



FCC CFR47 PART 27 SUBPART M

CERTIFICATION TEST REPORT

FOR

CDMA+ WIMAX + WIFI MOBILE HOT SPOT

MODEL NUMBER: AirCard W802S

FCC ID: N7N-MHS802

REPORT NUMBER: 10U13412-1, Revision A

ISSUE DATE: JANUARY 12, 2011

Prepared for

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Prepared by

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NVLAP LAB CODE 200065-0

Revision History

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
---	09/25/10	Initial Issue	T. Chan
A	01/12/11	Changed model name	A. Zaffar

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: SIERRA WIRELESS INC.
2200 FARADAY AVENUE, SUITE 150.
CARLSBAD, CA 92008, U.S.A.

EUT DESCRIPTION: CDMA+ WIMAX + WIFI MOBILE HOT SPOT

MODEL: AirCard W802S

SERIAL NUMBER: Primary Unit #3

DATE TESTED: SEPTEMBER 21-28, 2010

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 27 SUBPART M	PASS

Compliance Certification Services (UL CCS) tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL CCS based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL CCS and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL CCS will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Approved & Released For UL CCS By:

Tested By:



THU CHAN
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CHIN PANG
EMC ENGINEER
UL CCS

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with TIA/EIA 603C (2004), FCC CFR 47 Part 2, FCC CFR 47 Part 27M.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, California, USA.

UL CCS is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at <http://www.ccsemc.com>.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

$$\begin{aligned} \text{Field Strength (dBuV/m)} &= \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \\ &\text{Cable Loss (dB)} - \text{Preamp Gain (dB)} \\ 36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} &= 28.9 \text{ dBuV/m} \end{aligned}$$

4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	3.52 dB
Radiated Disturbance, 30 to 1000 MHz	4.94 dB

Uncertainty figures are valid to a confidence level of 95%.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a CDMA + WiMax + WiFi mobile Hot Spot router

The WiMax radio module is manufactured by Sierra Wireless.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum EIRP as follows:

Mode	Channel	Frequency (MHz)	EIRP (dBm)	EIRP (mW)
5MHz QPSK	High	2498.5	24.50	281.84
5MHz 16QAM	High	2498.5	24.40	275.42
10MHz QPSK	High	2501	24.70	295.12
10MHz 16QAM	High	2501	24.80	302.00

Only the highest EIRP for each channel BW and modulation is listed above. Measured EIRP for L/M/H channel for each channel BW and modulation is documented in section 8.1.1 of test report.

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an integrated monopole antenna, with a maximum peak gain of 2.12dBi.

5.4. SOFTWARE AND FIRMWARE

The test utility software used during testing was X350 VSG Beceem Diagnostic Control Panel Version .4.00.00.

5.5. WORST-CASE CONFIGURATION AND MODE

The worst-case channel is determined as the channel with the highest output power.

There are two ports as indicated antenna 1 and antenna 2, based on the RF conducted output power test results, the antenna 1 has the higher output power than antenna 2; therefore all tests were performed at antenna 1 port.

To determine the worst-case, the EUT was investigated at X, Y and Z Positions, and the worst position is at X position for 5MHZ and 10MHz Band.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop	HP	Compaq 6515b	CNU82518TY	DoC
AC Adapter	HP	PA-1900-08H2	597920SLLUJXZ	DoC

I/O CABLES (RF CONDUCTED TEST)

I/O CABLE LIST						
Cable No.	Port	# of Identic Ports	Connector Type	Cable Type	Cable Length	Remarks
1	DC	1	DC	Un-shielded	2m	NA
2	USB	1	EUT	Un-shielded	1m	NA
3	Antenna Port	1	Spectrum Analyzer	Un-shielded	0.2m	NA
4	RF In/Out	1	Antenna	Un-shielded	None	NA

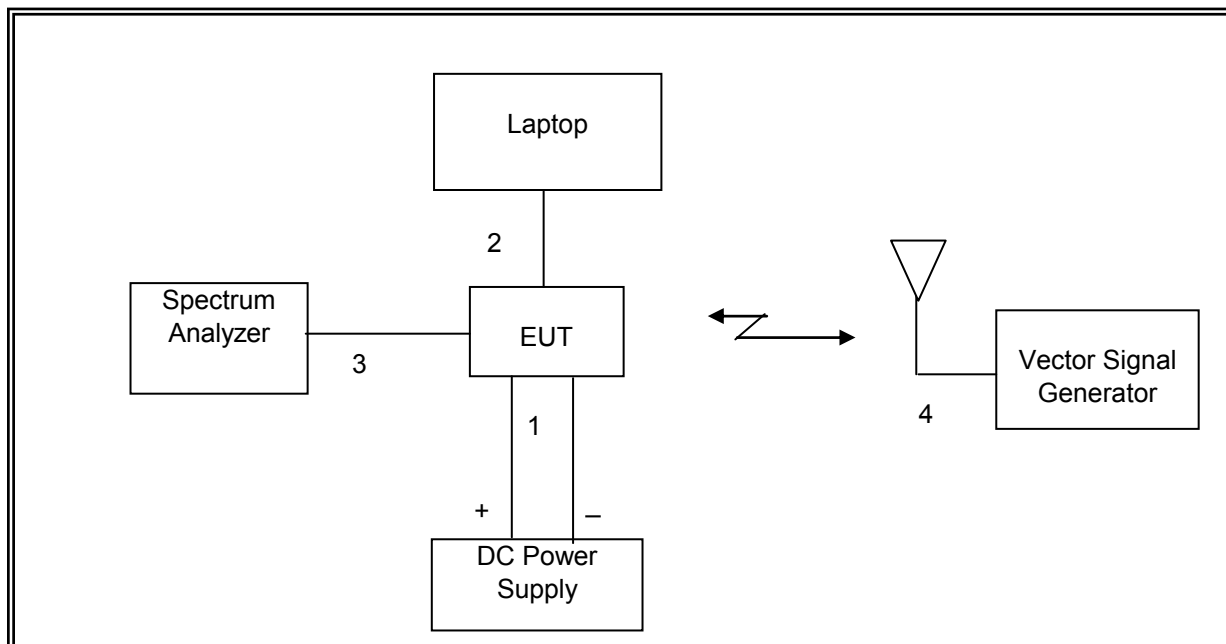
I/O CABLES (RF RADIATED TEST)

I/O CABLE LIST						
Cable No.	Port	# of Identic Ports	Connector Type	Cable Type	Cable Length	Remarks
1	RF In/Out	1	Antenna	Un-shielded	None	NA

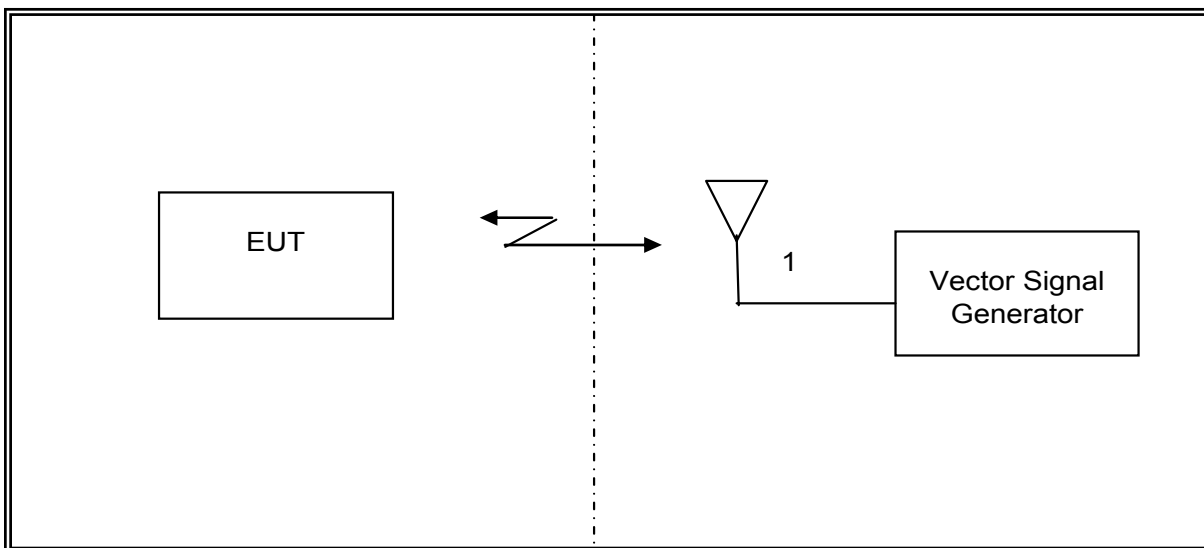
TEST SETUP

The EUT is a standalone device. Test software exercised the radio card.

SETUP DIAGRAM FOR RF CONDUCTED TESTS



SETUP DIAGRAM FOR RDIATED TESTS



6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

TEST EQUIPMENT LIST				
Description	Manufacturer	Model	Asset	Cal Due
Spectrum Analyzer, 26.5 GHz	Agilent / HP	E4440A	C01176	08/24/11
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01063	08/04/11
Antenna, Horn, 18 GHz	EMCO	3115	C00783	07/29/11
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00778	07/06/11
Antenna, Bilog, 2 GHz	Sunol Sciences	JB1	C01011	07/14/11
Temperature / Humidity Chamber	Thermotron	SE 600-10-10	C00930	04/06/11
Highpass Filter, 4.0 GHz	Micro-Tronics	HPM13351	N02706	CNR
EM Test Receiver, 30 MHz	R & S	ESHS 20	N02396	05/06/11
LISN, 30 MHz	FCC	LISN-50/250-25-2	N02625	11/06/10
Vector Signal Generator	Agilent / HP	E4438C	None	09/28/11

7. LIMITS AND RESULTS

7.1. ANTENNA PORT TEST RESULTS

7.1.1. 26 dB and 99% BANDWIDTH

LIMITS

§2.1049 & §27.53 (m)(6)

TEST PROCEDURE

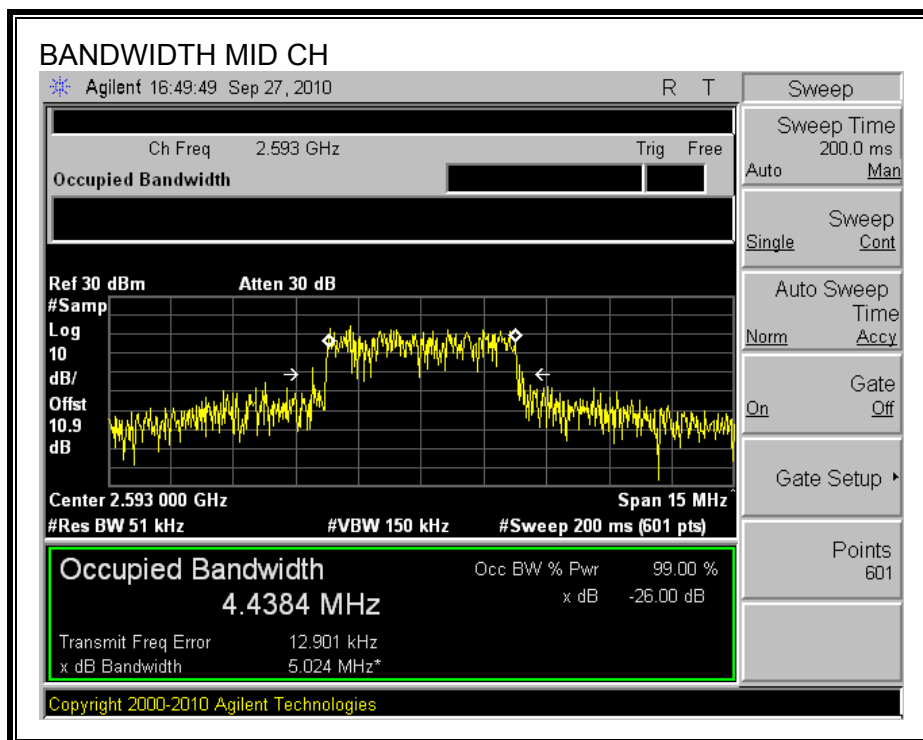
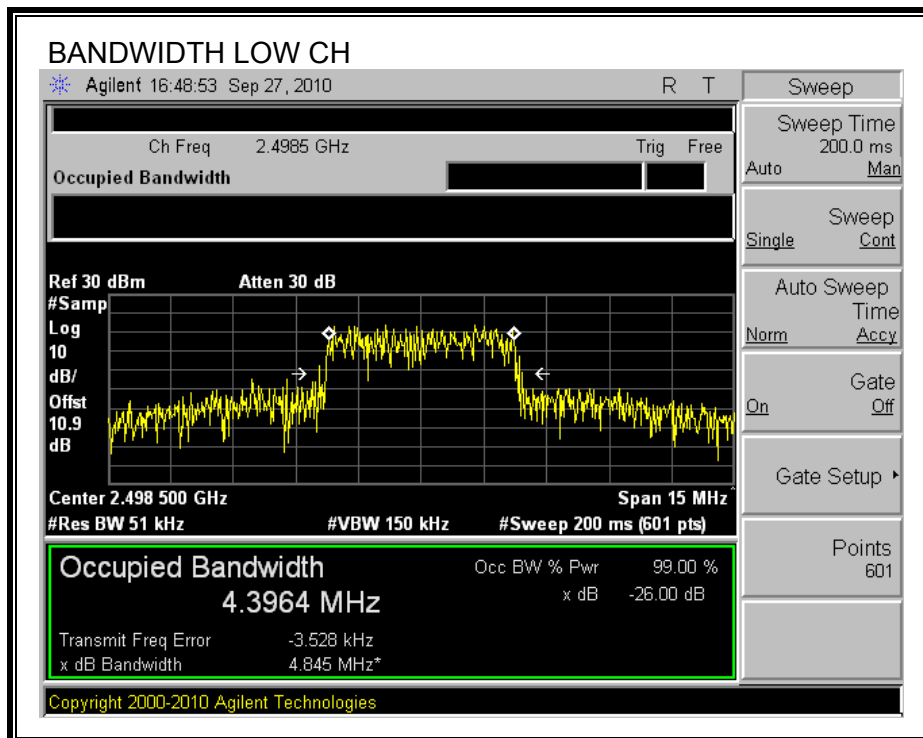
The transmitter outputs are connected to the spectrum analyzer via a combiner. The RBW is set to 1% to 3% of the measured bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal bandwidth function is utilized.

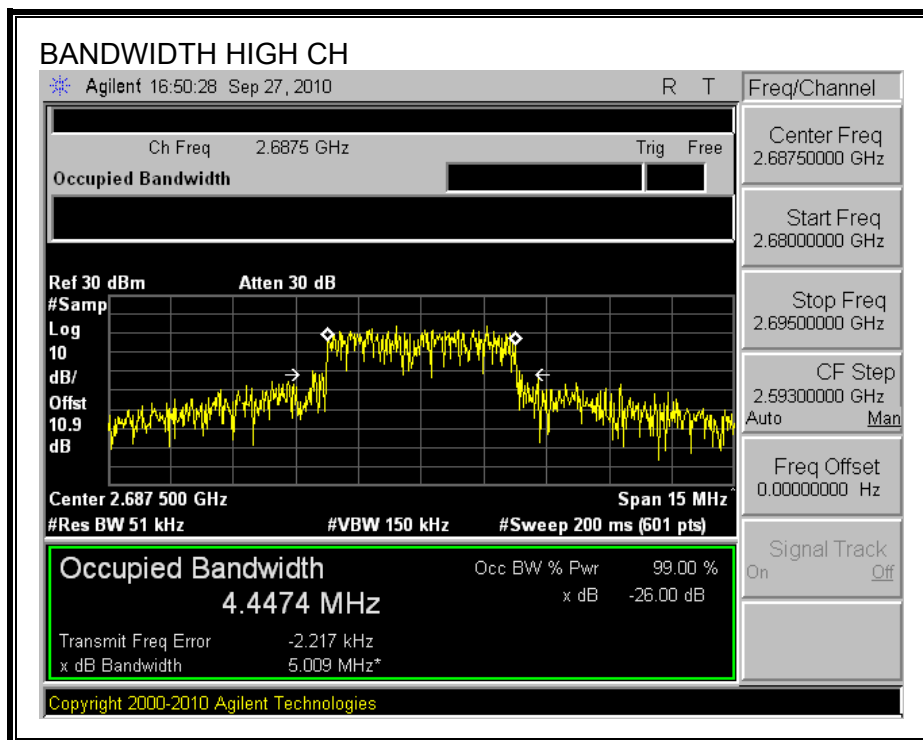
RESULTS

Mode	Channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
5MHz QPSK	Low	2498.5	4.845	4.3964
	Middle	2593	5.024	4.4384
	High	2687.5	5.009	4.4474
5MHz 16QAM	Low	2498.5	5.193	4.4516
	Middle	2593	4.703	4.4197
	High	2687.5	4.800	4.4223
10MHz QPSK	Low	2501	10.011	9.0518
	Middle	2593	10.032	9.1078
	High	2685	9.389	9.0944
10MHz 16QAM	Low	2501	9.327	9.0519
	Middle	2593	9.817	9.1339
	High	2685	9.390	9.0939

5MHz_QPSK

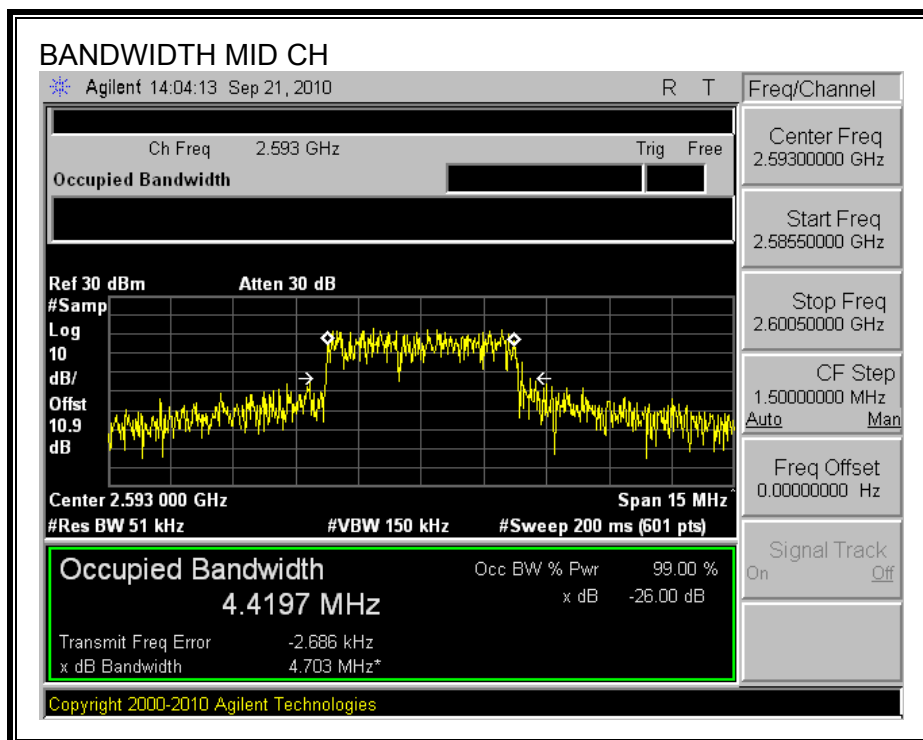
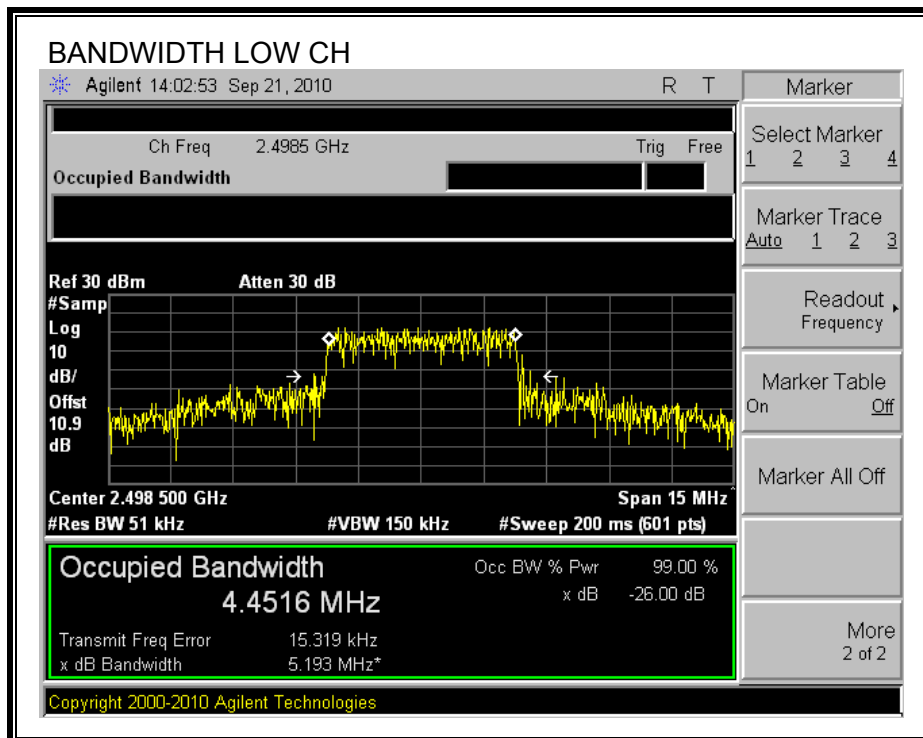
26 dB and 99% BANDWIDTH

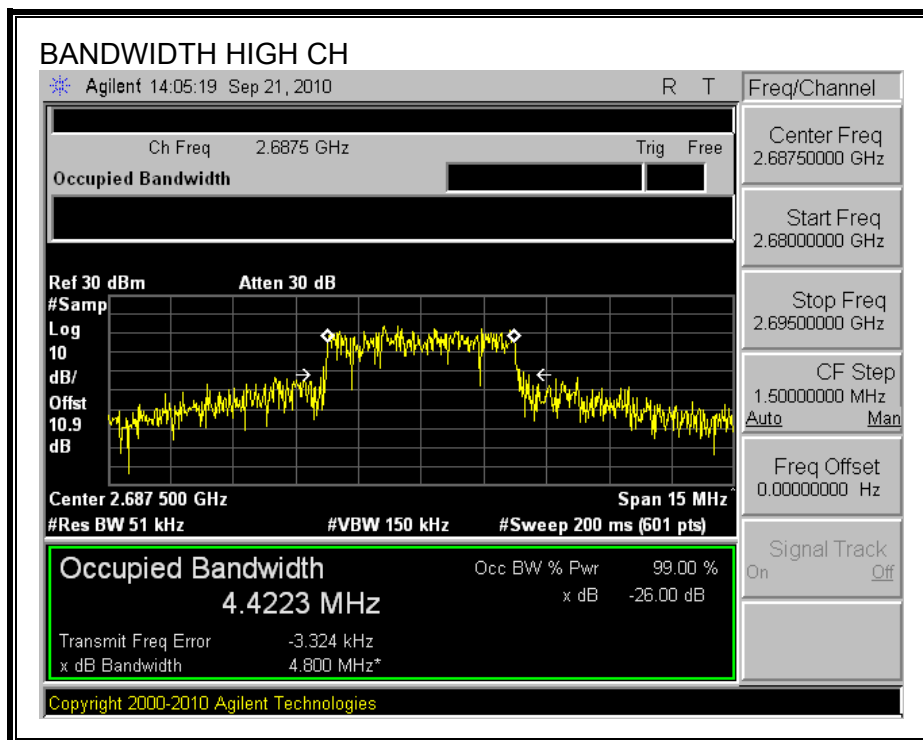




5MHz_16QAM

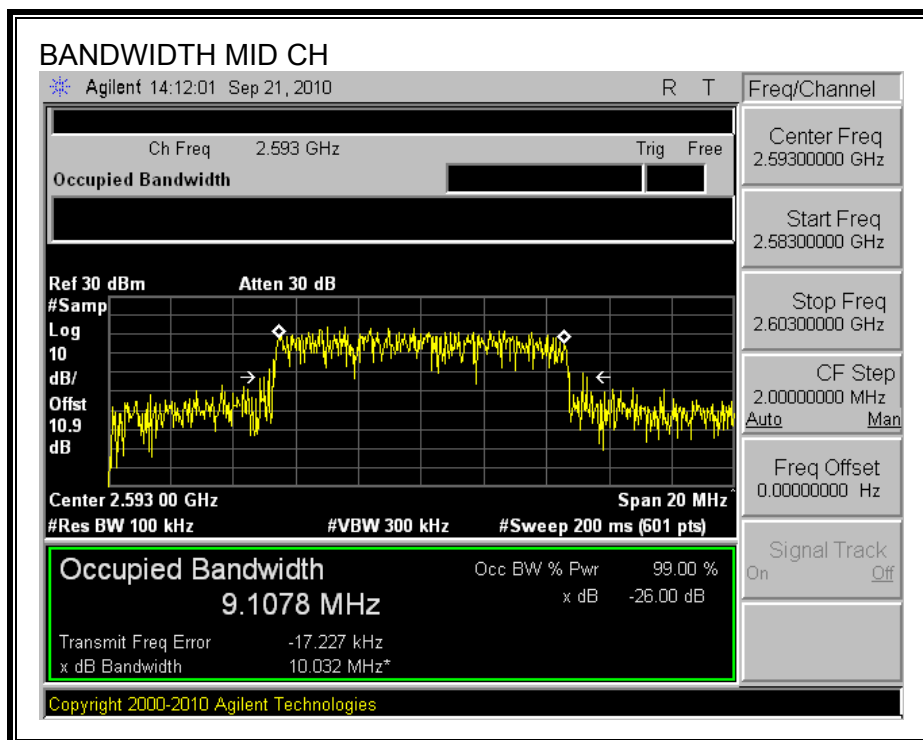
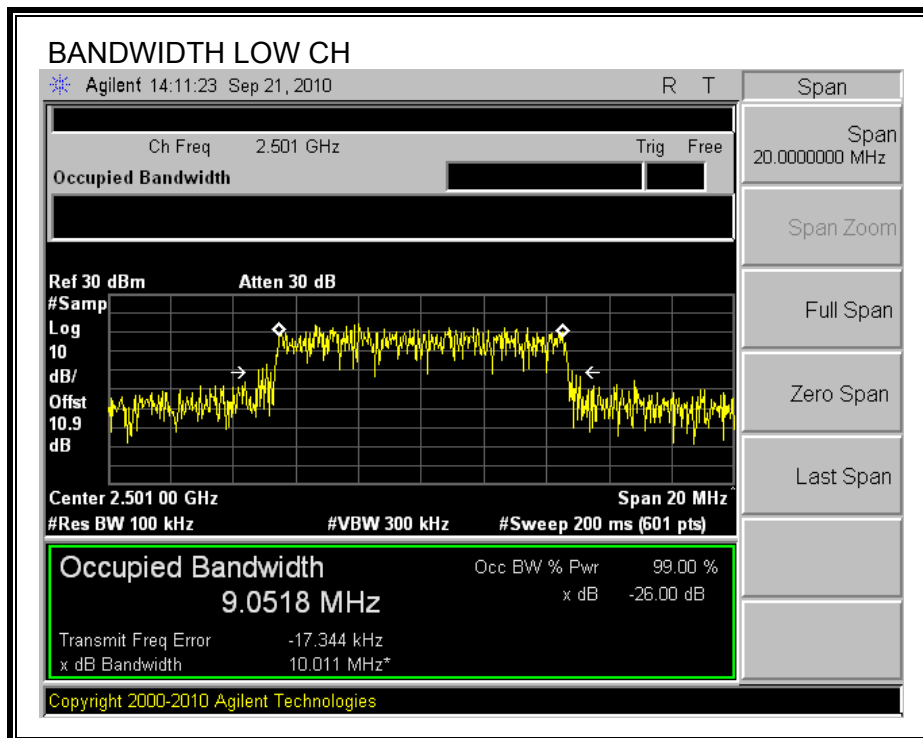
26 dB and 99% BANDWIDTH

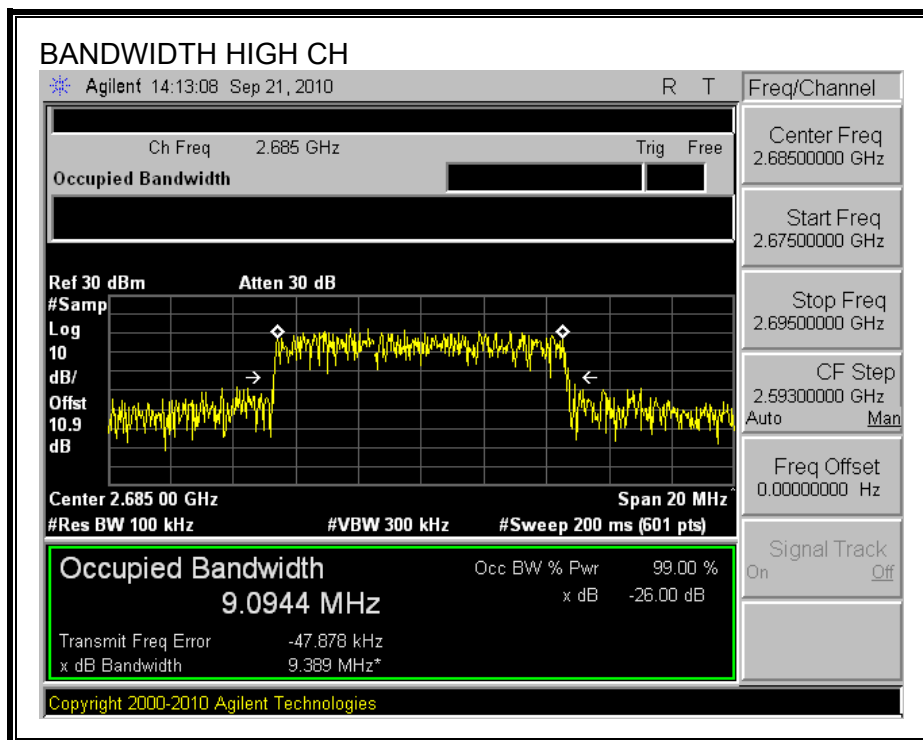




10MHz_QPSK

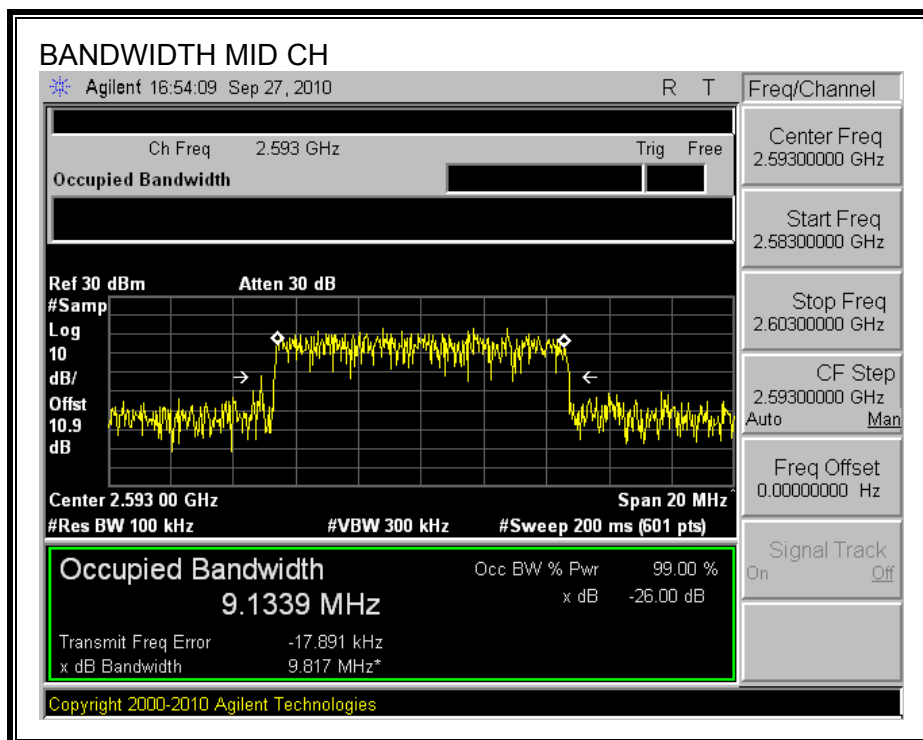
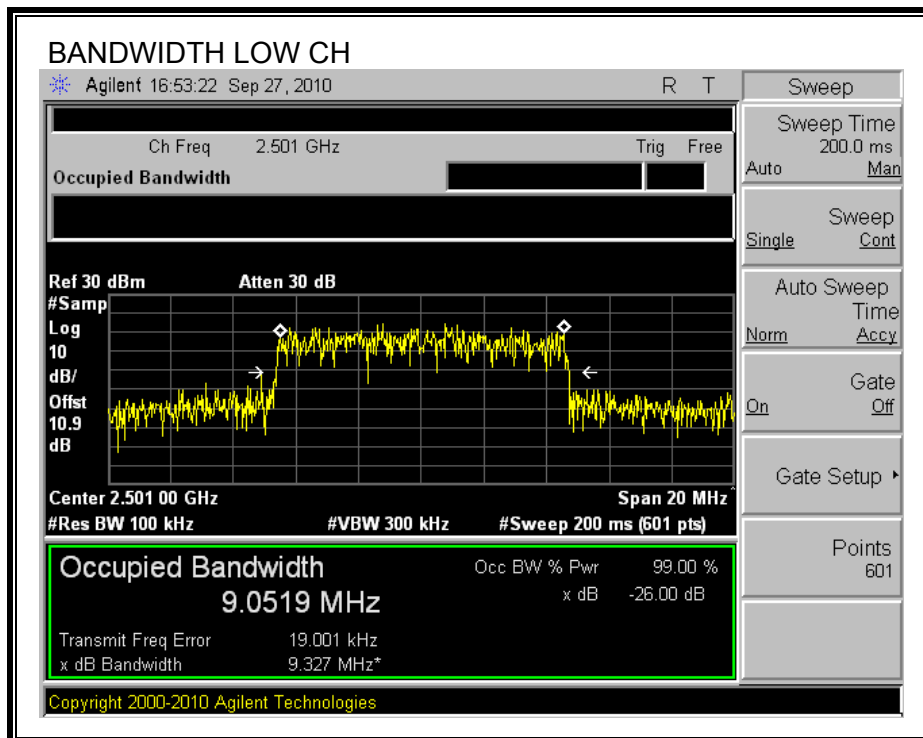
26 dB and 99% BANDWIDTH

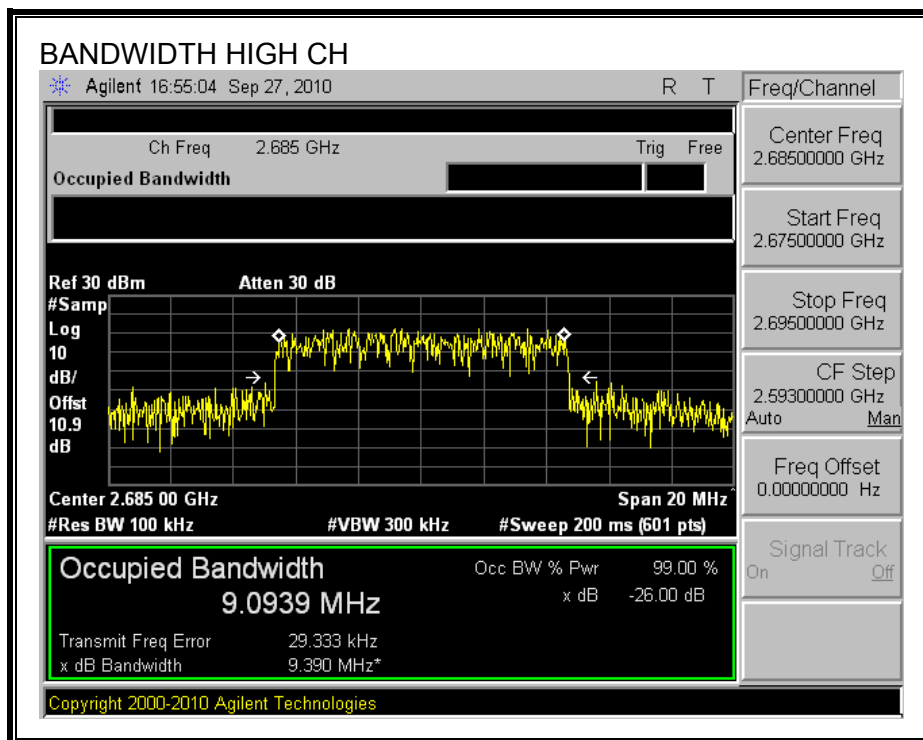




10MHz_16QAM

26 dB and 99% BANDWIDTH





7.1.2. RF POWER OUTPUT AT THE ANTENNA TERMINALS

LIMITS

§2.1046 & §27.50 (h)(2) Mobile and other user stations. Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.

TEST PROCEDURE

ANSI / TIA / EIA 603 Clause 2.2.17 and §27.50 (i)

RESULTS

RF Conducted @ Antenna 1Port :

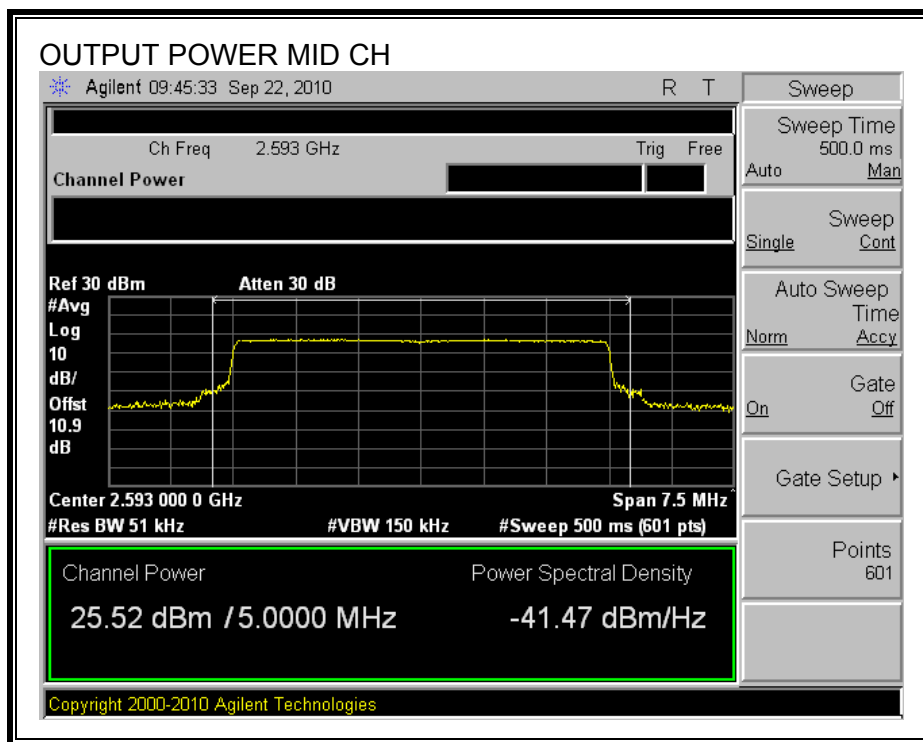
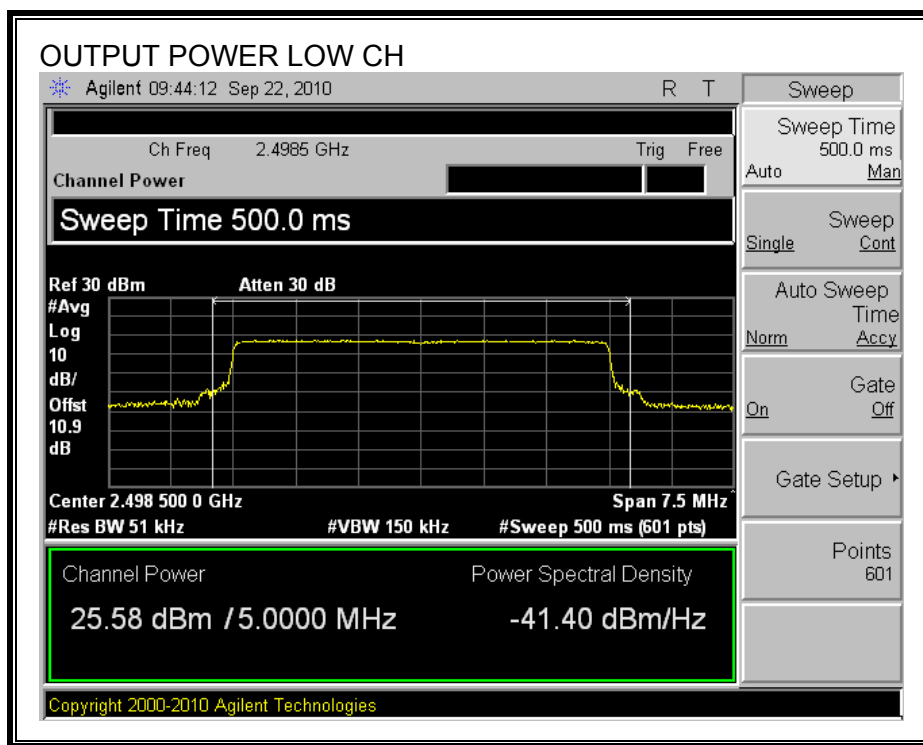
Mode	Test Vector file name	Channel	Frequency (MHz)	Output power (dBm)	Output power (mW)
5MHz QPSK	T5D29U184Q12S85	Low	2498.5	25.58	361.41
		Middle	2593	25.52	356.45
		High	2687.5	25.56	359.75
5MHz 16QAM	T5D29U1816Q34S85	Low	2498.5	25.52	356.45
		Middle	2593	25.61	363.92
		High	2687.5	25.62	364.75
10MHz QPSK	T10D29U184Q12S175	Low	2501	25.45	350.75
		Middle	2593	25.25	334.97
		High	2685	25.32	340.41
10MHz 16QAM	T10D29U1816Q12S175	Low	2501	25.17	328.85
		Middle	2593	25.12	325.09
		High	2685	25.26	335.74

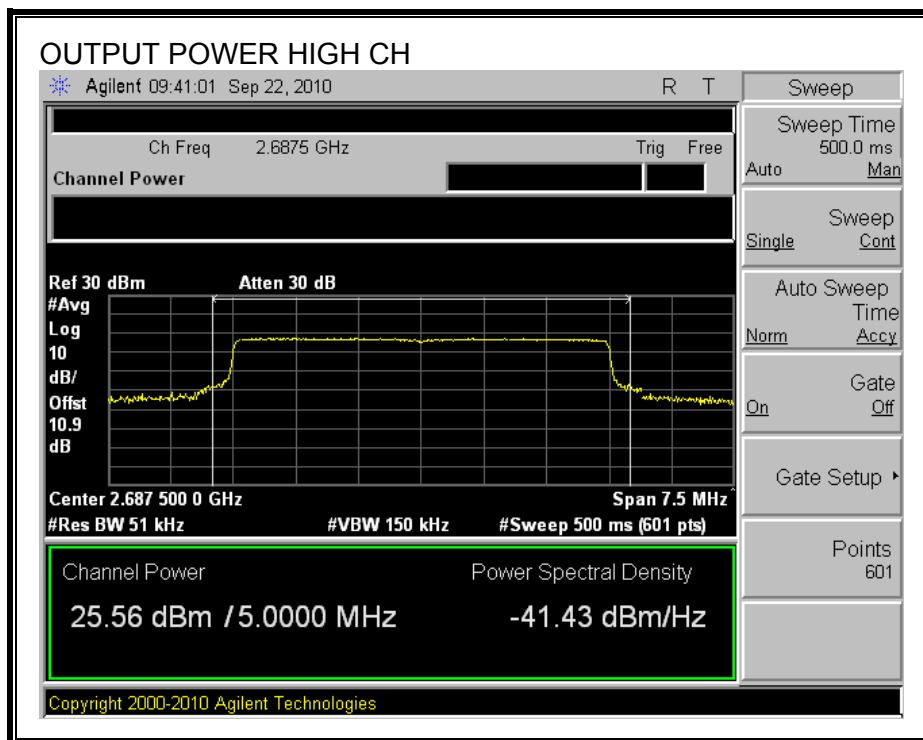
RF Conducted @ Antenna 2 Port :

Mode	Test Vector file name	Channel	Frequency (MHz)	Output power (dBm)	Output power (mW)
5MHz QPSK	T5D29U184Q12S85	Low	2498.5	25.57	360.58
		Middle	2593	25.54	358.10
		High	2687.5	25.49	354.00
5MHz 16QAM	T5D29U1816Q34S85	Low	2498.5	25.52	356.45
		Middle	2593	25.52	356.45
		High	2687.5	25.43	349.14
10MHz QPSK	T10D29U184Q12S175	Low	2501	25.04	319.15
		Middle	2593	25.17	328.85
		High	2685	25.10	323.59
10MHz 16QAM	T10D29U1816Q12S175	Low	2501	25.06	320.63
		Middle	2593	25.12	325.09
		High	2685	25.11	324.34

5MHz_QPSK (Antenna 1)

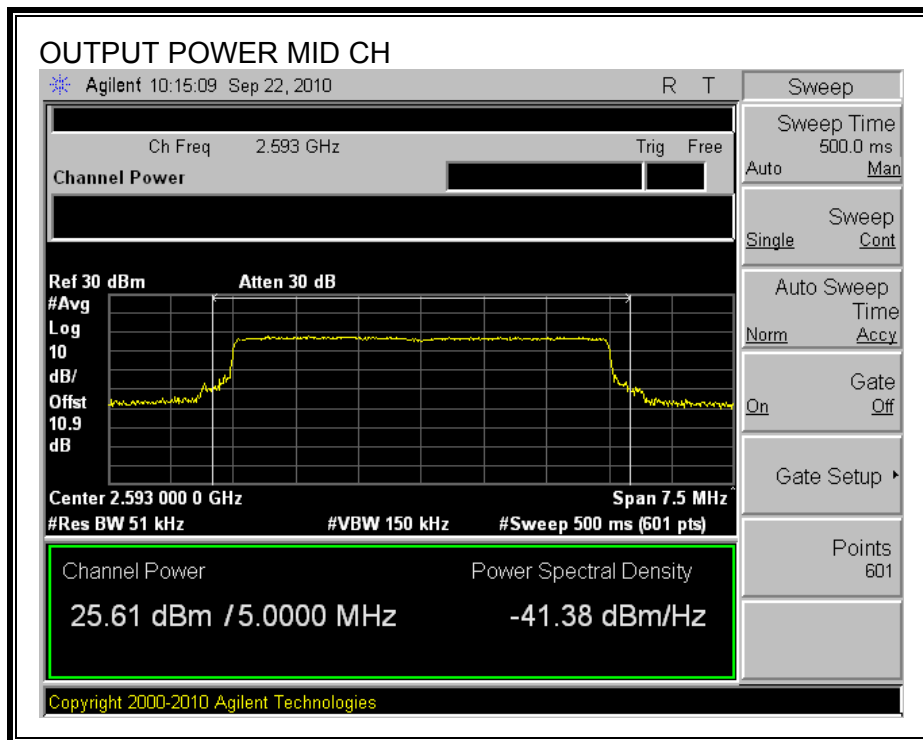
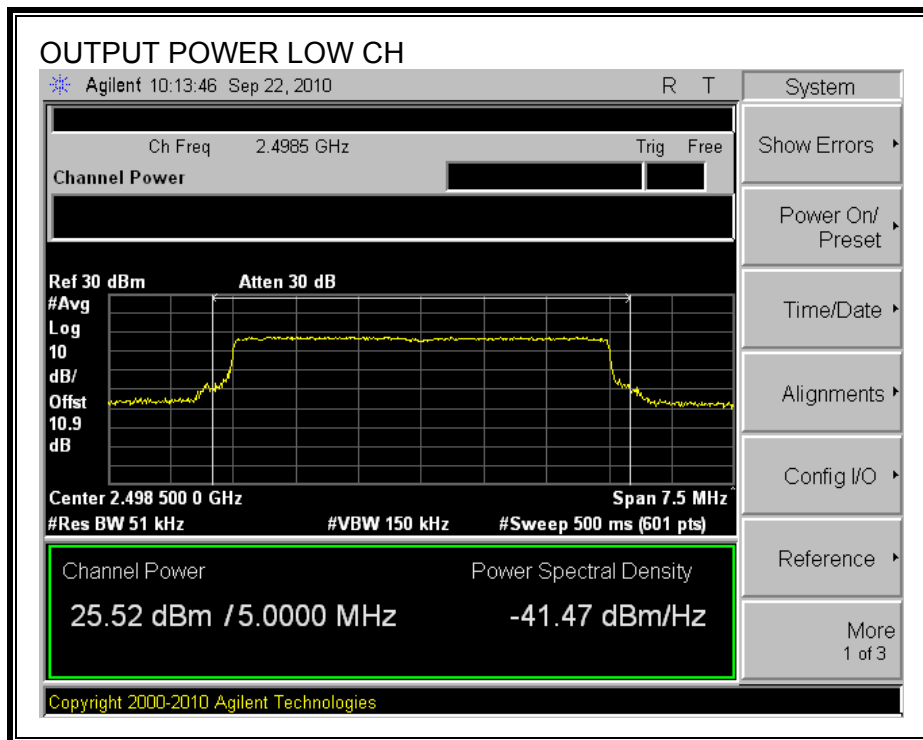
OUTPUT POWER

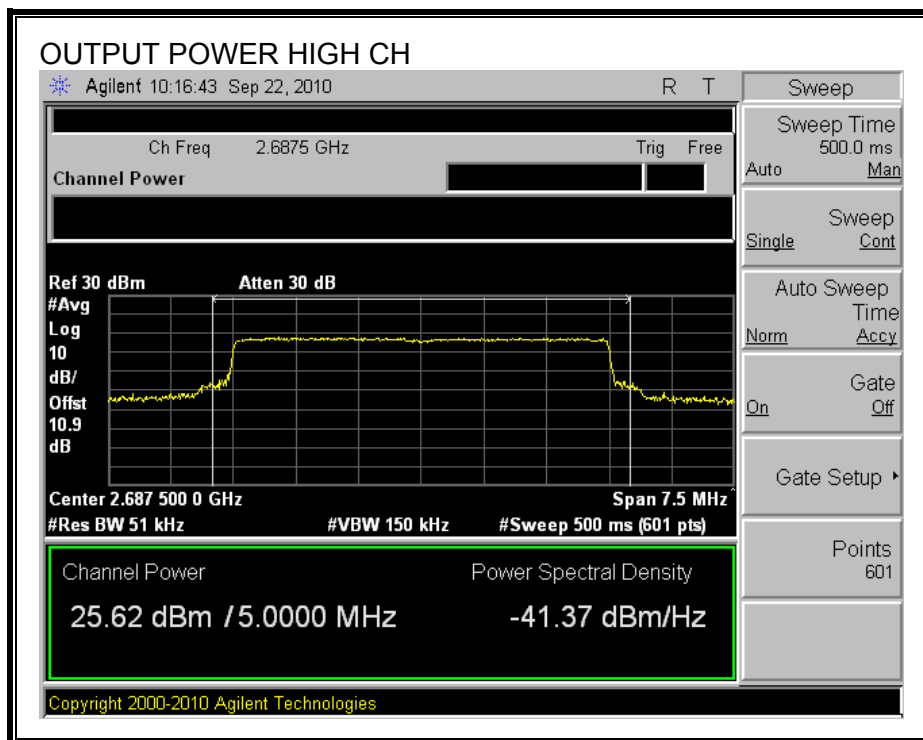




5MHz_16QAM

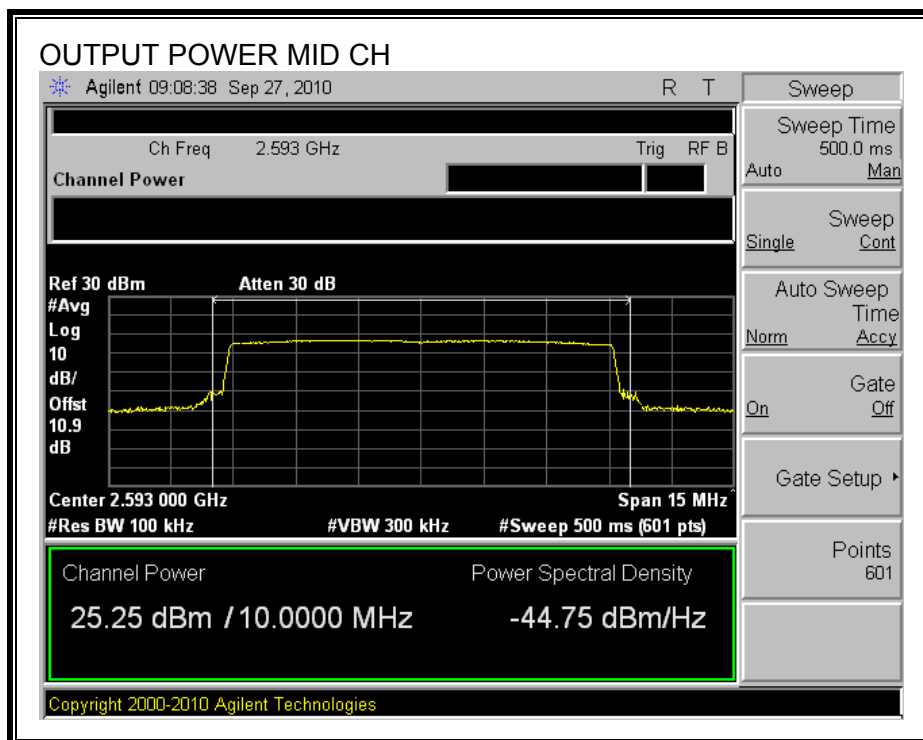
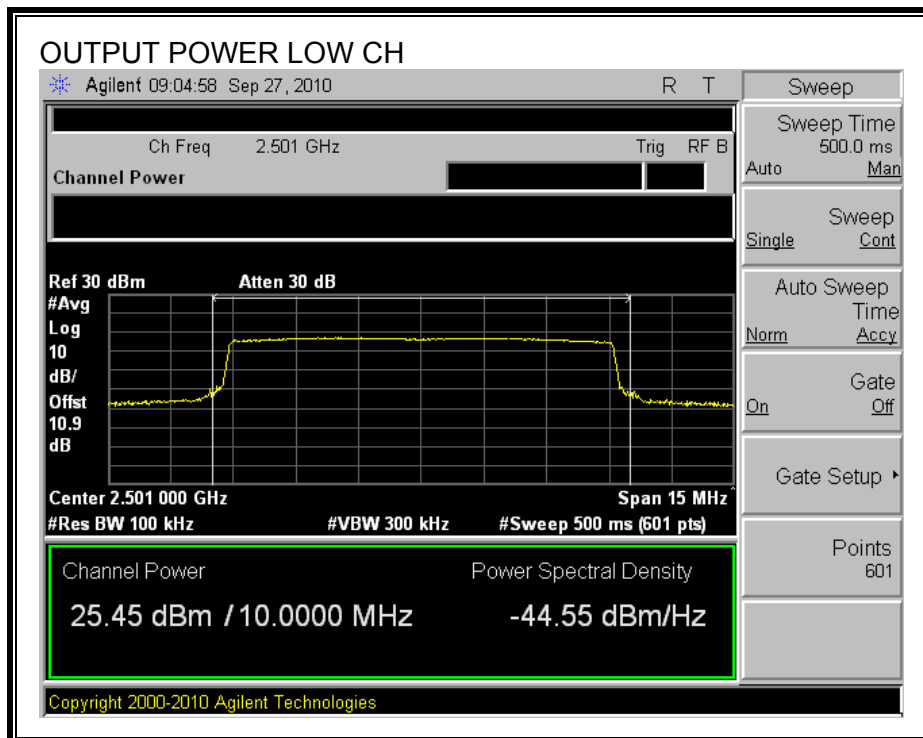
OUTPUT POWER

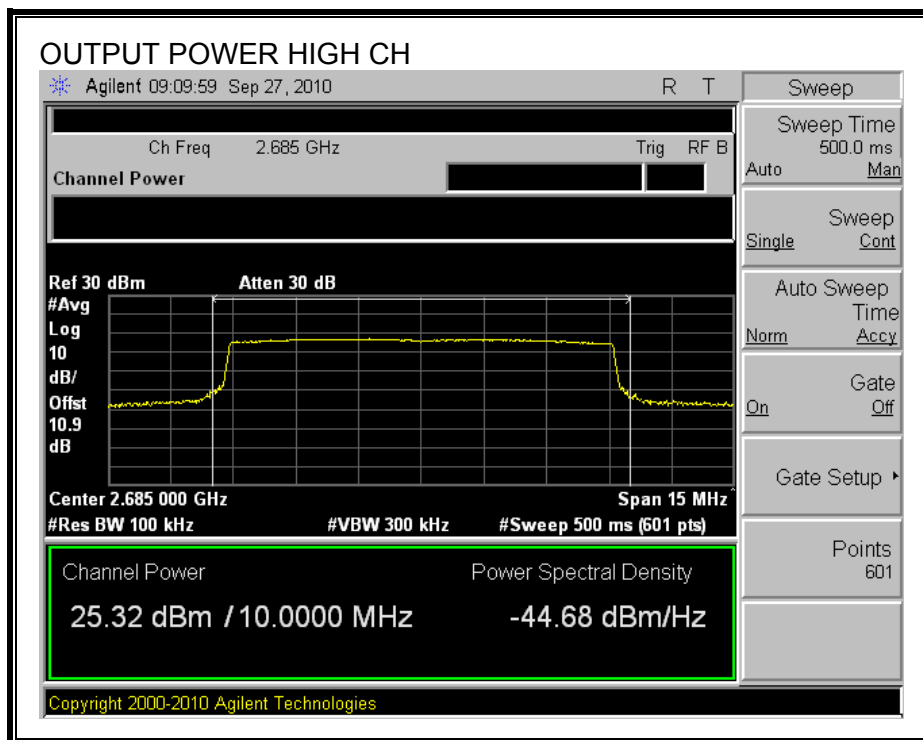




10MHz_QPSK

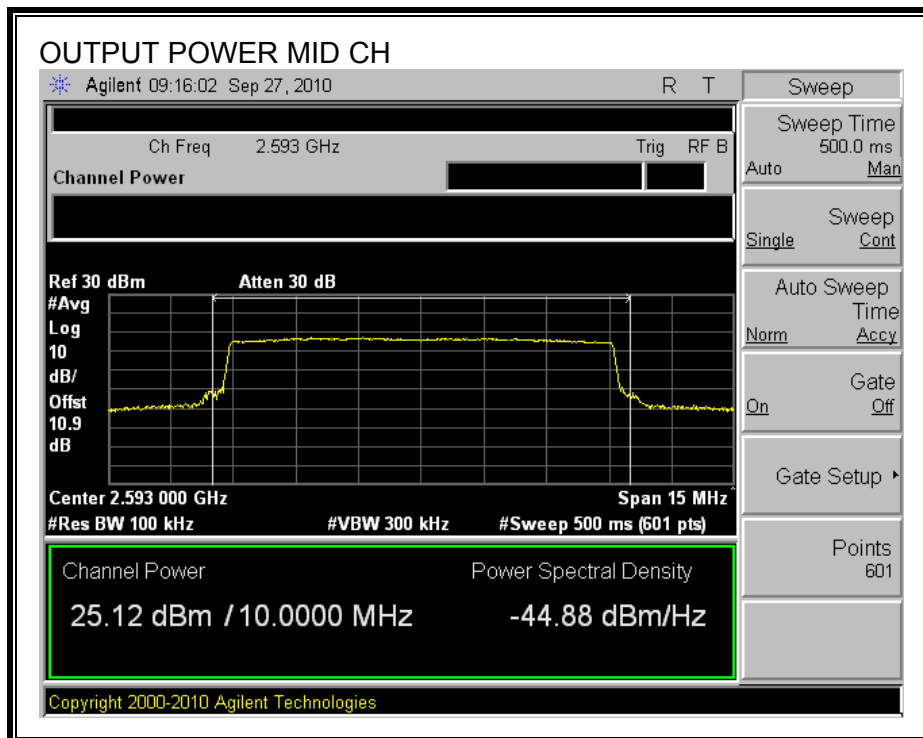
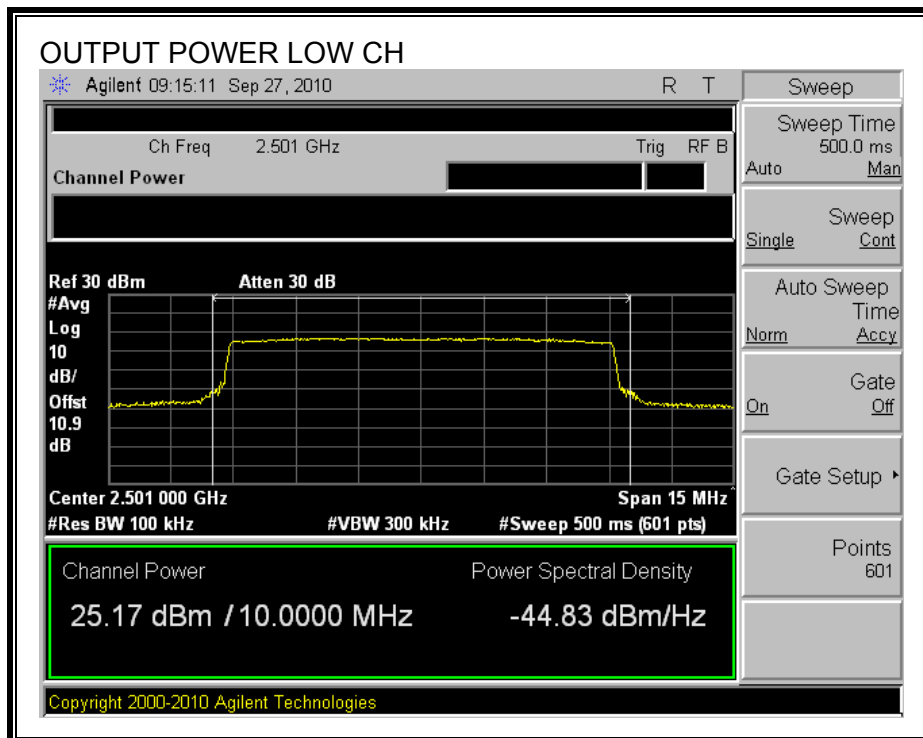
OUTPUT POWER

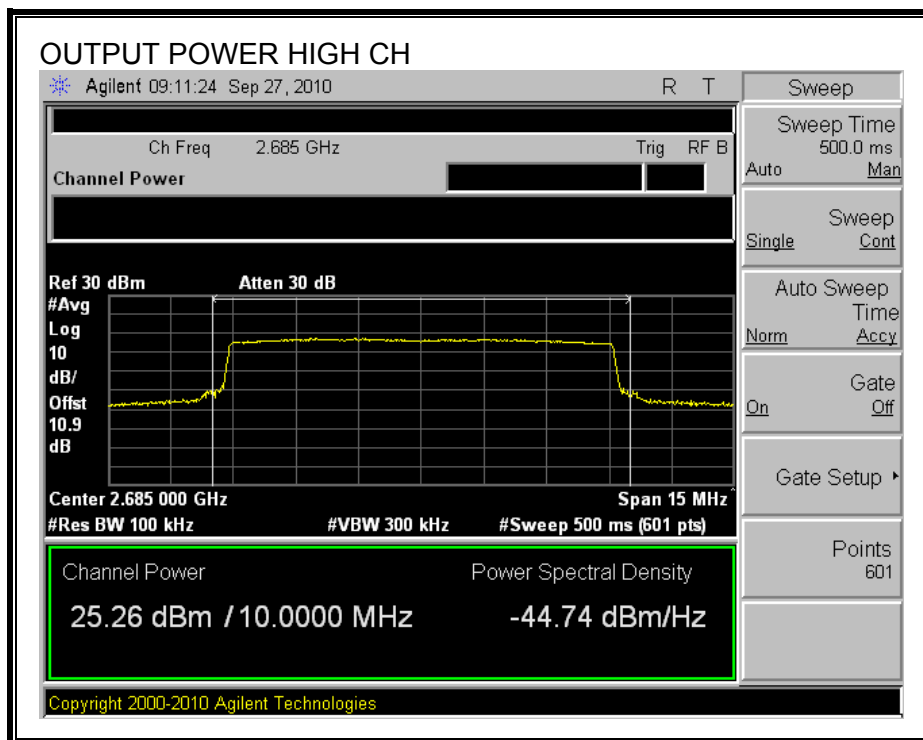




10MHz_16QAM

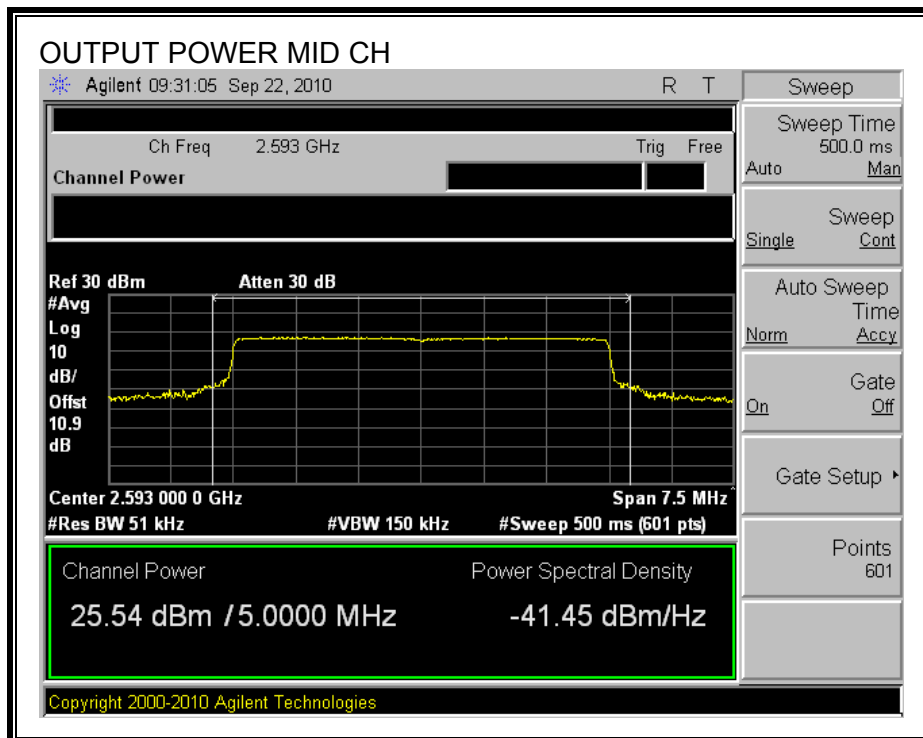
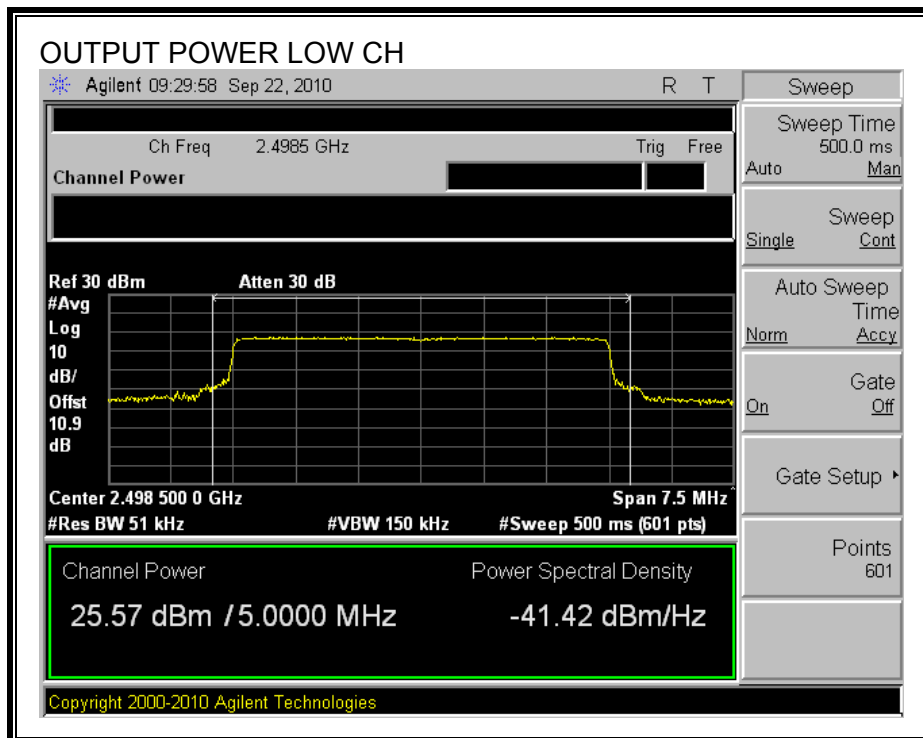
OUTPUT POWER

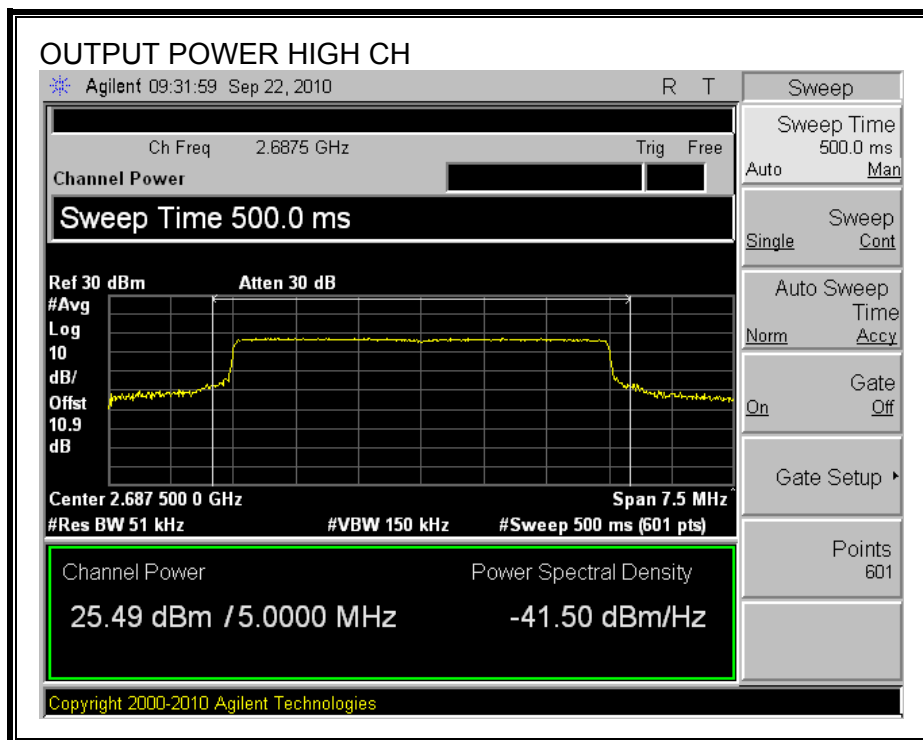




5MHz_QPSK (Antenna 2)

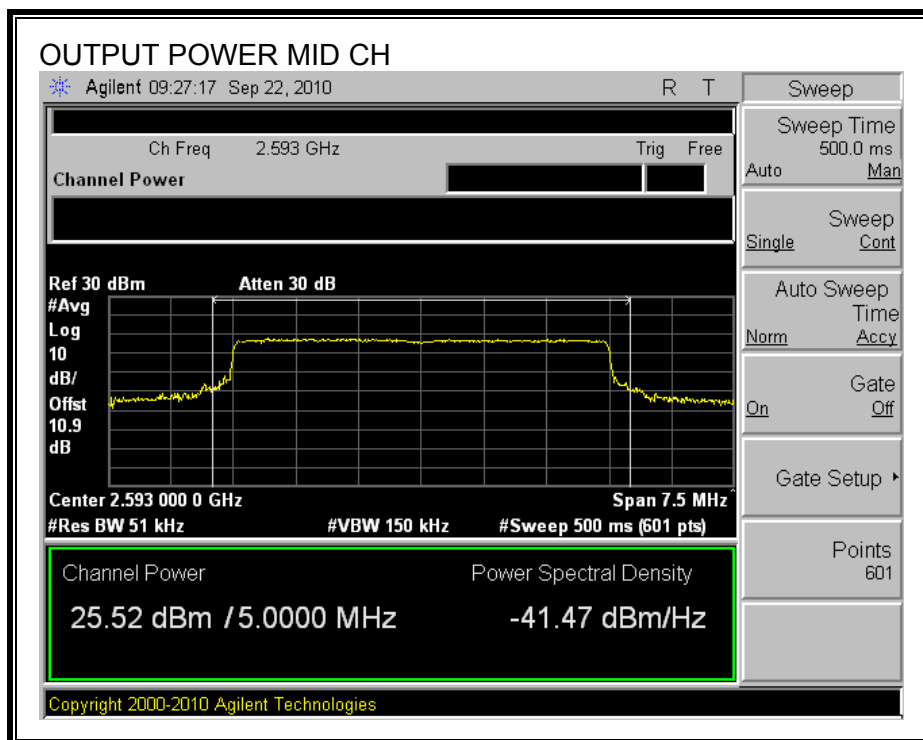
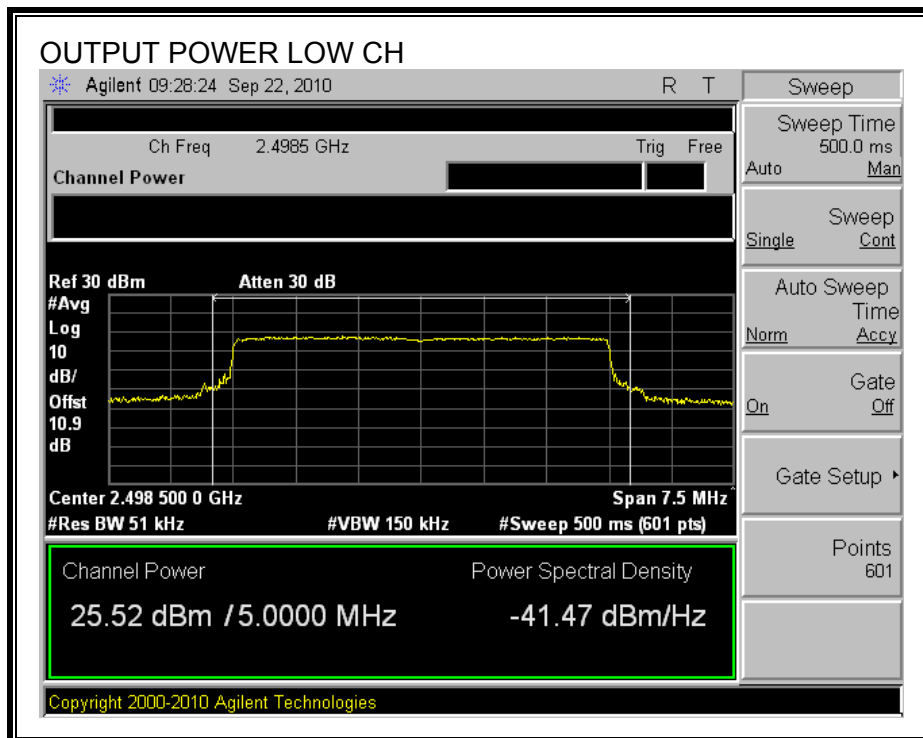
OUTPUT POWER

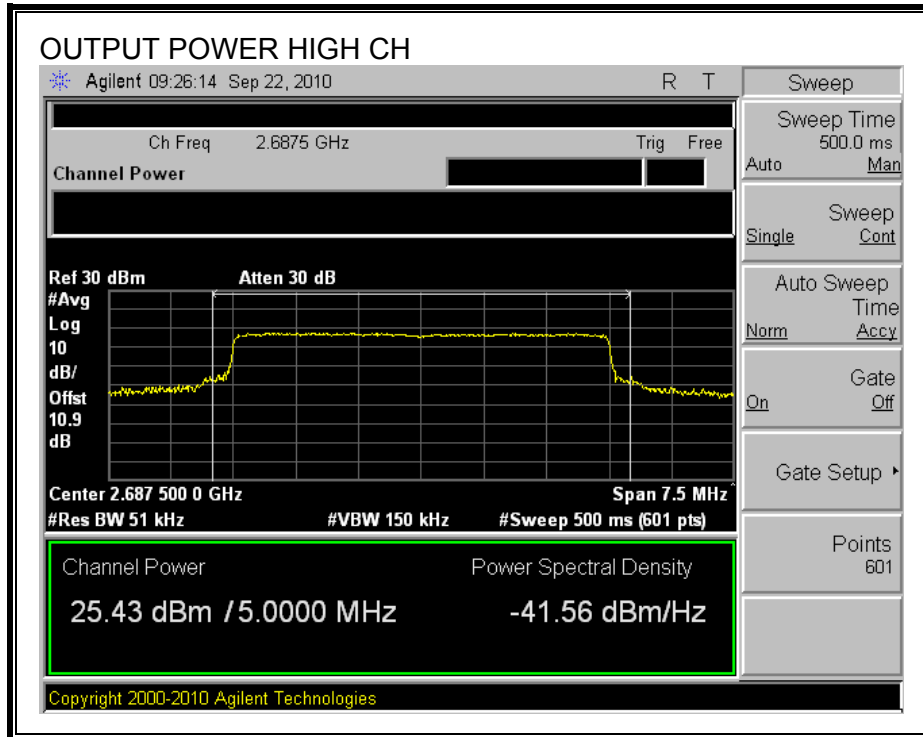




5MHz_16QAM

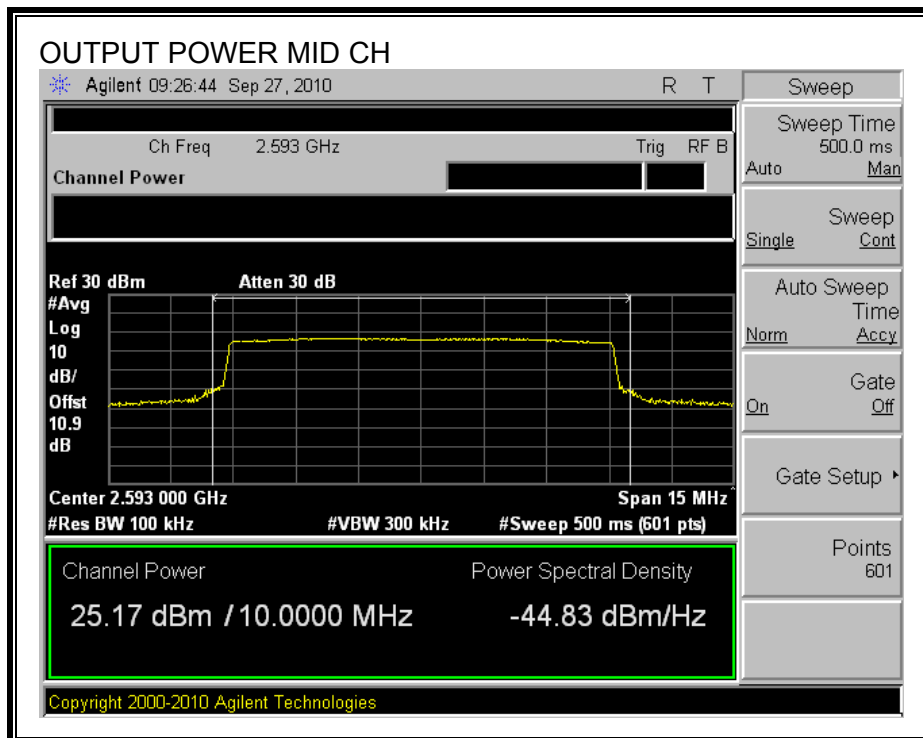
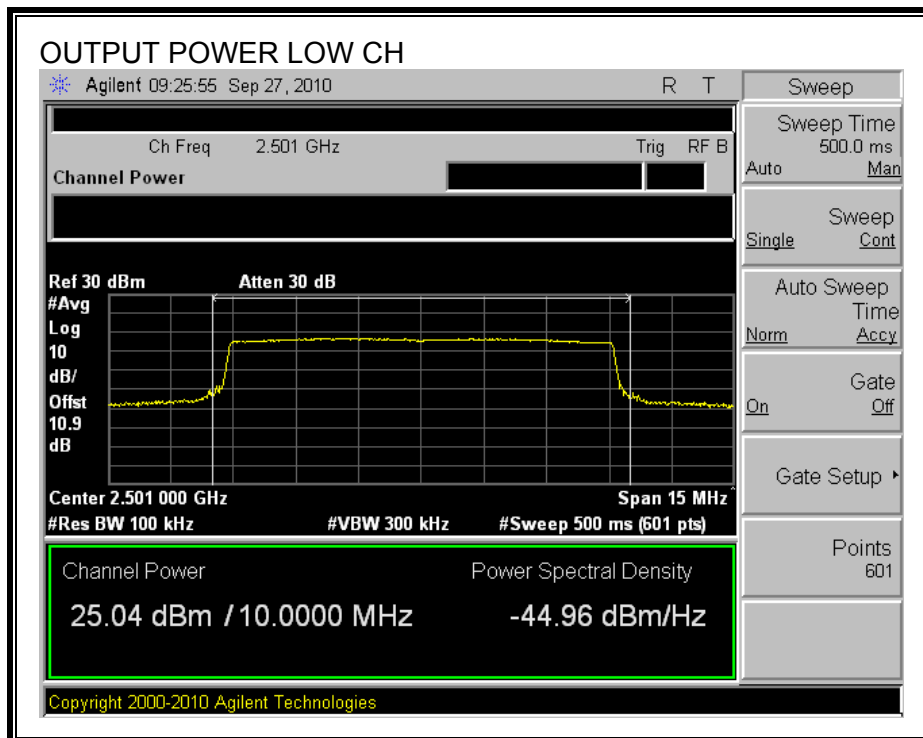
OUTPUT POWER

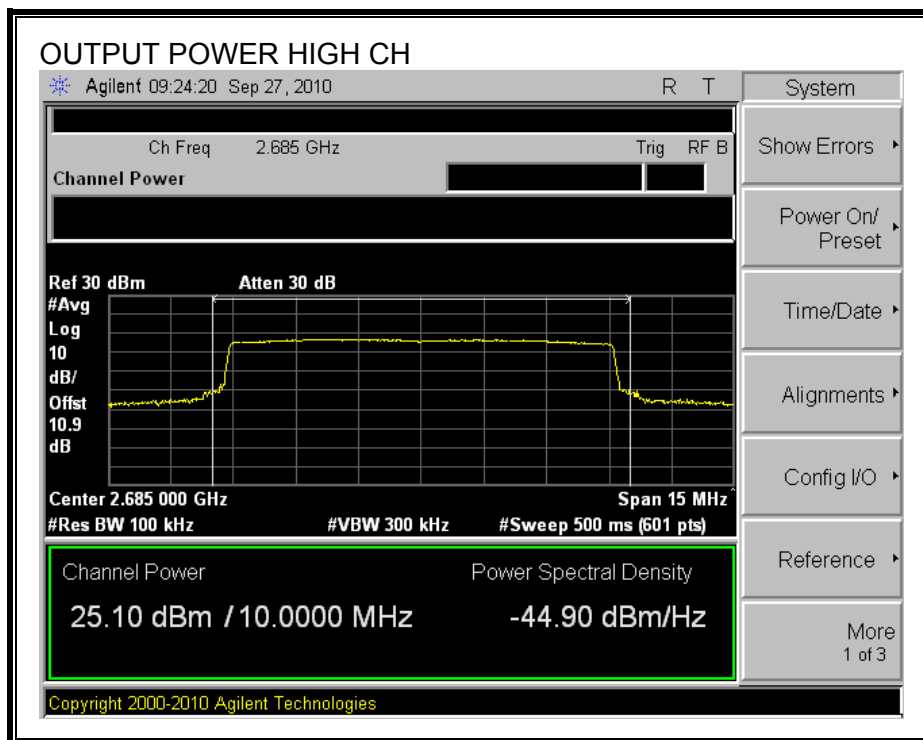




10MHz_QPSK

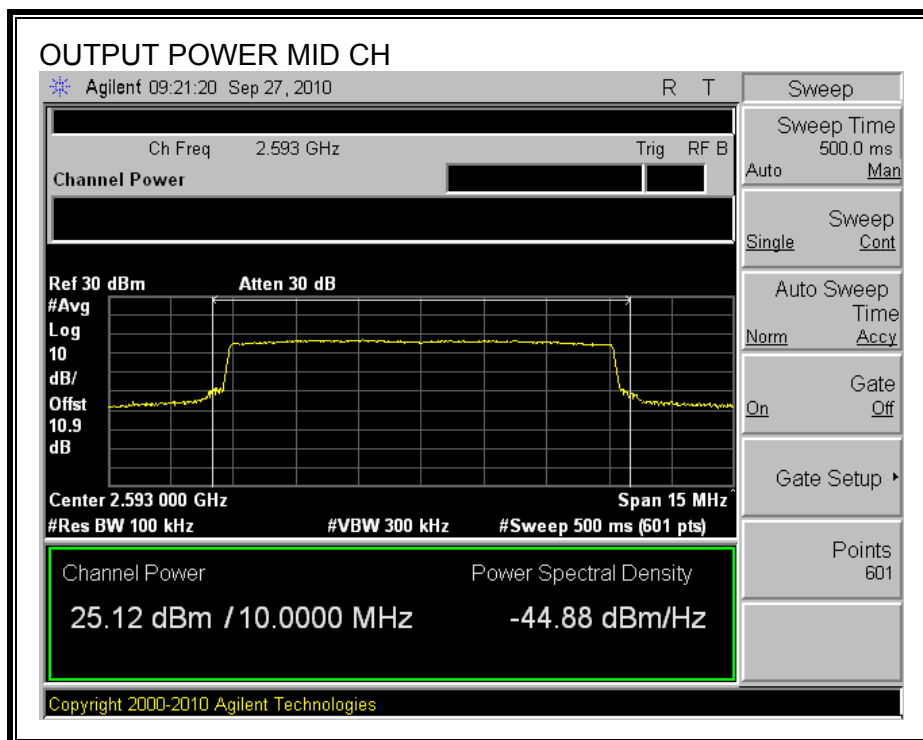
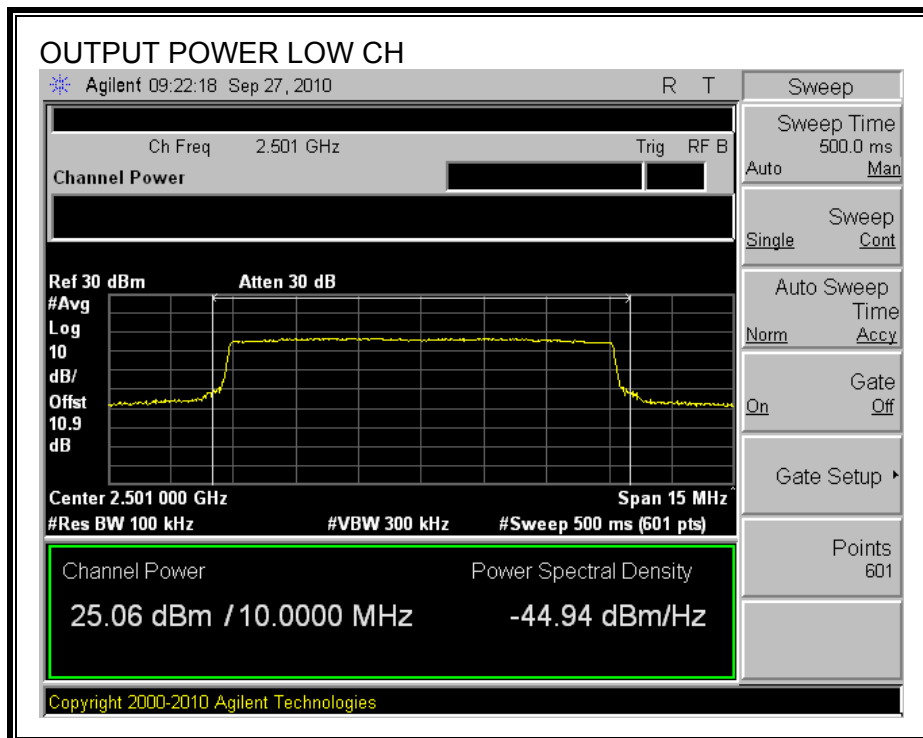
OUTPUT POWER

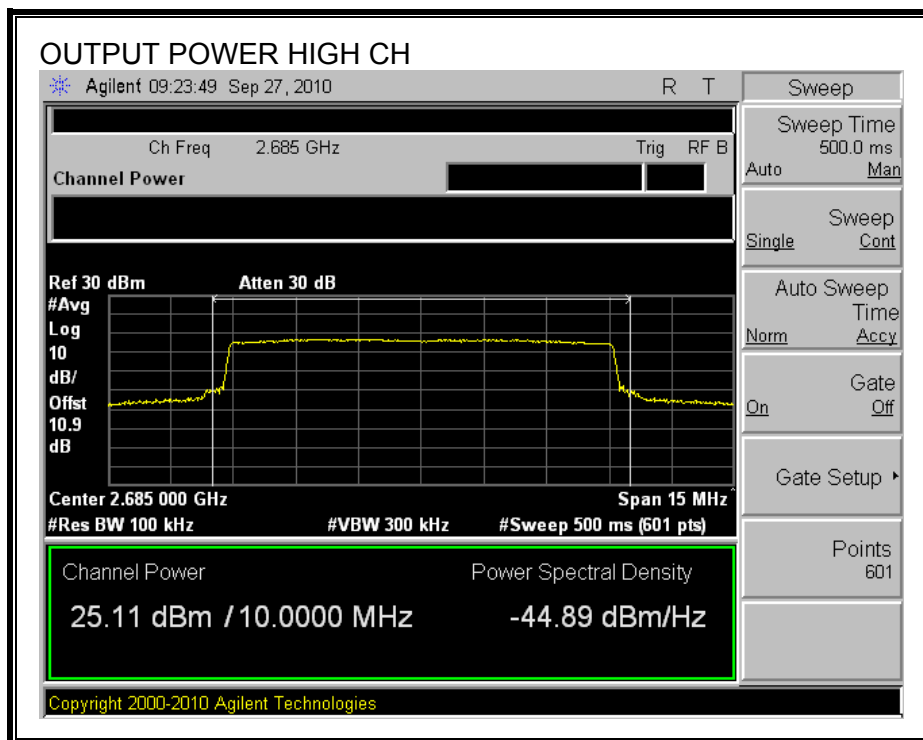




10MHz_16QAM

OUTPUT POWER



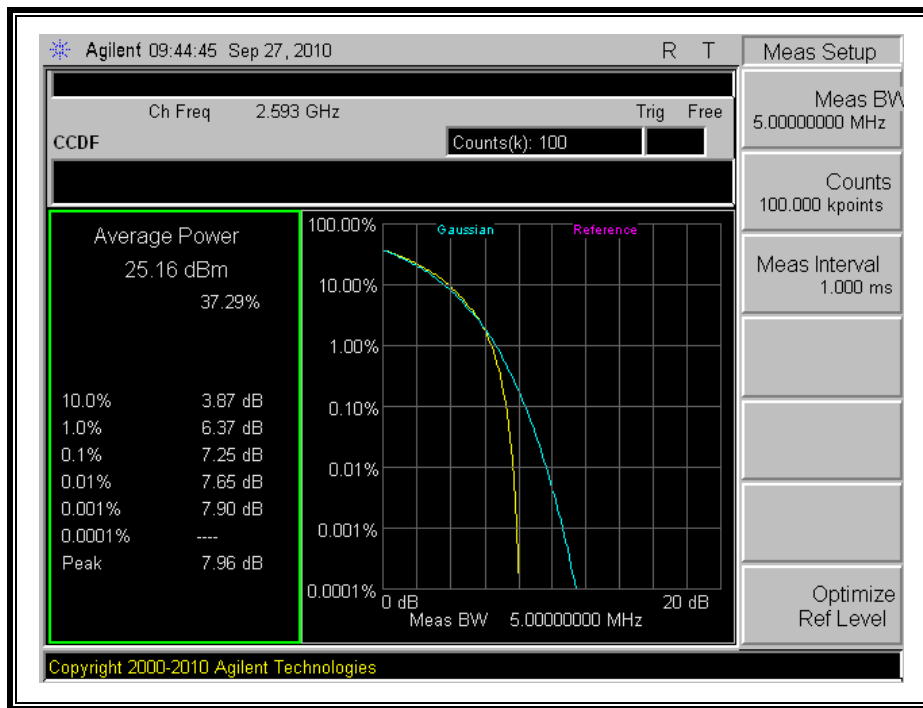


Peak-To-Average Ratio:

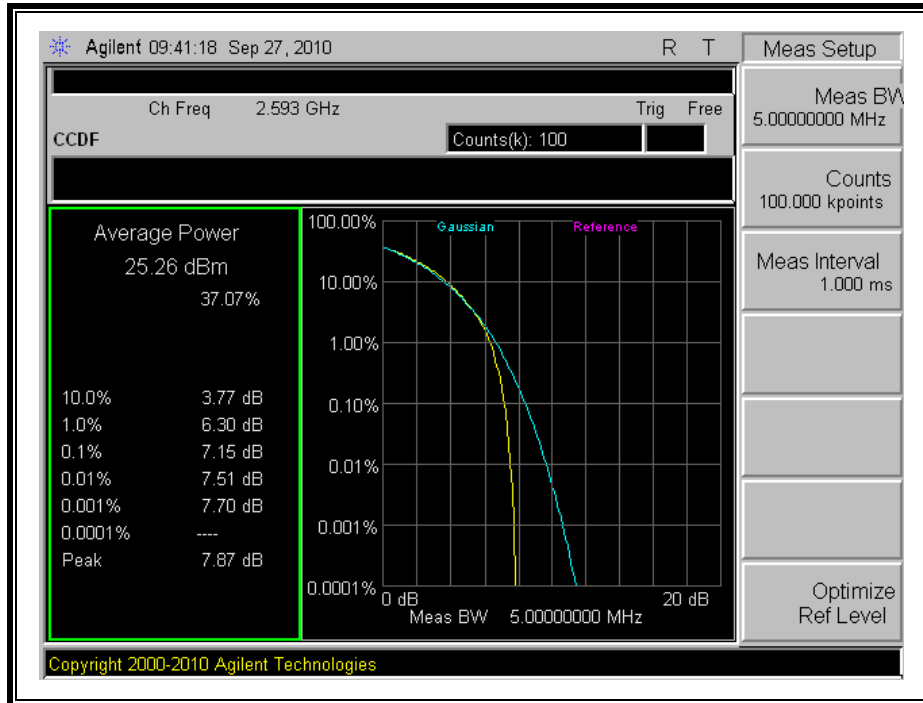
Offset: 0.9 (cable) + 10 (pad) = 10.90 dB

Mode	Channel Band-width (MHZ)	Ch. No.	f (MHz)	Couducted Power (dBm)		Peak-to-Average Ratio (PAR)
				*Peak	Average	
QPSK	5	378	2593	33.12	25.16	7.96
Mode	Channel Band-width	Ch. No.	f (MHz)	Couducted Power (dBm)		Peak-to-Average Ratio
				*Peak	Average	
16QAM	5	378	2593	33.13	25.26	7.87
Mode	Channel Band-width	Ch. No.	f (MHz)	Couducted Power (dBm)		Peak-to-Average Ratio
				*Peak	Average	
QPSK	10	368	2593	33.35	24.33	9.02
Mode	Channel Band-width	Ch. No.	f (MHz)	Couducted Power (dBm)		Peak-to-Average Ratio
				*Peak	Average	
16QAM	10	368	2593	33.7	24.26	9.44
*Peak Reading = Average Reading + Peak-to-Average Ratio						

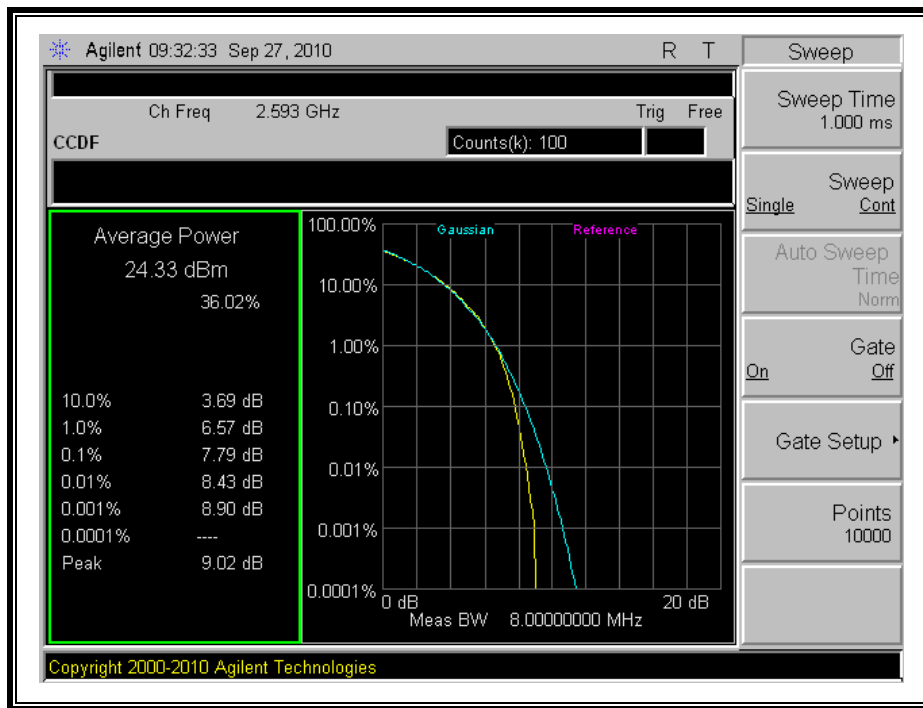
5MHz QPSK



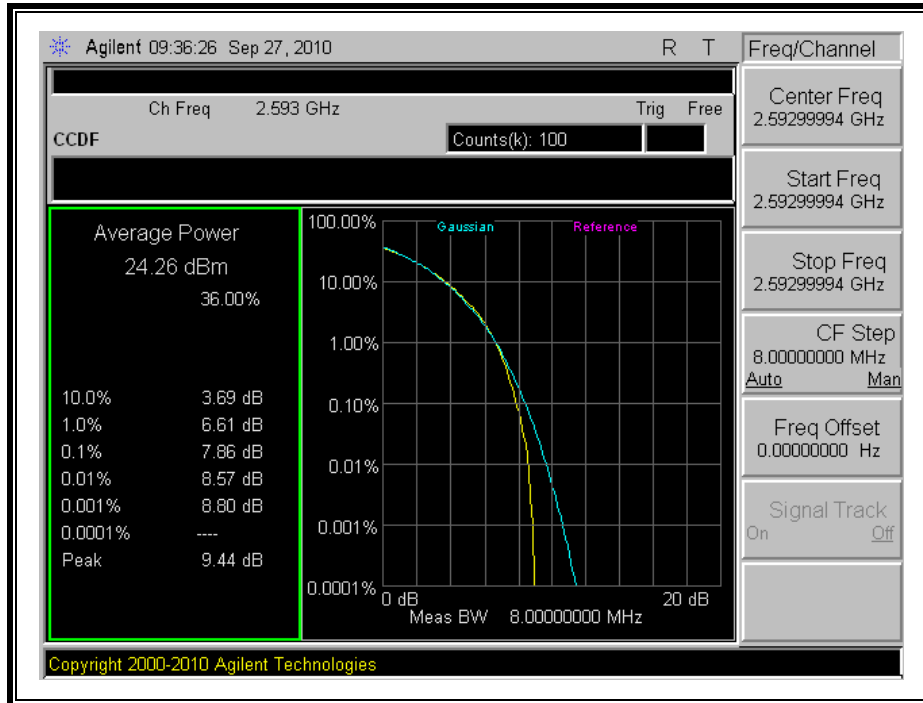
5MHz 16QAM



10MHz QPSK



10MHz 16QAM



7.1.3. LIMITS OF CHANNEL EDGE

LIMITs

§2.1051

§27.53 (m)(4)(6) For mobile digital stations, the attenuation factor shall be not less than $43 + 10 \log (P)$ dB at the channel edge, the limit of emission equal to -13dBm, and $55 + 10 \log (P)$ dB at 5.5 megahertz from the channel edges, the limit of emission equal to -25dBm.

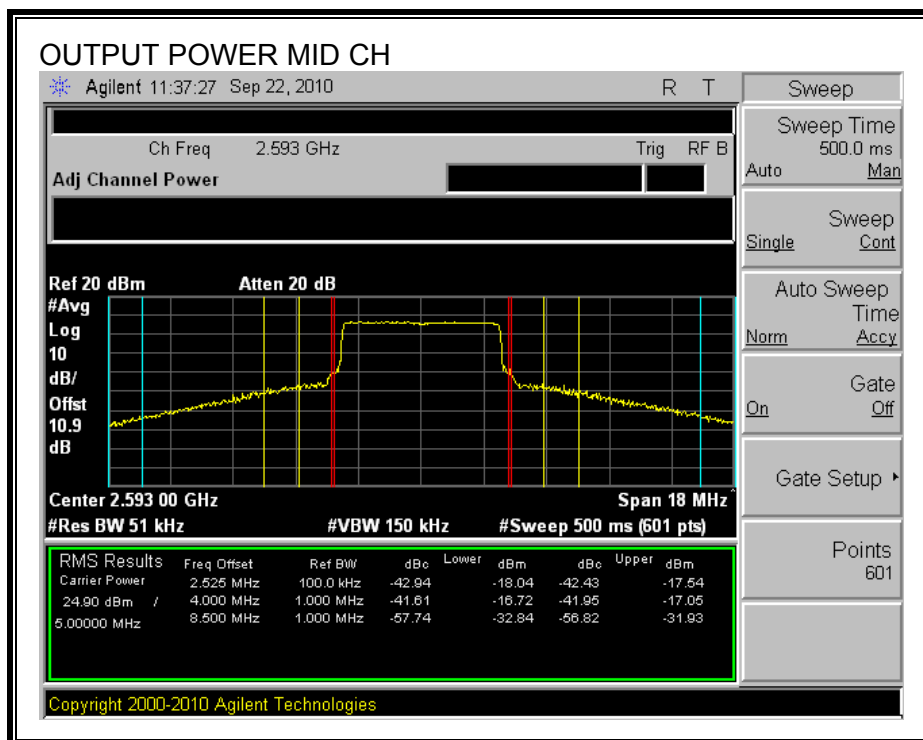
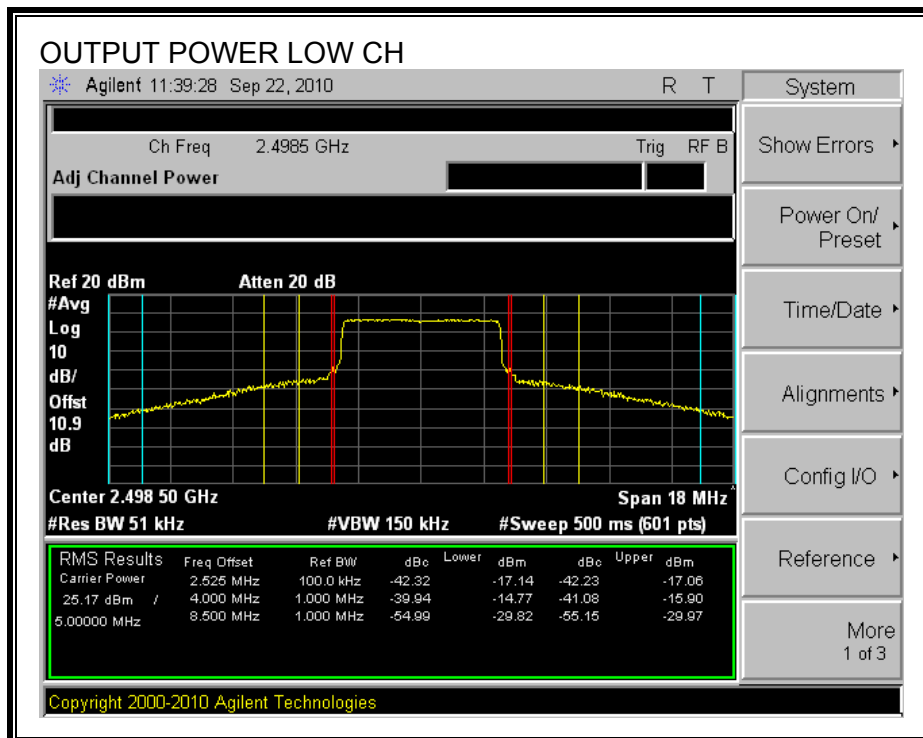
TEST PROCEDURE

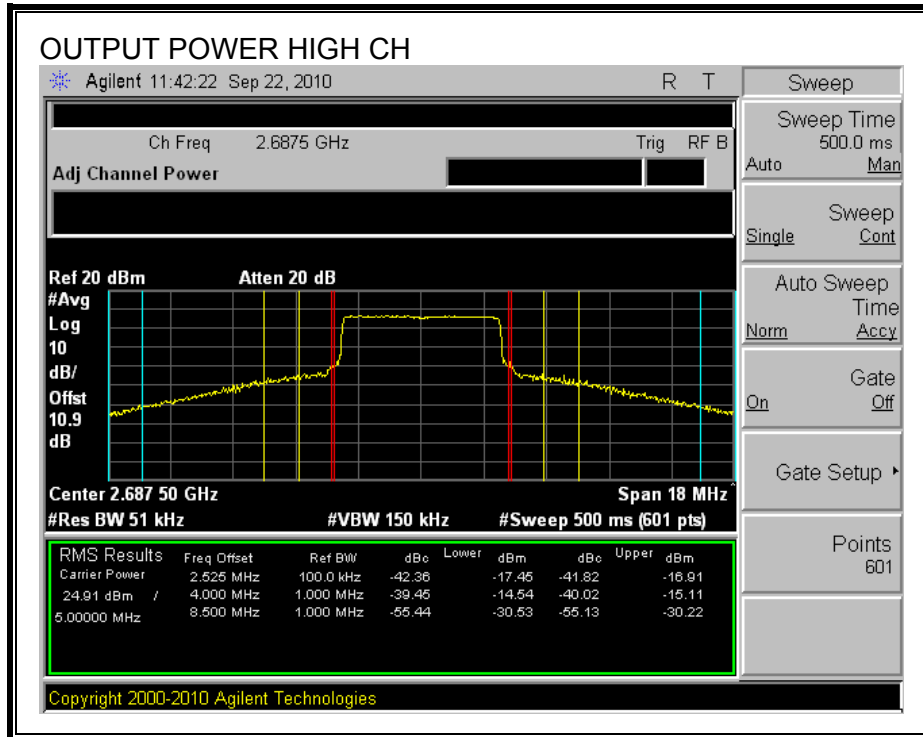
ANSI / TIA / EIA 603 Clause 3.2.12

RESULTS

5MHz_QPSK

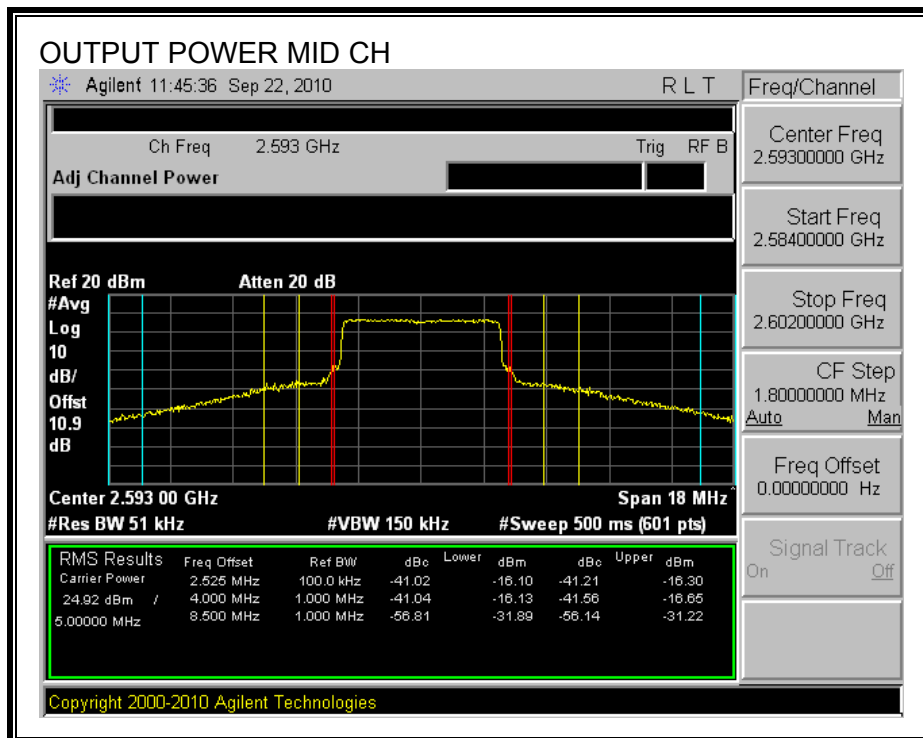
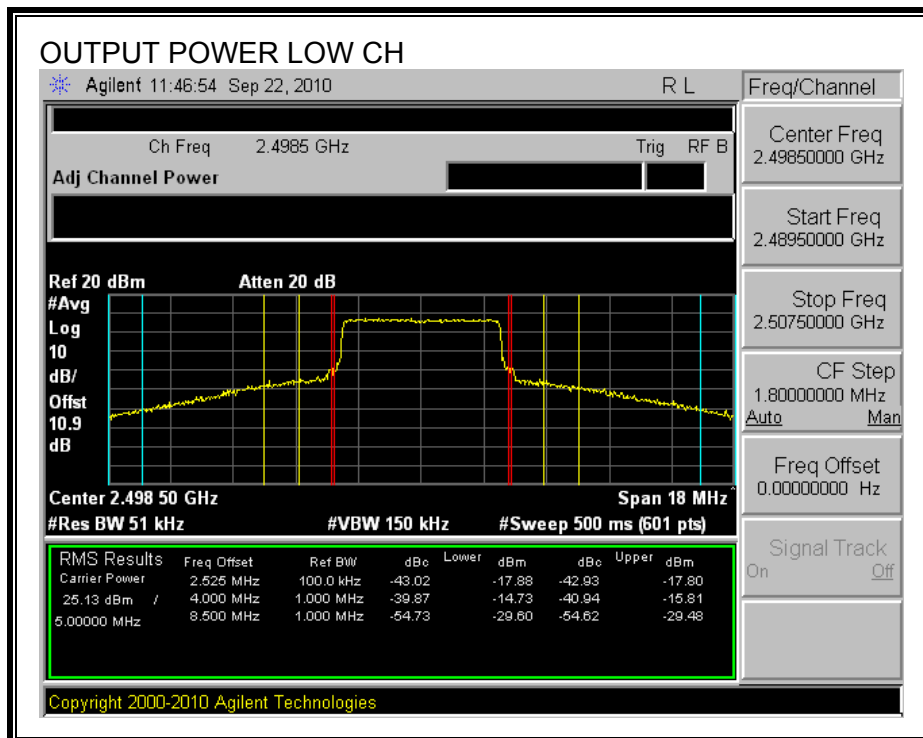
OUTPUT POWER

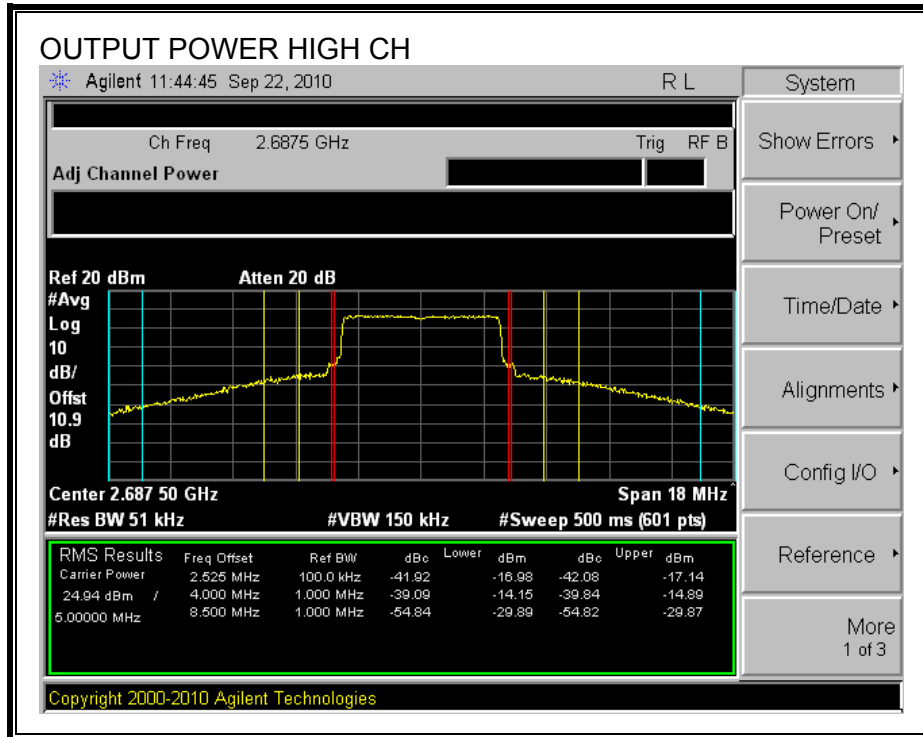




5MHz_16QAM

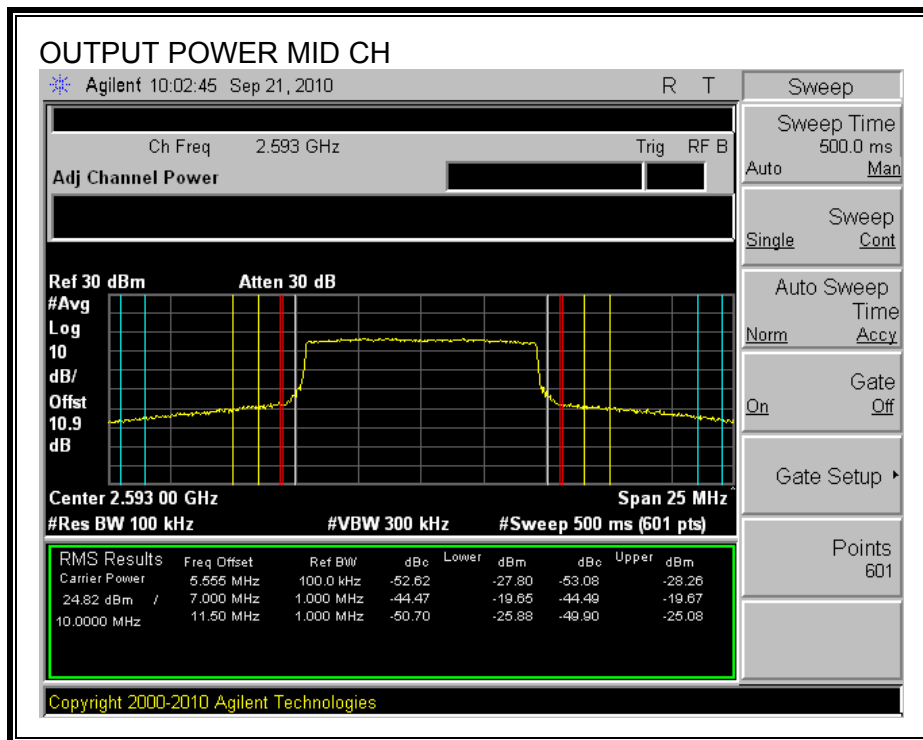
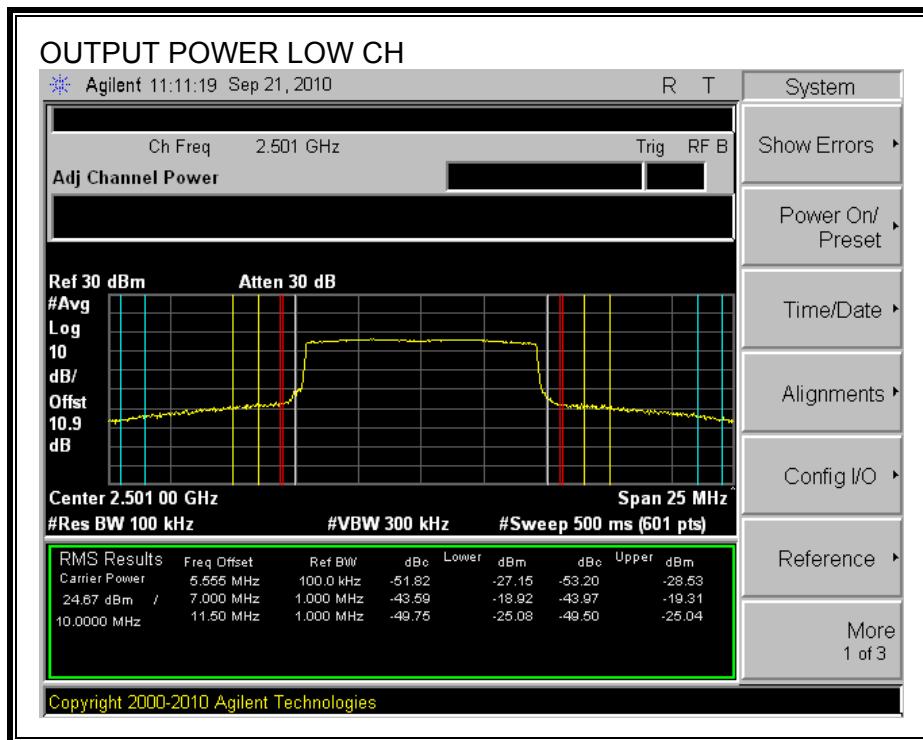
OUTPUT POWER

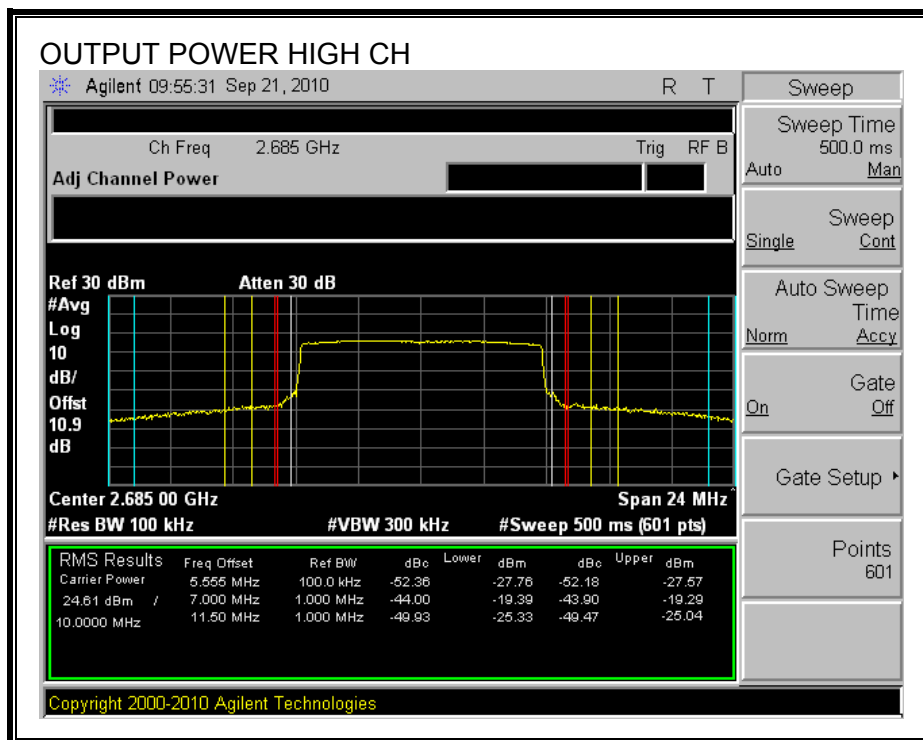




10MHz_QPSK

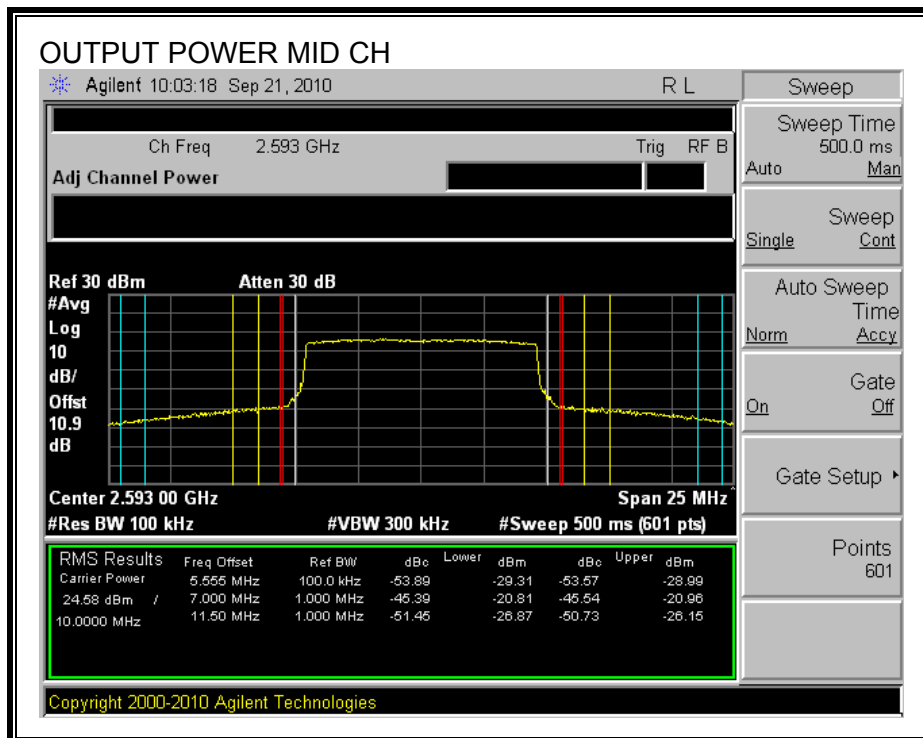
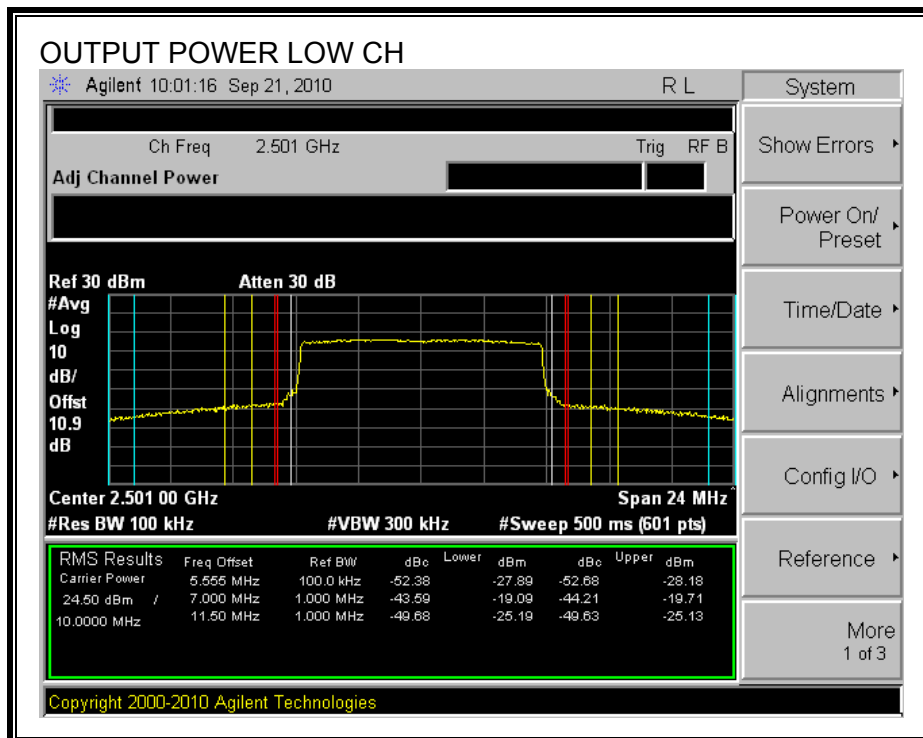
OUTPUT POWER

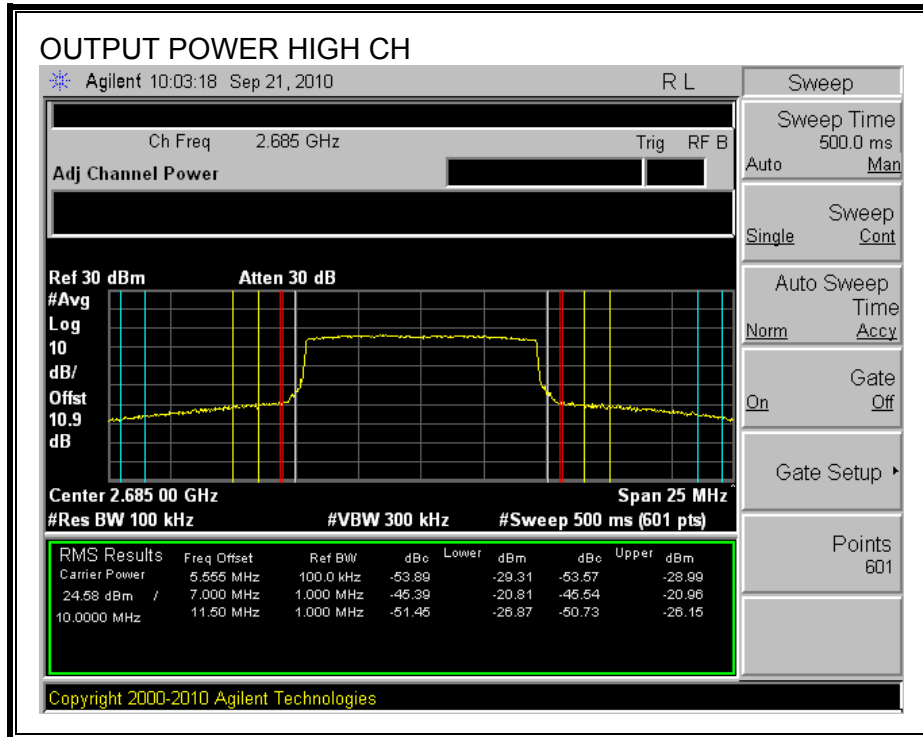




10MHz_16QAM

OUTPUT POWER





7.1.4. CONDUCTED SPURIOUS EMISSIONS

LIMIT

§2.1051

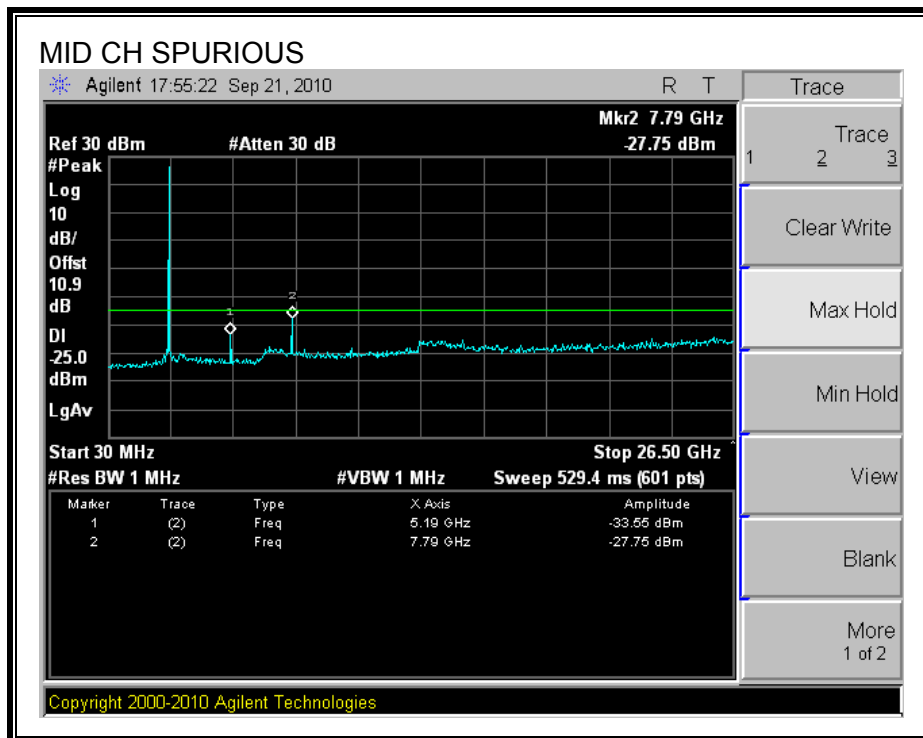
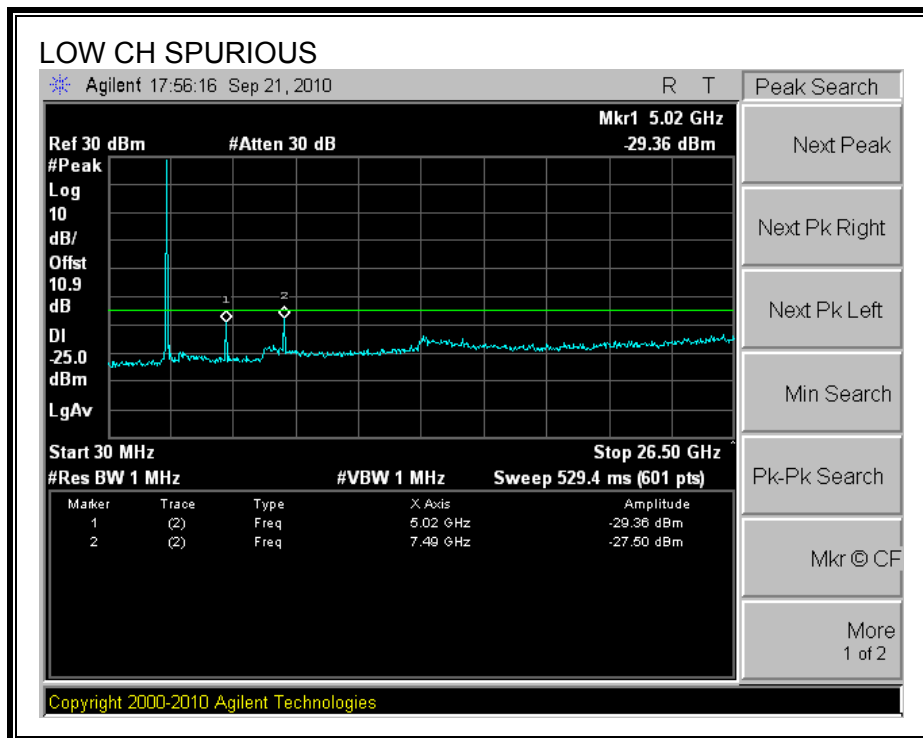
§27.53 (m)(4)(6) For mobile digital stations, the attenuation factor shall be not less than $43 + 10 \log (P)$ dB at the channel edge and $55 + 10 \log (P)$ dB at 5.5 megahertz from the channel edges.

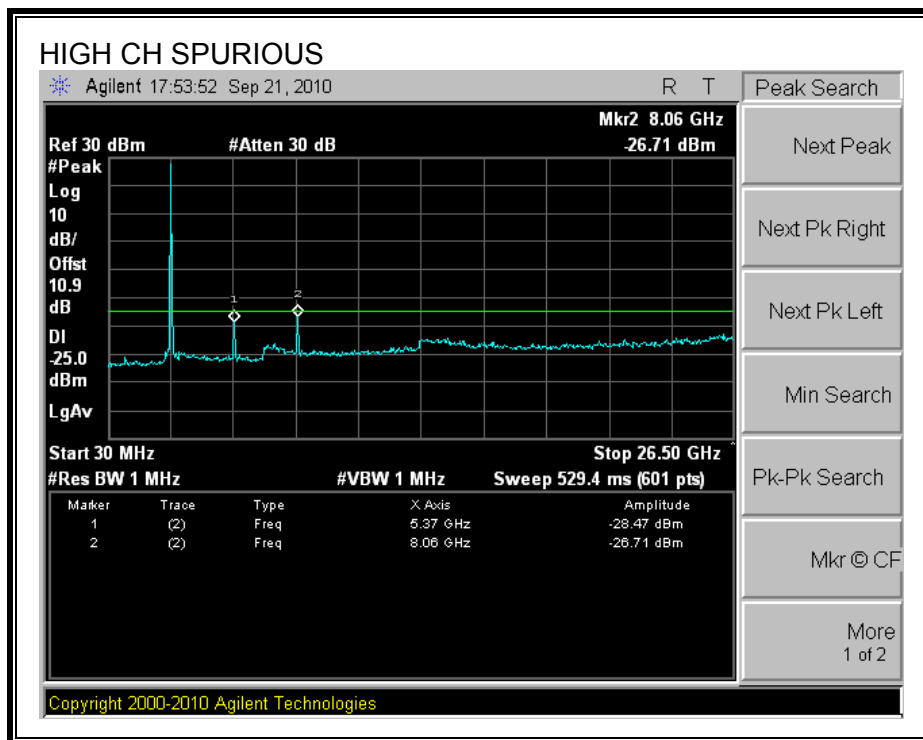
TEST PROCEDURE

ANSI / TIA / EIA 603 Clause 3.2.12 & FCC 27

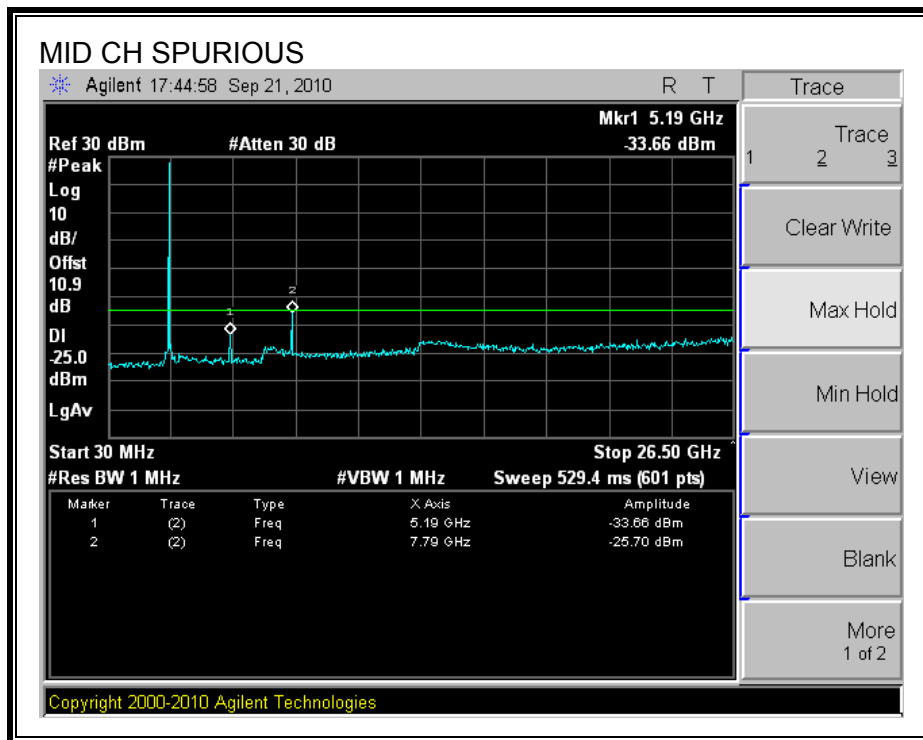
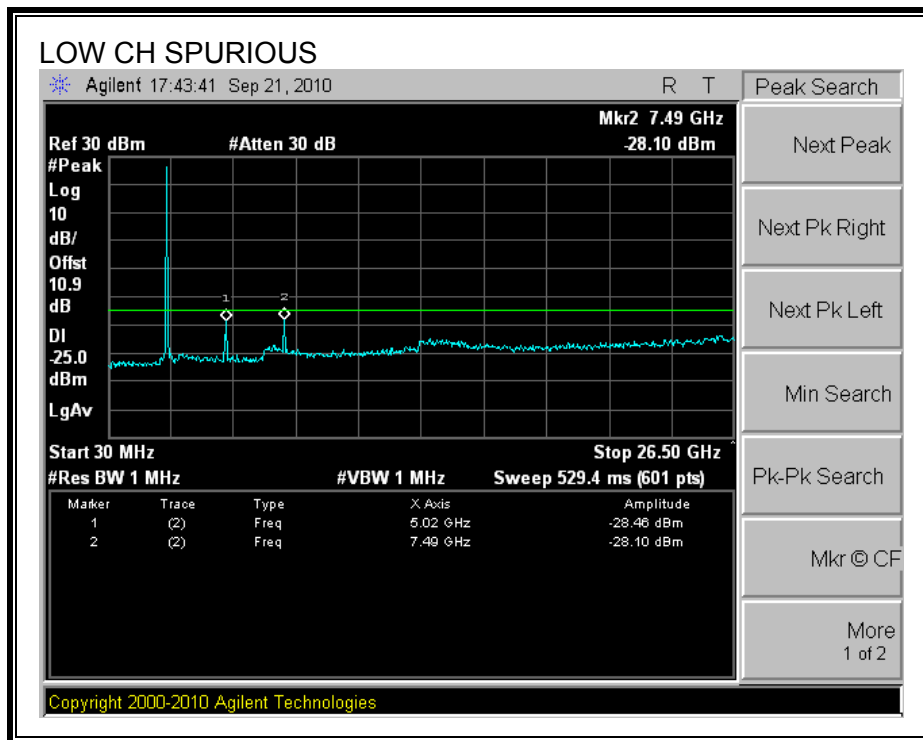
RESULTS

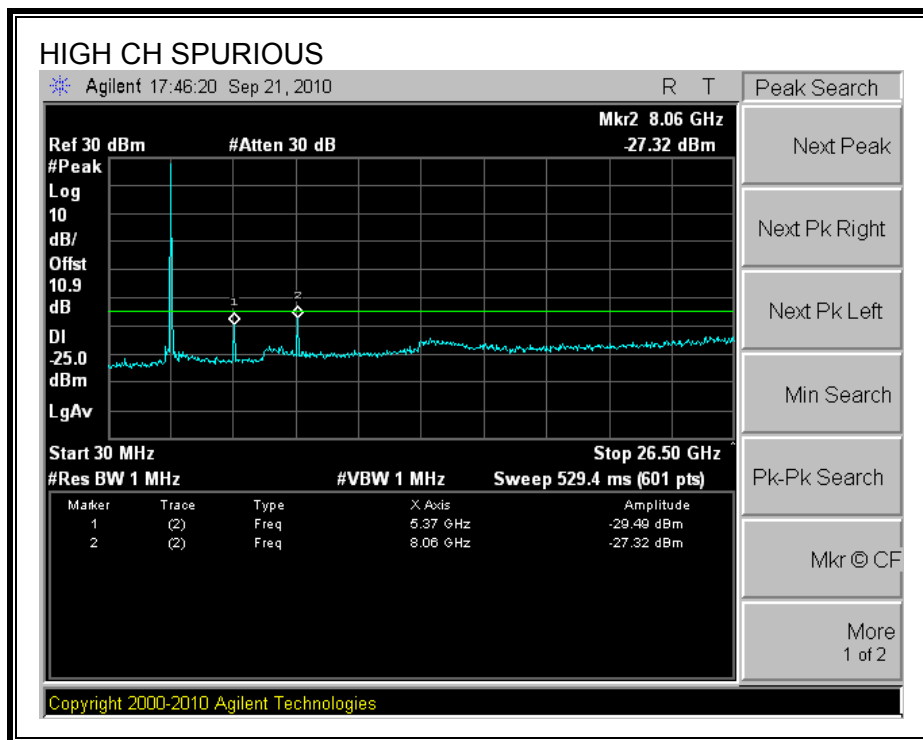
5MHz_QPSK



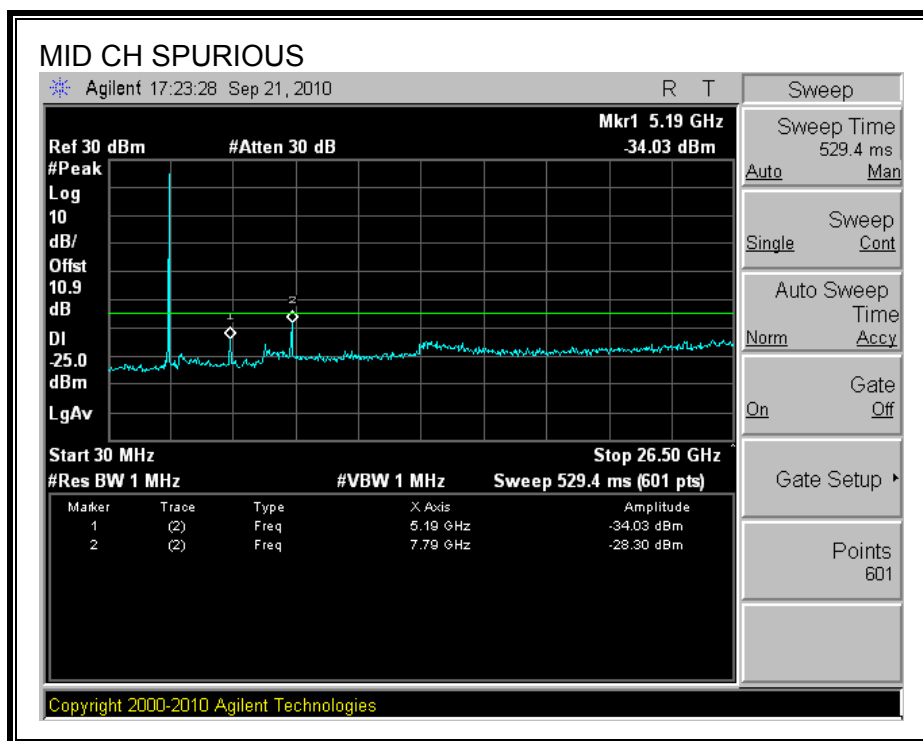
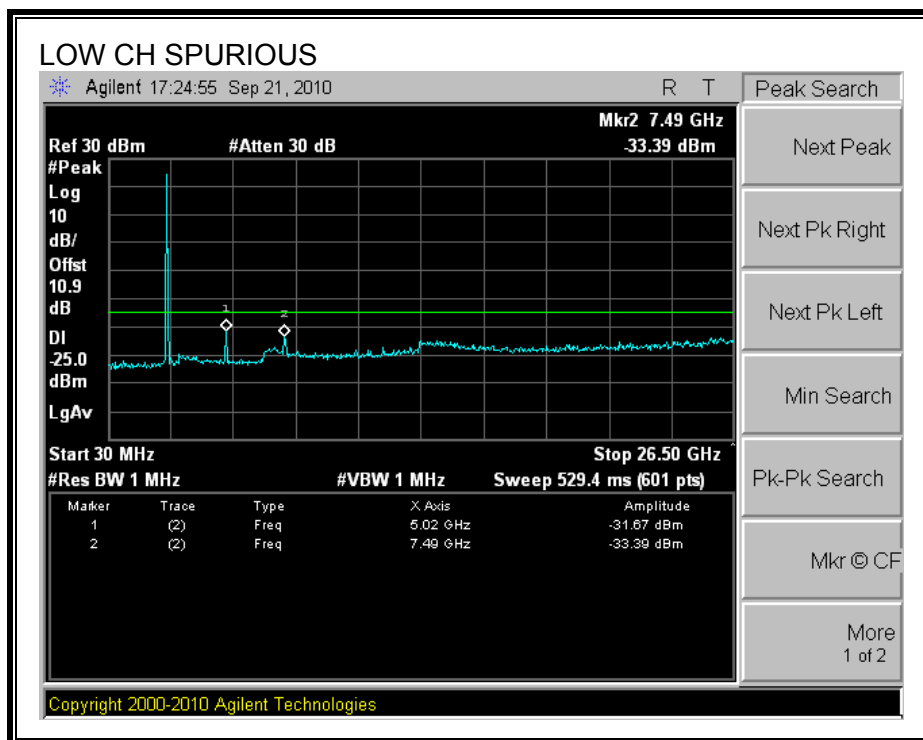


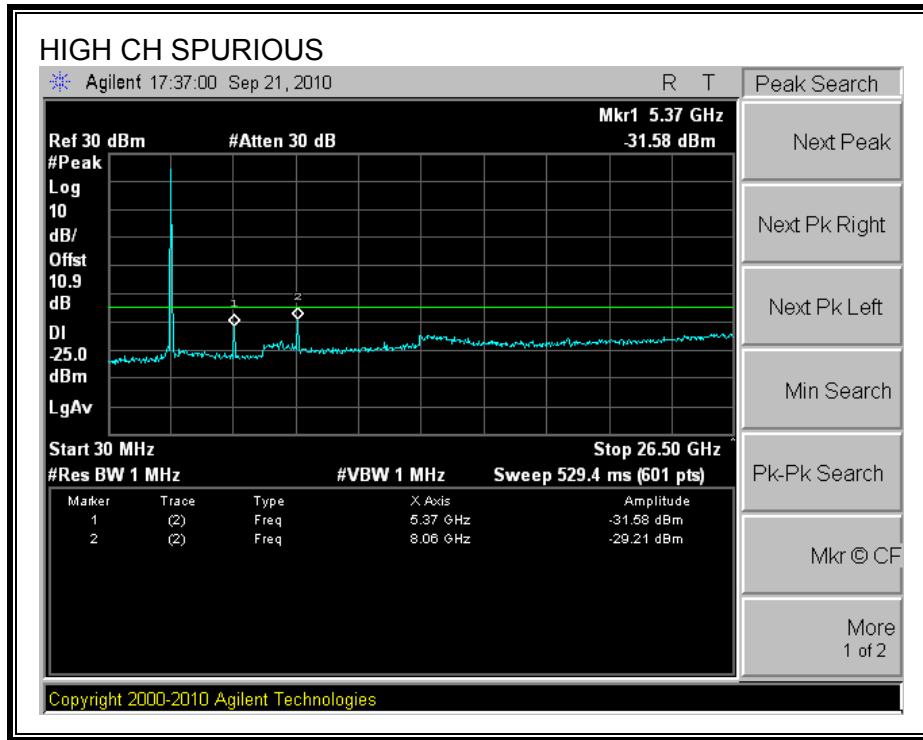
5MHz_16QAM



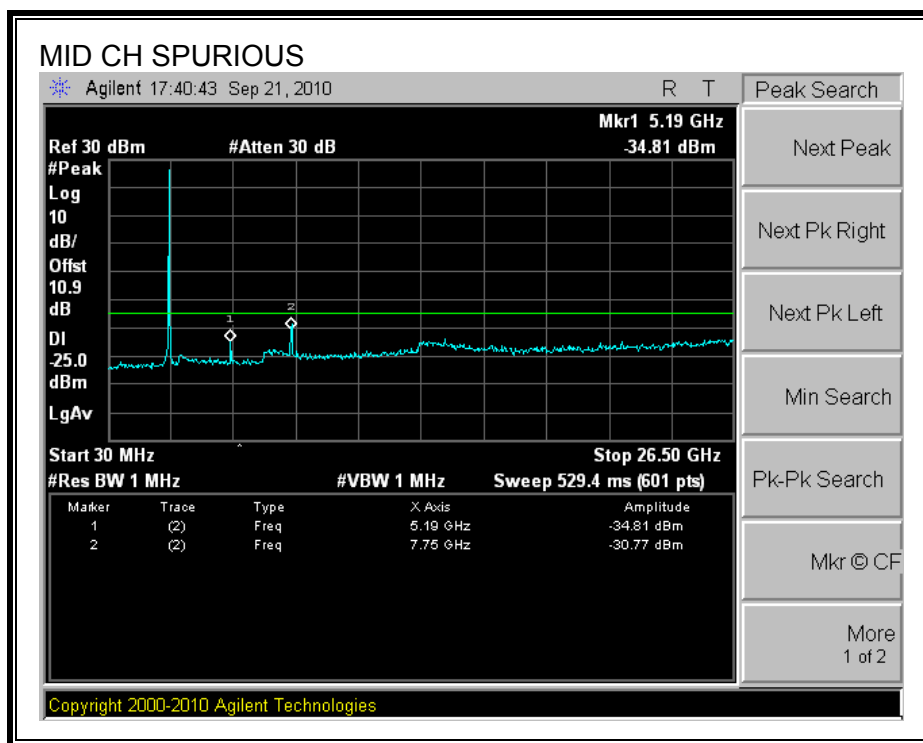
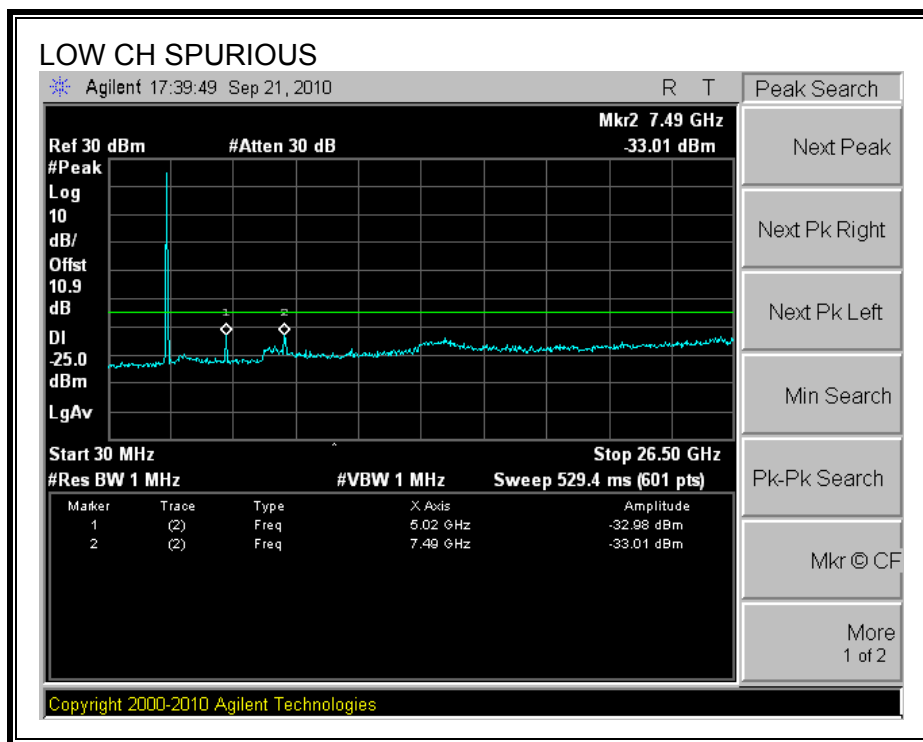


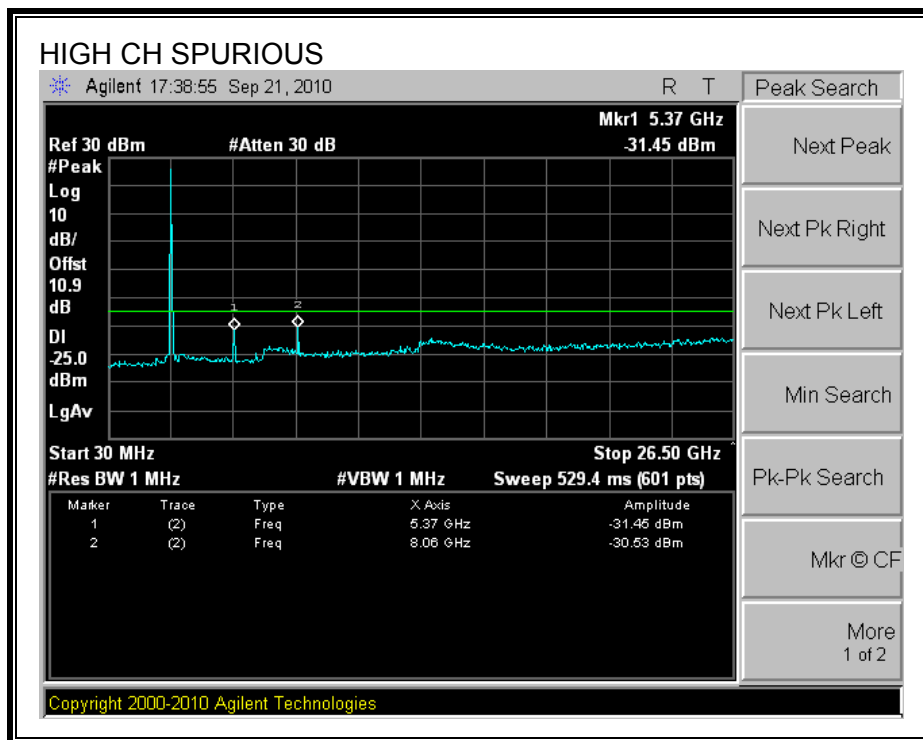
10MHz_QPSK





10MHz_16QAM





7.1.5. FREQUENCY STABILITY MEASUREMENT

LIMIT

§27.54 & 2.1055 Frequency stability.

Manufacturers of wireless medical telemetry devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all of the manufacturer's specified conditions.

TEST PROCEDURE

ANSI / TIA / EIA 603C Clause 2.3.1 and 2.3.2

TEST RESULTS

		Reference Frequency:	2593.0377	MHz @ 20°C
		Limit: ± 20 ppm =	51861	Hz
Power Supply (DC)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
4.20	50	2593.046565	-3.411	Within the authorized frequency band
4.20	40	2593.043176	-2.104	
4.20	30	2593.037393	0.126	
4.20	20	2593.037721	0.000	
4.20	10	2593.037565	0.060	
4.20	0	2593.040491	-1.068	
4.20	-10	2593.042648	-1.900	
4.20	-20	2593.039565	-0.711	
4.20	-30	2593.033015	1.815	
3.57	20	2593.03808	-0.137	
4.83	20	2593.03887	-0.445	Within the authorized frequency band

8. RADIATED TEST RESULTS

8.1.1. RADIATED OUTPUT POWER (EIRP)

LIMITS

§2.1046 & §27.50 (h)(2) Mobile and other user stations. Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.

TEST PROCEDURE

ANSI / TIA / EIA 603 Clause 2.2.17& FCC 27

RESULTS

Measurement was made with integrated antenna with 2.12 dBi peak gain.

Mode	Channel	Frequency (MHz)	EIRP (dBm)	EIRP (mW)
5MHz QPSK	Low	2498.5	23.50	223.87
	Middle	2593	23.60	229.09
	High	2687.5	24.50	281.84
5MHz 16QAM	Low	2498.5	23.00	199.53
	Middle	2593	23.40	218.78
	High	2687.5	24.40	275.42
10MHz QPSK	Low	2501	22.80	190.55
	Middle	2593	24.50	281.84
	High	2685	24.70	295.12
10MHz 16QAM	Low	2501	22.80	190.55
	Middle	2593	23.90	245.47
	High	2685	24.80	302.00

OUTPUT POWER (EIRP)

5MHz_QPSK

Compliance Certification Services
 Above 1GHz High Frequency Substitution Measurement

Company: Sierra Wireless Inc.
 Project #: 10U13412
 Date: 9/22/2010
 Test Engineer: Chin Pang
 Configuration: EUT Only
 Mode: QPSK_5MHz

Chamber

Pre-amplifier

Filter

Limit

5m Chamber B

Part 27

f GHz	SA reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Path Loss (dB)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch										
2.4985	-27.8	V	3.0	41.8			14.0	33.0	-19.0	
2.4985	-16.3	H	3.0	39.8			23.5	33.0	-9.5	
Mid Ch										
2.5930	-27.5	V	3.0	42.1			14.6	33.0	-18.4	
2.5930	-16.8	H	3.0	40.4			23.6	33.0	-9.4	
High Ch										
2.6875	-27.8	V	3.0	42.4			14.6	33.0	-18.4	
2.6875	-16.5	H	3.0	41.0			24.5	33.0	-8.5	

Rev. 03.03.09

5MHz_16QAM

Compliance Certification Services
 Above 1GHz High Frequency Substitution Measurement

Company: Sierra Wireless Inc.
 Project #: 10U13412
 Date: 9/22/2010
 Test Engineer: Chin Pang
 Configuration: EUT Only
 Mode: 16QAM_5MHz

Chamber	Pre-amplifier	Filter	Limit
5m Chamber B			Part 27

f GHz	SA reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Path Loss (dB)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch										
2.4985	-27.5	V	3.0	41.8			14.3	33.0	-18.7	
2.4985	-16.8	H	3.0	39.8			23.0	33.0	-10.0	
Mid Ch										
2.5930	-27.6	V	3.0	42.1			14.5	33.0	-18.5	
2.5930	-17.0	H	3.0	40.4			23.4	33.0	-9.6	
High Ch										
2.6875	-28.0	V	3.0	42.4			14.4	33.0	-18.6	
2.6875	-16.6	H	3.0	41.0			24.4	33.0	-8.6	

Rev. 03.03.09

10MHz_QPSK

Compliance Certification Services
 Above 1GHz High Frequency Substitution Measurement

Company: Sierra Wireless Inc.
 Project #: 10U13412
 Date: 9/22/2010
 Test Engineer: Chin Pang
 Configuration: EUT only
 Mode: 184Q34S175_10MHz

Chamber	Pre-amplifier	Filter	Limit
5m Chamber B			Part 27

f GHz	SA reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Path Loss (dB)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch										
2.501	-24.5	V	3.0	41.8			17.3	33.0	-15.7	
2.501	-17.0	H	3.0	39.8			22.8	33.0	-10.2	
Mid Ch										
2.593	-22.0	V	3.0	42.1			20.1	33.0	-12.9	
2.593	-15.9	H	3.0	40.4			24.5	33.0	-8.5	
High Ch										
2.685	-25.2	V	3.0	42.4			17.2	33.0	-15.8	
2.685	-16.3	H	3.0	41.0			24.7	33.0	-8.3	

Rev. 03.03.09

10MHz_16QAM

Compliance Certification Services
 Above 1GHz High Frequency Substitution Measurement

Company: Sierra Wireless Inc.
 Project #: 10U13412
 Date: 9/22/2010
 Test Engineer: Chin Pang
 Configuration: EUT only
 Mode: 1816Q12S175_10MHz

Chamber	Pre-amplifier	Filter	Limit
5m Chamber B			Part 27

f GHz	SA reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Path Loss (dB)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch										
2.501	-25.8	V	3.0	41.8			16.0	33.0	-17.0	
2.501	-17.0	H	3.0	39.8			22.8	33.0	-10.2	
Mid Ch										
2.593	-26.1	V	3.0	42.1			16.0	33.0	-17.0	
2.593	-16.5	H	3.0	40.4			23.9	33.0	-9.1	
High Ch										
2.685	-26.5	V	3.0	42.4			15.9	33.0	-17.1	
2.685	-16.2	H	3.0	41.0			24.8	33.0	-8.2	

Rev. 03.03.09

8.1.2. FIELD STRENGTH OF SPURIOUS RADIATION

LIMIT

§2.1053

§27.53 (m)(4) For mobile digital stations, the attenuation factor shall be not less than 43 + 10 log (P) dB at the channel edge and 55 + 10 log (P) dB at 5.5 megahertz from the channel edges.

TEST PROCEDURE

ANSI / TIA / EIA 603 Clause 3.2.12 & FCC 27

RESULTS

Below 1GHz at 5MHz Bandwidth (Worst Case)

Compliance Certification Services
30 - 1000MHz Substitution Measurement

Company: Sierra Wireless Inc.
 Project #: 10U13412
 Date: 9/27/2010
 Test Engineer: Chin Pang
 Configuration: EUT/Laptop
 Mode: below 1GHz on 16QAM_5M

Chamber

5m Chamber B

Pre-amplifier

T10 8447D

Filter

Limit

Part 27

f MHz	SA reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Path Loss (dB)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
95.00	-62.8	H	3.0	17.2	29.5		-73.0	-25.0	-48.0	
180.00	-70.5	H	3.0	19.1	29.2		-78.5	-25.0	-53.5	
360.00	-67.0	H	3.0	22.6	29.1		-71.3	-25.0	-46.3	
53.80	-57.0	V	3.0	34.0	29.6		-50.5	-25.0	-25.5	
68.80	-62.2	V	3.0	29.4	29.6		-60.3	-25.0	-35.3	
94.70	-64.2	V	3.0	19.6	29.5		-72.0	-25.0	-47.0	
195.00	-68.0	V	3.0	22.6	29.2		-72.4	-25.0	-47.4	

Rev. 03.03.09

Below 1GHz at 10MHz Bandwidth (Worst Case)

Compliance Certification Services
 30 - 1000MHz Substitution Measurement

Company: Sierra Wireless Inc.
 Project #: 10U13412
 Date: 9/27/2010
 Test Engineer: Chin Pang
 Configuration: EUT/Laptop
 Mode: below 1GHz on 16QAM_10M

Chamber

Pre-amplifier

Filter

Limit

5m Chamber B

T10 8447D

Part 27

f MHz	SA reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Path Loss (dB)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
55.90	-60.0	V	3.0	32.7	29.6		-54.8	-25.0	-29.8	
93.00	-61.3	V	3.0	19.3	29.5		-69.4	-25.0	-44.4	
195.00	-65.8	V	3.0	22.6	29.2		-70.2	-25.0	-45.2	
94.70	-67.0	H	3.0	17.2	29.5		-77.2	-25.0	-52.2	
222.00	-69.6	H	3.0	17.9	29.1		-78.6	-25.0	-53.6	
360.00	-70.5	H	3.0	22.6	29.1		-74.8	-25.0	-49.8	

Rev. 03.03.09

Above 1GHz at 5MHz Bandwidth (Worst Case)

5MHz_QPSK

Compliance Certification Services
 Above 1GHz High Frequency Substitution Measurement

Company: Sierra Wireless Inc.
 Project #: 10U13412
 Date: 9/27/2010
 Test Engineer: Chin Pang
 Configuration: EUT only
 Mode: QPSK_5MHz

Chamber

Pre-amplifier

Filter

Limit

5m Chamber B

T145 8449B

Filter 1

Part 27

f GHz	SA reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Path Loss (dB)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
2498.5MHz										
4.997	-55.3	H	3.0	48.9	35.3	1.0	-40.7	-25.0	-15.7	
7.495	-56.2	H	3.0	53.1	35.7	1.0	-37.8	-25.0	-12.8	
4.997	-54.6	V	3.0	48.3	35.3	1.0	-40.6	-25.0	-15.6	
7.495	-57.0	V	3.0	51.4	35.7	1.0	-40.3	-25.0	-15.3	
2593MHz										
5.186	-59.1	H	3.0	49.4	35.3	1.0	-44.1	-25.0	-19.1	
10.372	-58.3	H	3.0	55.9	35.3	1.0	-36.6	-25.0	-11.6	
5.186	-59.5	V	3.0	48.8	35.3	1.0	-45.1	-25.0	-20.1	
7.779	-51.8	V	3.0	51.8	35.7	1.0	-34.7	-25.0	-9.7	
2687.5MHz										
5.375	-54.8	H	3.0	49.7	35.4	1.0	-39.5	-25.0	-14.5	
10.750	-58.7	H	3.0	56.0	35.0	1.0	-36.7	-25.0	-11.7	
5.375	-51.8	V	3.0	49.0	35.4	1.0	-37.2	-25.0	-12.2	
10.750	-55.8	V	3.0	55.4	35.0	1.0	-34.4	-25.0	-9.4	

Rev. 03.03.09
 Note: No other emissions were detected above the system noise floor.

Above 1GHz at 10MHz Bandwidth (Worst Case)

10MHz_QPSK

Compliance Certification Services
 Above 1GHz High Frequency Substitution Measurement

Company: Sierra Wireless Inc.
 Project #: 10U13412
 Date: 9/27/2010
 Test Engineer: Chin Pang
 Configuration: EUT only
 Mode: QPSK_10MHz

Chamber

Pre-amplifier

Filter

Limit

5m Chamber B

T145 8449B

Filter 1

Part 27

f GHz	SA reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Path Loss (dB)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
2501MHz										
5.002	-59.6	H	3.0	48.9	35.3	1.0	-45.0	-25.0	-20.0	
7.503	-64.0	H	3.0	53.1	35.7	1.0	-45.6	-25.0	-20.6	
5.002	-58.3	V	3.0	48.3	35.3	1.0	-44.3	-25.0	-19.3	
7.503	-65.0	V	3.0	51.4	35.7	1.0	-48.3	-25.0	-23.3	
2593MHz										
5.186	-58.6	H	3.0	49.4	35.3	1.0	-43.6	-25.0	-18.6	
7.779	-63.2	H	3.0	53.4	35.7	1.0	-44.5	-25.0	-19.5	
5.186	-57.8	V	3.0	48.8	35.3	1.0	-43.4	-25.0	-18.4	
7.779	-61.8	V	3.0	51.8	35.7	1.0	-44.7	-25.0	-19.7	
2685MHz										
5.370	-59.9	H	3.0	49.7	35.4	1.0	-44.6	-25.0	-19.6	
8.055	-63.3	H	3.0	53.7	35.7	1.0	-44.3	-25.0	-19.3	
10.740	-63.0	H	3.0	56.0	35.0	1.0	-41.0	-25.0	-16.0	
5.370	-56.0	V	3.0	49.0	35.4	1.0	-41.4	-25.0	-16.4	
8.055	-60.0	V	3.0	52.1	35.7	1.0	-42.6	-25.0	-17.6	
10.740	-60.2	V	3.0	55.4	35.0	1.0	-38.8	-25.0	-13.8	

Rev. 03.03.09
 Note: No other emissions were detected above the system noise floor.

9. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56	56 to 46
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

TEST PROCEDURE

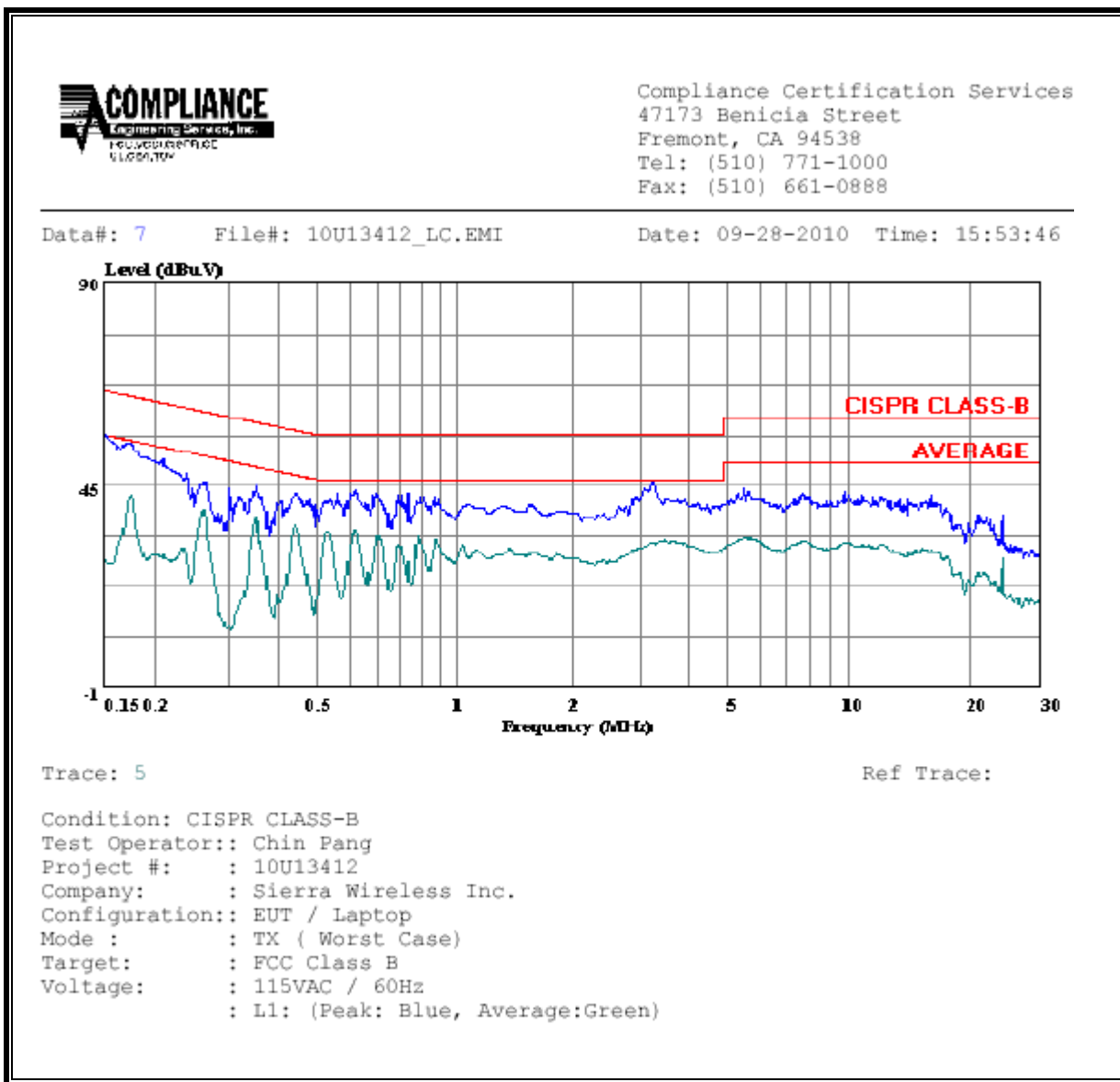
ANSI C63.4

RESULTS

6 WORST EMISSIONS

CONDUCTED EMISSIONS DATA (115VAC 60Hz)										
Freq. (MHz)	Reading			Class (dB)	Limit QP	EN B		Margin		Remark L1 / L2
	PK (dBuV)	QP (dBuV)	AV (dBuV)			AV	QP (dB)	AV (dB)		
0.17	54.05	--	42.02	0.00	64.86	54.86	-10.81	-12.84	L1	
0.35	44.60	--	37.02	0.00	58.96	48.96	-14.36	-11.94	L1	
3.53	44.30	--	31.99	0.00	56.00	46.00	-11.70	-14.01	L1	
0.28	55.63	--	36.48	0.00	60.85	50.85	-5.22	-14.37	L2	
0.95	48.64	--	31.43	0.00	56.00	46.00	-7.36	-14.57	L2	
3.78	42.61	--	31.90	0.00	56.00	46.00	-13.39	-14.10	L2	
6 Worst Data										

LINE 1 RESULTS



LINE 2 RESULTS

