COMPLIANCE WORLDWIDE INC.
TEST REPORT 505-12

In Accordance with the Requirements of

FCC PART 22:2012 Subpart H
IC RSS 132, Issue 3 (January 2013)

Issued to

Cellular Specialties, Inc.
670 North Commercial Street
Manchester, NH 03010
(603) 626-6677

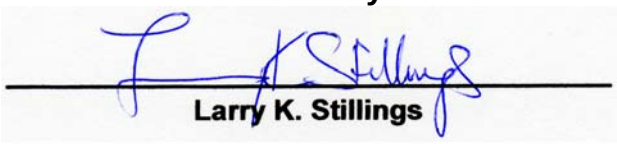
for

Co-Pilot Beacon C4
Model: CSI-CPBH-MG-C4

FCC ID: NVRCSICPBHMG-C4
IC: 4307A-CPBHMGC4

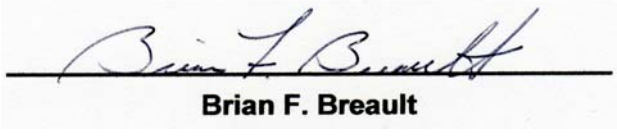
Report Issued on April 5, 2013

Tested by



Larry K. Stillings

Reviewed By



Brian F. Breault

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Compliance Worldwide, Inc. - 357 Main Street - Sandown, NH 03873
(603) 887 3903 Fax 887 6445
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1. Scope

This test report certifies that the Cellular Specialties Co-Pilot Beacon CSI-CPBH-MG-C4, as tested, meets the FCC Part 22 Subpart H requirements. The scope of this test report is limited to the test sample provided by the client, only in as much as that sample represents other production units. If any significant changes are made to the unit, the changes shall be evaluated and a retest may be required.

2. Product Details

2.1. Manufacturer: Cellular Specialties

2.2. Model Number: Co-Pilot Beacon CSI-CPBH-MG-C4

2.3. Serial Number: Pre production prototype

2.4. Description: The Co-Pilot Beacon C4 is the first viable location based solution for simulcast CDMA Distributed Antenna Systems (DASs). It is designed to improve location accuracy of cell phones and wireless devices outdoors and within buildings.

2.5. Power Source: 120 VAC, 60 Hz

2.6. EMC Modifications: None

3. Product Configuration

3.1. Support Equipment

Device	Manufacturer	Model	Serial No.	Comment
Power Supply	APX Technologies	SP130P954ER	06502248	
Notebook PC	Dell	Latitude D610	19472301901	Configuring Unit

3.2. Cables

Cable Type	Length	Shield	From	To
RF, 50 Ω, SMA male – SMA male	1M	Yes	DUT	Cellular Antennas
Pulse In	1M	Yes	DUT	Unterminated
EST Out	1M	Yes	DUT	Unterminated
GPS	5M	No	DUT	Garmin GPS Antenna
Power Supply	2M + 2M	Yes	DUT	120 VAC, 60 Hz
Serial 1	2M	Yes	DUT	Notebook PC
USB 1 & USB 2	2M	Yes	DUT	Notebook PC
Ethernet	2M	No	DUT	Notebook PC

Notebook PC is connected only during setup

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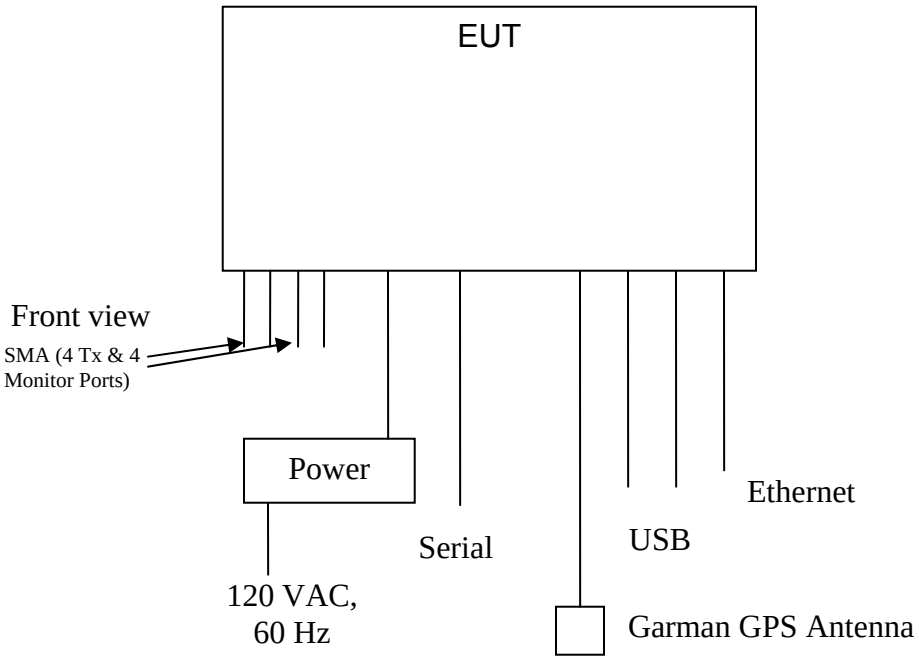
3. Product Configuration (continued)

3.3. Operational Characteristics & Software

(1) The unit was allowed to power up normally and go through its configuration cycle.

(2) Using the laptop as control the unit was configured to operate on individual channels and all channels as required.

3.4. Block Diagram



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4. Measurements Parameters

4.1. Measurement Equipment Used to Perform Test

Device	Manufacturer	Model No.	Serial No.	Cal Due
Spectrum Analyzer	Agilent Technologies	E4407B	MY45104493	2/26/2015
Spectrum Analyzer	Rohde & Schwarz	FSV40	100899	5/31/2013
EMI Receiver	Hewlett Packard	8546A	3330A00115	06/08/2014
Microwave Preamp	Hewlett Packard	8449B	3008A01323	12/01/2013
Bilog Antenna	Com-Power	AC-220	25509	8/31/2013
Horn Antenna	Electro-Metrics	EM-6961	6337	10/19/2013
Horn Antenna	Com-Power	AH-826	080151	08/27/2014
DMM / Temperature	Fluke	187	79690058	1/5/2013
Thermal Chamber	Associated Testing Labs	SLHU-1-CRLC	N/A	N/A
Barometric Pressure / Humidity / Temperature	Extech Instruments	SD700	Q590483	5/1/2013
AC Power Source	Combinova	AC Source 330	3475	UWCE

4.2. Measurement & Equipment Setup

Test Dates: 12/26/2012, 4/1/2013
Test Engineer: Larry Stillings
Normal Site Temperature (15 – 35°C): 21.6
Relative Humidity (20 -75%RH): 25

4.3. Test Procedures

The test measurements contained in this report are based on the requirements detailed in FCC Parts 2 & Part 22, Subpart H.

The test methods used to generate the data is this test report are in accordance with ANSI C63.4:2009, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.

Measurements were made in accordance with TIA-603-C:2004 Land Mobile FM or PM Communications Equipment Measurement and Performance Standard.

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5. Measurement Summary

Section Description or Test Requirement	FCC Reference	IC Part Reference	Test Report Section	Result	Comment
Effective Radiated Power Limits	22.913 (a)	RSS-132 5.4	6.1	Compliant	
Occupied Bandwidth	2.1049	RSS-GEN	6.2	Compliant	
Spurious Emissions at Antenna Terminals	22.917	RSS-132 5.5	6.3	Compliant	
Field Strength of Spurious Emissions	22.917	RSS-132 5.5 & 5.6	6.4	Compliant	
Frequency Stability	22.355	RSS-132 5.3	6.5	Compliant	1.5 ppm
Public Exposure to Radio Frequency Energy Levels	Section 1.1307 (b)(1)	RSS-102	6.6	Compliant	

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6. Measurement Data

6.1. Effective Radiated Power Limits 22.913 (a), RSS-132 5.4

Requirement: Maximum ERP. In general, the effective radiated power (ERP) of base transmitters and cellular repeaters must not exceed 500 Watts.

6.1.1. Peak Transmitter Output Power, Transmitter Only

Channels	Frequency	Output Power		
	(MHz)	(dBm)	(Watts)	Result
Low Channel 1015 – TX1	869.8	19.57	0.091	Compliant
Mid Channel 384 – TX1	881.5	20.38	0.109	Compliant
High Channel 775 – TX1	893.2	20.16	0.104	Compliant
All Channels – TX1	869.8 – 893.2	20.33	0.108	Compliant
Low Channel 1015 – TX2	869.8	20.07	0.102	Compliant
Mid Channel 384 – TX2	881.5	21.20	0.132	Compliant
High Channel 775 – TX2	893.2	20.42	0.110	Compliant
All Channels – TX2	869.8 – 893.2	20.19	0.104	Compliant
Low Channel 1015 – TX3	869.8	19.07	0.081	Compliant
Mid Channel 384 – TX3	881.5	20.47	0.111	Compliant
High Channel 775 – TX3	893.2	19.73	0.094	Compliant
All Channels – TX3	869.8 – 893.2	20.68	0.117	Compliant
Low Channel 1015 – TX4	869.8	18.53	0.071	Compliant
Mid Channel 384 – TX4	881.5	20.42	0.110	Compliant
High Channel 775 – TX4	893.2	19.95	0.099	Compliant
All Channels – TX4	869.8 – 893.2	20.05	0.101	Compliant

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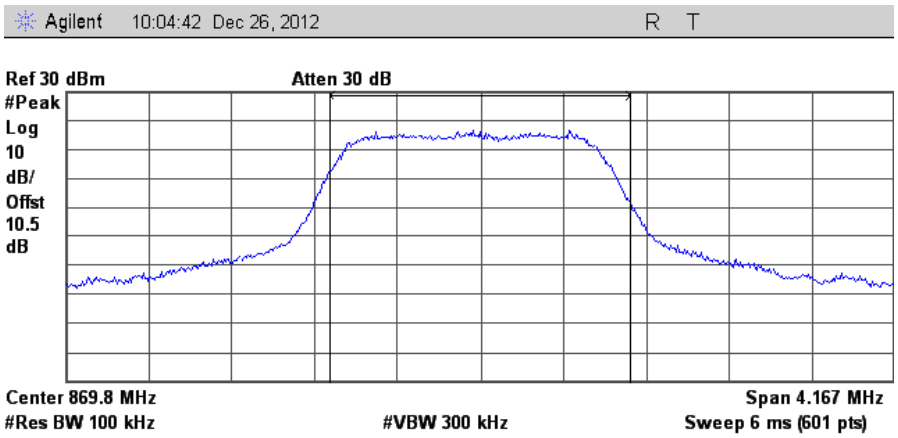
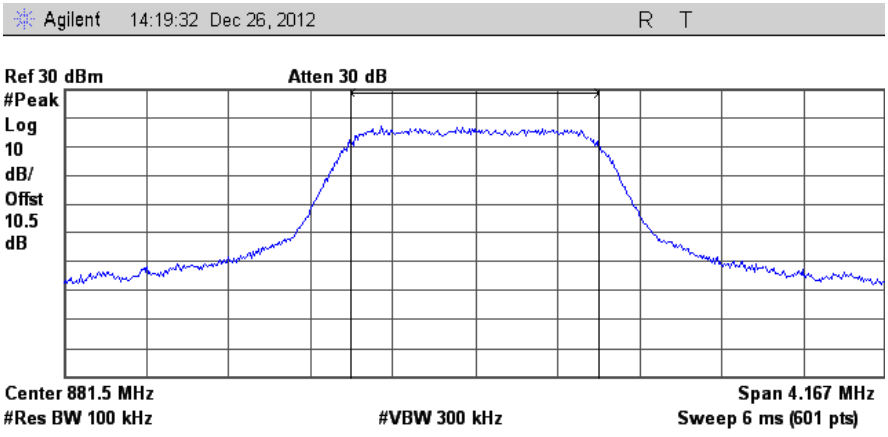
6. Measurement Data

6.1. Effective Radiated Power Limits 22.913 (a) (cont)

Low Channel 1015 – TX1



Mid Channel 384 – TX1



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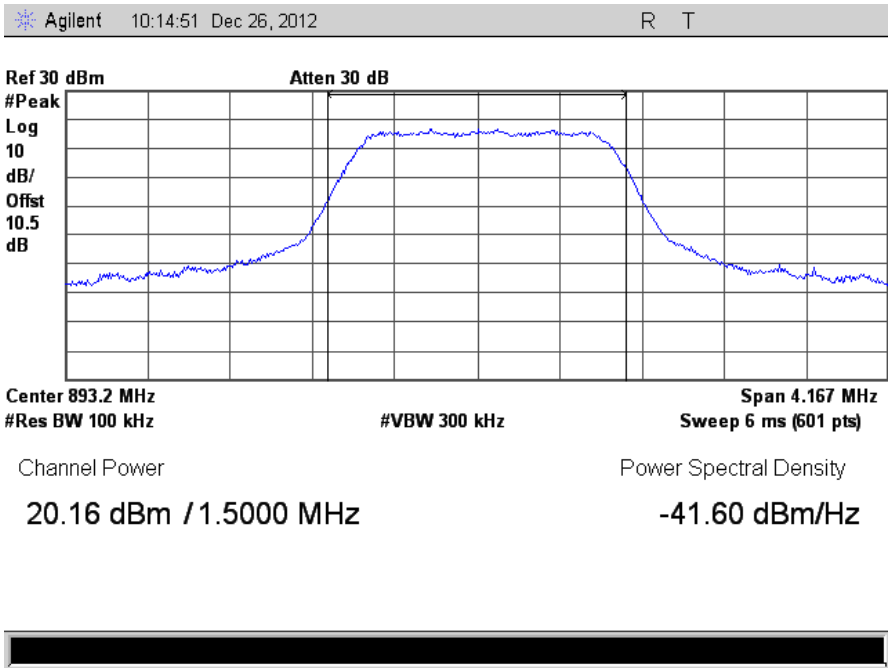
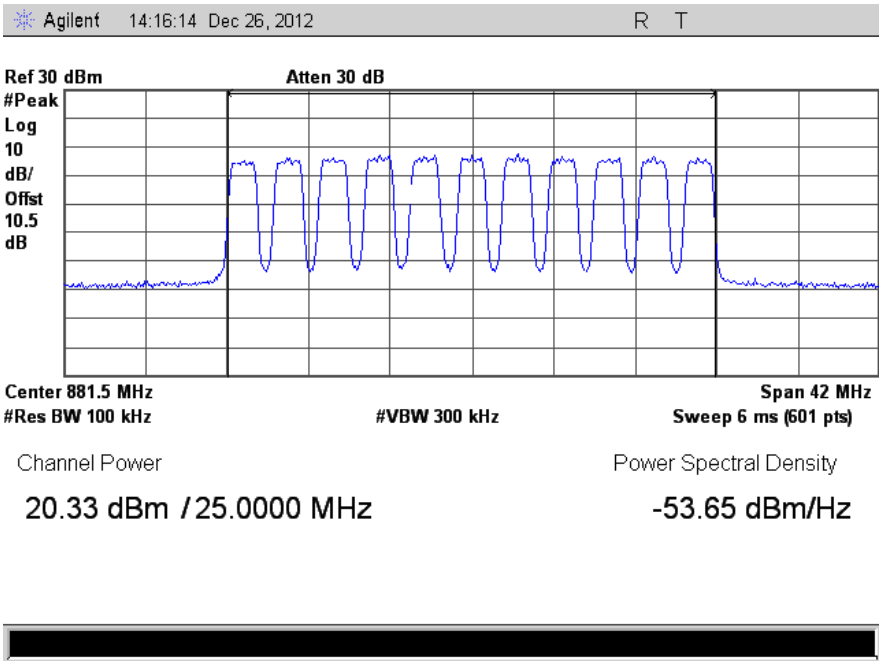
6. Measurement Data

6.1. Effective Radiated Power Limits 22.913 (a) (cont)

High Channel 775 – TX1



All Channels – TX1



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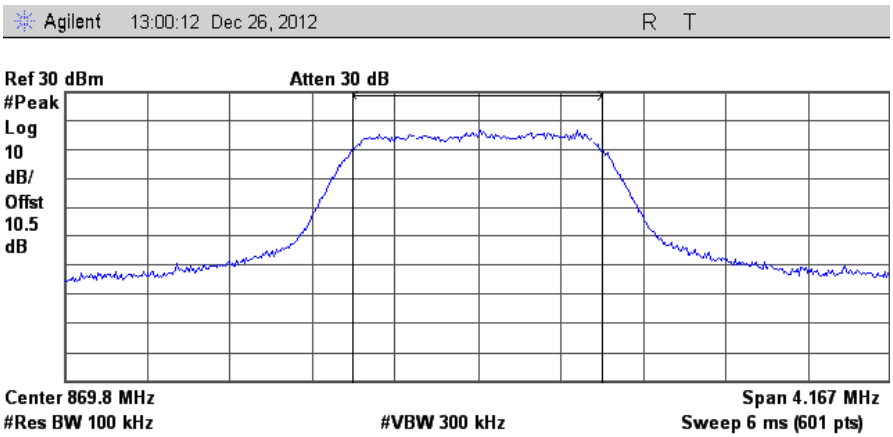
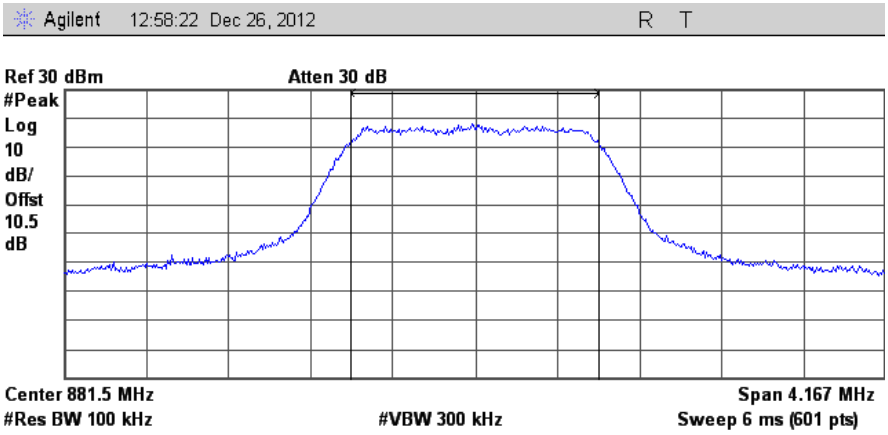
6. Measurement Data

6.1. Effective Radiated Power Limits 22.913 (a) (cont)

Low Channel 1015 – TX2



Mid Channel 384 – TX2



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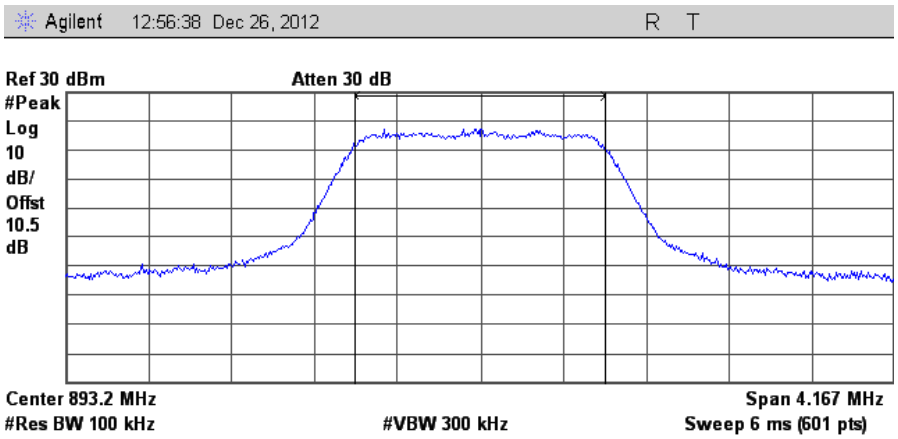
6. Measurement Data

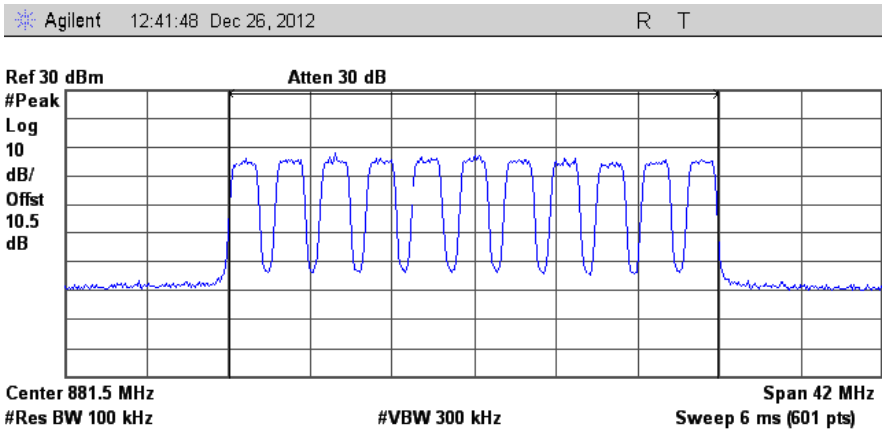
6.1. Effective Radiated Power Limits 22.913 (a) (cont)

High Channel 775 – TX2



[redacted]

All Channels – TX2



[redacted]

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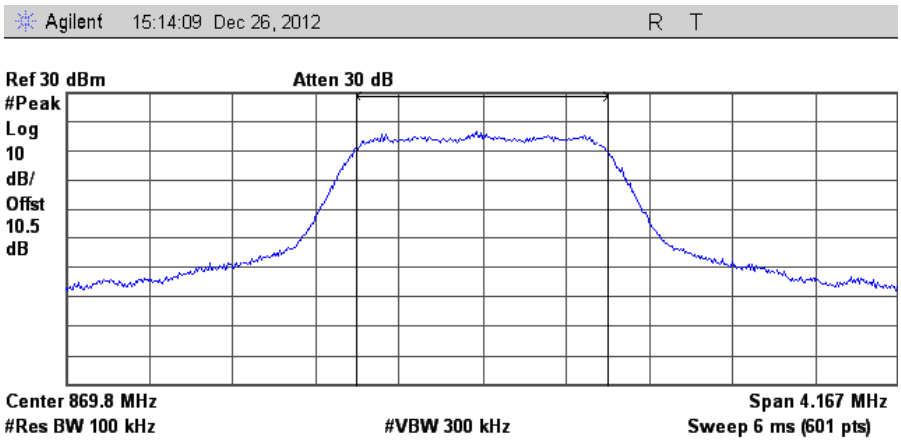
6. Measurement Data

6.1. Effective Radiated Power Limits 22.913 (a) (cont)

Low Channel 1015 – TX3



Channel Power

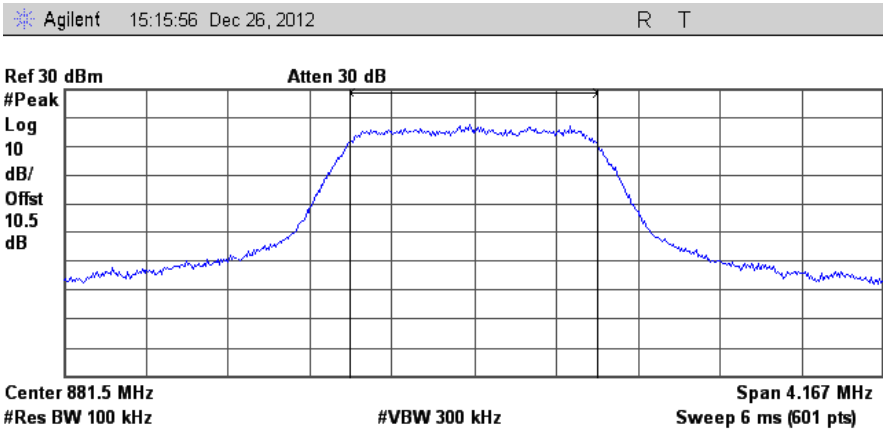
19.07 dBm / 1.2500 MHz

Power Spectral Density

-41.90 dBm/Hz

[redacted]

Mid Channel 384 – TX3



Channel Power

20.47 dBm / 1.2500 MHz

Power Spectral Density

-40.50 dBm/Hz

[redacted]

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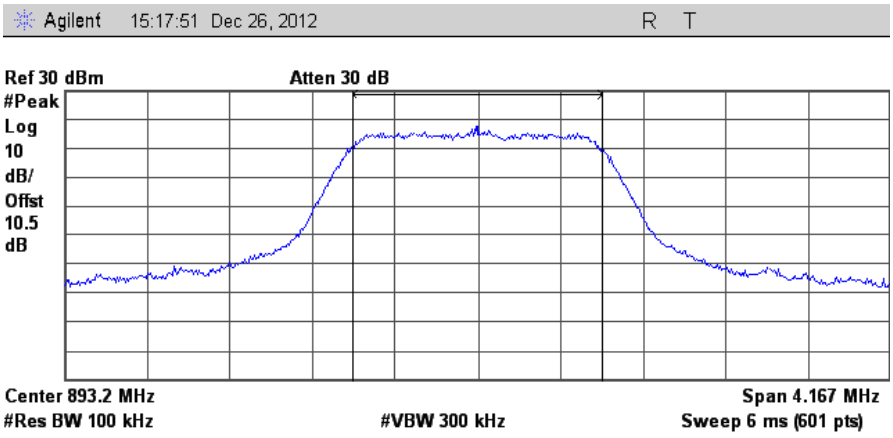
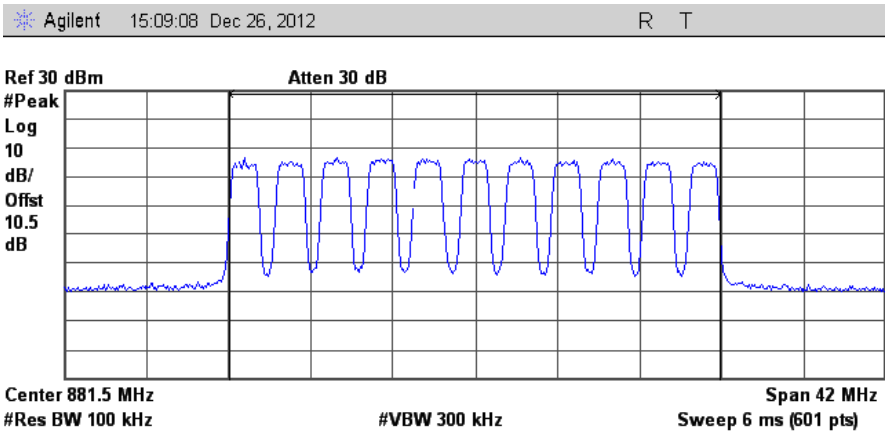
6. Measurement Data

6.1. Effective Radiated Power Limits 22.913 (a) (cont)

High Channel 775 – TX3



All Channels – TX3



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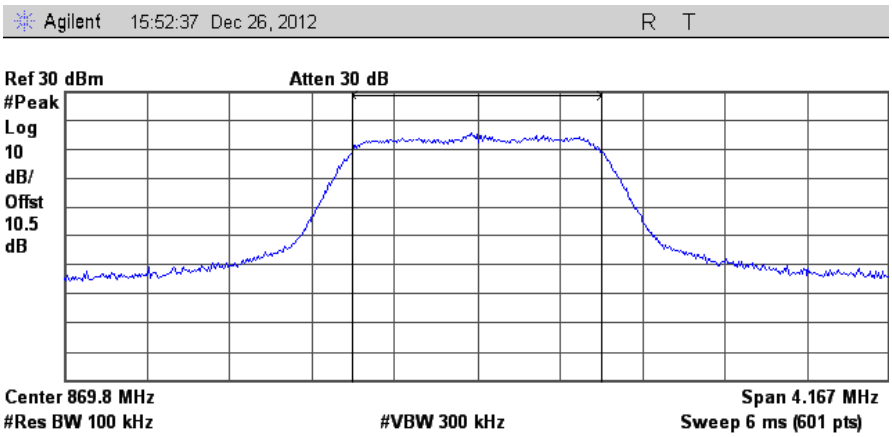
6. Measurement Data

6.1. Effective Radiated Power Limits 22.913 (a) (cont)

Low Channel 1015 – TX4



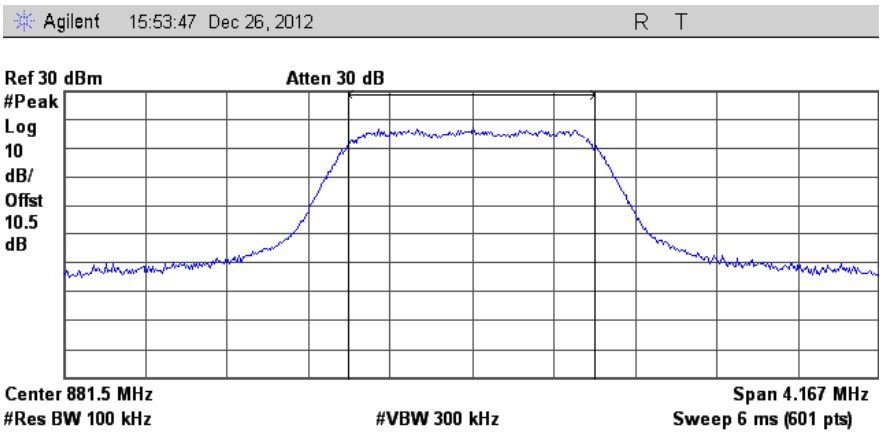
Channel Power

18.53 dBm / 1.2500 MHz

Power Spectral Density

-42.44 dBm/Hz

Mid Channel 384 – TX4



Channel Power

20.42 dBm / 1.2500 MHz

Power Spectral Density

-40.55 dBm/Hz

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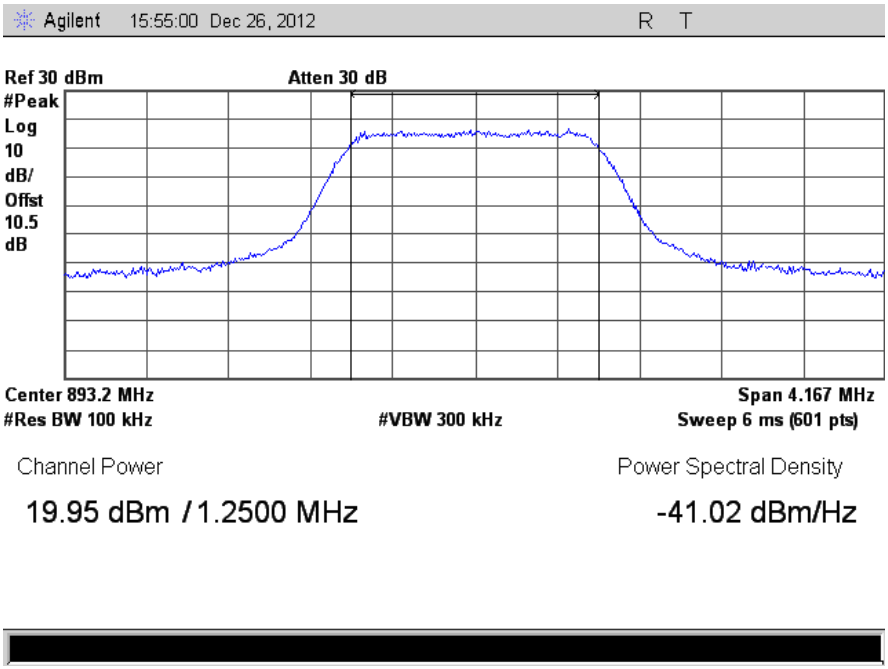
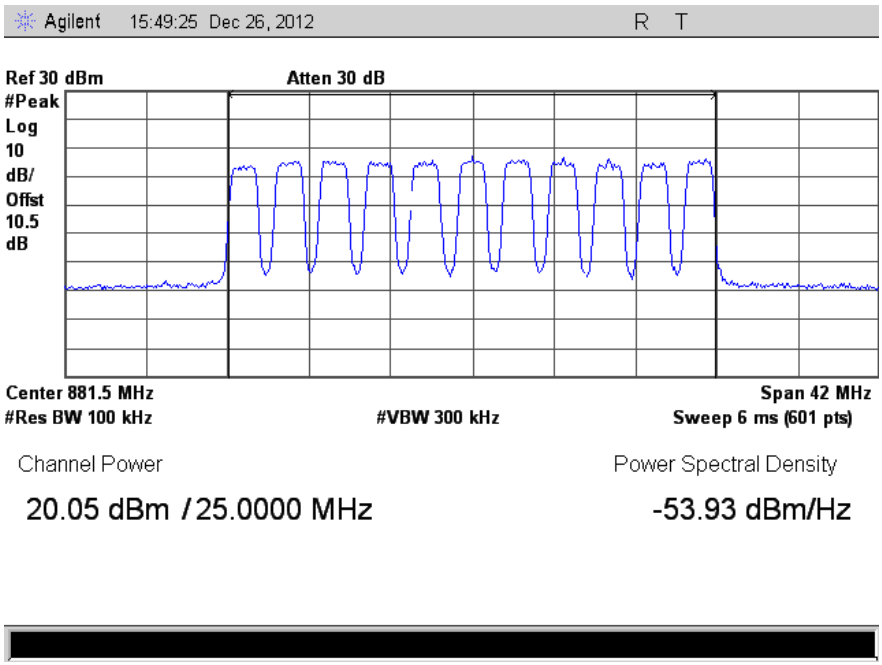
6. Measurement Data

6.1. Effective Radiated Power Limits 22.913 (a) (cont)

High Channel 775 – TX4



All Channels – TX4



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6. Measurement Data

6.1. Effective Radiated Power Limits (continued)

6.1.2. Maximum ERP

ERP is defined in FCC Title 47, Chapter I, Part 2, Subpart A, Section 2.1 as "Effective Radiated Power. The product of the power supplied to the antenna and its gain relative to a half-wave dipole in a given direction."

ERP = Transmitter Power (dBm) - Cable Loss (dB) + Antenna Gain (dBi)

The manufacturer of the device under test recommends 2 antennas for use with their product. The following table provides the worst case effective radiated power based on the measured transmitter output power and the antenna gain:

Channel	Frequency	Transmitter Power	Cable Insertion Loss	Antenna Gain	Total Output Power	
	MHz	dBm	dB	dBi	dBm	Watts
Low - TX1	869.8	19.57	0.00	3.00	22.57	0.18
Mid - TX1	881.5	20.38	0.00	3.00	23.38	0.22
High - TX1	893.2	20.16	0.00	3.00	23.16	0.21
All - TX1	869.8 – 893.2	20.33	0.00	3.00	23.33	0.22
Low - TX1	869.8	19.57	0.00	14.00	33.57	2.28
Mid - TX1	881.5	20.38	0.00	14.00	34.38	2.74
High - TX1	893.2	20.16	0.00	14.00	34.16	2.61
All - TX1	869.8 – 893.2	20.33	0.00	14.00	34.33	2.71
Low - TX2	869.8	20.07	0.00	3.00	23.07	0.20
Mid - TX2	881.5	21.20	0.00	3.00	24.20	0.26
High - TX2	893.2	20.42	0.00	3.00	23.42	0.22
All - TX2	869.8 – 893.2	20.19	0.00	3.00	23.19	0.21
Low - TX2	869.8	20.07	0.00	14.00	34.07	2.55
Mid - TX2	881.5	21.20	0.00	14.00	35.20	3.31
High - TX2	893.2	20.42	0.00	14.00	34.42	2.77
All - TX2	869.8 – 893.2	20.19	0.00	14.00	34.19	2.62

[1] Measured. See section 6.1.1.
[2] Customer supplied. 3 dBi for Indoor Applications, 14 dBi for Outdoor Applications

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6. Measurement Data

6.1. Effective Radiated Power Limits (continued)

6.1.2. Maximum ERP

ERP is defined in FCC Title 47, Chapter I, Part 2, Subpart A, Section 2.1 as "Effective Radiated Power. The product of the power supplied to the antenna and its gain relative to a half-wave dipole in a given direction."

ERP = Transmitter Power (dBm) - Cable Loss (dB) + Antenna Gain (dBi)

The manufacturer of the device under test recommends 2 antennas for use with their product. The following table provides the worst case effective radiated power based on the measured transmitter output power and the antenna gain:

Channel	Frequency	Transmitter Power	Cable Insertion Loss	Antenna Gain	Total Output Power	
	MHz	dBm	dB	dBi	dBm	Watts
Low - TX3	869.8	19.07	0.00	3.00	22.07	0.16
Mid - TX3	881.5	20.47	0.00	3.00	23.47	0.22
High - TX3	893.2	19.73	0.00	3.00	22.73	0.19
All - TX3	869.8 – 893.2	20.68	0.00	3.00	23.68	0.23
Low - TX3	869.8	19.07	0.00	14.00	33.07	2.03
Mid - TX3	881.5	20.47	0.00	14.00	34.47	2.80
High - TX3	893.2	19.73	0.00	14.00	33.73	2.36
All - TX3	869.8 – 893.2	20.68	0.00	14.00	34.68	2.94
Low - TX4	869.8	18.53	0.00	3.00	21.53	0.14
Mid - TX4	881.5	20.42	0.00	3.00	23.42	0.22
High - TX4	893.2	19.95	0.00	3.00	22.95	0.20
All - TX4	869.8 – 893.2	20.05	0.00	3.00	23.05	0.20
Low - TX4	869.8	18.53	0.00	14.00	32.53	1.79
Mid - TX4	881.5	20.42	0.00	14.00	34.42	2.77
High - TX4	893.2	19.95	0.00	14.00	33.95	2.48
All -TX4	869.8 – 893.2	20.05	0.00	14.00	34.05	2.54

[1] Measured. See section 6.1.1.
[2] Customer supplied. 3 dBi for Indoor Applications, 14 dBi for Outdoor Applications

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6. Measurement Data (continued)

6.2. Bandwidth Limitations FCC Part 2.1049, IC RSS-GEN

Requirement: Each authorization issued to a station licensed under this part will show an emission designator representing the class of emission authorized. The designator will be prefixed by a specified necessary bandwidth. This number does not necessarily indicate the bandwidth occupied by the emission at any instant.

6.2.1. Occupied (99% Power) Bandwidth

Channel	Frequency	Occupied Bandwidth	Result
	(MHz)	(MHz)	
Low Channel - TX1	869.8	1.2769	Compliant
Mid Channel - TX1	881.5	1.2707	Compliant
High Channel - TX1	893.2	1.2694	Compliant
Low Channel - TX2	869.8	1.2726	Compliant
Mid Channel - TX2	881.5	1.2681	Compliant
High Channel - TX2	893.2	1.2627	Compliant
Low Channel - TX3	869.8	1.2695	Compliant
Mid Channel - TX3	881.5	1.2679	Compliant
High Channel - TX3	893.2	1.2694	Compliant
Low Channel - TX4	869.8	1.2722	Compliant
Mid Channel - TX4	881.5	1.2674	Compliant
High Channel - TX4	893.2	1.2641	Compliant

NOTE: EUT can only transmit a CDMA signal

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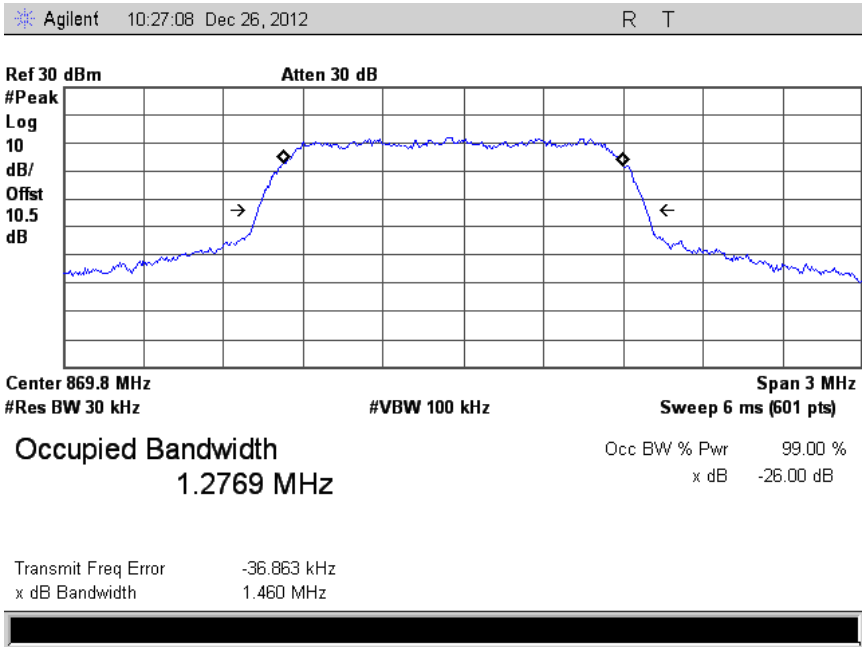
6. Measurement Data (continued)

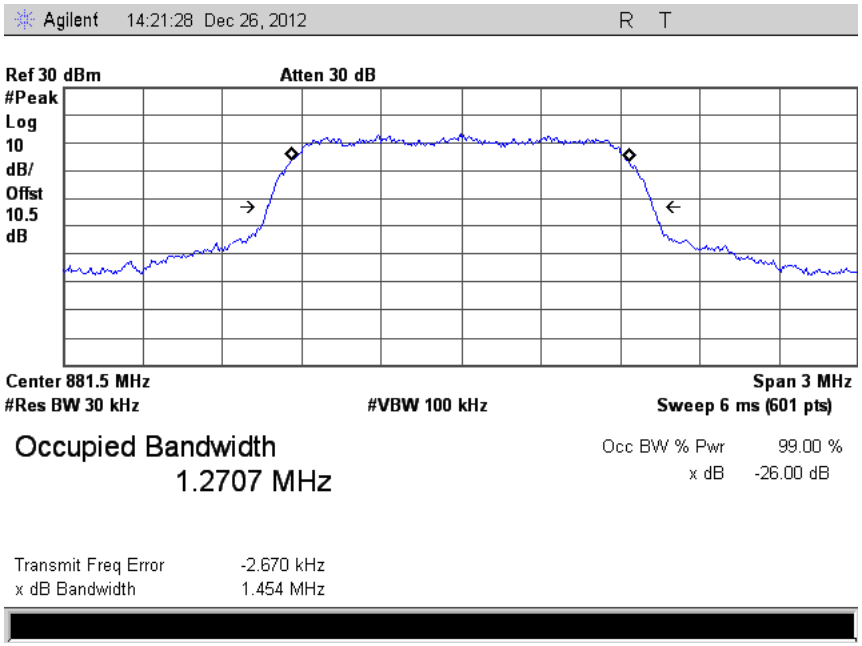
6.2. Bandwidth Limitations (FCC Part 2.1049) (continued)

6.2.1. Occupied (99% Power) Bandwidth (continued)

6.2.1.1. Occupied (99% Power) Bandwidth Measurement, 869.2 MHz – TX1



6.2.1.2. Occupied (99% Power) Bandwidth Input Signal, 881.5 MHz – TX1



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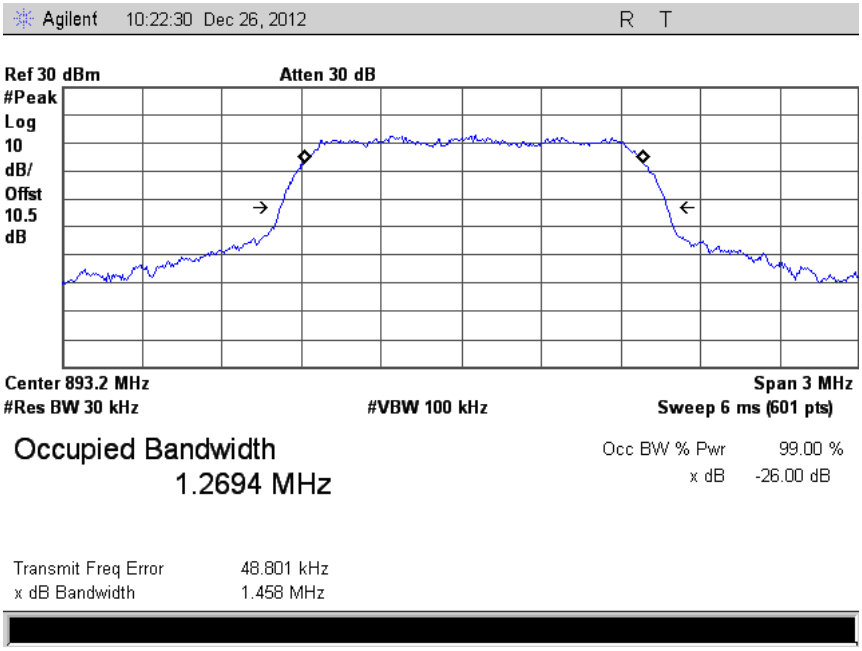
6. Measurement Data (continued)

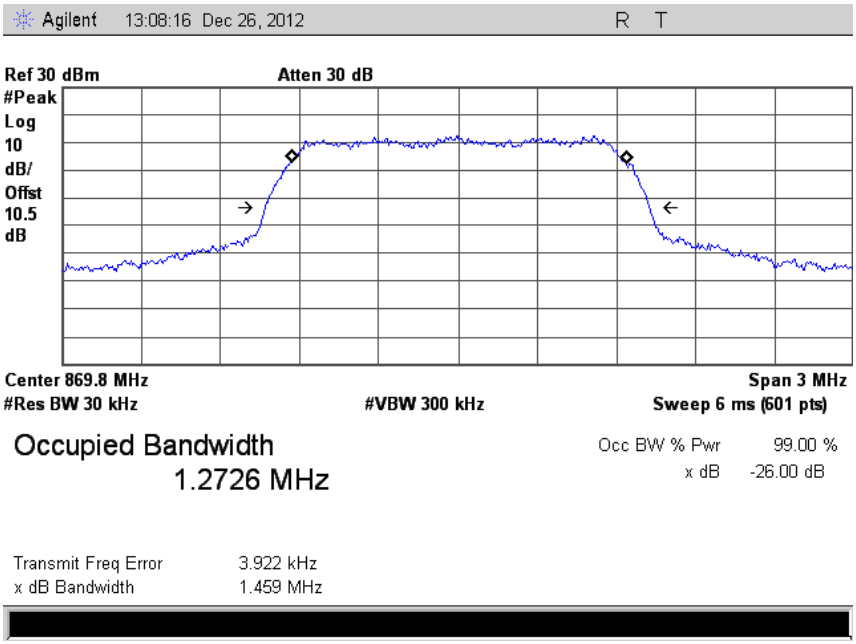
6.2. Bandwidth Limitations (FCC Part 2.1049) (continued)

6.2.1. Occupied (99% Power) Bandwidth (continued)

6.2.1.3. Occupied (99% Power) Bandwidth Measurement, 893.2 MHz – TX1



6.2.1.4. Occupied (99% Power) Bandwidth Measurement, 869.2 MHz – TX2



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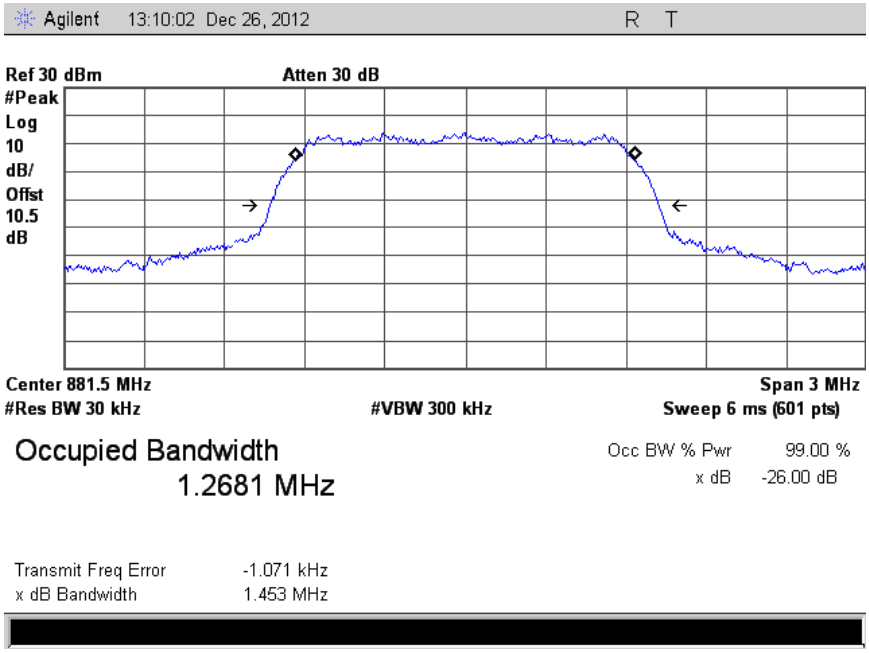
6. Measurement Data (continued)

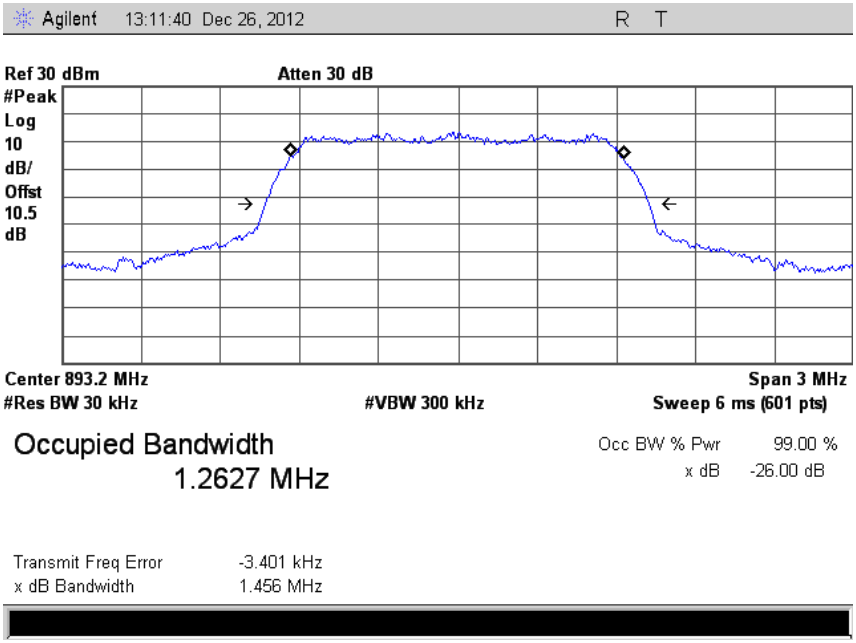
6.2. Bandwidth Limitations (FCC Part 2.1049) (continued)

6.2.1. Occupied (99% Power) Bandwidth (continued)

6.2.1.5. Occupied (99% Power) Bandwidth Input Signal, 881.5 MHz – TX2



6.2.1.6. Occupied (99% Power) Bandwidth Measurement, 893.2 MHz – TX2



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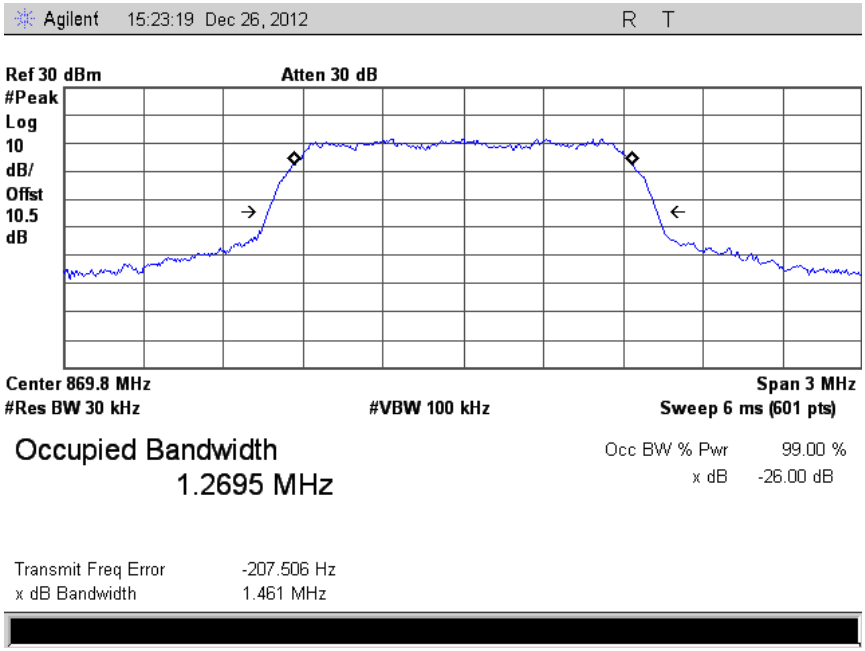
6. Measurement Data (continued)

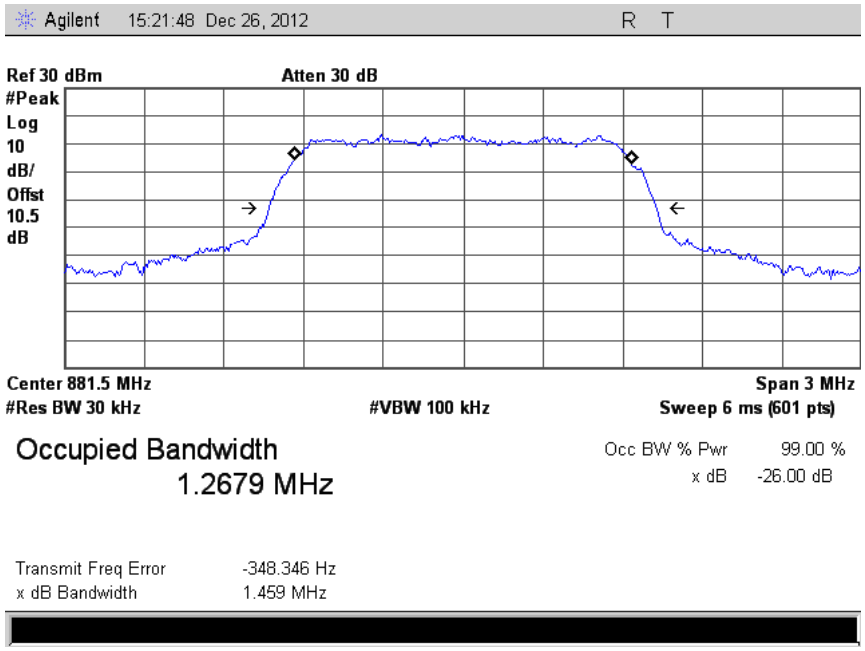
6.2. Bandwidth Limitations (FCC Part 2.1049) (continued)

6.2.1. Occupied (99% Power) Bandwidth (continued)

6.2.1.7. Occupied (99% Power) Bandwidth Measurement, 869.2 MHz – TX3



6.2.1.8. Occupied (99% Power) Bandwidth Input Signal, 881.5 MHz – TX3



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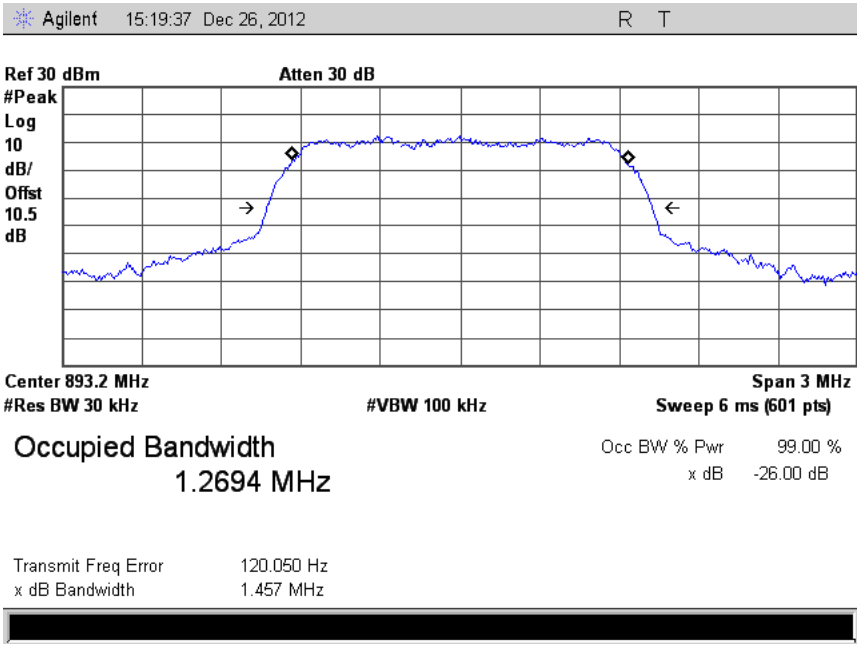
6. Measurement Data (continued)

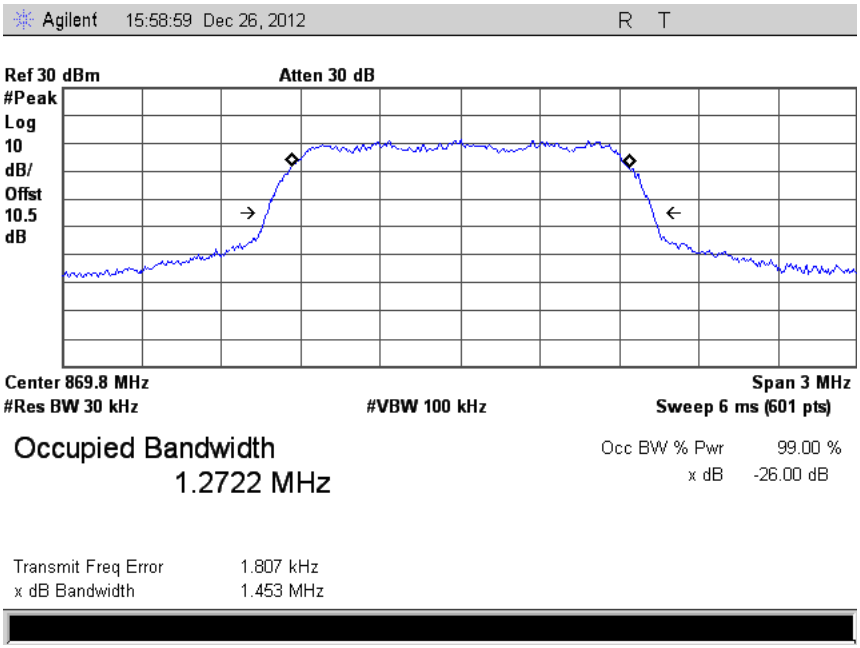
6.2. Bandwidth Limitations (FCC Part 2.1049) (continued)

6.2.1. Occupied (99% Power) Bandwidth (continued)

6.2.1.9. Occupied (99% Power) Bandwidth Measurement, 893.2 MHz – TX3



6.2.1.10. Occupied (99% Power) Bandwidth Measurement, 869.2 MHz – TX4



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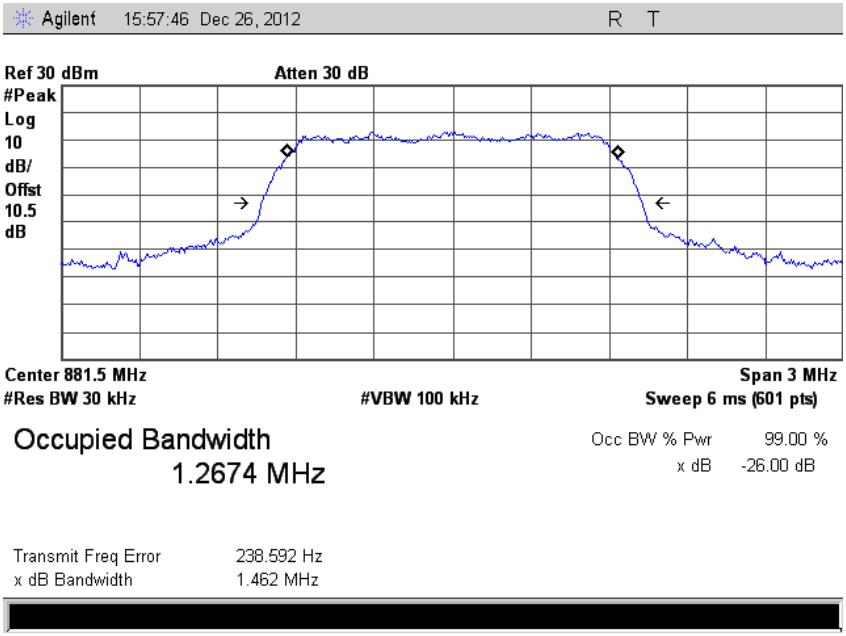
6. Measurement Data (continued)

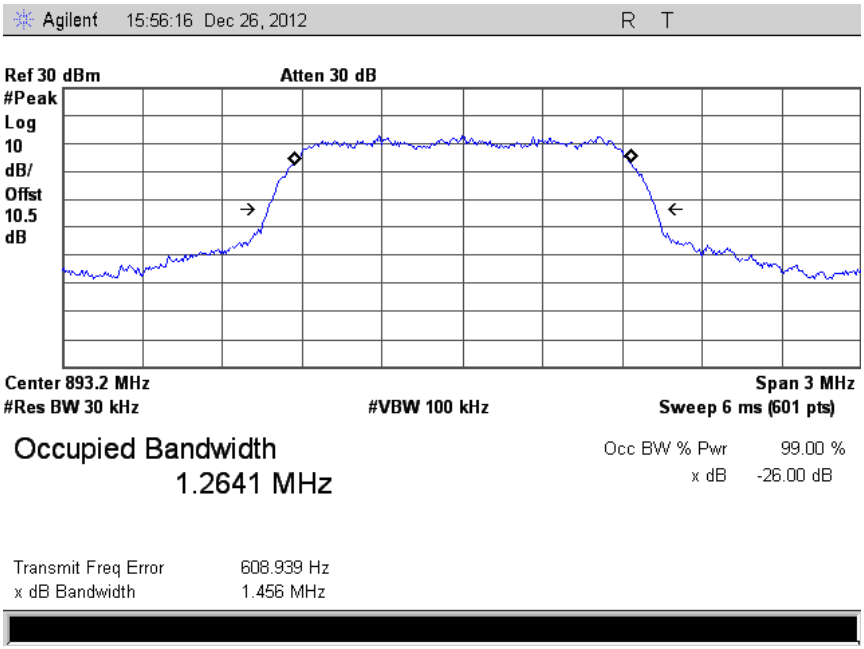
6.2. Bandwidth Limitations (FCC Part 2.1049) (continued)

6.2.1. Occupied (99% Power) Bandwidth (continued)

6.2.1.11. Occupied (99% Power) Bandwidth Input Signal, 881.5 MHz – TX4



6.2.1.12. Occupied (99% Power) Bandwidth Input Signal, 893.2 MHz – TX4



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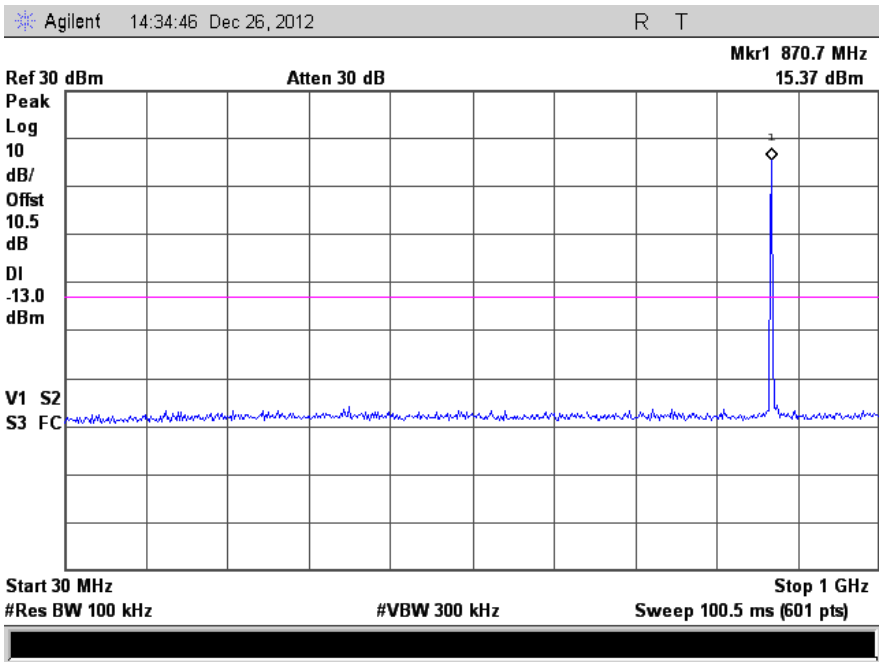
6. Measurement Data (continued)

6.3. Spurious Emissions at the Antenna Terminals 22.917 (a) (b), RSS-132 5.5

Requirement: 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

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.

6.3.1. Low channel, 30 MHz to 1 GHz – TX1



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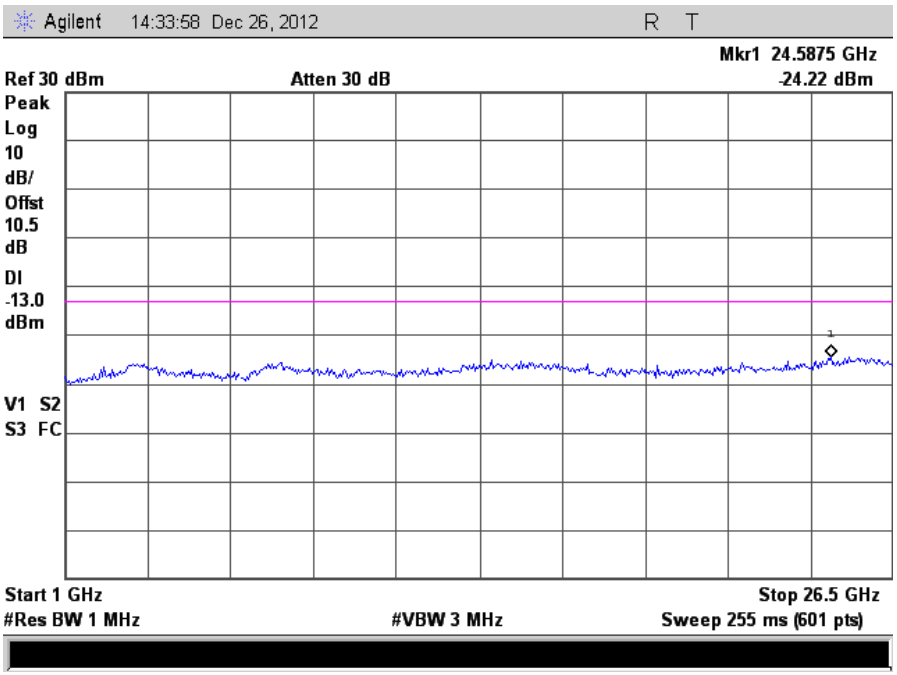
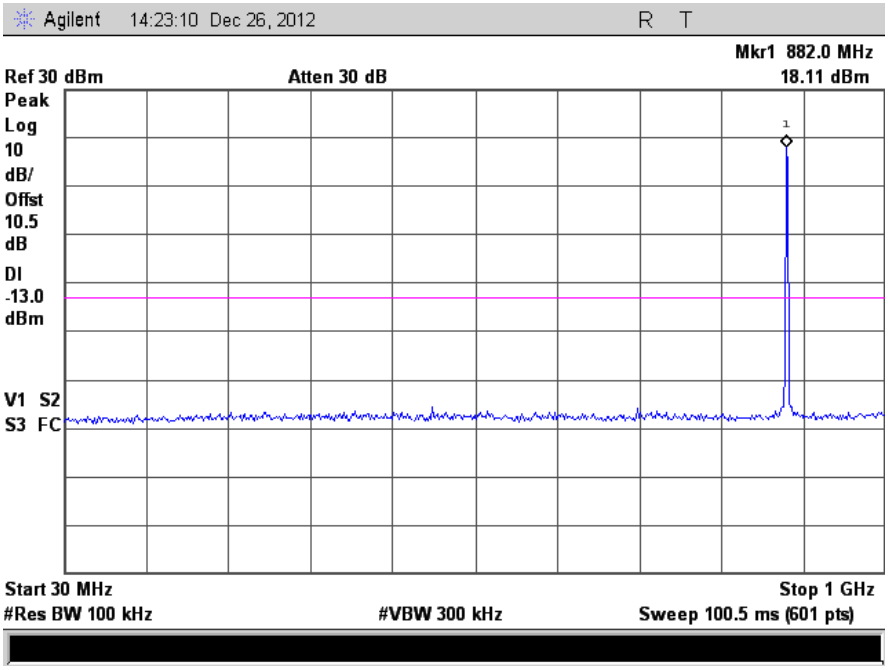
6. Measurement Data (continued)

6.3. Spurious Emissions at the Antenna Terminals 22.917 (a) (b) (continued)

6.3.2. Low Channel, 1 to 26.5 GHz – TX1



6.3.3. Mid Channel, 30 MHz to 1 GHz – TX1



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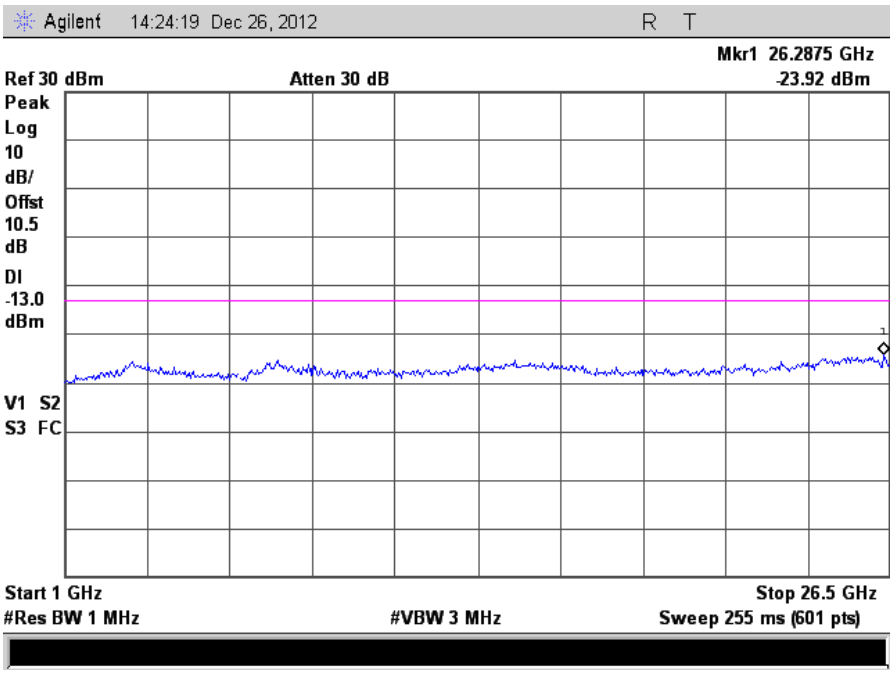
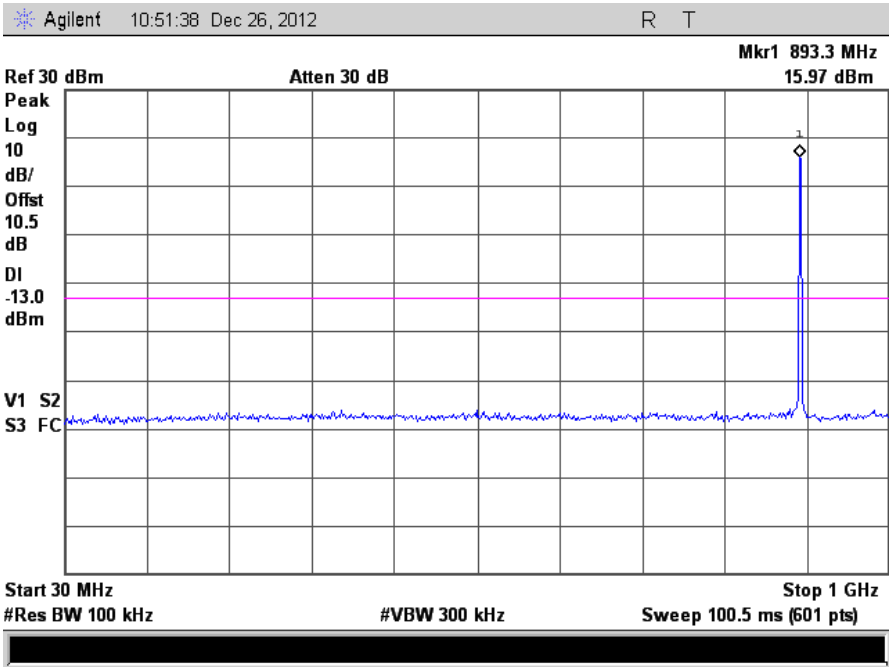
6. Measurement Data (continued)

6.3. Spurious Emissions at the Antenna Terminals 22.917 (a) (b) (continued)

6.3.4. Mid channel, 1 to 26.5 GHz – TX1



6.3.5. High Channel, 30 to 1000 MHz – TX1



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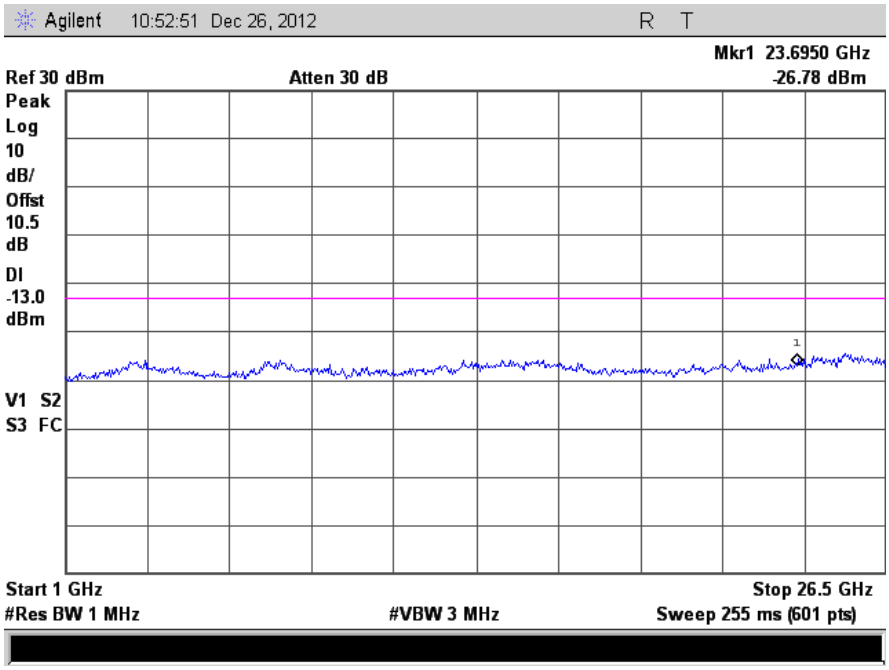
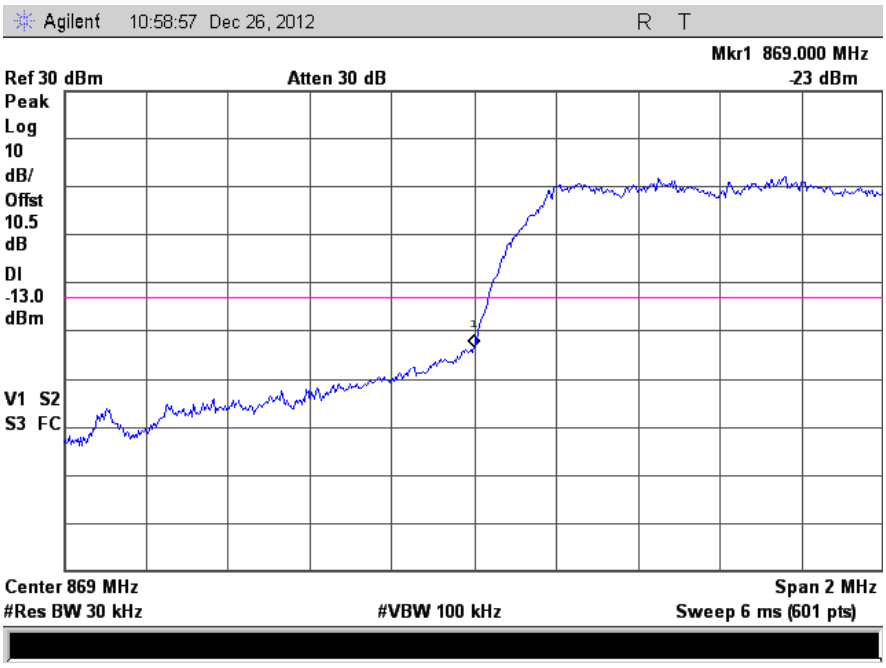
6. Measurement Data (continued)

6.3. Spurious Emissions at the Antenna Terminals 22.917 (a) (b) (continued)

6.3.6. High Channel, 1 to 26.5 GHz – TX1



6.3.7. Low Channel Lower Bandedge Measurement – TX1



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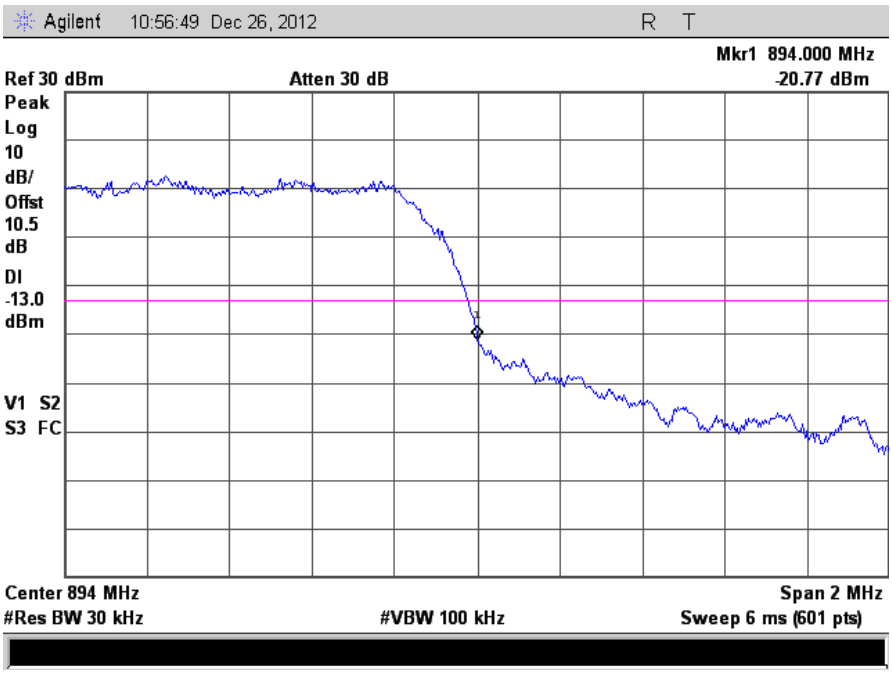
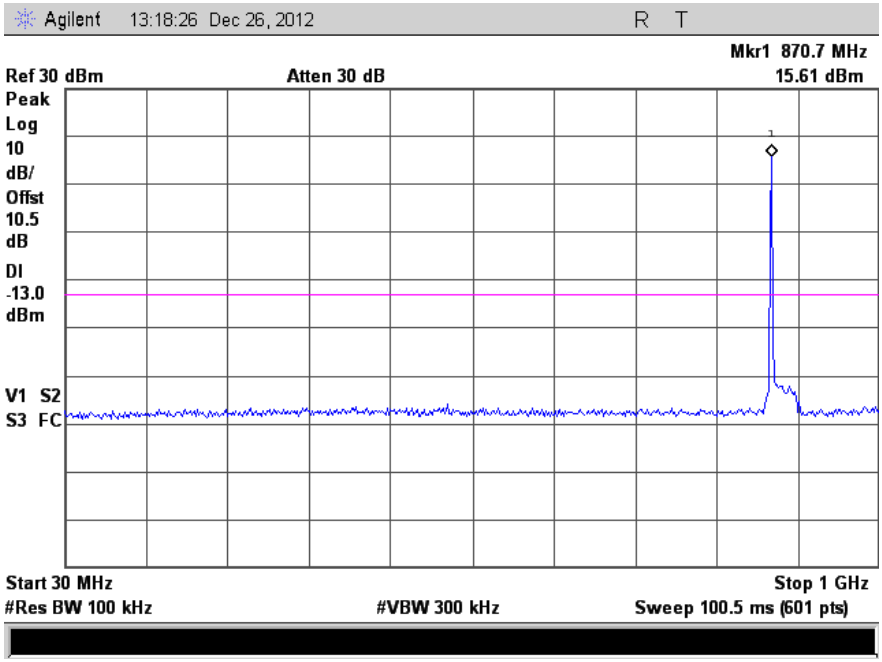
6. Measurement Data (continued)

6.3. Spurious Emissions at the Antenna Terminals 22.917 (a) (b) (continued)

6.3.8. High Channel Upper Bandedge Measurement – TX1



6.3.9. Low channel, 30 MHz to 1 GHz – TX2



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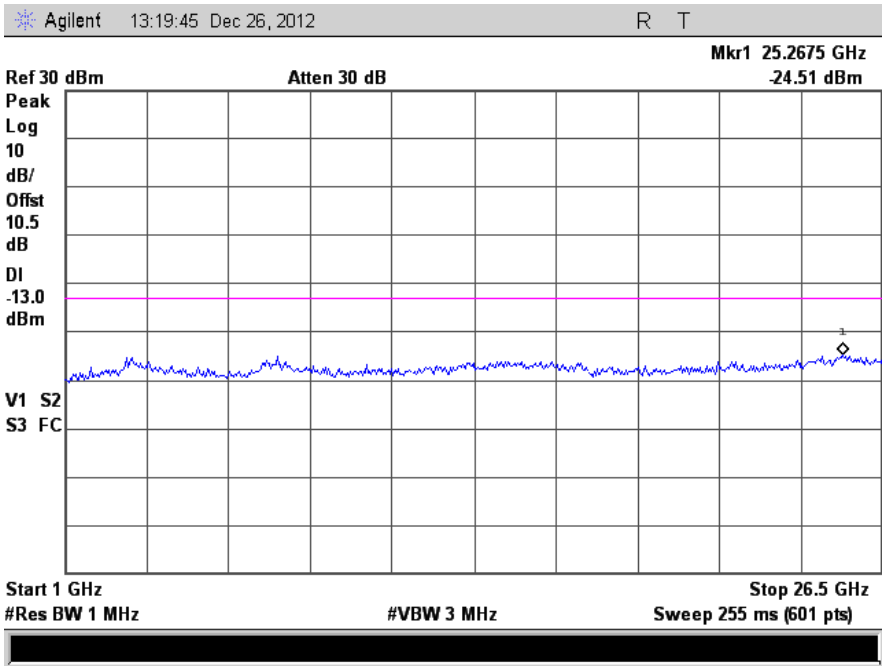
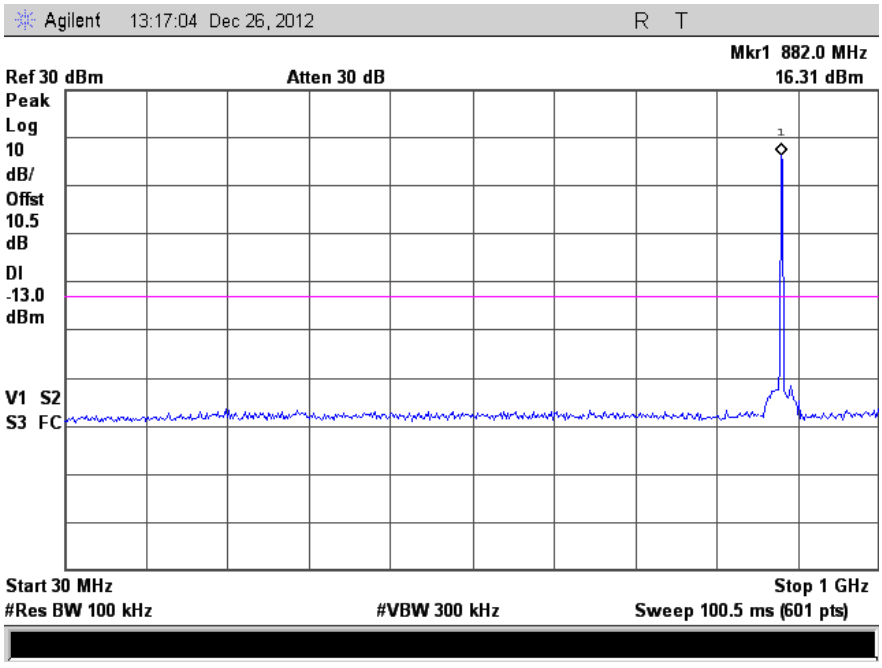
6. Measurement Data (continued)

6.3. Spurious Emissions at the Antenna Terminals 22.917 (a) (b) (continued)

6.3.10. Low Channel, 1 to 26.5 GHz – TX2



6.3.11. Mid Channel, 30 MHz to 1 GHz – TX2



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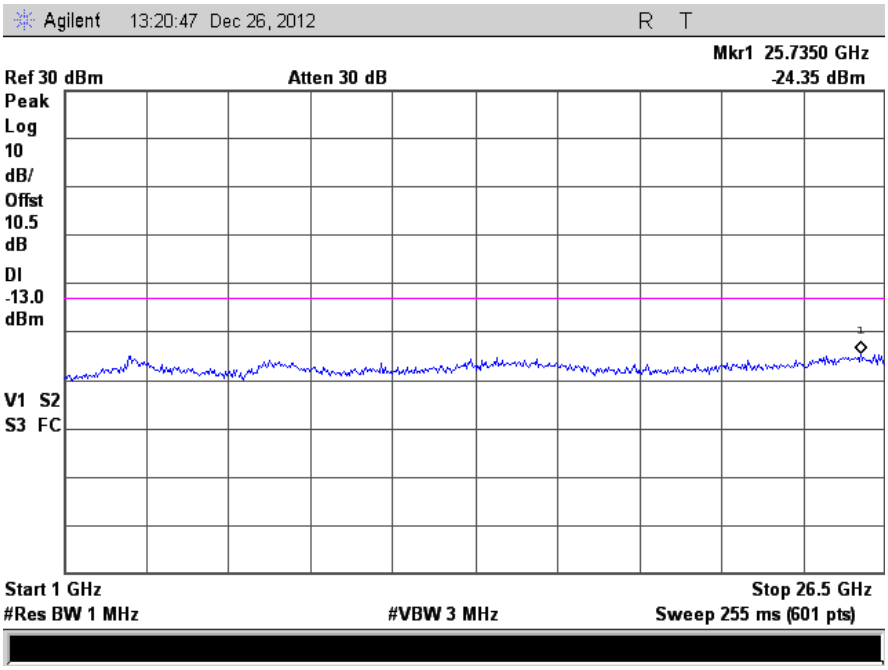
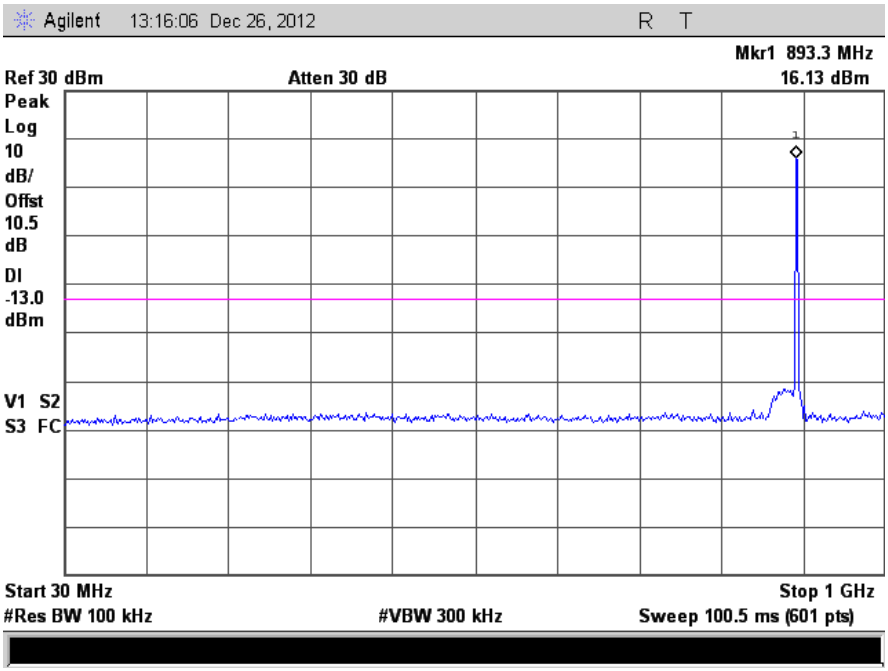
6. Measurement Data (continued)

6.3. Spurious Emissions at the Antenna Terminals 22.917 (a) (b) (continued)

6.3.12. Mid channel, 1 to 26.5 GHz – TX2



6.3.13. High Channel, 30 to 1000 MHz – TX2



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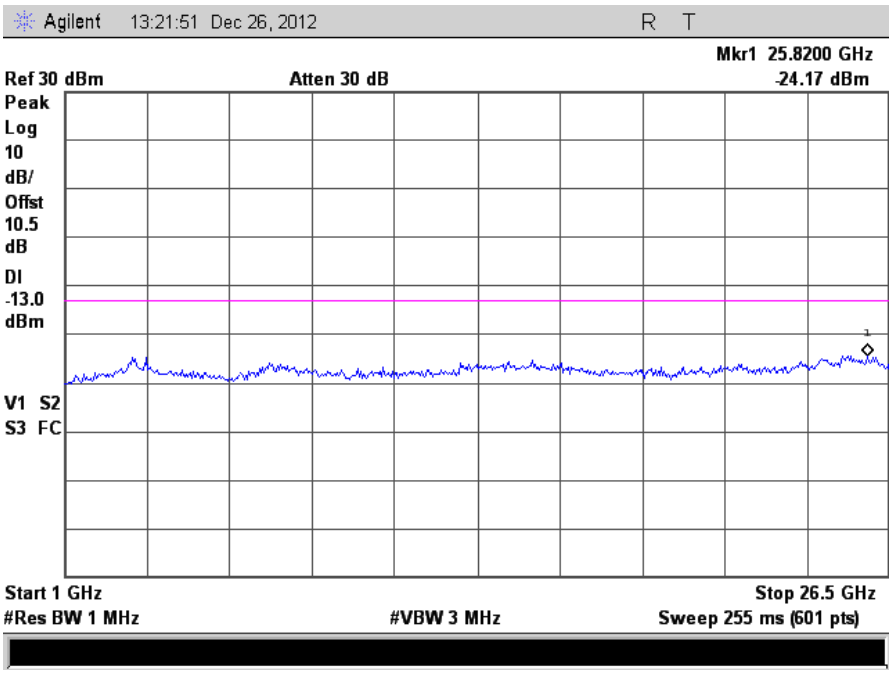
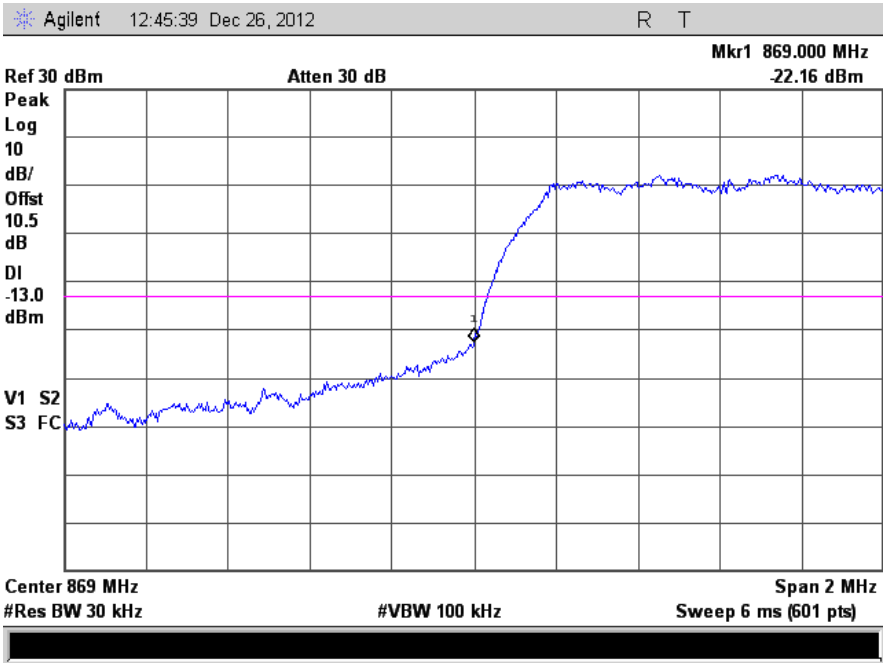
6. Measurement Data (continued)

6.3. Spurious Emissions at the Antenna Terminals 22.917 (a) (b) (continued)

6.3.14. High Channel, 1 to 26.5 GHz – TX2



6.3.15. Low Channel Lower Bandedge Measurement – TX2



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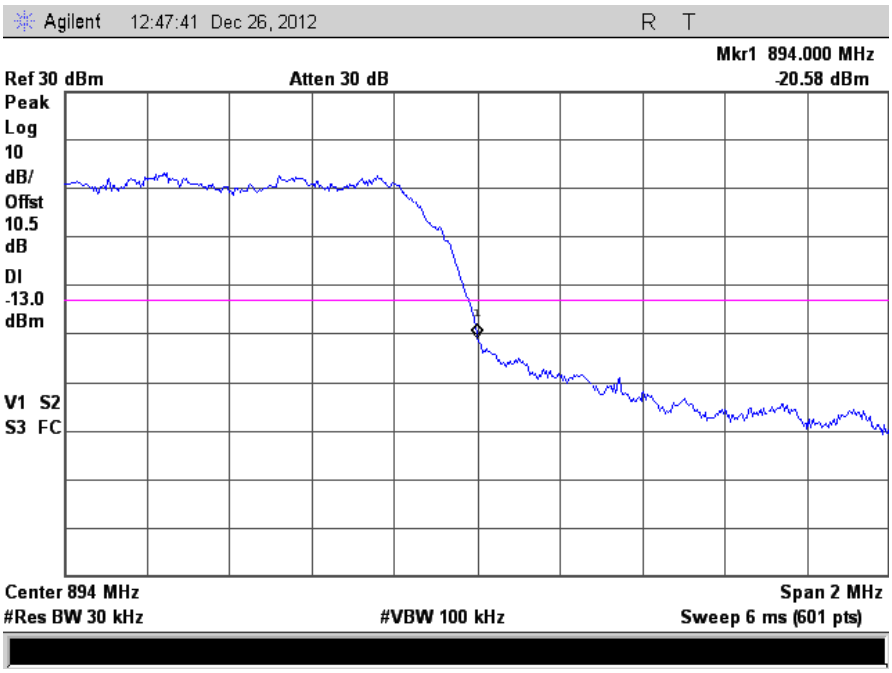
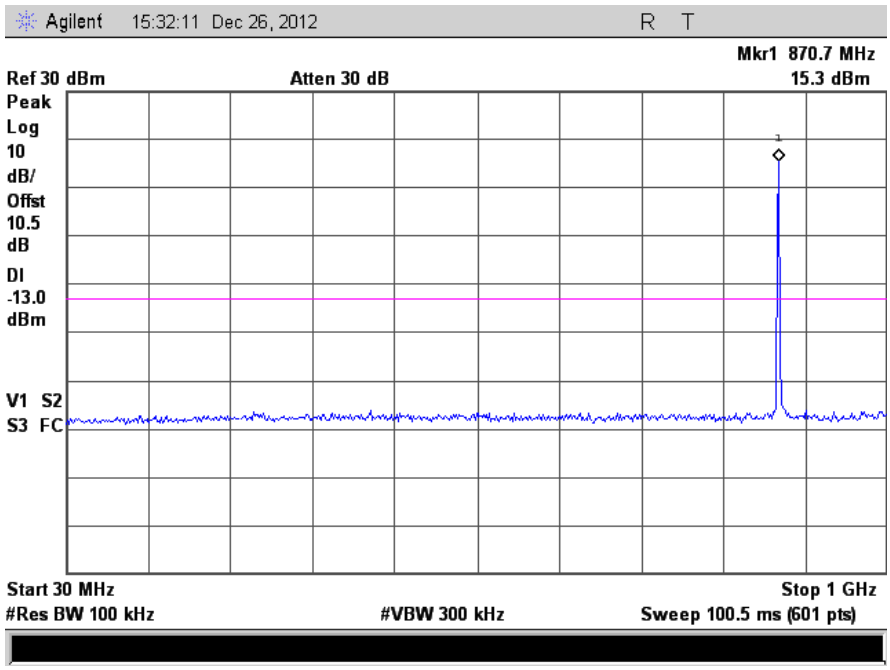
6. Measurement Data (continued)

6.3. Spurious Emissions at the Antenna Terminals 22.917 (a) (b) (continued)

6.3.16. High Channel Upper Bandedge Measurement – TX2



6.3.17. Low channel, 30 MHz to 1 GHz – TX3



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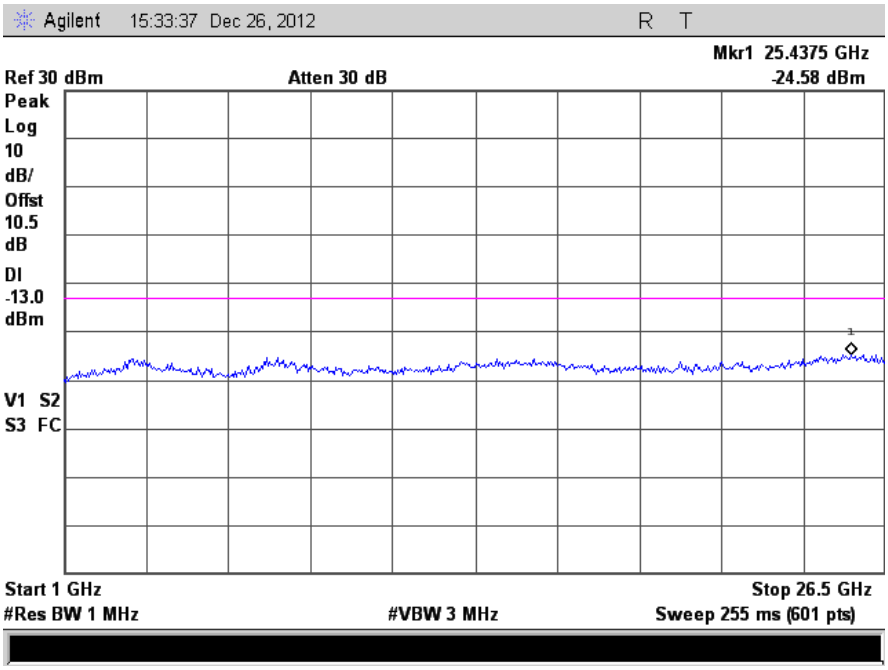
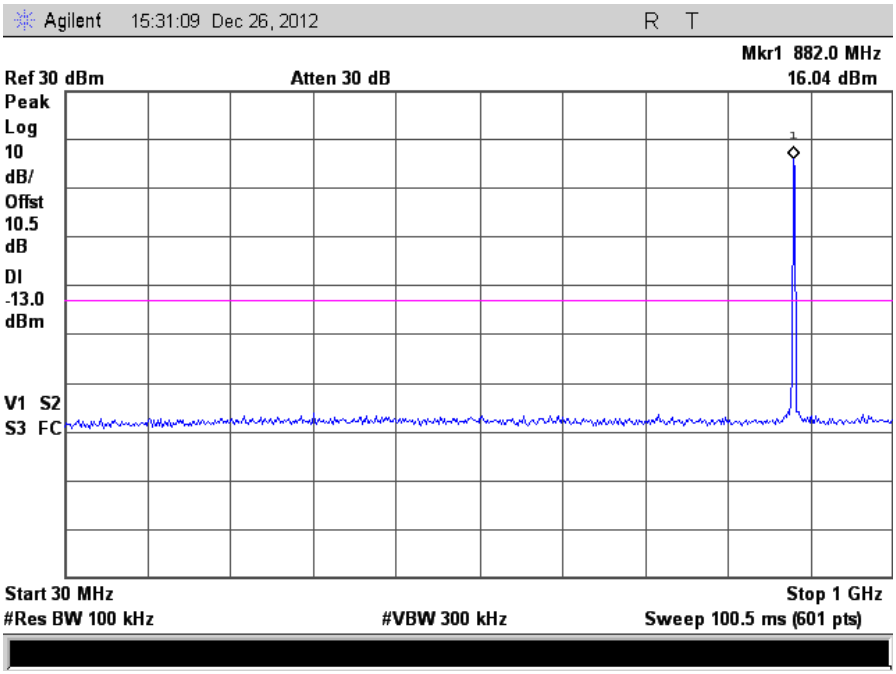
6. Measurement Data (continued)

6.3. Spurious Emissions at the Antenna Terminals 22.917 (a) (b) (continued)

6.3.18. Low Channel, 1 to 26.5 GHz – TX3



6.3.19. Mid Channel, 30 MHz to 1 GHz – TX3



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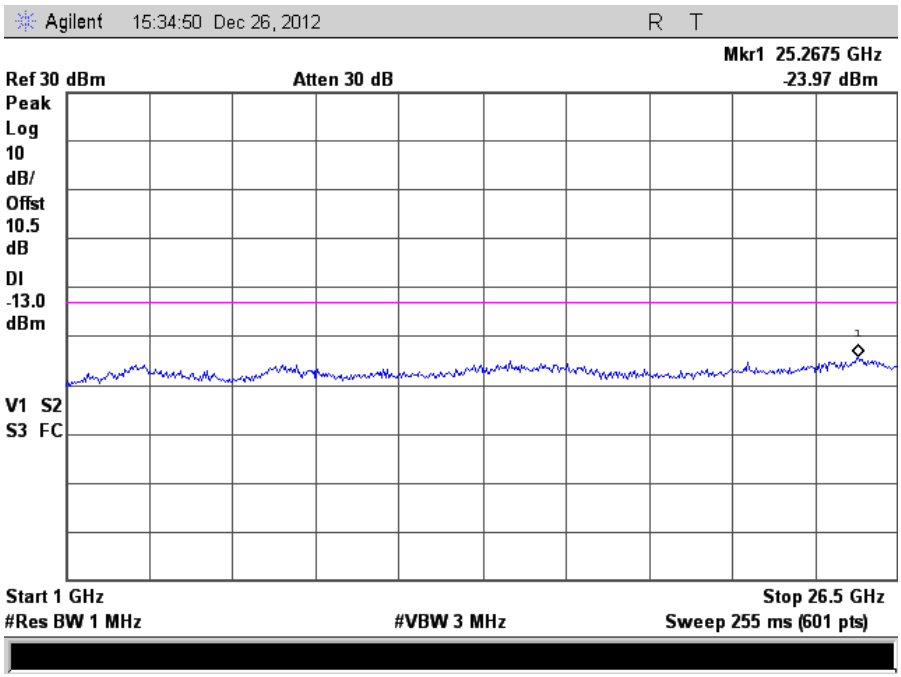
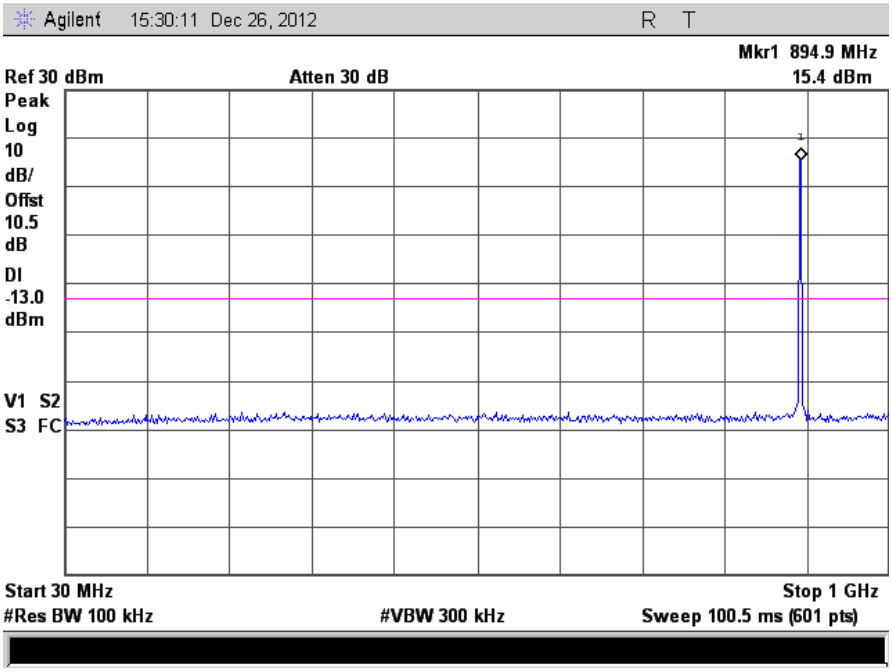
6. Measurement Data (continued)

6.3. Spurious Emissions at the Antenna Terminals 22.917 (a) (b) (continued)

6.3.20. Mid channel, 1 to 26.5 GHz – TX3



6.3.21. High Channel, 30 to 1000 MHz – TX3



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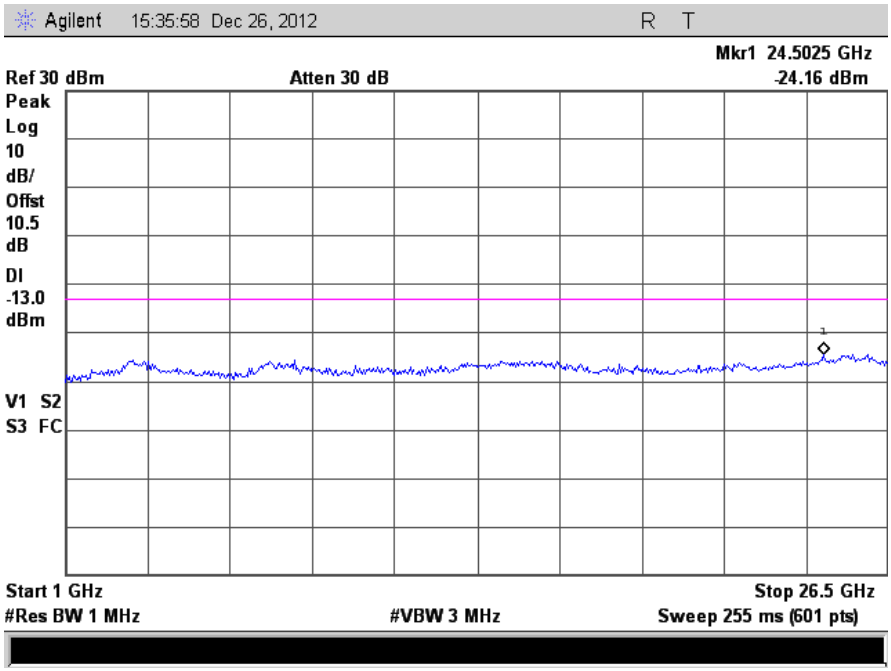
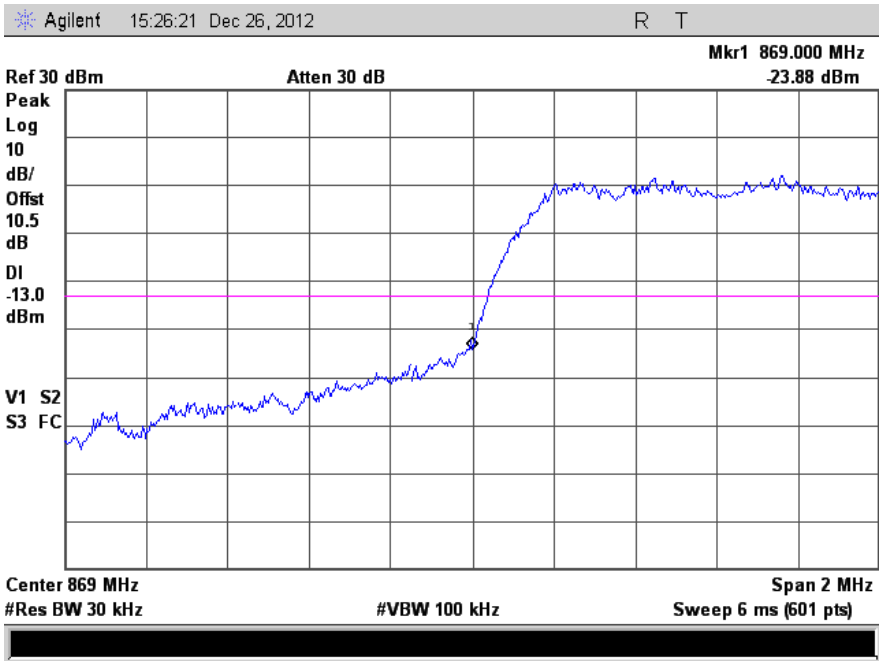
6. Measurement Data (continued)

6.3. Spurious Emissions at the Antenna Terminals 22.917 (a) (b) (continued)

6.3.22. High Channel, 1 to 26.5 GHz – TX3



6.3.23. Low Channel Lower Bandedge Measurement – TX3



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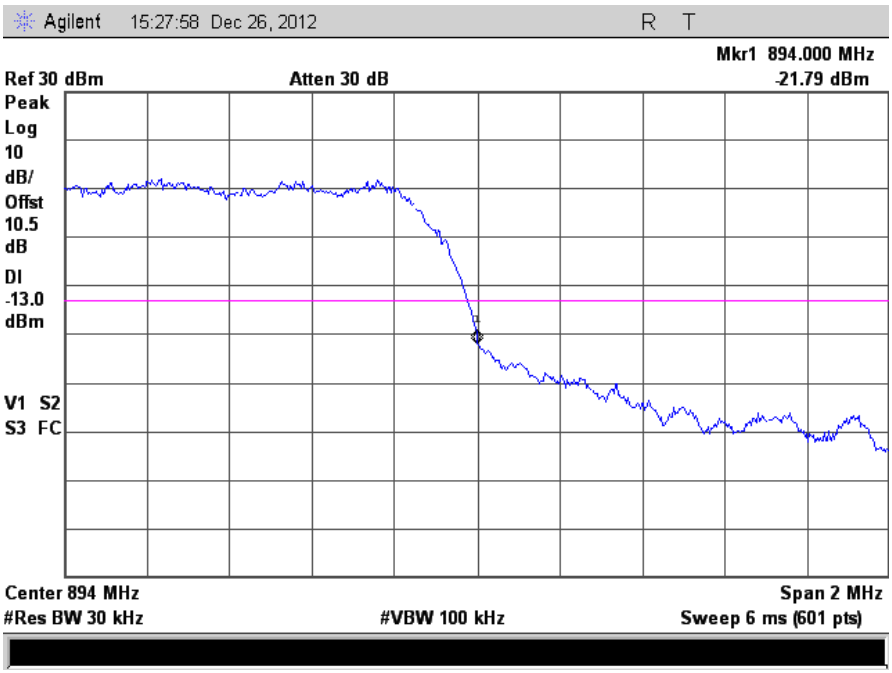
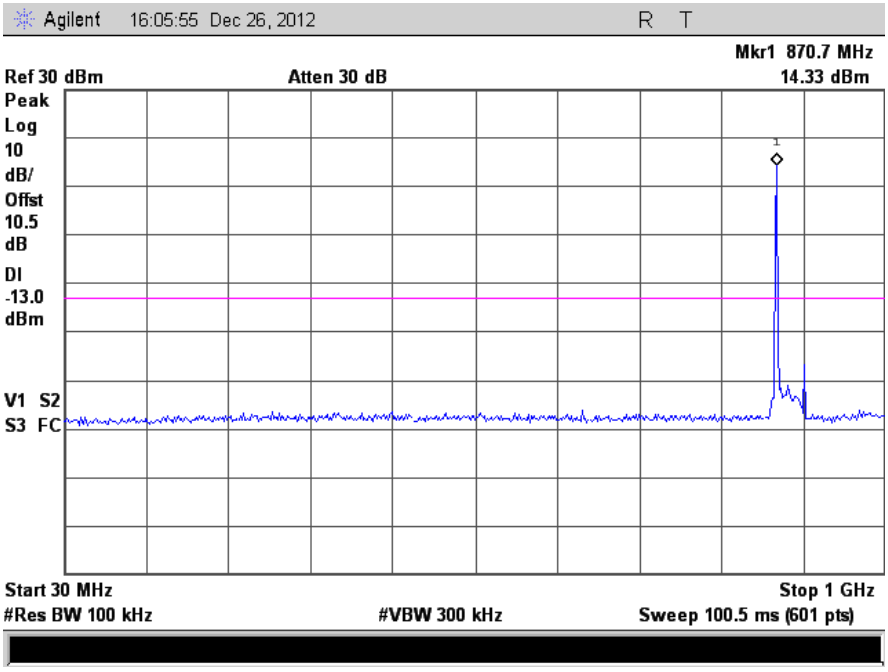
6. Measurement Data (continued)

6.3. Spurious Emissions at the Antenna Terminals 22.917 (a) (b) (continued)

6.3.24. High Channel Upper Bandedge Measurement – TX3



6.3.25. Low channel, 30 MHz to 1 GHz – TX4



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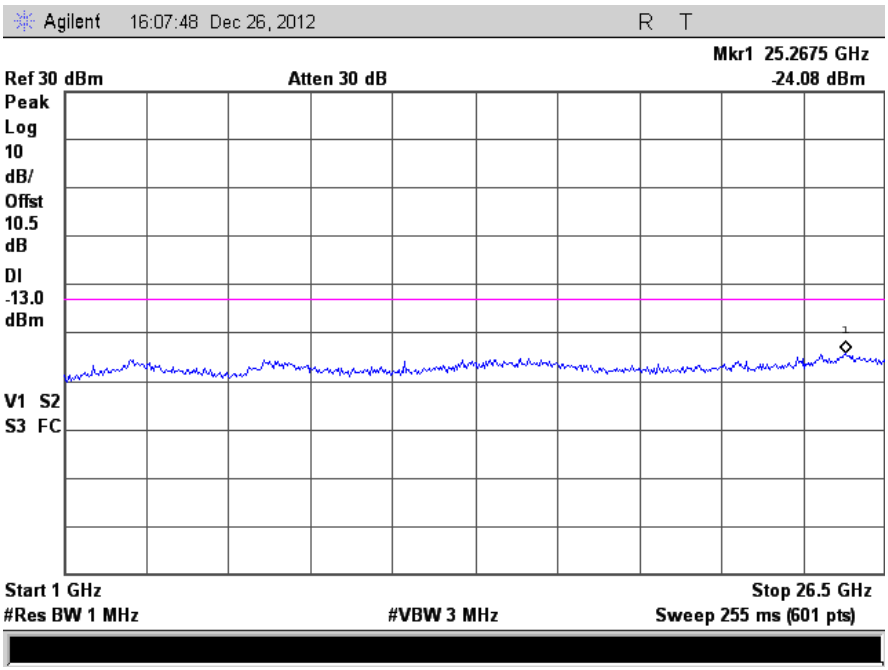
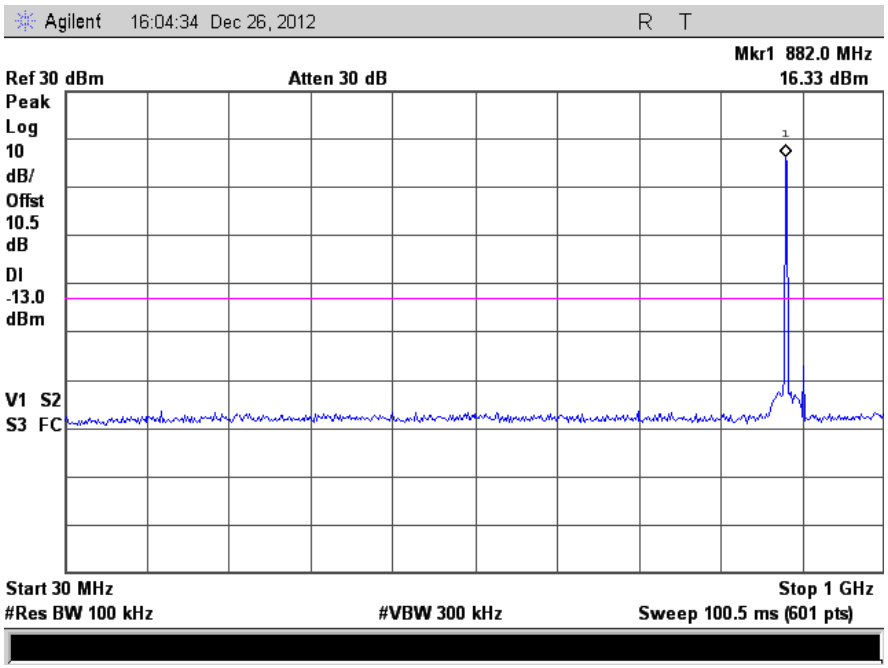
6. Measurement Data (continued)

6.3. Spurious Emissions at the Antenna Terminals 22.917 (a) (b) (continued)

6.3.26. Low Channel, 1 to 26.5 GHz – TX4



6.3.27. Mid Channel, 30 MHz to 1 GHz – TX4



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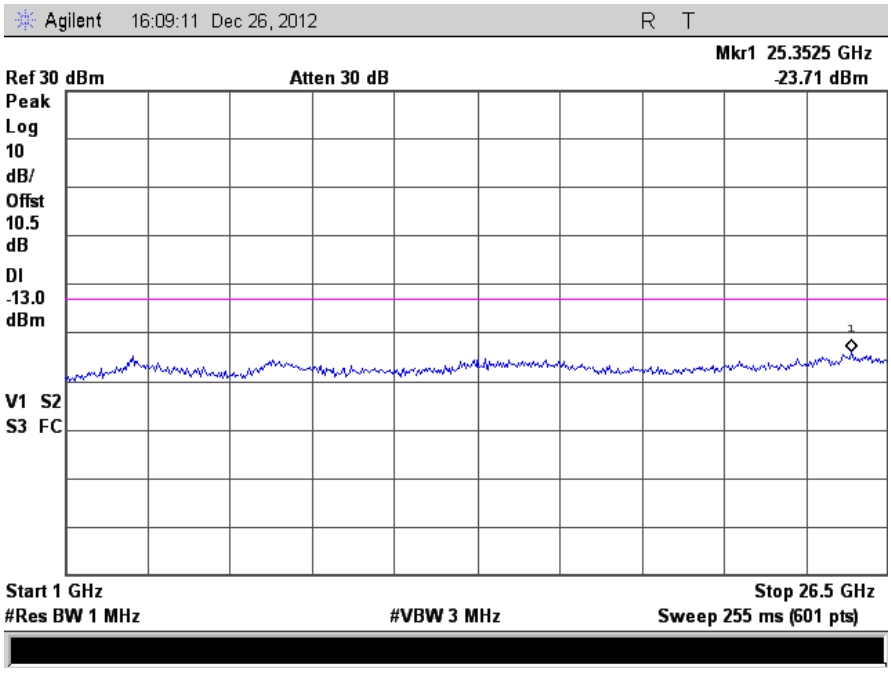
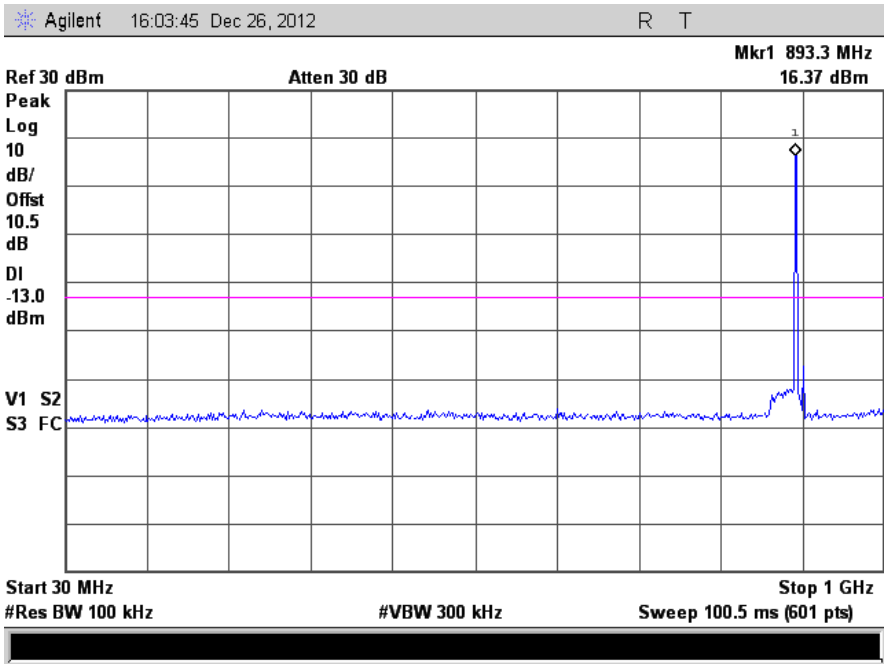
6. Measurement Data (continued)

6.3. Spurious Emissions at the Antenna Terminals 22.917 (a) (b) (continued)

6.3.28. Mid channel, 1 to 26.5 GHz – TX4



6.3.29. High Channel, 30 to 1000 MHz – TX4



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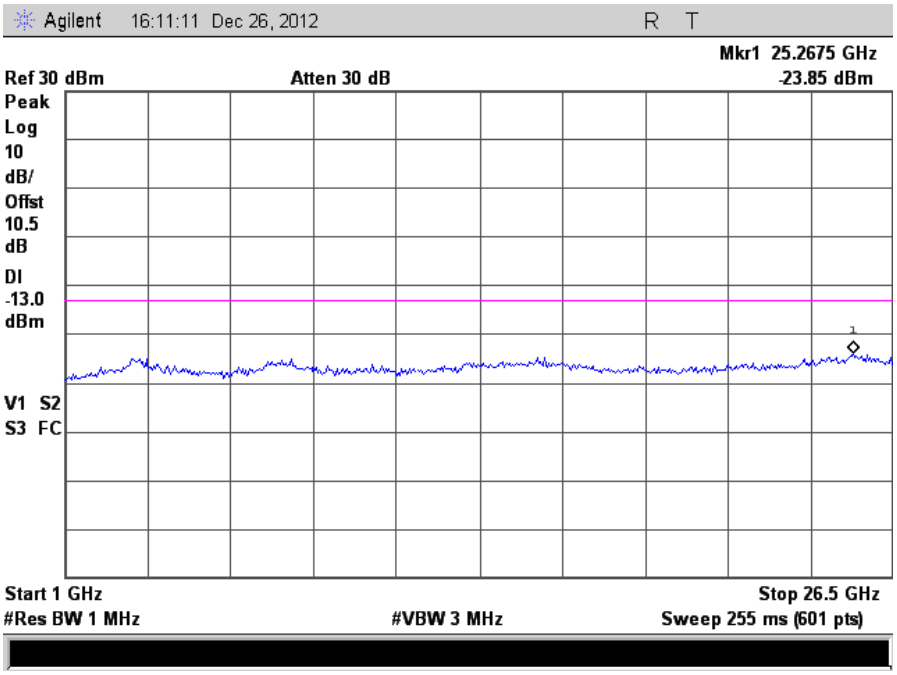
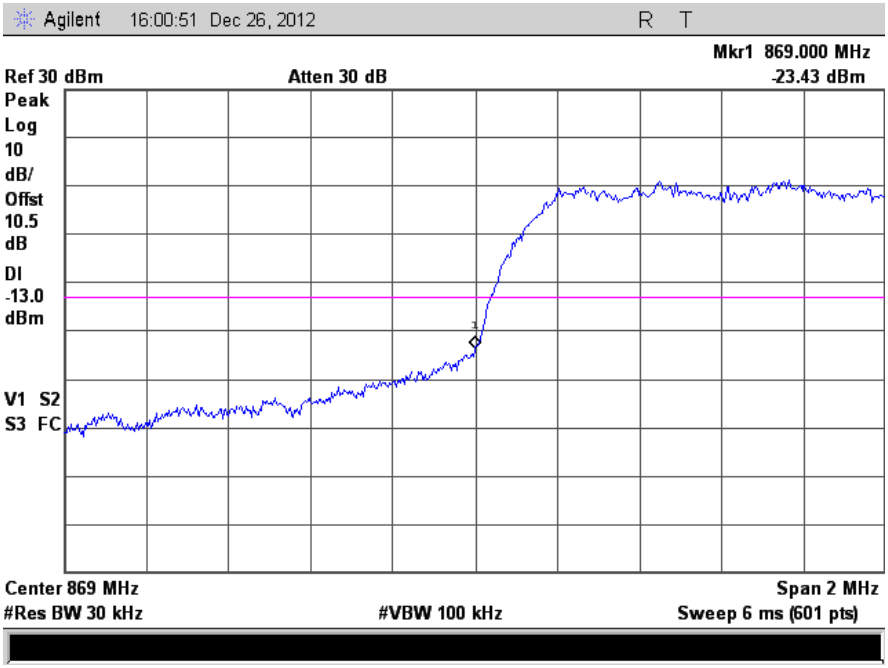
6. Measurement Data (continued)

6.3. Spurious Emissions at the Antenna Terminals 22.917 (a) (b) (continued)

6.3.30. High Channel, 1 to 26.5 GHz – TX4



6.3.31. Low Channel Lower Bandedge Measurement – TX4



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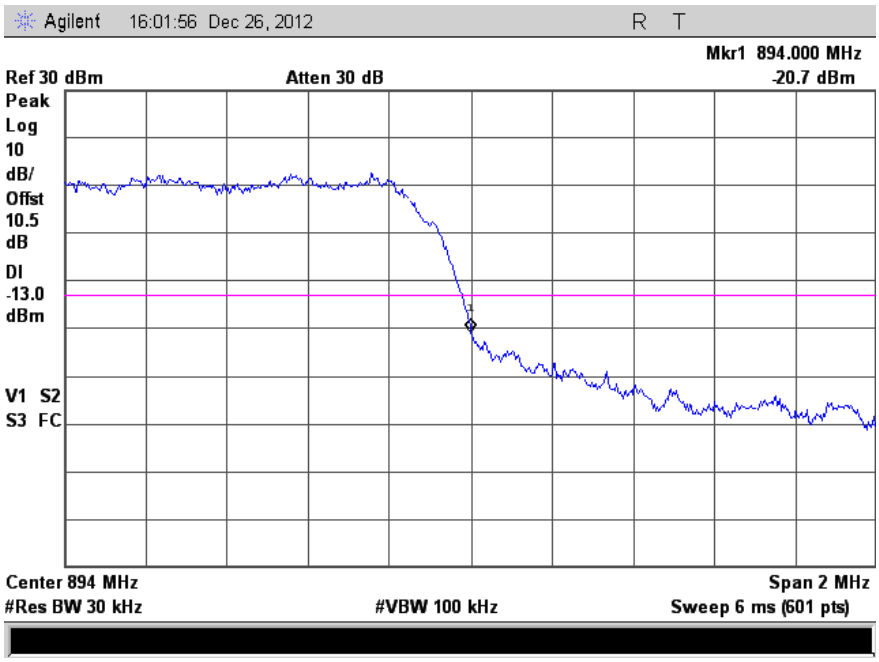
6. Measurement Data (continued)

6.3. Spurious Emissions at the Antenna Terminals 22.917 (a) (b) (continued)

6.3.32. High Channel Upper Bandedge Measurement – TX4



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6. Measurement Data (continued)

6.4. Field Strength of Spurious Emissions 22.917 (a) (b)

Requirement: 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

6.4.1. Measurement and Equipment Setup

Test Date:	04/01/2013
Test Engineer:	Anthony Marchisio
Site Temperature (°C):	21.5
Relative Humidity (%RH):	32
Frequency Range:	30 MHz to 1 GHz
Measurement Distance:	3 Meters
EMI Receiver IF Bandwidth:	120 kHz
EMI Receiver Avg Bandwidth:	300 kHz
Detector Functions:	Peak and Quasi-Peak.
Antenna Height:	1 to 4 meters

6.4.2 Test Procedure

Test measurements were made in accordance with ANSI C63.4-2003, Standard Methods of Measurement of Radio Noise Emissions from Low-Voltage Electrical and Electronics Equipment in the Range of 9 kHz to 40 GHz.

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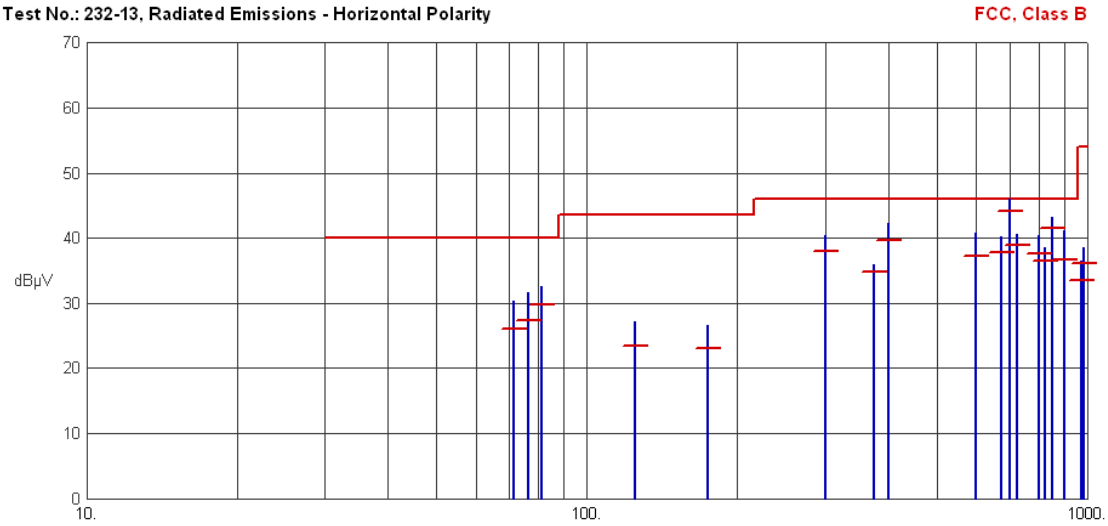
6. Measurement Data (continued)

6.4. Field Strength of Spurious Emissions 22.917 (a) (b) (continued)

6.4.3. Horizontal Polarity



Frequency (MHz)	Pk Amp (dBµV/m)	QP Amp (dBµV/m)	QP Limit (dBµV/m)	Margin (dB)	Ant Ht (cm)	Table (Deg)	Comments
71.4987	30.23	25.97	40.00	-14.03	N/A	N/A	
76.4025	31.71	27.30	40.00	-12.70	N/A	N/A	
81.3859	32.63	29.85	40.00	-10.15	N/A	N/A	
124.9915	27.24	23.49	43.50	-20.01	N/A	N/A	
175.0235	26.67	23.02	43.50	-20.48	N/A	N/A	
300.0635	40.38	38.03	46.00	-7.97	N/A	N/A	
375.0368	35.93	34.73	46.00	-11.27	N/A	N/A	
400.0797	42.25	39.70	46.00	-6.30	N/A	N/A	
600.1245	40.68	37.19	46.00	-8.81	N/A	N/A	
675.0512	40.29	37.83	46.00	-8.17	N/A	N/A	
700.1391	46.02	44.14	46.00	-1.86	N/A	N/A	
725.0652	40.51	38.92	46.00	-7.08	N/A	N/A	
800.1665	40.34	37.59	46.00	-8.41	N/A	N/A	
825.0678	38.48	36.48	46.00	-9.52	N/A	N/A	
850.0737	43.11	41.52	46.00	-4.48	N/A	N/A	
900.0675	41.19	36.63	46.00	-9.37	N/A	N/A	
975.0801	36.47	33.54	54.00	-20.46	N/A	N/A	
983.0236	38.56	36.11	54.00	-17.89	N/A	N/A	

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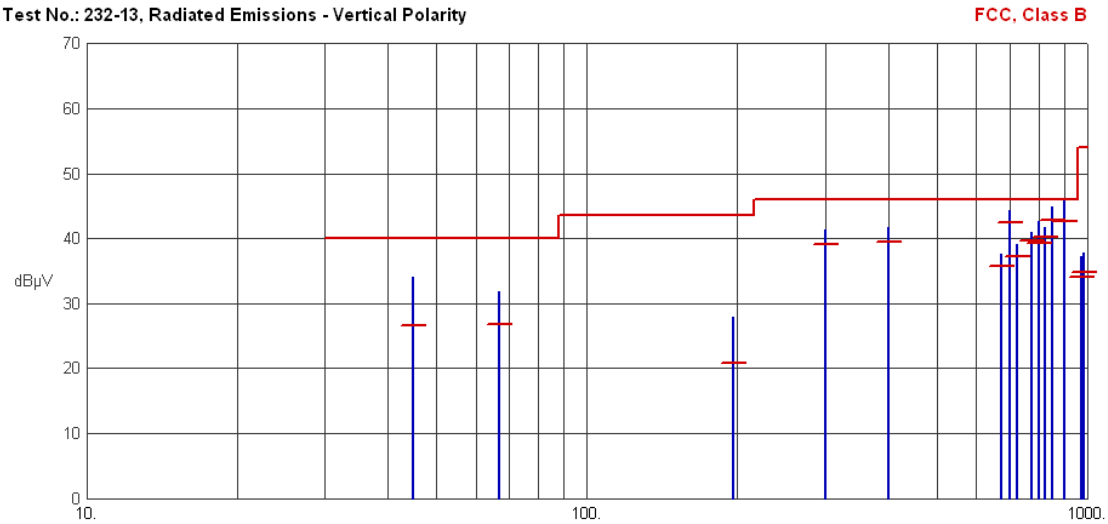
6. Measurement Data (continued)

6.4. Field Strength of Spurious Emissions 22.917 (a) (b) (continued)

6.4.4. Vertical Polarity



Frequency (MHz)	Pk Amp (dBµV/m)	QP Amp (dBµV/m)	QP Limit (dBµV/m)	Margin (dB)	Ant Ht (cm)	Table (Deg)	Comments
44.8701	34.04	26.60	40.00	-13.40	N/A	N/A	
66.7274	31.74	26.70	40.00	-13.30	N/A	N/A	
196.6637	27.94	20.74	43.50	-22.76	N/A	N/A	
300.0704	41.27	39.18	46.00	-6.82	N/A	N/A	
400.0669	41.72	39.52	46.00	-6.48	N/A	N/A	
675.0484	37.59	35.67	46.00	-10.33	N/A	N/A	
700.1356	44.38	42.52	46.00	-3.48	N/A	N/A	
725.0640	39.07	37.17	46.00	-8.83	N/A	N/A	
775.0659	40.96	39.62	46.00	-6.38	N/A	N/A	
800.0721	42.69	39.34	46.00	-6.66	N/A	N/A	
825.0740	41.71	40.28	46.00	-5.72	N/A	N/A	
850.0758	44.94	42.89	46.00	-3.11	N/A	N/A	
900.0757	45.79	42.59	46.00	-3.41	N/A	N/A	
975.0751	37.14	34.12	54.00	-19.88	N/A	N/A	
983.0539	37.76	34.87	54.00	-19.13	N/A	N/A	

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6. Measurement Data (continued)

6.4. Field Strength of Spurious Emissions 22.917 (a) (b) (continued)

6.4.5. Measurement and Equipment Setup

Test Date:	04/01/2013
Test Engineer:	Anthony Marchisio
Site Temperature (°C):	21.5
Relative Humidity (%RH):	32
Frequency Range:	Above 1 GHz
Measurement Distance:	3 Meters
EMI Receiver IF Bandwidth:	1 MHz
EMI Receiver Avg Bandwidth:	3 MHz
Detector Functions:	Peak and Average
Antenna Height:	1 to 4 meters

6.4.6. Radiated Emissions above 1 GHz

Note: There were no measurable signals above 1 GHz

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6. Measurement Data (continued)

6.5. Frequency Tolerance 22.355, IC RSS-133 5.3

Requirement: The carrier frequency of each transmitter in the Public Mobile Services must be maintained within 1.5 ppm for a base station in the frequency band 821 to 896 MHz.

The carrier frequency shall not depart from the reference frequency, in excess of ± 2.5 ppm for mobile stations and ± 1.0 ppm for base stations.

The temperature shall be varied from -30 to +50 degrees C in increments of 10 degrees C allowing time for the product to stabilize at each of the temperature steps.

Also, the frequency stability shall be measured with a variation of supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.

Temperature Degrees C	Frequency (MHz)	85% Nominal Voltage	115% Nominal Voltage
-30	881.499	881.499	881.499
-20	881.499	881.499	881.499
-10	881.499	881.499	881.499
0	881.500	881.500	881.500
10	881.500	881.500	881.500
20	**881.500**	**881.500**	**881.500**
30	881.500	881.500	881.500
40	881.500	881.500	881.500
50	881.499	881.499	881.499
Max Deviation (MHz)	**0.0010**	**0.0010**	**0.0010**
Max Deviation (ppm)	**1.1344**	**1.1344**	**1.1344**

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6. Measurement Data (continued)

6.6. Public Exposure to Radio Frequency Energy Levels 1.1307 (b)(1), IC RSS-102

Channel	MPE Distance (cm)	DUT Output Power (dBm)	DUT Antenna Gain (dBi)	Power Density		Limit (mW/cm2)	Result
				(mW/cm2)	(W/m2)		
	(1)	(2)	(3)	(4)		(5)	
Low	20.0	19.57	3.0000	0.0359526	0.3595259	1	Compliant
Mid	20.0	20.38	3.0000	0.0433242	0.4332416	1	Compliant
High	20.0	20.16	3.0000	0.0411842	0.4118415	1	Compliant
All	20.0	20.33	3.0000	0.0428282	0.4282823	1	Compliant
Low	20.0	20.07	3.0000	0.0403395	0.4033947	1	Compliant
Mid	20.0	21.20	3.0000	0.0523275	0.5232752	1	Compliant
High	20.0	20.42	3.0000	0.0437250	0.4372503	1	Compliant
All	20.0	20.19	3.0000	0.0414696	0.4146963	1	Compliant
Low	20.0	19.07	3.0000	0.0320428	0.3204278	1	Compliant
Mid	20.0	20.47	3.0000	0.0442313	0.4423134	1	Compliant
High	20.0	19.73	3.0000	0.0373018	0.3730183	1	Compliant
All	20.0	20.68	3.0000	0.0464227	0.4642267	1	Compliant
Low	20.0	18.53	3.0000	0.0282963	0.2829633	1	Compliant
Mid	20.0	20.42	3.0000	0.0437250	0.4372503	1	Compliant
High	20.0	19.95	3.0000	0.0392401	0.3924010	1	Compliant
All	20.0	20.05	3.0000	0.0401541	0.4015412	1	Compliant

$$PD = \frac{OP + AG}{(4 \times \pi \times d^2)}$$

1. Reference CFR 2.1093(b): For purposes of this section, a portable device is defined as a transmitting device designed to be used so that the radiating structure(s) of the device is/are within 20 centimeters of the body of the user. Actual separation distance was calculated for outdoor applications.
2. Section 6.1.2 of this test report. Note that the value has been adjusted to include the cable insertion loss.
3. Data supplied by the client. 3 dBi for Indoor, 14 dBi for Outdoor Applications
4. Power density is calculated from field strength measurement and antenna gain.
5. Reference CFR 1.1310, Table 1: Limits for Maximum Permissible Exposure (MPE), Section (B): Limits for General Population/Uncontrolled Exposure.

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6. Measurement Data (continued)

6.6. Public Exposure to Radio Frequency Energy Levels 1.1307 (b)(1), IC RSS-102

Channel	MPE Distance (cm)	DUT Output Power (dBm)	DUT Antenna Gain (dBi)	Power Density		Limit (mW/cm2)	Result
				(mW/cm2)	(W/m2)		
	(1)	(2)	(3)	(4)		(5)	
Low	20.0	19.57	14.0000	0.4526163	4.5261625	1	Compliant
Mid	20.0	20.38	14.0000	0.5454189	5.4541885	1	Compliant
High	20.0	20.16	14.0000	0.5184778	5.1847777	1	Compliant
All	20.0	20.33	14.0000	0.5391755	5.3917549	1	Compliant
Low	20.0	20.07	14.0000	0.5078438	5.0784379	1	Compliant
Mid	20.0	21.20	14.0000	0.6587644	6.5876443	1	Compliant
High	20.0	20.42	14.0000	0.5504656	5.5046555	1	Compliant
All	20.0	20.19	14.0000	0.5220717	5.2207169	1	Compliant
Low	20.0	19.07	14.0000	0.4033947	4.0339466	1	Compliant
Mid	20.0	20.47	14.0000	0.5568396	5.5683964	1	Compliant
High	20.0	19.73	14.0000	0.4696022	4.6960222	1	Compliant
All	20.0	20.68	14.0000	0.5844268	5.8442683	1	Compliant
Low	20.0	18.53	14.0000	0.3562297	3.5622972	1	Compliant
Mid	20.0	20.42	14.0000	0.5504656	5.5046555	1	Compliant
High	20.0	19.95	14.0000	0.4940036	4.9400364	1	Compliant
All	20.0	20.05	14.0000	0.5055105	5.0551046	1	Compliant

$$PD = \frac{OP + AG}{(4 \times \pi \times d^2)}$$

1. Reference CFR 2.1093(b): For purposes of this section, a portable device is defined as a transmitting device designed to be used so that the radiating structure(s) of the device is/are within 20 centimeters of the body of the user. Actual separation distance was calculated for outdoor applications.
2. Section 6.1.2 of this test report. Note that the value has been adjusted to include the cable insertion loss.
3. Data supplied by the client. 3 dBi for Indoor, 14 dBi for Outdoor Applications
4. Power density is calculated from field strength measurement and antenna gain.
5. Reference CFR 1.1310, Table 1: Limits for Maximum Permissible Exposure (MPE), Section (B): Limits for General Population/Uncontrolled Exposure.

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7. Test Site Description

Compliance Worldwide is located at 357 Main Street in Sandown, New Hampshire. The test sites at Compliance Worldwide are used for conducted and radiated emissions testing in accordance with Federal Communications Commission (FCC) and Industry Canada standards. A description of the test sites is on file with the FCC (registration number **96392**) and Industry Canada (file number **IC 3023A-1)**.

The radiated emissions test site is a 3 and 10 meter enclosed open area test site (OATS). Personnel, support equipment and test equipment are located in the basement beneath the OATS ground plane.

The conducted emissions site is part of a 16' x 20' x 12' ferrite tile chamber and uses one of the walls for the vertical ground plane required by EN 55022.

Both sites are designed to test products or systems 1.5 meter W x 1.5 meter L x 2.0 meter H, floor standing or table top.

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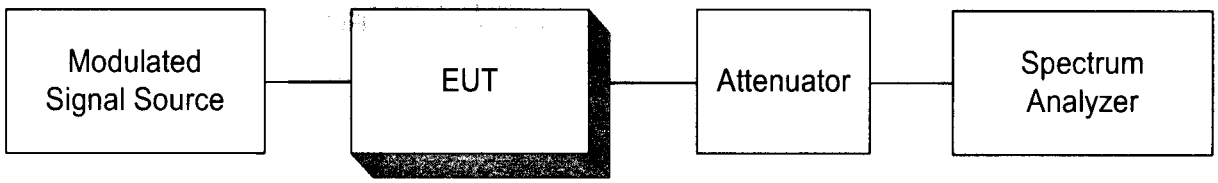
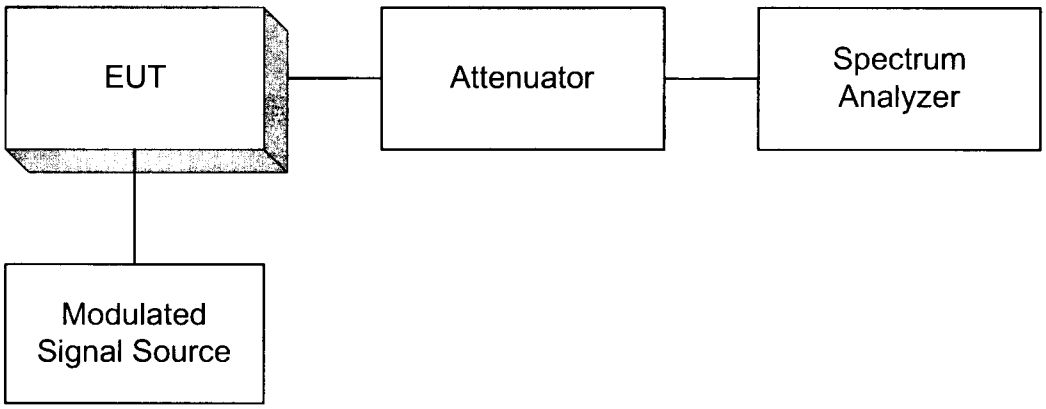
Appendix A

RF Output Power



Occupied Bandwidth



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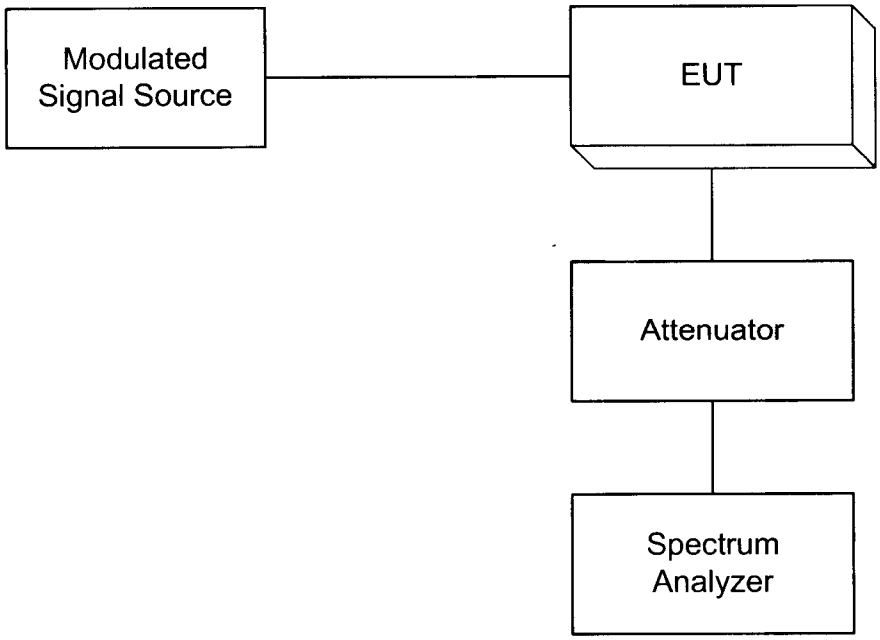
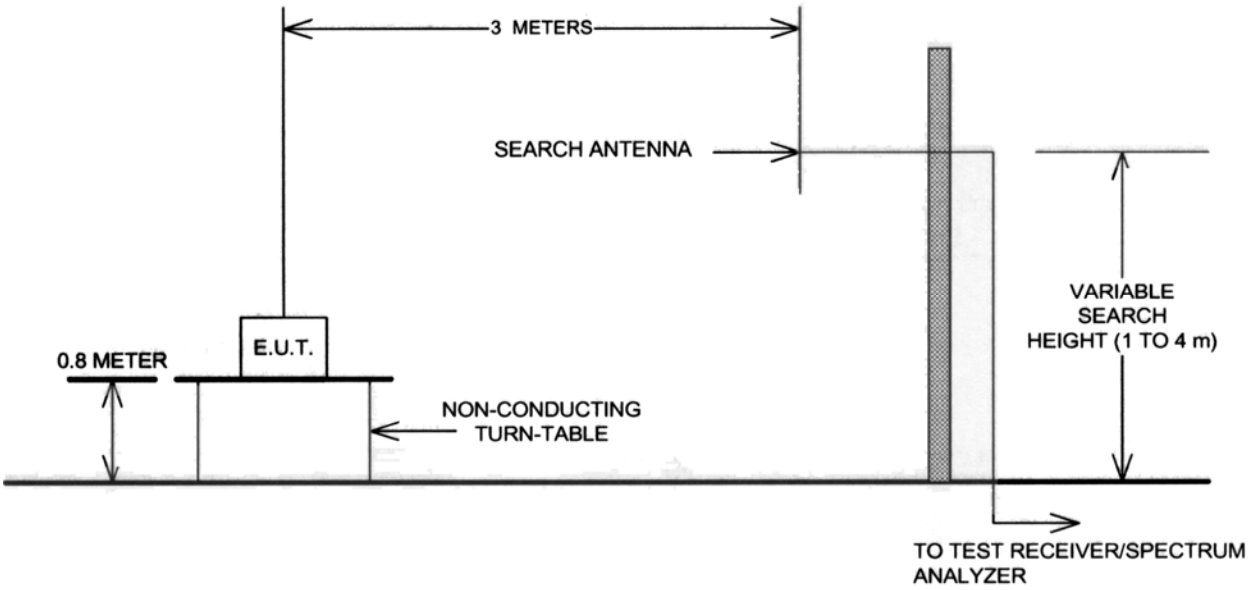
Appendix A

Spurious Emissions at the Antenna Terminals



Field Strength of Spurious Radiation



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