

## TEST REPORT

**Product** : Intelligent Vehicle Network Gateway  
**Trade mark** : TN-IVS-8000  
**Model/Type reference** : TN-IVS-8000  
**Serial Number** : N/A  
**Report Number** : EED32I00216506  
**FCC ID** : 2AJDT-TNIVS8000  
**Date of Issue** : Sep. 28, 2016  
**Test Standards** : 47 CFR Part 2(2015)  
47 CFR Part 22 subpart H(2015)  
**Test result** : PASS

Prepared for:

**ZHEJIANG THIRD NET CO., LTD.**

**6th FL Building A, The Intelligence e Valley, No. 482 Qianmo Road,  
Binjiang District, Hangzhou, Zhejiang, china**

Prepared by:

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Check No.: 2402635644

## 2 Version

Version No.	Date	Description
00	Sep. 28, 2016	Original

### 3 Test Summary

LTE Band 5			
Test Item	Test Requirement	Test method	Result
<b>Conducted output power</b>	Part 2.1046(a)/Part 22.913(a)	TIA-603-D-2010 &KDB 971168 D01v02r02	PASS
<b>Effective Radiated Power of Transmitter(ERP)</b>	Part 2.1046(a)/Part 22.913(a)	TIA-603-D-2010 &KDB 971168 D01v02r02	PASS
<b>99%&amp;26dB Occupied Bandwidth</b>	Part 2.1049(h)	Part 22.917(b) &KDB 971168 D01v02r02	PASS
<b>Band Edge at antenna terminals</b>	Part 2.1051/Part 22.917(a)	Part 22.917(b) &KDB 971168 D01v02r02	PASS
<b>Spurious emissions at antenna terminals</b>	Part 2.1051/ Part 2.1057/ Part 22.917(a)(b)	TIA-603-D-2010 &KDB 971168 D01v02r02	PASS
<b>Field strength of spurious radiation</b>	Part 2.1053/ Part 2.1057/ Part 22.917(a)(b)	TIA-603-D-2010 &KDB 971168 D01v02r02	PASS
<b>Frequency stability</b>	Part 2.1055/ Part 22.355	TIA-603-D-2010 &KDB 971168 D01v02r02	PASS

**Tx:** In this whole report Tx (or tx) means Transmitter.

**Rx:** In this whole report Rx (or rx) means Receiver.

**RF:** In this whole report RF means Radiated Frequency.

**CH:** In this whole report CH means channel.

**Volt:** In this whole report Volt means Voltage.

**Temp:** In this whole report Temp means Temperature.

**Humid:** In this whole report Humid means humidity.

**Press:** In this whole report Press means Pressure.

**N/A:** In this whole report not application

**Remark:**

The tested samples and the sample information are provided by the client.

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## 5 Test Requirement

### 5.1 Test setup

#### 5.1.1 For Radiated Emissions test setup

Radiated Emissions setup:

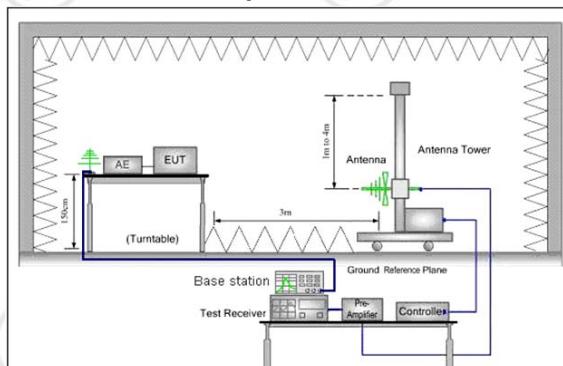


Figure 1. 1.30MHz to 1GHz

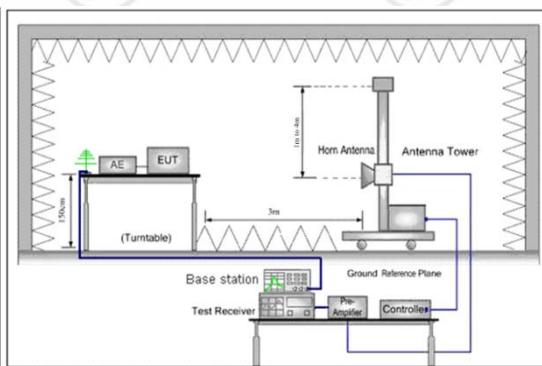


Figure 2. above 1GHz

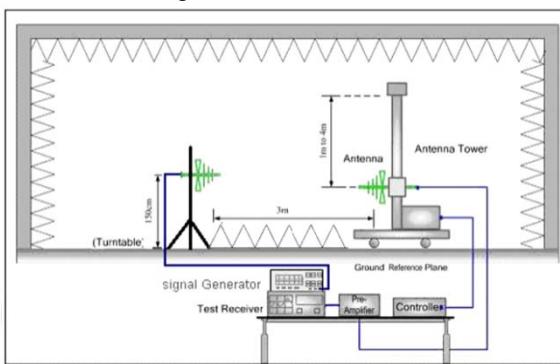


Figure 1. 30MHz to 1GHz

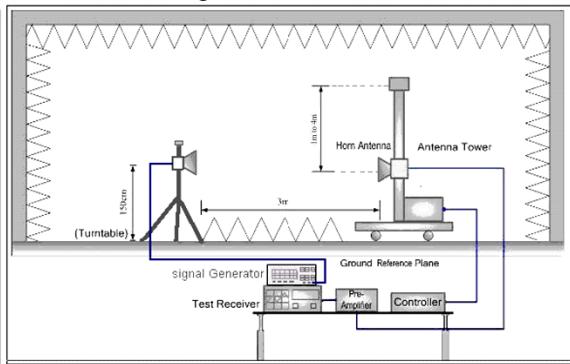


Figure 2. above 1GHz

### 5.2 Test Environment

#### Operating Environment:

Temperature:	24°C
Humidity:	46% RH
Atmospheric Pressure:	1010mbar

### 5.3 Test Condition

Test channel:

LTE

Test Mode	Test Frequency ID	Bandwidth (MHz)	Number [UL]	Frequency of Uplink(MHz)	Number [DL]	Frequency of Downlink(MHz)
LTE band 5 TX:824–849 MHz RX: 869–894MHz	Low Range	1.4	20407	824.7	2407	869.7
		3	20415	825.5	2415	870.5
		5	20425	826.5	2425	871.5
		10	20450	829	2450	874
	Mid Range	1.4/3/5/10	20525	836.5	2525	881.5
		1.4	20643	848.3	2643	893.3
		3	20635	847.5	2635	892.5
		5	20625	846.5	2625	891.5
		10	20600	844	2600	889

## 6 General Information

### 6.1 Client Information

Applicant:	ZHEJIANG THIRD NET CO., LTD.
Address of Applicant:	6th FL Building A, The Intelligence e Valley, No. 482 Qianmo Road, Binjiang District, Hangzhou, Zhejiang, china
Manufacturer:	ZHEJIANG THIRD NET CO., LTD.
Address of Manufacturer:	6th FL Building A, The Intelligence e Valley, No. 482 Qianmo Road, Binjiang District, Hangzhou, Zhejiang, china

### 6.2 General Description of EUT

Product Name:	Intelligent Vehicle Network Gateway
Model No.(EUT):	TN-IVS-8000
Trade Mark:	TN-IVS-8000
EUT Supports Radios application	GPS: 1575.42MHz Wlan 2.4GHz 802.11b/g/n(HT20&HT40) UMTS: Band II(1900MHz), Band IV(1700MHz), Band V(850MHz) WCDMA LTE: Band 2, Band 4, Band 5, Band 17
Power Supply:	DC 9-36V
Sample Received Date:	Aug. 01, 2016
Sample tested Date:	Aug. 01, 2016 to Sep. 27, 2016

### 6.3 Product Specification subjective to this standard

Frequency Band:	LTE Band 5: TX: 824 MHz – 849 MHz RX: 869 MHz – 894MHz
Modulation Type:	LTE Mode with QPSK,16QAM Modulation
Sample Type:	Fixed production
Antenna Type:	Temporary antenna
Antenna Gain:	LTE Band 2: 1.5dBi, LTE Band 4: 1.5dBi, LTE Band 5: 1dBi, LTE Band 17: 1dBi
Test Voltage:	DC 12V

### 6.4 Description of Support Units

The EUT has been tested with associated equipment below.

Description	Manufacturer	Model No.	Certification	Supplied by
DC Source	QIEKESI	10209898	FCC DOC	CTI

### 6.5 Test Location

All tests were performed at:

Centre Testing International Group Co., Ltd.

Hongwei Industrial Zone, Bao'an 70 District, Shenzhen, Guangdong, China 518101

Telephone: +86 (0) 755 33683668 Fax:+86 (0) 755 33683385

No tests were sub-contracted.

### 6.6 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

**CNAS-Lab Code: L1910**

Centre Testing International Group Co., Ltd. has been assessed and proved to be in compliance with  
CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025:  
2005 General Requirements) for the Competence of Testing and Calibration Laboratories..

#### **A2LA-Lab Cert. No. 3061.01**

Centre Testing International Group Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

#### **FCC-Registration No.: 886427**

Centre Testing International Group Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. Registration 886427.

#### **IC-Registration No.: 7408A-2**

The 3m Alternate Test Site of Centre Testing International Group Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 7408A-2 .

#### **IC-Registration No.: 7408B-1**

The 10m Alternate Test Site of Centre Testing International Group Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 7408B-1.

#### **NEMKO-Aut. No.: ELA503**

Centre Testing International Group Co., Ltd. has been assessed the quality assurance system, the testing facilities, qualifications and testing practices of the relevant parts of the organization. The quality assurance system of the Laboratory has been validated against ISO/IEC 17025 or equivalent. The laboratory also fulfils the conditions described in Nemko Document NLA-10.

#### **VCCI**

The Radiation 3 & 10 meters site of Centre Testing International Group Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-4096.

Main Ports Conducted Interference Measurement of Centre Testing International Group Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: C-4563.

Telecommunication Ports Conducted Disturbance Measurement of Centre Testing International Group Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: T-2146.

The Radiation 3 meters site of Centre Testing International Group Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-758

## **6.7 Deviation from Standards**

None.

## **6.8 Abnormalities from Standard Conditions**

None.

## 6.9 Other Information Requested by the Customer

None.

## 6.10 Measurement Uncertainty (95% confidence levels, k=2)

No.	Item	Measurement Uncertainty
1	Radio Frequency	$7.9 \times 10^{-8}$
2	RF power, conducted	0.31dB (30MHz-1GHz)
		0.57dB (1GHz-18GHz)
3	Radiated Spurious emission test	4.5dB (30MHz-1GHz)
		4.8dB (1GHz-12.75GHz)
4	Conduction emission	3.6dB (9kHz to 150kHz)
		3.2dB (150kHz to 30MHz)
5	Temperature test	0.64°C
6	Humidity test	2.8%
7	DC power voltages	0.025%

## 7 Equipment List

Communication RF test system					
Equipment	Manufacturer	Mode No.	Serial Number	Cal. Date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
Spectrum Analyzer	Agilent	E4440A	MY46185649	12-31-2015	12-29-2016
Signal Generator	Agilent	E4438C	MY45095744	04-01-2016	03-31-2017
Communication test set	Agilent	E5515C	GB47050534	04-01-2016	03-31-2017
Signal Generator	Keysight	E8257D	MY53401106	04-01-2016	03-31-2017
Communication test set	R&S	CMW500	152394	04-01-2016	03-31-2017
High-pass filter	Sinoscite	FL3CX03WG18 NM12-0398-002	---	01-12-2016	01-11-2017
High-pass filter	MICRO-TRONICS	SPA-F-63029-4	---	01-12-2016	01-11-2017
band rejection filter	Sinoscite	FL5CX01CA09C L12-0395-001	---	01-12-2016	01-11-2017
band rejection filter	Sinoscite	FL5CX01CA08C L12-0393-001	---	01-12-2016	01-11-2017
band rejection filter	Sinoscite	FL5CX02CA04C L12-0396-002	---	01-12-2016	01-11-2017
band rejection filter	Sinoscite	FL5CX02CA03C L12-0394-001	---	01-12-2016	01-11-2017
DC Power	Keysight	E3642A	MY54426112	04-08-2016	04-07-2017
DC Power	Keysight	E3642A	MY54426115	04-01-2016	03-31-2017
PC-2	Lenovo	R4960d	---	04-01-2016	03-31-2017
PC-3	Lenovo	R4960d	---	04-01-2016	03-31-2017
RF control unit	JS Tonscend	JS0806-1	158060004	04-01-2016	03-31-2017
DC power Box	JS Tonscend	JS0806-4	158060007	04-01-2016	03-31-2017
LTE Automatic test software	JS Tonscend	JS1120-1	---	04-01-2016	03-31-2017
WCDMA Automatic test software	JS Tonscend	JS1120-3	---	04-01-2016	03-31-2017
GSM Automatic test software	JS Tonscend	JS1120-3	---	04-01-2016	03-31-2017

Radiated Spurious Emission & Radiated Emission					
Equipment	Manufacturer	Mode No.	Serial Number	Cal. date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
3M Chamber & Accessory Equipment	TDK	SAC-3	---	06-05-2016	06-05-2019
TRILOG Broadband Antenna	SCHWARZBECK	VULB9163	9163-617	05-23-2016	05-22-2017
Microwave Preamplifier	Agilent	8449B	3008A02425	02-04-2016	02-03-2017
Horn Antenna	ETS-LINDGREN	3117	00057407	07-20-2015	07-18-2018
Loop Antenna	ETS	6502	00071730	07-30-2015	07-28-2017
Spectrum Analyzer	R&S	FSP40	100416	06-16-2016	06-15-2017
Receiver	R&S	ESCI	100435	06-16-2016	06-15-2017
Multi device Controller	maturo	NCD/070/10711 112	---	01-12-2016	01-11-2017
LISN	schwarzbeck	NNBM8125	81251547	06-16-2016	06-15-2017
LISN	schwarzbeck	NNBM8125	81251548	06-16-2016	06-15-2017
Signal Generator	Agilent	E4438C	MY45095744	04-01-2016	03-31-2017
Signal Generator	Keysight	E8257D	MY53401106	04-01-2016	03-31-2017
Temperature/ Humidity Indicator	TAYLOR	1451	1905	04-27-2016	04-26-2017
Communication test set	Agilent	E5515C	GB47050534	04-01-2016	03-31-2017
Cable line	Fulai(7M)	SF106	5219/6A	01-12-2016	01-11-2017
Cable line	Fulai(6M)	SF106	5220/6A	01-12-2016	01-11-2017
Cable line	Fulai(3M)	SF106	5216/6A	01-12-2016	01-11-2017
Cable line	Fulai(3M)	SF106	5217/6A	01-12-2016	01-11-2017
Communication test set	R&S	CMW500	152394	04-01-2016	03-31-2017
High-pass filter	Sinoscite	FL3CX03WG18 NM12-0398-002	---	01-12-2016	01-11-2017
High-pass filter	MICRO-TRONICS	SPA-F-63029-4	---	01-12-2016	01-11-2017
band rejection filter	Sinoscite	FL5CX01CA09C L12-0395-001	---	01-12-2016	01-11-2017
band rejection filter	Sinoscite	FL5CX01CA08C L12-0393-001	---	01-12-2016	01-11-2017
band rejection filter	Sinoscite	FL5CX02CA04C L12-0396-002	---	01-12-2016	01-11-2017
band rejection filter	Sinoscite	FL5CX02CA03C L12-0394-001	---	01-12-2016	01-11-2017

## 8 Radio Technical Requirements Specification

### Reference documents for testing:

No.	Identity	Document Title
1	PART 22 (2015)	PART 22 – PUBLIC MOBILE SERVICES Subpart H – Cellular Radiotelephone Service
2	PART 24 (2015)	PART 24 – PERSONAL COMMUNICATIONS SERVICES Subpart E – Broadband PCS
3	PART 27 (2015)	PART 27 – MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES Subpart C – Technical Standards
3	PART 2 (2015)	Frequency allocations and radio treaty matters; general rules and regulations
4	TIA-603-D-2010	Land Mobile FM or PM -Communications Equipment -Measurement and Performance Standards
5	KDB971168 D01	KDB971168 D01 Power Meas License Digital Systems v02r02

### Test Results List:

Test Requirement	Test method	Test item	Verdict	Note
Part 2.1046(a)/Part 22.913(a)	TIA-603-D&KDB 971168 D01v02r02	Conducted output power	PASS	Appendix A)
Part 2.1049(h)	Part 22.917(b) &KDB 971168 D01v02r02	99% &26dB Occupied Bandwidth	PASS	Appendix B)
Part 2.1051/Part 22.917(a)/	Part 22.917(b) &KDB 971168 D01v02r02	Band Edge at antenna terminals	PASS	Appendix C)
Part 2.1051/ Part 2.1057/ Part 22.917(a)(b)/	TIA-603-D &KDB 971168 D01v02r02	Spurious emissions at antenna terminals	PASS	Appendix D)
Part 2.1055/ Part 22.355	TIA-603-D &KDB 971168 D01v02r02	Frequency stability	PASS	Appendix E)
Part 2.1053/ Part 2.1057/ Part 22.917(a)(b)	TIA-603-D &KDB 971168 D01v02r02	Field strength of spurious radiation	PASS	Appendix F)
Part 2.1046(a)/Part 22.913(a)	TIA-603-D &KDB 971168 D01v02r02	Effective Radiated Power of Transmitter(ERP)	PASS	Appendix G)

## Appendix A: Effective Radiated Power of Transmitter (ERP/EIRP)

Receiver Setup:	<table border="1"> <thead> <tr> <th>Frequency</th><th>Detector</th><th>RBW</th><th>VBW</th><th>Remark</th></tr> </thead> <tbody> <tr> <td>30MHz-1GHz</td><td>peak</td><td>120kHz</td><td>300kHz</td><td>Peak</td></tr> <tr> <td>Above 1GHz</td><td>Peak</td><td>1MHz</td><td>3MHz</td><td>Peak</td></tr> </tbody> </table>					Frequency	Detector	RBW	VBW	Remark	30MHz-1GHz	peak	120kHz	300kHz	Peak	Above 1GHz	Peak	1MHz	3MHz	Peak
Frequency	Detector	RBW	VBW	Remark																
30MHz-1GHz	peak	120kHz	300kHz	Peak																
Above 1GHz	Peak	1MHz	3MHz	Peak																
Measurement Procedure:	<p>Test procedure as below:</p> <ol style="list-style-type: none"> <li>1) The EUT was powered ON and placed on a 1.5m hight table at a 3 meter fully Anechoic Chamber. The antenna of the transmitter was extended to its maximum length. modulation mode and the measuring receiver shall be tuned to the frequency of the transmitter under test.</li> <li>2) The EUT was set 3 meters(above 18GHz the distance is 1 meter) away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.</li> <li>3) The disturbance of the transmitter was maximized on the test receiver display by raising and lowering from 1m to 4m the receive antenna and by rotating through 360° the turntable. After the fundamental emission was maximized, a field strength measurement was made.</li> <li>4) Steps 1) to 3) were performed with the EUT and the receive antenna in both vertical and horizontal polarization.</li> <li>5) The transmitter was then removed and replaced with another antenna. The center of the antenna was approximately at the same location as the center of the transmitter.</li> <li>6) A signal at the disturbance was fed to the substitution antenna by means of a non-radiating cable. With both the substitution and the receive antennas horizontally polarized, the receive antenna was raised and lowered to obtain a maximum reading at the test receiver. The level of the signal generator was adjusted until the measured field strength level in step 3) is obtained for this set of conditions.</li> <li>7) The output power into the substitution antenna was then measured.</li> <li>8) Steps 6) and 7) were repeated with both antennas polarized.</li> <li>9) Calculate power in dBm by the following formula:           <math display="block">\text{ERP(dBm)} = \text{Pg(dBm)} - \text{cable loss (dB)} + \text{antenna gain (dBd)}</math> <math display="block">\text{EIRP(dBm)} = \text{Pg(dBm)} - \text{cable loss (dB)} + \text{antenna gain (dBi)}</math> <math display="block">\text{EIRP} = \text{ERP} + 2.15\text{dB}</math>           where:            Pg is the generator output power into the substitution antenna.         </li> <li>10) Test the EUT in the lowest channel, the middle channel the Highest channel</li> <li>11) Repeat above procedures until all frequencies measured was complete.</li> </ol>																			
Limit:	<table border="1"> <tr> <td>Mode</td> <td>LTE band 5</td> </tr> <tr> <td>Limit</td> <td>38.45dBm ( 7W )</td> </tr> </table>					Mode	LTE band 5	Limit	38.45dBm ( 7W )											
Mode	LTE band 5																			
Limit	38.45dBm ( 7W )																			

**Test Result****Channel Bandwidth: 1.4 MHz**

Modulation	Channel	RB Configuration		Average Power [dBm]	E.r.p [dBm]	Verdict
		Size	Offset			
QPSK	LCH	1	0	22.45	24.06	PASS
		1	3	22.60	24.05	PASS
		1	5	22.56	24.00	PASS
		3	0	22.53	23.96	PASS
		3	2	22.68	23.87	PASS
		3	3	22.58	23.81	PASS
		6	0	21.62	23.66	PASS
	MCH	1	0	22.82	24.92	PASS
		1	3	22.76	24.91	PASS
		1	5	22.84	24.85	PASS
		3	0	22.83	24.81	PASS
		3	2	22.81	24.74	PASS
		3	3	22.70	24.66	PASS
		6	0	21.90	24.60	PASS
16QAM	LCH	1	0	22.68	24.84	PASS
		1	3	22.52	24.81	PASS
		1	5	22.40	24.77	PASS
		3	0	22.62	24.73	PASS
		3	2	22.53	24.68	PASS
		3	3	22.38	24.61	PASS
		6	0	21.54	24.59	PASS
	MCH	1	0	21.61	23.82	PASS
		1	3	21.62	23.80	PASS
		1	5	21.57	23.76	PASS
		3	0	21.75	23.72	PASS
		3	2	21.70	23.69	PASS
		3	3	21.59	23.64	PASS
		6	0	20.59	23.55	PASS
	HCH	1	0	21.75	23.12	PASS
		1	3	21.71	23.10	PASS
		1	5	21.63	23.06	PASS
		3	0	21.89	23.01	PASS
		3	2	21.70	23.97	PASS
		3	3	21.73	23.95	PASS
		6	0	20.70	23.81	PASS
	HCH	1	0	21.55	23.70	PASS
		1	3	21.63	23.64	PASS
		1	5	21.45	23.61	PASS
		3	0	21.66	23.55	PASS
		3	2	21.54	23.48	PASS
		3	3	21.51	23.50	PASS
		6	0	20.52	23.51	PASS

## Channel Bandwidth: 3 MHz

Modulation	Channel	Channel Bandwidth: 3 MHz			
		RB Configuration	Average Power [dBm]	E.i.r.p [dBm]	Verdict
		Size	Offset		
QPSK	LCH	1	0	22.41	PASS
		1	7	22.48	PASS
		1	14	22.38	PASS
		8	0	21.56	PASS
		8	4	21.49	PASS
		8	7	21.45	PASS
		15	0	21.59	PASS
QPSK	MCH	1	0	22.78	PASS
		1	7	22.81	PASS
		1	14	22.58	PASS
		8	0	21.82	PASS
		8	4	21.71	PASS
		8	7	21.67	PASS
		15	0	21.79	PASS
QPSK	HCH	1	0	22.52	PASS
		1	7	22.52	PASS
		1	14	22.31	PASS
		8	0	21.58	PASS
		8	4	21.71	PASS
		8	7	21.54	PASS
		15	0	21.52	PASS
16QAM	LCH	1	0	21.43	PASS
		1	7	21.54	PASS
		1	14	21.28	PASS
		8	0	20.57	PASS
		8	4	20.57	PASS
		8	7	20.48	PASS
		15	0	20.52	PASS
16QAM	MCH	1	0	21.71	PASS
		1	7	21.69	PASS
		1	14	21.55	PASS
		8	0	20.93	PASS
		8	4	20.80	PASS
		8	7	20.70	PASS
		15	0	20.80	PASS
16QAM	HCH	1	0	21.46	PASS
		1	7	21.40	PASS
		1	14	21.29	PASS
		8	0	20.62	PASS
		8	4	20.74	PASS
		8	7	20.56	PASS
		15	0	20.57	PASS

## Channel Bandwidth: 5 MHz

Modulation	Channel	RB Configuration		Average Power [dBm]	E.i.r.p [dBm]	Verdict
		Size	Offset			
QPSK	LCH	1	0	22.63	25.55	PASS
		1	12	22.67	25.54	PASS
		1	24	22.48	25.34	PASS
		12	0	21.57	24.88	PASS
		12	6	21.57	24.88	PASS
		12	13	21.55	24.85	PASS
		25	0	21.50	24.80	PASS
	MCH	1	0	22.86	24.83	PASS
		1	12	22.95	24.80	PASS
		1	24	22.63	24.66	PASS
		12	0	21.85	24.59	PASS
		12	6	21.82	24.51	PASS
		12	13	21.67	23.44	PASS
		25	0	21.70	23.55	PASS
16QAM	LCH	1	0	22.71	23.43	PASS
		1	12	22.75	23.41	PASS
		1	24	22.47	23.33	PASS
		12	0	21.59	23.39	PASS
		12	6	21.62	22.28	PASS
		12	13	21.61	22.25	PASS
		25	0	21.48	22.01	PASS
	MCH	1	0	21.53	24.98	PASS
		1	12	21.52	24.97	PASS
		1	24	21.49	24.85	PASS
		12	0	20.61	24.63	PASS
		12	6	20.60	24.60	PASS
		12	13	20.47	24.51	PASS
		25	0	20.47	24.51	PASS
	HCH	1	0	21.68	23.83	PASS
		1	12	21.80	23.80	PASS
		1	24	21.60	23.60	PASS
		12	0	20.87	23.88	PASS
		12	6	20.73	23.73	PASS
		12	13	20.69	23.69	PASS
		25	0	20.74	23.27	PASS
	HCH	1	0	21.51	23.17	PASS
		1	12	21.71	23.11	PASS
		1	24	21.52	23.03	PASS
		12	0	20.63	23.93	PASS
		12	6	20.57	23.57	PASS
		12	13	20.59	23.60	PASS
		25	0	20.48	23.69	PASS

## Channel Bandwidth: 10 MHz

Modulation	Channel	RB Configuration		Average Power [dBm]	E.i.r.p [dBm]	Verdict
		Size	Offset			
QPSK	LCH	1	0	22.41	24.71	PASS
		1	24	22.32	24.68	PASS
		1	49	22.60	24.60	PASS
		25	0	21.47	23.77	PASS
		25	12	21.47	23.77	PASS
		25	25	21.46	23.76	PASS
		50	0	21.41	23.71	PASS
	MCH	1	0	22.59	24.46	PASS
		1	24	22.76	24.44	PASS
		1	49	22.57	24.37	PASS
		25	0	21.79	24.11	PASS
		25	12	21.81	24.12	PASS
		25	25	21.64	23.64	PASS
		50	0	21.62	23.62	PASS
16QAM	LCH	1	0	22.68	24.66	PASS
		1	24	22.46	24.46	PASS
		1	49	22.50	24.50	PASS
		25	0	21.59	23.79	PASS
		25	12	21.61	23.89	PASS
		25	25	21.51	23.61	PASS
		50	0	21.57	23.67	PASS
	MCH	1	0	21.41	24.91	PASS
		1	24	21.42	24.90	PASS
		1	49	21.45	24.85	PASS
		25	0	20.52	22.31	PASS
		25	12	20.42	22.22	PASS
		25	25	20.35	22.10	PASS
		50	0	20.47	22.29	PASS
	HCH	1	0	21.53	23.71	PASS
		1	24	21.56	23.70	PASS
		1	49	21.50	23.55	PASS
		25	0	20.75	23.11	PASS
		25	12	20.65	22.02	PASS
		25	25	20.64	22.01	PASS
		50	0	20.58	23.99	PASS
	HCH	1	0	21.72	23.10	PASS
		1	24	21.34	23.99	PASS
		1	49	21.33	23.97	PASS
		25	0	20.56	22.01	PASS
		25	12	20.60	22.06	PASS
		25	25	20.64	22.06	PASS
		50	0	20.62	22.03	PASS

## Appendix B: 26dB Bandwidth and Occupied Bandwidth

### Test Result

#### Channel Bandwidth: 1.4 MHz

Channel Bandwidth: 1.4 MHz						
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)	Verdict
		Size	Offset			
QPSK	LCH	6	0	1.0794	1.254	PASS
	MCH	6	0	1.0737	1.222	PASS
	HCH	6	0	1.0772	1.258	PASS
16QAM	LCH	6	0	1.0766	1.235	PASS
	MCH	6	0	1.0791	1.255	PASS
	HCH	6	0	1.0787	1.235	PASS

#### Channel Bandwidth: 3 MHz

Channel Bandwidth: 3 MHz						
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)	Verdict
		Size	Offset			
QPSK	LCH	15	0	2.6733	2.927	PASS
	MCH	15	0	2.6761	2.965	PASS
	HCH	15	0	2.6748	2.943	PASS
16QAM	LCH	15	0	2.6816	2.989	PASS
	MCH	15	0	2.6807	2.989	PASS
	HCH	15	0	2.6799	2.969	PASS

#### Channel Bandwidth: 5 MHz

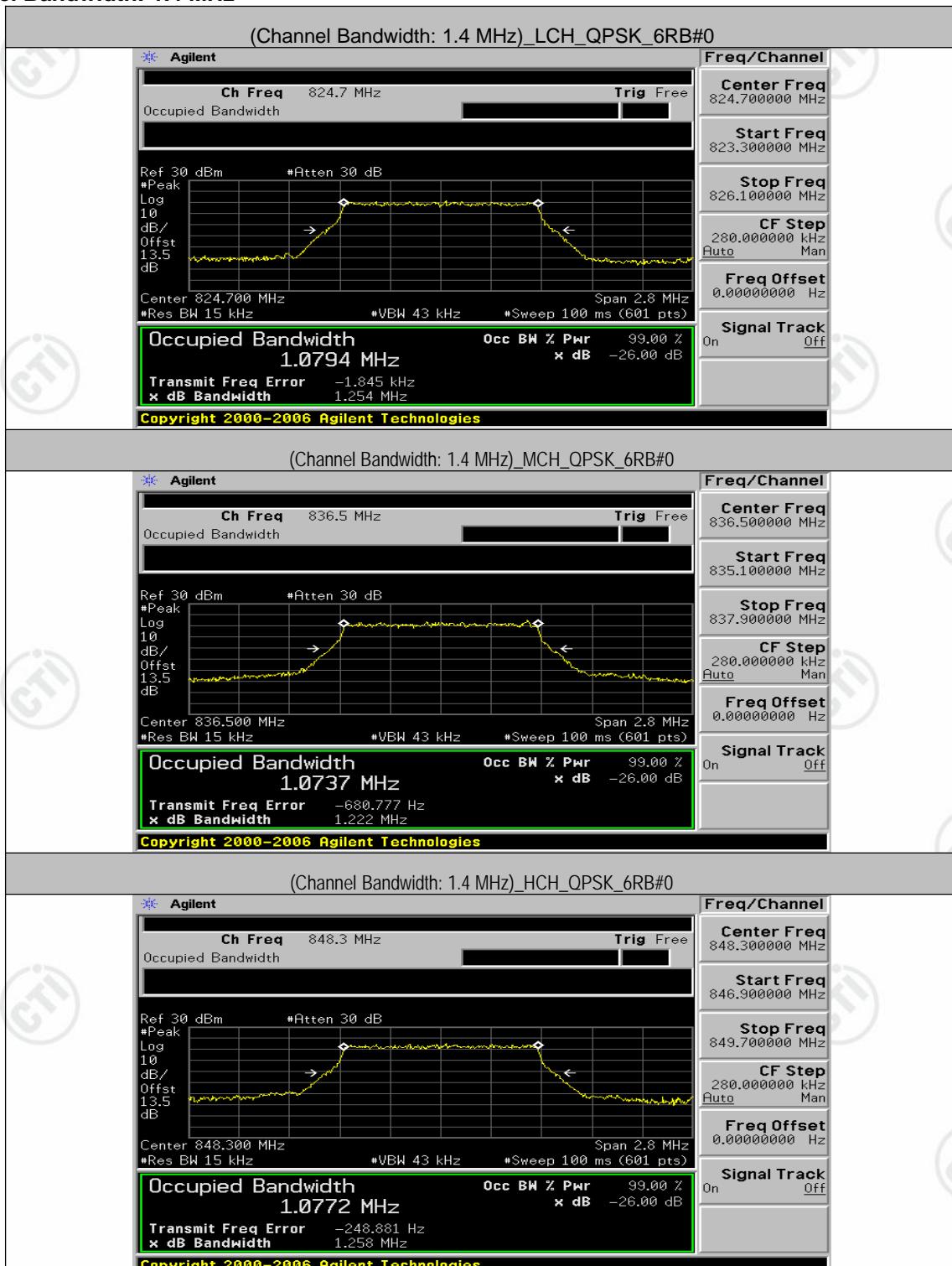
Channel Bandwidth: 5 MHz						
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)	Verdict
		Size	Offset			
QPSK	LCH	25	0	4.4808	5.011	PASS
	MCH	25	0	4.4708	4.922	PASS
	HCH	25	0	4.4801	4.997	PASS
16QAM	LCH	25	0	4.4697	4.997	PASS
	MCH	25	0	4.4752	4.936	PASS
	HCH	25	0	4.4830	4.982	PASS

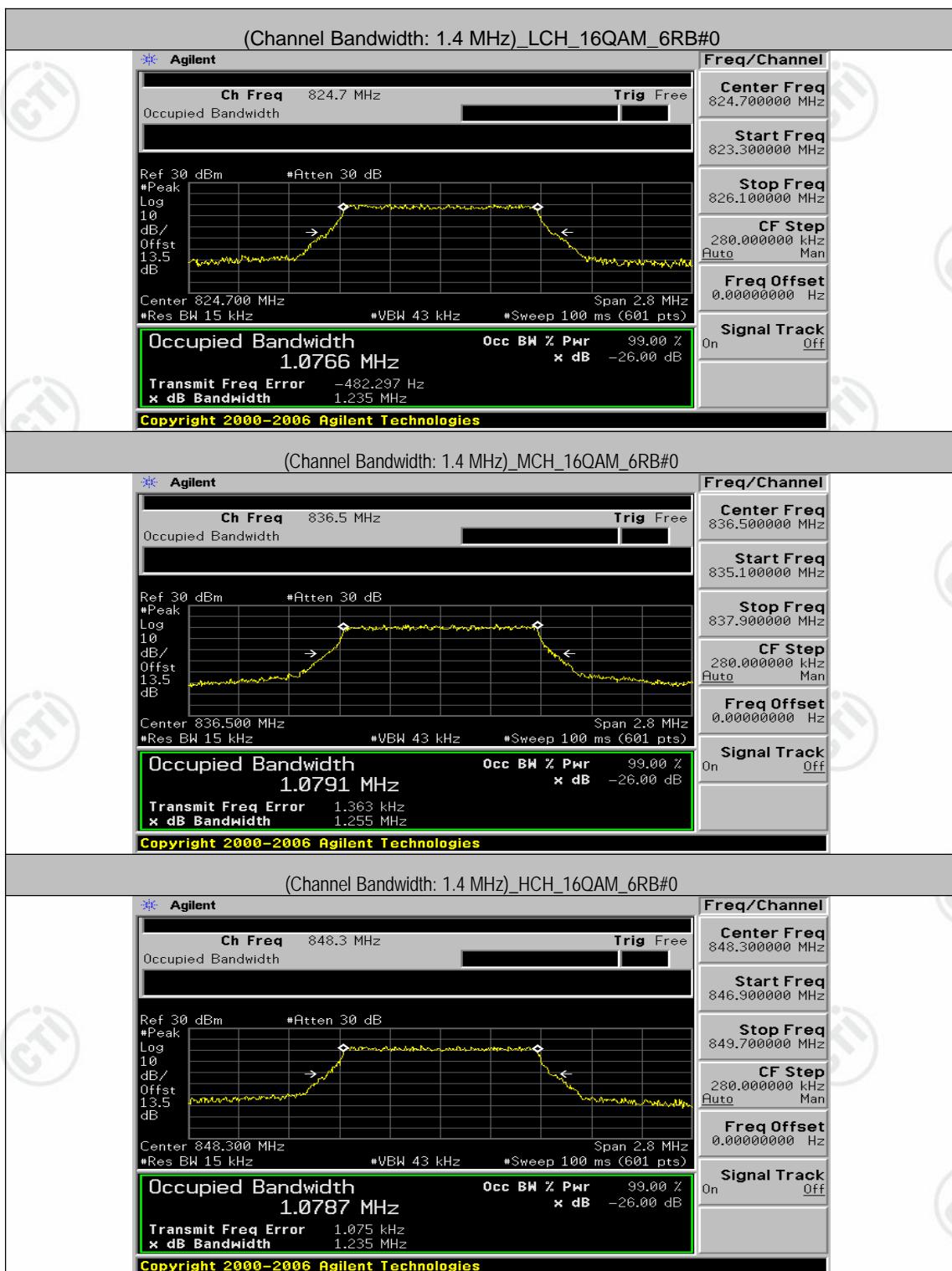
## Channel Bandwidth: 10 MHz

Modulation	Channel	Channel Bandwidth: 10 MHz			26dB Bandwidth (MHz)	Verdict
		RB Configuration	Size	Offset		
QPSK	LCH	50	0	8.9495	9.769	PASS
	MCH	50	0	8.9173	9.707	PASS
	HCH	50	0	8.9353	9.846	PASS
16QAM	LCH	50	0	8.9353	9.777	PASS
	MCH	50	0	8.9356	9.669	PASS
	HCH	50	0	8.9412	9.718	PASS

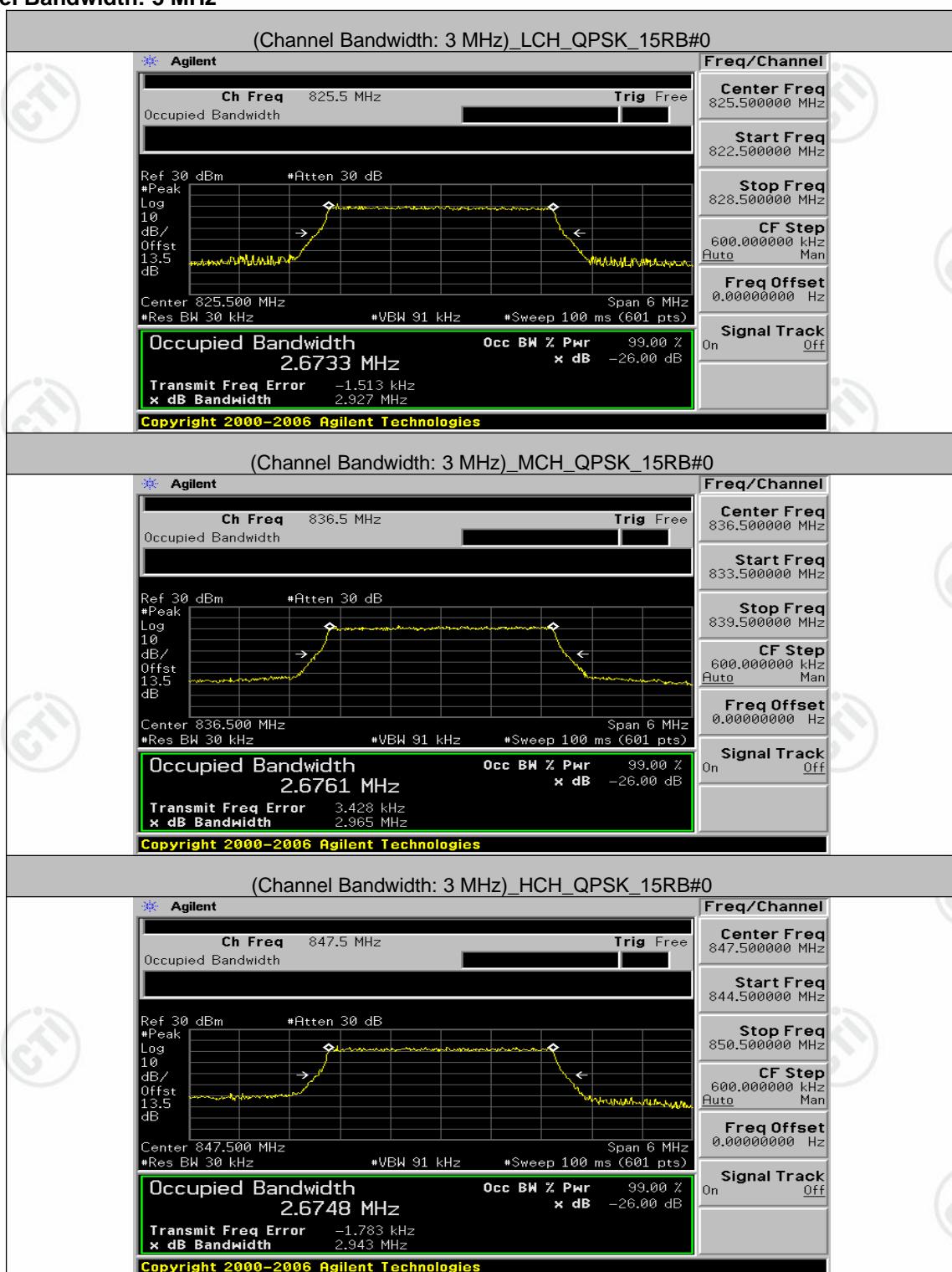
**Test Graphs**

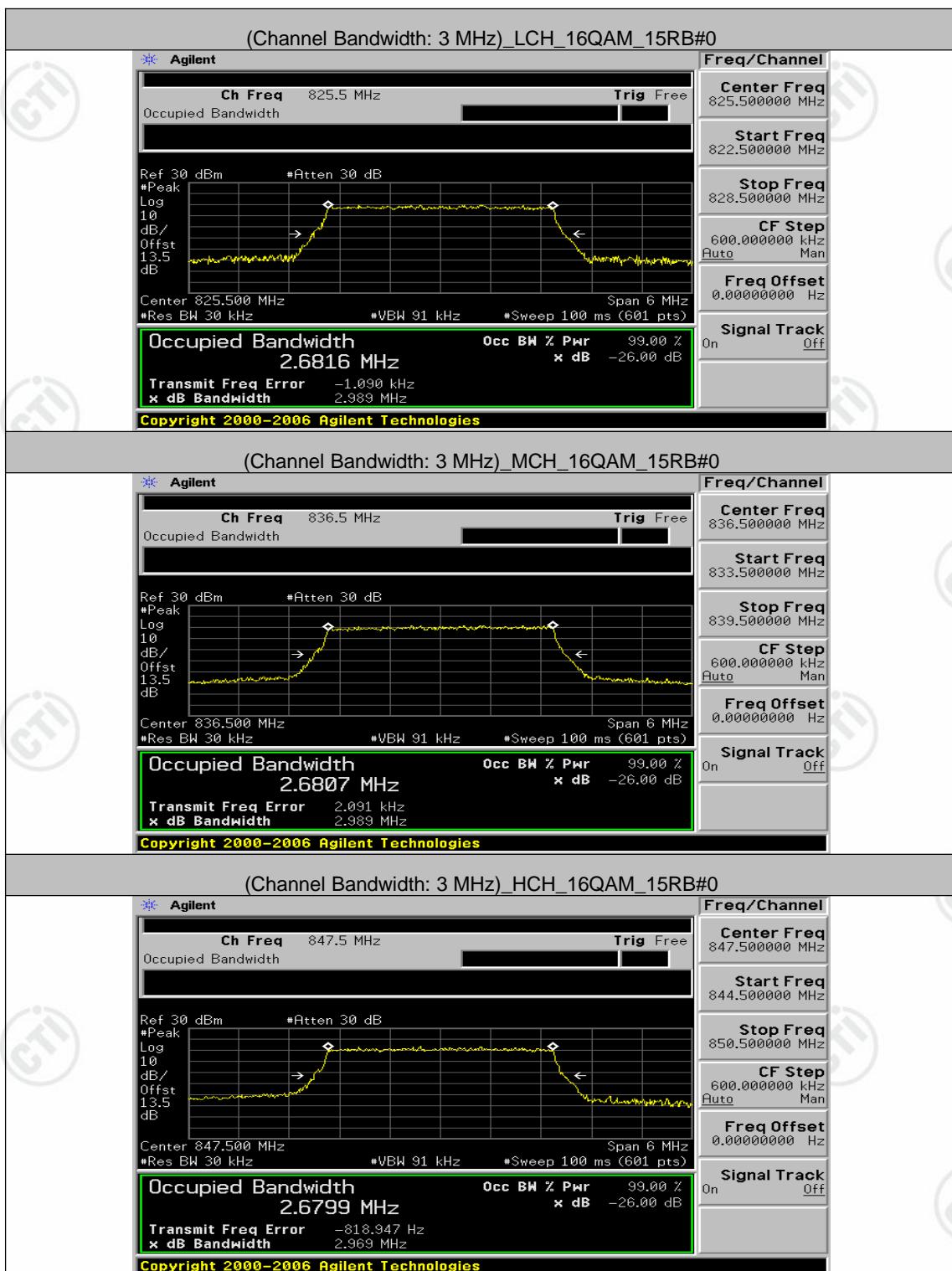
**Channel Bandwidth: 1.4 MHz**



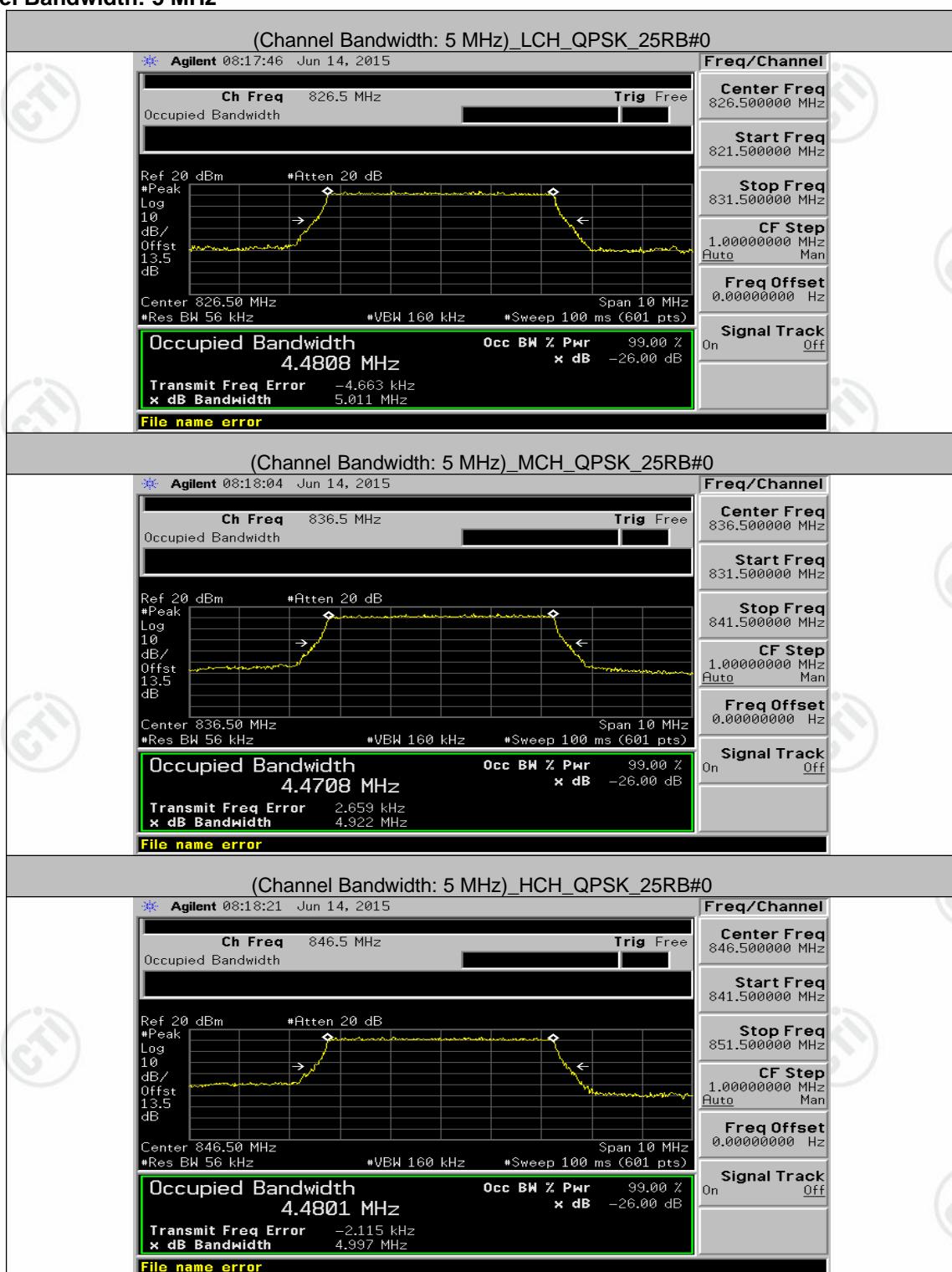


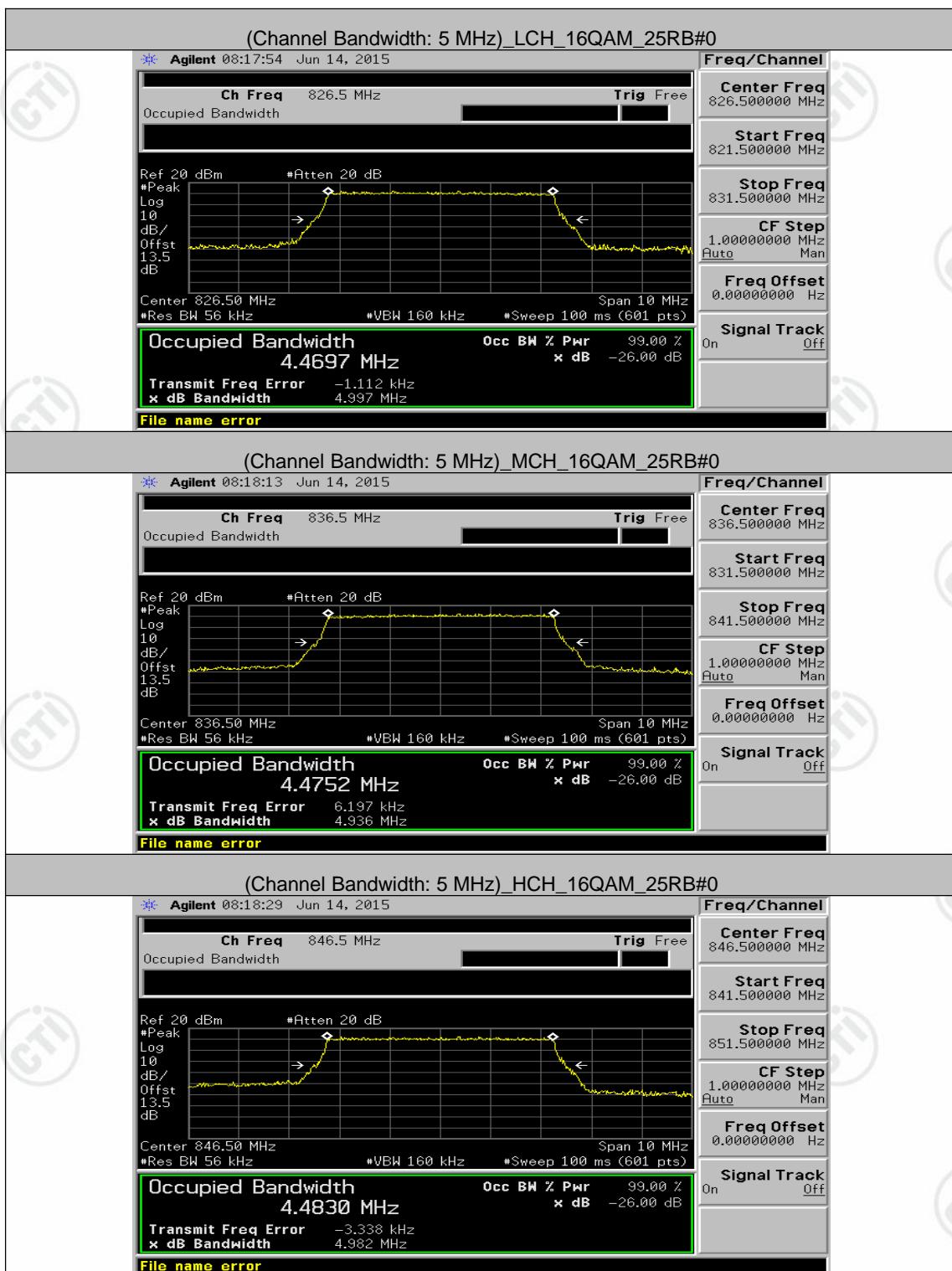
Channel Bandwidth: 3 MHz



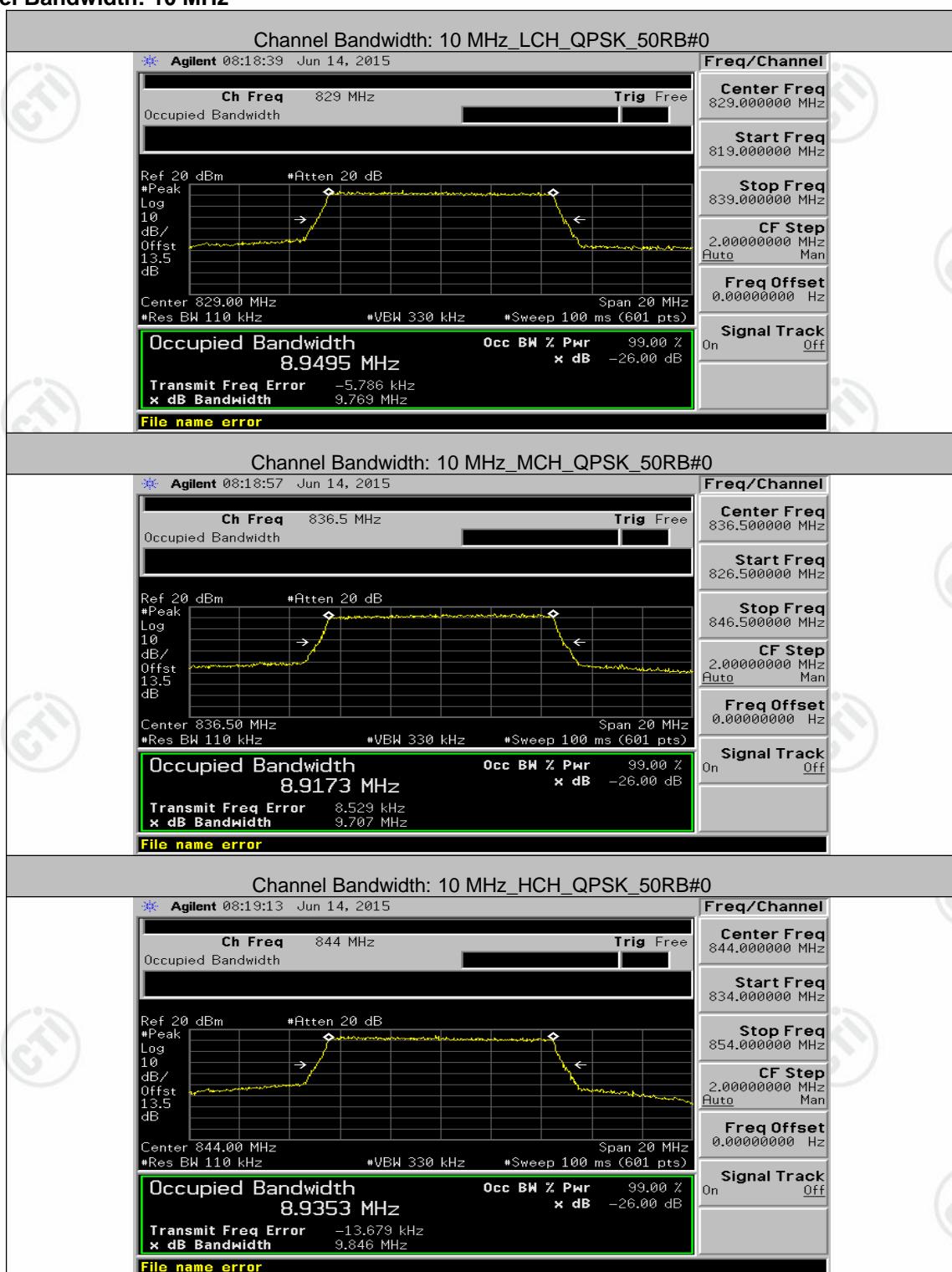


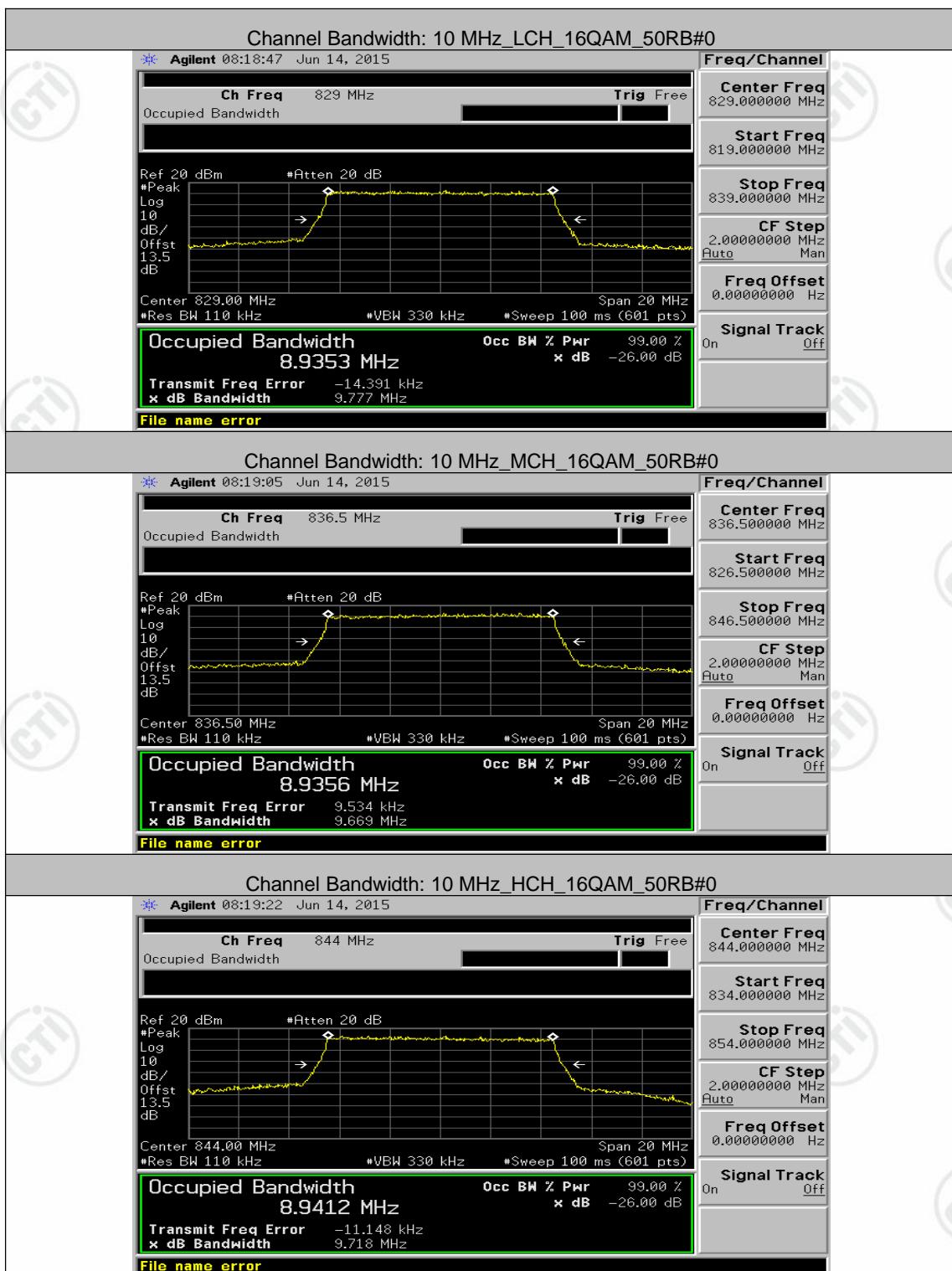
Channel Bandwidth: 5 MHz





Channel Bandwidth: 10 MHz

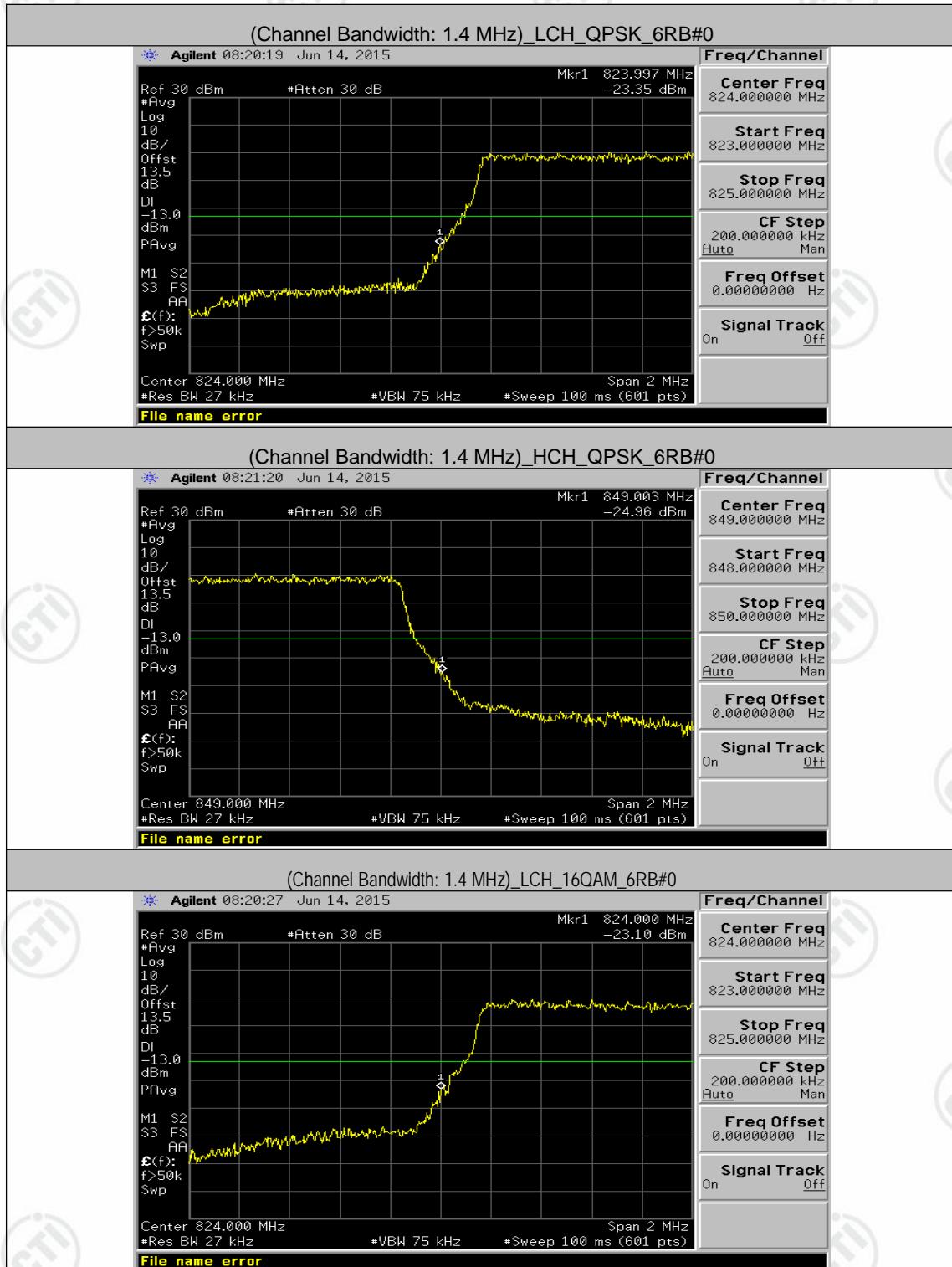


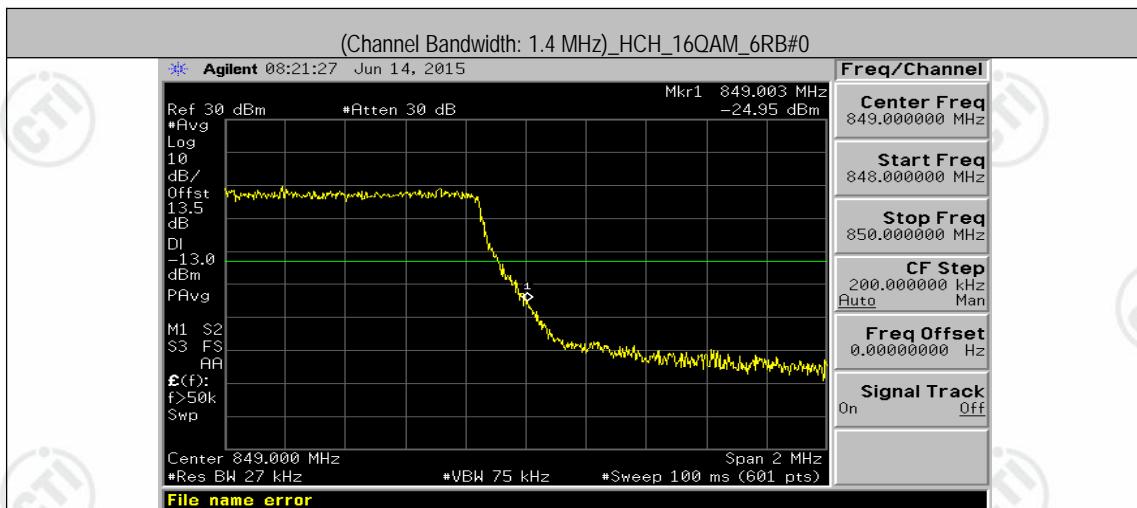


## Appendix C: Band Edge

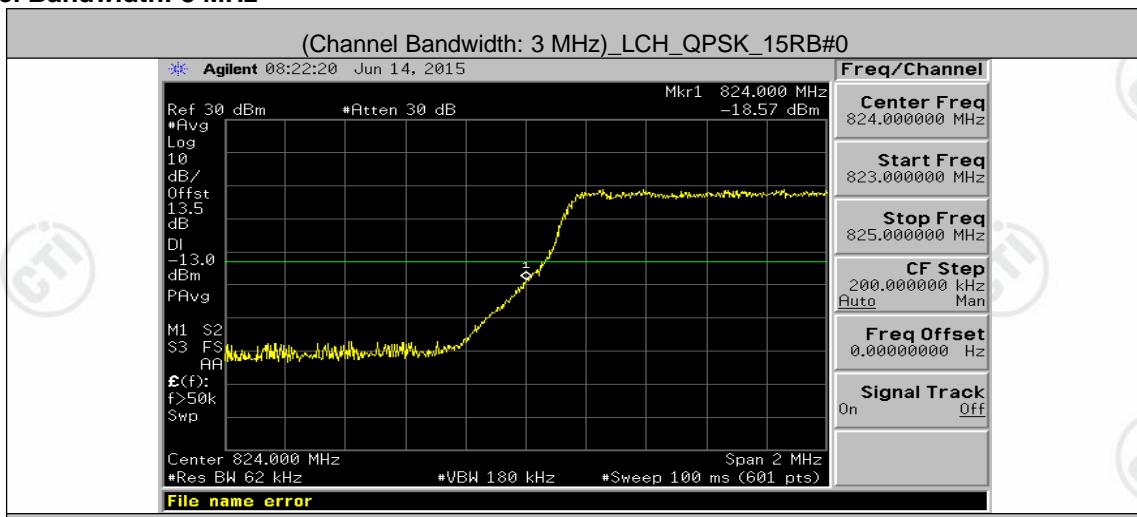
### Test Graphs

#### Channel Bandwidth: 1.4 MHz

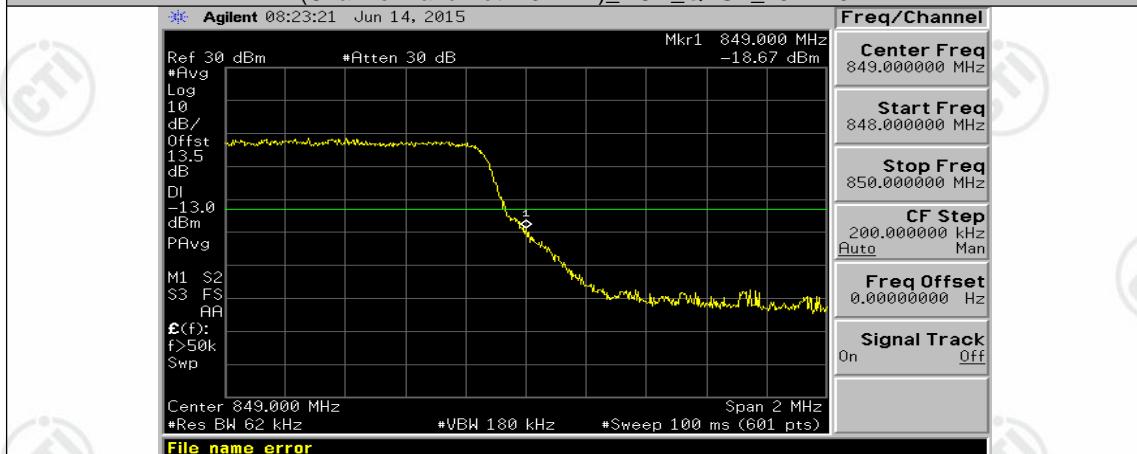


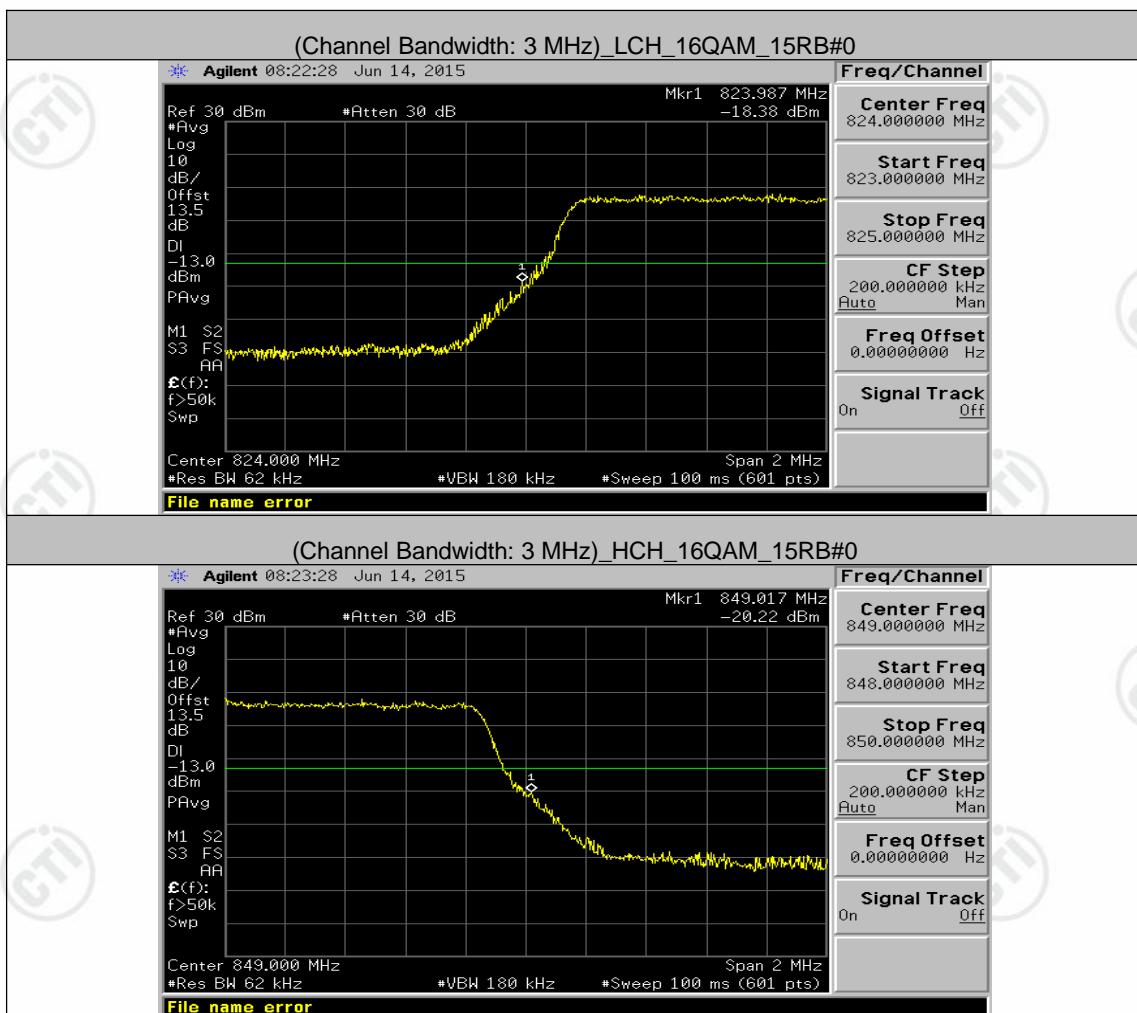


### Channel Bandwidth: 3 MHz

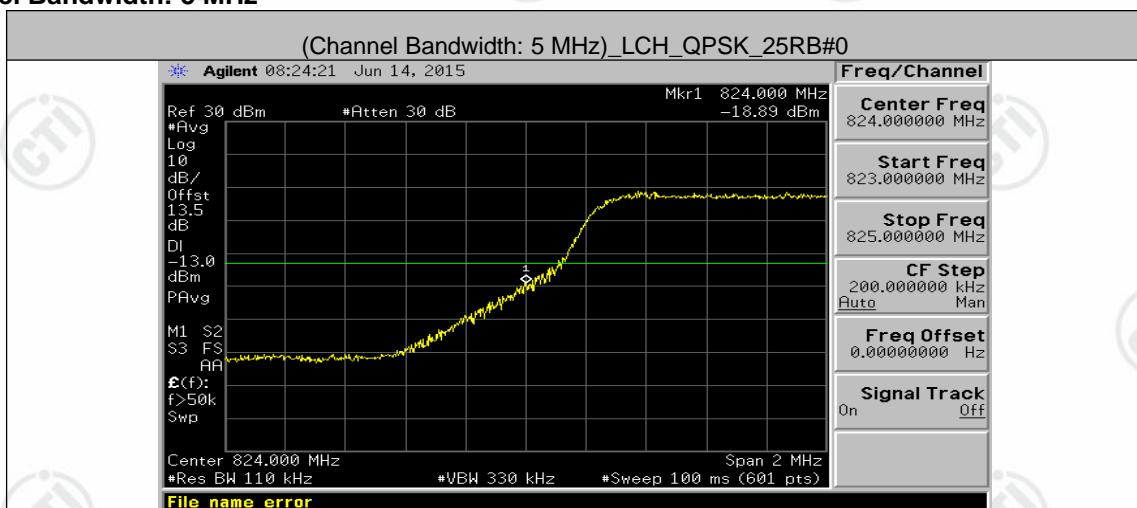


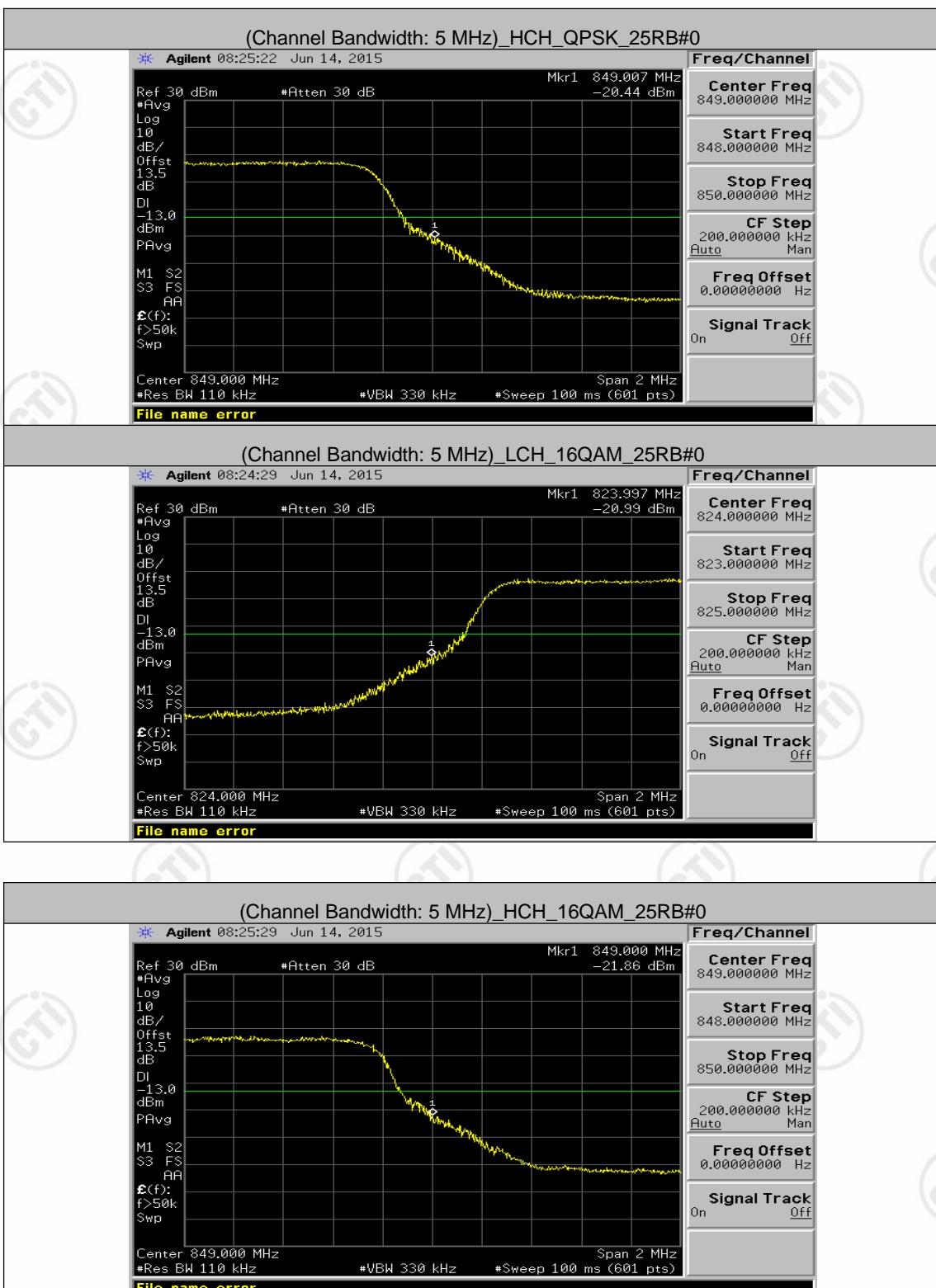
### (Channel Bandwidth: 3 MHz)\_HCH\_QPSK\_15RB#0



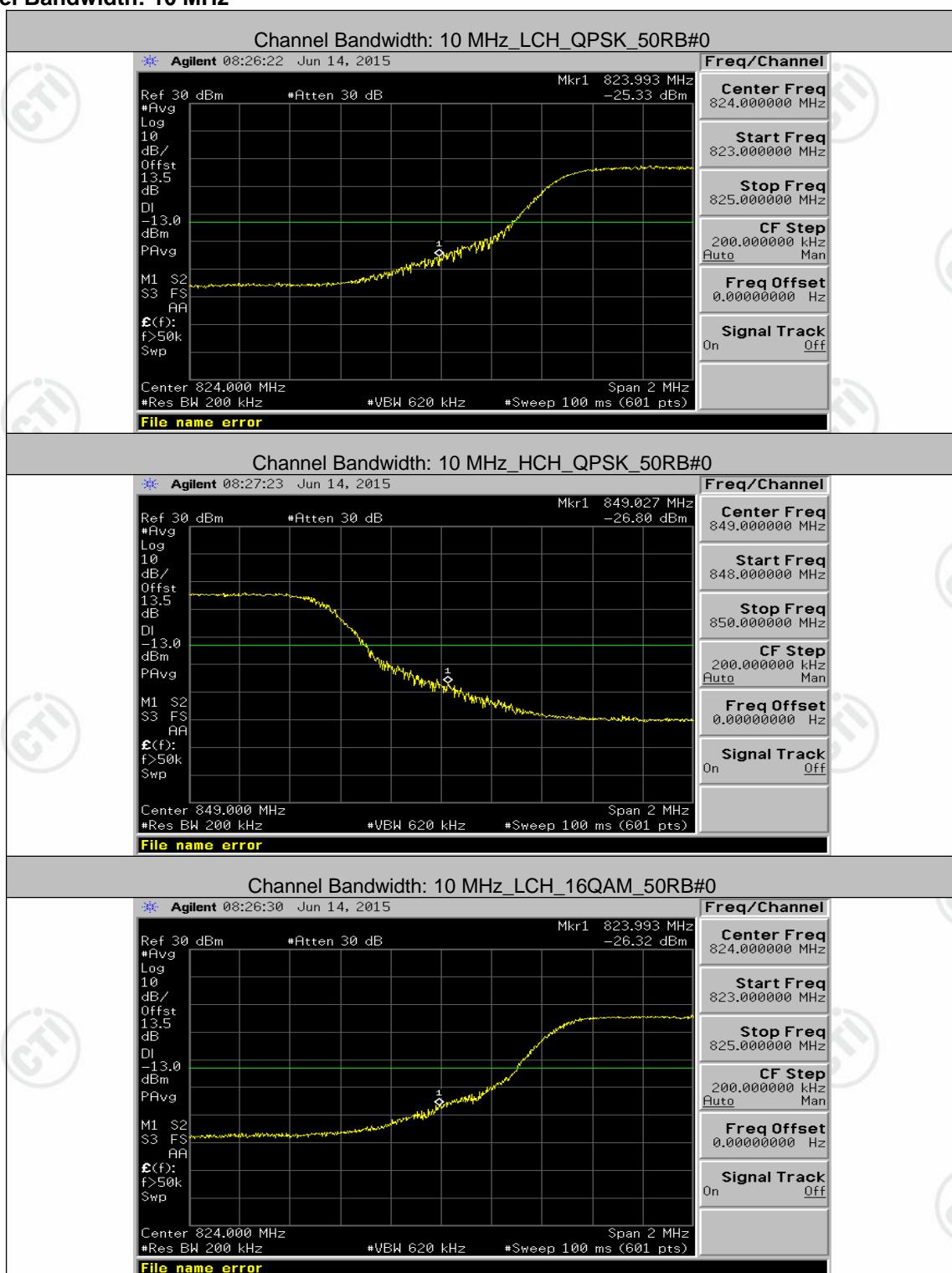


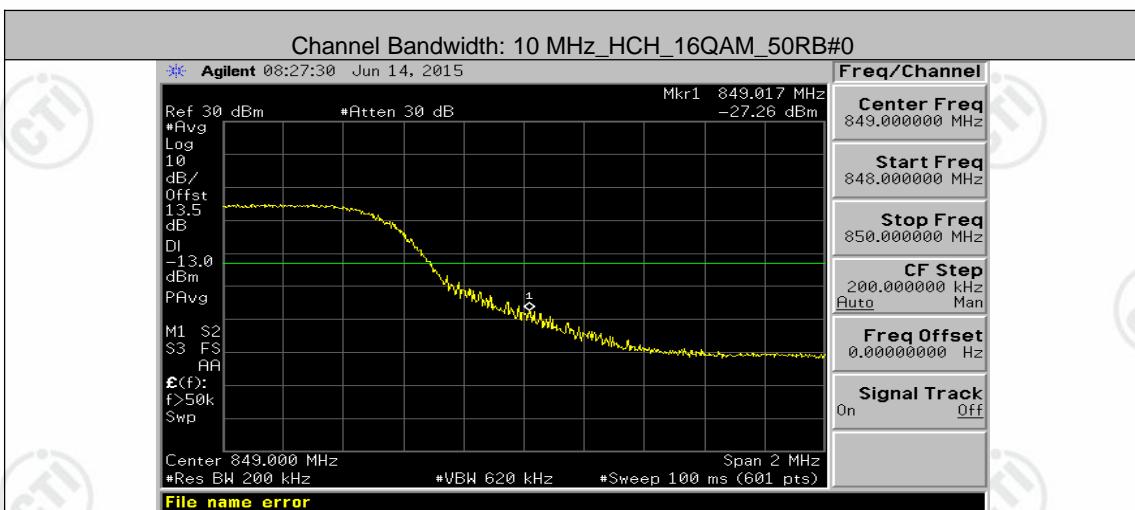
### Channel Bandwidth: 5 MHz





Channel Bandwidth: 10 MHz

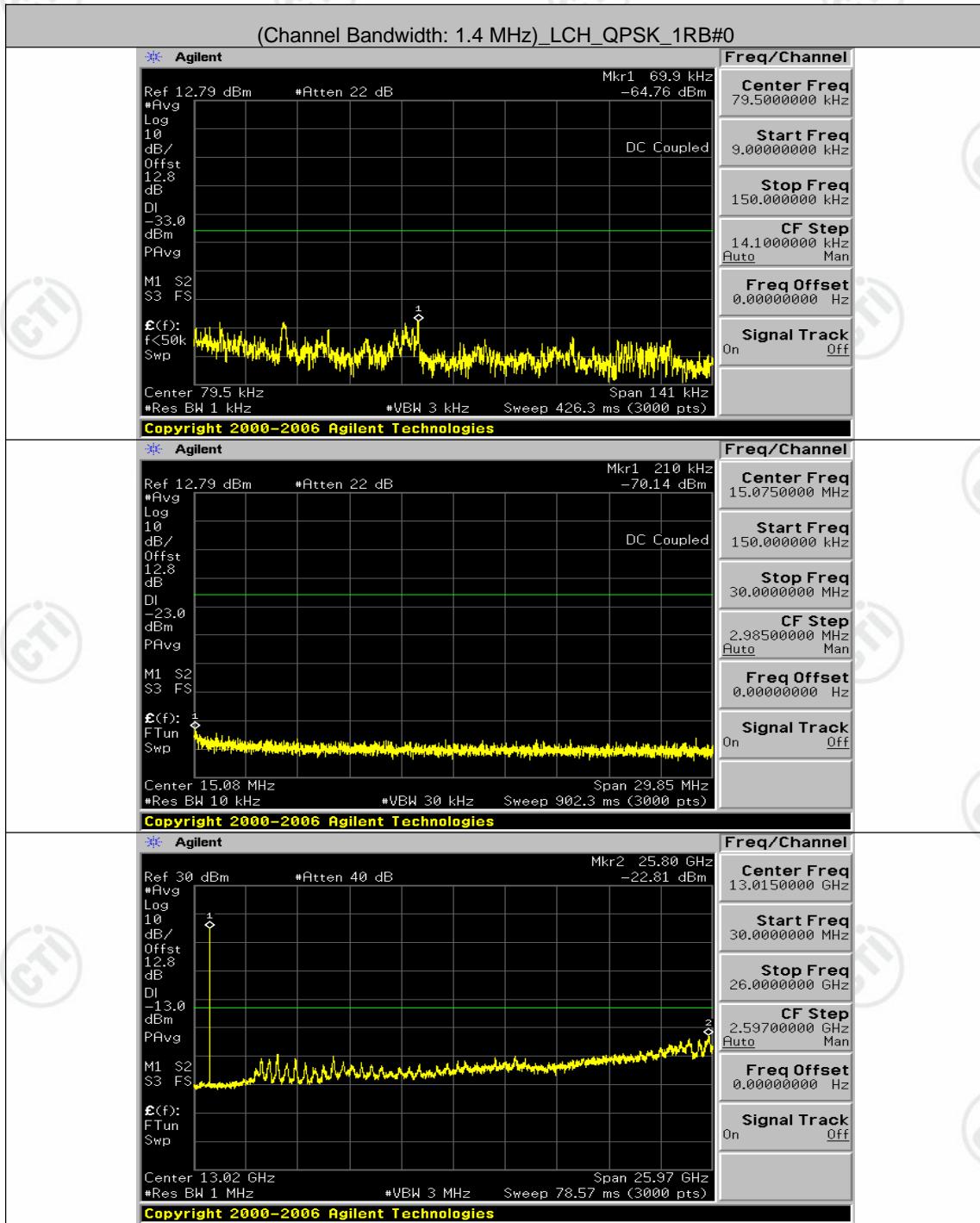


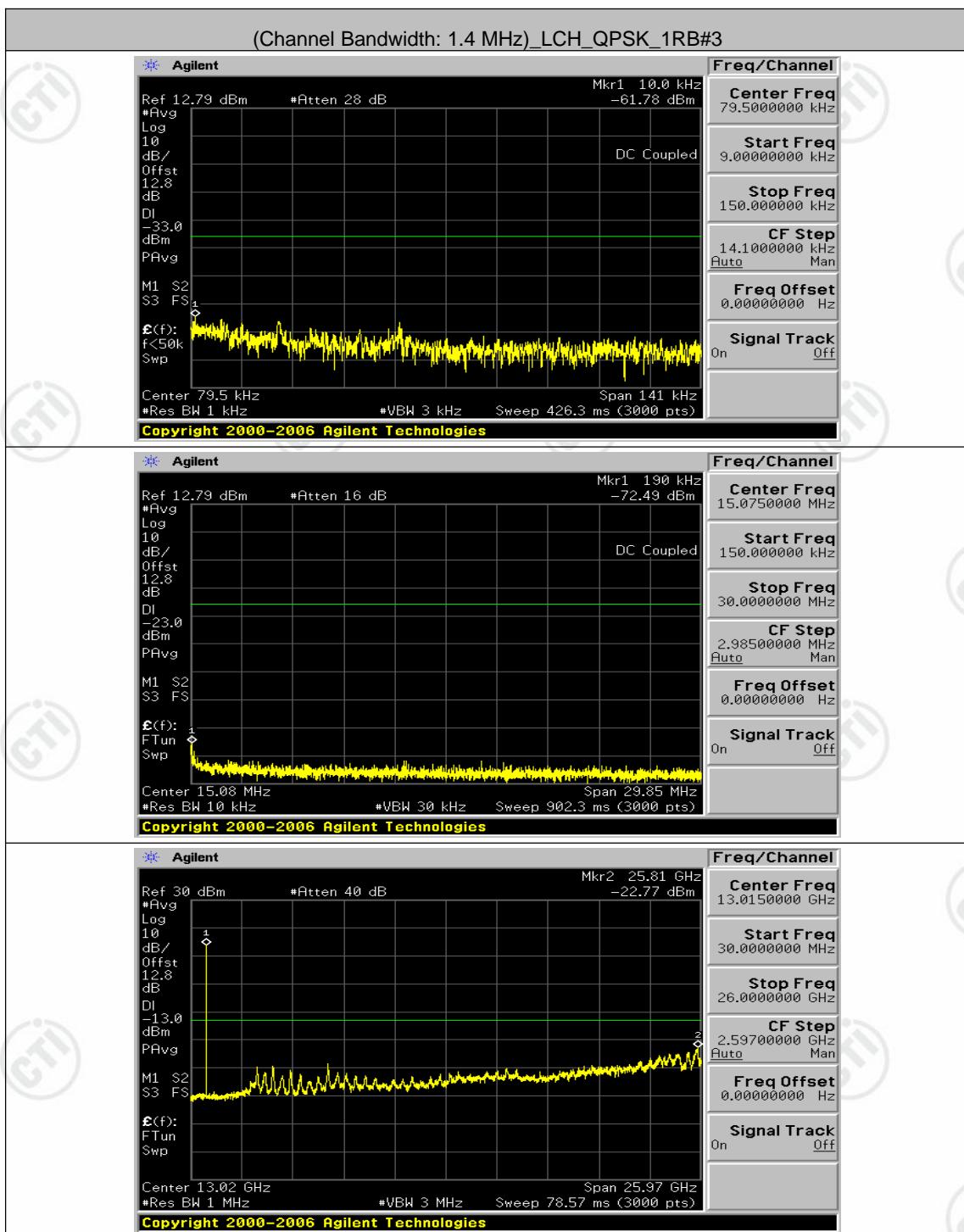


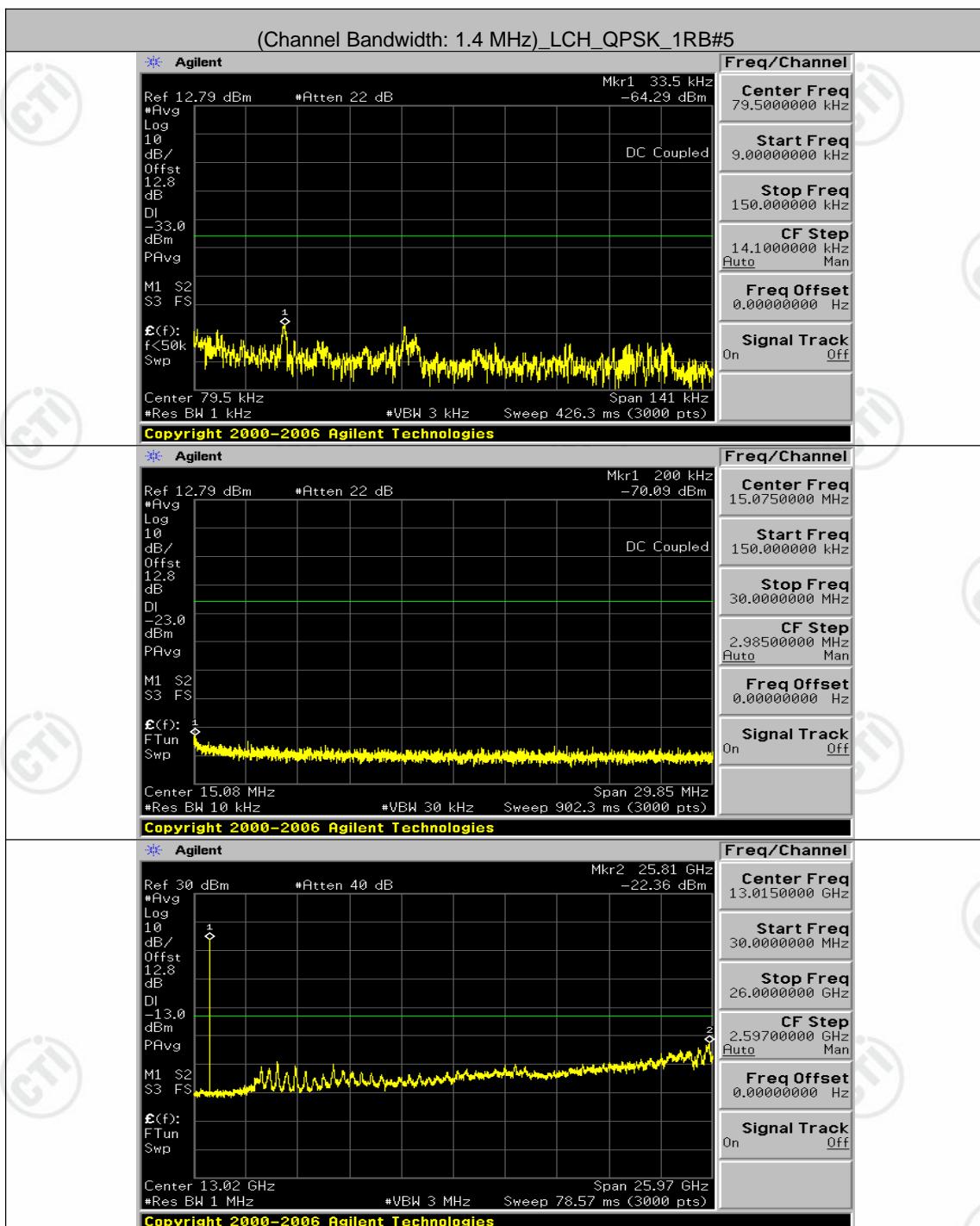
## Appendix D: Conducted Spurious Emission

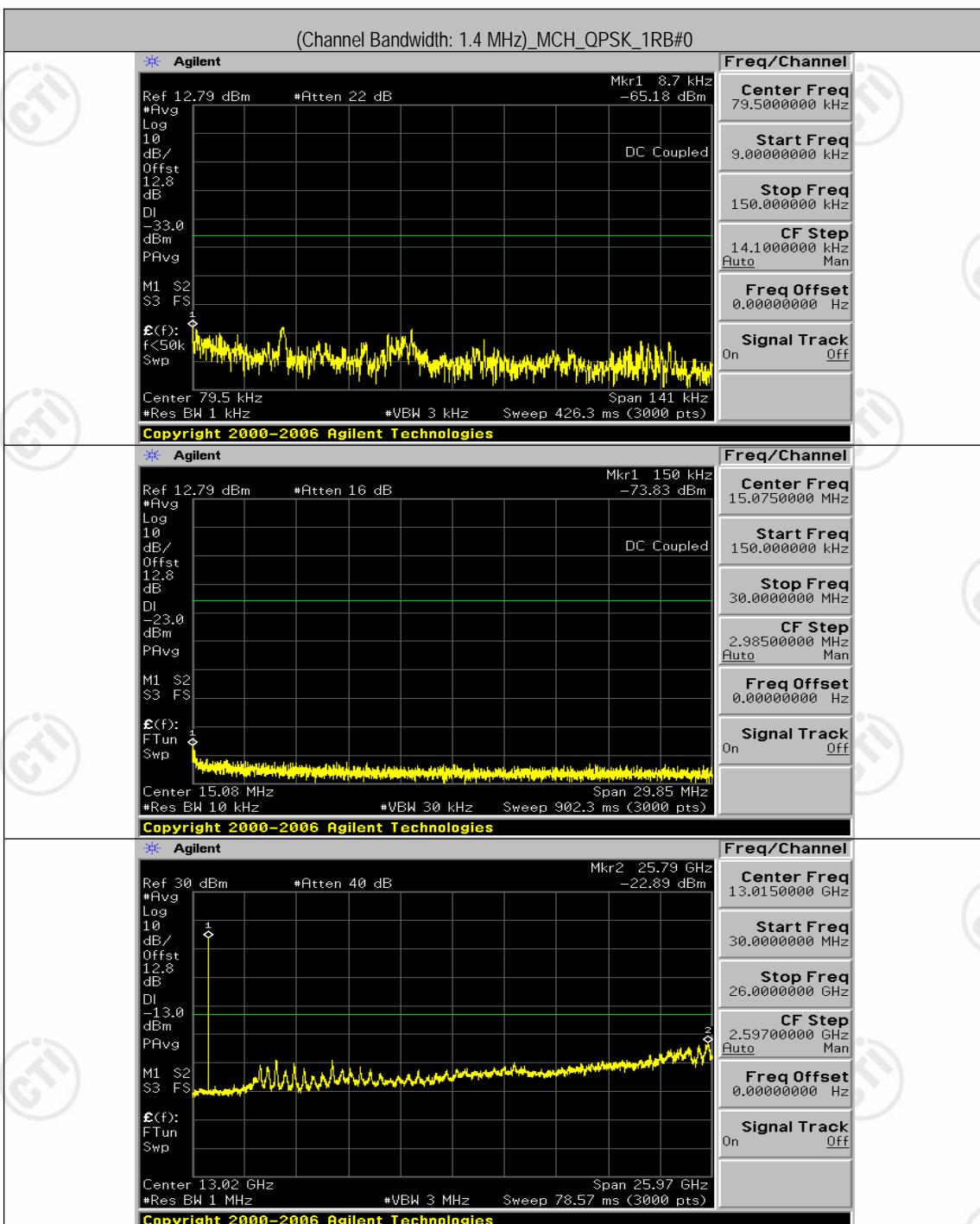
### Test Graphs

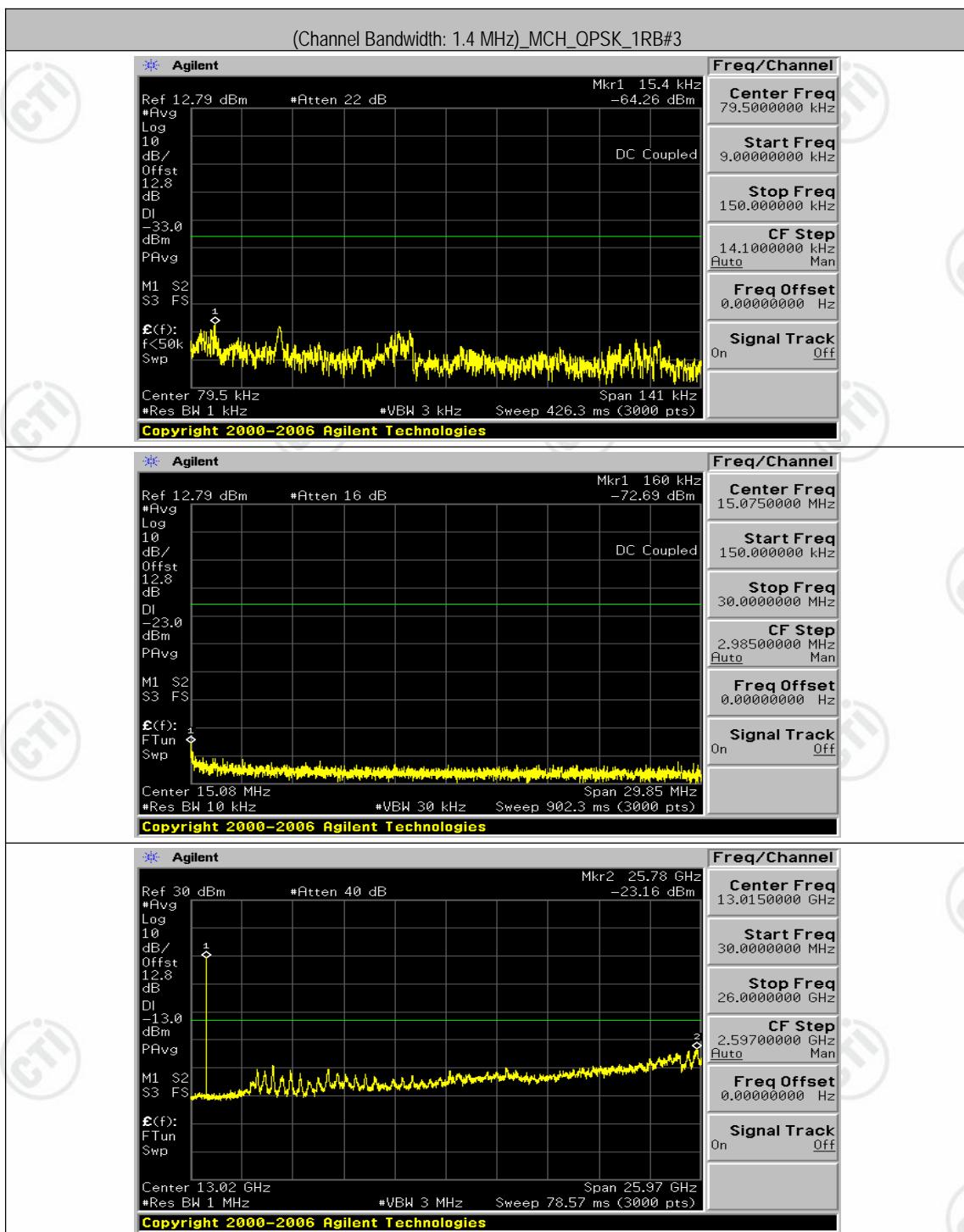
#### Channel Bandwidth: 1.4 MHz

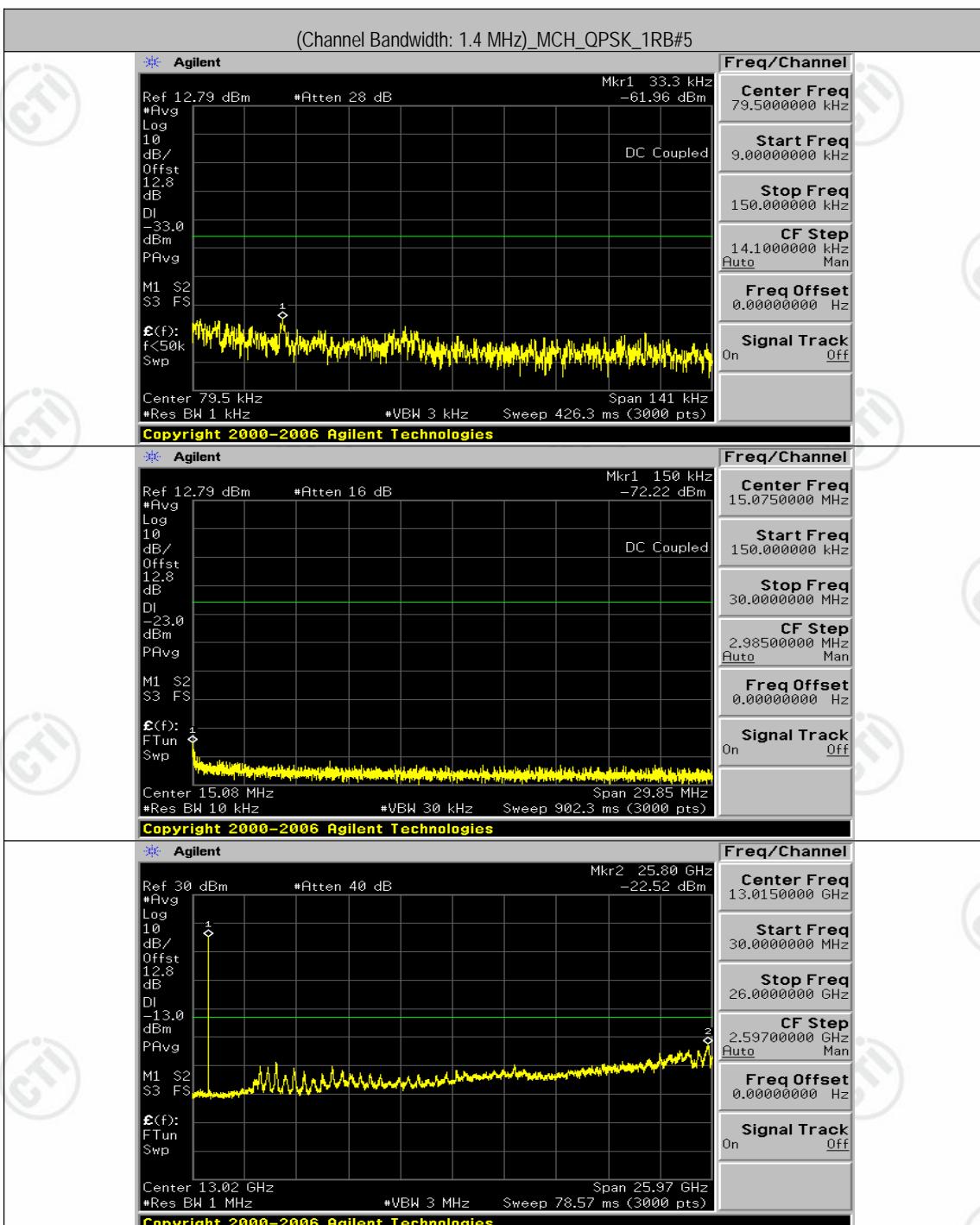


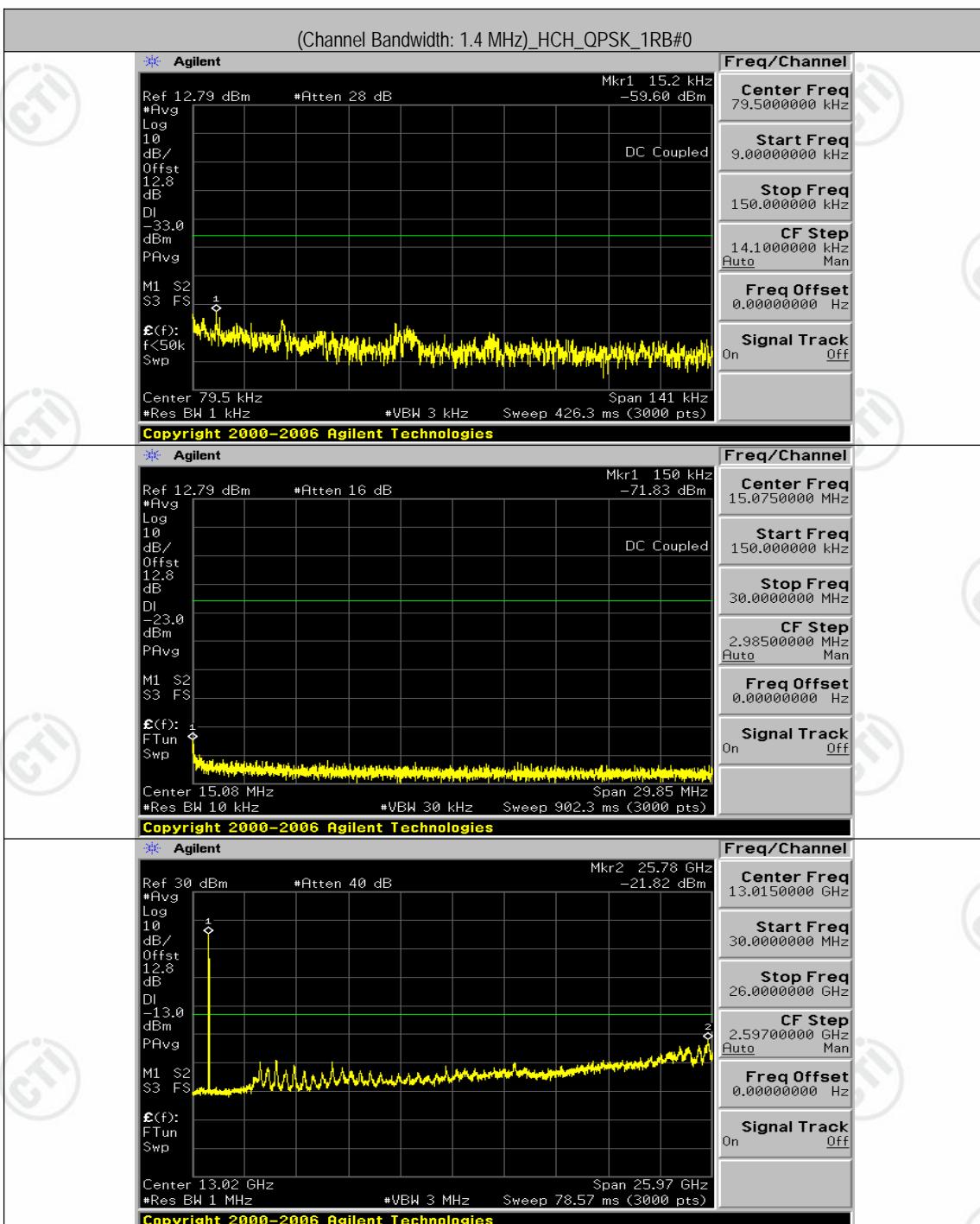


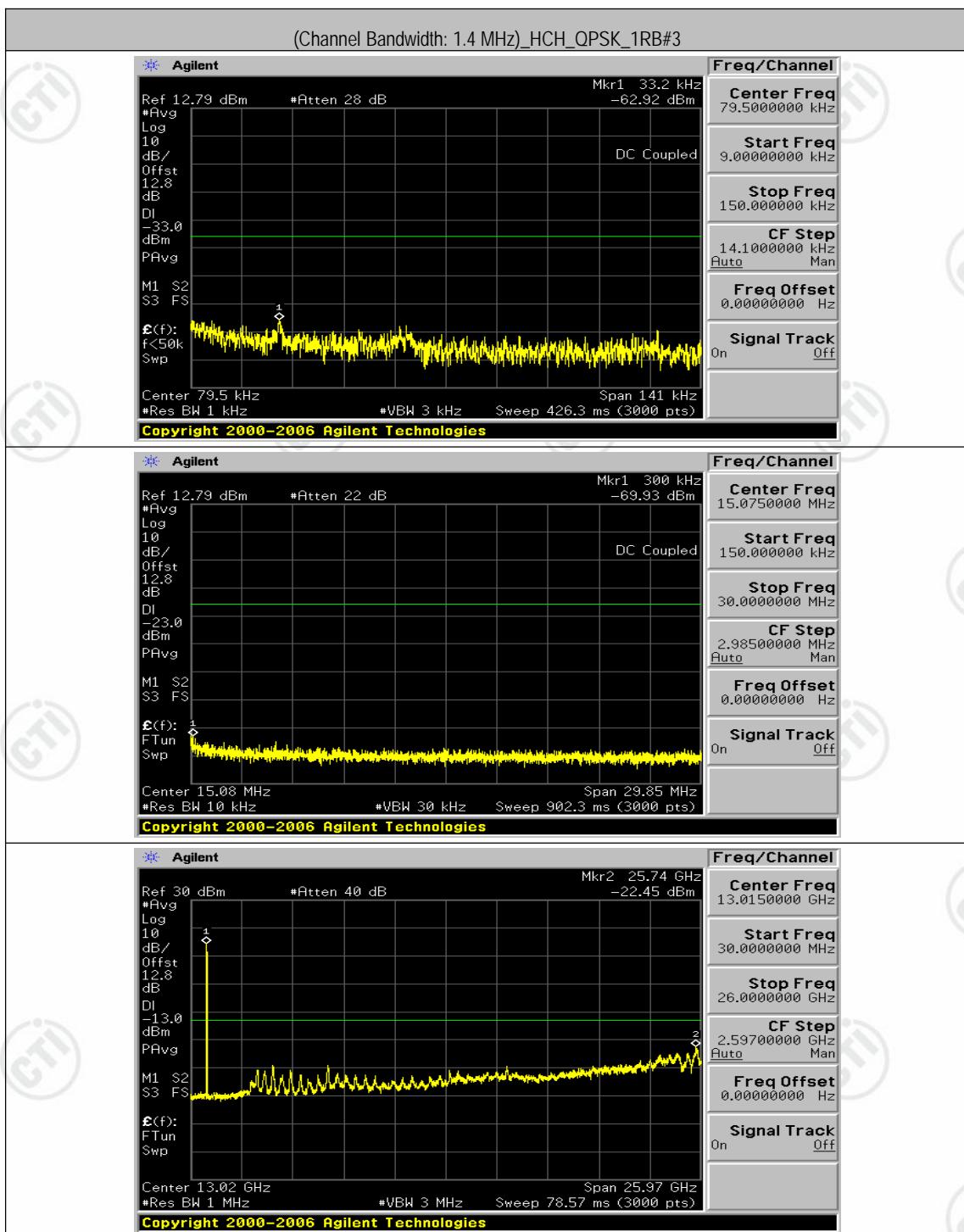


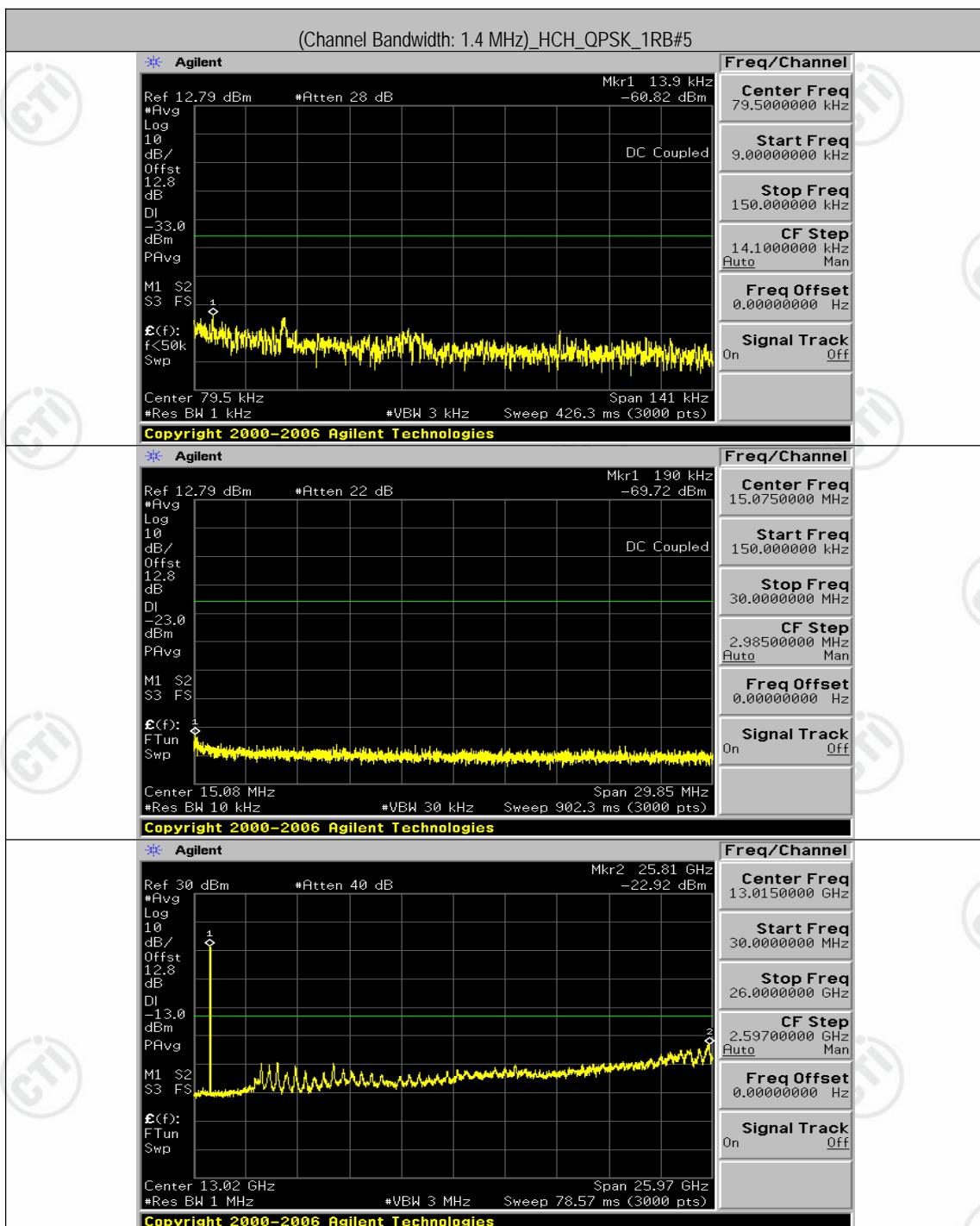


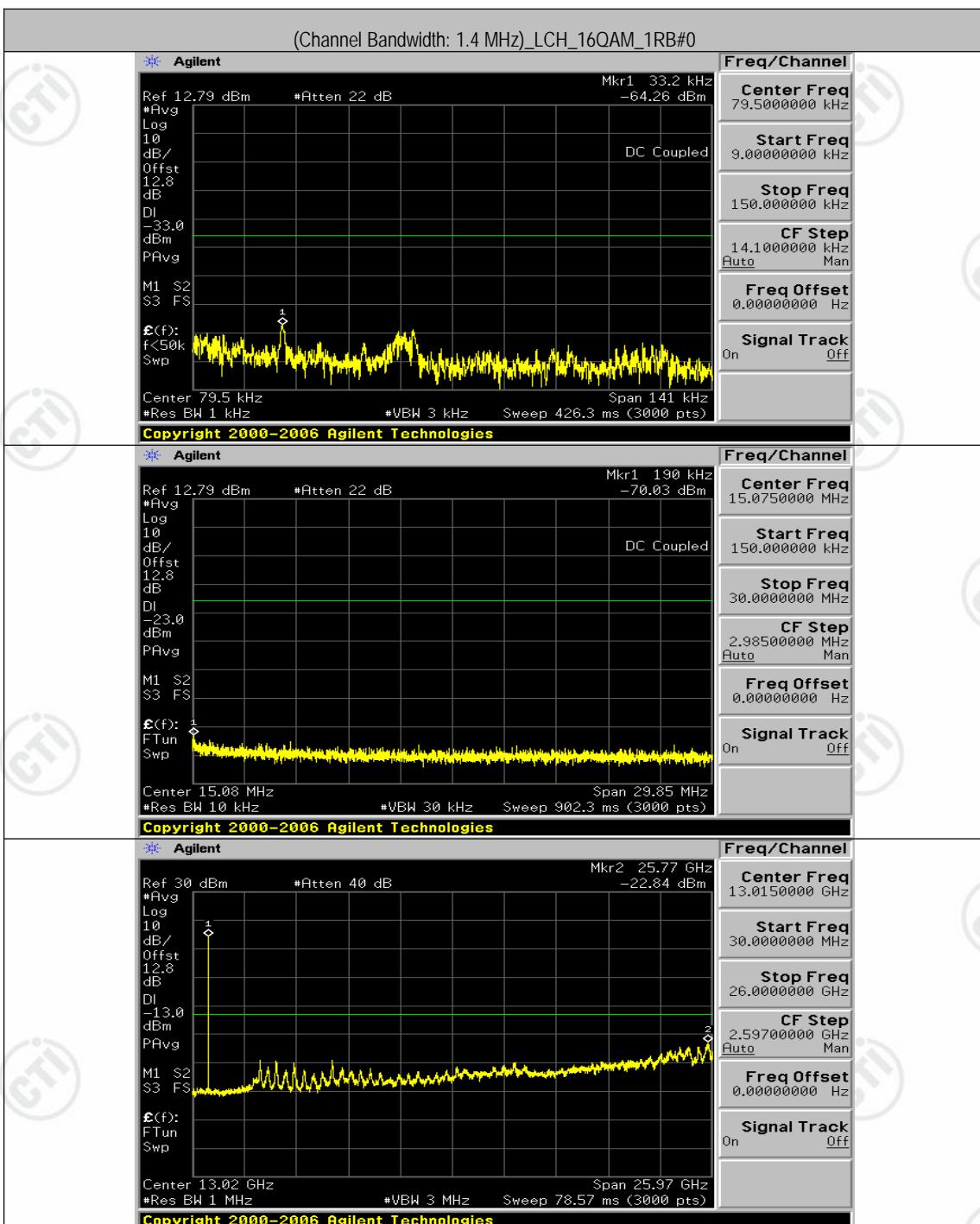


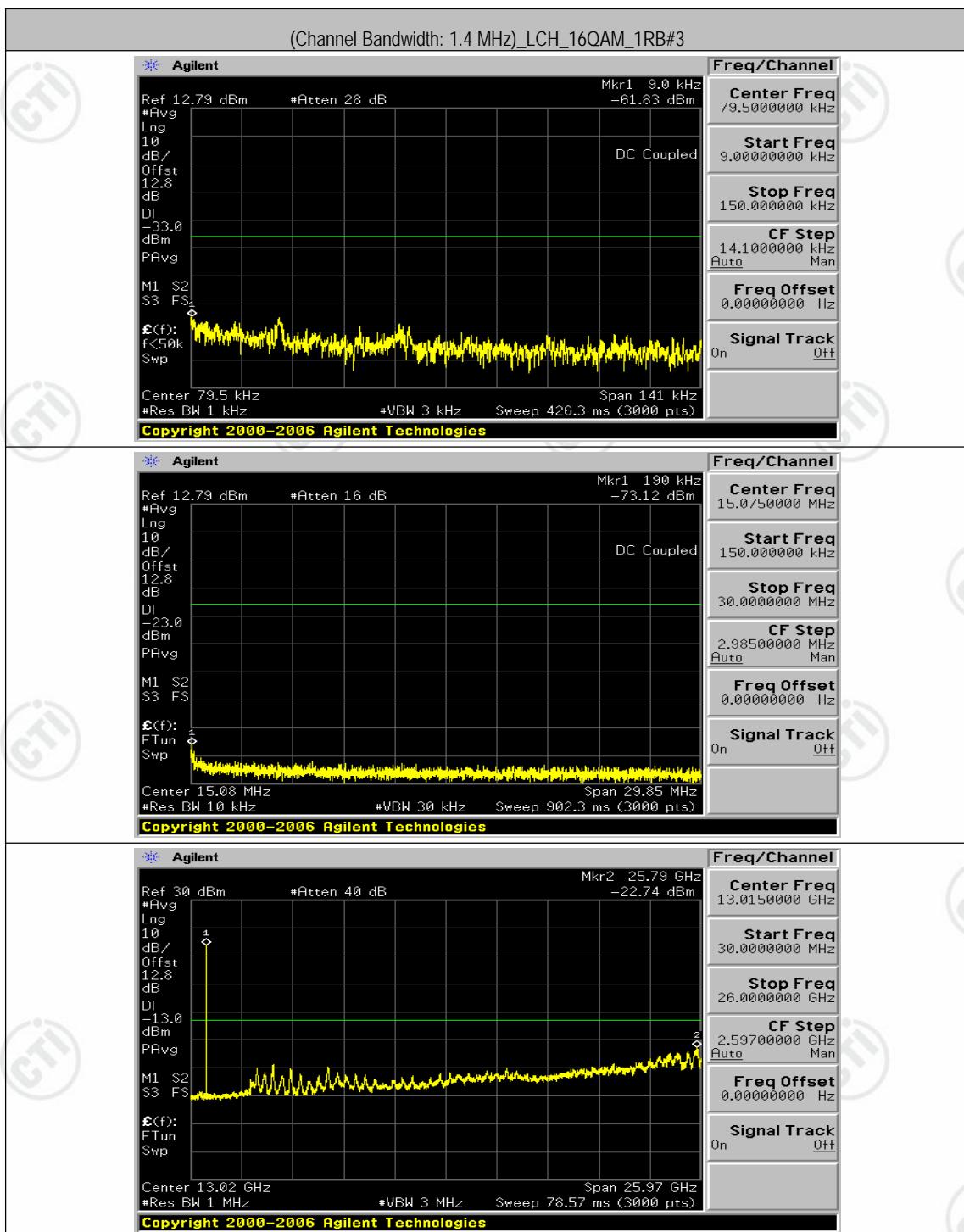


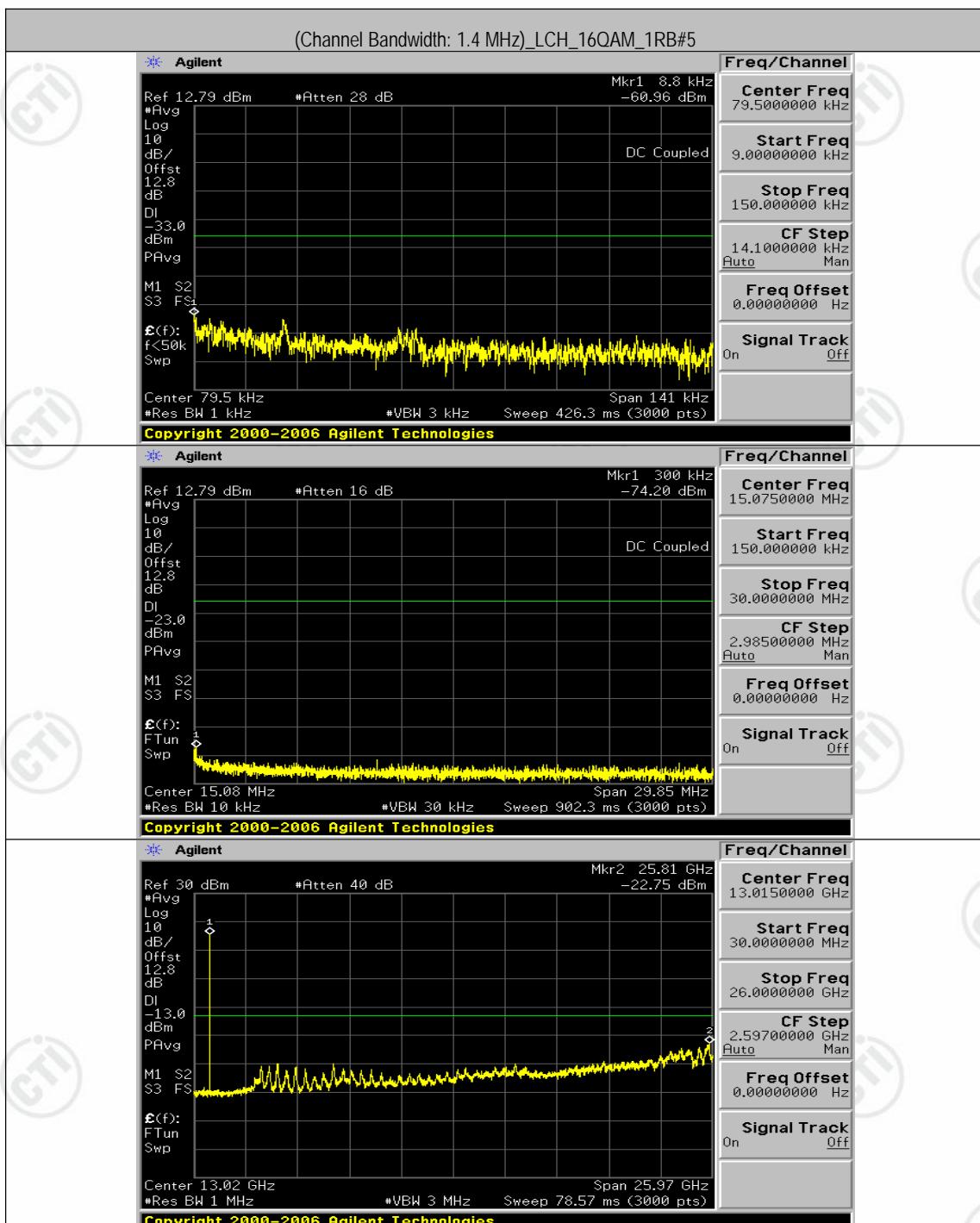


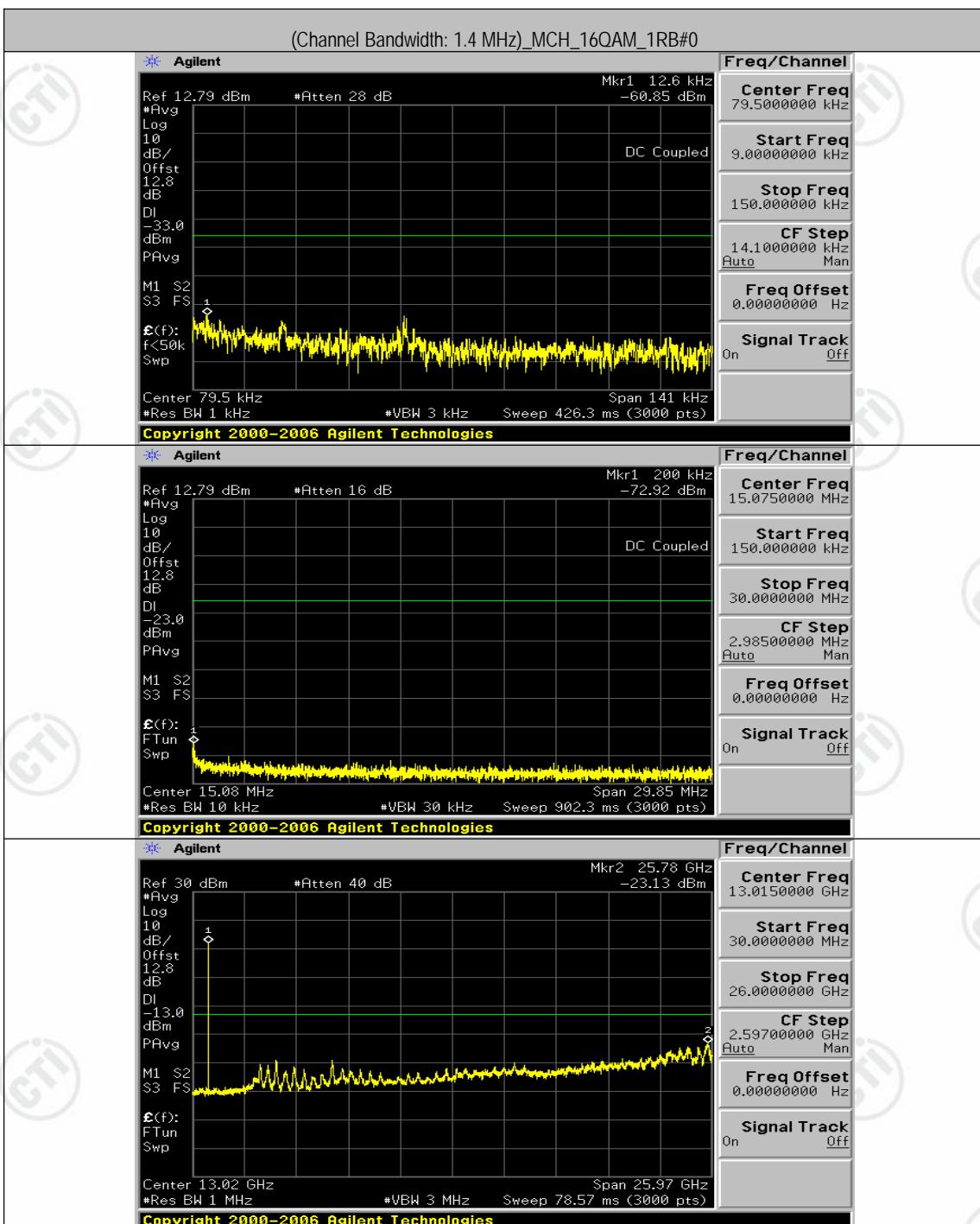


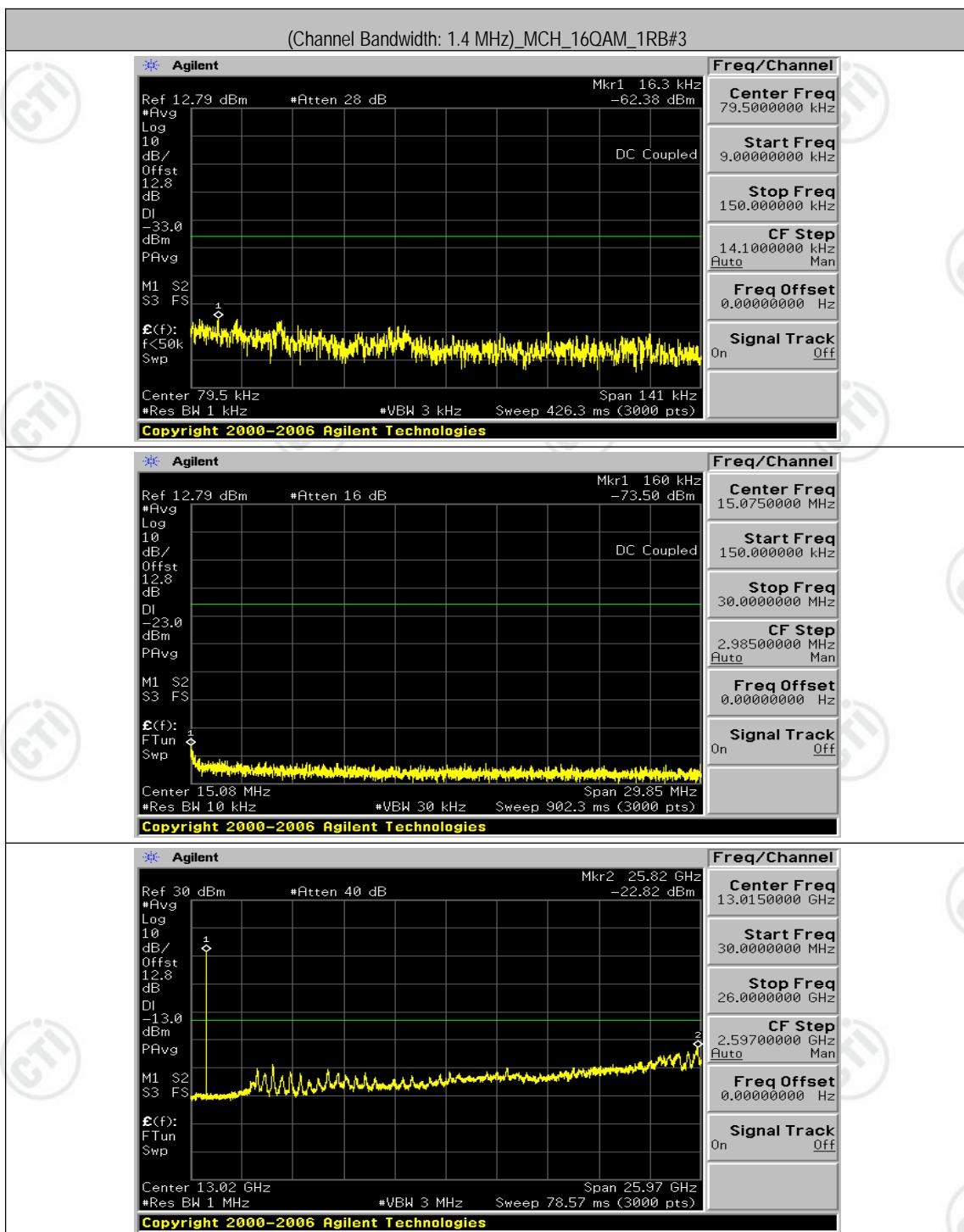


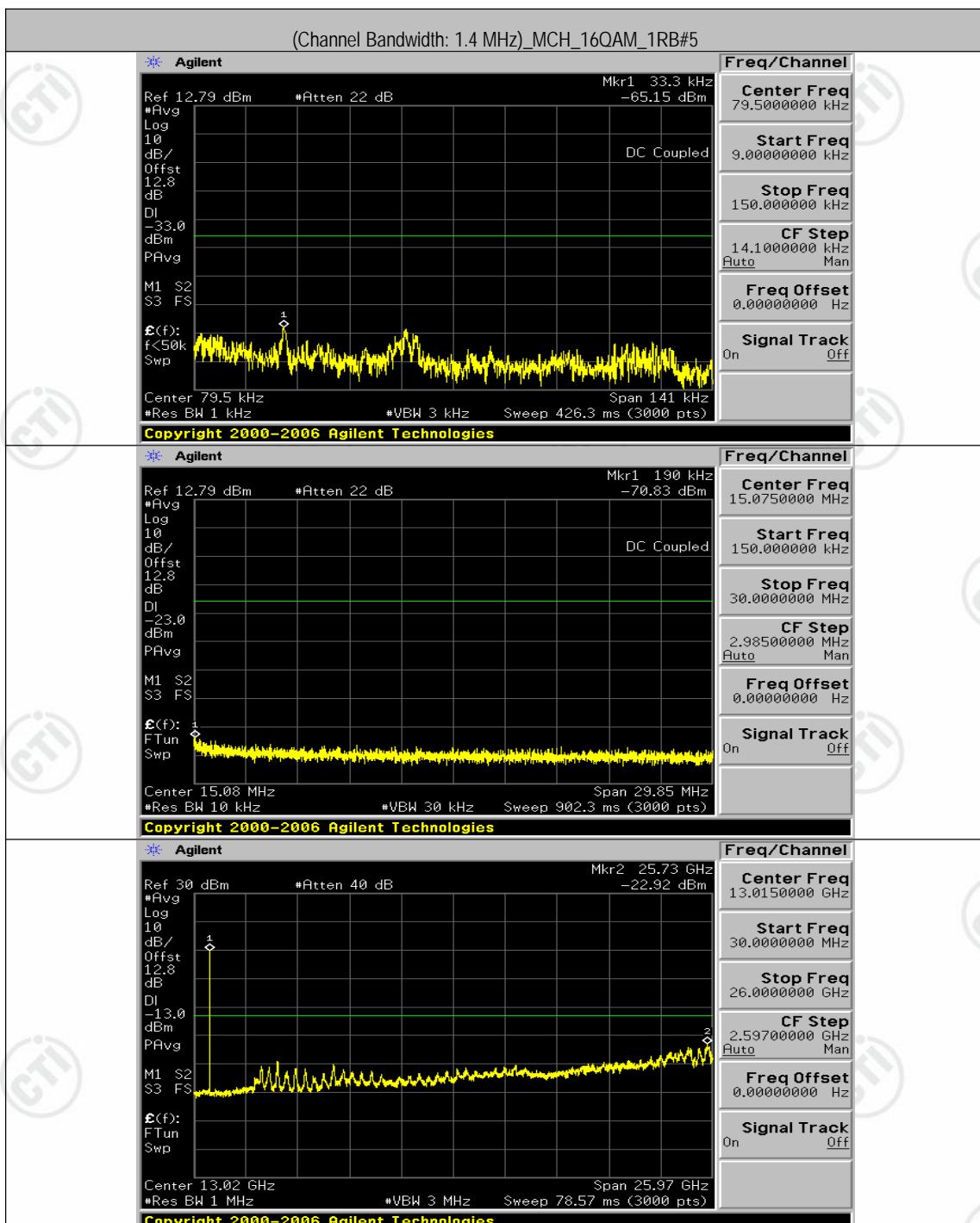


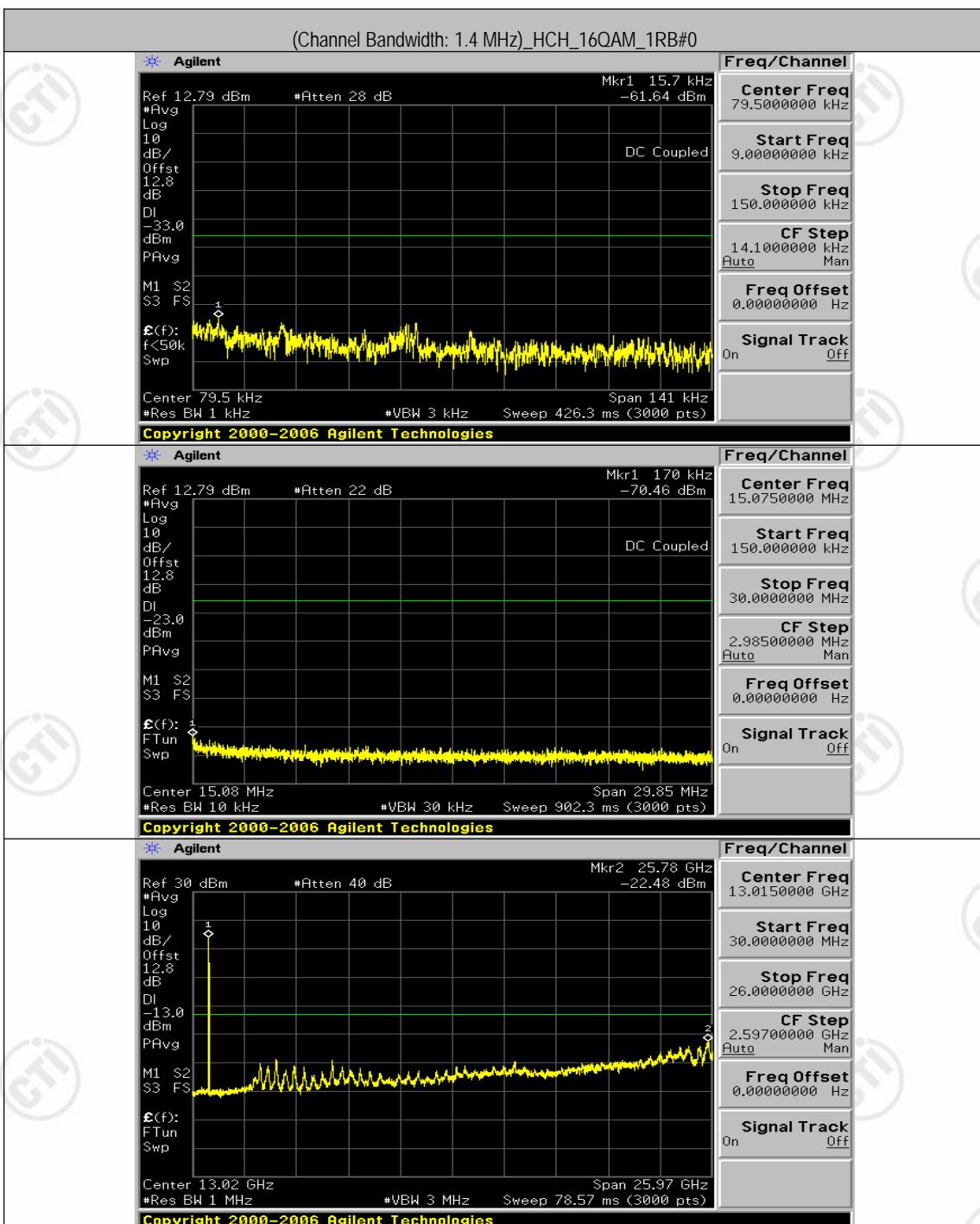


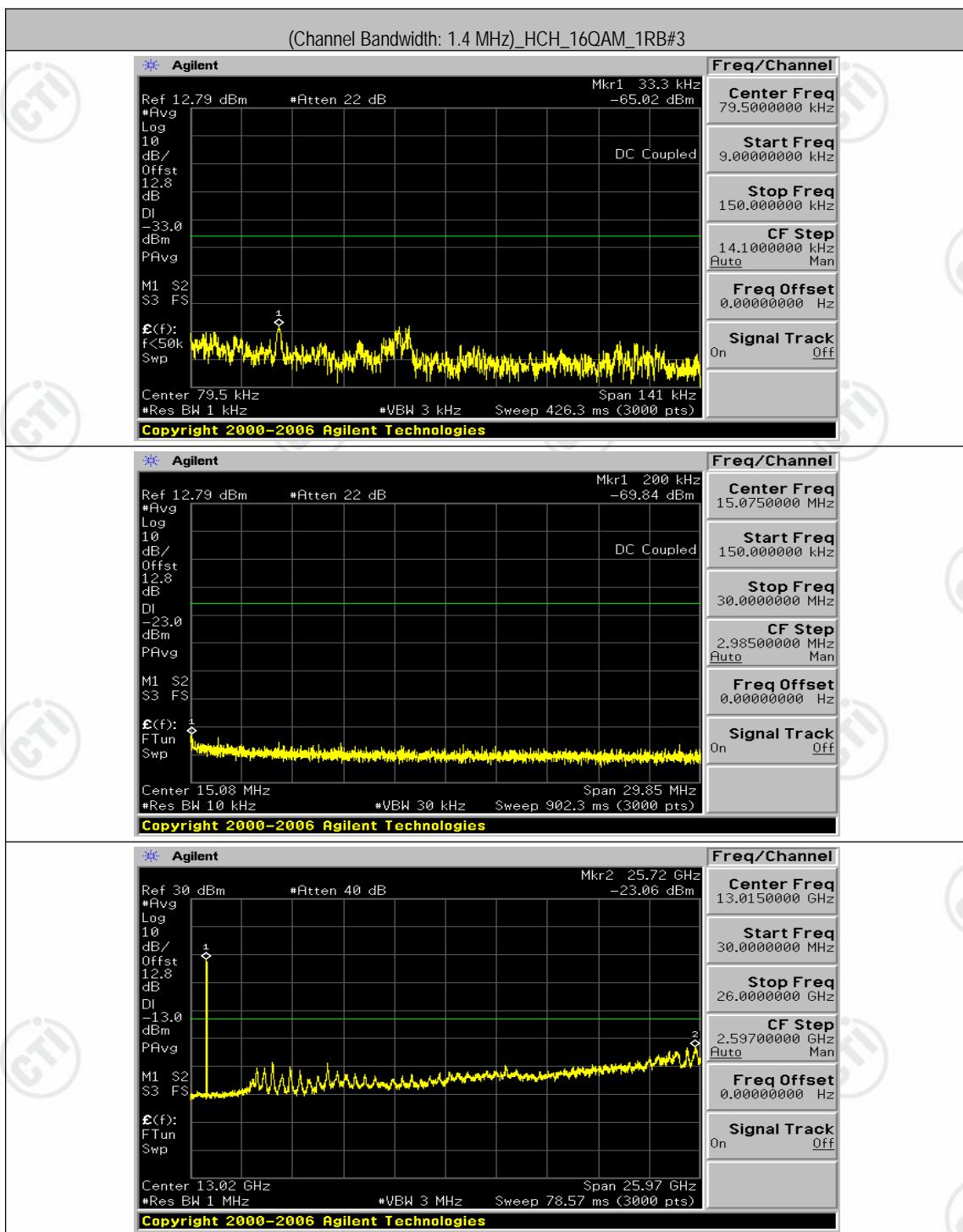


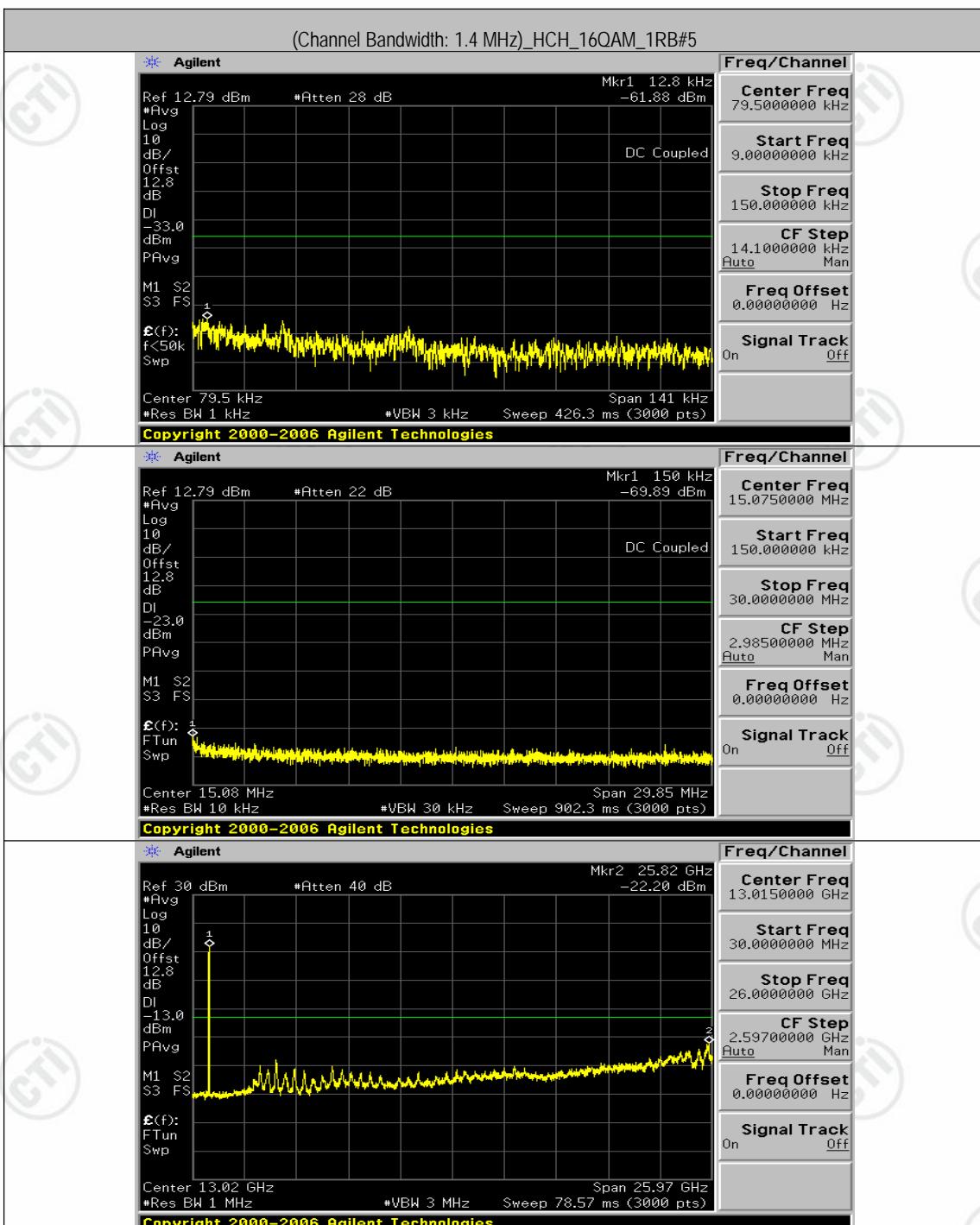




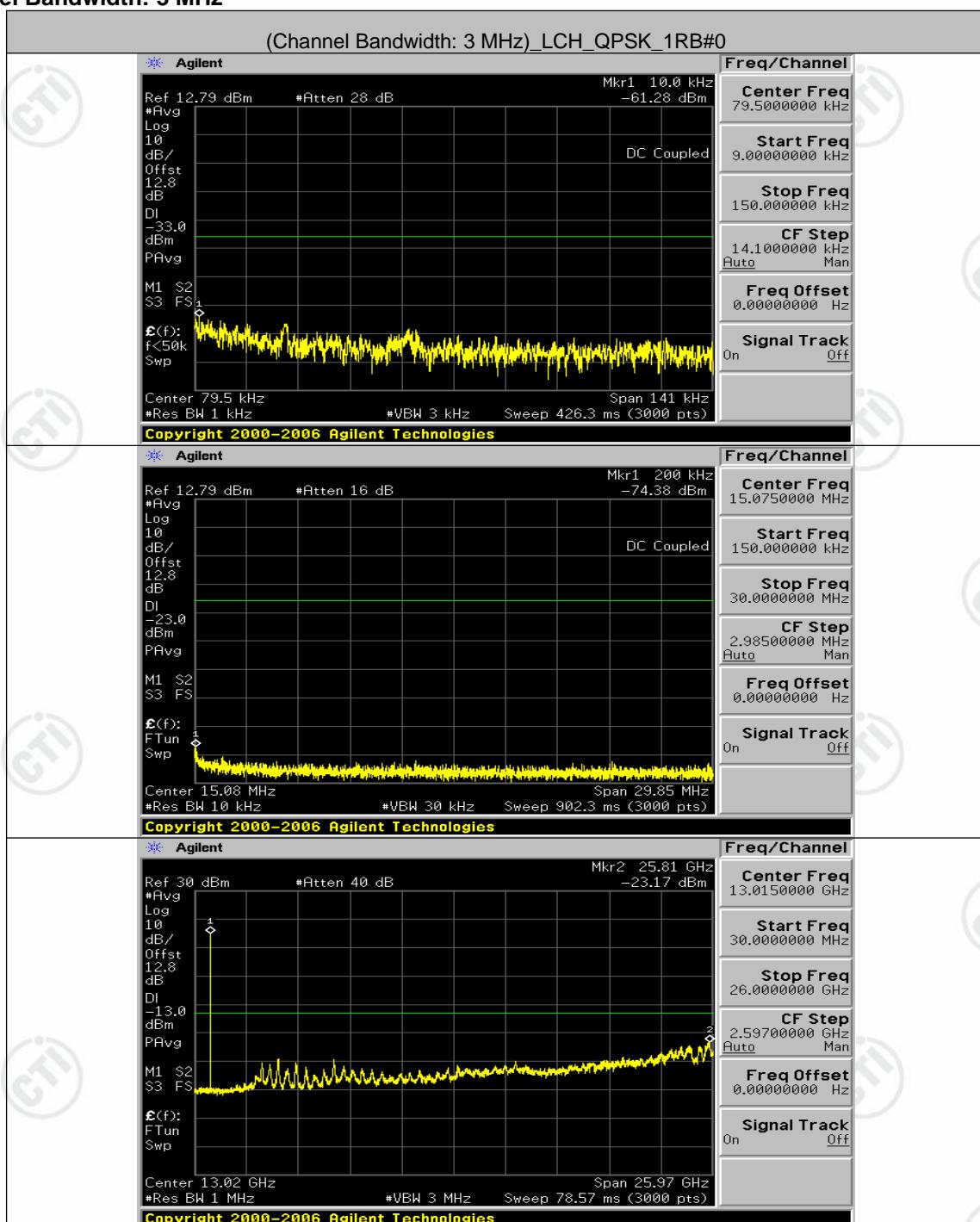


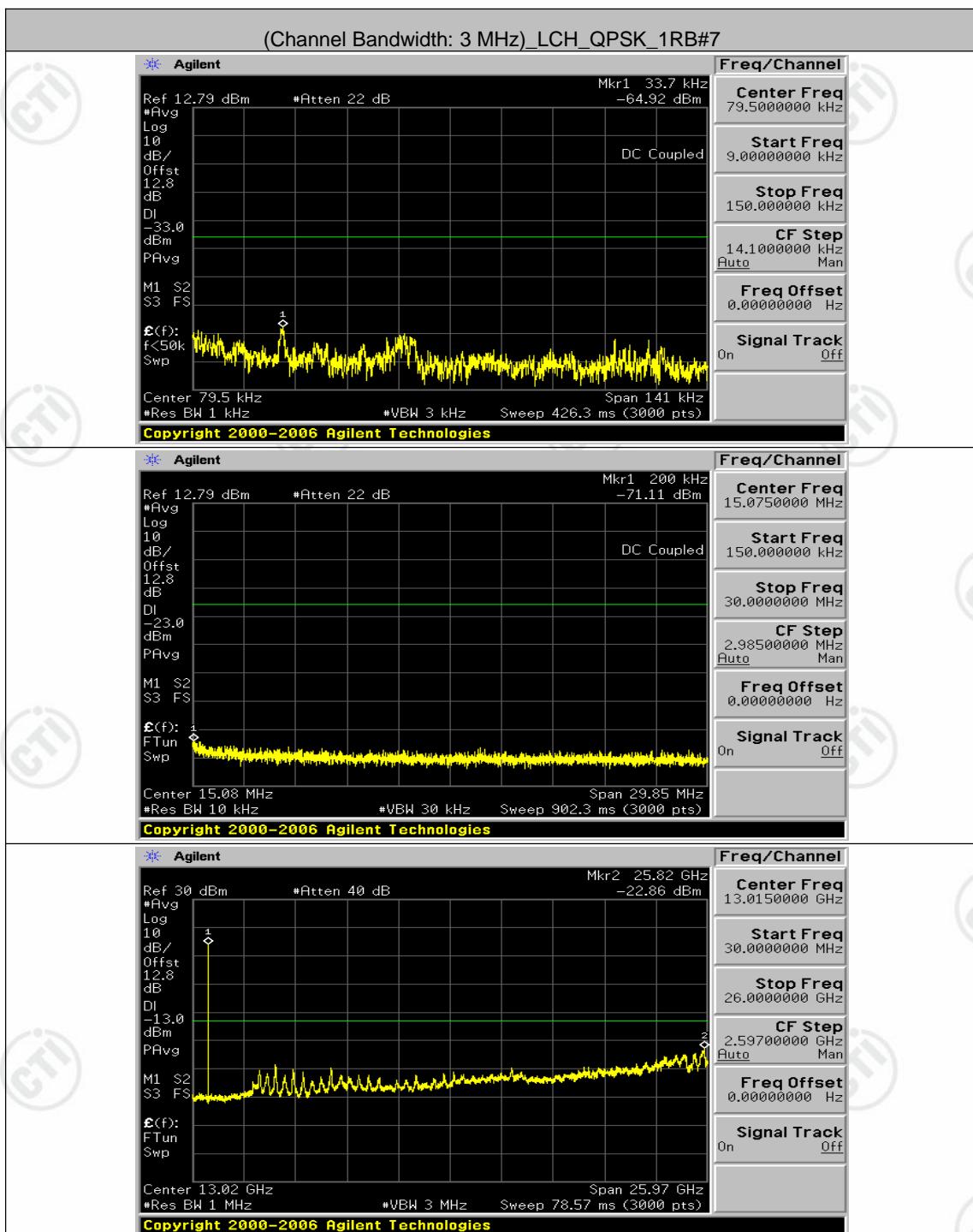


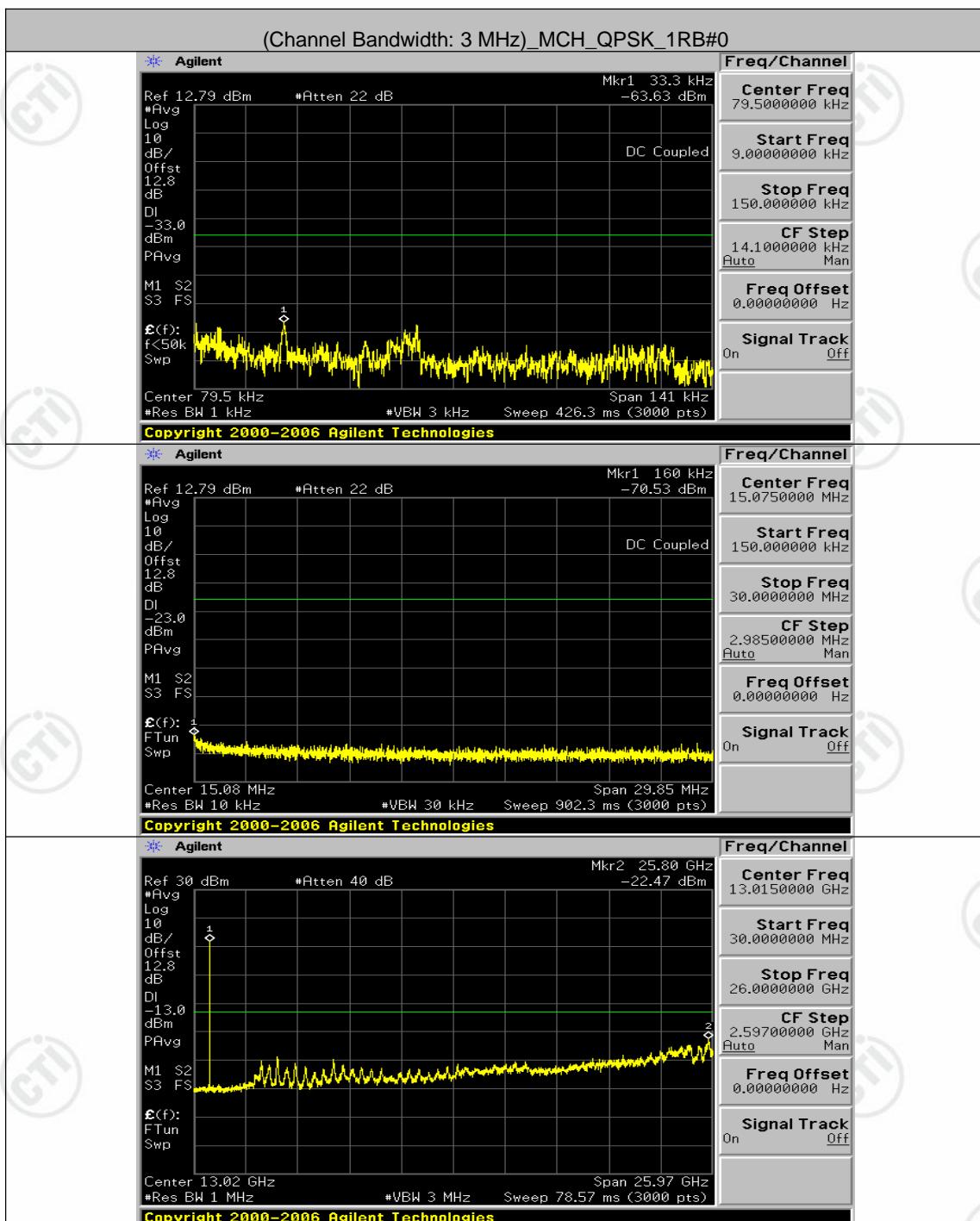


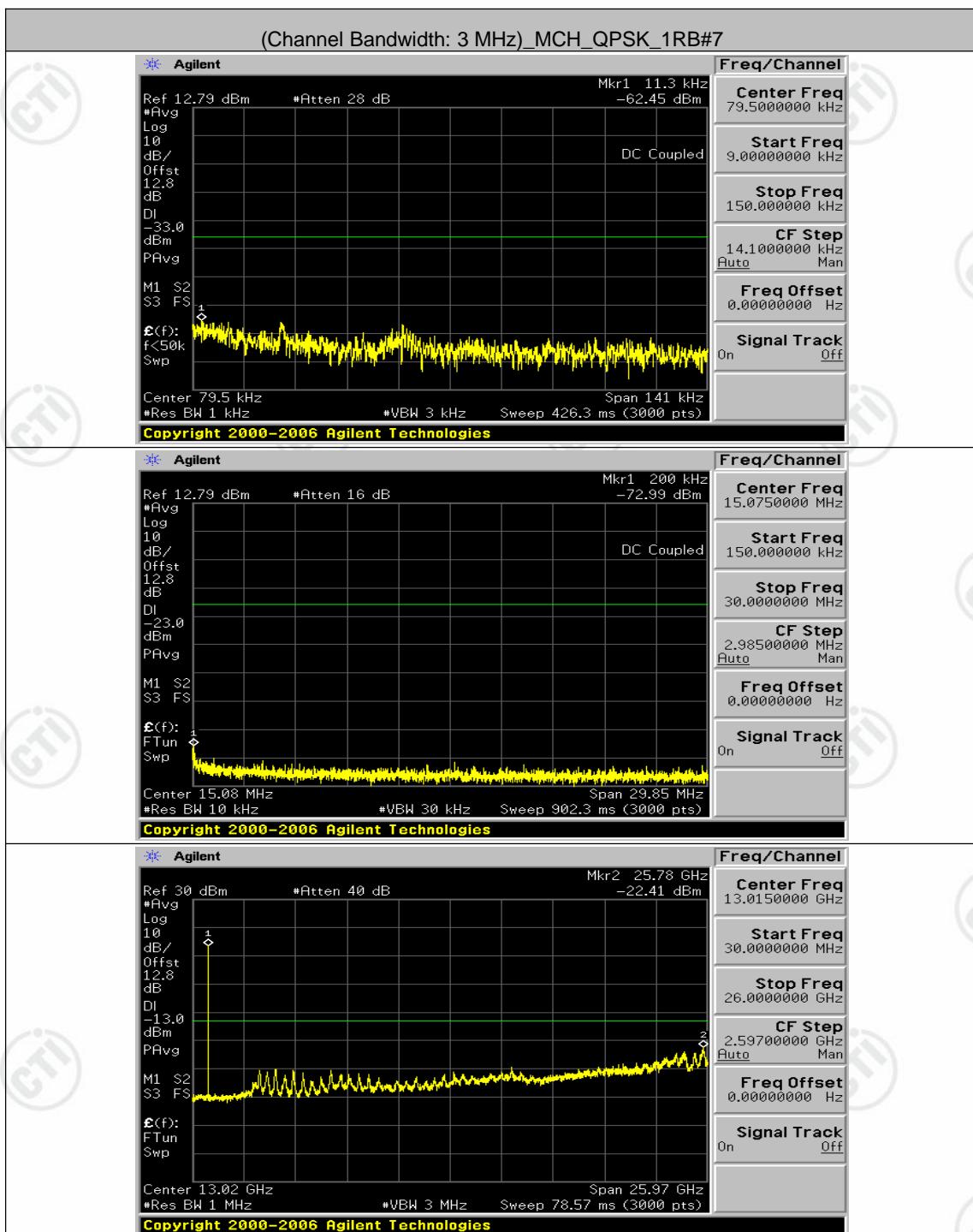


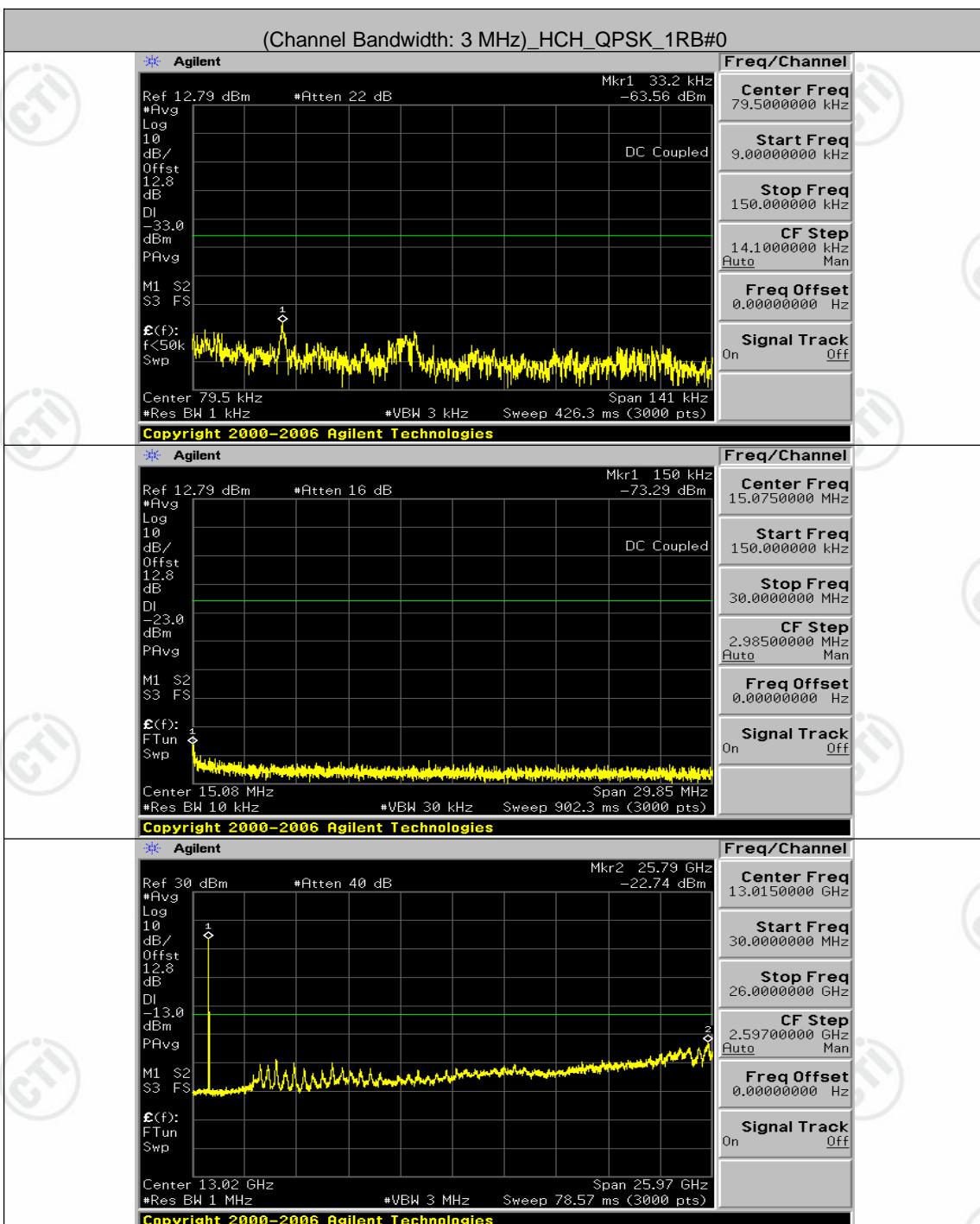
Channel Bandwidth: 3 MHz

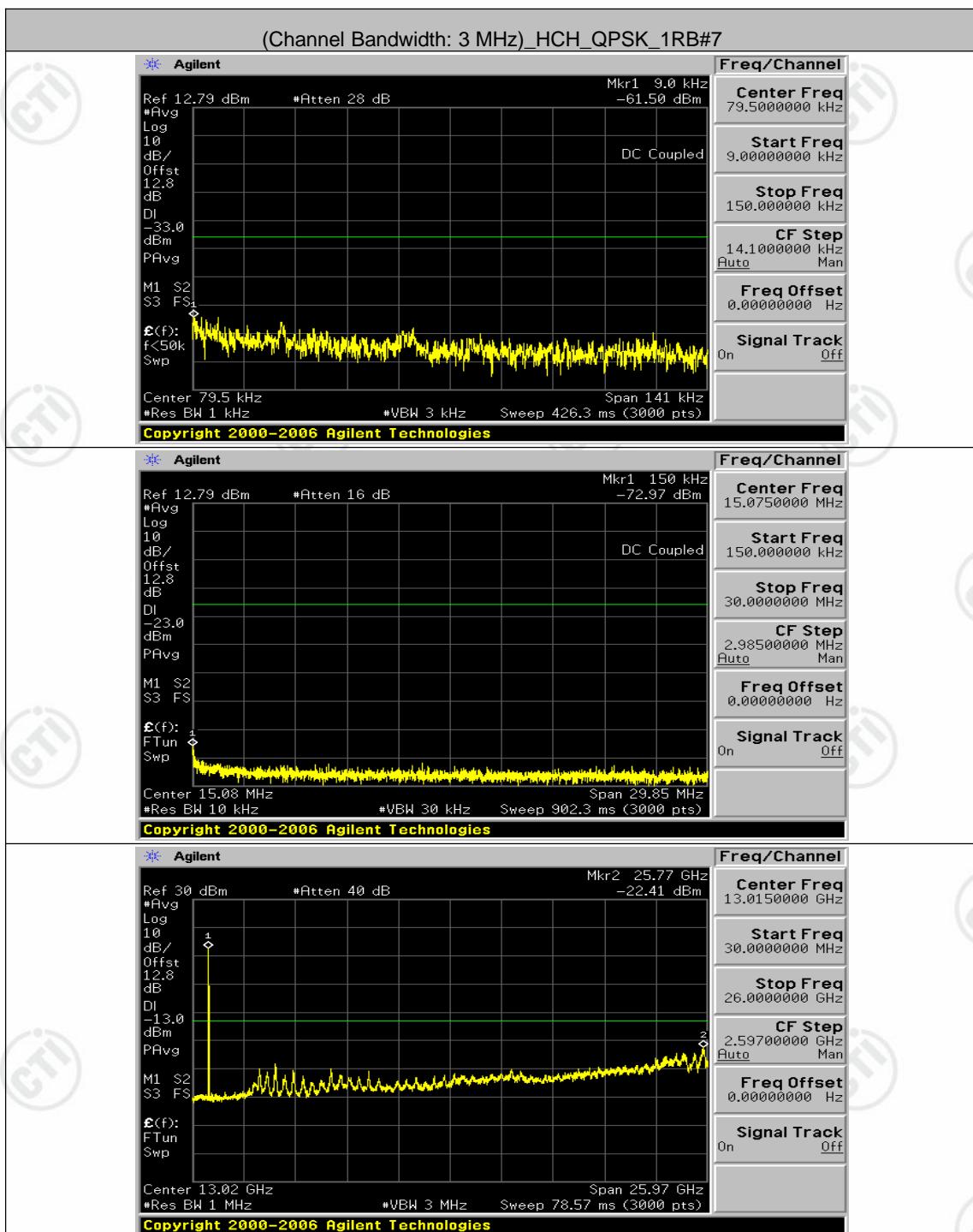


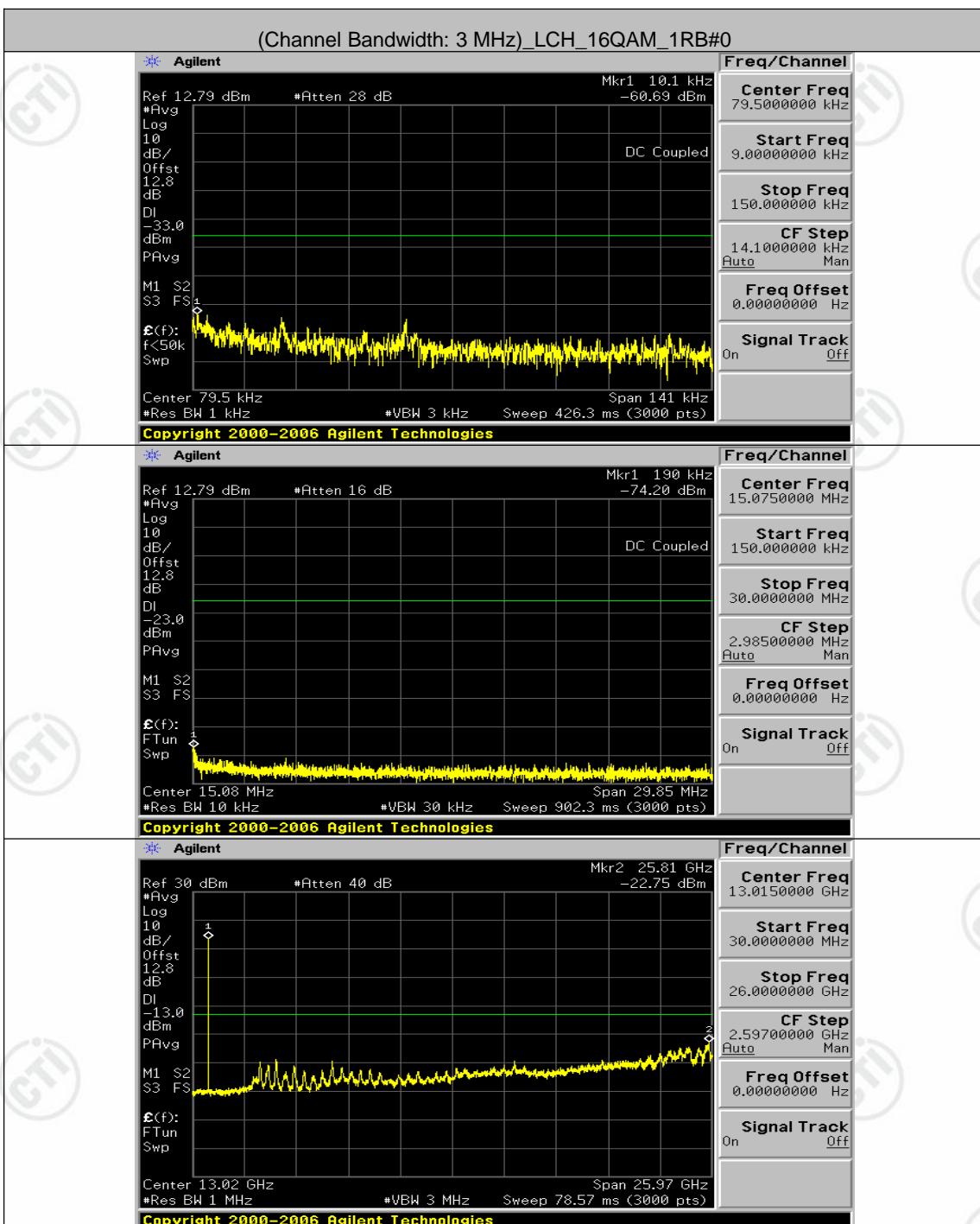


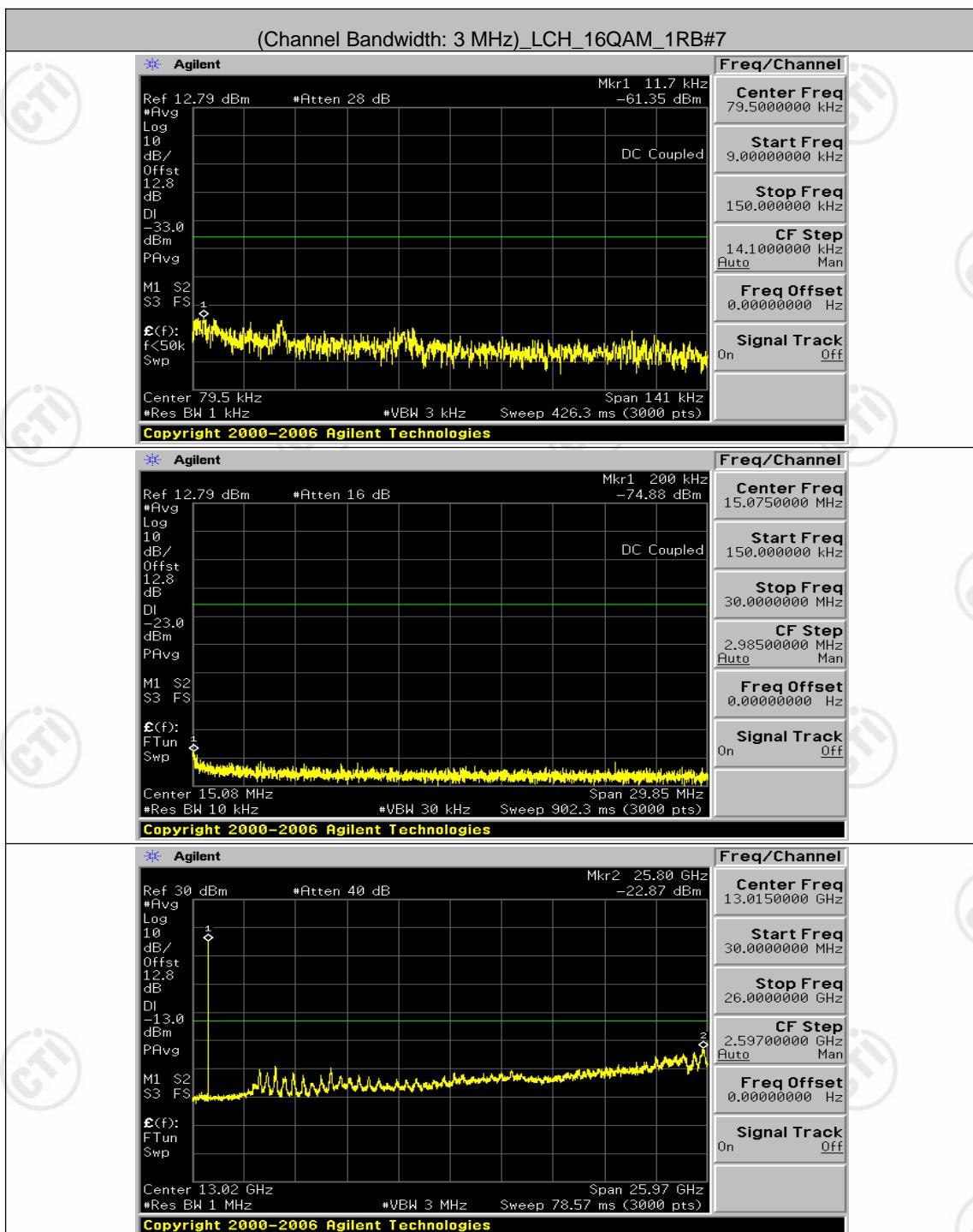


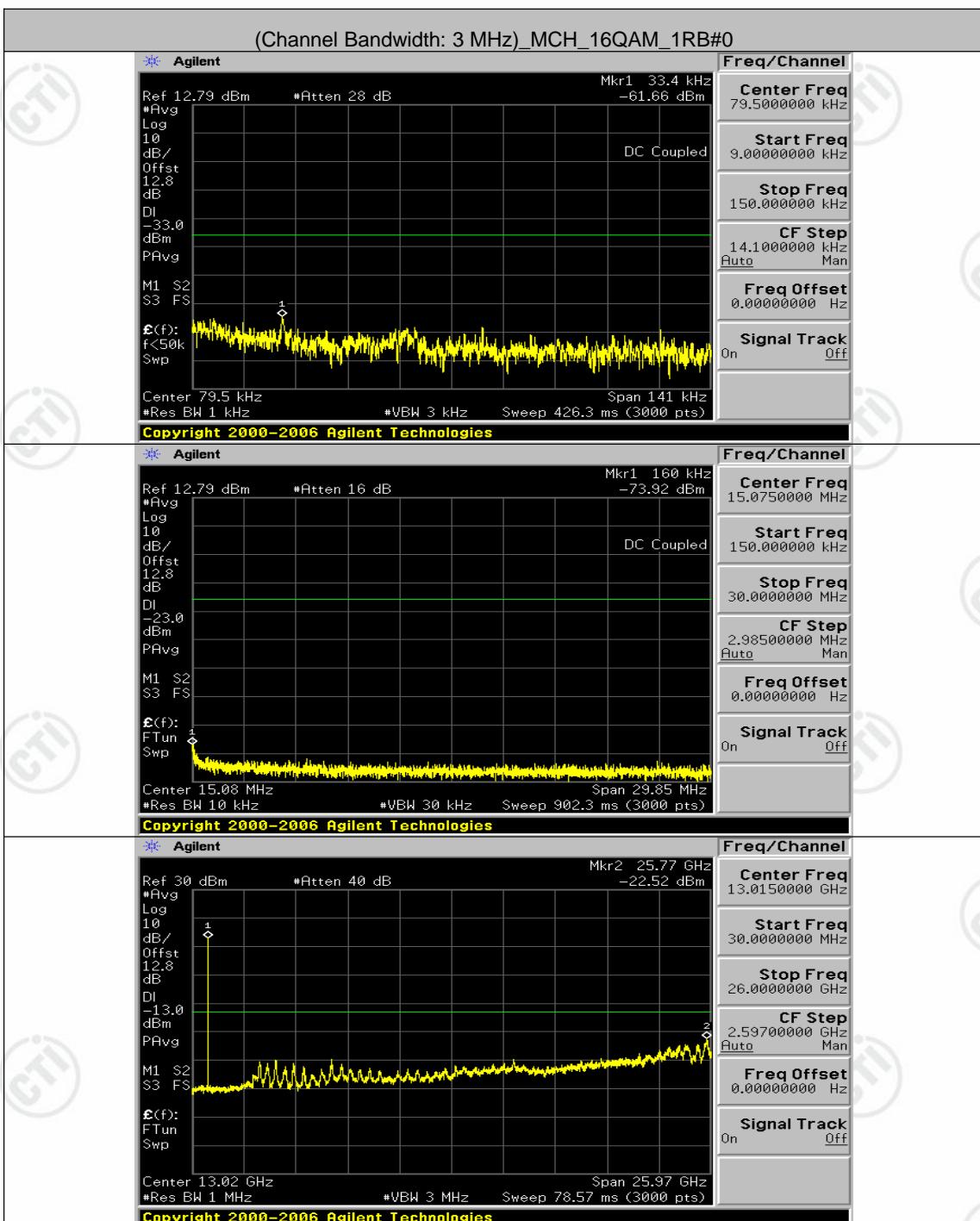


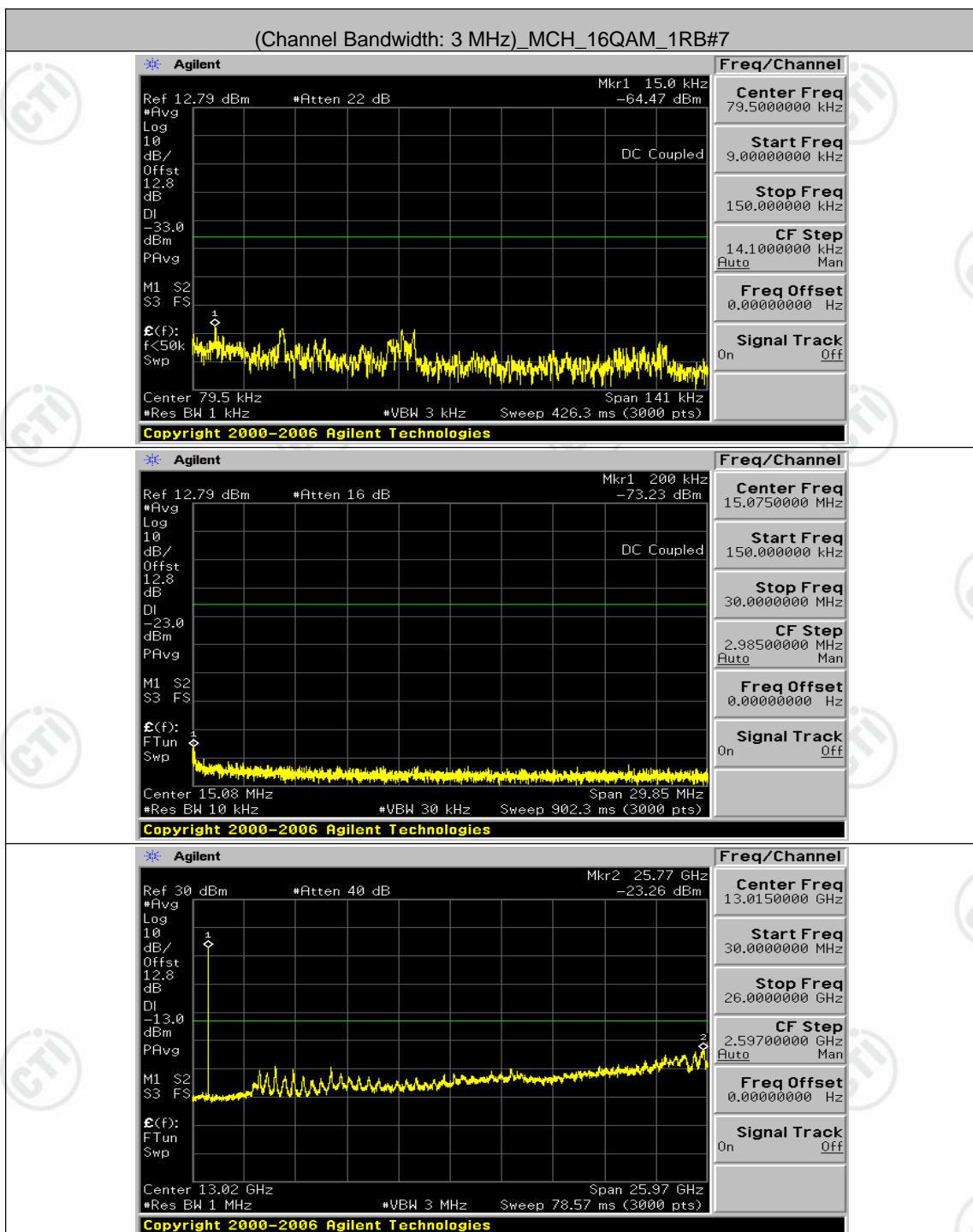


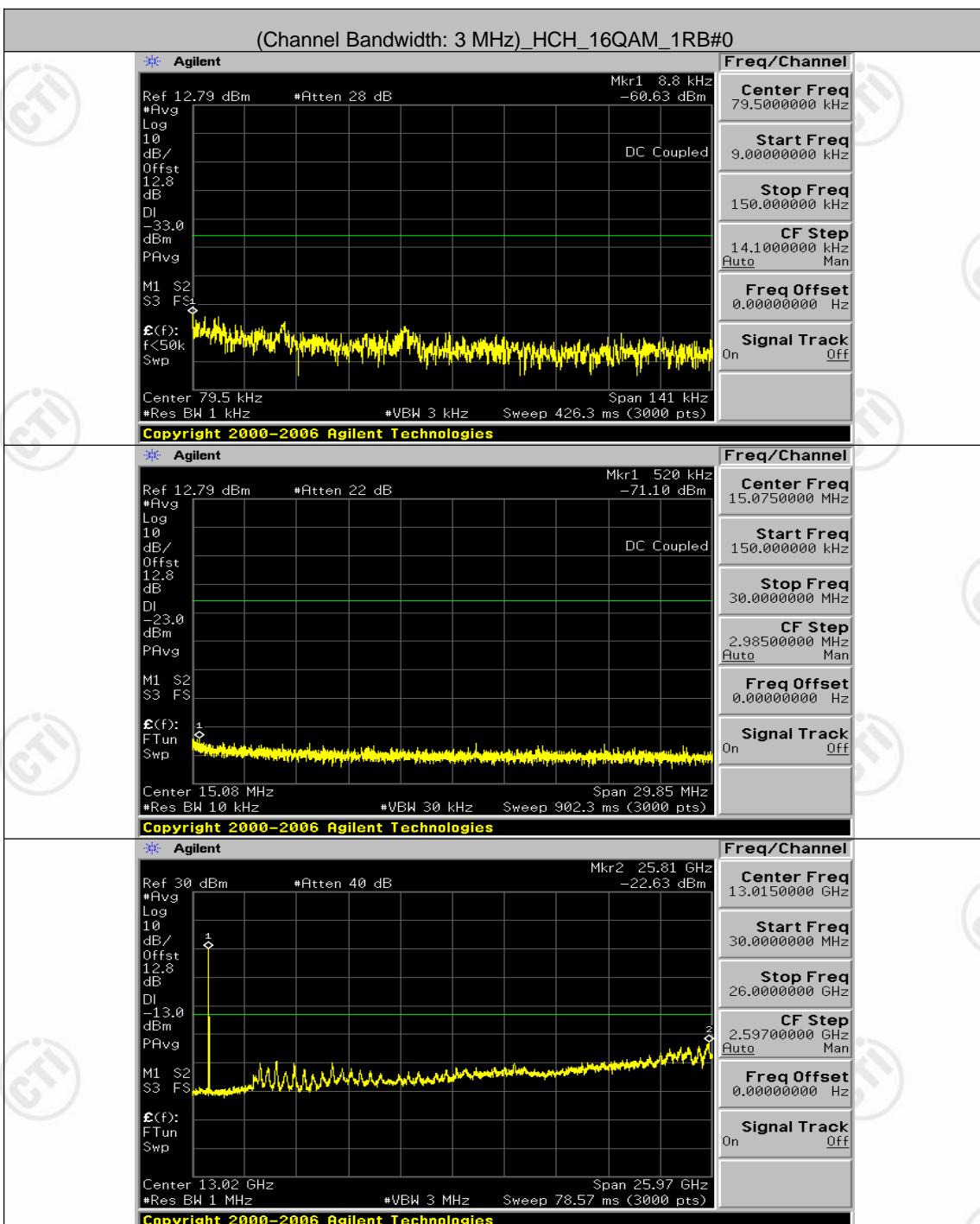


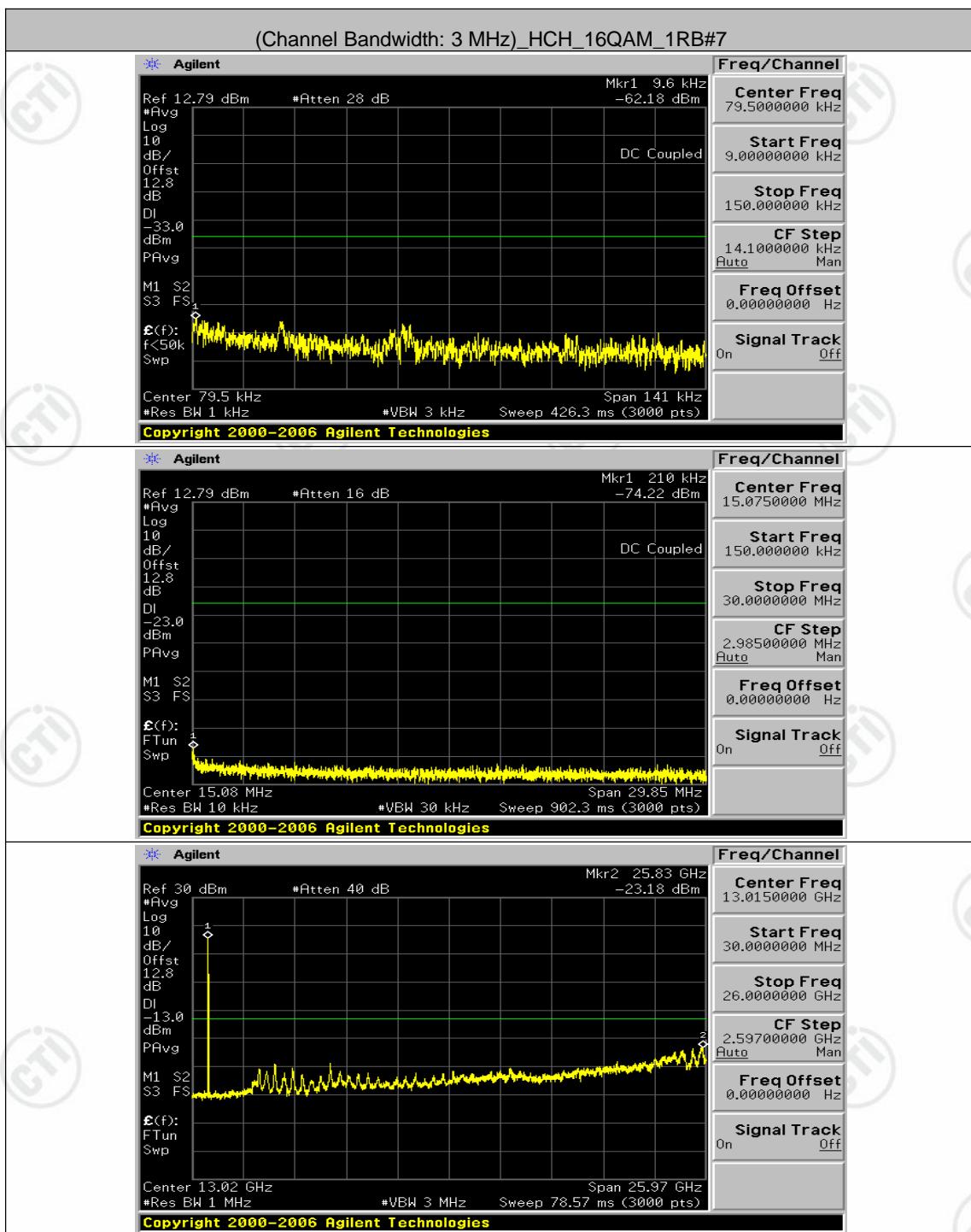




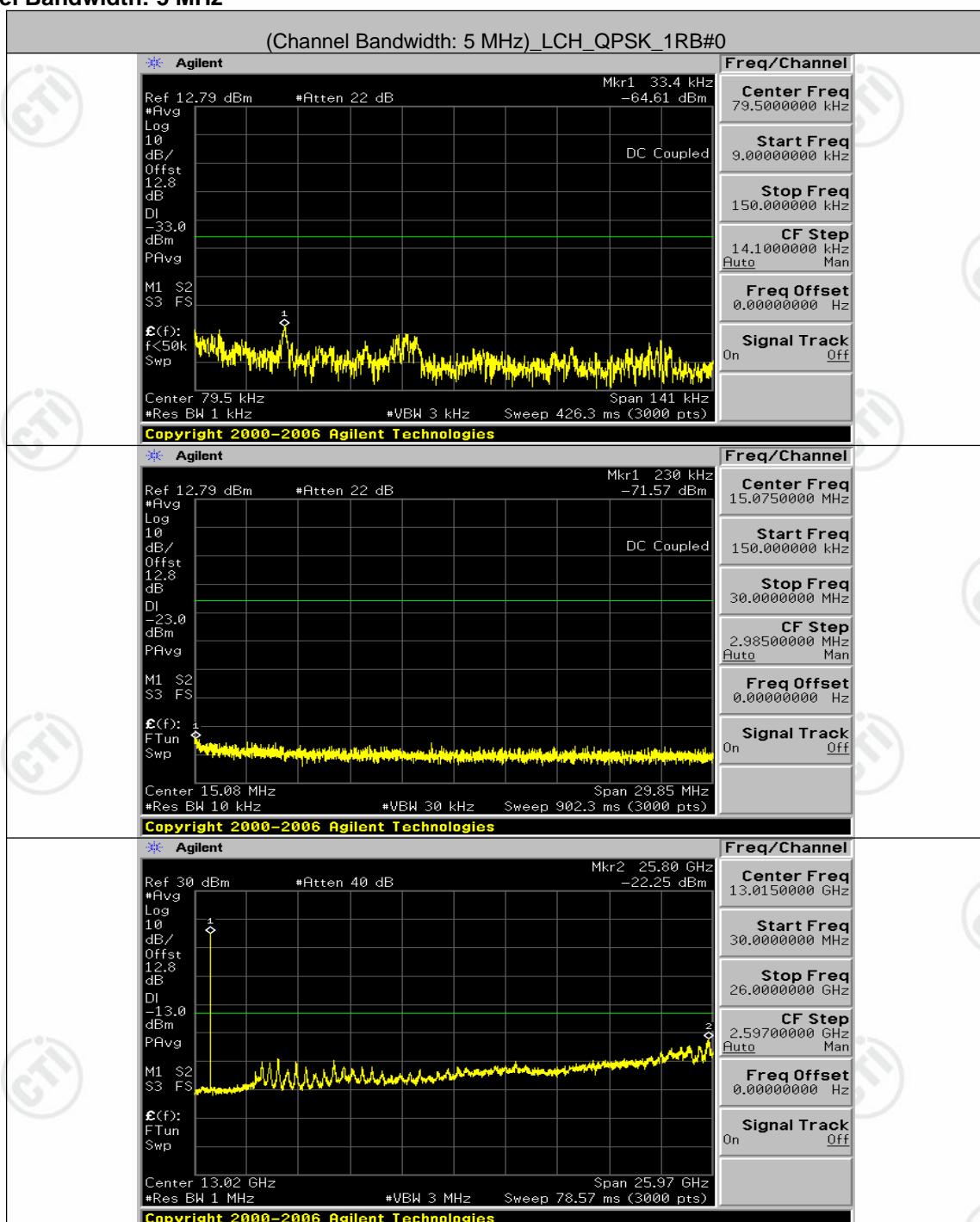


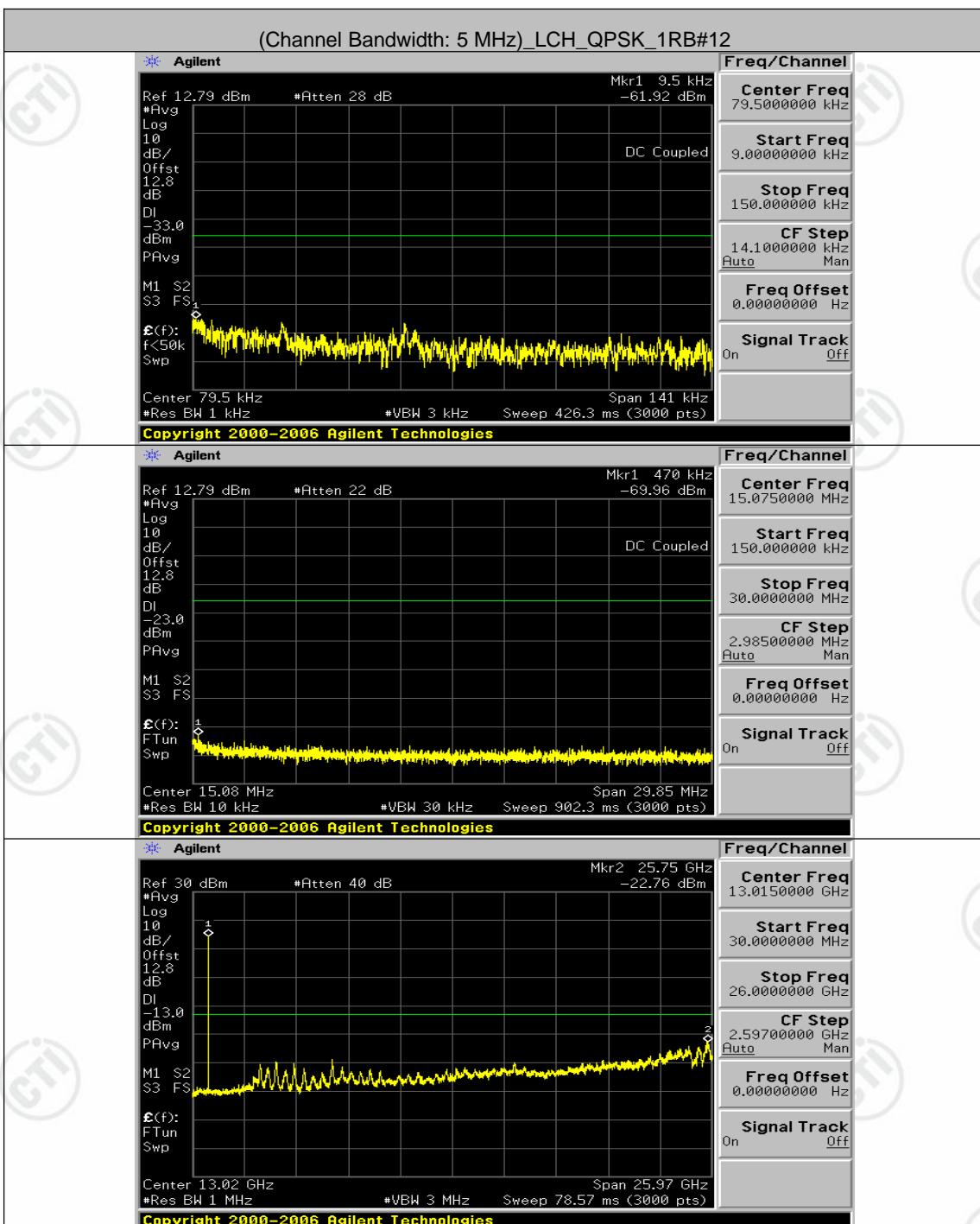


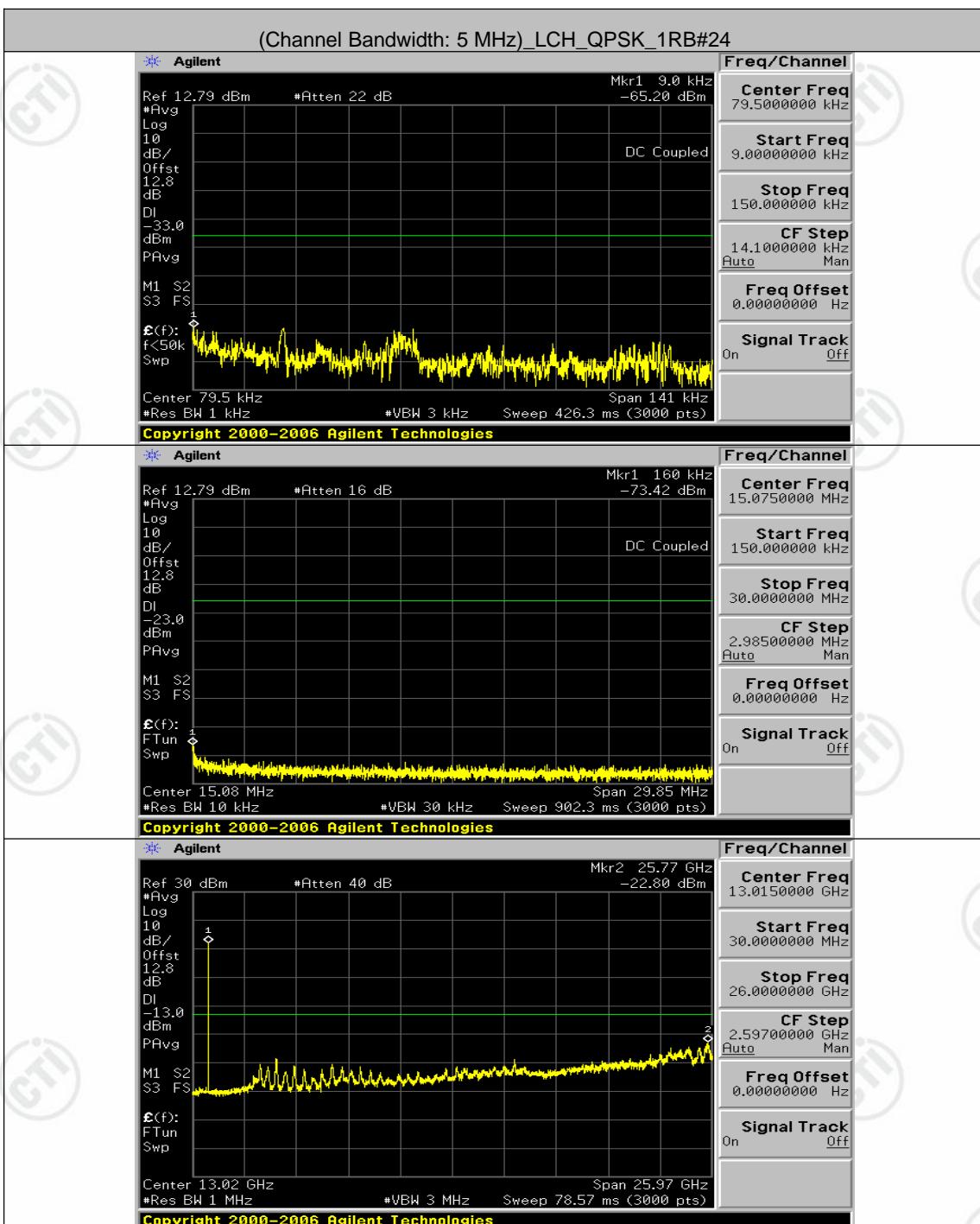


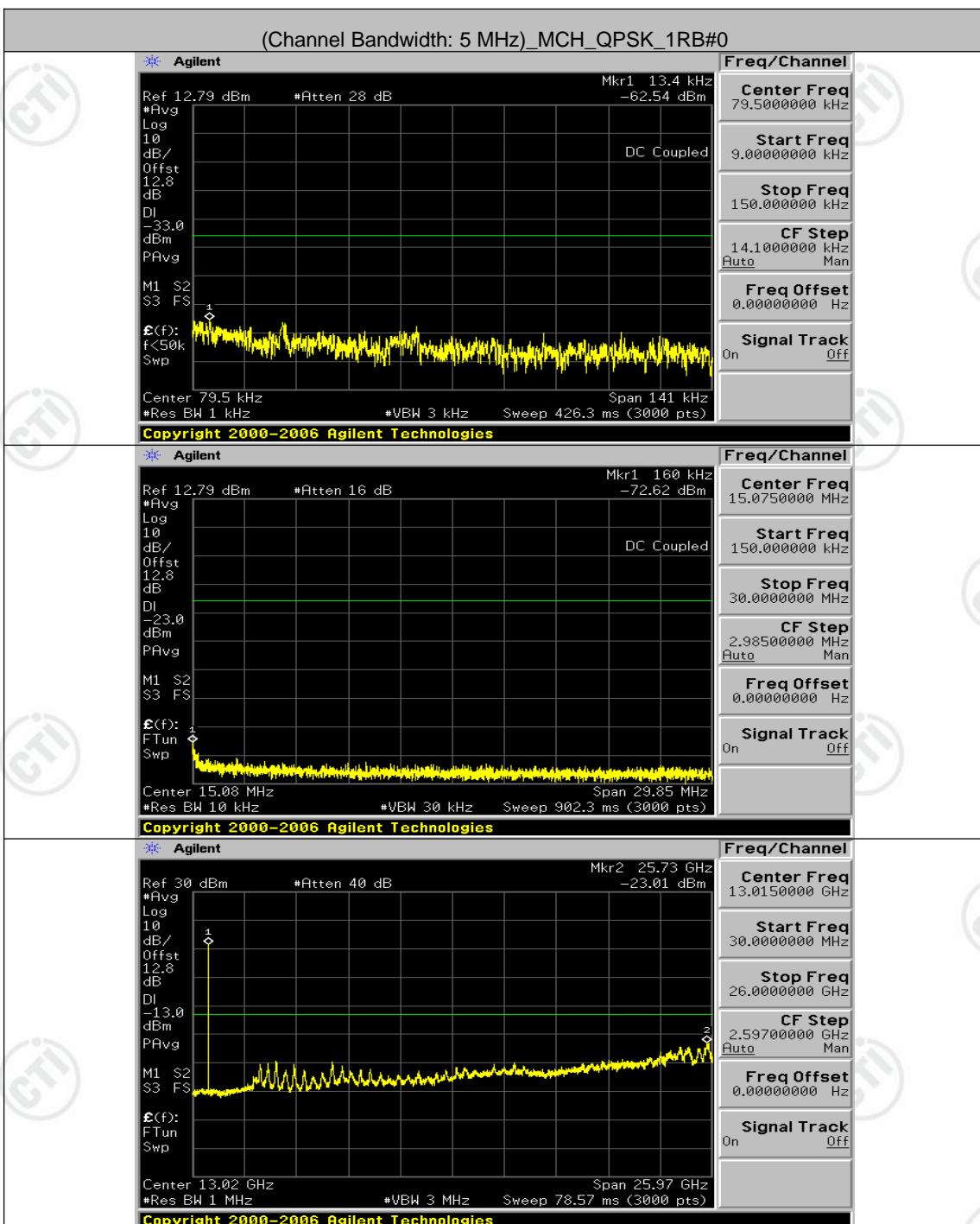


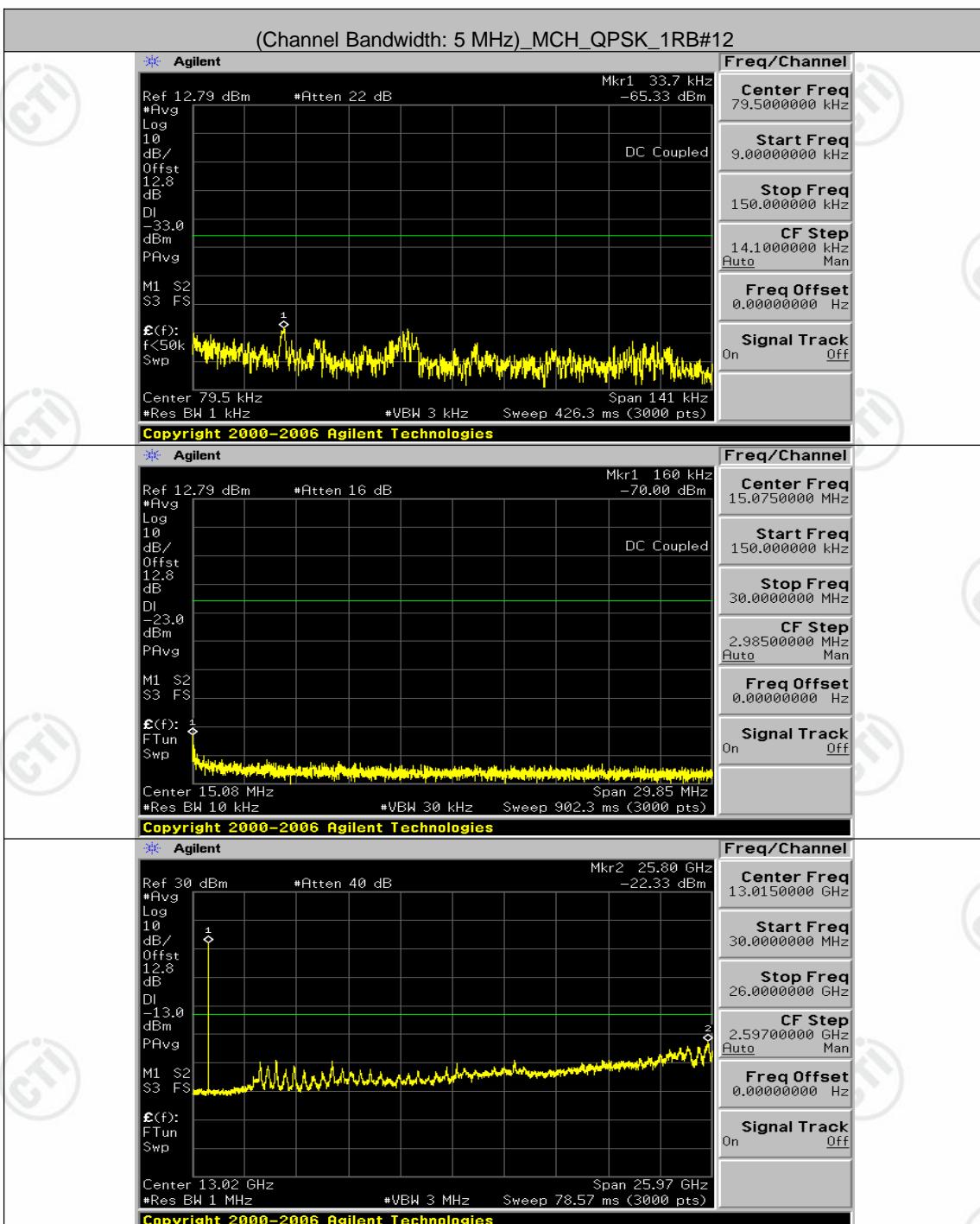
Channel Bandwidth: 5 MHz

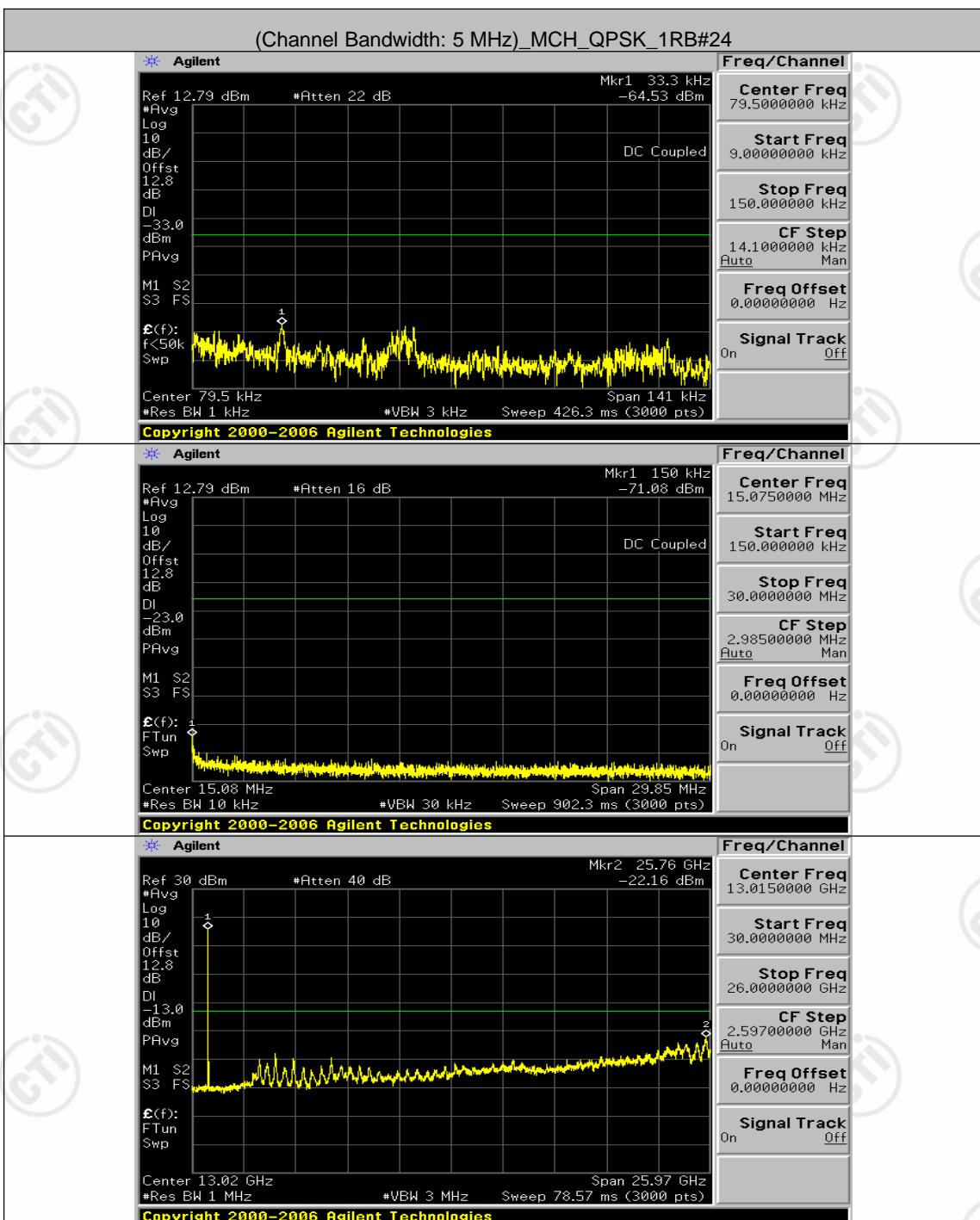


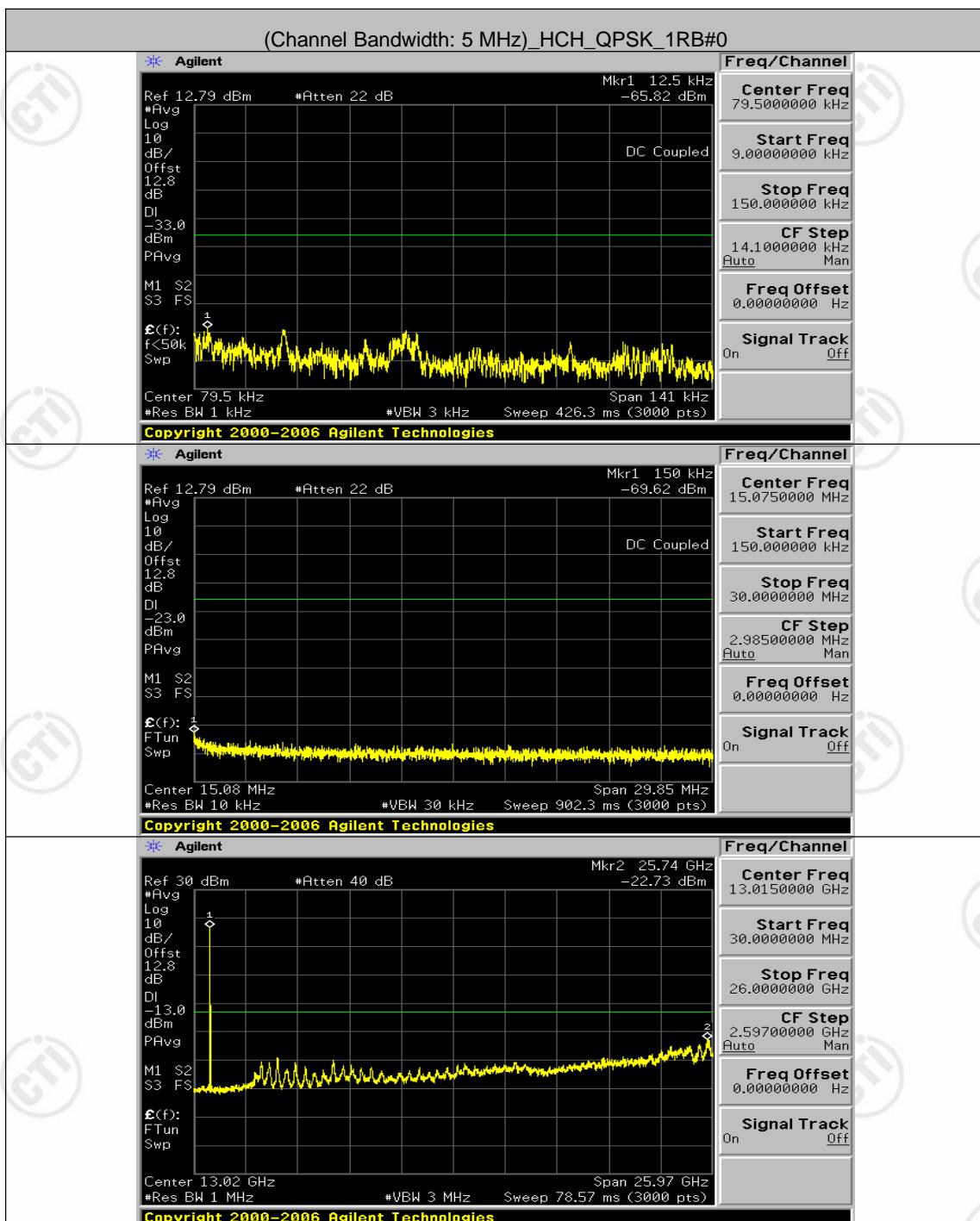


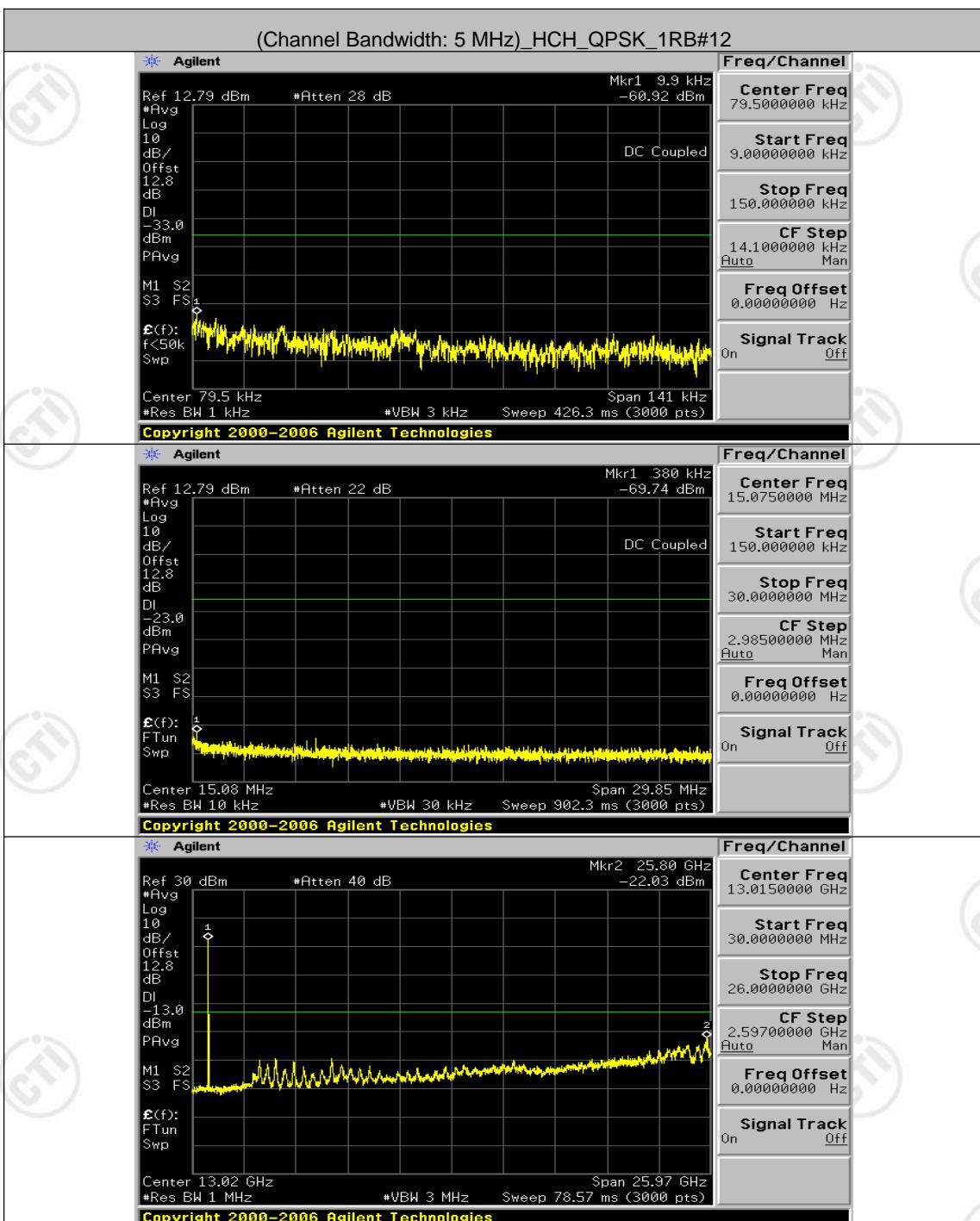


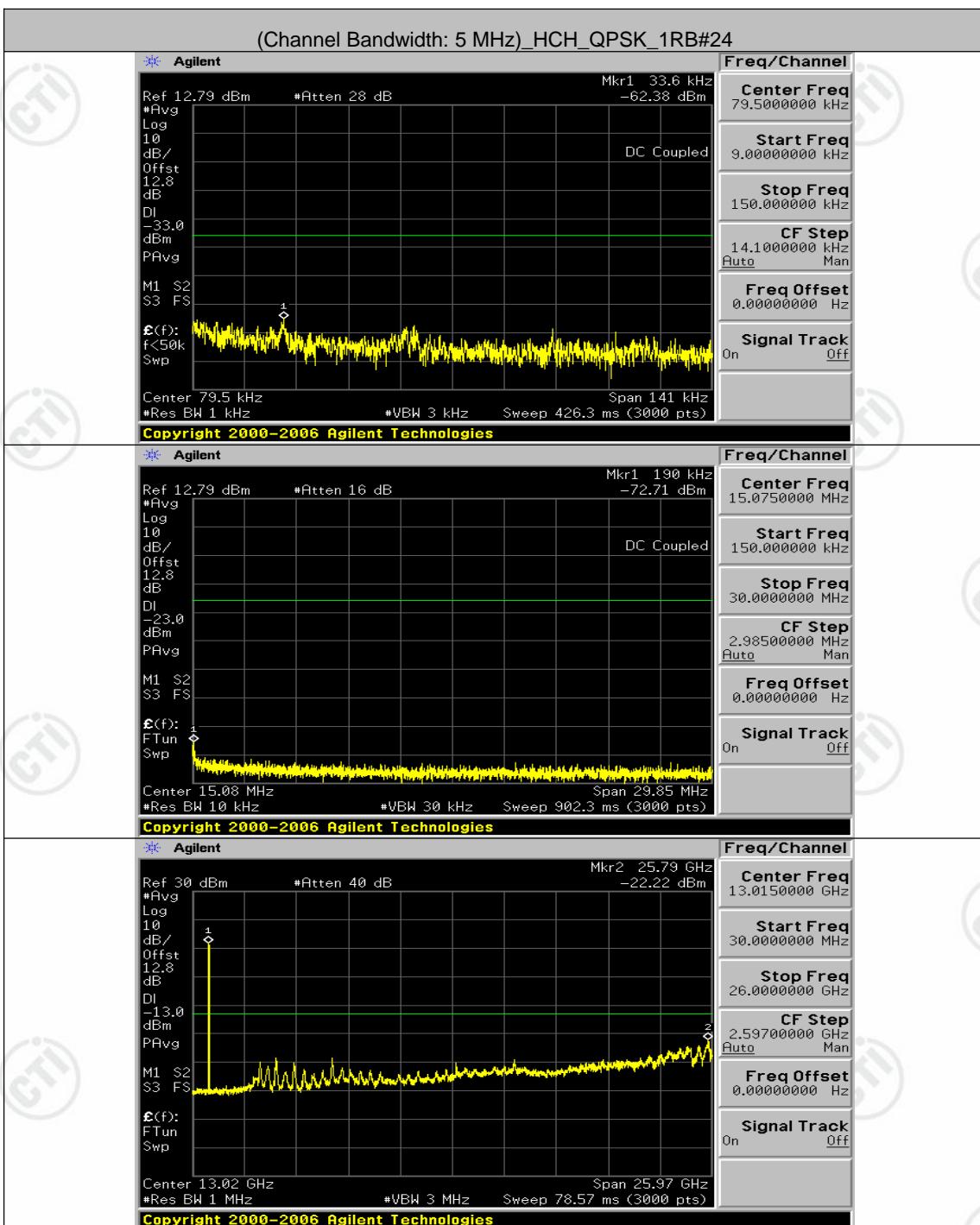


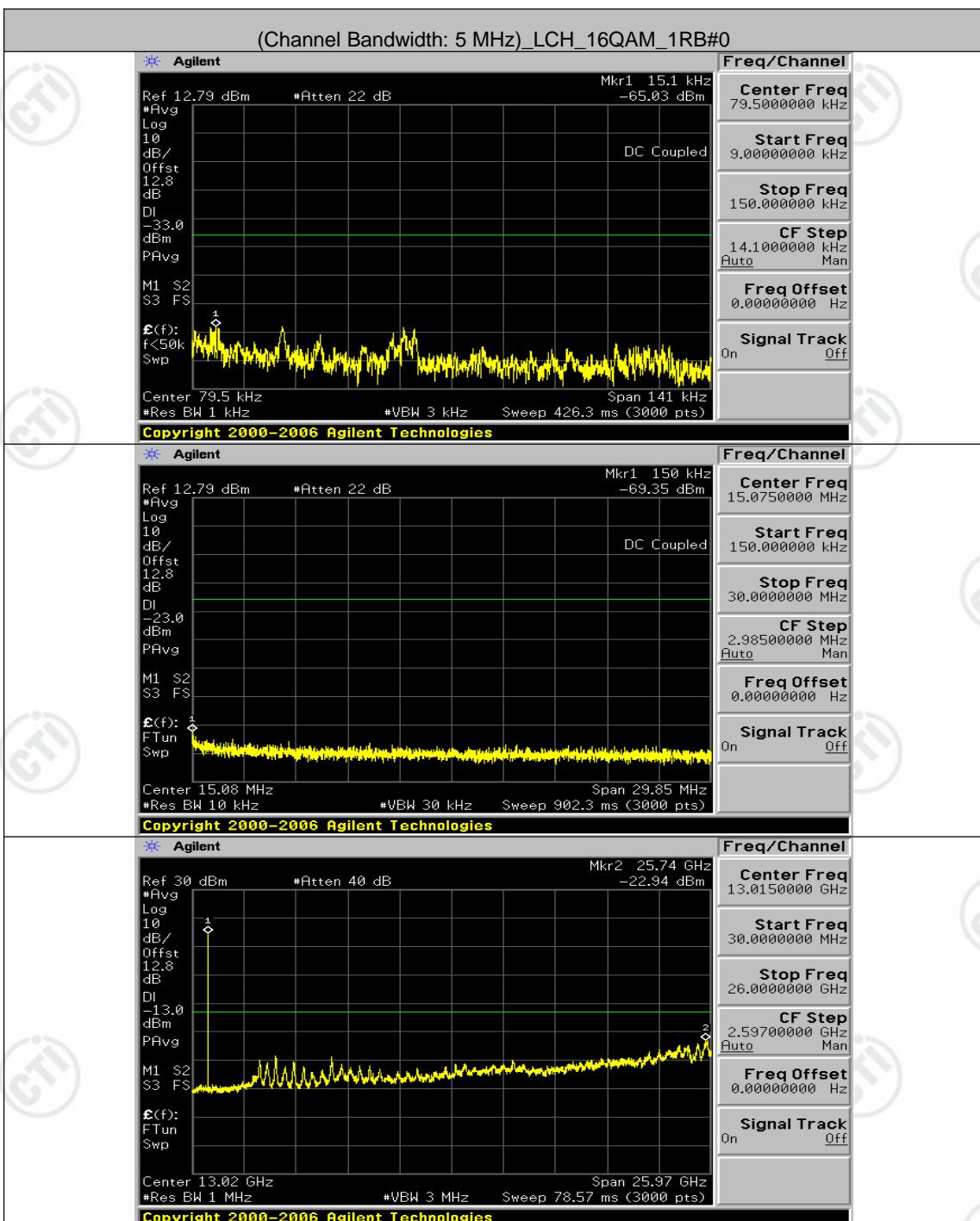


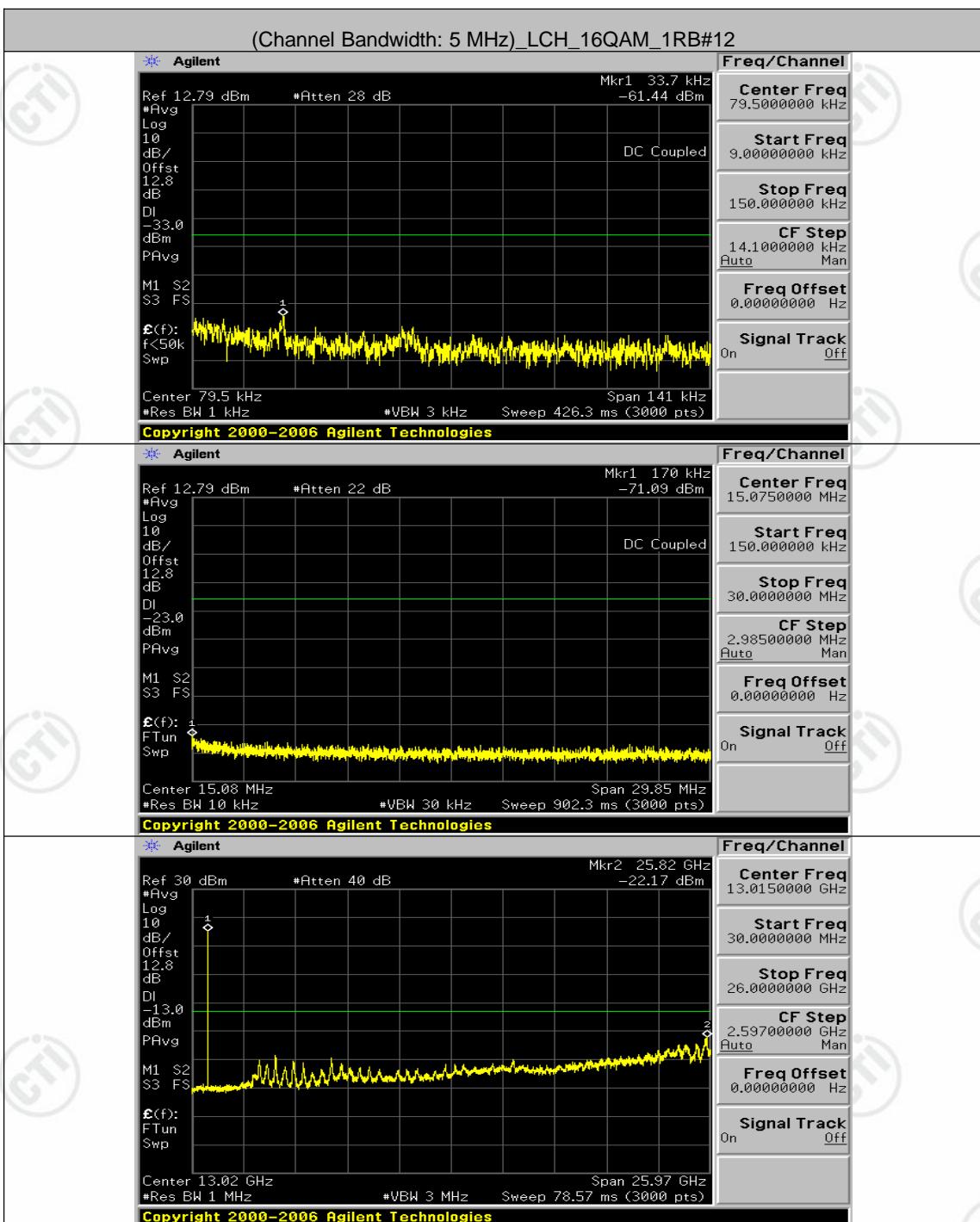


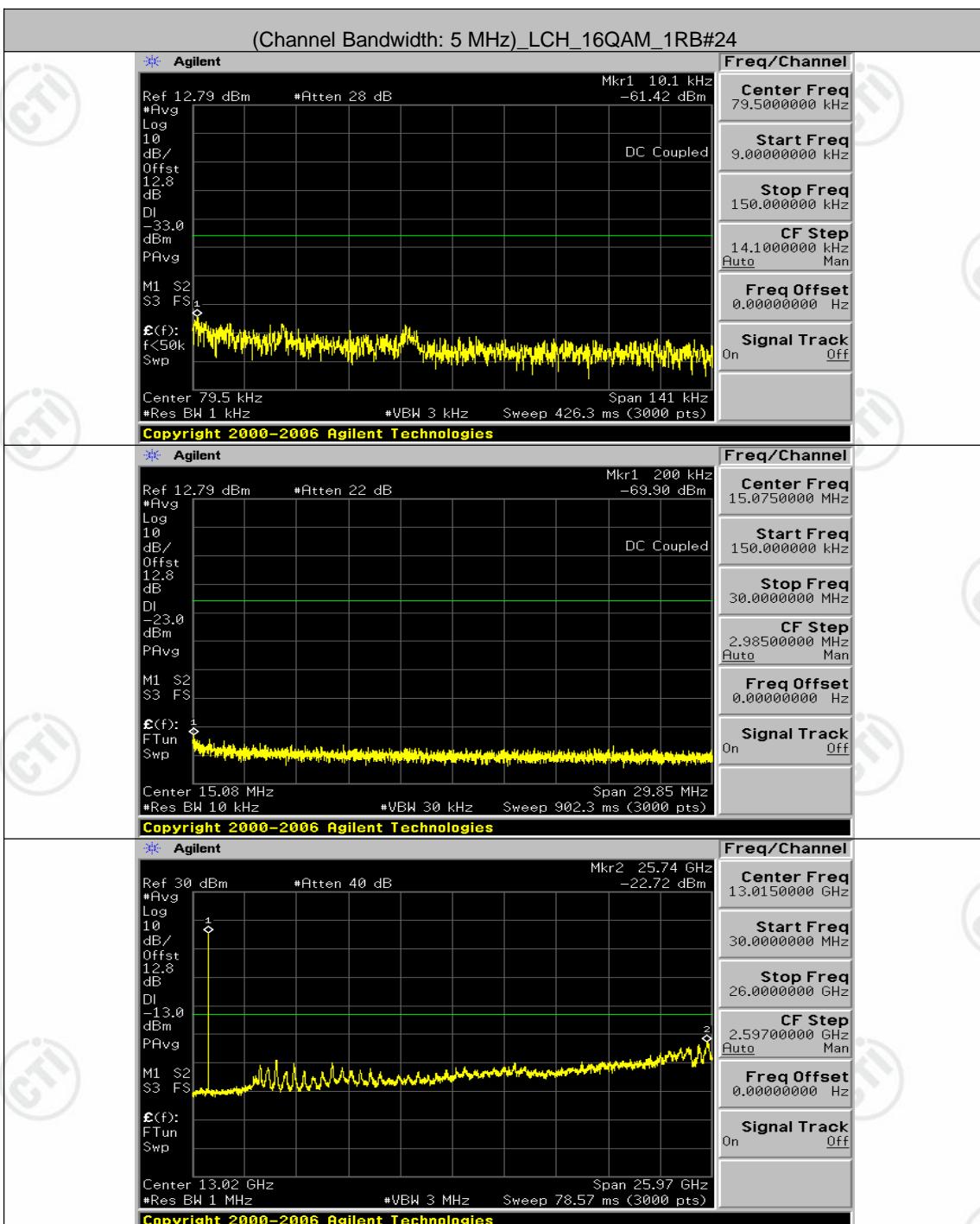


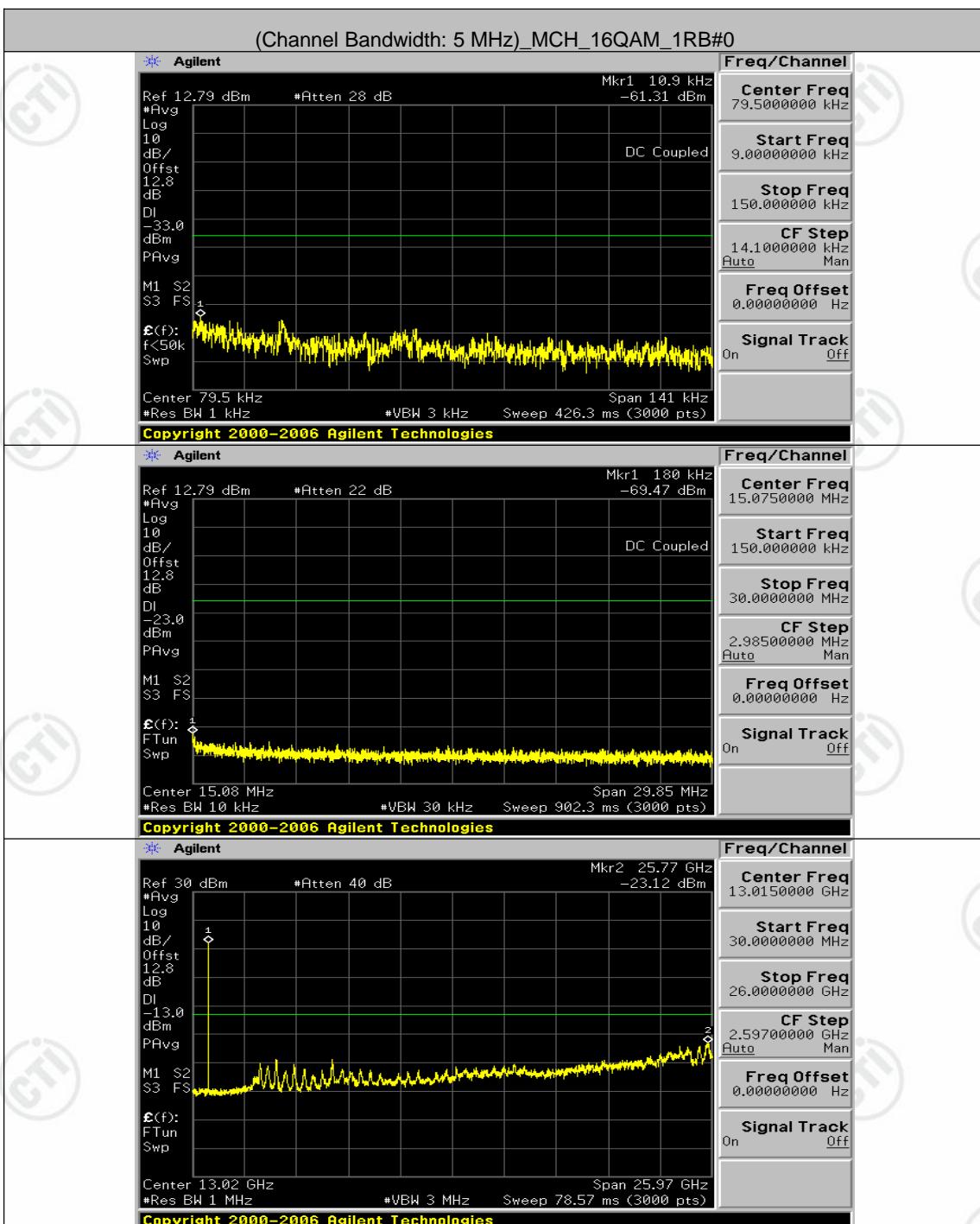


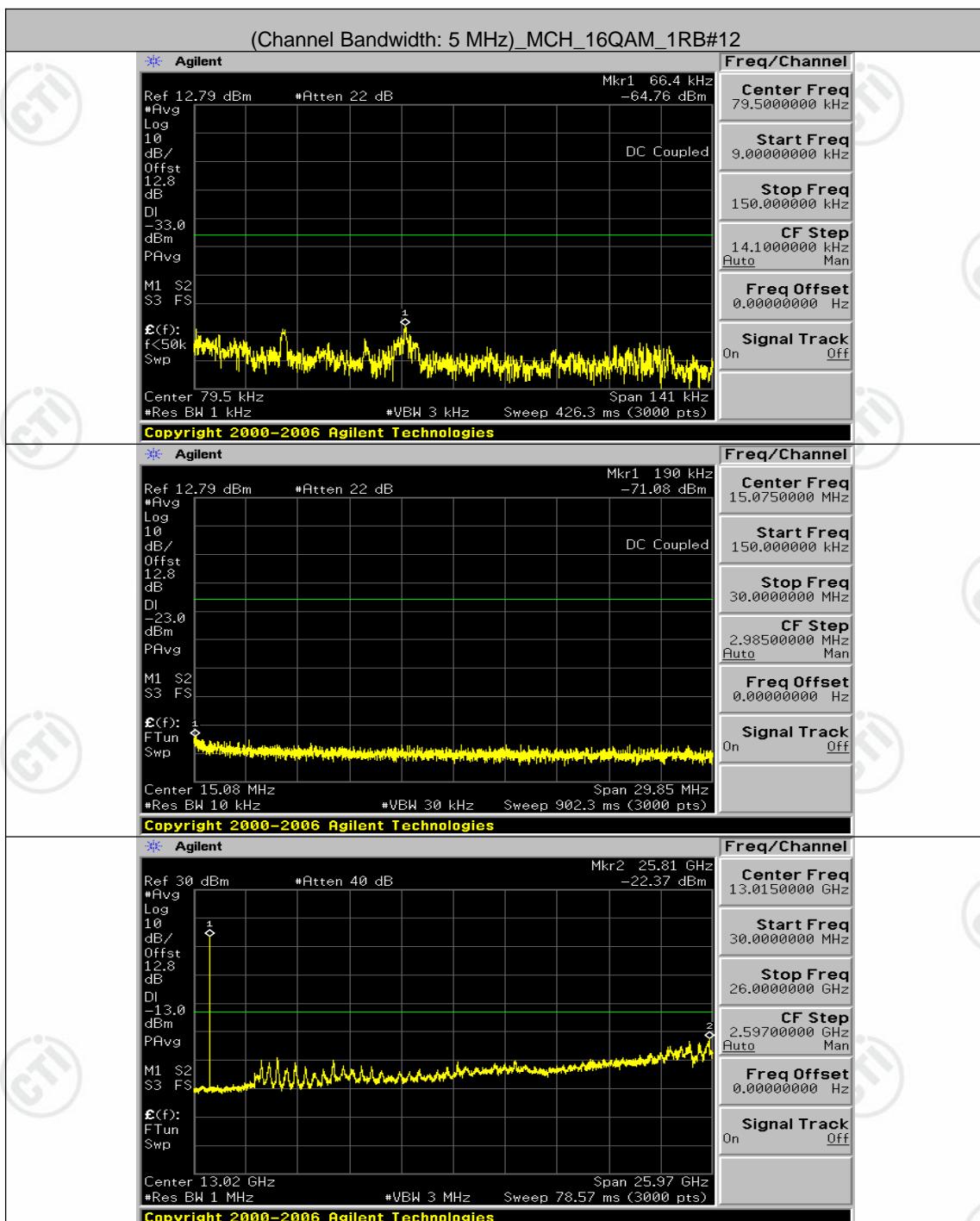


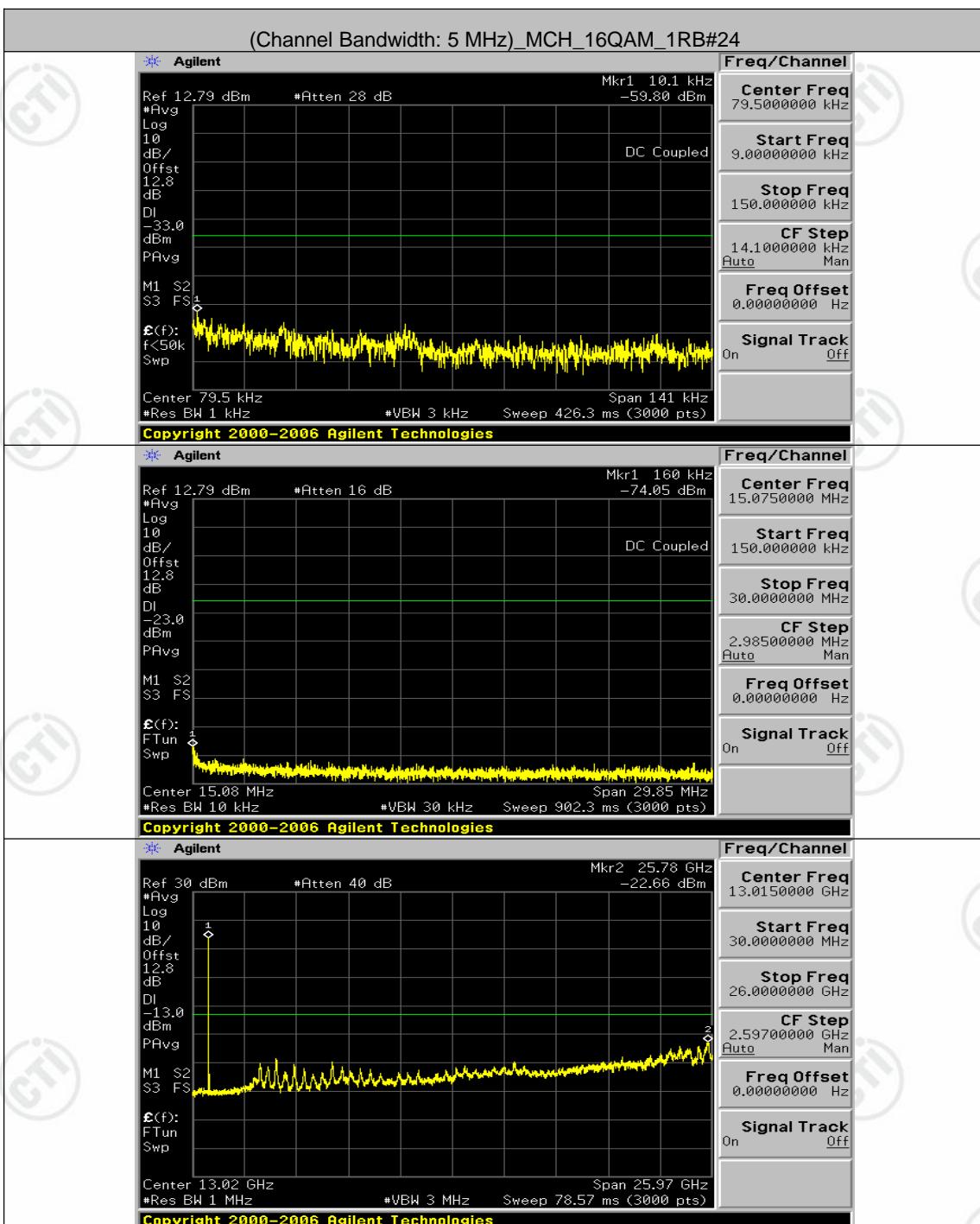


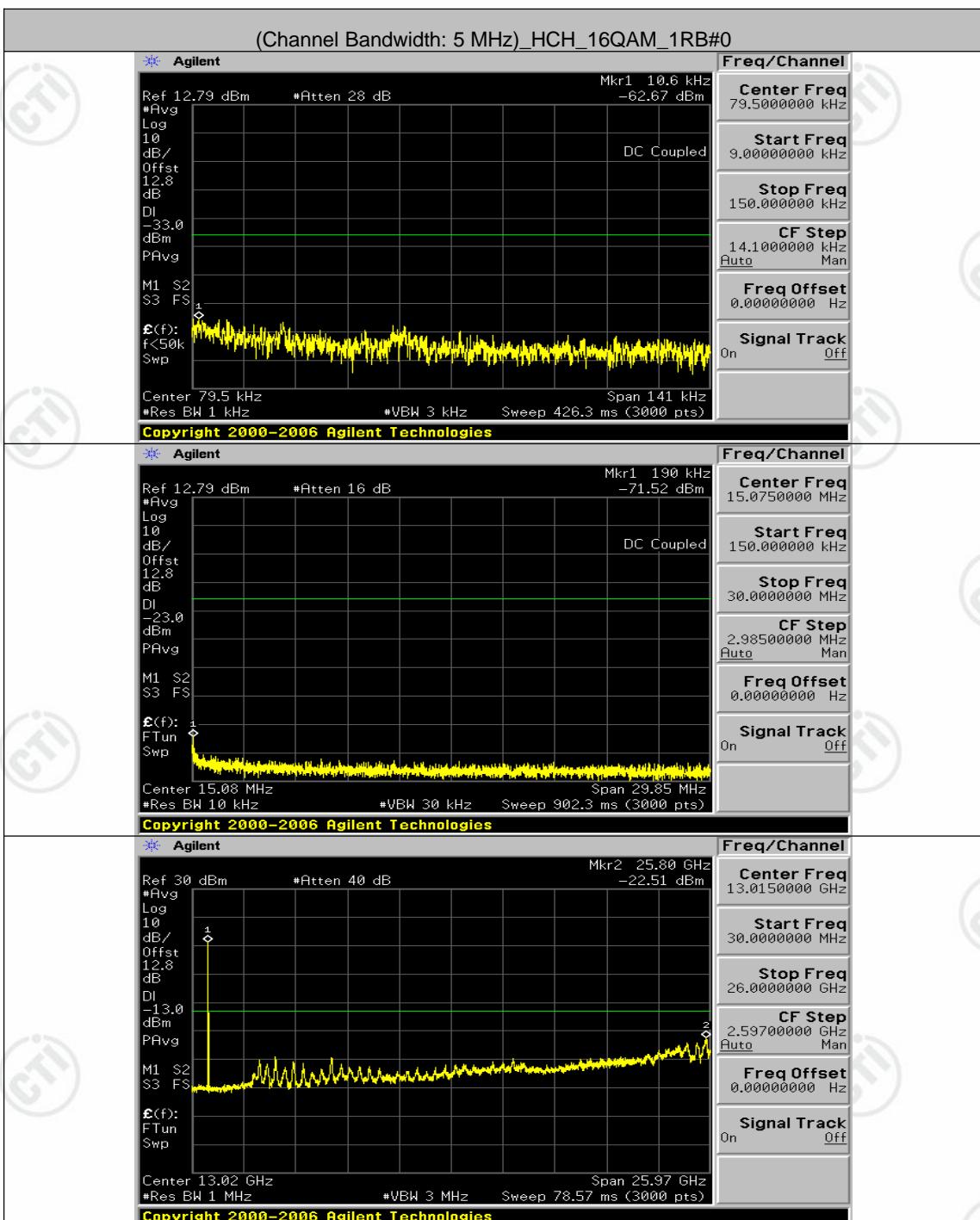


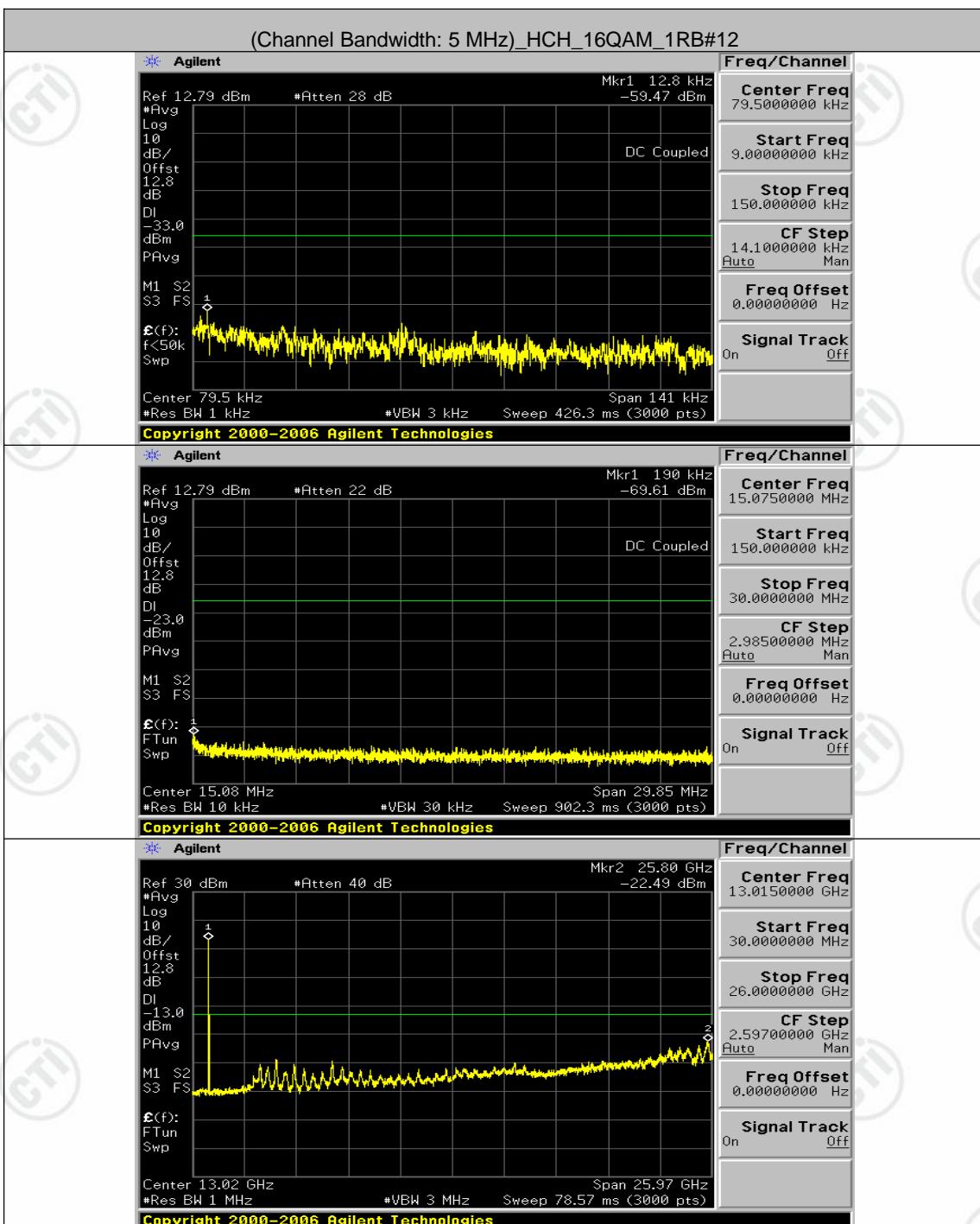


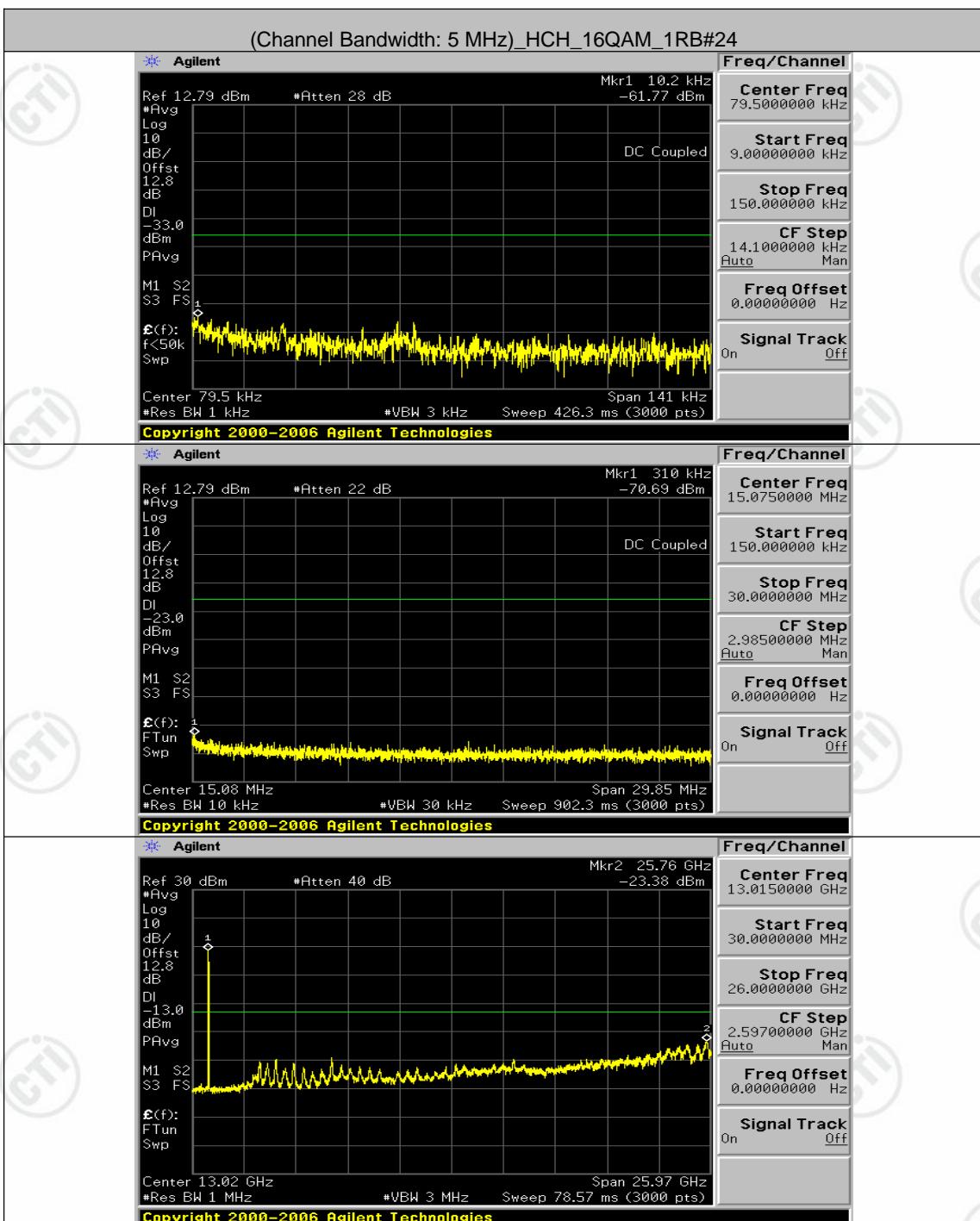




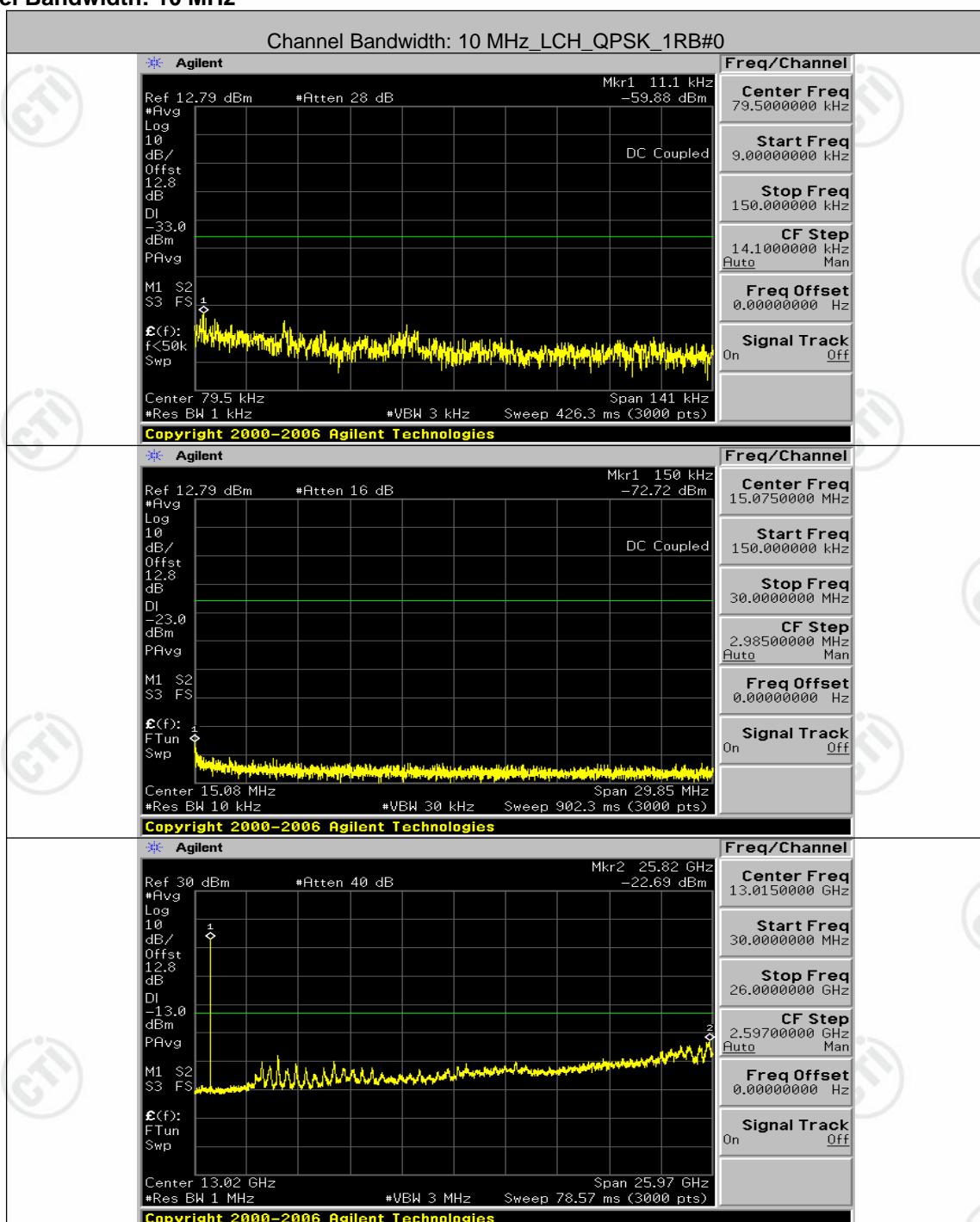


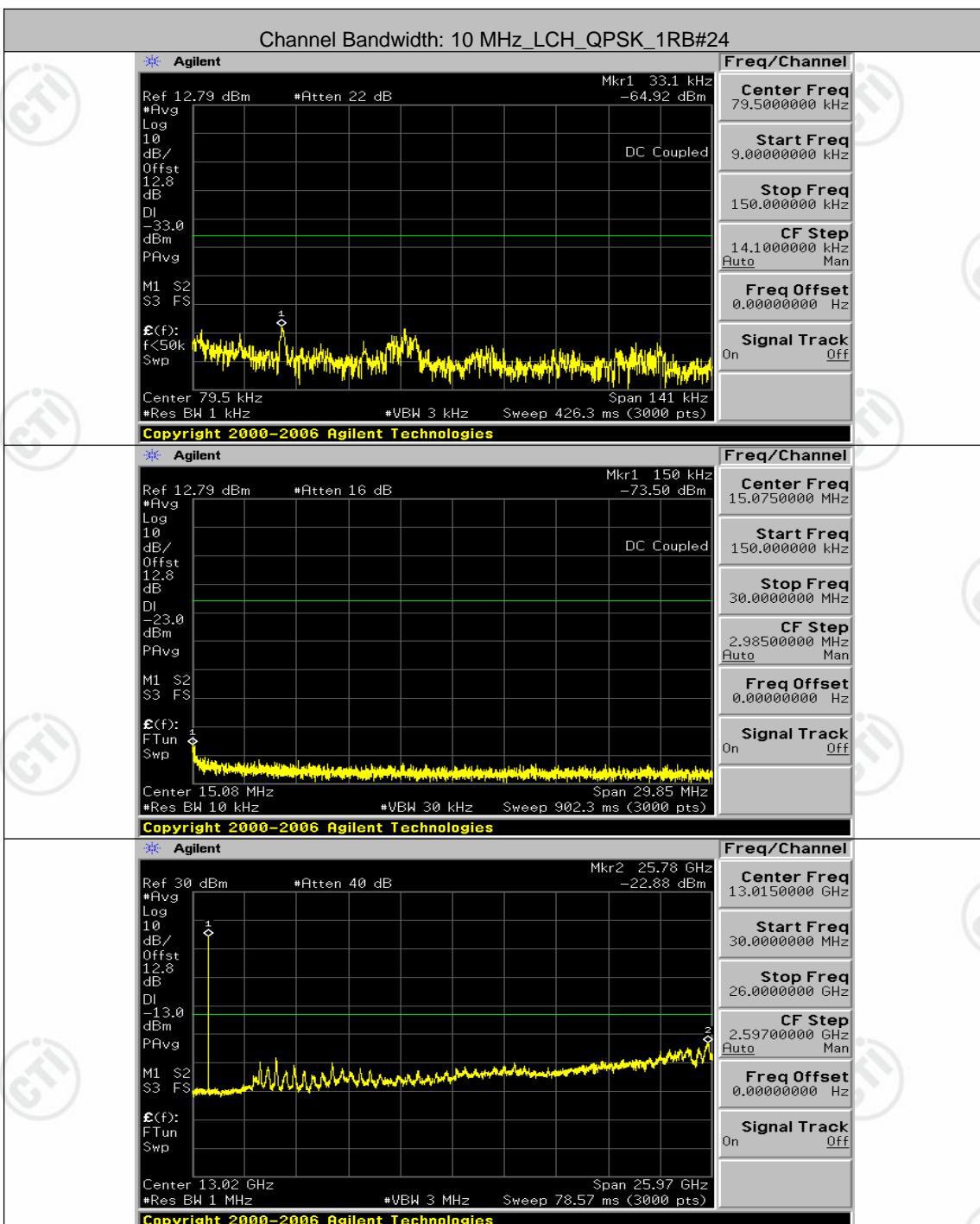


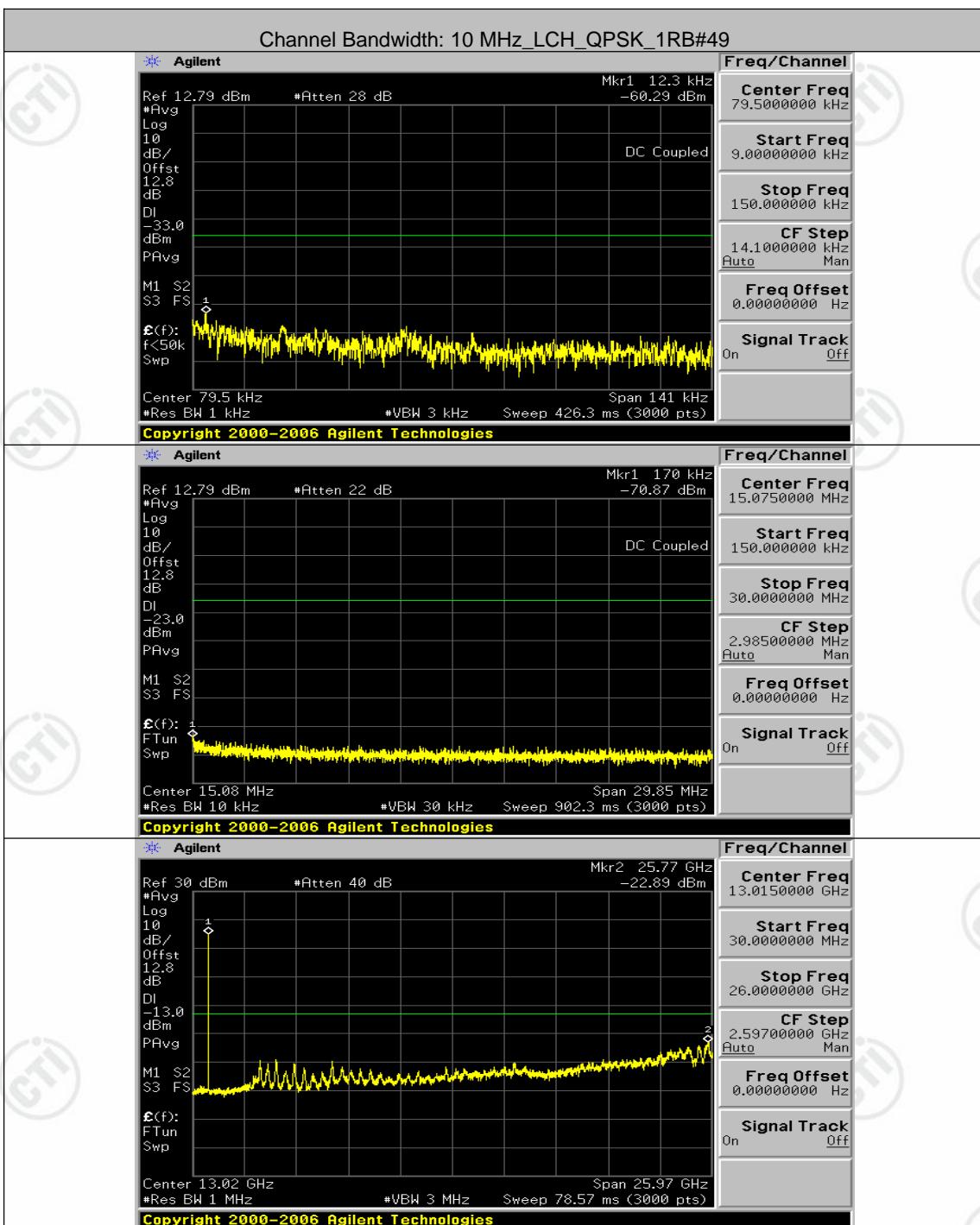


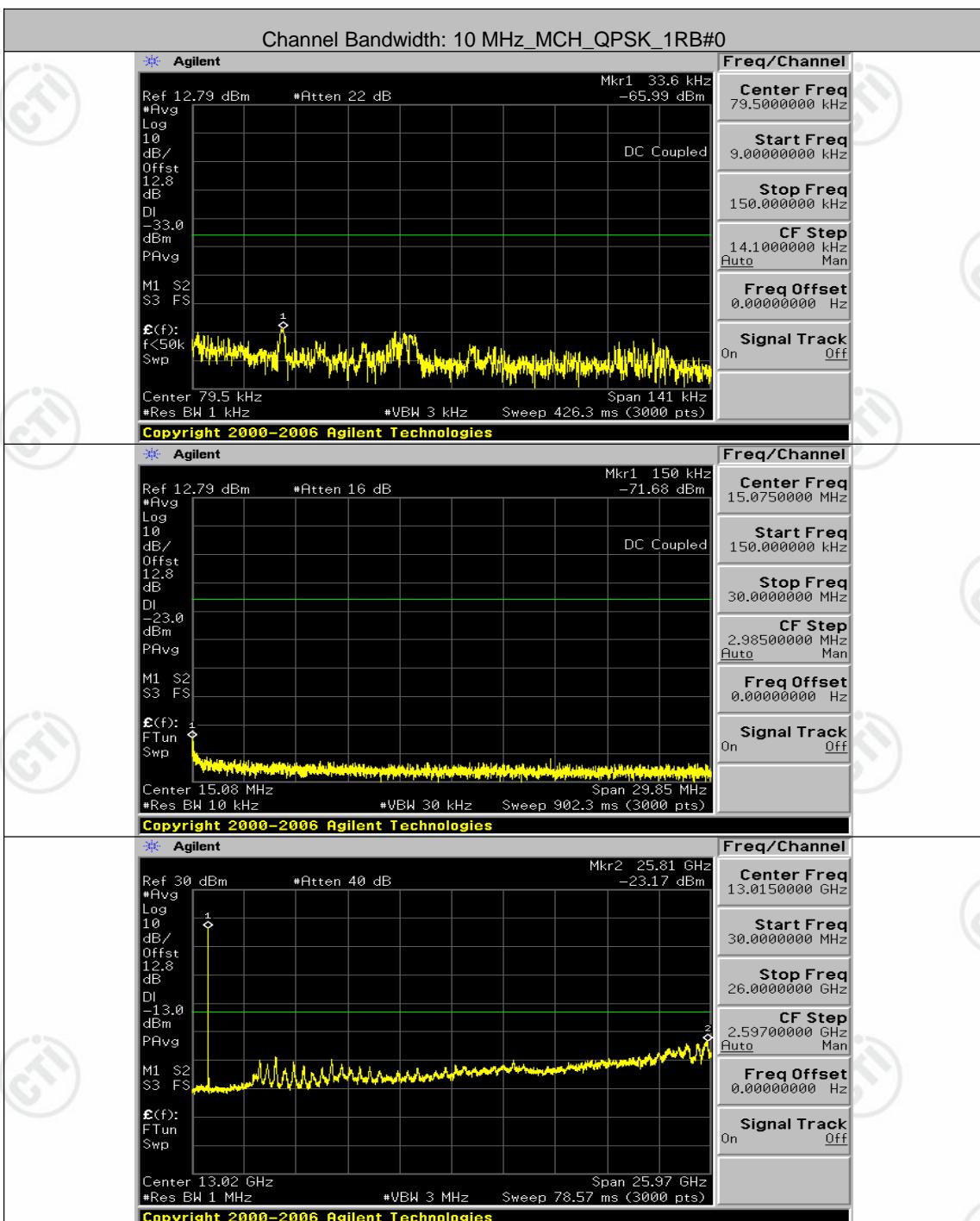


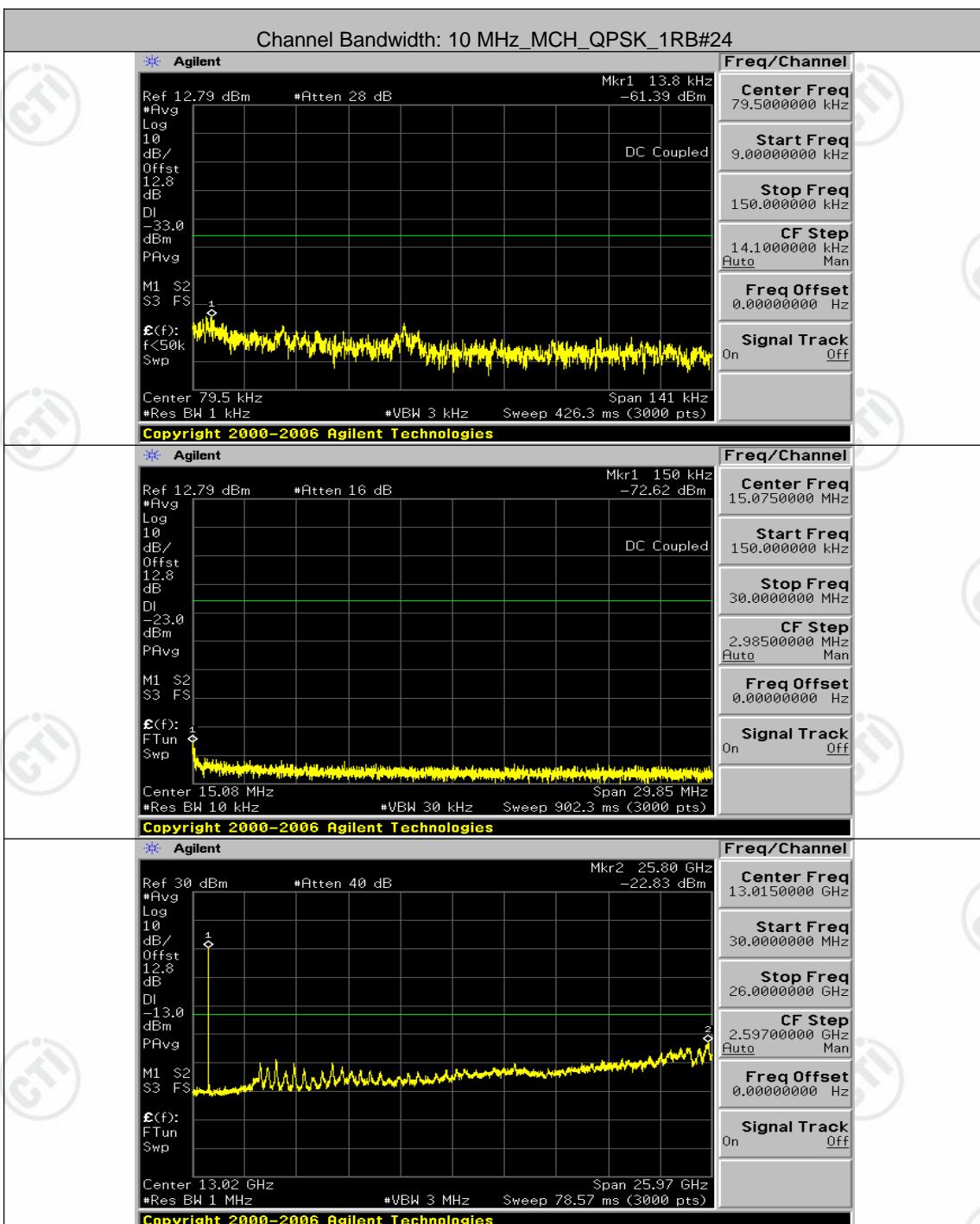
Channel Bandwidth: 10 MHz

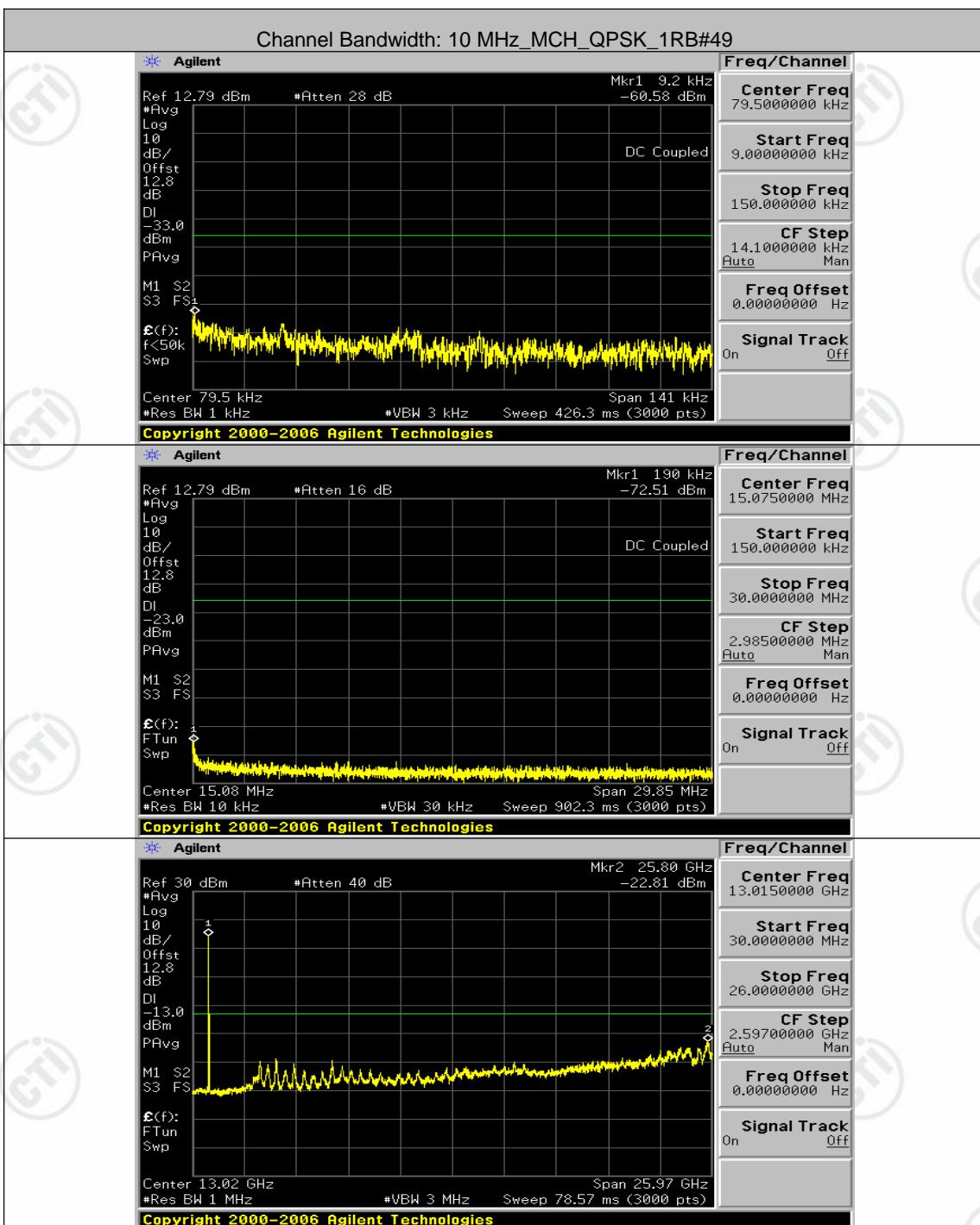


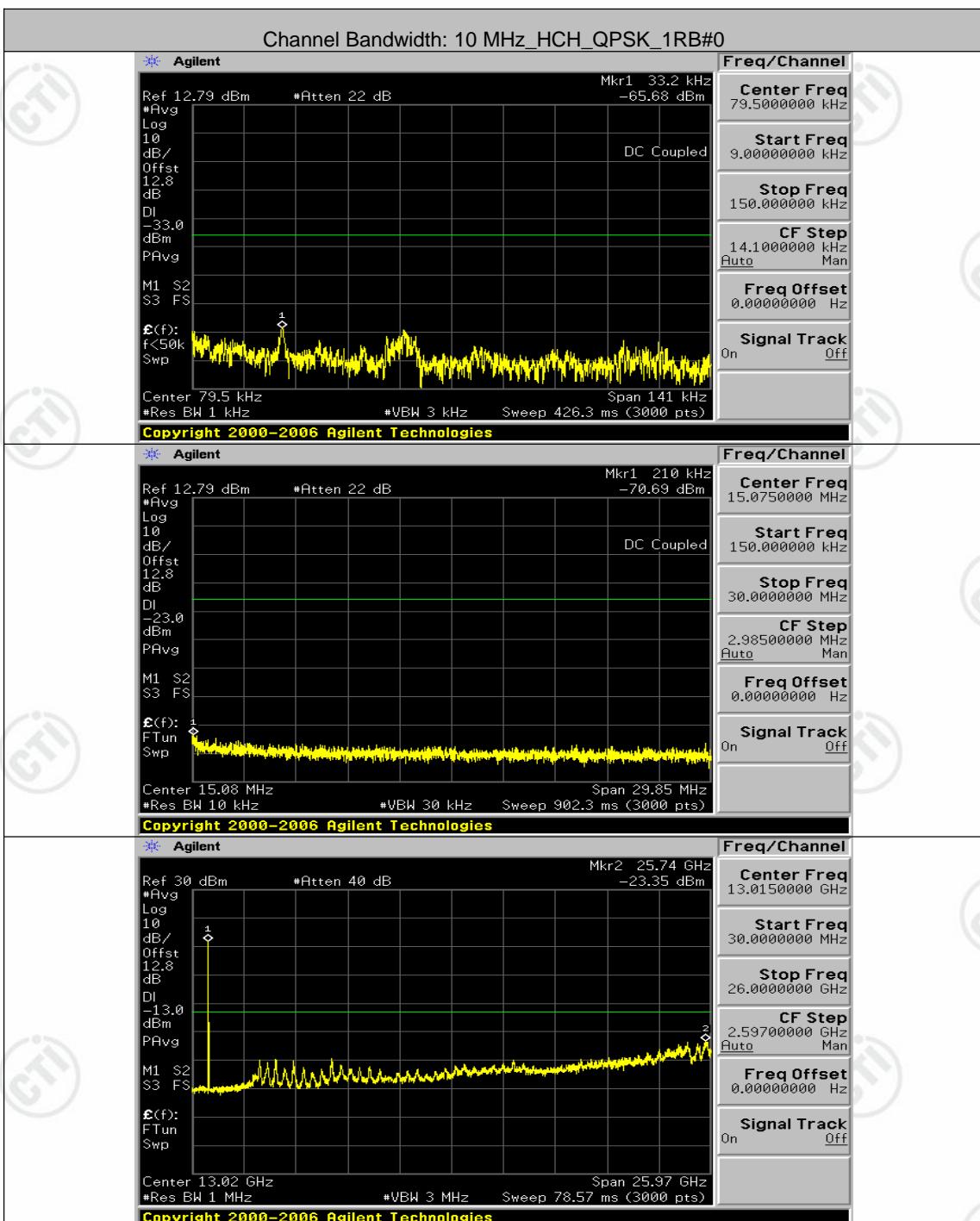


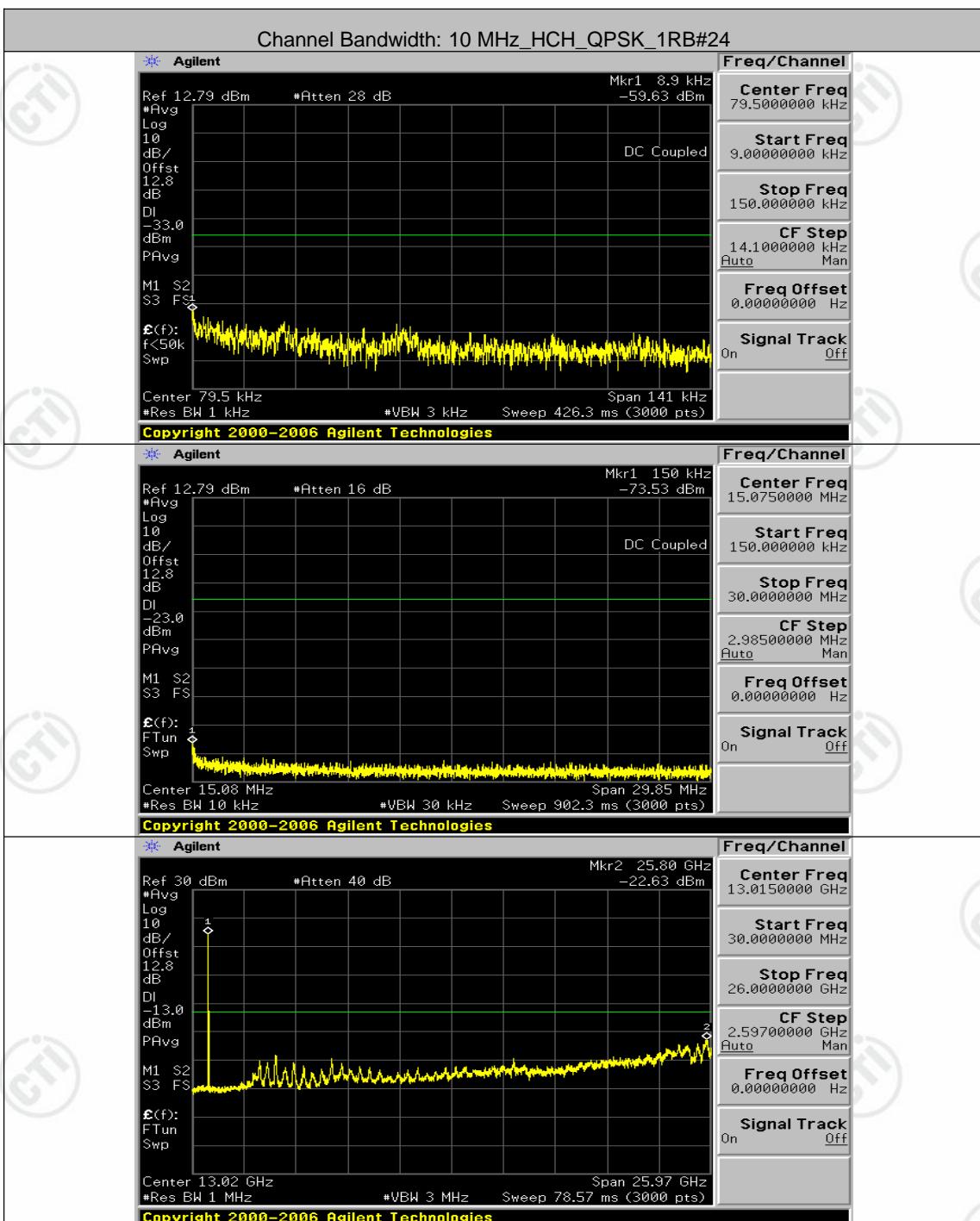


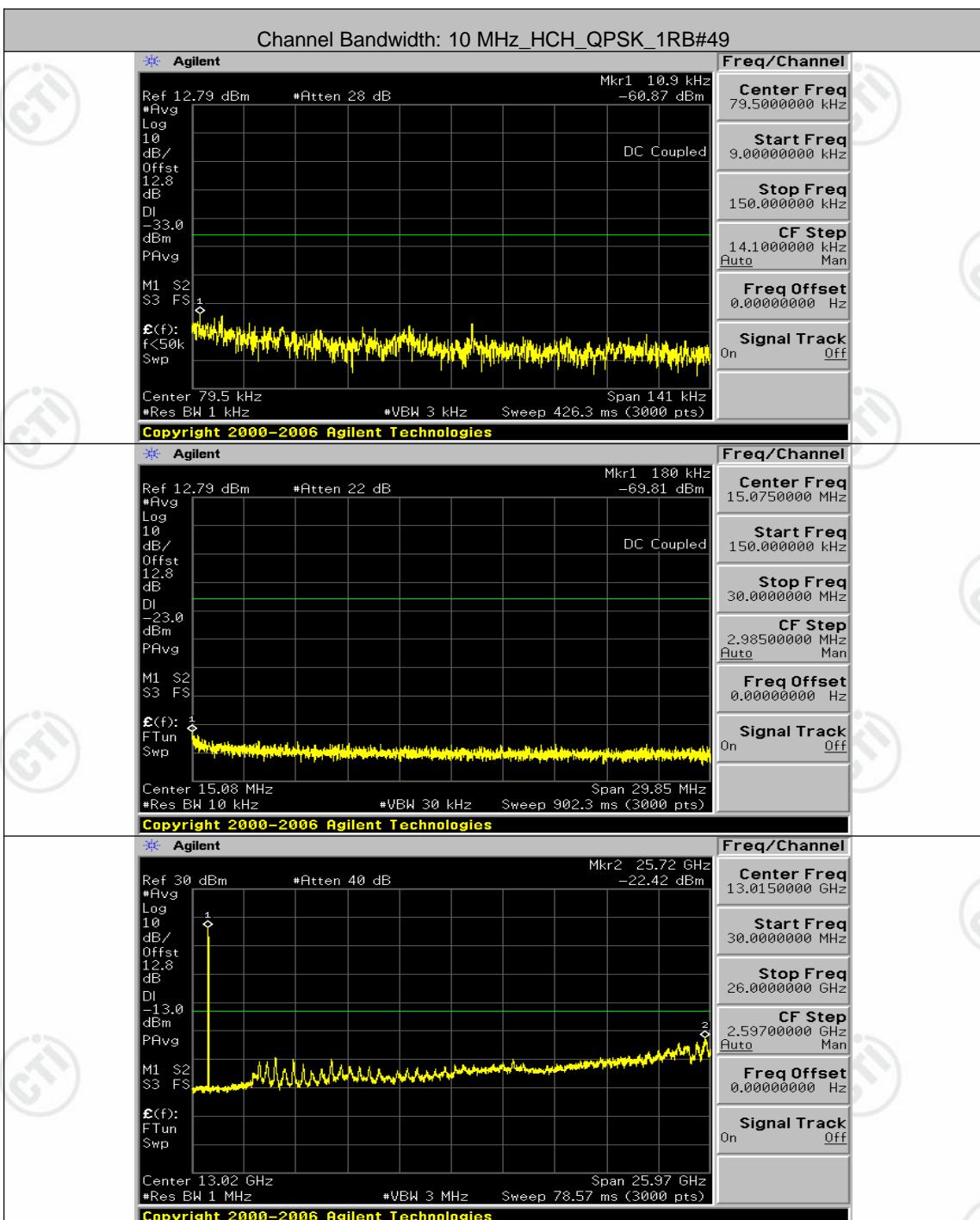


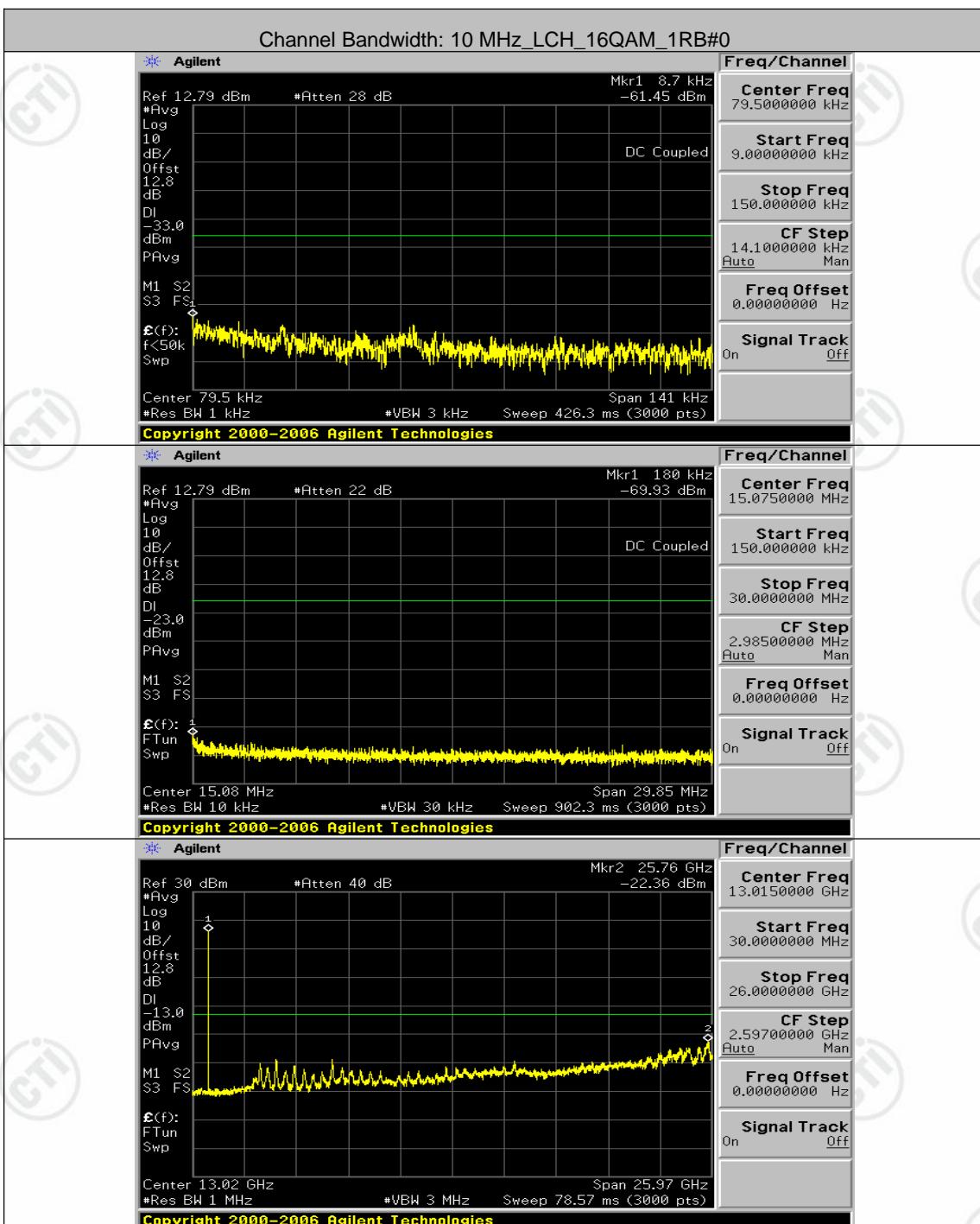


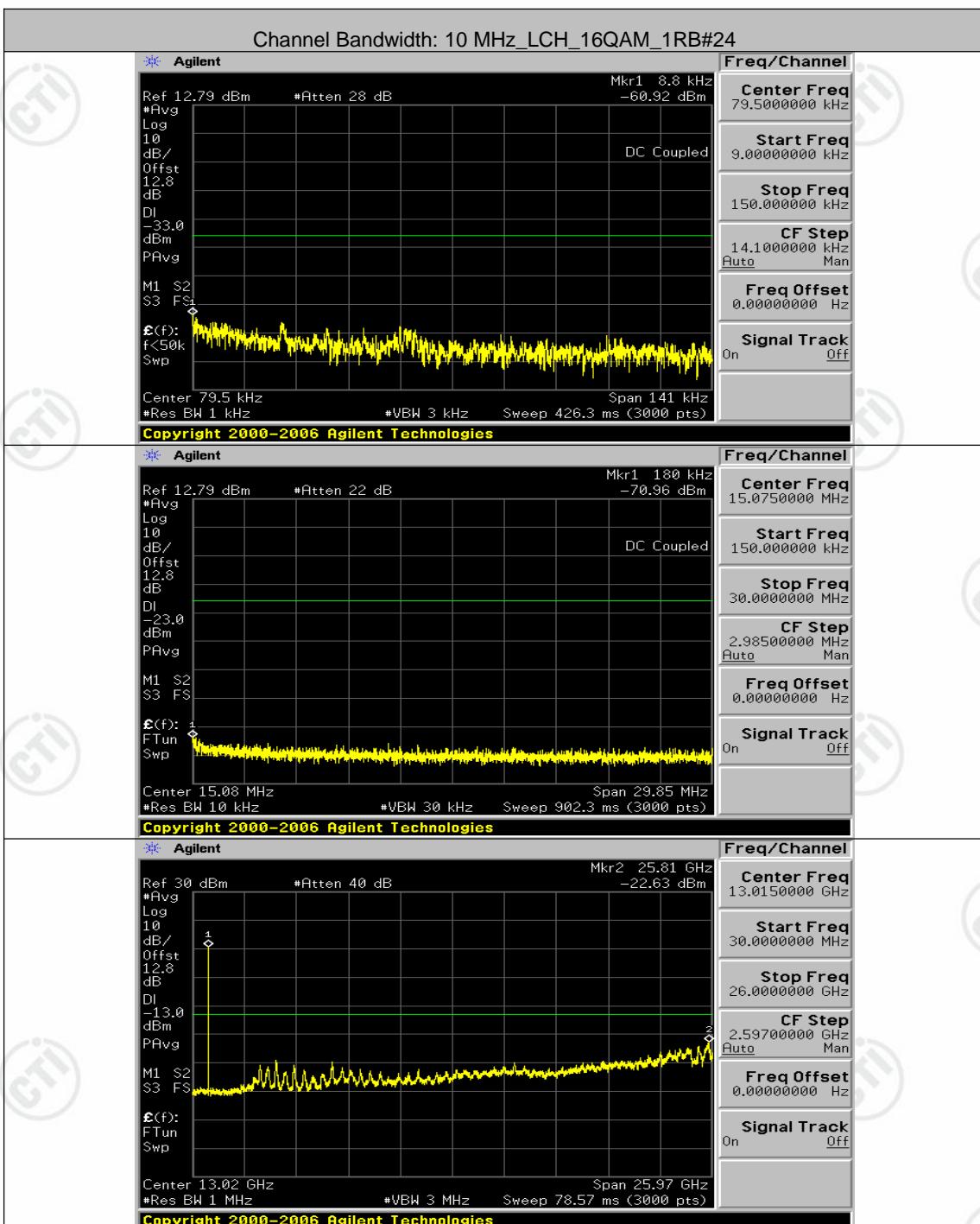


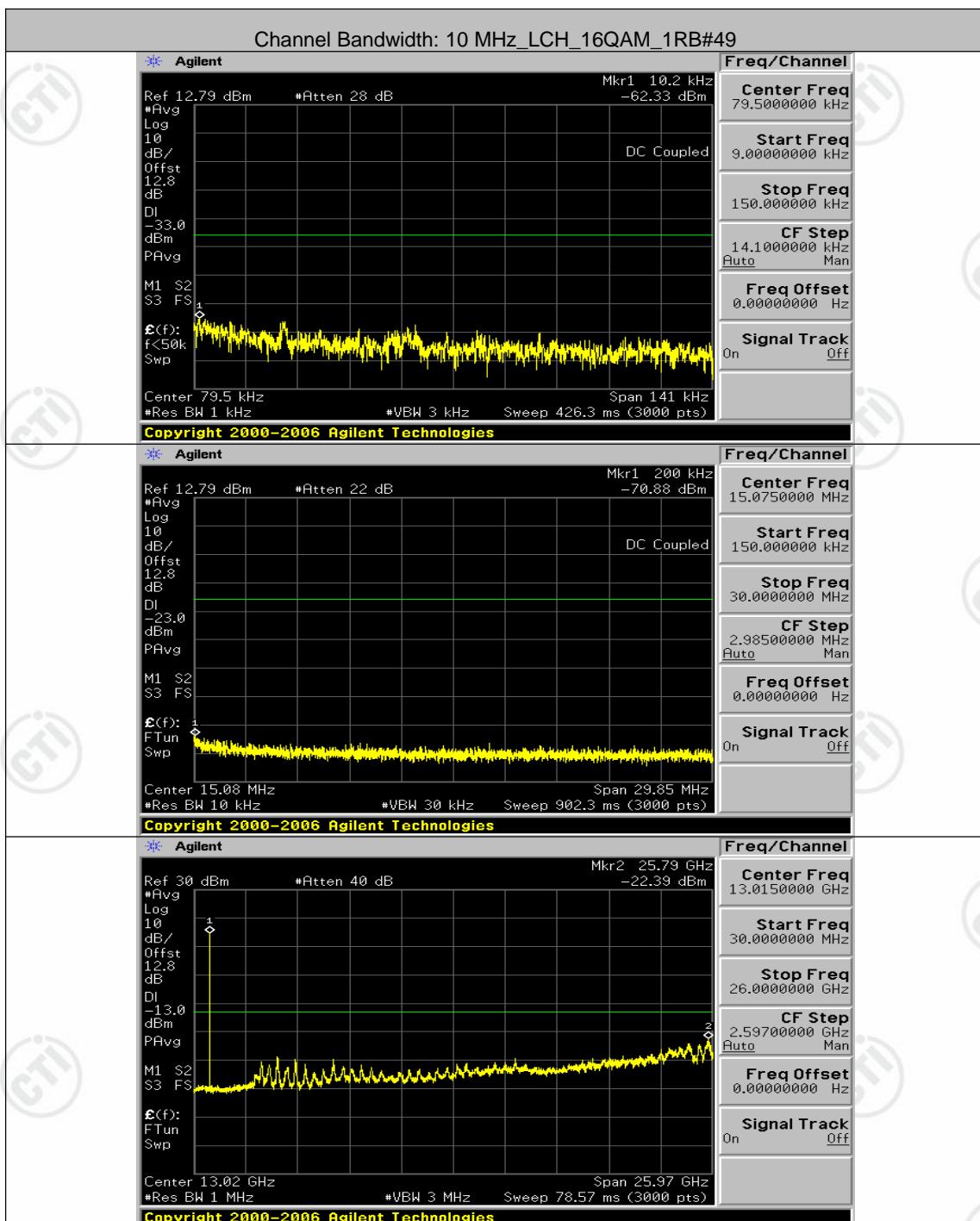


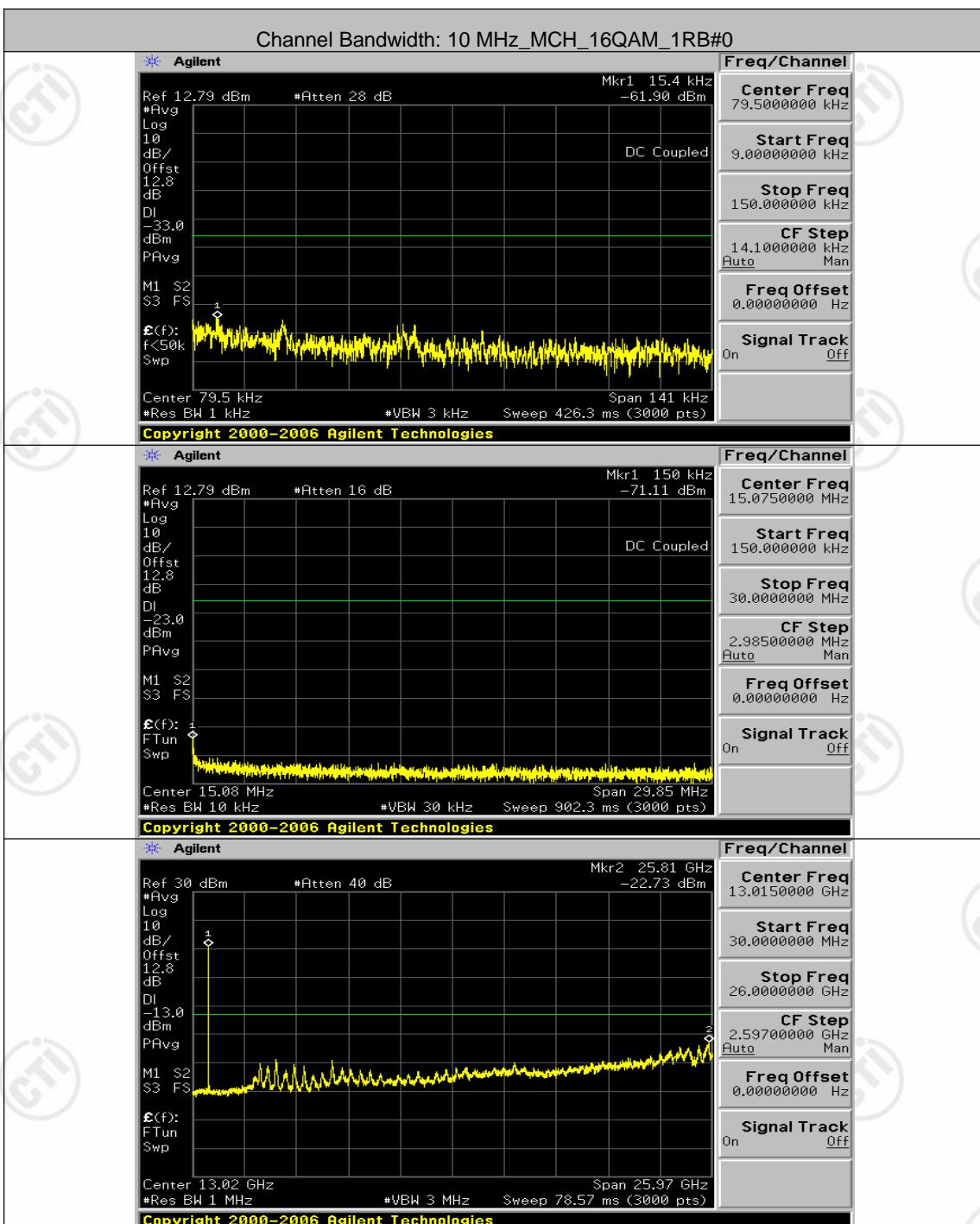


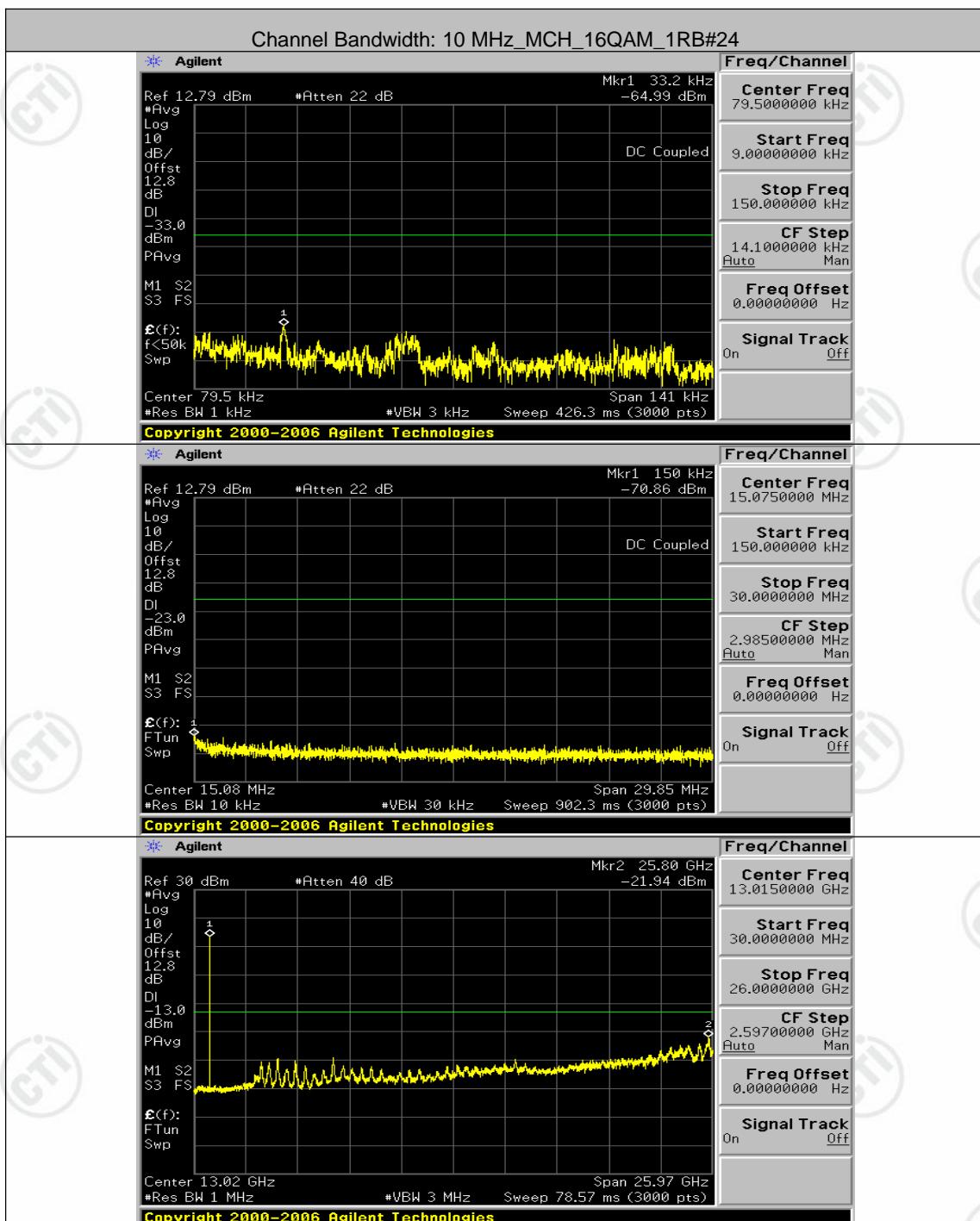


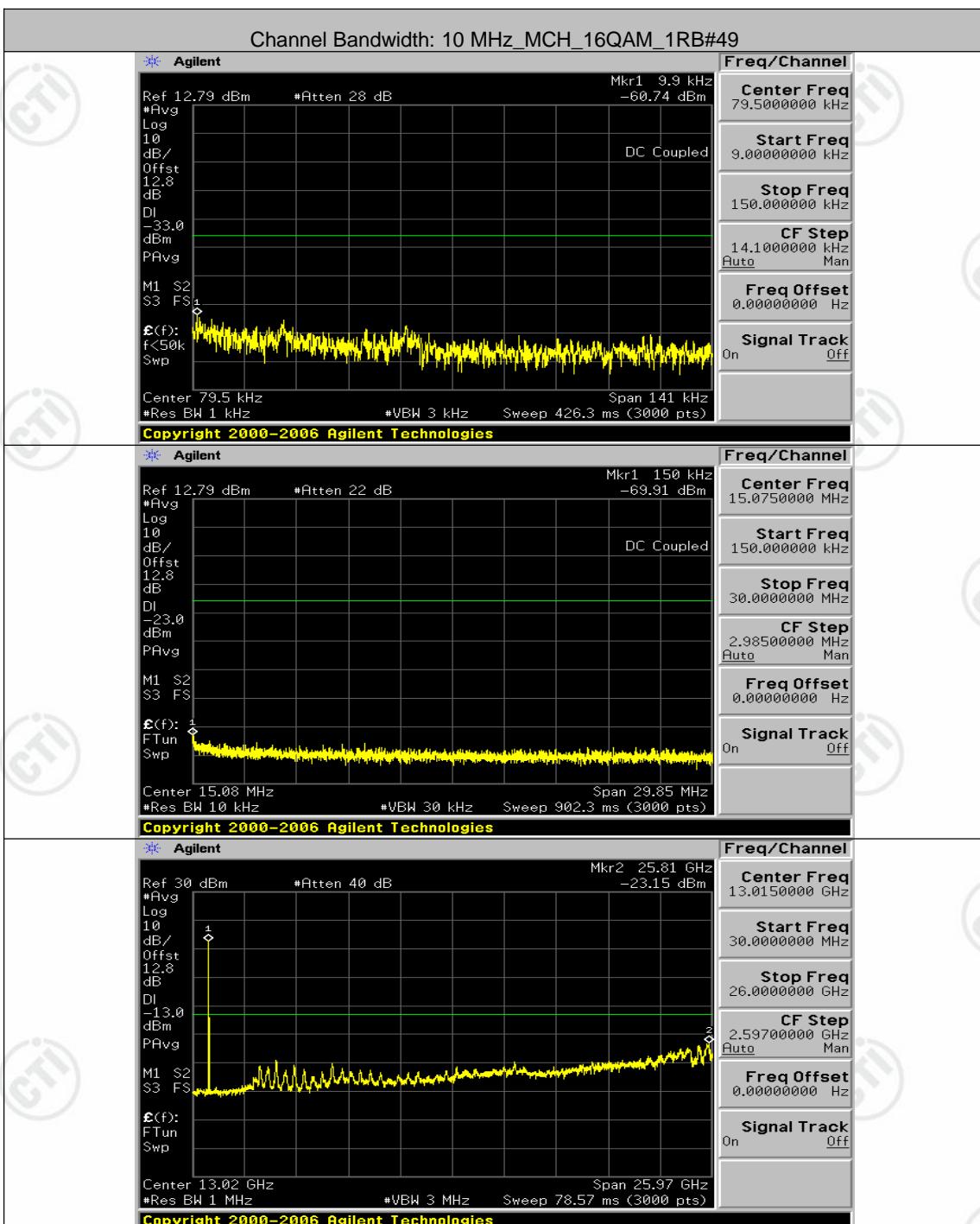


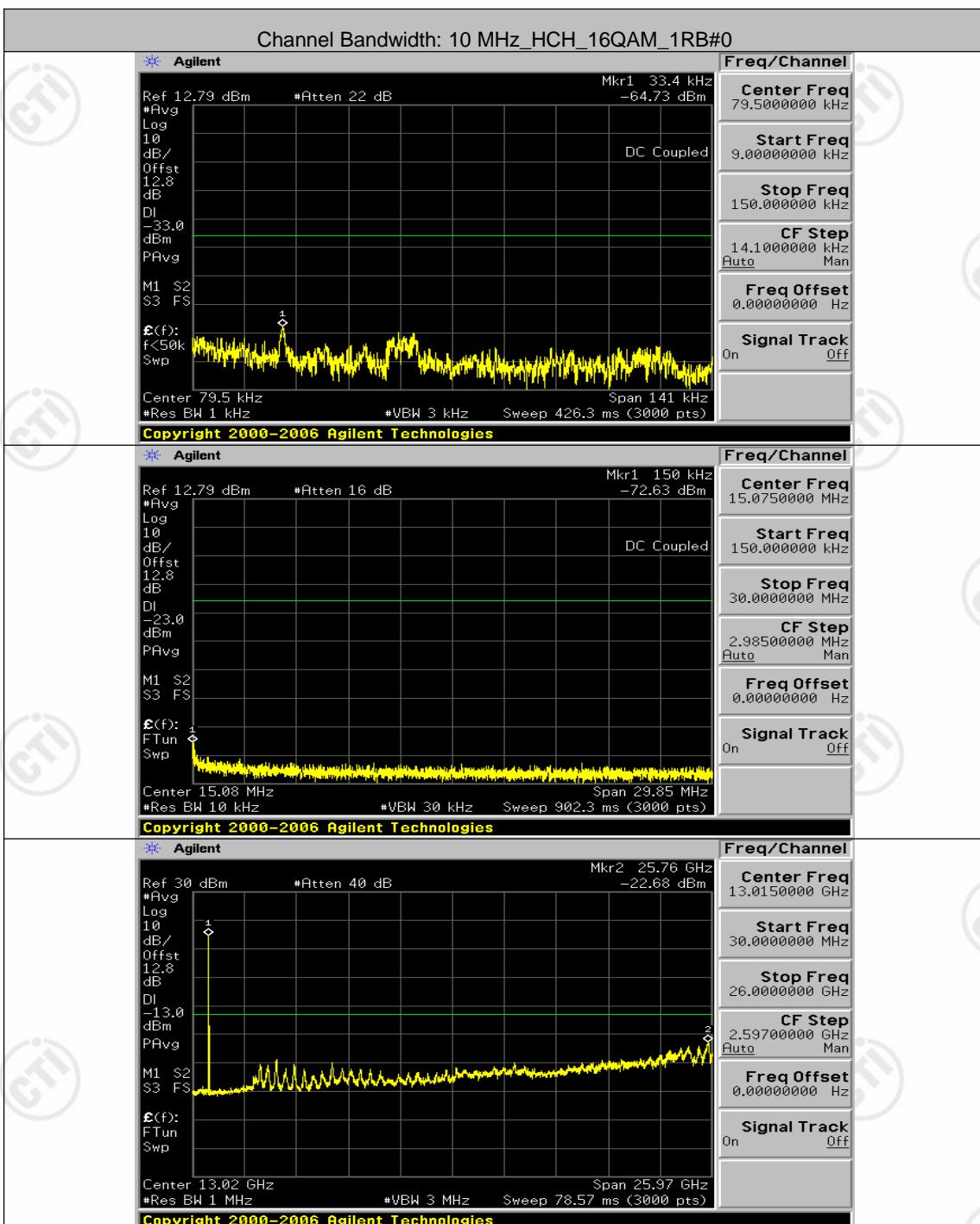


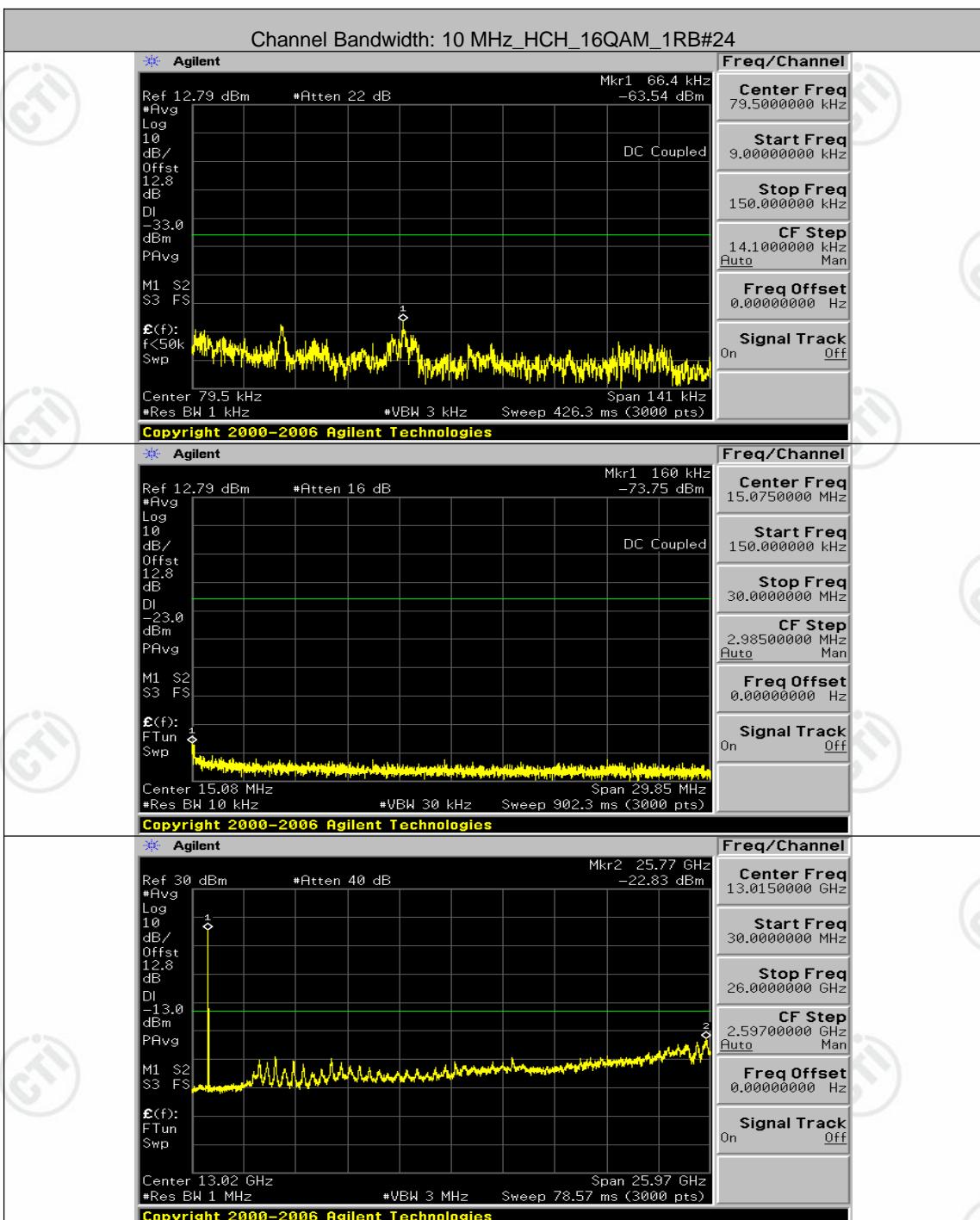


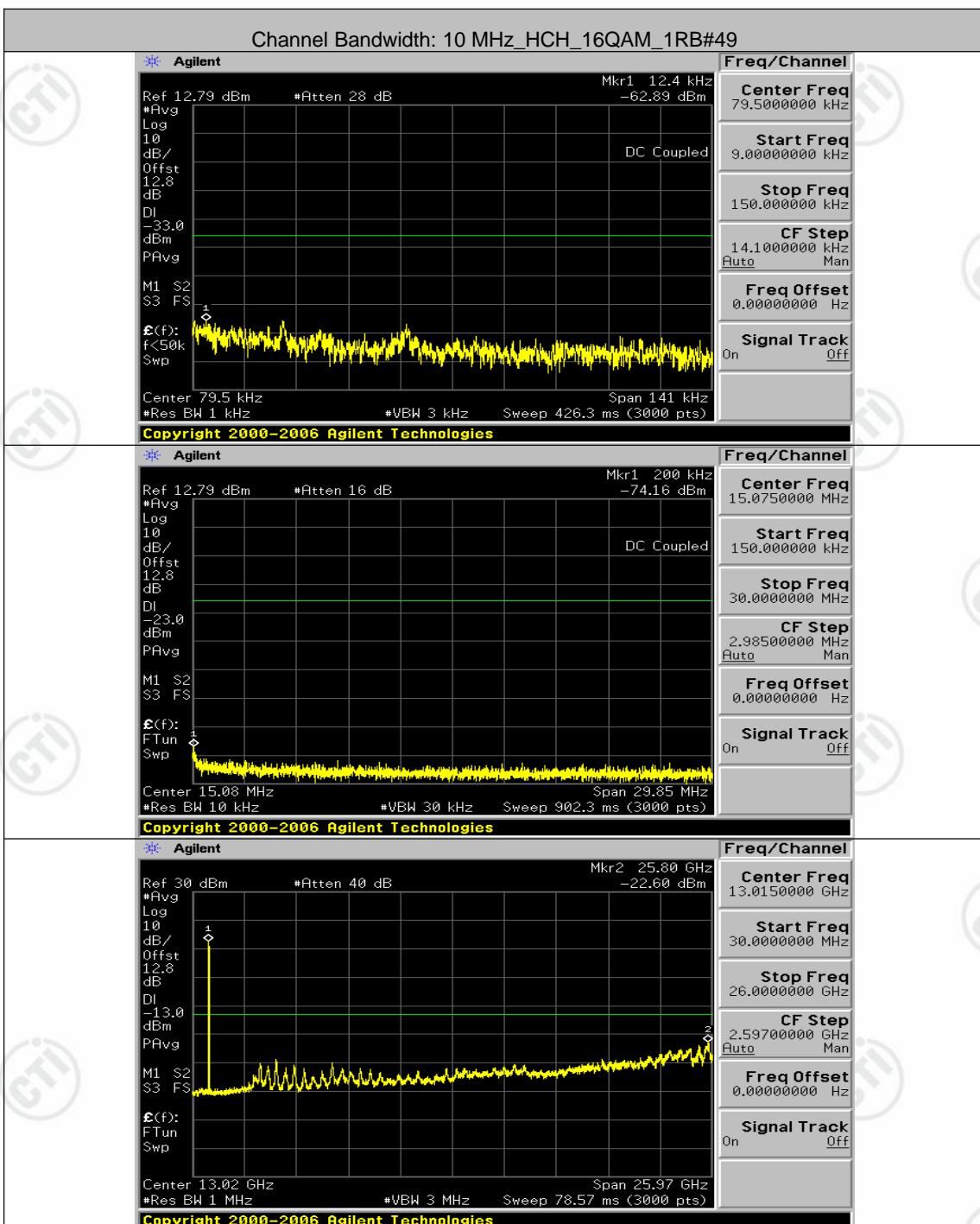












## Appendix E: Frequency Stability

### Test Result

#### Channel Bandwidth: 1.4 MHz

Channel Bandwidth: 1.4 MHz							
Voltage							
Modulation	Channel	Voltage [Vdc]	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
QPSK	LCH	VL	TN	-0.57	-0.000694	± 2.5	PASS
		VN	TN	-0.26	-0.000312	± 2.5	PASS
		VH	TN	-3.63	-0.004406	± 2.5	PASS
	MCH	VL	TN	0.83	0.000992	± 2.5	PASS
		VN	TN	1.50	0.001796	± 2.5	PASS
		VH	TN	-0.19	-0.000222	± 2.5	PASS
	HCH	VL	TN	-1.79	-0.002108	± 2.5	PASS
		VN	TN	-1.33	-0.001568	± 2.5	PASS
		VH	TN	-1.07	-0.001265	± 2.5	PASS
16QAM	LCH	VL	TN	-1.69	-0.002047	± 2.5	PASS
		VN	TN	-1.77	-0.002151	± 2.5	PASS
		VH	TN	-1.76	-0.002134	± 2.5	PASS
	MCH	VL	TN	1.69	0.002018	± 2.5	PASS
		VN	TN	0.99	0.001180	± 2.5	PASS
		VH	TN	0.47	0.000564	± 2.5	PASS
	HCH	VL	TN	-3.62	-0.004266	± 2.5	PASS
		VN	TN	-2.20	-0.002597	± 2.5	PASS
		VH	TN	-2.50	-0.002951	± 2.5	PASS
Temperature							
Modulation	Channel	Voltage [Vdc]	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
QPSK	LCH	VN	-30	0.20	0.000243	± 2.5	PASS
		VN	-20	-1.99	-0.002411	± 2.5	PASS
		VN	-10	-0.01	-0.000017	± 2.5	PASS
		VN	0	-2.90	-0.003521	± 2.5	PASS
		VN	10	-0.49	-0.000590	± 2.5	PASS
		VN	20	1.00	0.001214	± 2.5	PASS
		VN	30	-1.02	-0.001232	± 2.5	PASS
		VN	40	0.27	0.000330	± 2.5	PASS
		VN	50	0.76	0.000919	± 2.5	PASS
	MCH	VN	-30	1.80	0.002155	± 2.5	PASS
		VN	-20	1.32	0.001573	± 2.5	PASS
		VN	-10	0.43	0.000513	± 2.5	PASS
		VN	0	2.45	0.002924	± 2.5	PASS
		VN	10	-0.67	-0.000804	± 2.5	PASS
		VN	20	0.41	0.000496	± 2.5	PASS
		VN	30	-0.60	-0.000718	± 2.5	PASS
		VN	40	-0.54	-0.000650	± 2.5	PASS
		VN	50	0.99	0.001180	± 2.5	PASS
	HCH	VN	-30	-1.04	-0.001231	± 2.5	PASS
		VN	-20	-2.78	-0.003271	± 2.5	PASS
		VN	-10	-2.92	-0.003440	± 2.5	PASS
		VN	0	-3.65	-0.004300	± 2.5	PASS

		VN	10	-0.82	-0.000961	± 2.5	PASS
		VN	20	-3.16	-0.003727	± 2.5	PASS
		VN	30	-2.30	-0.002715	± 2.5	PASS
		VN	40	-2.10	-0.002479	± 2.5	PASS
		VN	50	-2.99	-0.003524	± 2.5	PASS
16QAM	LCH	VN	-30	-0.20	-0.000243	± 2.5	PASS
		VN	-20	-2.05	-0.002480	± 2.5	PASS
		VN	-10	-1.37	-0.001665	± 2.5	PASS
		VN	0	-2.46	-0.002983	± 2.5	PASS
		VN	10	-0.97	-0.001180	± 2.5	PASS
		VN	20	0.30	0.000364	± 2.5	PASS
		VN	30	-0.19	-0.000225	± 2.5	PASS
		VN	40	-2.49	-0.003018	± 2.5	PASS
	MCH	VN	50	-1.30	-0.001578	± 2.5	PASS
		VN	-30	0.36	0.000428	± 2.5	PASS
		VN	-20	-0.43	-0.000513	± 2.5	PASS
		VN	-10	1.13	0.001351	± 2.5	PASS
		VN	0	1.56	0.001864	± 2.5	PASS
		VN	10	1.75	0.002086	± 2.5	PASS
		VN	20	1.95	0.002326	± 2.5	PASS
		VN	30	0.69	0.000821	± 2.5	PASS
	HCH	VN	40	2.20	0.002634	± 2.5	PASS
		VN	50	1.43	0.001710	± 2.5	PASS
		VN	-30	-1.43	-0.001686	± 2.5	PASS
		VN	-20	-1.32	-0.001551	± 2.5	PASS
		VN	-10	-3.63	-0.004283	± 2.5	PASS
		VN	0	-2.06	-0.002428	± 2.5	PASS
		VN	10	-1.86	-0.002192	± 2.5	PASS
		VN	20	-4.18	-0.004924	± 2.5	PASS

## Channel Bandwidth: 3 MHz

Channel Bandwidth: 3 MHz+							
Voltage							
Modulation	Channel	Voltage [Vdc]	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
QPSK	LCH	VL	TN	-4.59	-0.005563	± 2.5	PASS
		VN	TN	-4.45	-0.005389	± 2.5	PASS
		VH	TN	-4.63	-0.005615	± 2.5	PASS
	MCH	VL	TN	1.04	0.001248	± 2.5	PASS
		VN	TN	1.27	0.001522	± 2.5	PASS
		VH	TN	1.34	0.001608	± 2.5	PASS
	HCH	VL	TN	-0.97	-0.001148	± 2.5	PASS
		VN	TN	0.13	0.000152	± 2.5	PASS
		VH	TN	0.67	0.000793	± 2.5	PASS
16QAM	LCH	VL	TN	-1.29	-0.001560	± 2.5	PASS
		VN	TN	-0.26	-0.000312	± 2.5	PASS
		VH	TN	-3.28	-0.003968	± 2.5	PASS
	MCH	VL	TN	-0.27	-0.000325	± 2.5	PASS
		VN	TN	3.36	0.004019	± 2.5	PASS

HCH	VH	TN	2.95	0.003523	± 2.5	PASS	
	VL	TN	-2.27	-0.002684	± 2.5	PASS	
	VN	TN	-1.09	-0.001283	± 2.5	PASS	
	VH	TN	0.30	0.000354	± 2.5	PASS	
Temperature							
Modulation	Channel	Voltage [Vdc]	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
QPSK	LCH	VN	-30	-1.77	-0.002149	± 2.5	PASS
		VN	-20	-3.86	-0.004679	± 2.5	PASS
		VN	-10	-2.90	-0.003518	± 2.5	PASS
		VN	0	-0.43	-0.000520	± 2.5	PASS
		VN	10	-1.63	-0.001976	± 2.5	PASS
		VN	20	-3.56	-0.004315	± 2.5	PASS
		VN	30	-4.28	-0.005181	± 2.5	PASS
		VN	40	-4.28	-0.005181	± 2.5	PASS
		VN	50	-4.13	-0.005008	± 2.5	PASS
	MCH	VN	-30	0.82	0.000975	± 2.5	PASS
		VN	-20	1.56	0.001864	± 2.5	PASS
		VN	-10	2.45	0.002924	± 2.5	PASS
		VN	0	0.59	0.000701	± 2.5	PASS
		VN	10	2.47	0.002958	± 2.5	PASS
		VN	20	2.03	0.002428	± 2.5	PASS
		VN	30	2.06	0.002463	± 2.5	PASS
		VN	40	0.06	0.000068	± 2.5	PASS
		VN	50	1.90	0.002274	± 2.5	PASS
	HCH	VN	-30	-0.17	-0.000203	± 2.5	PASS
		VN	-20	-1.32	-0.001553	± 2.5	PASS
		VN	-10	0.90	0.001063	± 2.5	PASS
		VN	0	-1.19	-0.001401	± 2.5	PASS
		VN	10	-2.86	-0.003376	± 2.5	PASS
		VN	20	-2.55	-0.003004	± 2.5	PASS
		VN	30	0.67	0.000793	± 2.5	PASS
		VN	40	-1.63	-0.001924	± 2.5	PASS
		VN	50	-1.24	-0.001468	± 2.5	PASS
16QAM	LCH	VN	-30	-0.79	-0.000953	± 2.5	PASS
		VN	-20	-1.06	-0.001282	± 2.5	PASS
		VN	-10	-0.82	-0.000988	± 2.5	PASS
		VN	0	-2.65	-0.003206	± 2.5	PASS
		VN	10	-1.65	-0.001993	± 2.5	PASS
		VN	20	-3.18	-0.003847	± 2.5	PASS
		VN	30	-3.20	-0.003882	± 2.5	PASS
		VN	40	-1.47	-0.001785	± 2.5	PASS
		VN	50	-3.10	-0.003760	± 2.5	PASS
	MCH	VN	-30	-0.09	-0.000103	± 2.5	PASS
		VN	-20	2.69	0.003215	± 2.5	PASS
		VN	-10	-0.34	-0.000410	± 2.5	PASS
		VN	0	0.56	0.000667	± 2.5	PASS
		VN	10	1.30	0.001556	± 2.5	PASS
		VN	20	1.09	0.001300	± 2.5	PASS
		VN	30	1.19	0.001419	± 2.5	PASS
		VN	40	-0.77	-0.000923	± 2.5	PASS
		VN	50	3.12	0.003728	± 2.5	PASS

HCH	VN	-30	-2.92	-0.003443	± 2.5	PASS
	VN	-20	0.64	0.000760	± 2.5	PASS
	VN	-10	-1.73	-0.002042	± 2.5	PASS
	VN	0	-2.90	-0.003426	± 2.5	PASS
	VN	10	-1.09	-0.001283	± 2.5	PASS
	VN	20	-2.43	-0.002869	± 2.5	PASS
	VN	30	-2.12	-0.002498	± 2.5	PASS
	VN	40	-1.70	-0.002009	± 2.5	PASS
	VN	50	-0.14	-0.000169	± 2.5	PASS

## Channel Bandwidth: 5 MHz

Channel Bandwidth: 5 MHz							
Voltage							
Modulation	Channel	Voltage [Vdc]	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
QPSK	LCH	VL	TN	0.43	0.000519	± 2.5	PASS
		VN	TN	-1.42	-0.001713	± 2.5	PASS
		VH	TN	-2.16	-0.002614	± 2.5	PASS
	MCH	VL	TN	-0.17	-0.000205	± 2.5	PASS
		VN	TN	0.56	0.000667	± 2.5	PASS
		VH	TN	1.92	0.002292	± 2.5	PASS
	HCH	VL	TN	-1.42	-0.001673	± 2.5	PASS
		VN	TN	-2.86	-0.003380	± 2.5	PASS
		VH	TN	-1.89	-0.002231	± 2.5	PASS
16QAM	LCH	VL	TN	-1.93	-0.002337	± 2.5	PASS
		VN	TN	-1.59	-0.001921	± 2.5	PASS
		VH	TN	-0.17	-0.000208	± 2.5	PASS
	MCH	VL	TN	-1.04	-0.001248	± 2.5	PASS
		VN	TN	0.41	0.000496	± 2.5	PASS
		VH	TN	2.03	0.002428	± 2.5	PASS
	HCH	VL	TN	-1.52	-0.001791	± 2.5	PASS
		VN	TN	-0.50	-0.000591	± 2.5	PASS
		VH	TN	-2.47	-0.002924	± 2.5	PASS
Temperature							
Modulation	Channel	Voltage [Vdc]	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
QPSK	LCH	VN	-30	0.80	0.000969	± 2.5	PASS
		VN	-20	1.07	0.001298	± 2.5	PASS
		VN	-10	-3.28	-0.003964	± 2.5	PASS
		VN	0	-0.67	-0.000813	± 2.5	PASS
		VN	10	-0.97	-0.001177	± 2.5	PASS
		VN	20	-2.03	-0.002458	± 2.5	PASS
		VN	30	-1.92	-0.002319	± 2.5	PASS
		VN	40	-0.60	-0.000727	± 2.5	PASS
		VN	50	-2.36	-0.002856	± 2.5	PASS
	MCH	VN	-30	1.93	0.002309	± 2.5	PASS
		VN	-20	0.72	0.000855	± 2.5	PASS

	HCH	VN	30	-0.49	-0.000581	± 2.5	PASS
		VN	40	0.90	0.001077	± 2.5	PASS
		VN	50	2.69	0.003215	± 2.5	PASS
		VN	-30	-1.57	-0.001859	± 2.5	PASS
		VN	-20	-0.96	-0.001132	± 2.5	PASS
		VN	-10	-1.53	-0.001808	± 2.5	PASS
		VN	0	-0.11	-0.000135	± 2.5	PASS
		VN	10	-1.09	-0.001284	± 2.5	PASS
		VN	20	-0.44	-0.000524	± 2.5	PASS
		VN	30	-3.03	-0.003583	± 2.5	PASS
	LCH	VN	40	-0.87	-0.001031	± 2.5	PASS
		VN	50	-0.77	-0.000913	± 2.5	PASS
		VN	-30	-2.00	-0.002423	± 2.5	PASS
		VN	-20	-1.72	-0.002077	± 2.5	PASS
		VN	-10	0.14	0.000173	± 2.5	PASS
		VN	0	0.36	0.000433	± 2.5	PASS
		VN	10	-3.32	-0.004015	± 2.5	PASS
		VN	20	-3.00	-0.003635	± 2.5	PASS
		VN	30	-1.56	-0.001887	± 2.5	PASS
		VN	40	-2.12	-0.002562	± 2.5	PASS
	MCH	VN	50	-3.26	-0.003946	± 2.5	PASS
		VN	-30	2.69	0.003215	± 2.5	PASS
		VN	-20	2.02	0.002411	± 2.5	PASS
		VN	-10	-0.59	-0.000701	± 2.5	PASS
		VN	0	0.72	0.000855	± 2.5	PASS
		VN	10	0.56	0.000667	± 2.5	PASS
		VN	20	2.00	0.002394	± 2.5	PASS
		VN	30	-1.02	-0.001214	± 2.5	PASS
		VN	40	0.06	0.000068	± 2.5	PASS
		VN	50	-0.76	-0.000906	± 2.5	PASS
	HCH	VN	-30	-2.40	-0.002839	± 2.5	PASS
		VN	-20	-2.66	-0.003143	± 2.5	PASS
		VN	-10	-1.62	-0.001910	± 2.5	PASS
		VN	0	-0.51	-0.000608	± 2.5	PASS
		VN	10	-2.10	-0.002484	± 2.5	PASS
		VN	20	-3.79	-0.004478	± 2.5	PASS
		VN	30	-2.03	-0.002400	± 2.5	PASS
		VN	40	-3.26	-0.003853	± 2.5	PASS
		VN	50	-1.06	-0.001251	± 2.5	PASS

## Channel Bandwidth: 10 MHz

Channel Bandwidth: 10 MHz							
Voltage							
Modulation	Channel	Voltage [Vdc]	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
QPSK	LCH	VL	TN	0.14	0.000173	± 2.5	PASS
		VN	TN	0.54	0.000656	± 2.5	PASS
		VH	TN	0.31	0.000380	± 2.5	PASS
	MCH	VL	TN	0.79	0.000941	± 2.5	PASS
		VN	TN	0.76	0.000906	± 2.5	PASS
		VH	TN	0.19	0.000222	± 2.5	PASS
	HCH	VL	TN	2.30	0.002729	± 2.5	PASS
		VN	TN	-0.47	-0.000559	± 2.5	PASS
		VH	TN	0.74	0.000881	± 2.5	PASS
16QAM	LCH	VL	TN	0.16	0.000190	± 2.5	PASS
		VN	TN	1.13	0.001363	± 2.5	PASS
		VH	TN	2.63	0.003175	± 2.5	PASS
	MCH	VL	TN	-0.04	-0.000051	± 2.5	PASS
		VN	TN	0.59	0.000701	± 2.5	PASS
		VH	TN	1.50	0.001796	± 2.5	PASS
	HCH	VL	TN	0.41	0.000492	± 2.5	PASS
		VN	TN	0.41	0.000492	± 2.5	PASS
		VH	TN	-0.13	-0.000153	± 2.5	PASS
Temperature							
Modulation	Channel	Voltage [Vdc]	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
16QAM	LCH	VN	-30	-0.69	-0.000828	± 2.5	PASS
		VN	-20	0.53	0.000638	± 2.5	PASS
		VN	-10	2.73	0.003296	± 2.5	PASS
		VN	0	3.19	0.003848	± 2.5	PASS
		VN	10	0.23	0.000276	± 2.5	PASS
		VN	20	-0.04	-0.000052	± 2.5	PASS
		VN	30	0.62	0.000742	± 2.5	PASS
		VN	40	-0.79	-0.000949	± 2.5	PASS
		VN	50	-0.92	-0.001104	± 2.5	PASS
	MCH	VN	-30	-0.24	-0.000291	± 2.5	PASS
		VN	-20	-0.33	-0.000393	± 2.5	PASS
		VN	-10	0.10	0.000120	± 2.5	PASS
		VN	0	-0.03	-0.000034	± 2.5	PASS
		VN	10	0.34	0.000410	± 2.5	PASS
		VN	20	1.04	0.001248	± 2.5	PASS
		VN	30	0.24	0.000291	± 2.5	PASS
		VN	40	1.77	0.002121	± 2.5	PASS
		VN	50	-0.92	-0.001094	± 2.5	PASS
	HCH	VN	-30	0.62	0.000729	± 2.5	PASS
		VN	-20	1.54	0.001831	± 2.5	PASS
		VN	-10	2.49	0.002949	± 2.5	PASS
		VN	0	0.44	0.000525	± 2.5	PASS
		VN	10	1.24	0.001475	± 2.5	PASS
		VN	20	-0.82	-0.000966	± 2.5	PASS
		VN	30	1.34	0.001593	± 2.5	PASS
		VN	40	0.00	0.000000	± 2.5	PASS

		VN	50	-0.10	-0.000119	± 2.5	PASS
QPSK	LCH	VN	-30	-0.03	-0.000035	± 2.5	PASS
		VN	-20	0.69	0.000828	± 2.5	PASS
		VN	-10	0.97	0.001173	± 2.5	PASS
		VN	0	-0.40	-0.000483	± 2.5	PASS
		VN	10	2.39	0.002882	± 2.5	PASS
		VN	20	-1.30	-0.001570	± 2.5	PASS
		VN	30	0.51	0.000621	± 2.5	PASS
		VN	40	0.16	0.000190	± 2.5	PASS
		VN	50	3.33	0.004021	± 2.5	PASS
	MCH	VN	-30	0.59	0.000701	± 2.5	PASS
		VN	-20	-1.14	-0.001368	± 2.5	PASS
		VN	-10	1.92	0.002292	± 2.5	PASS
		VN	0	1.39	0.001659	± 2.5	PASS
		VN	10	0.47	0.000564	± 2.5	PASS
		VN	20	1.43	0.001710	± 2.5	PASS
		VN	30	2.25	0.002685	± 2.5	PASS
		VN	40	1.86	0.002223	± 2.5	PASS
		VN	50	0.96	0.001146	± 2.5	PASS
	HCH	VN	-30	-0.94	-0.001119	± 2.5	PASS
		VN	-20	-0.40	-0.000475	± 2.5	PASS
		VN	-10	-0.01	-0.000017	± 2.5	PASS
		VN	0	2.95	0.003492	± 2.5	PASS
		VN	10	0.64	0.000763	± 2.5	PASS
		VN	20	-0.64	-0.000763	± 2.5	PASS
		VN	30	0.10	0.000119	± 2.5	PASS
		VN	40	3.13	0.003712	± 2.5	PASS
		VN	50	-0.01	-0.000017	± 2.5	PASS

## Appendix F: Field strength of spurious radiation

Receiver Setup:	Frequency	Detector	RBW	VBW	Remark
	0.009MHz-30MHz	Peak	10kHz	30kHz	Peak
	30MHz-1GHz	Peak	120kHz	300kHz	Peak
	Above 1GHz	Peak	1MHz	3MHz	Peak
Measurement Procedure:	<p>1. Scan up to 10<sup>th</sup> harmonic, find the maximum radiation frequency to measure.</p> <p>2. The technique used to find the Spurious Emissions of the transmitter was the antenna substitution method. Substitution method was performed to determine the actual ERP/EIRP emission levels of the EUT.</p> <p>Test procedure as below:</p> <ol style="list-style-type: none"> <li>1) The EUT was powered ON and placed on a 1.5m hight table at a 3 meter fully Anechoic Chamber. The antenna of the transmitter was extended to its maximum length. modulation mode and the measuring receiver shall be tuned to the frequency of the transmitter under test.</li> <li>2) The EUT was set 3 meters(above 18GHz the distance is 1 meter) away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.</li> <li>3) The disturbance of the transmitter was maximized on the test receiver display by raising and lowering from 1m to 4m the receive antenna and by rotating through 360° the turntable. After the fundamental emission was maximized, a field strength measurement was made.</li> <li>4) Steps 1) to 3) were performed with the EUT and the receive antenna in both vertical and horizontal polarization.</li> <li>5) The transmitter was then removed and replaced with another antenna. The center of the antenna was approximately at the same location as the center of the transmitter.</li> <li>6) A signal at the disturbance was fed to the substitution antenna by means of a non-radiating cable. With both the substitution and the receive antennas horizontally polarized, the receive antenna was raised and lowered to obtain a maximum reading at the test receiver. The level of the signal generator was adjusted until the measured field strength level in step 3) is obtained for this set of conditions.</li> <li>7) The output power into the substitution antenna was then measured.</li> <li>8) Steps 6) and 7) were repeated with both antennas polarized.</li> <li>9) Calculate power in dBm by the following formula:  <math display="block">\text{ERP(dBm)} = \text{Pg(dBm)} - \text{cable loss (dB)} + \text{antenna gain (dBd)}</math> <math display="block">\text{EIRP(dBm)} = \text{Pg(dBm)} - \text{cable loss (dB)} + \text{antenna gain (dBi)}</math> <math display="block">\text{EIRP} = \text{ERP} + 2.15\text{dB}</math> <p>where:  <math>\text{Pg}</math> is the generator output power into the substitution antenna.</p> </li> <li>10) Test the EUT in the lowest channel, the middle channel the Highest channel</li> <li>11) The radiation measurements are performed in X, Y, Z axis positioning for EUT operation mode, And found the X axis positioning which it is worse case.</li> <li>12) Repeat above procedures until all frequencies measured was complete.</li> </ol>				
Limit:	Attenuated at least $43 + 10\log(P)$				

**Test Data:**  
**Above 1GHz**  
**QPSK**

Band 5 20407 channel/BW1.4(lowest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1346.929	151	336	-53.80	-13	-40.80	Pass	H
1646.948	150	20	-50.66	-13	-37.66	Pass	H
2412.718	155	174	-37.37	-13	-24.37	Pass	H
3598.087	150	50	-50.12	-13	-37.12	Pass	H
6561.030	150	158	-46.11	-13	-33.11	Pass	H
9157.857	156	91	-44.61	-13	-31.61	Pass	H
1350.362	149	200	-54.91	-13	-41.91	Pass	V
1646.948	158	36	-48.74	-13	-35.74	Pass	V
2406.584	150	55	-39.25	-13	-26.25	Pass	V
4617.550	150	10	-48.86	-13	-35.86	Pass	V
6379.864	155	27	-45.88	-13	-32.88	Pass	V
11140.850	144	11	-43.94	-13	-30.94	Pass	V

Band 5 20525 channel/BW1.4(middle channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1350.362	158	114	-54.64	-13	-41.64	Pass	H
1672.296	150	100	-48.57	-13	-35.57	Pass	H
2500.251	144	251	-50.45	-13	-37.45	Pass	H
3598.087	150	36	-48.82	-13	-35.82	Pass	H
6396.125	156	200	-45.23	-13	-32.23	Pass	H
9985.762	150	78	-45.02	-13	-32.02	Pass	H
1115.673	150	54	-55.85	-13	-42.85	Pass	V
1672.296	158	121	-53.50	-13	-40.50	Pass	V
2412.718	150	20	-36.59	-13	-23.59	Pass	V
4202.500	154	33	-50.18	-13	-37.18	Pass	V
6527.712	160	11	-46.18	-13	-33.18	Pass	V
11140.850	150	20	-43.93	-13	-30.93	Pass	V

Band 5 20643 channel/BW1.4(highest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1115.673	150	88	-56.49	-13	-43.49	Pass	H
1693.716	154	224	-50.68	-13	-37.68	Pass	H
2412.718	150	110	-40.17	-13	-27.17	Pass	H
4846.367	155	360	-49.96	-13	-36.96	Pass	H
6478.053	148	78	-46.45	-13	-33.45	Pass	H
12334.980	150	22	-42.99	-13	-29.99	Pass	H
1198.095	150	59	-56.13	-13	-43.13	Pass	V
1693.716	150	10	-51.30	-13	-38.30	Pass	V
2412.718	154	45	-38.47	-13	-25.47	Pass	V
3607.257	150	110	-50.14	-13	-37.14	Pass	V
6544.350	155	64	-45.40	-13	-32.40	Pass	V
11933.470	148	20	-42.49	-13	-29.49	Pass	V

**16QAM**

Band 5 20407 channel/BW1.4(lowest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1346.929	155	336	-57.77	-13	-44.77	Pass	H
1646.948	147	20	-54.01	-13	-41.01	Pass	H
2481.231	150	11	-52.45	-13	-39.45	Pass	H
3805.334	151	247	-49.84	-13	-36.84	Pass	H
6412.427	150	226	-46.41	-13	-33.41	Pass	H
9441.913	156	89	-45.22	-13	-32.22	Pass	H
1346.929	158	360	-55.25	-13	-42.25	Pass	V
1646.948	155	78	-49.50	-13	-36.50	Pass	V
2500.251	150	200	-50.80	-13	-37.80	Pass	V
4332.852	154	54	-49.56	-13	-36.56	Pass	V
6511.117	149	81	-46.13	-13	-33.13	Pass	V
11197.710	150	51	-44.79	-13	-31.79	Pass	V

Band 5 20525 channel/BW1.4(middle channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1150.279	151	51	-56.72	-13	-43.72	Pass	H
2024.074	158	77	-54.72	-13	-41.72	Pass	H
3598.087	150	213	-49.52	-13	-36.52	Pass	H
6478.053	150	20	-46.15	-13	-33.15	Pass	H
9251.580	150	68	-45.08	-13	-32.08	Pass	H
12303.620	148	200	-42.78	-13	-29.78	Pass	H
1147.354	141	151	-57.09	-13	-44.09	Pass	V
2698.665	150	20	-51.88	-13	-38.88	Pass	V
4444.562	158	67	-49.57	-13	-36.57	Pass	V
6511.117	156	338	-46.16	-13	-33.16	Pass	V
9111.353	150	20	-45.88	-13	-32.88	Pass	V
11140.850	150	49	-44.38	-13	-31.38	Pass	V

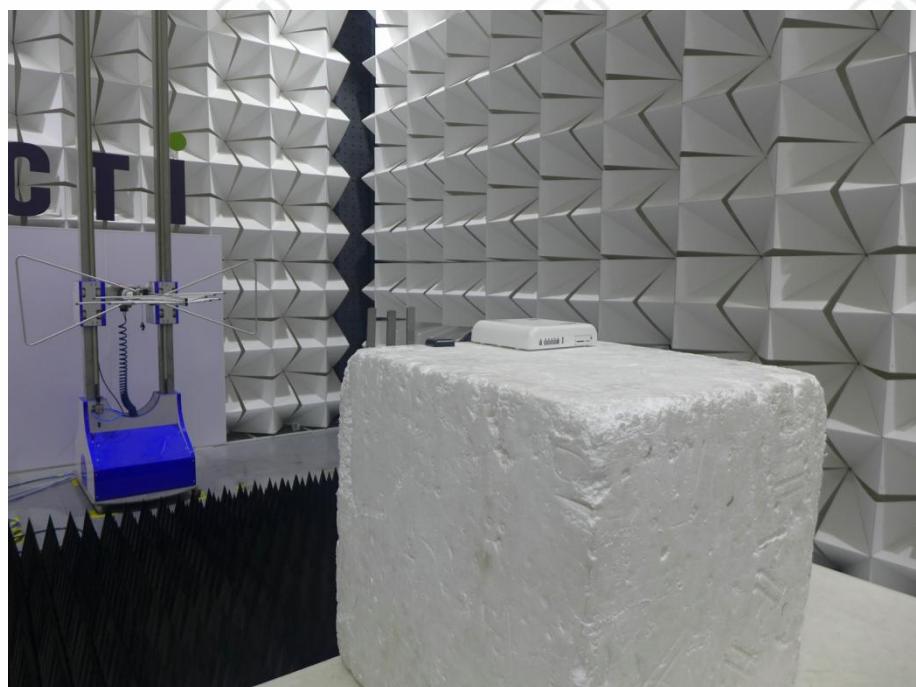
Band 5 20643 channel/BW1.4(highest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1350.362	151	55	-56.62	-13	-43.62	Pass	H
3128.013	150	11	-50.74	-13	-37.74	Pass	H
4433.263	152	261	-49.50	-13	-36.50	Pass	H
6527.712	148	200	-46.41	-13	-33.41	Pass	H
8527.851	150	315	-45.39	-13	-32.39	Pass	H
11169.240	153	78	-44.10	-13	-31.10	Pass	H
1350.362	156	91	-57.20	-13	-44.20	Pass	V
1668.044	150	200	-53.28	-13	-40.28	Pass	V
3776.385	151	45	-49.35	-13	-36.35	Pass	V
5910.798	155	36	-47.49	-13	-34.49	Pass	V
7941.185	160	110	-46.47	-13	-33.47	Pass	V
10295.500	148	72	-45.07	-13	-32.07	Pass	V

## Note:

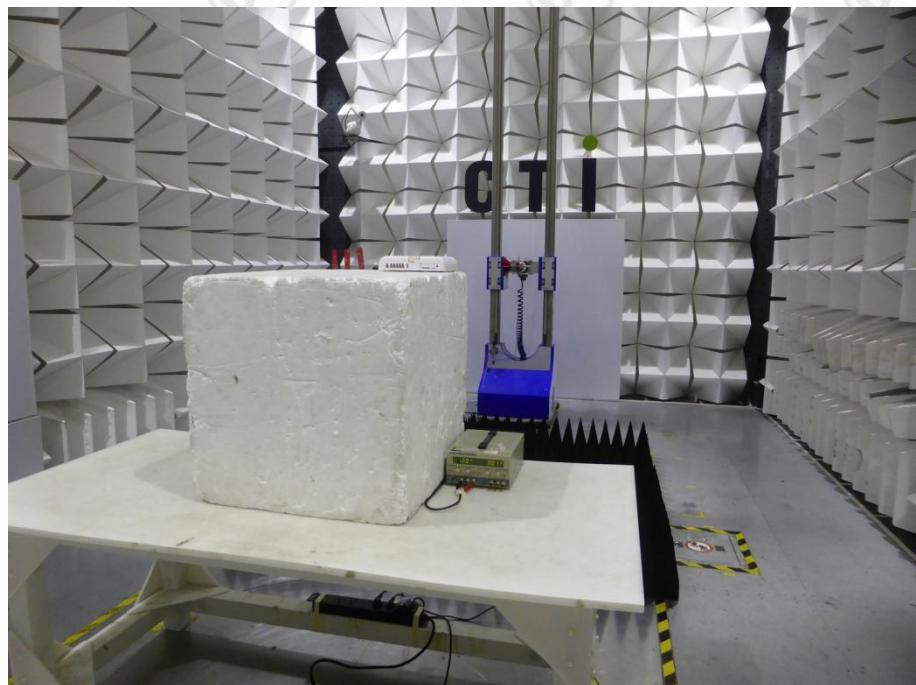
1) Scan from 9kHz to 25GHz, the disturbance above 13GHz and below 1GHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.

## PHOTOGRAPHS OF TEST SETUP

Test model No.: TN-IVS-8000



**Radiated spurious emission Test Setup-1(Below 1GHz)**



**Radiated spurious emission Test Setup-2(Above 1GHz)**

**Annex A: Appendix A: PHOTOGRAPHS OF EUT Constructional Details**  
**(Please See Appendix A)**

\*\*\* End of Report \*\*\*

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