



TEST DATA


Test Data Number: 3194045MIN-001M
Project Number: 3194045

Testing performed on the
PCS 40W Module – FWP-8810000MOD
to
47 CFR, Part 24:2008

For
LGC Wireless / ADC Telecommunications Inc.

Test Performed by:
Intertek Testing Services NA, Inc.
7250 Hudson Blvd., Suite 100
Oakdale, MN 55128

Test Authorized by:
LGC Wireless
541 E. Trimble Road
San Jose, CA 95131

Prepared by: 
Simon Khazon

Date: November 25, 2009

Reviewed by: 
Norman Shpilsher

Date: November 25, 2009



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1.0 DESCRIPTION OF THE SAMPLE (EUT)

Model:	PCS 40W Module – FWP-8810000MOD
Type of EUT:	Indoor / Outdoor Repeater
Serial Number:	N/A
Company:	LGC Wireless / ADC Telecommunications Inc.
Customer:	Sue Cyr
Address:	541 E. Trimble Road San Jose, CA 95131
Phone:	408-952-2445
Fax:	408-952-2645
Test Standards:	<input type="checkbox"/> EN 55022:2006 +A1:2007, Class █ <input type="checkbox"/> EN 55011:2007, Group █, Class █ <input checked="" type="checkbox"/> 47 CFR, Part 24:2008 <input type="checkbox"/> EN 55014-1:2006 <input type="checkbox"/> EN 61326-1:2006 <input type="checkbox"/> Class █ for Radiated and Conducted Emissions <input type="checkbox"/> EN 60601-1-2:2001 +A1:2006 <input type="checkbox"/> Class █ Radiated and Conducted Emissions <input type="checkbox"/> EN 61000-6-3:2007 <input type="checkbox"/> EN 61000-6-4:2007 <input type="checkbox"/> EN 61000-3-2:2006 <input type="checkbox"/> EN 61000-3-3:1995 +A1:2001 +A2:2006 <input type="checkbox"/> Other █

2.0 TEST SUMMARY

Referring to the performance criteria and the operating mode during the tests specified in this report, the equipment complies with the requirements according to the following standards.

TEST STANDARD	TEST	RESULT
Part 24	Spurious Enclosure Radiated Emissions	Pass

2.1 Statement of the Measurement Uncertainty

Note: The measured result in this report is within the specification limits by more than the measurement uncertainty; the measured result indicates that the product tested complies with the specification limit.

The expanded uncertainty ($k = 2$) for radiated emissions from 30 to 1000 MHz has been determined to be: ± 4 dB at 10m and ± 5.4 dB at 3m

The expanded uncertainty ($k = 2$) for conducted emissions from 150 kHz to 30 MHz has been determined to be: ± 2.6 dB

General notes:

1. Test was performed with the EUT tuned to the low frequency (1.931MHz), middle frequency (1.960MHz), and upper frequency (1.989MHz) of the operating band.
2. Testing was performed in frequency range from 30MHz to 22GHz. EUT tuned frequencies 1.931MHz, 1.960MHz, and 1.989MHz were excluded from the table 2.
3. The Spurious Radiated Power limits of -13dBm was correlated with field strength reference level of 82.2dB μ V/m during field strength measurements at 3m measurement distance

3.0 TEST RESULTS

Tables 1-2 show detected Radiated Emissions.

Graphs 1 to 18 show the EUT peak Radiated Emissions.

No Emissions were detected above 18GHz (see graphs 13-18)

No emissions were chosen for substitution measurements as the maximum emission is more than 20dB below the reference limit.



TILE Instrument Control System EMI Measurement Software

Radiated Emissions from 30MHz to 1GHz

Date: 11-17-2009

Company: LGC Wireless/ADC Telecommunications Inc.
Model: PCS 40 W Module
Test Engineer: Simon Khazon
Standard: FCC Part 24
Test Site: 3m Anechoic Chamber, 3m measurement distance
Note: The table shows the worst case radiated emissions
 Measurements were taken using a Peak detector

Table # 1

Frequency	Ant. Polarity	Peak Reading dB μ V	Ant.Factor dB1/m	Total at 3m dB μ V/m	QP Limit dB μ V/m	Margin dB
Operating Frequency 1931MHz						
36.234 MHz	V	25.3	17.5	42.7	82.2	-39.5
61.724 MHz	V	34.8	7.5	42.3	82.2	-39.9
184.26 MHz	V	33.5	11.2	44.7	82.2	-37.5
583.99 MHz	V	27.6	22.1	49.8	82.2	-32.4
750.31 MHz	V	21.9	23.8	45.7	82.2	-36.5
Operating Frequency 1960MHz						
36.58 MHz	V	25.0	17.3	42.3	82.2	-40.0
61.378 MHz	V	34.5	7.6	42.0	82.2	-40.2
500.18 MHz	V	31.2	20.6	51.7	82.2	-30.5
512.65 MHz	V	25.8	20.8	46.6	82.2	-35.6
583.99 MHz	V	20.2	22.1	42.3	82.2	-39.9
750.31 MHz	V	20.1	23.8	43.9	82.2	-38.3
500.18 MHz	H	31.2	20.6	51.7	82.2	-30.5
512.65 MHz	H	24.1	20.8	44.9	82.2	-37.3
824.58 MHz	H	24.2	24.7	48.8	82.2	-33.4
875.51 MHz	H	21.2	25.2	46.4	82.2	-35.8
Operating Frequency 1989MHz						
44.2 MHz	V	29.8	13.2	43.0	82.2	-39.2
500.18 MHz	V	31.2	20.6	51.8	82.2	-30.4
512.65 MHz	V	24.5	20.8	45.3	82.2	-36.9
750.31 MHz	V	20.4	23.8	44.2	82.2	-38.0
875.51 MHz	V	18.8	25.2	44.0	82.2	-38.2
500.18 MHz	H	30.4	20.6	50.9	82.2	-31.3
512.65 MHz	H	23.4	20.8	44.2	82.2	-38.0
750.31 MHz	H	21.0	23.8	44.8	82.2	-37.4
875.51 MHz	H	19.7	25.2	44.9	82.2	-37.3
937.75 MHz	H	19.1	25.7	44.9	82.2	-37.4



TILE Instrument Control System EMI Measurement Software

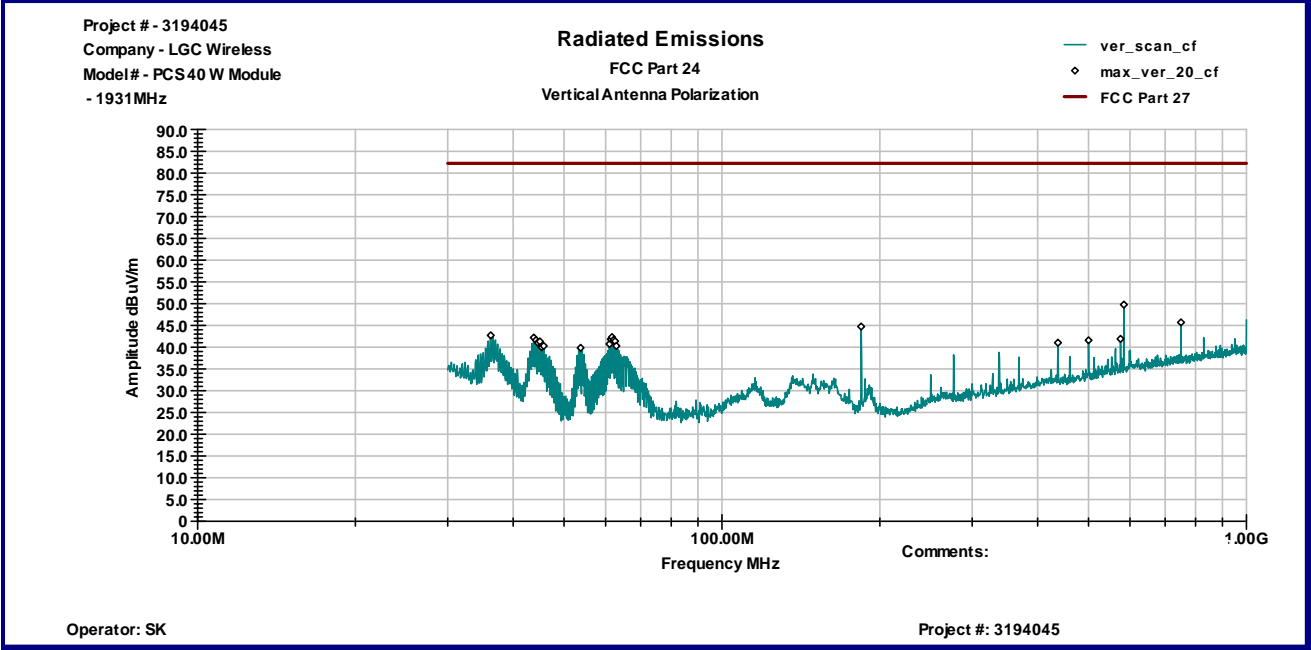
Radiated Emissions from 1GHz to 18GHz

Date: 11-17-2009

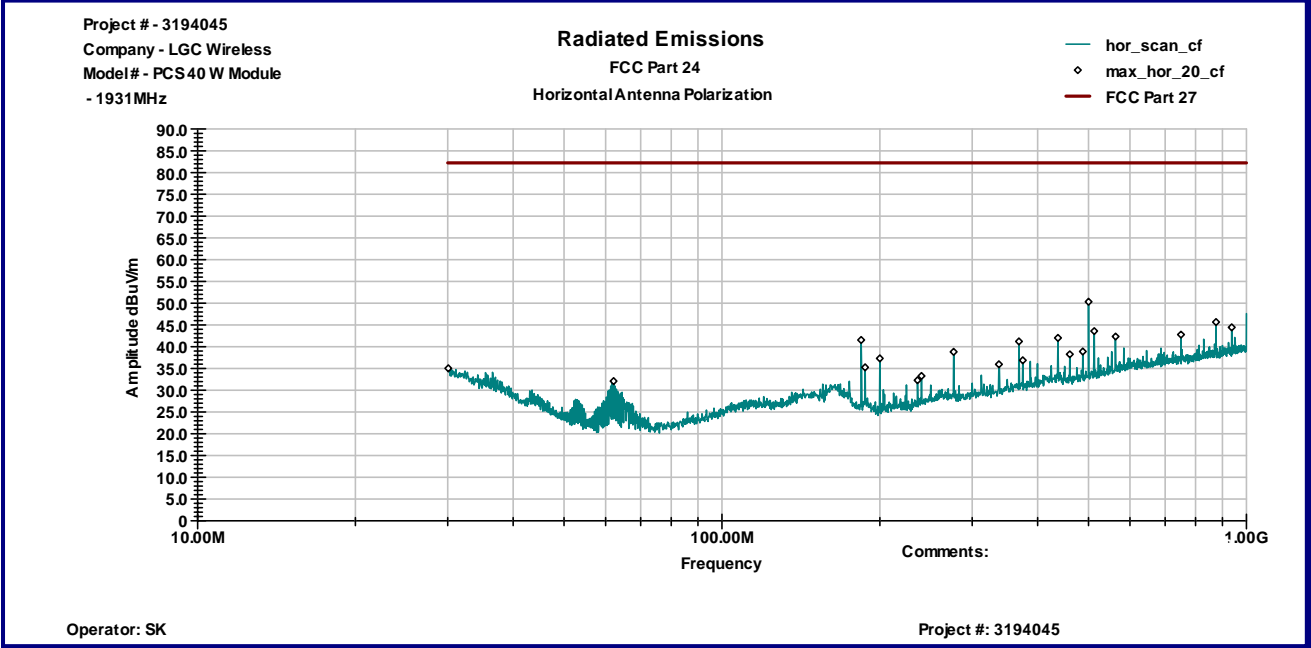
Company: LGC Wireless/ADC Telecommunications Inc.
Model: PCS 40 W Module
Test Engineer: Simon Khazon
Standard: FCC Part 24
Test Site: 3m Anechoic Chamber, 3m measurement distance
Note: The table shows the worst case radiated emissions
 All measurements were taken using a Peak detector

Table # 2

Frequency MHz	Antenna Polarity	Reading dBμV	Total C.F. dB1/m	Pre-Amp. Gain (dB)	Total at 3m dBμV/m	QP Limit dBμV/m	Margin dB
Operating Frequency 1931 MHz							
1.2482 GHz	V	58.5	27.5	42.6	43.4	82.2	-38.8
3.3188 GHz	V	50.6	35.1	43.4	42.4	82.2	-39.8
3.8628 GHz	V	52.3	36.7	43.0	46.0	82.2	-36.3
14.539 GHz	V	42.4	51.9	40.7	53.5	82.2	-28.7
18.0 GHz	V	41.8	56.7	41.3	57.2	82.2	-25.0
Operating Frequency 1960 MHz							
1.2482 GHz	H	63.0	27.5	42.6	47.9	82.2	-34.3
2.0166 GHz	H	56.1	31.1	43.3	43.9	82.2	-38.3
14.892 GHz	H	43.7	50.7	40.8	53.6	82.2	-28.6
17.925 GHz	H	42.5	56.3	41.3	57.6	82.2	-24.6
Operating Frequency 1960 MHz							
1.2482 GHz	V	58.9	27.5	42.6	43.8	82.2	-38.4
3.9206 GHz	V	53.6	36.8	43.0	47.5	82.2	-34.7
4.0362 GHz	V	46.0	37.2	42.8	40.3	82.2	-41.9
14.869 GHz	V	43.6	50.8	40.8	53.5	82.2	-28.7
17.908 GHz	V	42.1	56.3	41.3	57.0	82.2	-25.2
Operating Frequency 1989 MHz							
1.2482 GHz	H	62.3	27.5	42.6	47.2	82.2	-35.0
1.6596 GHz	H	57.3	29.4	42.9	43.8	82.2	-38.4
2.02 GHz	H	57.3	31.1	43.3	45.1	82.2	-37.1
14.556 GHz	H	42.2	51.8	40.8	53.2	82.2	-29.0
17.908 GHz	H	42.1	56.3	41.3	57.1	82.2	-25.1
Operating Frequency 1989 MHz							
1.2482 GHz	V	58.4	27.5	42.6	43.2	82.2	-39.0
3.9784 GHz	V	57.1	37.0	42.9	51.2	82.2	-31.1
14.637 GHz	V	43.5	51.5	40.8	54.3	82.2	-27.9
17.993 GHz	V	42.0	56.7	41.3	57.3	82.2	-24.9
Operating Frequency 1989 MHz							
1.2482 GHz	H	62.2	27.5	42.6	47.1	82.2	-35.1
1.6596 GHz	H	57.2	29.4	42.9	43.7	82.2	-38.5
2.1254 GHz	H	54.8	31.5	43.2	43.0	82.2	-39.2
4.0974 GHz	H	49.8	37.4	42.8	44.4	82.2	-37.8
13.825 GHz	H	44.0	50.8	41.1	53.7	82.2	-28.5
17.976 GHz	H	41.8	56.6	41.3	57.0	82.2	-25.2

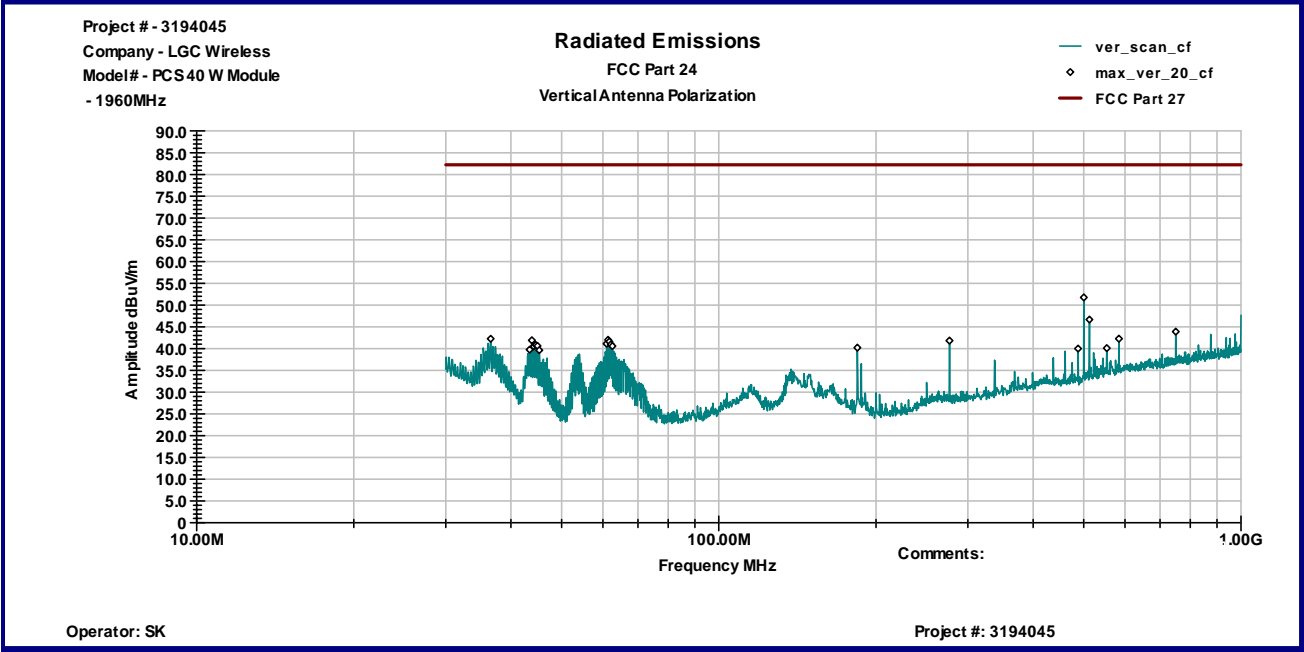


Graph 1

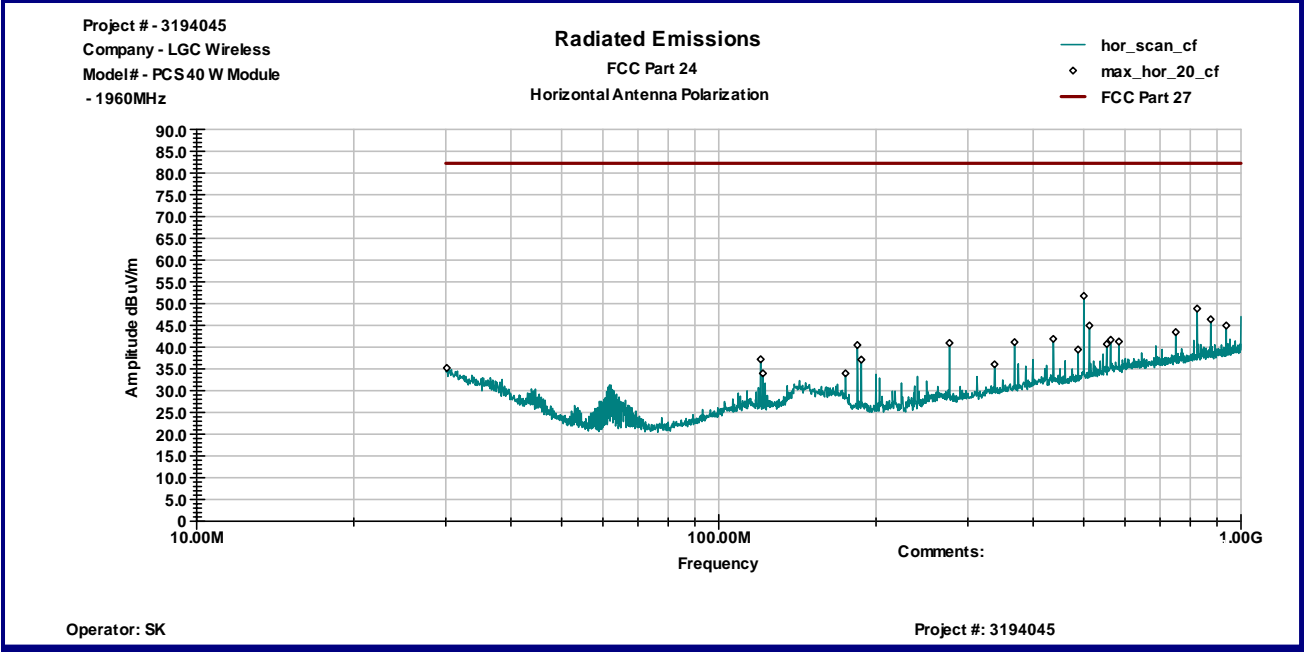


W

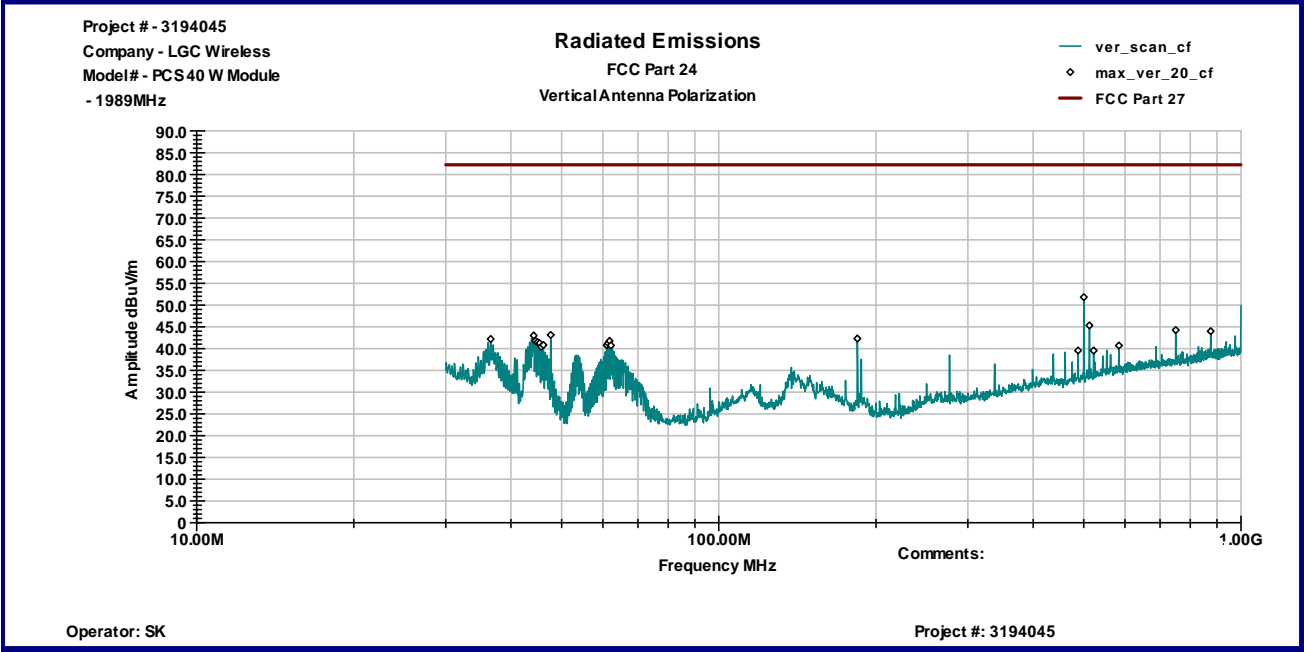
Graph 2



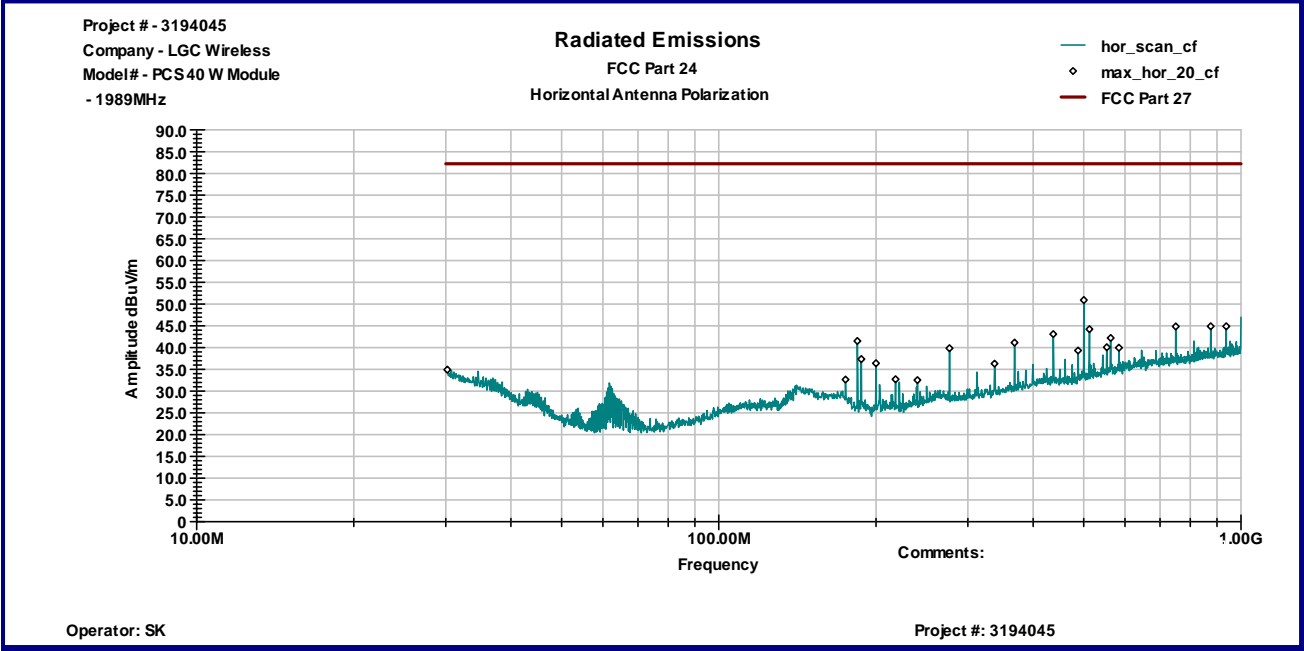
Graph 3



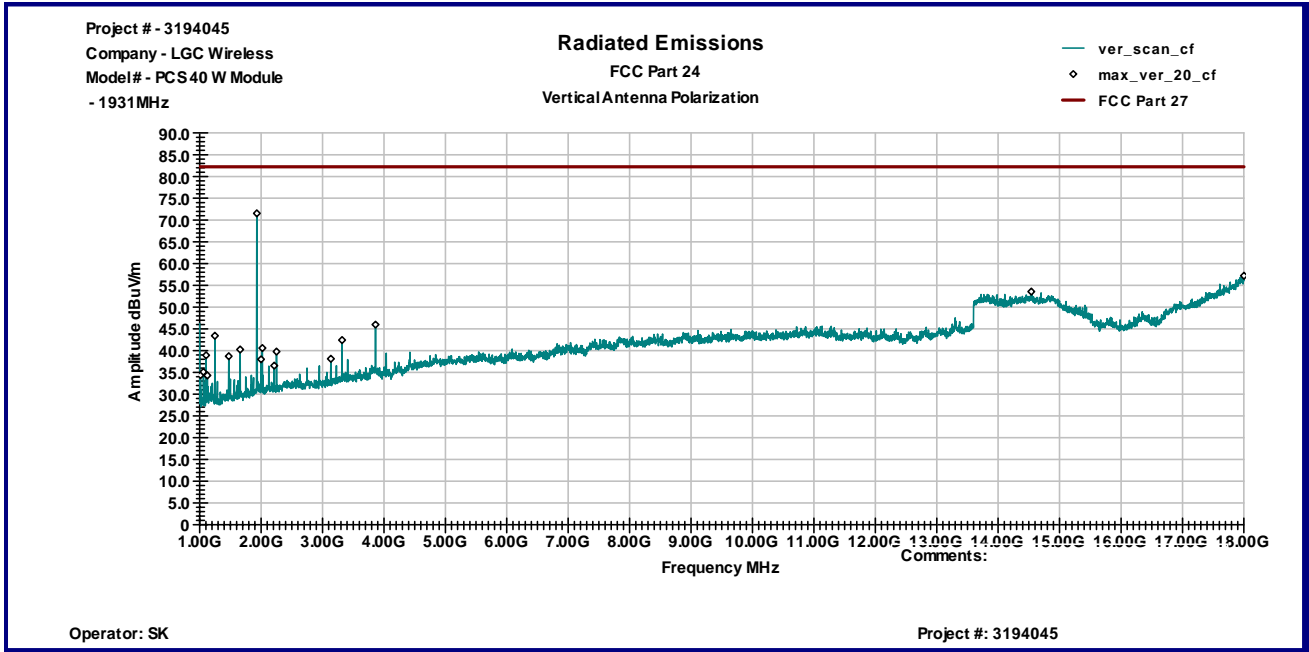
Graph 4



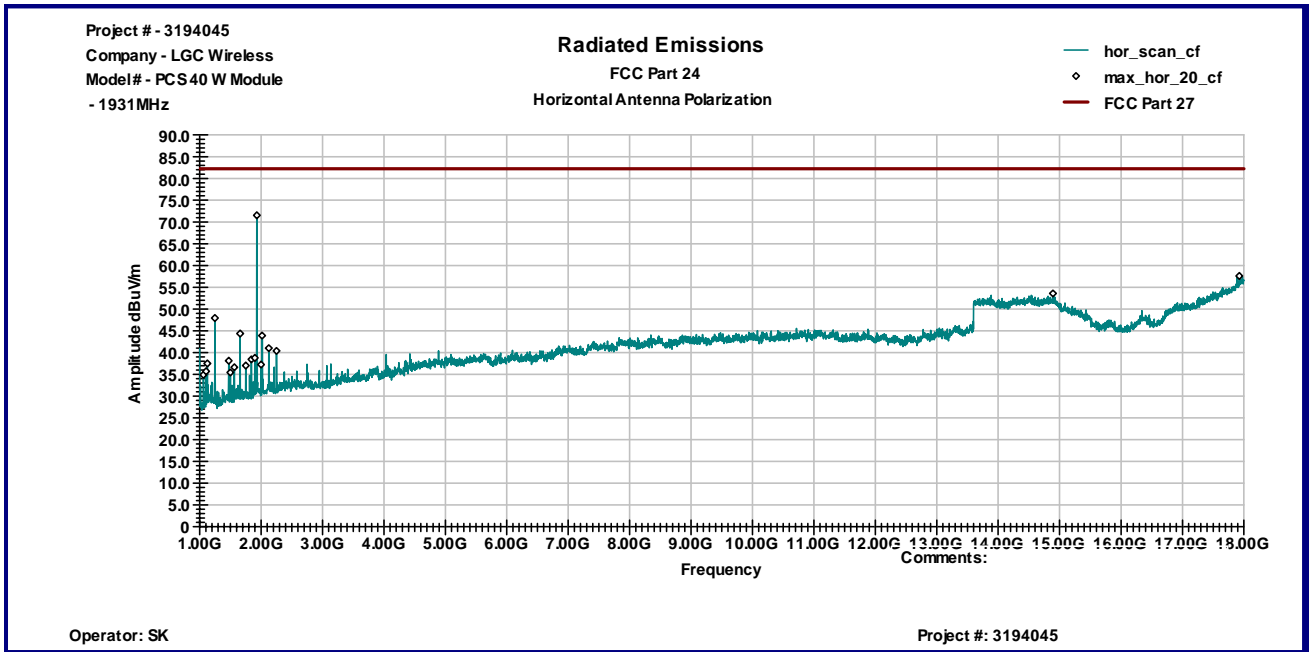
Graph 5



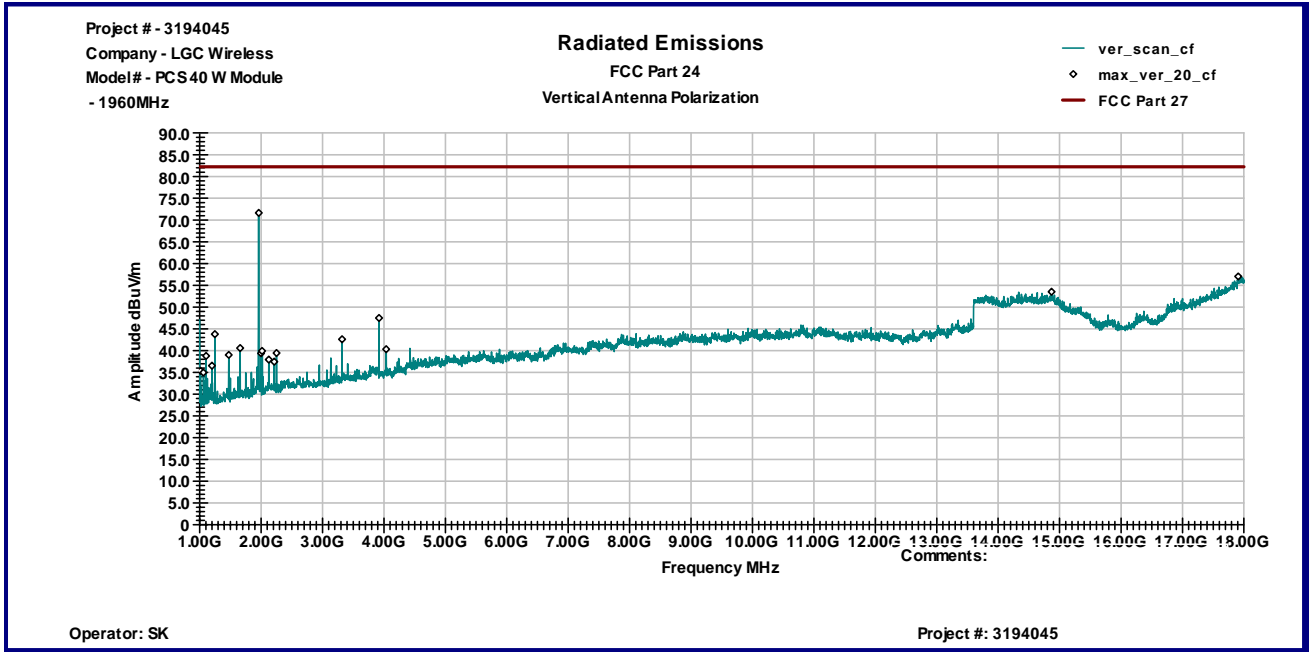
Graph 6



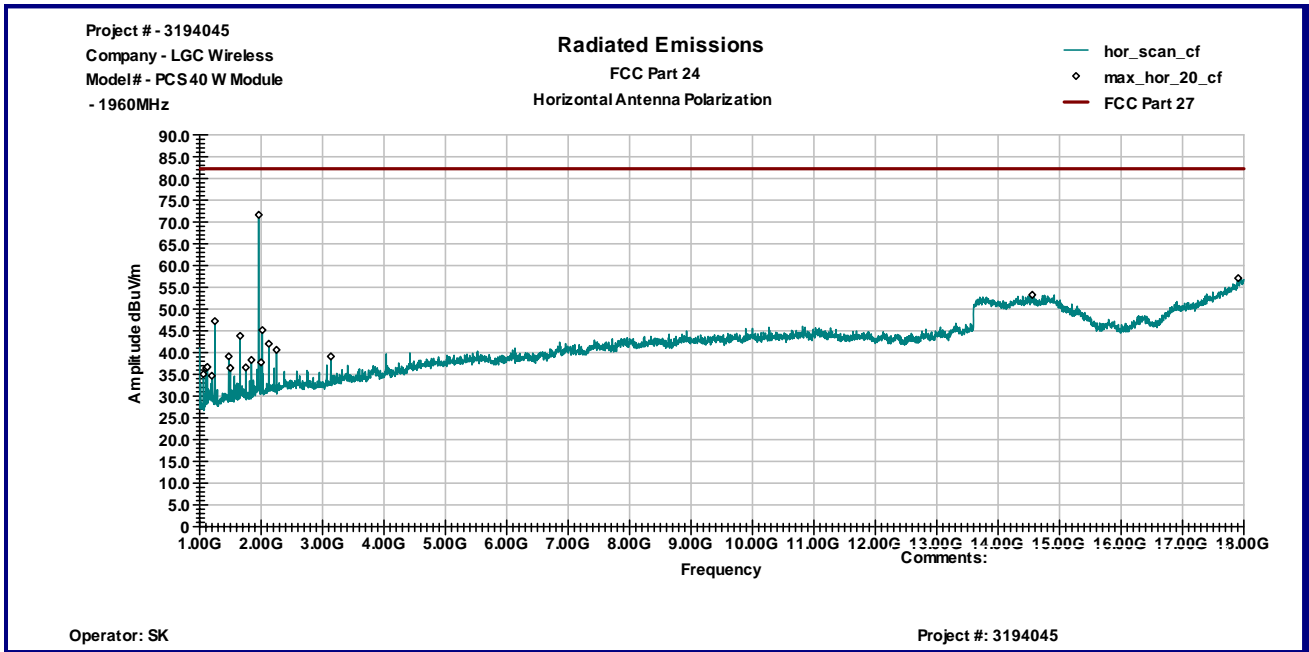
Graph 7



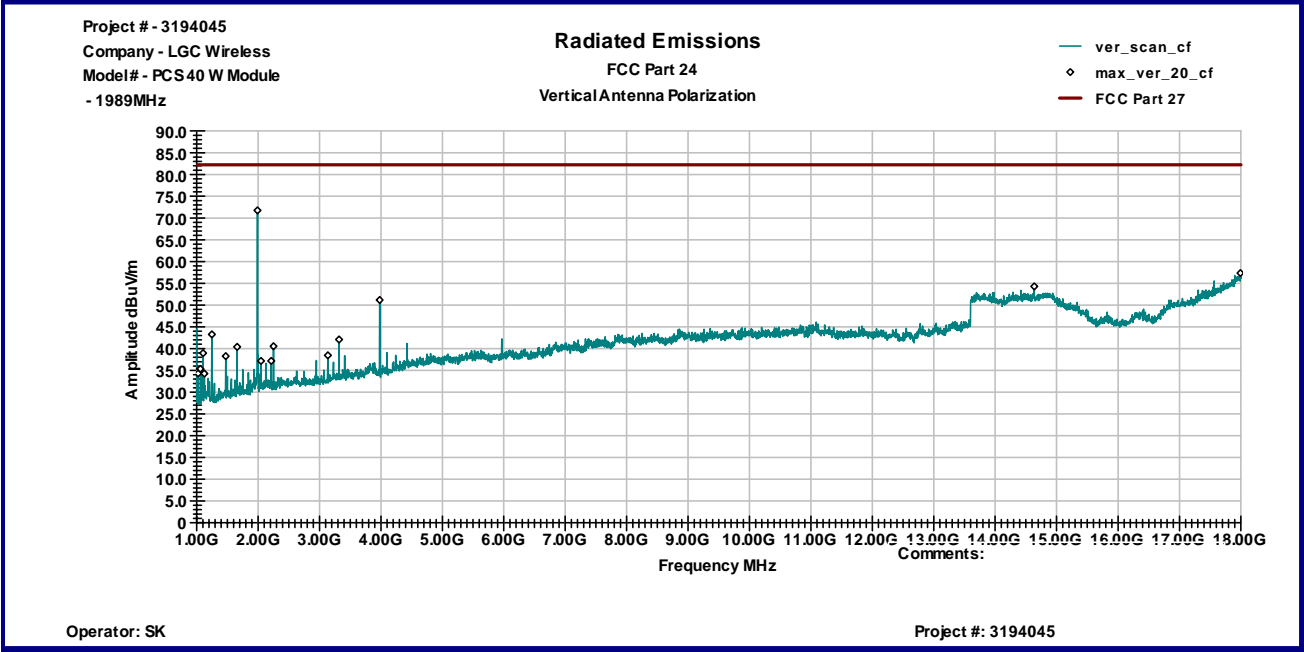
Graph 8



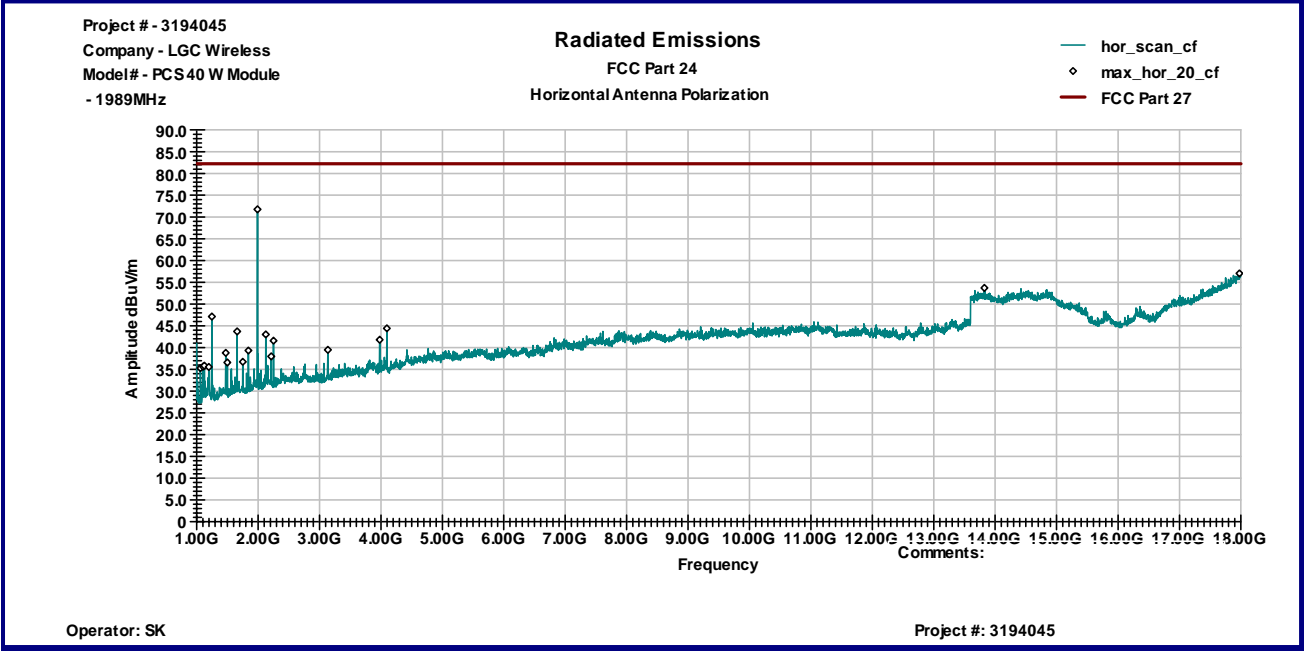
Graph 9



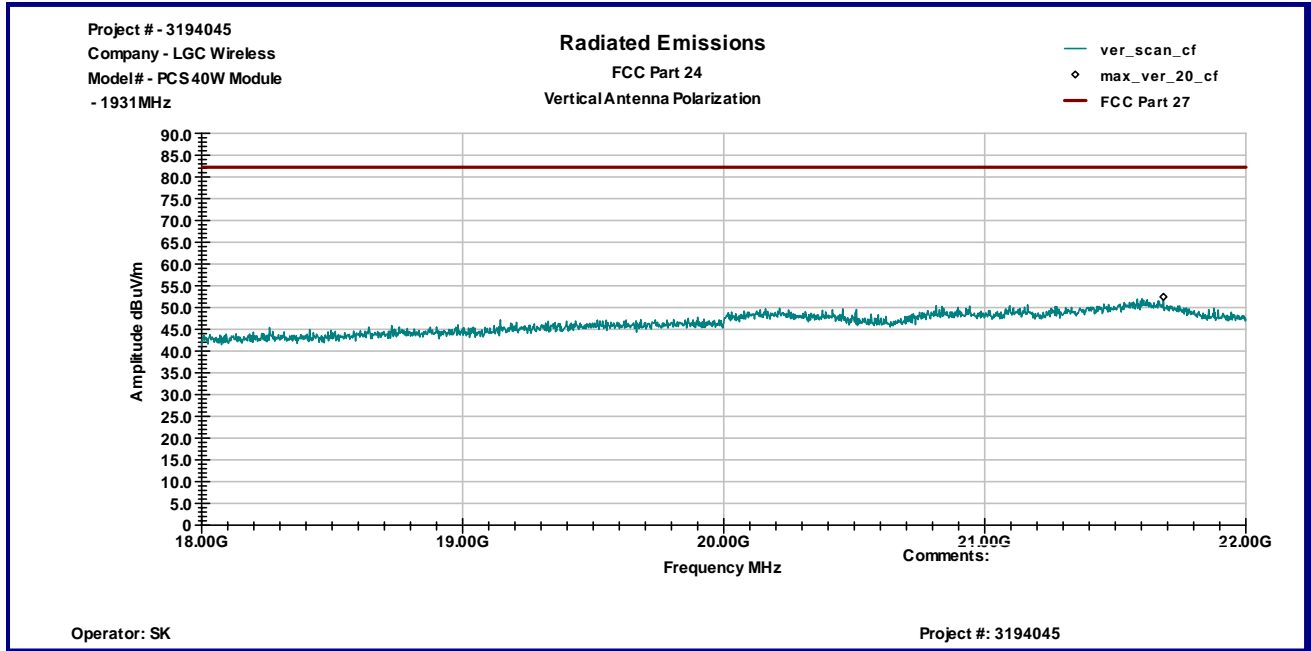
Graph 10



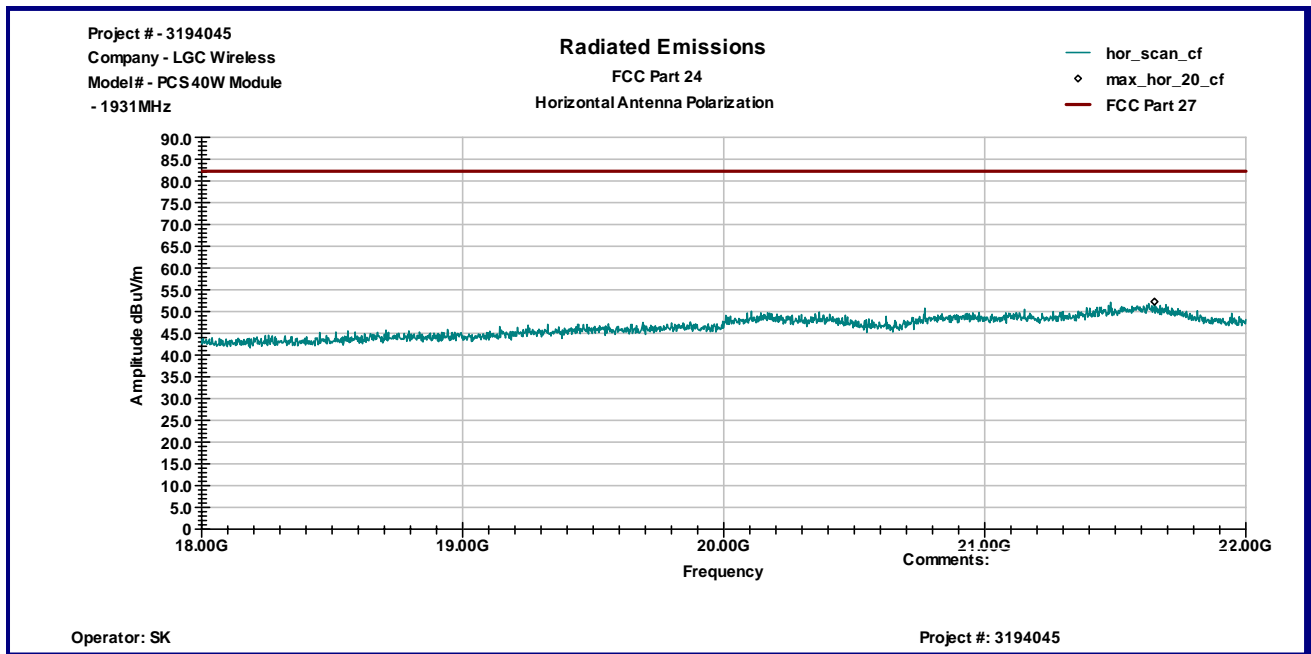
Graph 11



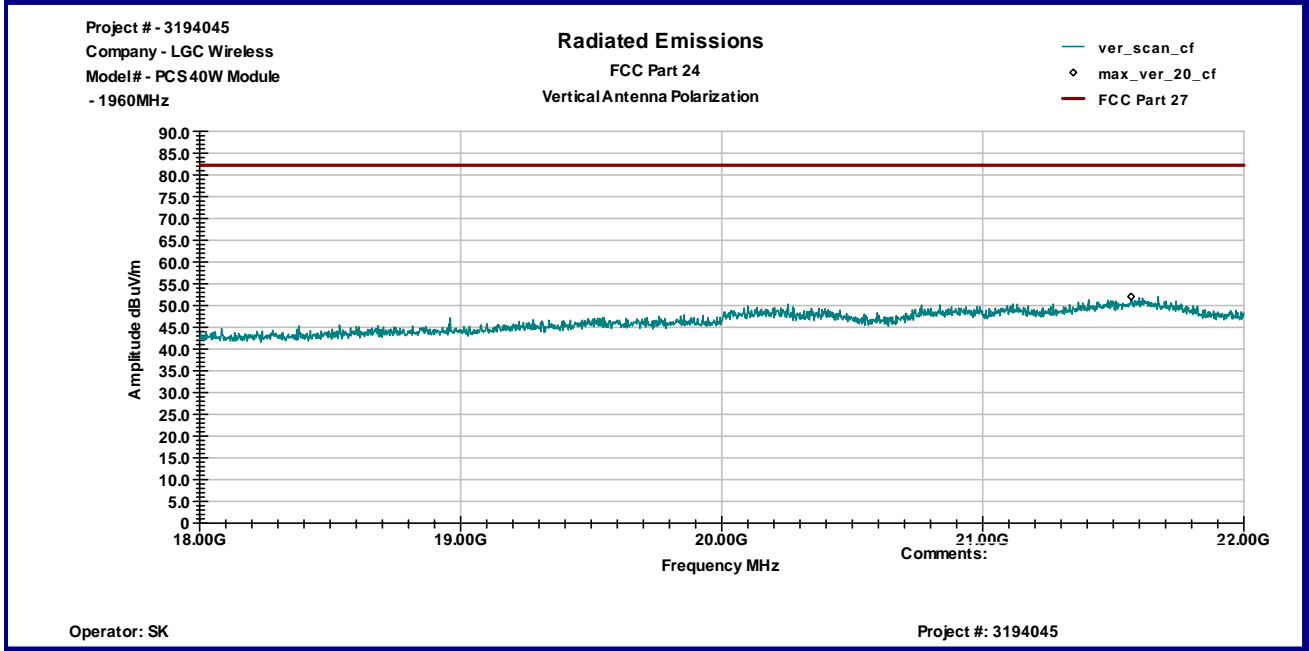
Graph 12



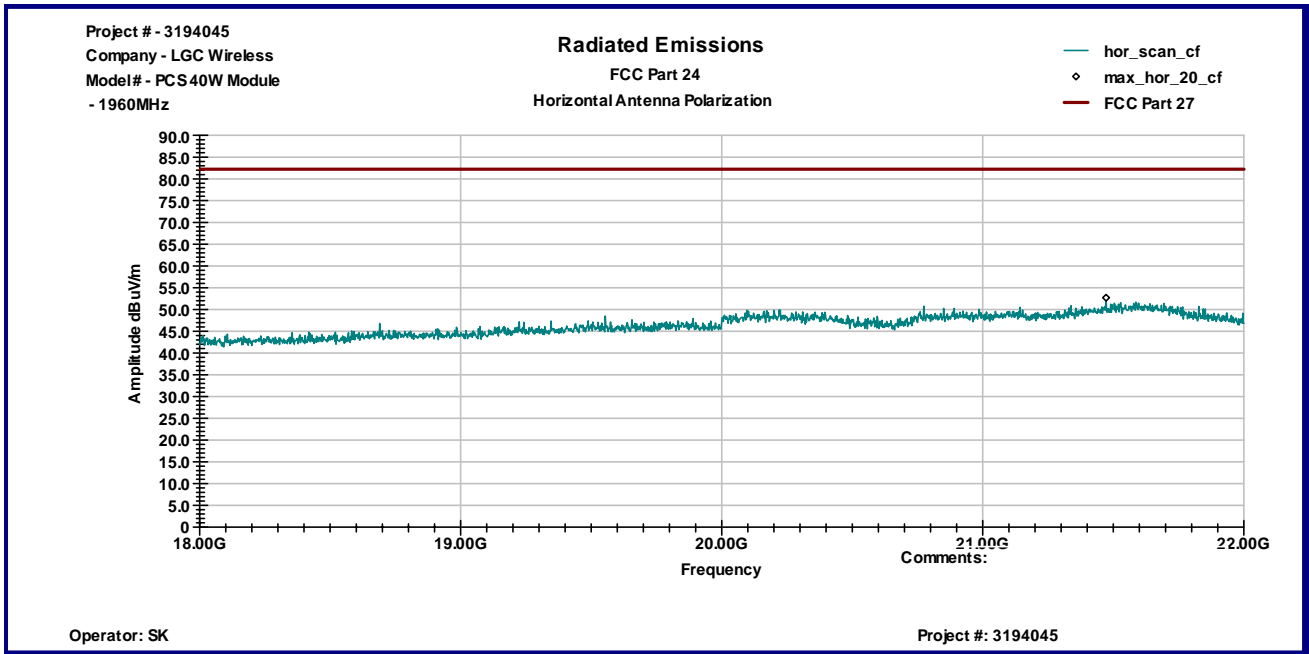
Graph 13



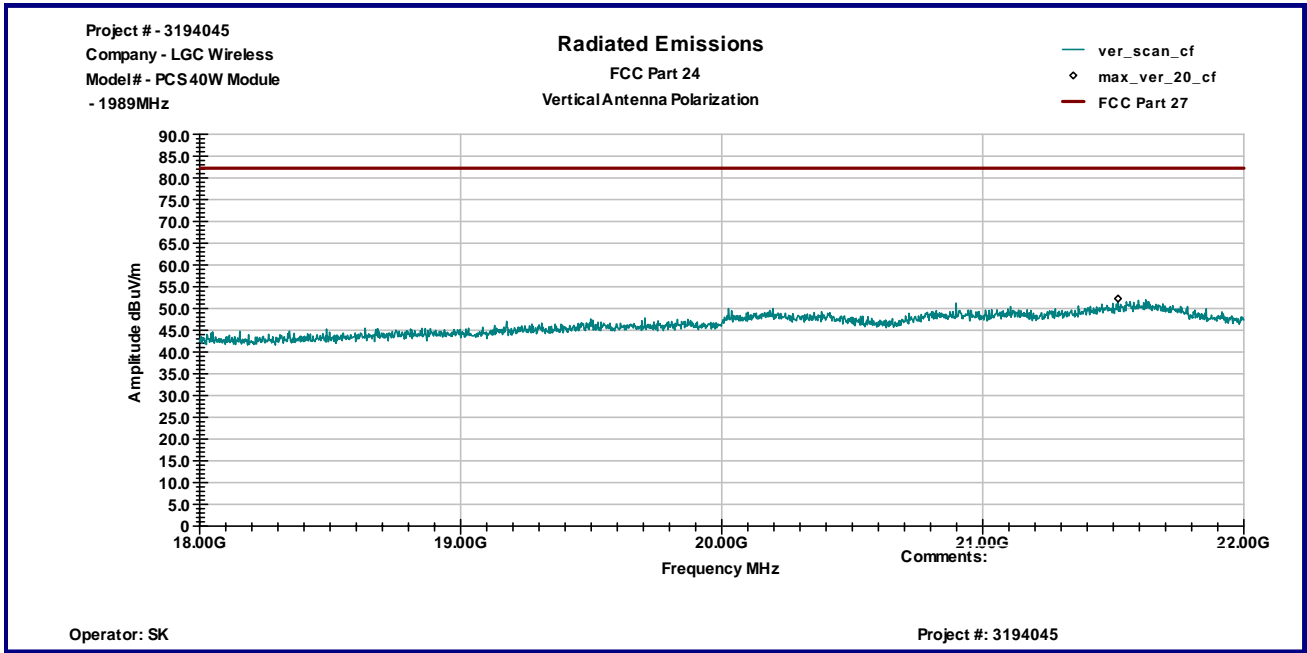
Graph 14



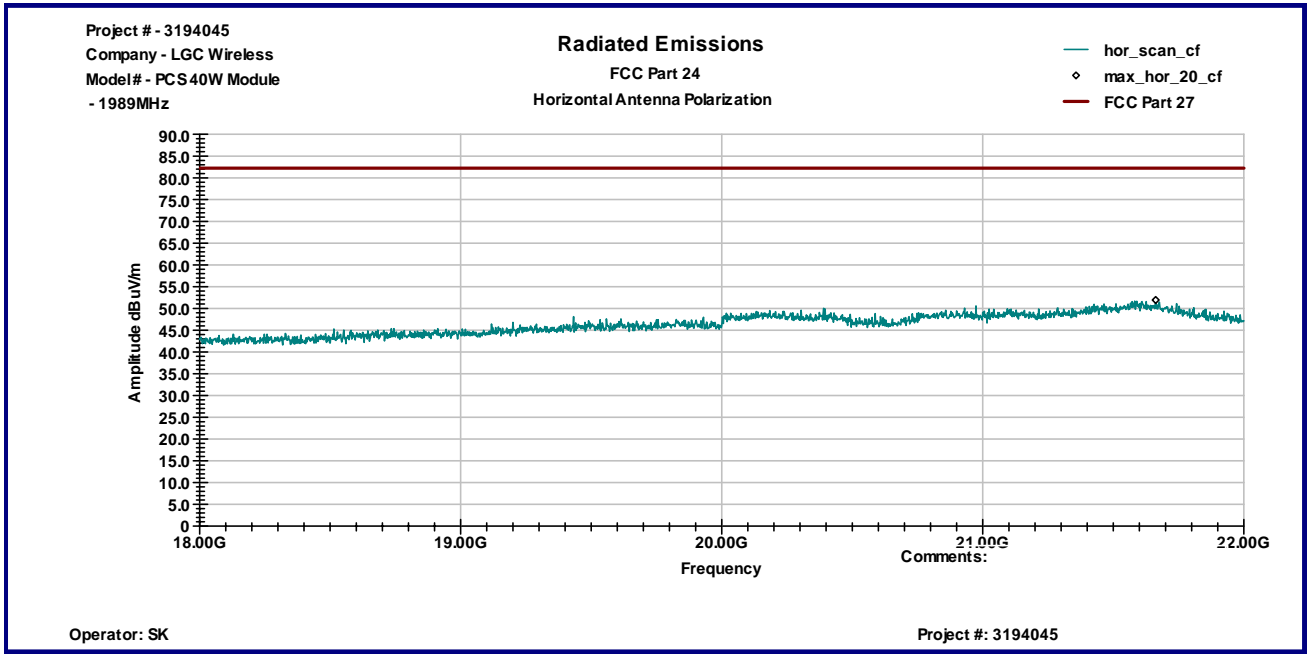
Graph 15



Graph 16



Graph 17



Graph 18

3.1 Environmental conditions

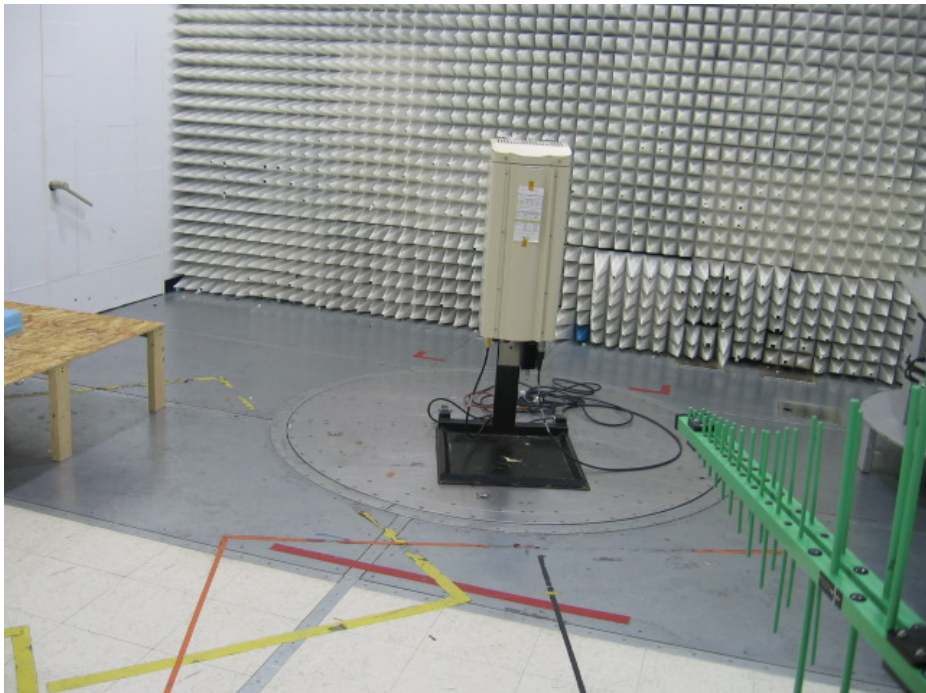
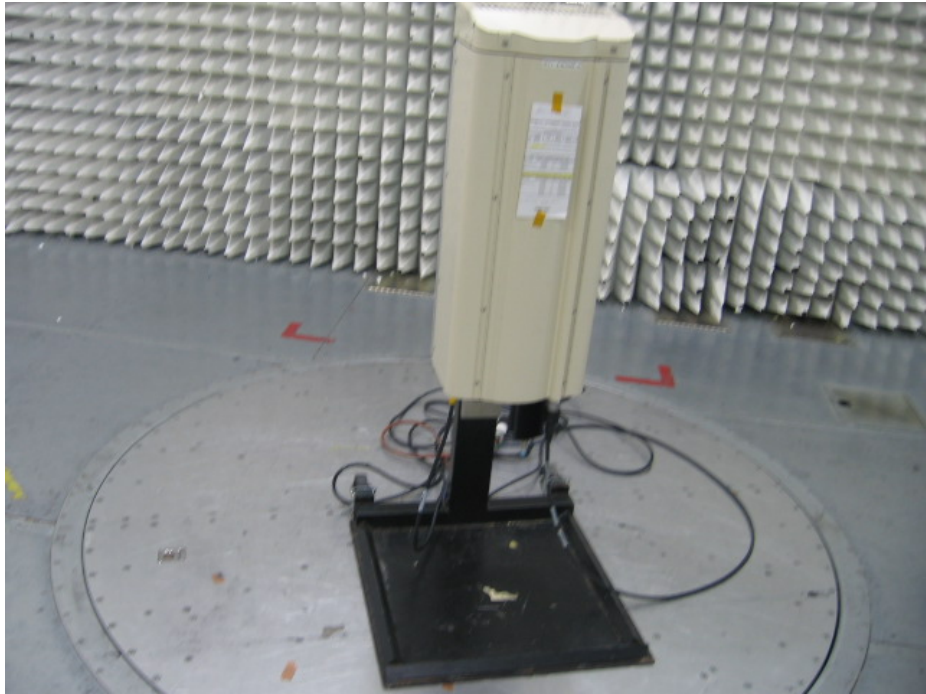
During the measurement the environmental conditions were within the listed ranges:

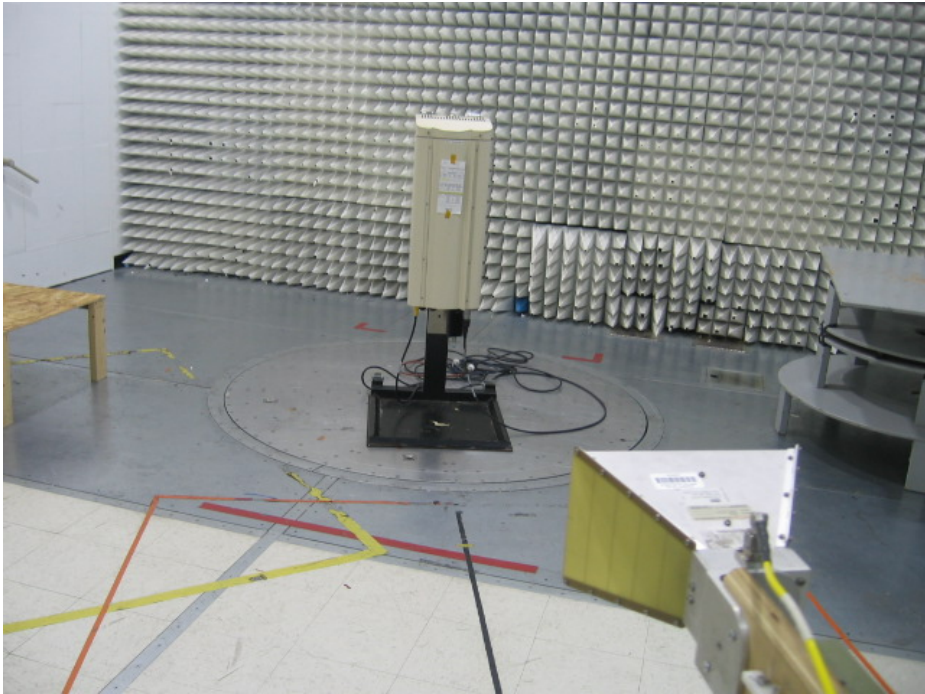
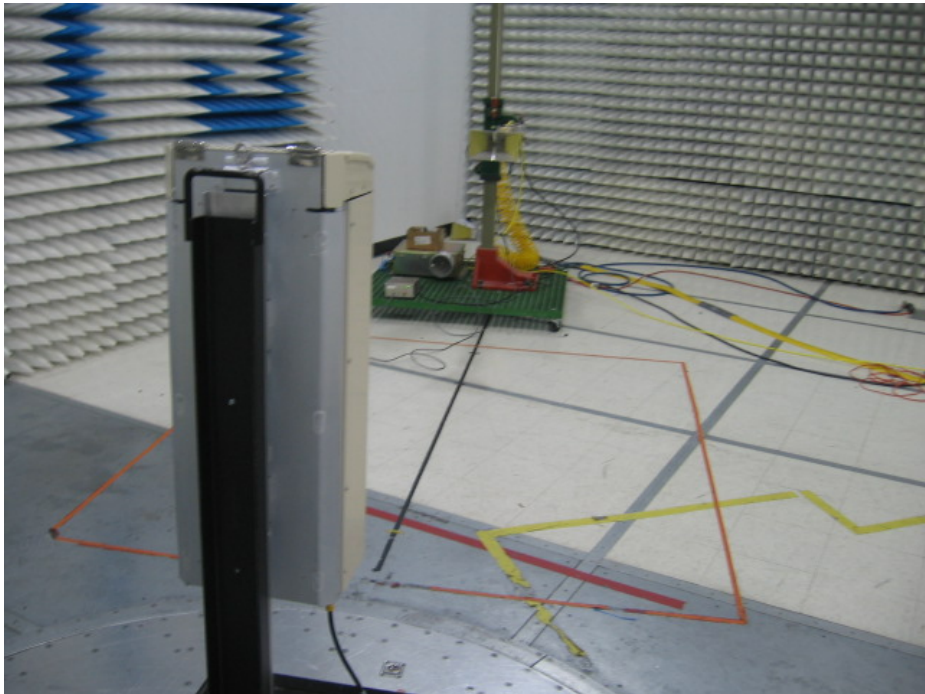
Temperature: 15-35 ° C

Humidity: 30-60 %

Atmospheric pressure: 86-106 kPa

4.0 PHOTOS







5.0 TEST EQUIPMENT

DESCRIPTION	MANUFACTURER	MODEL	SERIAL NO.	INTERTEK ID	CAL DUE	USED
Spectrum Analyzer	R & S	FSP 40	100024	12559	09/10/2010	<input checked="" type="checkbox"/>
Spectrum Analyzer	R & S	ESCI	100358	12909	05/18/2010	<input checked="" type="checkbox"/>
Bicono-Log Antenna	Schaffner-Chase	CBL 6112 B	2468	14459	09/22/2010	<input checked="" type="checkbox"/>
Bicono-Log Antenna	Schaffner-Chase	CBL 6112 B	2630	14459	10/02/2010	<input type="checkbox"/>
Horn Antenna	EMCO	3115	9507-4513	9936	03/04/2010	<input checked="" type="checkbox"/>
Horn Antenna	EMCO	3115	6579	15580	04/03/2010	<input type="checkbox"/>
Waveguide Horn Antenna	EMCO	3116	9904-2423	9705	08/06/2010	<input checked="" type="checkbox"/>
Loop Antenna	A.H.Systems	SAS-200/562	215	9817	05/21/2010	<input type="checkbox"/>
Loop Antenna	ETS	6512	00060486	19942	08/10/2010	<input type="checkbox"/>
Monopole Antenna	A.H.Systems	SAS-200/550-1	692	9986	05/27/2010	<input type="checkbox"/>
LISN	Fischer Custom Communications	FCC-LISN-50-50-4	115	9944	11/06/2010	<input type="checkbox"/>
LISN	Fischer Custom Communications	FCC-TLISN-T4	15333.01	9671	04/28/2010	<input type="checkbox"/>
Field Monitor	NARDA	ELT-400	J-0039	12740	02/18/2010	<input type="checkbox"/>
B-Field Sensor	NARDA	BN 2300	J-0049	12769	02/18/2010	<input type="checkbox"/>
RF Current Probe	Fischer Custom Communications	F-33-2	330	15298	04/14/2010	<input type="checkbox"/>
Absorbing Clamp	Fischer Custom Communications	F-201	167	9964	03/31/2010	<input type="checkbox"/>
Pre-Amplifier	MITEQ	AMF-5D-00501800-28-13P	1402232	172081	08/07/2010	<input checked="" type="checkbox"/>
Pre-Amplifier	MITEQ	AMF-6F-16002600-25-10P	1222383	MIN-0065	08/07/2010	<input checked="" type="checkbox"/>
Pre-Amplifier	MITEQ	AMF-6F-26004000-40-8P	13224444	MIN-0064	08/07/2010	<input type="checkbox"/>
Pre-Amplifier	HP	8447F OPT H64	3113A04974	9934	05/21/2010	<input type="checkbox"/>
System	TILE! Instrument Control		Ver. 3.4.K.29	15259	VBU	<input checked="" type="checkbox"/>



Annex 1: Antenna Conducted Emissions

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1.1 Test Regulations

- 24.232 Power and antenna height limits
- 24.235 Frequency stability
- 24.238 Emission limits for Broadband PCS equipment

IC RSS-131 Issue 2 Zone Enhancers for the Land Mobile Service

The emissions tests were performed according to the following regulations:

FCC Part 22

■ FCC Part 24

FCC Part 90

■ IC RSS-131 Issue 2

1.2 Test Operation Mode

Standby

Test Program

Practice Operation

■ Max composite in and out

1.3 Configuration of the Device Under Test:

Normal Operation – PCS - 1930 to 1990 MHz

1.4 Product Options:

None

1.5 Cables:

Cable Type	Length	From	To
RF	> 3M	Ancillary Equip	EUT
RF	< 3M	EUT	50 Ohm Load
Power	< 3M	Power	Input Power
Fiber	> 3M	Ancillary Equip	EUT

1.6 Support Equipment

Description	Manufacturer	Model #	FCC ID #
Power Meter	HP	EPM-441A	
Signal Generator	Agilent	E4438C	
Attenuator	Aeroflex	86-30-12	

1.7 Deviations from Standard:

Modifications required to pass:

As indicated on the data sheet(s)

■ **None**

Test Specification Deviations; Additions to or Exclusions from:

As indicated in the Test Plan

■ **None**

1.8 General Remarks:

None.

1.9 Summary:

The requirements according to the technical regulations are

■ **met**

not Met

2.0 FCC TEST RESULTS

2.1.1 24.232 Power and Antenna Height Limits

Test Summary:

- The requirements are: **MET** NOT MET
- Minimum margin of compliance is 3.02 dB at 1989.8 MHz (EDGE)

Test Location:

- Intertek (Oakdale, MN)

Test Distance:

- 3 Meters
- 10 Meters

- **Conducted measurement**

Test Limit:

100 Watts or 50 dBm Limit

Test Data:

Below

Date: 19 November, 2009

Conducted Output Power Test

*Note: The EUT is a fixed repeater and not a base station.

This measurement was made as a direct conducted emission measurement. The output from the EUT antenna connector was connected to the power meter. The carrier output, below, was conducted using a single GSM, EDGE and W-CDMA signal. The power meter level was offset to compensate for attenuators and cable loss between the EUT and the power meter.

A signal was used at the low, mid and high parts of the selected band. The power meter level was offset by 31.0 dB to compensate for cable loss and attenuator between the EUT and the power meter.

<u>GSM</u>	<u>48.64 Watts</u>
Carrier Frequency	Carrier Output
1930.2 MHz	<u>46.25</u> dBm
1960.0 MHz	<u>46.83</u> dBm
1989.8 MHz	<u>46.87</u> dBm

<u>EDGE</u>	<u>49.94 Watts</u>
Carrier Frequency	Carrier Output
1930.2 MHz	<u>46.87</u> dBm
1960.0 MHz	<u>46.76</u> dBm
1989.8 MHz	<u>46.98</u> dBm

<u>W-CDMA</u>	<u>48.64 Watts</u>
Carrier Frequency	Carrier Output
1932.6 MHz	<u>46.55</u> dBm
1960.0 MHz	<u>46.28</u> dBm
1987.4 MHz	<u>46.87</u> dBm

2.1.2 24.235 Frequency Stability

Test Summary:

- The requirements are: **MET** NOT MET
- The fundamental emission stays within the limit.
- Frequency measured over a temperature range of –30 to 50° C and an input voltage range of 100 to 240 VAC.

Test Location:

- Intertek (Oakdale, MN)

Test Distance:

- 3 Meters
- 10 Meters

■ Conducted measurement

Test Limit:

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

Test Data:

Below

Date: 18 November, 2009

Frequency Tolerance Test

HOST	REMOTE			
Input Voltage	Input Voltage	Carrier Frequency	Measured Frequency	Meets Requirements?
21 VDC	100 VAC	1930.200 MHz	1930.200 MHz	Yes
48 VDC	170 VAC	1930.200 MHz	1930.200 MHz	Yes
60 VDC	240 VAC	1930.200 MHz	1930.200 MHz	Yes
21 VDC	100 VAC	1960.000 MHz	1960.000 MHz	Yes
48 VDC	170 VAC	1960.000 MHz	1960.000 MHz	Yes
60 VDC	240 VAC	1960.000 MHz	1960.000 MHz	Yes
21 VDC	100 VAC	1989.800 MHz	1989.800 MHz	Yes
48 VDC	170 VAC	1989.800 MHz	1989.800 MHz	Yes
60 VDC	240 VAC	1989.800 MHz	1989.800 MHz	Yes
Temperature		Carrier Frequency	Measured Frequency	Meets Requirements?
-30 Deg. C		1930.200 MHz	1930.200 MHz	Yes
-20 Deg. C		1930.200 MHz	1930.200 MHz	Yes
-10 Deg. C		1930.200 MHz	1930.200 MHz	Yes
0 Deg. C		1930.200 MHz	1930.200 MHz	Yes
10 Deg. C		1930.200 MHz	1930.200 MHz	Yes
20 Deg. C		1930.200 MHz	1930.200 MHz	Yes
30 Deg. C		1930.200 MHz	1930.200 MHz	Yes
40 Deg. C		1930.200 MHz	1930.200 MHz	Yes
50 Deg. C		1930.200 MHz	1930.200 MHz	Yes
-30 Deg. C		1960.000 MHz	1960.000 MHz	Yes
-20 Deg. C		1960.000 MHz	1960.000 MHz	Yes
-10 Deg. C		1960.000 MHz	1960.000 MHz	Yes
0 Deg. C		1960.000 MHz	1960.000 MHz	Yes
10 Deg. C		1960.000 MHz	1960.000 MHz	Yes
20 Deg. C		1960.000 MHz	1960.000 MHz	Yes
30 Deg. C		1960.000 MHz	1960.000 MHz	Yes
40 Deg. C		1960.000 MHz	1960.000 MHz	Yes
50 Deg. C		1960.000 MHz	1960.000 MHz	Yes
-30 Deg. C		1989.800 MHz	1989.800 MHz	Yes
-20 Deg. C		1989.800 MHz	1989.800 MHz	Yes
-10 Deg. C		1989.800 MHz	1989.800 MHz	Yes
0 Deg. C		1989.800 MHz	1989.800 MHz	Yes
10 Deg. C		1989.800 MHz	1989.800 MHz	Yes
20 Deg. C		1989.800 MHz	1989.800 MHz	Yes
30 Deg. C		1989.800 MHz	1989.800 MHz	Yes
40 Deg. C		1989.800 MHz	1989.800 MHz	Yes
50 Deg. C		1989.800 MHz	1989.800 MHz	Yes

2.1.3 24.238 Emission Limitations for Broadband PCS Equipment

Test Summary:

- The requirements are: **MET** NOT MET
- Out of band emissions were less than -13 dBm.
- Outside the emission bandwidth of the carrier, all emissions are attenuated at least 26 dB below the transmitter power.

Test Location:

- Intertek (Oakdale, MN)

Test Distance:

- 3 Meters
- 10 Meters

■ Conducted measurement

Test Limit:

Out of band emissions:

Attenuated below the transmitting power (P) by a factor of at least $43 + 10\log(P)$ dB, or -13 dBm.

Outside of the carrier emissions bandwidth:

26 dB below the transmitter power

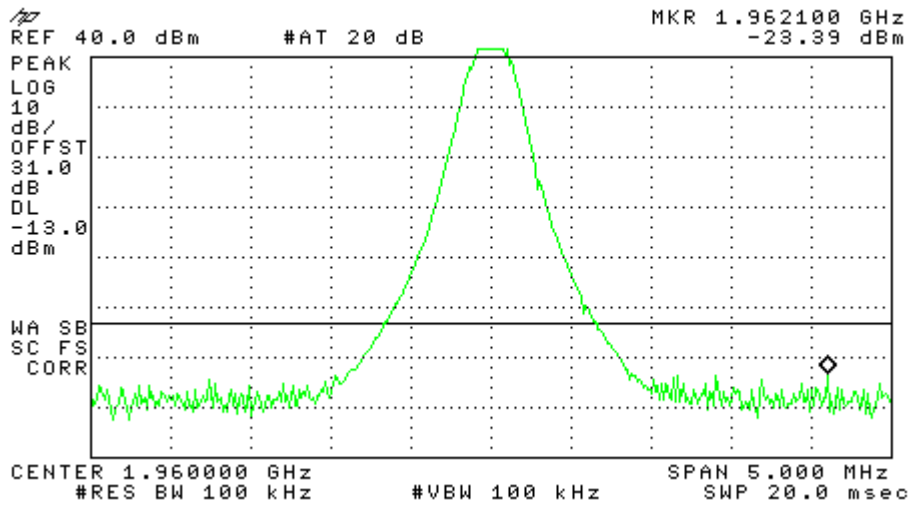
Test Data:

Conducted Emissions
Intermodulation Test
Occupied Bandwidth

Date: 19 November, 2009

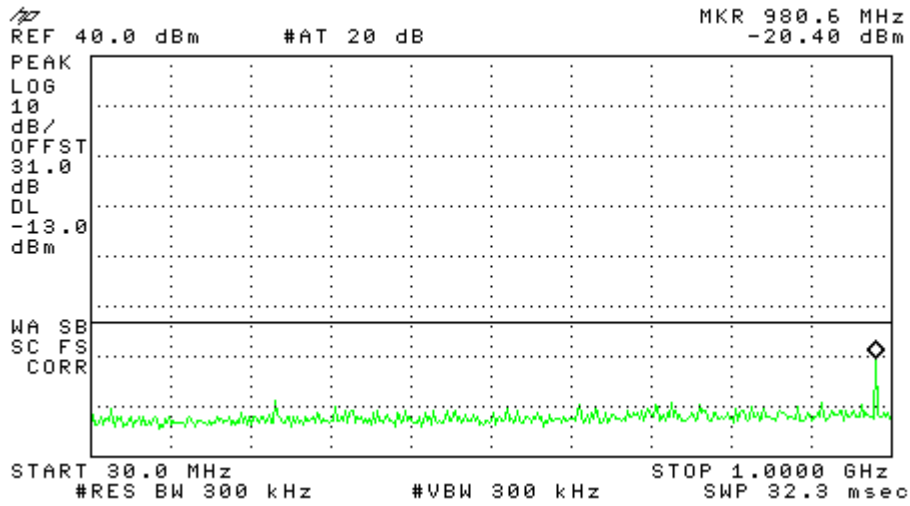
Below

Conducted Emissions GSM PCS
Center: 1960 MHz Span: 5 MHz RBW/VBW: 100 kHz



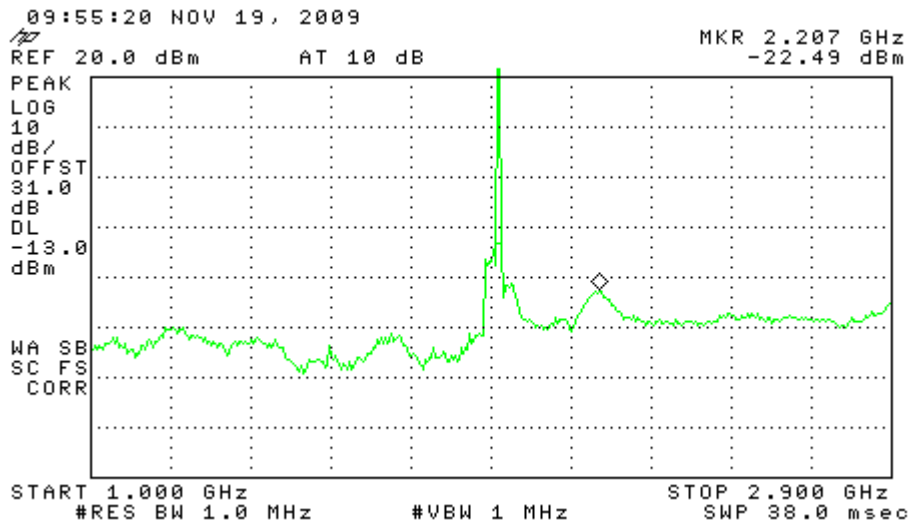
RL

Conducted Emissions GSM PCS
Span: 30 MHz to 1 GHz RBW/VBW: 300 kHz



RL

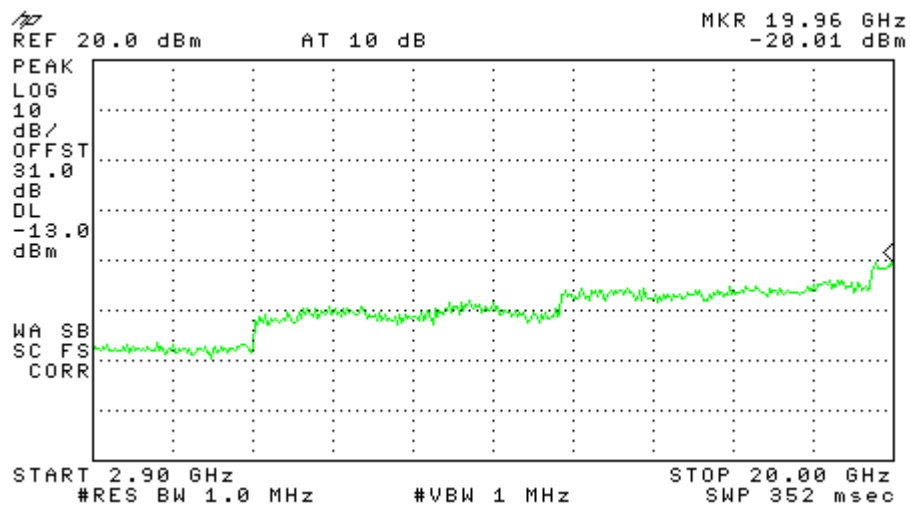
Conducted Emissions GSM PCS
Span: 1 GHz to 2.9 GHz RBW/VBW: 1 MHz



RL

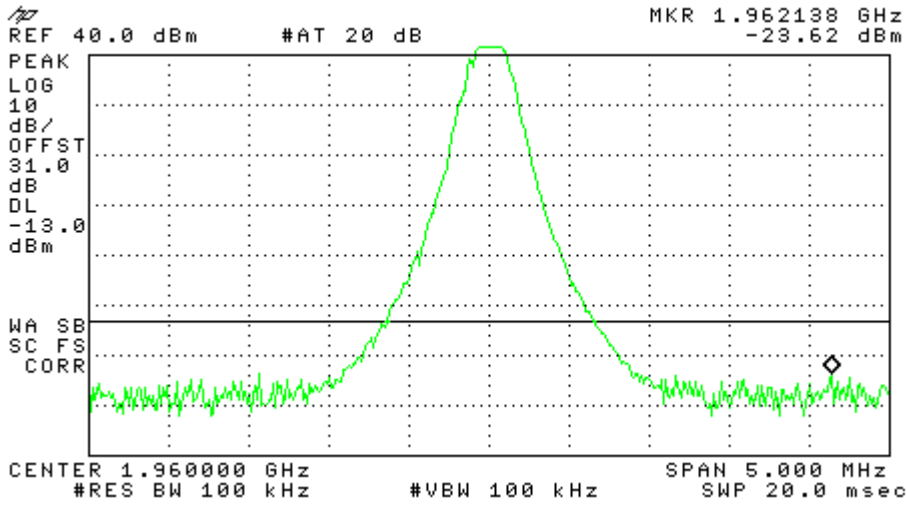
Conducted Emissions
Span: 2.9 GHz to 20 GHz

GSM PCS
RBW/VBW: 1 MHz



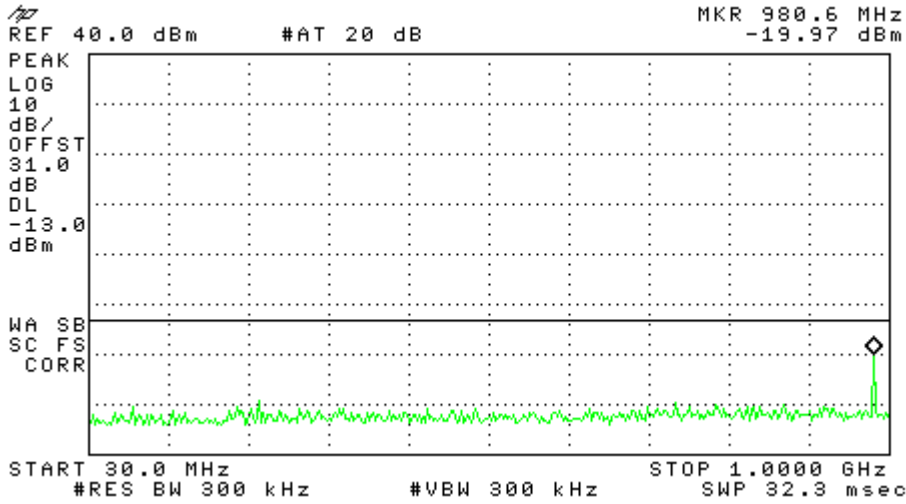
RL

Conducted Emissions EDGE PCS
Center: 1960 MHz Span: 5 MHz RBW/VBW: 100 kHz



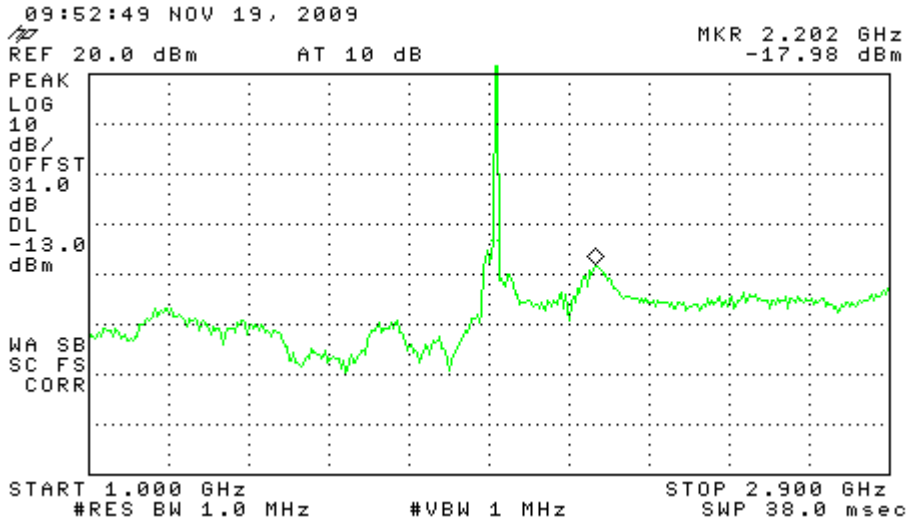
RL

Conducted Emissions EDGE PCS
Span: 30 MHz to 1 GHz RBW/VBW: 300 kHz



RL

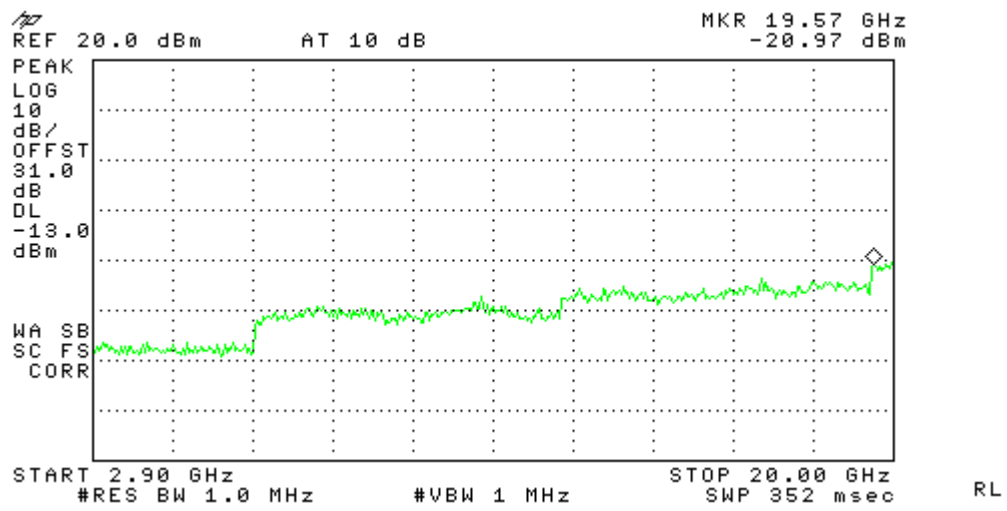
Conducted Emissions EDGE PCS
Span: 1 GHz to 2.9 GHz RBW/VBW: 1 MHz



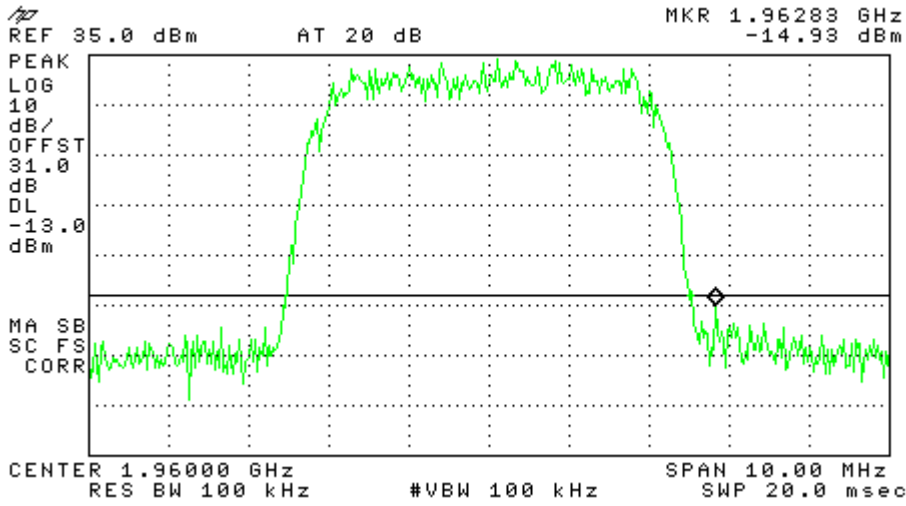
RL

Conducted Emissions
Span: 2.9 GHz to 20 GHz

EDGE PCS
RBW/VBW: 1 MHz

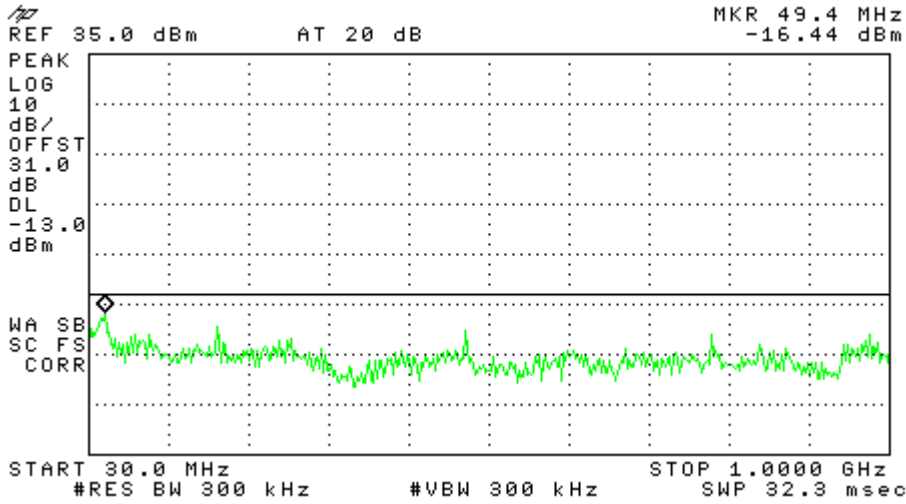


Conducted Emissions WCDMA PCS
 Center: 1960 MHz Span: 10 MHz RBW/VBW: 100 kHz



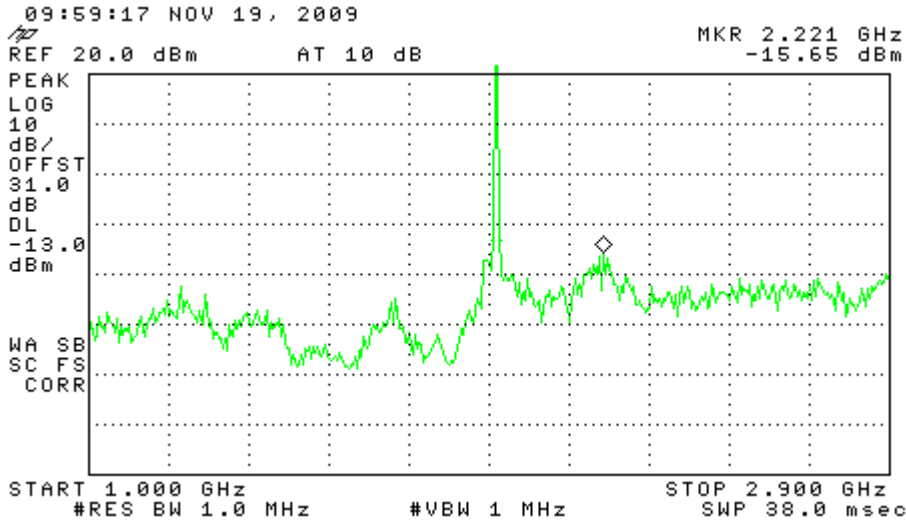
RL

Conducted Emissions WCDMA PCS
 Span: 30 MHz to 1 GHz RBW/VBW: 300 kHz



RL

Conducted Emissions WCDMA PCS
 Span: 1 GHz to 2.9 GHz RBW/VBW: 1 MHz

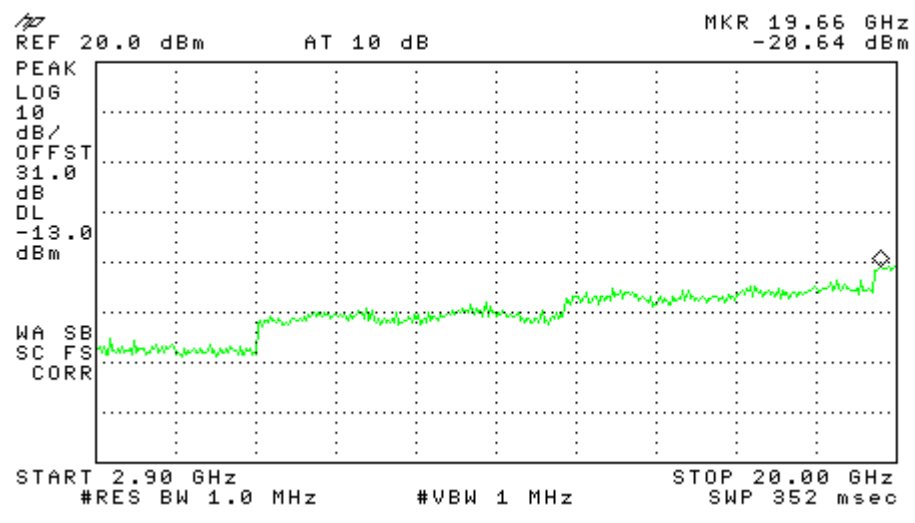


RL

Conducted Emissions
Span: 2.9 GHz to 20 GHz

WCDMA

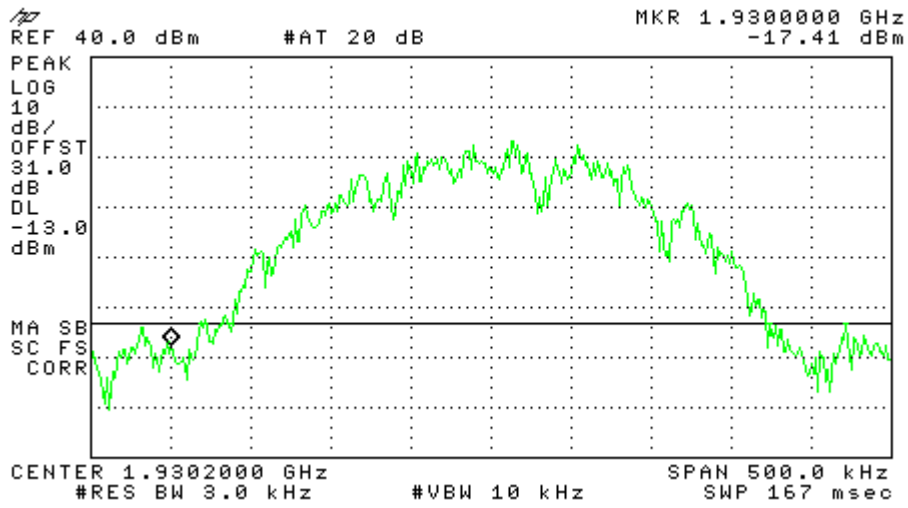
PCS
RBW/VBW: 1 MHz



RL

Band_Edge
Center: 1930.2 MHz Span: 500 kHz

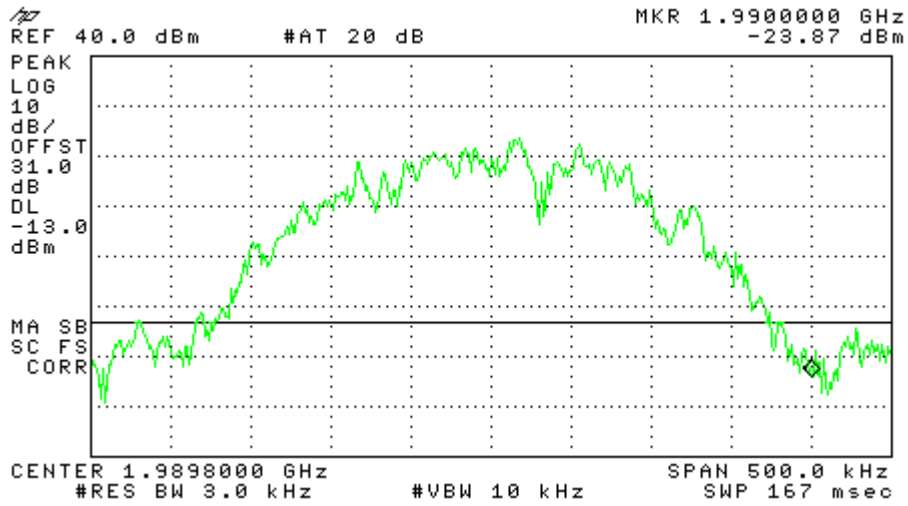
GSM
RBW: 3 kHz VBW: 10 kHz



RL

Band_Edge
Center: 1989.8 MHz Span: 500 kHz

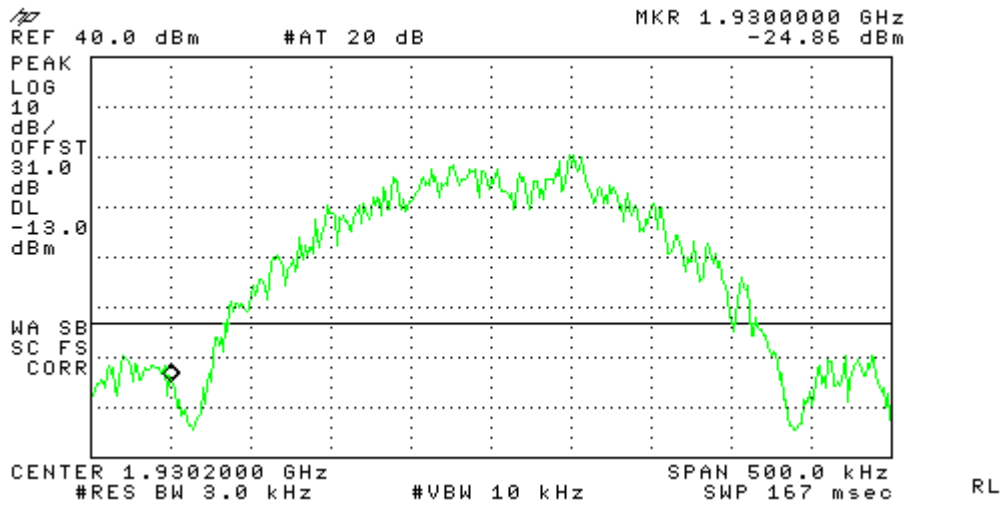
GSM
RBW: 3 kHz VBW: 10 kHz



RL

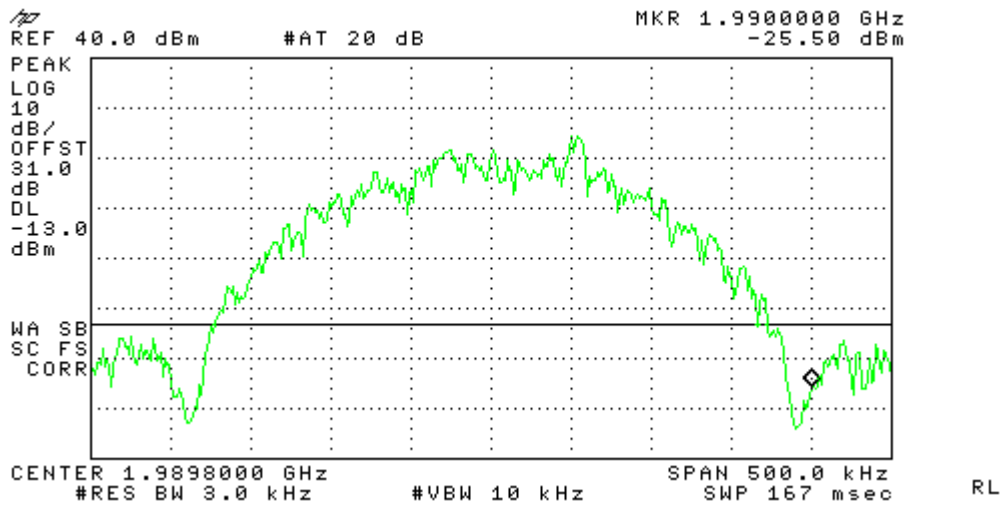
Band_Edge
Center: 1930.2 MHz Span: 500 kHz

EDGE
RBW: 3 kHz VBW: 10 kHz



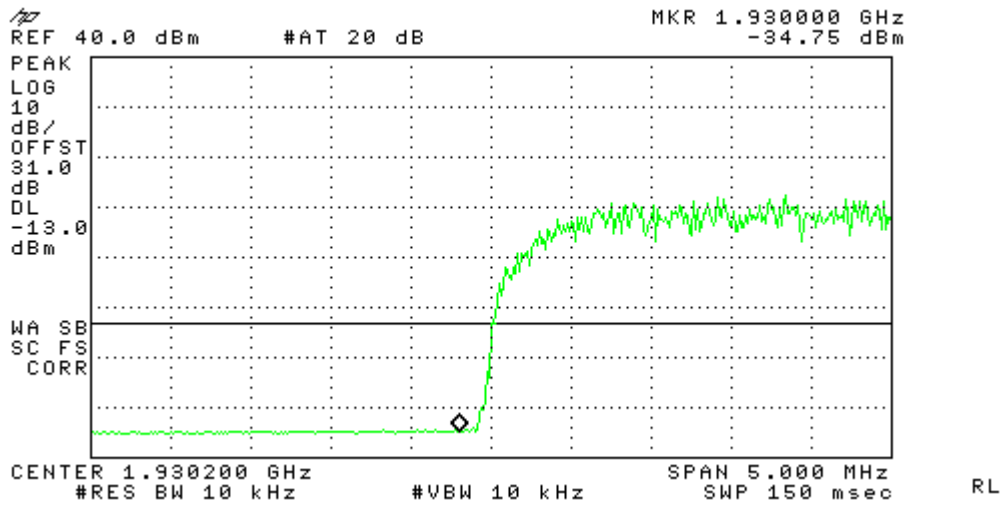
Band_Edge
Center: 1989.8 MHz Span: 500 kHz

EDGE
RBW: 3 kHz VBW: 10 kHz



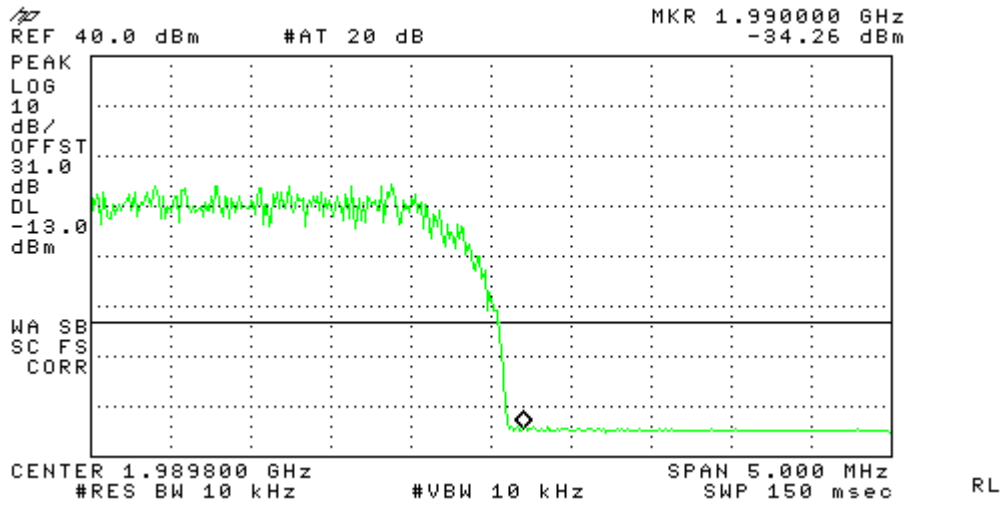
Band_Edge
Center: 1932.5 MHz Span: 5 MHz

WCDMA
RBW: 10 kHz VBW: 10 kHz

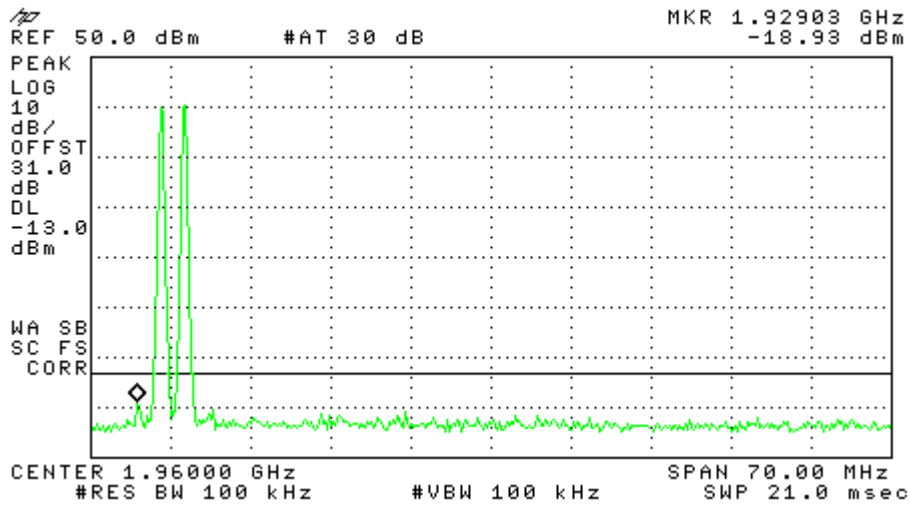


Band_Edge
Center: 1987.5 MHz Span: 5 MHz

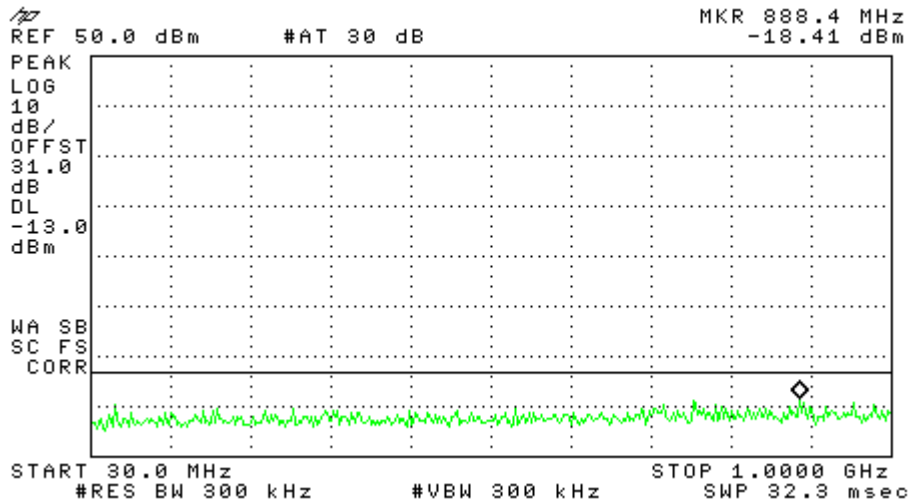
WCDMA
RBW: 10 kHz VBW: 10 kHz



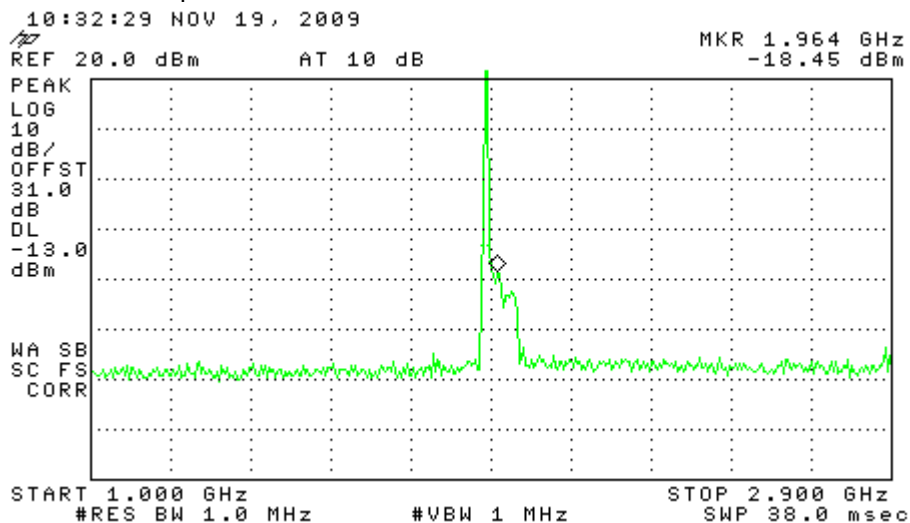
Intermodulation GSM_Low PCS_ADB
Center: 1960 MHz Span: 70 MHz RBW/VBW: 100 kHz



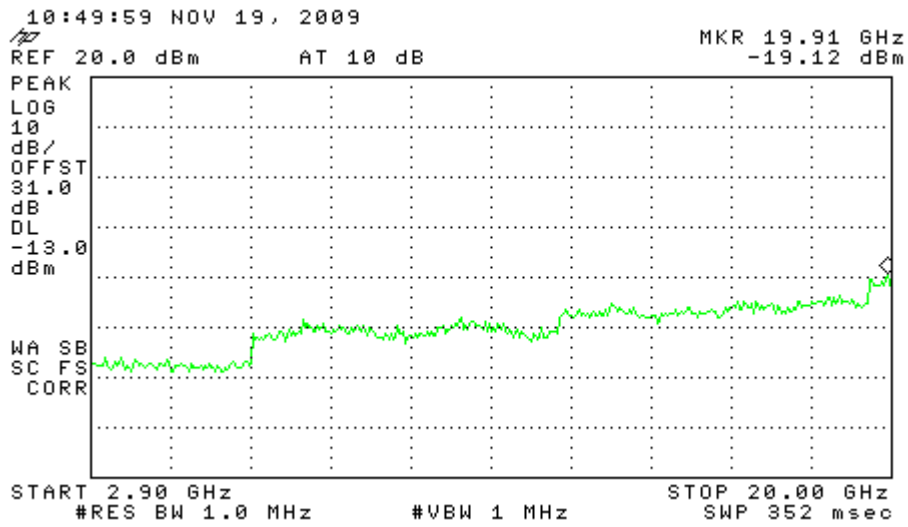
Intermodulation GSM_Low PCS_ADB
Span: 30 MHz to 1 GHz RBW/VBW: 300 kHz



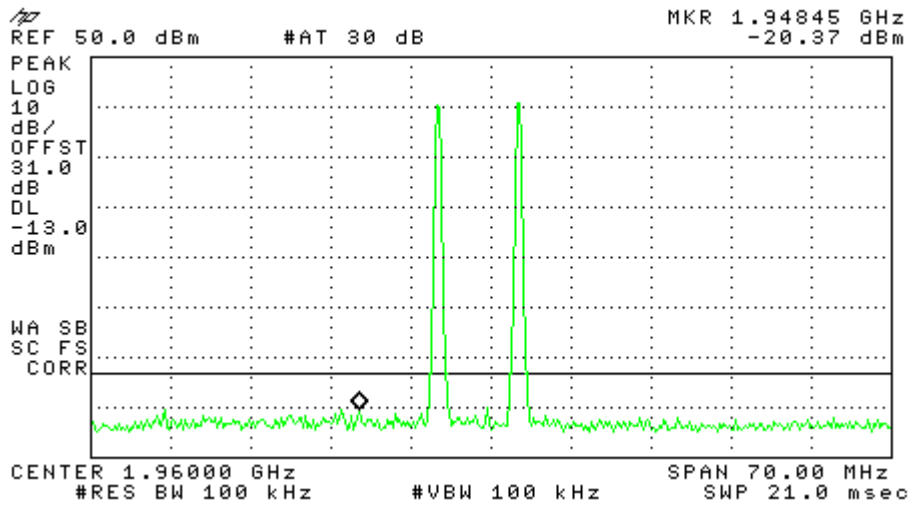
Intermodulation GSM_Low PCS_ADB
Span: 1 GHz to 2.9 GHz RBW/VBW: 1 MHz



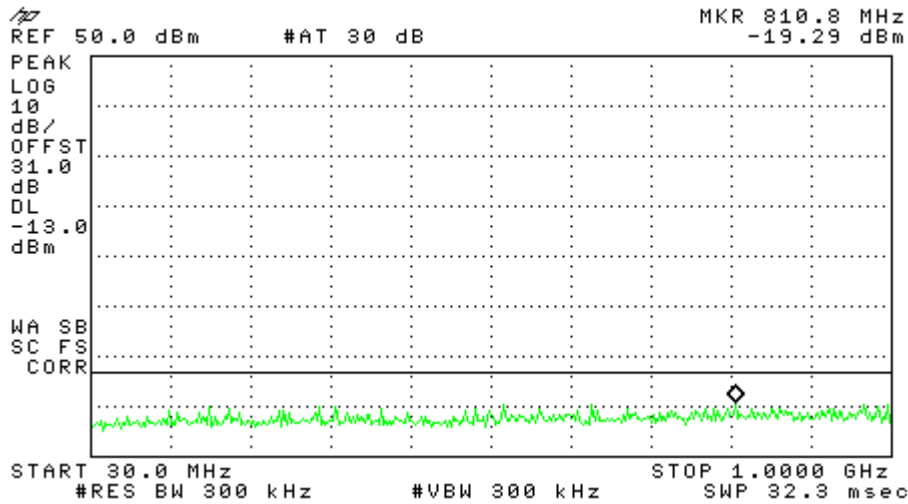
Intermodulation GSM_Low PCS_ADB
Span: 2.9 GHz to 20 GHz RBW/VBW: 1 MHz



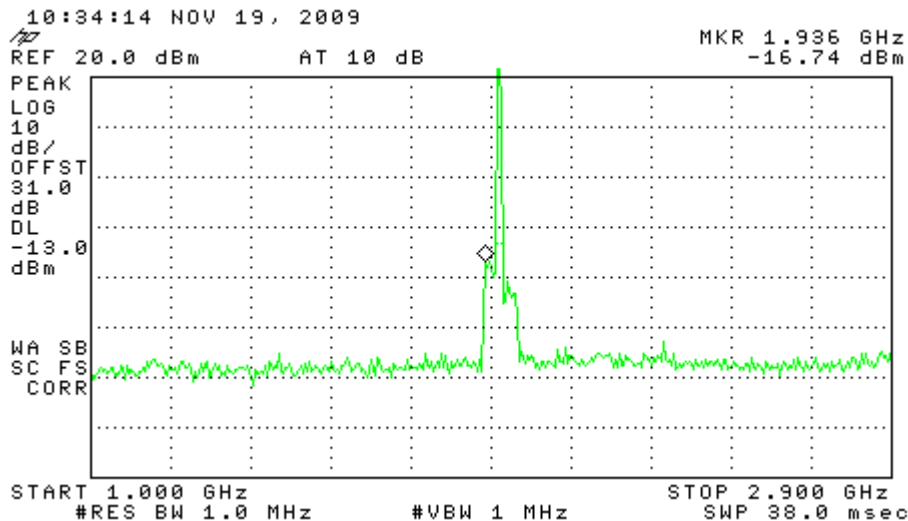
Intermodulation GSM_High PCS_ADB
Center: 1960 MHz Span: 70 MHz RBW/VBW: 100 kHz



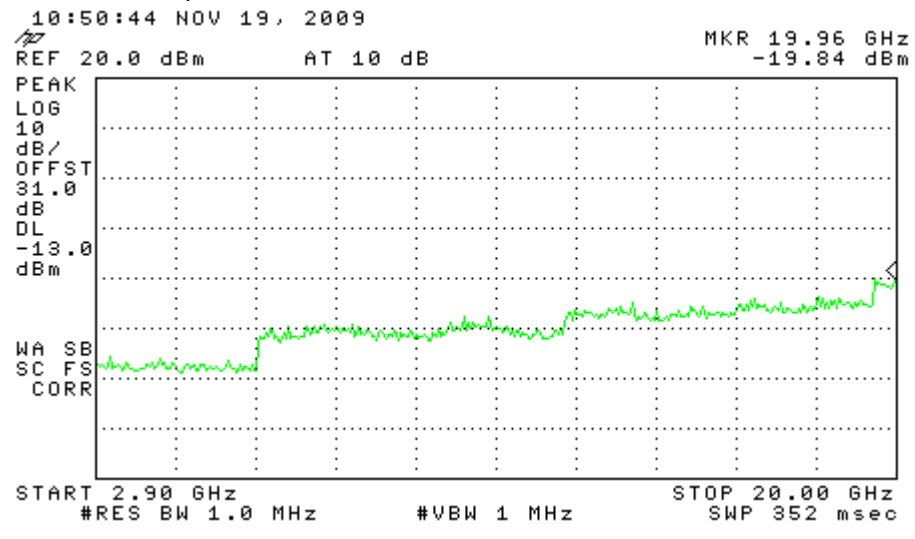
Intermodulation GSM_High PCS_ADB
Span: 30 MHz to 1 GHz RBW/VBW: 300 kHz



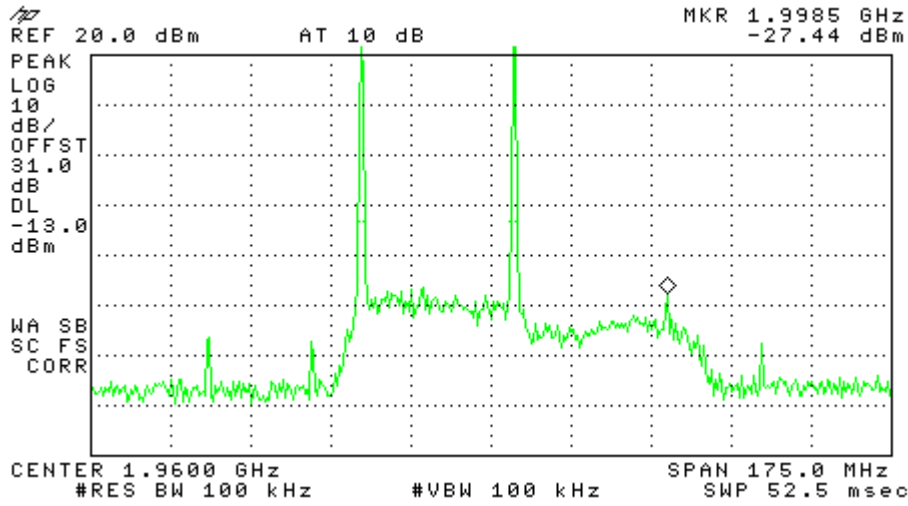
Intermodulation GSM_High PCS_ADB
Span: 1 GHz to 2.9 GHz RBW/VBW: 1 MHz



Intermodulation GSM_High PCS_ADB
Span: 2.9 GHz to 20 GHz RBW/VBW: 1 MHz

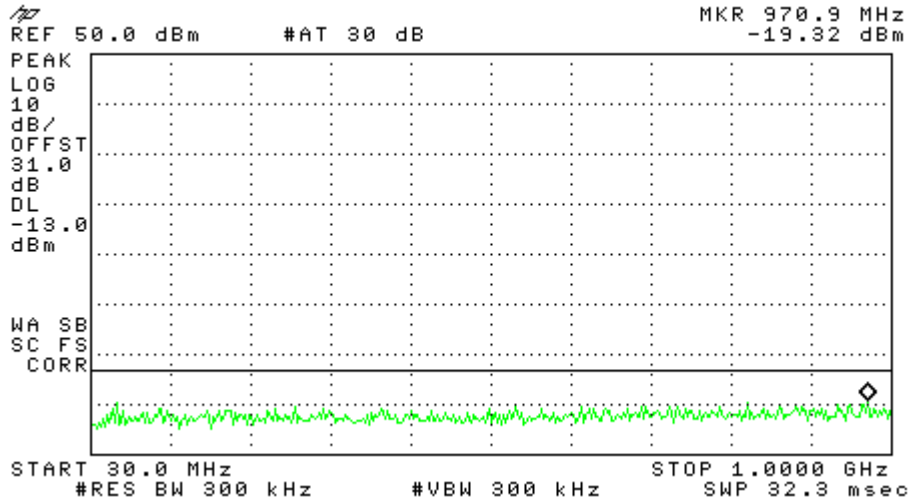


Intermodulation GSM_Apart PCS_ADB
 Center: 1960 MHz Span: 175 MHz RBW/VBW: 100 kHz



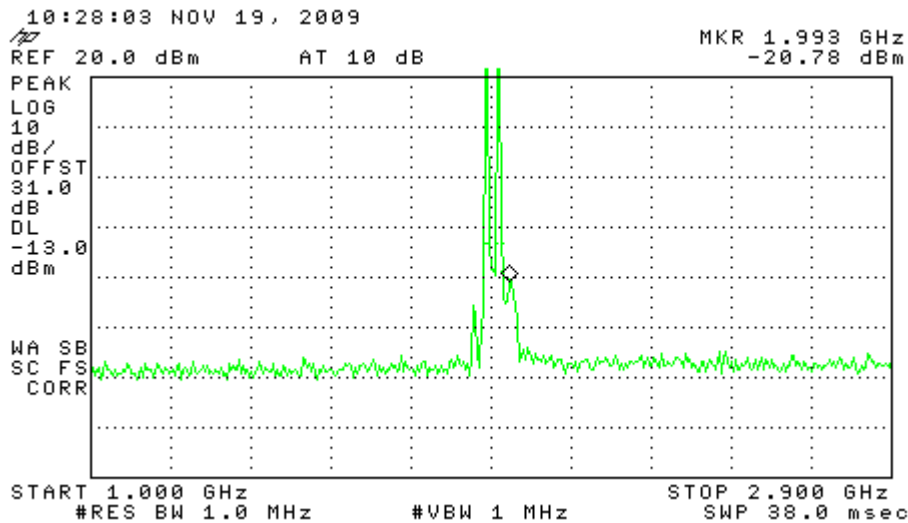
RL

Intermodulation GSM_Apart PCS_ADB
 Span: 30 MHz to 1 GHz RBW/VBW: 300 kHz



RL

Intermodulation GSM_Apart PCS_ADB
 Span: 1 GHz to 2.9GHz RBW/VBW: 1 MHz



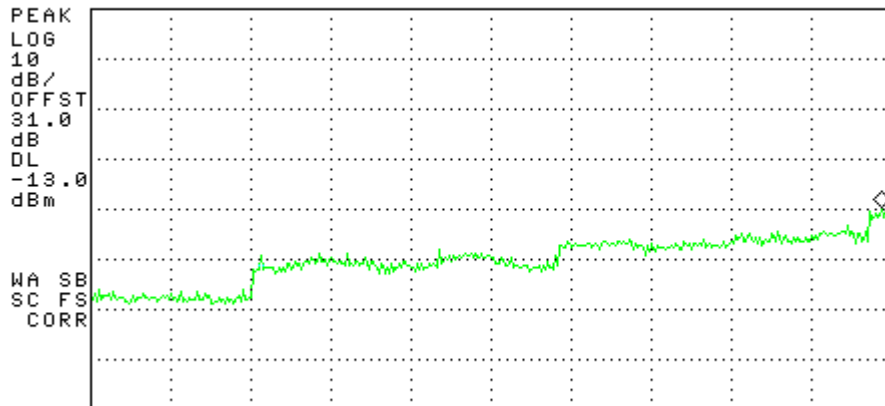
RL

Intermodulation GSM_Apart PCS_ADB
Span: 2.9 GHz to 20 GHz RBW/VBW: 1 MHz

10:51:20 NOV 19, 2009

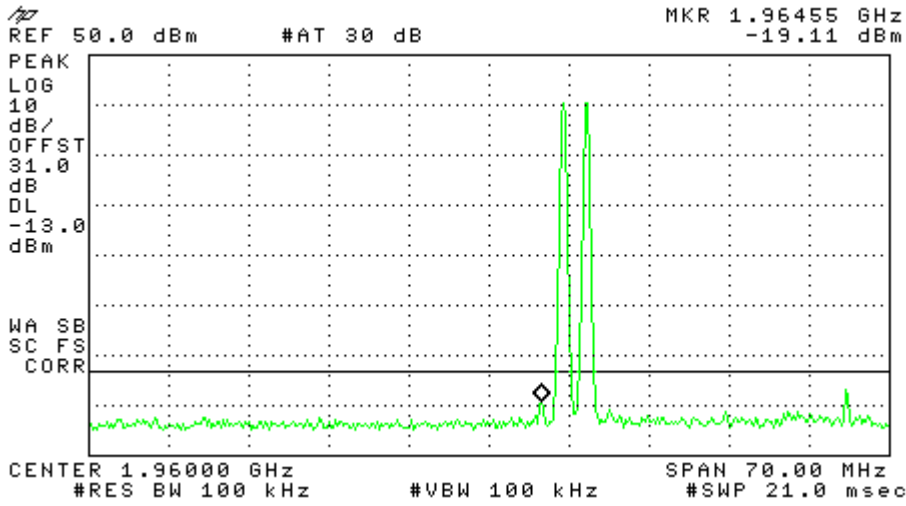
REF 20.0 dBm AT 10 dB

MKR 19.79 GHz
-19.62 dBm



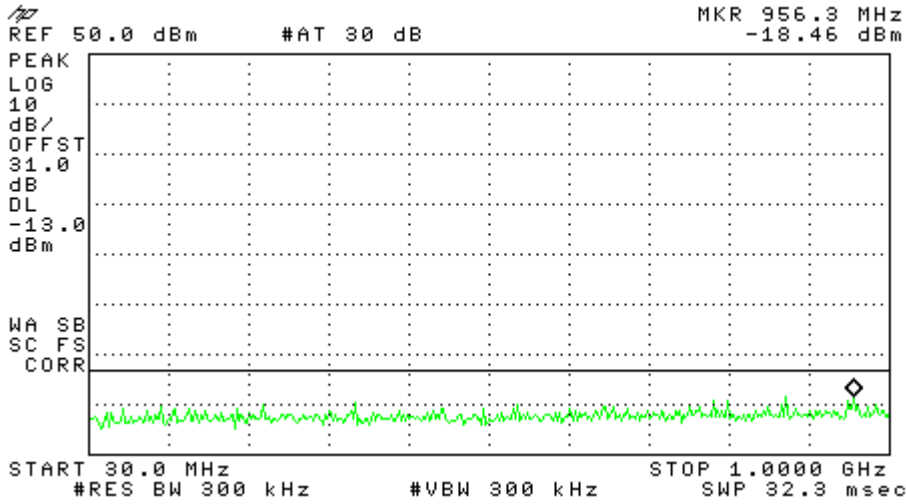
RL

Intermodulation GSM_Low PCS_EFC
Center: 1960 MHz Span: 70 MHz RBW/VBW: 100 kHz



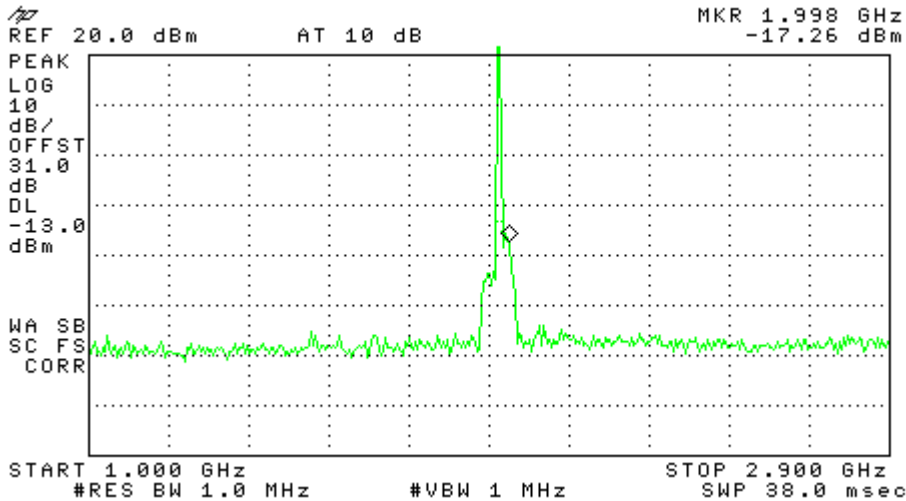
RL

Intermodulation GSM_Low PCS_EFC
Span: 30 MHz to 1 GHz RBW/VBW: 300 kHz



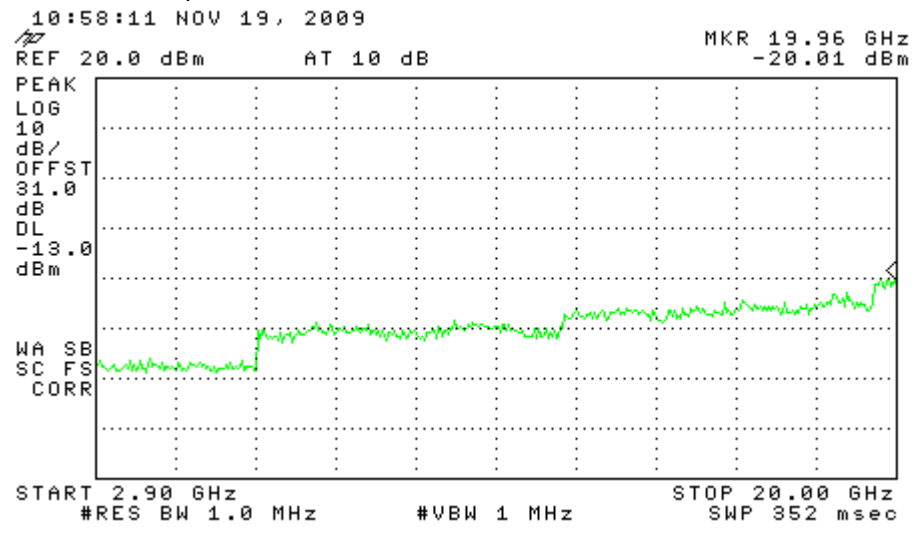
RL

Intermodulation GSM_Low PCS_EFC
Span: 1 GHz to 2.9 GHz RBW/VBW: 1 MHz



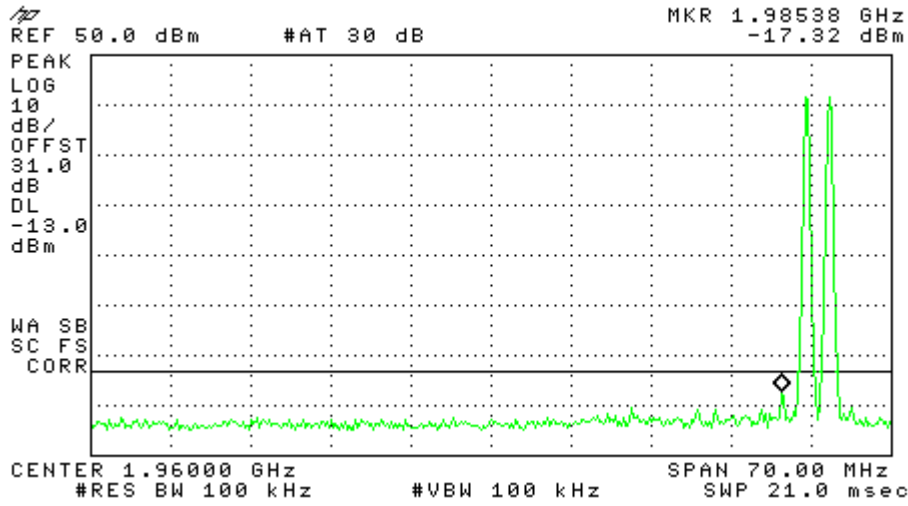
RL

Intermodulation GSM_Low PCS_EFC
Span: 2.9 GHz to 20 GHz RBW/VBW: 1 MHz



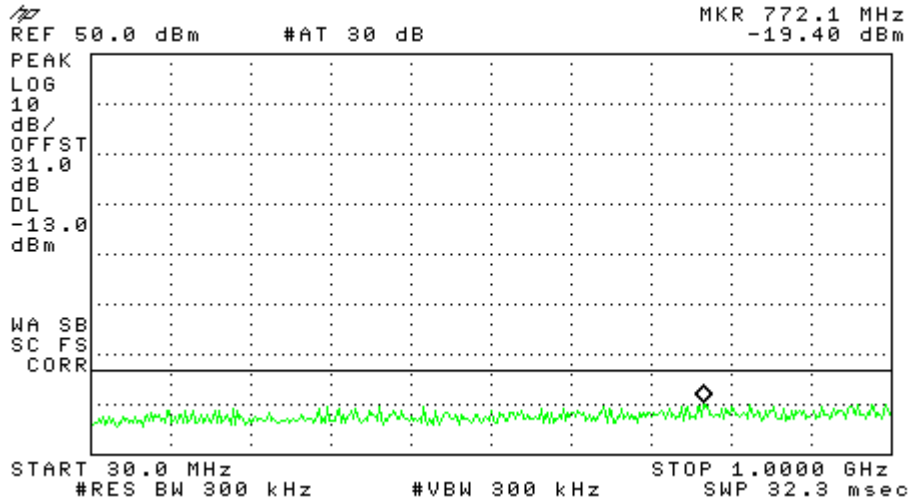
RL

Intermodulation GSM_High PCS_EFC
Center: 1960 MHz Span: 70 MHz RBW/VBW: 100 kHz



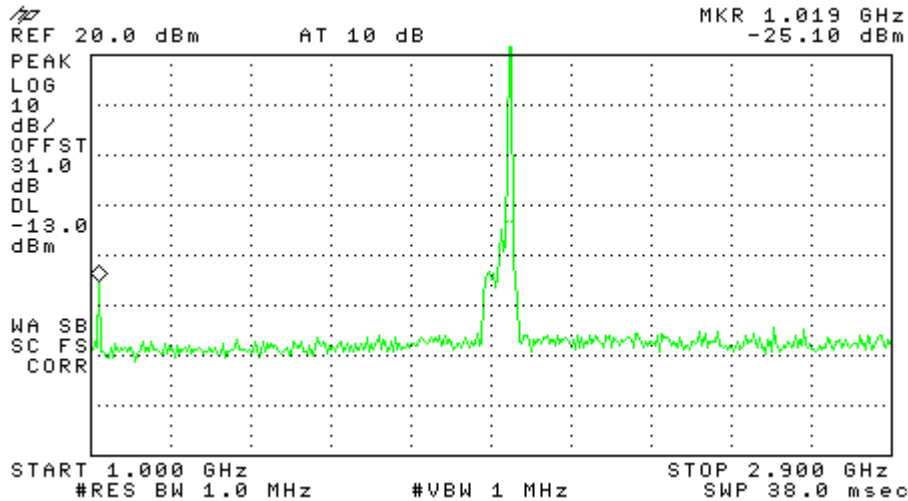
RL

Intermodulation GSM_High PCS_EFC
Span: 30 MHz to 1 GHz RBW/VBW: 300 kHz



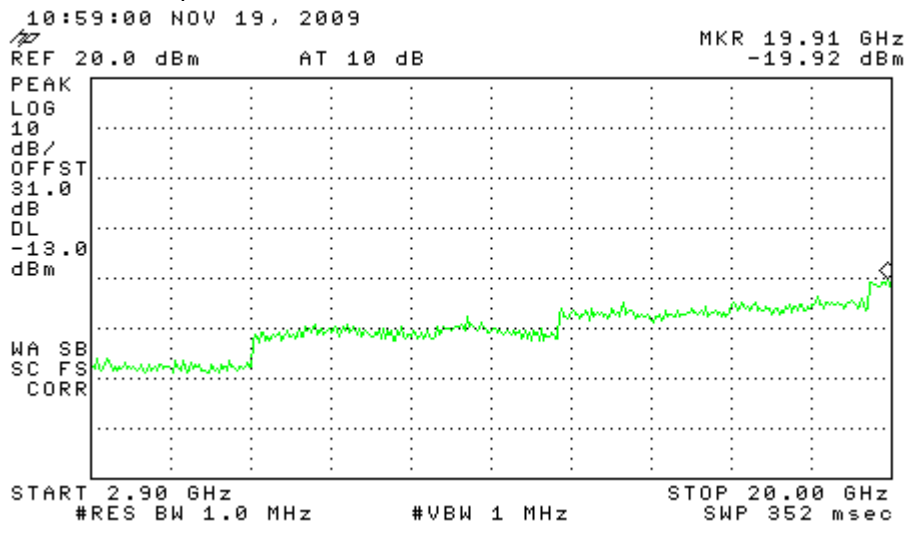
RL

Intermodulation GSM_High PCS_EFC
Span: 1 GHz to 2.9 GHz RBW/VBW: 1 MHz



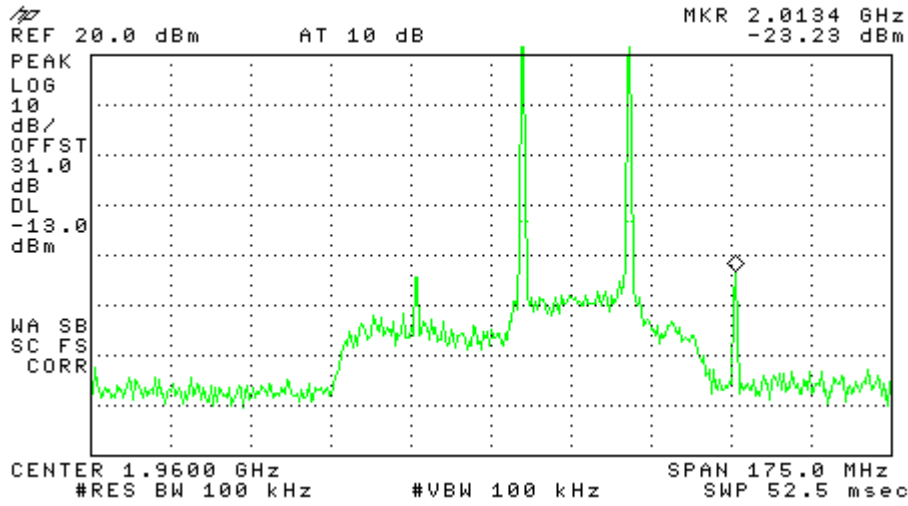
RL

Intermodulation GSM_High PCS_EFC
Span: 2.9 GHz to 20 GHz RBW/VBW: 1 MHz



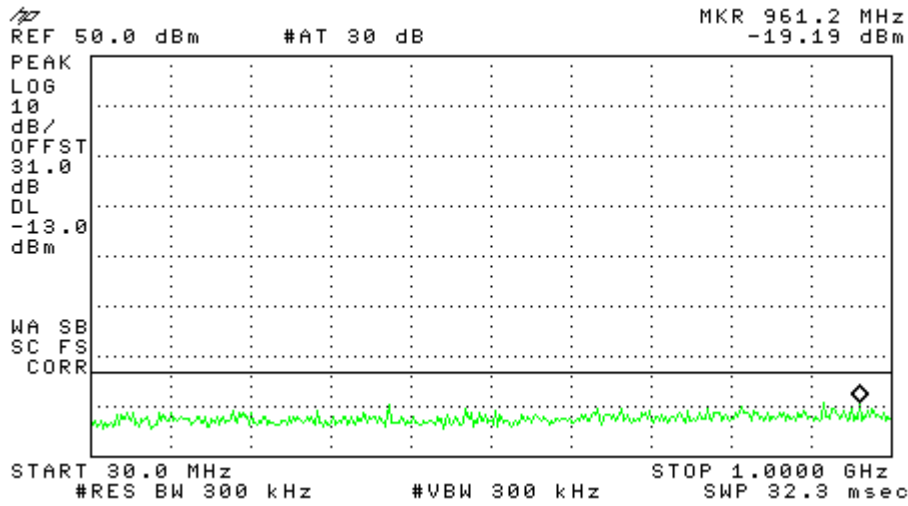
RL

Intermodulation GSM_Apart PCS_EFC
Center: 1960 MHz Span: 175 MHz RBW/VBW: 100 kHz



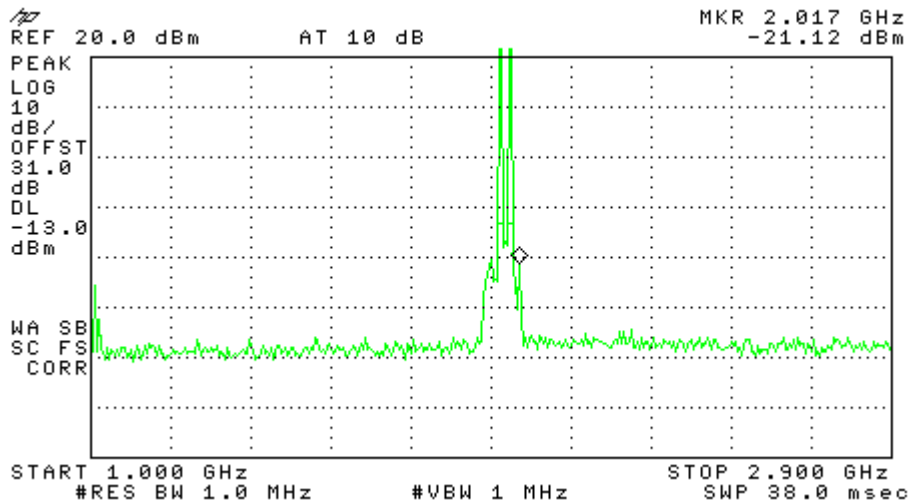
RL

Intermodulation GSM_Apart PCS_EFC
Span: 30 MHz to 1 GHz RBW/VBW: 300 kHz



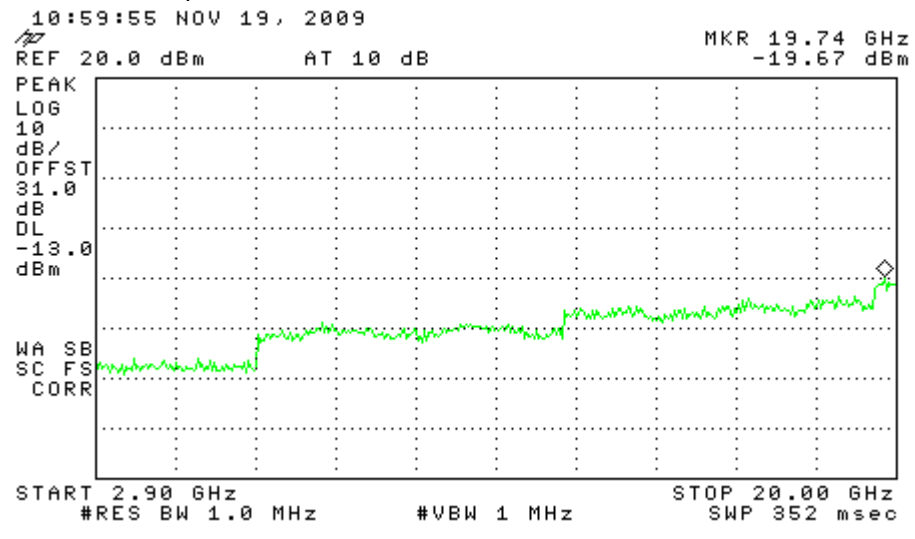
RL

Intermodulation GSM_Apart PCS_EFC
Span: 1 GHz to 2.9 GHz RBW/VBW: 1 MHz



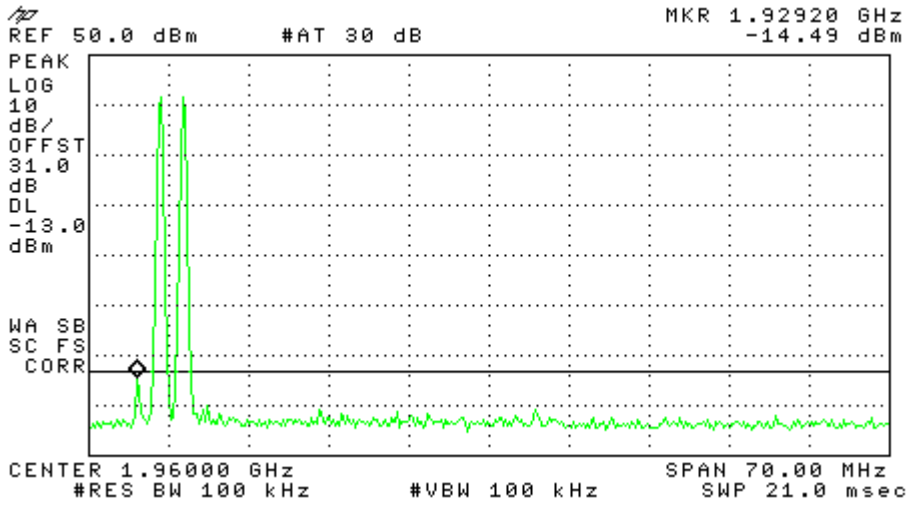
RL

Intermodulation GSM_Apart PCS_EFC
Span: 2.9 GHz to 20 GHz RBW/VBW: 1 MHz



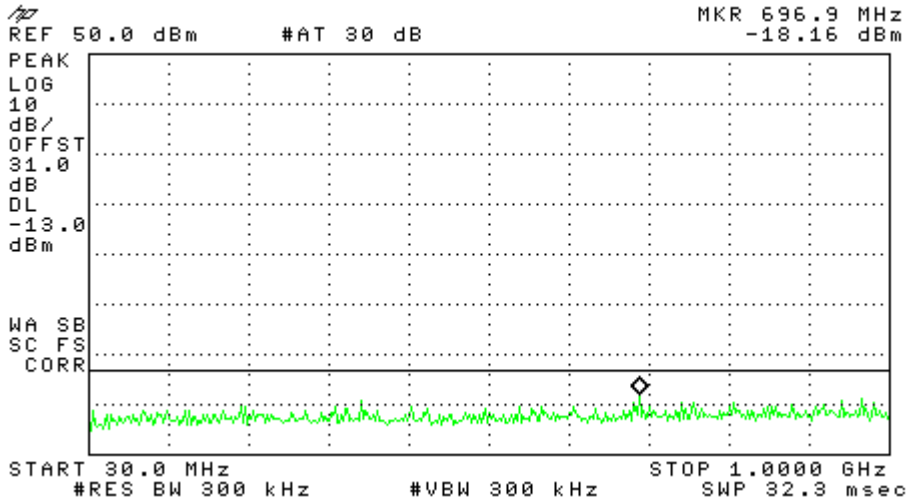
RL

Intermodulation EDGE_Low PCS_ADB
Center: 1960 MHz Span: 70 MHz RBW/VBW: 100 kHz



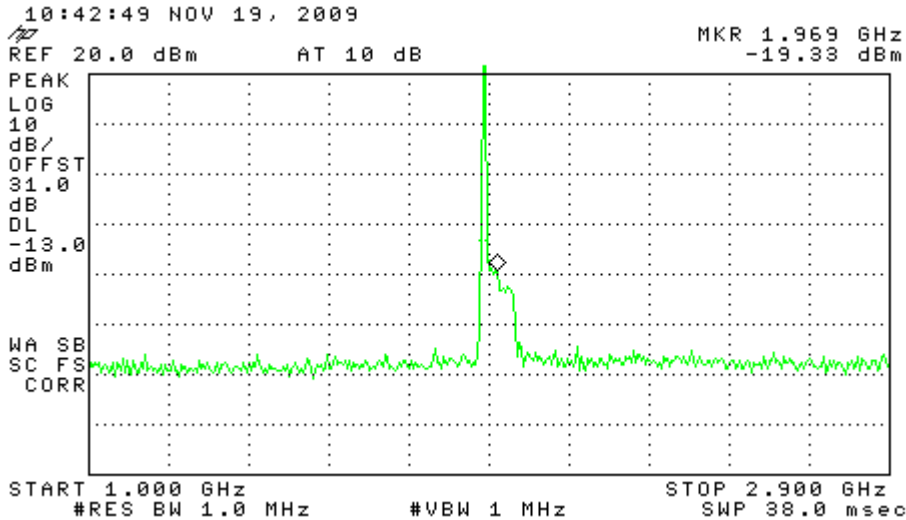
RL

Intermodulation EDGE_Low PCS_ADB
Span: 30 MHz to 1 GHz RBW/VBW: 300 kHz



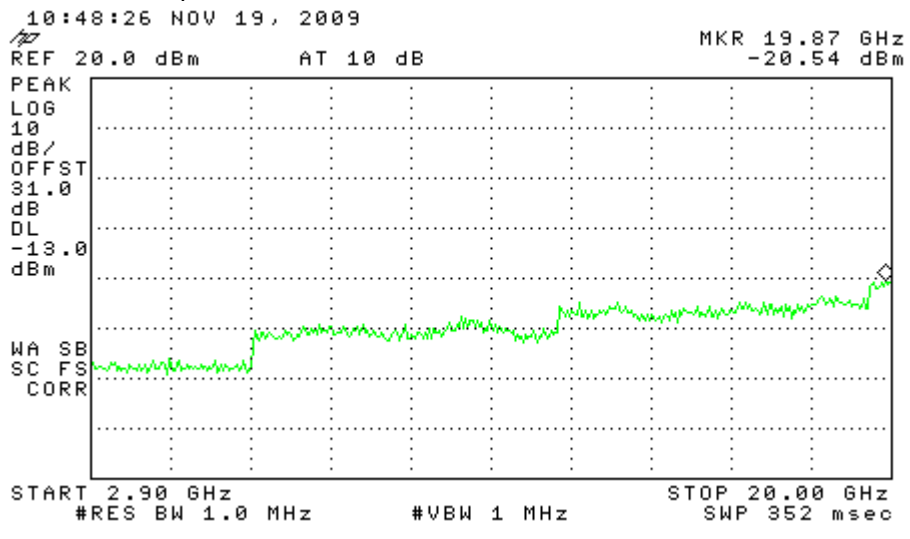
RL

Intermodulation EDGE_Low PCS_ADB
Span: 1 GHz to 2.9 GHz RBW/VBW: 1 MHz



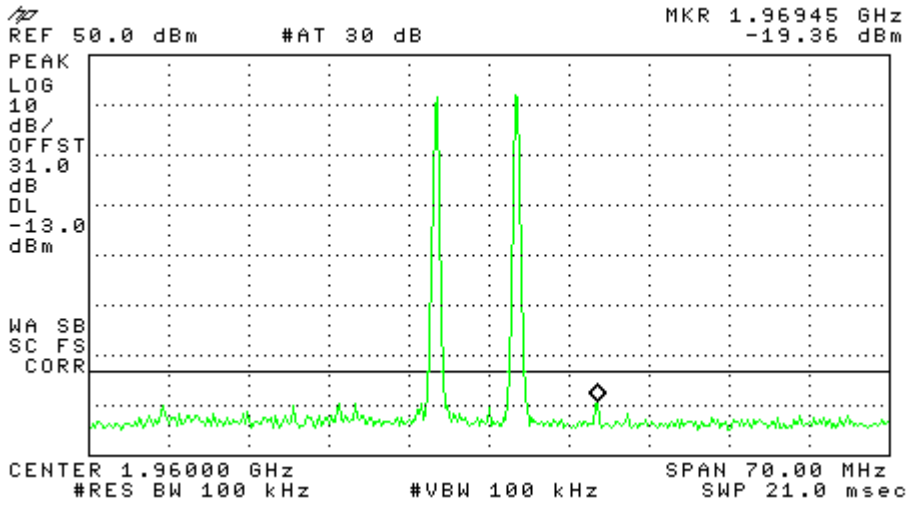
RL

Intermodulation EDGE_Low PCS_ADB
Span: 2.9 GHz to 20 GHz RBW/VBW: 1 MHz

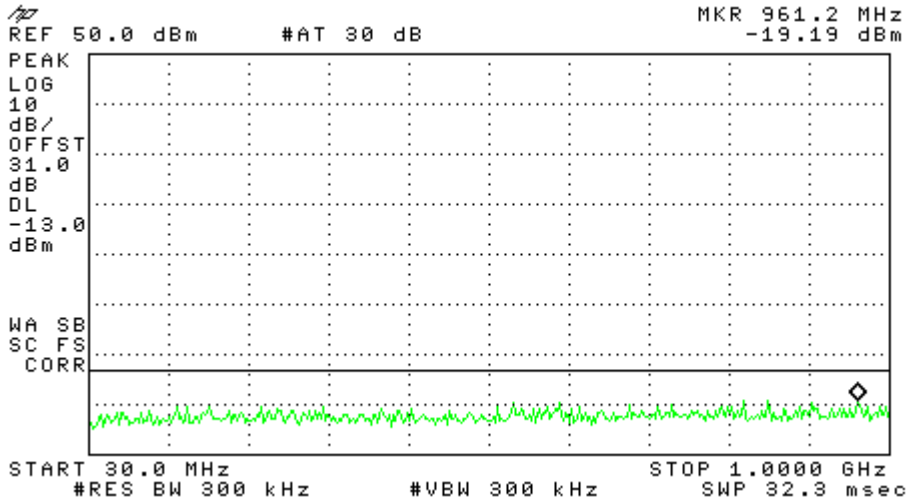


RL

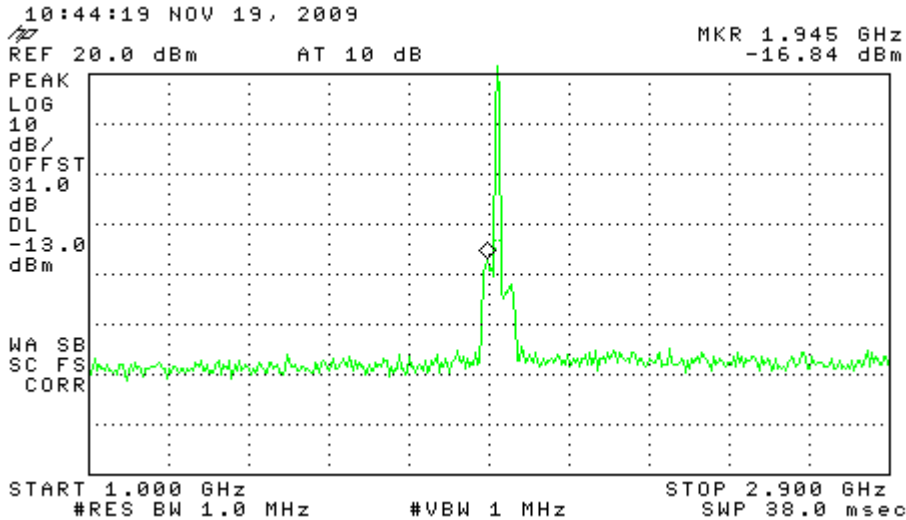
Intermodulation EDGE_High PCS_ADB
Center: 1960 MHz Span: 70 MHz RBW/VBW: 100 kHz



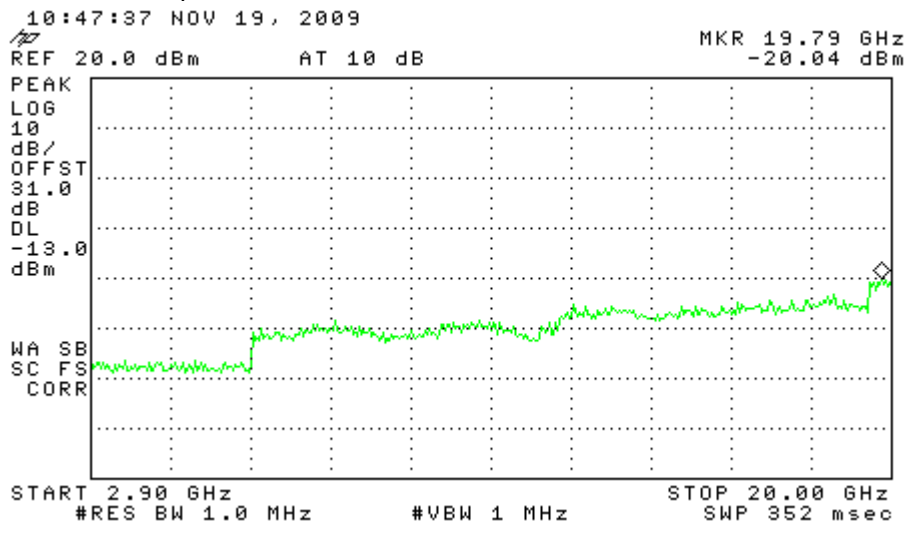
Intermodulation EDGE_High PCS_ADB
Span: 30 MHz to 1 GHz RBW/VBW: 300 kHz



Intermodulation EDGE_High PCS_ADB
Span: 1 GHz to 2.9 GHz RBW/VBW: 1 MHz

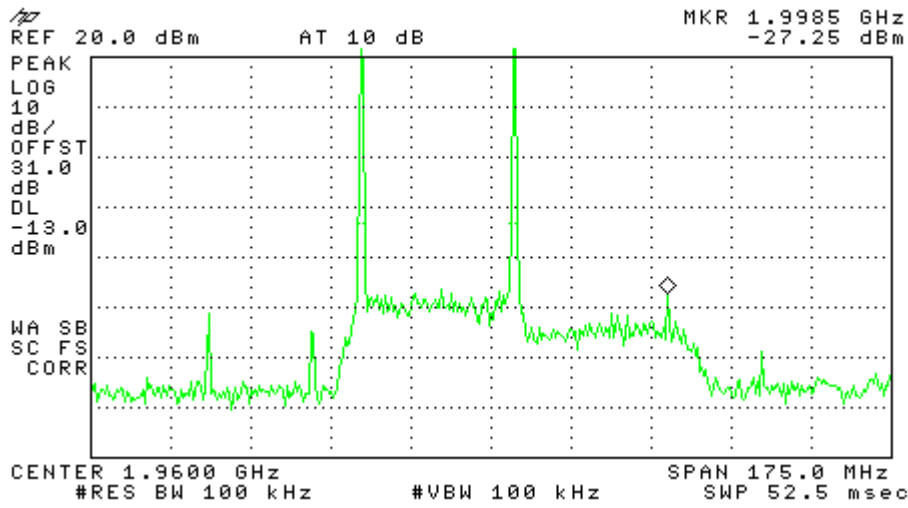


Intermodulation EDGE_High PCS_ADB
Span: 2.9 GHz to 20 GHz RBW/VBW: 1 MHz



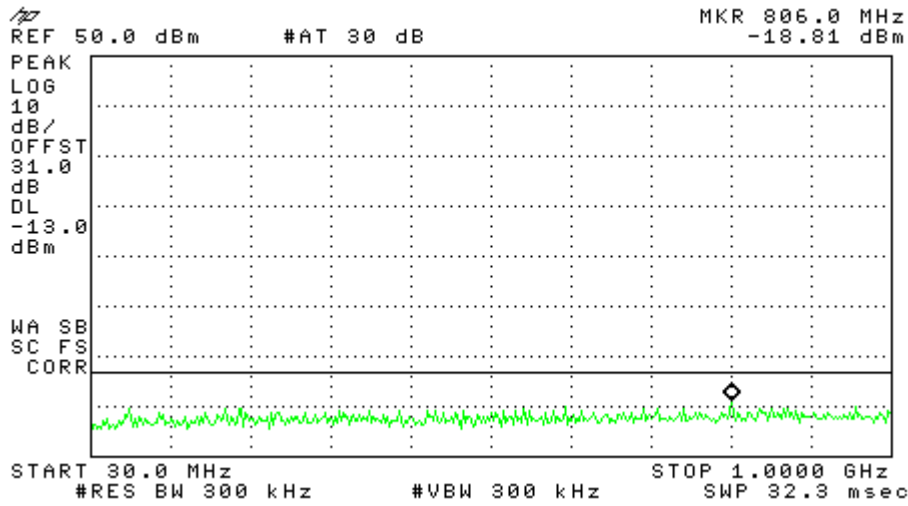
RL

Intermodulation EDGE_Apart PCS_ADB
Center: 1960 MHz Span: 175 MHz RBW/VBW: 100 kHz



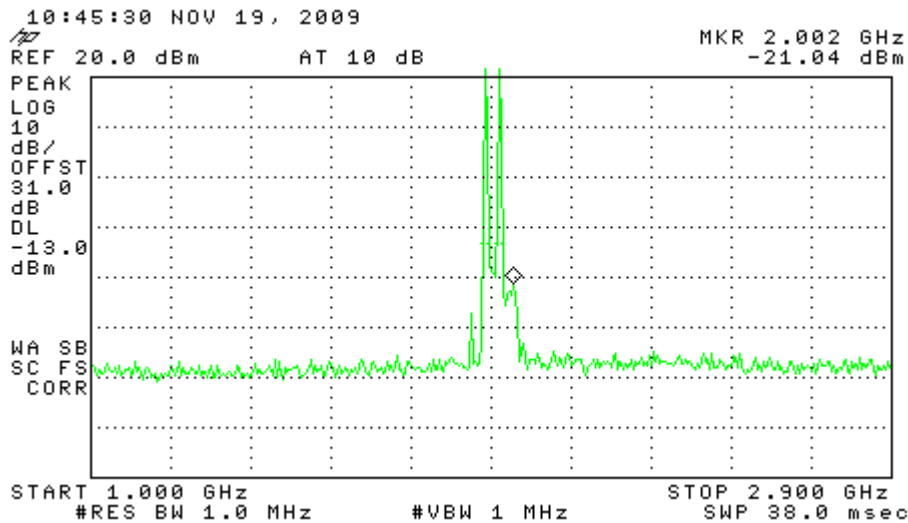
RL

Intermodulation EDGE_Apart PCS_ADB
Span: 30 MHz to 1 GHz RBW/VBW: 300 kHz



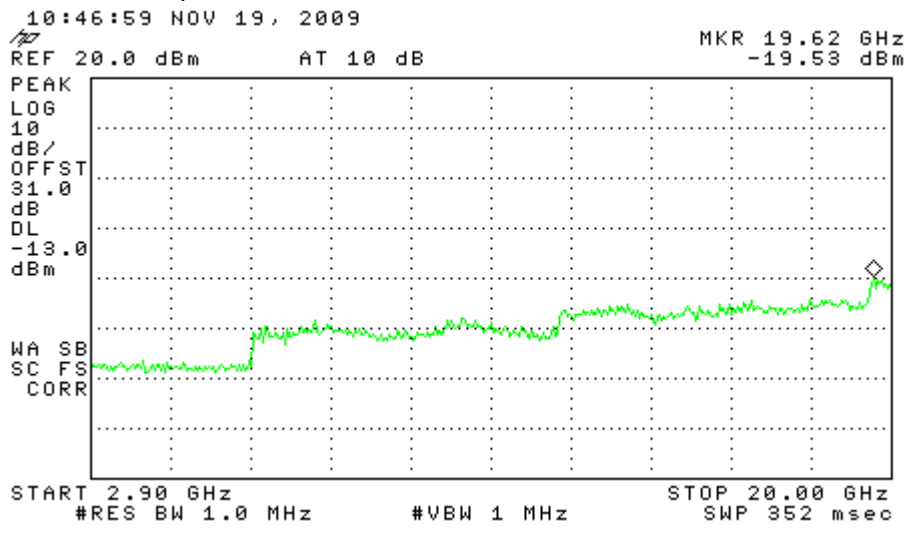
RL

Intermodulation EDGE_Apart PCS_ADB
Span: 1 GHz to 2.9 GHz RBW/VBW: 1 MHz



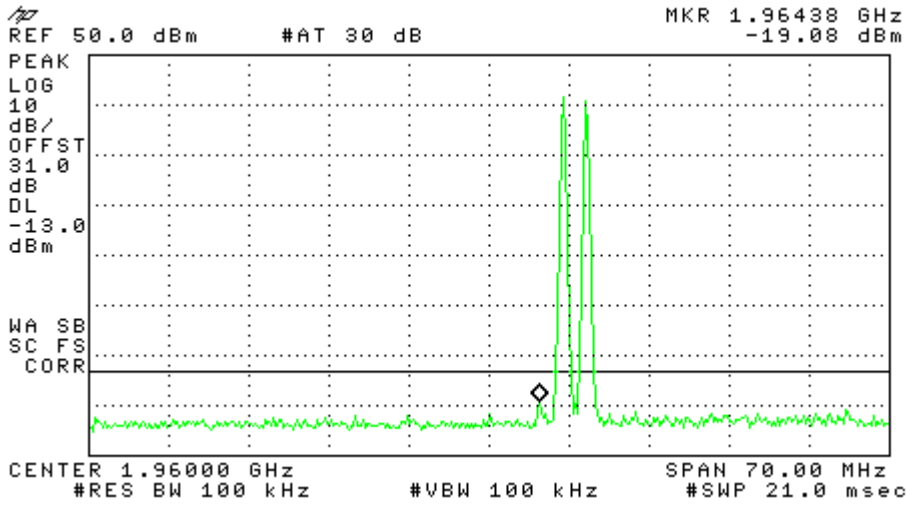
RL

Intermodulation EDGE_Apart PCS_ADB
Span: 2.9 GHz to 20 GHz RBW/VBW: 1 MHz



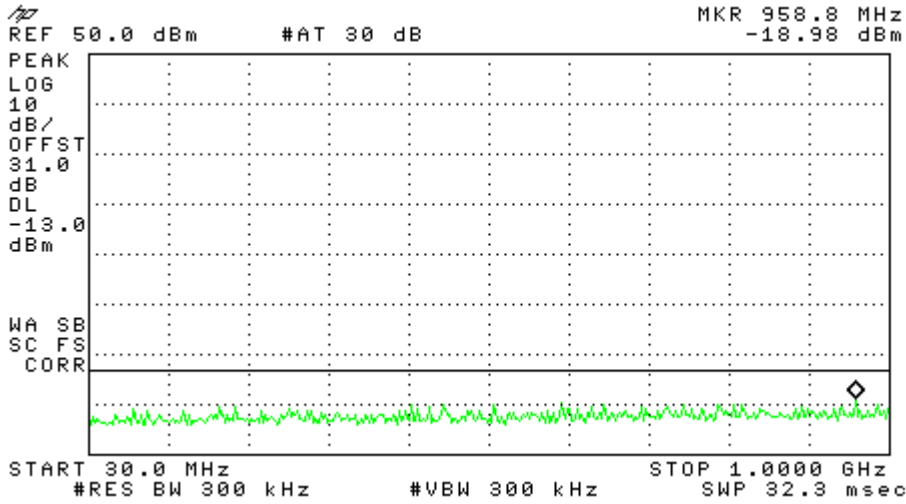
RL

Intermodulation EDGE_Low PCS_EFC
Center: 1960 MHz Span: 70 MHz RBW/VBW: 100 kHz



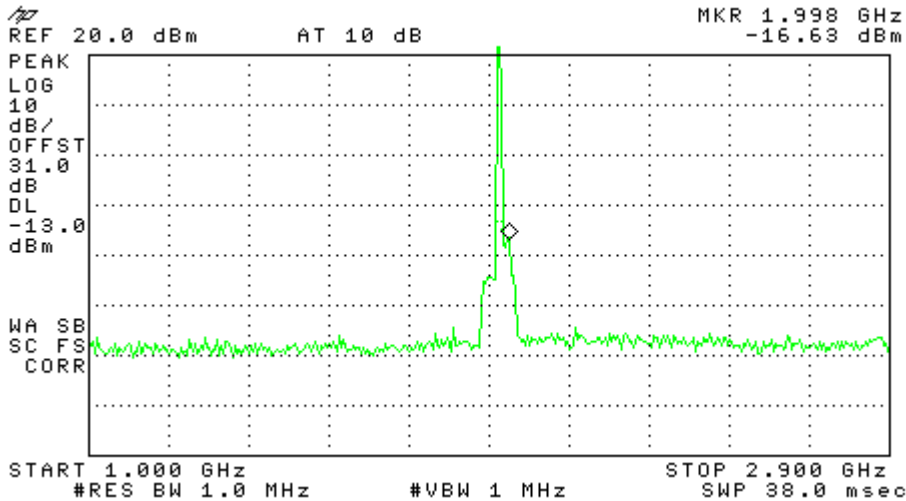
RL

Intermodulation EDGE_Low PCS_EFC
Span: 30 MHz to 1 GHz RBW/VBW: 300 kHz



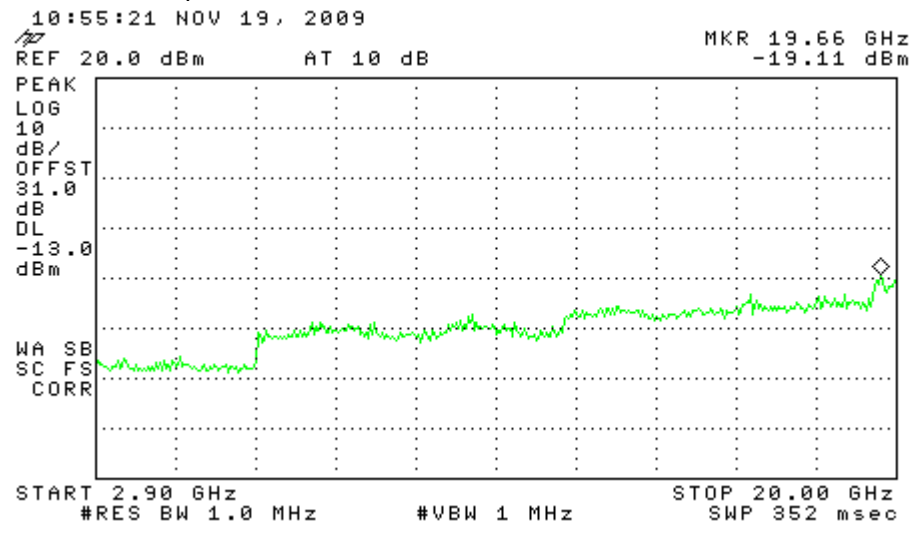
RL

Intermodulation EDGE_Low PCS_EFC
Span: 1 GHz to 2.9 GHz RBW/VBW: 1 MHz

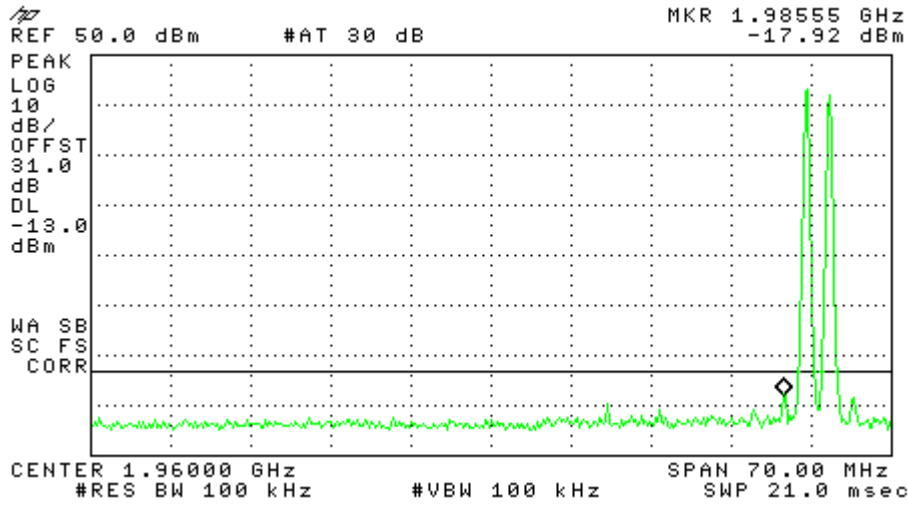


RL

Intermodulation EDGE_Low PCS_EFC
Span: 2.9 GHz to 20 GHz RBW/VBW: 1 MHz

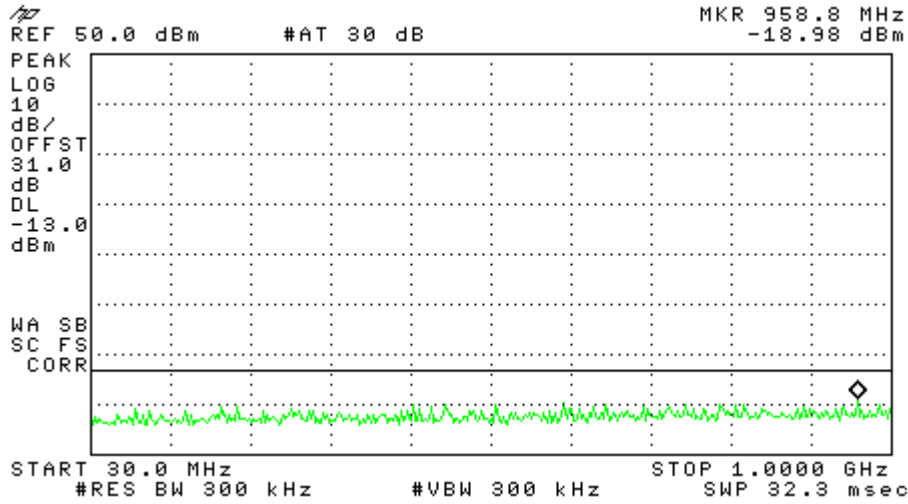


Intermodulation EDGE_High PCS_EFC
 Center: 1960 MHz Span: 70 MHz RBW/VBW: 100 kHz



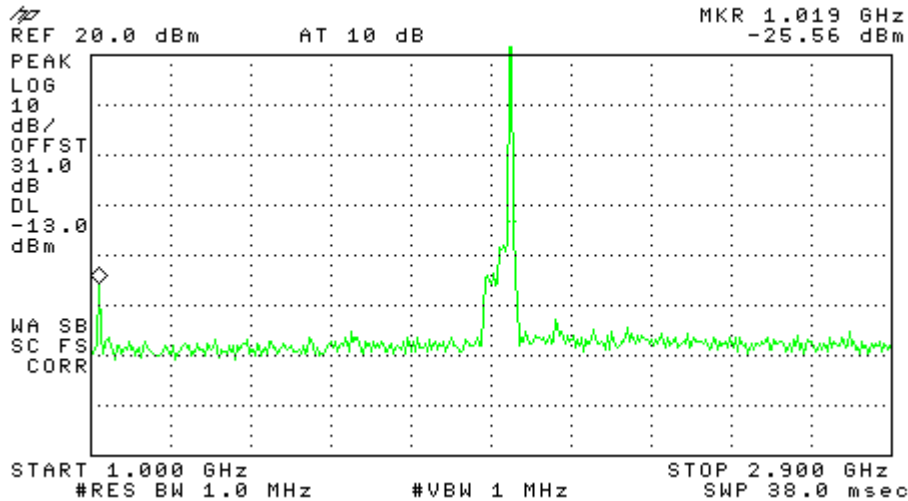
RL

Intermodulation EDGE_High PCS_EFC
 Span: 30 MHz to 1 GHz RBW/VBW: 300 kHz



RL

Intermodulation EDGE_High PCS_EFC
 Span: 1 GHz to 2.9 GHz RBW/VBW: 1 MHz



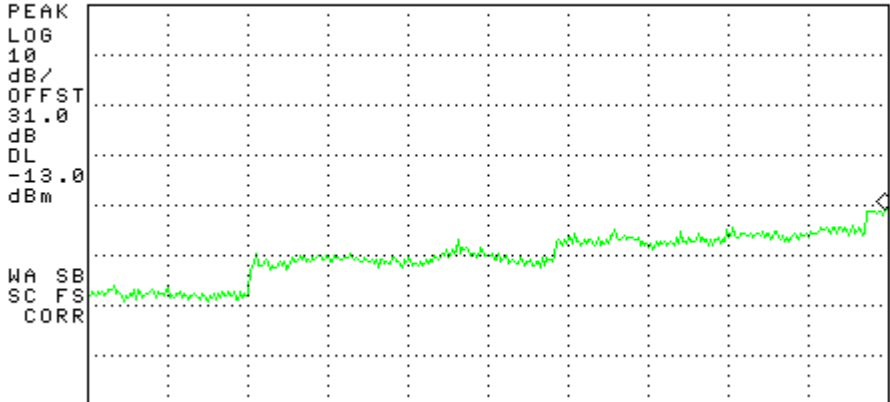
RL

Intermodulation EDGE_High PCS_EFC
Span: 2.9 GHz to 20 GHz RBW/VBW: 1 MHz

10:56:13 NOV 19, 2009

MKR 19.91 GHz
-20.63 dBm

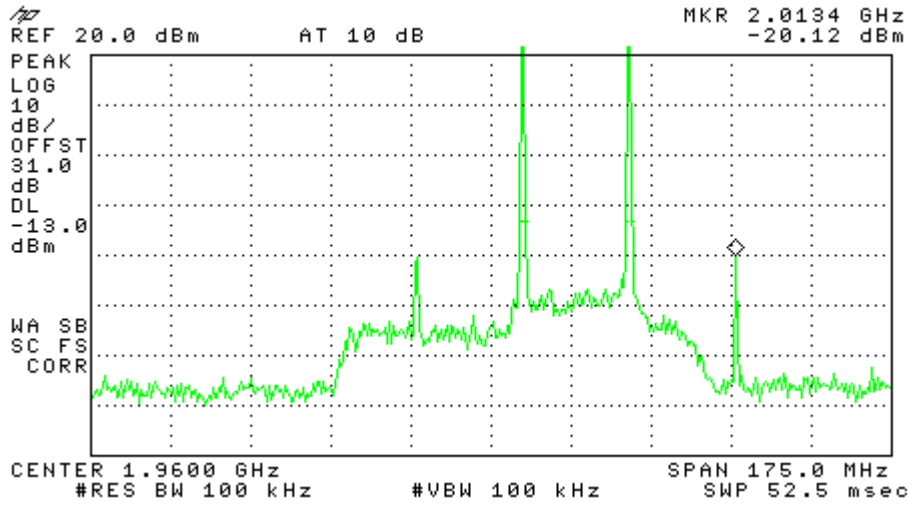
REF 20.0 dBm AT 10 dB



START 2.90 GHz STOP 20.00 GHz
#RES BW 1.0 MHz #VBW 1 MHz SWP 352 msec

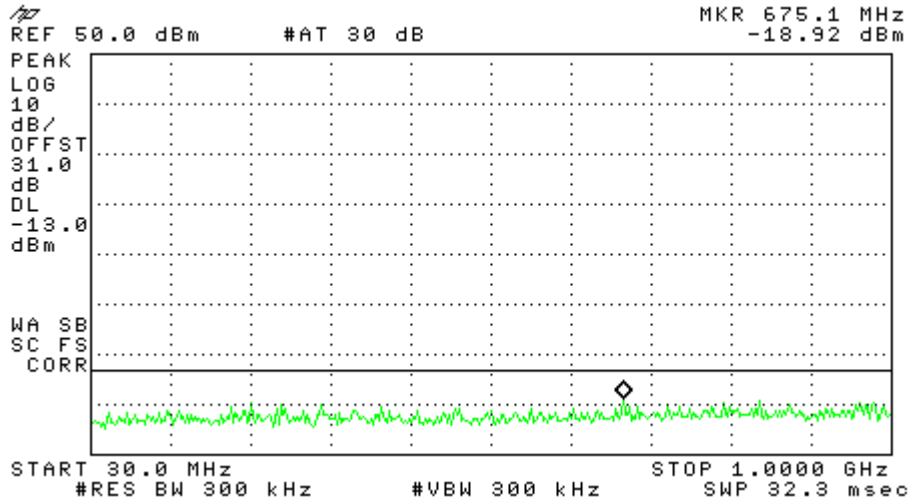
RL

Intermodulation EDGE_Apart PCS_EFC
Center: 1960 MHz Span: 175 MHz RBW/VBW: 100 kHz



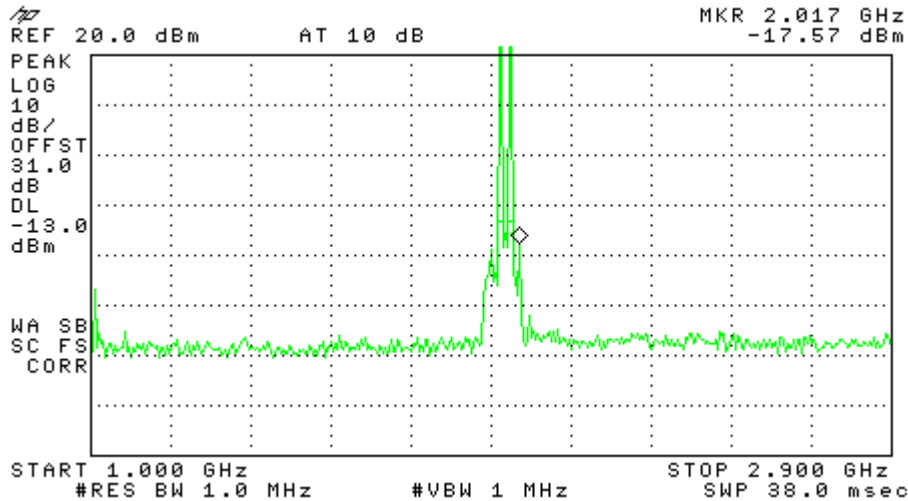
RL

Intermodulation EDGE_Apart PCS_EFC
Span: 30 MHz to 1 GHz RBW/VBW: 300 kHz



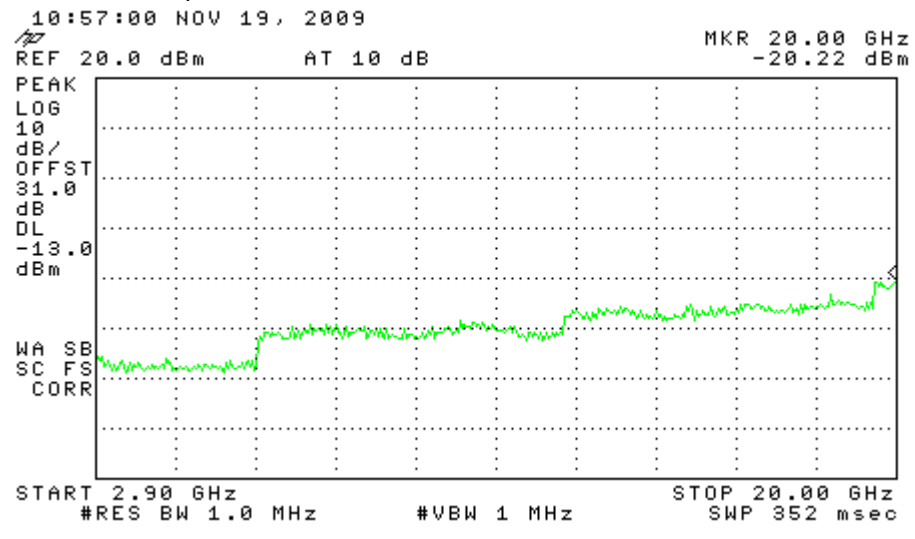
RL

Intermodulation EDGE_Apart PCS_EFC
Span: 1 GHz to 2.9 GHz RBW/VBW: 1 MHz



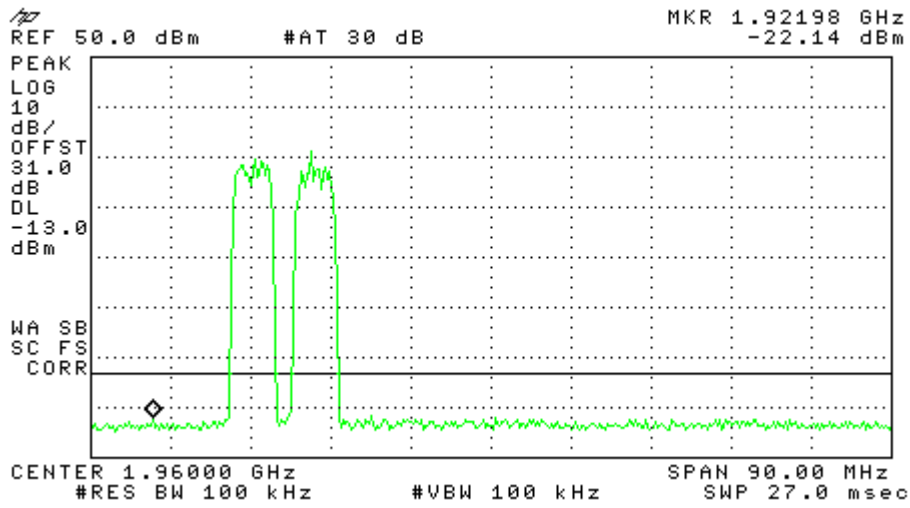
RL

Intermodulation EDGE_Apart PCS_EFC
Span: 2.9 GHz to 20 GHz RBW/VBW: 1 MHz

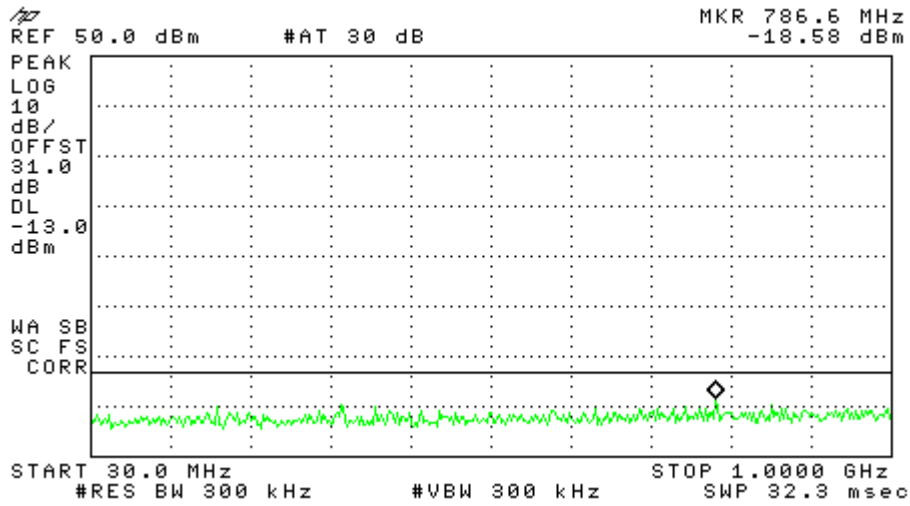


RL

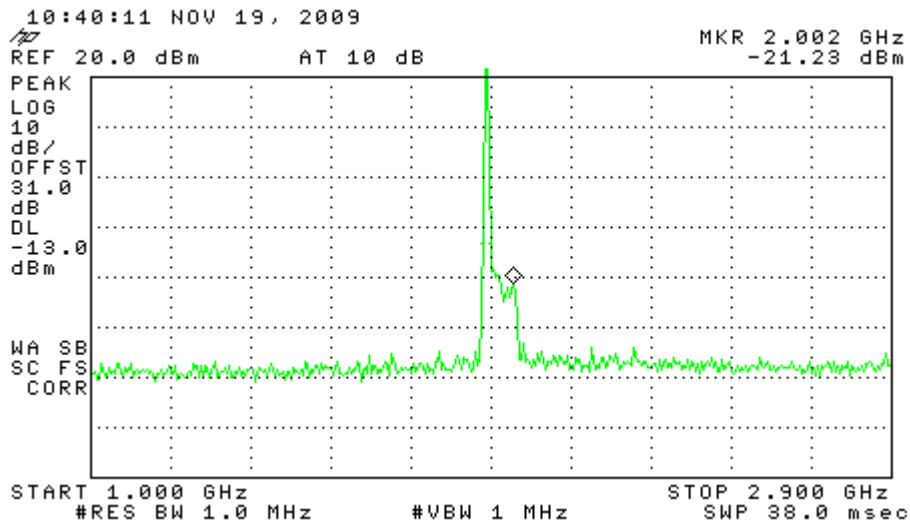
Intermodulation WCDMA_Low PCS_ADB
Center: 1960 MHz Span: 90 MHz RBW/VBW: 100 kHz



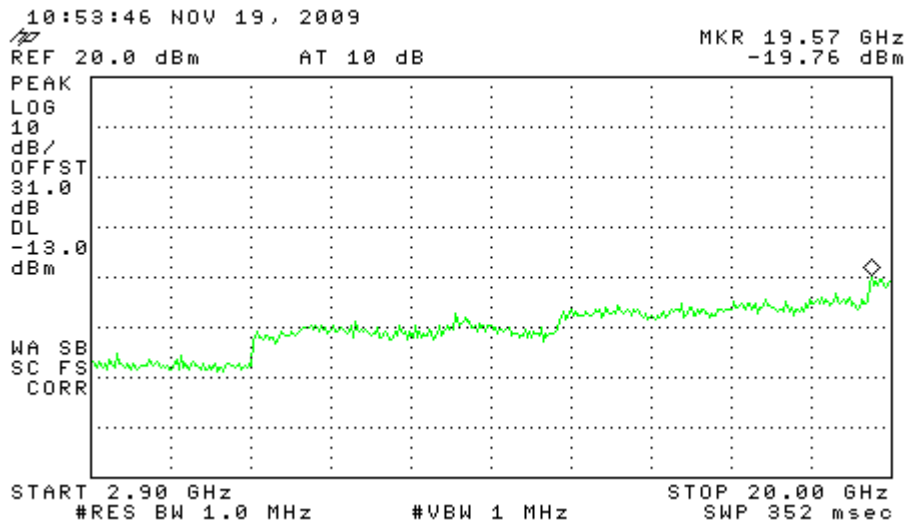
Intermodulation WCDMA_Low PCS_ADB
Span: 30 MHz to 1 GHz RBW/VBW: 300 kHz



Intermodulation WCDMA_Low PCS_ADB
Span: 1 GHz to 2.9 GHz RBW/VBW: 1 MHz

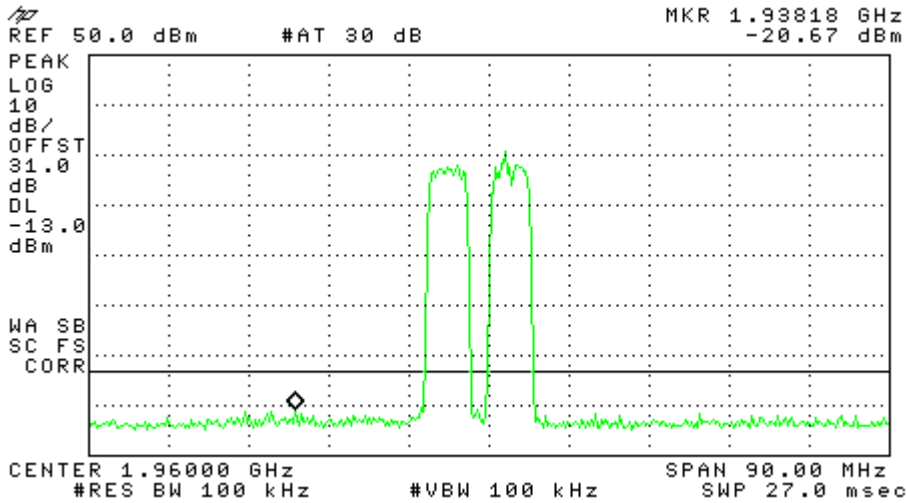


Intermodulation WCDMA_Low PCS_ADB
Span: 2.9 GHz to 20 GHz RBW/VBW: 1 MHz



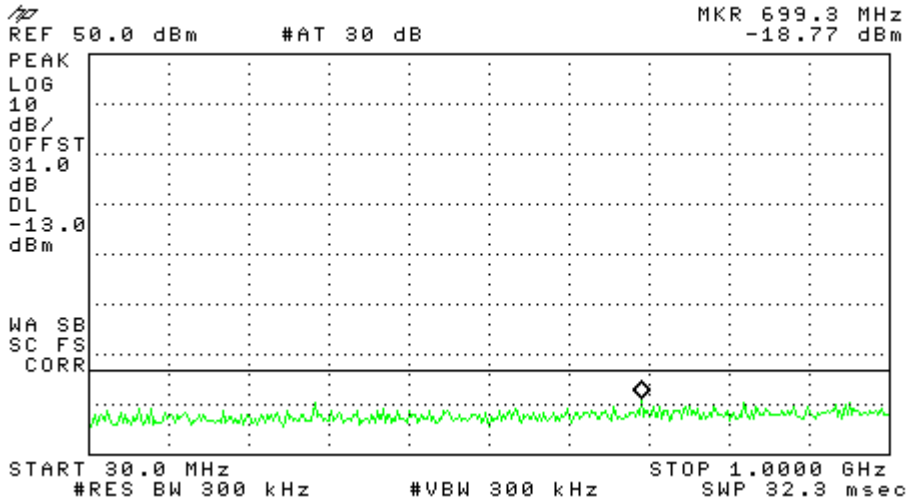
RL

Intermodulation WCDMA_High PCS_ADB
 Center: 1960 MHz Span: 90 MHz RBW/VBW: 100 kHz



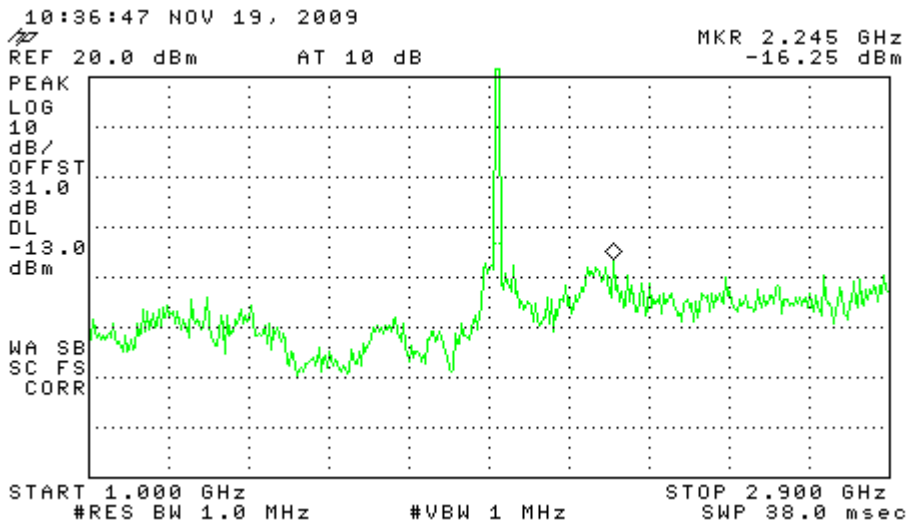
RL

Intermodulation WCDMA_High PCS_ADB
 Span: 30 MHz to 1 GHz RBW/VBW: 300 kHz



RL

Intermodulation WCDMA_High PCS_ADB
 Span: 1 GHz to 2.9 GHz RBW/VBW: 1 MHz



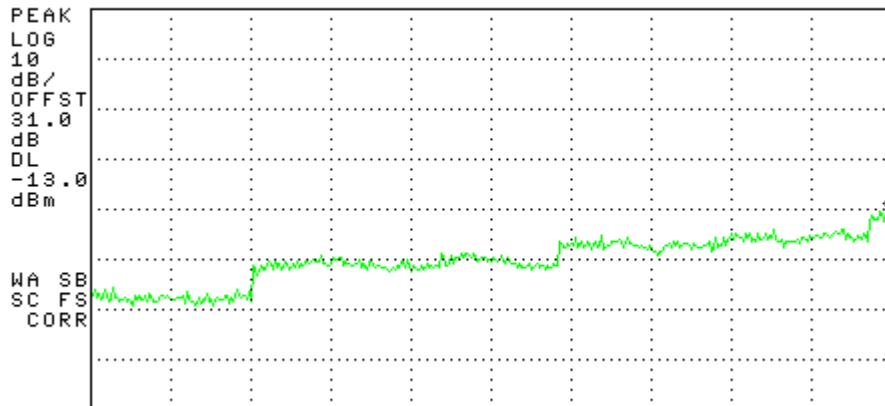
RL

Intermodulation WCDMA_High PCS_ADB
Span: 2.9 GHz to 20 GHz RBW/VBW: 1 MHz

10:53:14 NOV 19, 2009

REF 20.0 dBm AT 10 dB

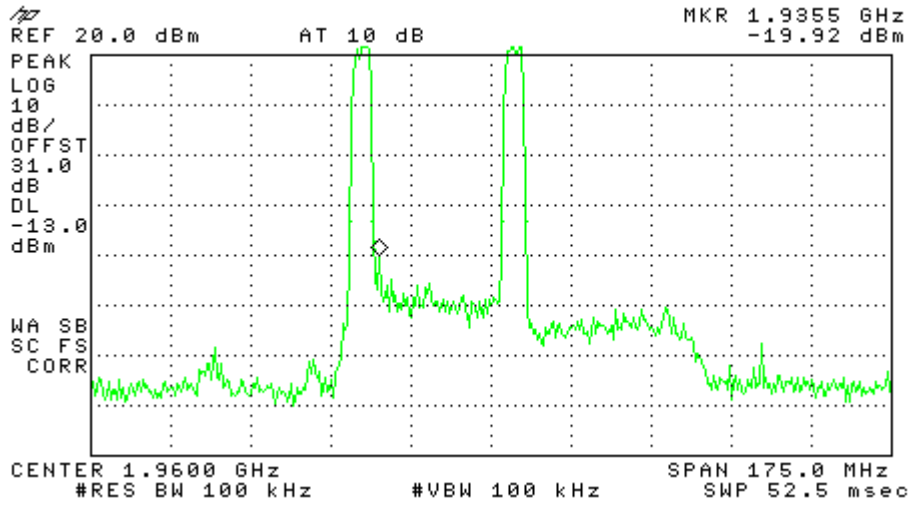
MKR 20.00 GHz
-20.24 dBm



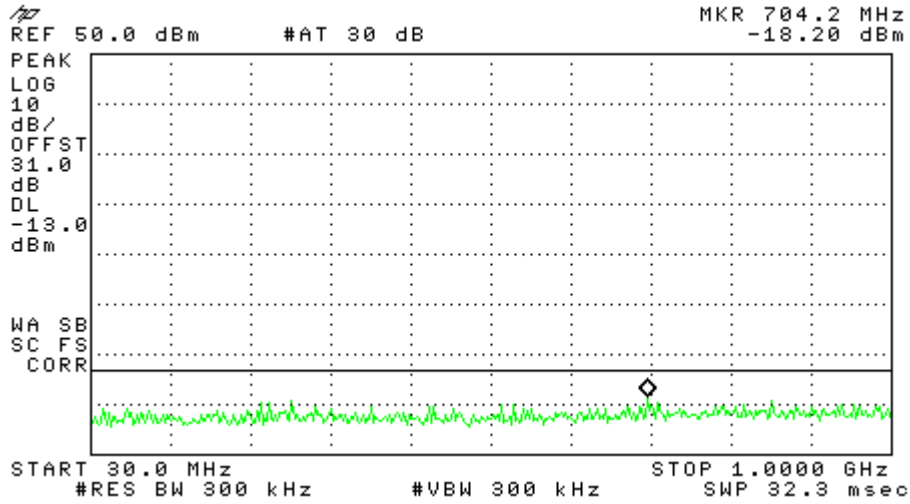
START 2.90 GHz STOP 20.00 GHz
#RES BW 1.0 MHz #VBW 1 MHz SWP 352 msec

RL

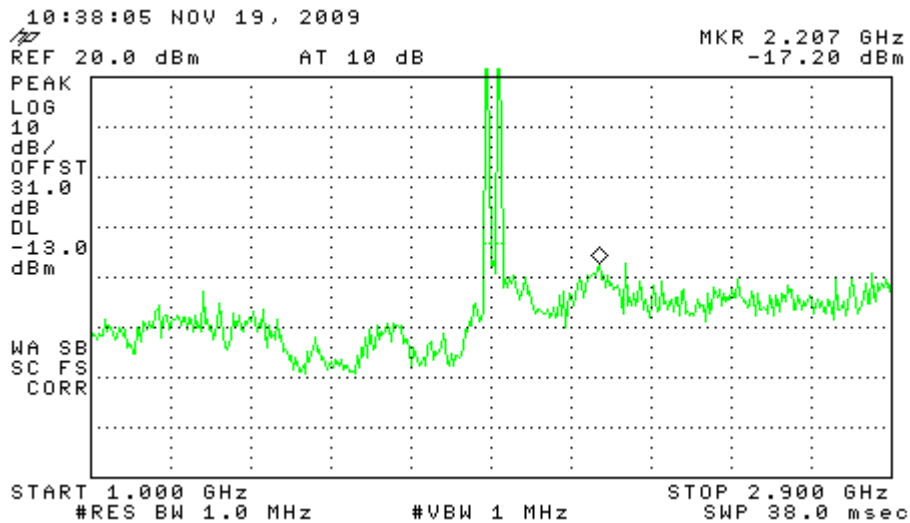
Intermodulation WCDMA_Apart PCS_ADB
Center: 1960 MHz Span: 175 MHz RBW/VBW: 100 kHz



Intermodulation WCDMA_Apart PCS_ADB
Span: 30 MHz to 1 GHz RBW/VBW: 300 kHz



Intermodulation WCDMA_Apart PCS_ADB
Span: 1 GHz to 2.9 GHz RBW/VBW: 1 MHz

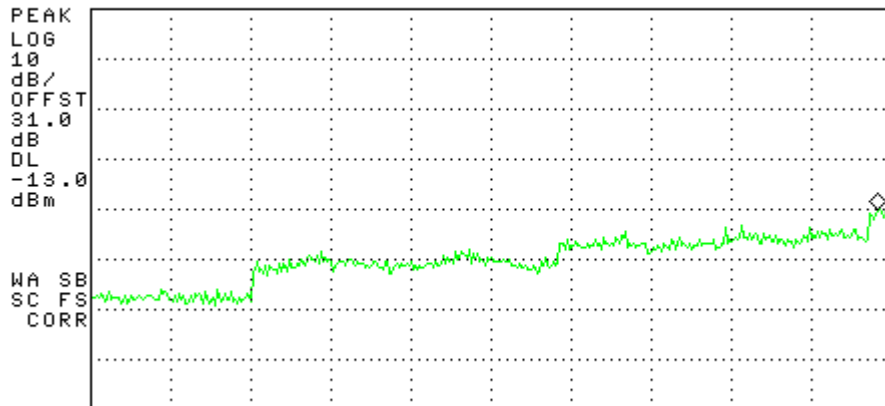


Intermodulation WCDMA_Apart PCS_ADB
Span: 2.9 GHz to 20 GHz RBW/VBW: 1 MHz

10:52:14 NOV 19, 2009

MKR 19.70 GHz
-20.01 dBm

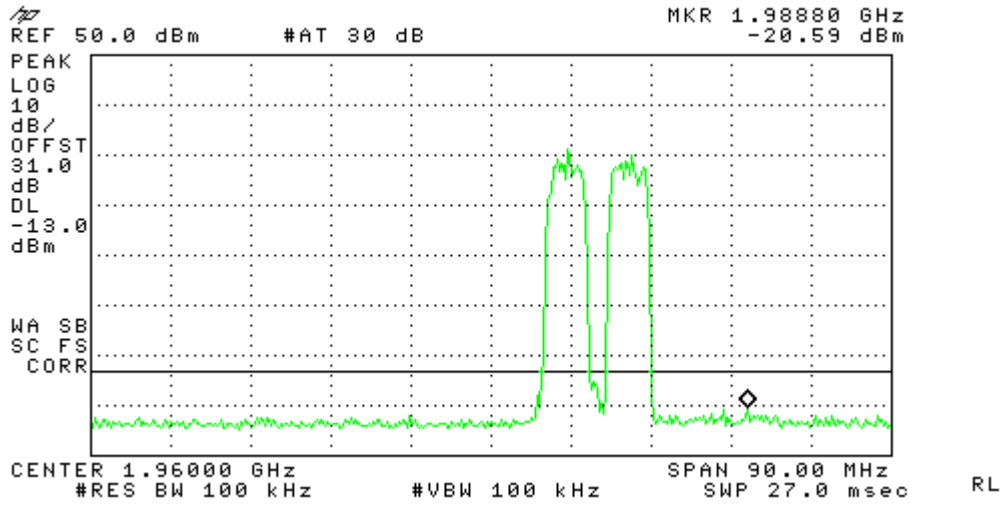
REF 20.0 dBm AT 10 dB



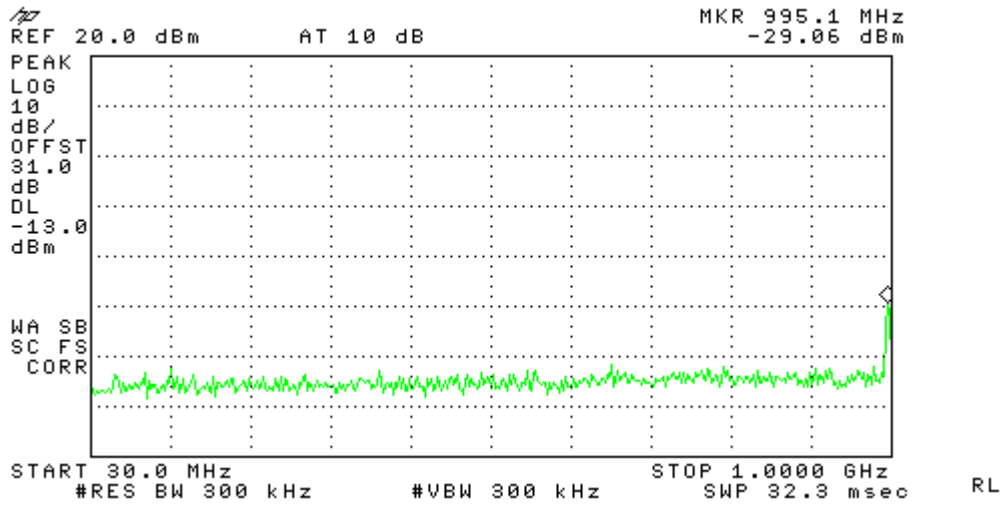
START 2.90 GHz STOP 20.00 GHz
#RES BW 1.0 MHz #VBW 1 MHz SWP 352 msec

RL

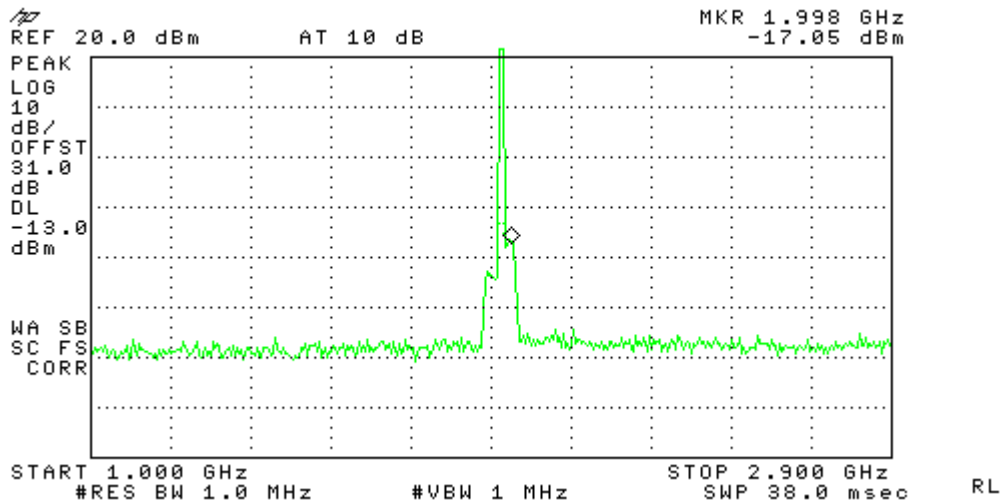
Intermodulation WCDMA_Low PCS_EFC
Center: 1960 MHz Span: 90 MHz RBW/VBW: 100 kHz



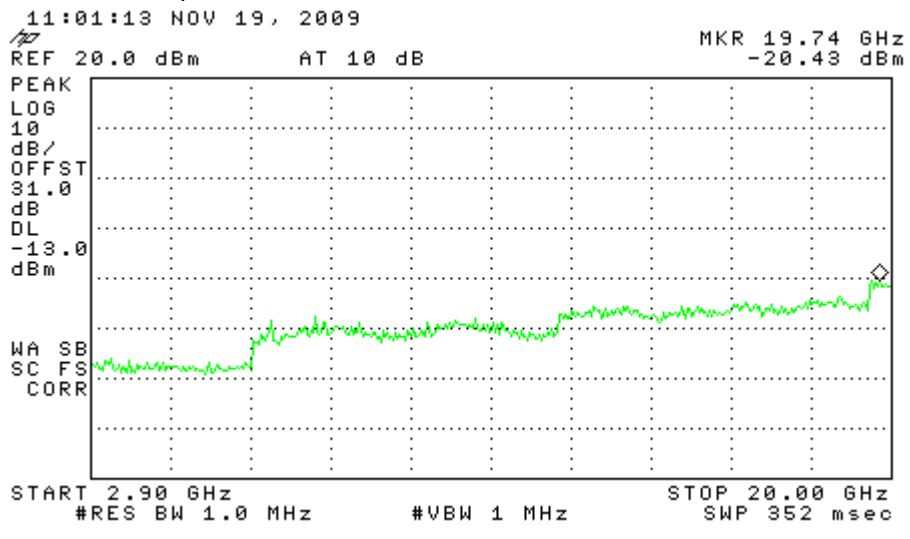
Intermodulation WCDMA_Low PCS_EFC
Span: 30 MHz to 1 GHz RBW/VBW: 300 kHz



Intermodulation WCDMA_Low PCS_EFC
Span: 1 GHz to 2.9 GHz RBW/VBW: 1 MHz

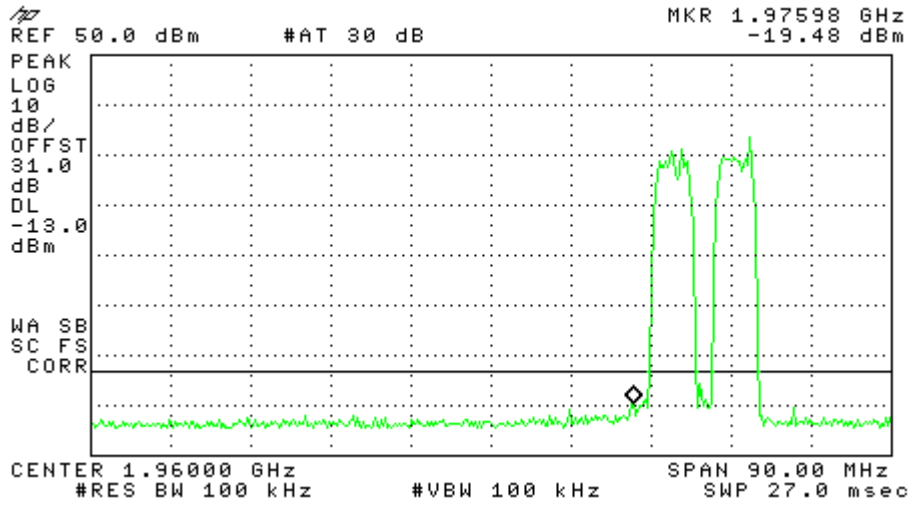


Intermodulation WCDMA_Low PCS_EFC
Span: 2.9 GHz to 20 GHz RBW/VBW: 1 MHz



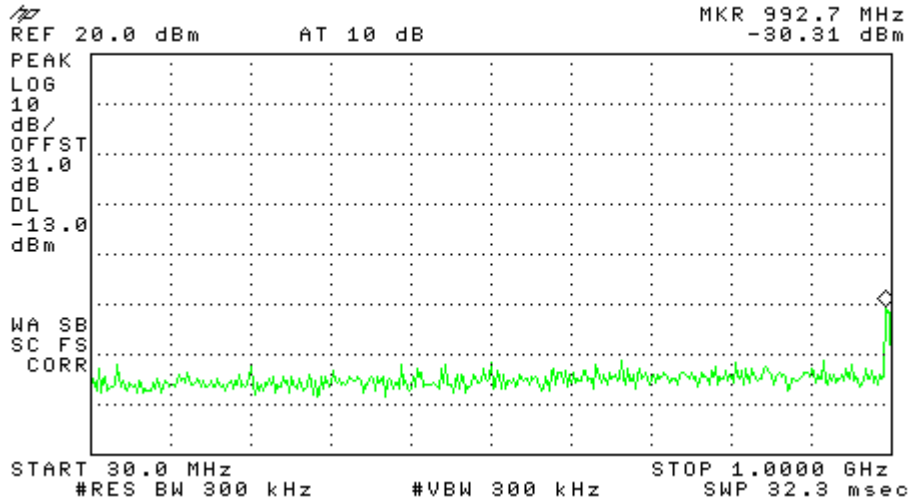
RL

Intermodulation WCDMA_High PCS_EFC
 Center: 1960 MHz Span: 90 MHz RBW/VBW: 100 kHz



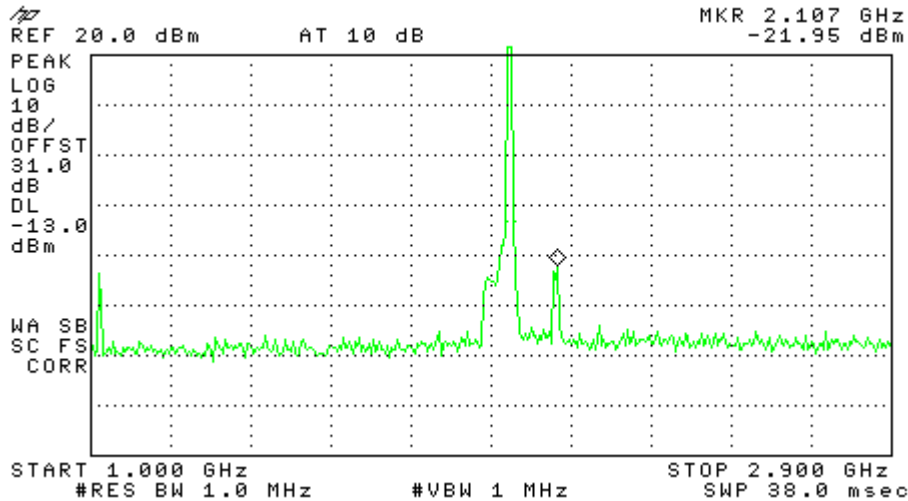
RL

Intermodulation WCDMA_High PCS_EFC
 Span: 30 MHz to 1 GHz RBW/VBW: 300 kHz



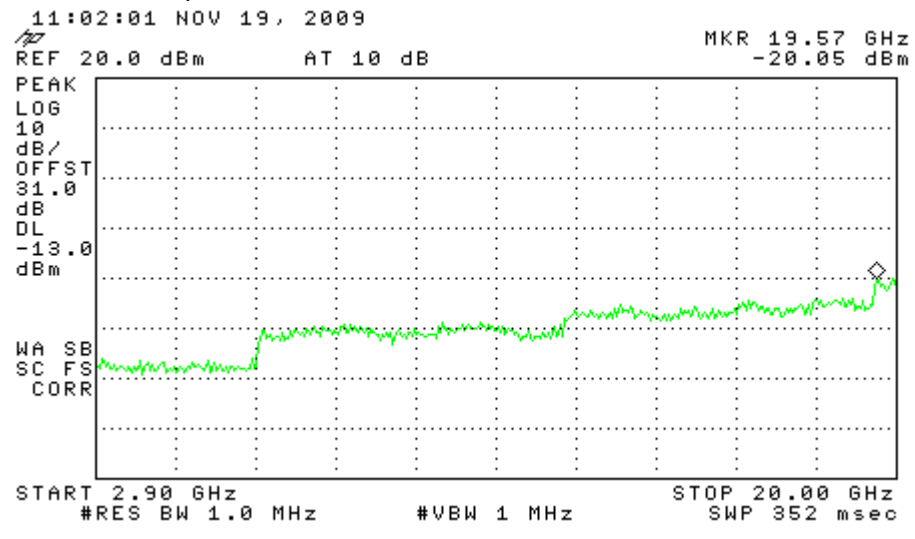
RL

Intermodulation WCDMA_High PCS_EFC
 Span: 1 GHz to 2.9 GHz RBW/VBW: 1 MHz



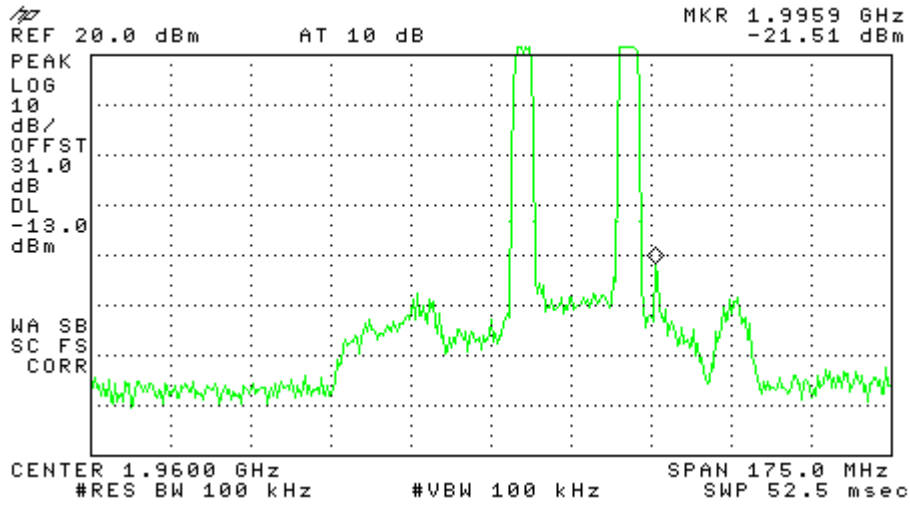
RL

Intermodulation WCDMA_High PCS_EFC
Span: 2.9 GHz to 20 GHz RBW/VBW: 1 MHz

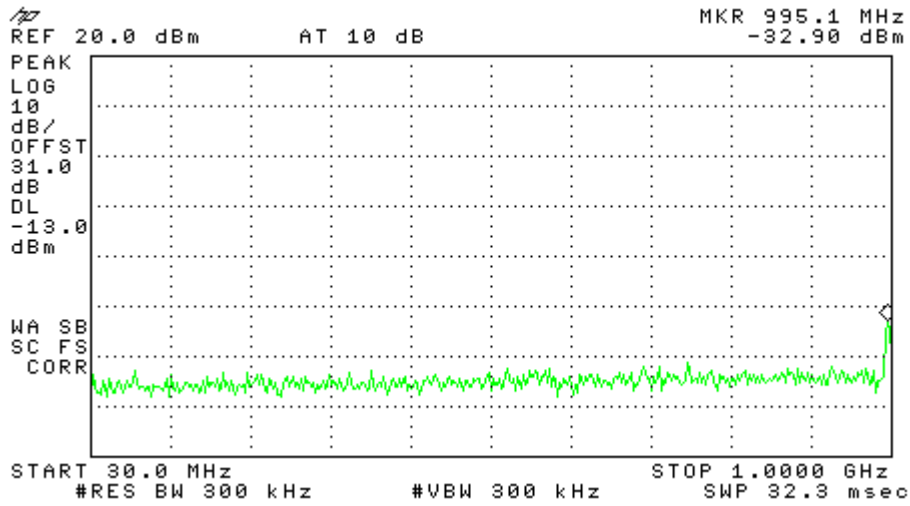


RL

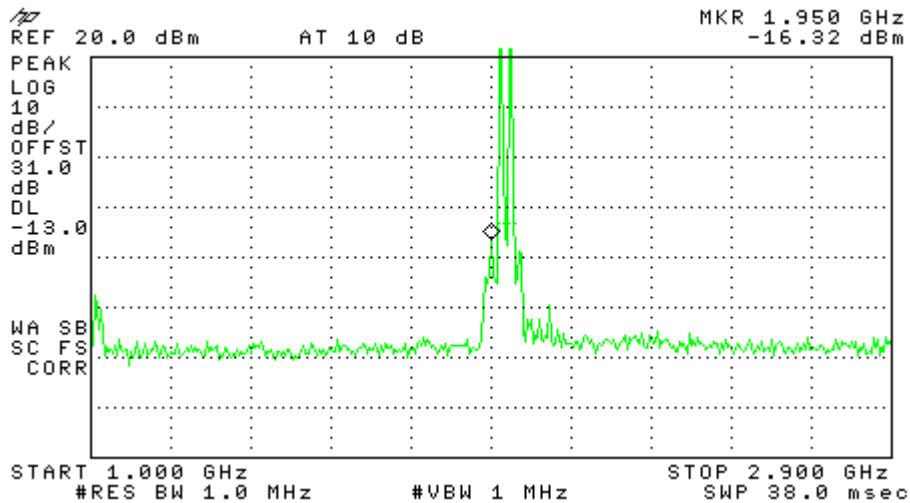
Intermodulation WCDMA_Apart PCS_EFC
Center: 1960 MHz Span: 175 MHz RBW/VBW: 100 kHz



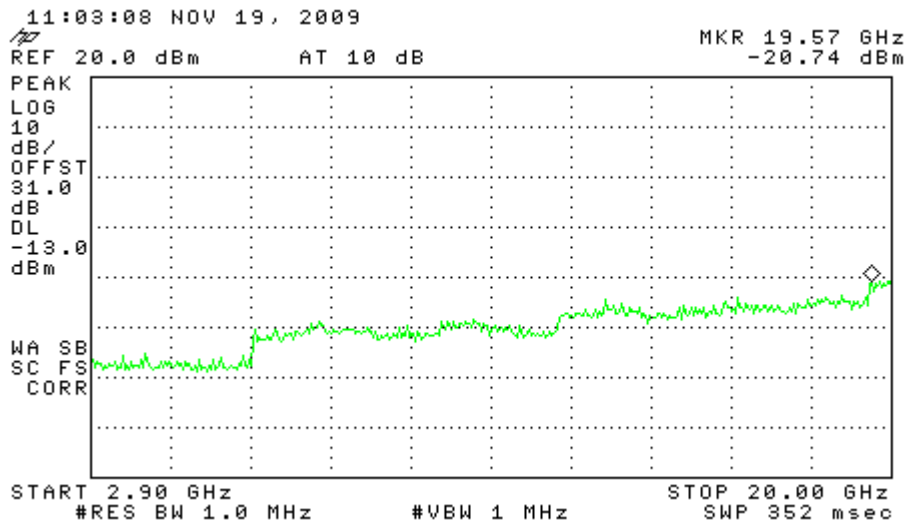
Intermodulation WCDMA_Apart PCS_EFC
Span: 30 MHz to 1 GHz RBW/VBW: 300 kHz



Intermodulation WCDMA_Apart PCS_EFC
Span: 1 GHz to 2.9 GHz RBW/VBW: 1 MHz



Intermodulation WCDMA_Apart PCS_EFC
Span: 2.9 GHz to 20 GHz RBW/VBW: 1 MHz



RL

3.0 INDUSTRY CANADA TEST RESULTS

3.1.1 4.2 Passband Gain and Bandwidth

Test Summary:

- The requirements are: **MET** NOT MET
- A plot of the 20 dB bandwidth was taken at the points where the gain had fallen by 20 dB. A measurement was taken to show the gain versus frequency response of the system, from the midband frequency f_0 of the passband up to at least $f_0 \pm 250\%$ the measured 20 dB bandwidth.

Test Location:

- Intertek (Oakdale, MN)

Test Distance:

- 3 Meters
- 10 Meters

- **Conducted measurement**

6.1 Test Limit:

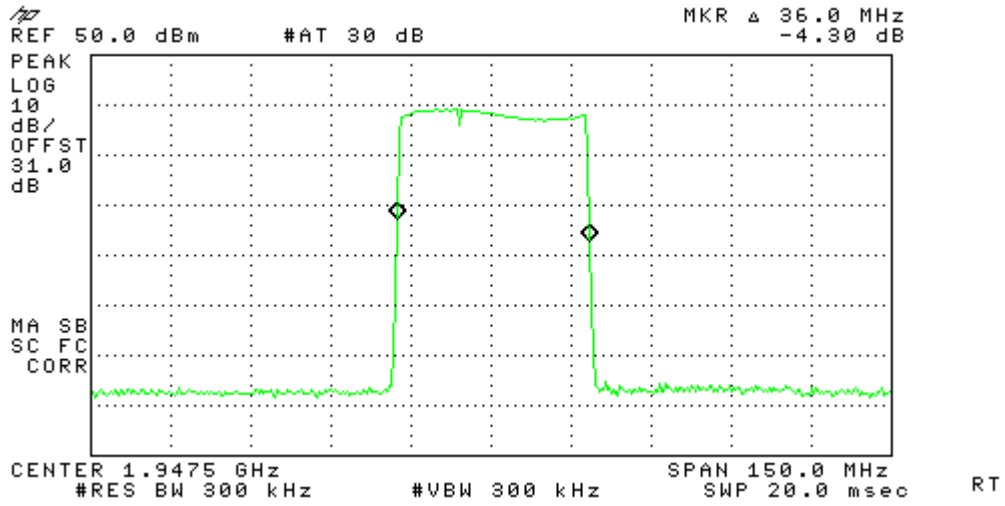
Passband gain shall not exceed the nominal gain by more than 1.0 dB. The 20 dB bandwidth shall not exceed the nominal bandwidth that is stated by the manufacturer. Outside of the 20 dB bandwidth, the gain shall not exceed the gain at the 20 dB point.

Test Data:

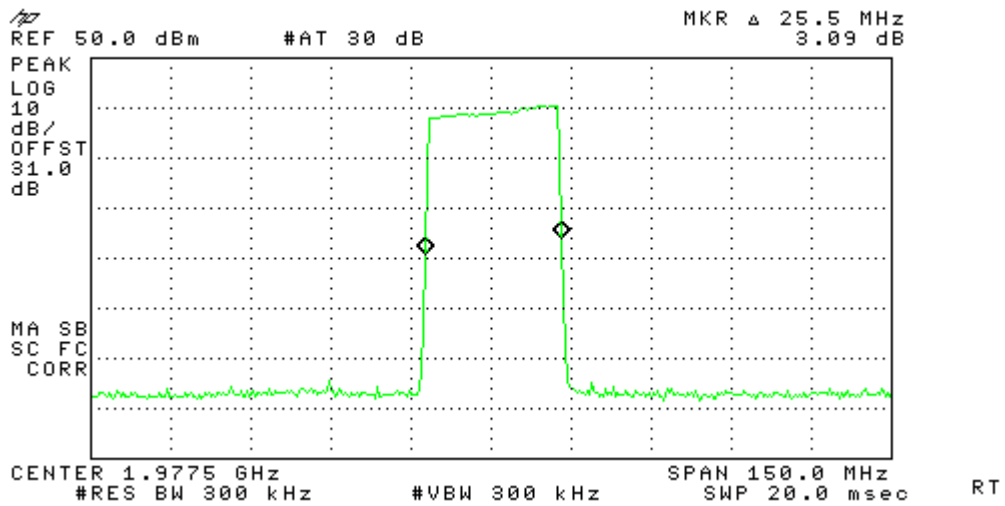
Below

Date: 19 November, 2009

IC_RSS_131_Section_4.2 20_dB_Passband PCS ADB
Center: 1947.5 MHz Span: 150 MHz RBW/VBW: 300 kHz



IC_RSS_131_Section_4.2 20_dB_Passband PCS EFC
Center: 1977.5 MHz Span: 150 MHz RBW/VBW: 300 kHz



3.1.2 4.3.1 Mean Output Power – Multi-channel Enhancer

Test Summary:

- The requirements are: **MET** NOT MET
- $P_{\text{mean}} = + 46.42 \text{ dBm}$ or 43.85 Watts

Test Location:

- Intertek (Oakdale, MN)

Test Distance:

- 3 Meters
- 10 Meters

- **Conducted measurement**

6.2 Test Limit:

The manufacturer's output power rating P_{rated} MUST NOT be greater than P_{mean} for all types of enhancers.

Test Data:

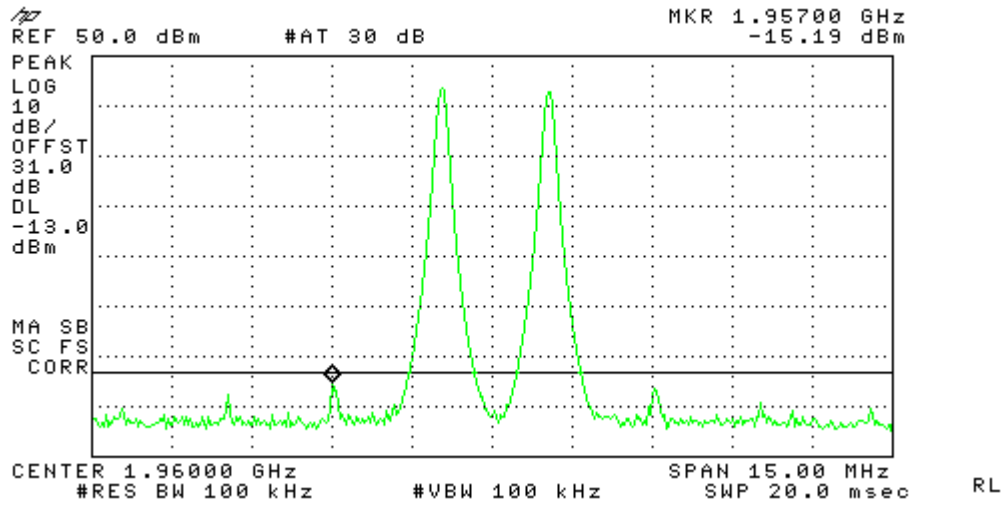
Below

Date: 19 November, 2009

IC_RSS_131_Section_4.3
Center: 1960 MHz

Mean_Output_Power_Spurious_Peak
Span: 15 MHz RBW/VBW: 100 kHz

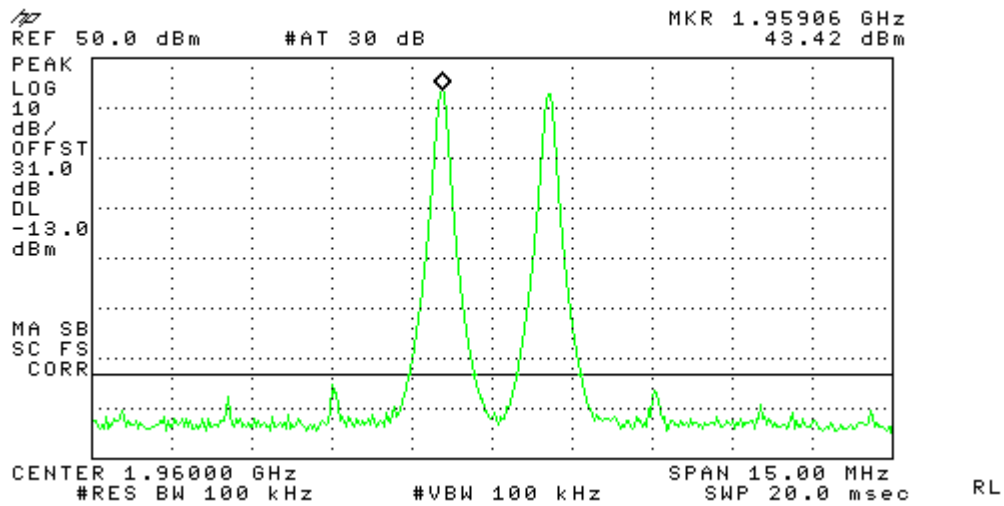
PCS



IC_RSS_131_Section_4.3
Center: 1960 MHz

Mean_Output_Power_Signal_Peak
Span: 15 MHz RBW/VBW: 100 kHz

PCS



3.1.3 4.4.1 Spurious Emissions – Multi-channel Enhancer

Test Summary:

- The requirements are: **MET** NOT MET
- Enhancer is < 500 watts. Raised the input level to the EUT until the greater level of the intermodulation products at the enhancer output terminals, Po3 or Po4, equaled –43 dBW. The spurious emissions of the equipment under test were measured using the two-tone method, with the two tones Po1 and Po2 set to the required levels. Using a spectrum analyzer with a resolution bandwidth set at 100 kHz, a search for spurious emissions from 30 MHz to 10 times the highest RF passband frequency was conducted. The search omitted the band that contains the test tones and intermodulation products. The highest spurious emission was –27.90 dBm at 19.74 GHz.

Test Location:

- Intertek (Oakdale, MN)

Test Distance:

- 3 Meters
- 10 Meters

■ Conducted measurement

Test Limit:

-43 dBW or –13 dBm

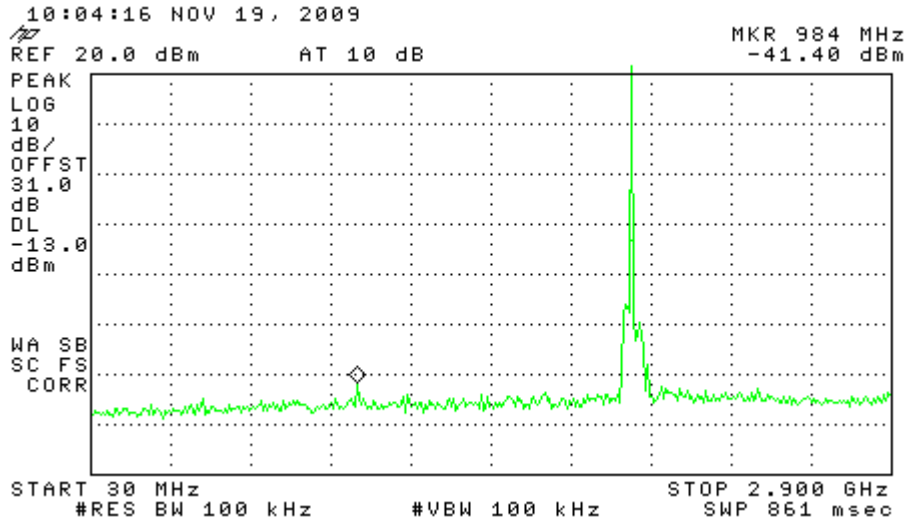
Test Data:

Below

Date: 19 November, 2009

IC_RSS_131_Section_4.4 Spurious_Emissions_Multi-Channel_Enhancer
Span: 30 MHz to 2.9 GHz RBW/VBW: 100 kHz

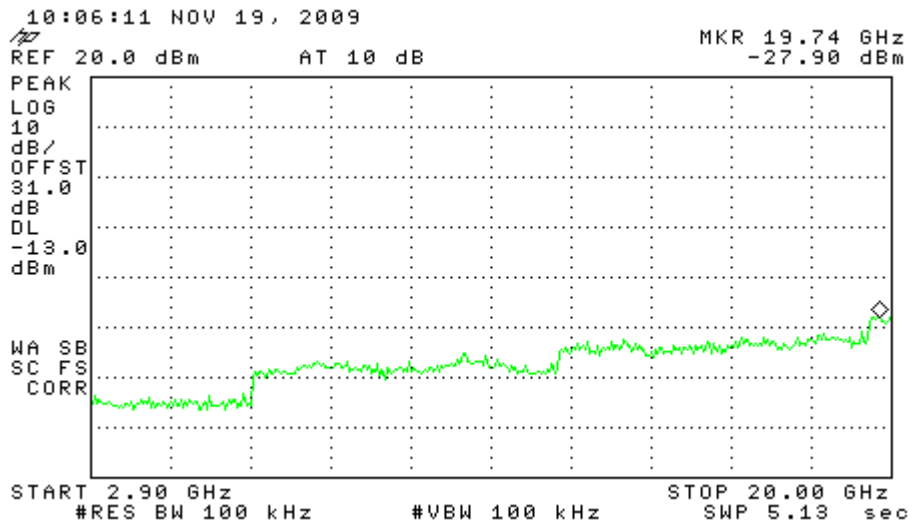
PCS



RL

IC_RSS_131_Section_4.4 Spurious_Emissions_Multi-Channel_Enhancer
Span: 2.9 GHz to 20 GHz RBW/VBW: 100 kHz

PCS



RL

3.1.4 4.5 Frequency Stability of Band Translators

Test Summary:

- The requirements are: **MET** NOT MET
- Frequency drift is < 1.5 parts per million (0.00015%) when monitored over extreme temperature and input voltage conditions.

Test Location:

- Intertek (Oakdale, MN)

Test Distance:

- 3 Meters
- 10 Meters

- **Conducted measurement**

Test Limit:

± 1.5 ppm

Test Data:

Below

Date: 18 November, 2009

Industry Canada
Section 4.5 – Frequency Tolerance Test
The frequency stability shall be within ± 1.5 parts per million (0.00015%)

HOST	REMOTE			
Input Voltage	Input Voltage	Carrier Frequency	Measured Frequency	Meets Requirements?
21 VDC	100 VAC	1930.200 MHz	1930.200 MHz	Yes
48 VDC	170 VAC	1930.200 MHz	1930.200 MHz	Yes
60 VDC	240 VAC	1930.200 MHz	1930.200 MHz	Yes
21 VDC	100 VAC	1960.000 MHz	1960.000 MHz	Yes
48 VDC	170 VAC	1960.000 MHz	1960.000 MHz	Yes
60 VDC	240 VAC	1960.000 MHz	1960.000 MHz	Yes
21 VDC	100 VAC	1989.800 MHz	1989.800 MHz	Yes
48 VDC	170 VAC	1989.800 MHz	1989.800 MHz	Yes
60 VDC	240 VAC	1989.800 MHz	1989.800 MHz	Yes
Temperature		Carrier Frequency	Measured Frequency	Meets Requirements?
-30 Deg. C		1930.200 MHz	1930.200 MHz	Yes
-20 Deg. C		1930.200 MHz	1930.200 MHz	Yes
-10 Deg. C		1930.200 MHz	1930.200 MHz	Yes
0 Deg. C		1930.200 MHz	1930.200 MHz	Yes
10 Deg. C		1930.200 MHz	1930.200 MHz	Yes
20 Deg. C		1930.200 MHz	1930.200 MHz	Yes
30 Deg. C		1930.200 MHz	1930.200 MHz	Yes
40 Deg. C		1930.200 MHz	1930.200 MHz	Yes
50 Deg. C		1930.200 MHz	1930.200 MHz	Yes
-30 Deg. C		1960.000 MHz	1960.000 MHz	Yes
-20 Deg. C		1960.000 MHz	1960.000 MHz	Yes
-10 Deg. C		1960.000 MHz	1960.000 MHz	Yes
0 Deg. C		1960.000 MHz	1960.000 MHz	Yes
10 Deg. C		1960.000 MHz	1960.000 MHz	Yes
20 Deg. C		1960.000 MHz	1960.000 MHz	Yes
30 Deg. C		1960.000 MHz	1960.000 MHz	Yes
40 Deg. C		1960.000 MHz	1960.000 MHz	Yes
50 Deg. C		1960.000 MHz	1960.000 MHz	Yes
-30 Deg. C		1989.800 MHz	1989.800 MHz	Yes
-20 Deg. C		1989.800 MHz	1989.800 MHz	Yes
-10 Deg. C		1989.800 MHz	1989.800 MHz	Yes
0 Deg. C		1989.800 MHz	1989.800 MHz	Yes
10 Deg. C		1989.800 MHz	1989.800 MHz	Yes
20 Deg. C		1989.800 MHz	1989.800 MHz	Yes
30 Deg. C		1989.800 MHz	1989.800 MHz	Yes
40 Deg. C		1989.800 MHz	1989.800 MHz	Yes
50 Deg. C		1989.800 MHz	1989.800 MHz	Yes

4.0 TEST EQUIPMENT

Number	Description	Manufacturer	Model	ADC Serial Number	Cal Due	Used
1	Spectrum Analyzer	HP	8593E	MC54593	9-29-10	<input checked="" type="checkbox"/>
2	Power Meter	HP	437B	MC27754	5-29-10	<input checked="" type="checkbox"/>
3	Multimeter	Fluke	79	MC18758	6-15-11	<input checked="" type="checkbox"/>
4	Frequency Counter	HP	5347A	MC27548	5-19-10	<input checked="" type="checkbox"/>
5	Temperature Chamber	Thermotron	SE-600-3-3	MC48285	4-2-10	<input checked="" type="checkbox"/>
6	Signal Generator	Aeroflex	3413	MC57343	5-21-10	<input checked="" type="checkbox"/>
7	Signal Generator	Aeroflex	3414	NA	1-16-11	<input checked="" type="checkbox"/>
8	RF Power Sensor	Agilent	8482H	MC27519	7-14-10	<input checked="" type="checkbox"/>
9	Variable Auto Transformer	Staco	1520CT	MC44655	CNR	<input checked="" type="checkbox"/>
10	Attenuator	Aeroflex	86-30-12	369	CNR	<input checked="" type="checkbox"/>

Equipment with a Calibration Not Required (CNR) listing is verified and compensated for with NIST traceable calibrated equipment.