



FCC Test Report

FCC ID: 2AKFLC5000

Product Name:	C5000 Mobile Data Terminal
Trademark:	N/A
Model Name:	C5000 C5100, H942, H941, H951
Prepared For: Address:	Shenzhen Handheld-Wireless Technology Co., Ltd 16th Floor, Block B, Dongfangtiande Bldg., Minzhi Street, Longhua New District, Shenzhen, China
Prepared By: Address:	Shenzhen BCTC Technology Co., Ltd. NO.101, Yousong Road, Longhua New District, Shenzhen, Guangdong, P.R.China
Test Date:	Nov. 10 – Nov. 20, 2016
Date of Report:	Nov. 22, 2016
Report No.:	BCTC-LH161111868-3E



VERIFICATION OF COMPLIANCE

Applicant's name: Shenzhen Handheld-Wireless Technology Co., Ltd
Address.....: 16th Floor, Block B, Dongfangtiande Bldg., Minzhi Street, Longhua New District, Shenzhen, China
Manufacture's Name: Shenzhen Handheld-Wireless Technology Co., Ltd
Address.....: 16th Floor, Block B, Dongfangtiande Bldg., Minzhi Street, Longhua New District, Shenzhen, China

Product description

Product name.....: C5000 Mobile Data Terminal
Trademark: N/A
Model Name: C5000
 C5100, H942, H941, H951
 FCC CFR Title 47 Part 2: 2015
 FCC CFR Title 47 Part22 Subpart H: 2015
Test procedure FCC CFR Title 47 Part24 Subpart E: 2015
 ANSI/ TIA/ EIA-603-D-2010
 FCC KDB 971168 D01 Power Meas. License Digital Systems v02v02


This device described above has been tested by BCTC, and the test results show that the equipment under test (EUT) is in compliance with the requirements. And it is applicable only to the tested sample identified in the report.

This report shall not be reproduced except in full, without the written approval of BCTC, this document may be altered or revised by BCTC, personal only, and shall be noted in the revision of the document.


Test Result : **Pass**

Testing Engineer : 

 Eric Yang

Reviewer Supervisor : 

 Jade Yang

Approved & Authorized Manager : 

 Carson Zhang



TABLE OF CONTENTS

	Page
Test Report Declaration	
1. TEST SUMMARY	4
2. GENERAL PRODUCT INFORMATION	5
2.1. Description of Device (EUT)	5
2.2. Product Function.....	6
2.3. Independent Operation Modes	6
3. TEST SITES	7
3.1. Test Facilities	7
3.2. List of Test and Measurement Instruments.....	8
4. TEST SET-UP AND OPERATION MODES	9
4.1. Principle of Configuration Selection	9
4.2. Block Diagram of Test Set-up.....	9
4.3. Test Environment:	9
5. EMISSION TEST RESULTS	10
5.1. Conducted RF Output Power.....	10
5.2. -26dB and 99% Occupied Bandwidth	12
5.3. Peak to Average Ratio.....	22
5.4. Frequency Stability.....	24
5.5. Conducted Spurious Emissions.....	28
5.6. Conducted Out of Band Emissions	53
5.7. Transmitter Radiated Power (EIRP/ERP)	60
5.8. Radiated Out of Band Emissions.....	65
6. PHOTOGRAPHS OF TEST SET-UP.....	79
7. PHOTOGRAPHS OF THE EUT	80



1. TEST SUMMARY

Test Items	Test Requirement	Result
RF Exposure (SAR)	Part 1.1307 Part 2.1093	Passed* (Please refer to SAR Report)
Conducted RF Output Power	2.1046	PASS
Peak to Average Ratio	2.1055,22.355 24.235,27.54	PASS
99% & -26 dB Occupied Bandwidth	2.1049, 22.917 24.238,	PASS
Frequency Stability	2.1055, 22.355 24.235,	PASS
Conducted Out of Band Emissions	2.1051,2.1057 22.917, 24.238	PASS
Band Edge	2.1051,2.1057 22.917, 24.238	PASS
Transmitter Radiated Power (EIPR/ERP)	22.913, 24.232	PASS
Radiated Out of Band Emissions	2.1053,2.1057 22.917, 24.238	PASS



2.GENERAL PRODUCT INFORMATION

2.1. Description of Device (EUT)

Product Name:	C5000 Mobile Data Terminal
Trademark	N/A
Model No.:	C5000 C5100, H942, H941, H951
Model Difference	The product's different for model name and outlook color.
Operation Frequency:	Bluetooth:2402~2480MHz WIFI:2412MHz~2462MHz (802.11b/802.11g/802.11n(H20)) 2422MHz~2452MHz (802.11n(H40)) RF ID:13.56MHz GSM 850MHz: Tx: 824.20 - 848.80MHz (at intervals of 200kHz); Rx: 869.20 - 893.80MHz (at intervals of 200kHz) GSM 1900MHz: Tx: 1850.20 - 1909.80MHz (at intervals of 200kHz); Rx: 1930.20 - 1989.80MHz (at intervals of 200kHz) WCDMA Band II: TX: 1852.4MHz - 1907.60MHz, RX: 1932.4MHz - 1987.60MHz WCDMA Band V: Tx: 826.40 - 846.60MHz (at intervals of 200kHz); Rx: 871.40 - 891.60MHz (at intervals of 200kHz)
Channel numbers:	Bluetooth:40 Channels WIFI:11 Channel for 802.11b/g/n(HT20), 9 Channel for 802.11n(HT40)
Channel separation:	Bluetooth:1M WIFI:5M
Modulation technology:	Bluetooth: GFSK WIFI:DBPSK/ DQPSK/CCK/BPSK/ QPSK/ 16QAM/ 64QAM GSM/GPRS/EGPRS Mode with GMSK Modulation WCDMA Mode with BPSK Modulation HSDPA Mode with QPSK, 16QAM Modulation HSUPA Mode with QPSK, 16QAM Modulation
Antenna Type:	Internal Antenna
Antenna gain:	1.5dBi (BT &WIFI) 2.0dBi (GSM&WCDMA)
Power supply:	DC 3.7V from battery DC 5V from adapter
GPRS Class:	12
EGPRS Class:	12



2.2. Product Function

Refer to Technical Construction Form and User Manual.

2.3. Independent Operation Modes

During all testing, EUT is in link mode with base station emulator at maximum power level. The spurious emission measurements were carried out in semi-anechoic chamber with 3-meter test range, and EUT is rotated on three test planes to find out the worst emission.

Band	Test modes	
	Radiated	Conducted
GSM 850	<ul style="list-style-type: none"> ■ GSM link ■ EGPRS 8 link 	<ul style="list-style-type: none"> ■ GSM link ■ EGPRS 8 link
PCS 1900	<ul style="list-style-type: none"> ■ GSM link ■ EGPRS 8 link 	<ul style="list-style-type: none"> ■ GSM link ■ EGPRS 8 link
WCDMA Band II	<ul style="list-style-type: none"> ■ RMC 12.2Kbps link 	<ul style="list-style-type: none"> ■ RMC 12.2Kbps link
WCDMA Band V	<ul style="list-style-type: none"> ■ RMC 12.2Kbps link 	<ul style="list-style-type: none"> ■ RMC 12.2Kbps link

Note: The maximum power levels are GSM mode for GMSK link, EGPRS multi-slot class 8 mode for 8PSK link, RMC12.2Kbps mode for WCDMA Band II and V. only these modes were used for all tests.

The conducted average power tables are as follows:

Conducted Average Power (dBm)						
Band	GSM850			PCS1900		
Channel	128	190	251	512	661	810
Frequency (MHz)	824.20	836.60	848.80	1850.20	1880.00	1909.80
SIM 1	32.24	32.27	32.49	29.77	29.61	29.68



3. TEST SITES

3.1. Test Facilities

Site Description

- Name of Firm : Shenzhen BCTC Technology Co., Ltd.
- Site Location : NO.101, Yousong Road, Longhua New District,
Shenzhen, Guangdong, P.R.China
- Lab Qualifications : Certificated by Industry Canada
Registration No.: 12655A
Date of registration: January 19, 2015
- Certificated by FCC, USA
Registration No.: 187086
Date of registration: November 28, 2014
- Certificated by CNAS China
Registration No.: CNAS L6046
Date of registration: February 3, 2013

3.1.1. Measurement Uncertainty

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately **95 %**.

No.	Item	Uncertainty
1	Conducted Emission Test	$\pm 1.38\text{dB}$
2	RF power, conducted	$\pm 0.16\text{dB}$
3	Spurious emissions, conducted	$\pm 0.21\text{dB}$
4	All emissions, radiated (<1G)	$\pm 4.68\text{dB}$
5	All emissions, radiated (>1G)	$\pm 4.89\text{dB}$
6	Temperature	$\pm 0.5^\circ\text{C}$
7	Humidity	$\pm 2\%$



3.2. List of Test and Measurement Instruments

3.2.1. For conducted emission at the mains terminals test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
843 Shielded Room	ChengYu	843 Room	843	2016.08.27	2017.08.26
EMI Receiver	R&S	ESCI	101421	2016.08.27	2017.08.26
LISN	Schwarzbeck	NSLK8127	8127739	2016.08.27	2017.08.26
Attenuator	R&S	ESH3-Z2	BCTC021E	2016.08.27	2017.08.26
843 Cable 1#	FUJIKURA	843C1#	001	2016.08.27	2017.08.26

3.2.2. For radiated test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Test Receiver	R&S	ESPI	101318	2016.08.27	2017.08.26
System Simulator	Agilent	E5515C	GB43130252	2016.08.27	2017.08.26
Power Splitter	Weinschel	1506A	NW534	2016.08.27	2017.08.26
Bilog Antenna	SCHWARZBECK	VULB9160	VULB9160-3369	2016.08.27	2017.08.26
Bilog Antenna	TESEQ	CBL6111D	31217	2016.08.27	2017.08.26
Loop antenna	ARA	PLA-1030/B	1029	2016.06.07	2017.06.06
Spectrum Analyzer	Agilent	E4411B	MY4511235	2016.07.06	2017.07.05
Signal Amplifier	SCHWARZBECK	BBV9718	9718-270	2016.08.27	2017.08.26
Signal Amplifier	Agilent	8449B	3008A00213	2016.08.27	2017.08.26
RF Cable	R&S	R203	R20X	2016.08.27	2017.08.26
MULTI-DEVICE Controller	ETS-LINDGREEN	31250	126821	N/A	N/A
Horn Antenna	EM	EM-AH-10180	2011071402	2016.07.06	2017.07.05
Horn Antenna	EM	EM-AH-10180	2011071401	2016.07.06	2017.07.05
Horn Antenna	Schwarzbeck	BBHA 9170	9170-181	2016.07.06	2017.07.05
Spectrum Analyzer	Agilent	8593E	3911A03928	2016.08.27	2017.08.26
Spectrum Analyzer	Agilent	E4407B	MY45108040	2016.08.27	2017.08.26
Signal Amplifier	DAZE	ZN3380B	11235	2016.08.27	2017.08.26
High Pass filter	KANGMAI	WHKX1.0/1.5G-10SS	40	2016.08.27	2017.08.26
Filter	COM-MW	ZBSF-C836.5-25-X	BCTC042	2016.08.27	2017.08.26
Filter	COM-MW	ZBSF-C1747.5-75-X2	BCTC045	2016.08.27	2017.08.26
Filter	COM-MW	ZBSF-C1880-60-X2	BCTC047	2016.08.27	2017.08.26
Splitter	Agilent	11435B	1125162	2016.08.27	2017.08.26
RF CONDUCTED TEST					
System Simulator	Agilent	E5515C	GB43130252	2016.08.27	2017.08.26
Spectrum Analyzer	Agilent	E4407B	MY45108040	2016.08.27	2017.08.26
DC Power Supply	LongWei	PS-305D	010965682	2016.08.27	2017.08.26
Constant temperature and humidity box	GF	GTH-800-40-2P	MAA9906-012	2016.08.27	2017.08.26
Universal radio communication tester	R&S	CMU200	115295	2016.08.27	2017.08.26



4. TEST SET-UP

4.1. Principle of Configuration Selection

Emission: The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the Operating Instructions.

4.2. Block Diagram of Test Set-up

System Diagram of Connections between EUT and Simulators



(EUT: C5000 Mobile Data Terminal)

4.3. Test Environment:

Ambient conditions in the test laboratory:

Items	Actual
Temperature (°C)	21~23
Humidity (%RH)	50~65



5. EMISSION TEST RESULTS

5.1. Conducted RF Output Power

5.1.1. Limit

According to FCC section 2.1046(a) , FCC part22.913(a) and FCC part 24.232(b) ,for transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in FCC section 2.1033(c)(8).

5.1.2. Test Setup

The EUT, which is powered by the adapter, is coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum output power.

5.1.3. Test Result

Here the lowest, middle and highest channels are selected to perform testing to verify the conducted RF output power of the EUT.

Measurement data



The conducted power tables are as follows:

Average Conducted Power (dBm)						
Band	GSM850			PCS1900		
Channel	128	190	251	512	661	810
Frequency (MHz)	824.20	836.60	848.80	1850.20	1880.00	1909.80
GSM (GMSK, 1 TX slot)	32.24	32.27	32.49	29.77	29.61	29.68
GPRS (GMSK, 1 TX slot)	32.25	32.26	32.46	28.75	28.20	28.66
GPRS (GMSK, 2 TX slot)	31.40	31.51	31.71	27.99	27.44	27.91
GPRS (GMSK, 3 TX slot)	29.34	29.53	29.73	26.33	26.47	26.53
GPRS (GMSK, 4 TX slot)	27.45	27.42	27.62	24.34	24.36	24.82
EGPRS(GMSK, 1 TX slot)	32.21	32.22	32.18	29.29	29.16	29.32
EGPRS(GMSK, 2 TX slot)	31.48	31.49	31.69	27.37	27.42	27.39
EGPRS(GMSK, 3 TX slot)	29.49	29.48	29.68	26.38	26.42	26.48
EGPRS(GMSK, 4 TX slot)	27.46	27.43	27.63	24.45	24.37	24.43
EGPRS (8PSK, 1 TX slot)	26.38	26.85	26.43	24.63	24.62	24.98
EGPRS (8PSK, 2 TX slot)	25.43	25.57	25.49	23.46	23.40	23.72
EGPRS (8PSK, 3 TX slot)	23.51	23.43	23.61	22.42	22.36	22.33
EGPRS (8PSK, 4 TX slot)	22.48	22.35	22.57	21.32	21.10	21.42

Average Conducted Power						
Band	WCDMA Band II.			WCDMA Band V.		
Frequency	1852.4	1880.0	1907.6	826.4	836.6	846.6
RMC 12.2Kbps	24.13	24.65	24.26	22.79	22.68	22.66
RMC 64kbps	24.09	24.59	24.22	22.73	22.56	22.58
RMC 144kbps	24.10	24.61	24.19	22.67	22.45	22.50
RMC 384kbps	24.07	24.57	24.17	22.61	22.34	22.41
HSDPA Subtest-1	24.11	24.64	24.24	22.42	22.34	22.39
HSDPA Subtest-2	24.10	24.62	24.23	22.36	22.33	22.39
HSDPA Subtest-3	24.08	24.61	24.21	22.31	22.29	22.31
HSDPA Subtest-4	24.07	24.59	24.19	22.28	22.20	22.33
HSUPA Subtest-1	24.12	24.63	24.25	22.26	22.29	22.27
HSUPA Subtest-2	24.09	24.62	24.23	22.23	22.18	22.29
HSUPA Subtest-3	24.07	24.61	24.22	22.36	22.28	22.33
HSUPA Subtest-4	24.13	24.65	24.26	22.18	22.21	22.29

Note: Measurement Uncertainty: ±2.6 dB.



5.2. -26dB and 99% Occupied Bandwidth

5.2.1. Limit

According to FCC section 2.1049 and FCC part22.913(a) and FCC part24.232(b), the occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission.

Occupied bandwidth is also known as the 99% emission bandwidth,

5.2.2. Test Setup

The EUT, which is powered by the adapter, is coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum output power.



5.2.3. Test Result

Measurement Data

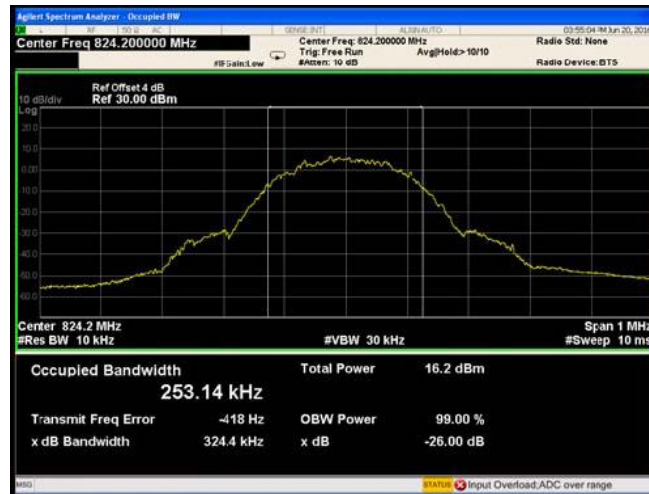
EUT Mode	Channel	Frequency (MHz)	99% Occupy bandwidth (KHz)	-26dB bandwidth (KHz)
GSM 850 (GSM link)	128	824.20	253.14	324.40
	190	836.60	252.27	328.80
	251	848.80	250.82	320.30
GSM 850 (GPRS 8 link)	128	824.20	253.14	324.40
	190	836.60	252.27	328.80
	251	848.80	250.82	320.30
GSM 850 (EGPRS 8 link)	128	824.20	250.91	319.60
	190	836.60	254.61	326.00
	251	848.80	250.17	328.50
PCS 1900 (GSM link)	512	1850.20	244.13	319.50
	661	1880.00	247.46	321.80
	810	1909.80	250.26	317.70
PCS 1900 (GPRS 8 link)	512	1850.20	244.13	319.50
	661	1880.00	247.46	321.80
	810	1909.80	250.26	317.70
PCS 1900 (EGPRS 8 link)	512	1850.20	244.83	318.50
	661	1880.00	247.48	319.10
	810	1909.80	246.38	318.70
WCDMA Band II (RMC 12.2Kbps link)	9262	1852.4	4336.30	4961.00
	9400	1880.0	4343.50	4934.00
	9538	1907.6	4346.00	4983.00
WCDMA Band V (RMC 12.2Kbps link)	4132	826.4	4438.50	5054.00
	4175	836.0	4451.60	5046.00
	4233	846.6	4458.70	5053.00

Note: Measurement Uncertainty: $\pm 20\text{Hz}$.



Test plot as follows:

GSM 850MHz Lowest channel



GSM 850MHz Middle channel



GSM 850MHz Highest channel:

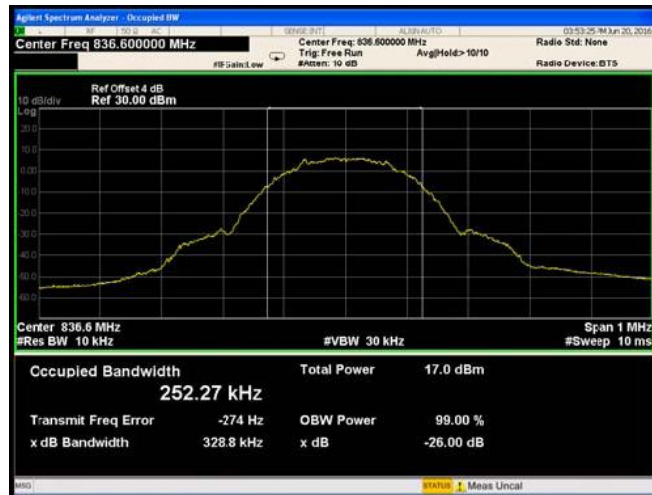




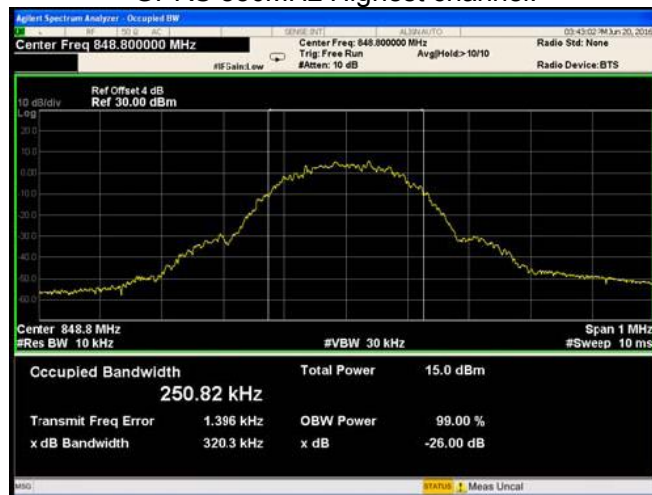
GPRS 850MHz Lowest channel



GPRS 850MHz Middle channel



GPRS 850MHz Highest channel:

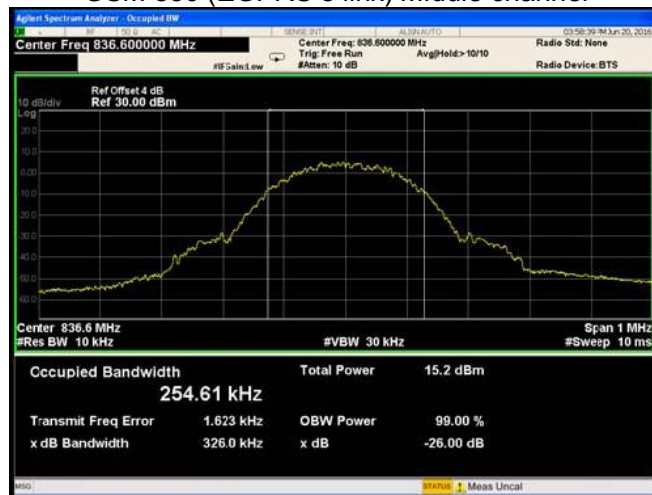




GSM 850 (EGPRS 8 link) Lowest channel



GSM 850 (EGPRS 8 link) Middle channel

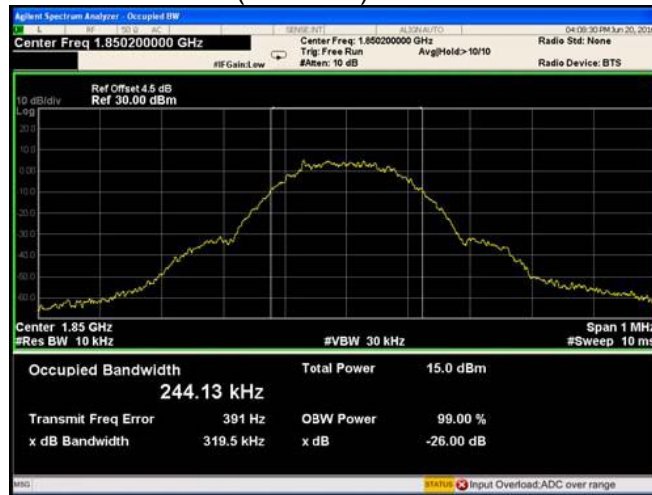


GSM 850 (EGPRS 8 link) Highest channel





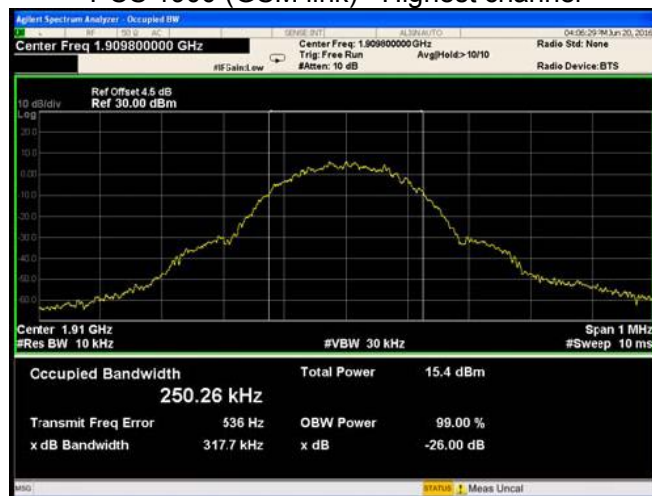
PCS 1900 (GSM link) Lowest channel



PCS 1900 (GSM link) Middle channel



PCS 1900 (GSM link) Highest channel





GPRS 1900 Lowest channel



GPRS 1900 Middle channel

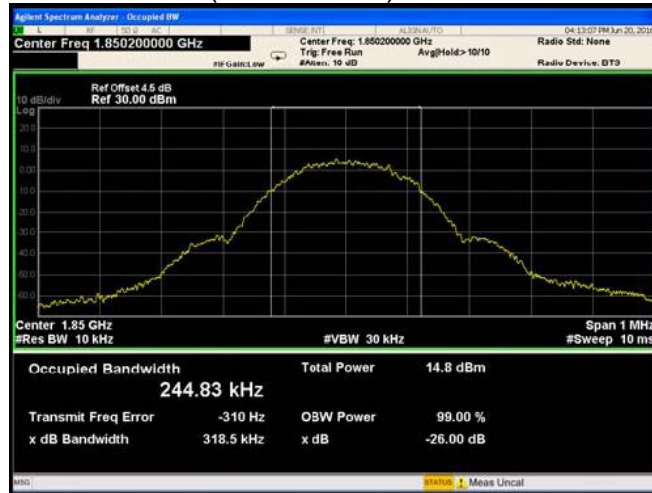


GPRS 1900 Highest channel





PCS 1900 (EGPRS 8 link) Lowest channel



EGPRS 1900MHz Middle channel

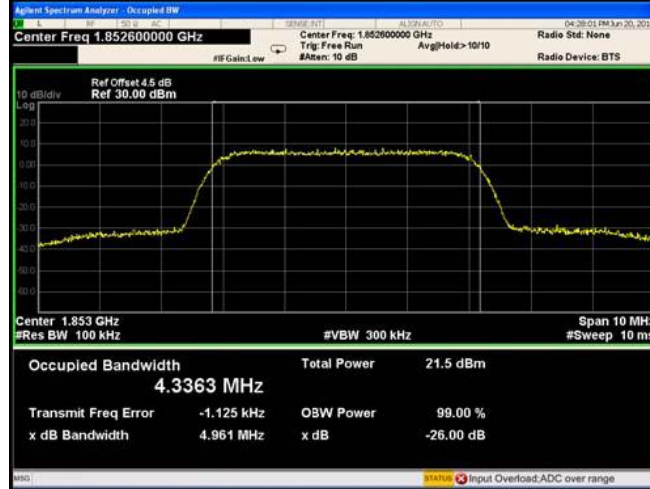


EGPRS 1900MHz Highest channel

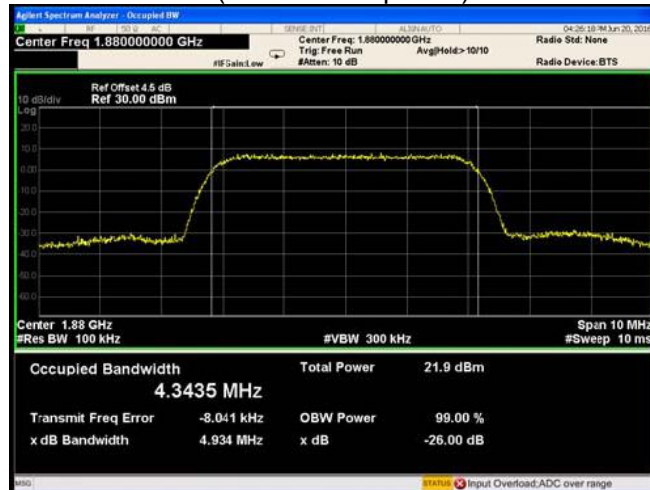




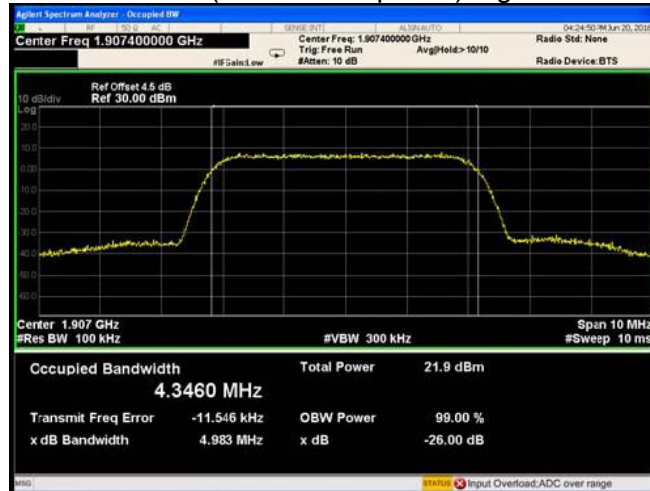
WCDMA Band II (RMC 12.2Kbps link) Lowest channel



WCDMA Band II (RMC 12.2Kbps link) Middle channel

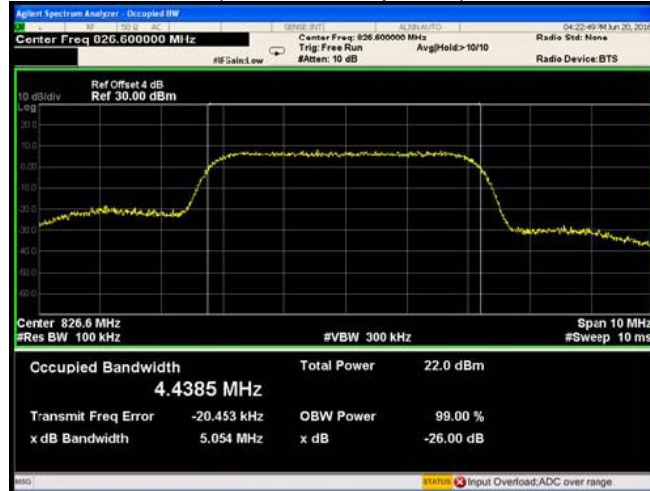


WCDMA Band II (RMC 12.2Kbps link) Highest channel

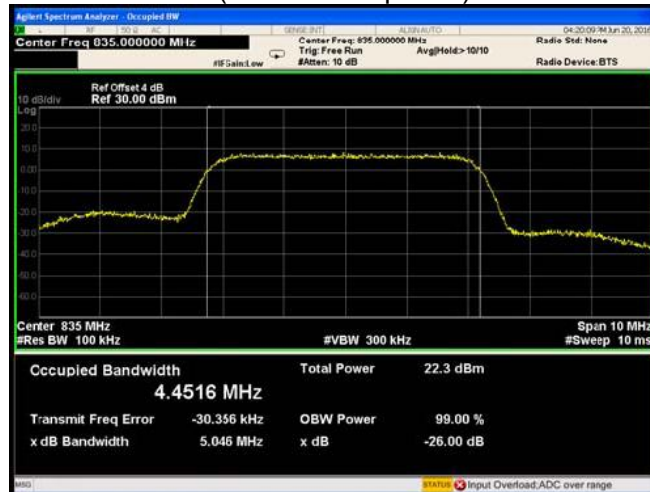




WCDMA Band V (RMC 12.2Kbps link) Lowest channel



WCDMA Band V (RMC 12.2Kbps link) Middle channel



WCDMA Band V (RMC 12.2Kbps link) Highest channel

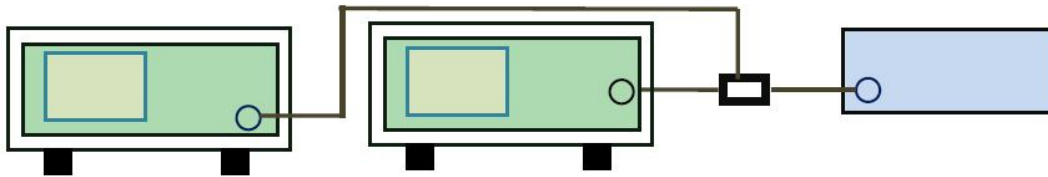


5.3. Peak to Average Ratio

5.3.1. Limit

According to FCC section 27.50(d)(5) , the peak to average ratio(PAR) of the transmission may not exceed 13dB.

5.3.2. Test Setup



5.3.3. Test Procedure

According with KDB 971168 v02r02

1. The signal analyzer's CCDF measurement profile is enabled
2. Frequency = carrier center frequency
3. Measurement BW > Emission bandwidth of signal
4. The signal analyzer was set to collect one million samples to generate the CCDF curve
5. The measurement interval was set depending on the type of signal analyzed. For continuous signals (>98% duty cycle), the measurement interval was set to 1ms. For burst transmissions, the spectrum analyzer is set to use an internal " RF Burst" trigger that is synced with an incoming pulse and the measurement interval is set to less than the duration of the " on time" of one burst to ensure that energy is only captured during a time in which the transmitter is operating at maximum power

5.3.4. Test Result



Measurement data as follows:

Band	Channel	Conducted power(dBm)		Peak-Average Ratio(PAR)
		Peak	Average	
PCS1900	Low	30.91	29.77	1.14
	Middle	30.78	29.61	1.17
	High	30.91	29.68	1.23
EGPRS 1900	Low	30.86	29.29	1.57
	Middle	31.00	29.16	1.84
	High	30.95	29.32	1.63
WCDMA Band II	Low	26.45	24.13	2.32
	Middle	27.06	24.65	2.41
	High	26.63	24.26	2.37

Note: Measurement Uncertainty: ± 0.2 dB.

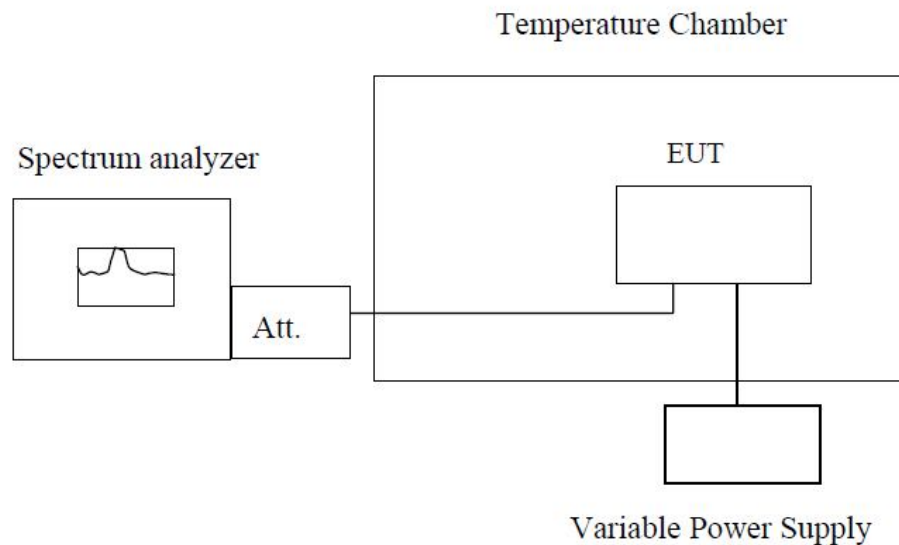
5.4. Frequency Stability

5.4.1. Limit

According to FCC section 22.355 and FCC section 24.235, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. According to FCC section 2.1055, the test conditions are:

- (a) The temperature is varied from -30°C to $+50^{\circ}\text{C}$ at intervals of not more than 10°C .
- (b) For hand carried battery powered equipment, the primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacture. The supply voltage shall be measured at the input to the cable normally provided with the equipment, or at the power supply terminals if cables are not normally provided.

5.4.2. Test Setup



Note : Measurement setup for testing on Antenna connector

The EUT, which is powered by the DC Power Supply directly, is located in the Temperature Chamber.

The EUT is commanded by the System Simulator (SS) to operate at the maximum output power

5.4.3. Test Result

The nominal, highest and lowest extreme voltages are separately 3.8VDC, 4.25VDC and 3.6VDC which are specified by the applicant; the normal temperature here used is 25°C . The frequency deviation limit of 850MHz band is $\pm 2.5\text{ppm}$, and 1900MHz is $\pm 1\text{ppm}$



Test Conditions			Frequency Deviation			Result
Band	Power(Vdc)	Temperature (°C)	Frequency Error(Hz)	ppm	Limit	
GSM850 (GSM link) Middle channel =836.6MHz	3.7	-30	66	0.0789	±2.5	PASS
	3.7	-20	41	0.0490		
	3.7	-10	43	0.0514		
	3.7	0	33	0.0394		
	3.7	10	24	0.0287		
	3.7	20	26	0.0311		
	3.7	30	27	0.0323		
	3.7	40	43	0.0514		
	3.7	50	28	0.0335		
	4.25	25	36	0.0430		
	3.70	25	25	0.0299		
	3.40	25	27	0.0323		
	GPRS850 (Middle channel =836.6MHz	3.7	-30	53		
3.7		-20	34	0.0406		
3.7		-10	26	0.0311		
3.7		0	33	0.0394		
3.7		10	24	0.0287		
3.7		20	21	0.0251		
3.7		30	28	0.0335		
3.7		40	35	0.0418		
3.7		50	37	0.0442		
4.25		25	29	0.0347		
3.70		25	25	0.0299		
3.40		25	31	0.0371		
GSM850 (EGPRS 8 link) Middle channel =836.6MHz		3.7	-30	51	0.0610	±2.5
	3.7	-20	32	0.0383		
	3.7	-10	26	0.0311		
	3.7	0	19	0.0227		
	3.7	10	27	0.0323		
	3.7	20	43	0.0514		
	3.7	30	32	0.0383		
	3.7	40	28	0.0335		
	3.7	50	36	0.0430		
	4.25	25	29	0.0347		
	3.70	25	31	0.0371		
	3.40	25	27	0.0323		



Test Conditions			Frequency Deviation			Result
Band	Power(Vdc)	Temperature(°C)	Frequency Error(Hz)	ppm	Limit	
PCS1900 (GSM link) Middle channel =1880MHz	3.7	-30	72	0.0383	±1	PASS
	3.7	-20	51	0.0271		
	3.7	-10	38	0.0202		
	3.7	0	41	0.0218		
	3.7	10	35	0.0186		
	3.7	20	40	0.0213		
	3.7	30	28	0.0149		
	3.7	40	34	0.0181		
	3.7	50	41	0.0218		
	4.25	25	33	0.0176		
	3.70	25	27	0.0144		
	3.40	25	29	0.0154		
GPRS1900 Middle channel =1880MHz	3.7	-30	68	0.0362	±1	PASS
	3.7	-20	42	0.0223		
	3.7	-10	21	0.0112		
	3.7	0	35	0.0186		
	3.7	10	37	0.0197		
	3.7	20	42	0.0223		
	3.7	30	36	0.0191		
	3.7	40	28	0.0149		
	3.7	50	41	0.0218		
	4.25	25	27	0.0144		
	3.70	25	26	0.0138		
	3.40	25	28	0.0149		
PCS1900 (EGPRS 8 link) Middle channel =1880MHz	3.7	-30	62	0.0330	±1	PASS
	3.7	-20	36	0.0191		
	3.7	-10	42	0.0223		
	3.7	0	31	0.0165		
	3.7	10	34	0.0181		
	3.7	20	29	0.0154		
	3.7	30	46	0.0245		
	3.7	40	28	0.0149		
	3.7	50	33	0.0176		
	4.25	25	29	0.0154		
	3.70	25	42	0.0223		
	3.40	25	39	0.0207		



Test Conditions			Frequency Deviation			Result
Band	Power(Vdc)	Temperature(°C)	Frequency Error(Hz)	ppm	Limit	
WCDMA Band II Middle channel=188 0.0MHz	3.7	-30	85	0.0452	±1	PASS
	3.7	-20	36	0.0191		
	3.7	-10	43	0.0229		
	3.7	0	61	0.0324		
	3.7	10	48	0.0255		
	3.7	20	63	0.0335		
	3.7	30	78	0.0415		
	3.7	40	49	0.0261		
	3.7	50	27	0.0144		
	4.25	25	42	0.0223		
	3.70	25	38	0.0202		
	3.40	25	41	0.0218		
	WCDMA Band V Middle channel=835. 0MHz	3.7	-30	75		
3.7		-20	34	0.0407		
3.7		-10	38	0.0455		
3.7		0	46	0.0551		
3.7		10	29	0.0347		
3.7		20	37	0.0443		
3.7		30	42	0.0503		
3.7		40	26	0.0311		
3.7		50	31	0.0371		
4.25		25	29	0.0347		
3.70		25	35	0.0419		
3.40		25	42	0.0503		

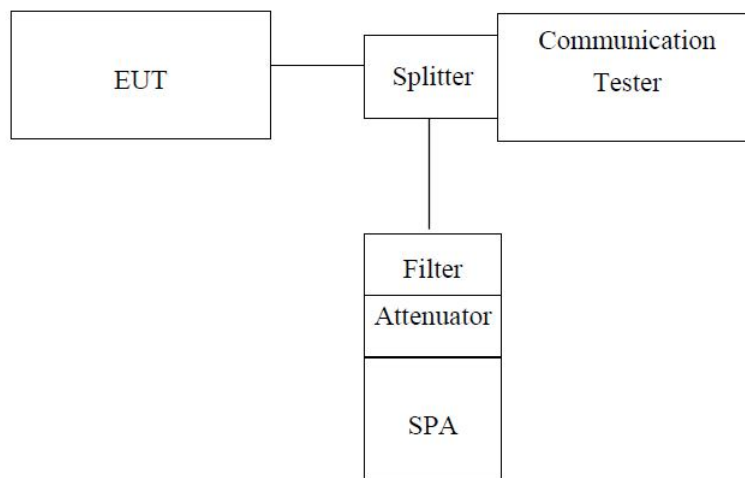
Note: Measurement Uncertainty: ±20Hz.

5.5. Conducted Spurious Emissions

5.5.1. Limit

According to FCC section 22.917(a) and FCC section 24.238(a), the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43+10*\log(P)$ dB. This calculated to be -13dBm.

5.5.2. Test Setup



Note: Measurement setup for testing on Antenna connector

5.5.3. Measurement Procedure

The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 1MHz, sufficient scans were taken to show the out of band Emissions if any up to 10th harmonic.

For the out of band: Set the RBW, VBW = 100KHz, Start=30MHz, Stop= 10th harmonic.

Limit = -13dBm

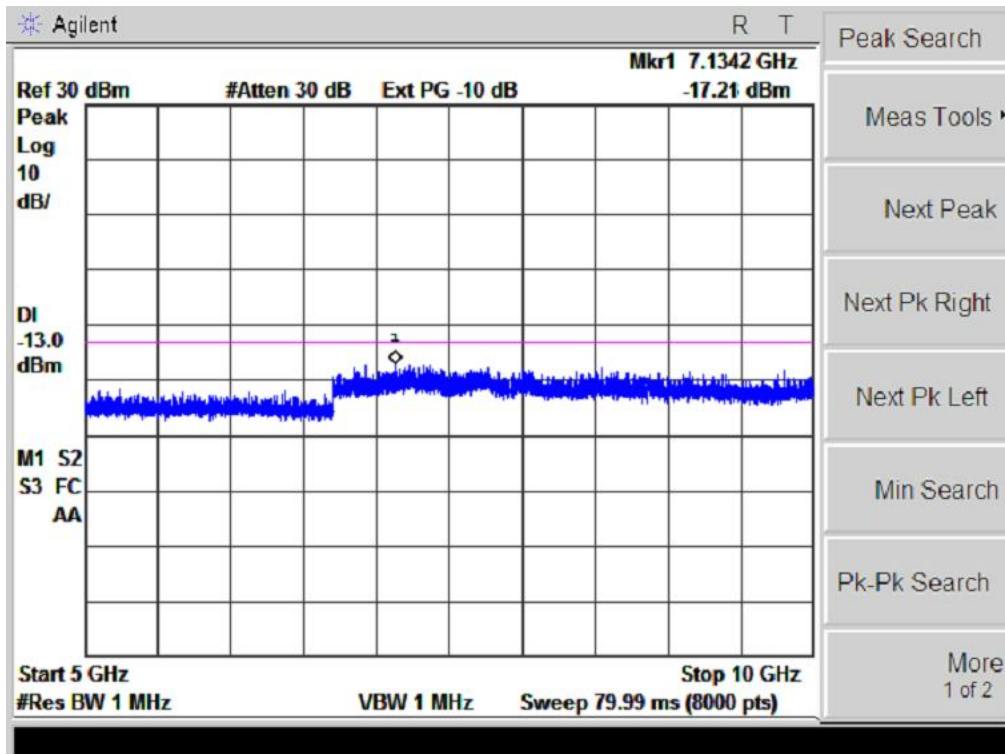
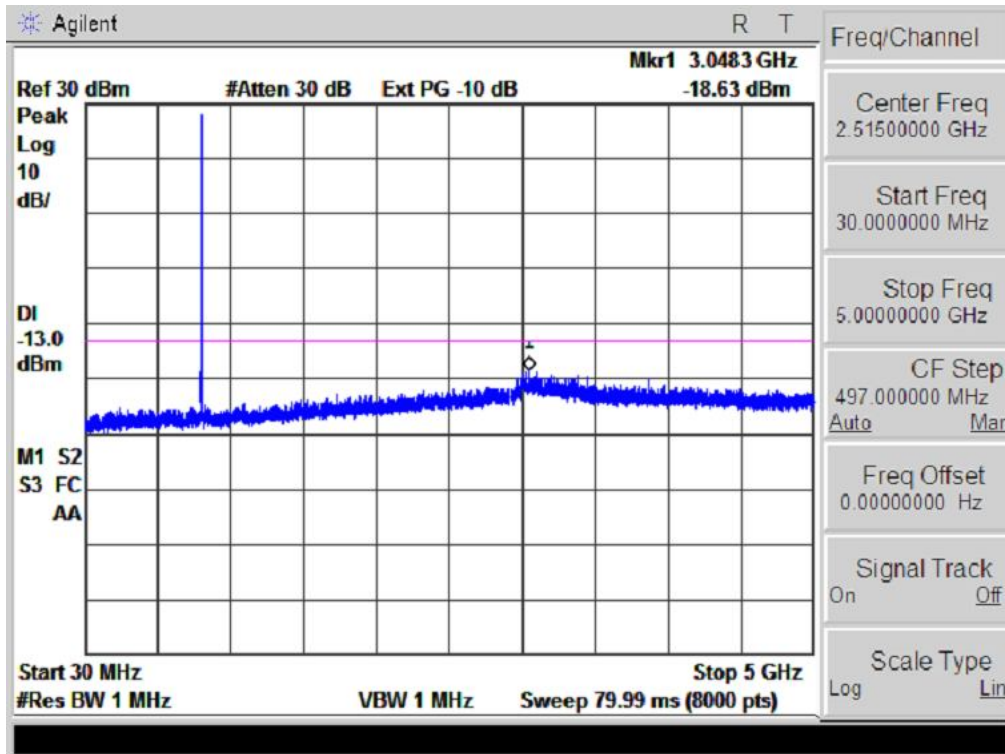
5.5.4. Test Result

The measurement frequency range is from 30MHz to the 10th harmonic of the fundamental frequency. The lowest, middle and highest channels are tested to verify the out of band emissions.

Test plot as follows:

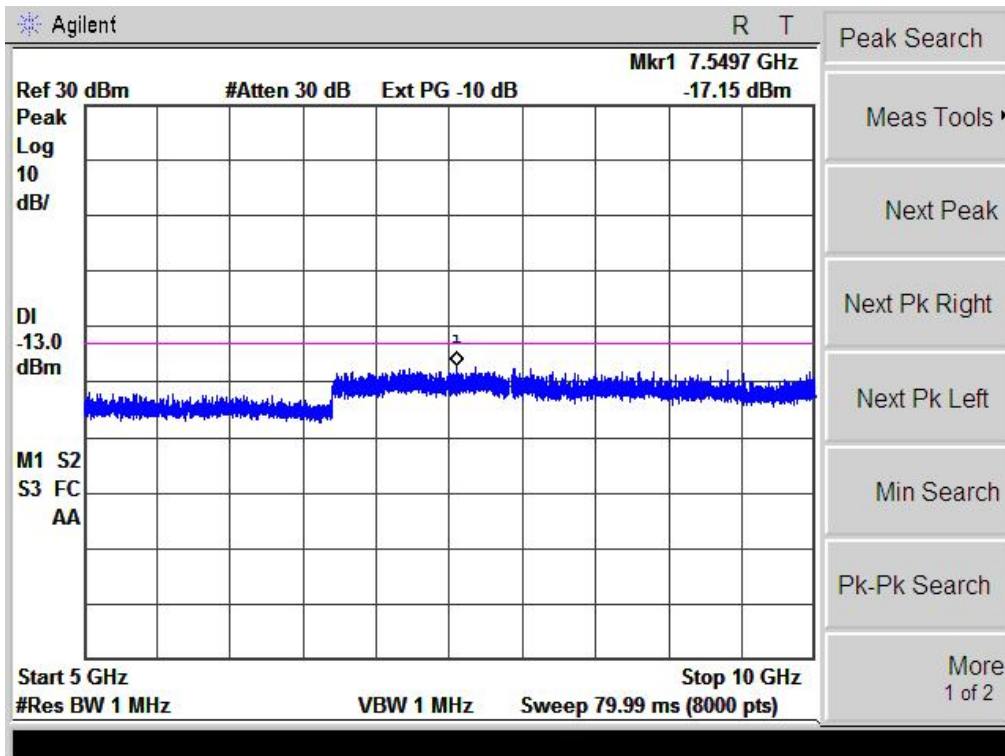
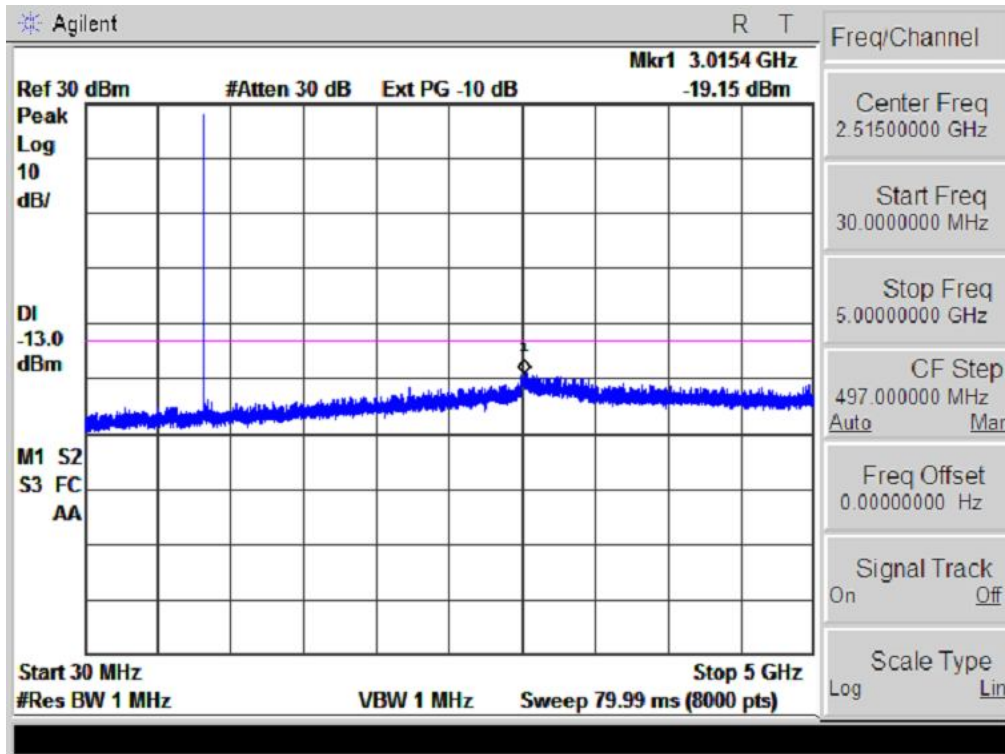


GSM 850MHz Lowest channel



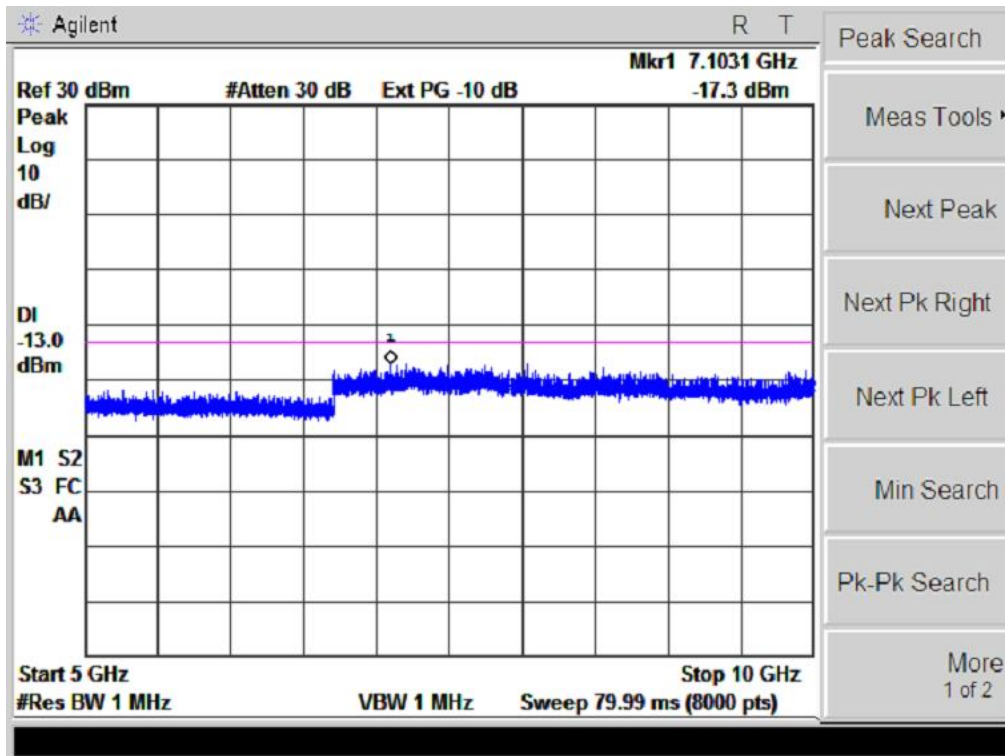
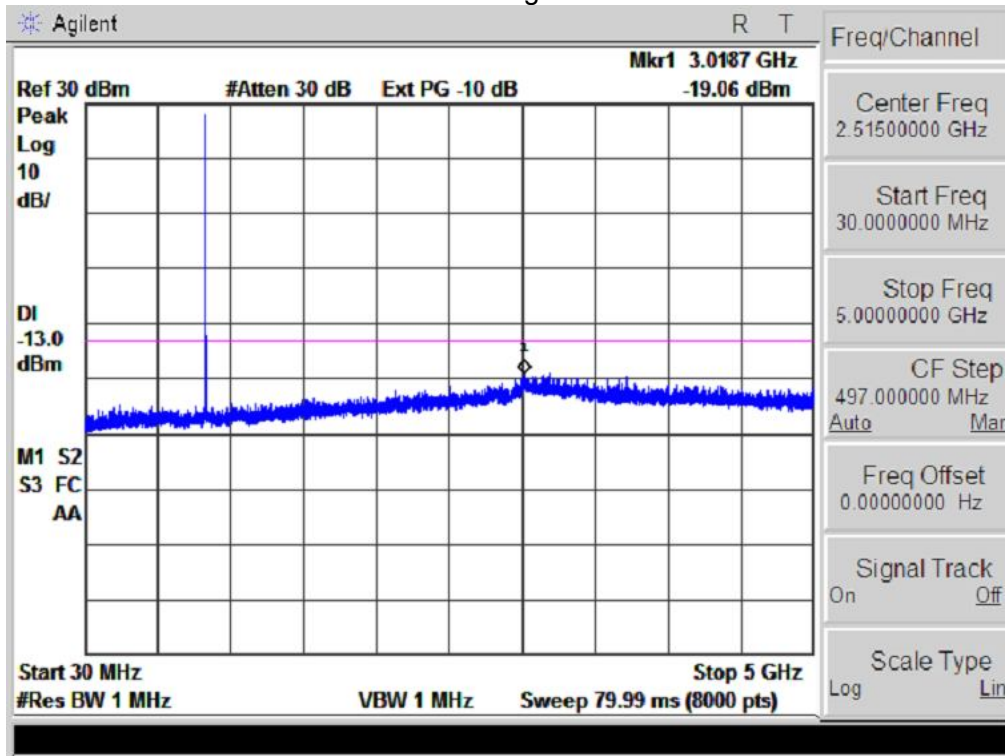


GSM 850MHz Middle channel



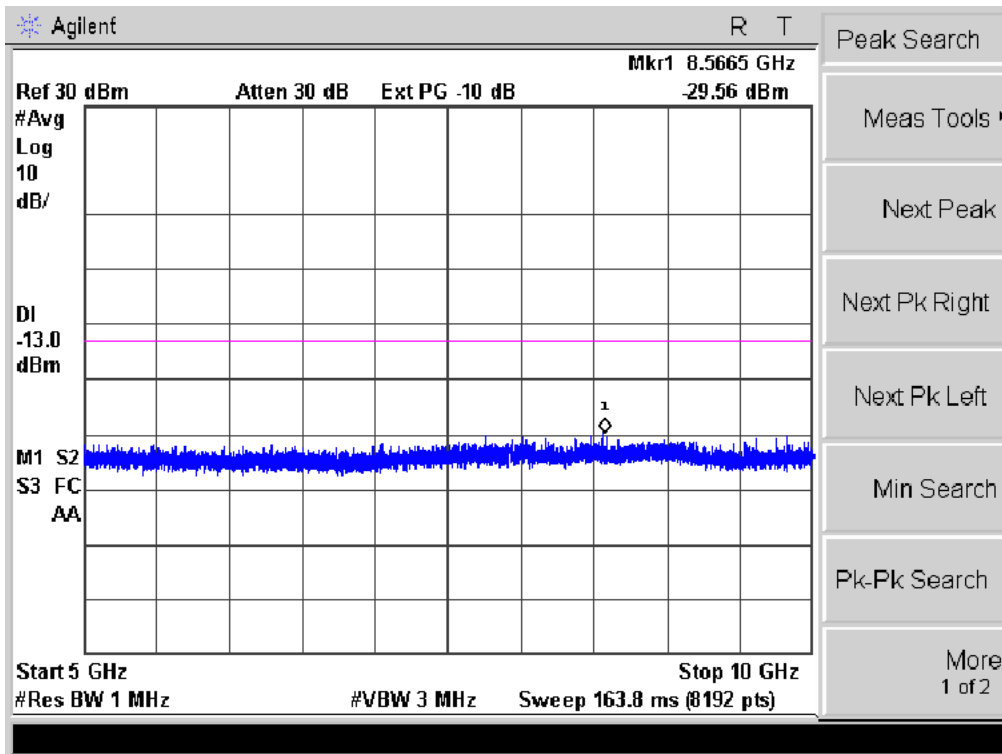
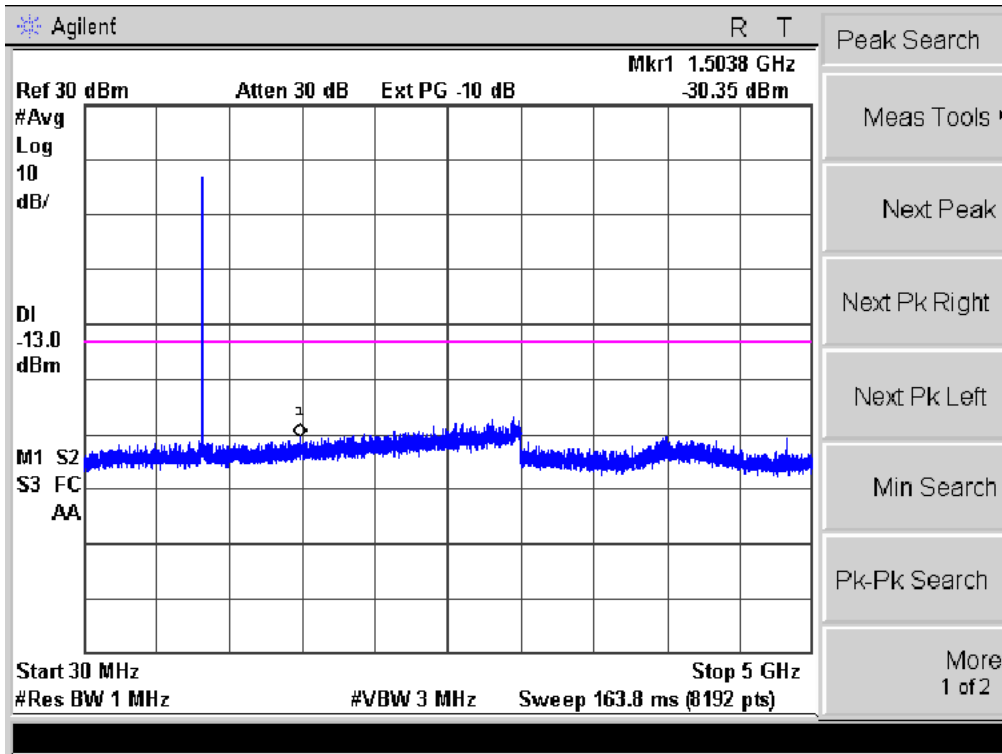


GSM 850MHz Highest channel



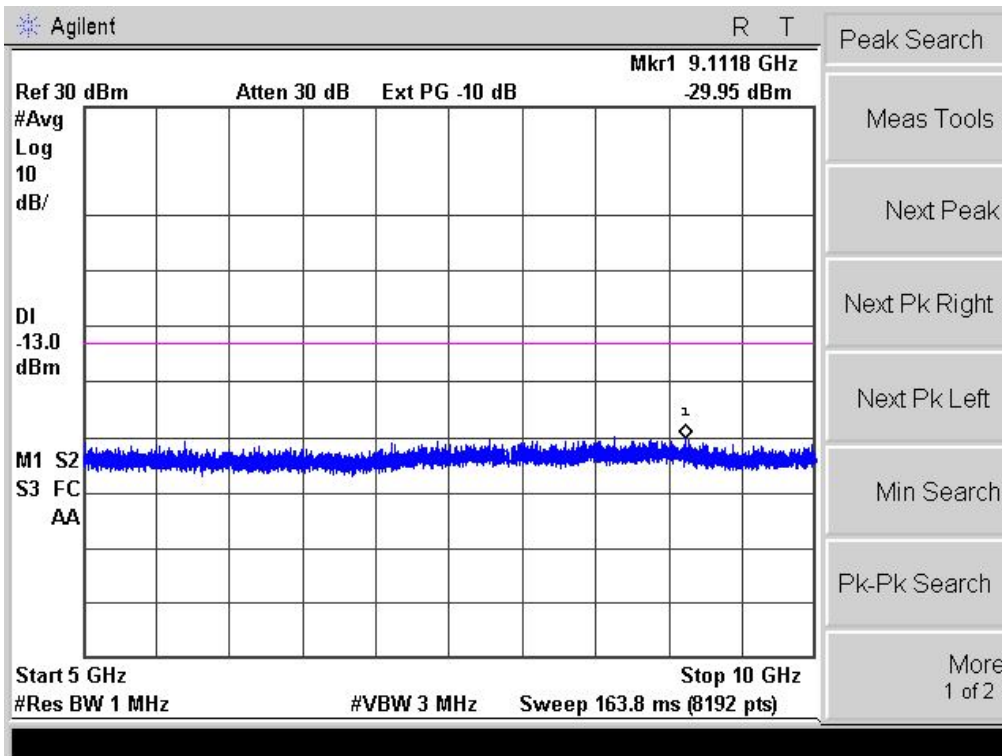
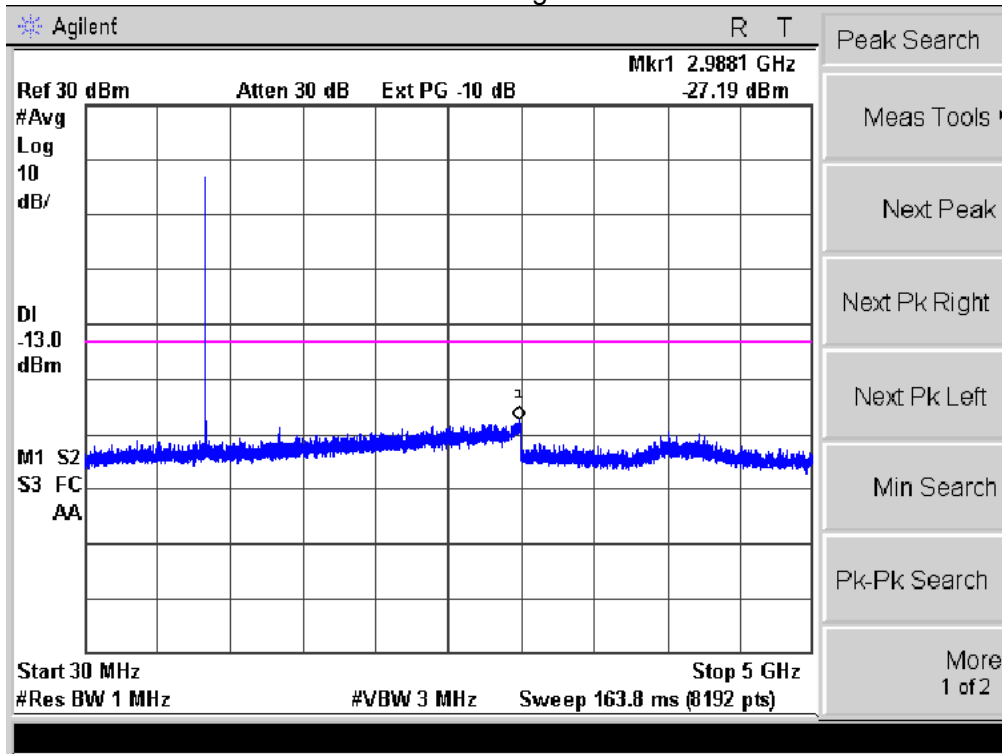


GPRS 850MHz Middle channel



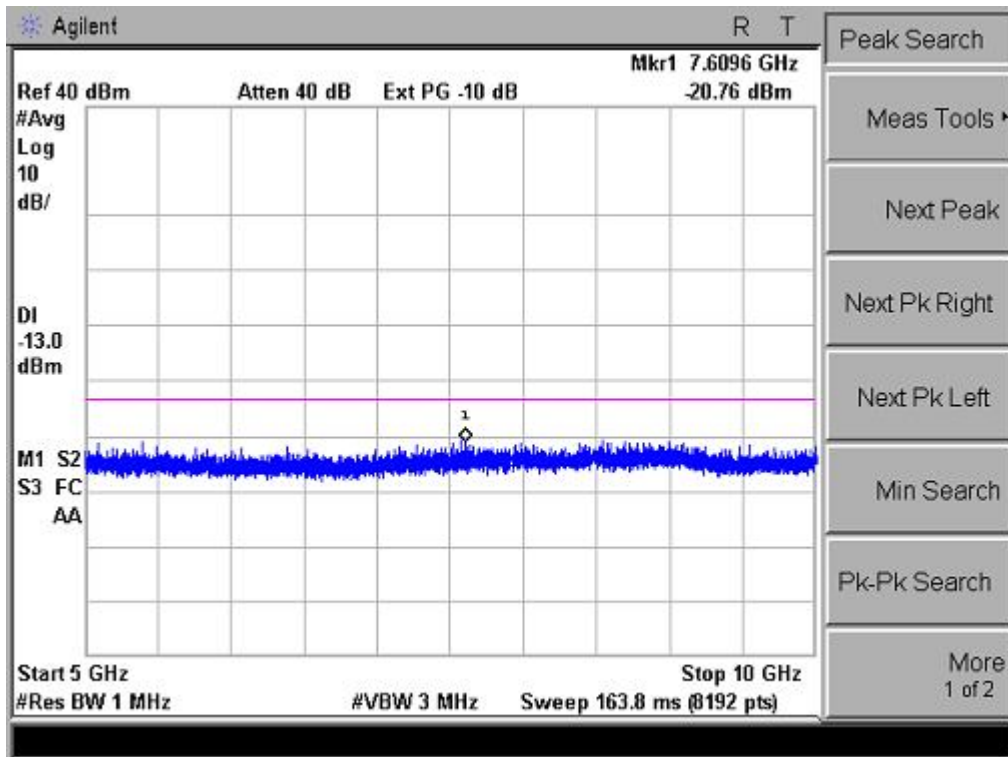
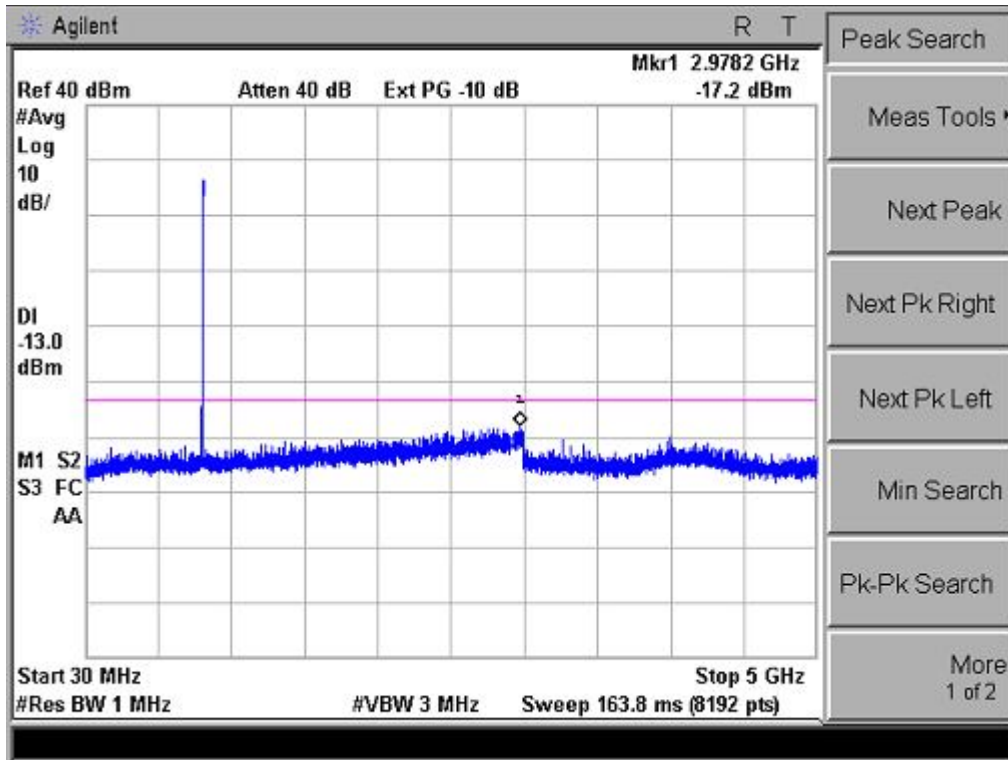


GPRS 850MHz Highest channel



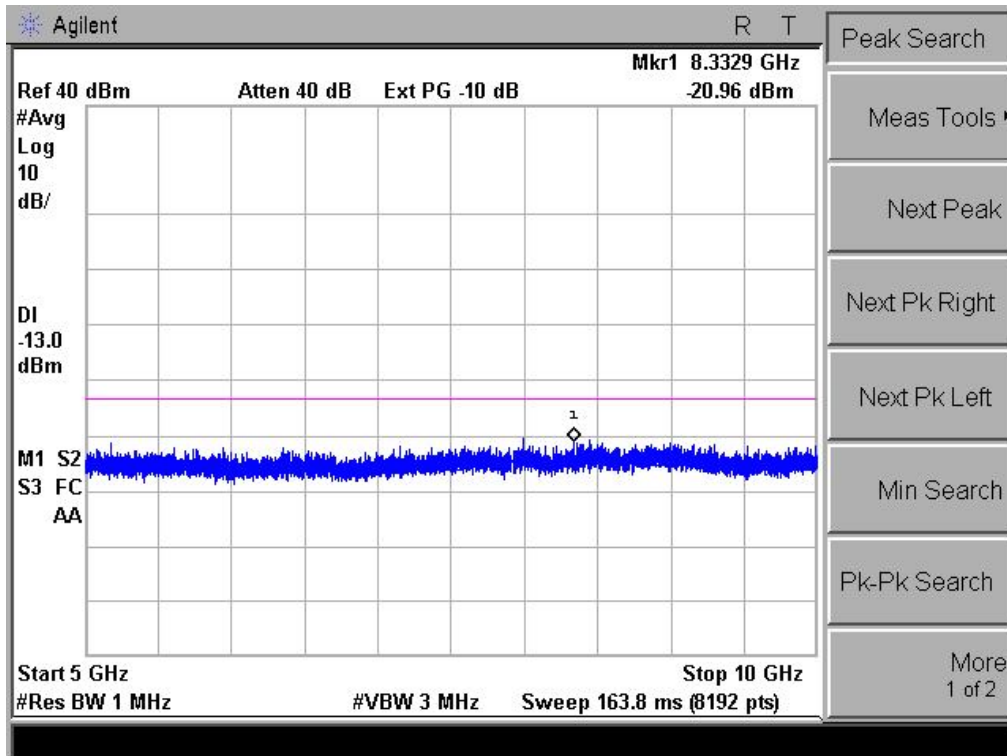
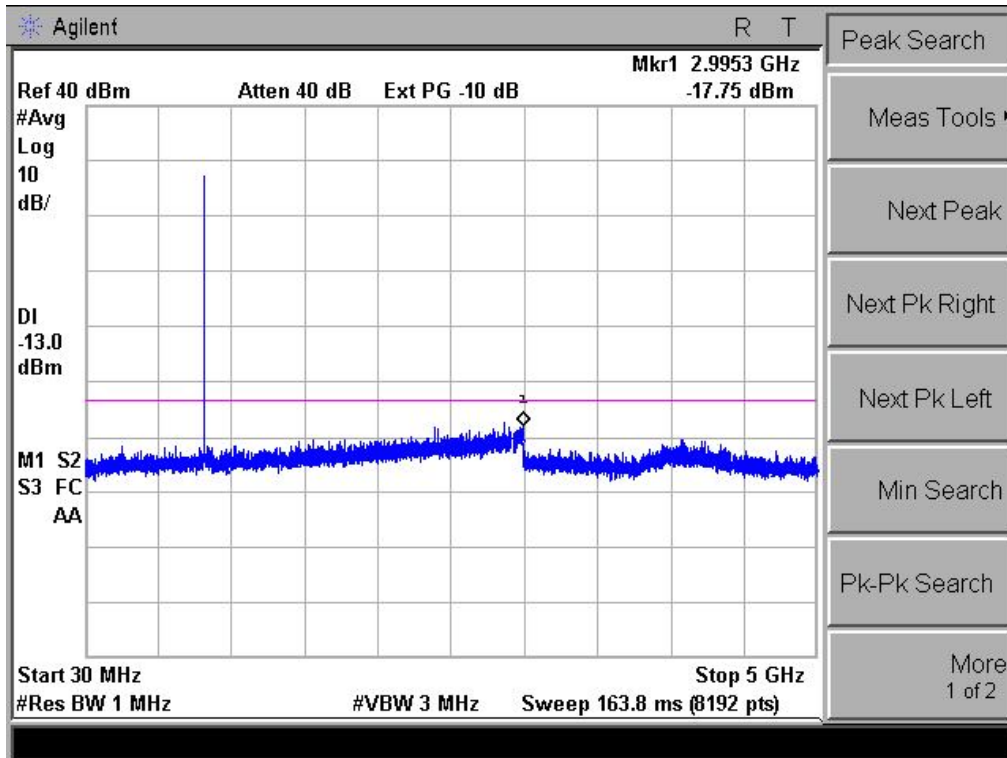


EGPRS 850MHz Lowest channel



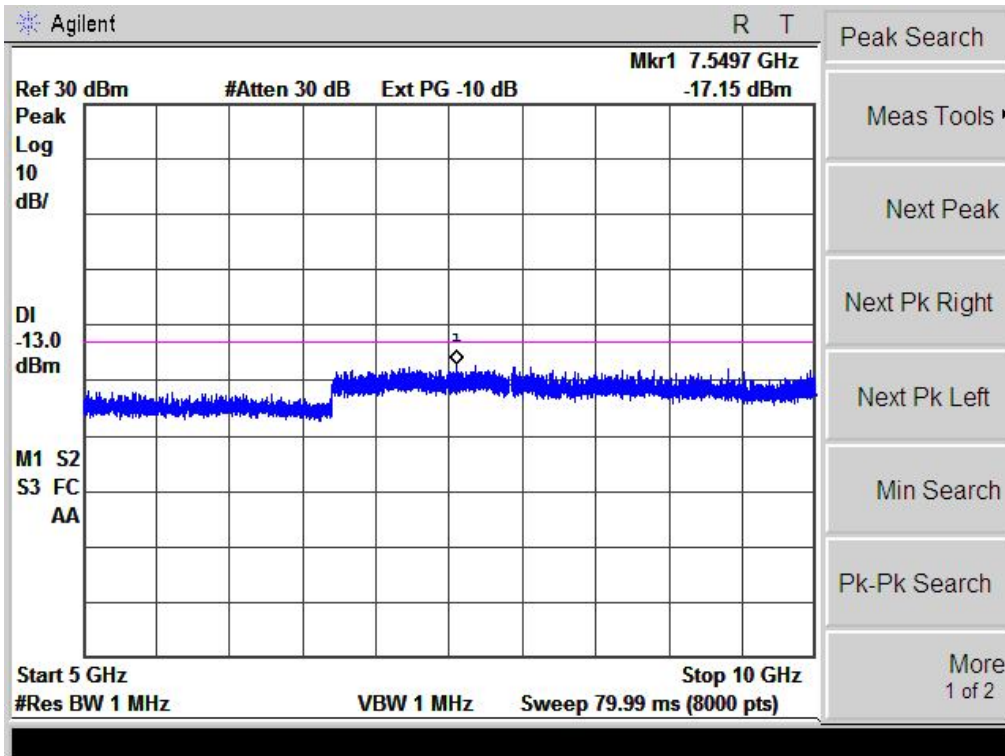
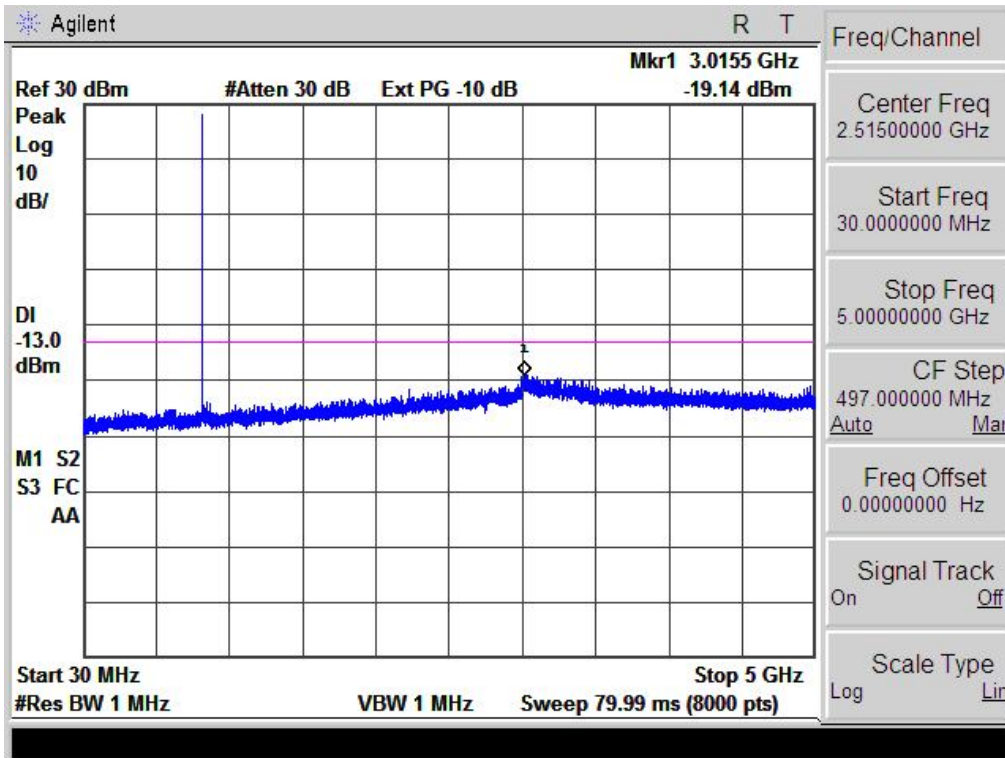


EGPRS 850MHz Middle channel



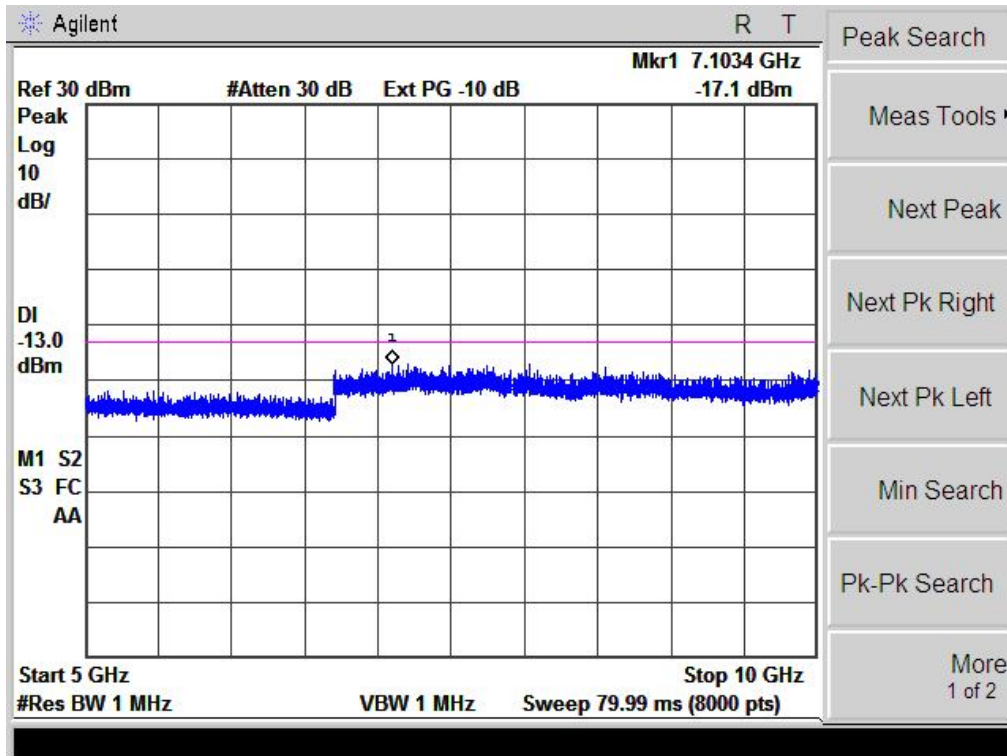
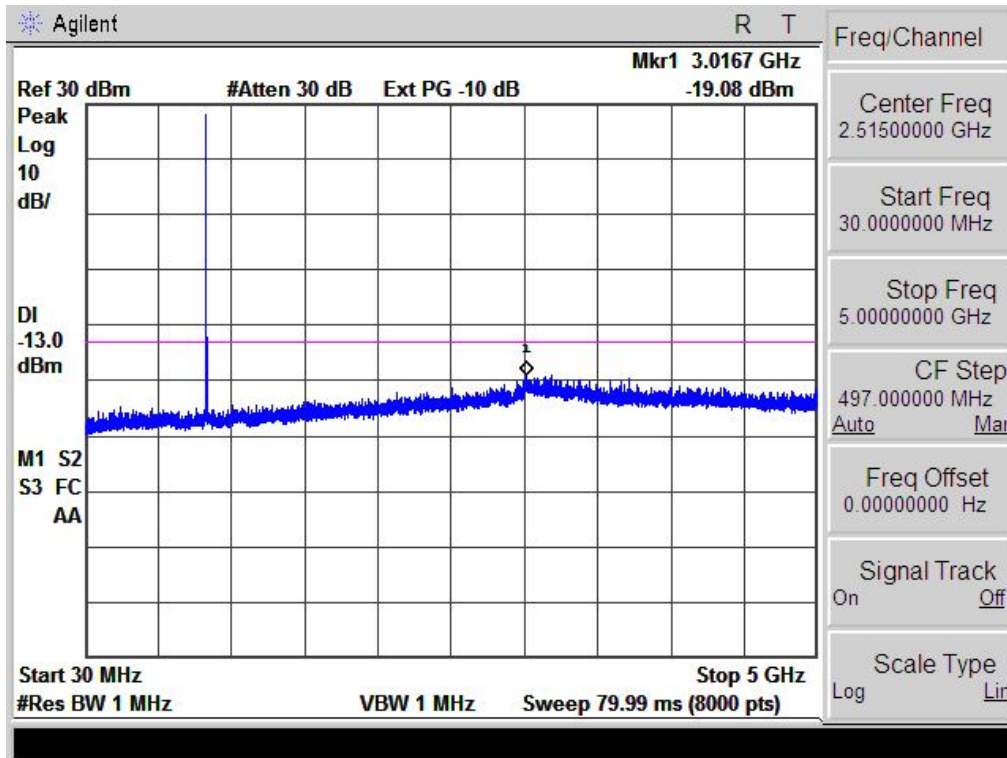


GSM 1900MHz Lowest channel



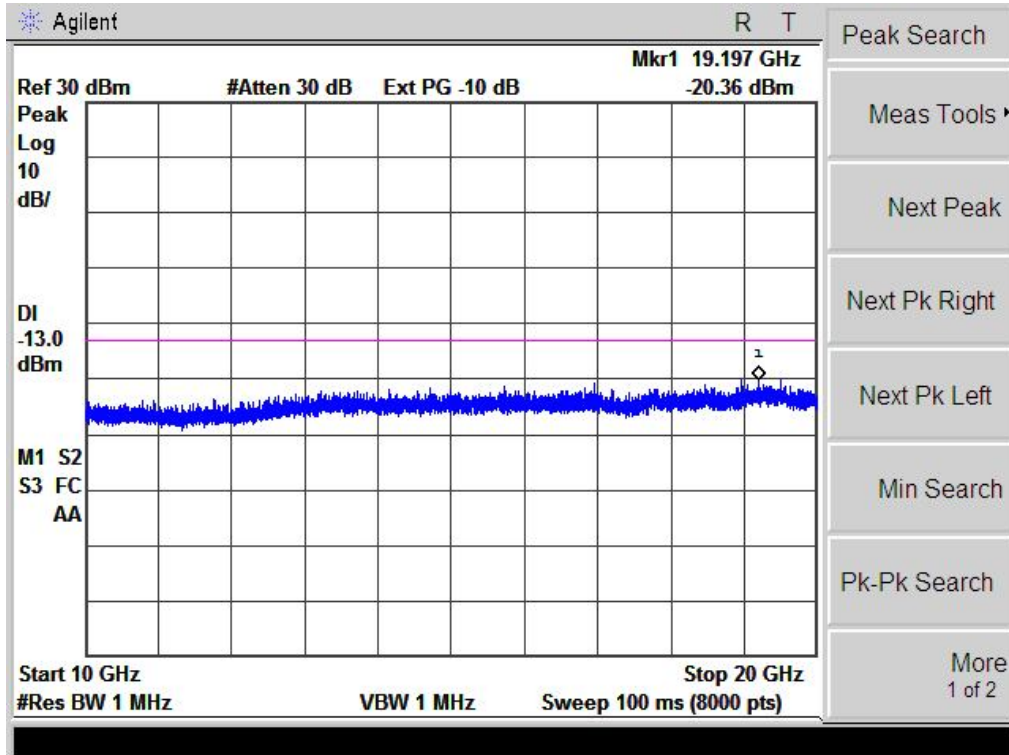
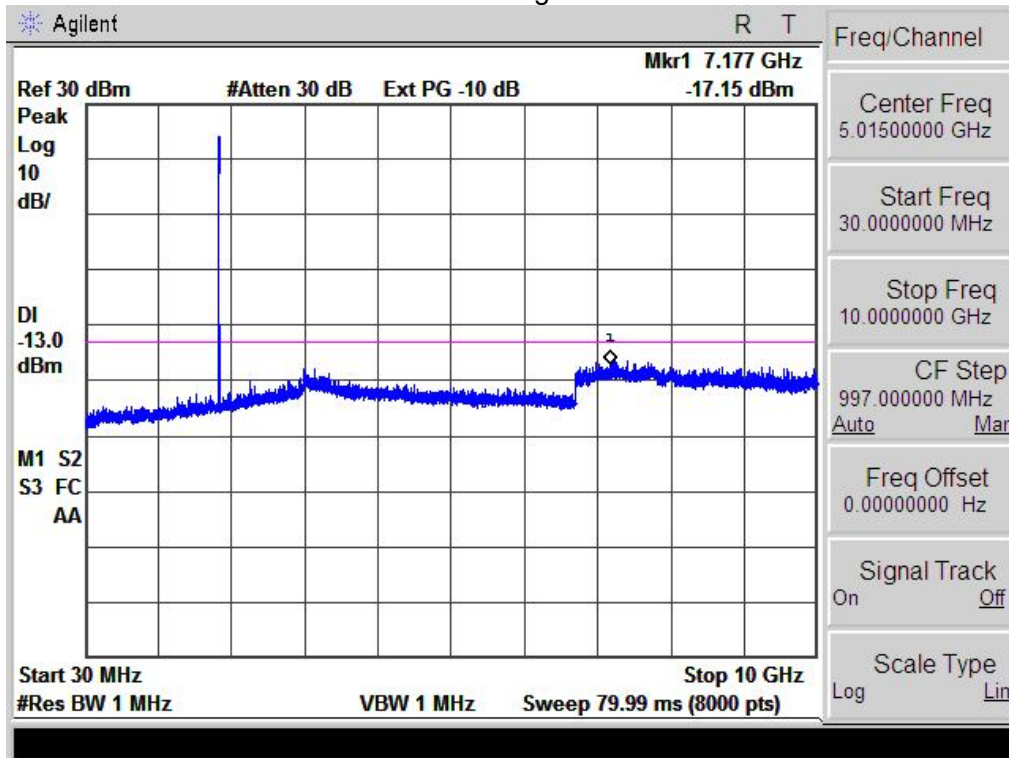


GSM 1900MHz Middle channel



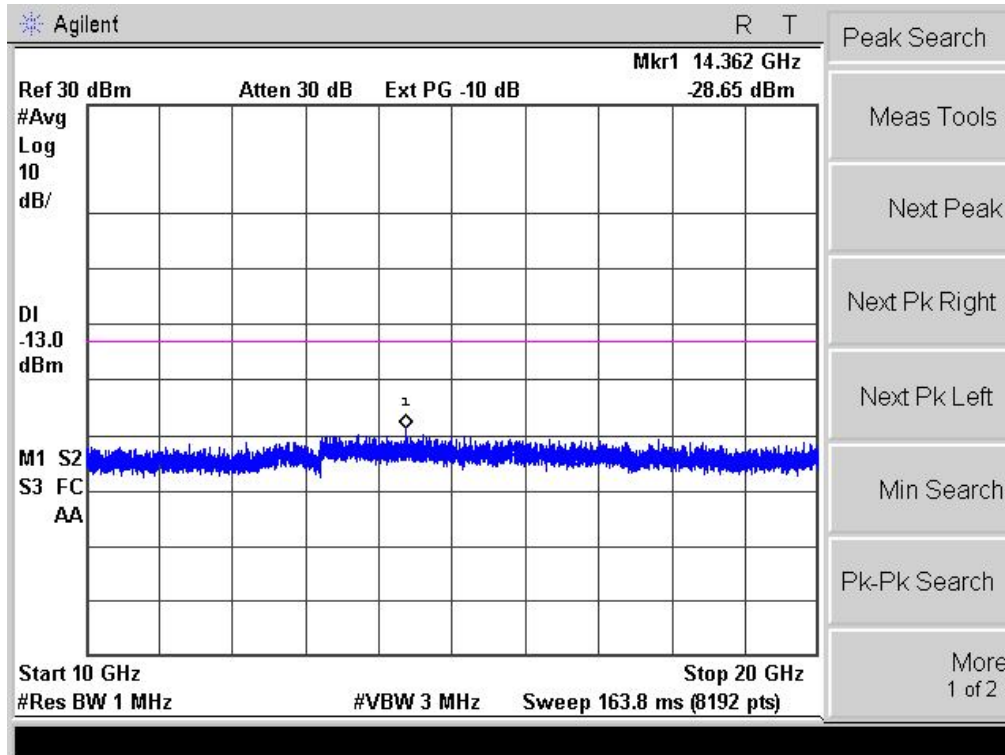
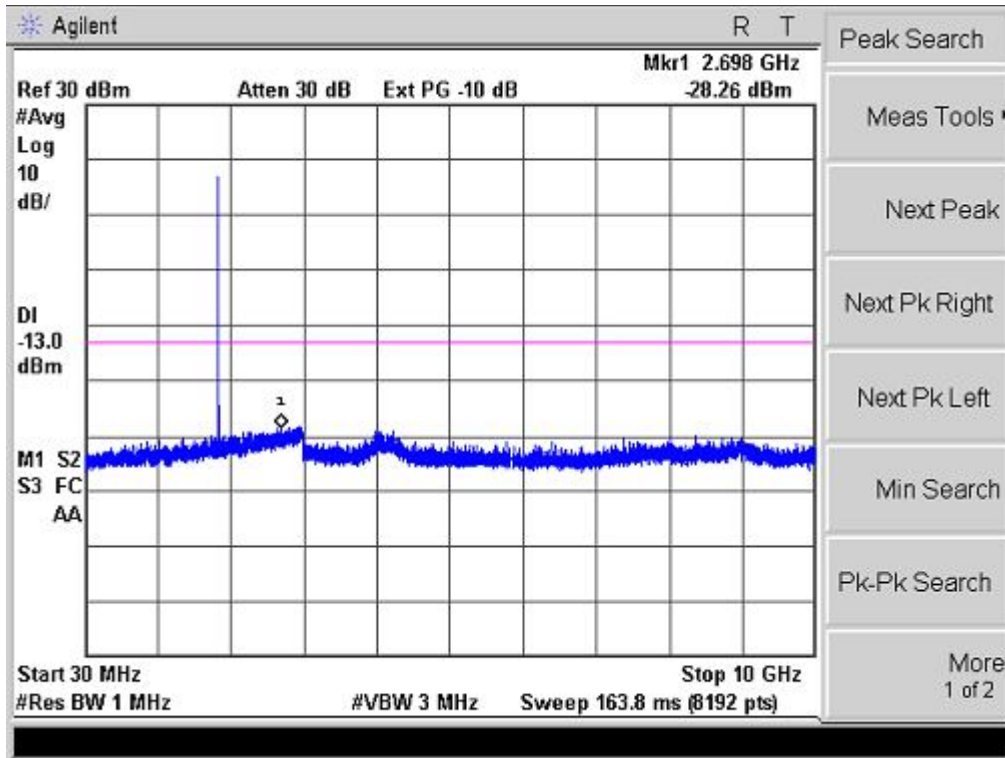


GSM 1900MHz Highest channel



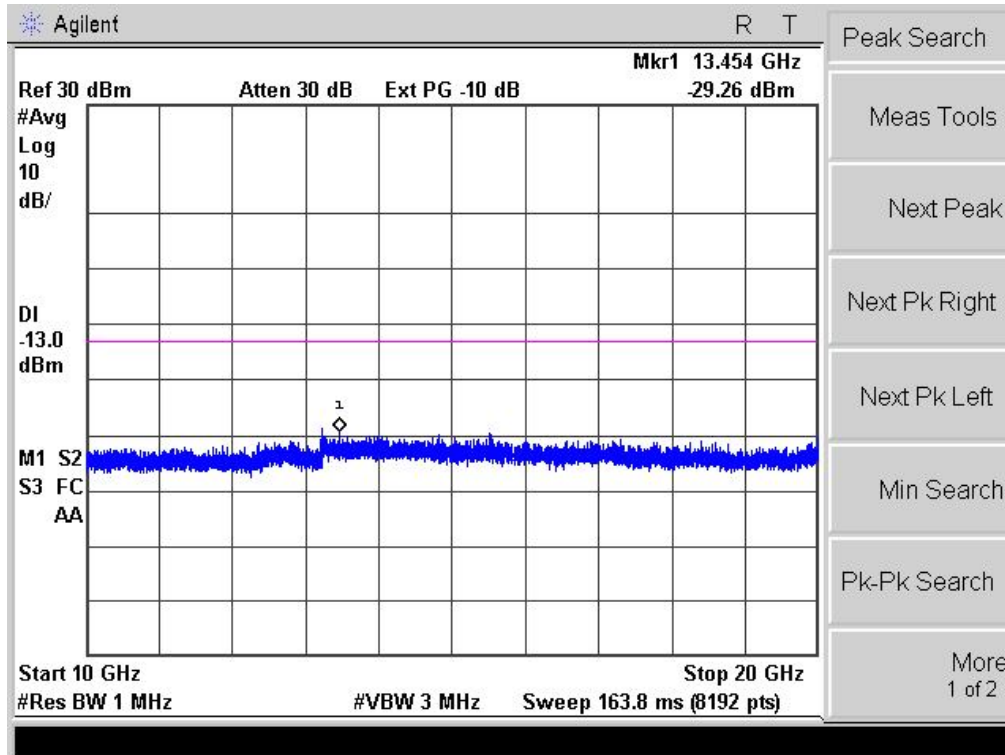
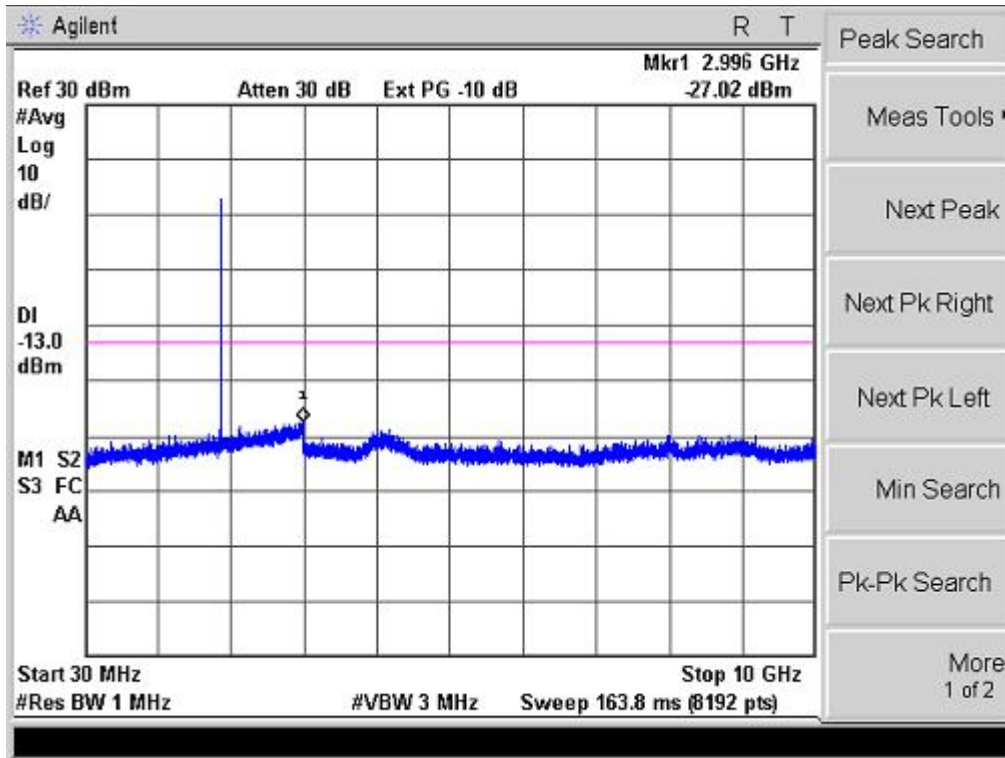


GPRS 1900MHz Lowest channel



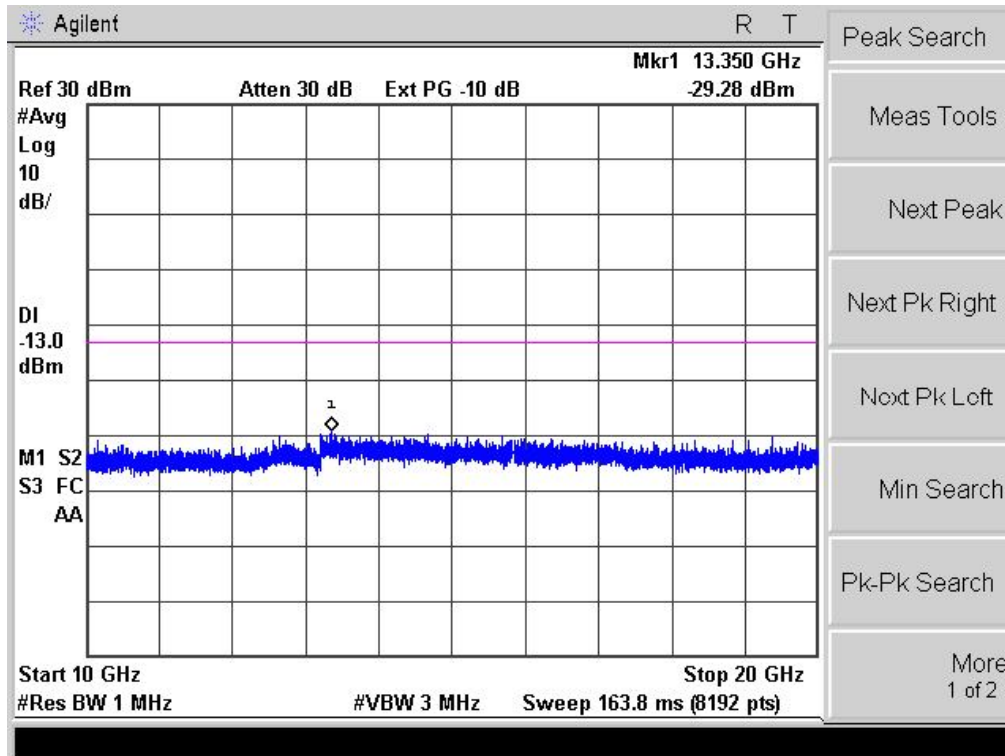
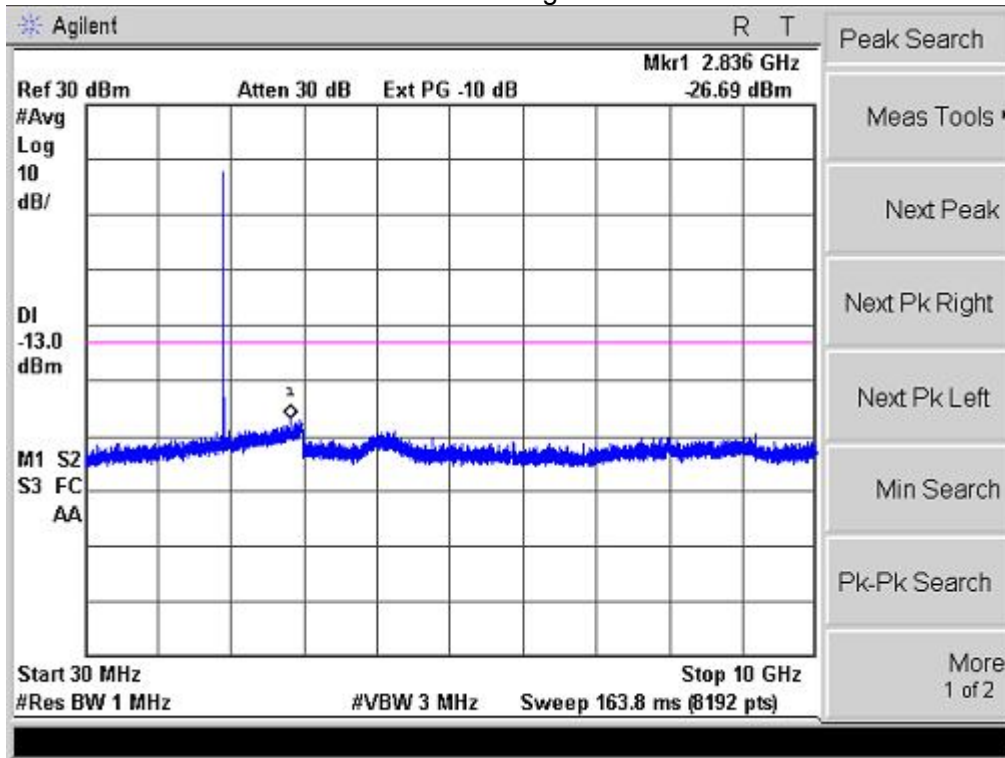


GPRS 1900MHz Middle channel



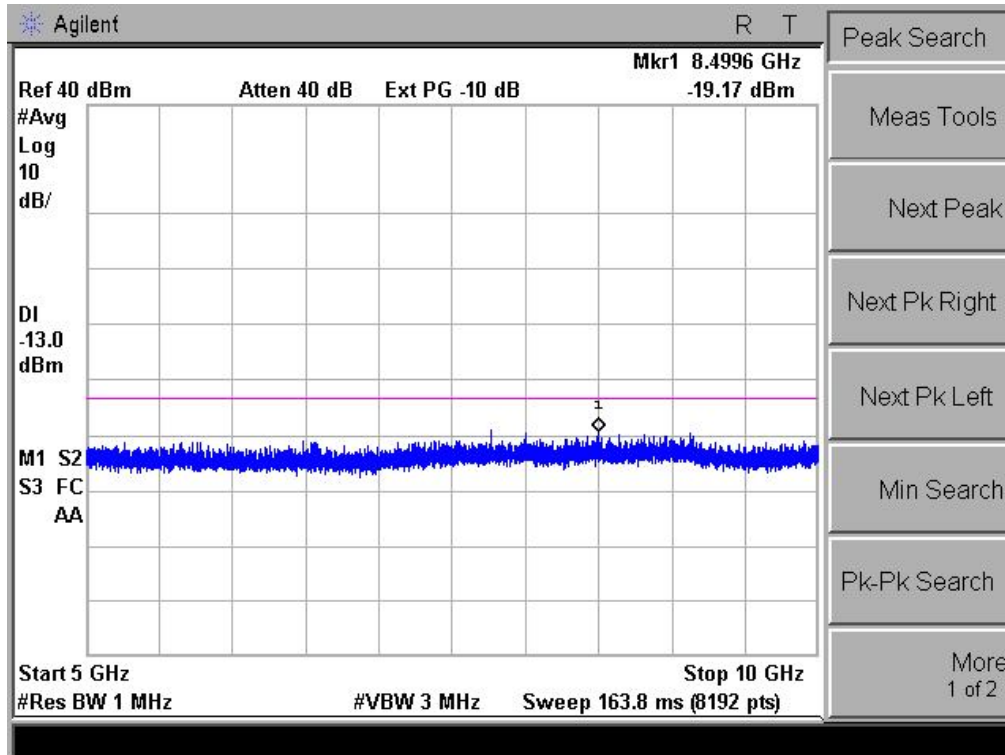
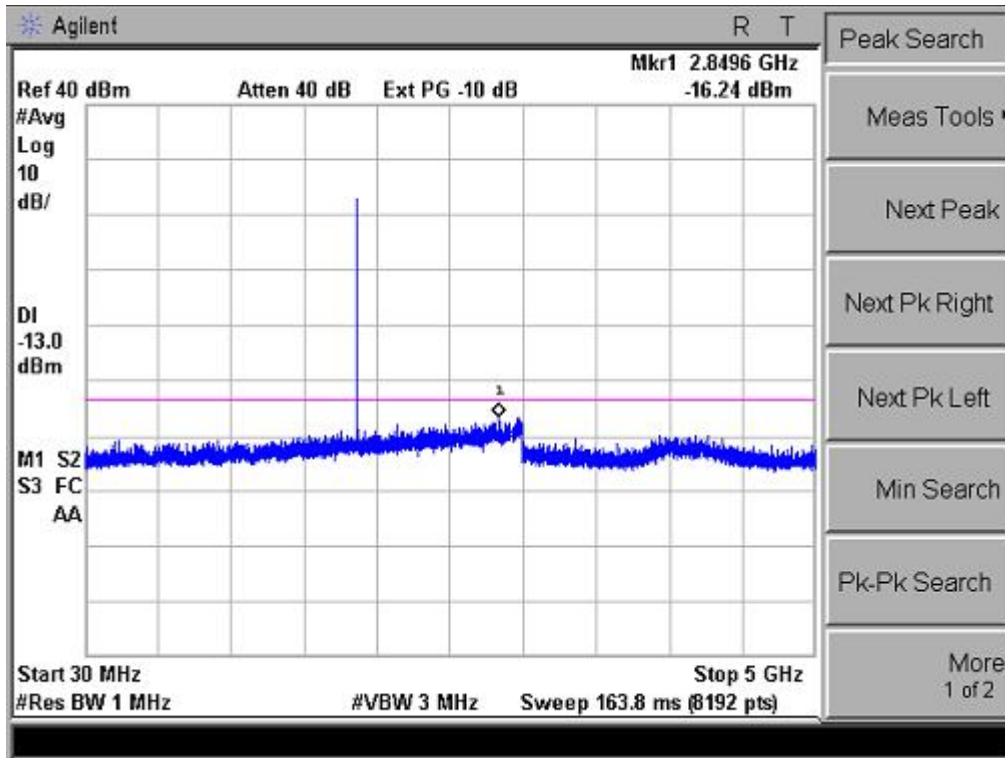


GPRS 1900MHz Highest channel



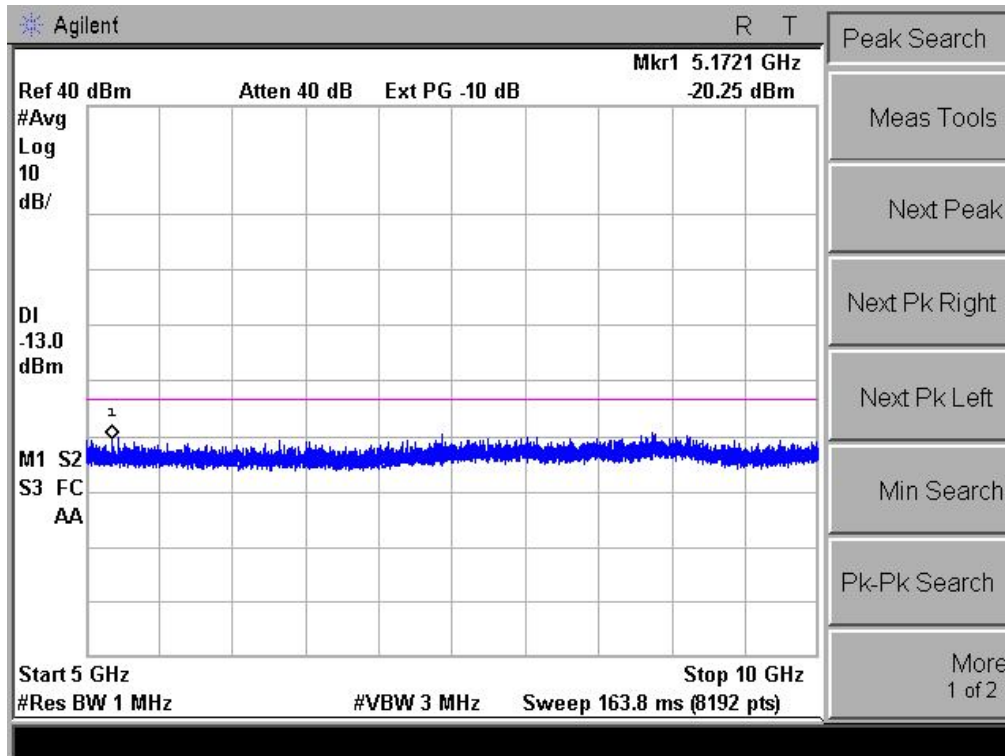
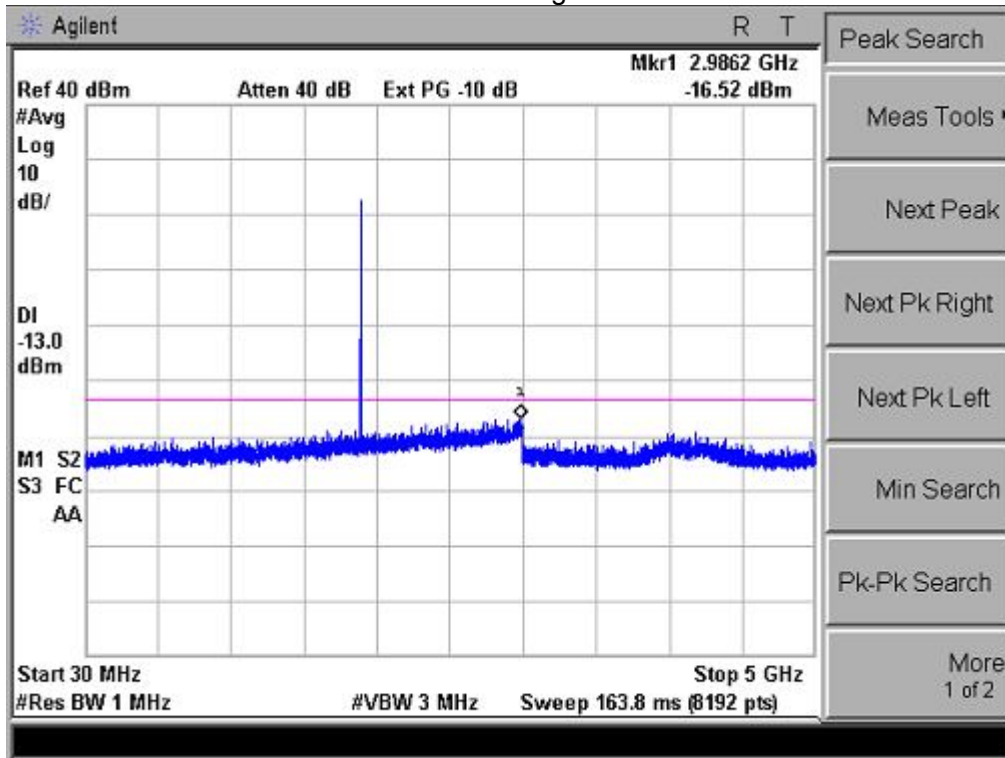


EGPRS 1900MHz Middle channel



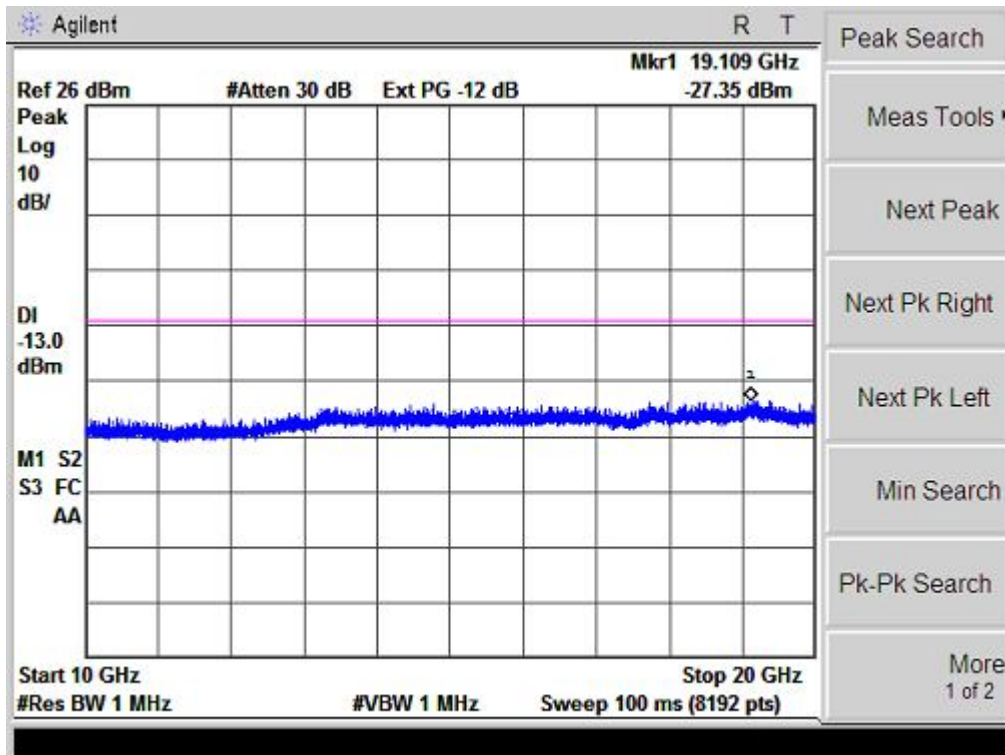
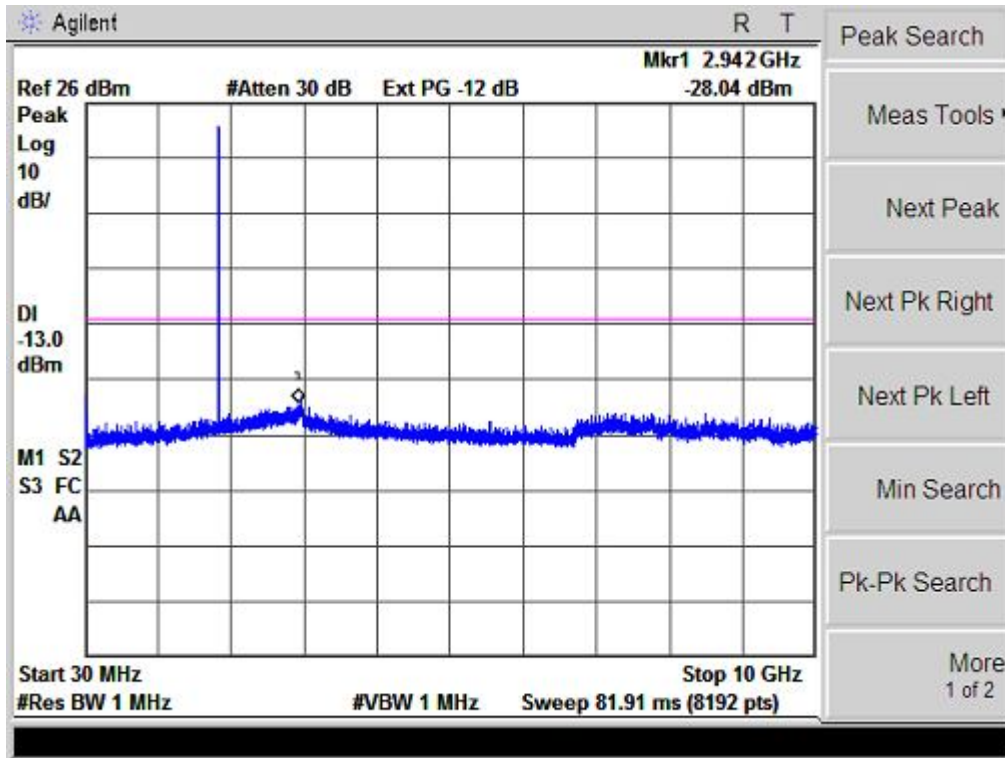


EGPRS 1900MHz Highest channel



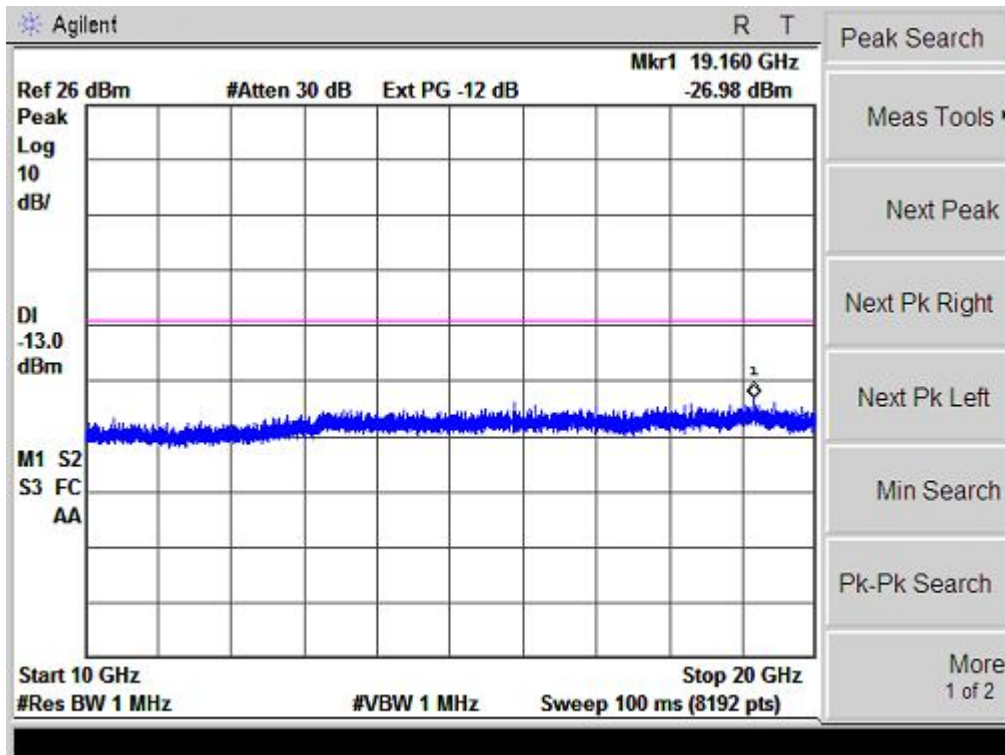
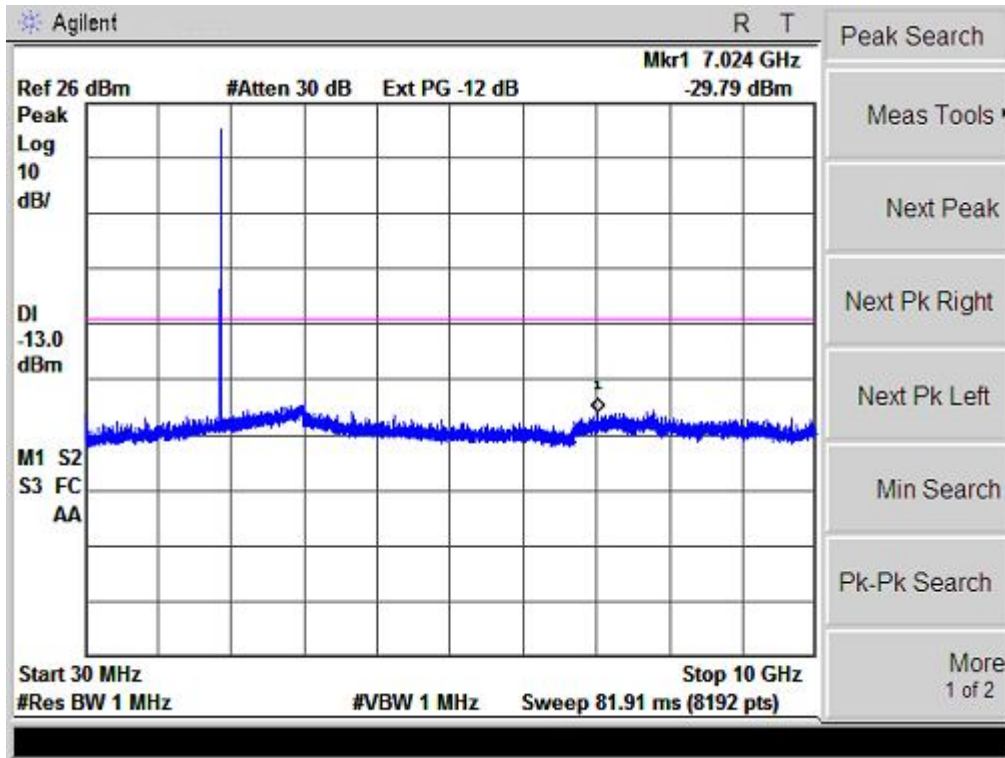


WCDMA Band II Lowest channel



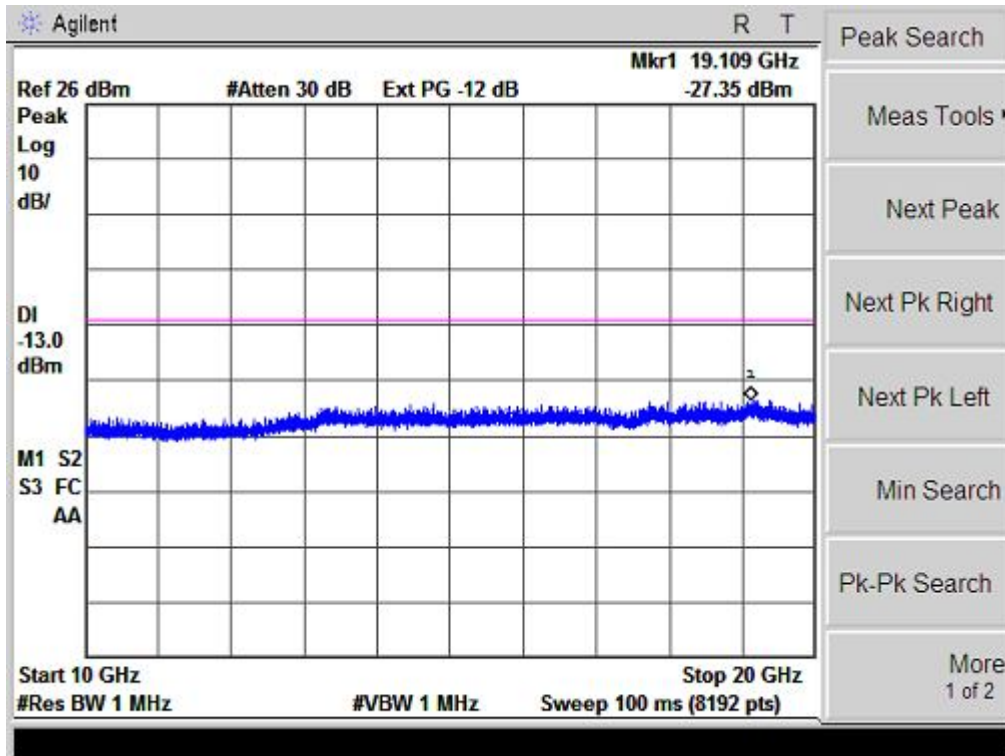
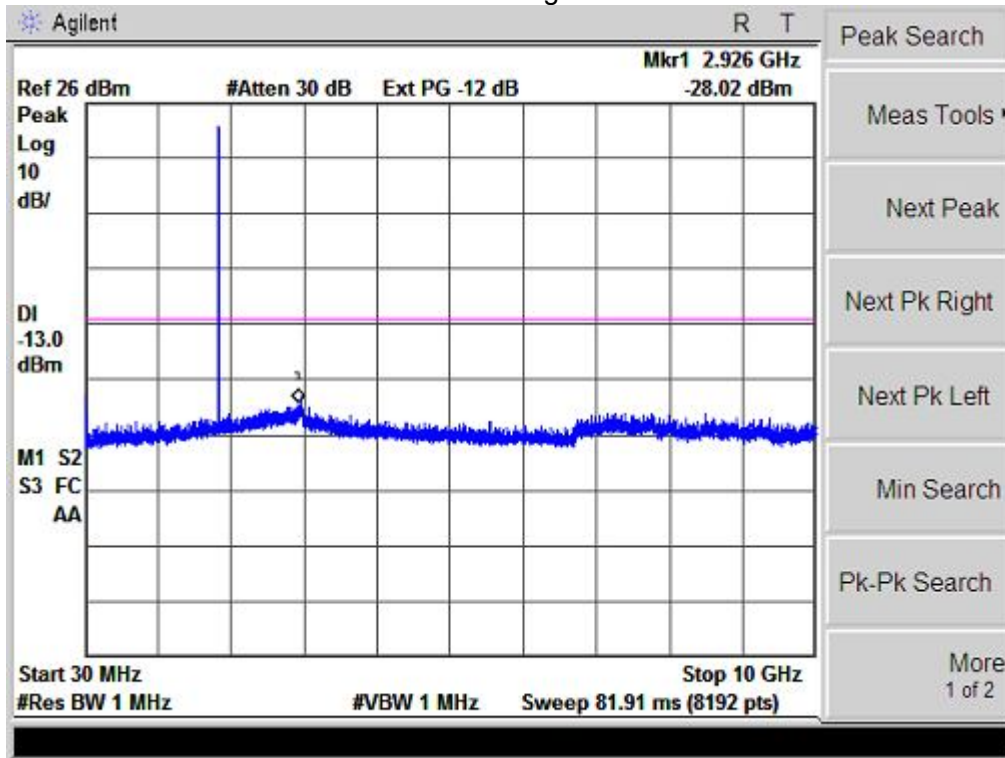


WCDMA Band II Middle channel



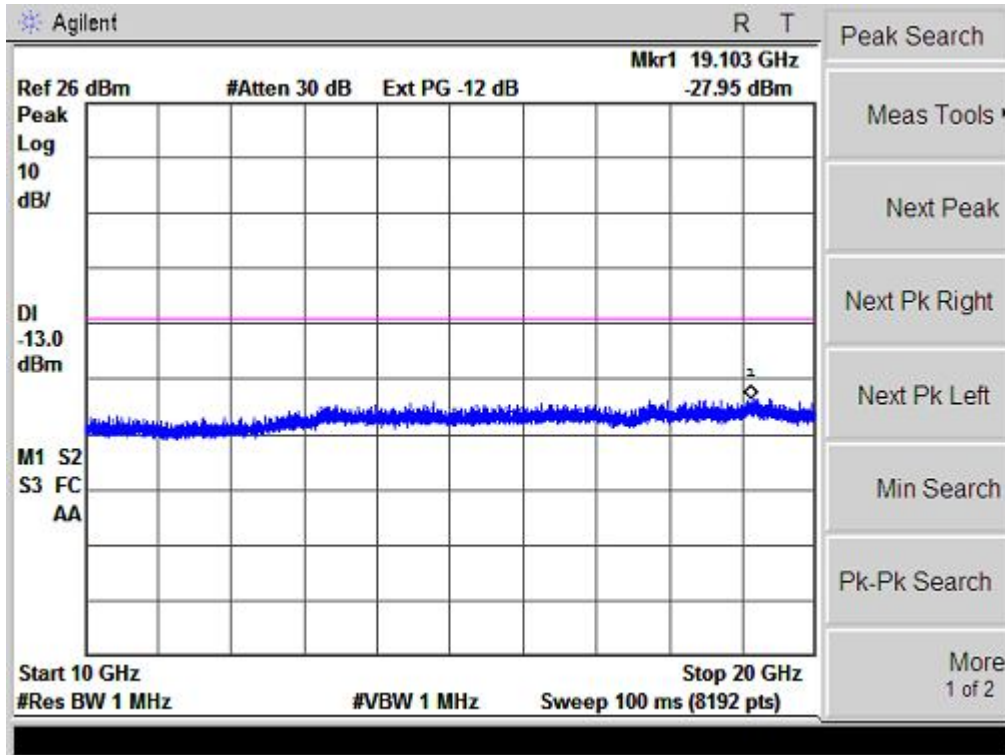
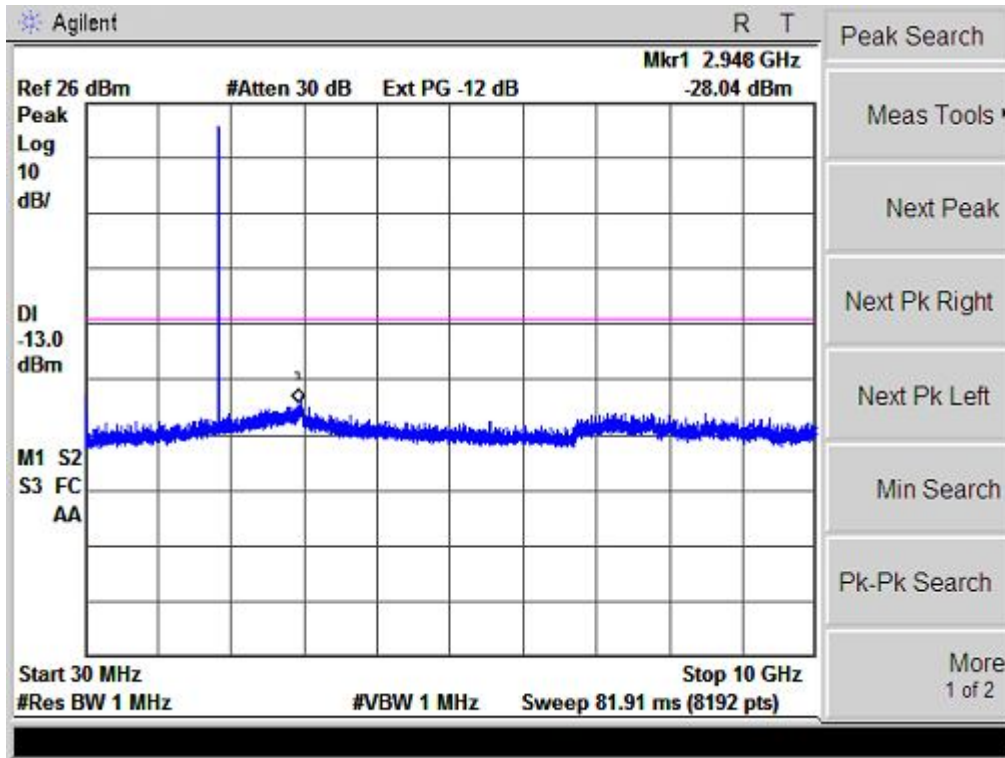


WCDMA Band II Highest channel



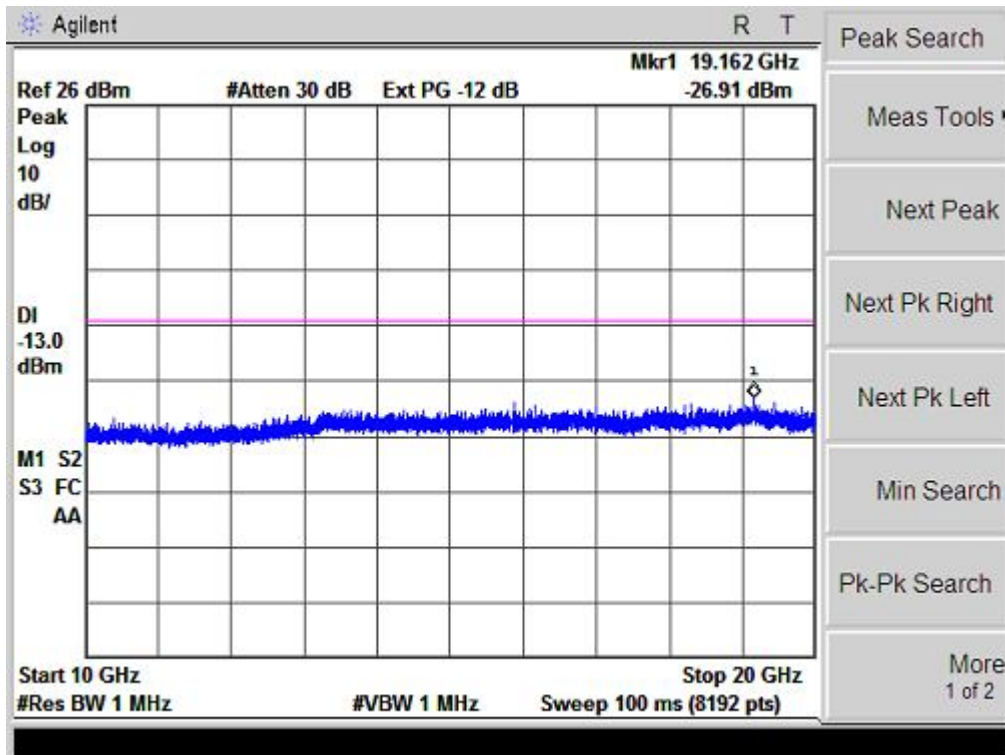
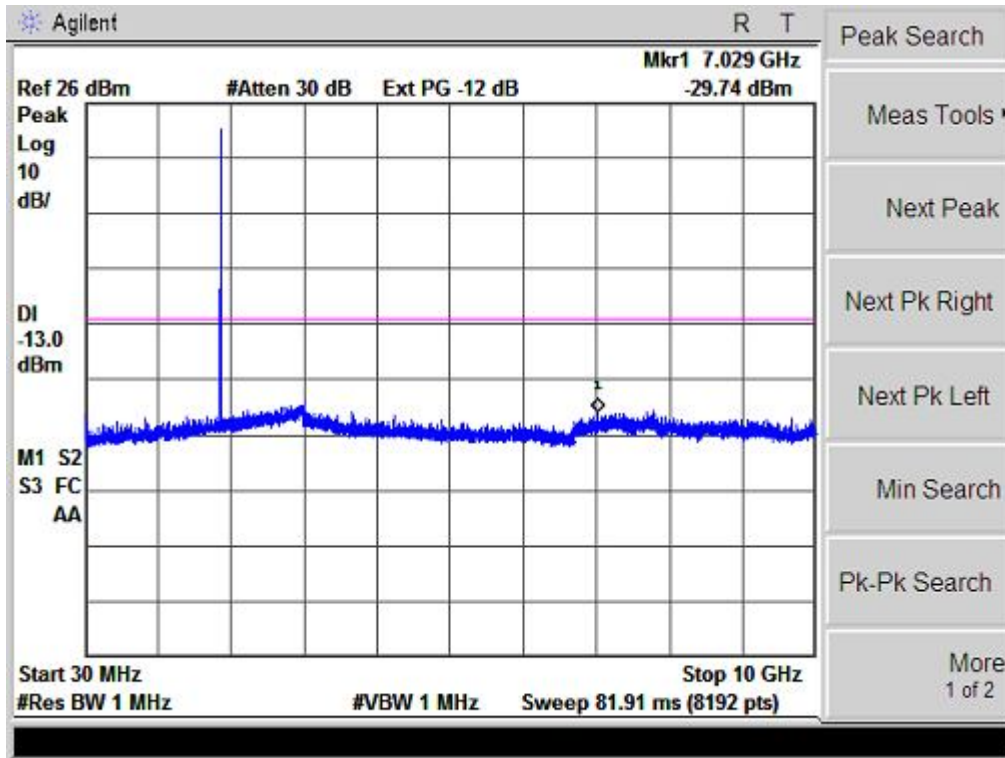


WCDMA Band V Lowest channel





WCDMA Band V Middle channel





WCDMA Band V Highest channel

