BTI Wireless

TEST REPORT FOR

1900MHz 40W Transmitting Remote Unit
Model: mBSC1900-040-RUSSF01

Tested To The Following Standards:

FCC Part 24E

Report No.: 95157-5

Date of issue: December 17, 2013

ACCREDITED
Testing Certificates:
803.01, 803.02, 803.05, 803.06

This test report bears the accreditation symbol indicating that the testing performed herein meets the test and reporting requirements of ISO/IEC 17025 under the applicable scope of EMC testing for CKC Laboratories, Inc.

We strive to create long-term, trust based relationships by providing sound, adaptive, customer first testing services. We embrace each of our customers' unique EMC challenges, not as an interruption to set processes, but rather as the reason we are in business.

Testing the Future
CKC LABORATORIES, INC.

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ADMINISTRATIVE INFORMATION

Test Report Information

REPORT PREPARED FOR:

BTI Wireless
6185 Phyllis Dr. Unit D
Cypress, CA 90630

REPRESENTATIVE: Raymond Shin
Customer Reference Number: 9913650

REPORT PREPARED BY:

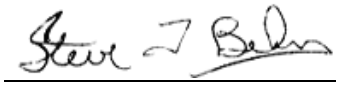
Morgan Tramontin
CKC Laboratories, Inc.
5046 Sierra Pines Drive
Mariposa, CA 95338

Project Number: 95157

DATE OF EQUIPMENT RECEIPT: November 21, 2013
DATE(S) OF TESTING: November 21 – December 3, 2013

Report Authorization

The test data contained in this report documents the observed testing parameters pertaining to and are relevant for only the sample equipment tested in the agreed upon operational mode(s) and configuration(s) as identified herein. Compliance assessment remains the client's responsibility. This report may not be used to claim product endorsement by A2LA or any government agencies. This test report has been authorized for release under quality control from CKC Laboratories, Inc.



Steve Behm
Director of Quality Assurance & Engineering Services
CKC Laboratories, Inc.

Test Facility Information

Our laboratories are configured to effectively test a wide variety of product types. CKC utilizes first class test equipment, anechoic chambers, data acquisition and information services to create accurate, repeatable and affordable test results.

TEST LOCATION(S):
CKC Laboratories, Inc.
110 Olinda Place
Brea, CA 92823

Software Versions

CKC Laboratories Proprietary Software	Version
EMITest Emissions	5.00.14
Immunity	5.00.07

Site Registration & Accreditation Information

Location	CB #	TAIWAN	CANADA	FCC	JAPAN
Brea A	US0060	SL2-IN-E-1146R	3082D-1	90473	A-0147
Brea D	US0060	SL2-IN-E-1146R	3082D-2	100638	A-0147

SUMMARY OF RESULTS

Standard / Specification: FCC Parts 24E

Description	Test Procedure/Method	Results
RF Power Output	FCC Part 24E § 22.232(a) / 2.1046	Pass
Occupied Bandwidth	FCC Part 24E / 2.1049(I)	Pass
Spurious Emissions at Antenna Terminal	FCC Part 24E § 24.238(a) / 2.1051	Pass
Field Strength of Spurious Radiation	FCC Part 24E § 24.236 & 24.238/ 2.1053	Pass
Band Edge		Pass
Intermodulation		Pass
Out of Band Rejection		Pass

Conditions During Testing

This list is a summary of the conditions noted for or modifications made to the equipment during testing.

Summary of Conditions
None

EQUIPMENT UNDER TEST (EUT)

The following model has been tested by CKC Laboratories:
1900MHz 40W Transmitting Remote Unit, mBSC1900-040-RUSSF01

The manufacturer states that the following additional model is identical electrically to the one which was tested, or any differences between them does not affect their EMC characteristics, and therefore It meets the level of testing equivalent to the tested model:
1900MHz 40W Transmitting Remote Unit, mBSC1900-040-RU

EQUIPMENT UNDER TEST

1900MHz 40W Transmitting Remote Unit
Manuf: BTI Wireless
Model: mBSC1900-040-RUSSF01
Serial: 10935304010113111101

PERIPHERAL DEVICES

The EUT was tested with the following peripheral device(s):

ESG Vector Signal Generator
Manuf: Agilent
Model: 4438C
Serial: MY45091601

Step Attenuator 110dB pad
Manuf: HP
Model: 8496B
Serial: 1350A01241

Cable
Manuf: Pasternack
Model: Sucoflex 104A
Serial: 12237/4A

Attenuator 30db Pad
Manuf: Weinschel
Model: 49-30-43
Serial: KW075

50 ohm Load
Manuf: Generic
Model: NA
Serial: NA

FCC PARTS 24E

2.1046 RF Power Output

Test Data

Test Location: CKC Laboratories Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714-993-6112

Customer:	**BTI Wireless**		
Specification:	**RF Output Power**		
Work Order #:	**95157**	Date:	11/22/2013
Test Type:	**Conducted Emissions**	Time:	14:18:02
Equipment:	**1900MHz 40W Transmitting Remote Unit**	Sequence#:	4
Manufacturer:	BTI Wireless	Tested By:	Don Nguyen
Model:	mBSC1900-040-RUSSF01		110V 60Hz
S/N:	10935304010113111101		

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02869	Spectrum Analyzer	E4440A	2/6/2013	2/6/2015
T2	AN03239	Cable	32022-2-29094K-24TC	10/30/2013	10/30/2015

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
1900MHz 40W Transmitting Remote Unit*	BTI Wireless	mBSC1900-040-RUSSF01	10935304010113111101

Support Devices:

Function	Manufacturer	Model #	S/N
ESG Vector Signal Generator	Agilent	4438C	MY45091601
Attenuator 30db Pad	Weinschel	49-30-43	KW075
Step Attenuator 110dB pad	HP	8496B	1350A01241
50 ohm Load	Generic	NA	NA
Cable	Pasternack	Sucoflex 104A	12237/4A

Test Conditions / Notes:

The EUT is placed on the test bench. Tx In is connected to an ESG Signal generator via cable Sucoflex 104A. ANT port is connected to 30db attenuator and 110db step attenuator. A spectrum analyzer is connected to attenuators via cable 32022-2-29094K-24TC. RX out port is terminated to 50 ohm load.

The evaluation is performed at the antenna port .

Freq: 1930-1990MHz
Signal protocol: GSM, EDGE, CDMA (IS95A), UMTS (WCDMA_3GPP), LTE-TM1.1 1.4MHz, 5MHz. 20MHz

22°C, 45% Relative Humidity

Site A

§24.232 Power and antenna height limit:
(a)(2): Base stations with an emission bandwidth greater than 1 MHz are limited to 1640 watts/MHz equivalent isotropically radiated power (EIRP) with an antenna height up to 300 meters HAAT

40W

Modulation	Signal Generator Output Power (dbm)	Cable Loss (db)	Input Power (dbm)	Measured Output Power (dbm)	Measured Output Power (W)
GSM					
1932.04MHz	-11.22	1.2	-12.42	46.02	39.99447498
1960.00MHz	-12.04	1.2	-13.24	46.03	40.08667176
1987.96MHz	-11.36	1.2	-12.56	45.99	39.71915495
EDGE					
1932.04MHz	-11.24	1.2	-12.44	45.92	39.08408958
1960.00MHz	-11.24	1.2	-12.44	46	39.81071706
1987.96MHz	-11.12	1.2	-12.32	46.06	40.3645393
CDMA (IS95A)					
1932.5MHz	-11.08	1.2	-12.28	46.02	39.99447498
1960.00MHz	-11.44	1.2	-12.64	46.04	40.17908108
1987.5MHz	-11.02	1.2	-12.22	45.99	39.71915495
UMTS (WCMDA 3GPP)					
1933.9MHz	-11.2	1.2	-12.4	46.02	39.99447498
1960.00MHz	-11.62	1.2	-12.82	46	39.81071706
1986.1MHz	-11.14	1.2	-12.34	46.01	39.90249024
LTE 1.4MHz					

1932.40MHz	-11.14	1.2	-12.34	45.99	39.71915495
1960.00MHz	-11.62	1.2	-12.82	46.05	40.27170343
1987.75MHz	-11.02	1.2	-12.22	46.02	39.99447498
LTE 5MHz					
1934.05MHz	-11.3	1.2	-12.5	46.02	39.99447498
1960.00MHz	-11.78	1.2	-12.98	46	39.81071706
1986.11MHz	-11.24	1.2	-12.44	46	39.81071706
LTE 20MHz					
1941.2MHz	-11.76	1.2	-12.96	46	39.81071706
1960.00MHz	-11.76	1.2	-12.96	46.05	40.27170343
1979.5MHz	-11.52	1.2	-12.72	46.01	39.90249024

20W

Modulation	Signal Generator Output Power (dbm)	Cable Loss (db)	Input Power (dbm)	Measured Output Power (dbm)	Measured Output Power (W)
GSM					
1932.04MHz	-12.89	1.2	-14.09	42.99	19.90673339
1960.00MHz	-13.04	1.2	-14.24	43.03	20.09092813
1987.96MHz	-13.46	1.2	-14.66	43.04	20.1372425
EDGE					
1932.04MHz	-8.42	1.2	-9.62	42.73	18.74994508
1960.00MHz	-8.02	1.2	-9.22	42.71	18.66379691
1987.96MHz	-7.86	1.2	-9.06	42.71	18.66379691
CDMA (IS95A)					
1932.5MHz	-11.22	1.2	-12.42	43.05	20.18366364
1960.00MHz	-11.34	1.2	-12.54	43.04	20.1372425
1987.5MHz	-10.6	1.2	-11.8	43.04	20.1372425
UMTS (WCMDA 3GPP)					
1933.9MHz	-12.76	1.2	-13.96	43.01	19.9986187
1960.00MHz	-14.18	1.2	-15.38	43.01	19.9986187
1986.1MHz	-13.62	1.2	-14.82	43	19.95262315

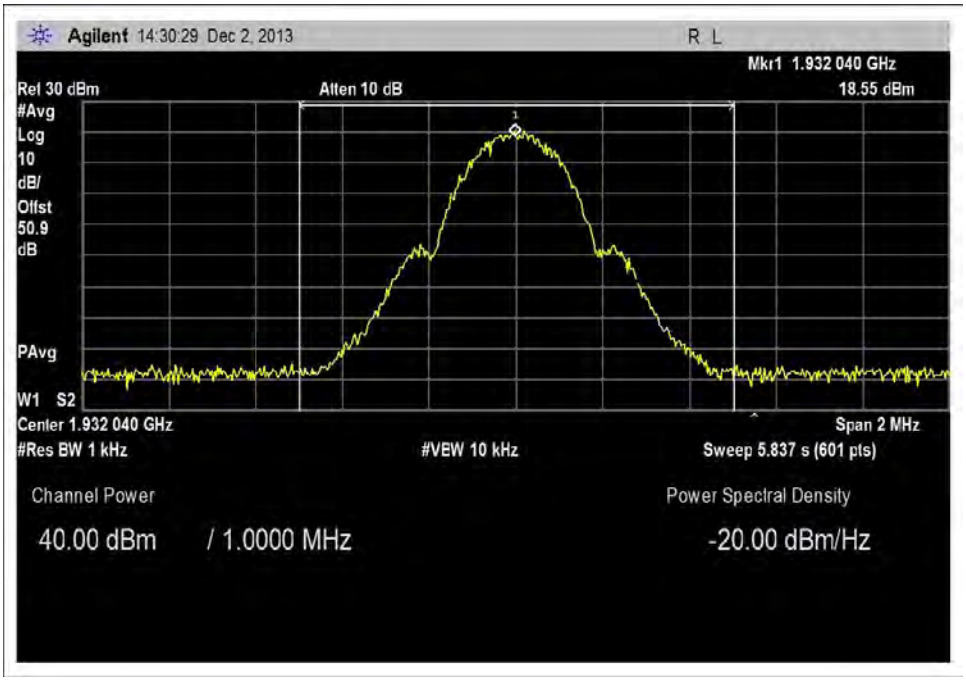
LTE 1.4MHz					
1932.40MHz	-13.34	1.2	-14.54	43.01	19.9986187
1960.00MHz	-13.34	1.2	-14.54	42.98	19.86094917
1987.75MHz	-12.66	1.2	-13.86	42.99	19.90673339
LTE 5MHz					
1934.05MHz	-13.82	1.2	-15.02	43	19.95262315
1960.00MHz	-14.4	1.2	-15.6	42.99	19.90673339
1986.11MHz	-13.78	1.2	-14.98	43	19.95262315
LTE 20MHz					
1941.2MHz	-14.38	1.2	-15.58	42.99	19.90673339
1960.00MHz	-14.38	1.2	-15.58	43.04	20.1372425
1979.5MHz	-14.12	1.2	-15.32	43.01	19.9986187

10W

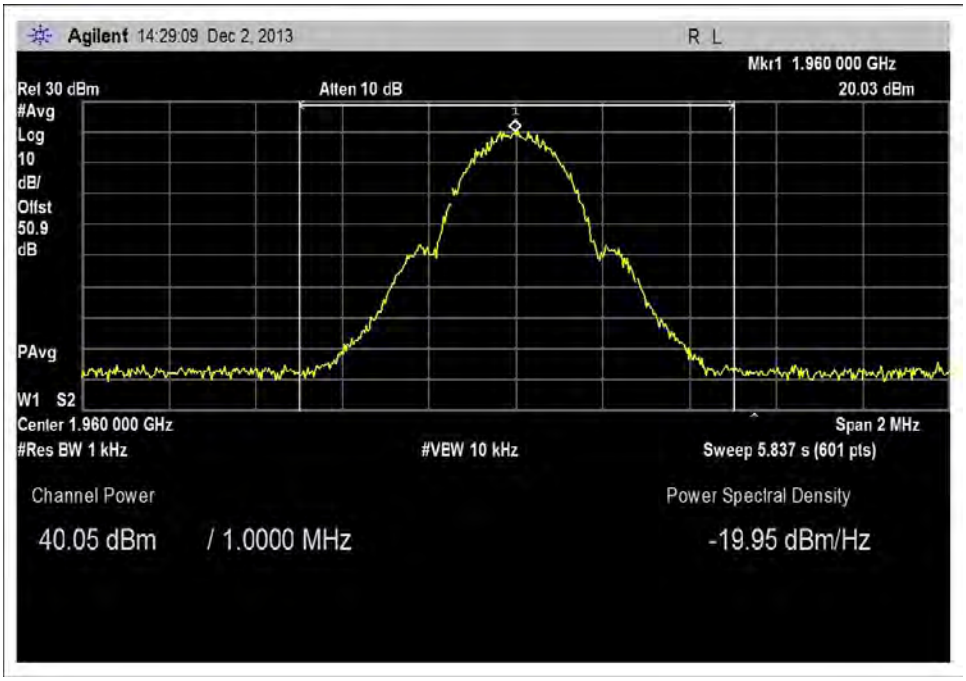
Modulation	Signal Generator Output Power (dbm)	Cable Loss (db)	Input Power (dbm)	Measured Output Power (dbm)	Measured Output Power (W)
GSM					
1932.04MHz	-16.9	1.2	-18.1	40	10
1960.00MHz	-17.64	1.2	-18.84	40.05	10.11579454
1987.96MHz	-16.94	1.2	-18.14	40.03	10.06931669
EDGE					
1932.04MHz	-17.3	1.2	-18.5	39.6	9.120108394
1960.00MHz	-17.3	1.2	-18.5	39.88	9.727472238
1987.96MHz	-17.04	1.2	-18.24	39.88	9.727472238
CDMA (IS95A)					
1932.5MHz	-16.86	1.2	-18.06	39.98	9.954054174
1960.00MHz	-17.02	1.2	-18.22	39.99	9.977000638
1987.5MHz	-16.92	1.2	-18.12	39.96	9.908319449
UMTS (WCMDA 3GPP)					
1933.9MHz	-17.04	1.2	-18.24	40.01	10.02305238
1960.00MHz	-17.62	1.2	-18.82	40	10
1986.1MHz	-16.9	1.2	-18.1	40.05	10.11579454

LTE 1.4MHz					
1932.40MHz	-17.02	1.2	-18.22	39.97	9.931160484
1960.00MHz	-17.02	1.2	-18.22	40.01	10.02305238
1987.75MHz	-16.82	1.2	-18.02	40.01	10.02305238
LTE 5MHz					
1934.05MHz	-17	1.2	-18.2	40.05	10.11579454
1960.00MHz	-17.6	1.2	-18.8	40.04	10.09252886
1986.11MHz	-17	1.2	-18.2	40.01	10.02305238
LTE 20MHz					
1941.2MHz	-17.62	1.2	-18.82	40	10
1960.00MHz	-17.62	1.2	-18.82	40.03	10.06931669
1979.5MHz	-17.48	1.2	-18.68	40.02	10.0461579

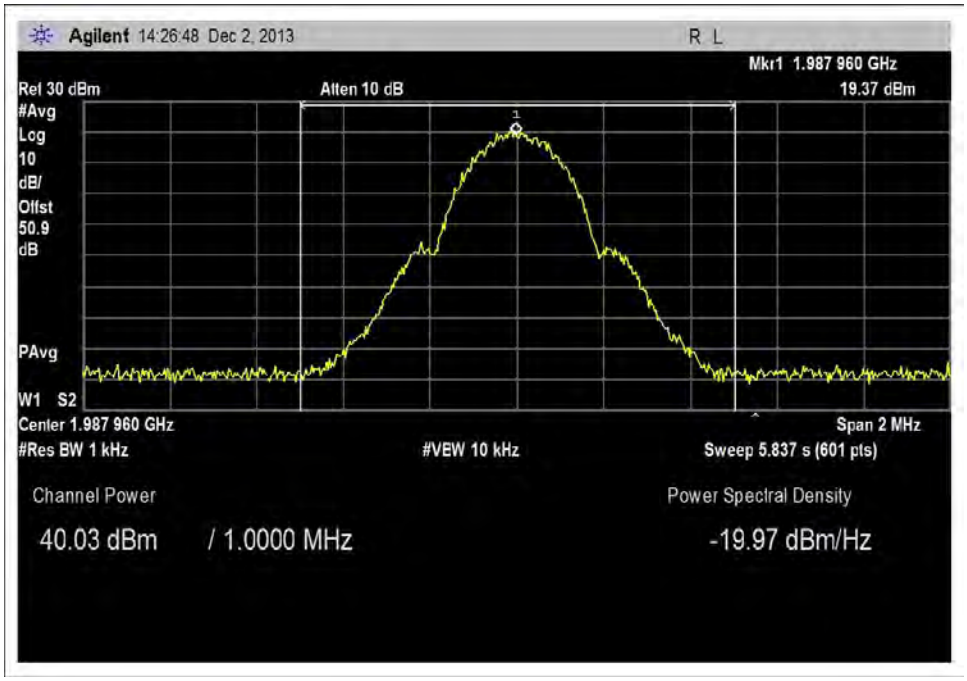
Test Plots



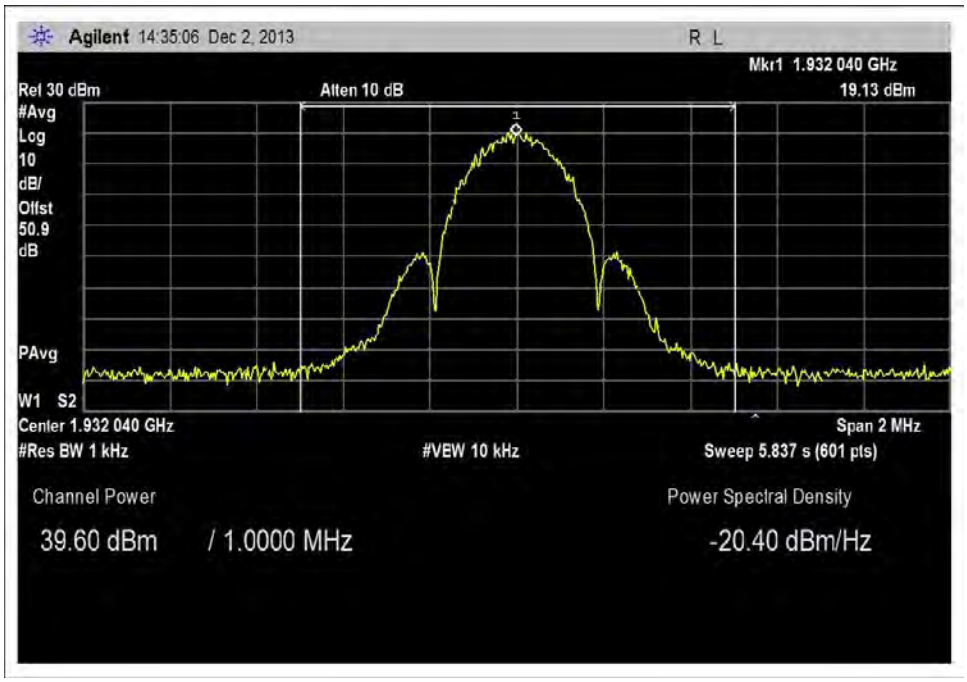
10W, GSM - Low



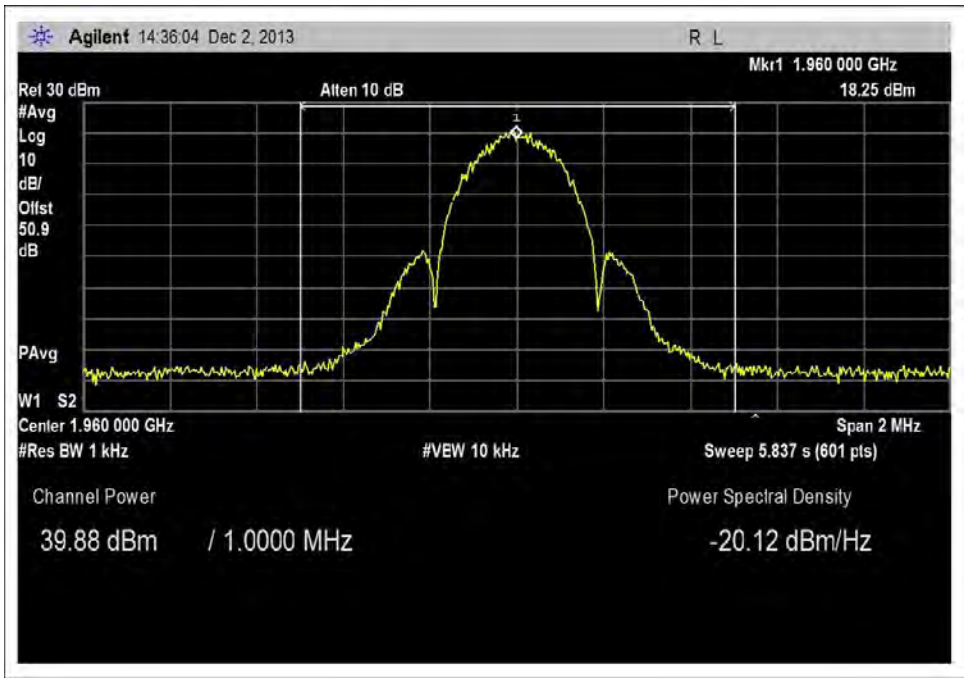
10W, GSM - Middle



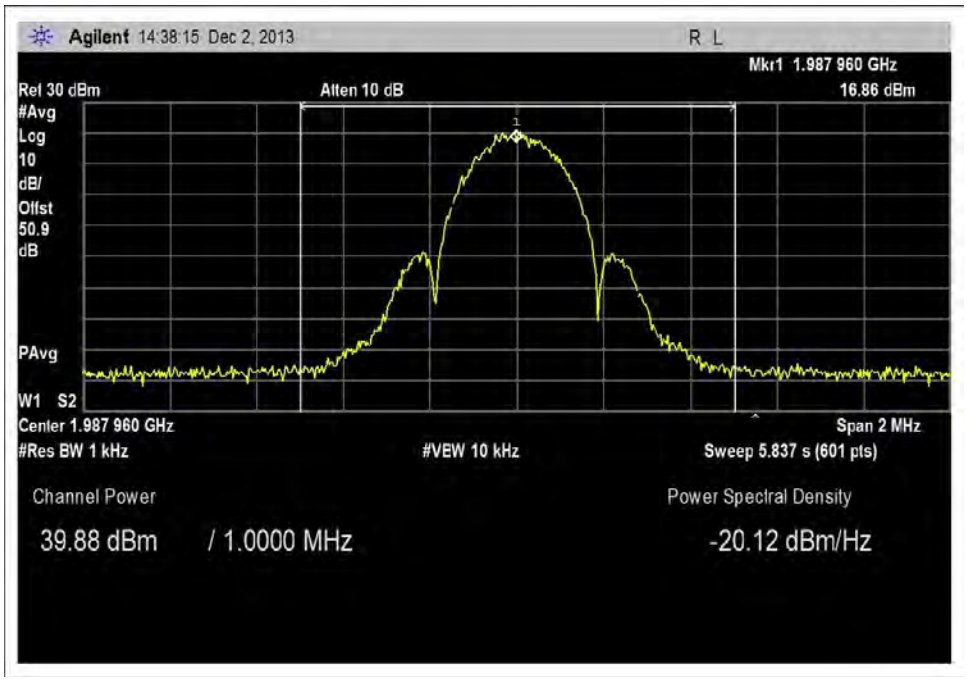
10W, GSM - High



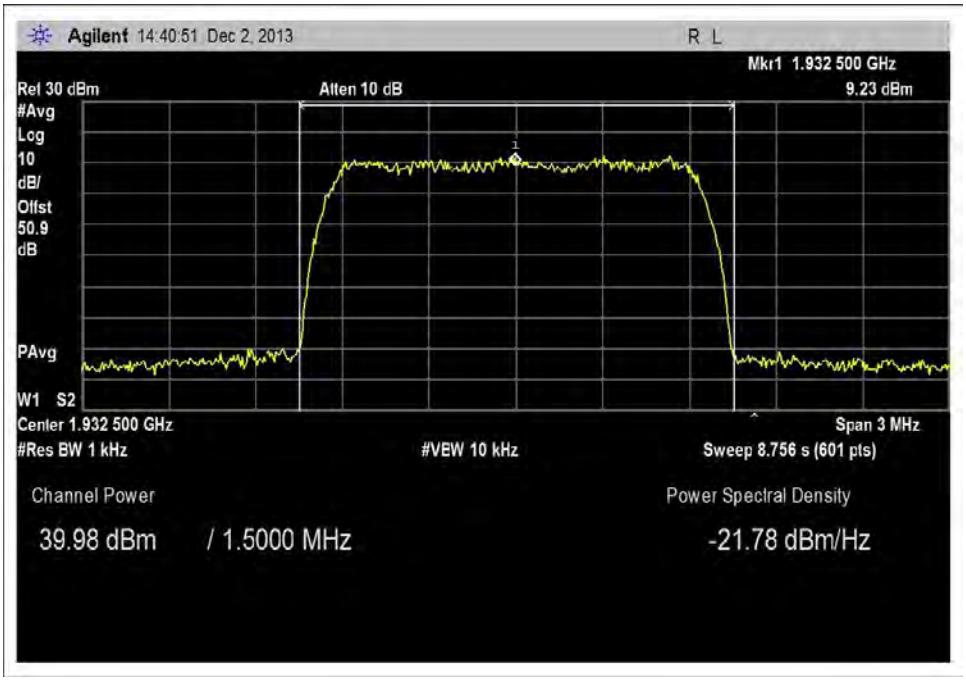
10W, EDGE - Low



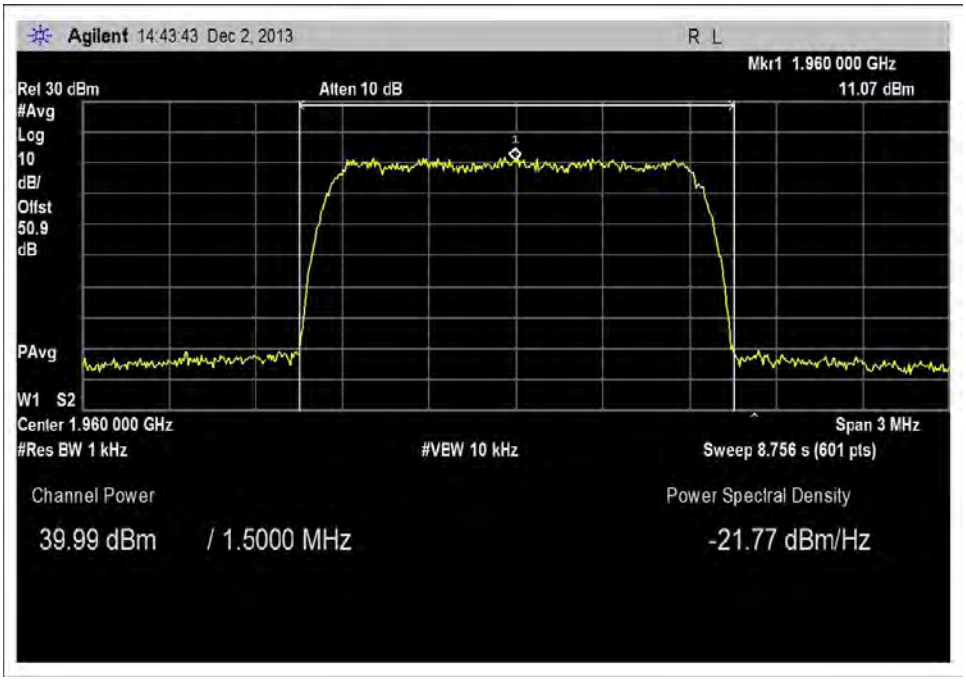
10W, EDGE - Middle



10W, EDGE - High



10W, CDMA IS95A - Low



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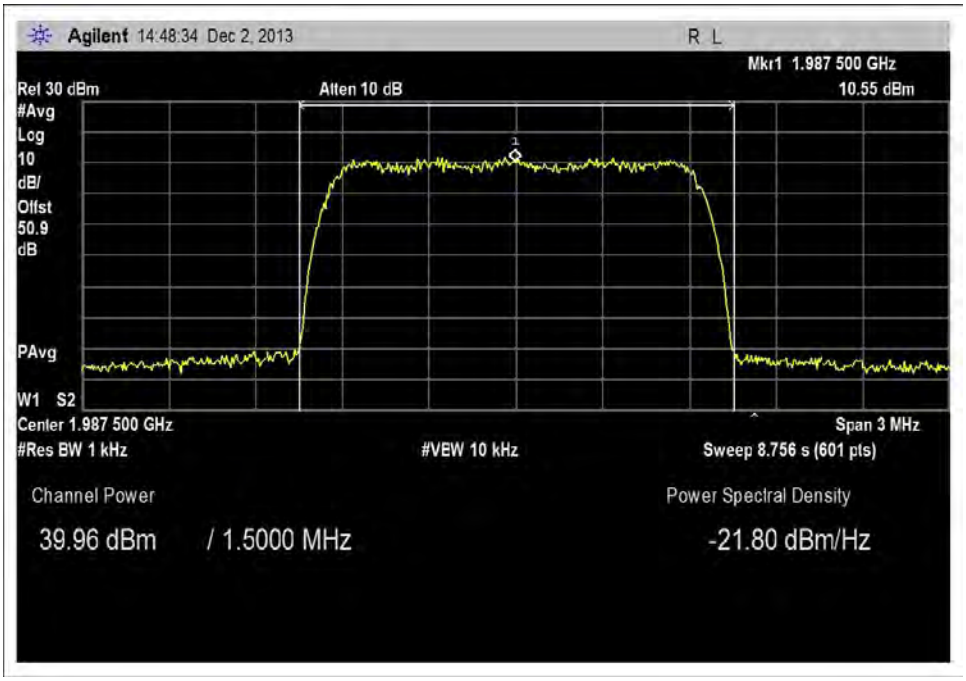
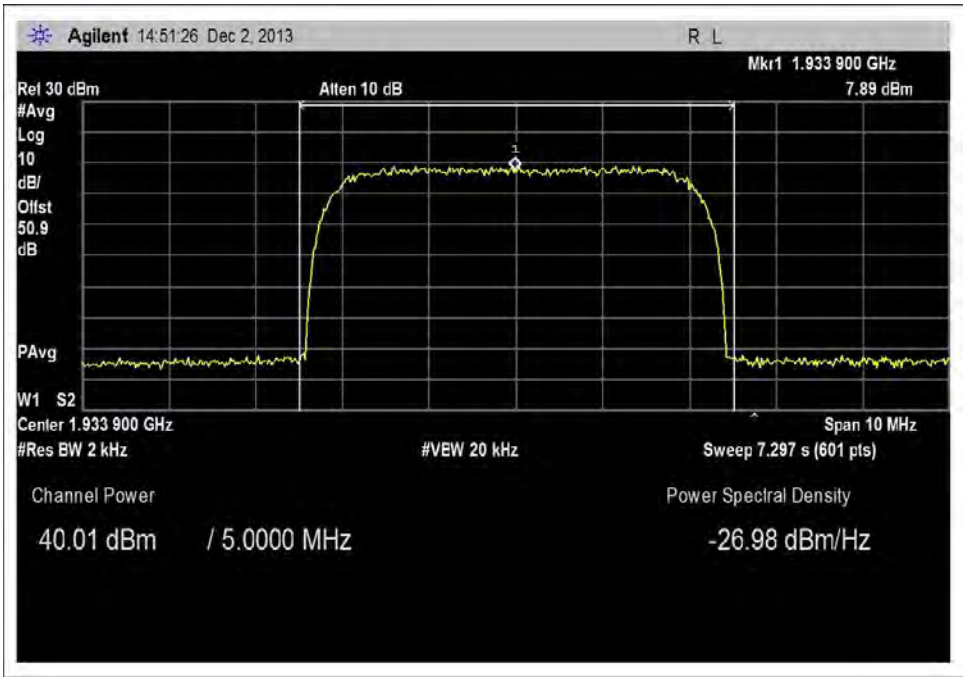
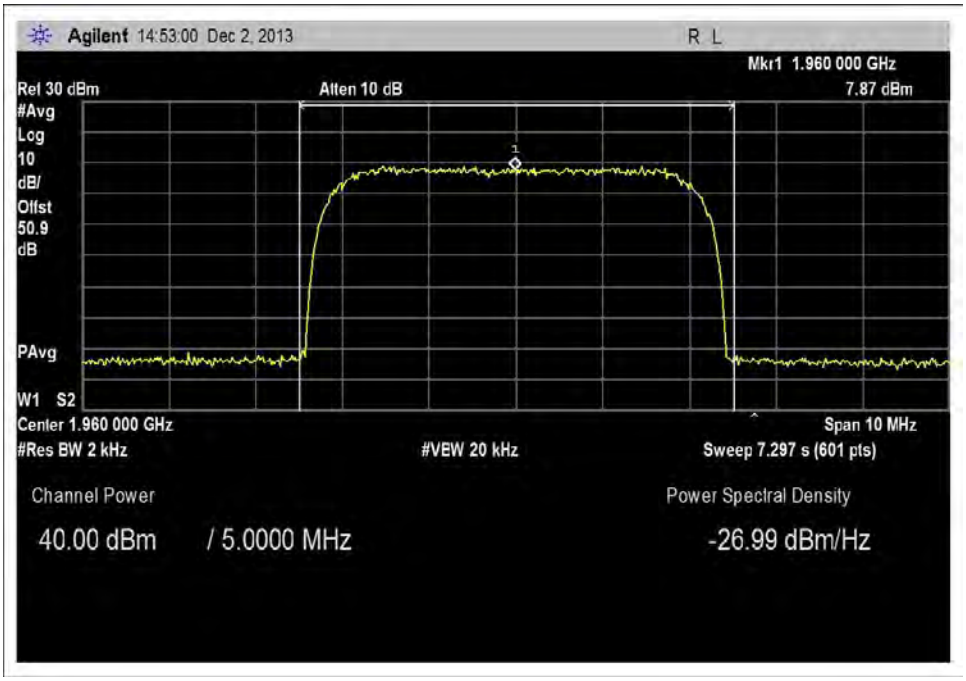


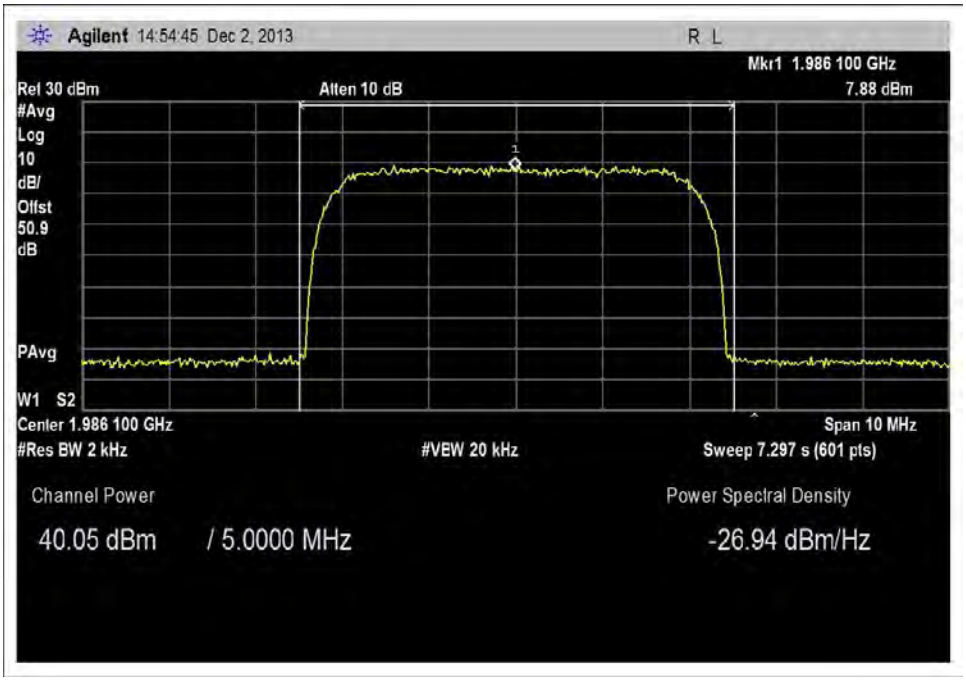
10W, CDMA IS95A - High



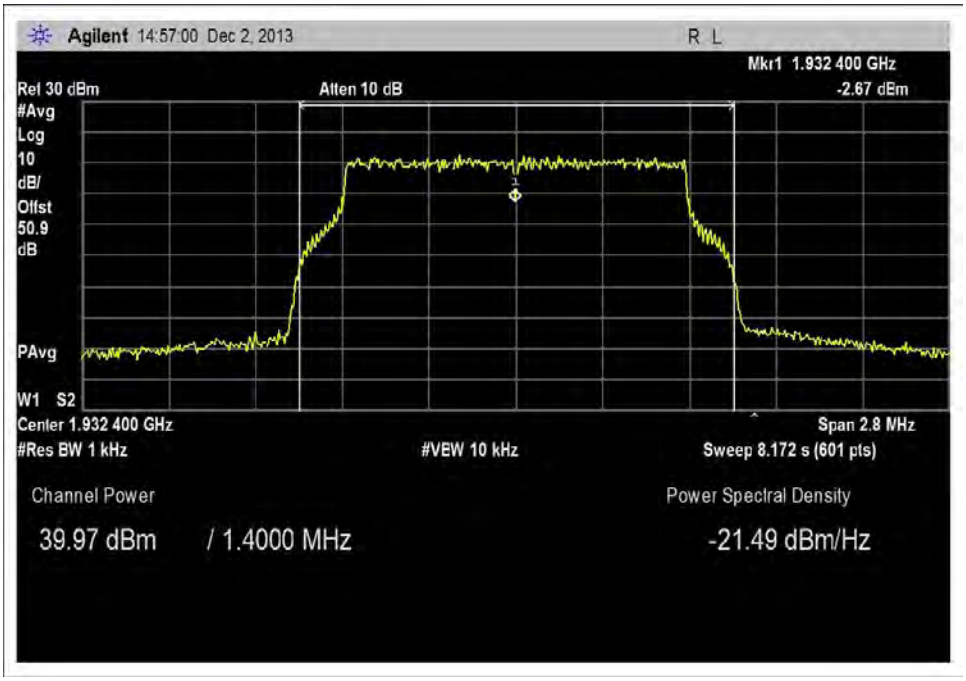
10W, WCDMA - Low



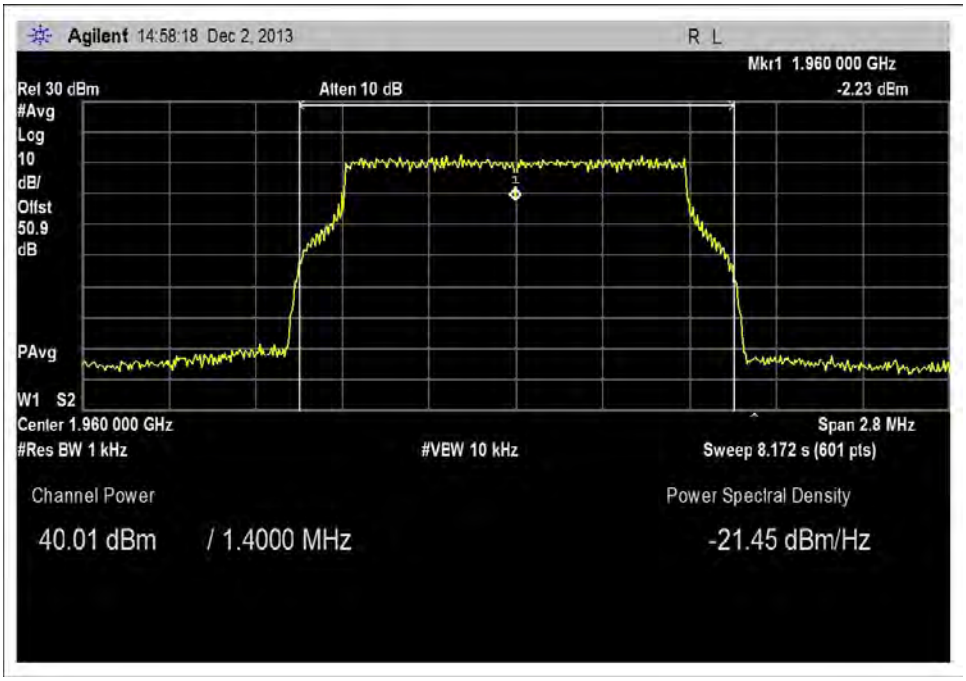
10W, WCDMA - Middle



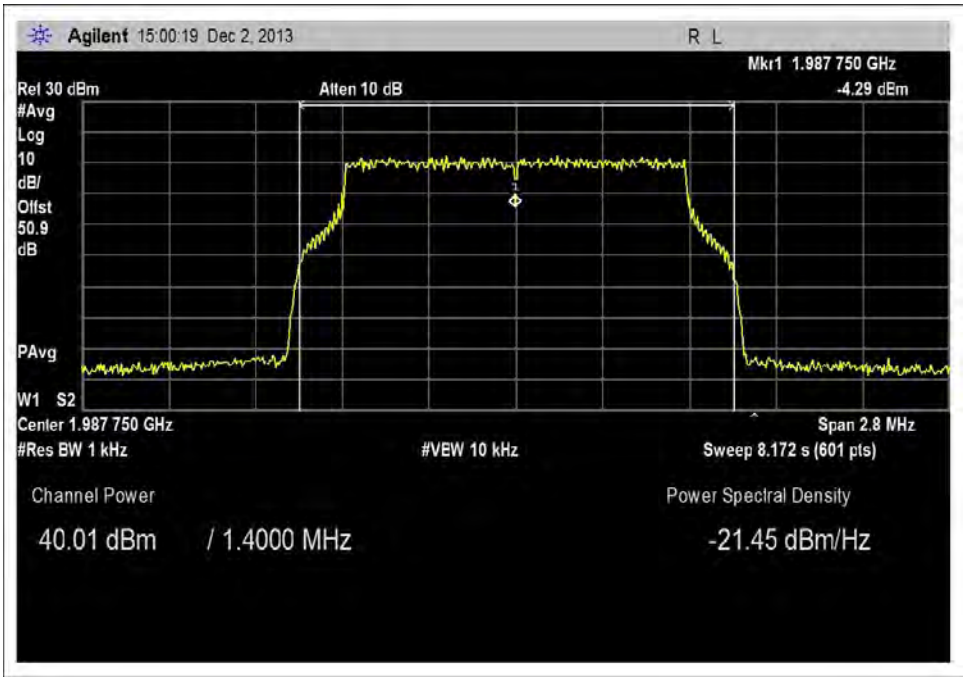
10W, WCDMA - High



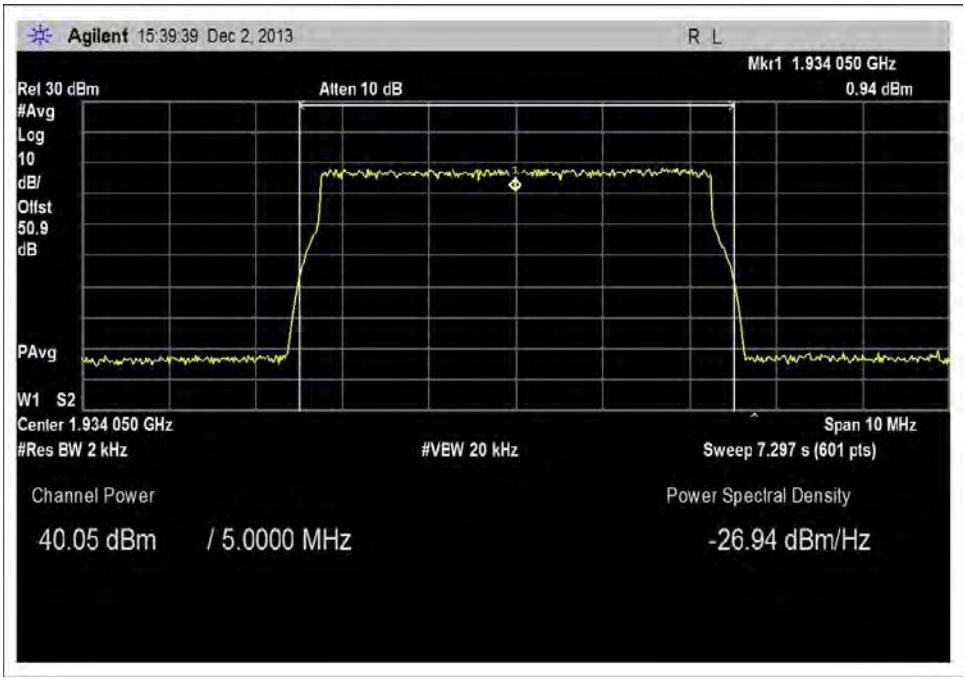
10W, LTE 1.4MHz - Low



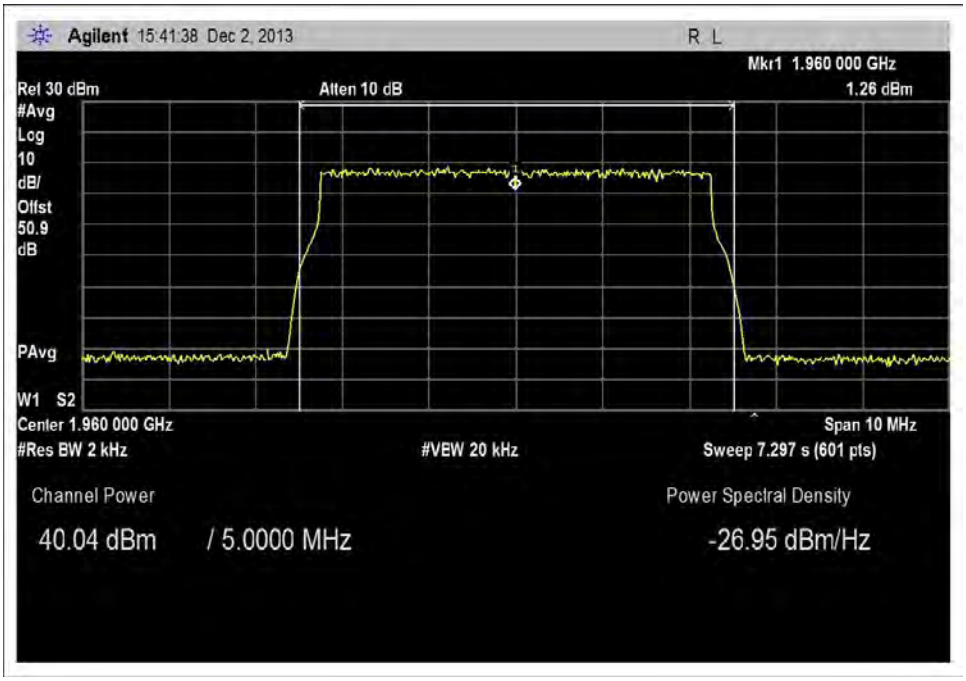
10W, LTE 1.4MHz - Middle



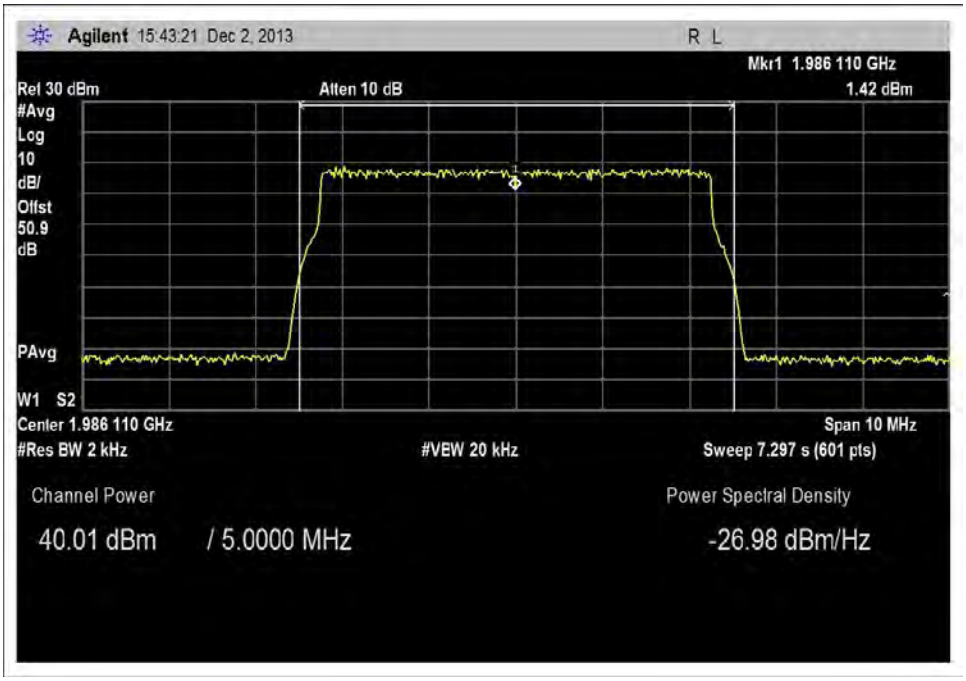
10W, LTE 1.4MHz - High



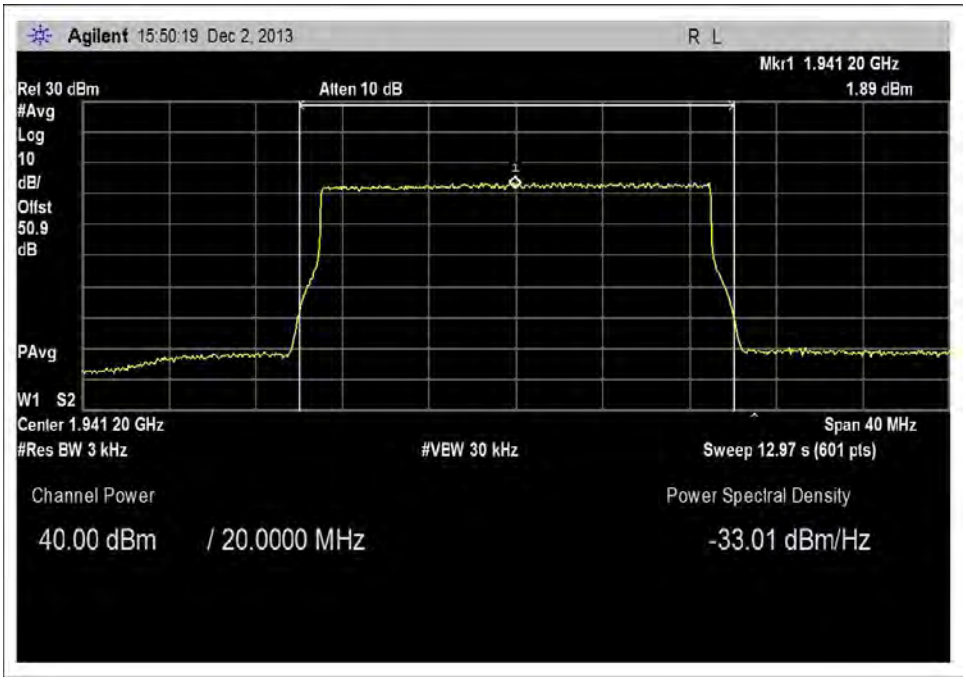
10W, LTE 5MHz - Low



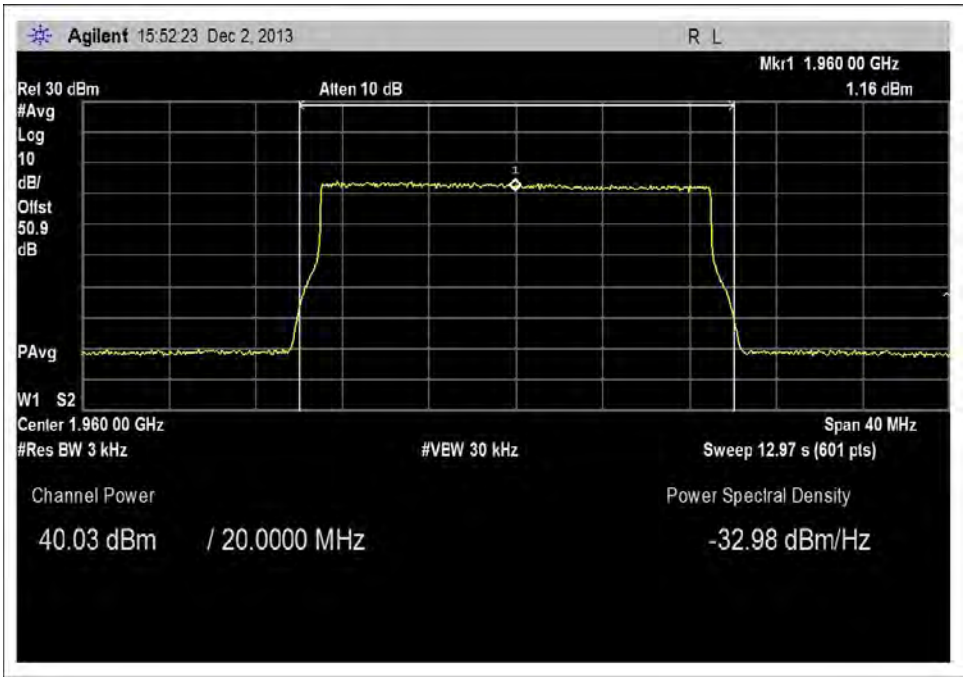
10W, LTE 5MHz - Middle



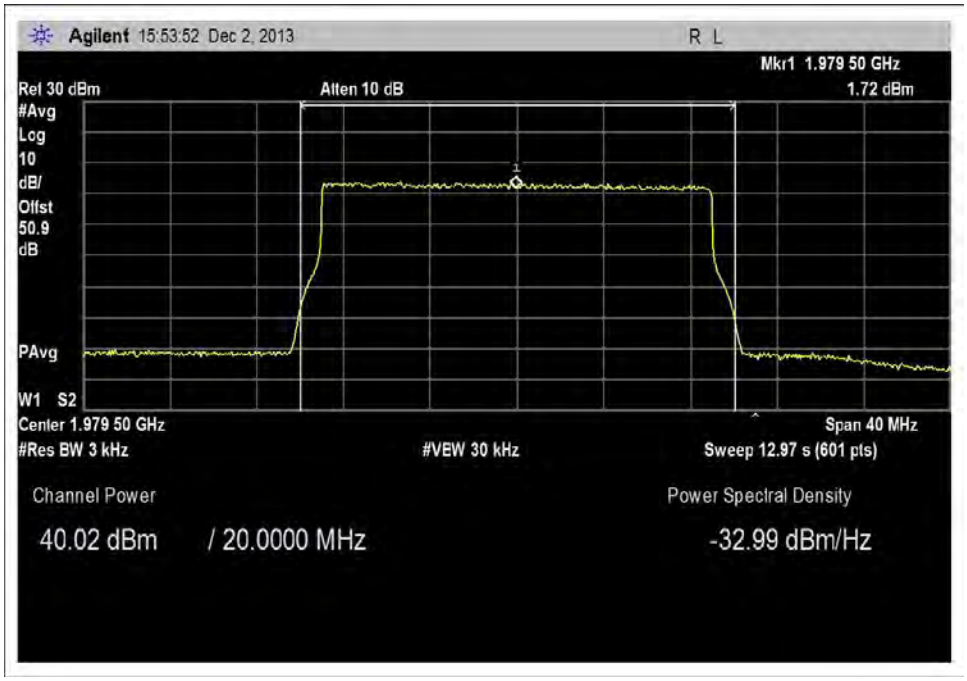
10W, LTE 5MHz - High



10W, LTE 20MHz - Low



10W, LTE 20MHz - Middle



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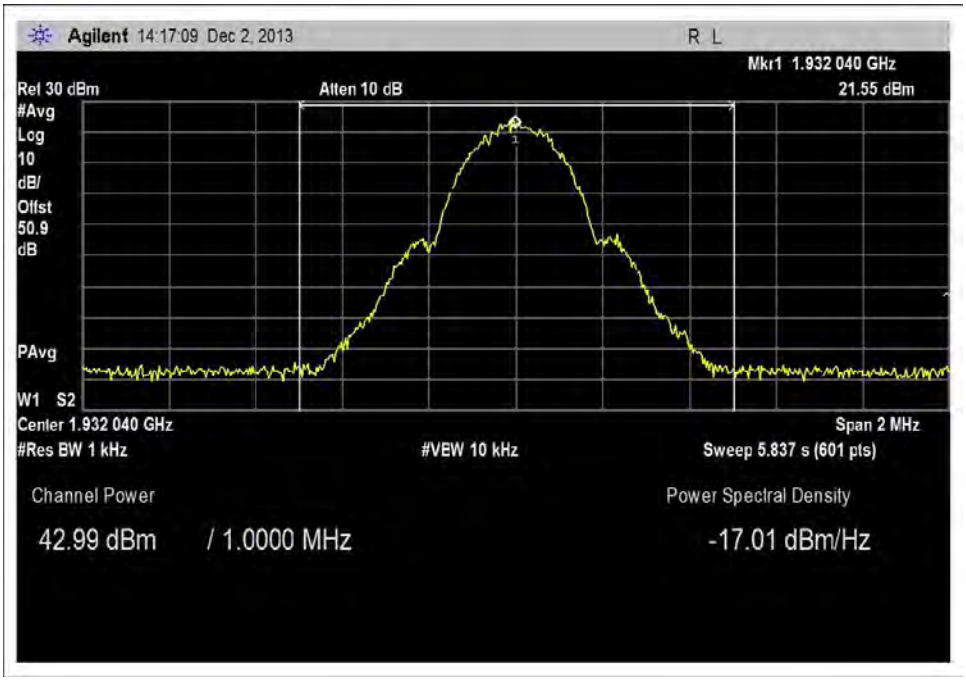
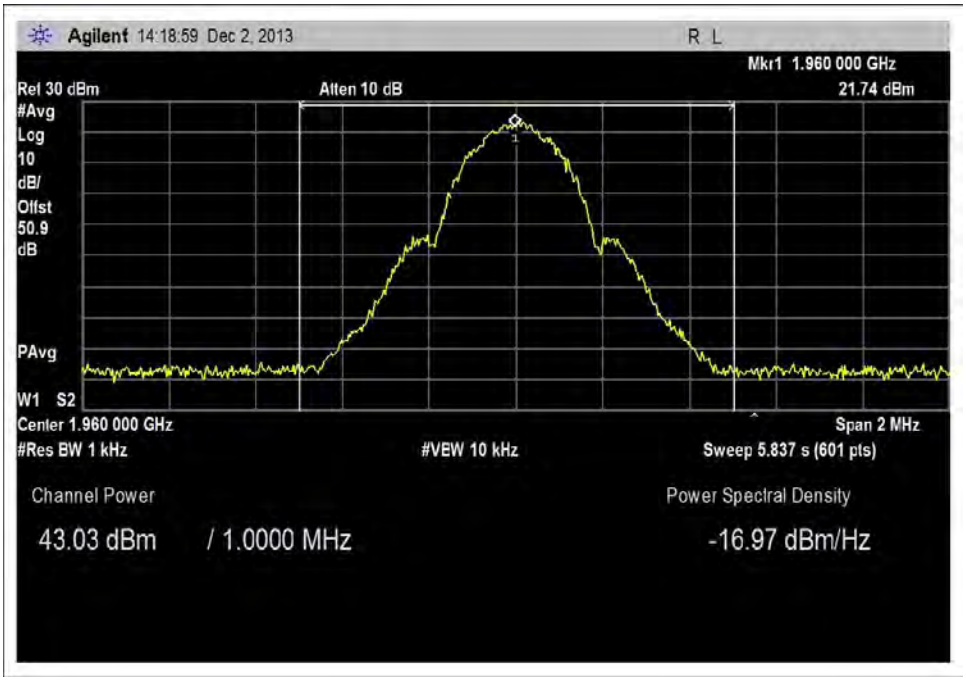
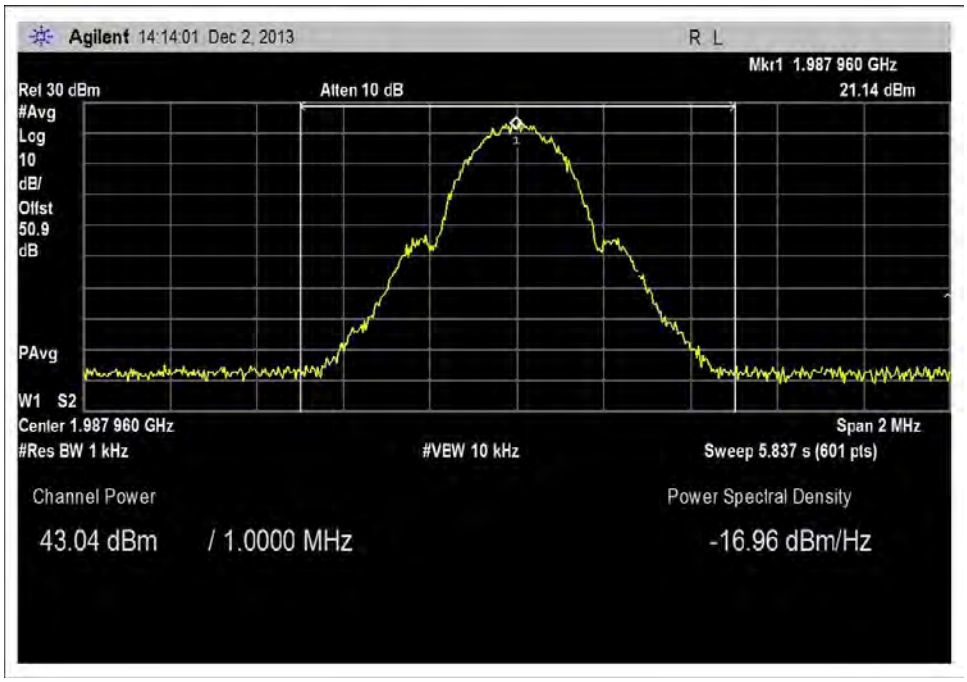


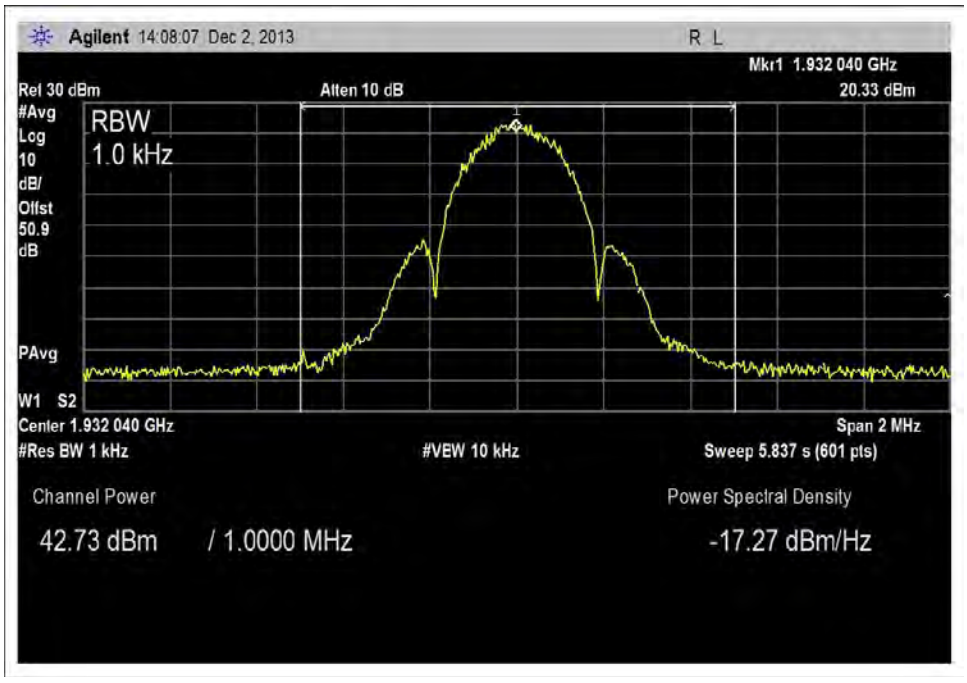
20W, GSM - Low



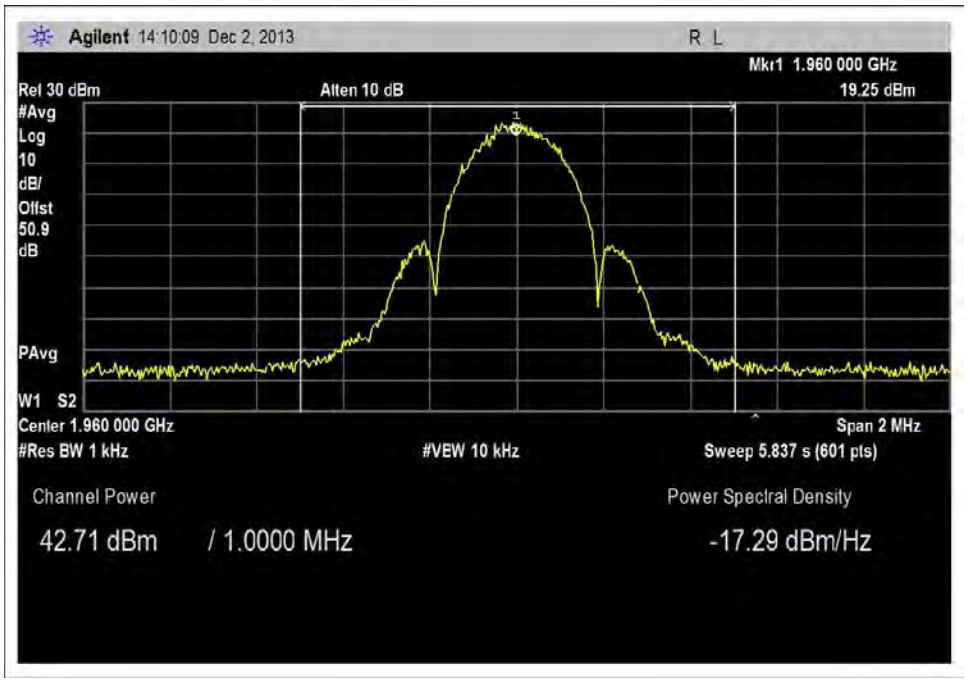
20W, GSM - Middle



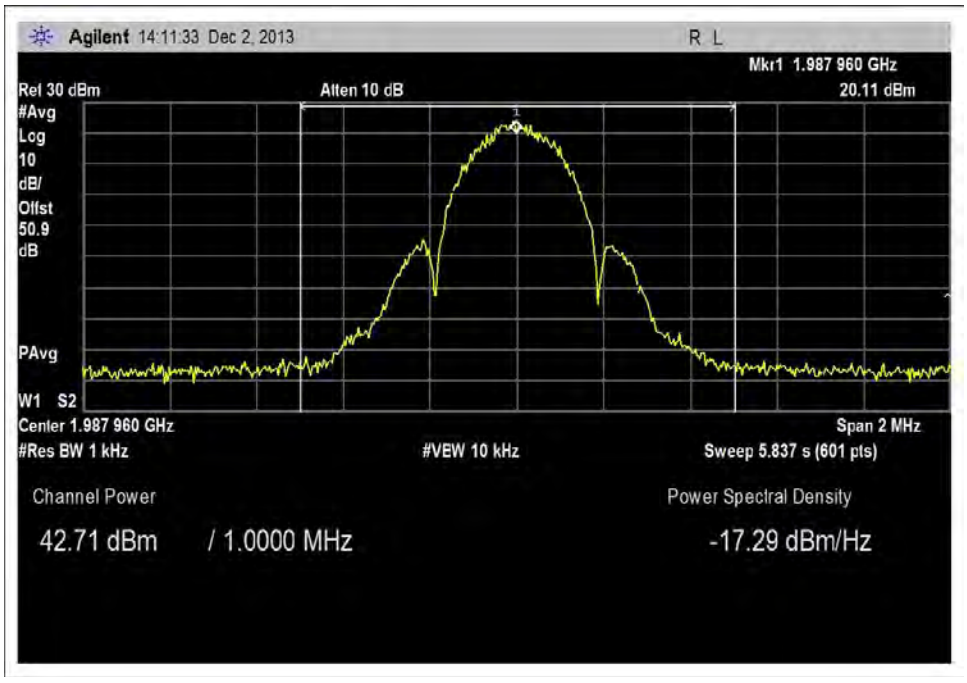
20W, GSM 1MHz - High



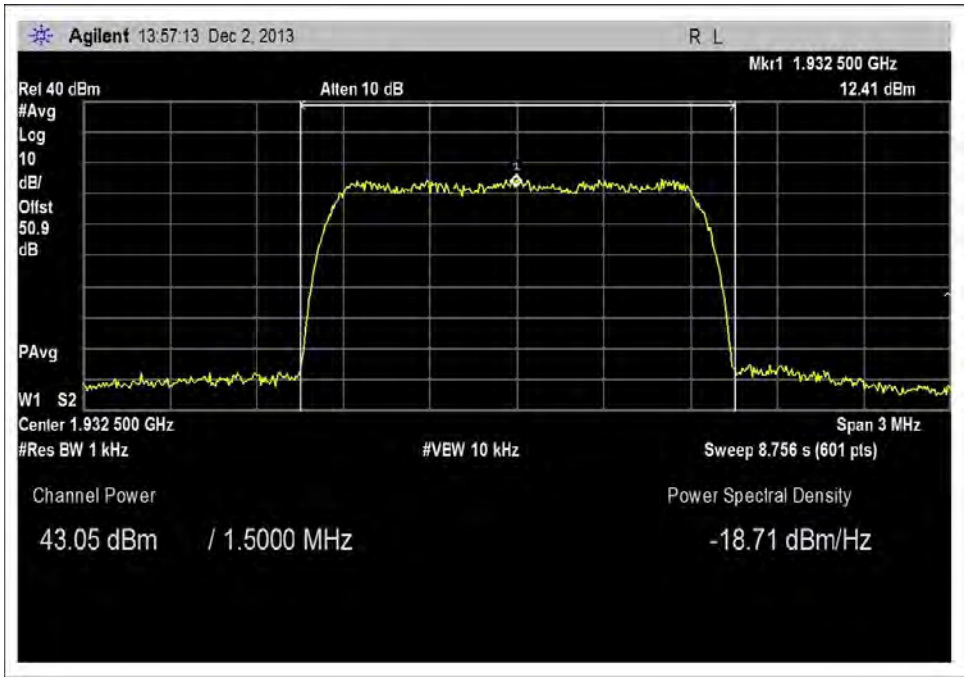
20W, EDGE - Low



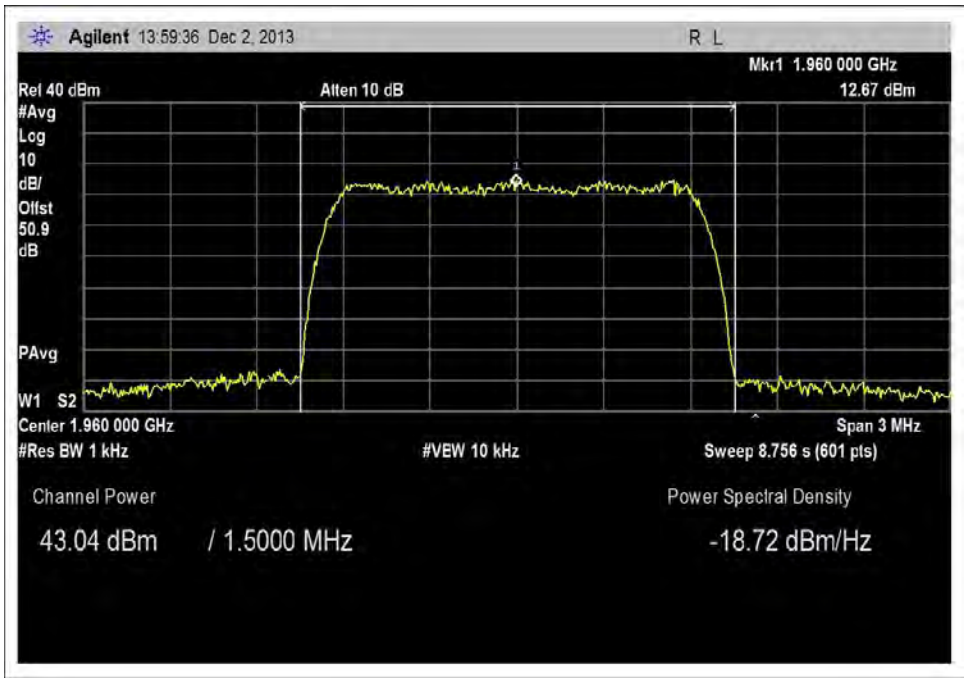
20W, EDGE - Middle



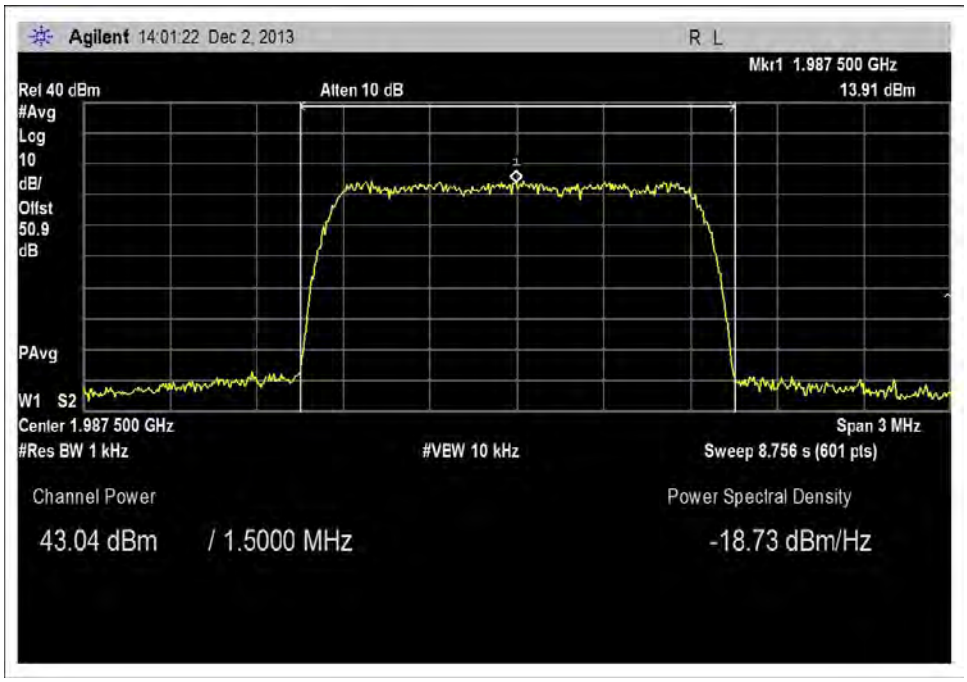
20W, EDGE – High



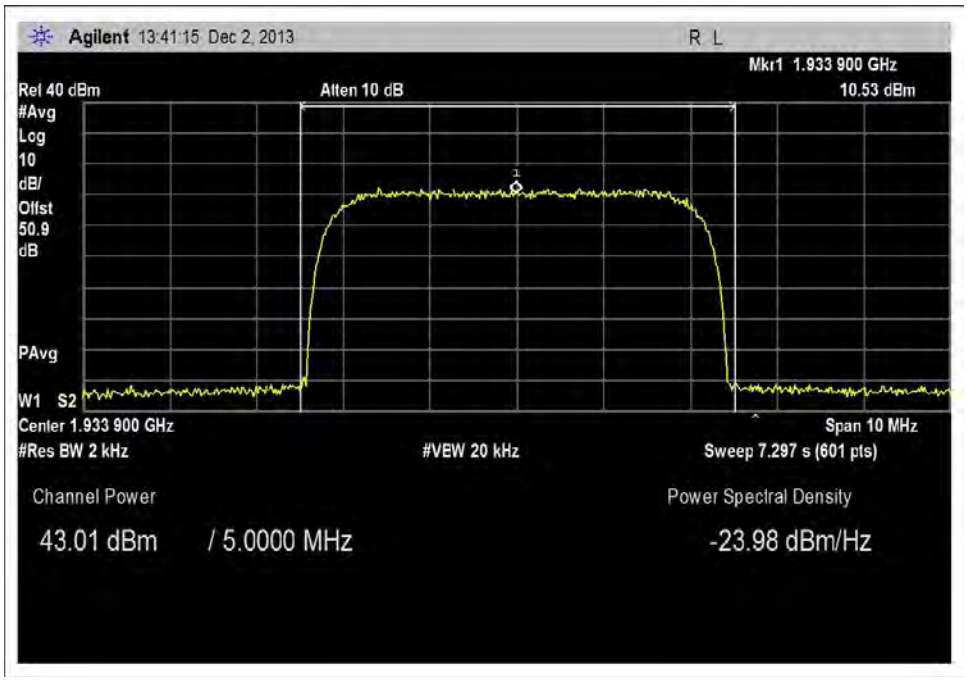
20W, CDMA IS95A - Low



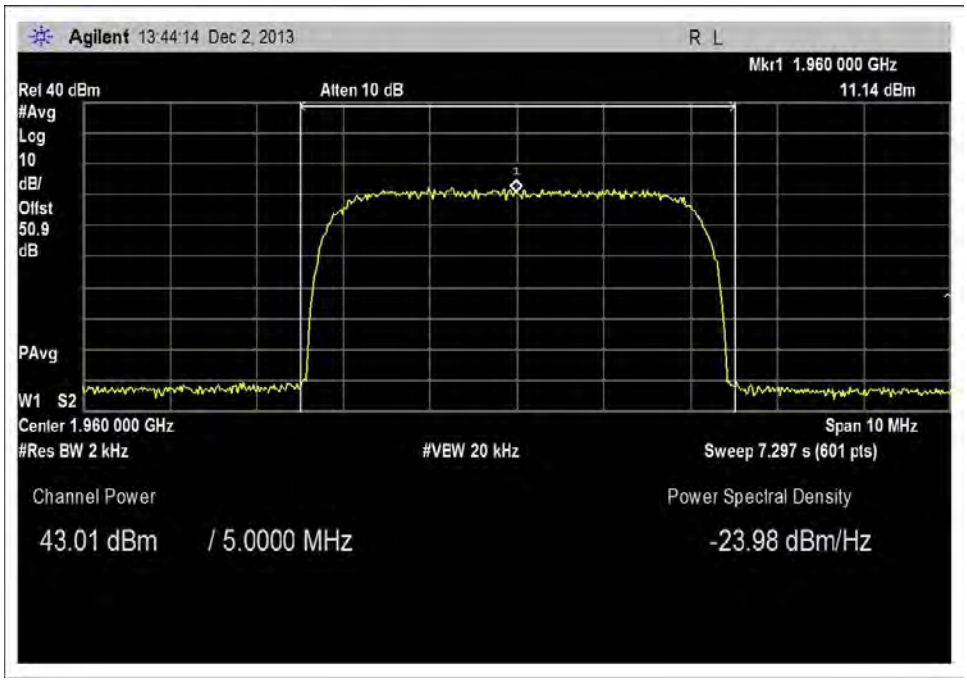
20W, CDMA IS95A - Middle



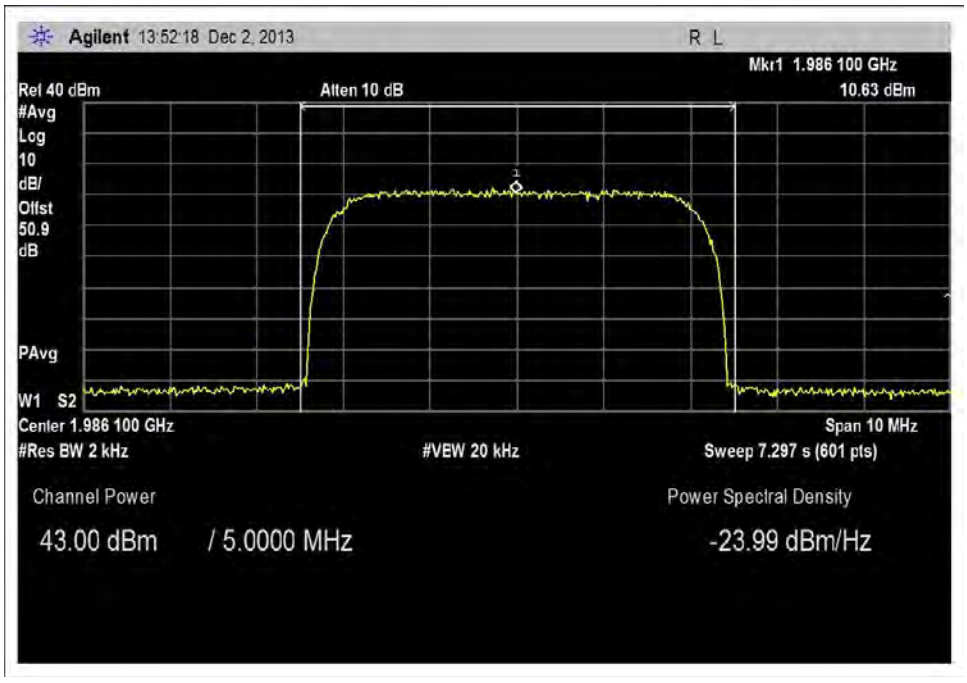
20W, CDMA IS95A - High



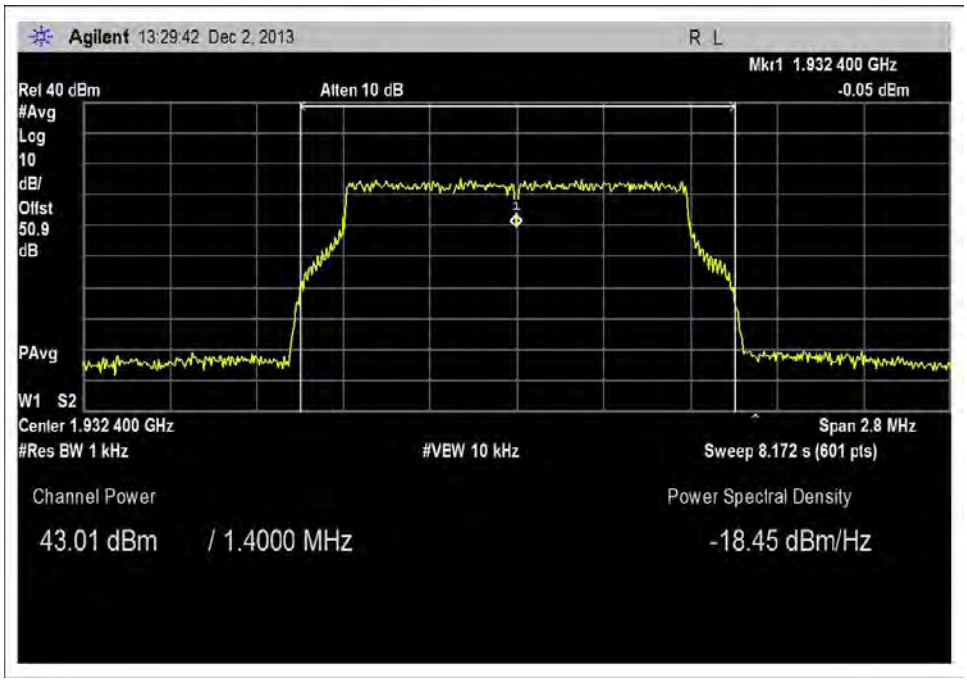
20W, WCDMA - Low



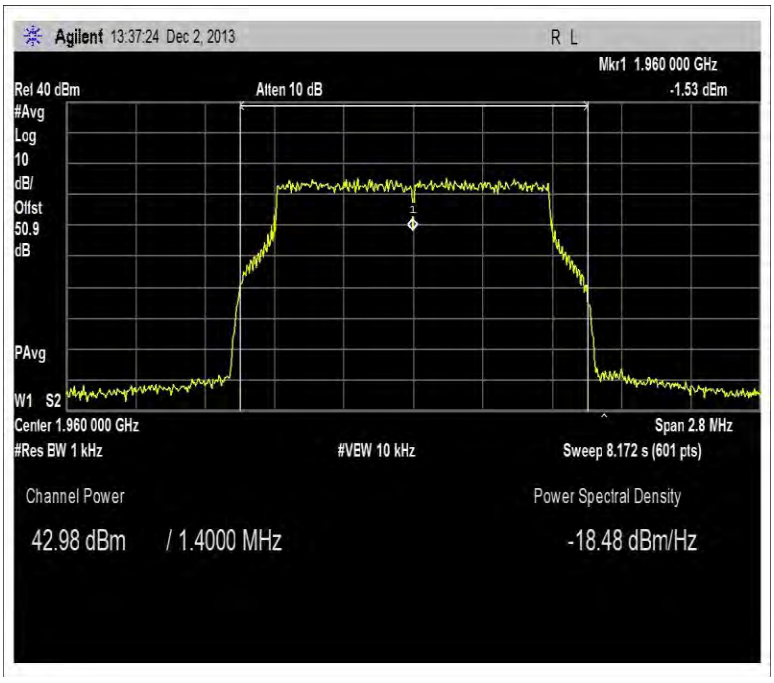
20W, WCDMA - Middle



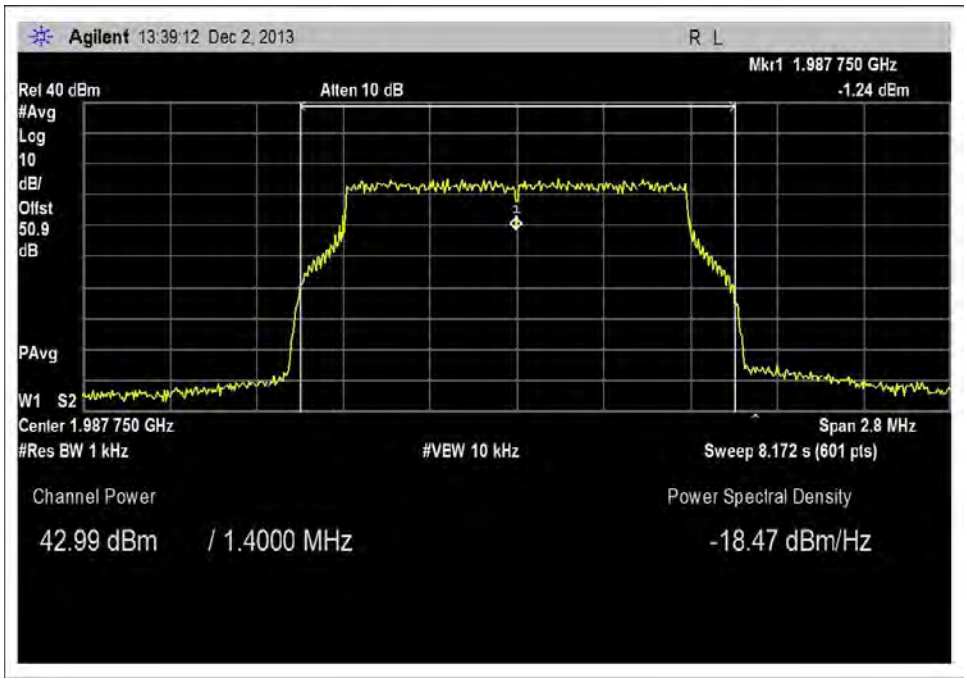
20W, WCDMA - High



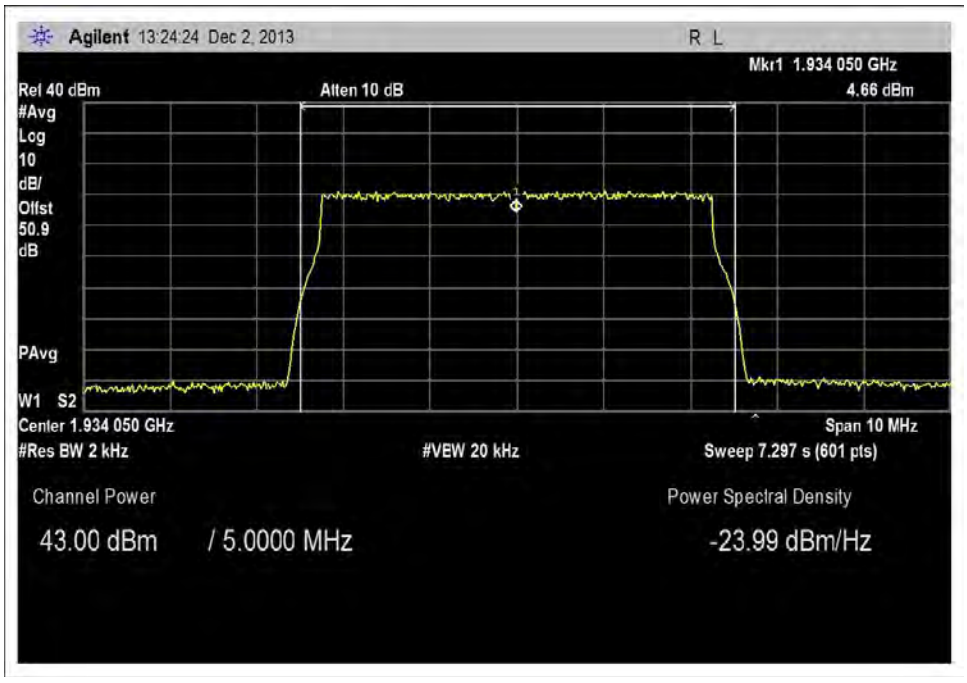
20W, LTE 1.4MHz - Low



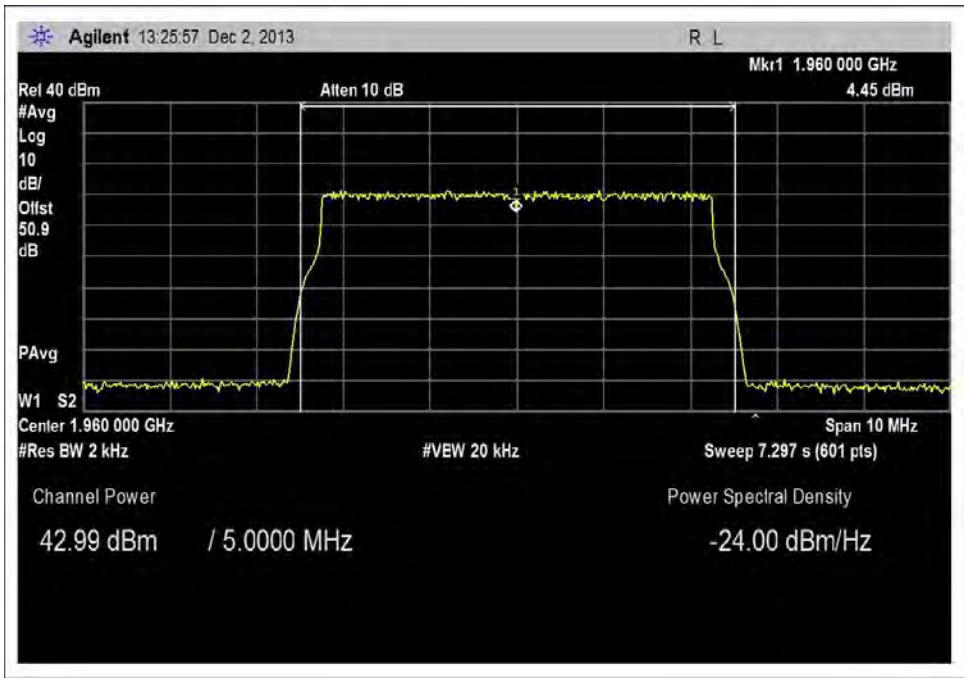
20W, LTE 1.4MHz - Middle



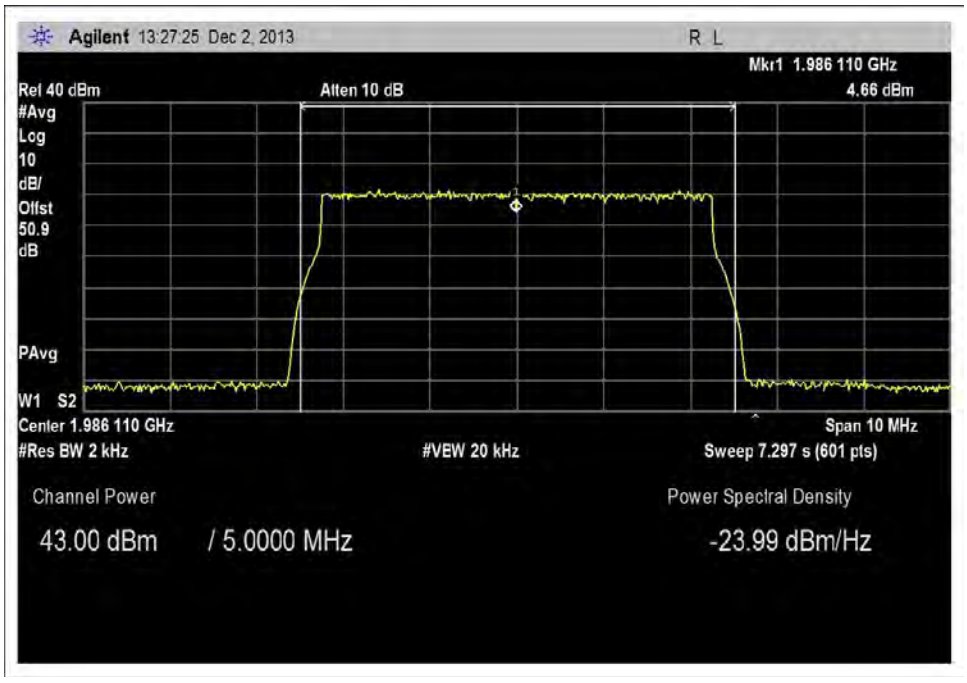
20W, LTE 1.4MHz - High



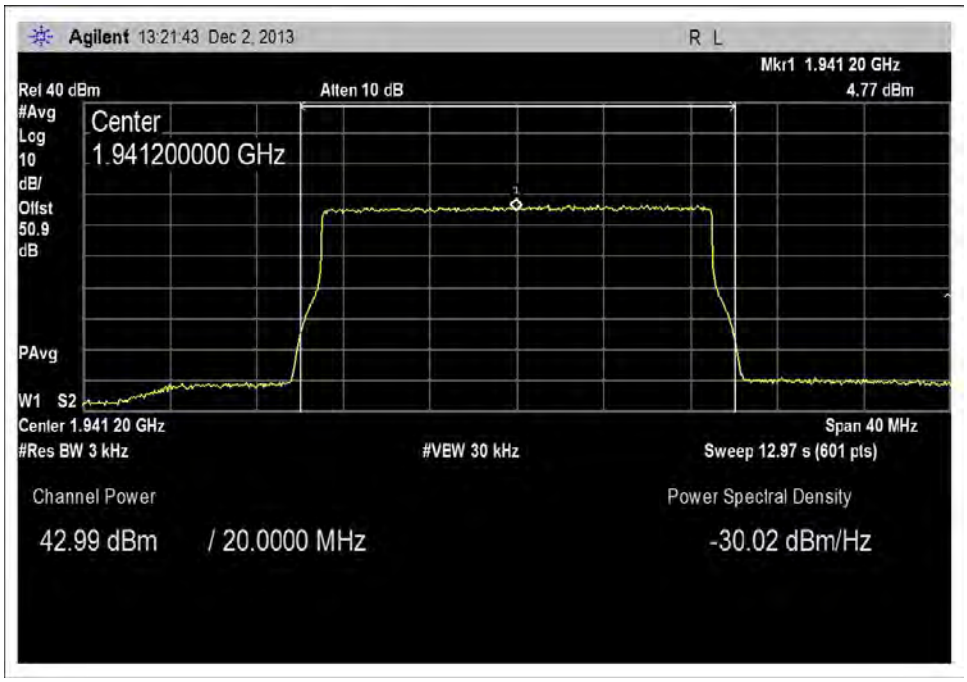
20W, LTE 5MHz - Low



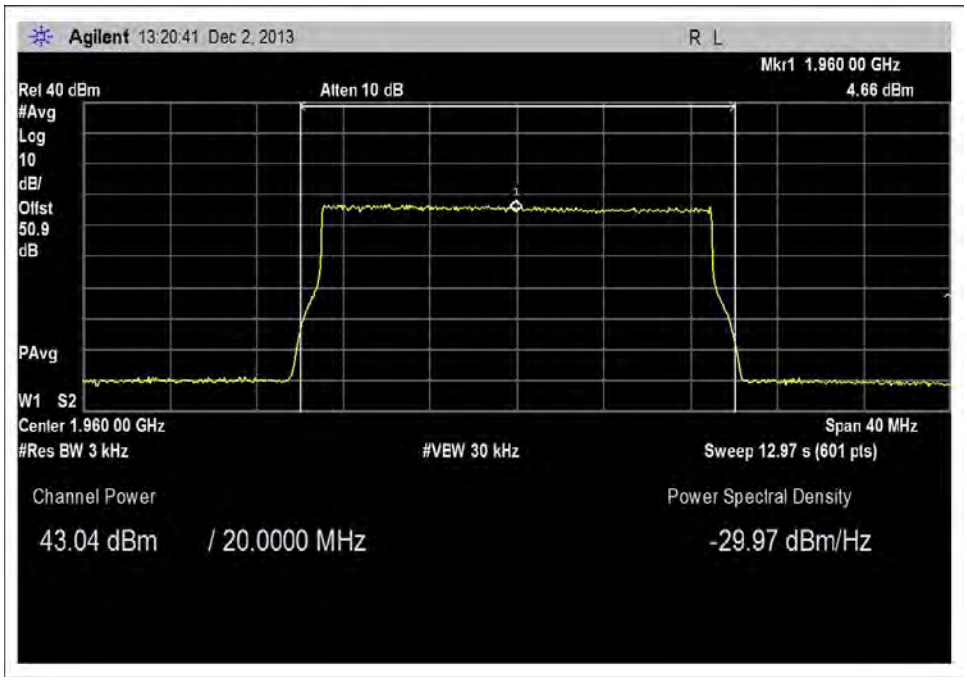
20W, LTE 5MHz - Middle



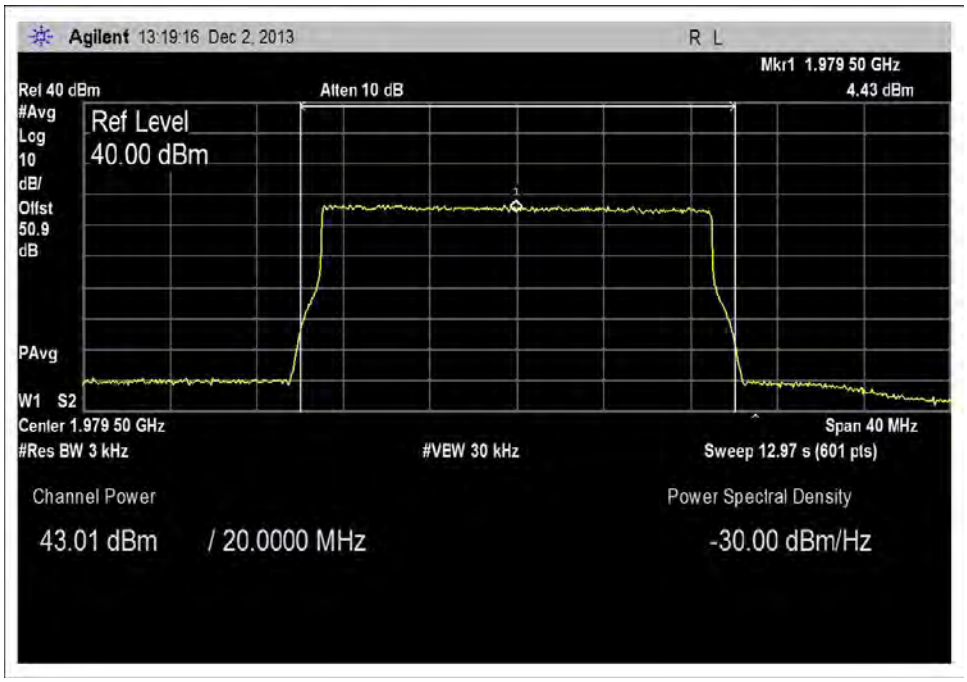
20W, LTE 5MHz - High



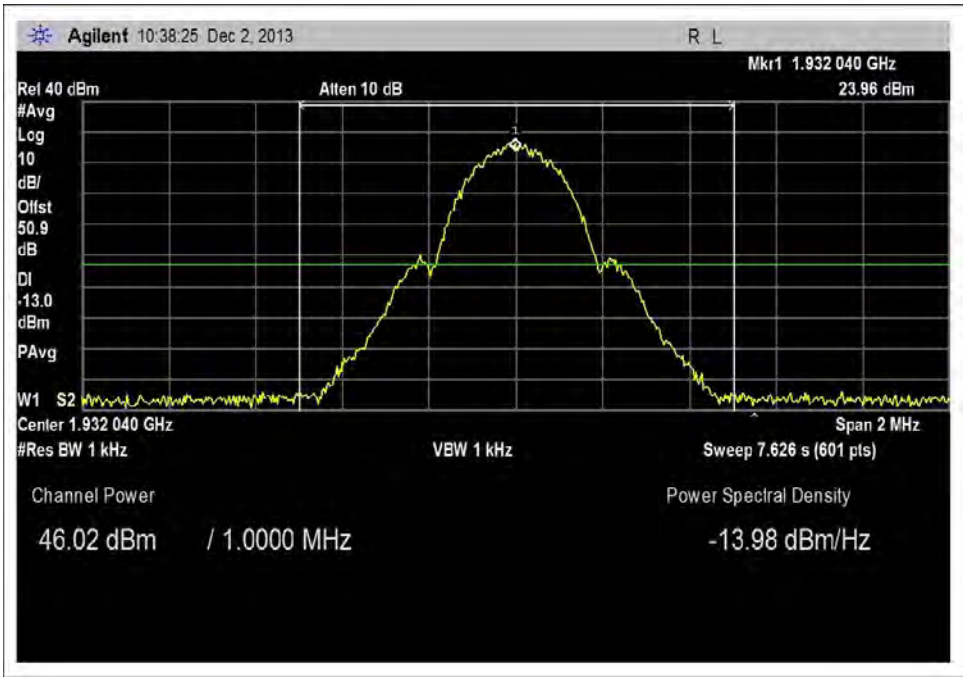
20W, LTE 20MHz - Low



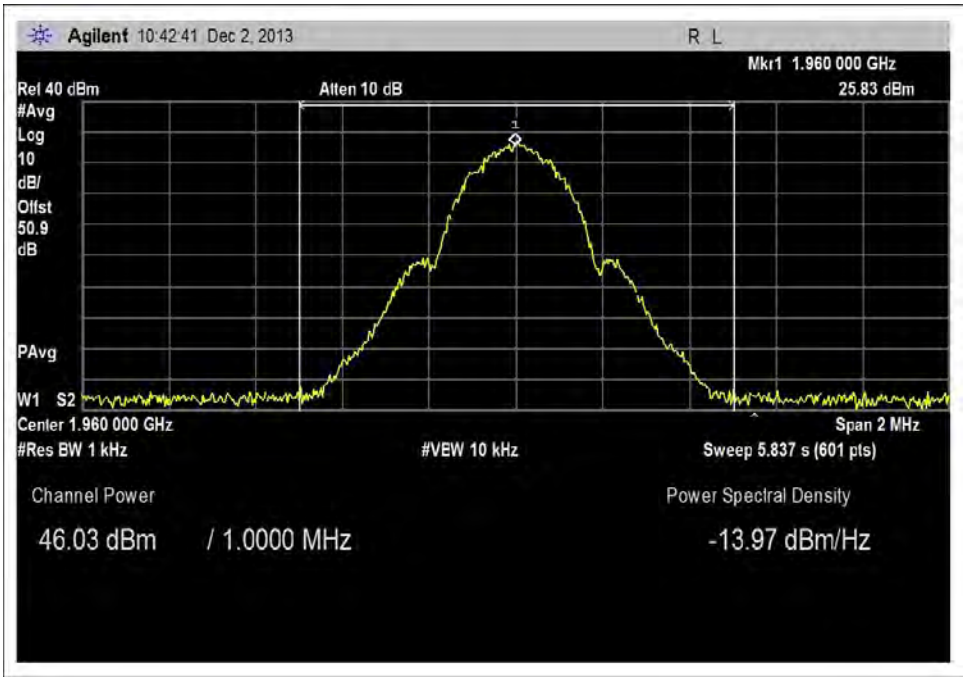
20W, LTE 20MHz - Middle



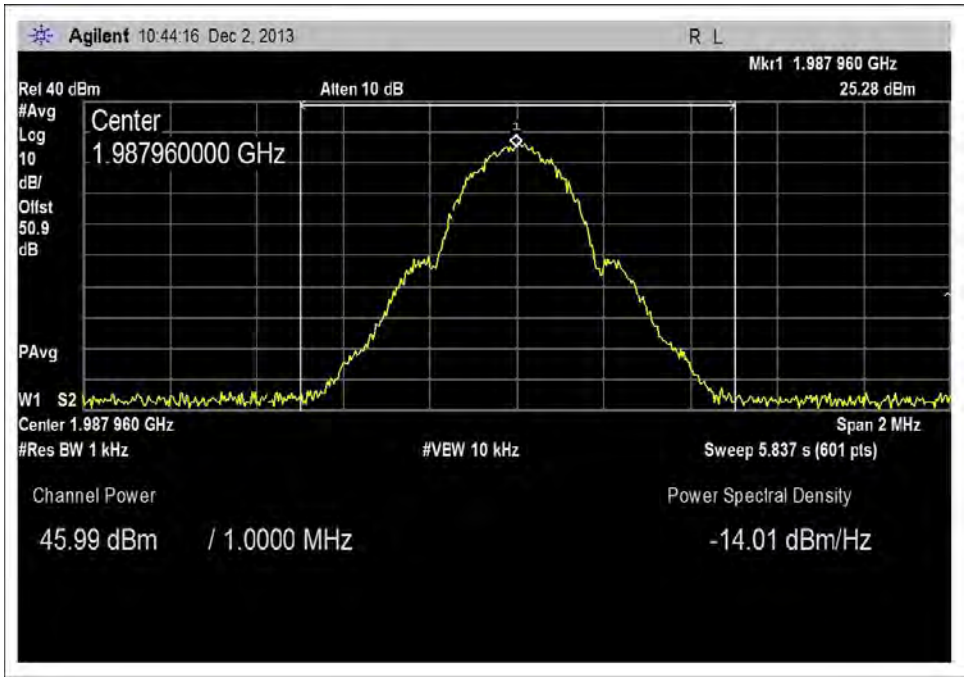
20W, LTE 20MHz - High



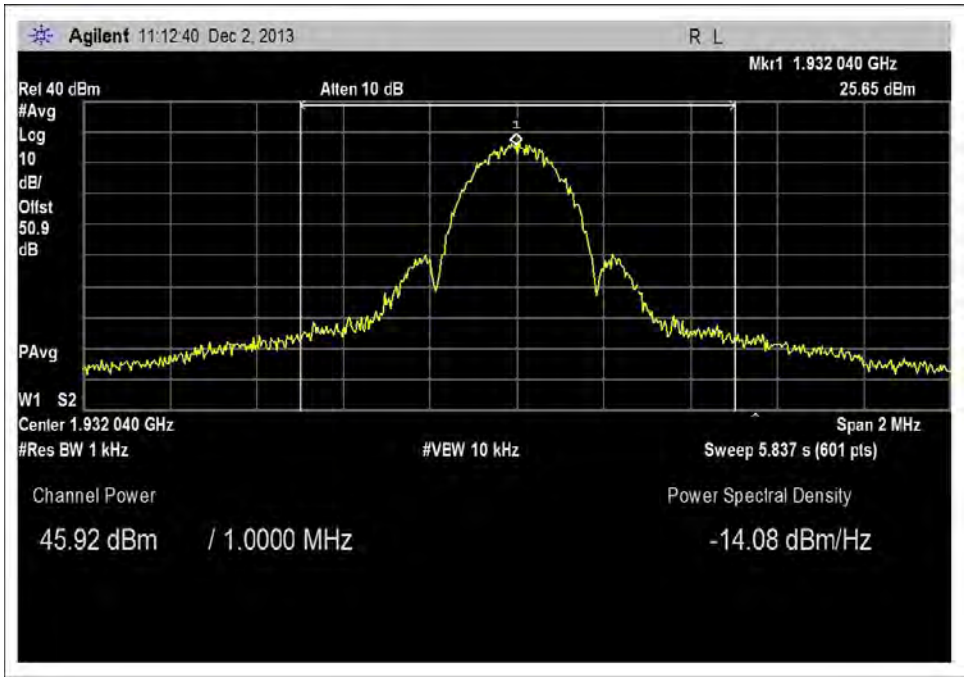
40W, GSM - Low



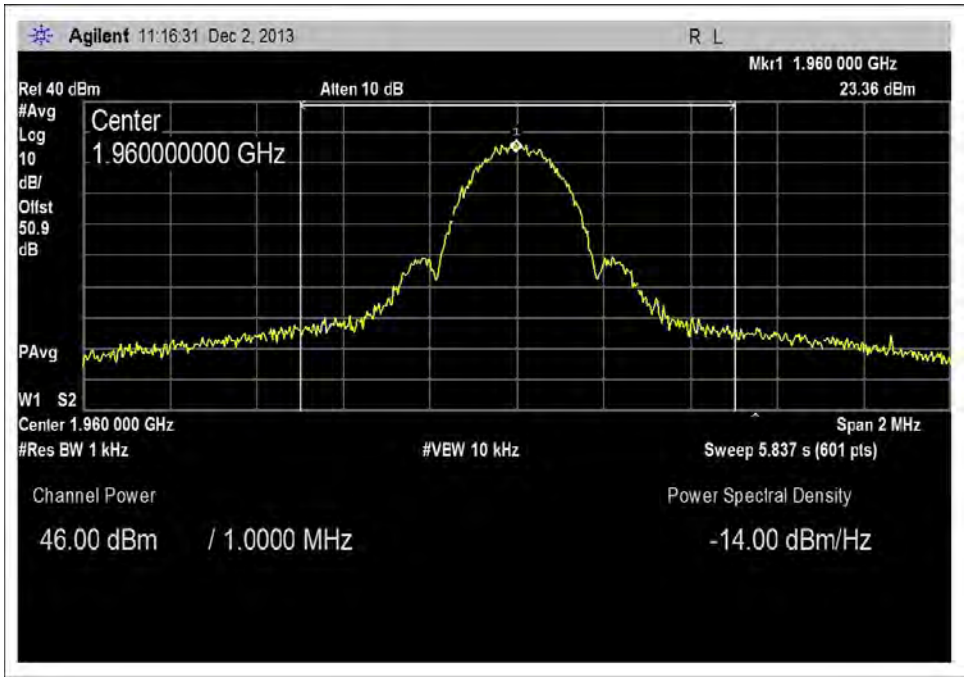
40W, GSM - Middle



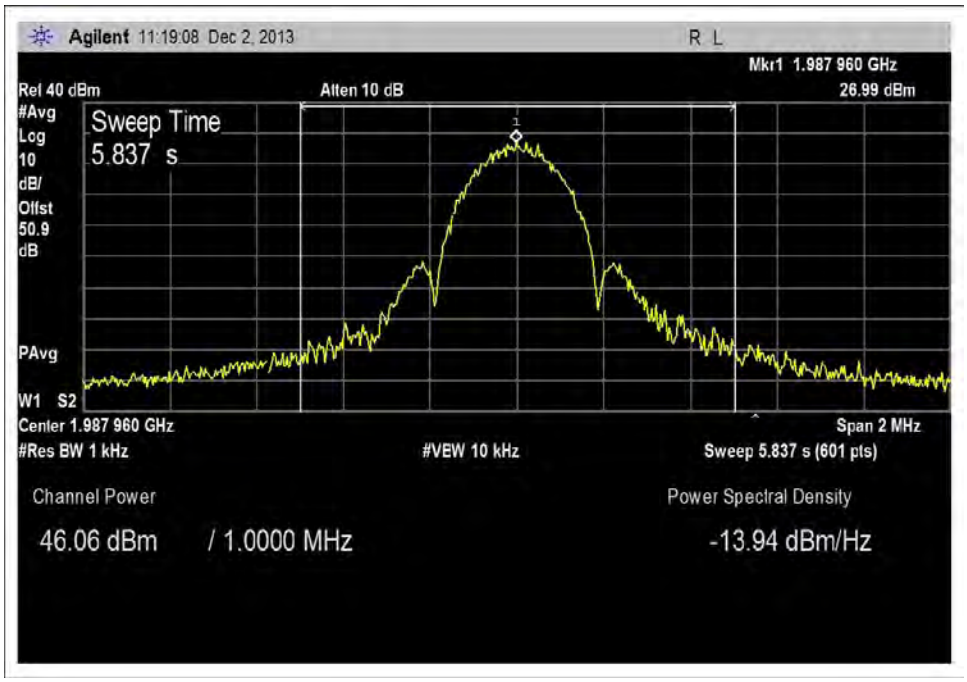
40W, GSM - High



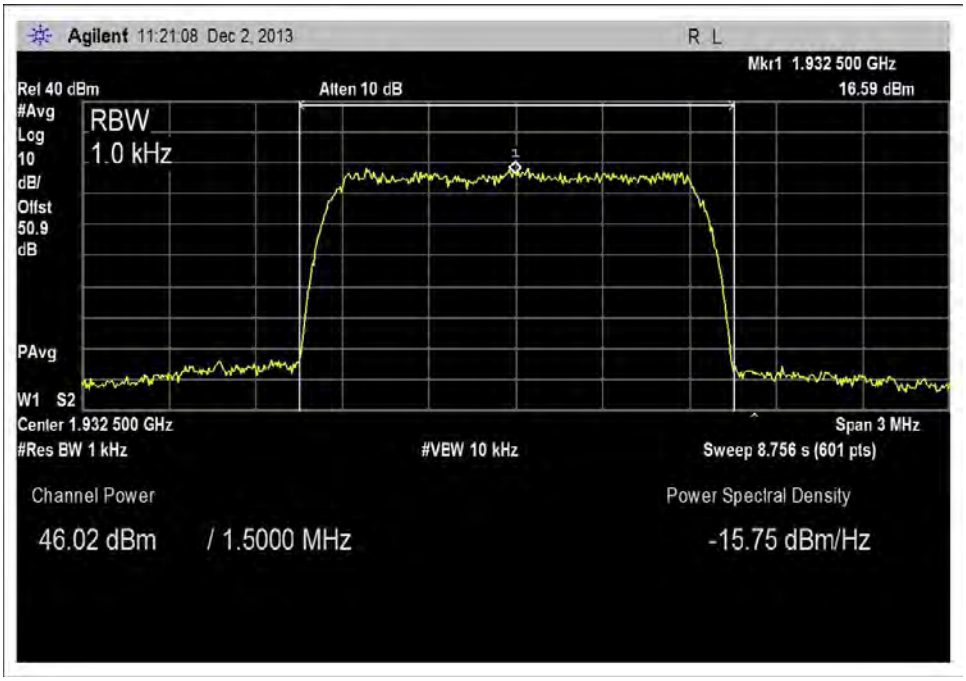
40W, EDGE - Low



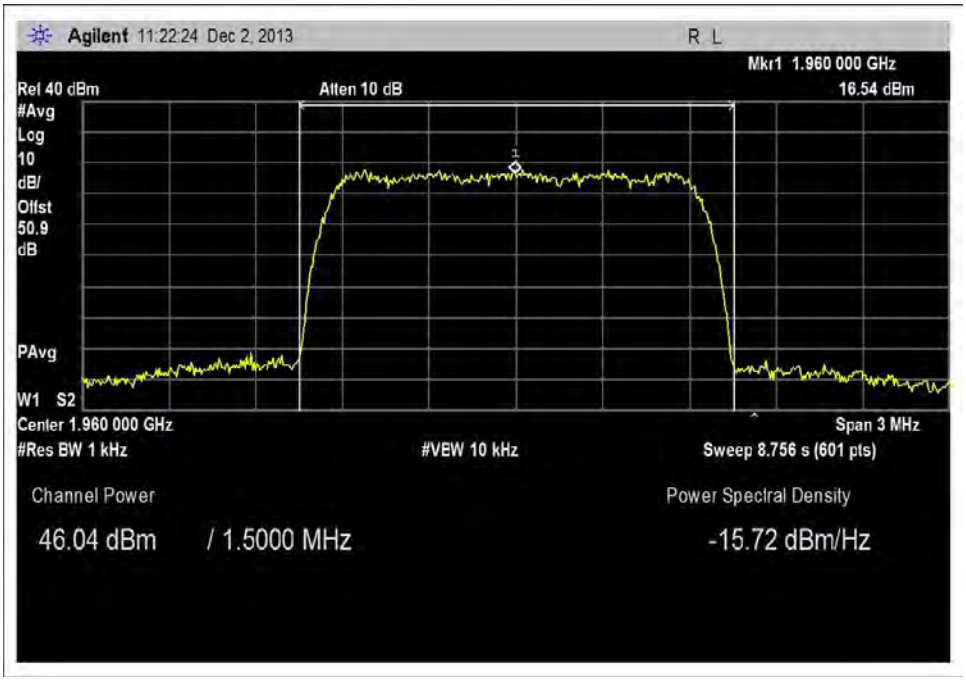
40W, EDGE - Middle



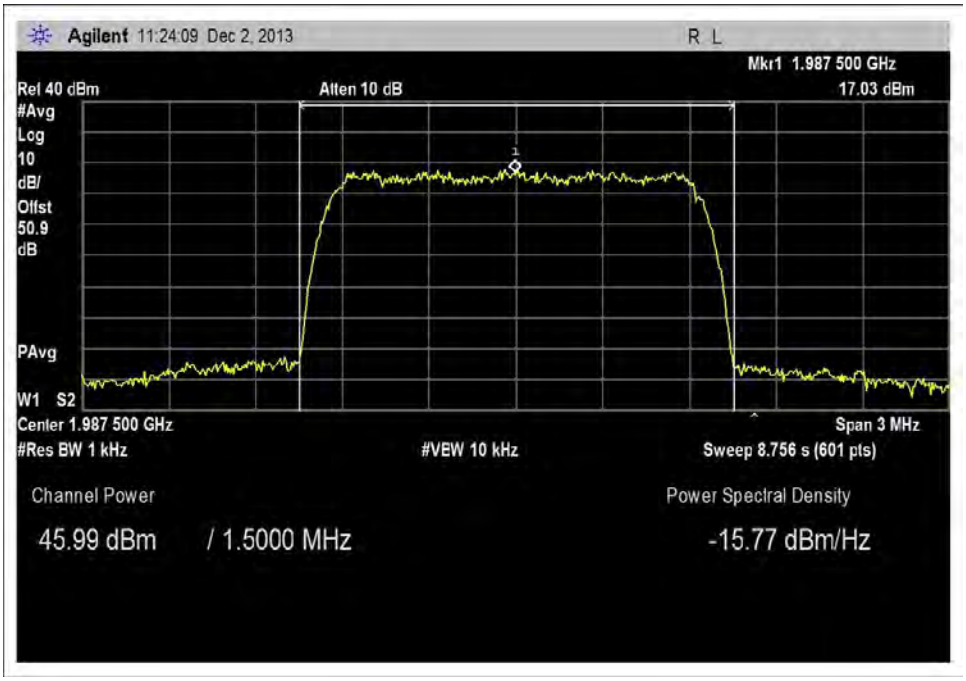
40W, EDGE - High



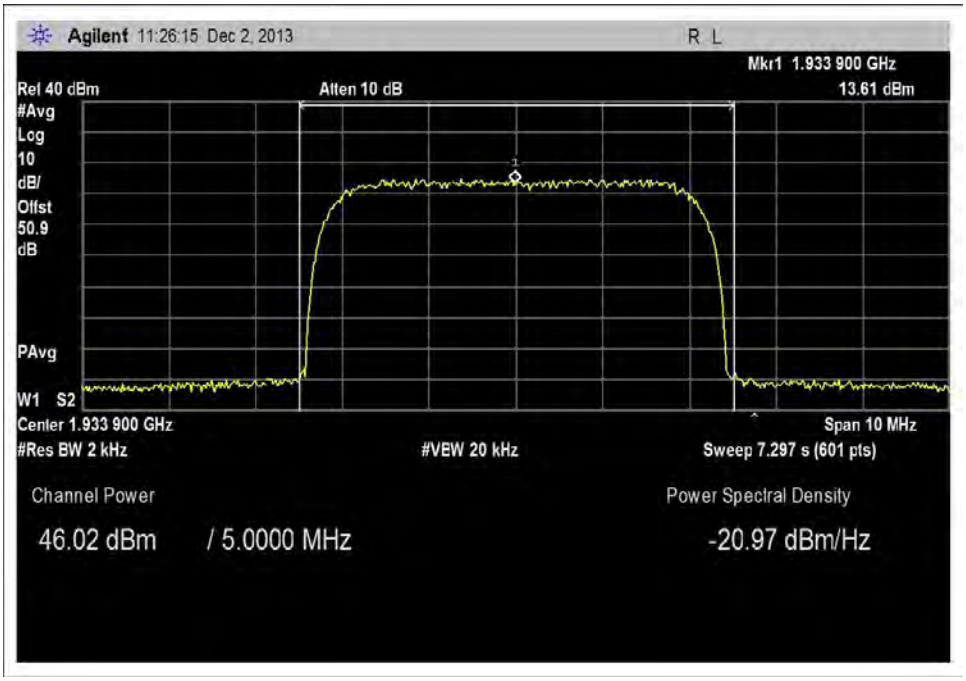
40W, CDMA S95A - Low



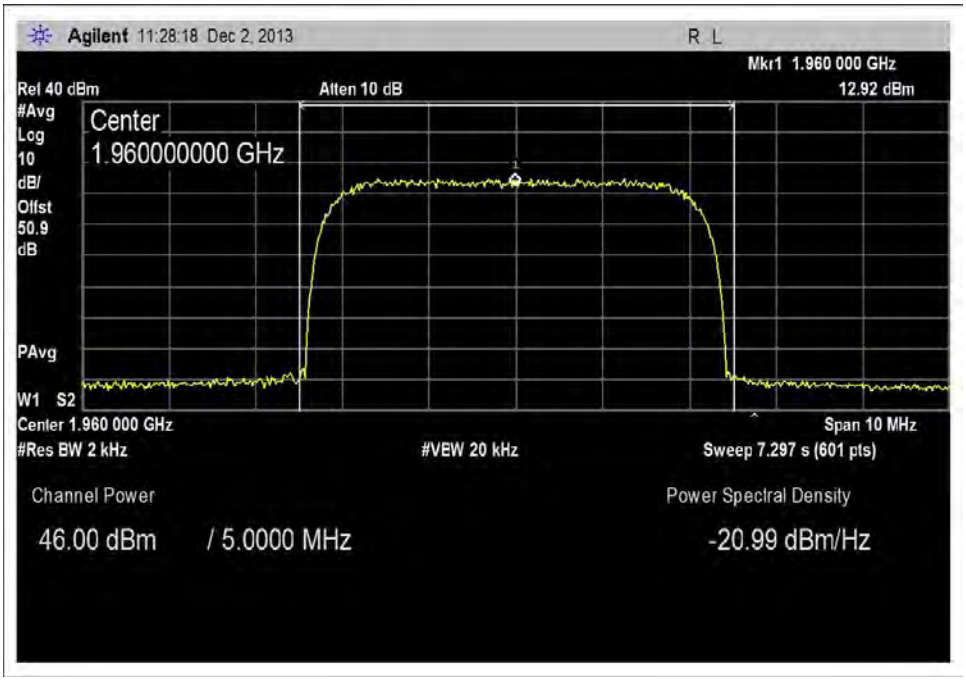
40W, CDMA S95A - Middle



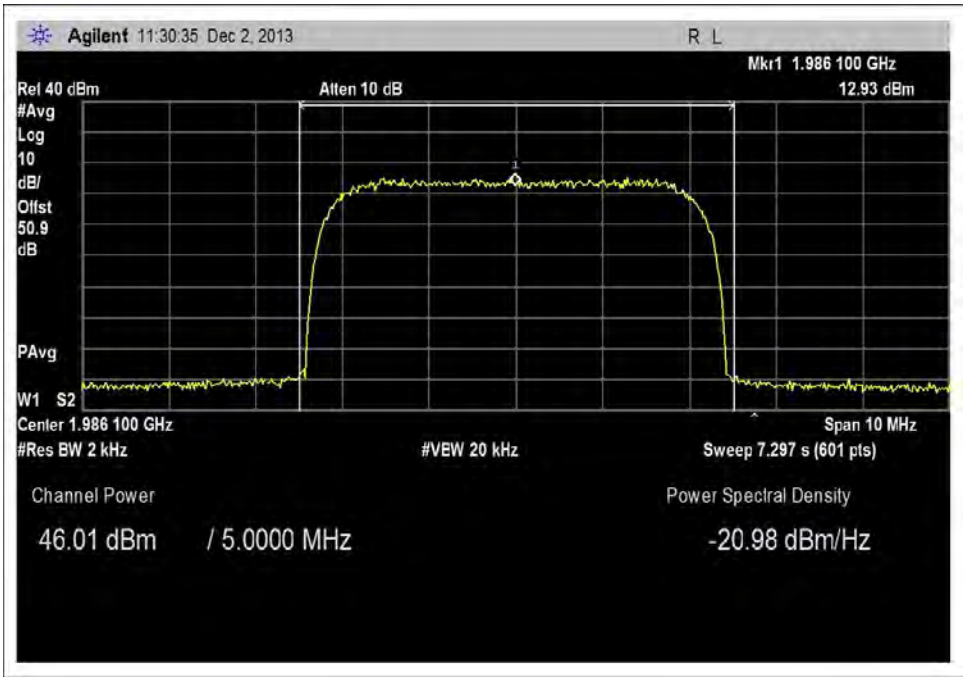
40W, CDMA S95A - High



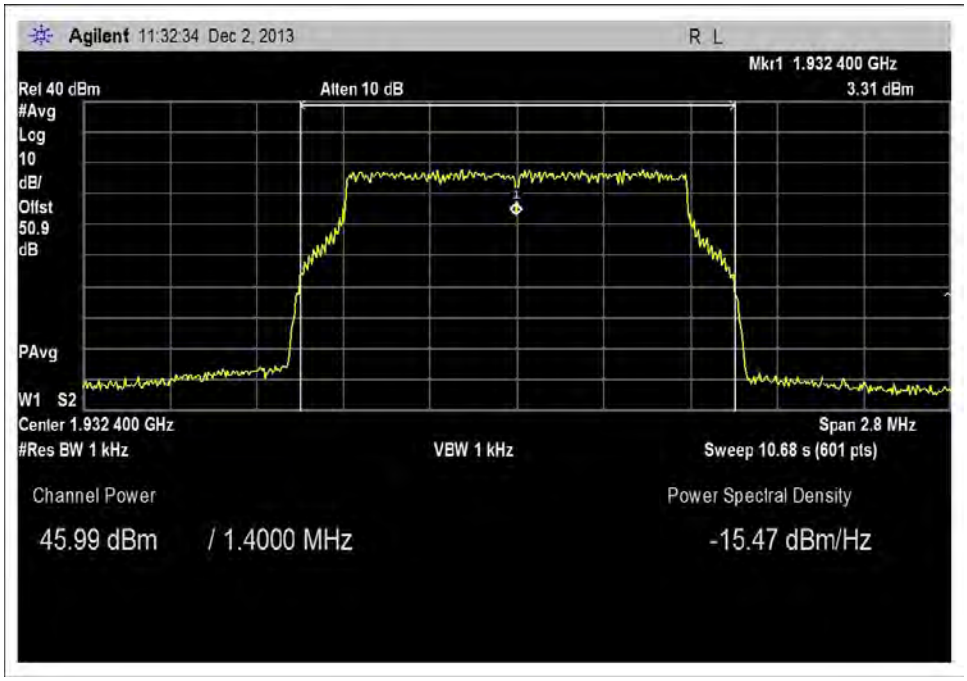
40W, WCDMA - Low



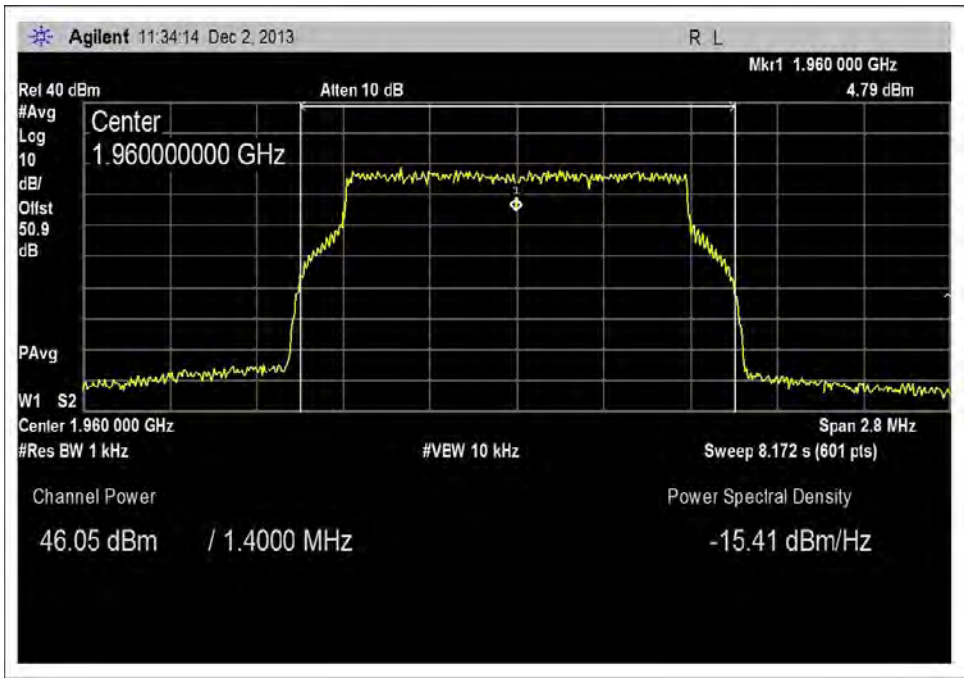
40W, WCDMA - Middle



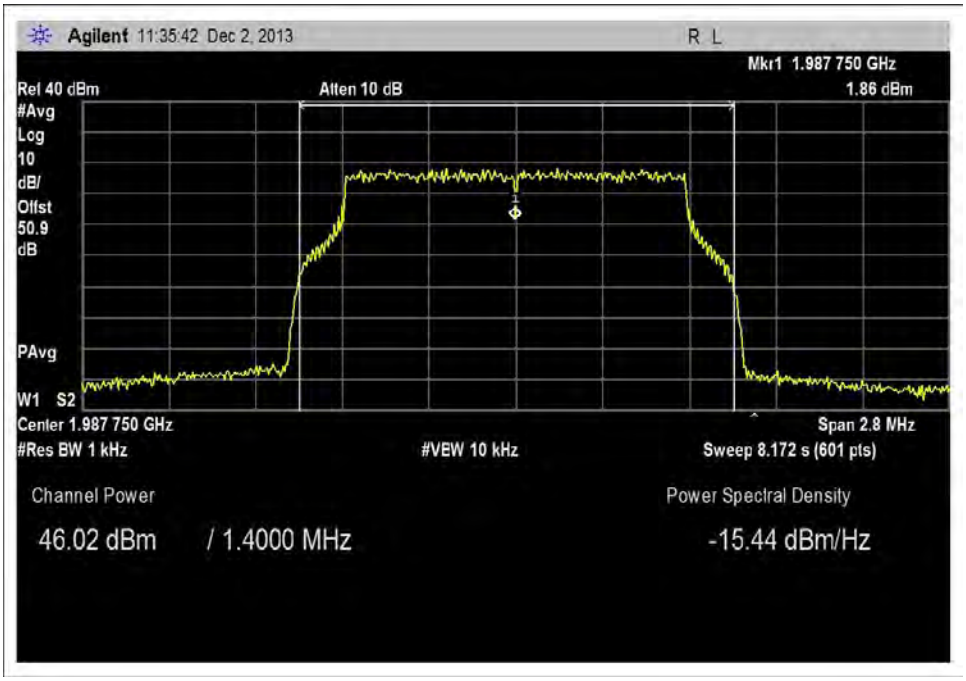
40W, WCDMA - High



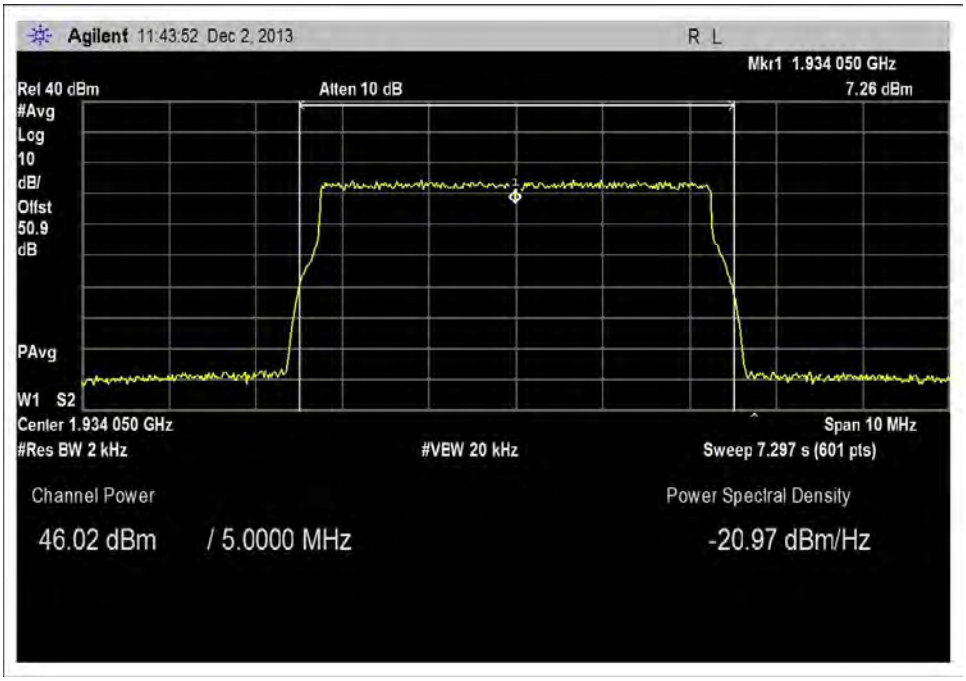
40W, LTE 1.4MHz - Low



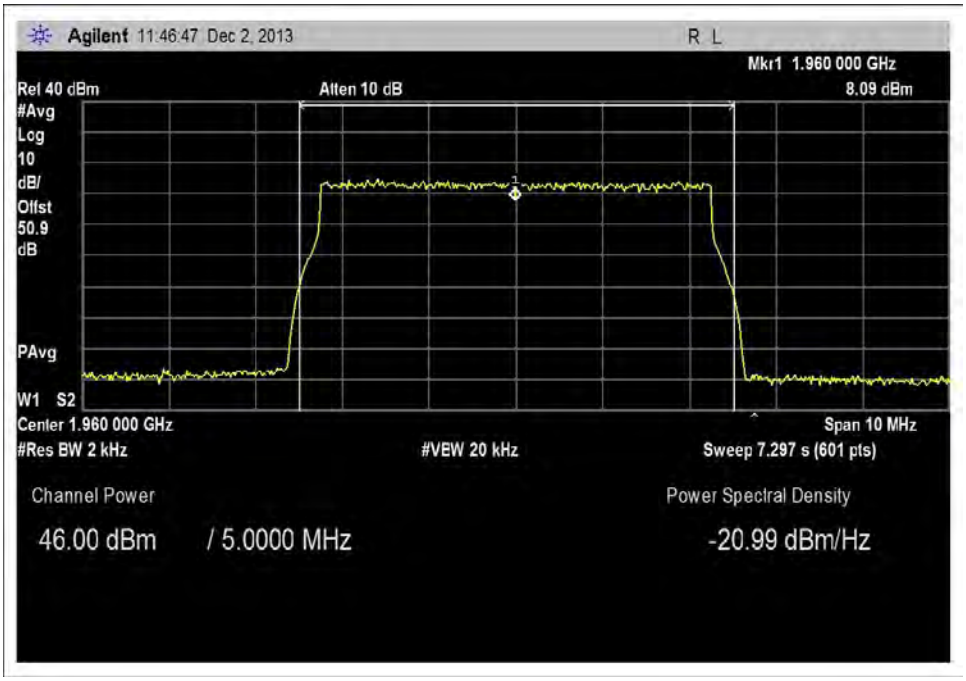
40W, LTE 1.4MHz - Middle



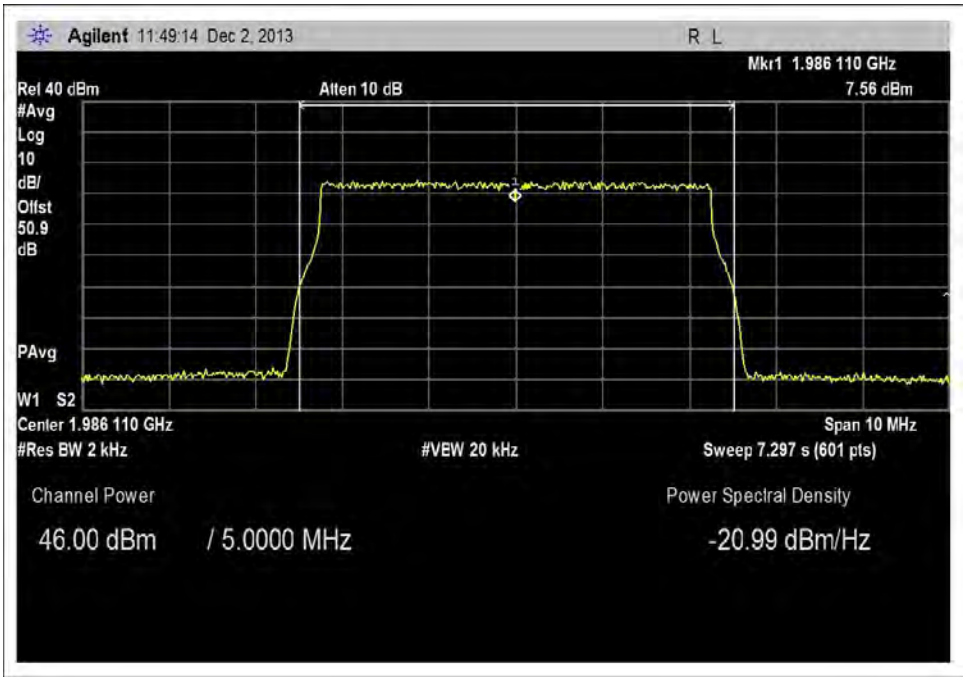
40W, LTE 1.4MHz - High



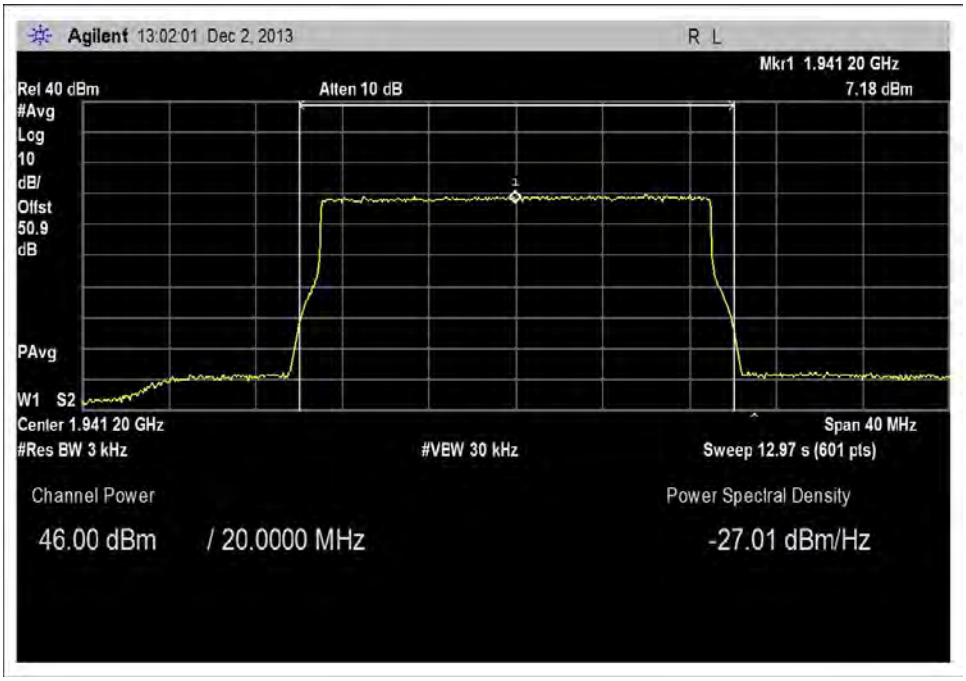
40W, LTE 5MHz - Low



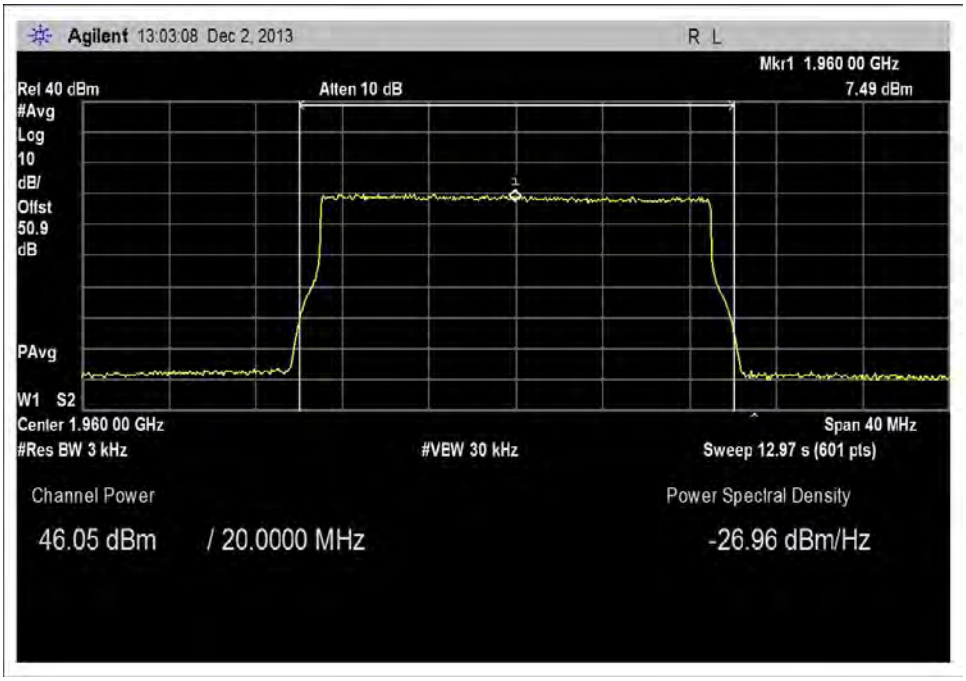
40W, LTE 5MHz - Middle



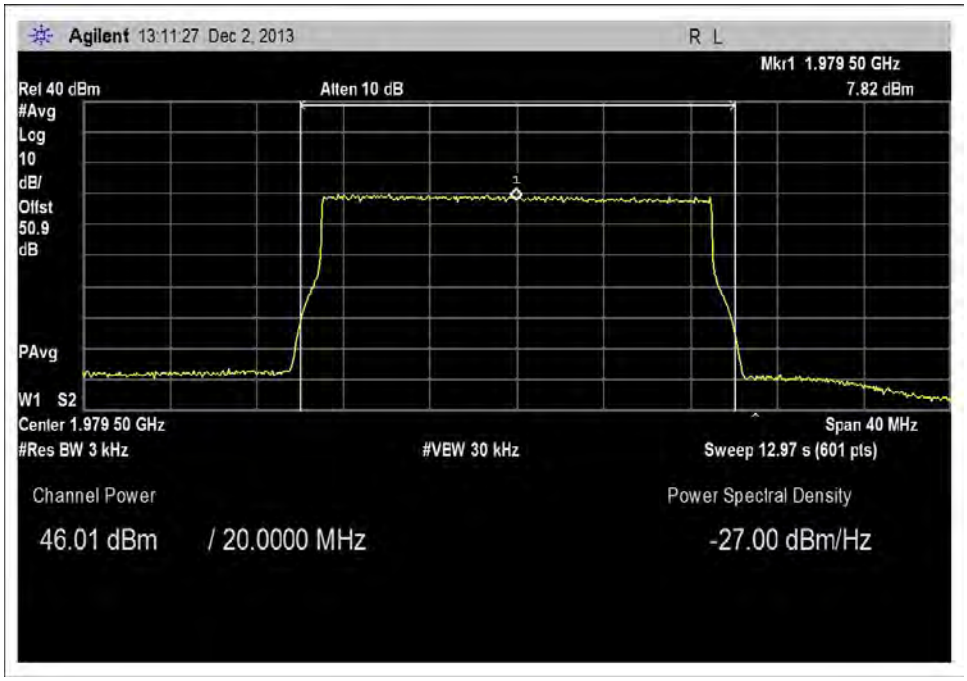
40W, LTE 5MHz - High



40W, LTE 20MHz - Low



40W, LTE 20MHz - Middle



40W, LTE 20MHz - High

Test Setup Photos

Overall Test Setup

2.1049(I) Occupied Bandwidth

Test Data

Test Location: CKC Laboratories Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714-993-6112

Customer:	**BTI Wireless**		
Specification:	**Input vs Output Plots**		
Work Order #:	**95157**	Date:	11/22/2013
Test Type:	**Conducted Emissions**	Time:	14:18:02
Equipment:	**1900MHz 40W Transmitting Remote Unit**	Sequence#:	4
Manufacturer:	BTI Wireless	Tested By:	Don Nguyen
Model:	mBSC1900-040-RUSSF01		110V 60Hz
S/N:	10935304010113111101		

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02869	Spectrum Analyzer	E4440A	2/6/2013	2/6/2015
T2	AN03239	Cable	32022-2-29094K-24TC	10/30/2013	10/30/2015

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
1900MHz 40W Transmitting Remote Unit*	BTI Wireless	mBSC1900-040-RUSSF01	10935304010113111101

Support Devices:

Function	Manufacturer	Model #	S/N
ESG Vector Signal Generator	Agilent	4438C	MY45091601
Attenuator 30db Pad	Weinschel	49-30-43	KW075
Step Attenuator 110dB pad	HP	8496B	1350A01241
50 ohm Load	Generic	NA	NA
Cable	Pasternack	Sucoflex 104A	12237/4A

Test Conditions / Notes:

The EUT is placed on the test bench. Tx In is connected to an ESG Signal generator via cable Sucoflex 104A. ANT port is connected to 30db attenuator and 110db step attenuator. A spectrum analyzer is connected to attenuators via cable 32022-2-29094K-24TC. RX out port is terminated to 50 ohm load.

The evaluation is performed at the antenna port.

Freq: 1930-1990MHz
Signal protocol: GSM, EDGE, CDMA (IS95A), UMTS (WCDMA_3GPP), LTE-TM1.1 1.4MHz, 5MHz. 20MHz

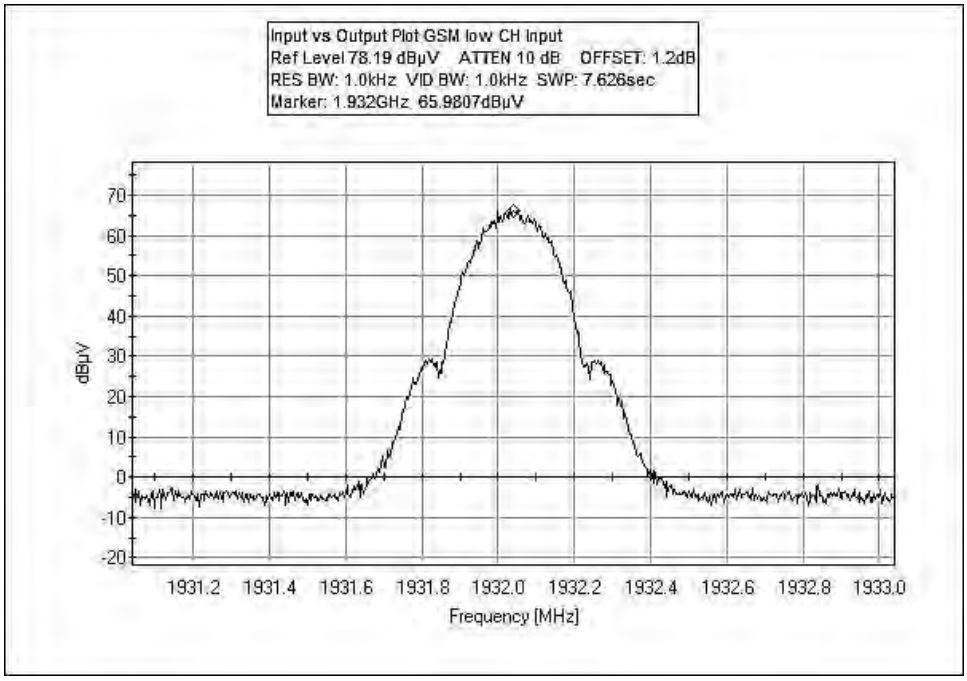
40W

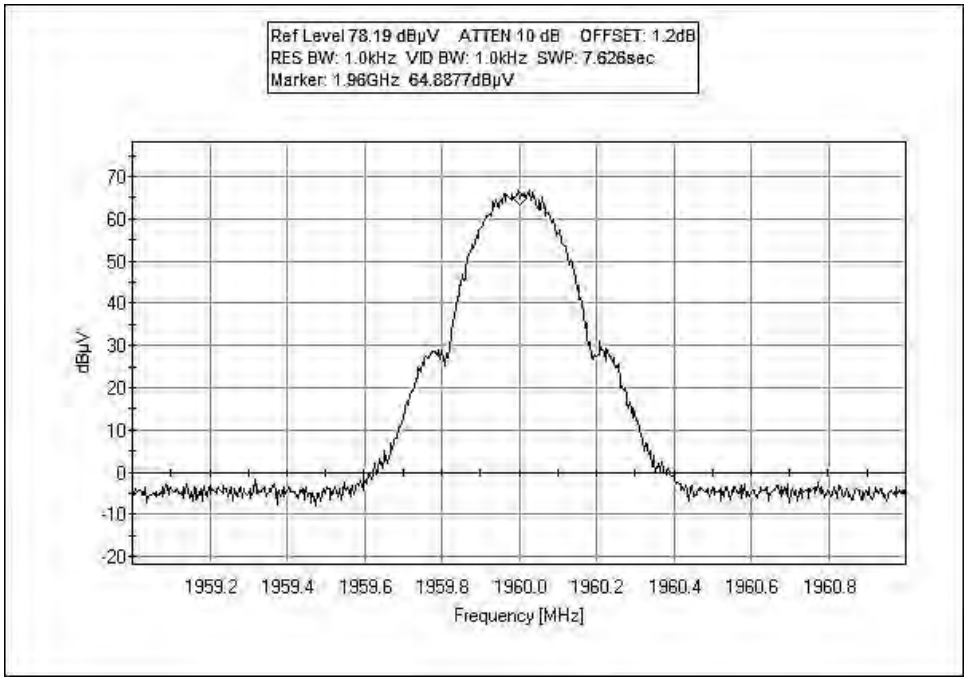
Modulation	Input Power (dbm)
GSM	
1932.04MHz	-12.42
1960.00MHz	-12.04
1987.96MHz	-11.36
EDGE	
1932.04MHz	-11.24
1960.00MHz	-11.24
1987.96MHz	-11.12
CDMA (IS95A)	
1932.5MHz	-11.08
1960.00MHz	-11.44
1987.5MHz	-11.02
UMTS (WCMDA 3GPP)	
1933.9MHz	-11.2
1960.00MHz	-11.62
1986.1MHz	-11.14
LTE 1.4MHz	
1932.40MHz	-11.14
1960.00MHz	-11.62
1987.75MHz	-11.02
LTE 5MHz	
1934.05MHz	-11.3
1960.00MHz	-11.78
1986.11MHz	-11.24
LTE 20MHz	
1941.2MHz	-11.76
1960.00MHz	-11.76
1979.5MHz	-11.52

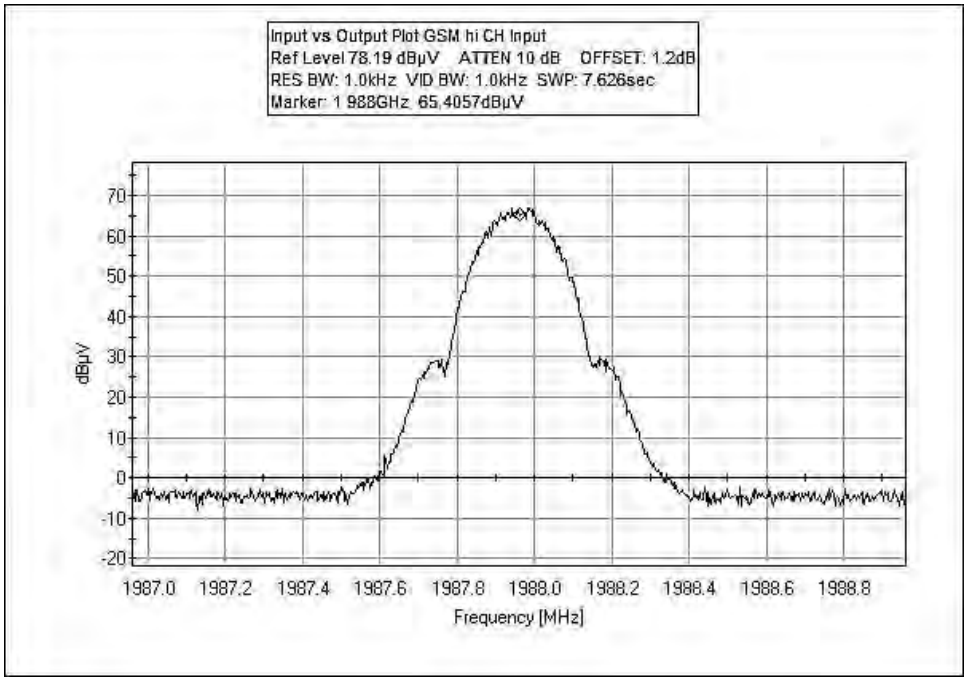
22°C, 45% Relative Humidity

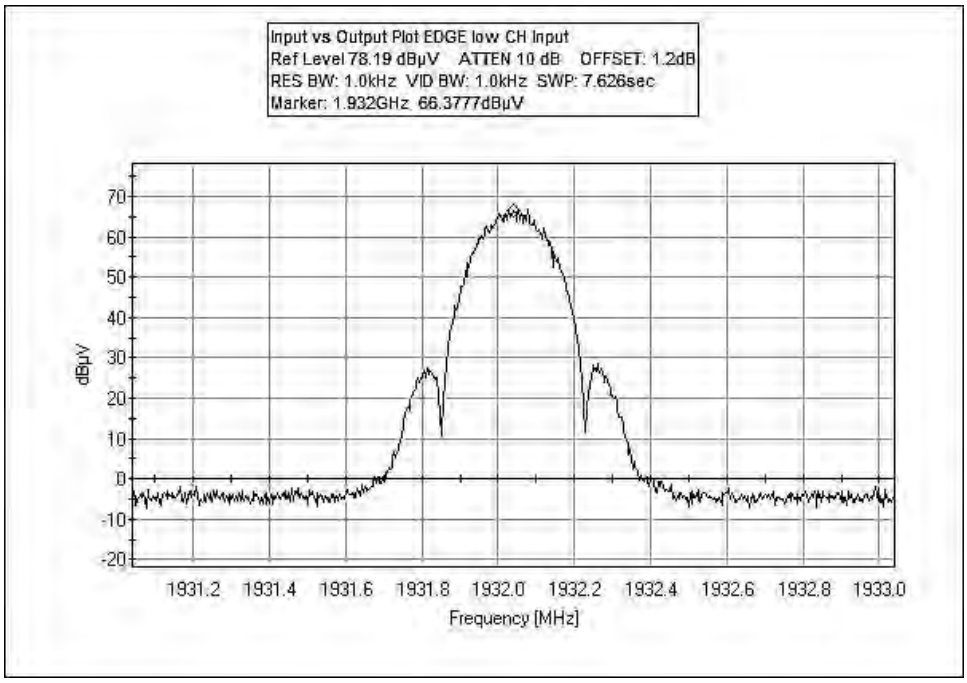
Site A

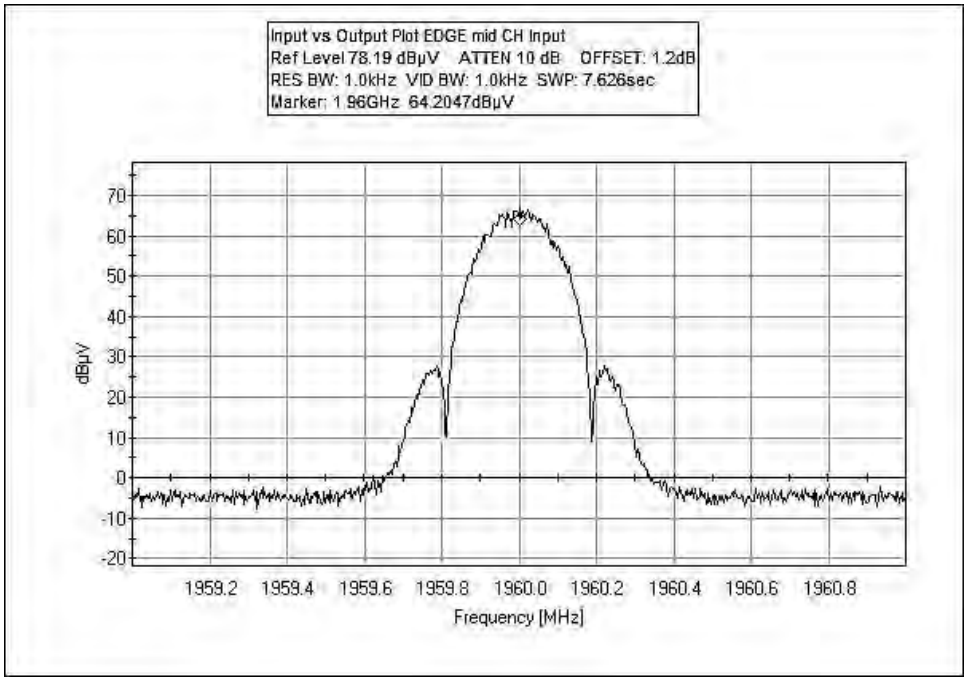
Test Plots

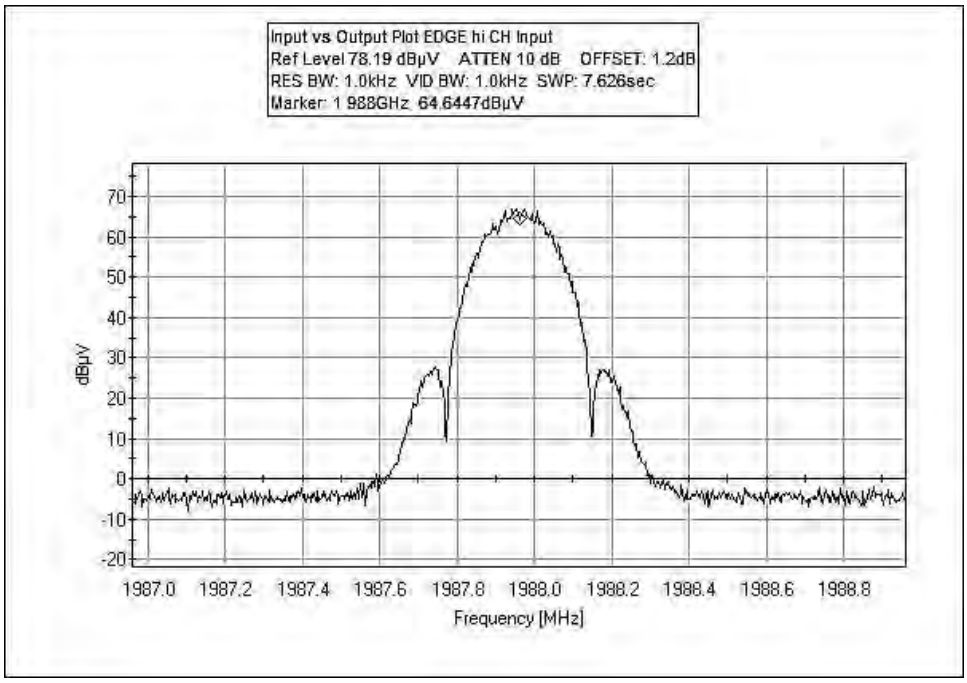

Input vs Output Plot GSM low CH Input
Ref Level 78.19 dBµV ATTEN 10 dB OFFSET: 1.2dB
RES BW: 1.0kHz VID BW: 1.0kHz SWP: 7.626sec
Marker: 1.932GHz 65.9807dBµV
dBµV
70
60
50
40
30
20
10
0
-10
-20
1931.2 1931.4 1931.6 1931.8 1932.0 1932.2 1932.4 1932.6 1932.8 1933.0
Frequency [MHz]

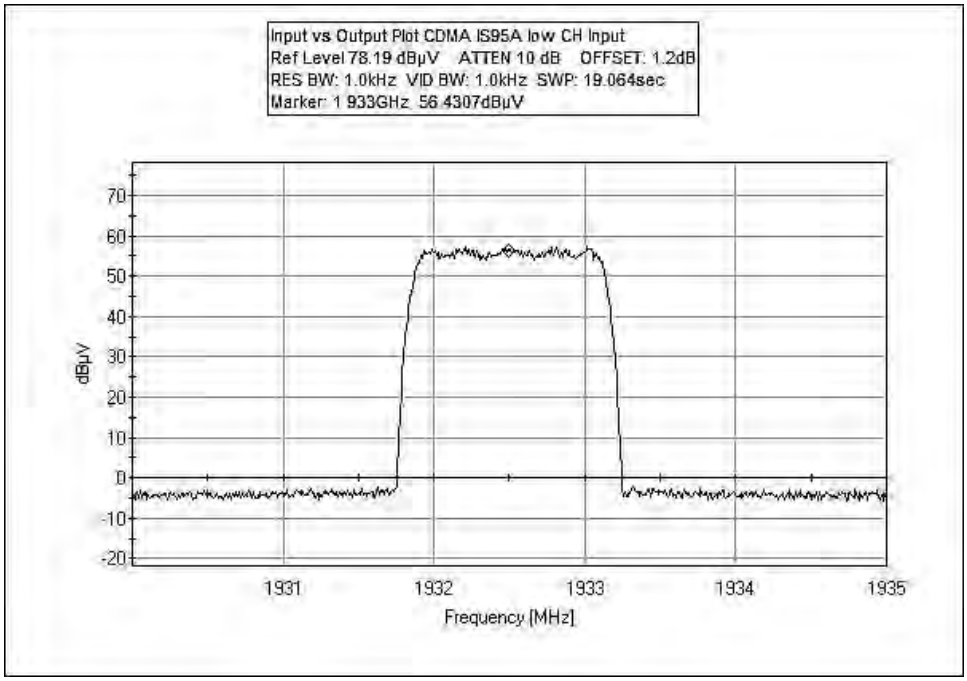

Ref Level 78.19 dBµV ATTEN 10 dB OFFSET: 1.2dB
RES BW: 1.0kHz VID BW: 1.0kHz SWP: 7.626sec
Marker: 1.96GHz 64.8877dBµV
dBµV
70
60
50
40
30
20
10
0
-10
-20
1959.2 1959.4 1959.6 1959.8 1960.0 1960.2 1960.4 1960.6 1960.8
Frequency [MHz]

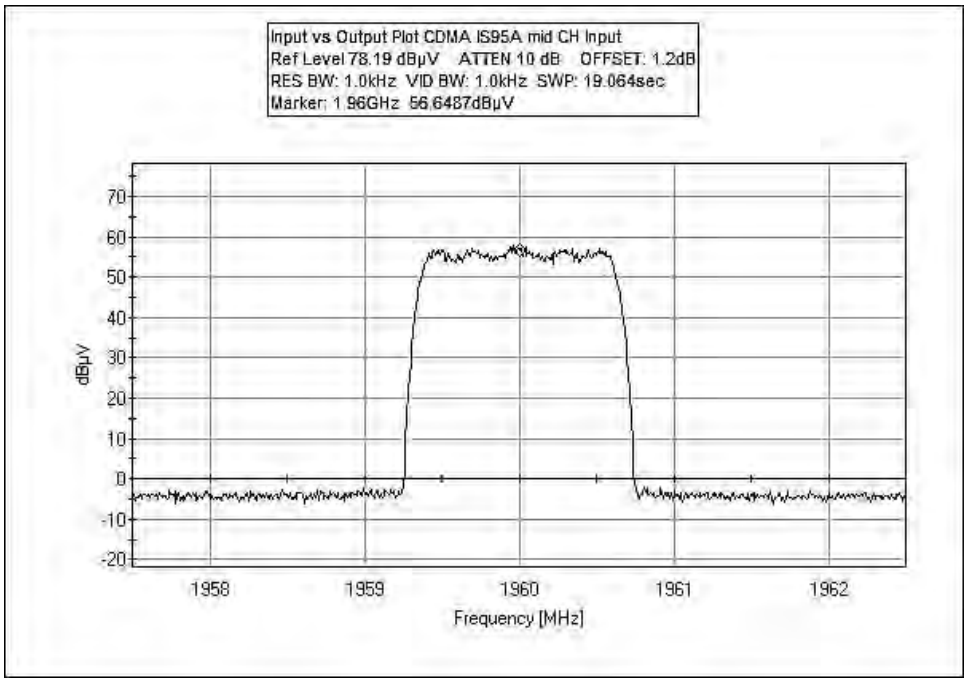

Input vs Output Plot GSM hi CH Input
Ref Level 78.19 dBµV ATTEN 10 dB OFFSET: 1.2dB
RES BW: 1.0kHz VID BW: 1.0kHz SWP: 7.626sec
Marker: 1.988GHz 65.4057dBµV
dBµV
70
60
50
40
30
20
10
0
-10
-20
1987.0 1987.2 1987.4 1987.6 1987.8 1988.0 1988.2 1988.4 1988.6 1988.8
Frequency [MHz]

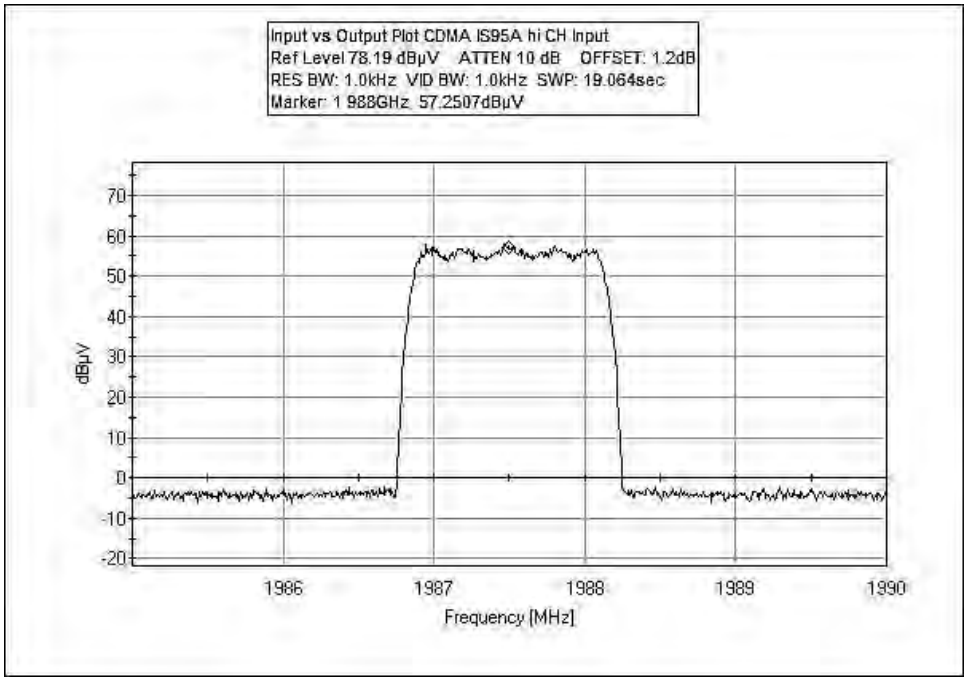

Input vs Output Plot EDGE low CH Input
Ref Level 78.19 dBµV ATTEN 10 dB OFFSET: 1.2dB
RES BW: 1.0kHz VID BW: 1.0kHz SWP: 7.626sec
Marker: 1.932GHz 66.3777dBµV
dBµV
70
60
50
40
30
20
10
0
-10
-20
1931.2 1931.4 1931.6 1931.8 1932.0 1932.2 1932.4 1932.6 1932.8 1933.0
Frequency [MHz]

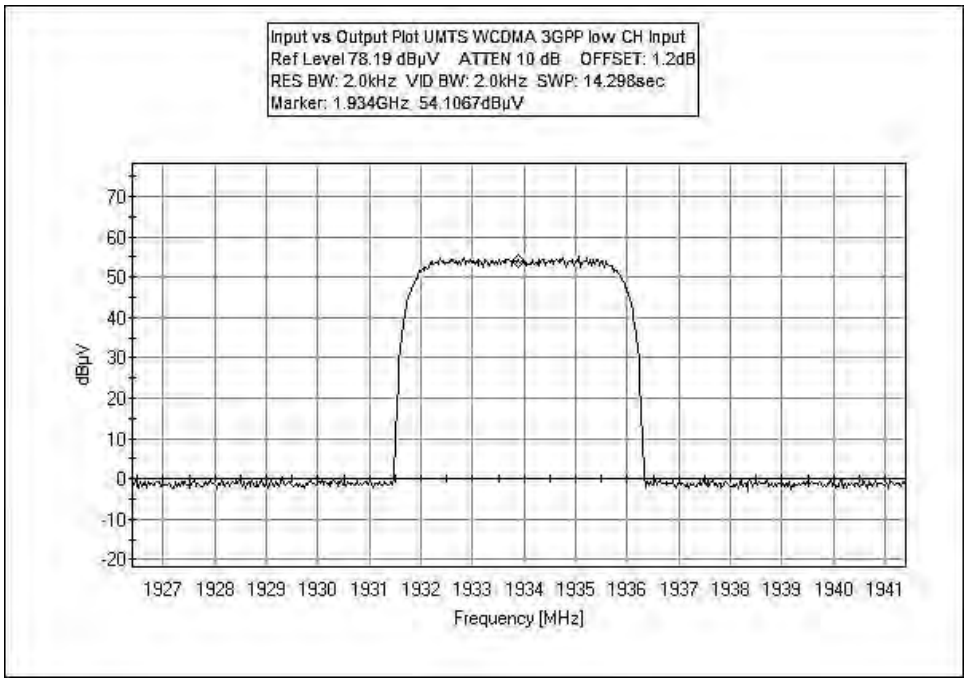

Input vs Output Plot EDGE mid CH Input
Ref Level 78.19 dBµV ATTEN 10 dB OFFSET: 1.2dB
RES BW: 1.0kHz VID BW: 1.0kHz SWP: 7.626sec
Marker: 1.96GHz 64.2047dBµV
dBµV
70
60
50
40
30
20
10
0
-10
-20
1959.2 1959.4 1959.6 1959.8 1960.0 1960.2 1960.4 1960.6 1960.8
Frequency [MHz]

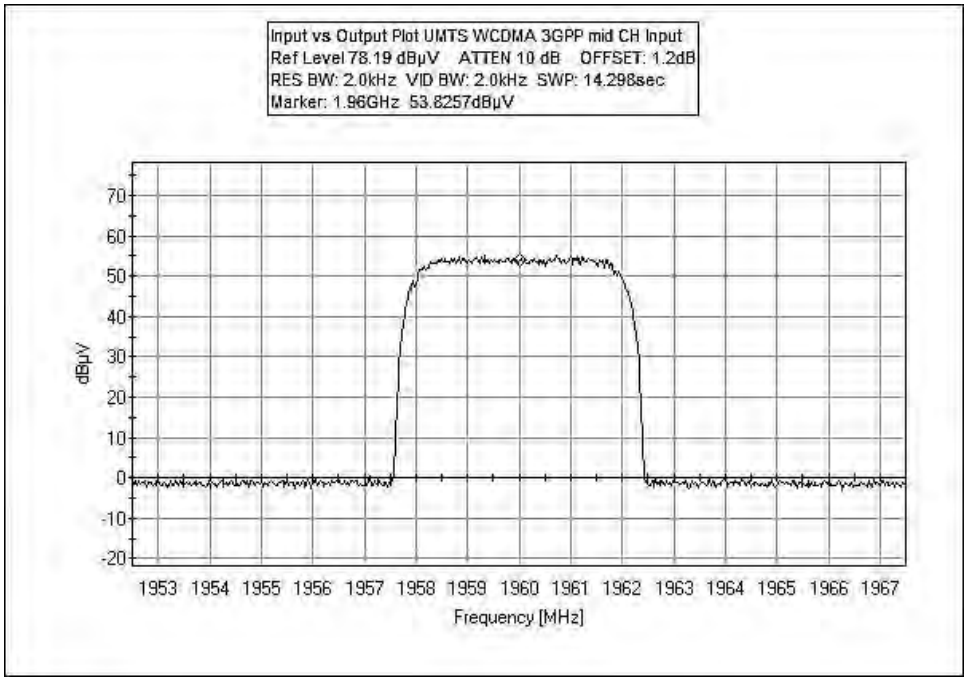

Input vs Output Plot EDGE hi CH Input
Ref Level 78.19 dBµV ATTEN 10 dB OFFSET: 1.2dB
RES BW: 1.0kHz VID BW: 1.0kHz SWP: 7.626sec
Marker: 1.988GHz 64.6447dBµV
dBµV
70
60
50
40
30
20
10
0
-10
-20
1987.0 1987.2 1987.4 1987.6 1987.8 1988.0 1988.2 1988.4 1988.6 1988.8
Frequency [MHz]

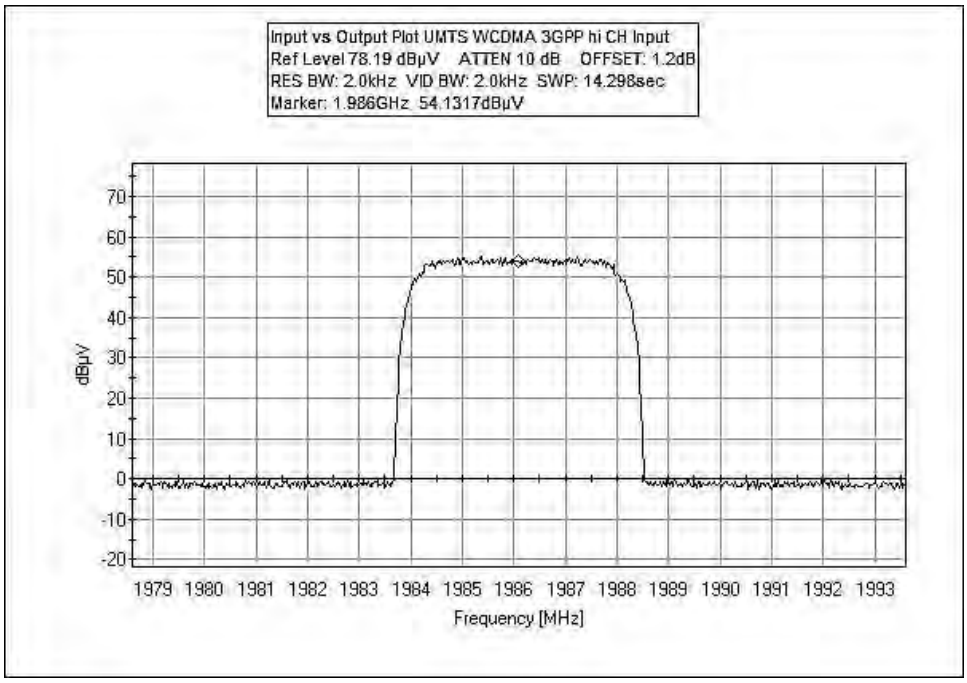

Input vs Output Plot CDMA IS95A low CH Input
Ref Level 78.19 dBµV ATTEN 10 dB OFFSET: 1.2dB
RES BW: 1.0kHz VID BW: 1.0kHz SWP: 19.064sec
Marker: 1.933GHz 56.4307dBµV
dBµV
70
60
50
40
30
20
10
0
-10
-20
1931
1932
1933
1934
1935
Frequency [MHz]

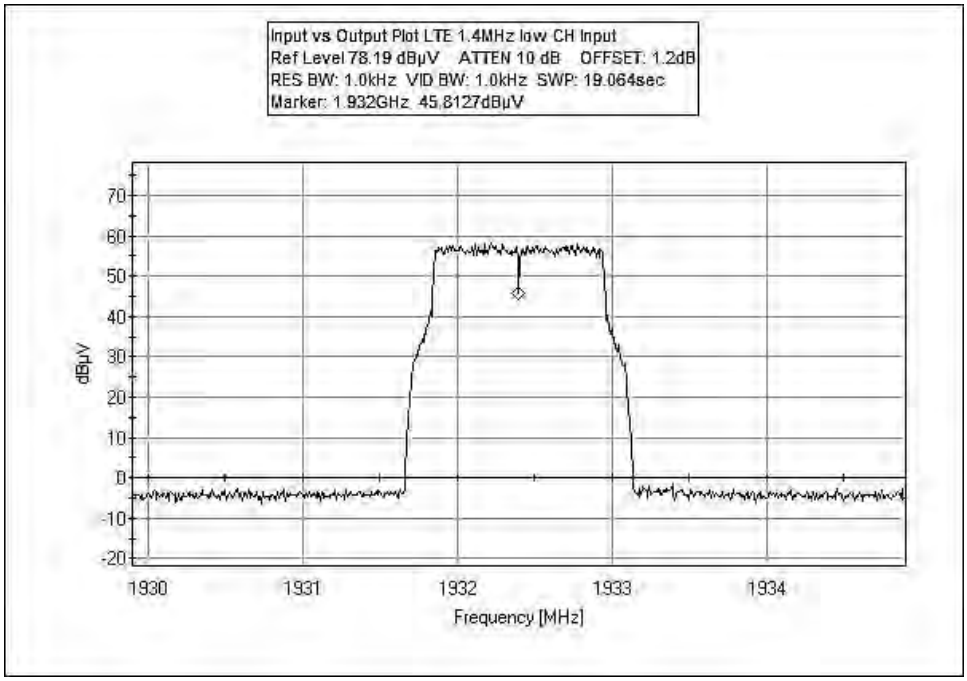

Input vs Output Plot CDMA IS95A mid CH Input
Ref Level 78.19 dBµV ATTEN 10 dB OFFSET: 1.2dB
RES BW: 1.0kHz VID BW: 1.0kHz SWP: 19.064sec
Marker: 1.96GHz 56.6487dBµV
dBµV
70
60
50
40
30
20
10
0
-10
-20
1958
1959
1960
1961
1962
Frequency [MHz]

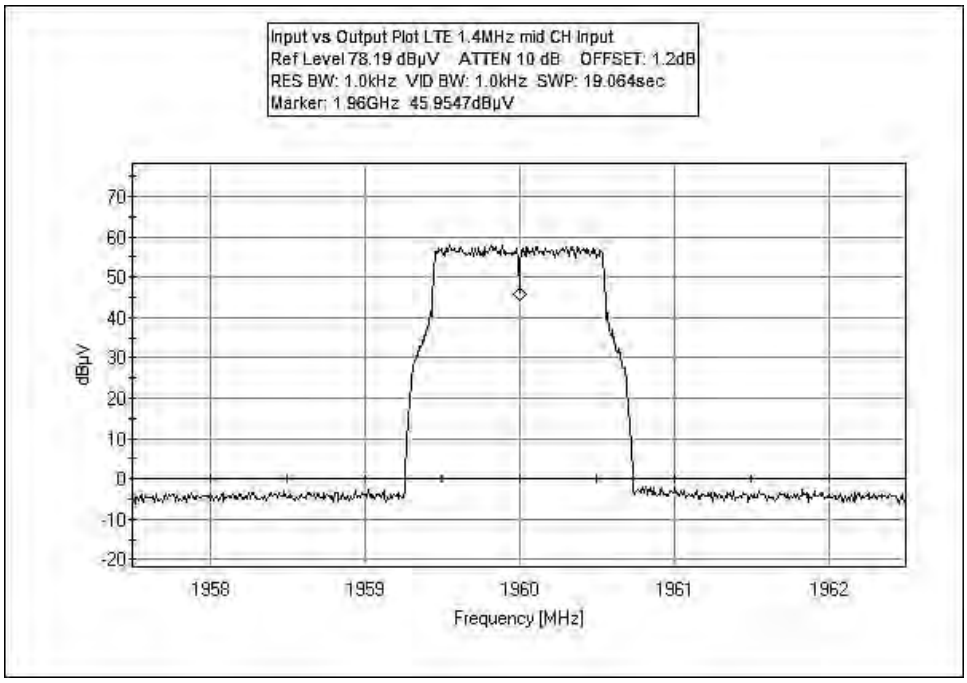

Input vs Output Plot CDMA IS95A hi CH Input
Ref Level 78.19 dBµV ATTEN 10 dB OFFSET: 1.2dB
RES BW: 1.0kHz VID BW: 1.0kHz SWP: 19.064sec
Marker: 1.988GHz 57.2507dBµV
dBµV
70
60
50
40
30
20
10
0
-10
-20
1986
1987
1988
1989
1990
Frequency [MHz]

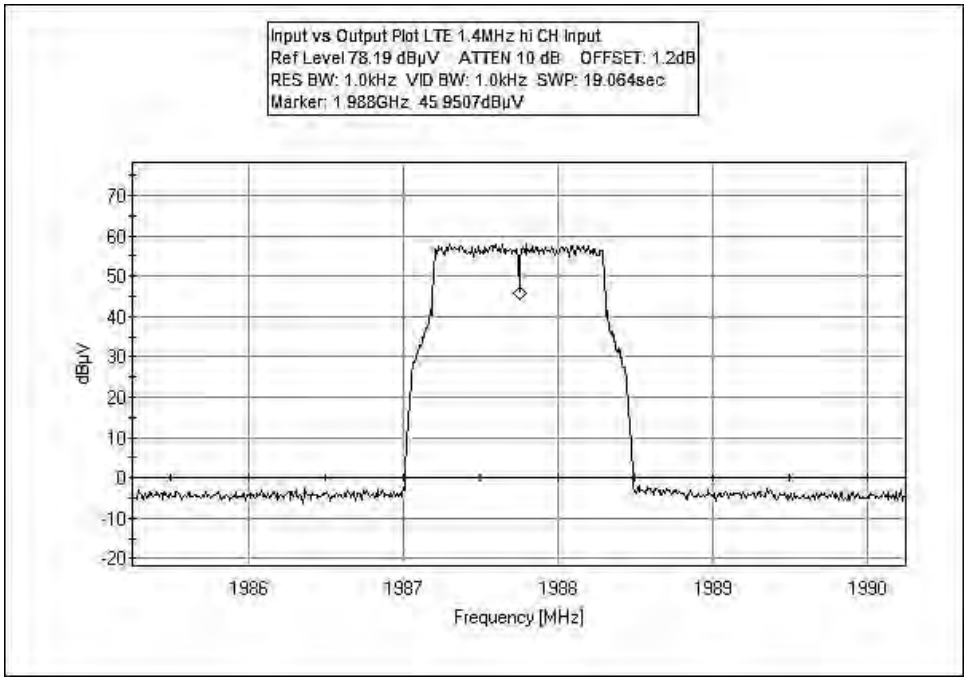

Input vs Output Plot UMTS WCDMA 3GPP low CH Input
Ref Level 78.19 dBµV ATTEN 10 dB OFFSET: 1.2dB
RES BW: 2.0kHz VID BW: 2.0kHz SWP: 14.298sec
Marker: 1.934GHz 54.1067dBµV
dBµV
70
60
50
40
30
20
10
0
-10
-20
1927 1928 1929 1930 1931 1932 1933 1934 1935 1936 1937 1938 1939 1940 1941
Frequency [MHz]

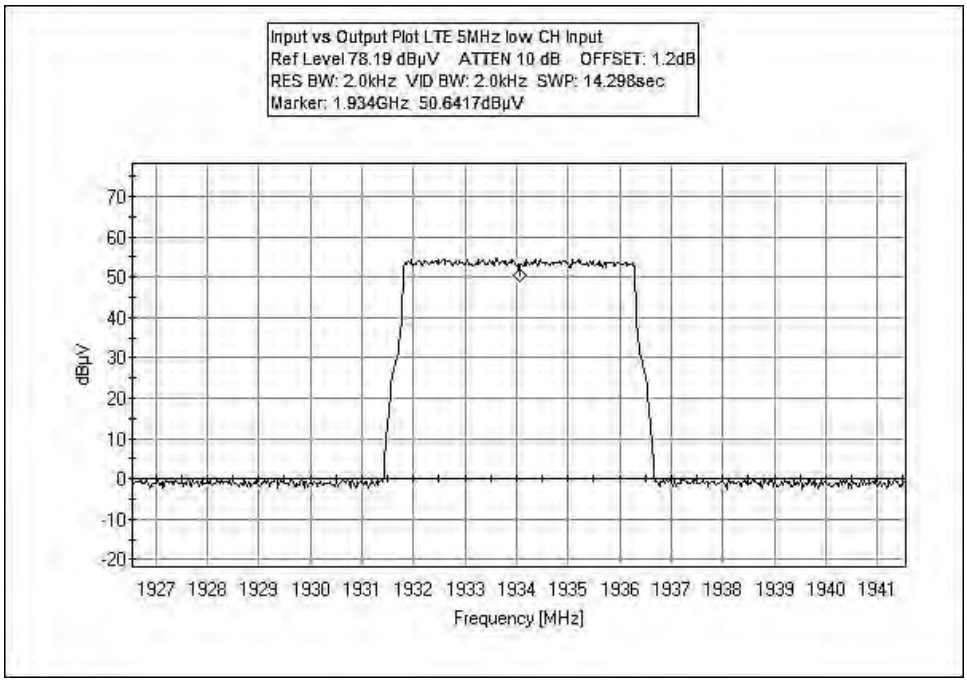

Input vs Output Plot UMTS WCDMA 3GPP mid CH Input
Ref Level 78.19 dBµV ATTEN 10 dB OFFSET: 1.2dB
RES BW: 2.0kHz VID BW: 2.0kHz SWP: 14.298sec
Marker: 1.96GHz 53.8257dBµV
dBµV
70
60
50
40
30
20
10
0
-10
-20
1953 1954 1955 1956 1957 1958 1959 1960 1961 1962 1963 1964 1965 1966 1967
Frequency [MHz]

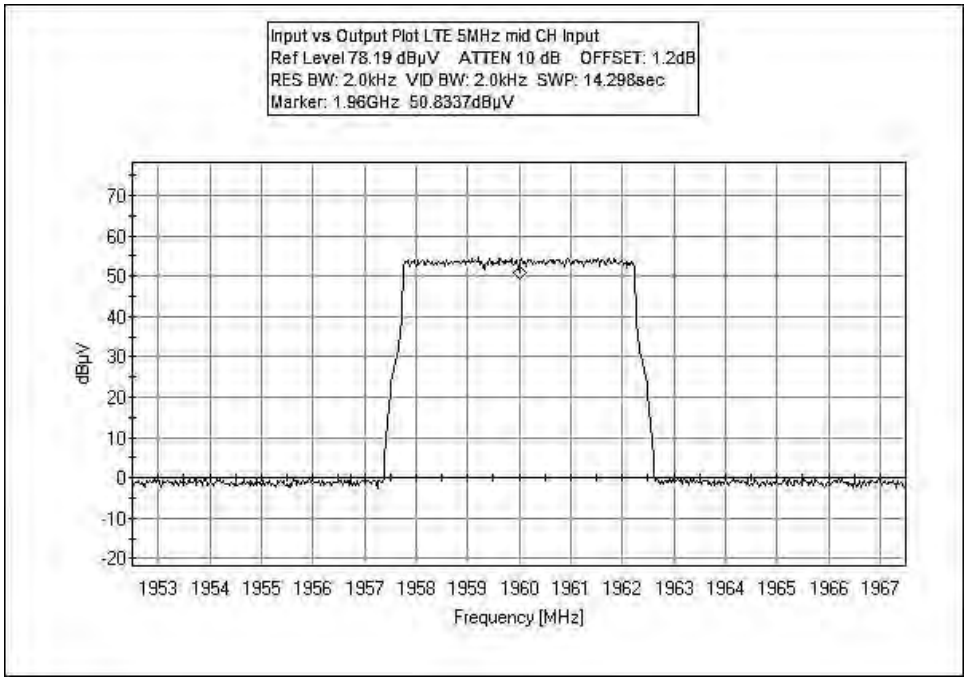

Input vs Output Plot UMTS WCDMA 3GPP hi CH Input
Ref Level 78.19 dBµV ATTEN 10 dB OFFSET: 1.2dB
RES BW: 2.0kHz VID BW: 2.0kHz SWP: 14.298sec
Marker: 1.986GHz 54.1317dBµV
dBµV
70
60
50
40
30
20
10
0
-10
-20
1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993
Frequency [MHz]

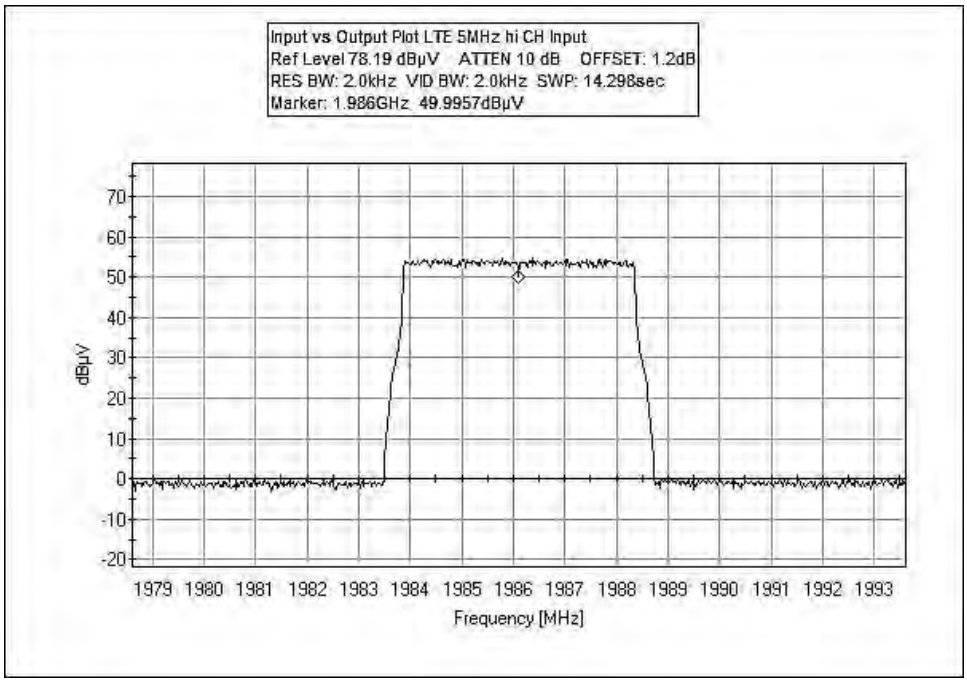

Input vs Output Plot LTE 1.4MHz low CH Input
Ref Level 78.19 dBµV ATTEN 10 dB OFFSET: 1.2dB
RES BW: 1.0kHz VID BW: 1.0kHz SWP: 19.064sec
Marker: 1.932GHz 45.8127dBµV
dBµV
70
60
50
40
30
20
10
0
-10
-20
1930
1931
1932
1933
1934
Frequency [MHz]

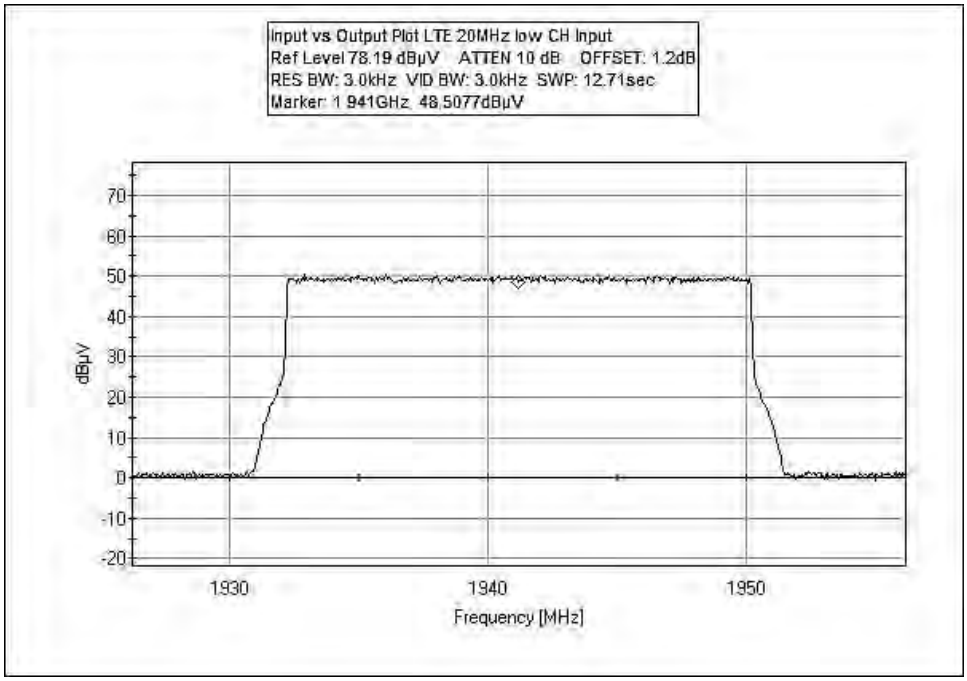

Input vs Output Plot LTE 1.4MHz mid CH Input
Ref Level 78.19 dBµV ATTEN 10 dB OFFSET: 1.2dB
RES BW: 1.0kHz VID BW: 1.0kHz SWP: 19.064sec
Marker: 1.96GHz 45.9547dBµV
dBµV
70
60
50
40
30
20
10
0
-10
-20
1958
1959
1960
1961
1962
Frequency [MHz]

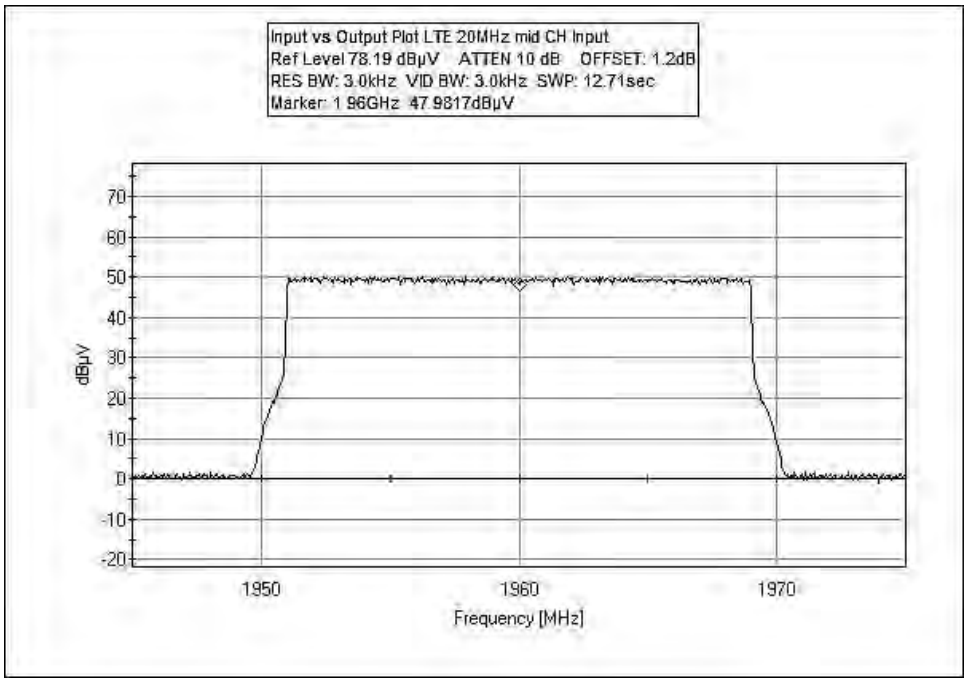

Input vs Output Plot LTE 1.4MHz hi CH Input
Ref Level 78.19 dBµV ATTEN 10 dB OFFSET: 1.2dB
RES BW: 1.0kHz VID BW: 1.0kHz SWP: 19.064sec
Marker: 1.988GHz 45.9507dBµV
dBµV
70
60
50
40
30
20
10
0
-10
-20
1986
1987
1988
1989
1990
Frequency [MHz]

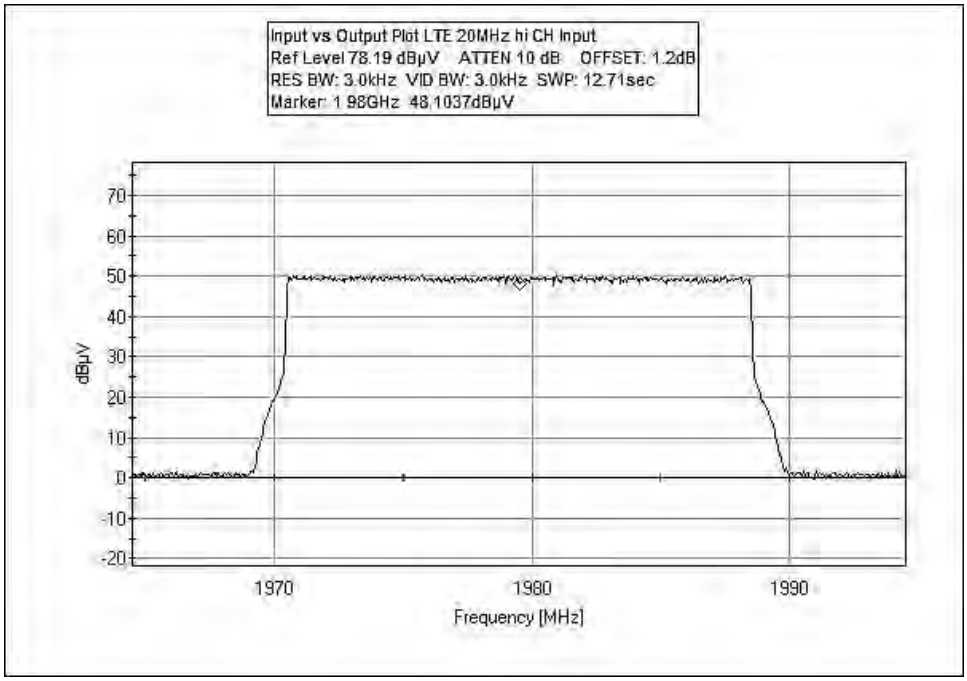

Input vs Output Plot LTE 5MHz low CH Input
Ref Level 78.19 dBµV ATTEN 10 dB OFFSET: 1.2dB
RES BW: 2.0kHz VID BW: 2.0kHz SWP: 14.298sec
Marker: 1.934GHz 50.6417dBµV
dBµV
70
60
50
40
30
20
10
0
-10
-20
1927 1928 1929 1930 1931 1932 1933 1934 1935 1936 1937 1938 1939 1940 1941
Frequency [MHz]

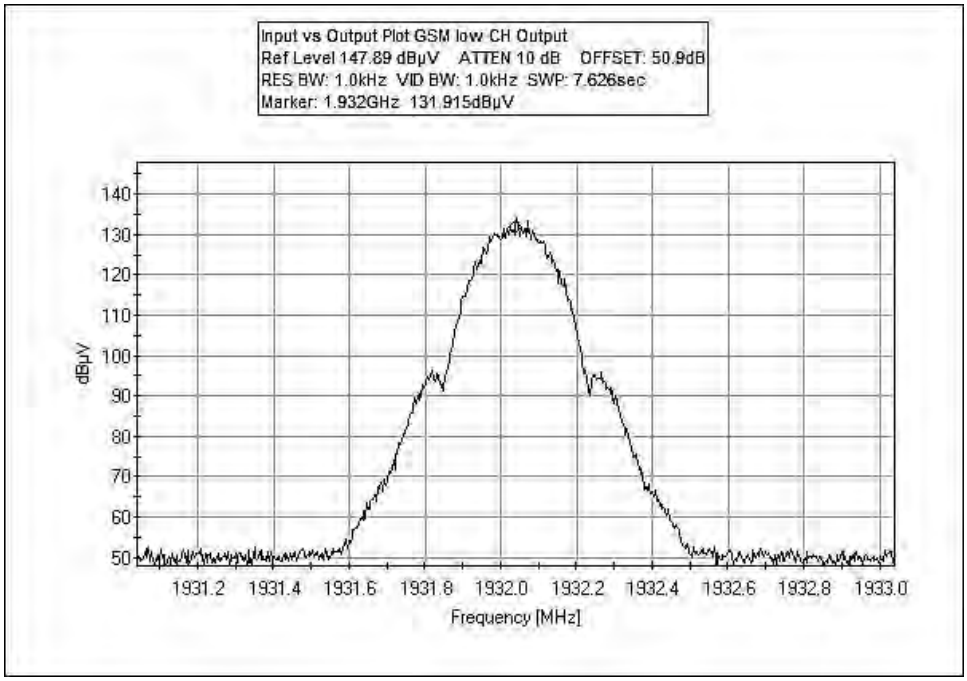

Input vs Output Plot LTE 5MHz mid CH Input
Ref Level 78.19 dBµV ATTEN 10 dB OFFSET: 1.2dB
RES BW: 2.0kHz VID BW: 2.0kHz SWP: 14.298sec
Marker: 1.96GHz 50.8337dBµV
dBµV
70
60
50
40
30
20
10
0
-10
-20
1953 1954 1955 1956 1957 1958 1959 1960 1961 1962 1963 1964 1965 1966 1967
Frequency [MHz]

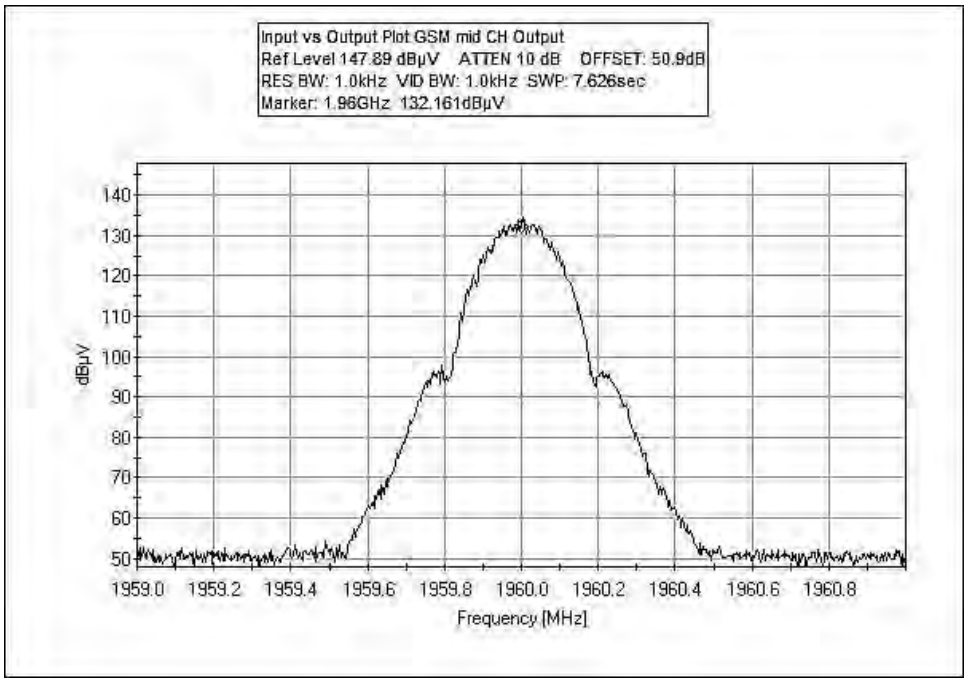

Input vs Output Plot LTE 5MHz hi CH Input
Ref Level 78.19 dBµV ATTEN 10 dB OFFSET: 1.2dB
RES BW: 2.0kHz VID BW: 2.0kHz SWP: 14.298sec
Marker: 1.986GHz 49.9957dBµV
dBµV
70
60
50
40
30
20
10
0
-10
-20
1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993
Frequency [MHz]

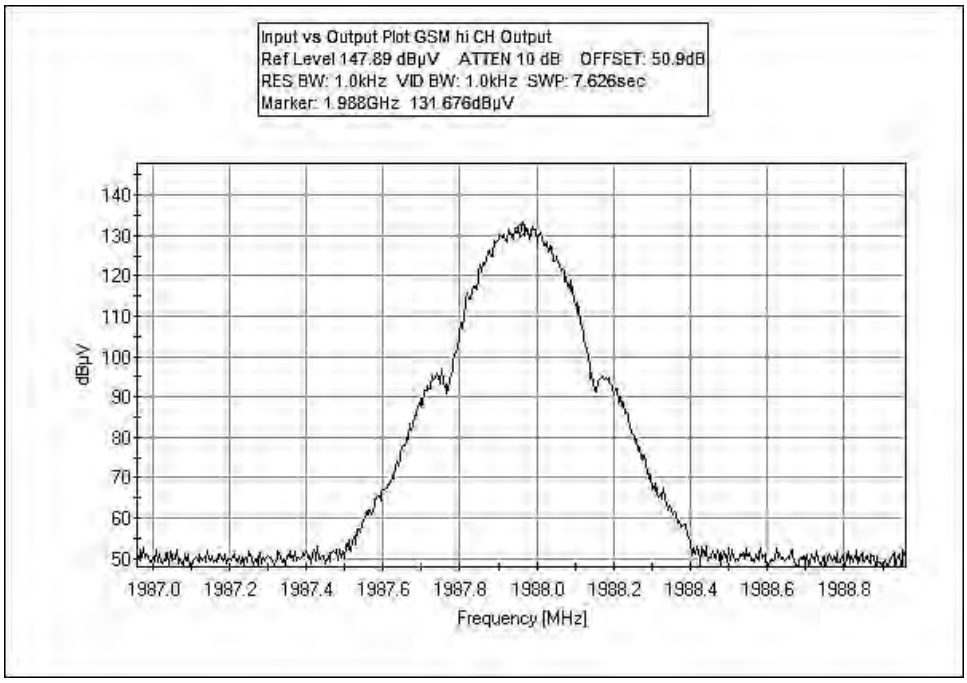

Input vs Output Plot LTE 20MHz low CH Input
Ref Level 78.19 dBµV ATTEN 10 dB OFFSET: 1.2dB
RES BW: 3.0kHz VID BW: 3.0kHz SWP: 12.71sec
Marker: 1.941GHz 48.5077dBµV
dBµV
70
60
50
40
30
20
10
0
-10
-20
1930
1940
1950
Frequency [MHz]

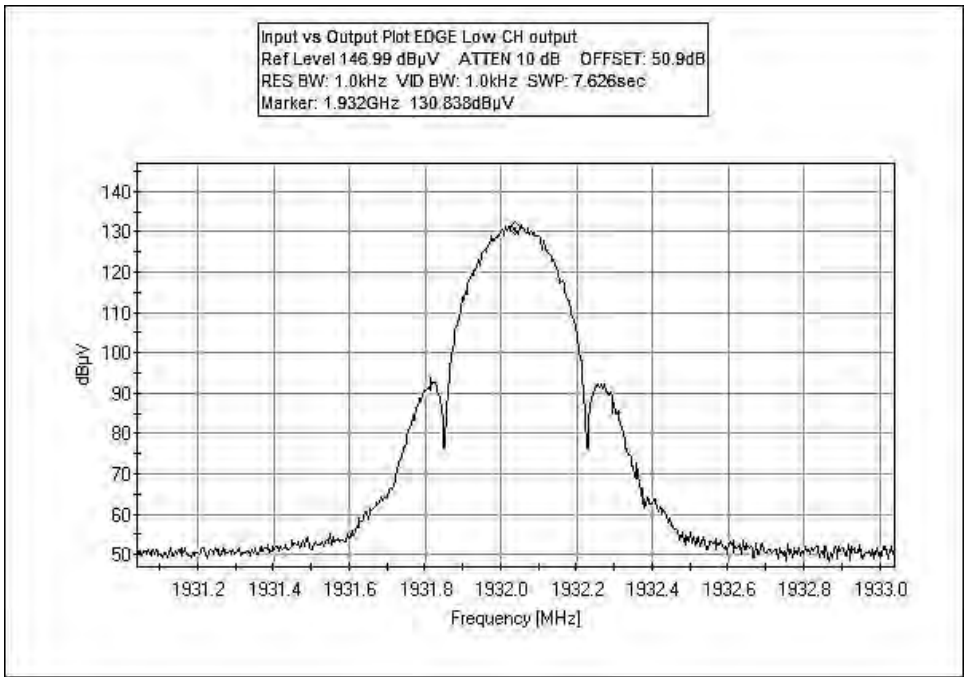

Input vs Output Plot LTE 20MHz mid CH Input
Ref Level 78.19 dBµV ATTEN 10 dB OFFSET: 1.2dB
RES BW: 3.0kHz VID BW: 3.0kHz SWP: 12.71sec
Marker: 1.96GHz 47.9817dBµV
dBµV
70
60
50
40
30
20
10
0
-10
-20
1950
1960
1970
Frequency [MHz]

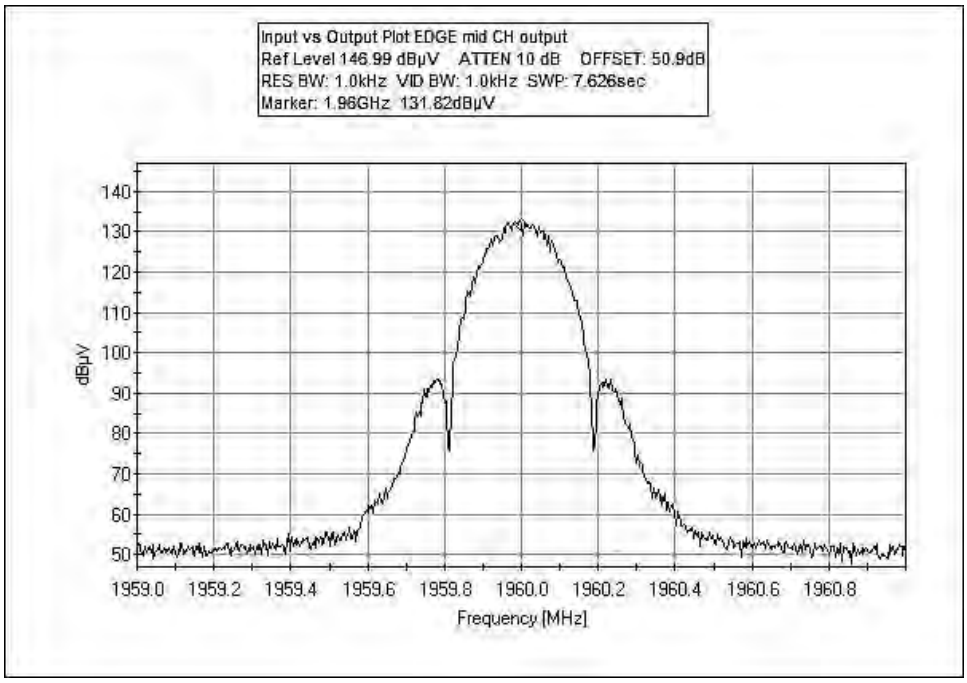

Input vs Output Plot LTE 20MHz hi CH Input
Ref Level 78.19 dBµV ATTEN 10 dB OFFSET: 1.2dB
RES BW: 3.0kHz VID BW: 3.0kHz SWP: 12.71sec
Marker: 1.98GHz 48.1037dBµV
dBµV
70
60
50
40
30
20
10
0
-10
-20
1970
1980
1990
Frequency [MHz]

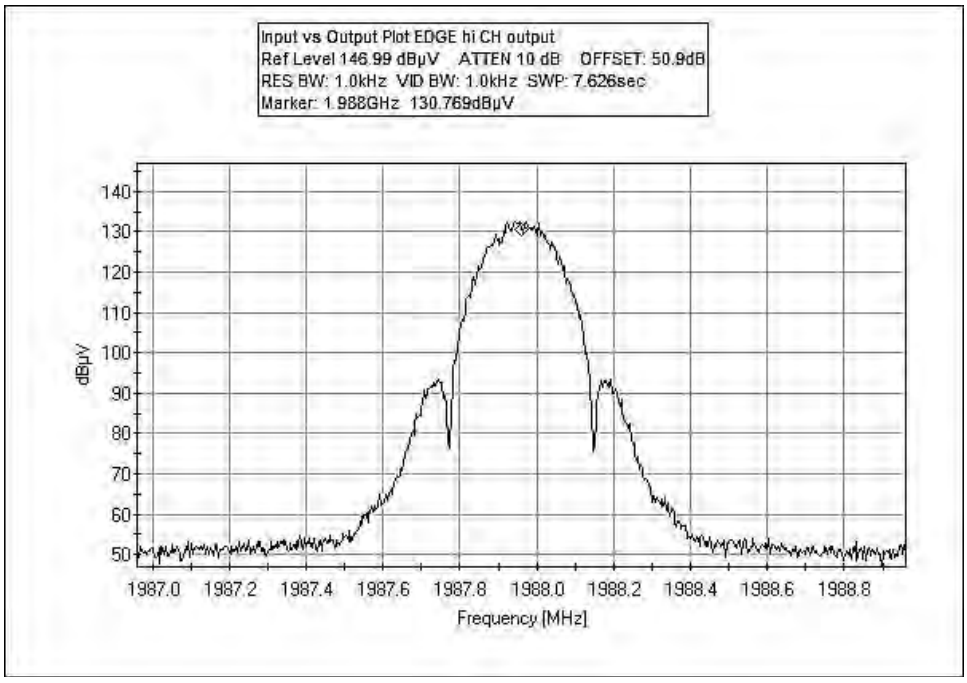

Input vs Output Plot GSM low CH Output
Ref Level 147.89 dBµV ATTEN 10 dB OFFSET: 50.9dB
RES BW: 1.0kHz VID BW: 1.0kHz SWP: 7.626sec
Marker: 1.932GHz 131.915dBµV
dBµV
140
130
120
110
100
90
80
70
60
50
1931.2 1931.4 1931.6 1931.8 1932.0 1932.2 1932.4 1932.6 1932.8 1933.0
Frequency [MHz]

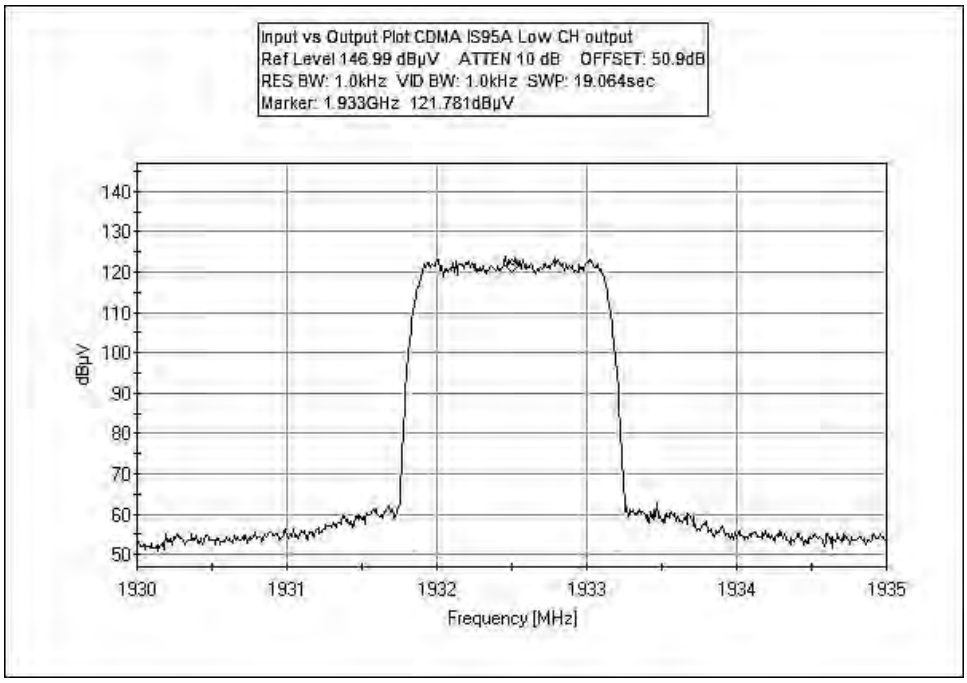

Input vs Output Plot GSM mid CH Output
Ref Level 147.89 dBµV ATTEN 10 dB OFFSET: 50.9dB
RES BW: 1.0kHz VID BW: 1.0kHz SWP: 7.626sec
Marker: 1.96GHz 132.161dBµV
dBµV
140
130
120
110
100
90
80
70
60
50
1959.0 1959.2 1959.4 1959.6 1959.8 1960.0 1960.2 1960.4 1960.6 1960.8
Frequency [MHz]

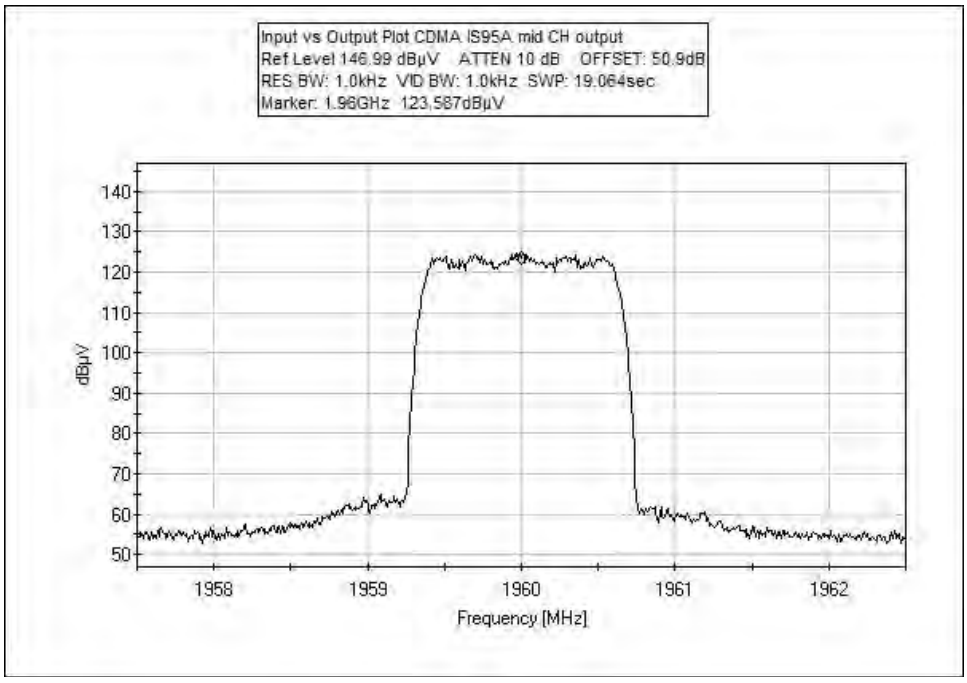

Input vs Output Plot GSM hi CH Output
Ref Level 147.89 dBµV ATTEN 10 dB OFFSET: 50.9dB
RES BW: 1.0kHz VID BW: 1.0kHz SWP: 7.626sec
Marker: 1.988GHz 131.676dBµV
dBµV
140
130
120
110
100
90
80
70
60
50
1987.0 1987.2 1987.4 1987.6 1987.8 1988.0 1988.2 1988.4 1988.6 1988.8
Frequency [MHz]

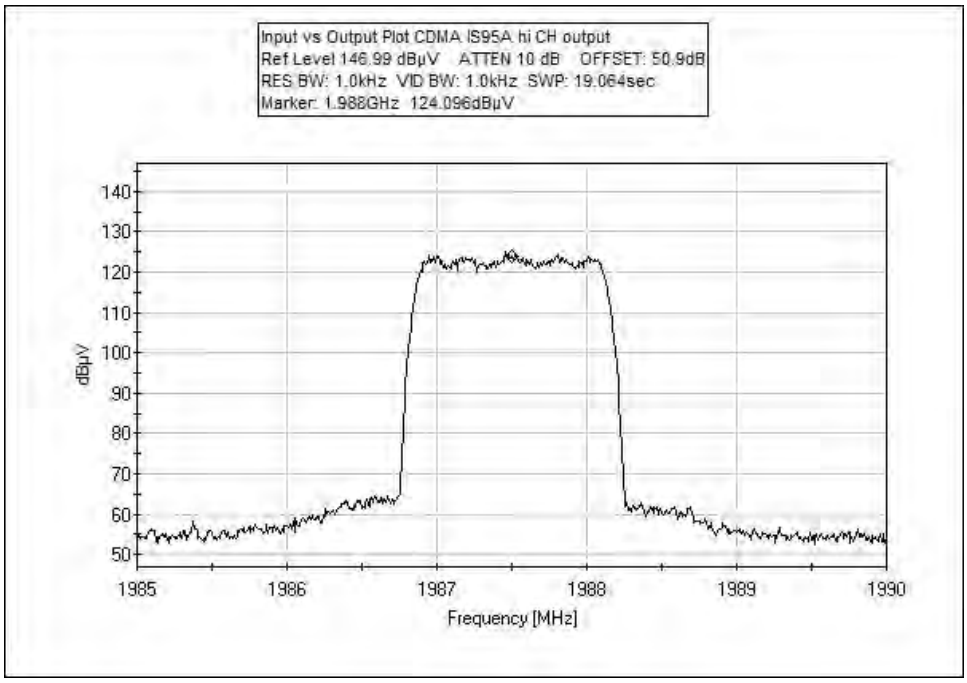

Input vs Output Plot EDGE Low CH output
Ref Level 146.99 dBµV ATTEN 10 dB OFFSET: 50.9dB
RES BW: 1.0kHz VID BW: 1.0kHz SWP: 7.626sec
Marker: 1.932GHz 130.838dBµV
dBµV
140
130
120
110
100
90
80
70
60
50
1931.2 1931.4 1931.6 1931.8 1932.0 1932.2 1932.4 1932.6 1932.8 1933.0
Frequency [MHz]

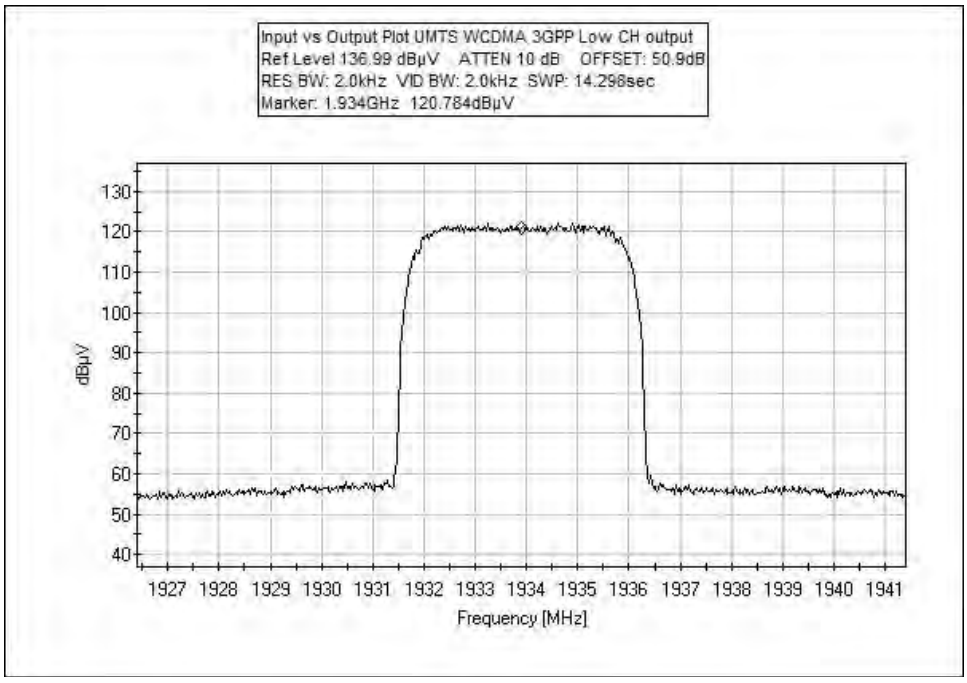

Input vs Output Plot EDGE mid CH output
Ref Level 146.99 dBµV ATTEN 10 dB OFFSET: 50.9dB
RES BW: 1.0kHz VID BW: 1.0kHz SWP: 7.626sec
Marker: 1.96GHz 131.82dBµV
dBµV
140
130
120
110
100
90
80
70
60
50
1959.0 1959.2 1959.4 1959.6 1959.8 1960.0 1960.2 1960.4 1960.6 1960.8
Frequency [MHz]

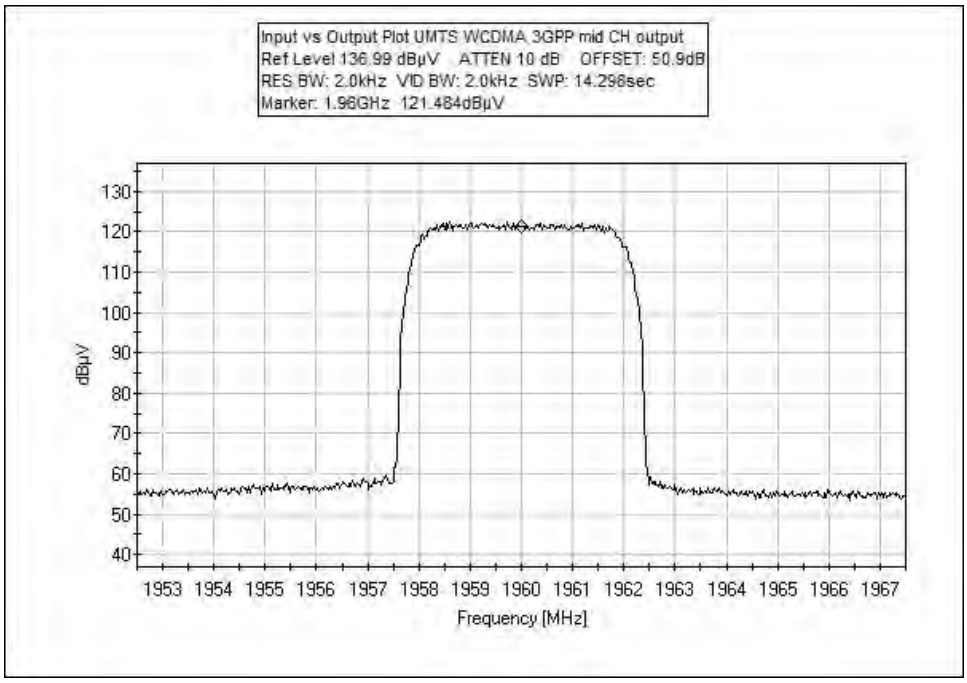

Input vs Output Plot EDGE hi CH output
Ref Level 146.99 dBµV ATTEN 10 dB OFFSET: 50.9dB
RES BW: 1.0kHz VID BW: 1.0kHz SWP: 7.626sec
Marker: 1.988GHz 130.769dBµV
dBµV
140
130
120
110
100
90
80
70
60
50
1987.0 1987.2 1987.4 1987.6 1987.8 1988.0 1988.2 1988.4 1988.6 1988.8
Frequency [MHz]

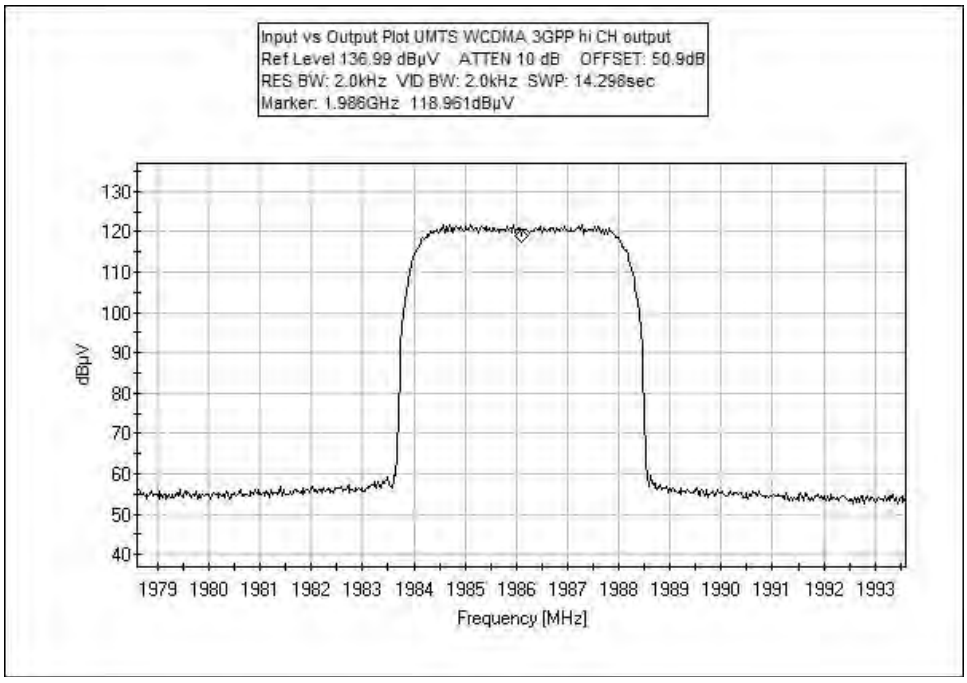

Input vs Output Plot CDMA IS95A Low CH output
Ref Level 146.99 dBµV ATTEN 10 dB OFFSET: 50.9dB
RES BW: 1.0kHz VID BW: 1.0kHz SWP: 19.064sec
Marker: 1.933GHz 121.781dBµV
dBµV
140
130
120
110
100
90
80
70
60
50
1930
1931
1932
1933
1934
1935
Frequency [MHz]

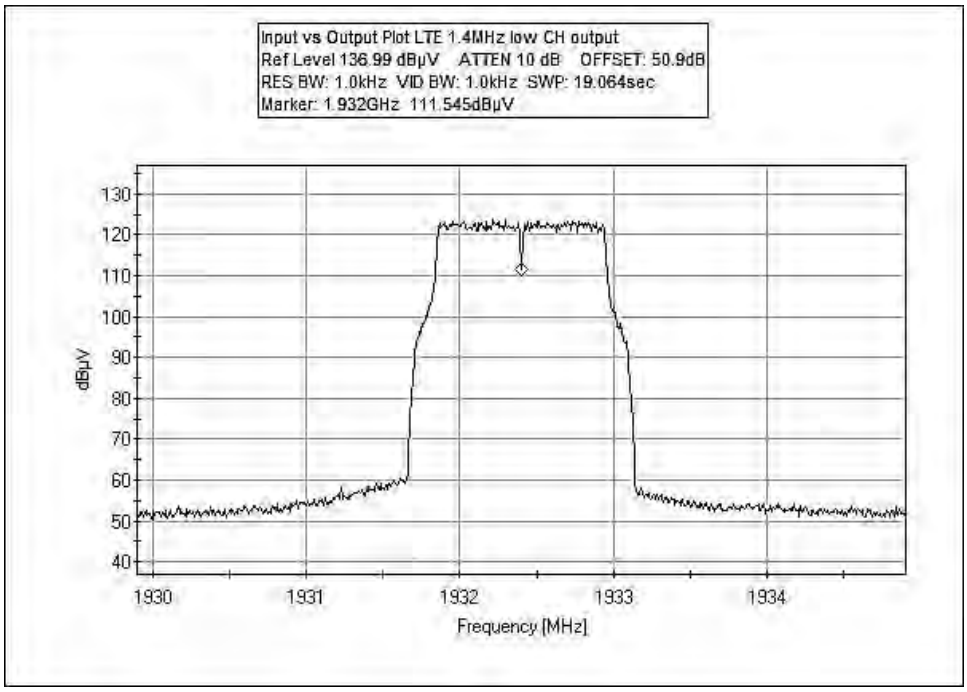

Input vs Output Plot CDMA IS95A mid CH output
Ref Level 146.99 dBµV ATTEN 10 dB OFFSET: 50.9dB
RES BW: 1.0kHz VID BW: 1.0kHz SWP: 19.064sec
Marker: 1.96GHz 123.587dBµV
dBµV
140
130
120
110
100
90
80
70
60
50
1958
1959
1960
1961
1962
Frequency [MHz]

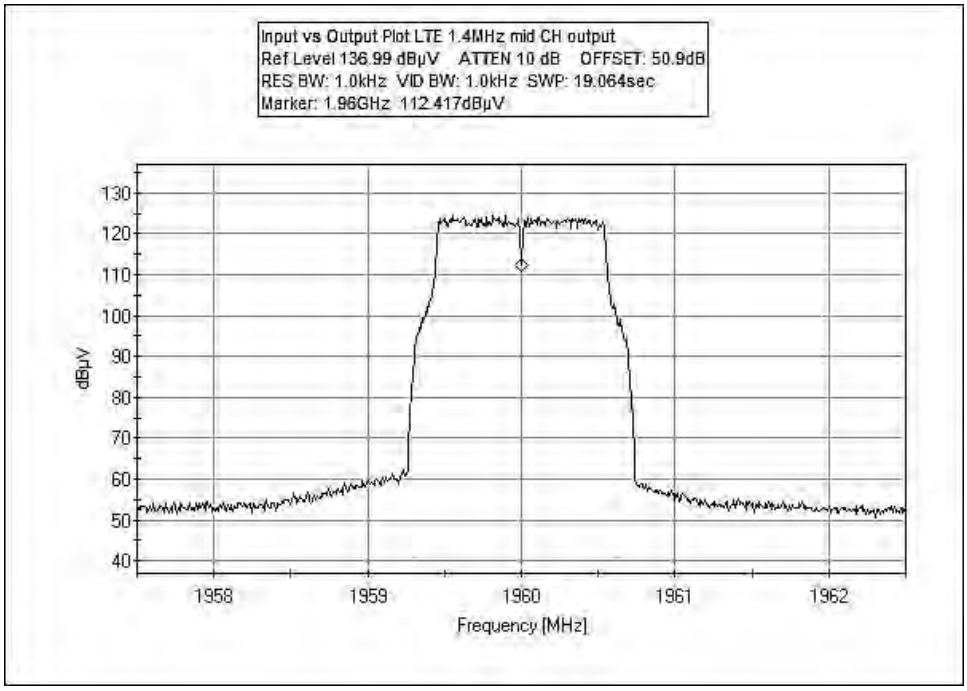

Input vs Output Plot CDMA IS95A hi CH output
Ref Level 146.99 dBµV ATTEN 10 dB OFFSET: 50.9dB
RES BW: 1.0kHz VID BW: 1.0kHz SWP: 19.064sec
Marker: 1.988GHz 124.096dBµV
dBµV
140
130
120
110
100
90
80
70
60
50
1985
1986
1987
1988
1989
1990
Frequency [MHz]

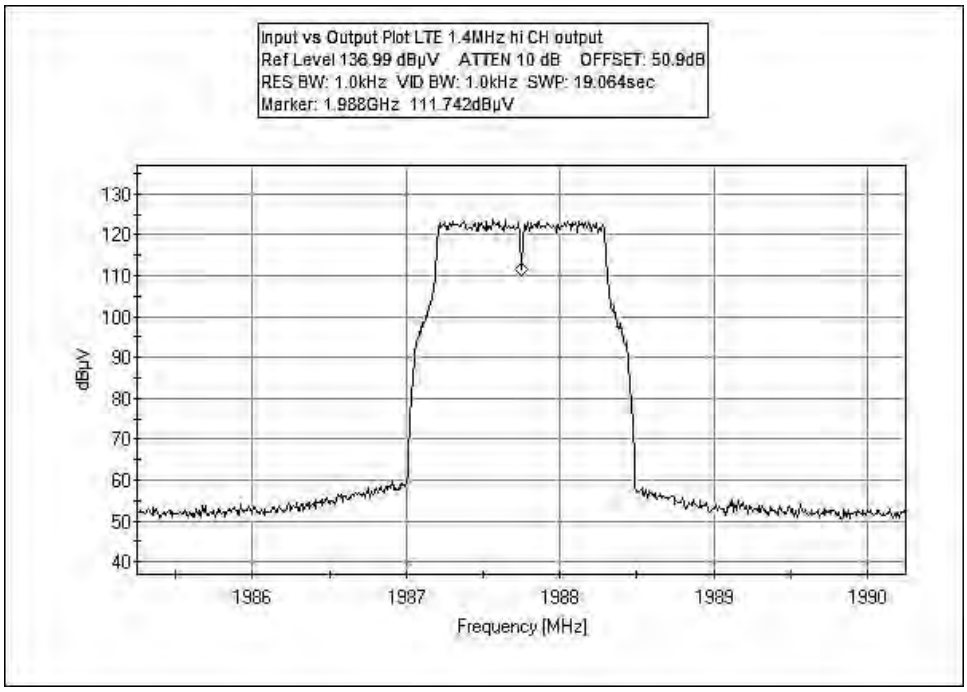

Input vs Output Plot UMTS WCDMA 3GPP Low CH output
Ref Level 136.99 dBµV ATTEN 10 dB OFFSET: 50.9dB
RES BW: 2.0kHz VID BW: 2.0kHz SWP: 14.298sec
Marker: 1.934GHz 120.784dBµV
dBµV
130
120
110
100
90
80
70
60
50
40
1927 1928 1929 1930 1931 1932 1933 1934 1935 1936 1937 1938 1939 1940 1941
Frequency [MHz]

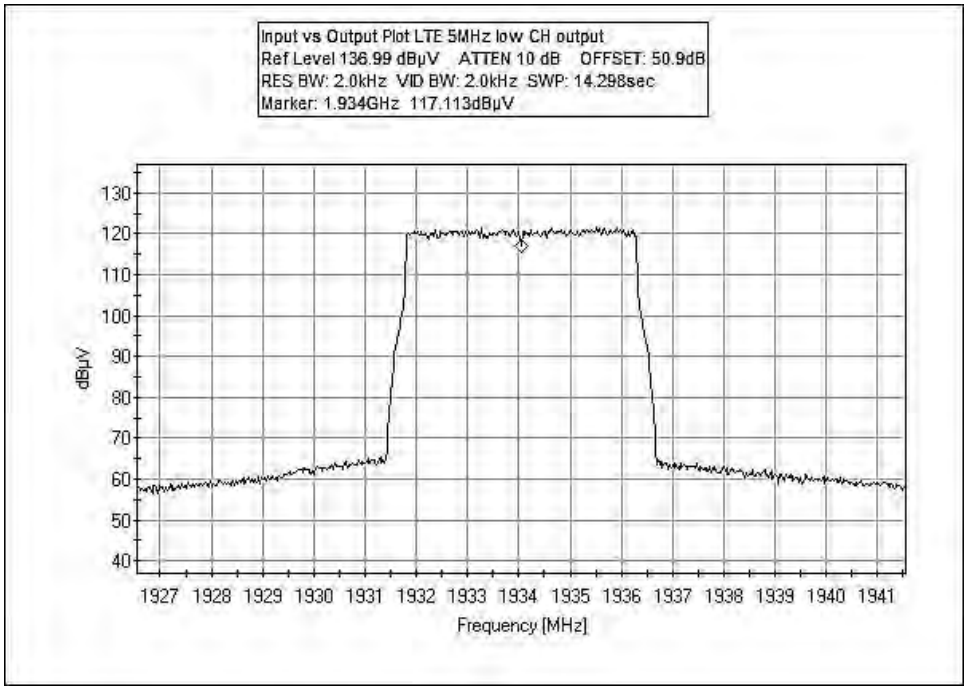

Input vs Output Plot UMTS WCDMA 3GPP mid CH output
Ref Level 136.99 dBµV ATTEN 10 dB OFFSET: 50.9dB
RES BW: 2.0kHz VID BW: 2.0kHz SWP: 14.298sec
Marker: 1.96GHz 121.484dBµV
dBµV
130
120
110
100
90
80
70
60
50
40
1953 1954 1955 1956 1957 1958 1959 1960 1961 1962 1963 1964 1965 1966 1967
Frequency [MHz]

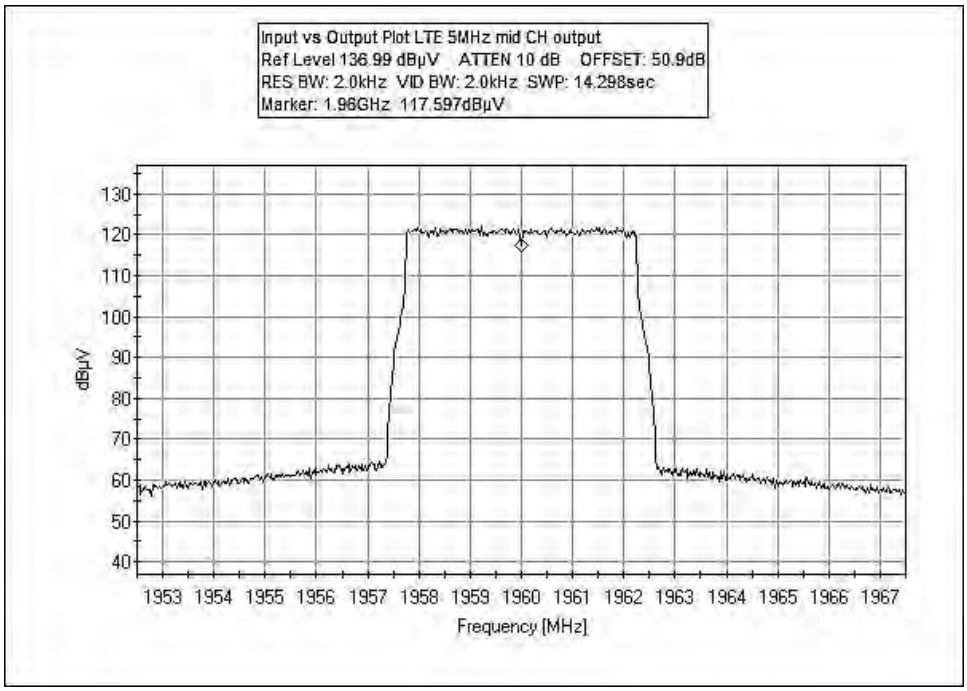

Input vs Output Plot UMTS WCDMA 3GPP hi CH output
Ref Level 136.99 dBµV ATTEN 10 dB OFFSET: 50.9dB
RES BW: 2.0kHz VID BW: 2.0kHz SWP: 14.298sec
Marker: 1.986GHz 118.961dBµV
dBµV
130
120
110
100
90
80
70
60
50
40
1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993
Frequency [MHz]

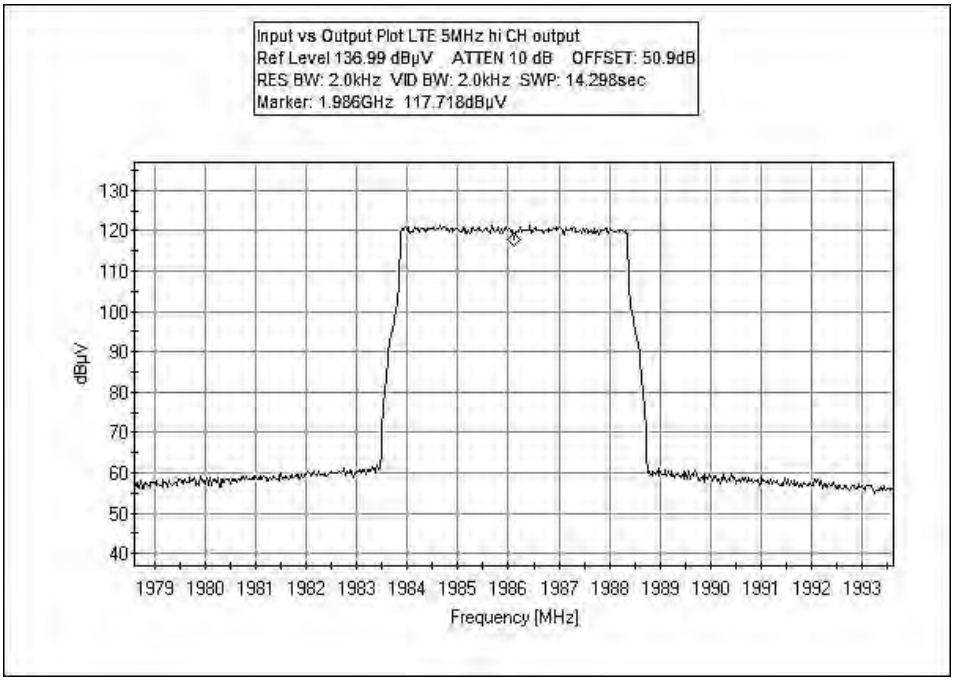

Input vs Output Plot LTE 1.4MHz low CH output
Ref Level 136.99 dBµV ATTEN 10 dB OFFSET: 50.9dB
RES BW: 1.0kHz VID BW: 1.0kHz SWP: 19.064sec
Marker: 1.932GHz 111.545dBµV
dBµV
130
120
110
100
90
80
70
60
50
40
1930
1931
1932
1933
1934
Frequency [MHz]

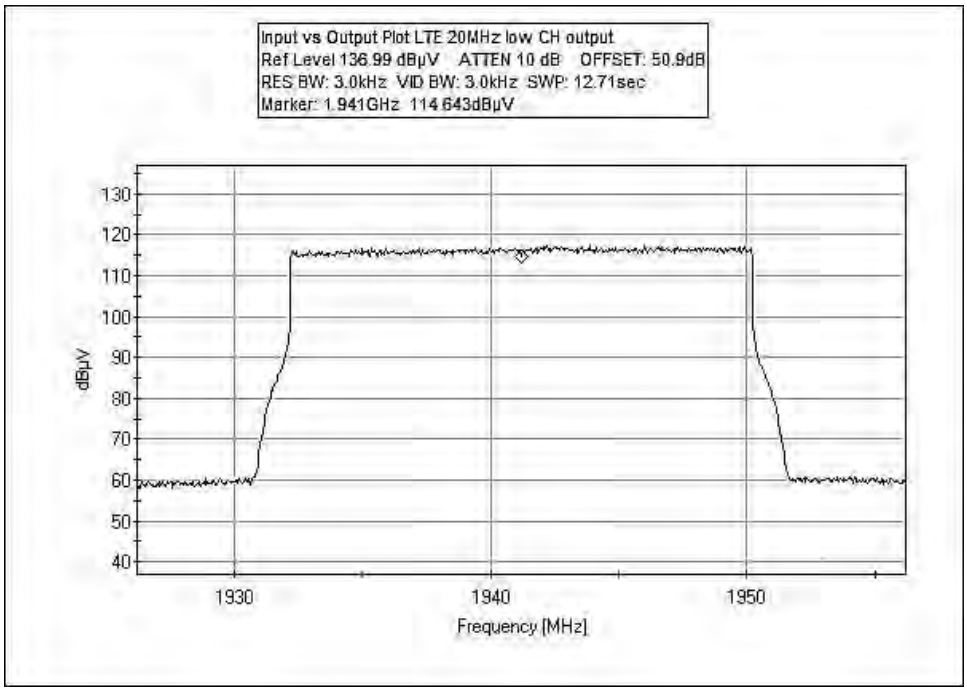

Input vs Output Plot LTE 1.4MHz mid CH output
Ref Level 136.99 dBµV ATTEN 10 dB OFFSET: 50.9dB
RES BW: 1.0kHz VID BW: 1.0kHz SWP: 19.064sec
Marker: 1.96GHz 112.417dBµV
dBµV
130
120
110
100
90
80
70
60
50
40
1958
1959
1960
1961
1962
Frequency [MHz]

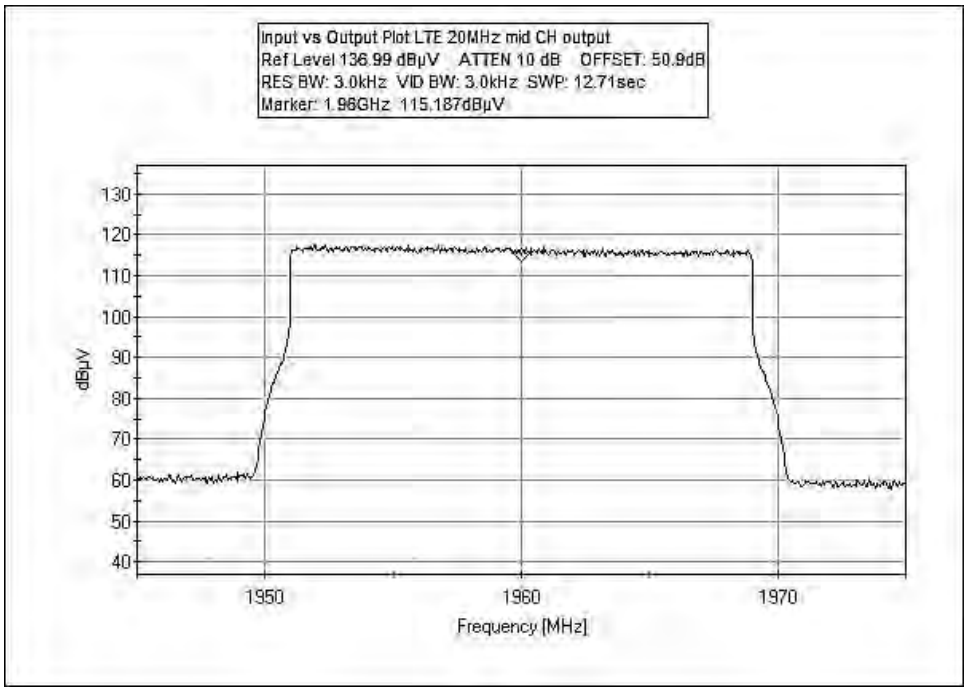

Input vs Output Plot LTE 1.4MHz hi CH output
Ref Level 136.99 dBµV ATTEN 10 dB OFFSET: 50.9dB
RES BW: 1.0kHz VID BW: 1.0kHz SWP: 19.064sec
Marker: 1.988GHz 111.742dBµV
dBµV
130
120
110
100
90
80
70
60
50
40
1986
1987
1988
1989
1990
Frequency [MHz]

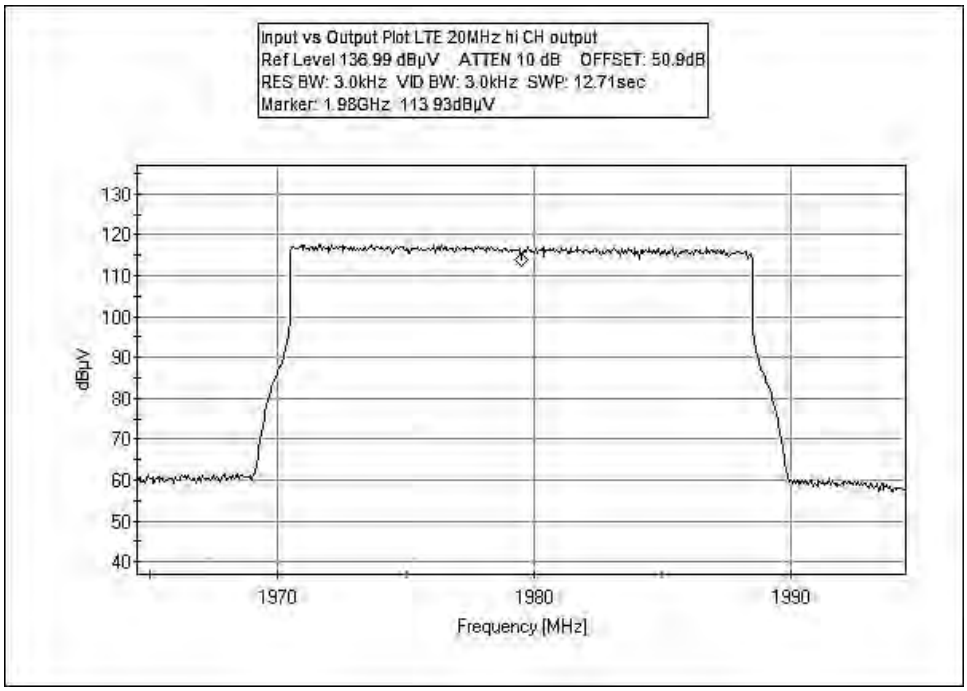

Input vs Output Plot LTE 5MHz low CH output
Ref Level 136.99 dBµV ATTEN 10 dB OFFSET: 50.9dB
RES BW: 2.0kHz VID BW: 2.0kHz SWP: 14.298sec
Marker: 1.934GHz 117.113dBµV
dBµV
130
120
110
100
90
80
70
60
50
40
1927 1928 1929 1930 1931 1932 1933 1934 1935 1936 1937 1938 1939 1940 1941
Frequency [MHz]


Input vs Output Plot LTE 5MHz mid CH output
Ref Level 136.99 dBµV ATTEN 10 dB OFFSET: 50.9dB
RES BW: 2.0kHz VID BW: 2.0kHz SWP: 14.298sec
Marker: 1.96GHz 117.597dBµV
dBµV
130
120
110
100
90
80
70
60
50
40
1953 1954 1955 1956 1957 1958 1959 1960 1961 1962 1963 1964 1965 1966 1967
Frequency [MHz]


Input vs Output Plot LTE 5MHz hi CH output
Ref Level 136.99 dBµV ATTEN 10 dB OFFSET: 50.9dB
RES BW: 2.0kHz VID BW: 2.0kHz SWP: 14.298sec
Marker: 1.986GHz 117.718dBµV
dBµV
130
120
110
100
90
80
70
60
50
40
1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993
Frequency [MHz]


Input vs Output Plot LTE 20MHz low CH output
Ref Level 136.99 dBµV ATTEN 10 dB OFFSET: 50.9dB
RES BW: 3.0kHz VID BW: 3.0kHz SWP: 12.71sec
Marker: 1.941GHz 114.643dBµV
dBµV
130
120
110
100
90
80
70
60
50
40
1930
1940
1950
Frequency [MHz]


Input vs Output Plot LTE 20MHz mid CH output
Ref Level 136.99 dBµV ATTEN 10 dB OFFSET: 50.9dB
RES BW: 3.0kHz VID BW: 3.0kHz SWP: 12.71sec
Marker: 1.96GHz 115.187dBµV
dBµV
130
120
110
100
90
80
70
60
50
40
1950
1960
1970
Frequency [MHz]


Input vs Output Plot LTE 20MHz hi CH output
Ref Level 136.99 dBµV ATTEN 10 dB OFFSET: 50.9dB
RES BW: 3.0kHz VID BW: 3.0kHz SWP: 12.71sec
Marker: 1.98GHz 113.93dBµV
dBµV
130
120
110
100
90
80
70
60
50
40
1970
1980
1990
Frequency [MHz]

Test Setup Photos

Overall Test Setup

2.1051 Spurious Emissions at Antenna Terminal

Test Data

Test Location: CKC Laboratories Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714-993-6112

Customer:	**BTI Wireless**		
Specification:	**24.238 (a) Broadband PCS Conducted Spurious Emission**		
Work Order #:	**95157**	Date:	11/22/2013
Test Type:	**Conducted Emissions**	Time:	14:18:02
Equipment:	**1900MHz 40W Transmitting Remote Unit**	Sequence#:	4
Manufacturer:	BTI Wireless	Tested By:	Don Nguyen
Model:	mBSC1900-040-RUSSF01		110V 60Hz
S/N:	10935304010113111101		

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02869	Spectrum Analyzer	E4440A	2/6/2013	2/6/2015
T2	AN03239	Cable	32022-2-29094K-24TC	10/30/2013	10/30/2015
	AN03385	High Pass Filter	11SH10-3000/T10000-O/O	6/5/2013	6/5/2015

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
1900MHz 40W Transmitting Remote Unit*	BTI Wireless	mBSC1900-040-RUSSF01	10935304010113111101

Support Devices:

Function	Manufacturer	Model #	S/N
ESG Vector Signal Generator	Agilent	4438C	MY45091601
Attenuator 30db Pad	Weinschel	49-30-43	KW075
Step Attenuator 110dB pad	HP	8496B	1350A01241
50 ohm Load	Generic	NA	NA
Cable	Pasternack	Sucoflex 104A	12237/4A

Test Conditions / Notes:

The EUT is placed on the test bench. Tx In is connected to an ESG Signal generator via cable Sucoflex 104A. ANT port is connected to 30db attenuator and 110db step attenuator. A spectrum analyzer is connected to attenuators via cable 32022-2-29094K-24TC. RX out port is terminated to 50 ohm load.

The evaluation is performed at the antenna port .

Freq: 1930-1990MHz
Signal protocol: GSM, EDGE, CDMA (IS95A), UMTS (WCDMA_3GPP), LTE-TM1.1 1.4MHz, 5MHz. 20MHz

The RF output power was measured with the following power settings:

40W

Modulation	Input Power (dbm)
GSM	
1932.04MHz	-12.42
1960.00MHz	-12.04
1987.96MHz	-11.36
EDGE	
1932.04MHz	-11.24
1960.00MHz	-11.24
1987.96MHz	-11.12
CDMA (IS95A)	
1932.5MHz	-11.08
1960.00MHz	-11.44
1987.5MHz	-11.02
UMTS (WCMDA 3GPP)	
1933.9MHz	-11.2
1960.00MHz	-11.62
1986.1MHz	-11.14
LTE 1.4MHz	
1932.40MHz	-11.14
1960.00MHz	-11.62
1987.75MHz	-11.02
LTE 5MHz	
1934.05MHz	-11.3
1960.00MHz	-11.78
1986.11MHz	-11.24
LTE 20MHz	
1941.2MHz	-11.76
1960.00MHz	-11.76
1979.5MHz	-11.52

20W

Modulation	Input Power (dbm)
GSM	
1932.04MHz	-14.09
1960.00MHz	-14.24
1987.96MHz	-14.66
EDGE	
1932.04MHz	-9.62
1960.00MHz	-9.22
1987.96MHz	-9.06
CDMA (IS95A)	
1932.5MHz	-12.42

1960.00MHz	-12.54
1987.5MHz	-11.8
UMTS (WCMDA 3GPP)	
1933.9MHz	-13.96
1960.00MHz	-15.38
1986.1MHz	-14.82
LTE 1.4MHz	
1932.40MHz	-14.54
1960.00MHz	-14.54
1987.75MHz	-13.86
LTE 5MHz	
1934.05MHz	-15.02
1960.00MHz	-15.6
1986.11MHz	-14.98
LTE 20MHz	
1941.2MHz	-15.58
1960.00MHz	-15.58
1979.5MHz	-15.32
10W	
Modulation	Input Power (dbm)
GSM	
1932.04MHz	-18.1
1960.00MHz	-18.84
1987.96MHz	-18.14
EDGE	
1932.04MHz	-18.5
1960.00MHz	-18.5
1987.96MHz	-18.24
CDMA (IS95A)	
1932.5MHz	-18.06
1960.00MHz	-18.22
1987.5MHz	-18.12
UMTS (WCMDA 3GPP)	
1933.9MHz	-18.24
1960.00MHz	-18.82
1986.1MHz	-18.1
LTE 1.4MHz	
1932.40MHz	-18.22
1960.00MHz	-18.22
1987.75MHz	-18.02
LTE 5MHz	

1934.05MHz -18.2
1960.00MHz -18.8
1986.11MHz -18.2

LTE 20MHz
1941.2MHz -18.82
1960.00MHz -18.82
1979.5MHz -18.68

Frequency range of measurement = 9kHz- 20GHz.
9 kHz -150 kHz;RBW=200 Hz,VBW=200 Hz;150 kHz-30 MHz;RBW=9 kHz,VBW=9 kHz;30 MHz-1000 MHz;RBW=120 kHz,VBW=120 kHz,1000 MHz-20000 MHz;RBW=1 MHz,VBW=1 MHz.

22°C, 45% Relative Humidity

Site A

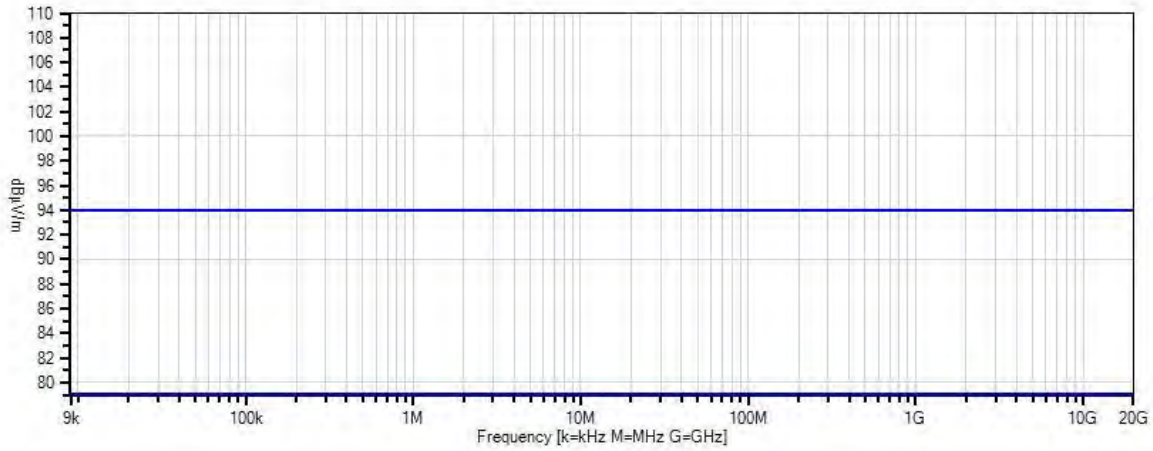
No harmonic emission was found above 1GHz. Data represents the worst case power settings.

Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Lead: Ant Port

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	12.093M Ave	64.1	+0.0	+0.2			+0.0	64.3	94.0 40W, CDMA IS95A, hi CH, input power= -11.02dbm	-29.7	Ant P
^	12.093M	72.6	+0.0	+0.2			+0.0	72.8	94.0 40W, CDMA IS95A, hi CH, input power= -11.02dbm	-21.2	Ant P
3	14.937M Ave	60.8	+0.0	+0.2			+0.0	61.0	94.0 40W, CDMA IS95A, hi CH, input power= -11.02dbm	-33.0	Ant P
^	14.937M	68.4	+0.0	+0.2			+0.0	68.6	94.0 40W, CDMA IS95A, hi CH, input power= -11.02dbm	-25.4	Ant P
5	11.147M Ave	60.2	+0.0	+0.3			+0.0	60.5	94.0 40W, CDMA IS95A, hi CH, input power= -11.02dbm	-33.5	Ant P
^	11.147M	70.9	+0.0	+0.3			+0.0	71.2	94.0 40W, CDMA IS95A, hi CH, input power= -11.02dbm	-22.8	Ant P

CKC Laboratories Inc. Date: 11/22/2013 Time: 14:18:02 BTI Wireless WO#: 95157
24.238 (a) Broadband PCS Conducted Spurious Emission Test Lead: Ant Port 110V 60Hz Sequence#: 4 Ext
ATTN: 0 dB



Sweep Data
Readings
Peak Readings
QP Readings
Average Readings
Ambient
1 - 24.238 (a) Broadband PCS Conducted Spurious Emission

Test Setup Photos

Overall Test Setup

Field Strength of Spurious Radiation

Test Data

Test Location: CKC Laboratories Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714-993-6112

Customer: **BTI Wireless**
Specification: **24.238 (a) Broadband PCS Radiated Spurious Emission**
Work Order #: **95157** Date: 11/21/2013
Test Type: **Maximized Emissions** Time: 10:46:03
Equipment: **1900MHz 40W Transmitting Remote Unit** Sequence#: 6
Manufacturer: BTI Wireless Tested By: Don Nguyen
Model: mBSC1900-040-RUSSF01
S/N: 10935304010113111101

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN00309	Preamp	8447D	3/29/2012	3/29/2014
T2	AN01995	Biconilog Antenna	CBL6111C	5/16/2012	5/16/2014
T3	ANP05050	Cable	RG223/U	1/21/2013	1/21/2015
T4	ANP05198	Cable-Amplitude 15 to 45degC (dB)	8268	12/11/2012	12/11/2014
T5	AN02869	Spectrum Analyzer	E4440A	2/6/2013	2/6/2015
	AN00787	Preamp	83017A	5/31/2013	5/31/2015
	AN00849	Horn Antenna	3115	4/13/2012	4/13/2014
	ANP05421	Cable	Sucoflex 104A	2/8/2012	2/8/2014
	ANP05988	Cable	LDF1-50	3/12/2012	3/12/2014
	AN03239	Cable	32022-2-29094K-24TC	10/30/2013	10/30/2015
	AN00314	Loop Antenna	6502	6/29/2012	6/29/2014

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
1900MHz 40W Transmitting Remote Unit*	BTI Wireless	mBSC1900-040-RUSSF01	10935304010113111101

Support Devices:

Function	Manufacturer	Model #	S/N
ESG Vector Signal Generator	Agilent	4438C	MY45091601
Power Meter	HP	EPM-441A	GB37170458
Power Sensor	Agilent	E4412A	MY41502826

Test Conditions / Notes:

The EUT is placed on wooden table. Tx In is connected to an ESG located remotely, ANT is connected to a power meter to verify power output. RX out port is terminated to 50 ohm load.

Freq: 1930 - 1990MHz
Signal protocol: LTE 1.4MHz, 5Mhz. 20MHz, GSM/EDGE/CDMA/WCDMA

Highest rating power : 40 W

Frequency range of measurement = 9 kHz- 20GHz.
9 kHz -150 kHz;RBW=200 Hz,VBW=200 Hz;150 kHz-30 MHz;RBW=9 kHz,VBW=9 kHz;30 MHz-1000 MHz;RBW=120 kHz,VBW=120 kHz,1000 MHz-20000 MHz;RBW=1 MHz,VBW=1 MHz.

19°C, 63% Relative Humidity

PK= RMS detector. ave=Trace average 100 traces.
Data is presented in the worst case scenario.

Operating Frequency:	1930-1990MHz			
Channels:	CDMA IS95A			
Highest Measured Output Power:	46.00	(dBm)=	40	(Watts)
Distance:	3	meters		
Limit:	43+10Log(P)=	59.02	dBc	

Freq. (MHz)	Reference Level (dBm)	Antenna Polarity (H/V)	dBc
86.75	-59.52059991	Vert	105.52
86.75	-58.42059991	Horiz	104.42
125.35	-58.32059991	Vert	104.32
125.35	-57.72059991	Horiz	103.72
133.40	-59.22059991	Vert	105.22
133.40	-64.92059991	Horiz	110.92
172.80	-63.52059991	Vert	109.52
172.80	-62.62059991	Horiz	108.62
235.40	-62.22059991	Vert	108.22
235.40	-58.62059991	Horiz	104.62

Test Setup Photos

Band Edge

Test Data

Test Location: CKC Laboratories Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714-993-6112

Customer: **BTI Wireless**
Specification: **Band Edge Plots**
Work Order #: **95157** Date: 11/22/2013
Test Type: **Conducted Emissions** Time: 14:18:02
Equipment: **1900MHz 40W Transmitting Remote Unit** Sequence#: 4
Manufacturer: BTI Wireless Tested By: Don Nguyen
Model: mBSC1900-040-RUSSF01 110V 60Hz
S/N: 10935304010113111101

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02869	Spectrum Analyzer	E4440A	2/6/2013	2/6/2015
T2	AN03239	Cable	32022-2-29094K-24TC	10/30/2013	10/30/2015

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
1900MHz 40W Transmitting Remote Unit*	BTI Wireless	mBSC1900-040-RUSSF01	10935304010113111101

Support Devices:

Function	Manufacturer	Model #	S/N
ESG Vector Signal Generator	Agilent	4438C	MY45091601
Attenuator 30db Pad	Weinschel	49-30-43	KW075
Step Attenuator 110dB pad	HP	8496B	1350A01241
50 ohm Load	Generic	NA	NA
Cable	Pasternack	Sucoflex 104A	12237/4A

Test Conditions / Notes:

The EUT is placed on the test bench. Tx In is connected to an ESG Signal generator via cable Sucoflex 104A. ANT port is connected to 30db attenuator and 110db step attenuator. A spectrum analyzer is connected to attenuators via cable 32022-2-29094K-24TC. RX out port is terminated to 50 ohm load.

The evaluation is performed at the antenna port.

Freq: 1930-1990MHz
Signal protocol: GSM, EDGE, CDMA (IS95A), UMTS (WCDMA_3GPP), LTE-TM1.1 1.4MHz, 5MHz. 20MHz

40W

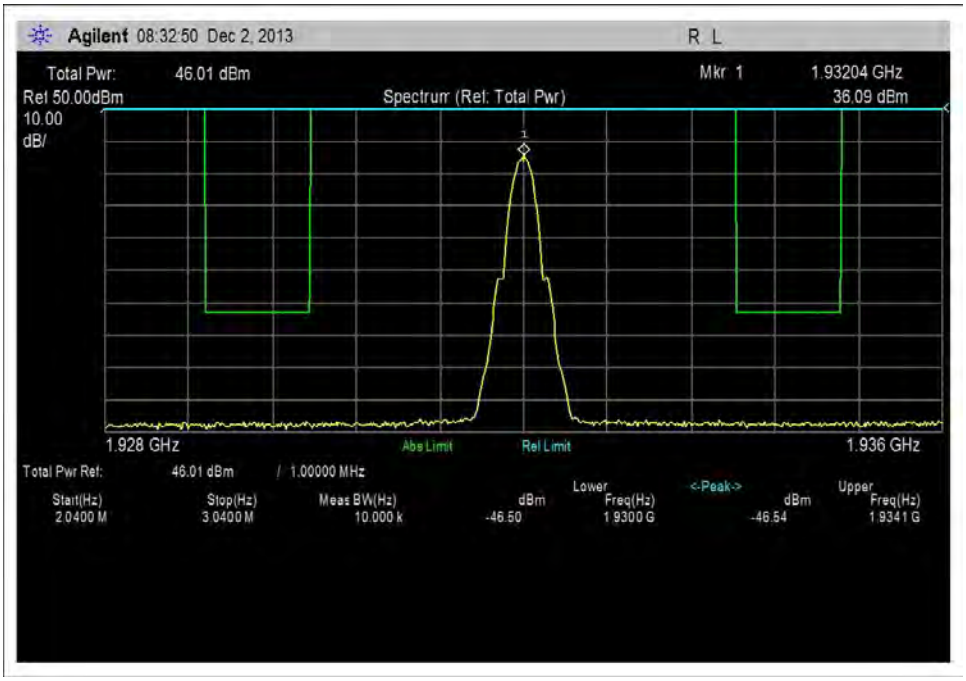
Modulation	Input Power (dbm)
GSM	
1932.04MHz	-12.42
1960.00MHz	-12.04

1987.96MHz	-11.36
EDGE	
1932.04MHz	-11.24
1960.00MHz	-11.24
1987.96MHz	-11.12
CDMA (IS95A)	
1932.5MHz	-11.08
1960.00MHz	-11.44
1987.5MHz	-11.02
UMTS (WCMDA 3GPP)	
1933.9MHz	-11.2
1960.00MHz	-11.62
1986.1MHz	-11.14
LTE 1.4MHz	
1932.40MHz	-11.14
1960.00MHz	-11.62
1987.75MHz	-11.02
LTE 5MHz	
1934.05MHz	-11.3
1960.00MHz	-11.78
1986.11MHz	-11.24
LTE 20MHz	
1941.2MHz	-11.76
1960.00MHz	-11.76
1979.5MHz	-11.52

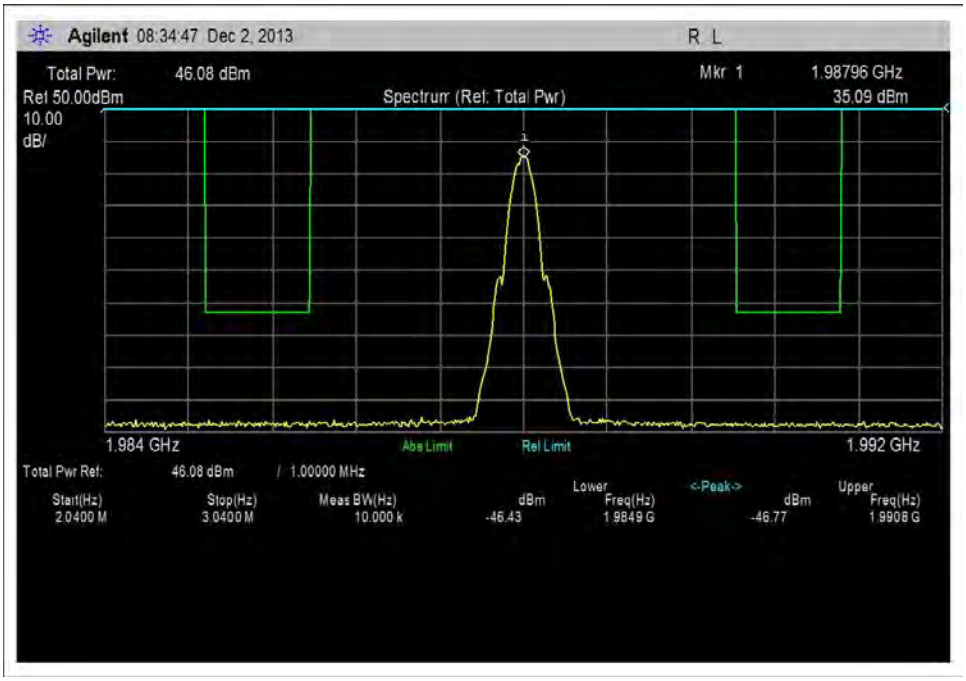
22°C, 45% Relative Humidity

Site A

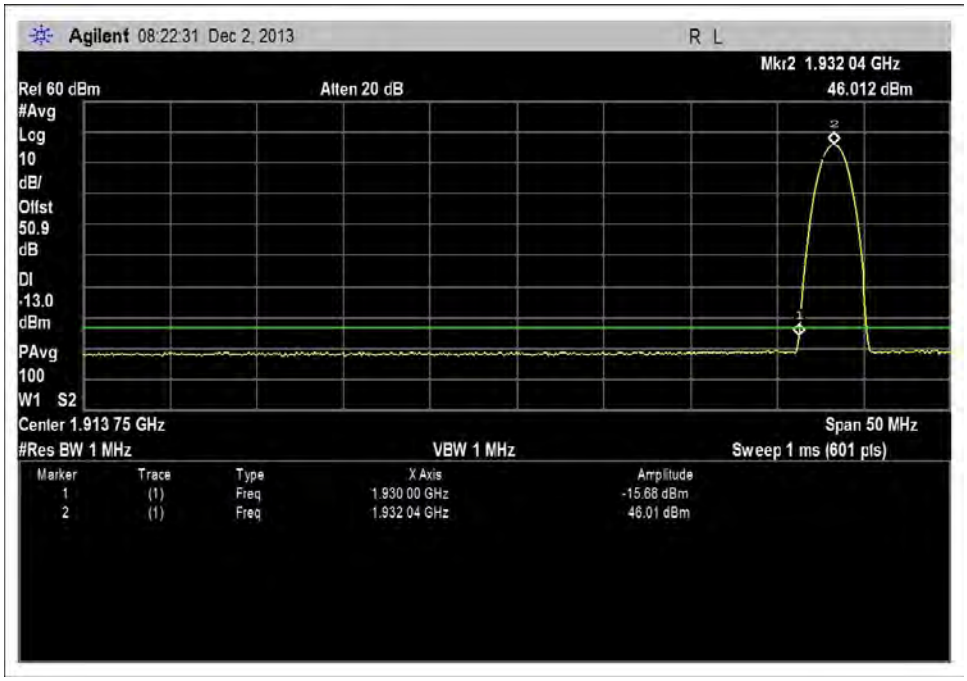
Test Plots



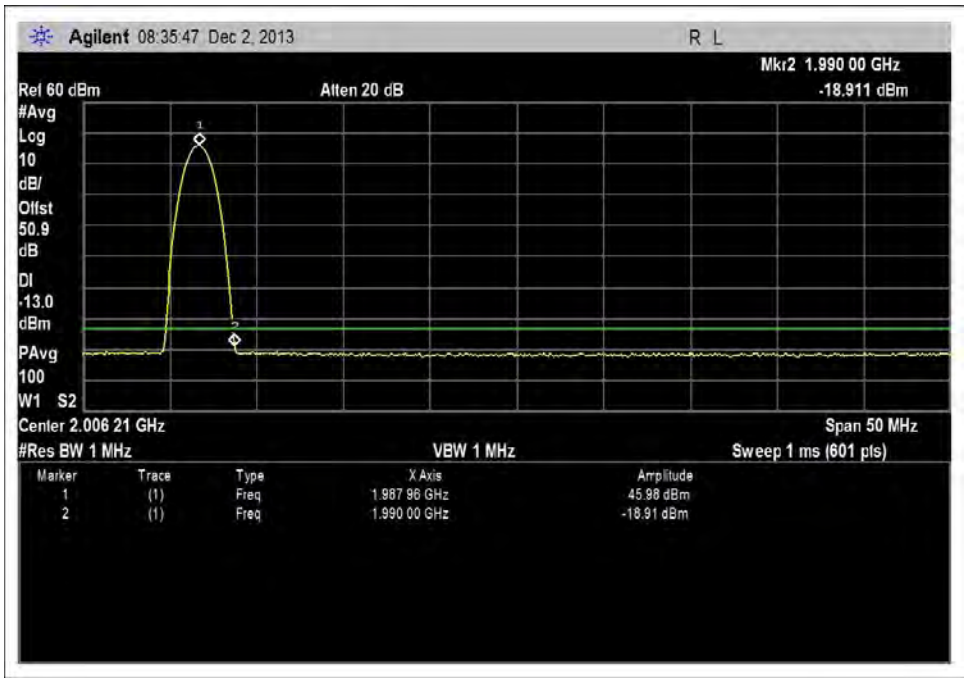
40W, GSM 10kHz – Low



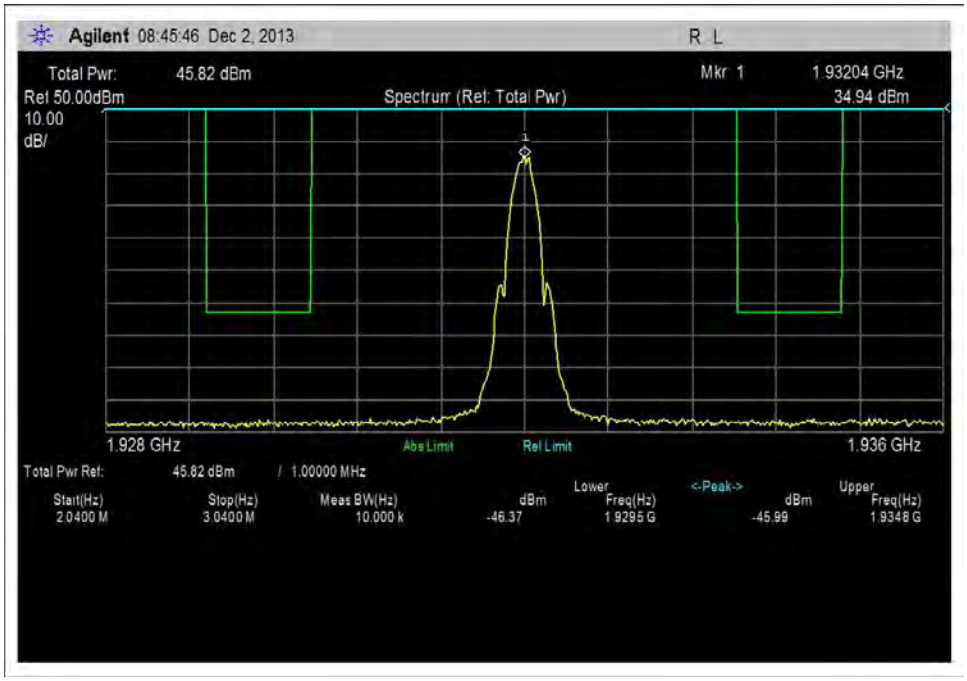
40W, GSM 10kHz – High



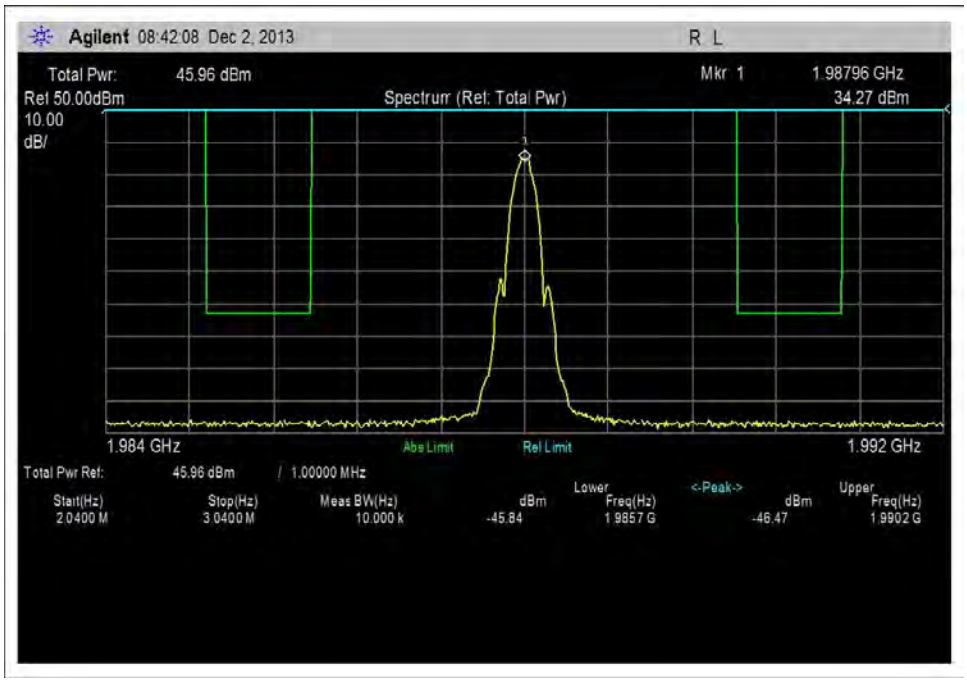
40W, GSM 1MHz - Low



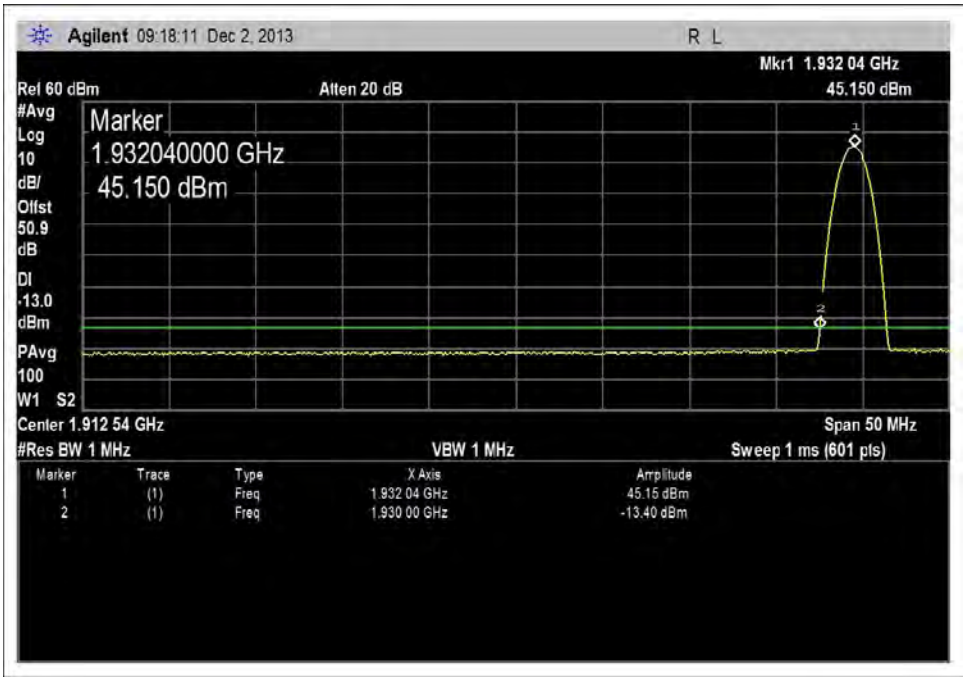
40W, GSM 1MHz - High



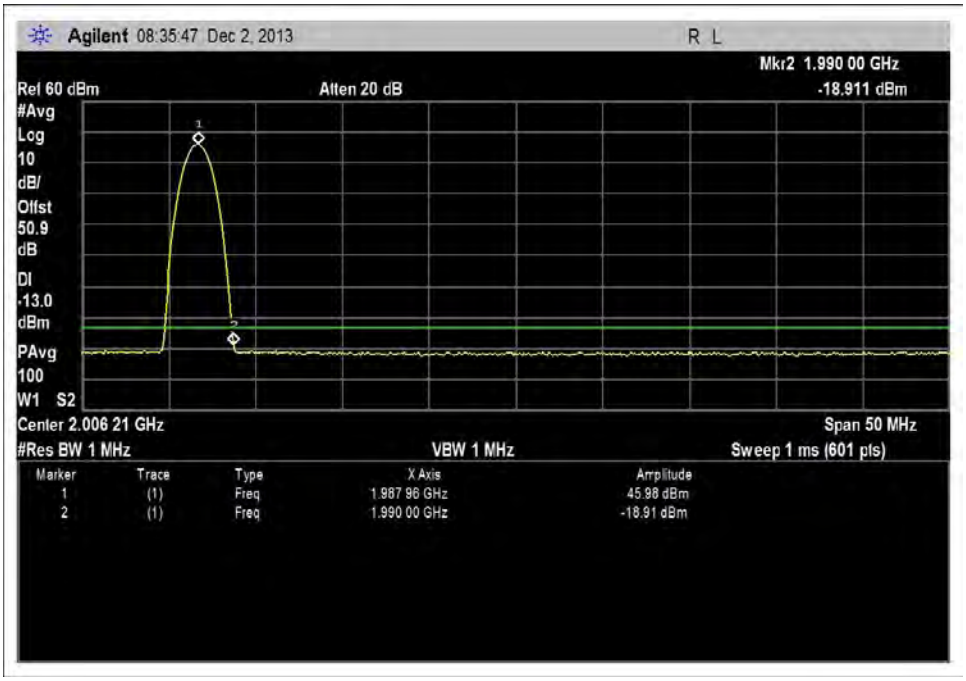
40W, EDGE 10kHz - Low



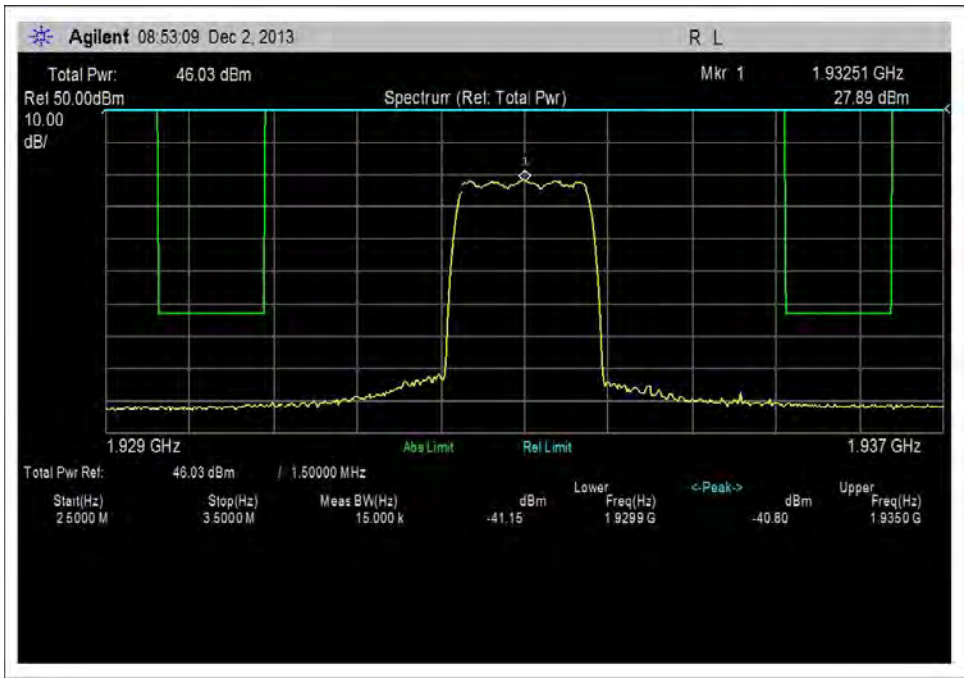
40W, EDGE 10kHz - High



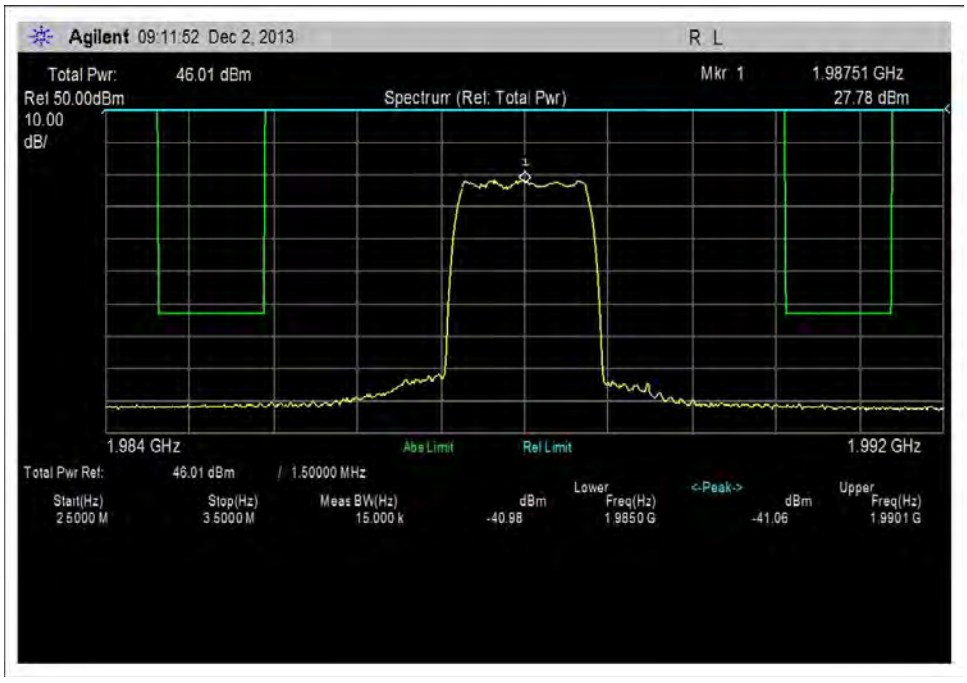
40W, EDGE 1MHz - Low



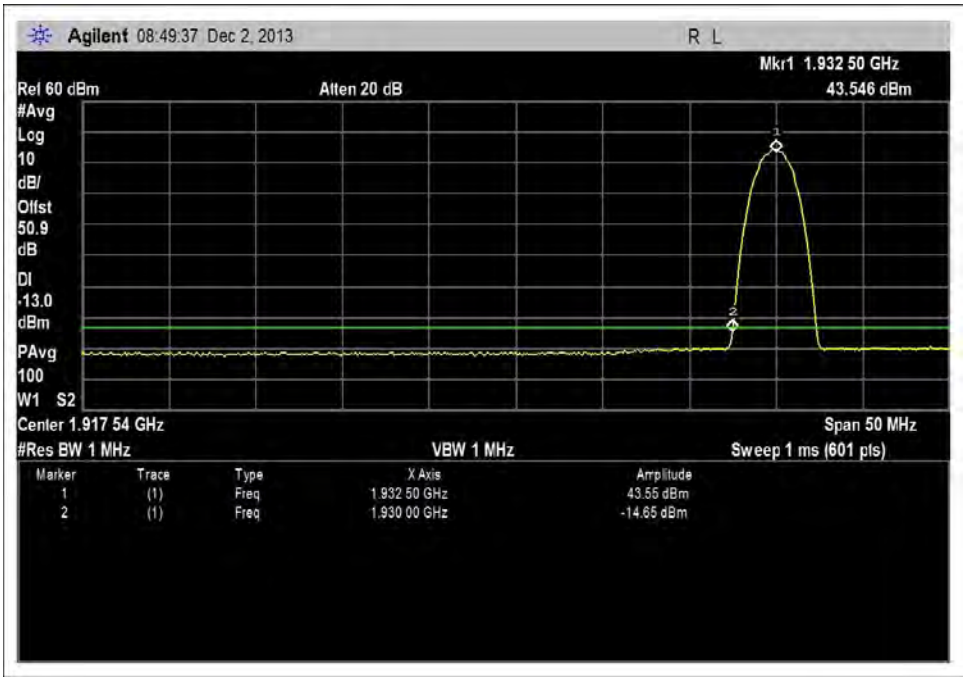
40W, EDGE 1MHz - High



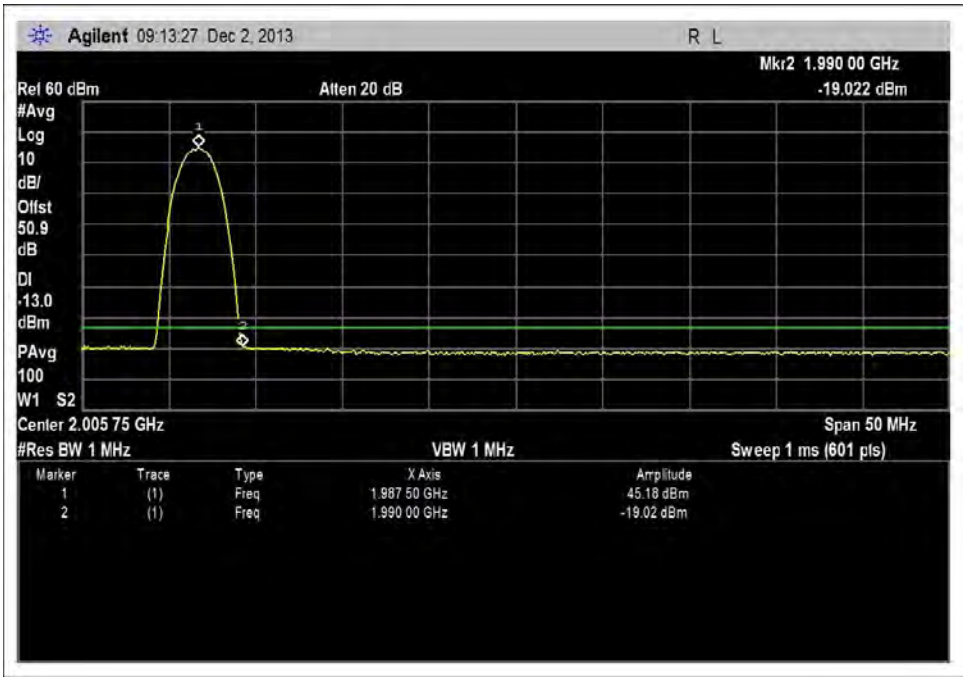
40W, CDMA IS95A 15kHz - Low



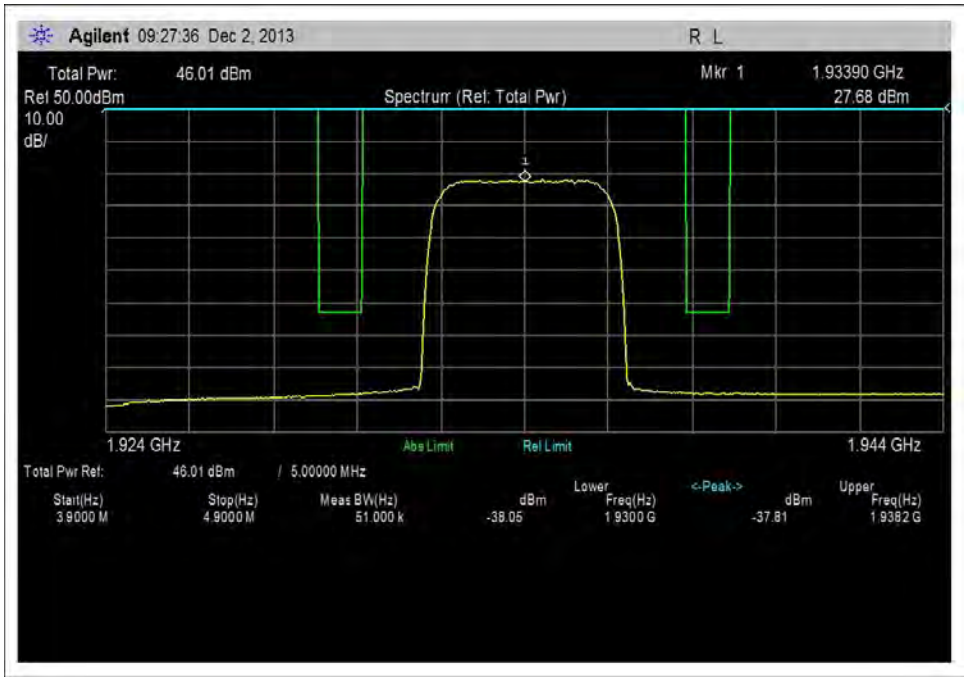
40W, CDMA IS95A 15kHz - High



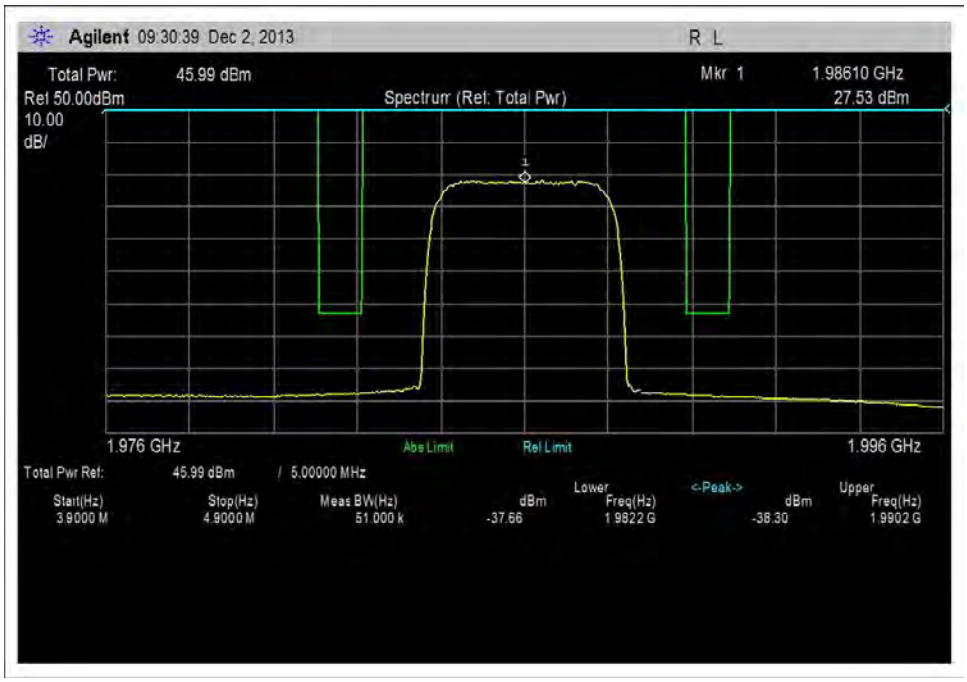
40W, CDMA IS95A 1MHz - Low



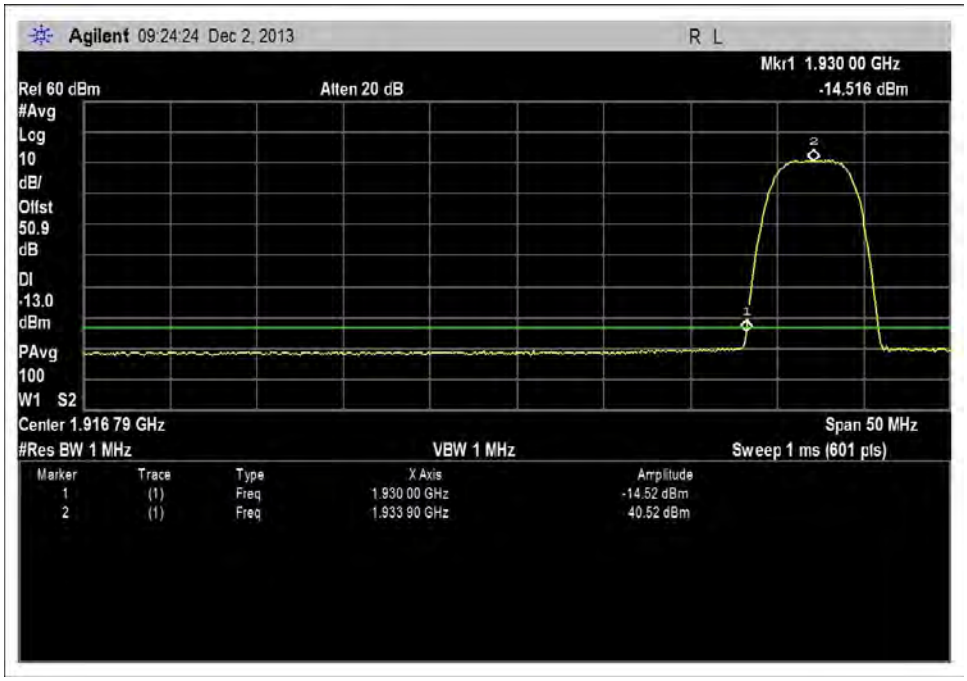
40W, CDMA IS95A 1MHz - High



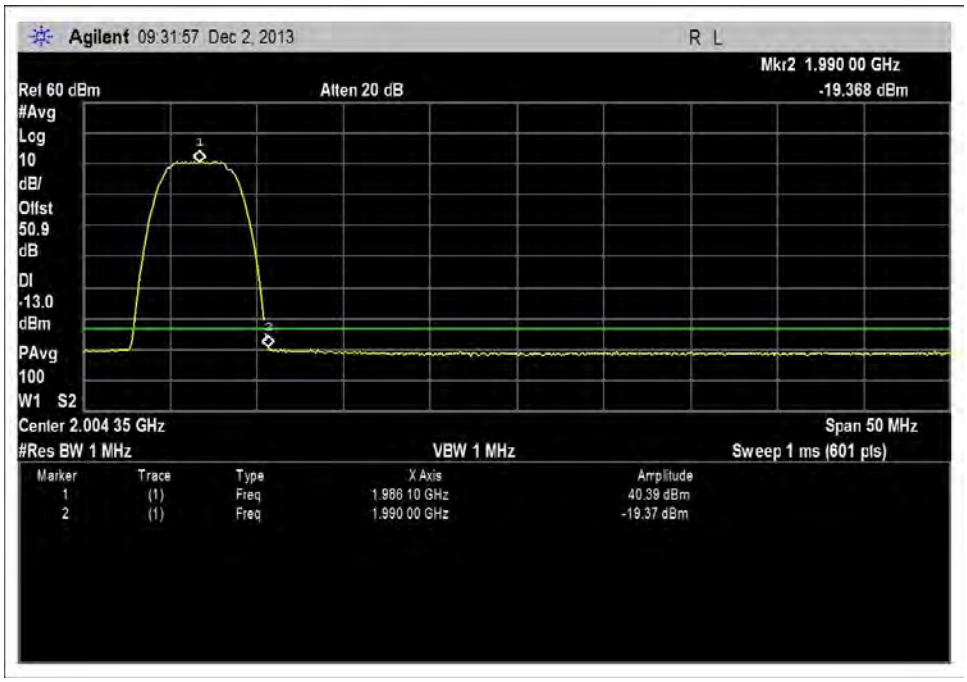
40W, WCDMA 51kHz- Low



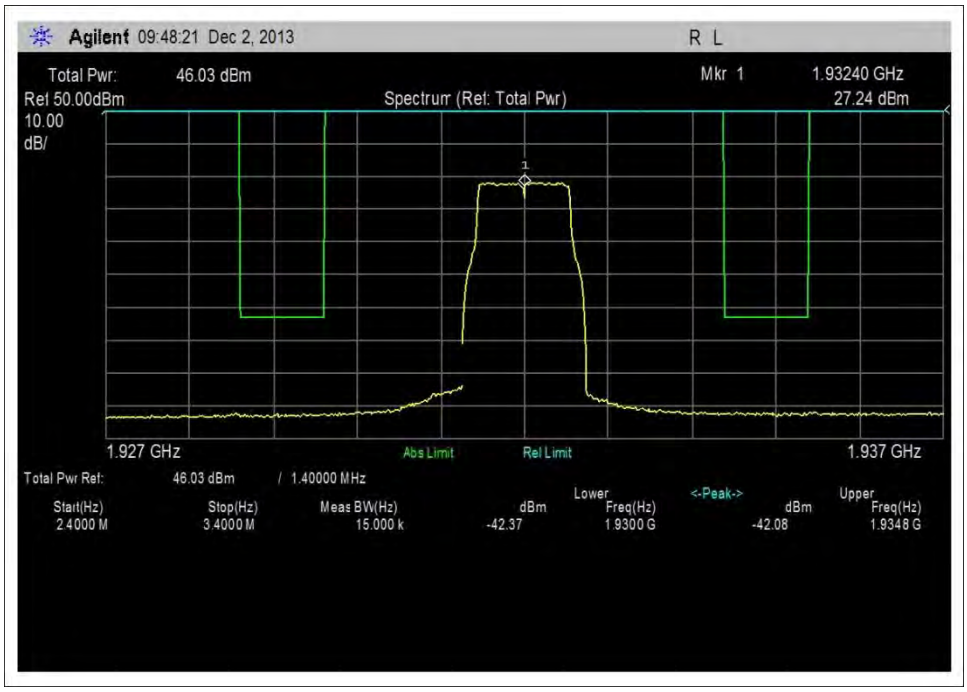
40W, WCDMA 51kHz- High



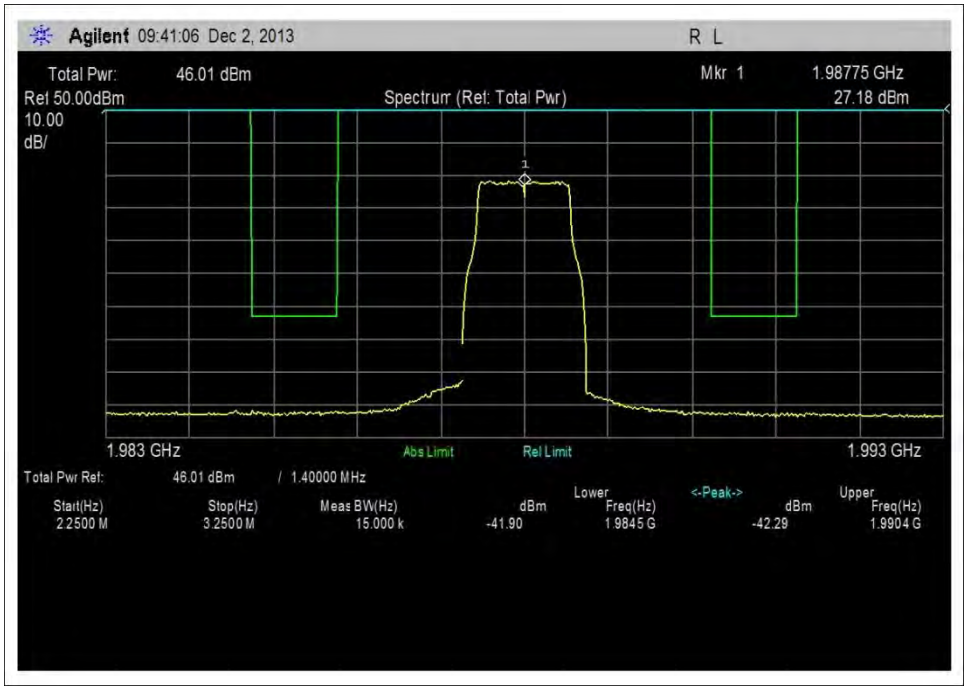
40W, WCDMA 1MHz- Low



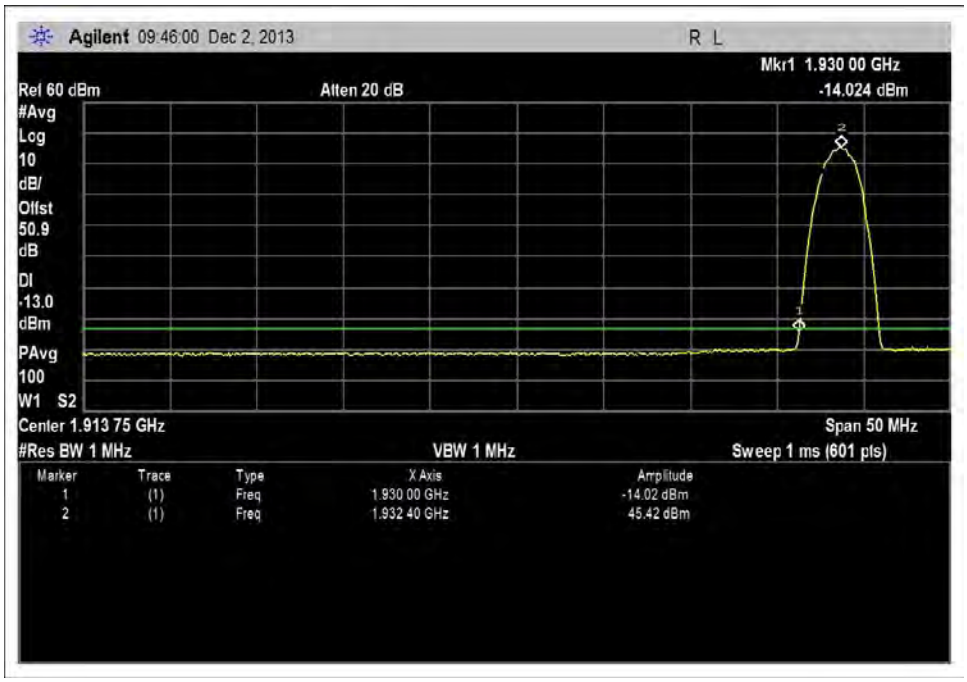
40W, WCDMA 1MHz- High



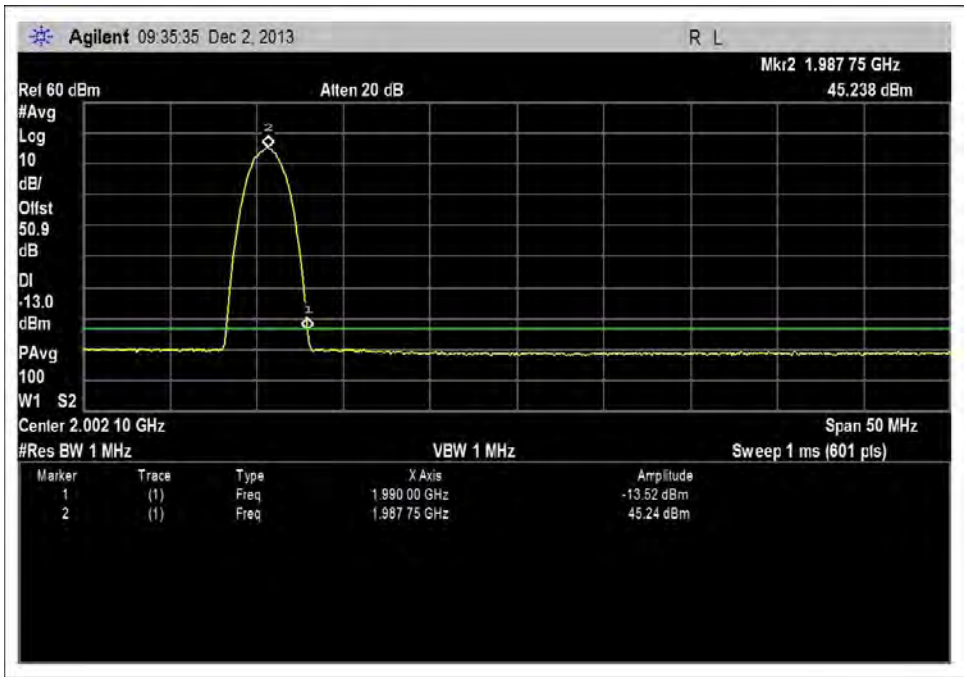
40W, LTE 1.4MHz 15kHz – Low



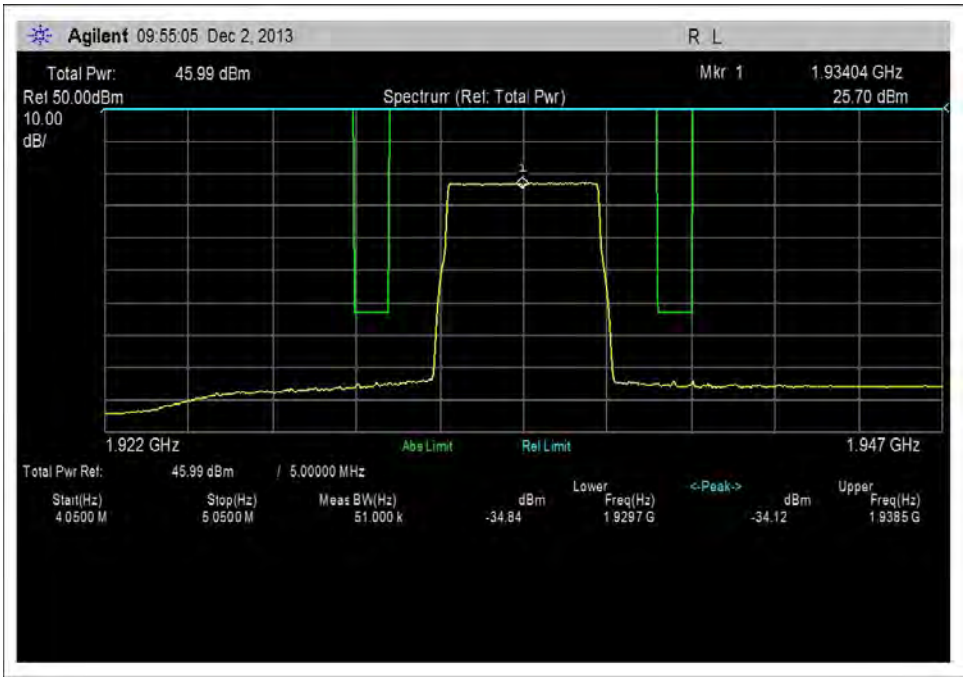
40W, LTE 1.4MHz 15kHz – High



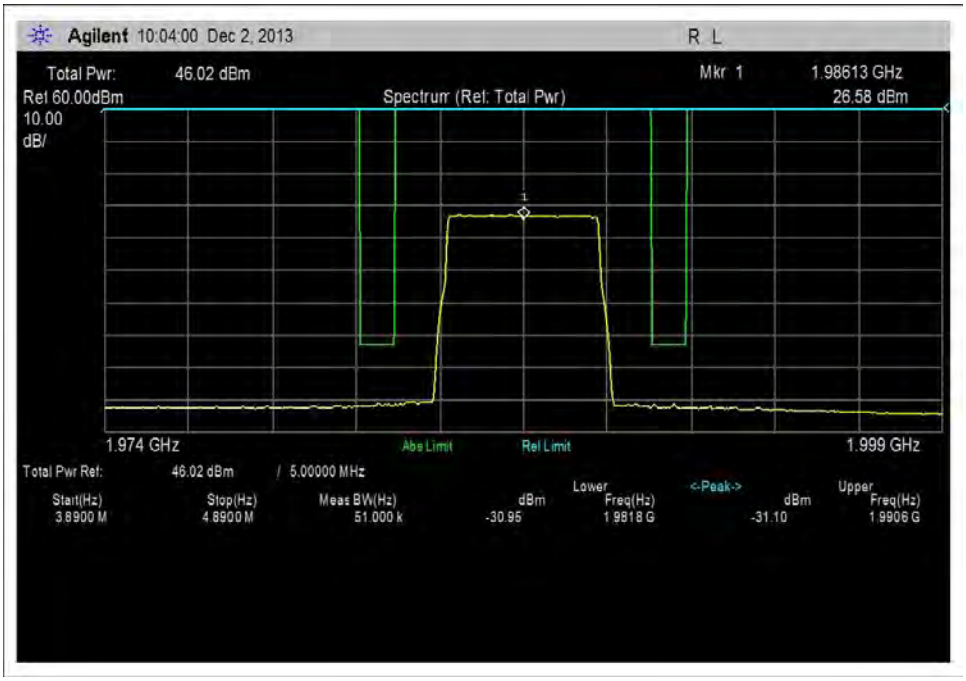
40W, LTE 1.4MHz 1MHz - Low



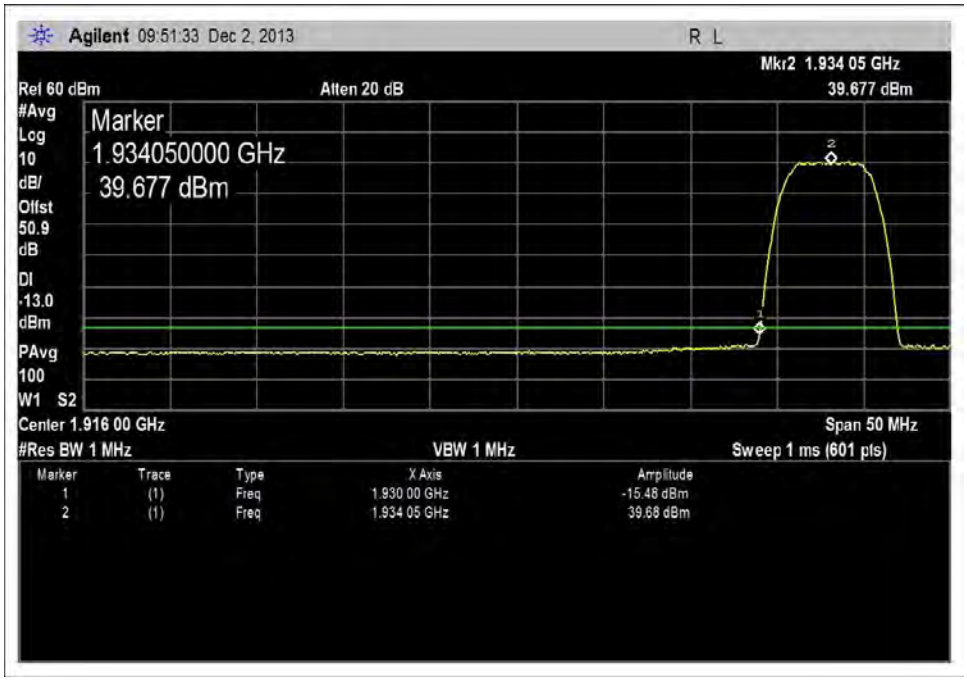
40W, LTE 1.4MHz 1MHz - High



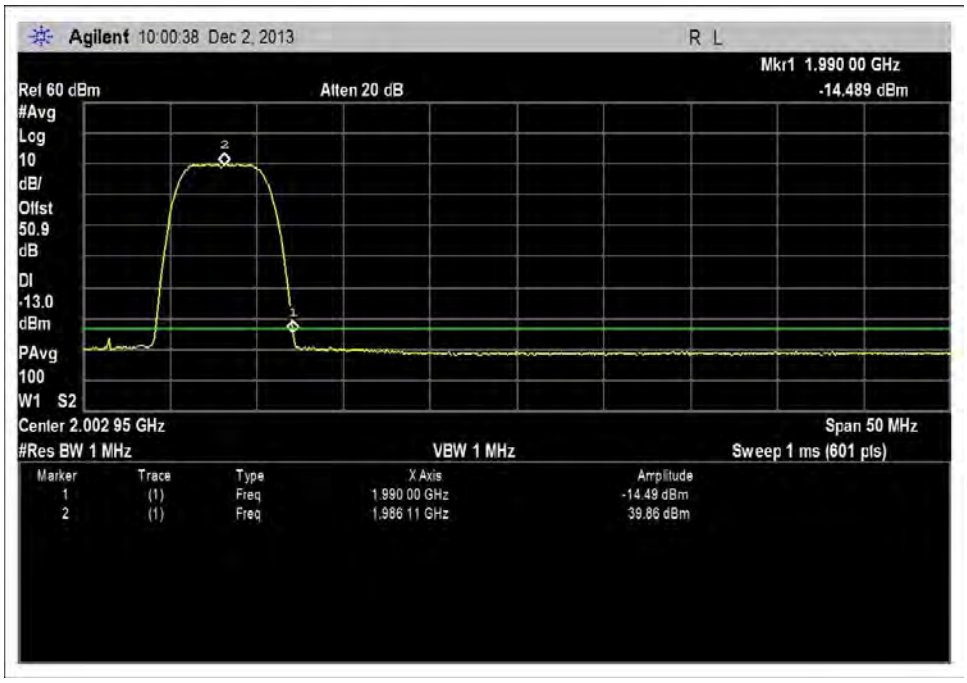
40W, LTE 5MHz 51kHz- Low



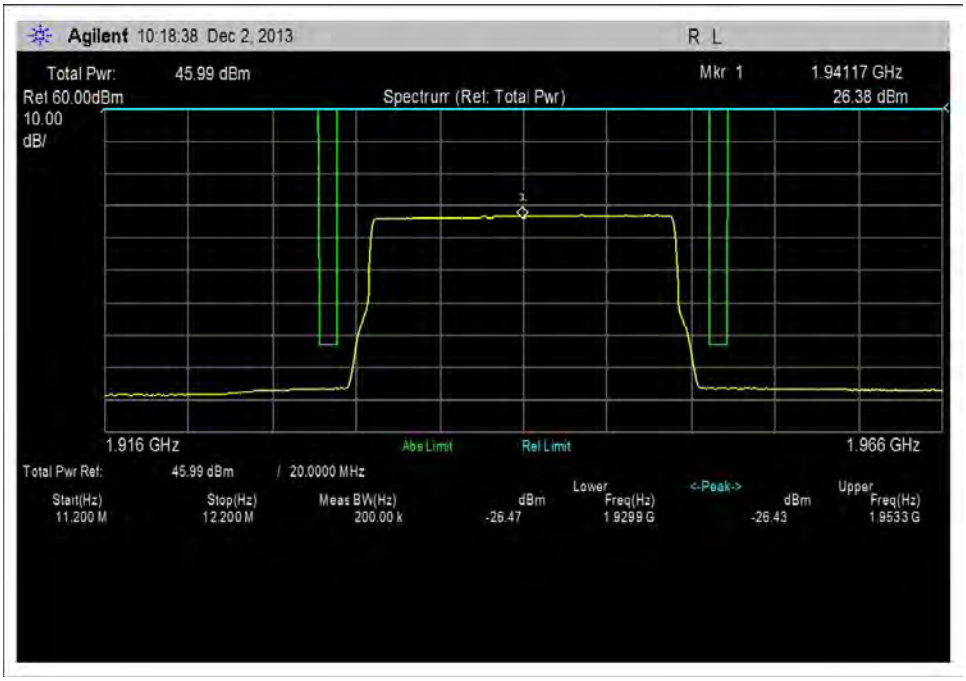
40W, LTE 5MHz 51kHz - High



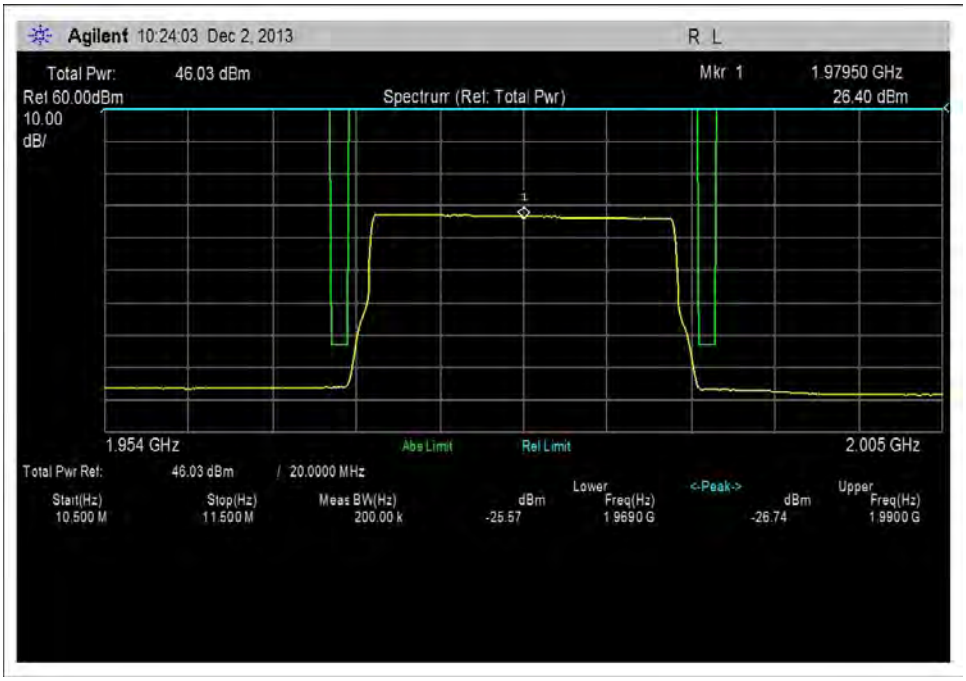
40W, LTE 5MHz 1MHz- Low



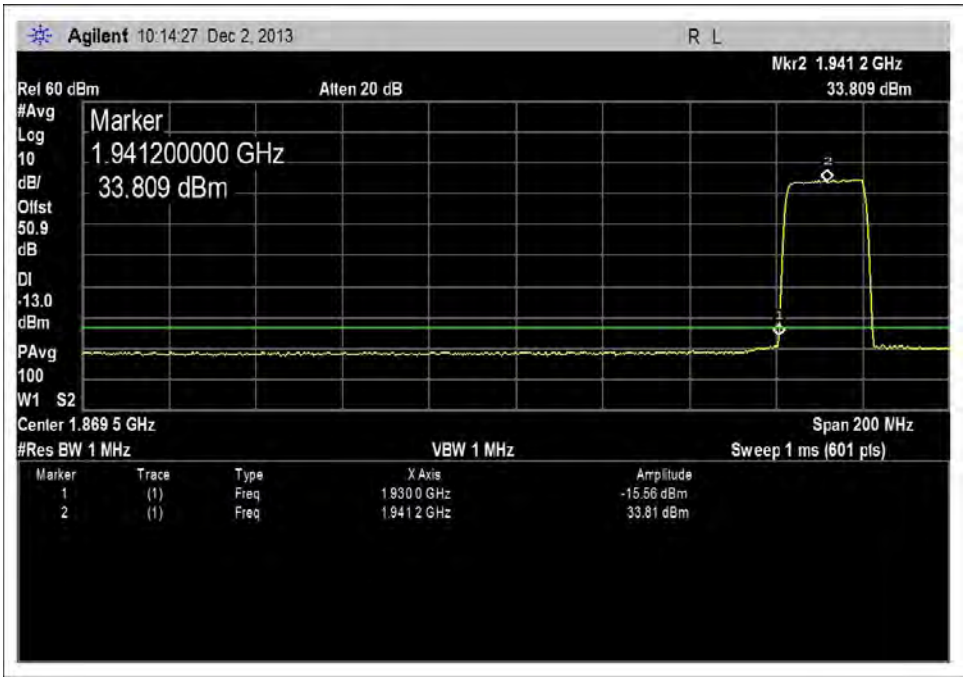
40W, LTE 5MHz 1MHz - High



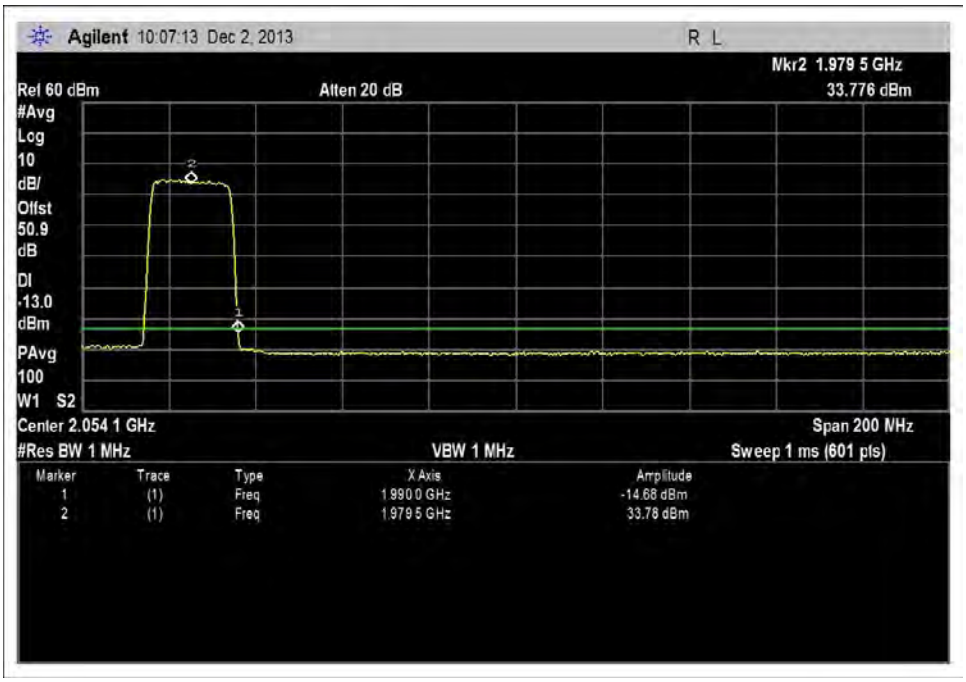
40W, LTE 20MHz 200kHz - Low



40W, LTE 20MHz 200kHz - High



40W, LTE 20MHz 1MHz - Low



40W, LTE 20MHz 1MHz - High

Test Setup Photos

Overall Test Setup

Intermodulation

Test Data

Test Location: CKC Laboratories Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714-993-6112

Customer: **BTI Wireless**
Specification: **Intermodulation Plots**
Work Order #: **95157** Date: 11/22/2013
Test Type: **Conducted Emissions** Time: 14:18:02
Equipment: **1900MHz 40W Transmitting Remote Unit** Sequence#: 4
Manufacturer: BTI Wireless Tested By: Don Nguyen
Model: mBSC1900-040-RUSSF01 110V 60Hz
S/N: 10935304010113111101

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02869	Spectrum Analyzer	E4440A	2/6/2013	2/6/2015
T2	AN03239	Cable	32022-2-29094K-24TC	10/30/2013	10/30/2015

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
1900MHz 40W Transmitting Remote Unit*	BTI Wireless	mBSC1900-040-RUSSF01	10935304010113111101

Support Devices:

Function	Manufacturer	Model #	S/N
ESG Vector Signal Generator	Agilent	4438C	MY45091601
ESG Vector Signal Generator	Agilent	4438C	MY42082260
Cable	Huber & Suhner	Sucoflex 104A	12237/4A
Attenuator 30db Pad	Weinschel	49-30-43	KW075
Step Attenuator 110dB pad	HP	8496B	1350A01241
50 ohm Load	Generic	NA	NA
Power Divider	Anaren	44000	NA

Test Conditions / Notes:

The EUT is placed on the test bench. Tx In is connected to two ESGs via a power divider. ANT is connected to a spectrum analyzer and attenuators. RX out port is terminated to 50 ohm load.

The evaluation is performed at the antenna port.

Freq: 1930-1990MHz
Signal protocol: GSM, EDGE, CDMA (IS95A), UMTS (WCDMA_3GPP), LTE-TM1.1 1.4MHz, 5MHz. 20MHz

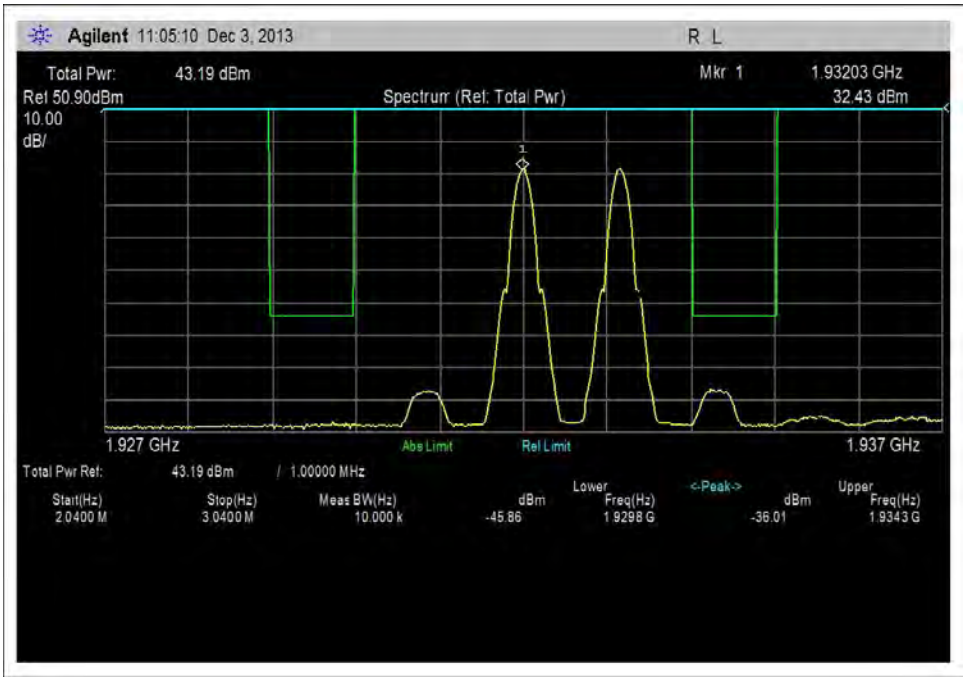
40W

Modulation	Input Power (dbm)
GSM	
1932.04MHz	-12.42
1960.00MHz	-12.04
1987.96MHz	-11.36
EDGE	
1932.04MHz	-11.24
1960.00MHz	-11.24
1987.96MHz	-11.12
CDMA (IS95A)	
1932.5MHz	-11.08
1960.00MHz	-11.44
1987.5MHz	-11.02
UMTS (WCMDA 3GPP)	
1933.9MHz	-11.2
1960.00MHz	-11.62
1986.1MHz	-11.14
LTE 1.4MHz	
1932.40MHz	-11.14
1960.00MHz	-11.62
1987.75MHz	-11.02
LTE 5MHz	
1934.05MHz	-11.3
1960.00MHz	-11.78
1986.11MHz	-11.24
LTE 20MHz	
1941.2MHz	-11.76
1960.00MHz	-11.76
1979.5MHz	-11.52

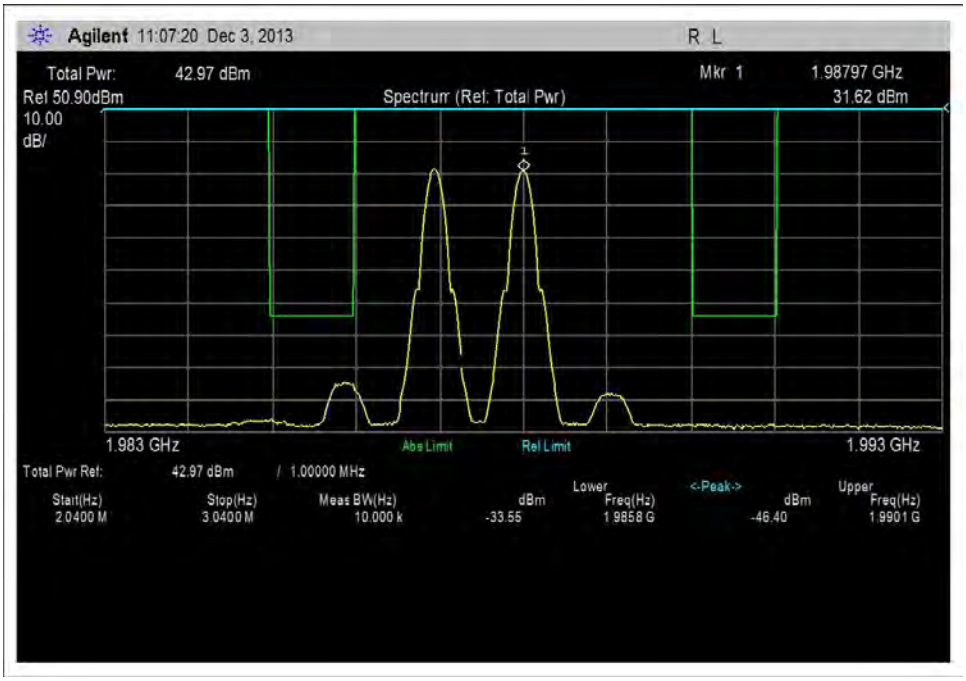
22°C, 45% Relative Humidity

Site A

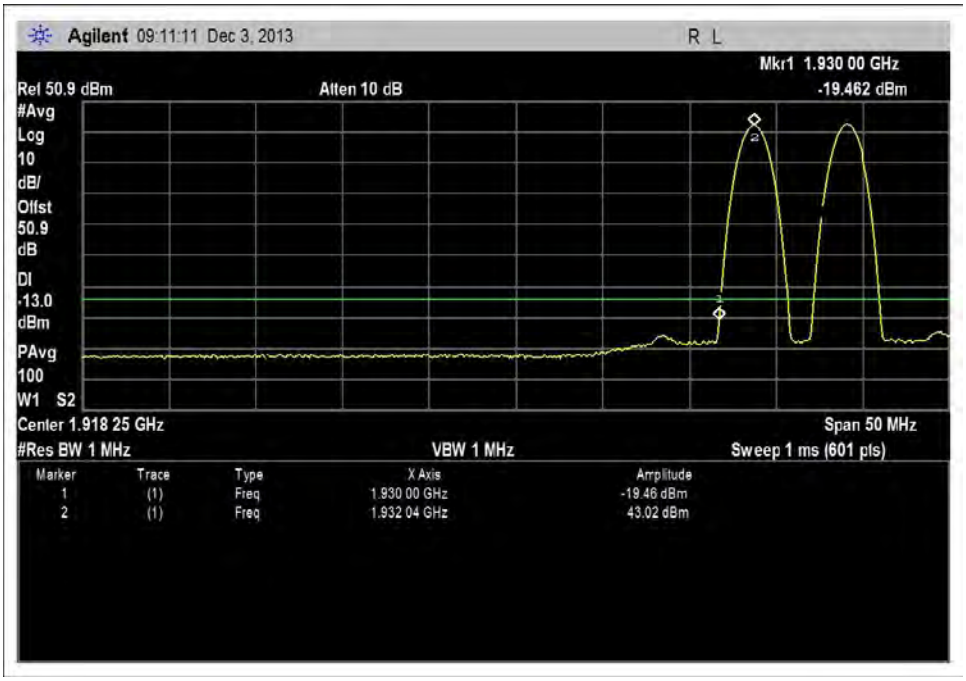
Test Setup Photos



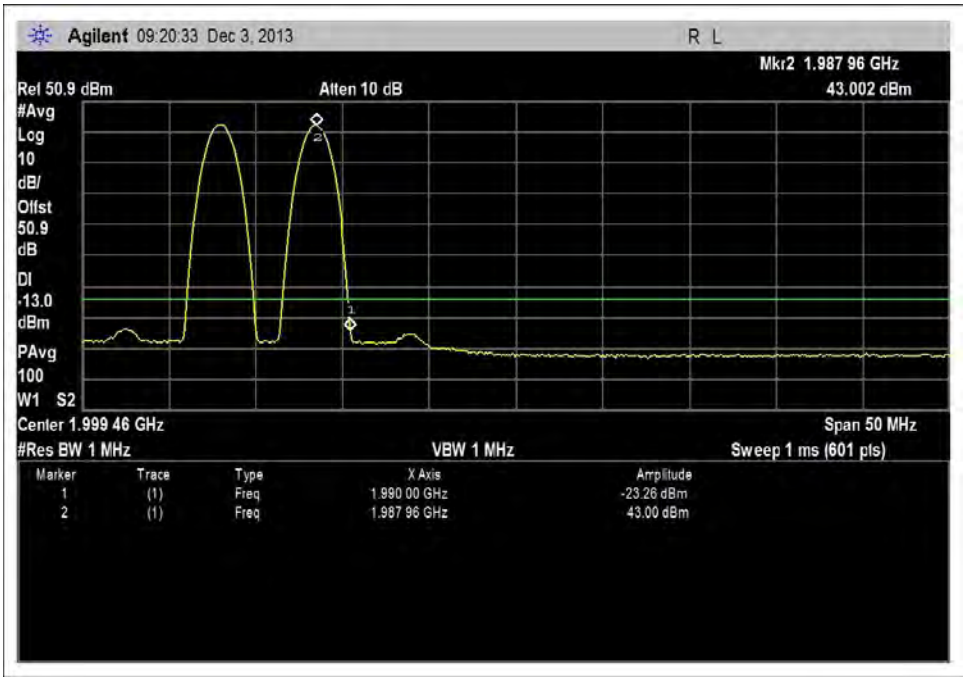
GSM 10kHz - Low



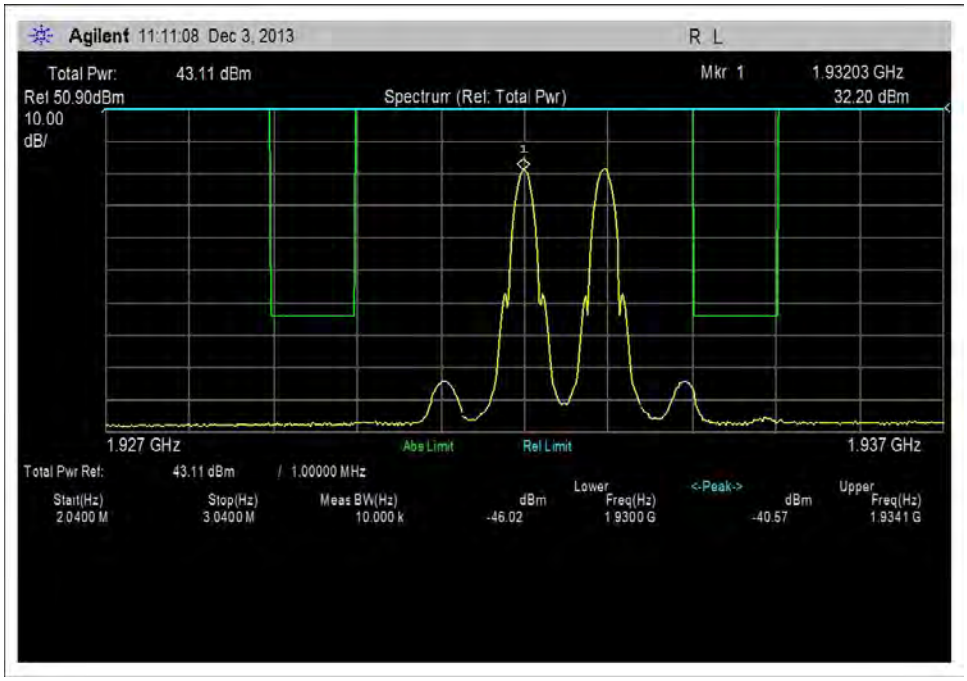
GSM 10kHz - High



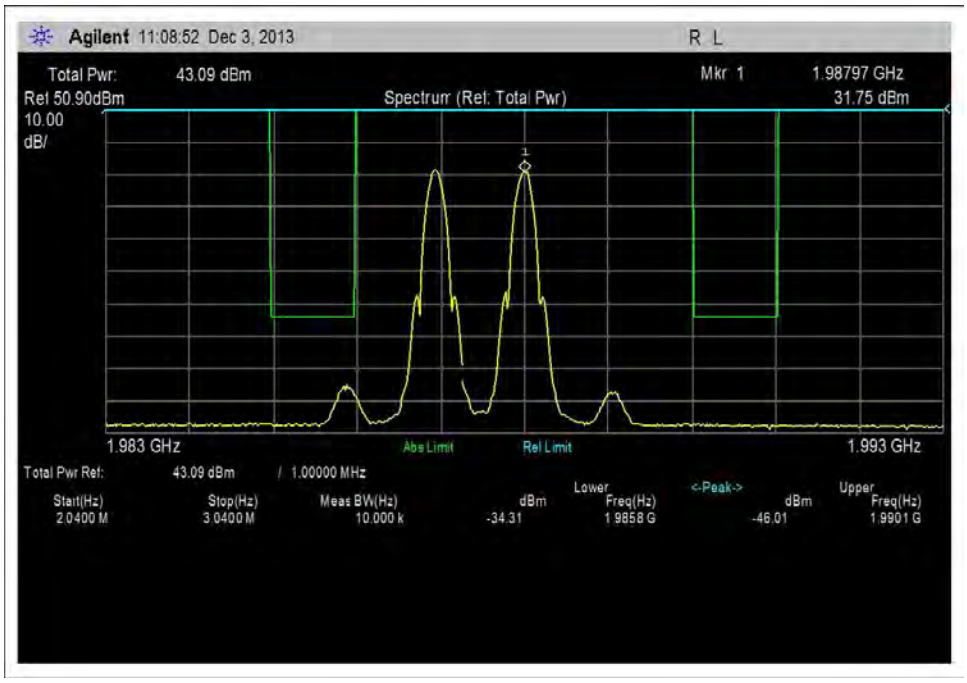
GSM 1MHz - Low



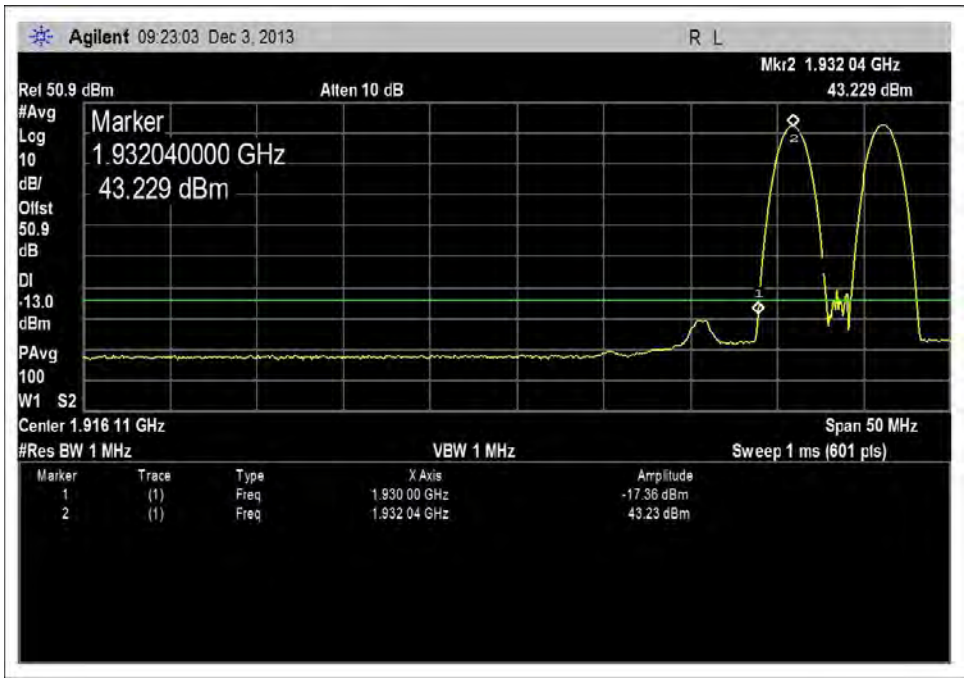
GSM 1MHz - High



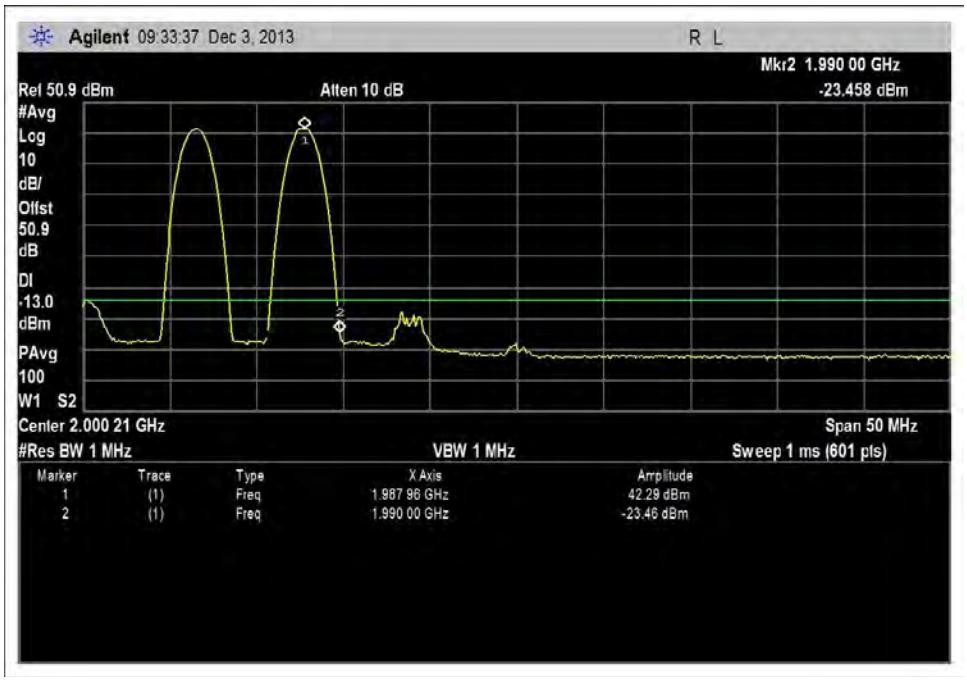
EDGE 10kHz - Low



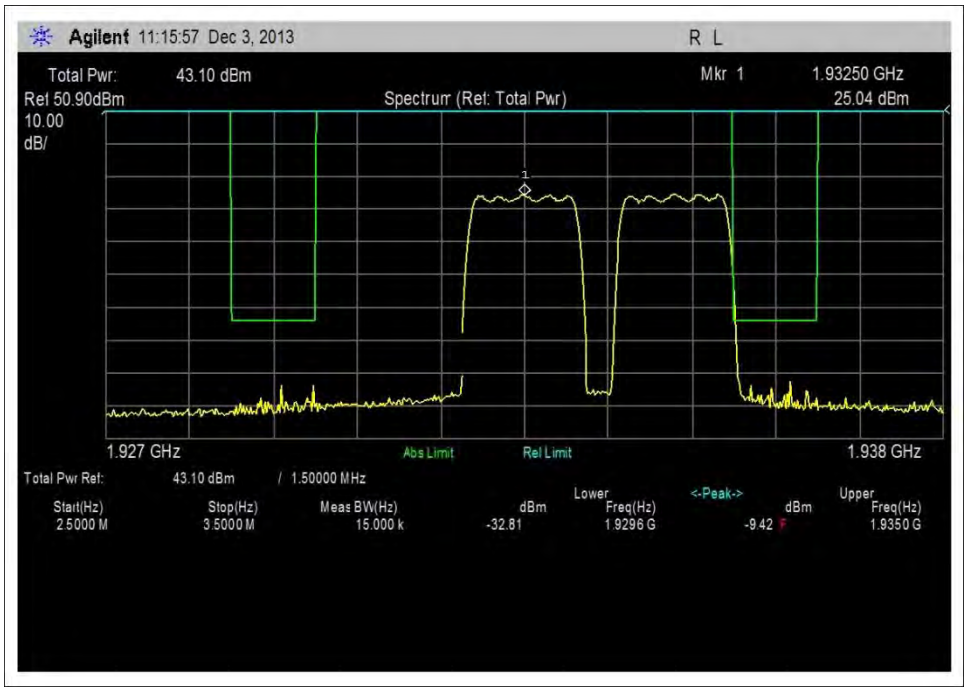
EDGE 10kHz - High



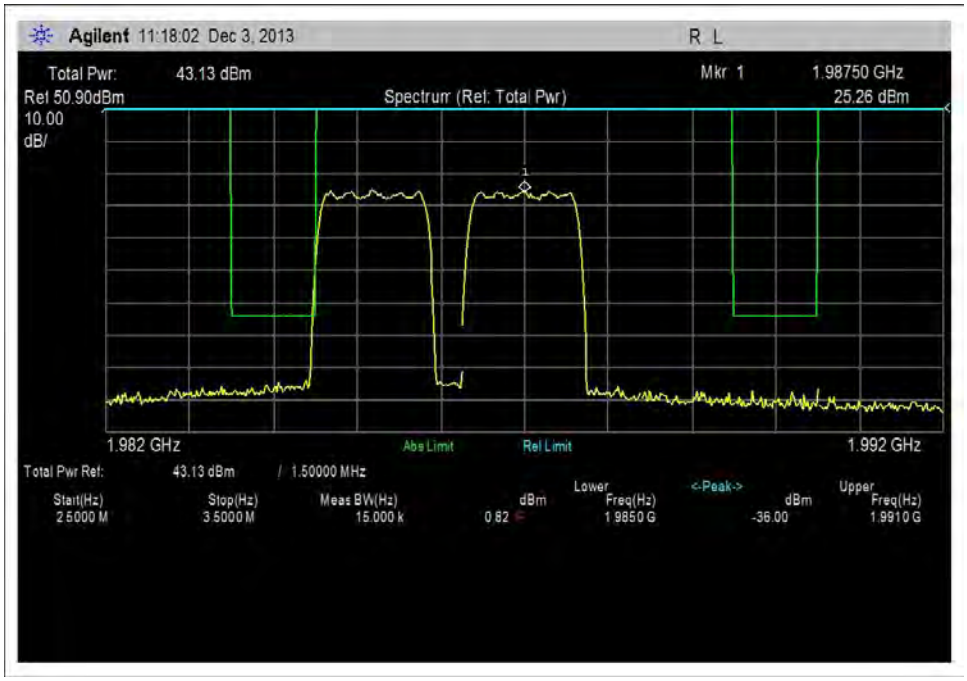
EDGE 1MHz - Low



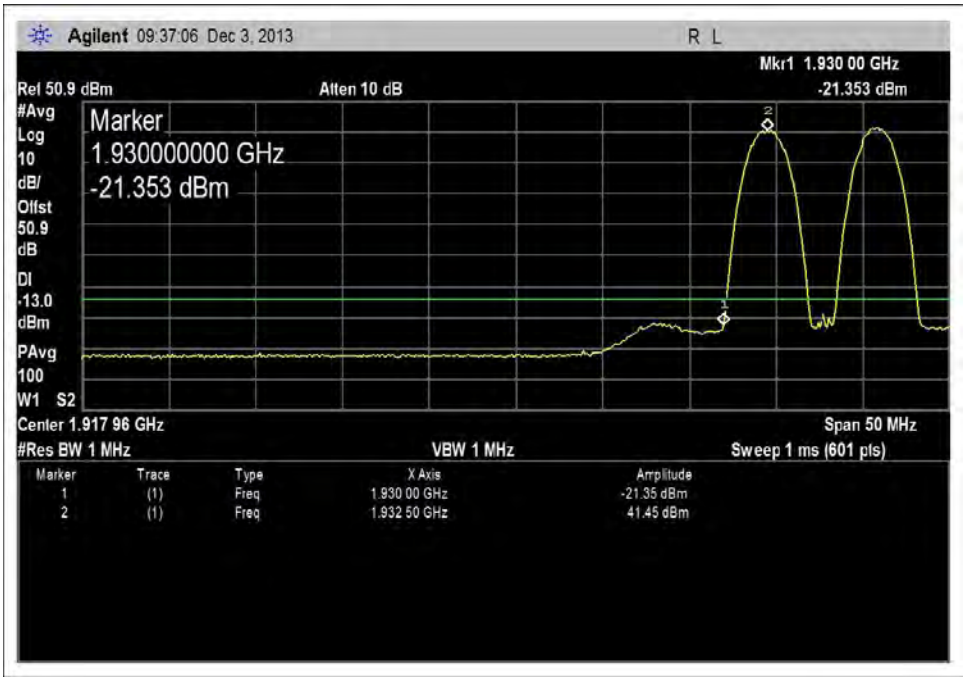
EDGE 1MHz - High



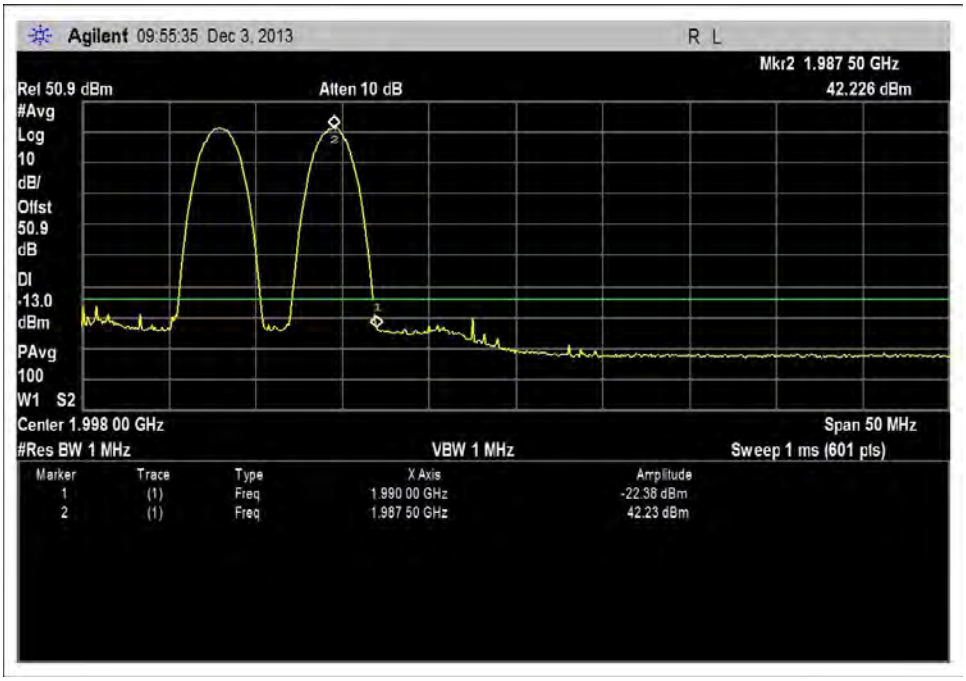
CDMA IS95A 15kHz - Low



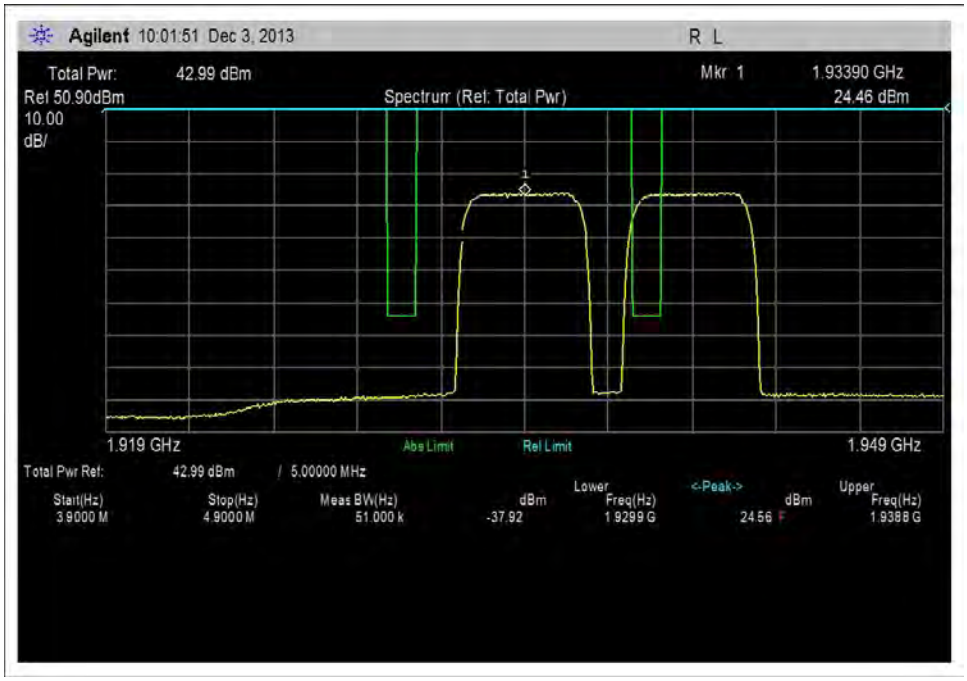
CDMA IS95A 15kHz - High



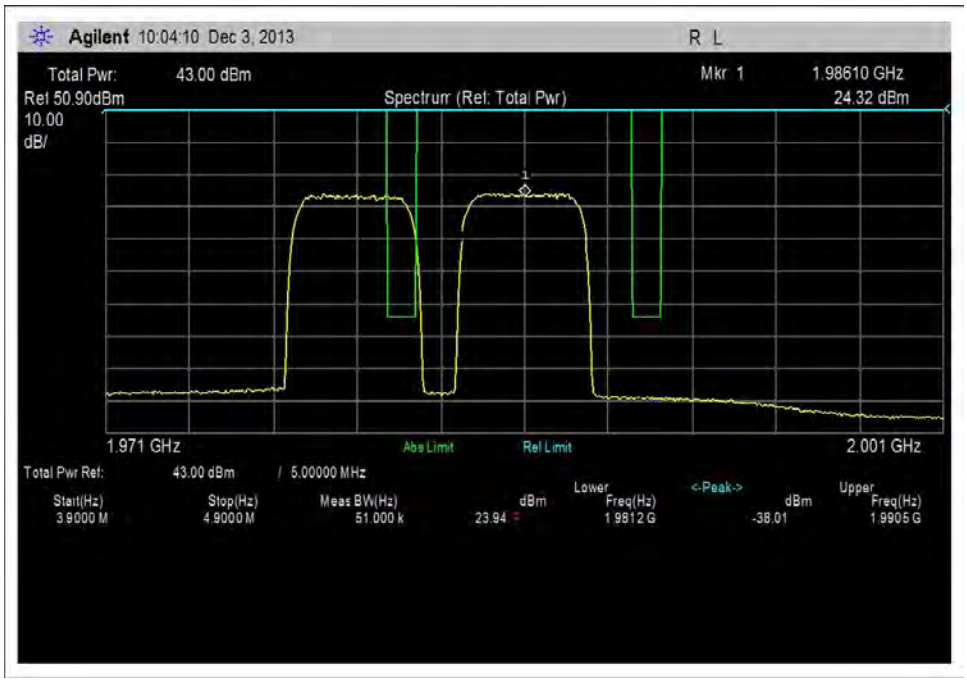
CDMA IS95A 1MHz - Low



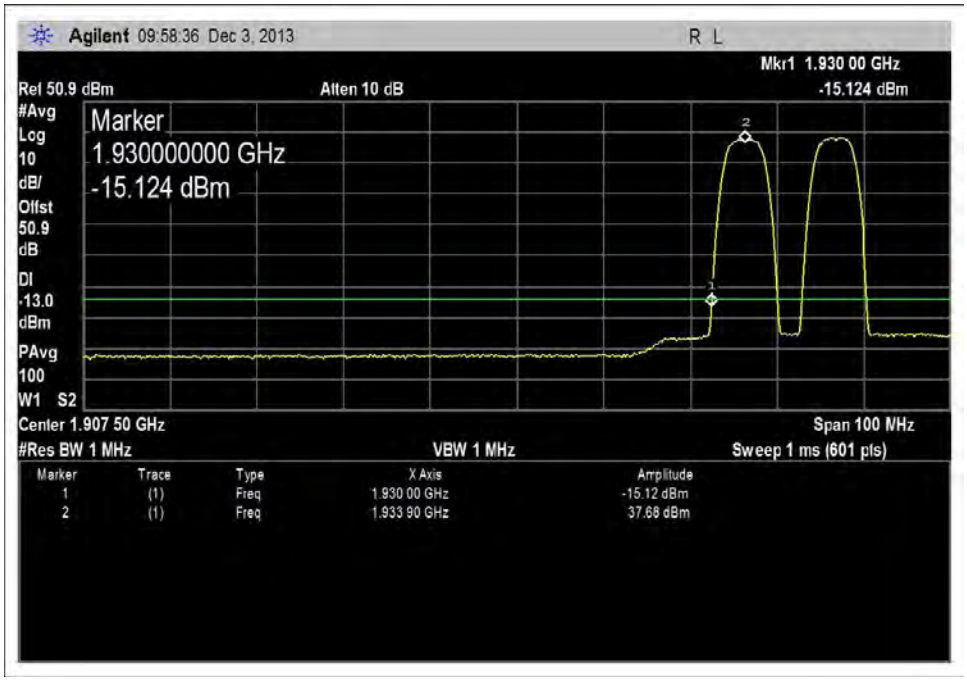
CDMA IS95A 1MHz- High



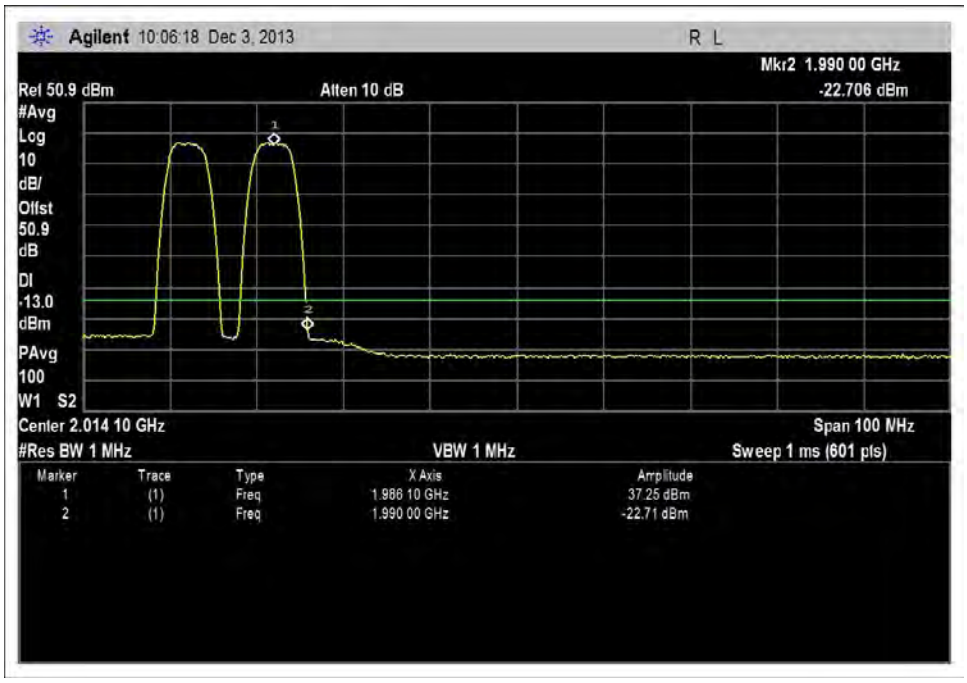
WCDMA 51kHz - Low



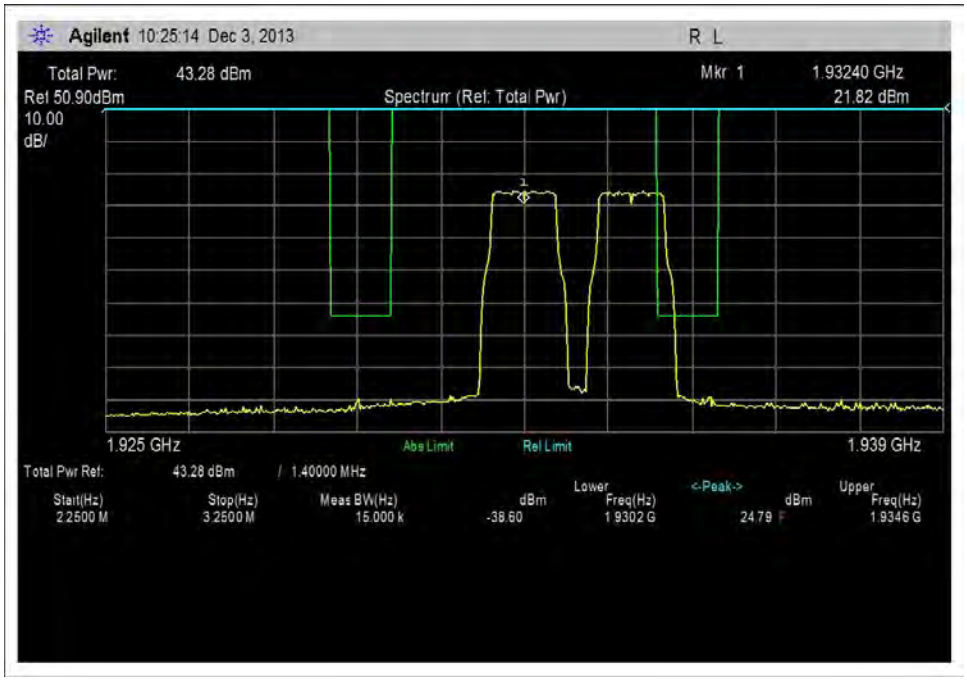
WCDMA 51kHz - High



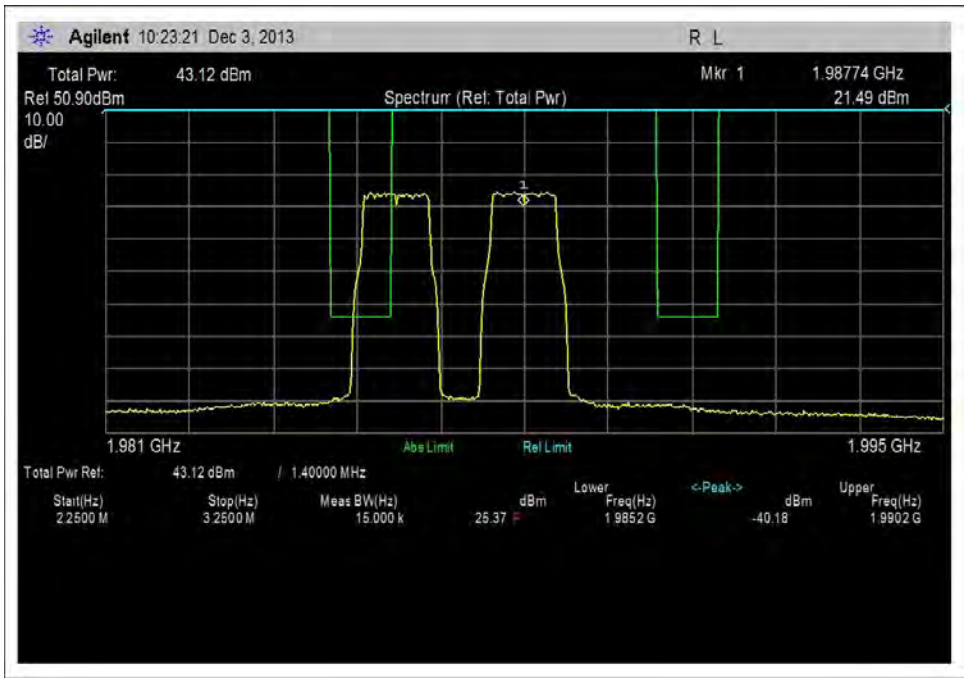
WCDMA 1MHz - Low



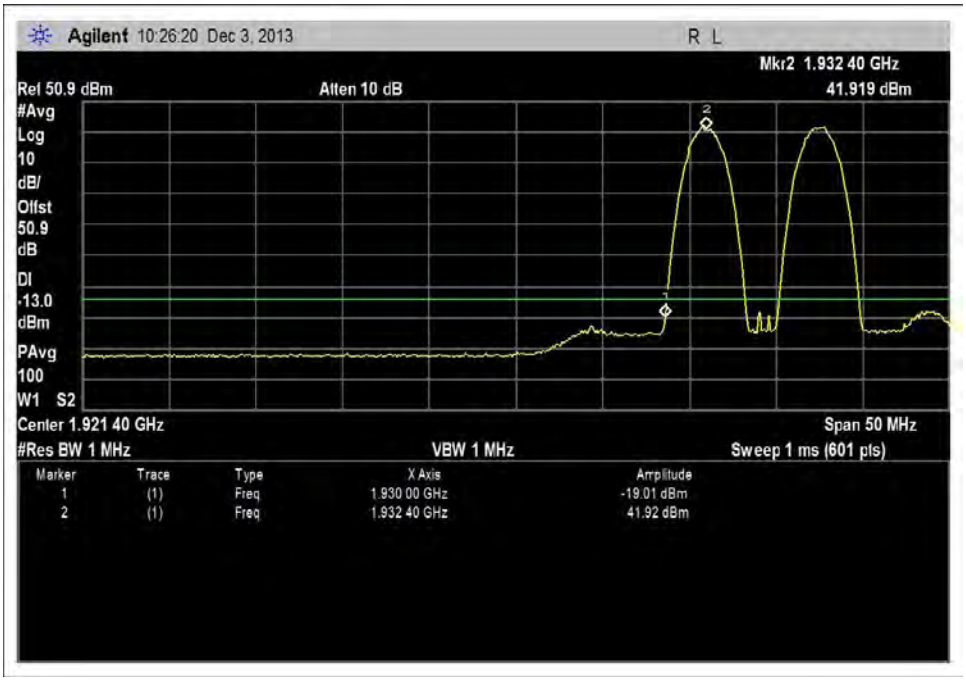
WCDMA 1MHz - High



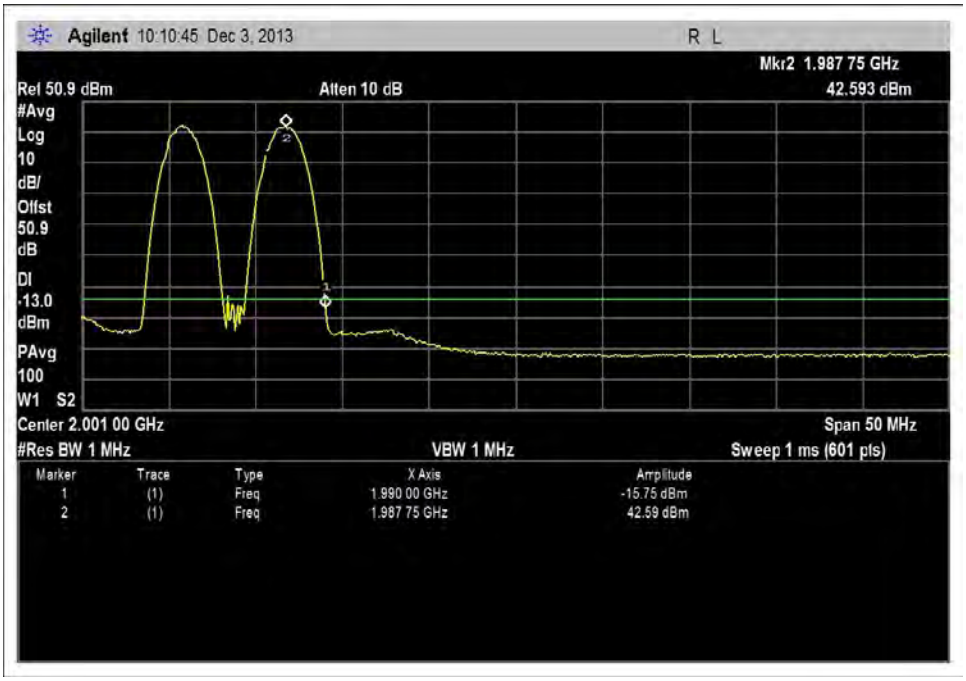
LTE 1.4MHz, 15kHz - Low



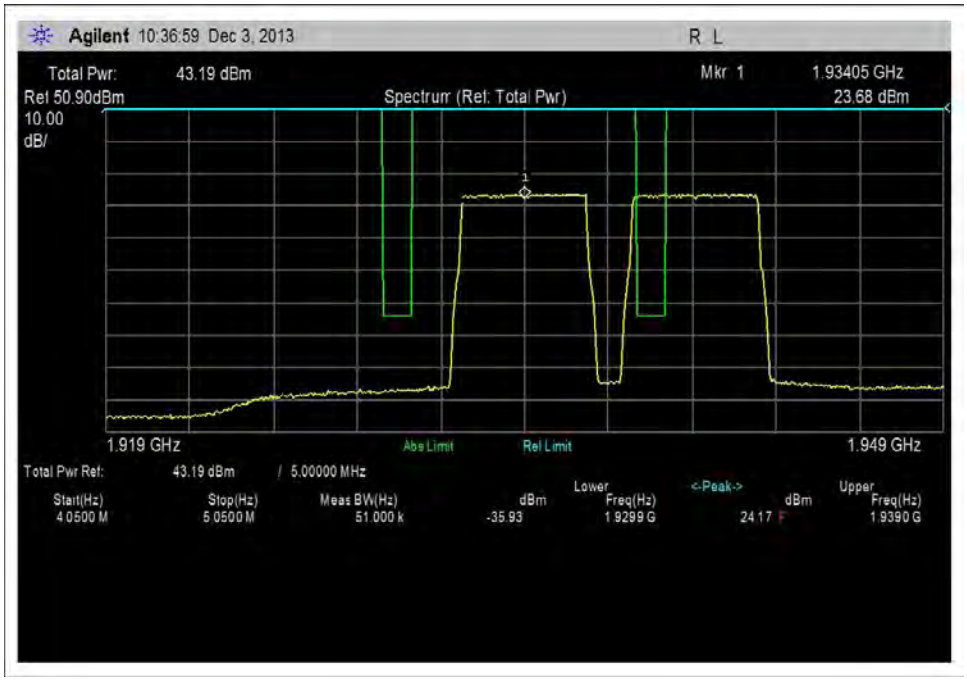
LTE 1.4MHz, 15kHz - High



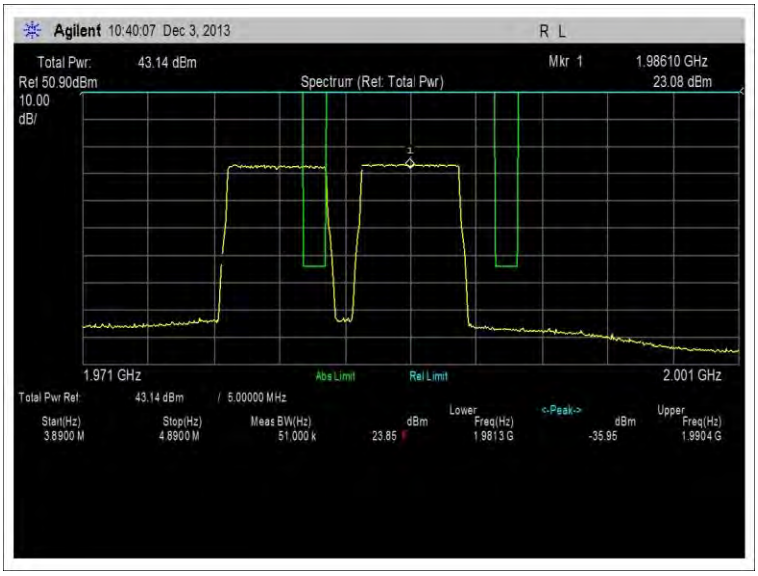
LTE 1.4MHz, 1MHz - Low



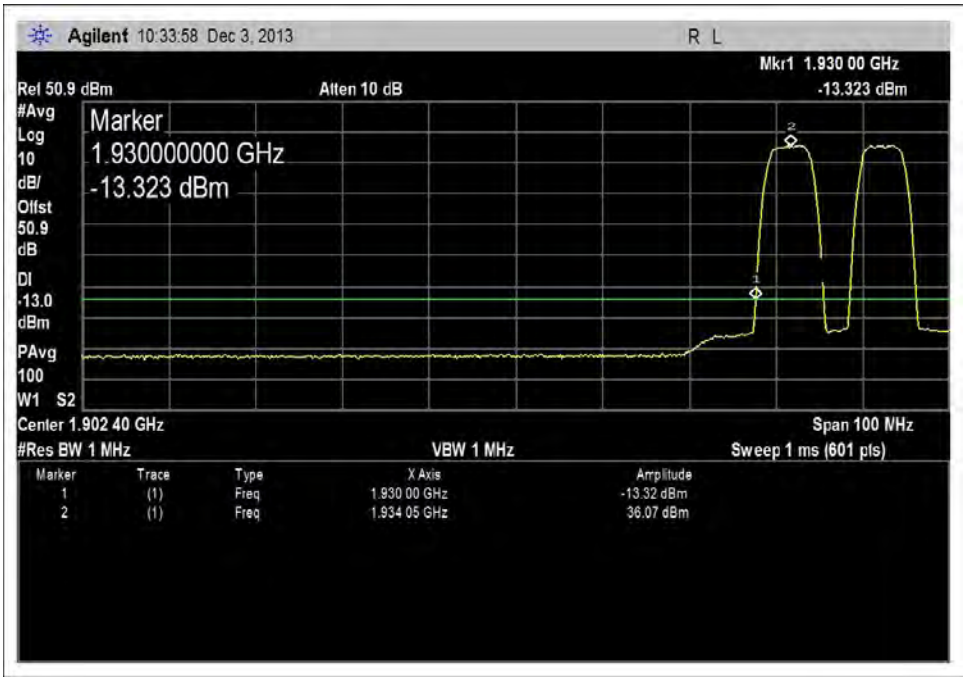
LTE 1.4MHz, 1MHz - High



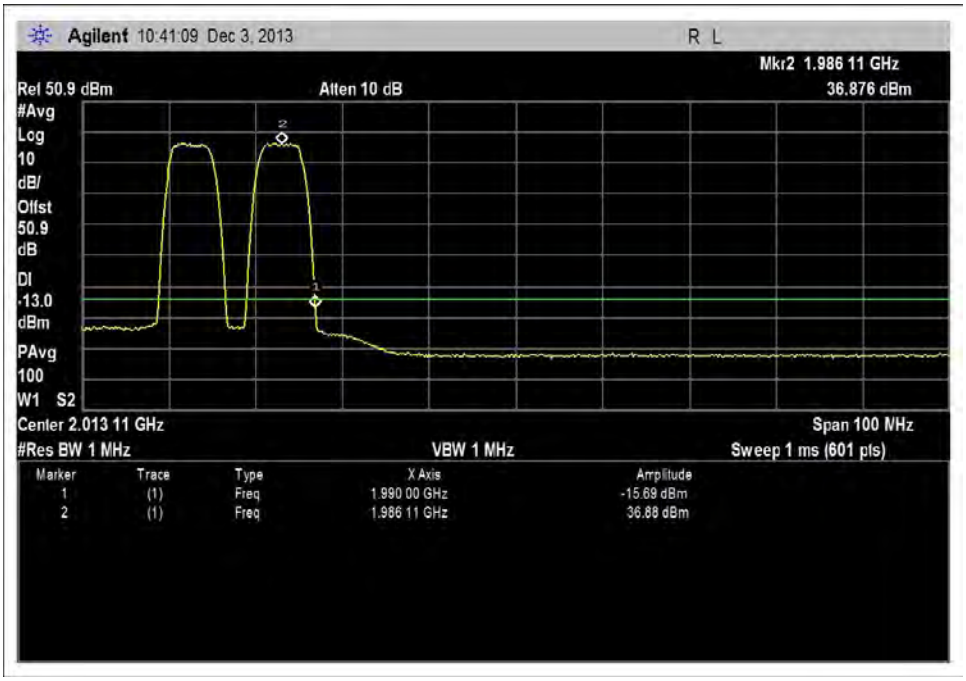
LTE 5MHz, 51kHz - Low



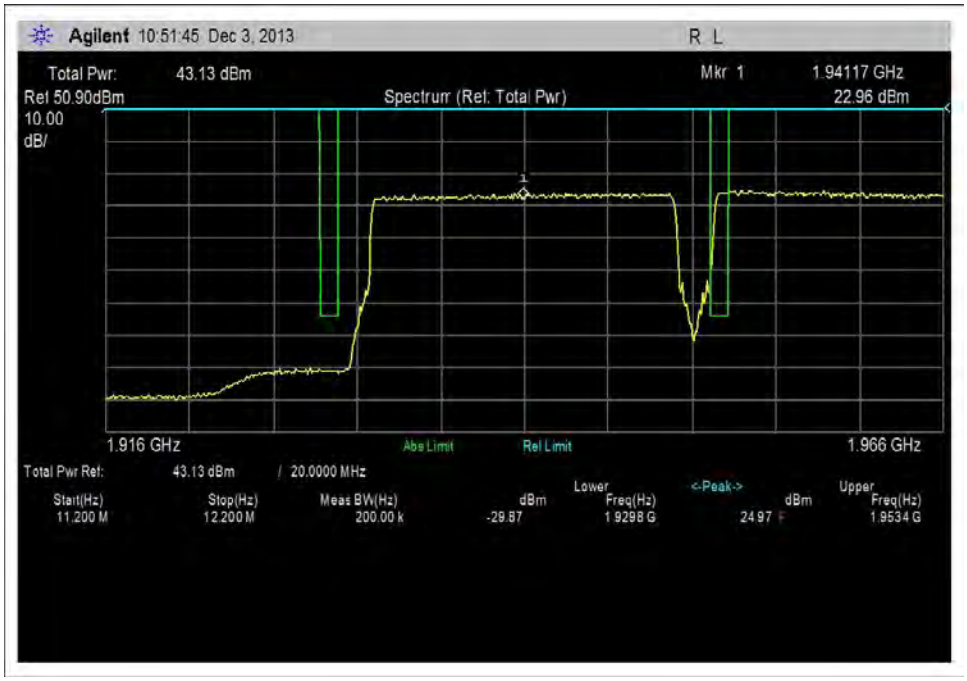
LTE 5MHz, 51kHz - High



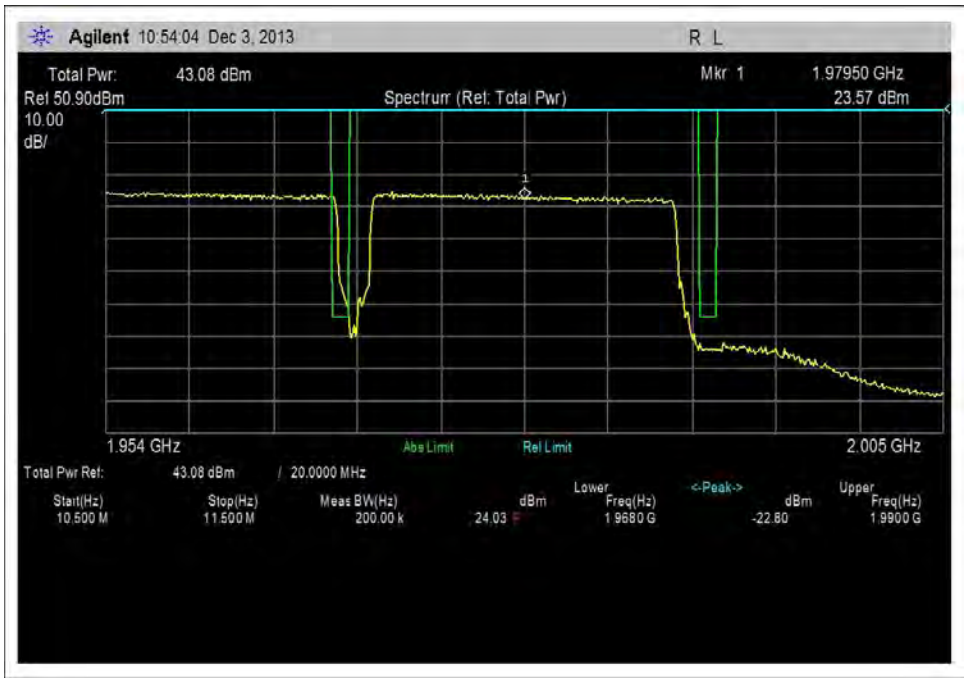
LTE 5MHz 1MHz - Low



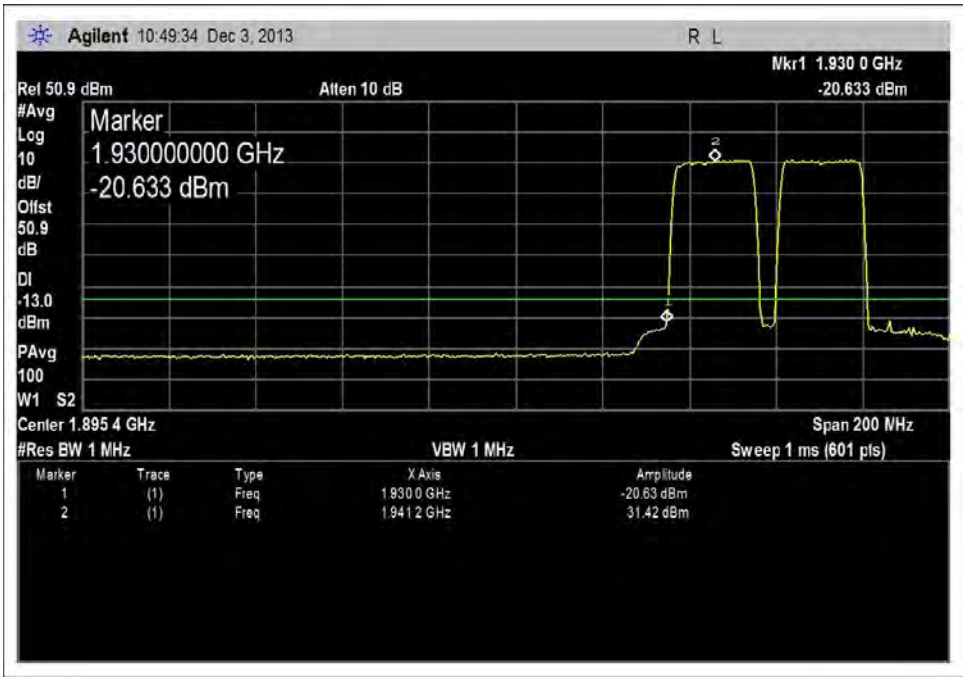
LTE 5MHz 1MHz - High



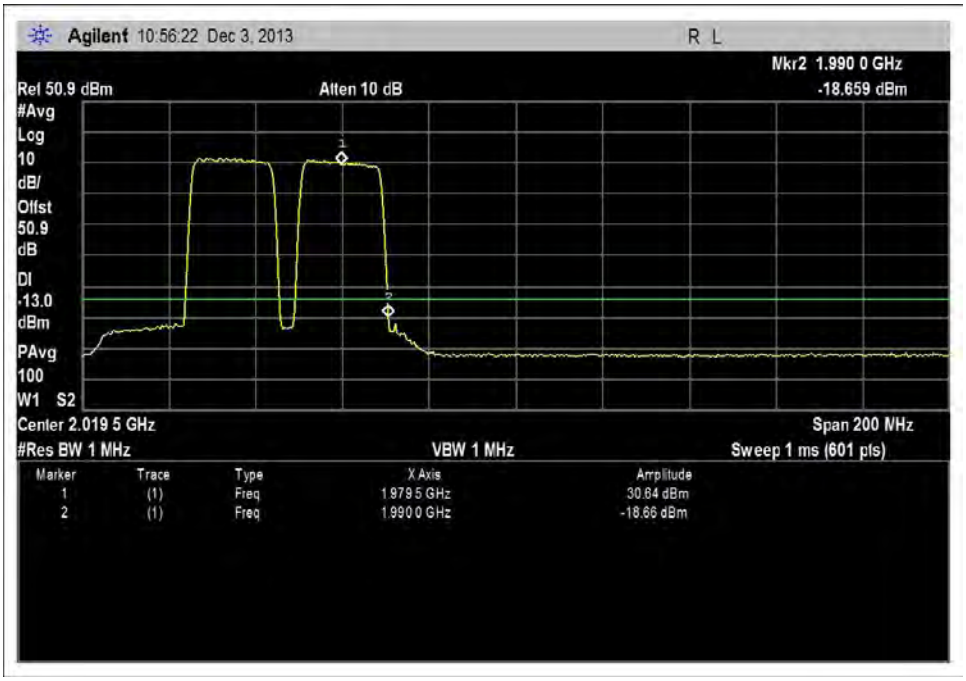
LTE 20MHz, 200kHz - Low



LTE 20MHz, 200kHz - High



LTE 20MHz, 1MHz - Low



LTE 20MHz, 1MHz - High

Test Setup Photos

Overall Test Setup

Out of Band Rejection

Test Data

Test Location: CKC Laboratories Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714-993-6112

Customer: **BTI Wireless**
Specification: **Out of Band Rejection Plot**
Work Order #: **95157** Date: 11/22/2013
Test Type: **Conducted Emissions** Time: 14:18:02
Equipment: **1900MHz 40W Transmitting Remote Unit** Sequence#: 4
Manufacturer: BTI Wireless Tested By: Don Nguyen
Model: mBSC1900-040-RUSSF01 110V 60Hz
S/N: 10935304010113111101

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02869	Spectrum Analyzer	E4440A	2/6/2013	2/6/2015
T2	AN03239	Cable	32022-2-29094K-24TC	10/30/2013	10/30/2015

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
1900MHz 40W Transmitting Remote Unit*	BTI Wireless	mBSC1900-040-RUSSF01	10935304010113111101

Support Devices:

Function	Manufacturer	Model #	S/N
ESG Vector Signal Generator	Agilent	4438C	MY45091601
Attenuator 30db Pad	Weinschel	49-30-43	KW075
Step Attenuator 110dB pad	HP	8496B	1350A01241
50 ohm Load	Generic	NA	NA
Cable	Pasternack	Sucoflex 104A	12237/4A

Test Conditions / Notes:

The EUT is placed on the test bench. Tx In is connected to an ESG Signal generator via cable Sucoflex 104A. ANT port is connected to 30db attenuator and 110db step attenuator. A spectrum analyzer is connected to attenuators via cable 32022-2-29094K-24TC. RX out port is terminated to 50 ohm load.

The evaluation is performed at the antenna port.

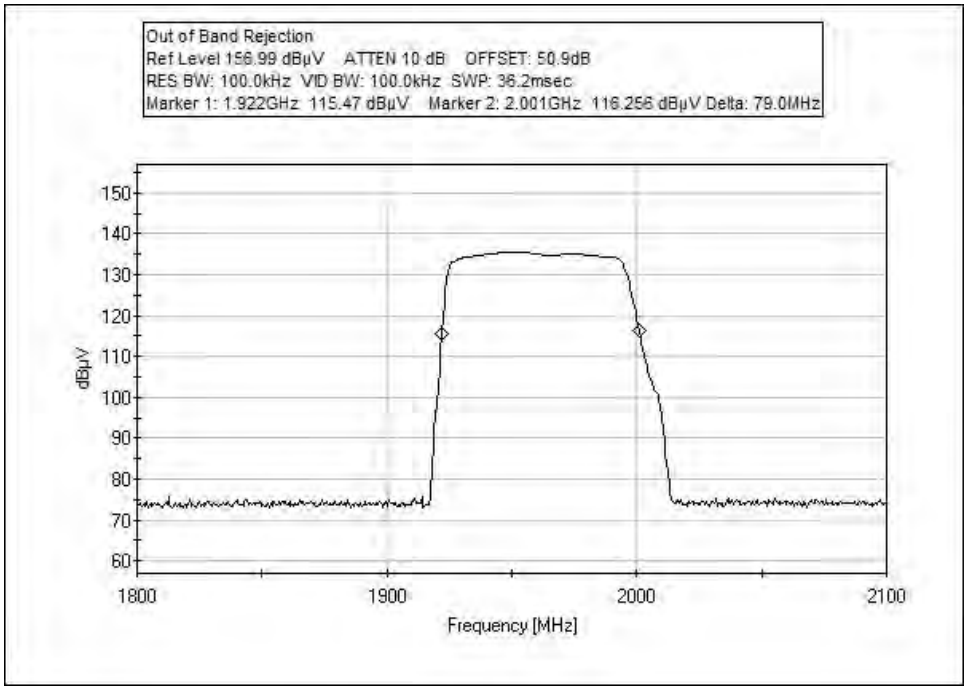
Signal generator is set to sweep from 1930 – 1990 MHz

EUT power setting: 40W

22°C, 45% Relative Humidity

Site A

Test Plot



Test Setup Photos

Overall Test Setup

SUPPLEMENTAL INFORMATION

Measurement Uncertainty

Uncertainty Value	Parameter
4.73 dB	Radiated Emissions
3.34 dB	Mains Conducted Emissions
3.30 dB	Disturbance Power

The reported measurement uncertainties are calculated based on the worst case of all laboratory environments from CKC Laboratories, Inc. test sites. Only those parameters which require estimation of measurement uncertainty are reported. The reported worst case measurement uncertainty is less than the maximum values derived in CISPR 16-4-2. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k=2. Compliance is deemed to occur provided measurements are below the specified limits.

Emissions Test Details

TESTING PARAMETERS

Unless otherwise indicated, the following configuration parameters are used for equipment setup: The cables were routed consistent with the typical application by varying the configuration of the test sample. Interface cables were connected to the available ports of the test unit. The effect of varying the position of the cables was investigated to find the configuration that produced maximum emissions. Cables were of the type and length specified in the individual requirements. The length of cable that produced maximum emissions was selected.

The equipment under test (EUT) was set up in a manner that represented its normal use, as shown in the setup photographs. Any special conditions required for the EUT to operate normally are identified in the comments that accompany the emissions tables.

The emissions data was taken with a spectrum analyzer or receiver. Incorporating the applicable correction factors for distance, antenna, cable loss and amplifier gain, the data was reduced as shown in the table below. The corrected data was then compared to the applicable emission limits. Preliminary and final measurements were taken in order to ensure that all emissions from the EUT were found and maximized.

CORRECTION FACTORS

The basic spectrum analyzer reading was converted using correction factors as shown in the highest emissions readings in the tables. For radiated emissions in dBµV/m, the spectrum analyzer reading in dBµV was corrected by using the following formula. This reading was then compared to the applicable specification limit.

SAMPLE CALCULATIONS		
	Meter reading	(dBµV)
+	Antenna Factor	(dB)
+	Cable Loss	(dB)
-	Distance Correction	(dB)
-	Preamplifier Gain	(dB)
=	Corrected Reading	(dBµV/m)

TEST INSTRUMENTATION AND ANALYZER SETTINGS

The test instrumentation and equipment listed were used to collect the emissions data. A spectrum analyzer or receiver was used for all measurements. Unless otherwise specified, the following table shows the measuring equipment bandwidth settings that were used in designated frequency bands. For testing emissions, an appropriate reference level and a vertical scale size of 10 dB per division were used.

MEASURING EQUIPMENT BANDWIDTH SETTINGS PER FREQUENCY RANGE			
TEST	BEGINNING FREQUENCY	ENDING FREQUENCY	BANDWIDTH SETTING
CONDUCTED EMISSIONS	150 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	9 kHz	150 kHz	200 Hz
RADIATED EMISSIONS	150 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	30 MHz	1000 MHz	120 kHz
RADIATED EMISSIONS	1000 MHz	>1 GHz	1 MHz

SPECTRUM ANALYZER/RECEIVER DETECTOR FUNCTIONS

The notes that accompany the measurements contained in the emissions tables indicate the type of detector function used to obtain the given readings. Unless otherwise noted, all readings were made in the "positive peak" detector mode. Whenever a "quasi-peak" or "average" reading was recorded, the measurement was annotated with a "QP" or an "Ave" on the appropriate rows of the data sheets. In cases where quasi-peak or average limits were employed and data exists for multiple measurement types for the same frequency then the peak measurement was retained in the report for reference, however the numbering for the affected row was removed and an arrow or carrot ("^") was placed in the far left-hand column indicating that the row above takes precedence for comparison to the limit. The following paragraphs describe in more detail the detector functions and when they were used to obtain the emissions data.

Peak

In this mode, the spectrum analyzer or receiver recorded all emissions at their peak value as the frequency band selected was scanned. By combining this function with another feature called "peak hold," the measurement device had the ability to measure intermittent or low duty cycle transient emission peak levels. In this mode the measuring device made a slow scan across the frequency band selected and measured the peak emission value found at each frequency across the band.

Quasi-Peak

Quasi-peak measurements were taken using the quasi-peak detector when the true peak values exceeded or were within 2 dB of a quasi-peak specification limit. Additional QP measurements may have been taken at the discretion of the operator.

Average

Average measurements were taken using the average detector when the true peak values exceeded or were within 2 dB of an average specification limit. Additional average measurements may have been taken at the discretion of the operator. If the specification or test procedure requires trace averaging, then the averaging was performed using 100 samples or as required by the specification. All other average measurements are performed using video bandwidth averaging. To make these measurements, the test engineer reduces the video bandwidth on the measuring device until the modulation of the signal is filtered out. At this point the measuring device is set into the linear mode and the scan time is reduced.