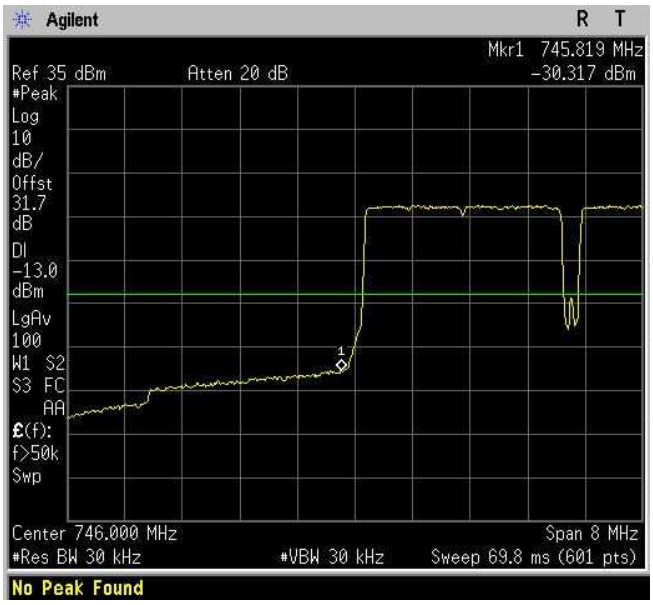
Spurious Emissions at Antenna Terminals
Uplink – 1.4 QPSK
LOW BAND EDGE



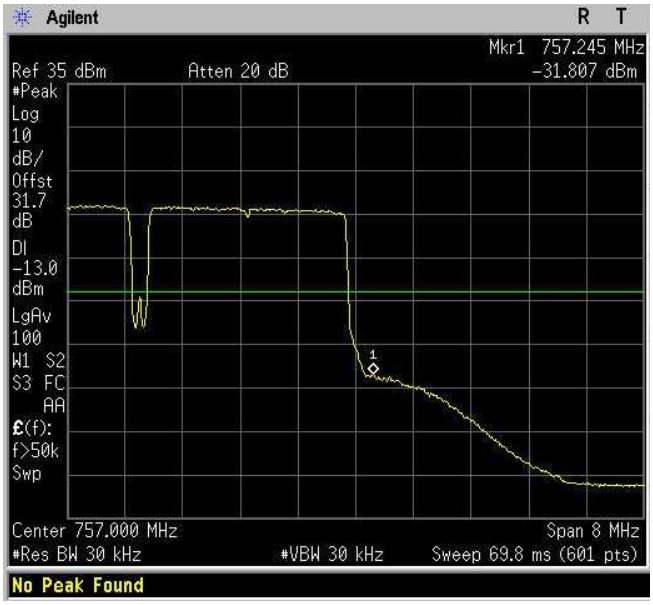
Spurious Emissions at Antenna Terminals
Uplink – 1.4 QPSK
HIGH BAND EDGE



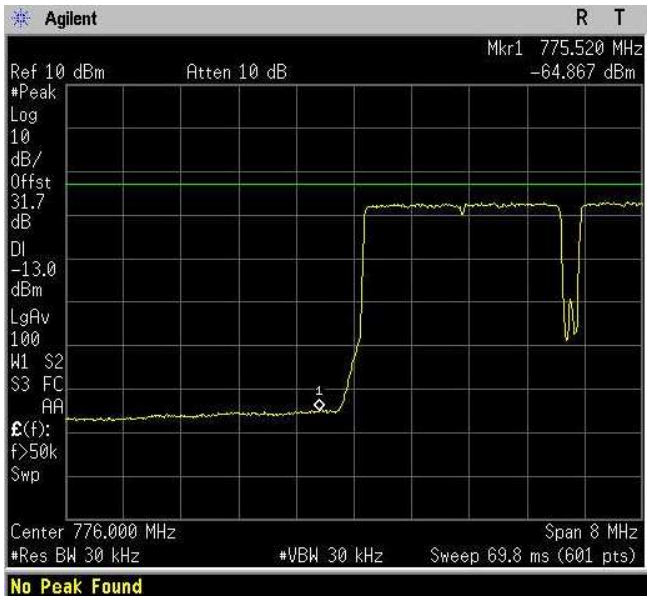
Spurious Emissions at Antenna Terminals
Downlink – 3 QAM
LOW BAND EDGE



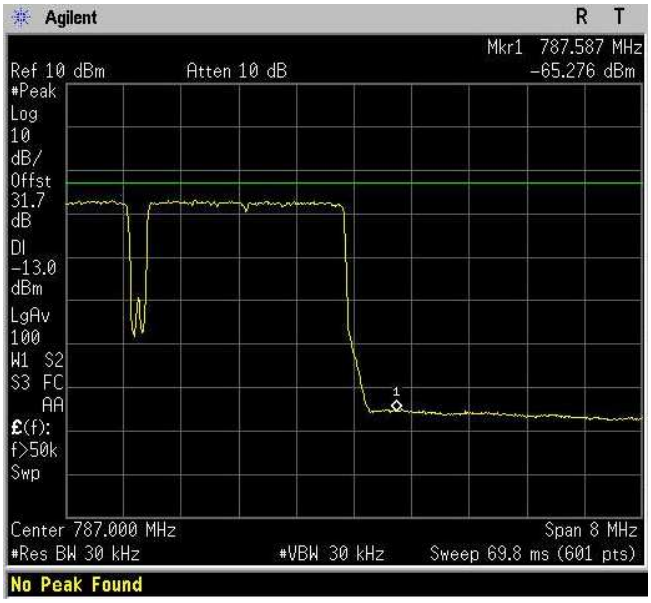
Spurious Emissions at Antenna Terminals
Downlink – 3 QAM
HIGH BAND EDGE



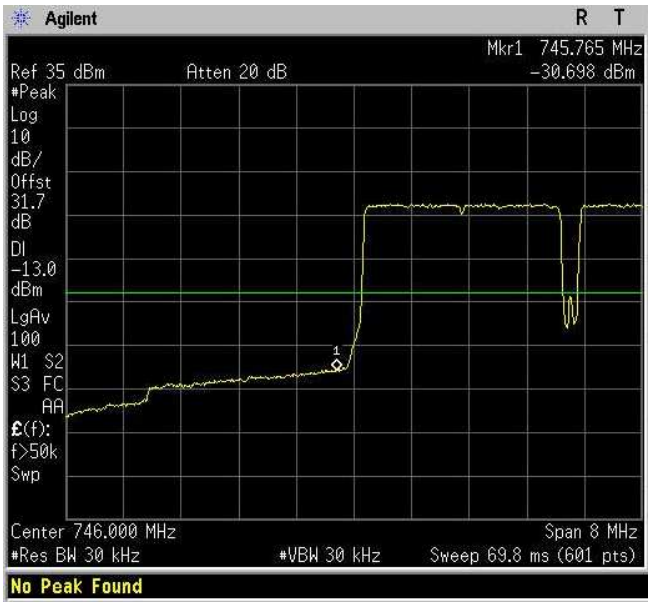
Spurious Emissions at Antenna Terminals
Uplink – 3 QAM
LOW BAND EDGE



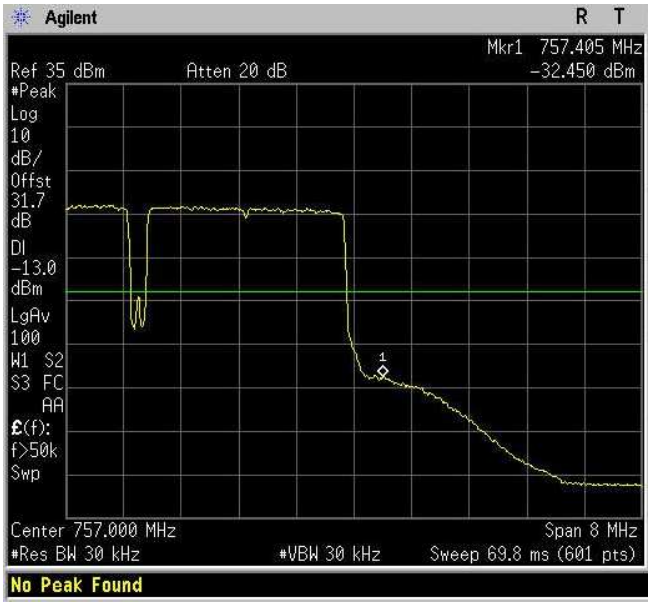
Spurious Emissions at Antenna Terminals
Uplink – 3 QAM
HIGH BAND EDGE



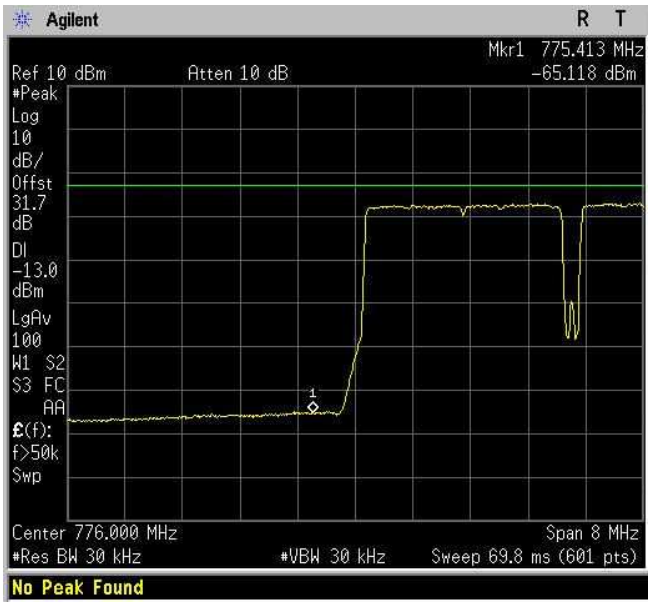
Spurious Emissions at Antenna Terminals
Downlink – 3 QPSK
LOW BAND EDGE



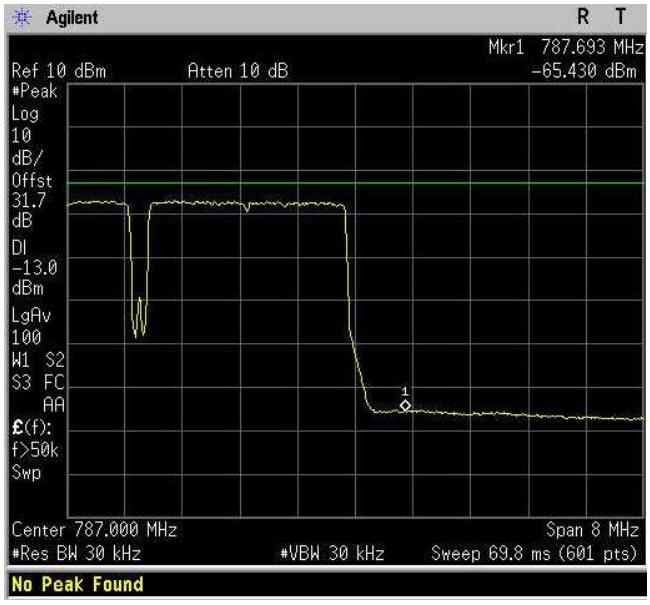
Spurious Emissions at Antenna Terminals
Downlink – 3 QPSK
HIGH BAND EDGE



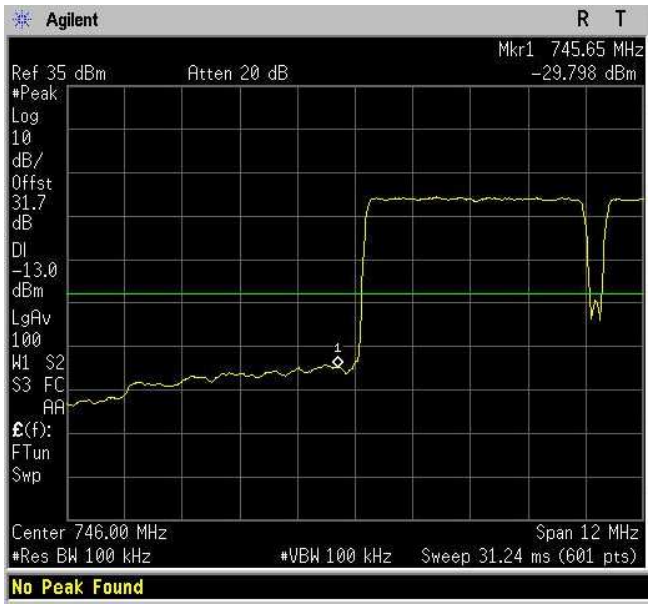
Spurious Emissions at Antenna Terminals
Uplink – 3 QPSK
LOW BAND EDGE



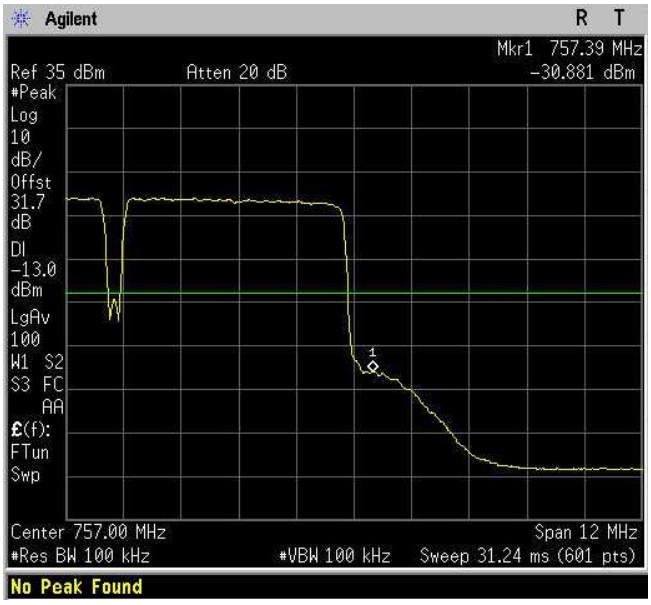
Spurious Emissions at Antenna Terminals
Uplink – 3 QPSK
HIGH BAND EDGE



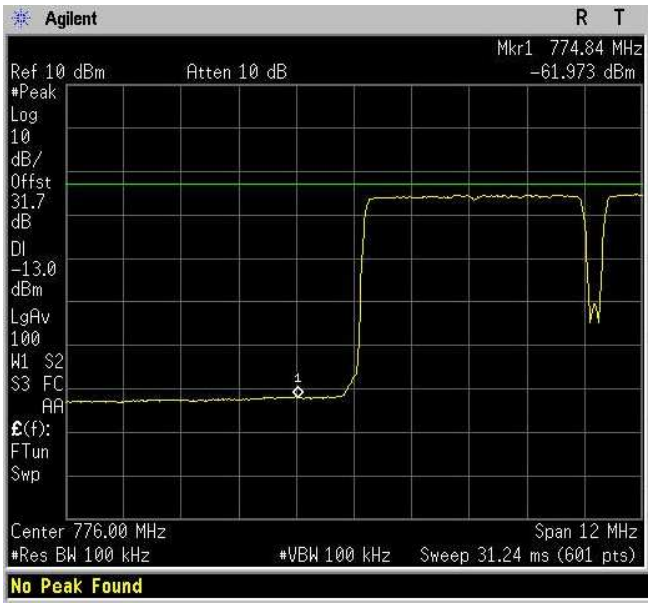
Spurious Emissions at Antenna Terminals
Downlink – 5 QAM
LOW BAND EDGE



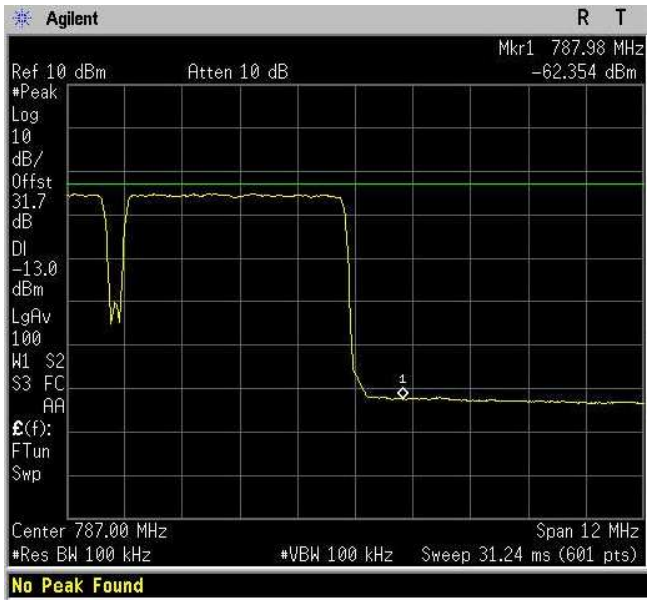
Spurious Emissions at Antenna Terminals
Downlink – 5 QAM
HIGH BAND EDGE



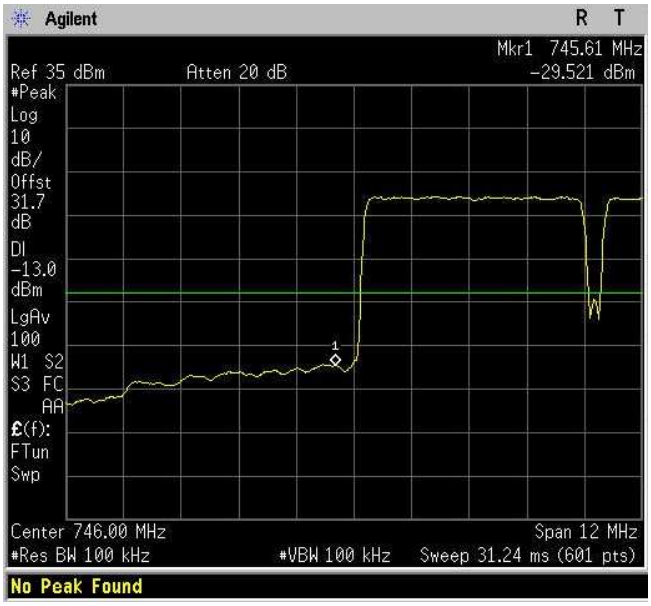
Spurious Emissions at Antenna Terminals
Uplink – 5 QAM
LOW BAND EDGE



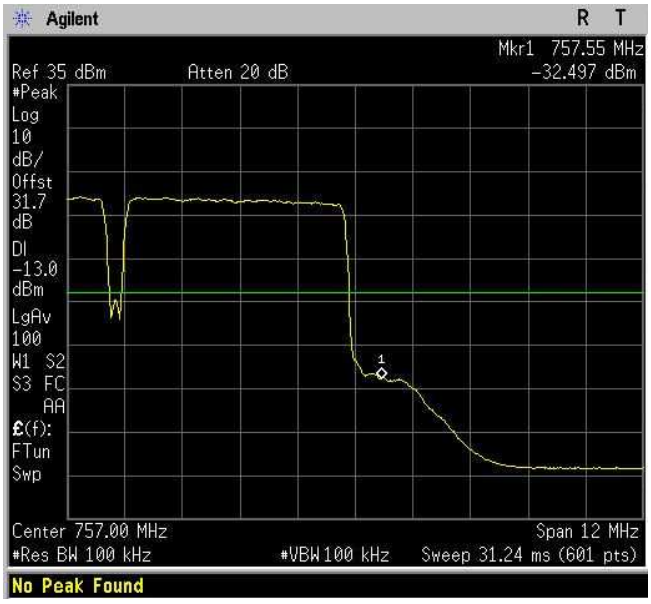
Spurious Emissions at Antenna Terminals
Uplink – 5 QAM
HIGH BAND EDGE



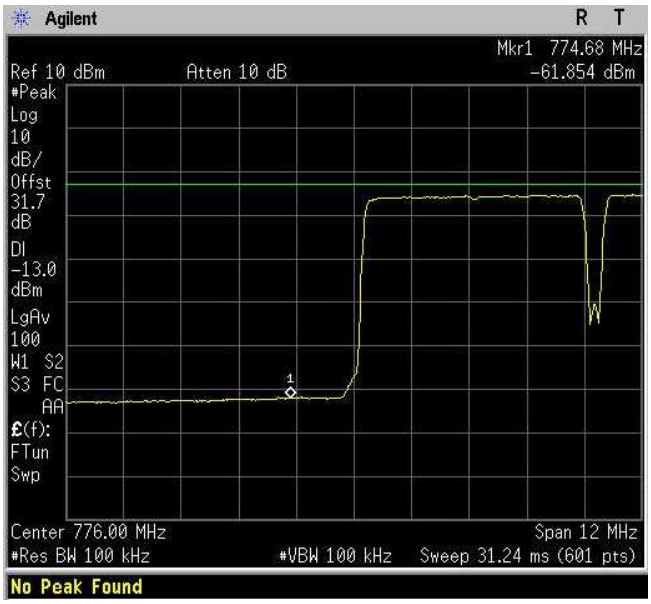
Spurious Emissions at Antenna Terminals
Downlink – 5 QPSK
LOW BAND EDGE



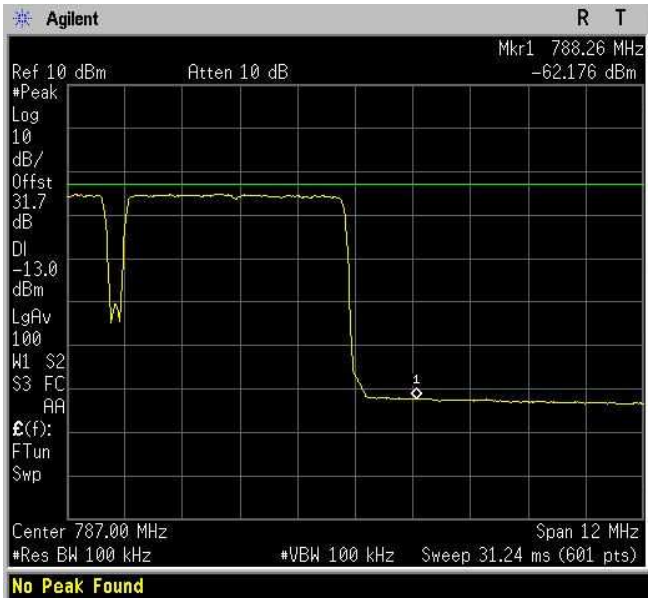
Spurious Emissions at Antenna Terminals
Downlink – 5 QPSK
HIGH BAND EDGE



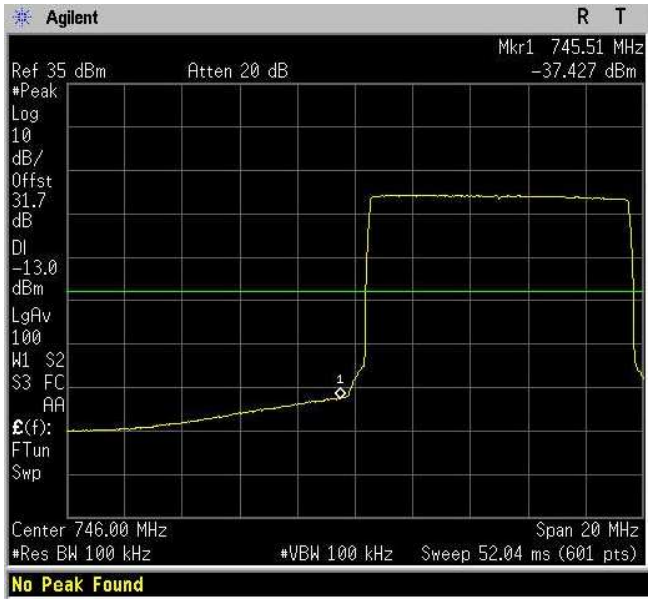
Spurious Emissions at Antenna Terminals
Uplink – 5 QPSK
LOW BAND EDGE



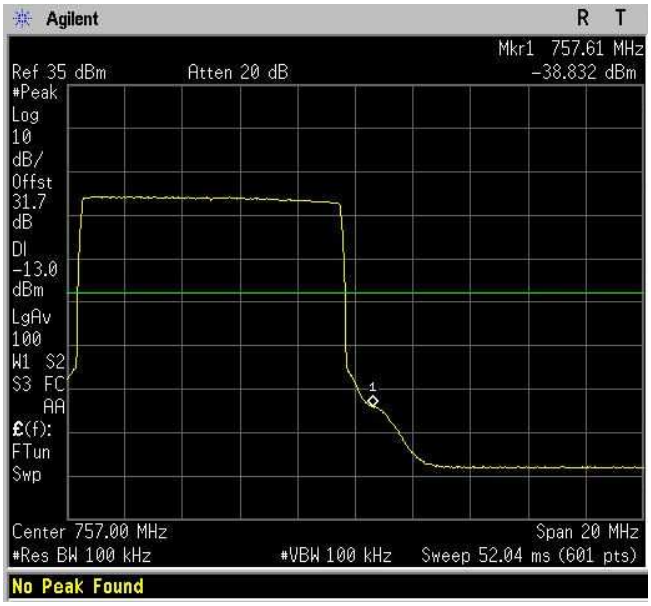
Spurious Emissions at Antenna Terminals
Uplink – 5 QPSK
HIGH BAND EDGE



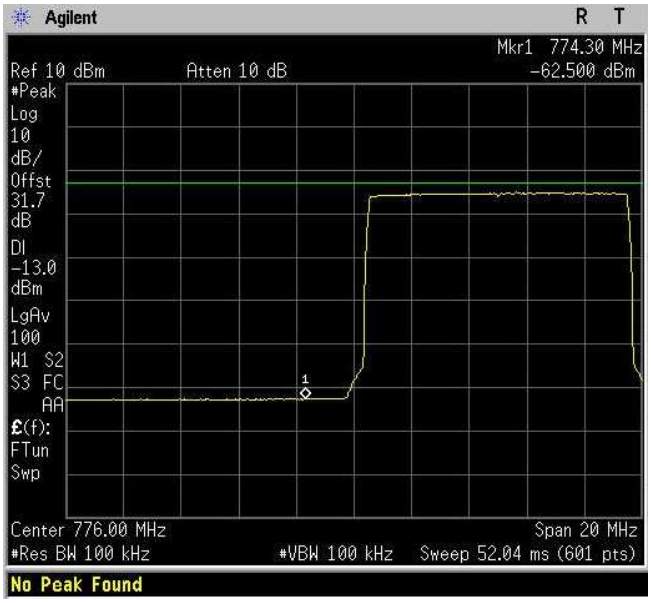
Spurious Emissions at Antenna Terminals
Downlink – 10 QAM
LOW BAND EDGE



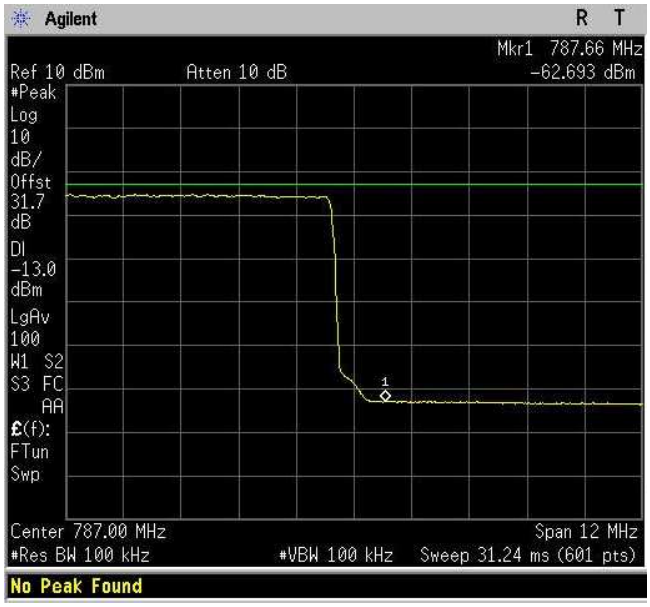
Spurious Emissions at Antenna Terminals
Downlink – 10 QAM
HIGH BAND EDGE



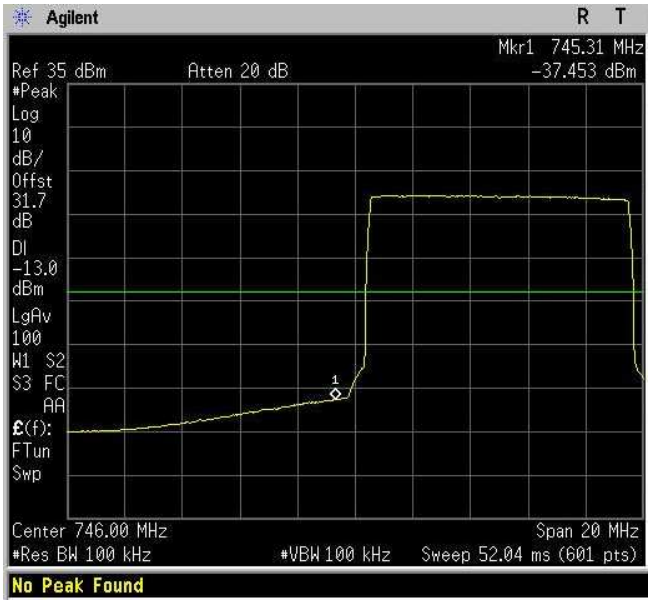
Spurious Emissions at Antenna Terminals
Uplink – 10 QAM
LOW BAND EDGE



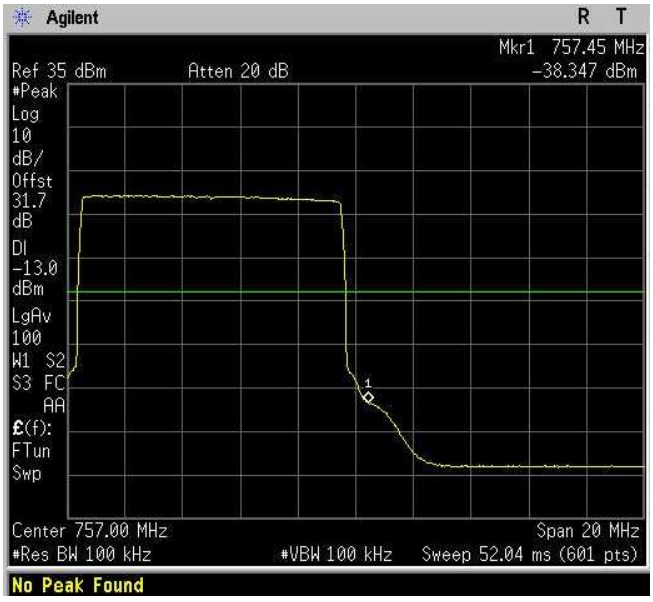
Spurious Emissions at Antenna Terminals
Uplink – 10 QAM
HIGH BAND EDGE



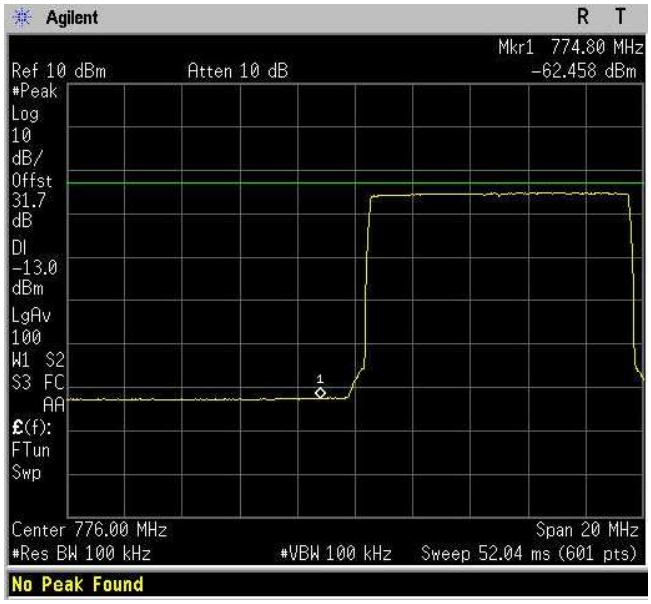
Spurious Emissions at Antenna Terminals
Downlink – 10 QPSK
LOW BAND EDGE



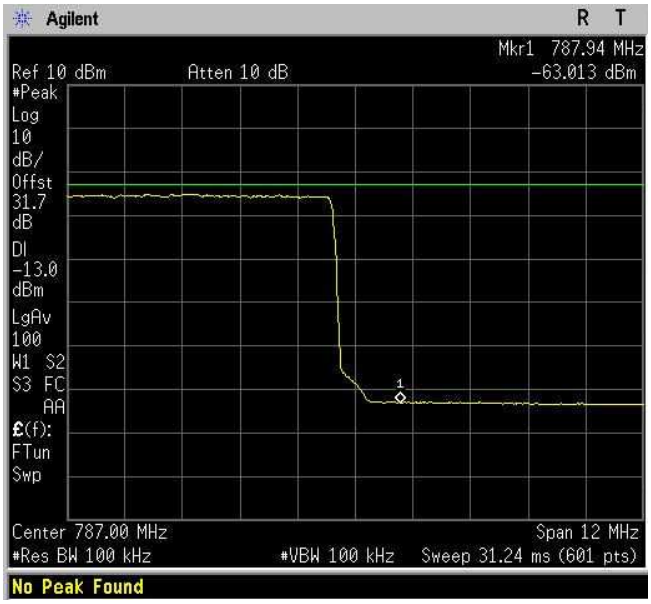
Spurious Emissions at Antenna Terminals
Downlink – 10 QPSK
HIGH BAND EDGE



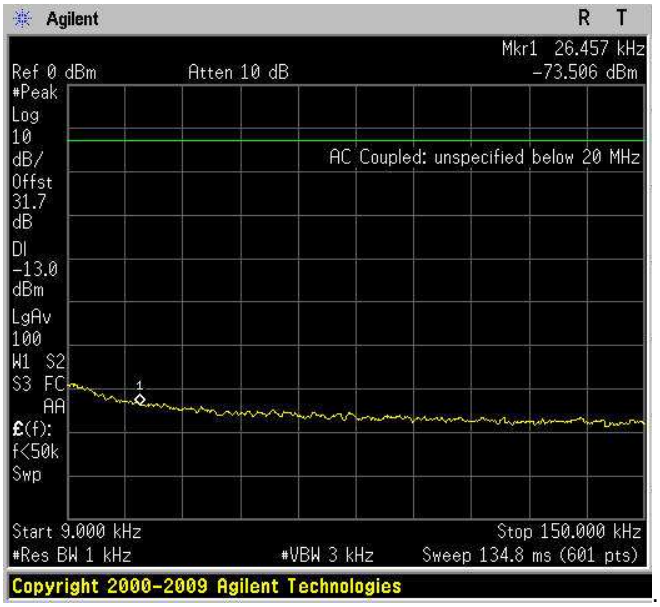
Spurious Emissions at Antenna Terminals
Uplink – 10 QPSK
LOW BAND EDGE



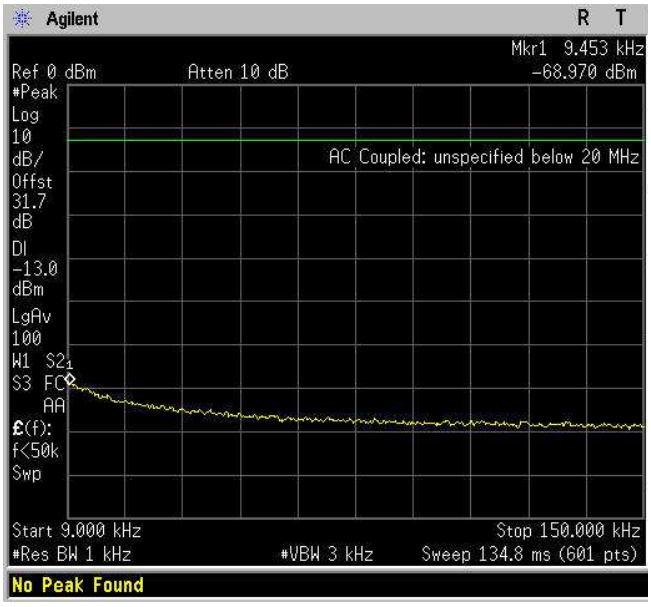
Spurious Emissions at Antenna Terminals
Uplink – 10 QPSK
HIGH BAND EDGE



Spurious Emissions at Antenna Terminals
Downlink – 1,4 QAM
9 kHz – 150 kHz

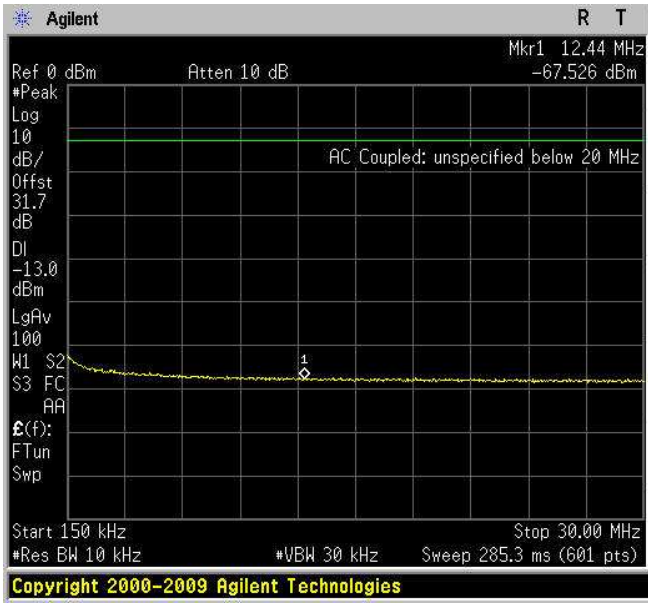


Spurious Emissions at Antenna Terminals
Uplink – 1,4 QAM
9 kHz – 150 kHz

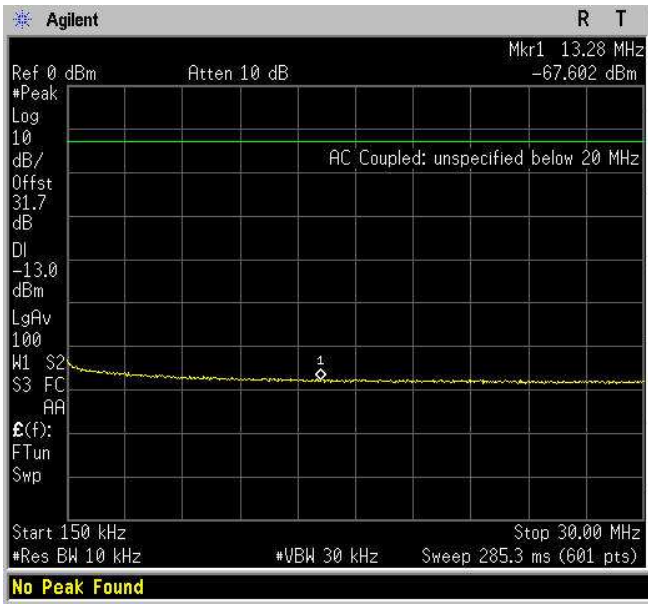


Only 1,4 QAM 9kHz-150kHz spurious emission plots are included here, other modulations spurious emission plots are negligible and the same.

Spurious Emissions at Antenna Terminals
Downlink – 1,4 QAM
150 kHz – 30MHz

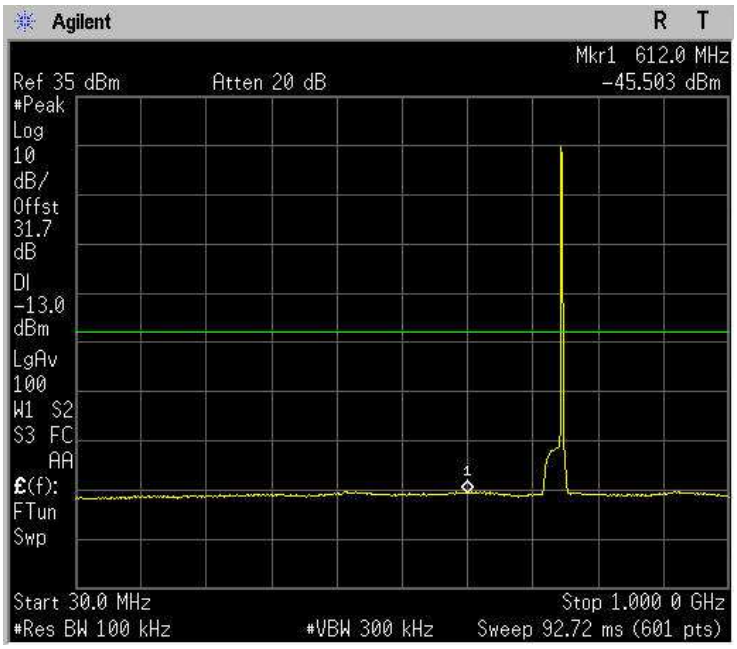


Spurious Emissions at Antenna Terminals
Uplink – 1,4 QAM
150 kHz – 30MHz

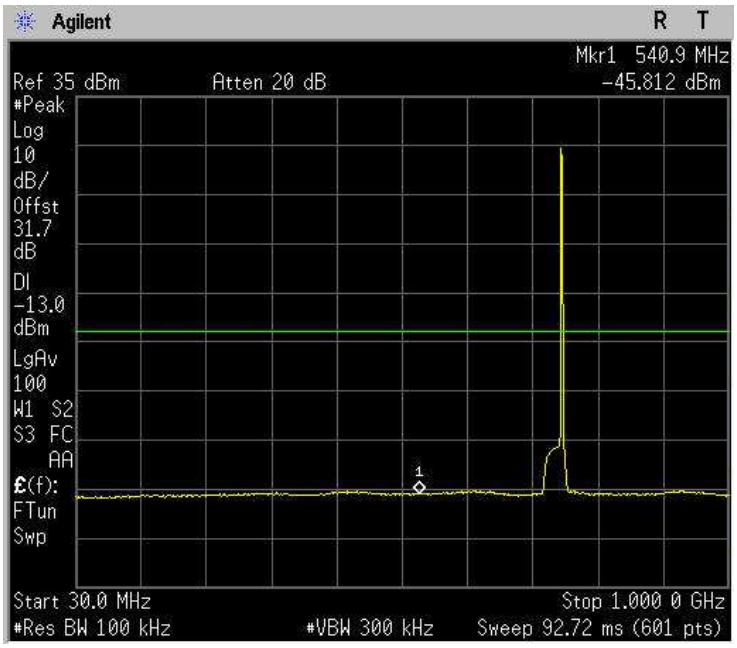


Only 1,4 QAM 150kHz-30MHz spurious emission plots are included here, other modulations spurious emission plots are negligible and the same.

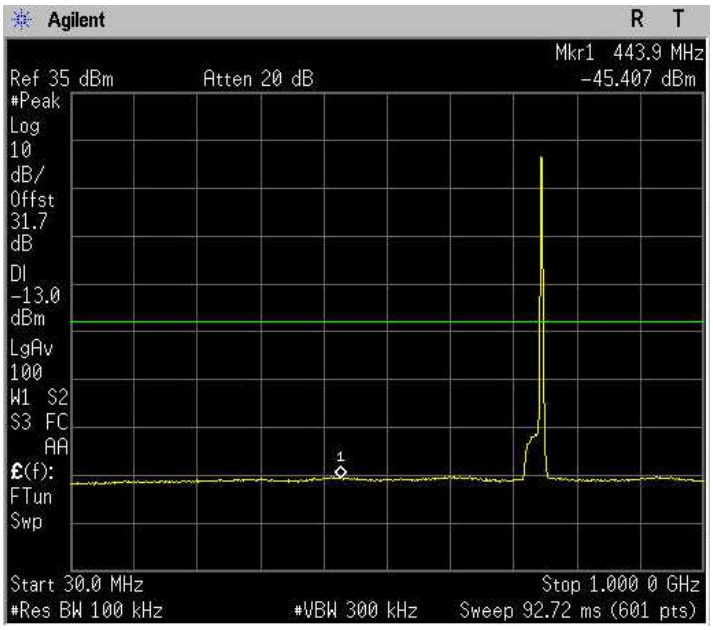
Spurious Emissions at Antenna Terminals
Downlink – 1,4 QAM
30MHz – 1 GHz



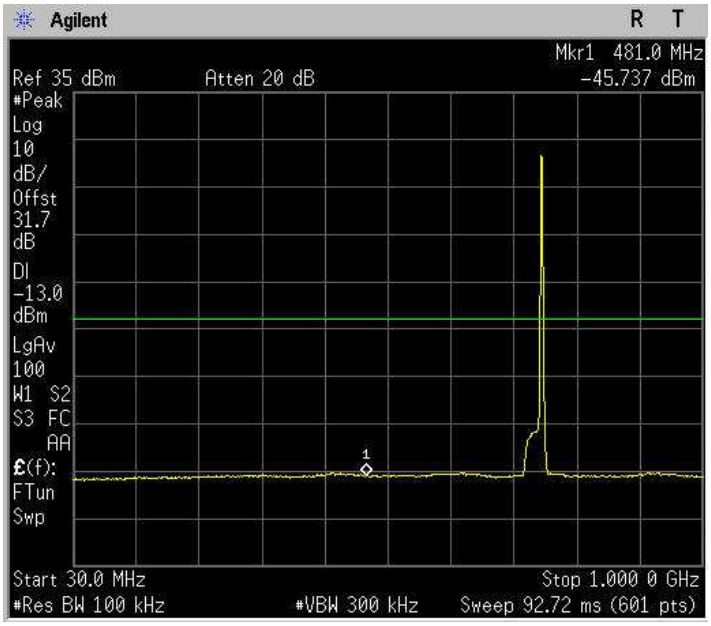
Spurious Emissions at Antenna Terminals
Downlink – 1,4 QPSK
30MHz – 1 GHz



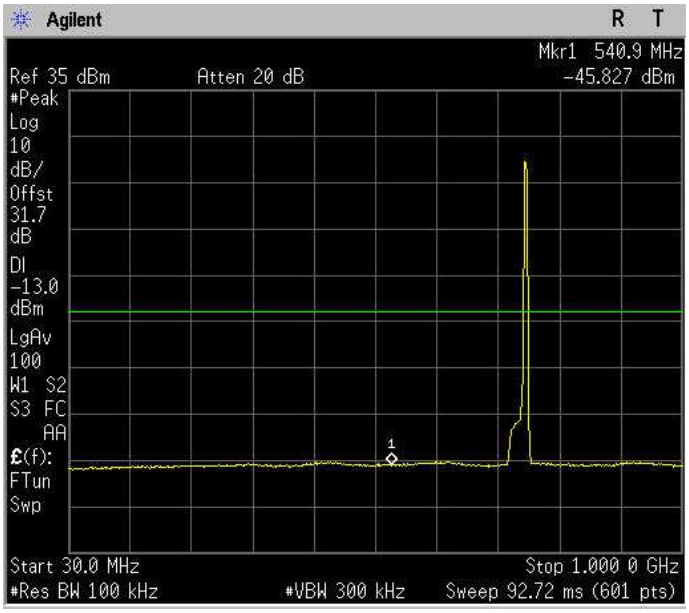
Spurious Emissions at Antenna Terminals
Downlink – 3 QAM
30MHz – 1 GHz



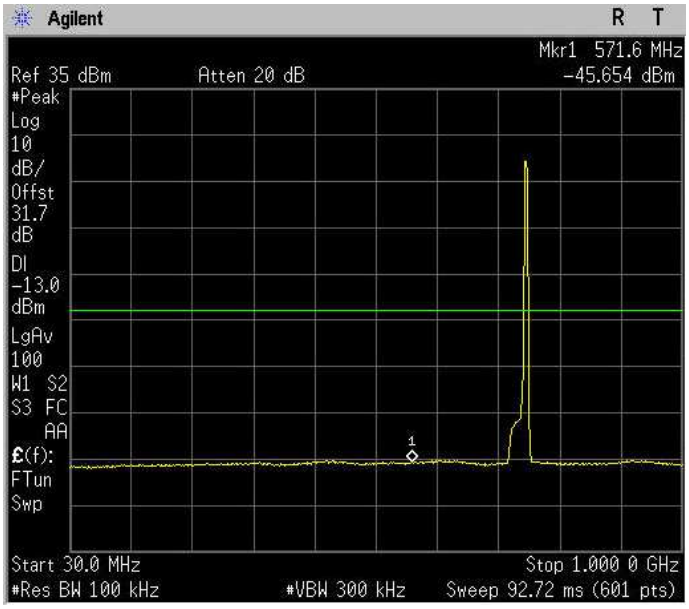
Spurious Emissions at Antenna Terminals
Downlink – 3 QPSK
30MHz – 1 GHz



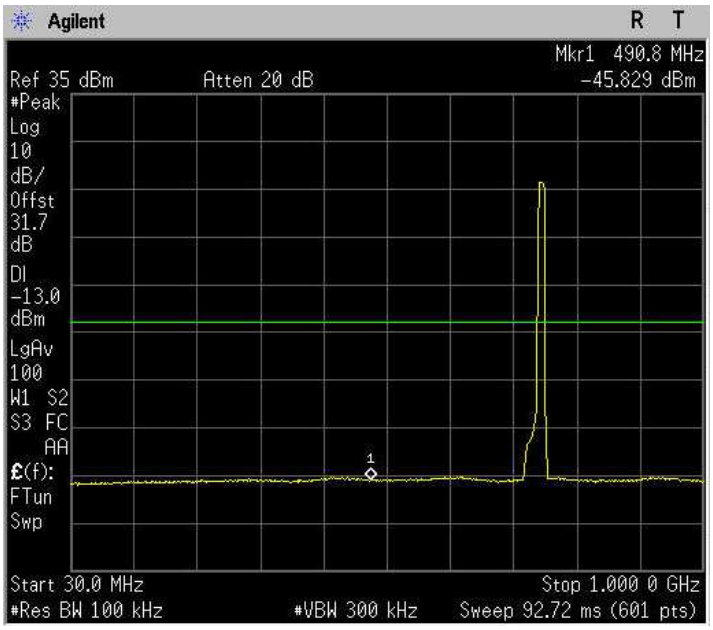
Spurious Emissions at Antenna Terminals
Downlink – 5 QAM
30MHz – 1 GHz



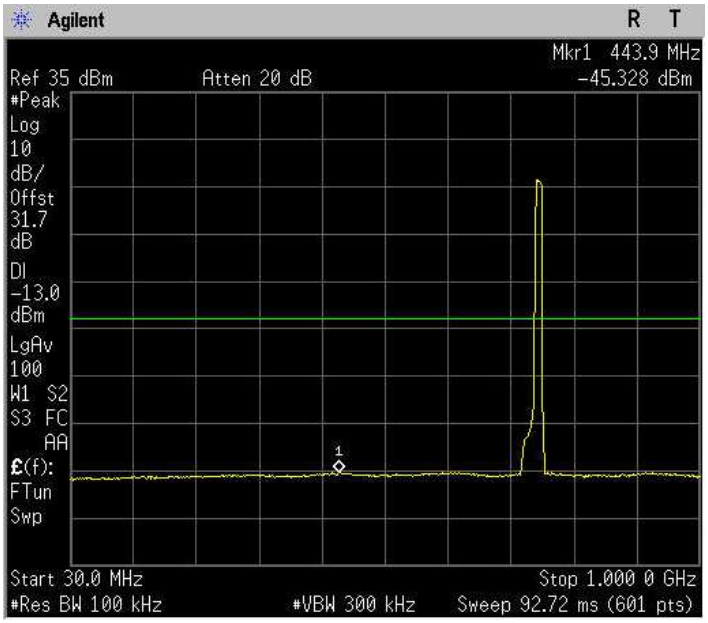
Spurious Emissions at Antenna Terminals
Downlink – 5 QPSK
30MHz – 1 GHz



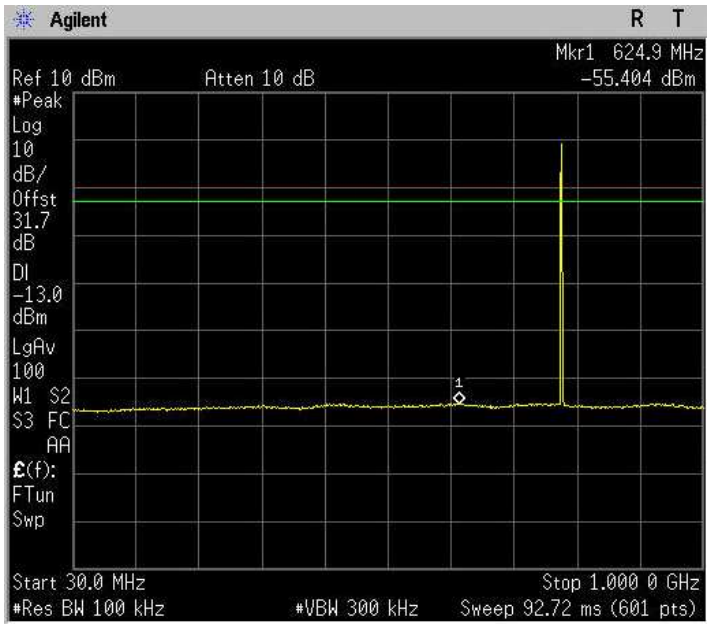
Spurious Emissions at Antenna Terminals
Downlink – 10 QAM
30MHz – 1 GHz



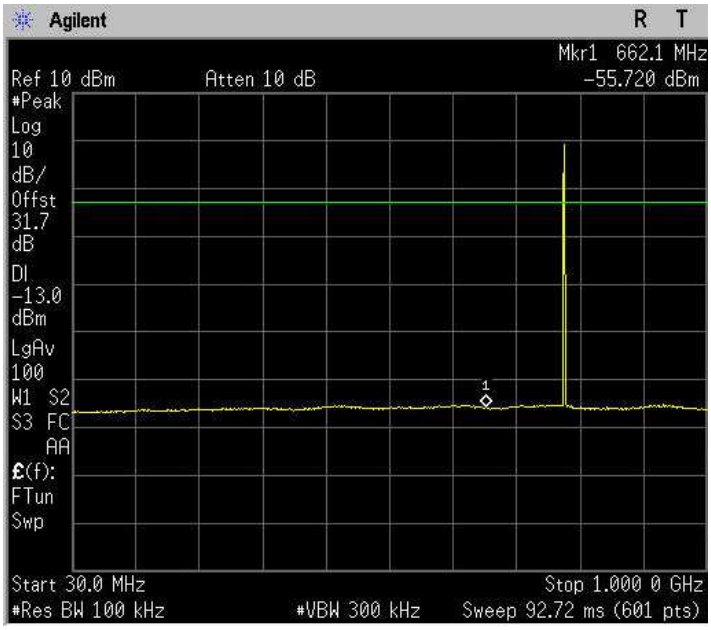
Spurious Emissions at Antenna Terminals
Downlink – 10 QPSK
30MHz – 1 GHz



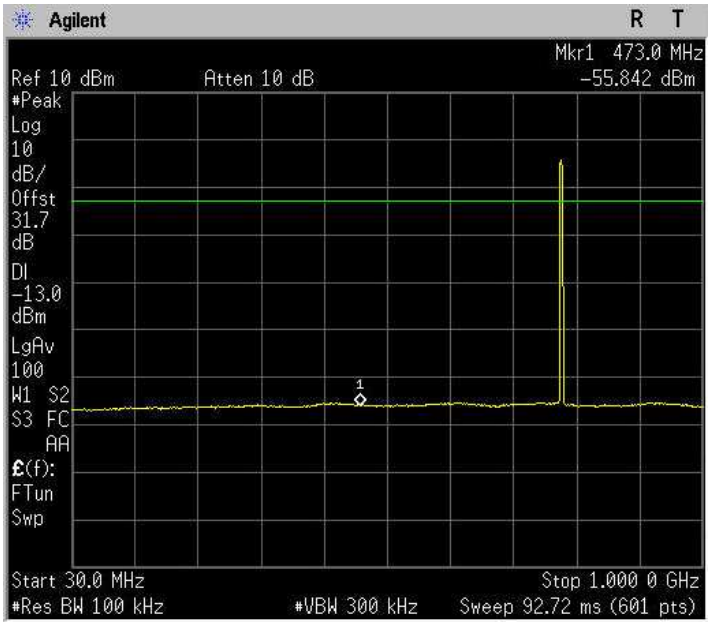
Spurious Emissions at Antenna Terminals
Uplink – 1,4 QAM
30MHz – 1 GHz



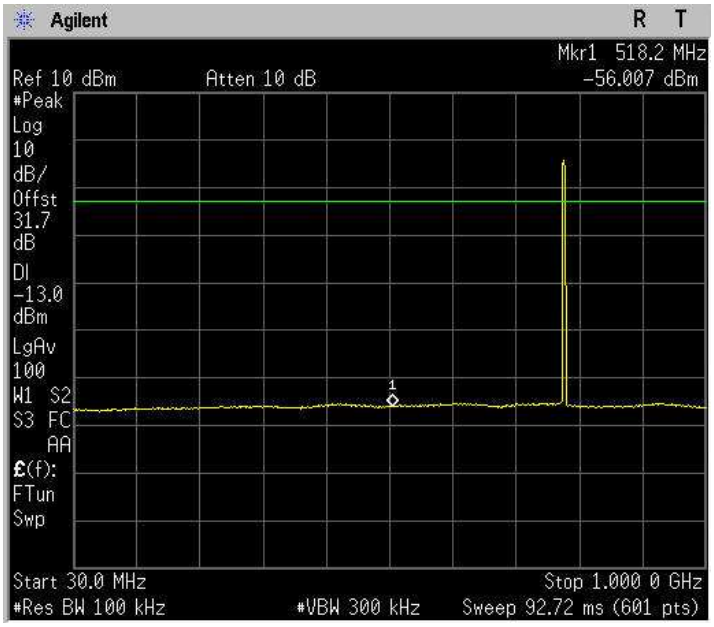
Spurious Emissions at Antenna Terminals
Uplink – 1,4 QPSK
30MHz – 1 GHz



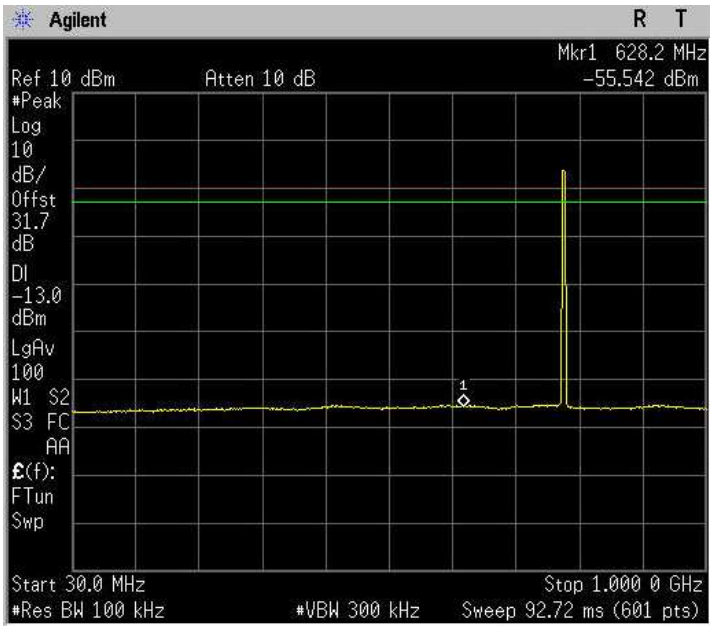
Spurious Emissions at Antenna Terminals
Uplink – 3 QAM
30MHz – 1 GHz



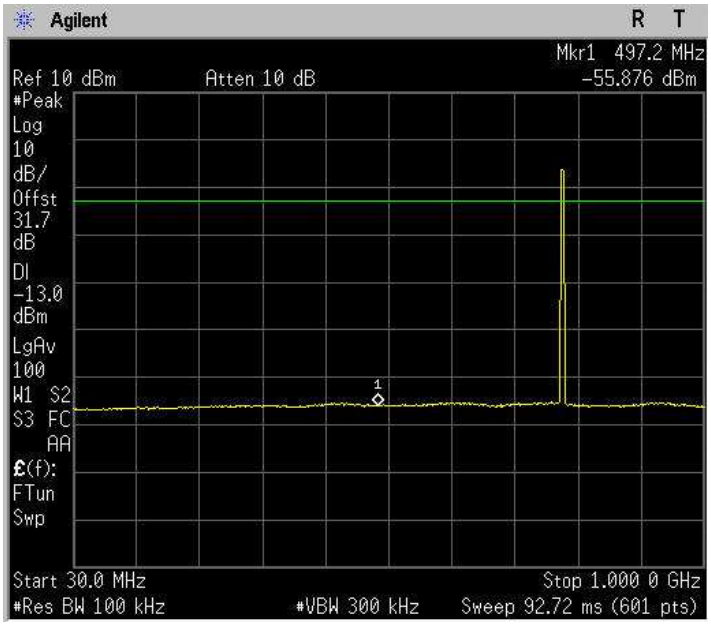
Spurious Emissions at Antenna Terminals
Uplink – 3 QPSK
30MHz – 1 GHz



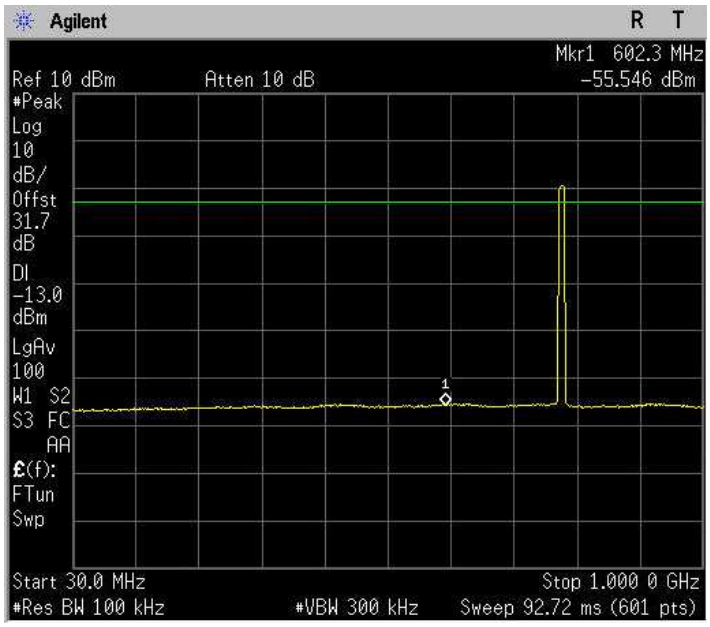
Spurious Emissions at Antenna Terminals
Uplink – 5 QAM
30MHz – 1 GHz



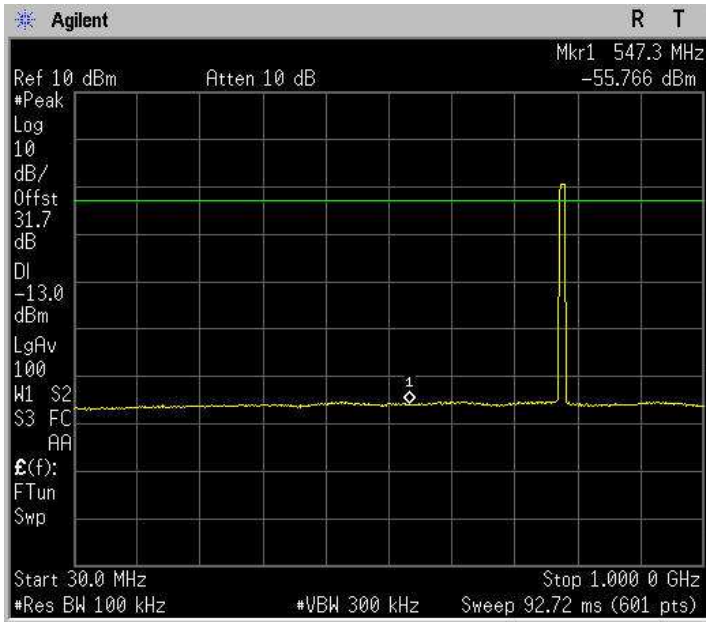
Spurious Emissions at Antenna Terminals
Uplink – 5 QPSK
30MHz – 1 GHz



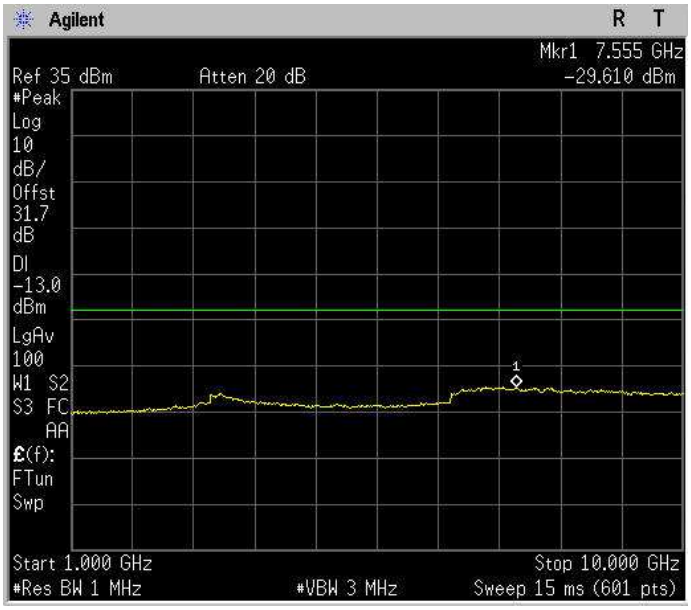
Spurious Emissions at Antenna Terminals
Uplink – 10 QAM
30MHz – 1 GHz



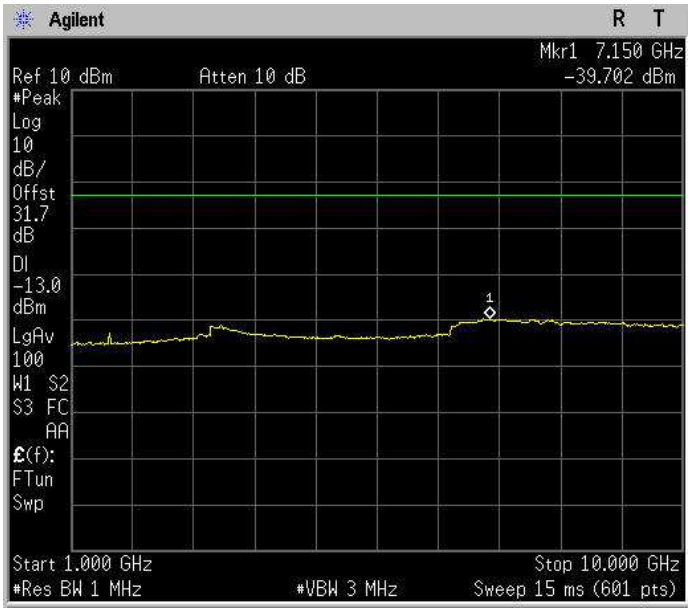
Spurious Emissions at Antenna Terminals
Uplink – 10 QPSK
30MHz – 1 GHz



Spurious Emissions at Antenna Terminals
Downlink – 1,4 QAM
1 GHz – 10 GHz



Spurious Emissions at Antenna Terminals
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.

8.4 Clause 27.53 (g) Radiated spurious emissions

(g) For operations in the 698–746 MHz band and the 776–788 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log (P) dB.

Compliance with the provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed.

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.

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 Ω 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.

The anechoic chamber is pre-calibrated as regards 0 dBm. (antenna factor not necessary).

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

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

Special notes

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

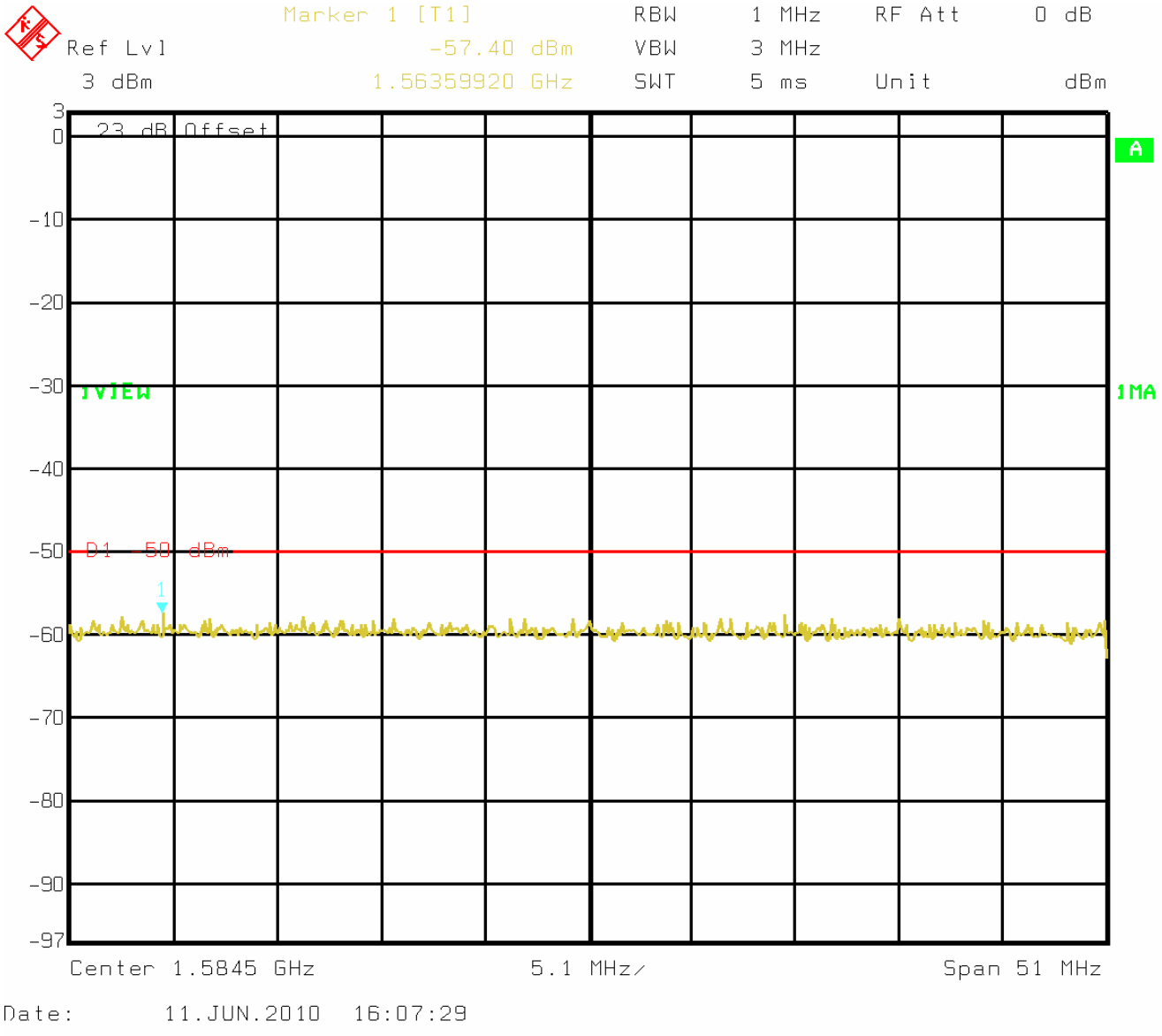
Test performed with antenna connector terminated on shielded 50 Ω dummy load.

Result of D.L. 29 dBm, 751.5 MHz, “1.4” QAM occupied bandwidth 1.2 MHz

(the same for “10”QAM occupied bandwidth 9 MHz)

Test data

Insert plots here



D.L. 29 dBm 751.5 MHz

Spurious emissions measurement results:

Frequency (MHz)	Polarization. V/H	Field strength (dBm)eirp	Limit (dBm)eirp	Margin (dB)
1563.59	The same	-57.40	-50	-7.40

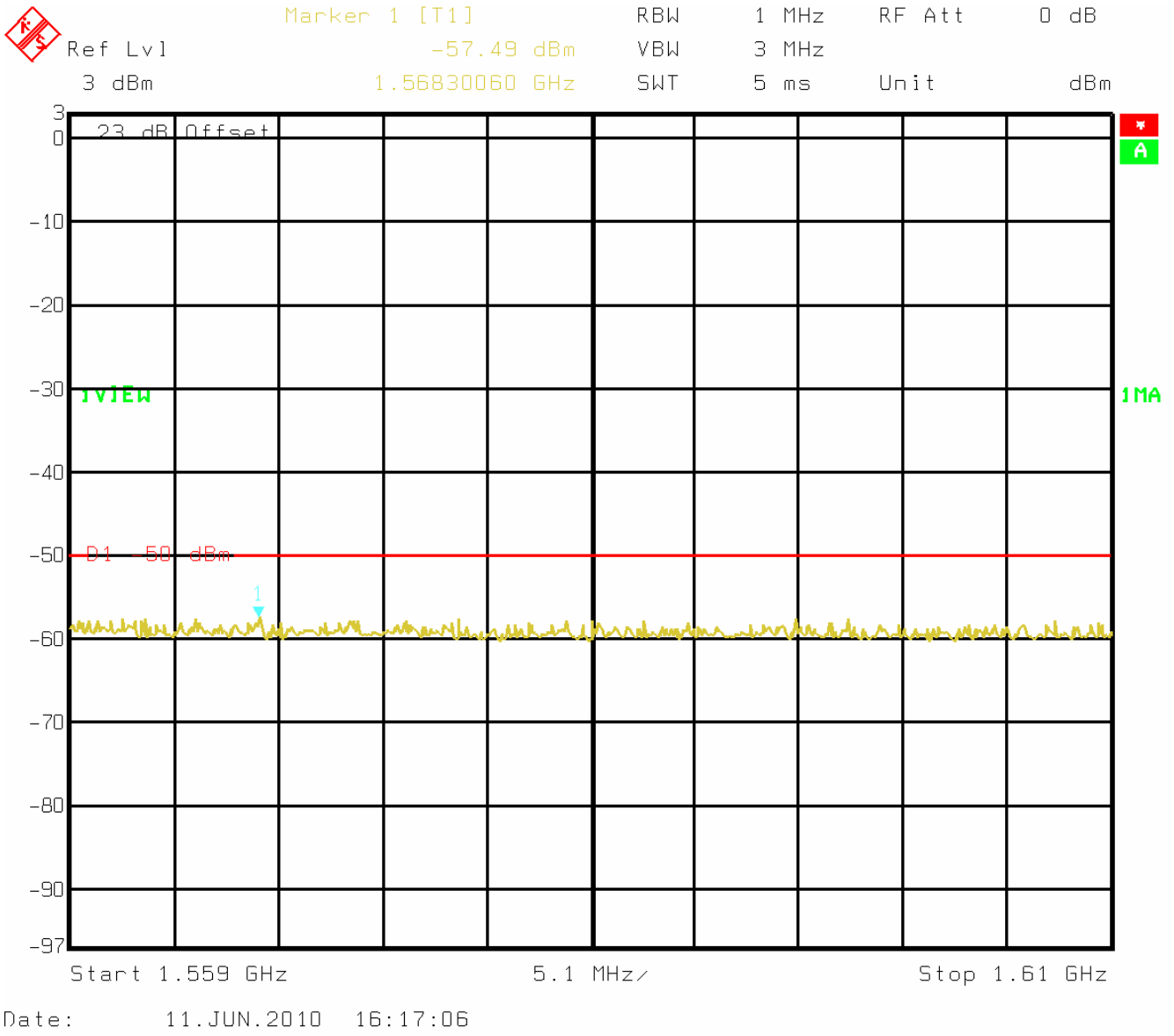
Note: Field strength includes correction factor of antenna, cable loss, amplifier, and attenuators where applicable.

Limit used for discrete emissions: -80 dBw = -50 dBm

Anechoic chamber directly precalibrated in dBm eirp at 3 m.distance.

Result of U.L. 4 dBm, 781.5 MHz, “1.4” QAM occupied bandwidth 1.2 MHz

(the same for “10”QAM occupied bandwidth 9 MHz)



U.L. 4 dBm 781.5 MHz

Spurious emissions measurement results:				
Frequency (MHz)	Polarization. V/H	Field strength (dBm)eirp	Limit (dBm)eirp	Margin (dB)
1568.30	The same	-57.49	-50	-7.49
Note: Field strength includes correction factor of antenna, cable loss, amplifier, and attenuators where applicable.				

Limit used for discrete emissions: -80 dBw = -50 dBm

Anechoic chamber directly precalibrated in dBm eirp at 3 m.distance.

8.6 Clause 27.54 Frequency stability

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

Special notes

- 26 dBc points including frequency tolerance were assessed to remain within assigned band.
- 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

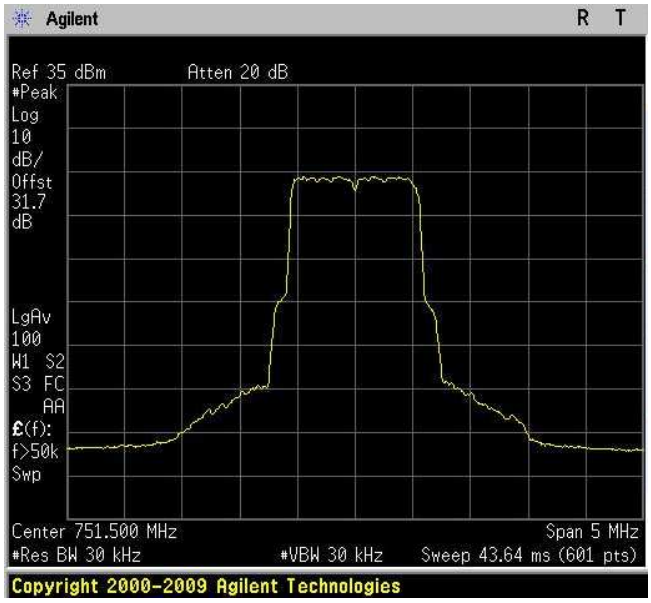
8.7 Clause 2.1049 Occupied bandwidth

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.

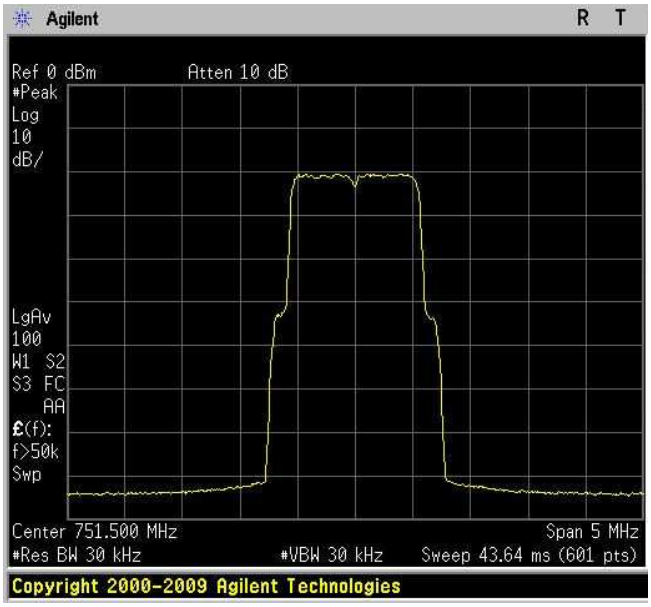
Special notes

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

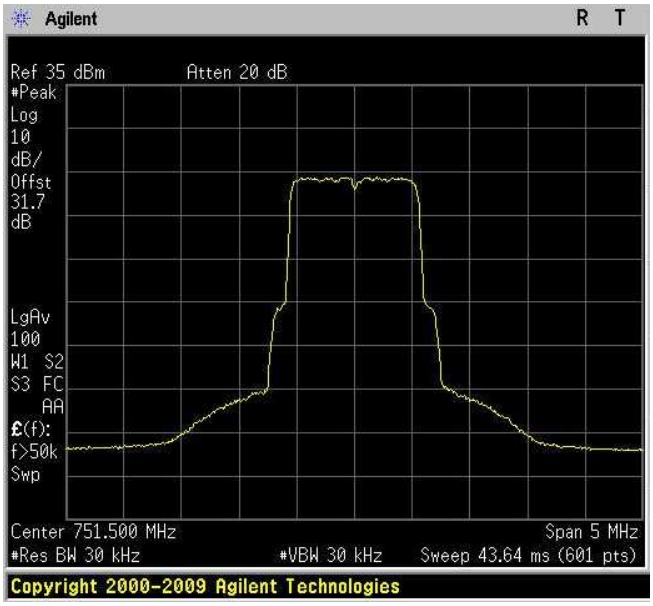
Occupied Bandwidth
Downlink – 1.4 QAM
OUTPUT



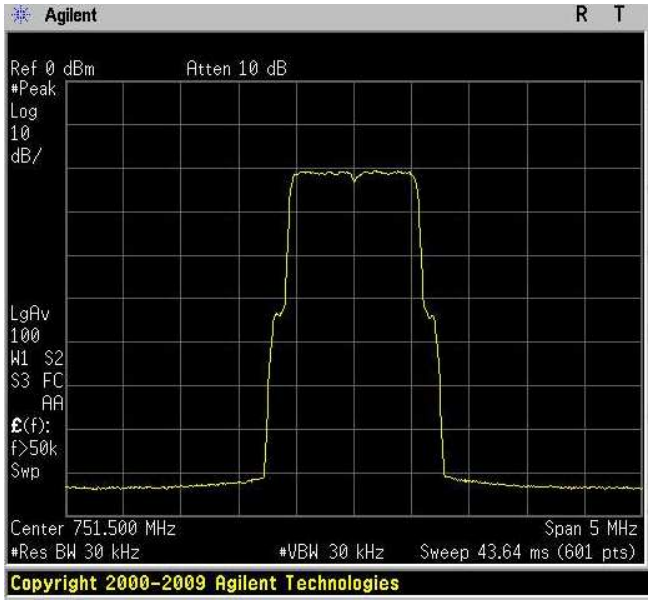
Occupied Bandwidth
Downlink – 1.4 QAM
INPUT



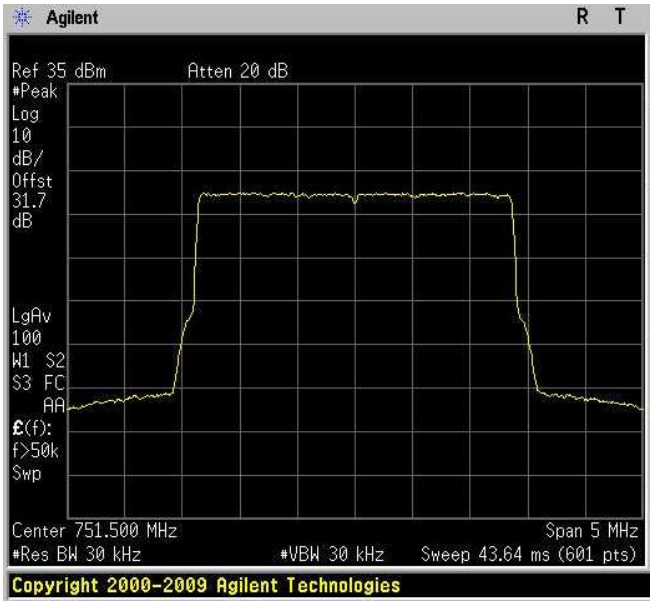
Occupied Bandwidth
Downlink – 1.4 QPSK
OUTPUT



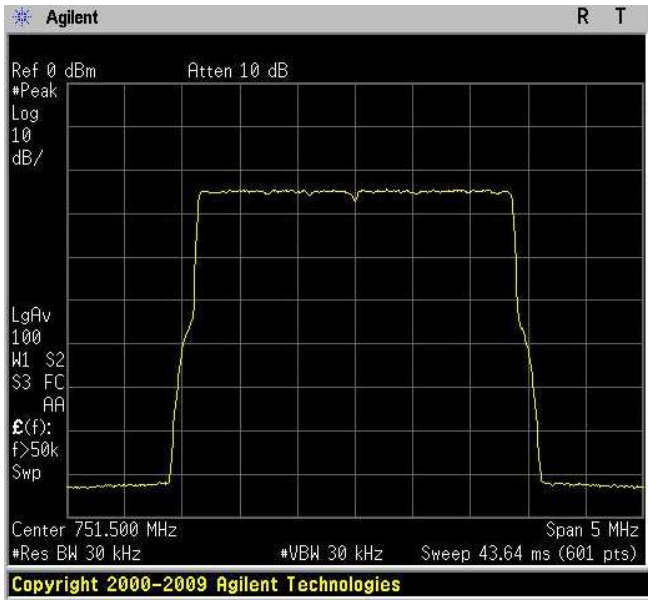
Occupied Bandwidth
Downlink – 1.4 QPSK
INPUT



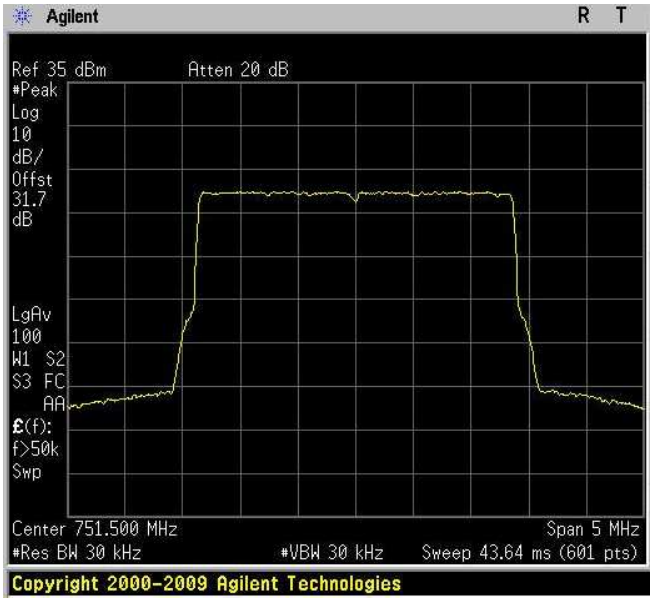
Occupied Bandwidth
Downlink – 3 QAM
OUTPUT



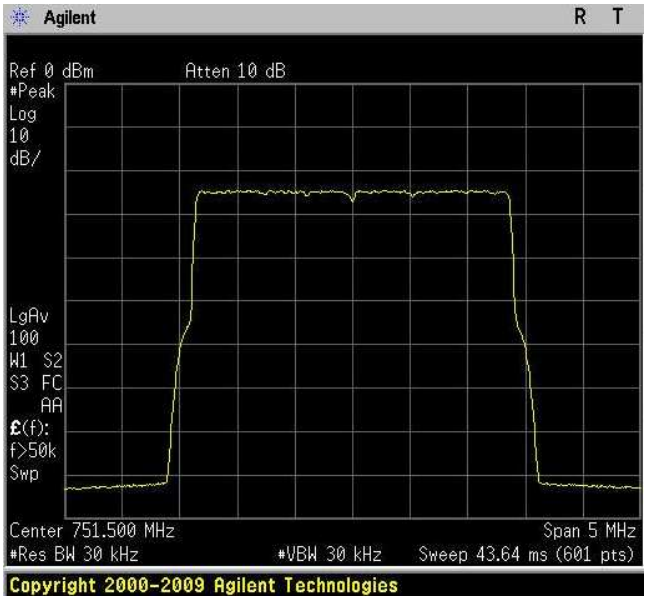
Occupied Bandwidth
Downlink – 3 QAM
INPUT



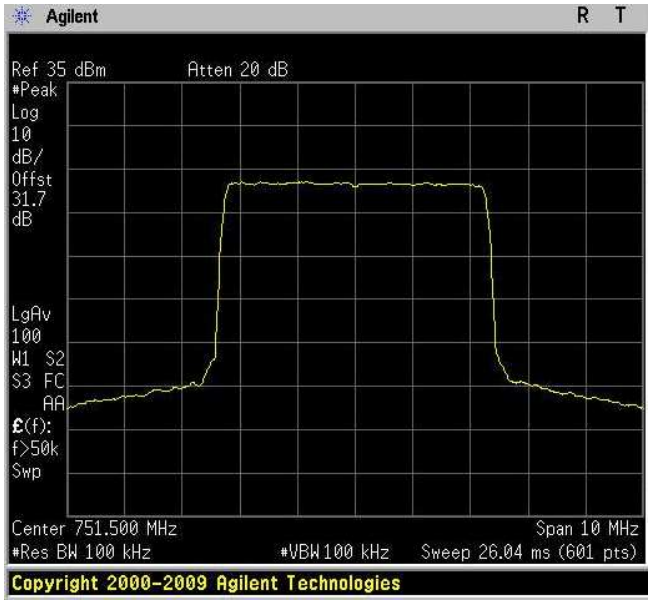
Occupied Bandwidth
Downlink – 3 QPSK
OUTPUT



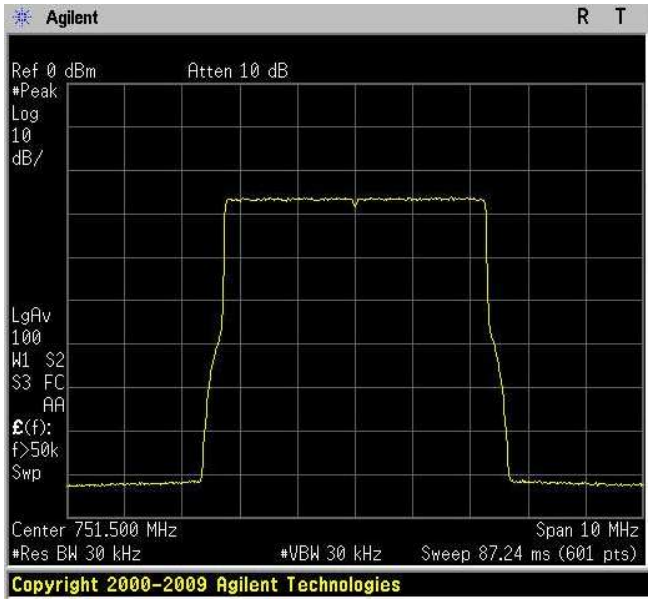
Occupied Bandwidth
Downlink – 3 QPSK
INPUT



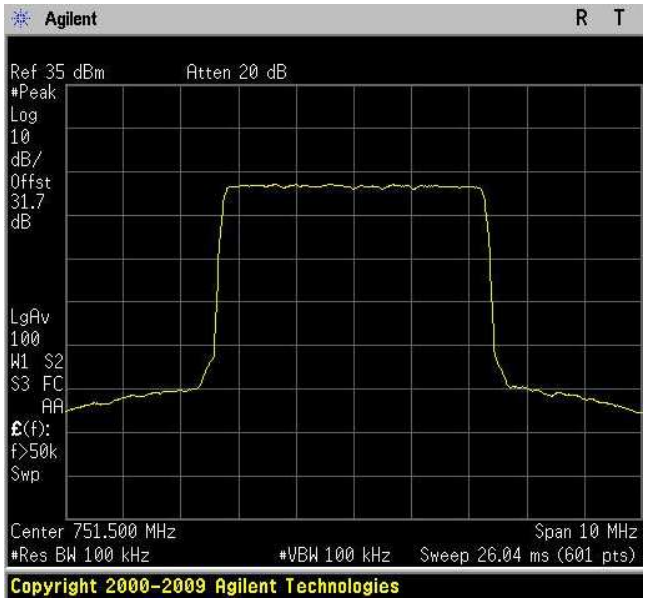
Occupied Bandwidth
Downlink – 5 QAM
OUTPUT



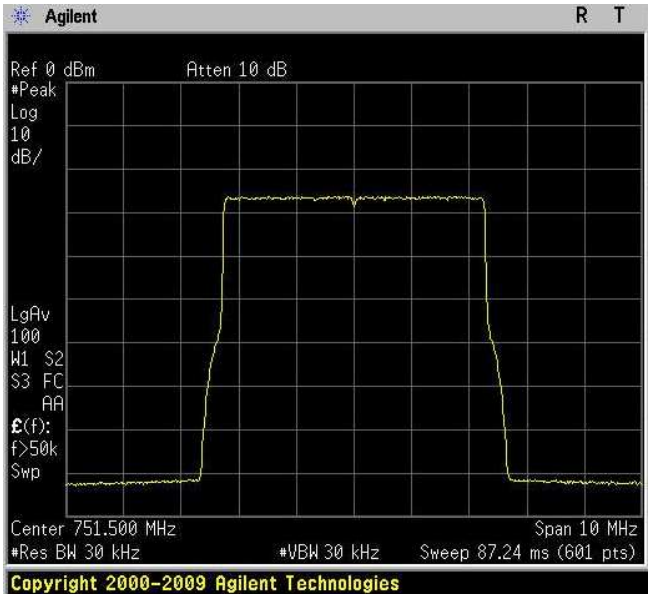
Occupied Bandwidth
Downlink – 5 QAM
INPUT



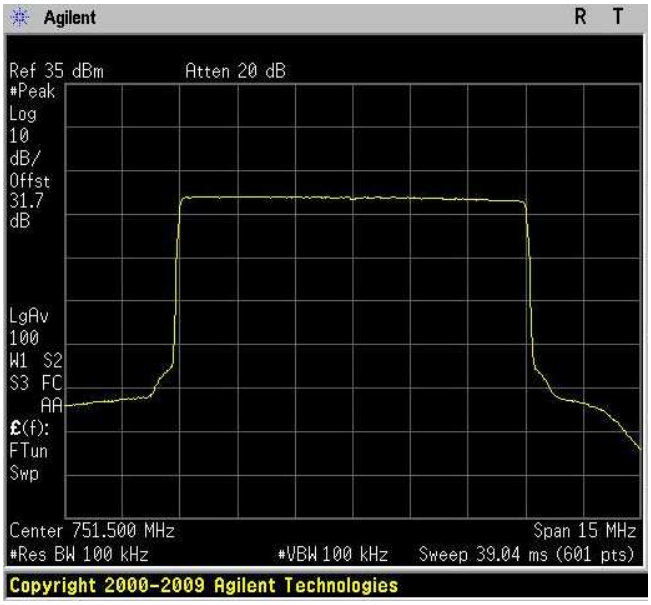
Occupied Bandwidth
Downlink – 5 QPSK
OUTPUT



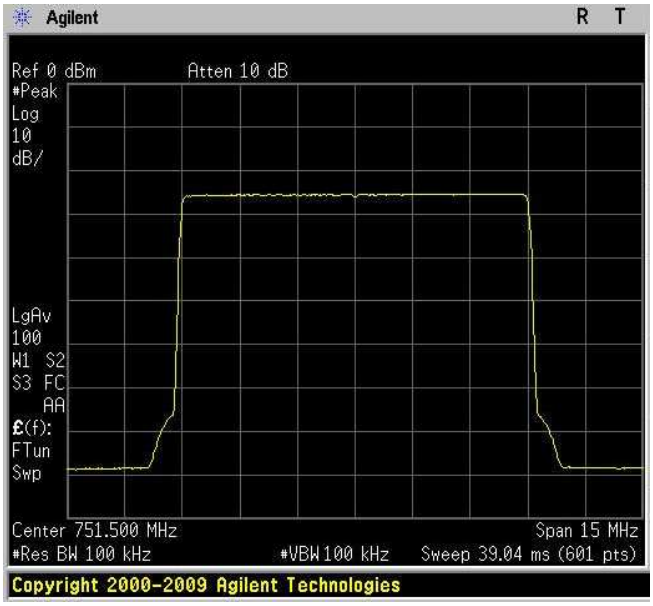
Occupied Bandwidth
Downlink – 5 QPSK
INPUT



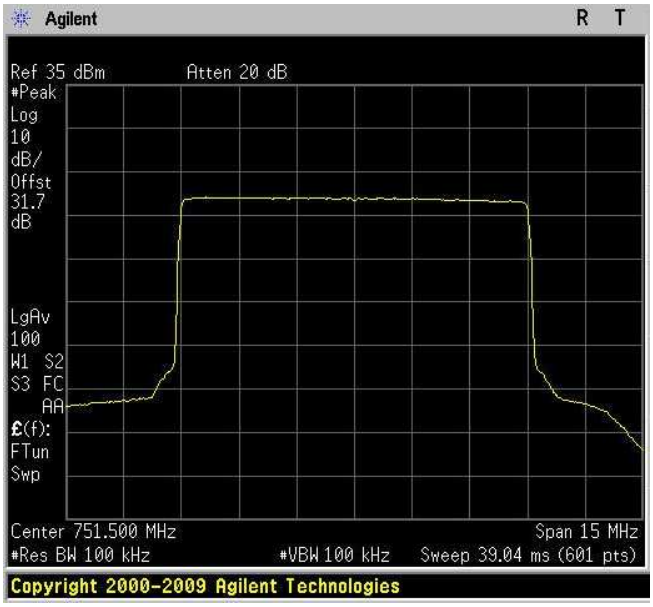
Occupied Bandwidth
Downlink – 10 QAM
OUTPUT



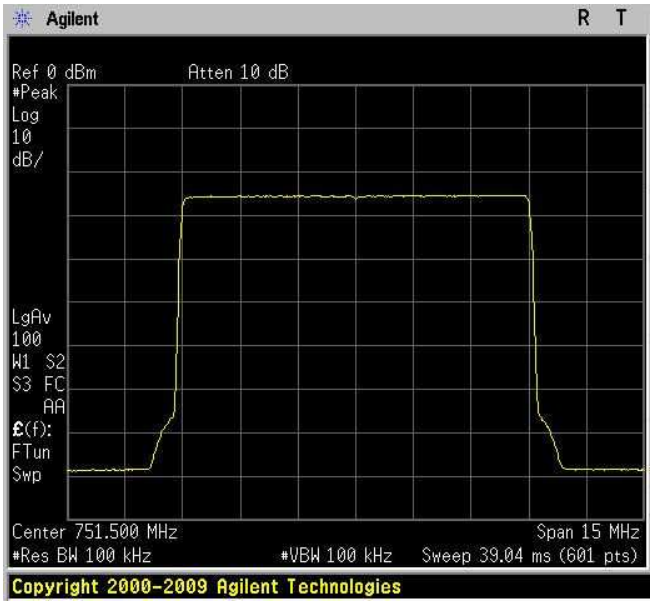
Occupied Bandwidth
Downlink – 10 QAM
INPUT



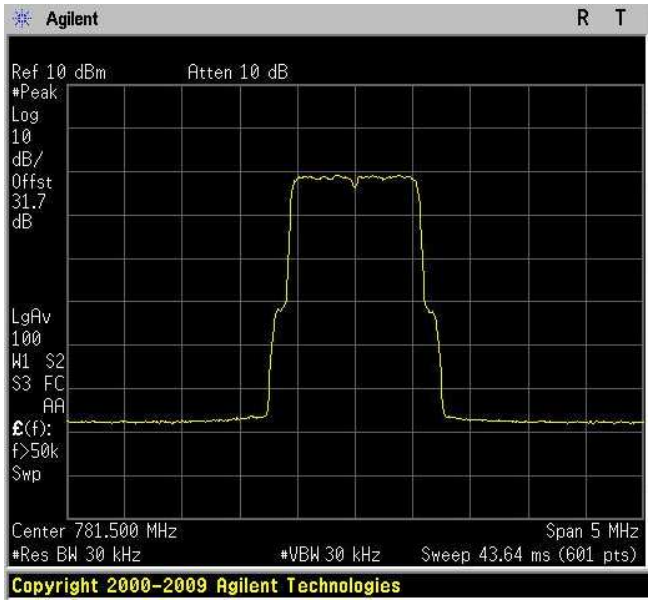
Occupied Bandwidth
Downlink – 10 QPSK
OUTPUT



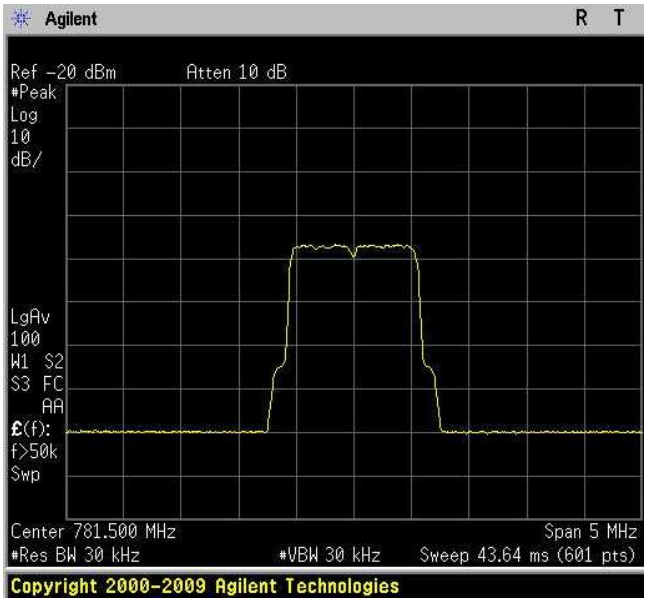
Occupied Bandwidth
Downlink – 10 QPSK
INPUT



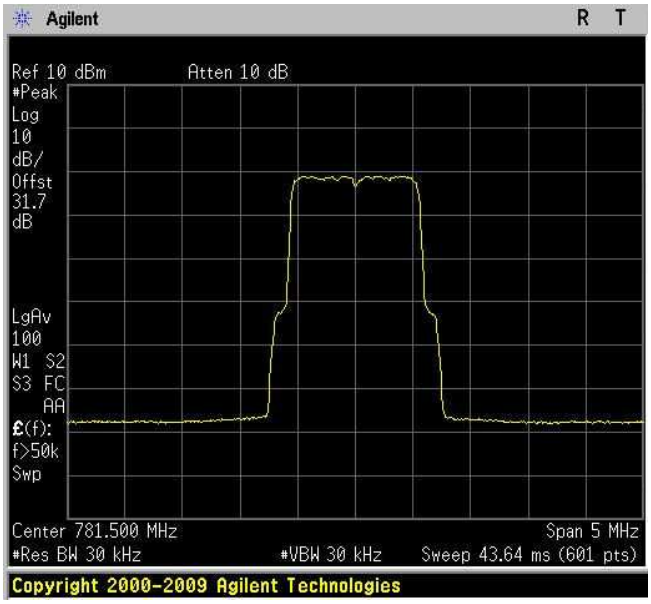
Occupied Bandwidth
Uplink – 1,4 QAM
OUTPUT



Occupied Bandwidth
Uplink – 1,4 QAM
INPUT



Occupied Bandwidth
Uplink – 1,4 QPSK
OUTPUT



Occupied Bandwidth
Uplink – 1,4 QPSK
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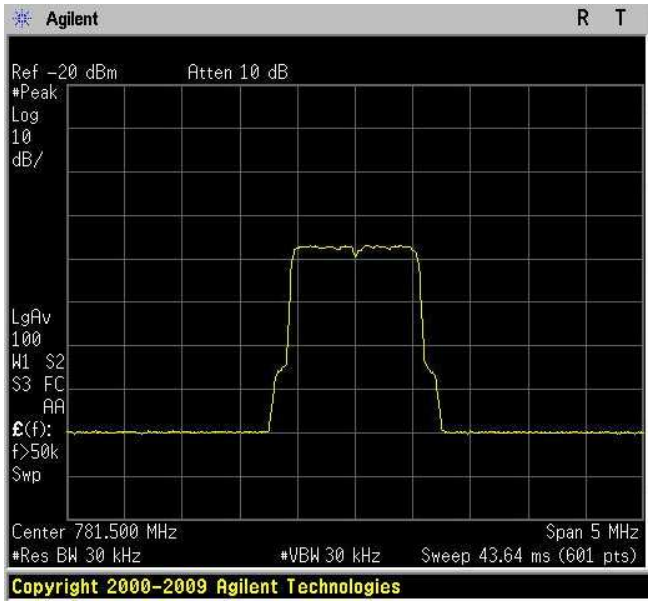

Occupied Bandwidth
Uplink – 3 QAM
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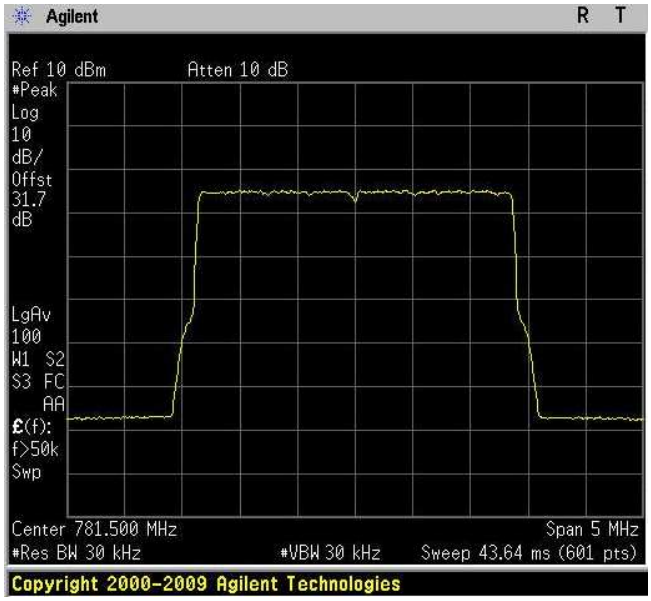
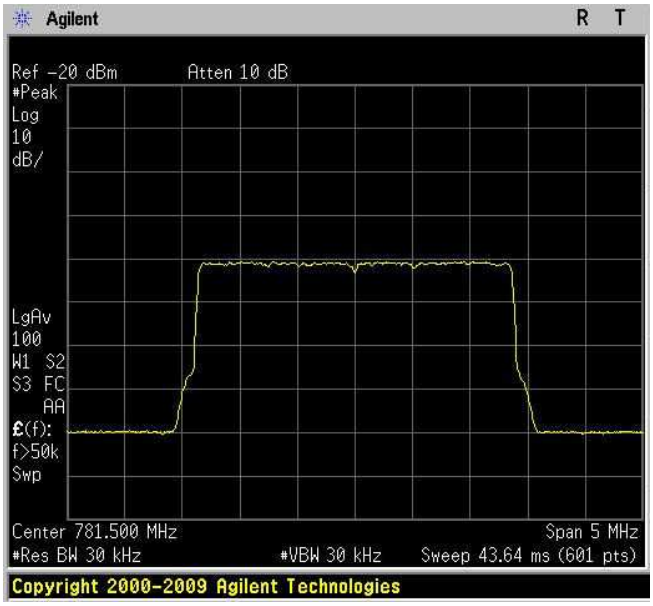
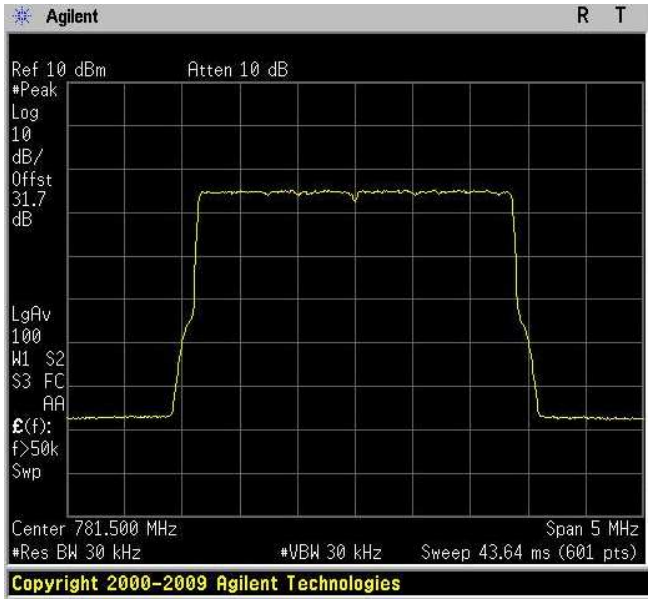


Occupied Bandwidth
Uplink – 3 QAM
INPUT



Occupied Bandwidth
Uplink – 3 QPSK
OUTPUT



Occupied Bandwidth
Uplink – 3 QPSK
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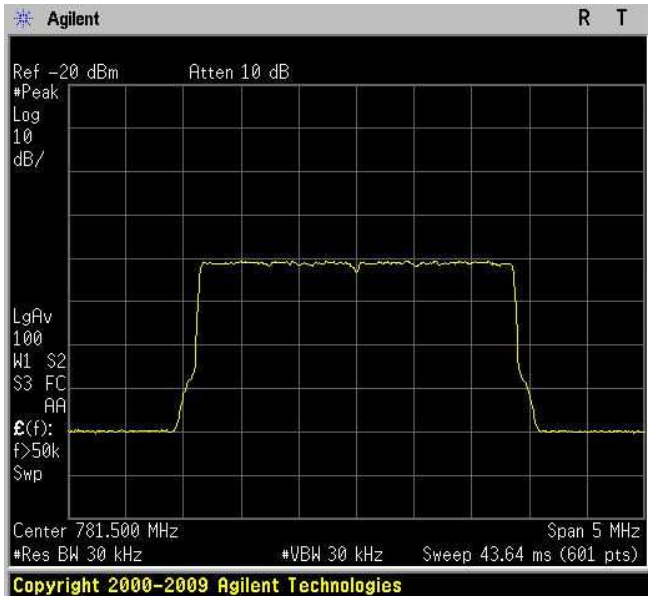

Occupied Bandwidth
Uplink – 5 QAM
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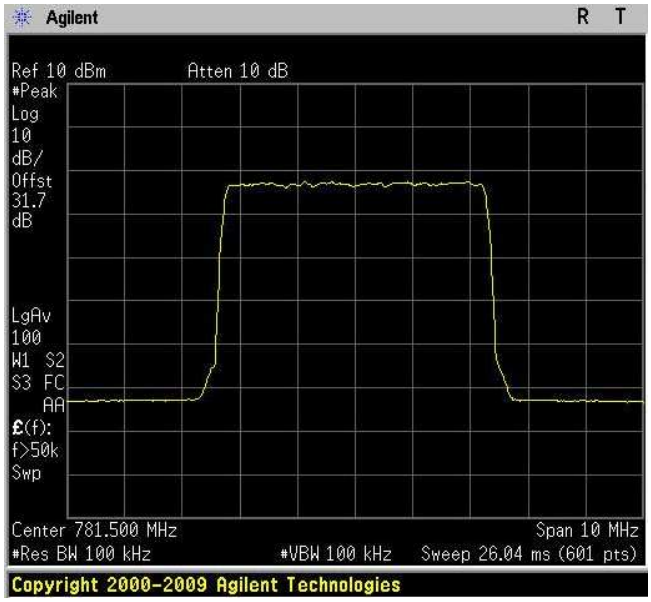
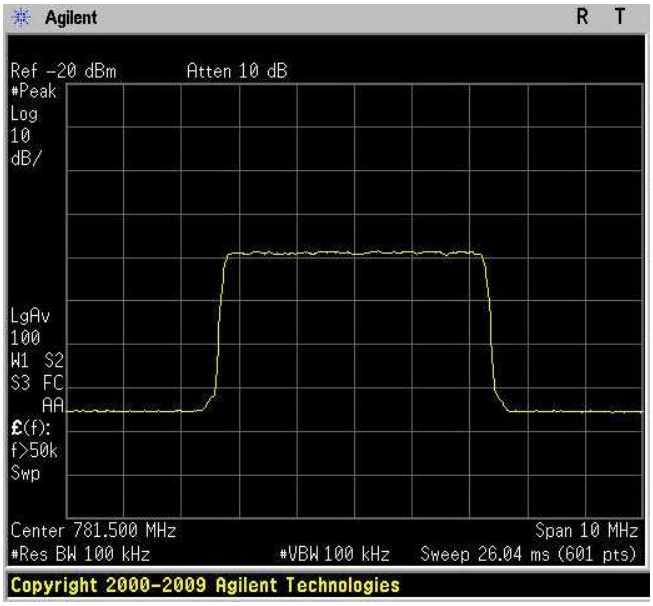
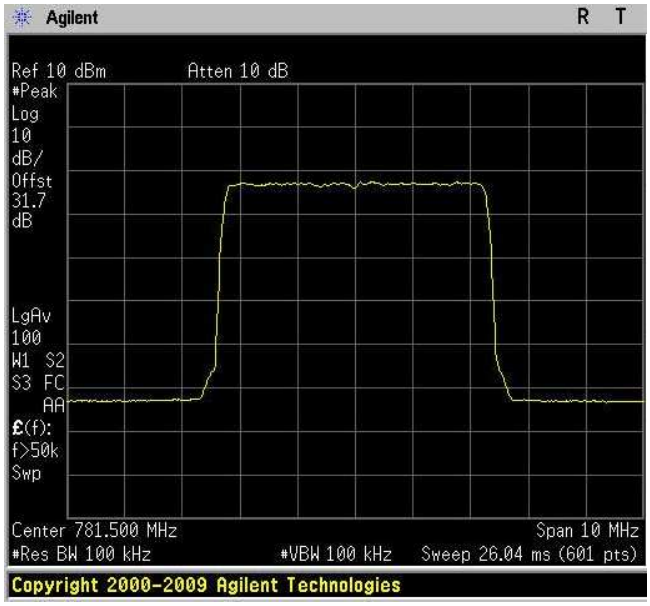


Occupied Bandwidth
Uplink – 5 QAM
INPUT

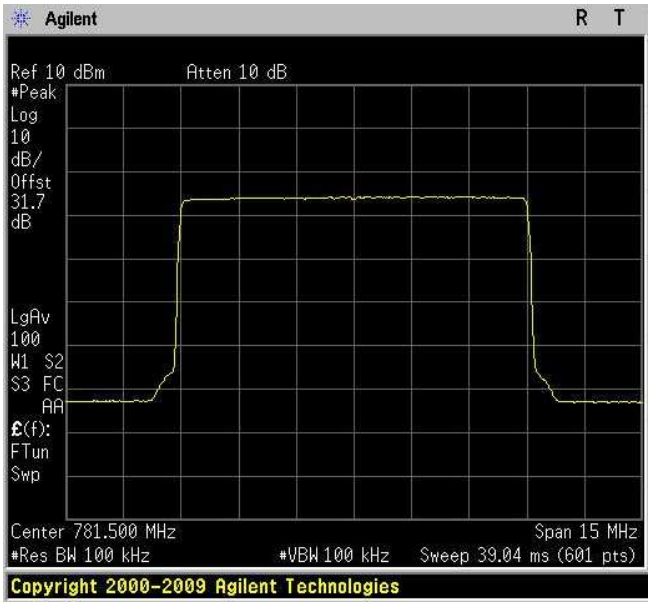


Occupied Bandwidth
Uplink – 5 QPSK
OUTPUT

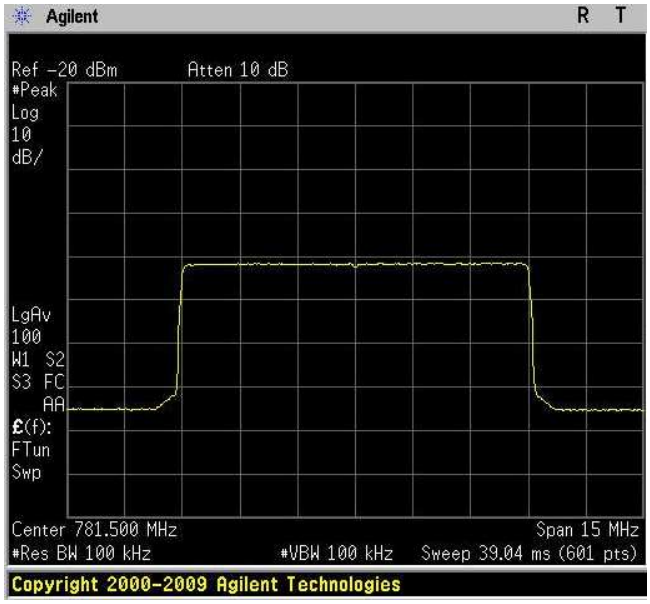


Occupied Bandwidth
Uplink – 5 QPSK
INPUT

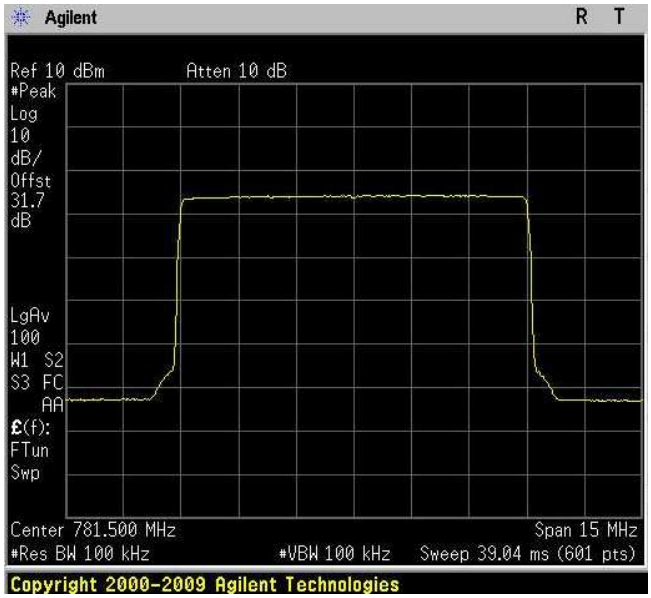
Occupied Bandwidth
Uplink – 10 QAM
OUTPUT



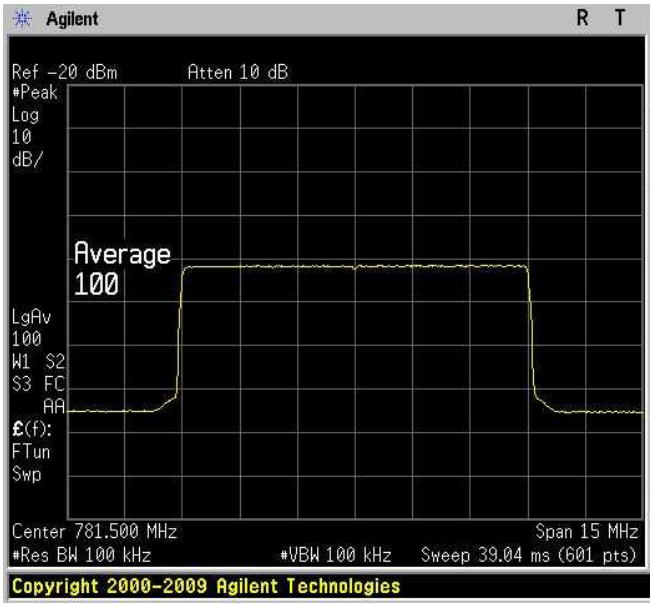
Occupied Bandwidth
Uplink – 10 QAM
INPUT



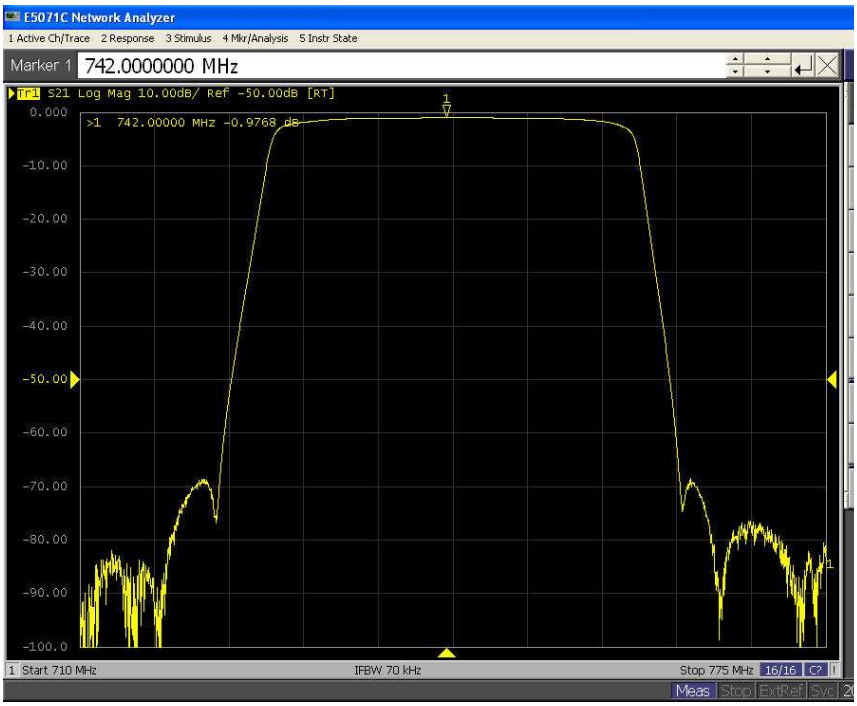
Occupied Bandwidth
Uplink – 10 QPSK
OUTPUT



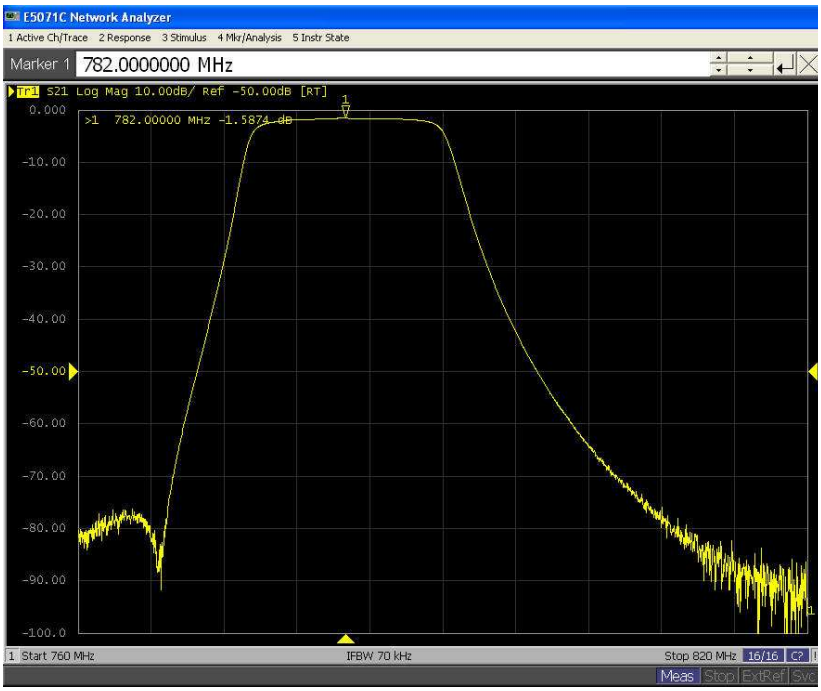
Occupied Bandwidth
Uplink – 10 QPSK
INPUT



Section 9: Filter Frequency Response



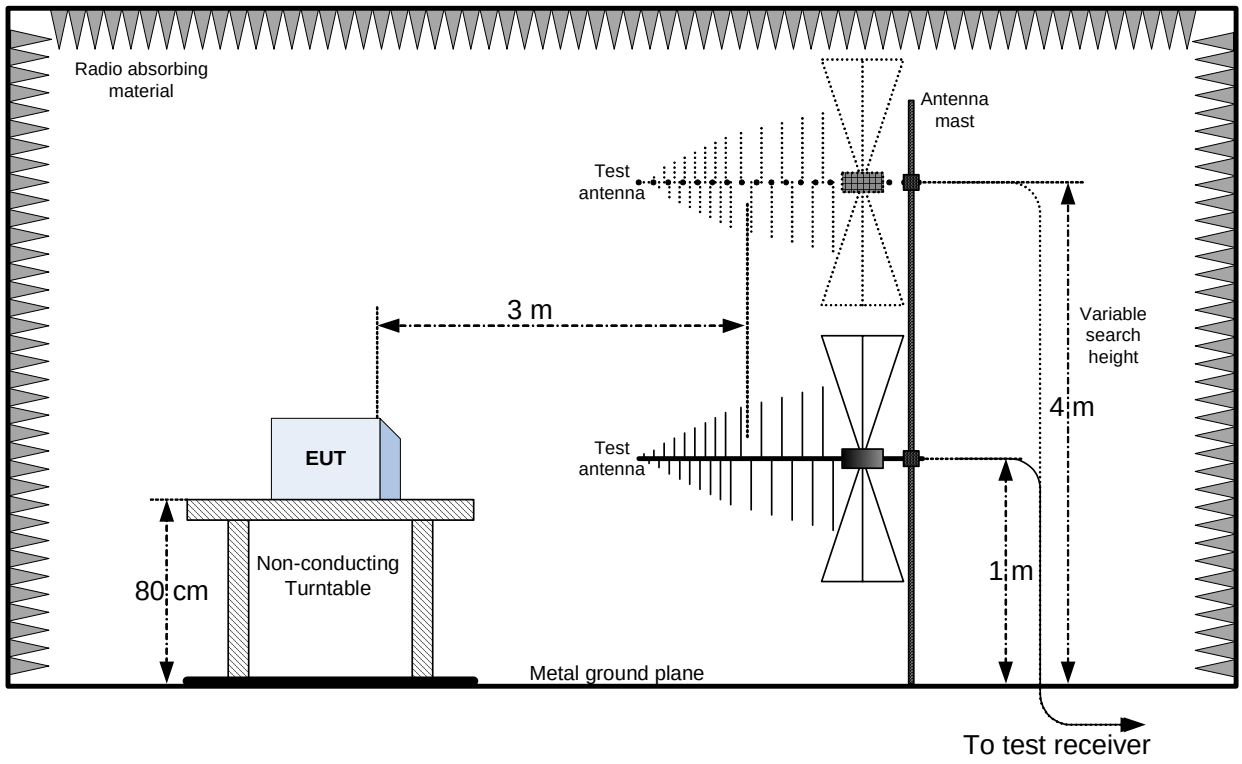
Down-link



Up-link

Section 10: Block diagrams of test set-ups

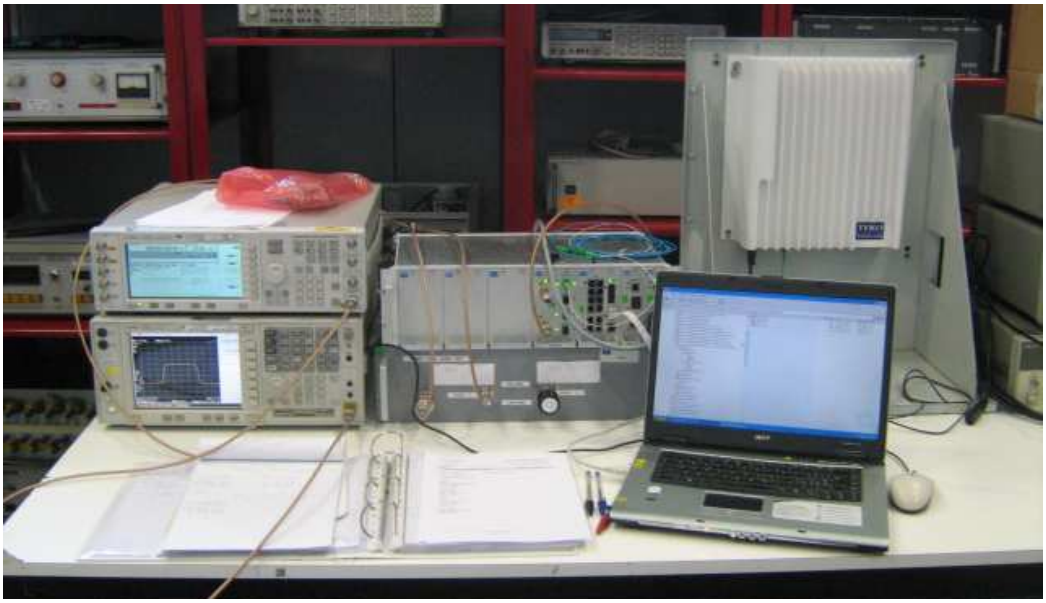
Radiated emissions set-up



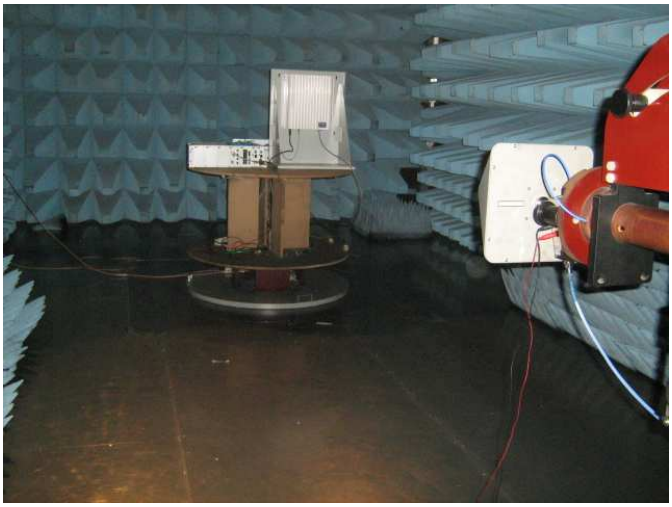
Section 11: EUT photos

EUT

SETUP



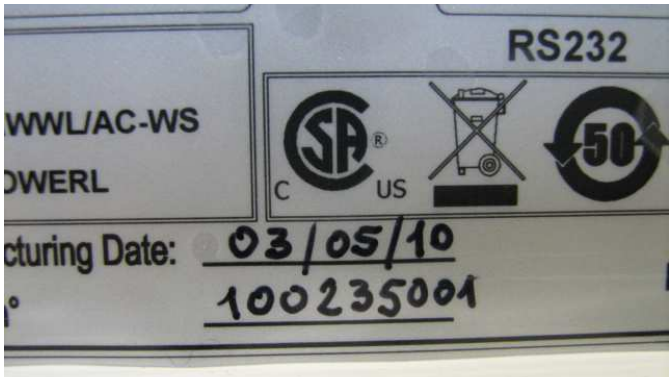
EUT



REMOTE

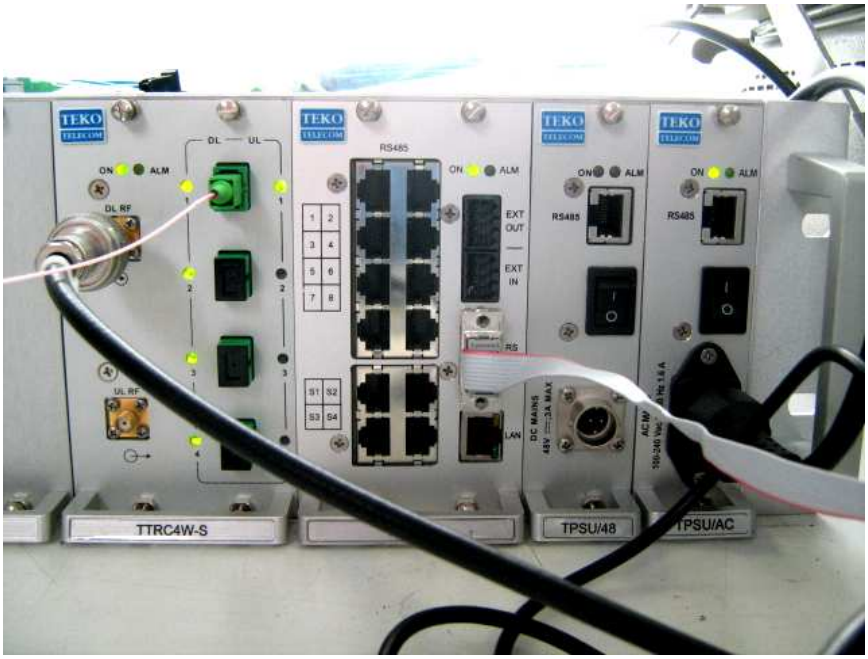

LASER PRODUCT
TELECOM
MADE IN ITALY
Model:TRU7S8AAWWL/AC-WS
Frequency 698 ÷ 787MHz
Range: 824 ÷ 894MHz
1710 ÷ 2155MHz


CLASS 1
LASER PRODUCT
AC MAINS
(100-240V~; 50-60Hz; 1.5A)


RS232
WWL/AC-WS
OWERL
C US
cturing Date: 03/05/10
100235001

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