

TEST REPORT

Product : Intelligent Vehicle Network Gateway
Trade mark : TN-IVS-8000
Model/Type reference : TN-IVS-8000
Serial Number : N/A
Report Number : EED32I00216507
FCC ID : 2AJDT-TNIVS8000
Date of Issue : Sep. 28, 2016
Test Standards : 47 CFR Part 2(2015)
47 CFR Part 27 subpart C(2015)
Test result : PASS

Prepared for:

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6th FL Building A, The Intelligence e Valley, No. 482 Qianmo Road,
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2 Version

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

3 Test Summary

LTE Band 17			
Test Item	Test Requirement	Test method	Result
Conducted output power	Part 2.1046(a) /Part 27.50(c)	TIA-603-D-2010&KDB 971168 D01v02r02	PASS
Effective Radiated Power of Transmitter(EIRP)	Part 2.1046(a) / Part 27.50(c)	TIA-603-D-2010 &KDB 971168 D01v02r02	PASS
peak-to-average ratio	Part 27.50(c)	KDB 971168 D01v02r02	PASS
99% &26dB Occupied Bandwidth	Part 2.1049(g)	Part 27.53(g) &KDB 971168 D01v02r02	PASS
Band Edge at antenna terminals	Part 2.1051/ Part 27.53(g)	Part 27.53(g) &KDB 971168 D01v02r02	PASS
Spurious emissions at antenna terminals	Part 2.1051/ Part 27.53(g)	TIA-603-D-2010 &KDB 971168 D01v02r02	PASS
Field strength of spurious radiation	Part 2.1053/ Part 27.53(g)	TIA-603-D-2010 &KDB 971168 D01v02r02	PASS
Frequency stability	Part 2.1055/Part 27.54	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:

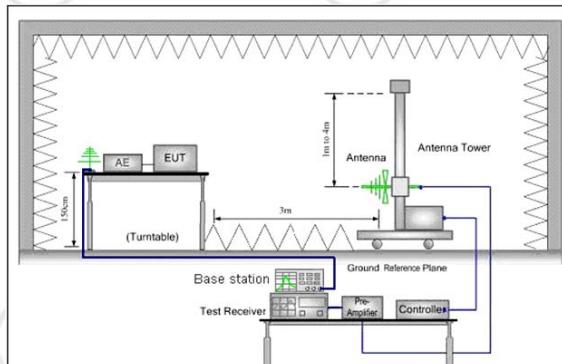


Figure 1. 30MHz to 1GHz

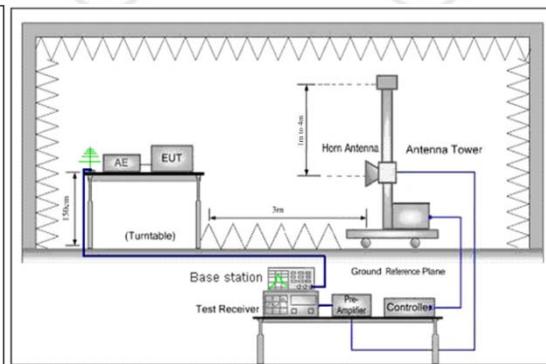


Figure 2. above 1GHz

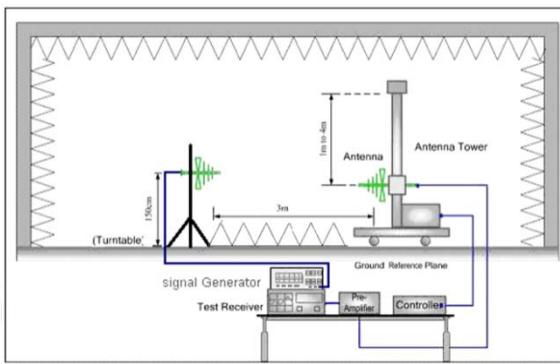


Figure 1. 30MHz to 1GHz

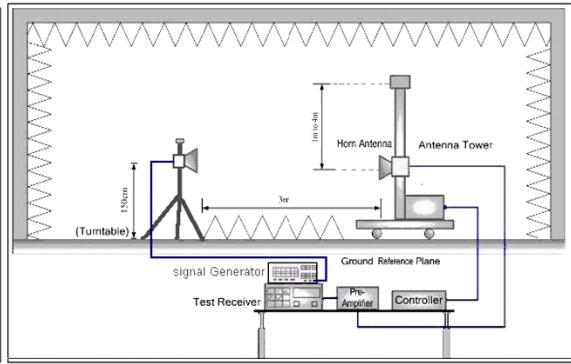


Figure 2. above 1GHz

5.2 Test Environment

Operating Environment:

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

5.3 Test Condition

Test channel:

Test Mode	Test Frequency ID	Bandwidth (MHz)	Number [UL]	Frequency of Uplink(MHz)	Number [DL]	Frequency of Downlink(MHz)
LTEband17 TX:704-716MHz RX:734-746MHz	Low Range	5	23755	706.5	5755	736.5
		10	23780	709	5780	739
	Mid Range	5/10	23790	710	5790	740
		5	23825	713.5	5825	743.5
	High Range	10	23800	711	5800	741

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 17: TX:704-716MHz, RX:734-746MHz
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	7.9×10^{-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)/ Part 27.50(c)	TIA-603-D&KDB 971168 D01v02r02	Conducted output power	PASS	Appendix A)
Part 2.1049(g)	Part 27.53(g) &KDB 971168 D01v02r02	99% &26dB Occupied Bandwidth	PASS	Appendix B)
Part 2.1051/Part 22.917(a)/ Part 27.53(g)	Part 27.53(g) &KDB 971168 D01v02r02	Band Edge at antenna terminals	PASS	Appendix C)
Part 2.1051/ Part 2.1057/ Part 27.53(g)	TIA-603-D &KDB 971168 D01v02r02	Spurious emissions at antenna terminals	PASS	Appendix D)
Part 2.1055/ Part 22.355/ Part 27.54	TIA-603-D &KDB 971168 D01v02r02	Frequency stability	PASS	Appendix E)
Part 2.1053/ Part 2.1057/ Part 27.53(g)	TIA-603-D &KDB 971168 D01v02r02	Field strength of spurious radiation	PASS	Appendix F)
Part 2.1046(a)/ Part 27.50(g)	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"> 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. 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. 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. 4) Steps 1) to 3) were performed with the EUT and the receive antenna in both vertical and horizontal polarization. 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. 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. 7) The output power into the substitution antenna was then measured. 8) Steps 6) and 7) were repeated with both antennas polarized. 9) Calculate power in dBm by the following formula: $\text{ERP(dBm)} = \text{Pg(dBm)} - \text{cable loss (dB)} + \text{antenna gain (dBd)}$ $\text{EIRP(dBm)} = \text{Pg(dBm)} - \text{cable loss (dB)} + \text{antenna gain (dBi)}$ $\text{EIRP} = \text{ERP} + 2.15\text{dB}$ where: Pg is the generator output power into the substitution antenna. 10) Test the EUT in the lowest channel, the middle channel the Highest channel 11) Repeat above procedures until all frequencies measured was complete. 																			
Limit:	<table border="1"> <tr> <td>Mode</td><td>LTE band 17</td></tr> <tr> <td>Limit</td><td>34.77dBm (3W)</td></tr> </table>					Mode	LTE band 17	Limit	34.77dBm (3W)											
Mode	LTE band 17																			
Limit	34.77dBm (3W)																			

Test Result**Channel Bandwidth: 5 MHz**

Modulation	Channel	RB Configuration		Average Power [dBm]	E.r.p [dBm]	Verdict
		Size	Offset			
QPSK	LCH	1	0	23.13	23.79	PASS
		1	12	23.03	23.78	PASS
		1	24	22.94	23.75	PASS
		12	0	21.95	23.73	PASS
		12	6	21.90	23.68	PASS
		12	13	21.89	23.66	PASS
		25	0	21.89	23.61	PASS
	MCH	1	0	22.95	23.30	PASS
		1	12	23.06	23.29	PASS
		1	24	22.93	23.27	PASS
		12	0	21.89	23.23	PASS
		12	6	21.95	23.20	PASS
		12	13	21.83	23.19	PASS
		25	0	21.87	23.15	PASS
16QAM	HCH	1	0	23.01	23.76	PASS
		1	12	23.04	23.74	PASS
		1	24	22.54	23.71	PASS
		12	0	21.91	23.68	PASS
		12	6	21.86	23.65	PASS
		12	13	21.83	23.62	PASS
		25	0	21.77	23.54	PASS
	LCH	1	0	22.01	22.09	PASS
		1	12	21.90	22.01	PASS
		1	24	21.92	22.99	PASS
		12	0	20.97	22.95	PASS
		12	6	20.90	22.91	PASS
		12	13	20.91	21.87	PASS
		25	0	20.90	21.85	PASS
	MCH	1	0	21.82	22.67	PASS
		1	12	21.91	22.62	PASS
		1	24	21.95	22.60	PASS
		12	0	20.88	21.54	PASS
		12	6	20.96	21.52	PASS
		12	13	20.88	21.50	PASS
		25	0	20.89	21.51	PASS
	HCH	1	0	21.88	22.87	PASS
		1	12	22.00	22.87	PASS
		1	24	21.35	22.99	PASS
		12	0	20.88	22.54	PASS
		12	6	20.87	21.53	PASS
		12	13	20.73	21.42	PASS
		25	0	20.73	21.42	PASS

Channel Bandwidth: 10 MHz

Modulation	Channel	RB Configuration		Average Power [dBm]	E.i.r.p [dBm]	Verdict
		Size	Offset			
QPSK	LCH	1	0	22.89	23.26	PASS
		1	24	22.86	23.24	PASS
		1	49	22.85	23.23	PASS
		25	0	21.92	22.14	PASS
		25	12	21.99	22.16	PASS
		25	25	21.83	22.10	PASS
		50	0	21.79	22.99	PASS
	MCH	1	0	22.68	23.05	PASS
		1	24	22.93	23.04	PASS
		1	49	22.75	23.00	PASS
		25	0	21.89	21.99	PASS
		25	12	21.94	21.95	PASS
		25	25	21.91	21.91	PASS
		50	0	21.89	21.90	PASS
16QAM	LCH	1	0	22.97	23.03	PASS
		1	24	22.91	23.00	PASS
		1	49	22.57	22.98	PASS
		25	0	21.95	22.91	PASS
		25	12	22.03	22.88	PASS
		25	25	21.81	22.61	PASS
		50	0	21.82	22.62	PASS
	MCH	1	0	21.89	22.28	PASS
		1	24	21.80	22.18	PASS
		1	49	21.78	22.07	PASS
		25	0	20.95	22.00	PASS
		25	12	20.95	22.97	PASS
		25	25	20.79	22.92	PASS
		50	0	20.80	22.87	PASS
	HCH	1	0	21.65	22.52	PASS
		1	24	21.81	22.50	PASS
		1	49	21.78	22.49	PASS
		25	0	20.92	22.43	PASS
		25	12	20.90	22.40	PASS
		25	25	20.87	22.38	PASS
		50	0	20.91	21.28	PASS

Appendix B: 26dB Bandwidth and Occupied Bandwidth

Test Result

Channel Bandwidth: 5 MHz

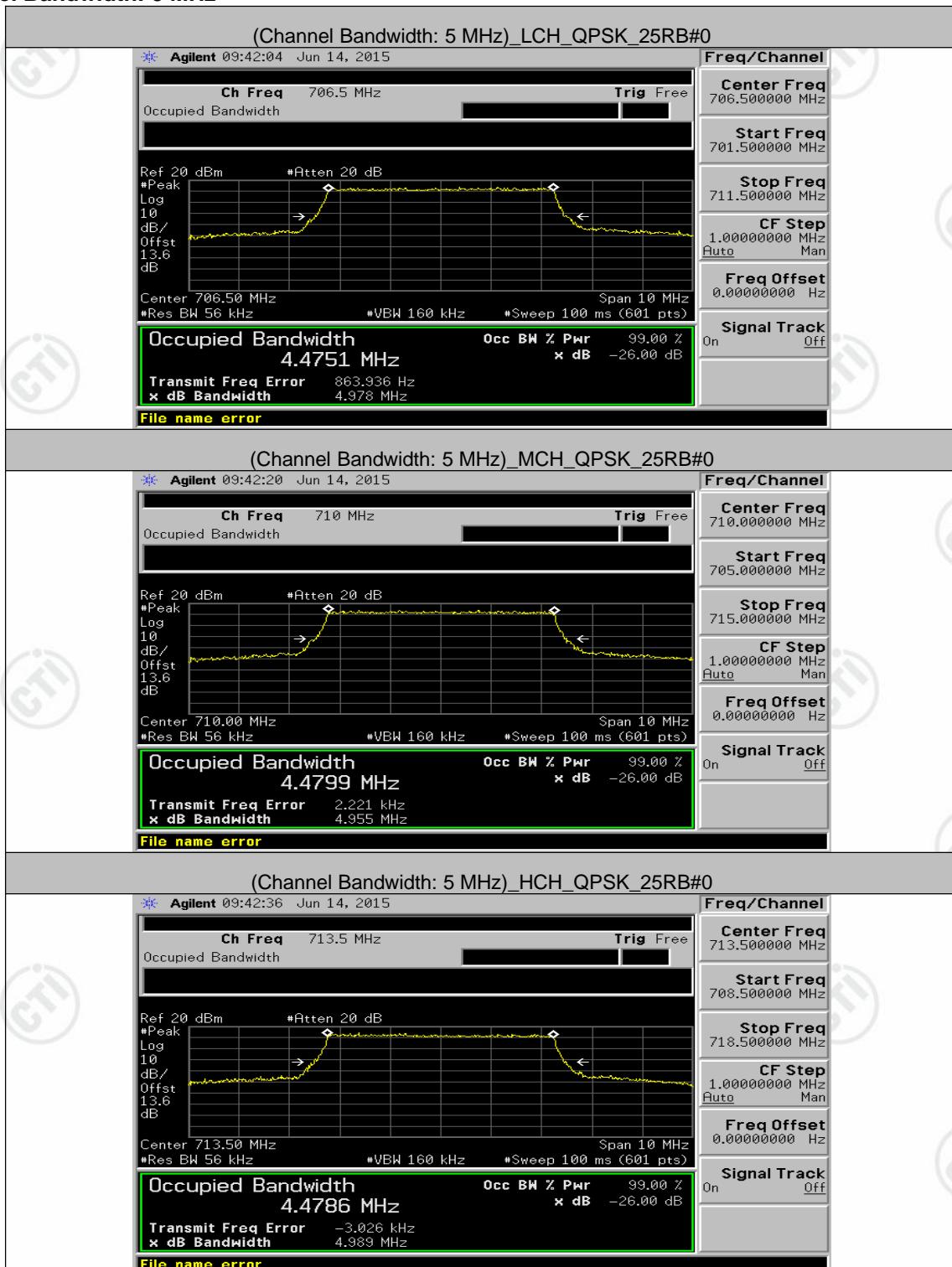
Modulation	Channel	Channel Bandwidth: 5 MHz				Verdict
		RB Configuration	Size	Offset	Occupied Bandwidth (MHz)	
QPSK	LCH	15	0	4.4751	4.978	PASS
	MCH	15	0	4.4799	4.955	PASS
	HCH	15	0	4.4786	4.989	PASS
16QAM	LCH	15	0	4.4804	5.035	PASS
	MCH	15	0	4.4787	5.004	PASS
	HCH	15	0	4.4805	4.976	PASS

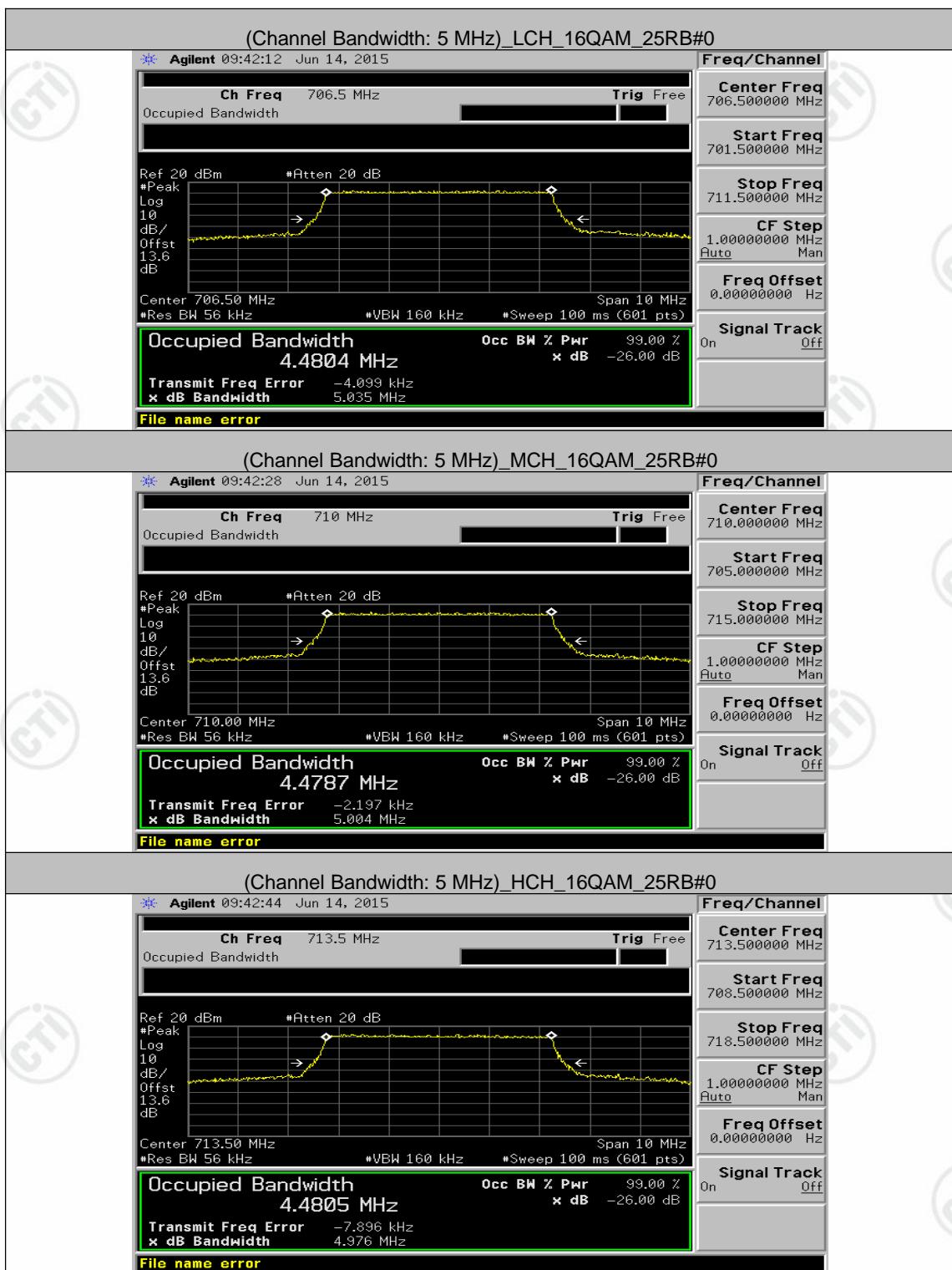
Channel Bandwidth: 10 MHz

Modulation	Channel	Channel Bandwidth: 10 MHz				Verdict
		RB Configuration	Size	Offset	Occupied Bandwidth (MHz)	
QPSK	LCH	50	0	8.9318	9.810	PASS
	MCH	50	0	8.9302	9.794	PASS
	HCH	50	0	8.9256	9.816	PASS
16QAM	LCH	50	0	8.9286	9.747	PASS
	MCH	50	0	8.9258	9.729	PASS
	HCH	50	0	8.9275	9.703	PASS

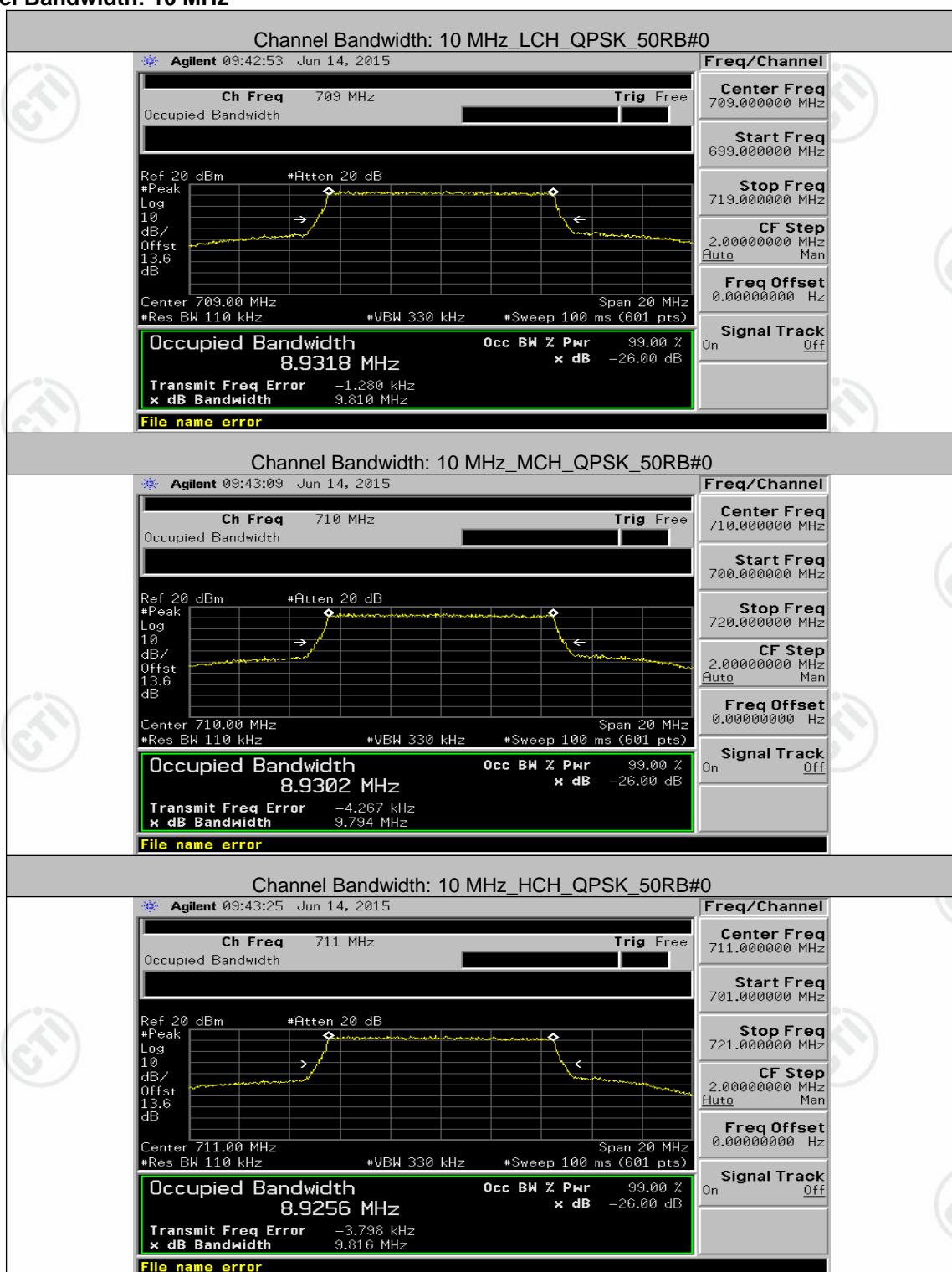
Test Graphs

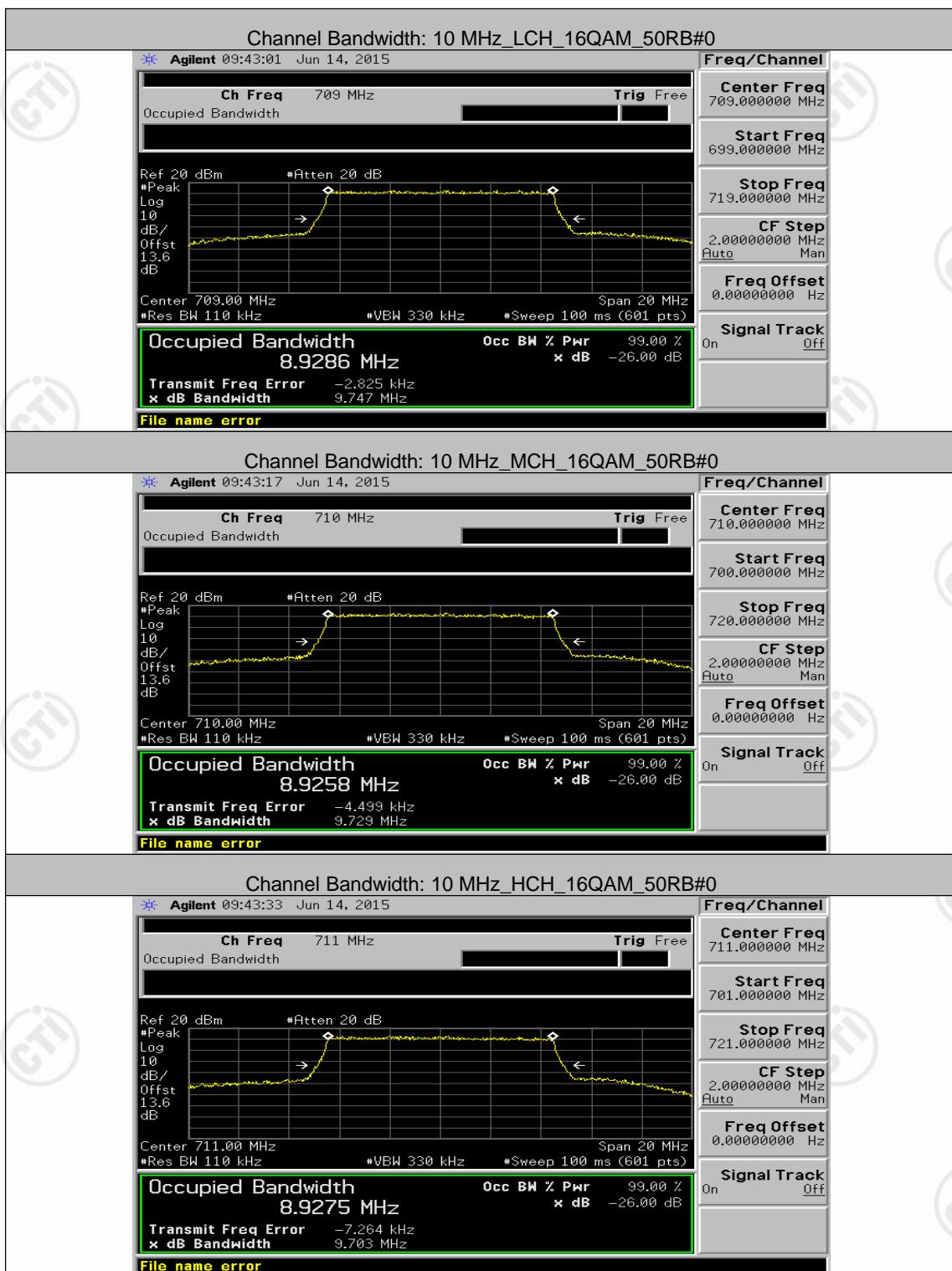
Channel Bandwidth: 5 MHz





Channel Bandwidth: 10 MHz

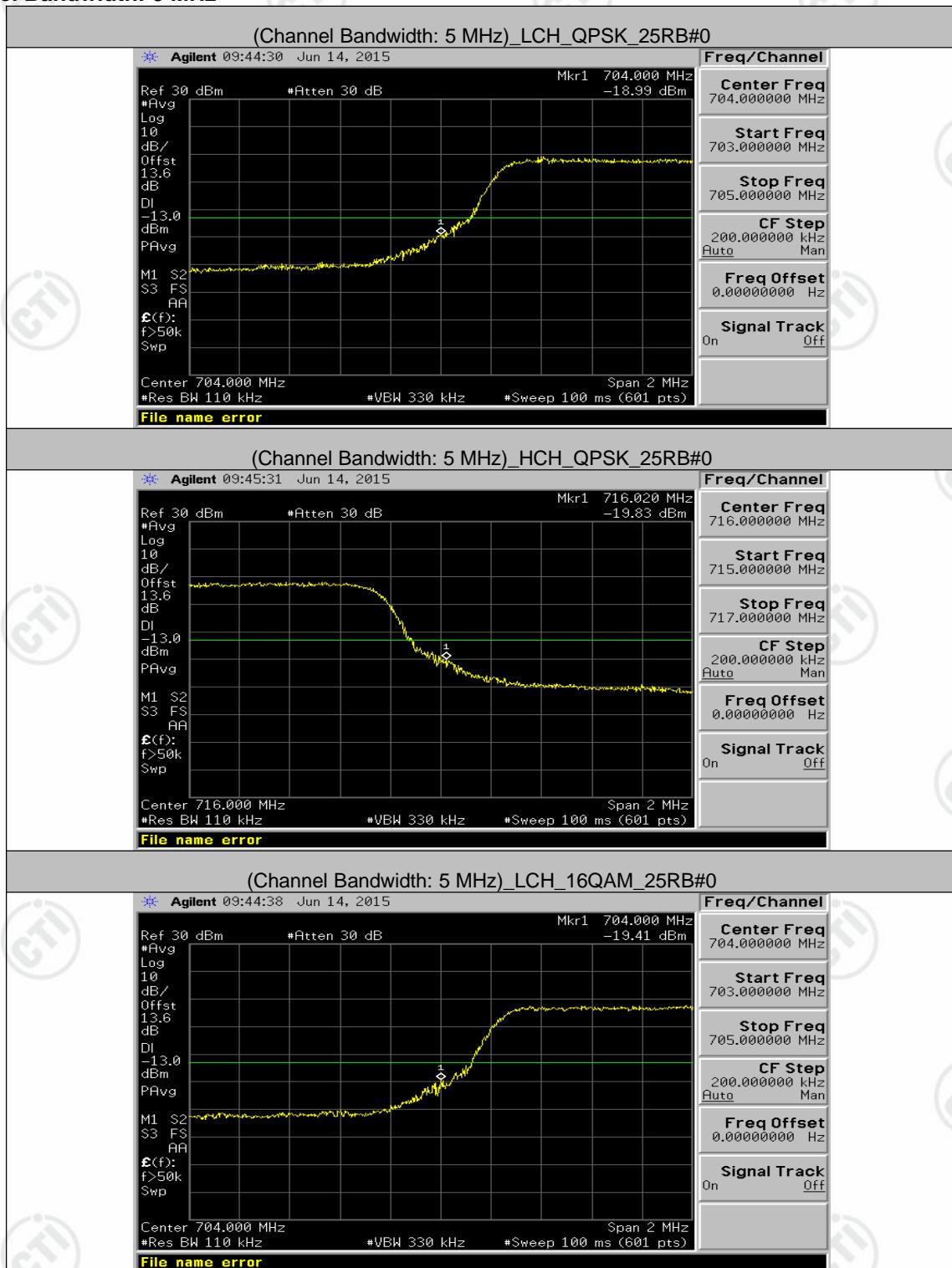


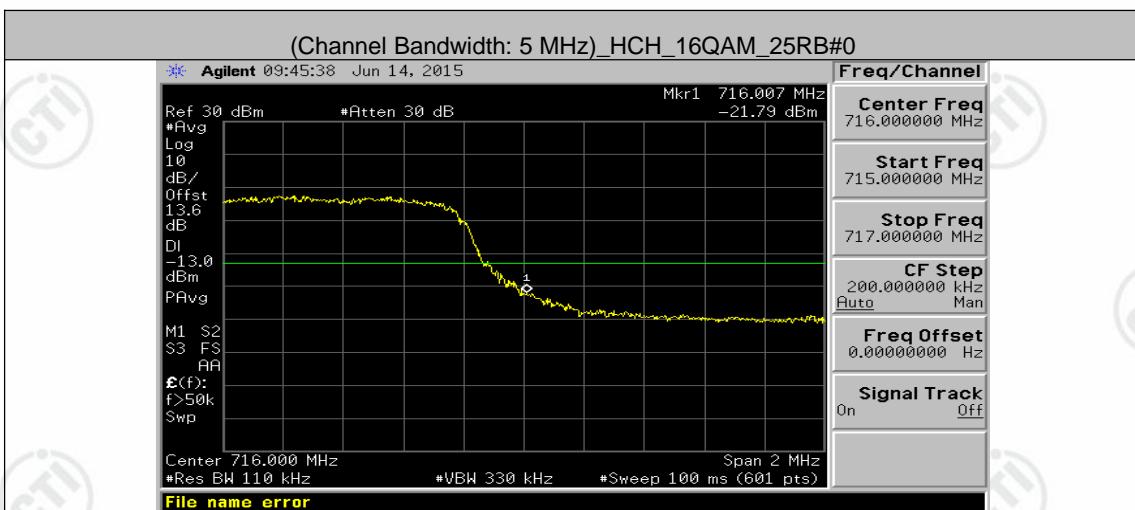


Appendix C: Band Edge

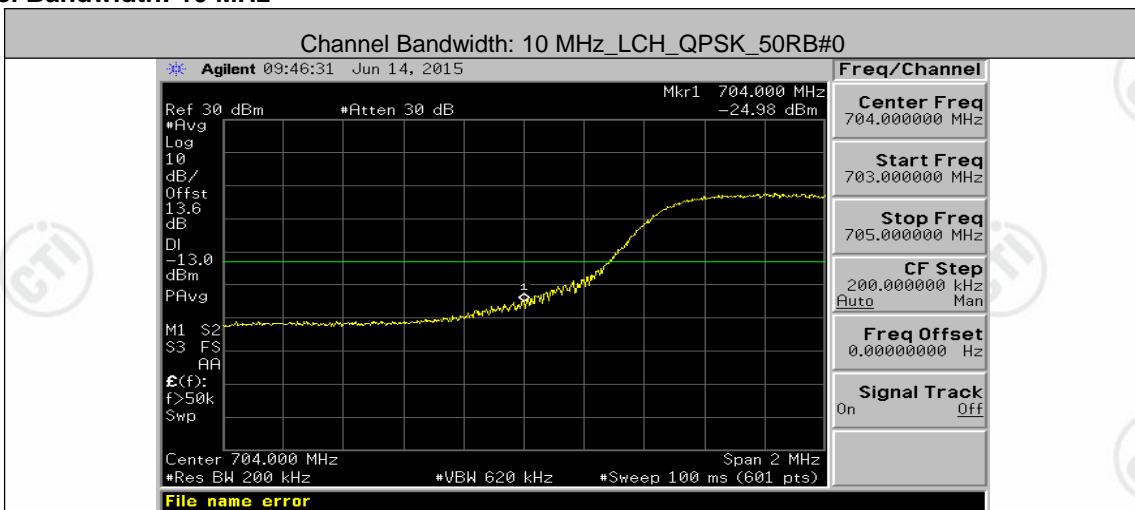
Test Graphs

Channel Bandwidth: 5 MHz

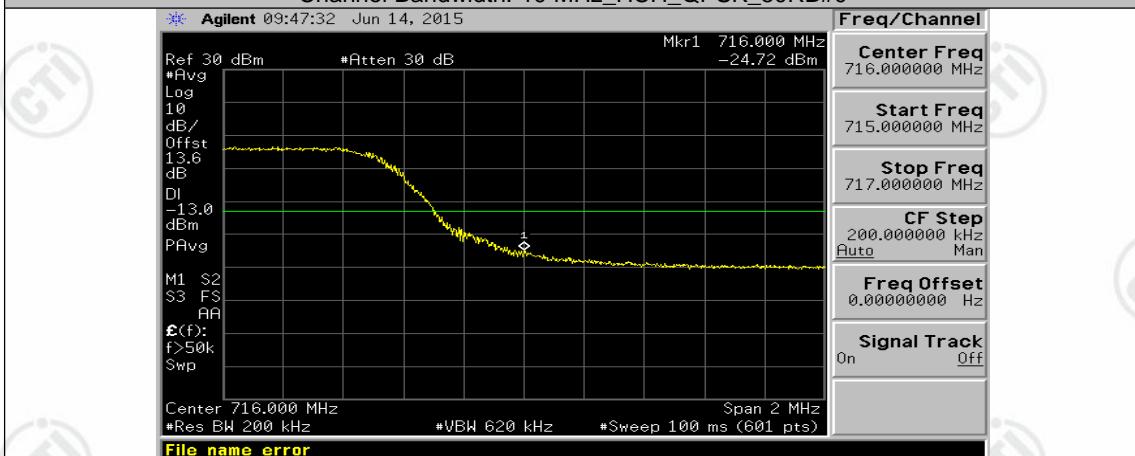


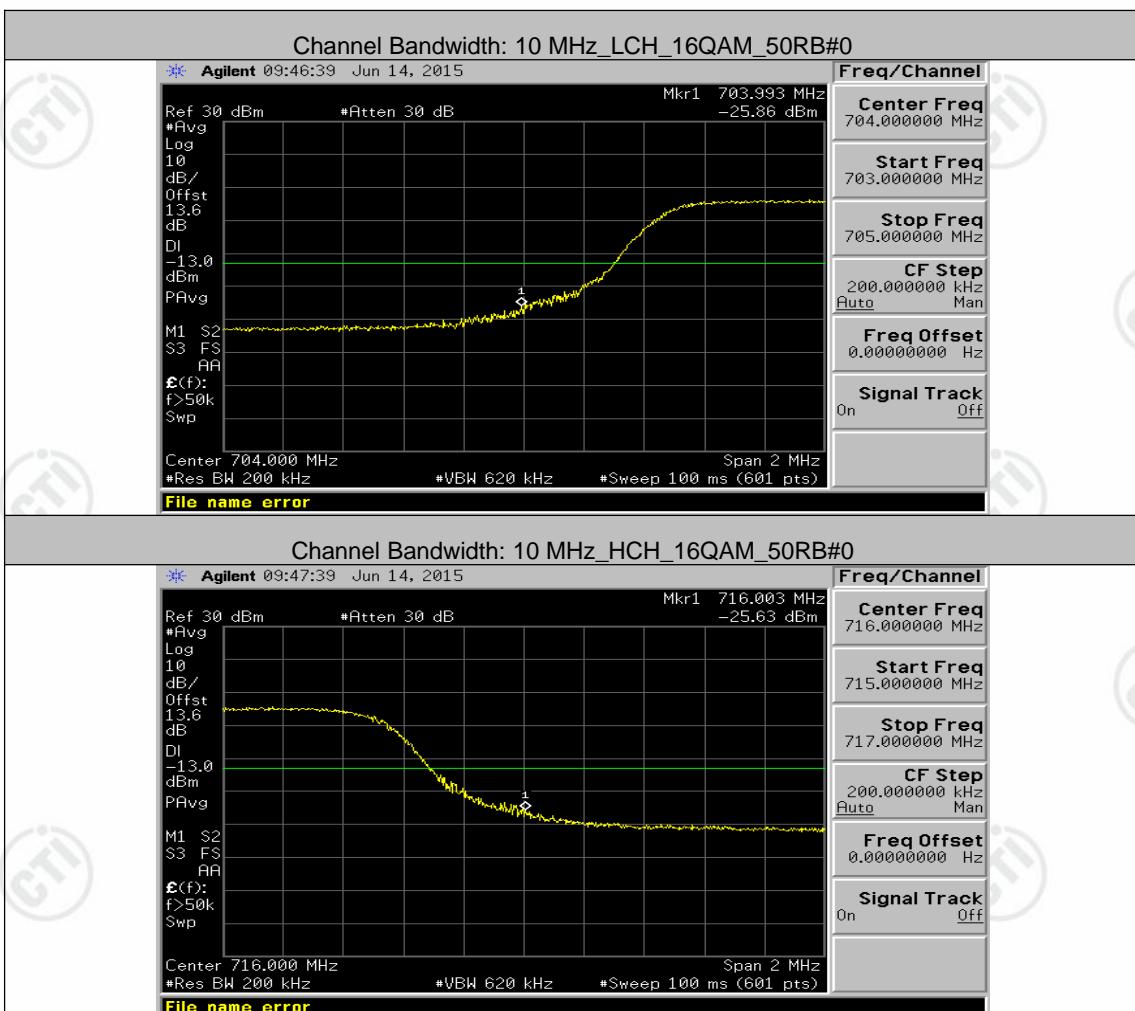


Channel Bandwidth: 10 MHz



Channel Bandwidth: 10 MHz_HCH_QPSK_50RB#0

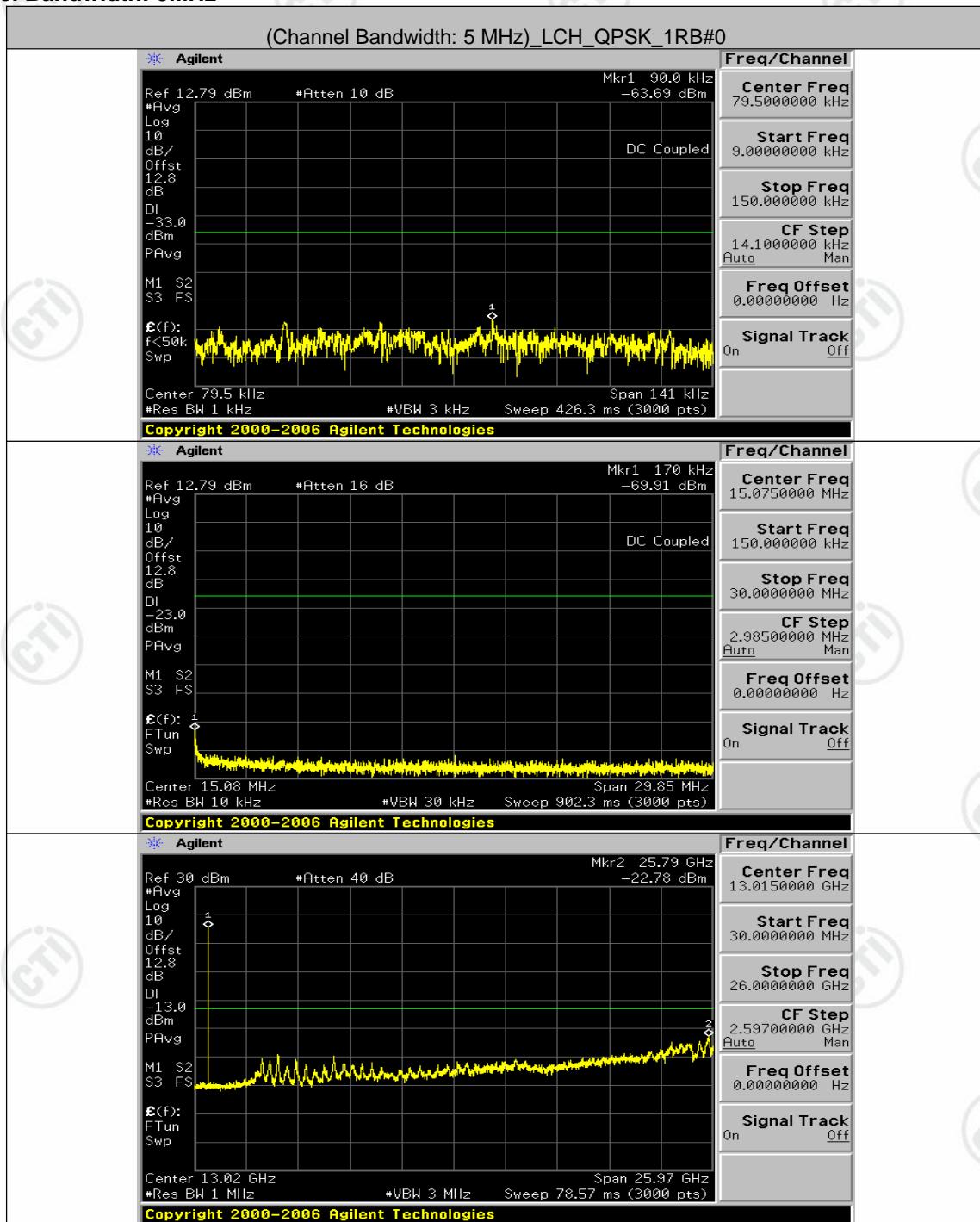


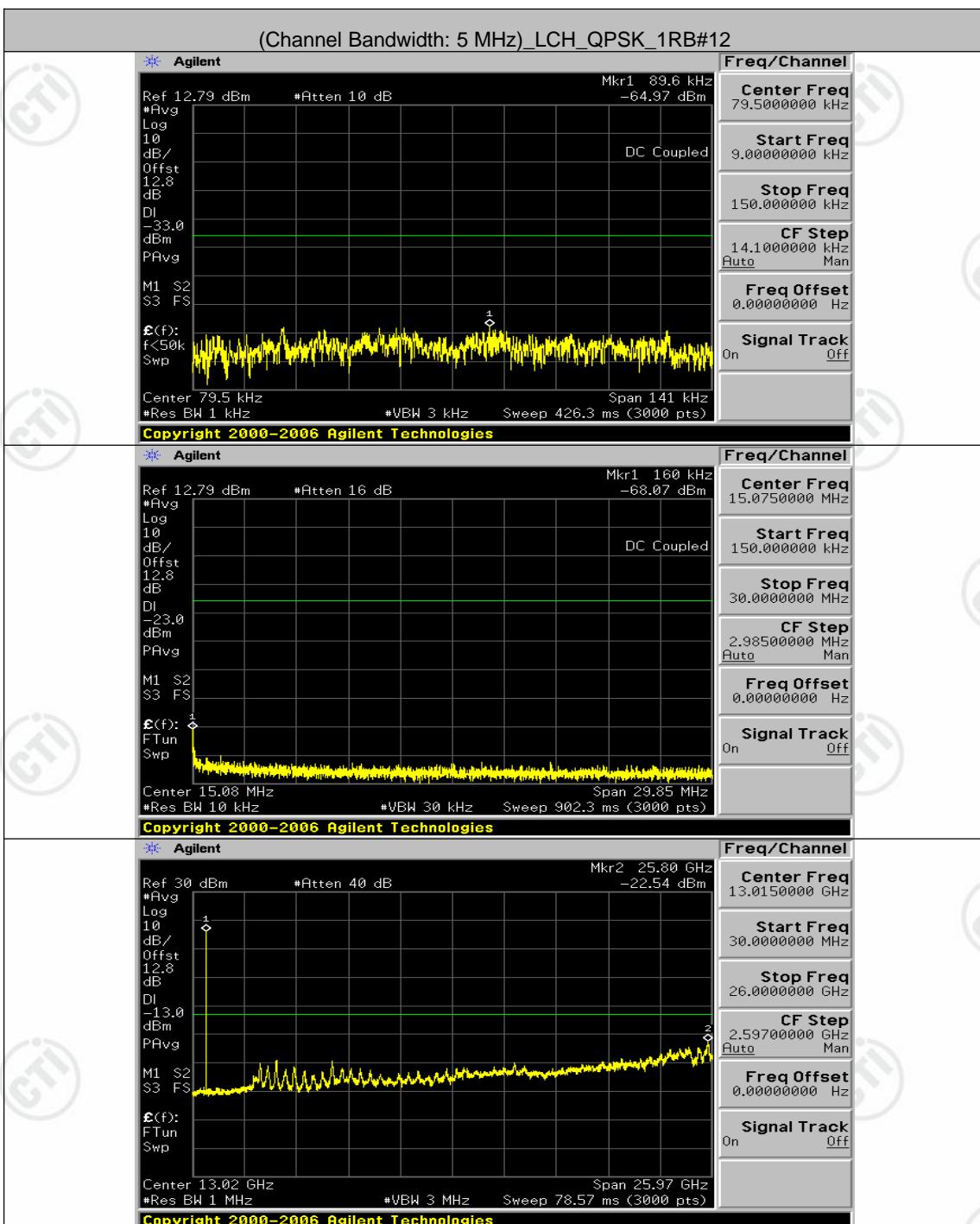


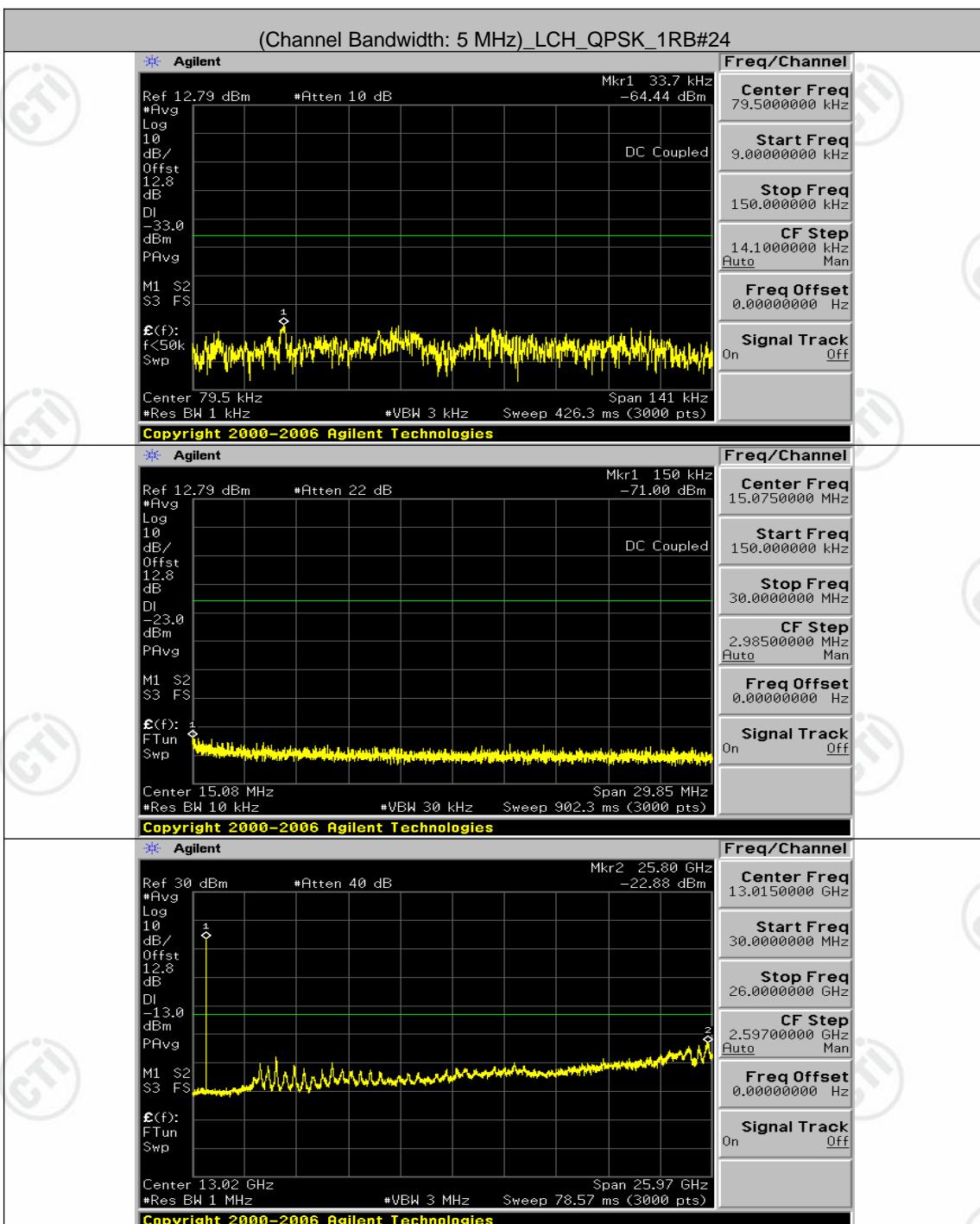
Appendix D: Conducted Spurious Emission

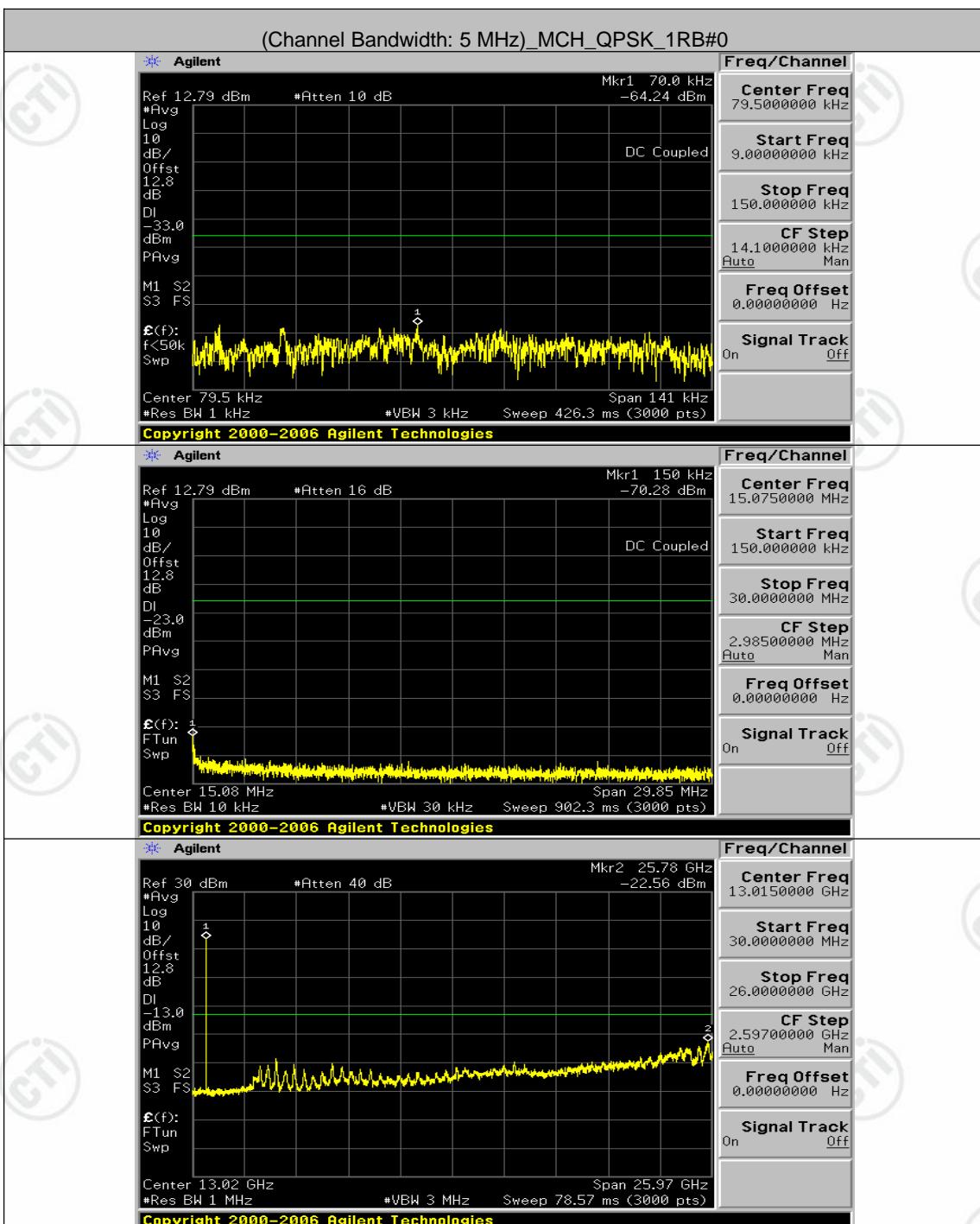
Test Graphs

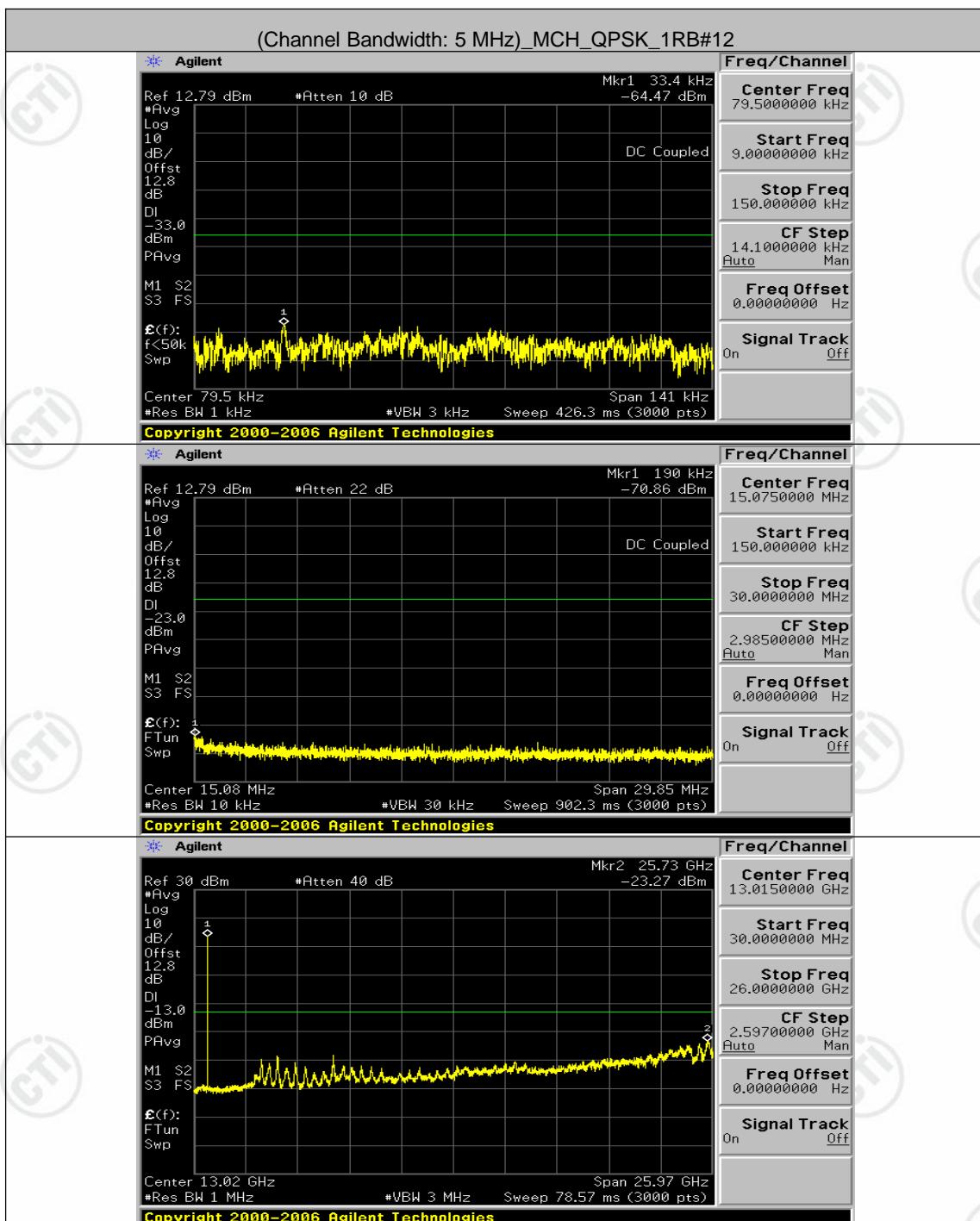
Channel Bandwidth: 5MHz

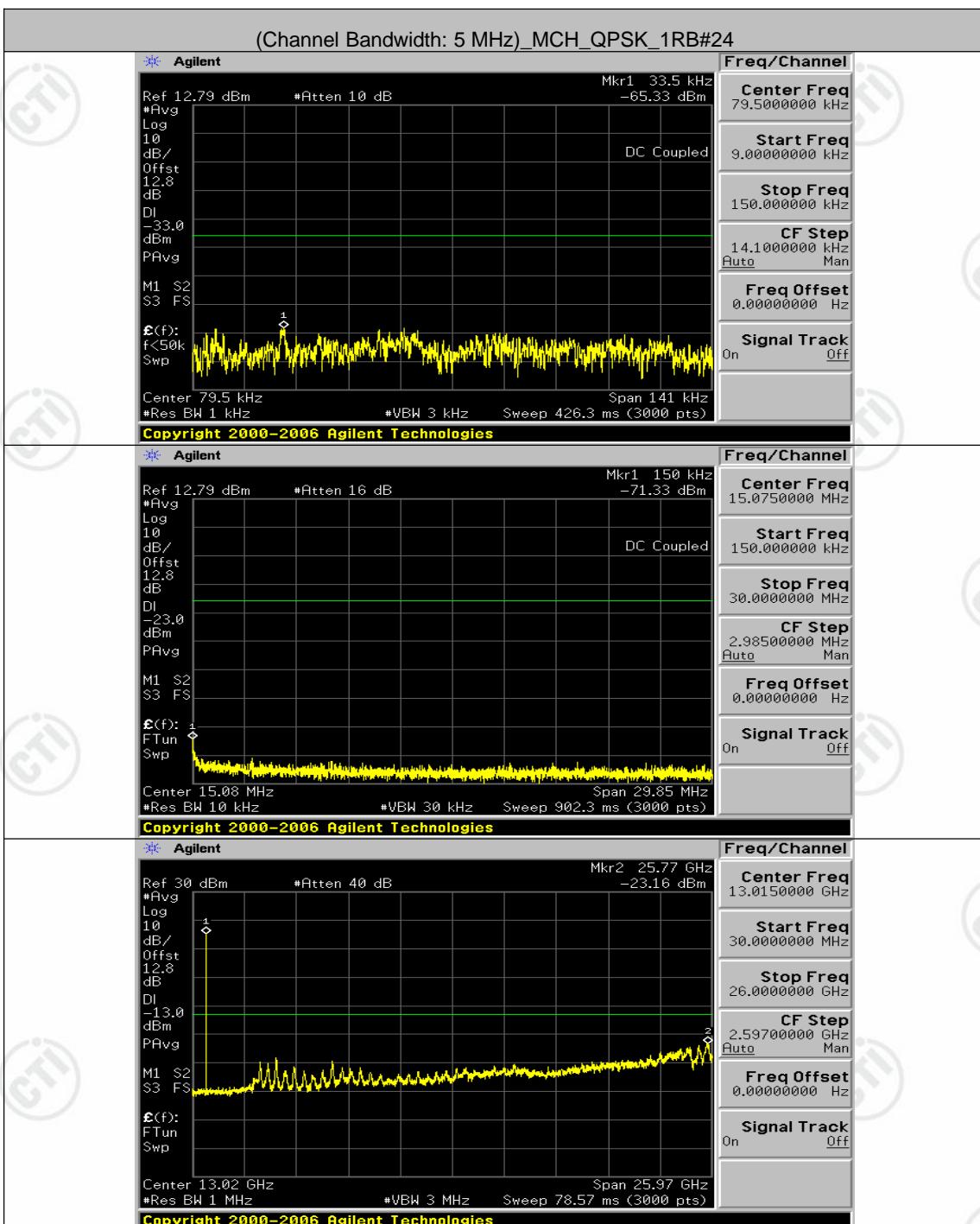


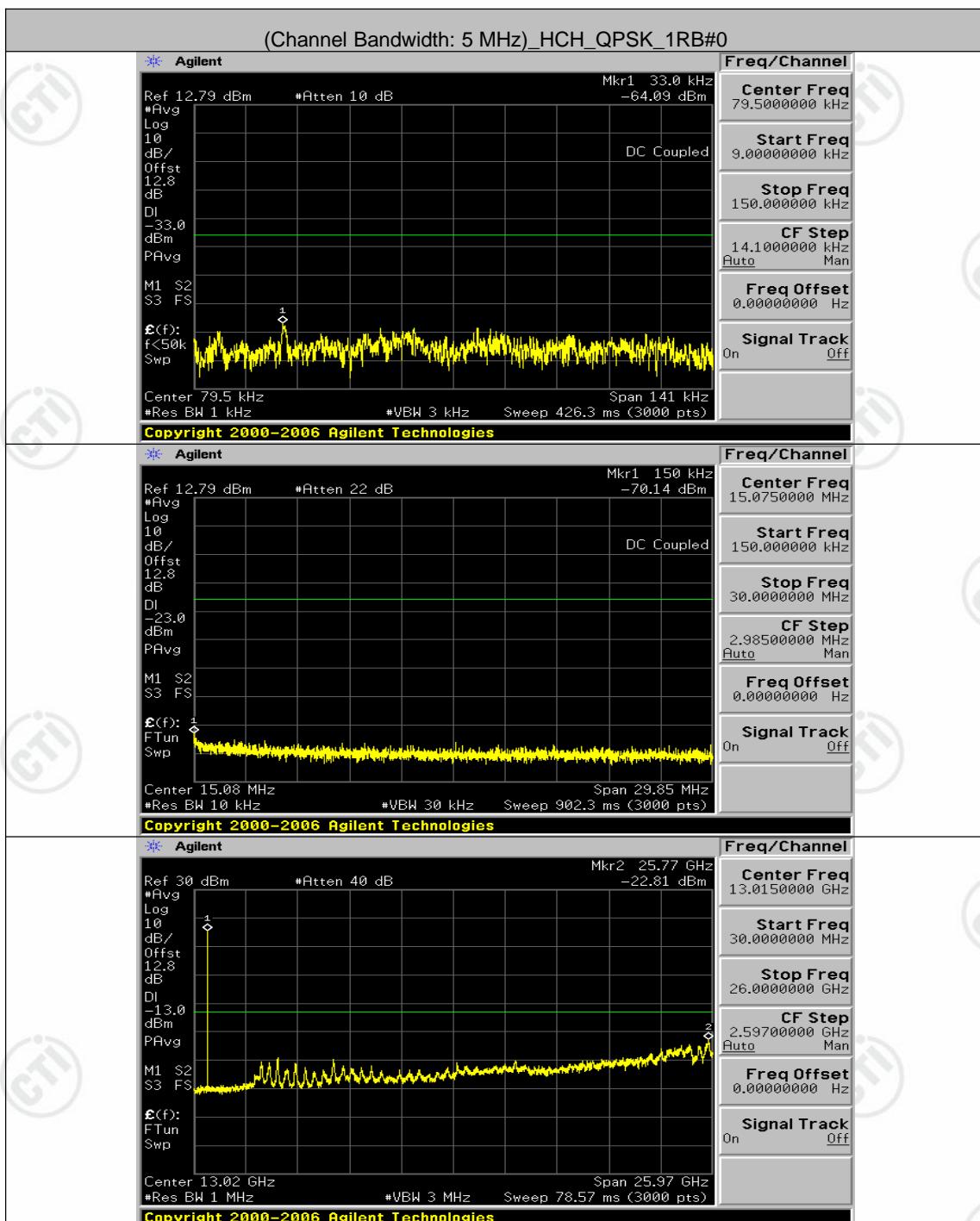


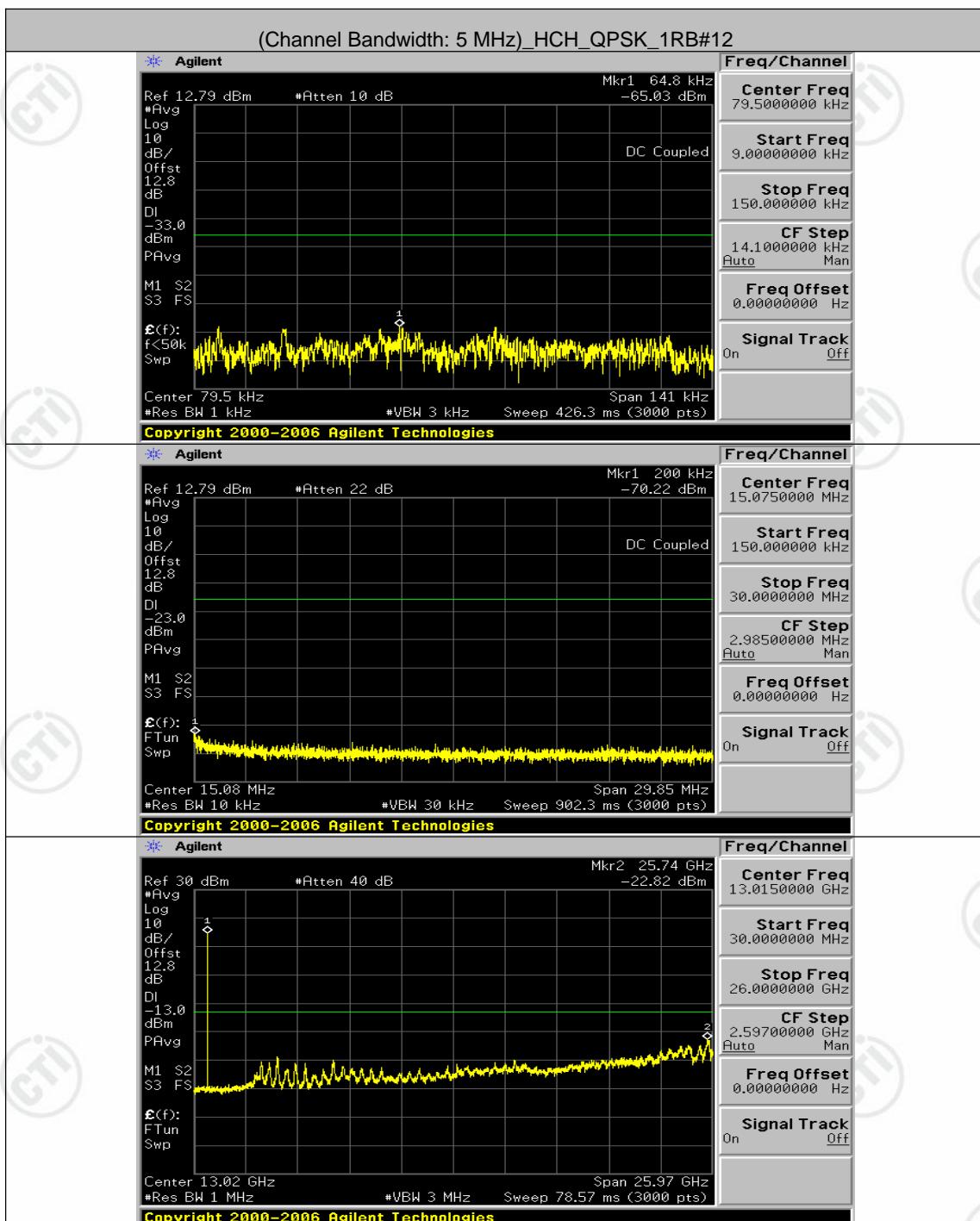


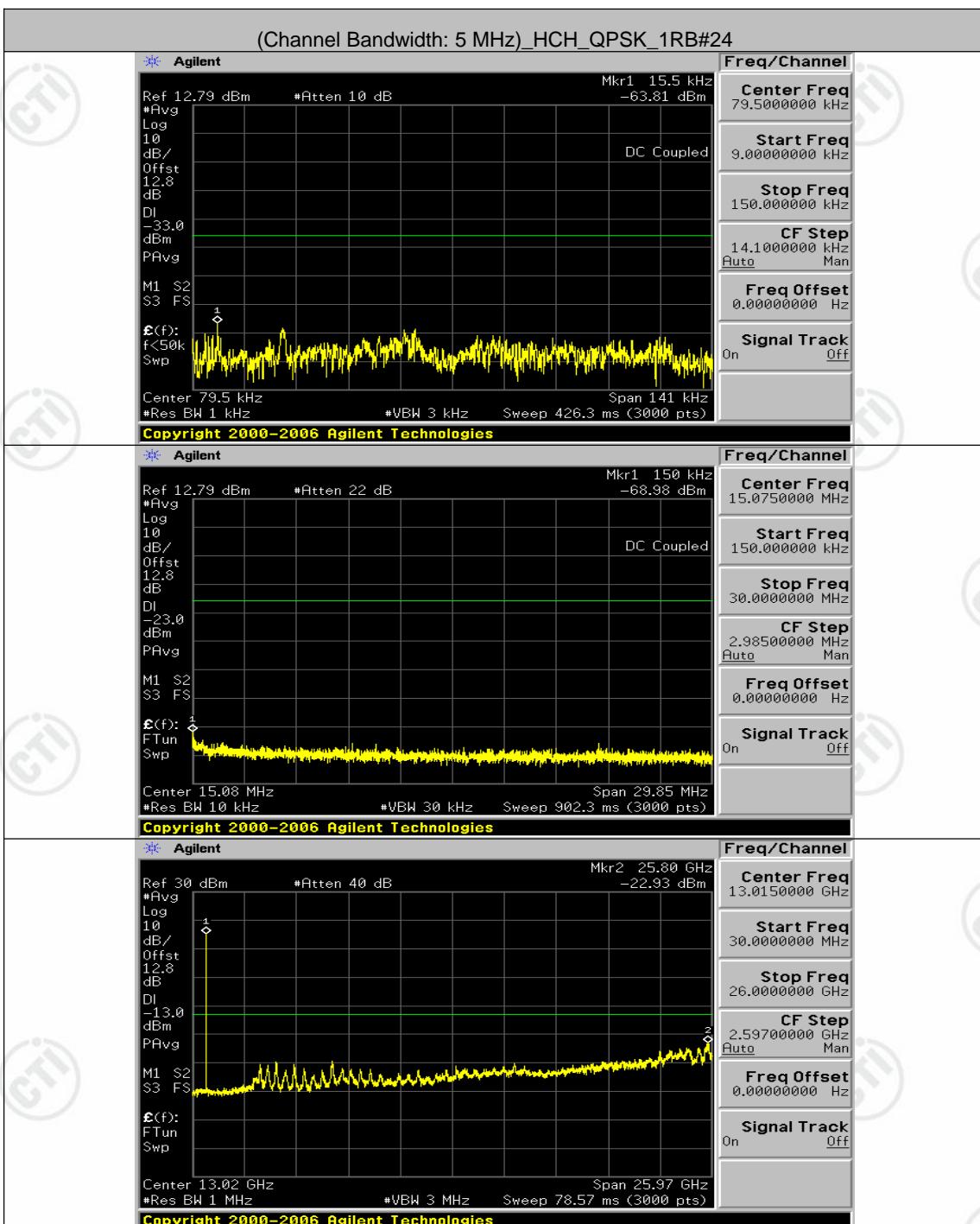


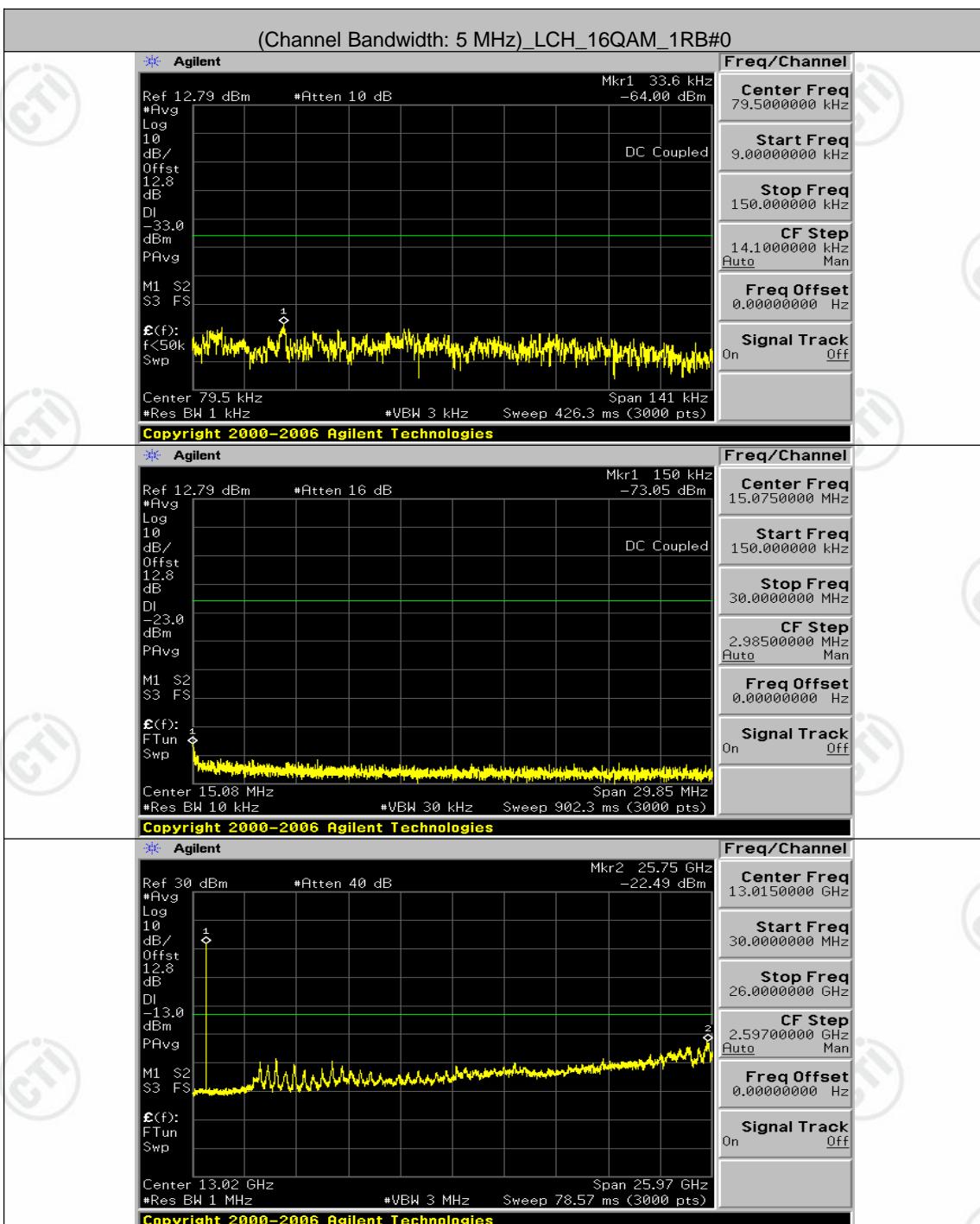


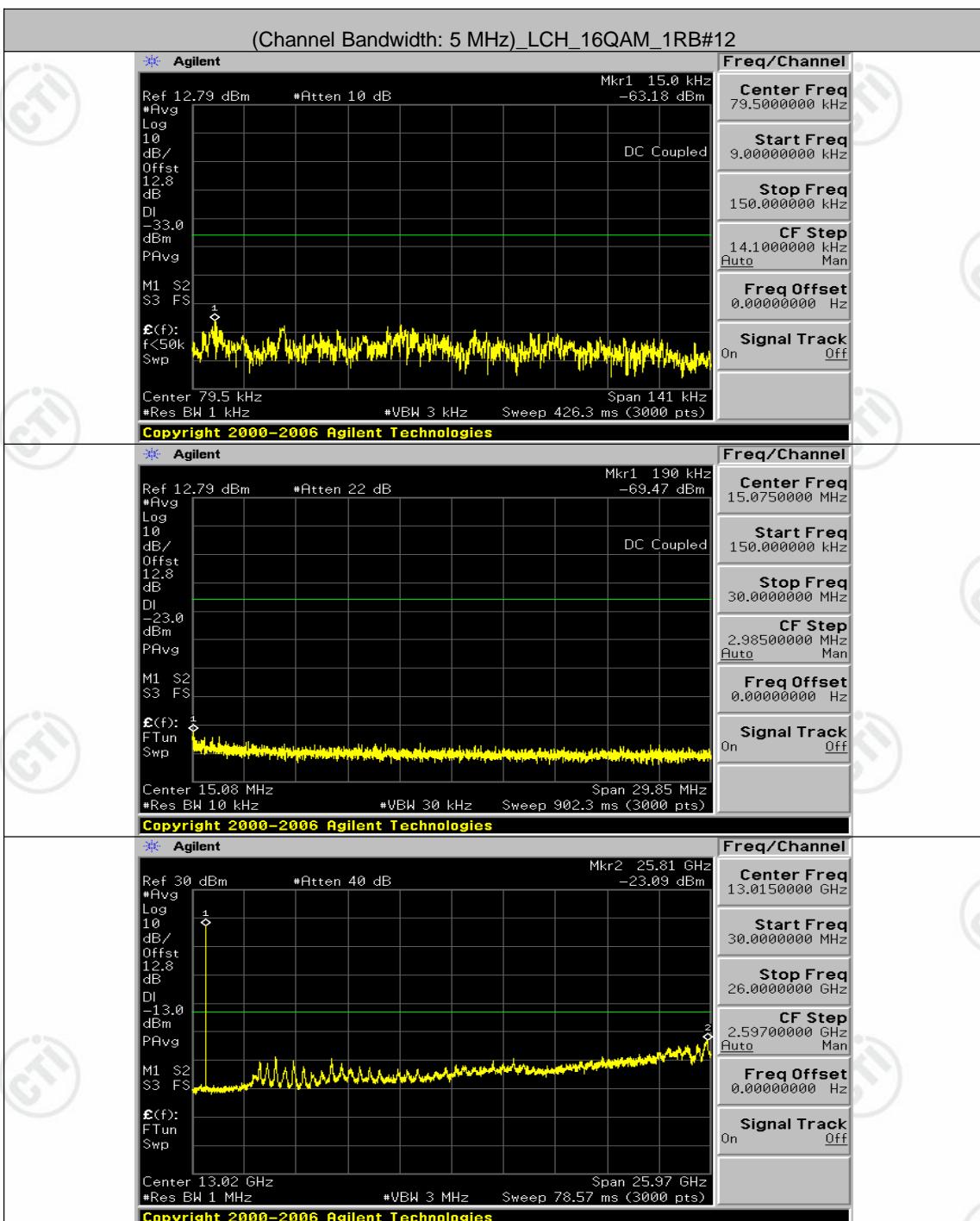


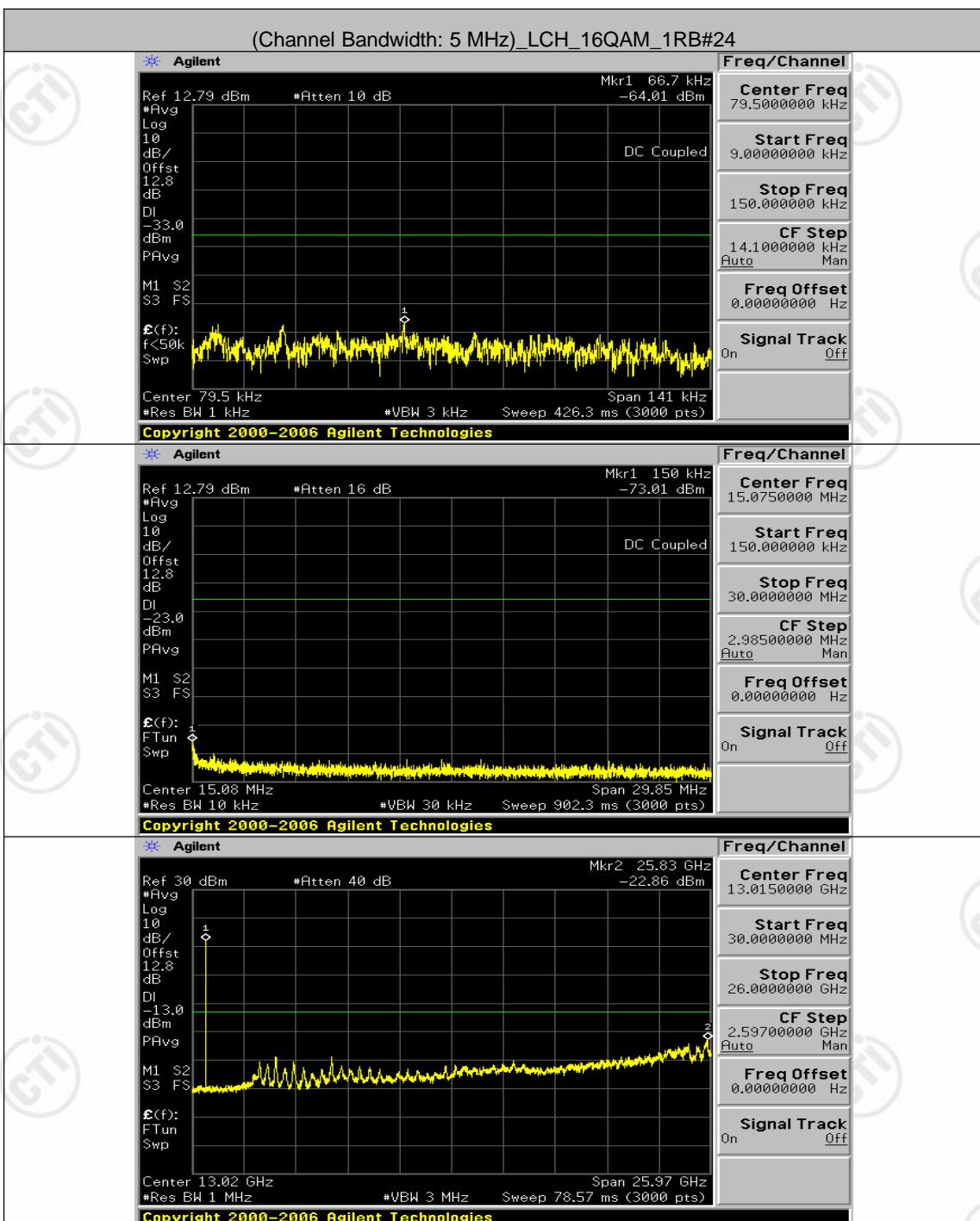


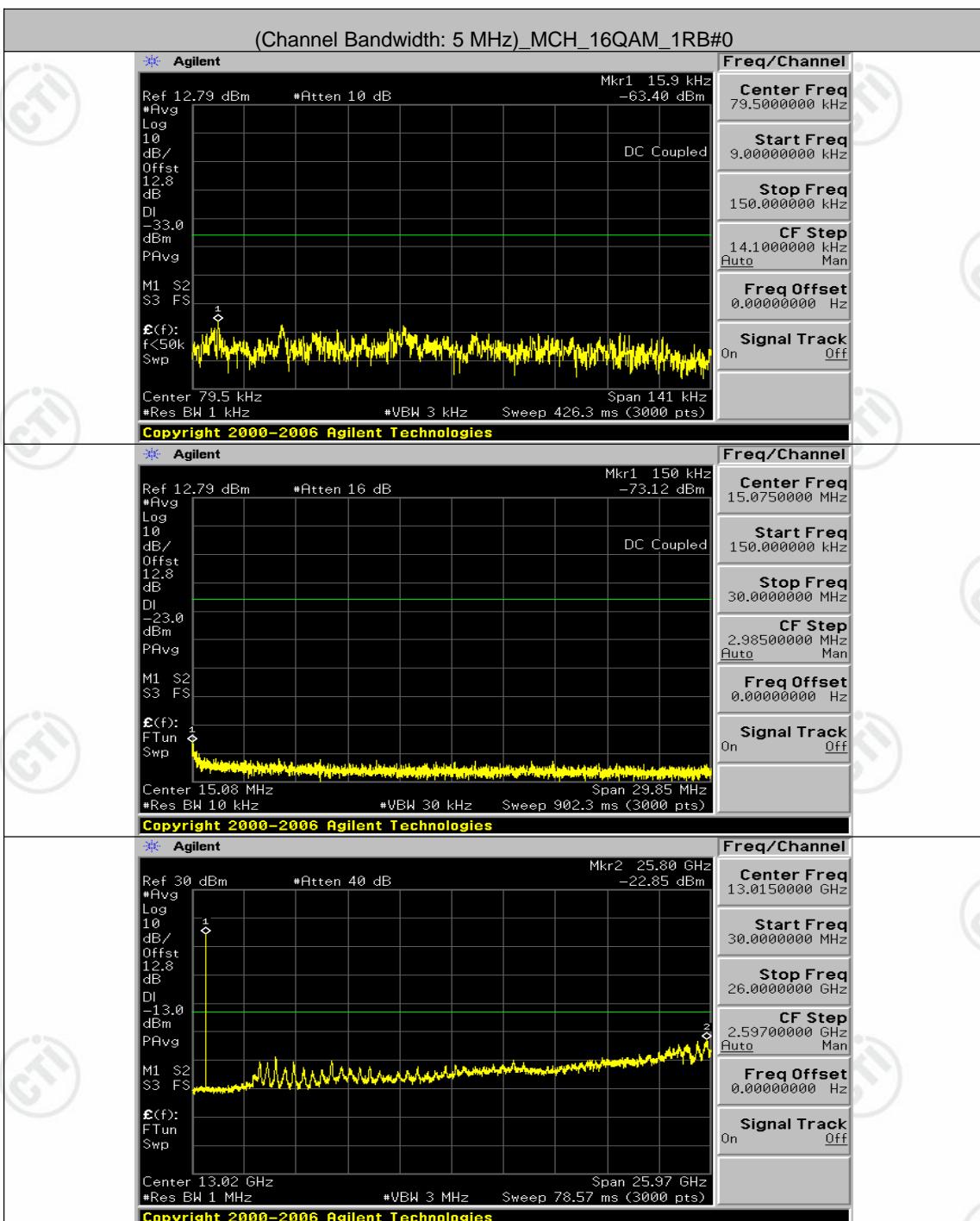


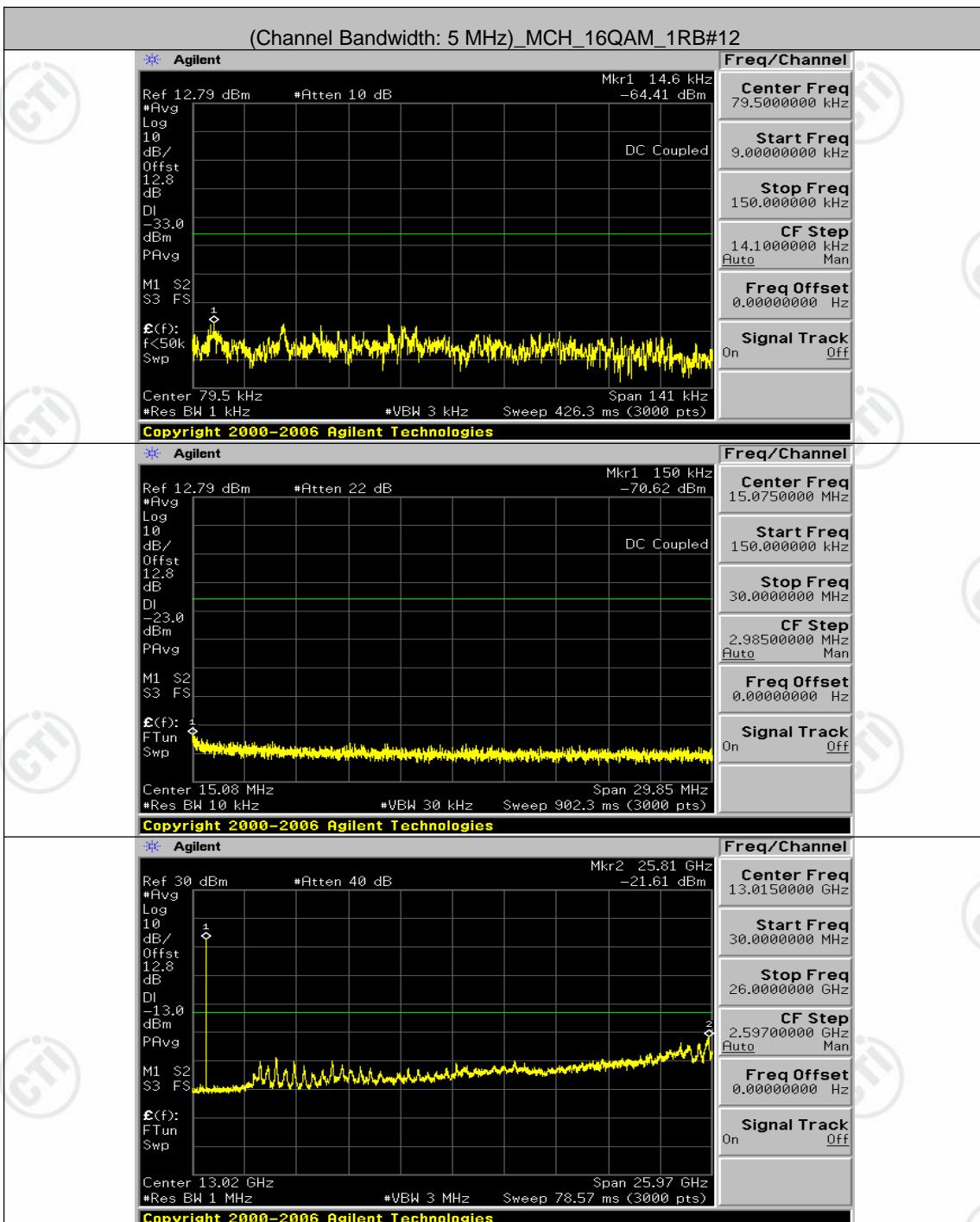


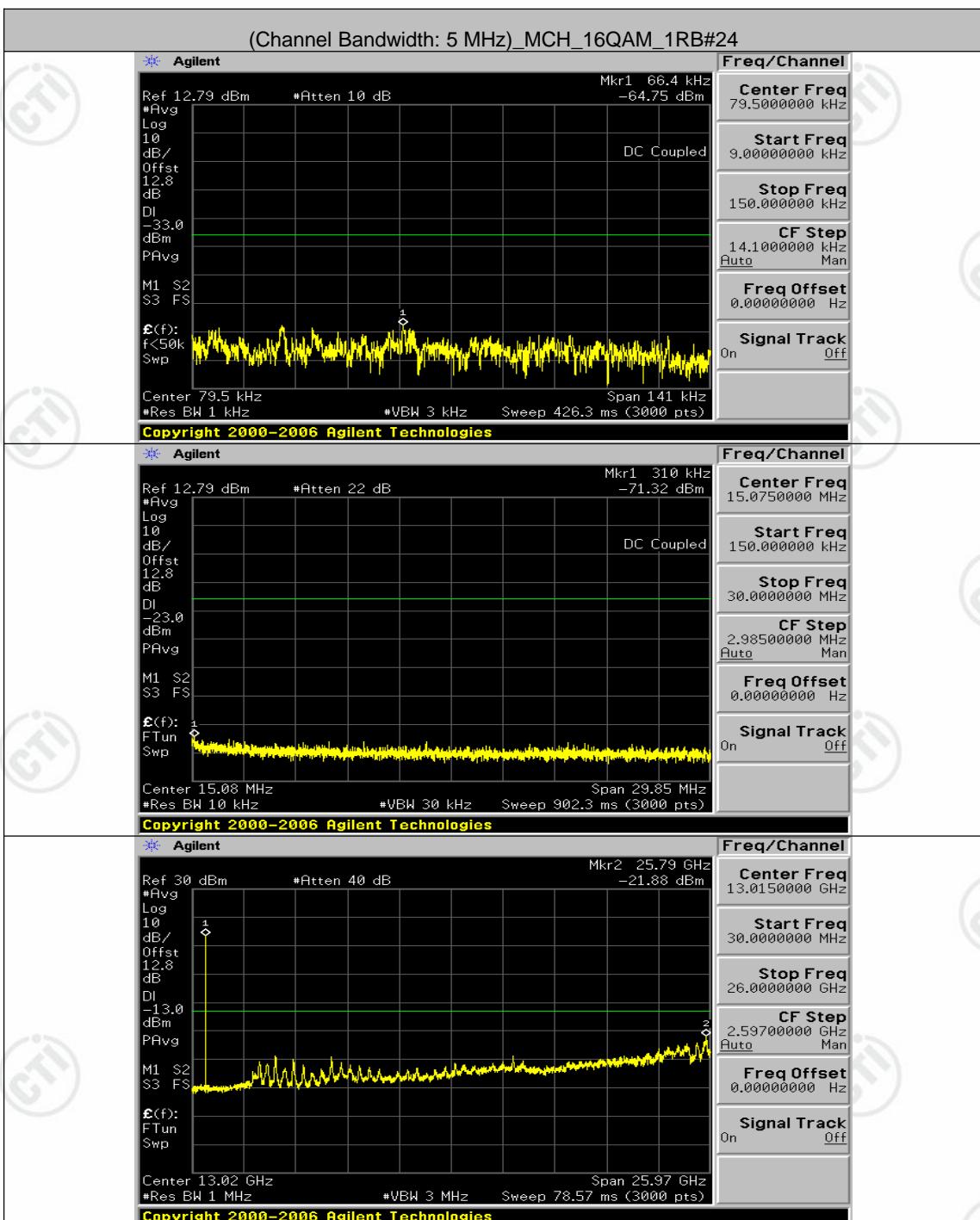


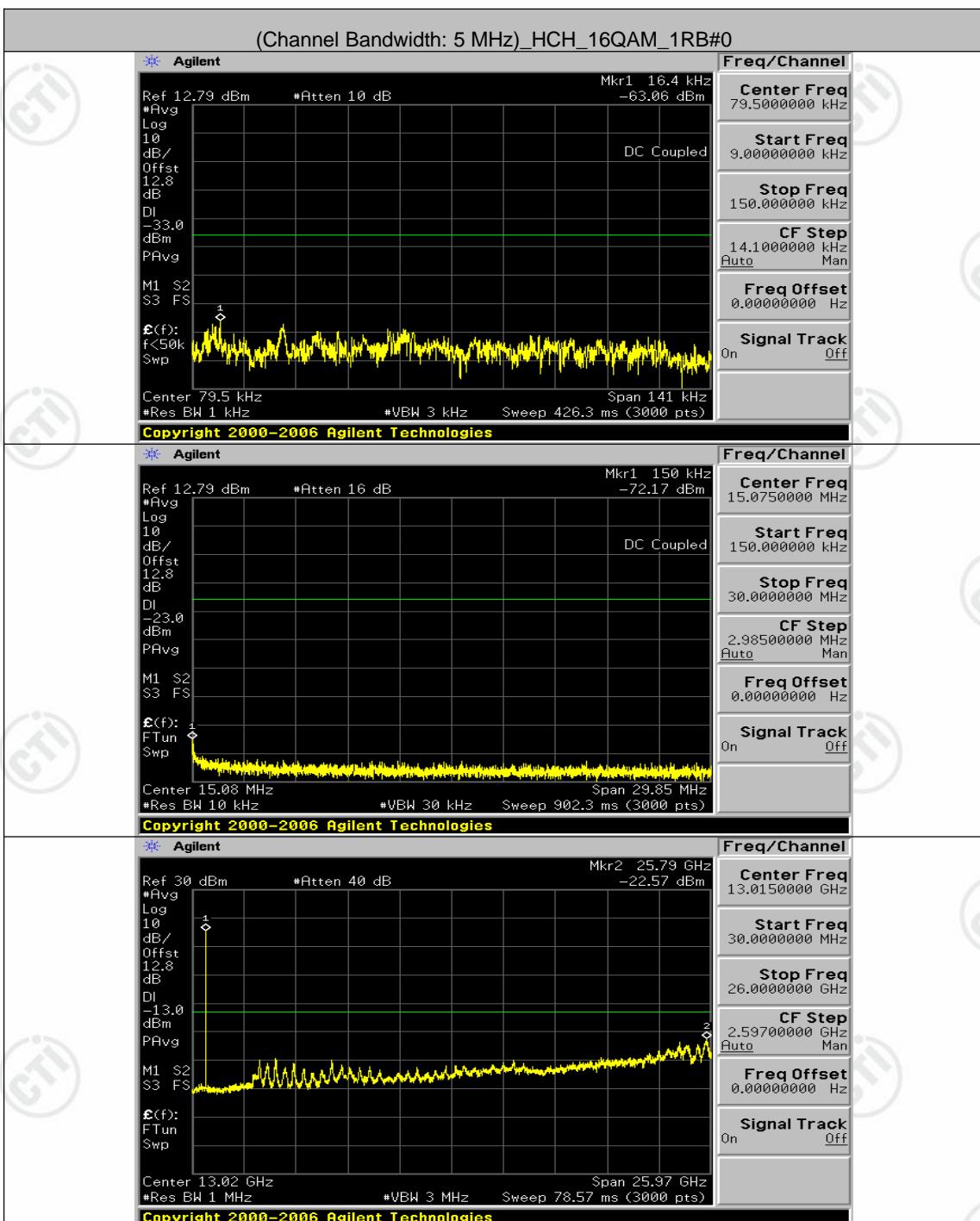


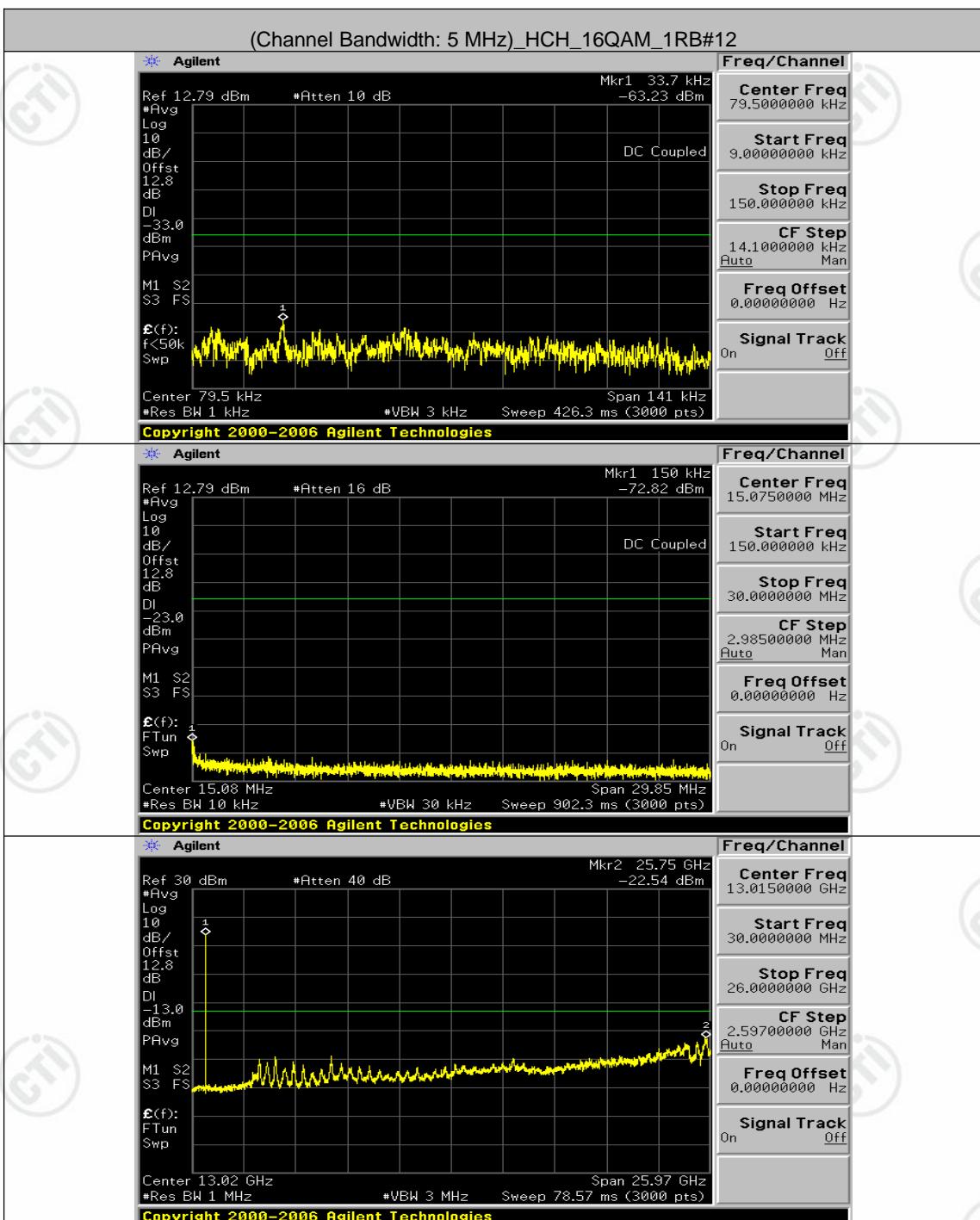


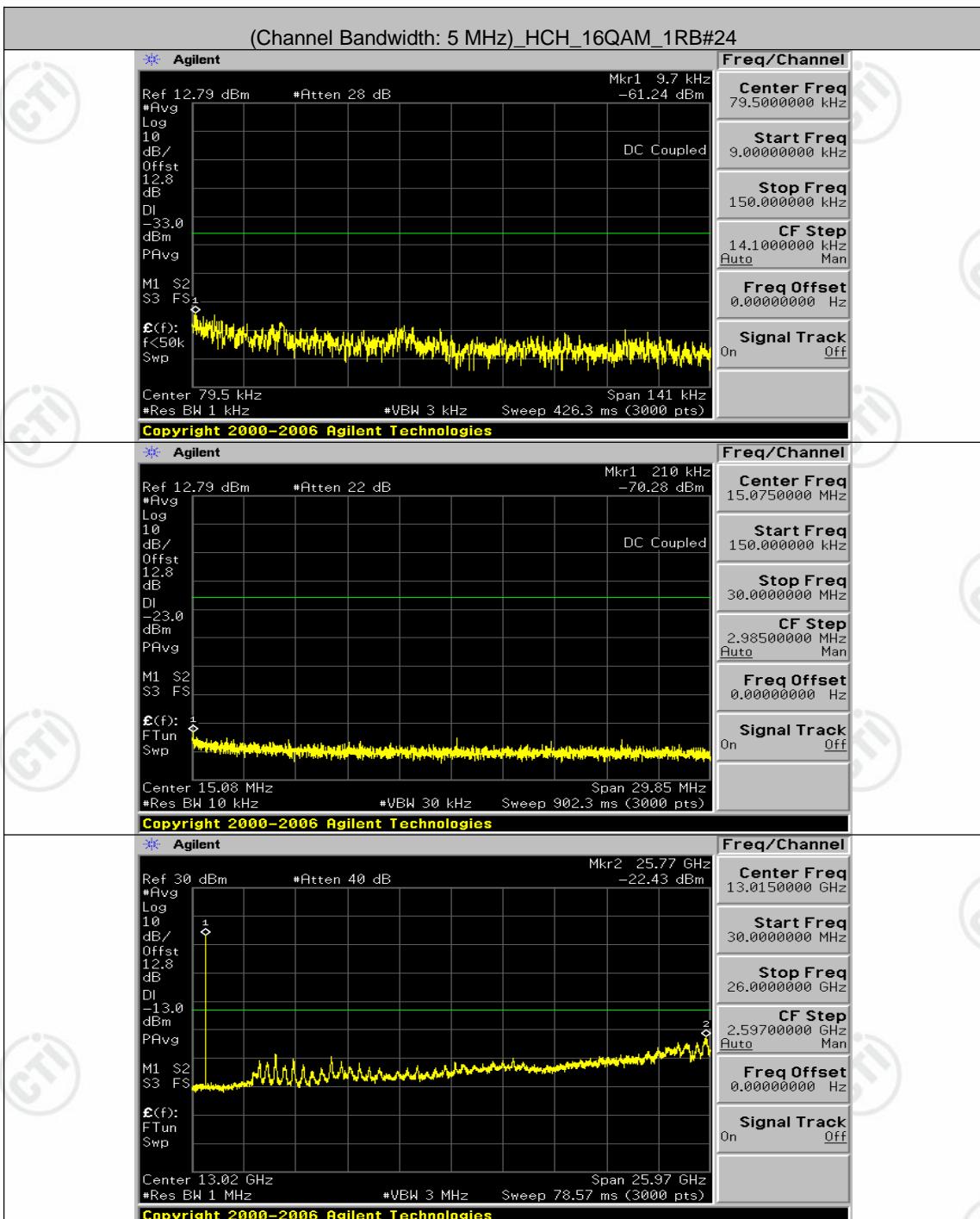




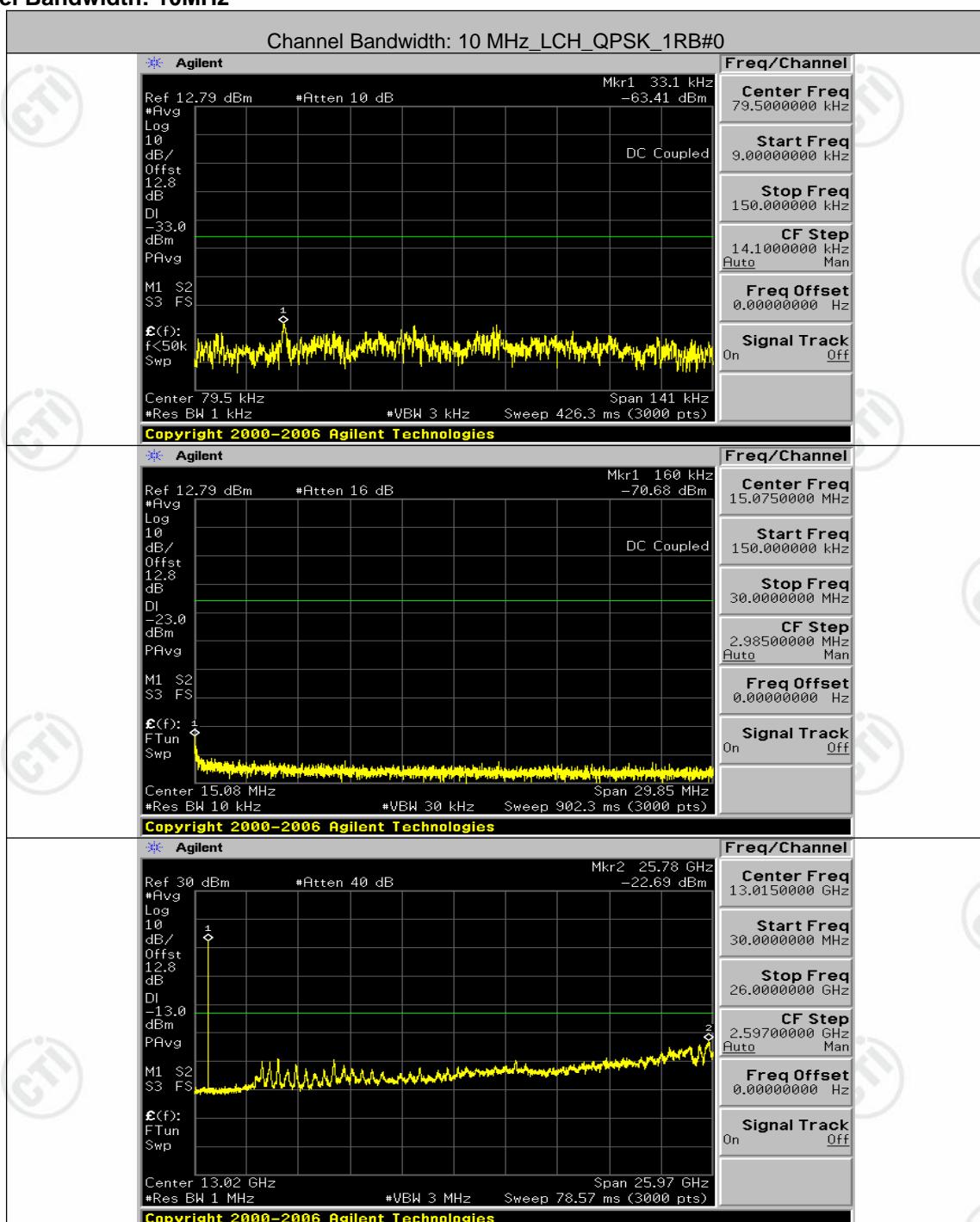


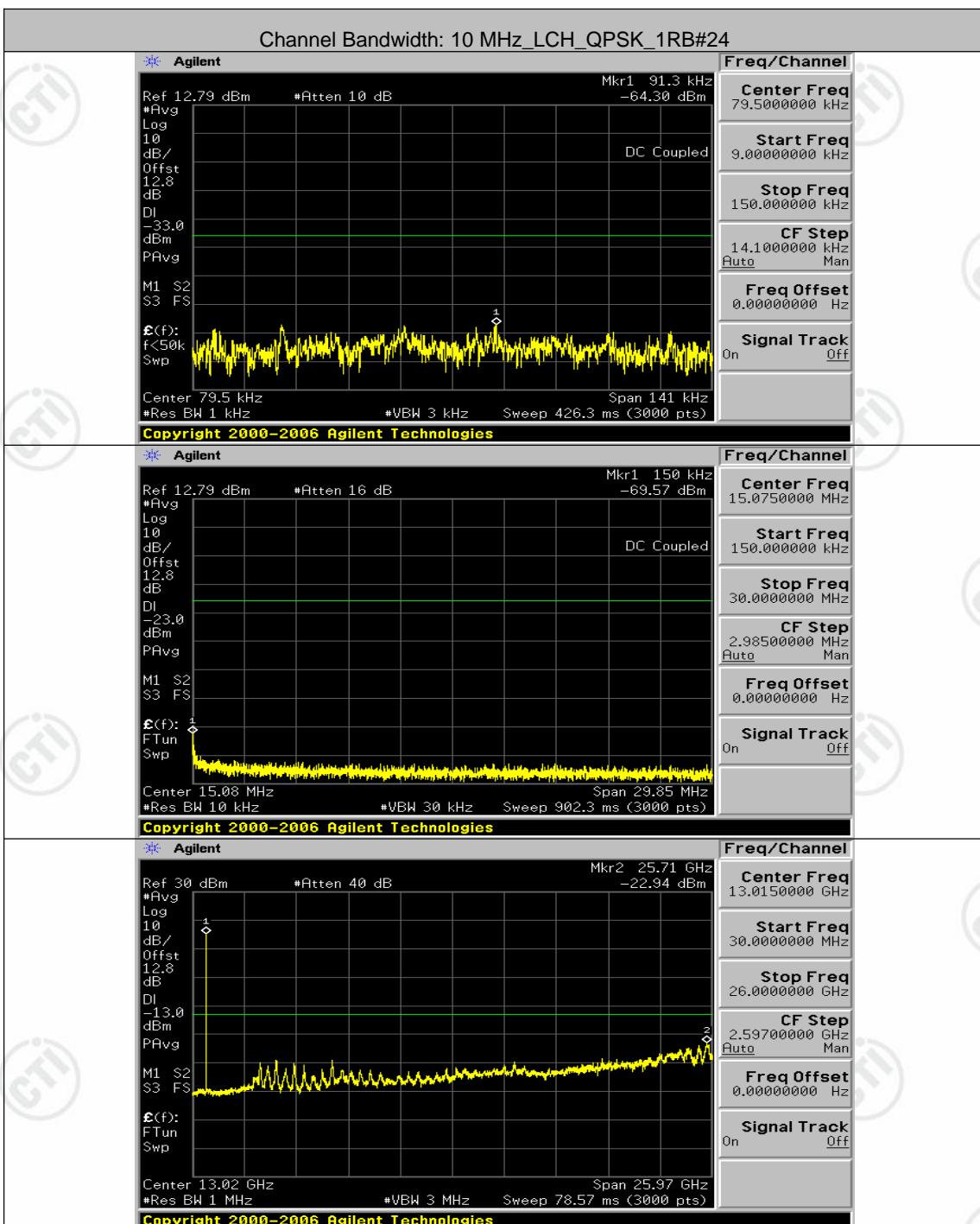


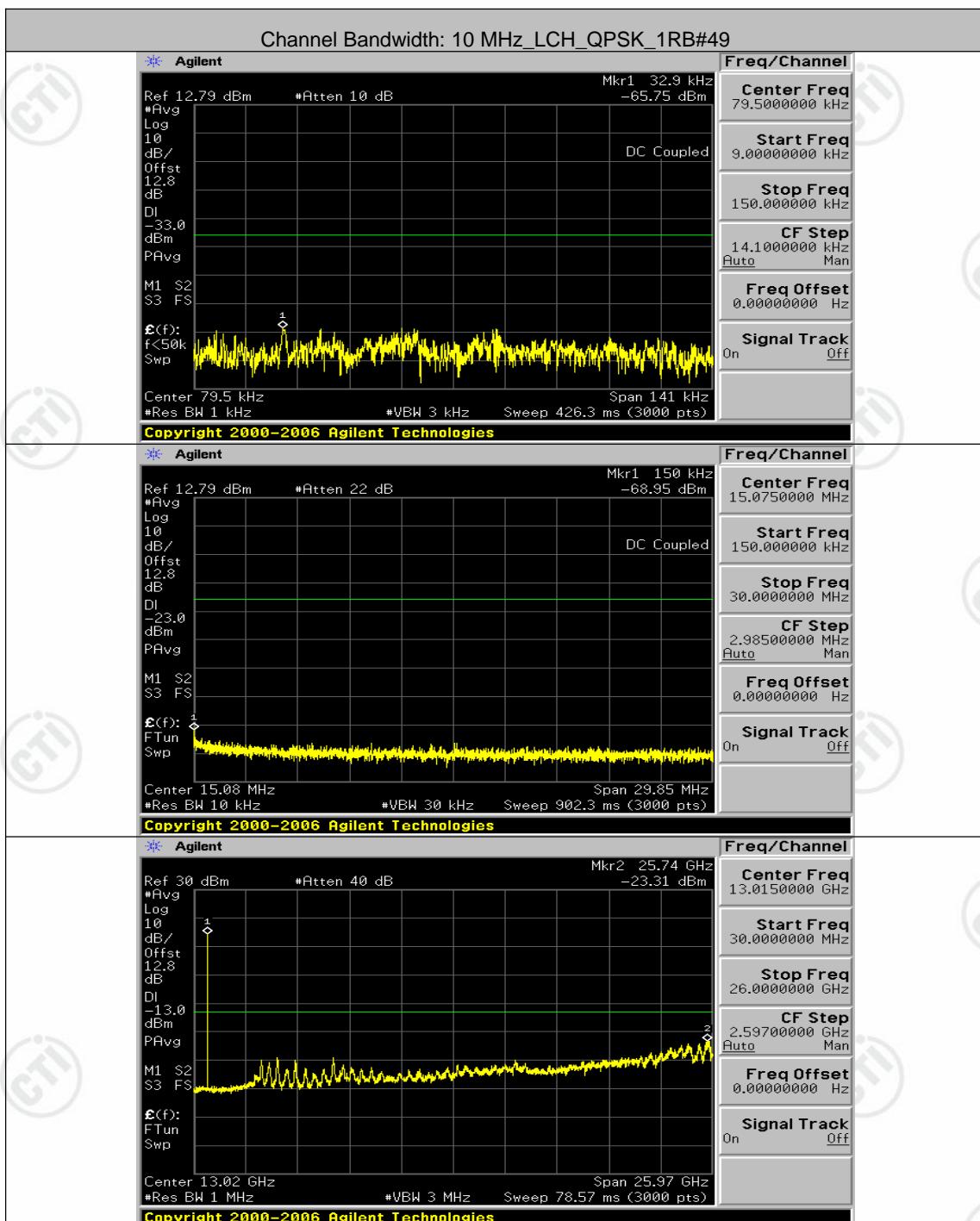


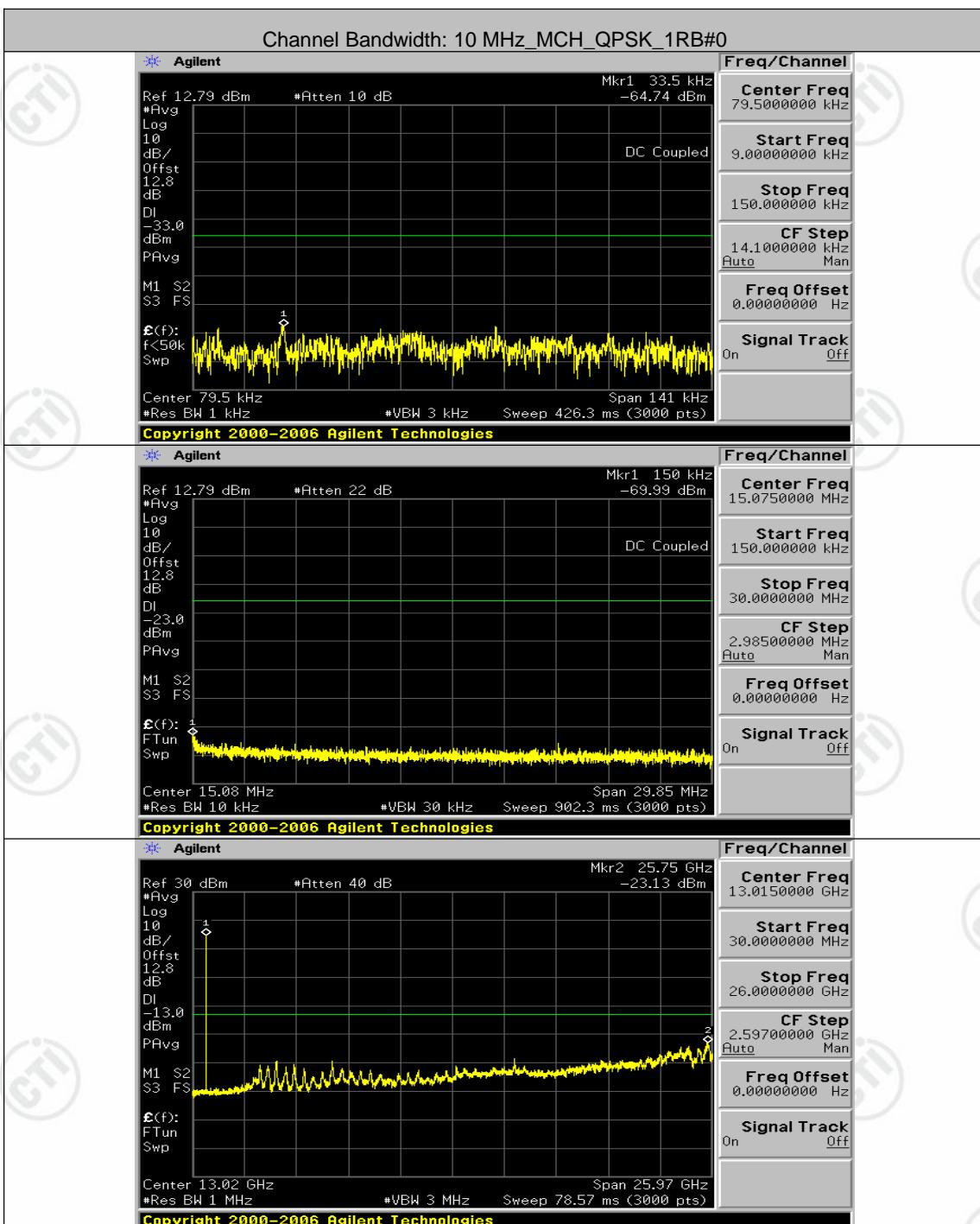


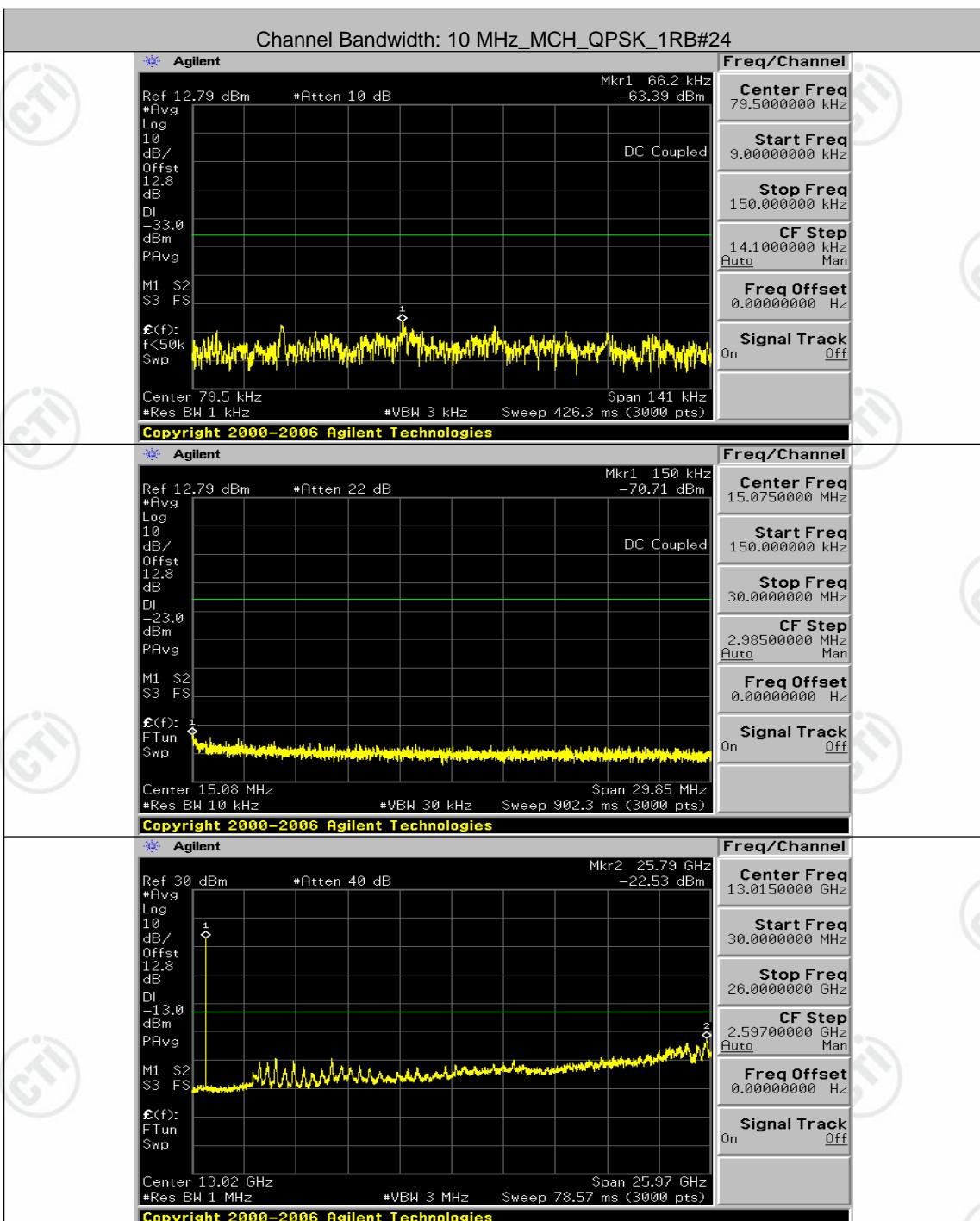
Channel Bandwidth: 10MHz

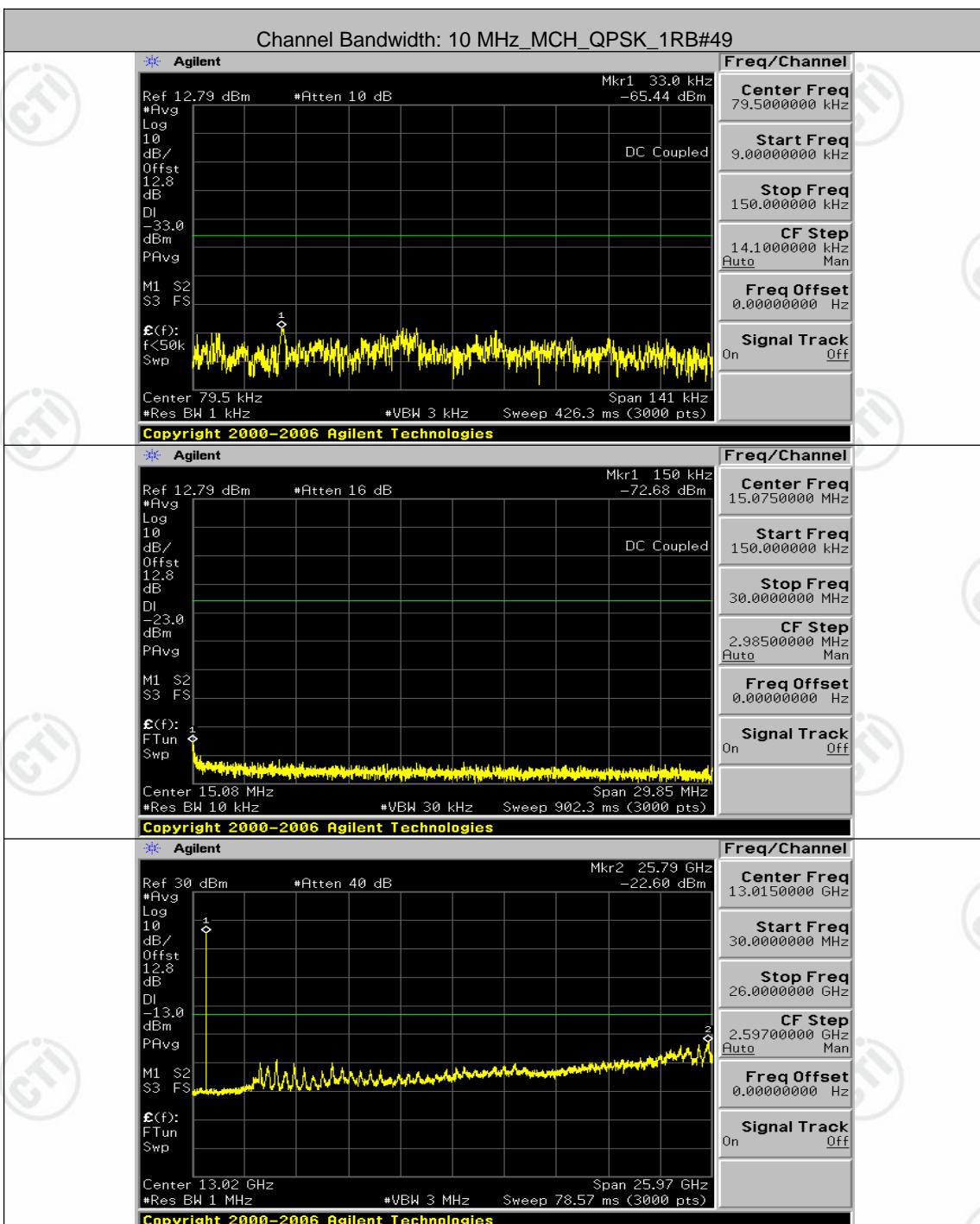


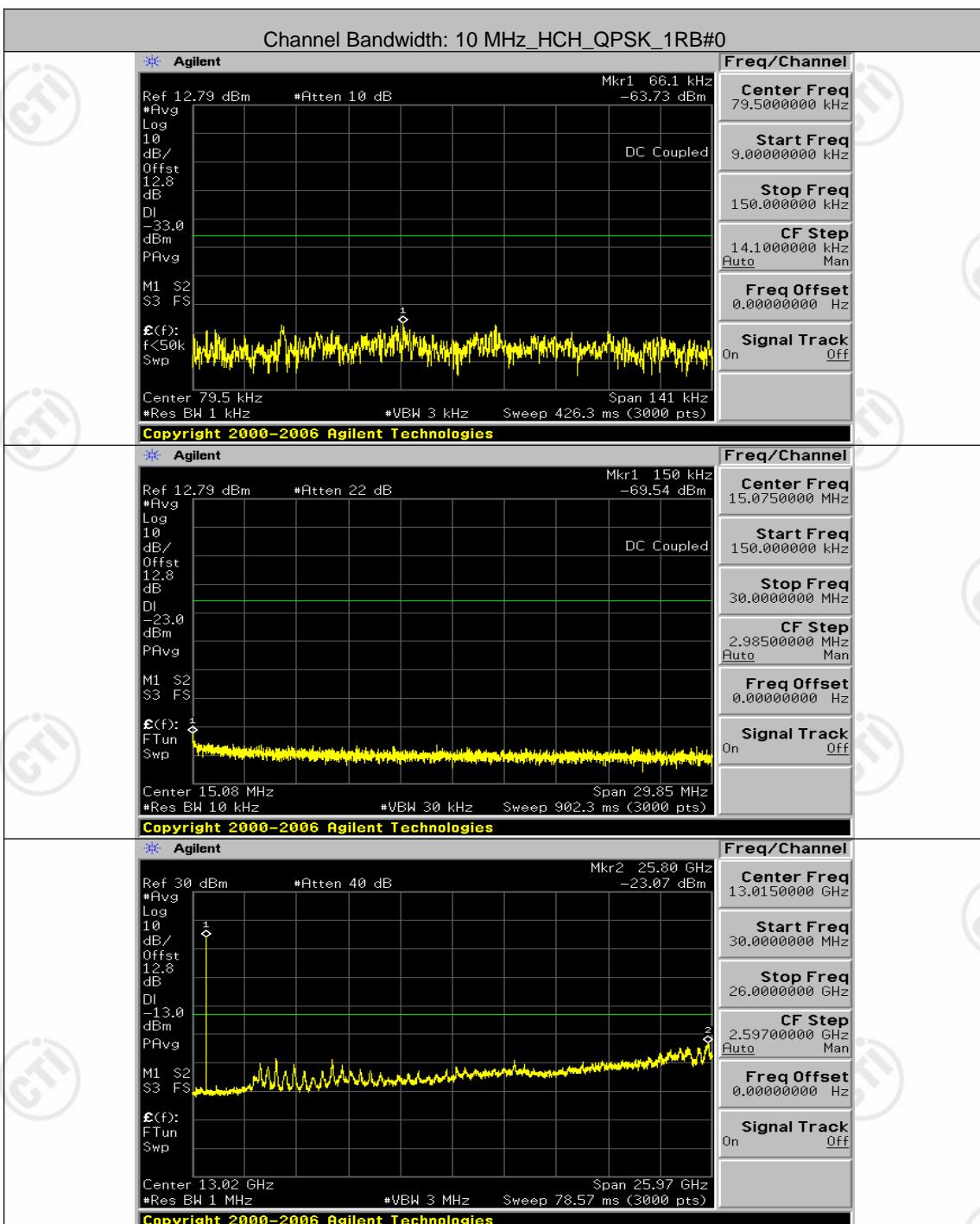


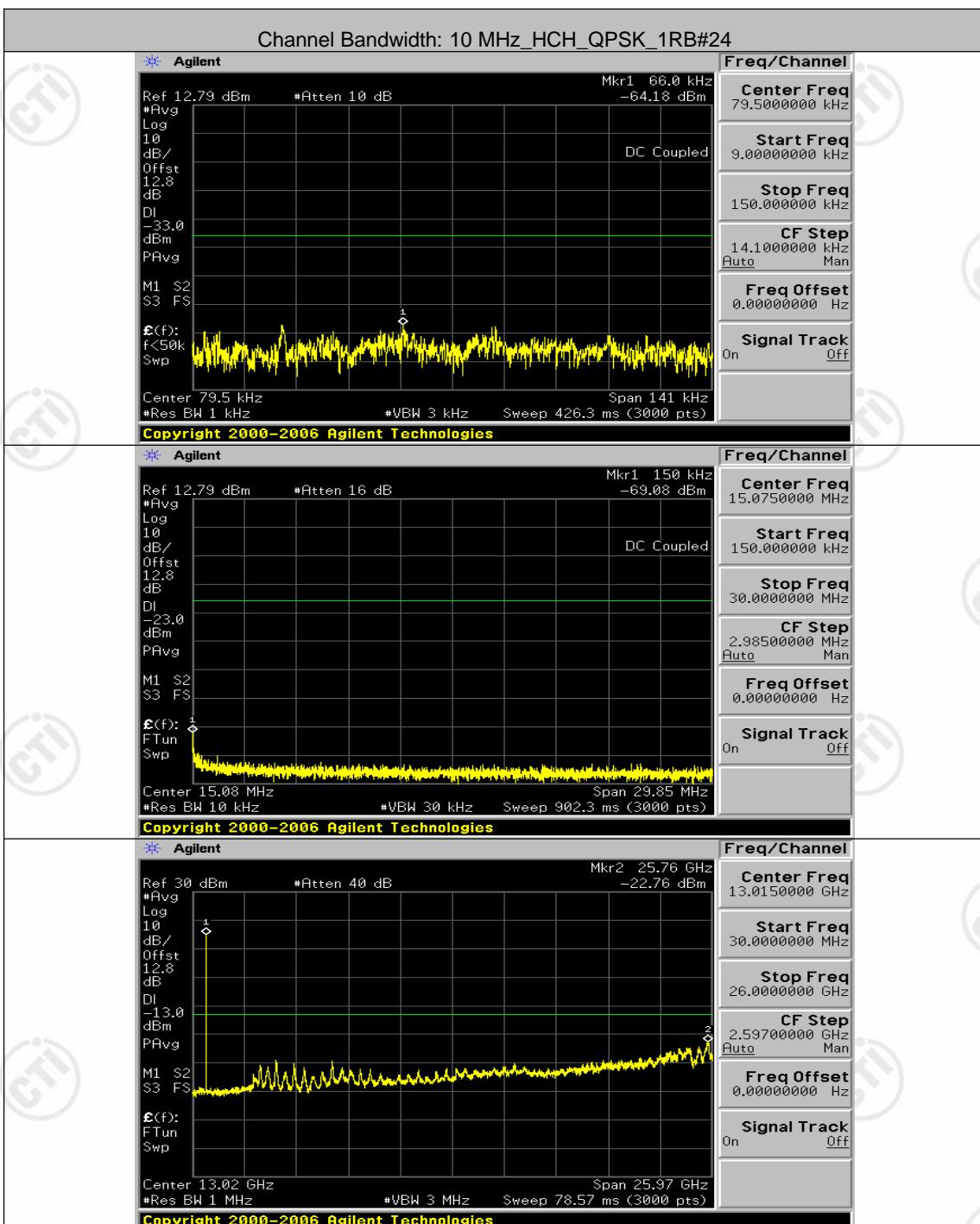


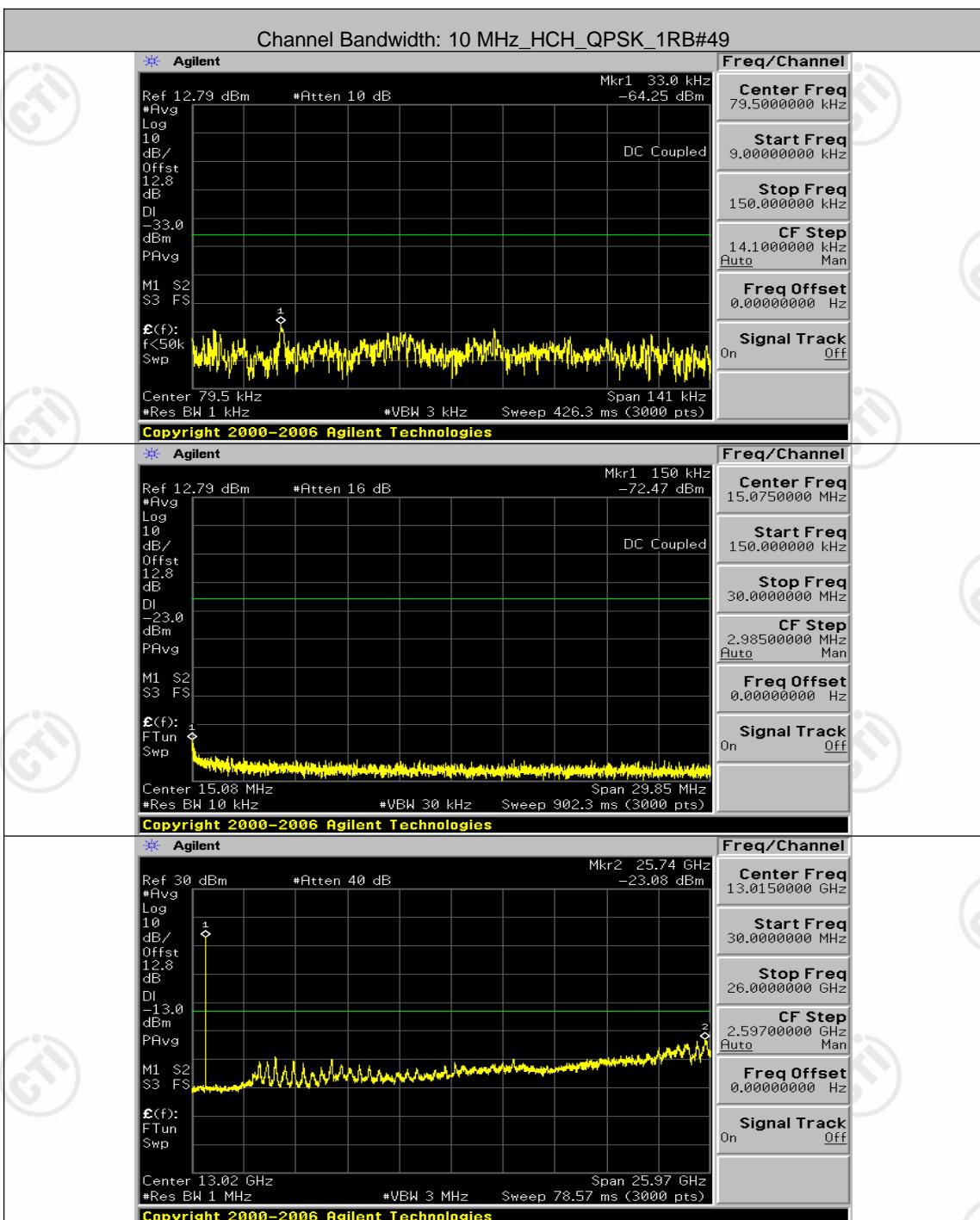


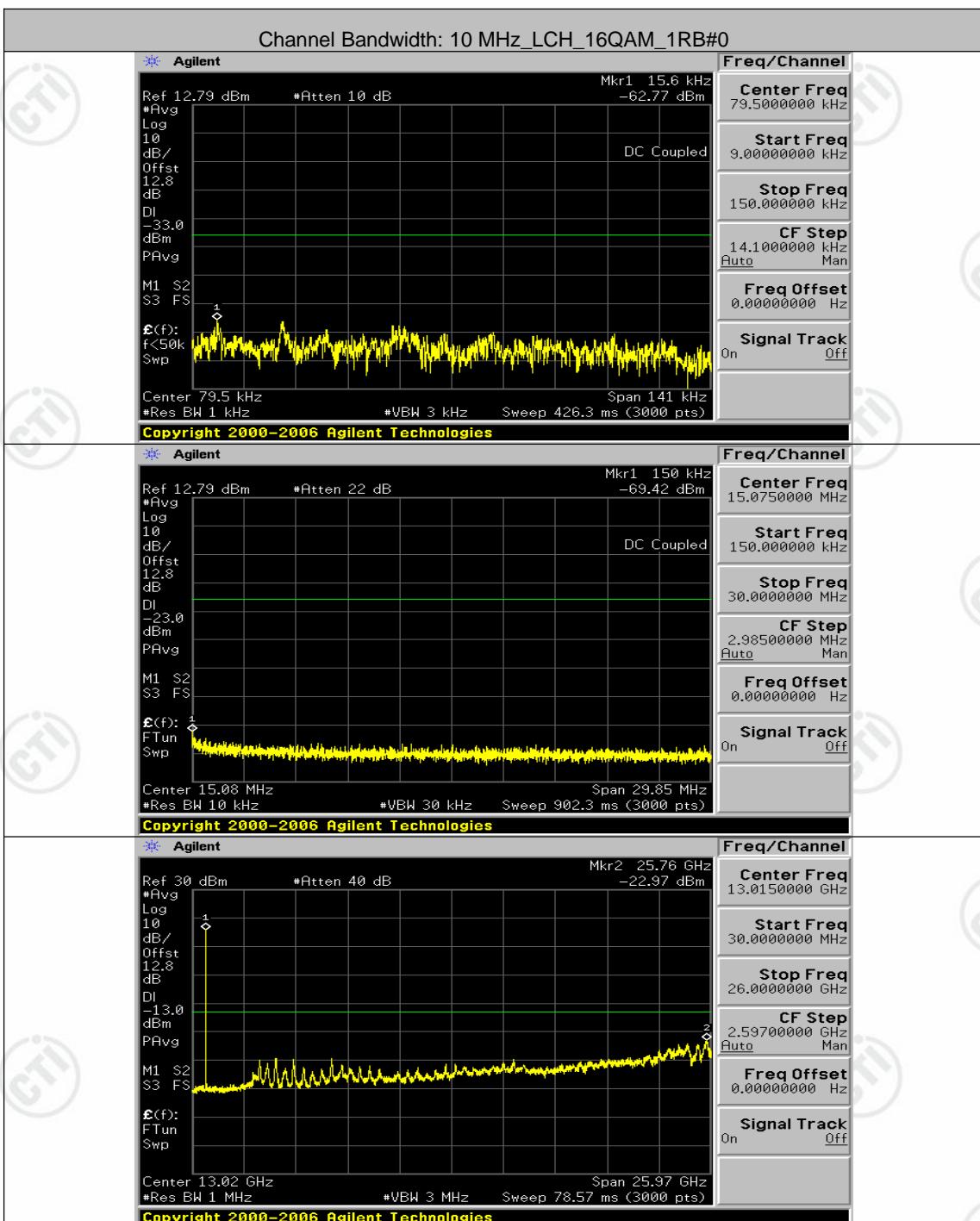


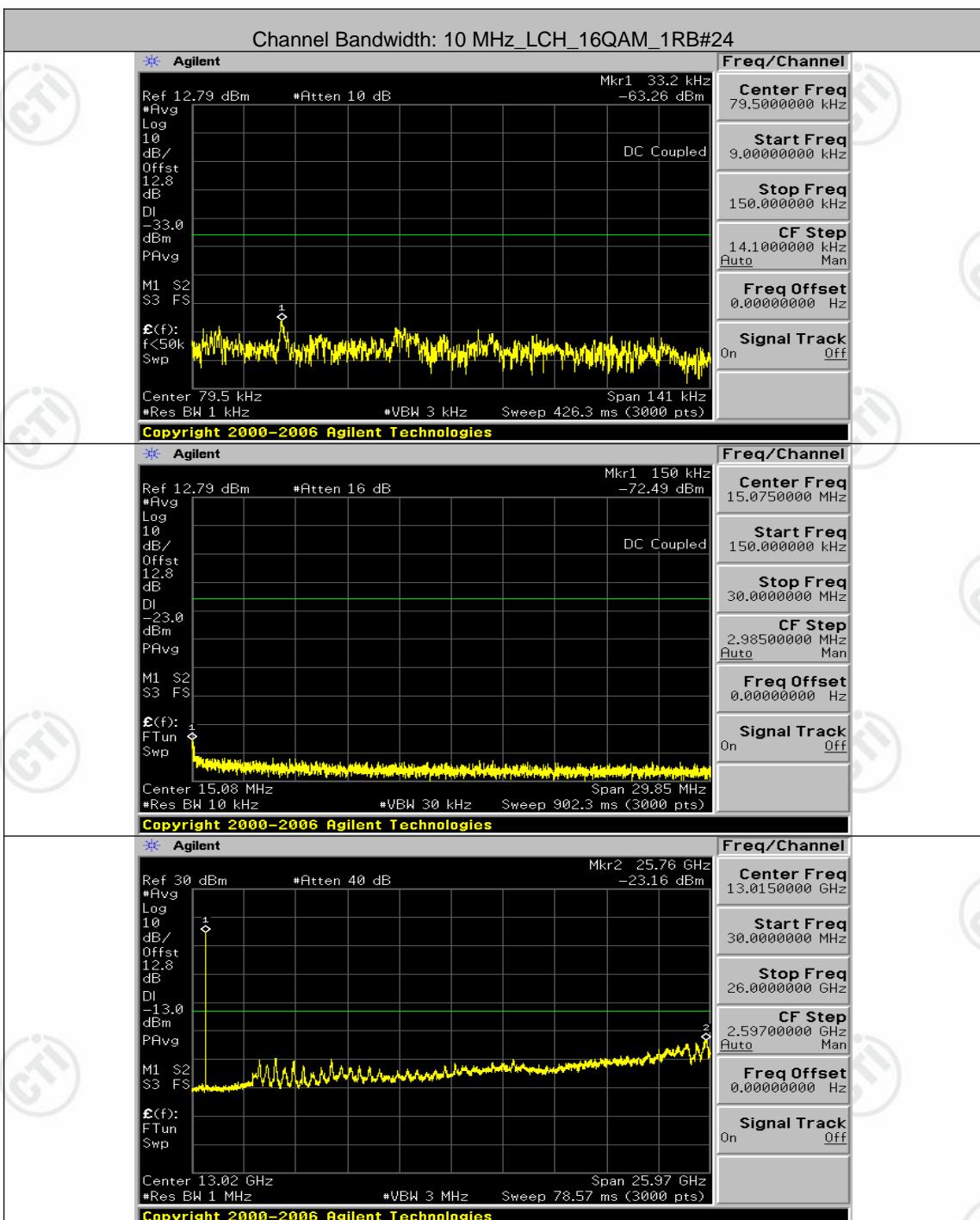


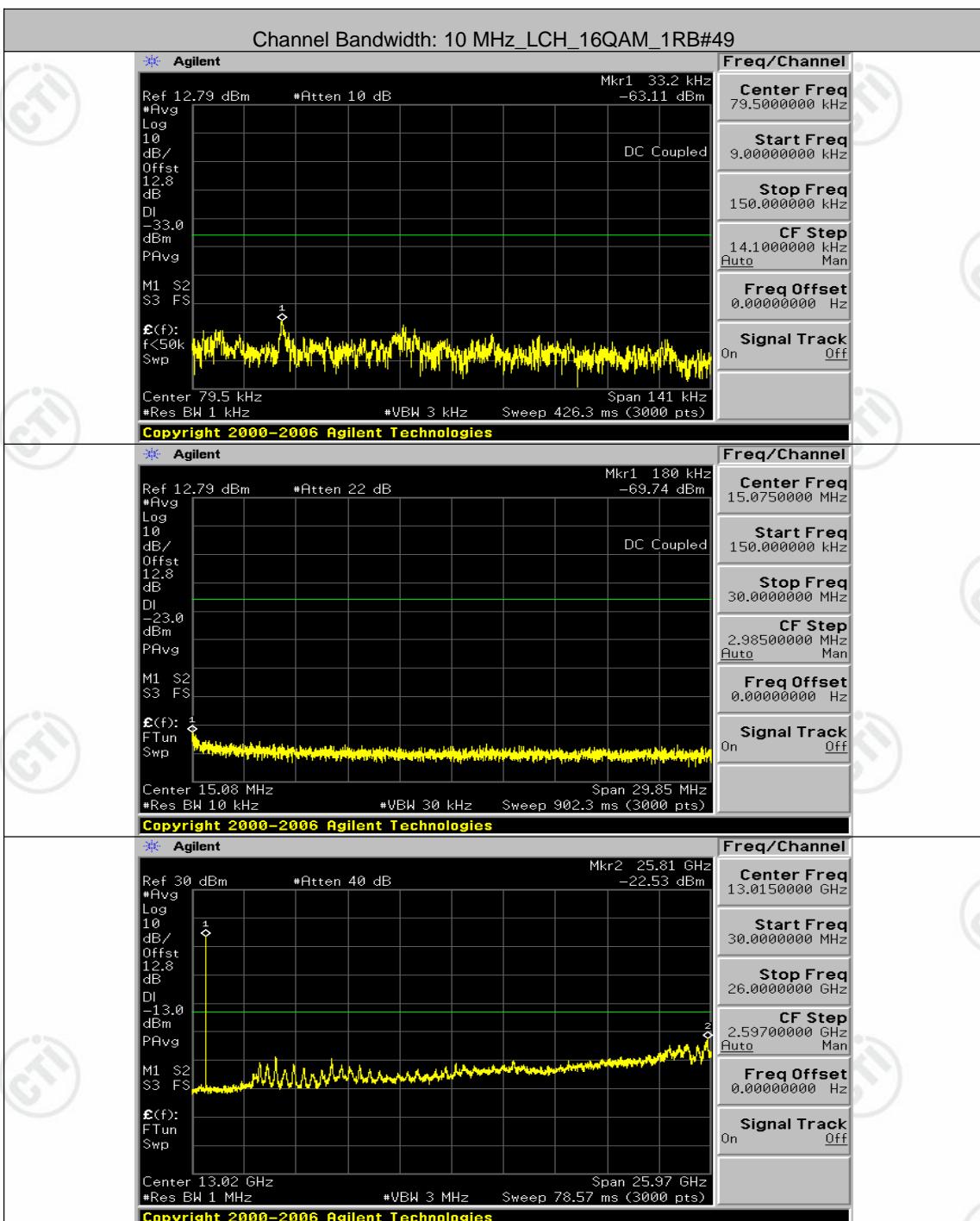


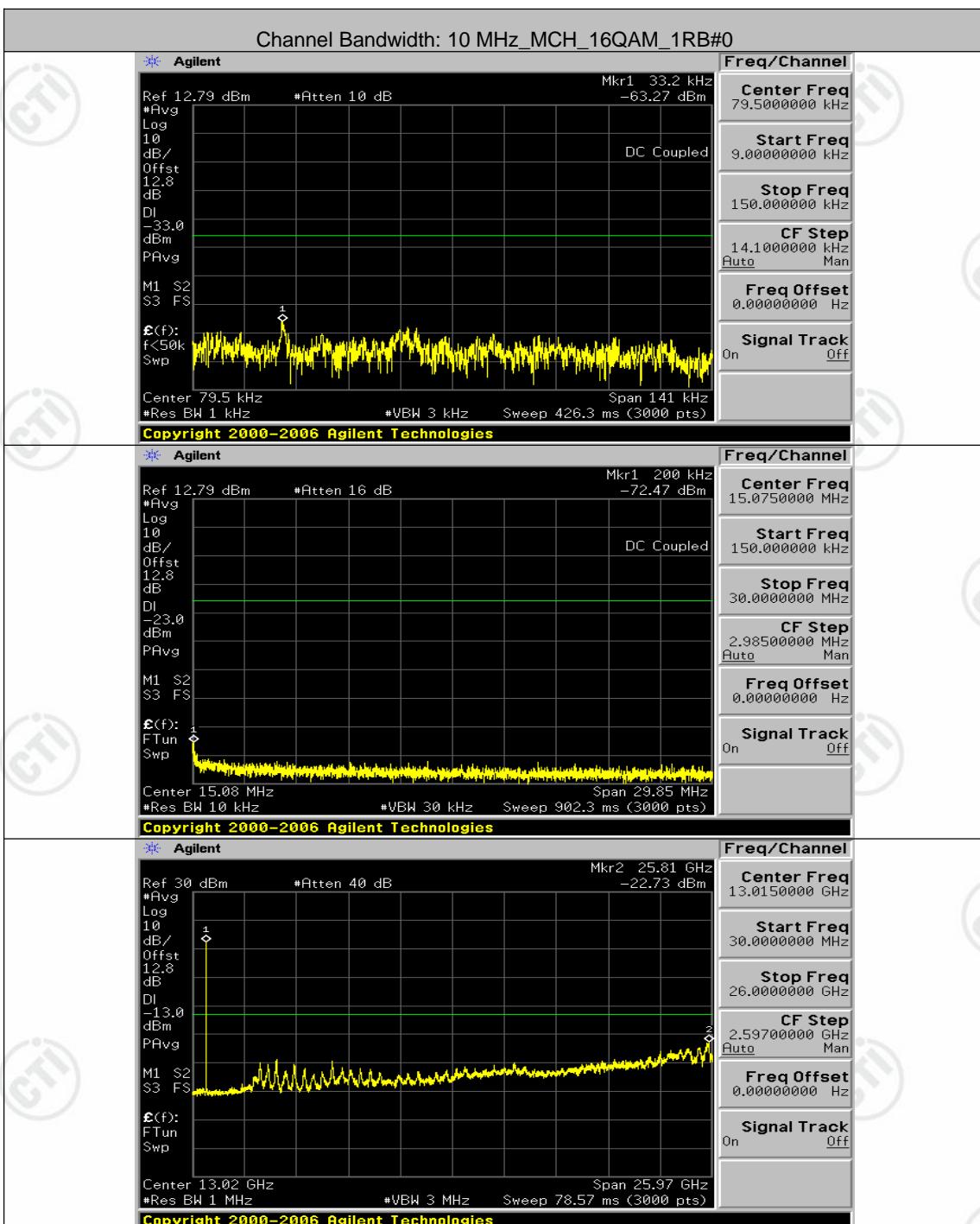


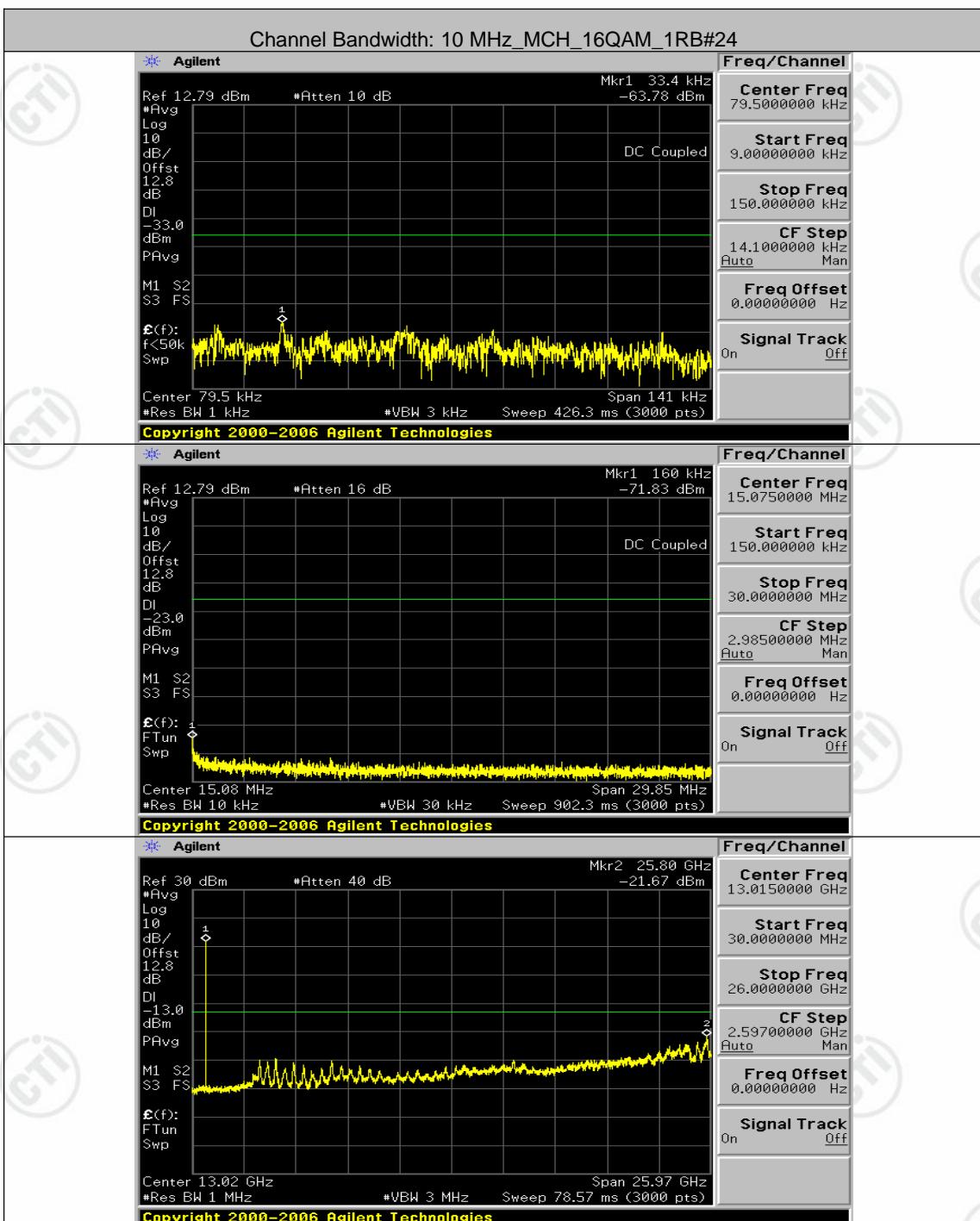


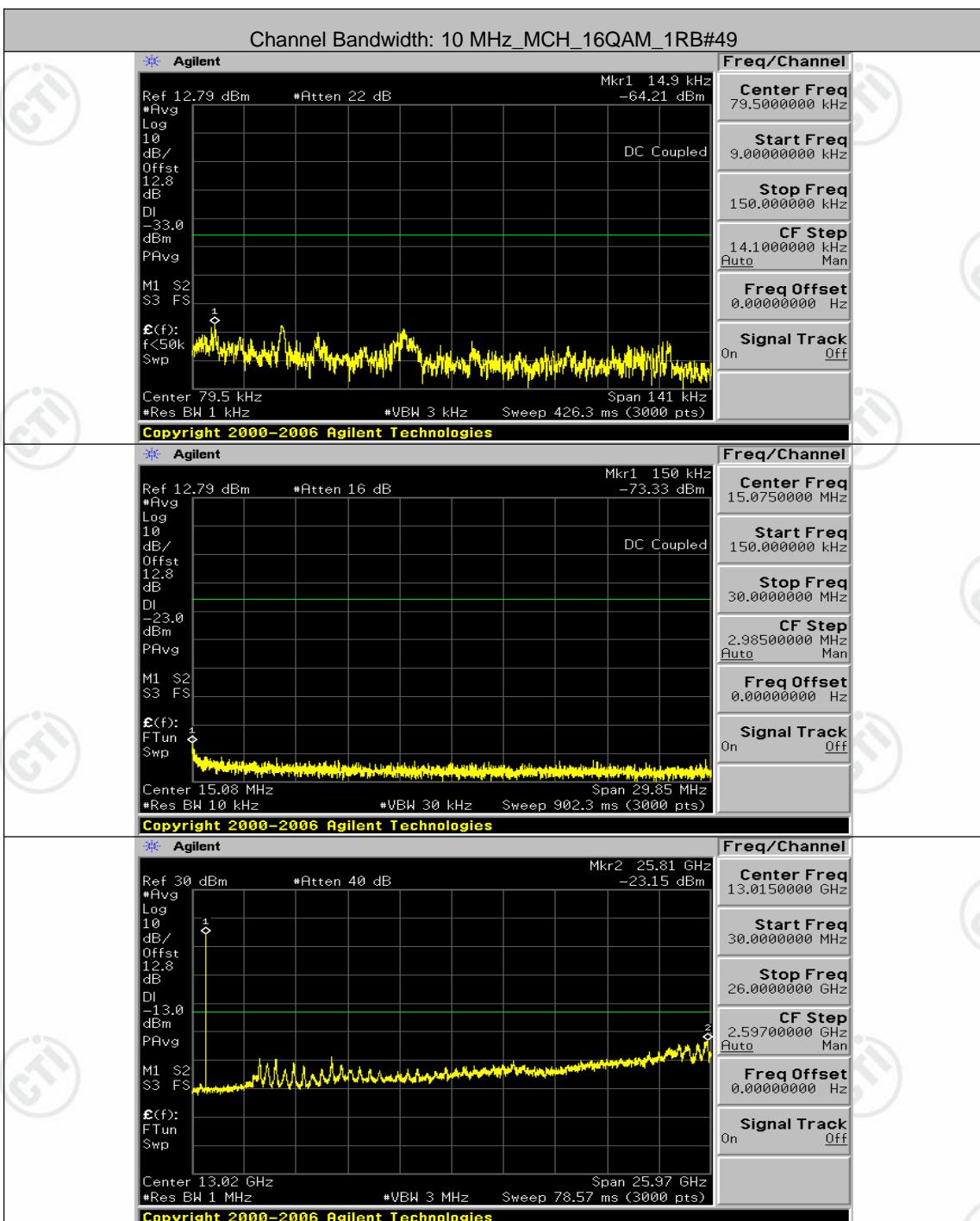


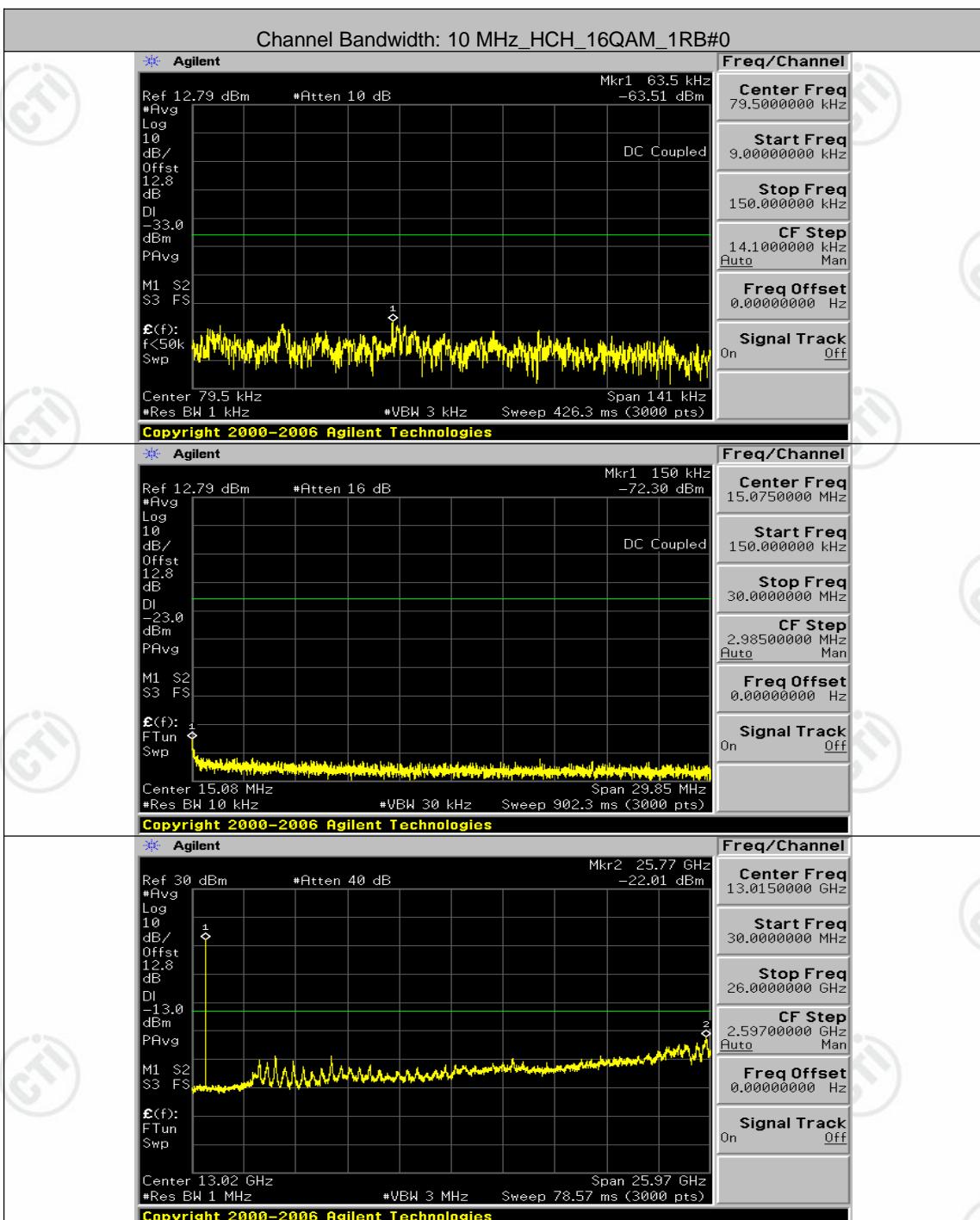


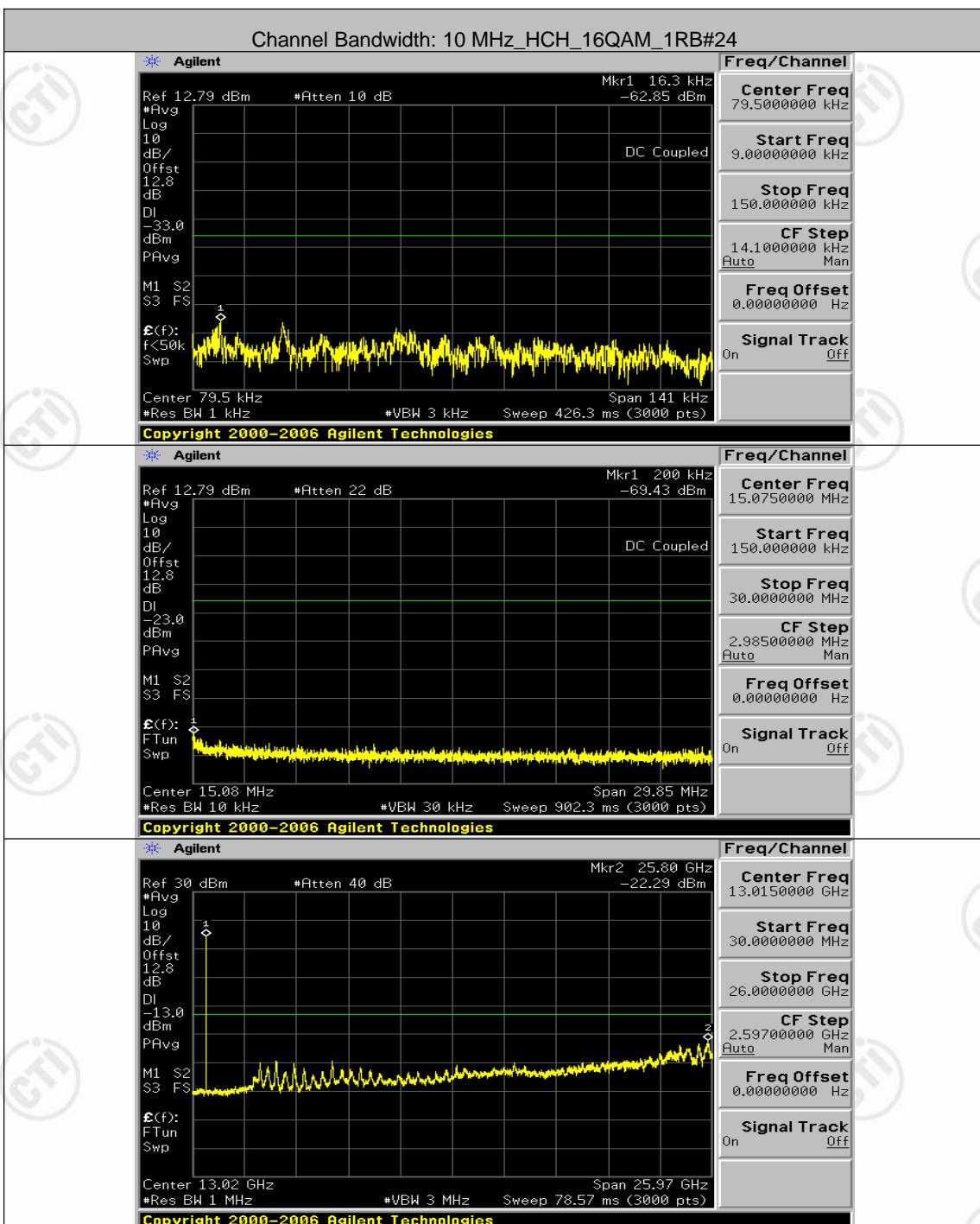


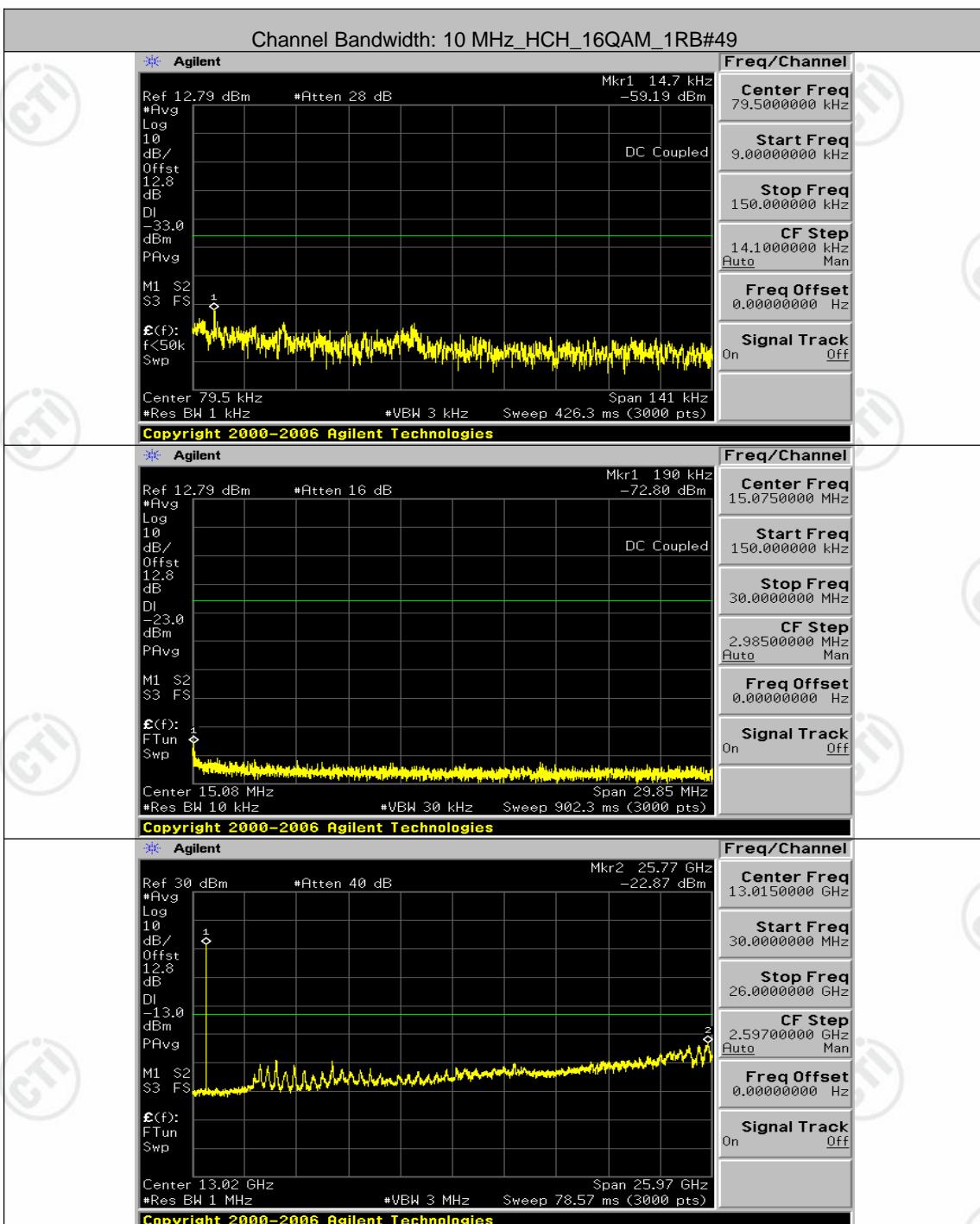












Appendix E: Frequency Stability

Channel Bandwidth: 5 MHz

Channel Bandwidth: 5 MHz						
Voltage						
Modulation	Channel	Voltage [Vdc]	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Verdict
QPSK	LCH	VL	TN	0.59	0.000830	PASS
		VN	TN	-1.72	-0.002430	PASS
		VH	TN	-0.33	-0.000466	PASS
	MCH	VL	TN	0.31	0.000443	PASS
		VN	TN	-0.66	-0.000927	PASS
		VH	TN	0.72	0.001007	PASS
	HCH	VL	TN	-1.99	-0.002787	PASS
		VN	TN	-1.57	-0.002205	PASS
		VH	TN	-2.53	-0.003549	PASS
16QAM	LCH	VL	TN	-1.07	-0.001519	PASS
		VN	TN	0.49	0.000688	PASS
		VH	TN	-0.36	-0.000506	PASS
	MCH	VL	TN	-0.01	-0.000020	PASS
		VN	TN	-2.30	-0.003244	PASS
		VH	TN	0.03	0.000040	PASS
	HCH	VL	TN	-0.13	-0.000180	PASS
		VN	TN	0.34	0.000481	PASS
		VH	TN	-2.10	-0.002947	PASS
Temperature						
Modulation	Channel	Voltage [Vdc]	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Verdict
QPSK	LCH	VN	-30	0.29	0.000405	PASS
		VN	-20	-0.04	-0.000061	PASS
		VN	-10	-2.68	-0.003786	PASS
		VN	0	-1.42	-0.002005	PASS
		VN	10	-1.46	-0.002065	PASS
		VN	20	-2.63	-0.003726	PASS
		VN	30	-2.06	-0.002916	PASS
		VN	40	-3.03	-0.004293	PASS
		VN	50	-3.26	-0.004617	PASS
	MCH	VN	-30	-0.36	-0.000504	PASS
		VN	-20	-3.96	-0.005581	PASS
		VN	-10	-2.07	-0.002921	PASS
		VN	0	-2.90	-0.004090	PASS
		VN	10	-2.69	-0.003788	PASS
		VN	20	-1.99	-0.002801	PASS
		VN	30	-2.66	-0.003748	PASS
		VN	40	-3.18	-0.004473	PASS
		VN	50	-0.50	-0.000705	PASS
	HCH	VN	-30	-2.32	-0.003248	PASS
		VN	-20	-1.50	-0.002105	PASS
		VN	-10	0.59	0.000822	PASS
		VN	0	-3.20	-0.004491	PASS
		VN	10	0.29	0.000401	PASS
		VN	20	-2.78	-0.003890	PASS

		VN	30	0.27	0.000381	PASS
		VN	40	0.10	0.000140	PASS
		VN	50	0.46	0.000642	PASS
16QAM	LCH	VN	-30	-2.73	-0.003867	PASS
		VN	-20	-1.53	-0.002167	PASS
		VN	-10	-0.09	-0.000121	PASS
		VN	0	-0.21	-0.000304	PASS
		VN	10	-0.27	-0.000385	PASS
		VN	20	-1.47	-0.002086	PASS
		VN	30	0.04	0.000061	PASS
		VN	40	-0.54	-0.000769	PASS
		VN	50	-3.08	-0.004353	PASS
		VN	-30	0.50	0.000705	PASS
16QAM	MCH	VN	-20	-1.70	-0.002398	PASS
		VN	-10	-3.35	-0.004715	PASS
		VN	0	0.51	0.000725	PASS
		VN	10	0.51	0.000725	PASS
		VN	20	-0.47	-0.000665	PASS
		VN	30	-2.42	-0.003405	PASS
		VN	40	0.31	0.000443	PASS
		VN	50	-0.43	-0.000604	PASS
		VN	-30	1.06	0.001484	PASS
		VN	-20	-1.86	-0.002606	PASS
16QAM	HCH	VN	-10	0.60	0.000842	PASS
		VN	0	-2.35	-0.003288	PASS
		VN	10	-0.14	-0.000200	PASS
		VN	20	0.09	0.000120	PASS
		VN	30	-0.17	-0.000241	PASS
		VN	40	-0.44	-0.000622	PASS
		VN	50	-0.43	-0.000601	PASS
		VN	-30	1.06	0.001484	PASS
		VN	-20	-1.86	-0.002606	PASS
		VN	-10	0.60	0.000842	PASS

Channel Bandwidth: 10 MHz

Channel Bandwidth: 10 MHz						
Voltage						
Modulation	Channel	Voltage [Vdc]	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Verdict
QPSK	LCH	VL	TN	-0.60	-0.000847	PASS
		VN	TN	0.47	0.000666	PASS
		VH	TN	-2.50	-0.003531	PASS
	MCH	VL	TN	-1.04	-0.001471	PASS
		VN	TN	-1.92	-0.002700	PASS
		VH	TN	-2.85	-0.004009	PASS
16QAM	HCH	VL	TN	0.09	0.000121	PASS
		VN	TN	0.09	0.000121	PASS
		VH	TN	-1.76	-0.002475	PASS
	LCH	VL	TN	-1.76	-0.002482	PASS
		VN	TN	-2.30	-0.003248	PASS
		VH	TN	-2.17	-0.003067	PASS
	MCH	VL	TN	-0.82	-0.001148	PASS
		VN	TN	-0.11	-0.000161	PASS
		VH	TN	-2.55	-0.003586	PASS

	HCH	VL	TN	-1.80	-0.002535	PASS
		VN	TN	-2.62	-0.003682	PASS
		VH	TN	0.29	0.000402	PASS
Temperature						
Modulation	Channel	Voltage [Vdc]	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Verdict
16QAM	LCH	VN	-30	-1.40	-0.001977	PASS
		VN	-20	-1.52	-0.002139	PASS
		VN	-10	-1.24	-0.001755	PASS
		VN	0	-2.89	-0.004076	PASS
		VN	10	-0.59	-0.000827	PASS
		VN	20	-1.82	-0.002562	PASS
		VN	30	-1.70	-0.002401	PASS
		VN	40	0.20	0.000282	PASS
		VN	50	-1.43	-0.002018	PASS
	MCH	VN	-30	-3.29	-0.004634	PASS
		VN	-20	0.27	0.000383	PASS
		VN	-10	-0.39	-0.000544	PASS
		VN	0	-1.30	-0.001833	PASS
		VN	10	-2.47	-0.003486	PASS
		VN	20	-1.77	-0.002498	PASS
		VN	30	0.70	0.000987	PASS
		VN	40	-0.24	-0.000343	PASS
		VN	50	-0.14	-0.000201	PASS
	HCH	VN	-30	-1.40	-0.001972	PASS
		VN	-20	-0.49	-0.000684	PASS
		VN	-10	-2.12	-0.002978	PASS
		VN	0	-1.10	-0.001549	PASS
		VN	10	0.89	0.001247	PASS
		VN	20	1.53	0.002153	PASS
		VN	30	-2.42	-0.003400	PASS
		VN	40	-0.40	-0.000563	PASS
		VN	50	-0.56	-0.000785	PASS
QPSK	LCH	VN	-30	-3.52	-0.004963	PASS
		VN	-20	-0.37	-0.000525	PASS
		VN	-10	-1.87	-0.002643	PASS
		VN	0	-4.21	-0.005932	PASS
		VN	10	-1.37	-0.001937	PASS
		VN	20	-4.01	-0.005649	PASS
		VN	30	-3.48	-0.004903	PASS
		VN	40	-2.49	-0.003511	PASS
		VN	50	-2.06	-0.002905	PASS
	MCH	VN	-30	-0.41	-0.000584	PASS
		VN	-20	-1.39	-0.001954	PASS
		VN	-10	-1.03	-0.001451	PASS
		VN	0	-2.06	-0.002901	PASS
		VN	10	-2.82	-0.003969	PASS
		VN	20	-0.79	-0.001108	PASS
		VN	30	-2.22	-0.003123	PASS
		VN	40	-0.33	-0.000463	PASS
		VN	50	-2.39	-0.003365	PASS
	HCH	VN	-30	-0.90	-0.001268	PASS

	VN	-20	-2.13	-0.002998	PASS
	VN	-10	-3.53	-0.004970	PASS
	VN	0	-1.24	-0.001750	PASS
	VN	10	-0.13	-0.000181	PASS
	VN	20	-1.07	-0.001509	PASS
	VN	30	-1.73	-0.002434	PASS
	VN	40	-1.06	-0.001489	PASS
	VN	50	-0.46	-0.000644	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:	<ol style="list-style-type: none"> 1. Scan up to 10th harmonic, find the maximum radiation frequency to measure. 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>Test procedure as below:</p> <ol style="list-style-type: none"> 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. 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. 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. 4) Steps 1) to 3) were performed with the EUT and the receive antenna in both vertical and horizontal polarization. 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. 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. 7) The output power into the substitution antenna was then measured. 8) Steps 6) and 7) were repeated with both antennas polarized. 9) Calculate power in dBm by the following formula: $\text{ERP(dBm)} = \text{Pg(dBm)} - \text{cable loss (dB)} + \text{antenna gain (dBd)}$ $\text{EIRP(dBm)} = \text{Pg(dBm)} - \text{cable loss (dB)} + \text{antenna gain (dBi)}$ $\text{EIRP} = \text{ERP} + 2.15\text{dB}$ <p>where: Pg is the generator output power into the substitution antenna.</p> 10) Test the EUT in the lowest channel, the middle channel the Highest channel 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. 12) Repeat above procedures until all frequencies measured was complete. 				
Limit:	Attenuated at least $43 + 10\log(P)$				

Test Data:
Above 1GHz
QPSK

Band 17 23755 channel/BW5(lowest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1410.080	151	34	-49.54	-13	-36.54	Pass	H
2113.586	150	221	-45.33	-13	-32.33	Pass	H
2406.584	152	20	-40.67	-13	-27.67	Pass	H
3616.451	149	78	-49.81	-13	-36.81	Pass	H
6187.929	150	200	-47.76	-13	-34.76	Pass	H
9134.575	160	146	-45.75	-13	-32.75	Pass	H
1115.673	155	20	-57.12	-13	-44.12	Pass	V
1410.080	151	157	-46.68	-13	-33.68	Pass	V
2118.973	150	20	-41.90	-13	-28.90	Pass	V
3588.939	150	360	-49.32	-13	-36.32	Pass	V
6445.156	155	89	-46.32	-13	-33.32	Pass	V
8145.925	150	80	-46.10	-13	-33.10	Pass	V

Band 17 23790 channel/BW5(middle channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1420.890	151	88	-44.62	-13	-31.62	Pass	H
2129.789	150	200	-30.41	-13	-17.41	Pass	H
2846.851	155	151	-48.83	-13	-35.83	Pass	H
6379.864	150	20	-45.87	-13	-32.87	Pass	H
9441.913	152	360	-45.66	-13	-32.66	Pass	H
12055.600	150	45	-44.20	-13	-31.20	Pass	H
1065.707	150	27	-52.41	-13	-39.41	Pass	V
1420.890	148	10	-44.06	-13	-31.06	Pass	V
2129.789	144	251	-23.39	-13	-10.39	Pass	V
2412.718	150	20	-42.93	-13	-29.93	Pass	V
2846.851	156	20	-39.02	-13	-26.02	Pass	V
6428.771	155	36	-46.14	-13	-33.14	Pass	V

Band 17 23825 channel/BW5(highest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1428.142	150	187	-46.33	-13	-33.33	Pass	H
2140.659	155	20	-33.50	-13	-20.50	Pass	H
2412.718	151	36	-39.37	-13	-26.37	Pass	H
3757.208	150	22	-49.54	-13	-36.54	Pass	H
6494.564	148	100	-46.30	-13	-33.30	Pass	H
11782.550	149	360	-44.08	-13	-31.08	Pass	H
1424.511	151	89	-41.19	-13	-28.19	Pass	V
2140.659	150	20	-21.65	-13	-8.65	Pass	V
2854.107	150	187	-40.74	-13	-27.74	Pass	V
6283.164	156	20	-46.78	-13	-33.78	Pass	V
9859.472	150	36	-45.29	-13	-32.29	Pass	V
12303.620	148	22	-42.82	-13	-29.82	Pass	V

16QAM

Band 17 23755 channel/BW5(lowest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1406.496	155	337	-45.35	-13	-32.35	Pass	H
2113.586	150	20	-41.56	-13	-28.56	Pass	H
2412.718	154	145	-42.61	-13	-29.61	Pass	H
3766.785	150	20	-50.01	-13	-37.01	Pass	H
6412.427	152	151	-45.64	-13	-32.64	Pass	H
9441.913	148	61	-45.20	-13	-32.20	Pass	H
1410.080	149	40	-46.73	-13	-33.73	Pass	V
2118.973	150	214	-42.30	-13	-29.30	Pass	V
3728.625	156	22	-49.99	-13	-36.99	Pass	V
6428.771	155	57	-45.29	-13	-32.29	Pass	V
9157.857	150	60	-45.80	-13	-32.80	Pass	V
11603.960	150	10	-44.39	-13	-31.39	Pass	V

Band 17 23790 channel/BW5(middle channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1424.511	151	88	-42.99	-13	-29.99	Pass	H
2135.217	150	47	-22.92	-13	-9.92	Pass	H
2412.718	152	154	-37.52	-13	-24.52	Pass	H
2846.851	150	220	-39.44	-13	-26.44	Pass	H
6299.178	150	360	-47.19	-13	-34.19	Pass	H
9298.801	154	15	-44.48	-13	-31.48	Pass	H
1420.890	155	78	-42.52	-13	-29.52	Pass	V
2135.217	151	22	-22.11	-13	-9.11	Pass	V
2406.584	148	10	-41.01	-13	-28.01	Pass	V
2846.851	149	317	-38.87	-13	-25.87	Pass	V
6544.350	150	70	-45.97	-13	-32.97	Pass	V
10587.850	150	60	-45.30	-13	-32.30	Pass	V

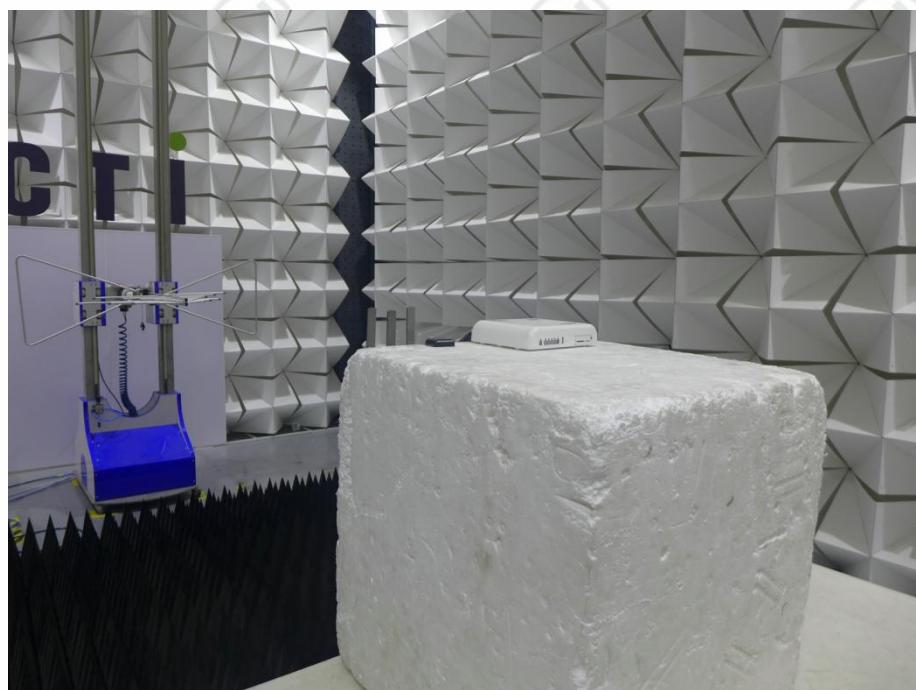
Band 17 23825 channel/BW5(highest channel)							
Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis.
1424.511	155	87	-47.20	-13	-34.20	Pass	H
2140.659	147	254	-34.54	-13	-21.54	Pass	H
3607.257	150	115	-50.93	-13	-37.93	Pass	H
6527.712	150	67	-46.98	-13	-33.98	Pass	H
7961.425	152	45	-47.05	-13	-34.05	Pass	H
10087.960	156	95	-46.49	-13	-33.49	Pass	H
1428.142	150	221	-42.77	-13	-29.77	Pass	V
2140.659	154	20	-27.22	-13	-14.22	Pass	V
2854.107	149	360	-46.70	-13	-33.70	Pass	V
4433.263	160	70	-51.01	-13	-38.01	Pass	V
6396.125	155	81	-47.07	-13	-34.07	Pass	V
8973.250	150	245	-46.57	-13	-33.57	Pass	V

Note:

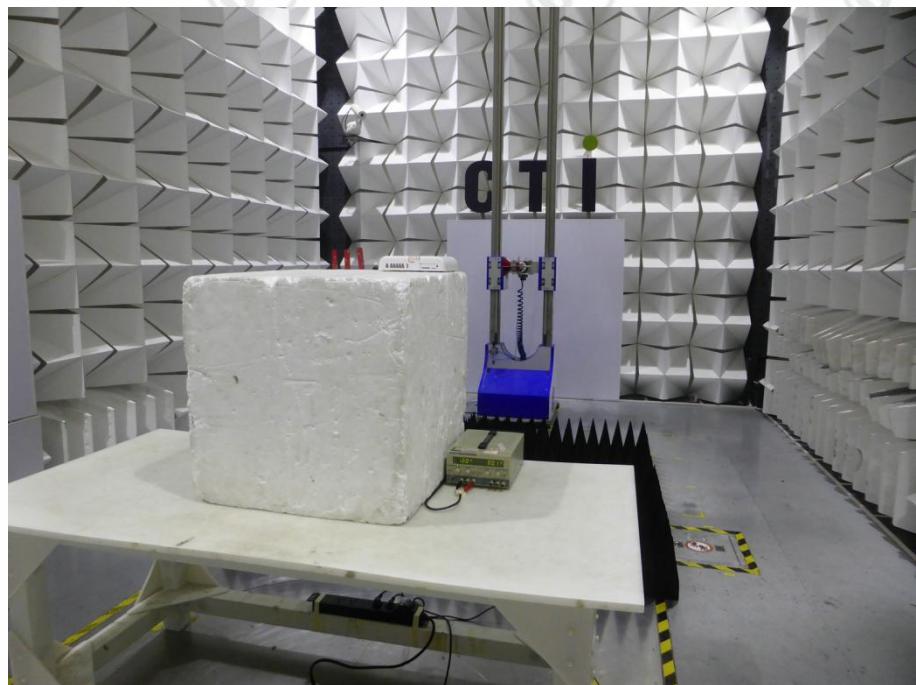
1) Scan from 9kHz to 25GHz, the disturbance above 13GHz and below 1GHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below 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 ***

The test report is effective only with both signature and specialized stamp, The result(s) shown in this report refer only to the sample(s) tested. Without written approval of CTI, this report can't be reproduced except in full.