



POWERWAVE TECHNOLOGIES, INC. TEST REPORT
FOR THE
BOOSTER AMPLIFIER ASSEMBLY, OS-1933-E0-001
FCC PART 24E
TESTING

DATE OF ISSUE: NOVEMBER 7, 2008

PREPARED FOR:

Powerwave Technologies, Inc.
1801 E. St. Andrew Place
Santa Ana, CA 92705

P.O. No.: 121217
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PREPARED BY:

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Date of test: August 4-5, 2008

Report No.: FC08-106

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ADMINISTRATIVE INFORMATION

DATE OF TEST: August 4-5, 2008

DATE OF RECEIPT: August 4, 2008

REPRESENTATIVE: Carmine Fiorello

MANUFACTURER:
Powerwave Technologies, Inc.
1801 E. St. Andrew Place
Santa Ana, CA 92705

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

FREQUENCY RANGE TESTED: 10 kHz-10 GHz

TEST METHOD: FCC Part 24E

PURPOSE OF TEST:

Original Report: To perform the testing of the Booster Amplifier Assembly, OS-1933-E0-001 with the requirements for FCC Part 24E devices.

QUALITY ASSURANCE:

Steve Behm, Director of Engineering Services

TEST PERSONNEL:

Stuart Yamamoto, Senior EMC Engineer

SITE FILE REGISTRATION NUMBERS

Location	Japan	Canada	FCC
Brea A	R-301 & C-314	IC 3172-A	90473

SUMMARY OF RESULTS

Test	Specification	Results
RF Power Output	FCC 2.1046/24.232(a)	Pass
Input Plots	FCC 2.1049(i)	Pass
Output Plots	FCC 2.1049(i)	Pass
Spurious Emissions at Antenna Terminal	FCC 2.1051/24.238(a)	Pass
Field Strength of Spurious Radiation	FCC 2.1053/24.238(a)	Pass
Block Edge	FCC 24.238	Pass
Intermodulation		Pass
Out of Band Rejection		Pass

CONDITIONS DURING TESTING

No modifications to the EUT were necessary during testing.



EQUIPMENT UNDER TEST (EUT) DESCRIPTION

The customer declares the EUT tested by CKC Laboratories was representative of a production unit.

EQUIPMENT UNDER TEST

Booster Amplifier Assembly

Manuf: Powerwave Technologies, Inc.
Model: OS-1933-E0-001
Serial: NA
FCC ID: pending

PERIPHERAL DEVICES

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

Signal Generator (3 each)

Manuf: Agilent
Model: E4433B
Serial: US40051207, US40052093 &
US40051852

Amplifier Driver (3 each)

Manuf: Powerwave Technologies, Inc.
Model: G3L-1929-160-001
Serial: PD00000FUP, CL07080007 &
CL07080003

Laptop Computer

Manuf: HP
Model: compaqnc60000
Serial: CNUS1121KN

DC Power Supply

Manuf: HP
Model: 6683A
Serial: US36420334



TEMPERATURE AND HUMIDITY DURING TESTING

The temperature during testing was within +15°C and + 35°C.
The relative humidity was between 20% and 75%.

FCC 2.1033(c)(3) USER'S MANUAL

The necessary information is contained in a separate document.

FCC 2.1033 (c)(4) TYPE OF EMISSIONS

GXW, G7W, F9W

FCC 2.1033 (c)(5) FREQUENCY RANGE

1930MHz -1990MHz

FCC 2.1033 (c)(6) OPERATING POWER

145 Watts

FCC 2.1033 (c)(8) DC VOLTAGES

The necessary information is contained in a separate document.

FCC 2.1033 (c)(9) TUNE-UP PROCEDURE

The necessary information is contained in a separate document.

FCC 2.1033(c)(10) SCHEMATICS AND CIRCUITRY DESCRIPTION

The necessary information is contained in a separate document.

FCC 2.1033(c)(11) LABEL AND PLACEMENT

The necessary information is contained in a separate document.

FCC 2.1033(c)(12) SUBMITTAL PHOTOS

The necessary information is contained in a separate document.

FCC 2.1033 (c)(13) MODULATION INFORMATION

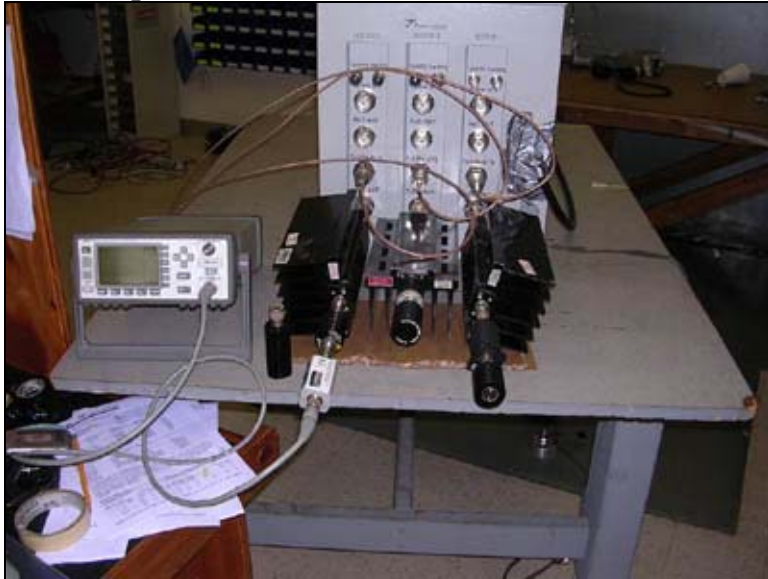
CDMA, EDGE, GSM, WCDMA

FCC 2.1033(c)(14)/2.1046/24.232(a) - RF POWER OUTPUT

Test Equipment

Equipment	Asset #	Manufacturer	Model #	Serial #	Cal Date	Cal Due
RF Power meter	02778	HP	EPM-441A	GB37170458	021508	021510
Power Sensor	02777	Agilent	E4412A	MY41502826	052308	052310

Test Setup Photos



Test Data

FCC Part 24.232(a) RF Output Power

The equipment under test (EUT) is a booster amplifier assembly. The manufacture does not provide an antenna for sale with this product. The end user of this product is to exercise proper engineering judgment to select the appropriate antenna to comply with the EIRP limitation set forth by FCC 24.232(a)

The equipment under test (EUT) is placed stand alone on the table top. The EUT's three Tx1/BTS ports are connected to remotely located drive amplifiers. Three signal generators are providing the signal to the EUT through the three drive amplifiers. Two of the EUT's three Tx/Rx ANT ports are connected to high power attenuators then terminated with fifty ohm loads. One of the EUT's Tx/Rx ANT ports is connected to high power attenuators and then connected to the power meter. Temperature: 22C, Humidity: 48%, Pressure: 100kPa. Voltage to the EUT is 230Vac 60Hz.

The RF output power of the EUT was measured at the antenna port. The measured conducted output power meets the rated output power of this device.

Part 24.232(a)

Frequency (MHz)	Modulation	Power (dBm)	Power (Watts)
1931	GSM	+51.6	145
1960	GSM	+51.6	145
1989	GSM	+51.6	145
1931	EDGE	+51.6	145
1960	EDGE	+51.6	145
1989	EDGE	+51.6	145
1932	CDMA	+51.6	145
1960	CDMA	+51.6	145
1988	CDMA	+51.6	145
1933	WCMA	+51.6	145
1960	WCMA	+51.6	145
1987	WCMA	+51.6	145

Sec. 24.232 Power and antenna height limits.

(a) Base stations are limited to 1640 watts peak equivalent isotropically radiated power (EIRP) with an antenna height up to 300 meters HAAT, except as described in paragraph (b) below. See Sec. 24.53 for HAAT calculation method. Base station antenna heights may exceed 300 meters with a corresponding reduction in power; see Table 1 of this section. The service area boundary limit and microwave protection criteria specified in Sec. Sec. 24.236 and 24.237 apply.

Table 1--Reduced Power for Base Station Antenna Heights Over 300 Meters

HAAT in meters	Maximum EIRP watts
<= 300.....	1640
<= 500.....	1070
<= 1000.....	490
<= 1500.....	270
<= 2000.....	160

FCC 2.1033(c)(14)/2.1049(i)- INPUT PLOTS

Test Equipment

Equipment	Asset #	Manufacturer	Model #	Serial #	Cal Date	Cal Due
Spectrum Analyzer	02672	Agilent	E4446A	US44300438	072308	072309
Coaxial Cable	P02945	Astrolab	32022-2-2909K-36TC	(none)	091807	091809

Test Conditions

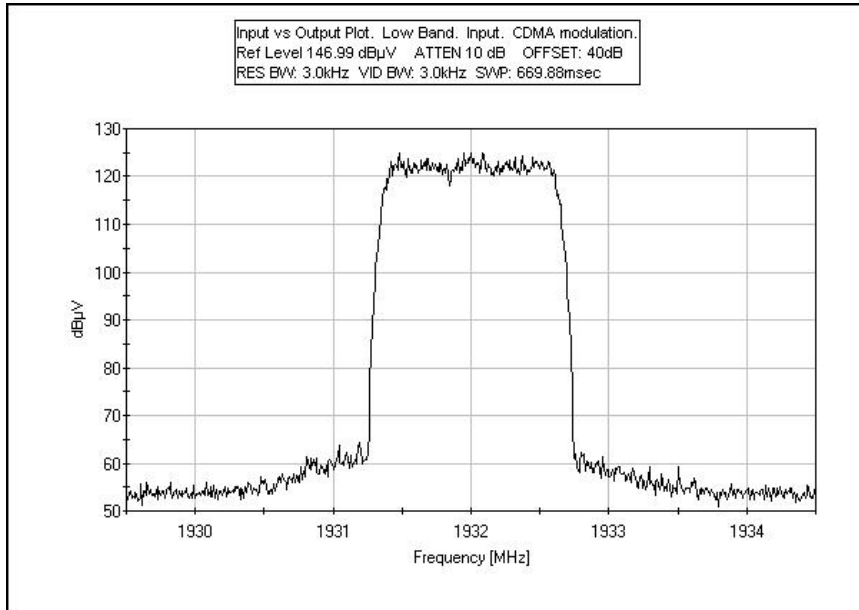
The equipment under test (EUT) is placed stand alone on the table top. One of the EUT’s Tx1/BTS ports is connected to a remotely located drive amplifier. A signal generator is providing the signal to the EUT through the drive amplifier. For the input plot, the output of the drive amplifier is sent to the input of the spectrum analyzer through power attenuators. A plot of the input signal signature is made. For the output plot, one of the EUT’s Tx/Rx ANT ports is connected to the input of the spectrum analyzer and a plot is made of the output signal signature. Temperature: 22°C, Humidity: 48%, Pressure: 100kPa. Voltage to the EUT is 230Vac 60Hz. Plots were made with the signal generator set to low, middle, and high channels using GSM, EDGE, CDMA, and WCDMA modulations. Output of the EUT is set to its rated output power of 51.6dBm. The frequency range tested was 1931MHz to 1989MHz. The operating range of the device tested is 1930MHz to 1990MHz. The actual operating frequencies of the device used were 1931MHz, 1960MHz, and 1989MHz for GSM and EDGE. The actual operating frequencies of the device used on this datasheet are 1932MHz, 1960MHz, and 1988MHz for CDMA. The actual operating frequencies of the device used on this datasheet are 1933MHz, 1960MHz, and 1987MHz for WCDMA. Bandwidth settings: SA RES BW=3kHz, SA VID BW=3kHz.

Test Setup Photos

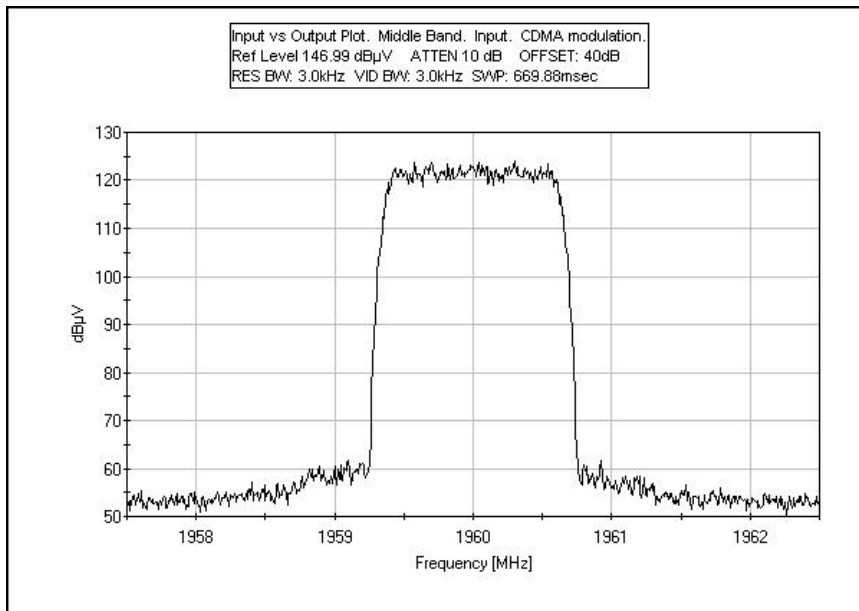


Test Plots

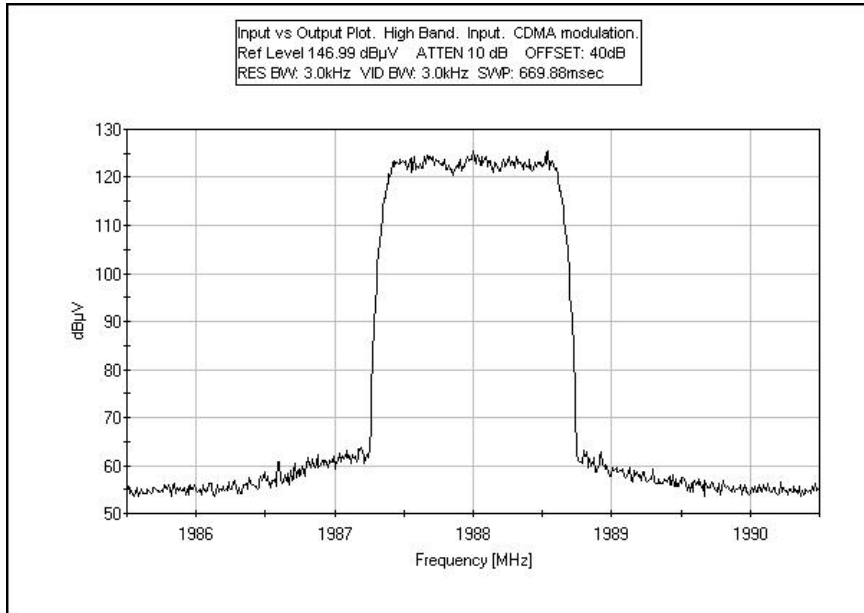
INPUT PLOT - CDMA LOW BAND



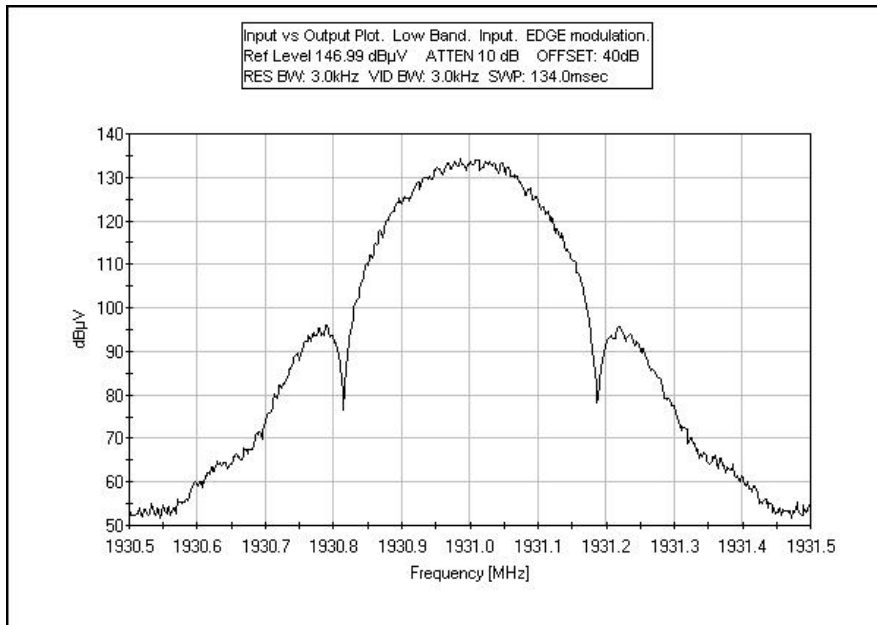
INPUT PLOT - CDMA MIDDLE BAND



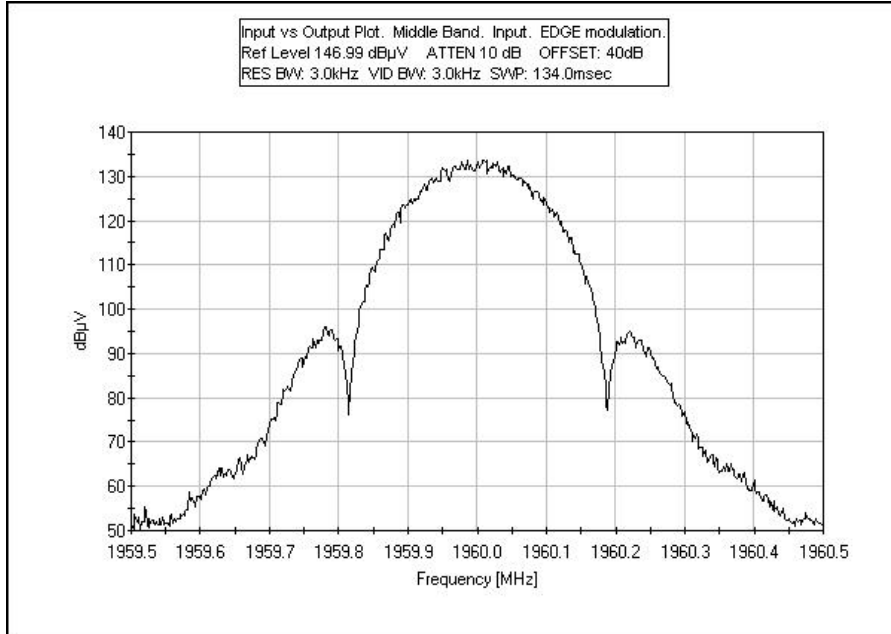
INPUT PLOT - CDMA HIGH BAND



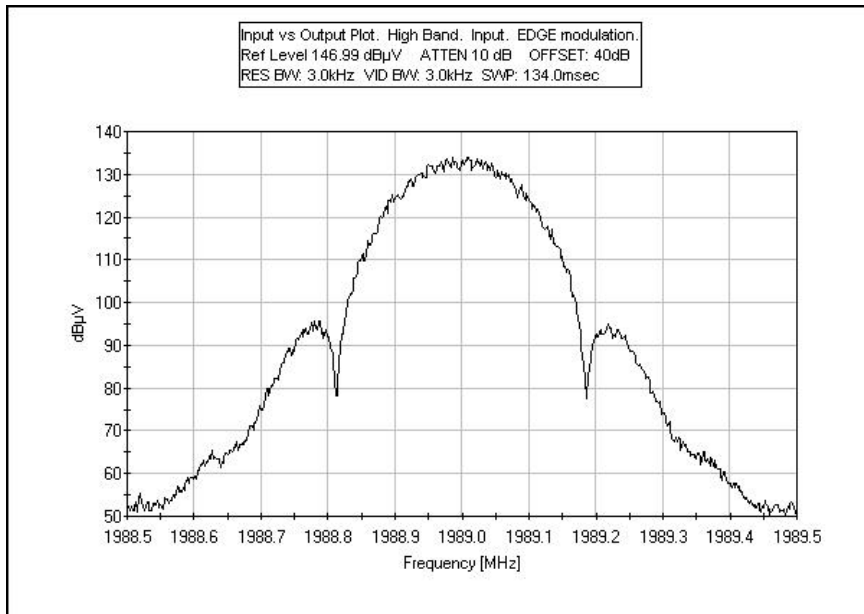
INPUT PLOT - EDGE LOW BAND



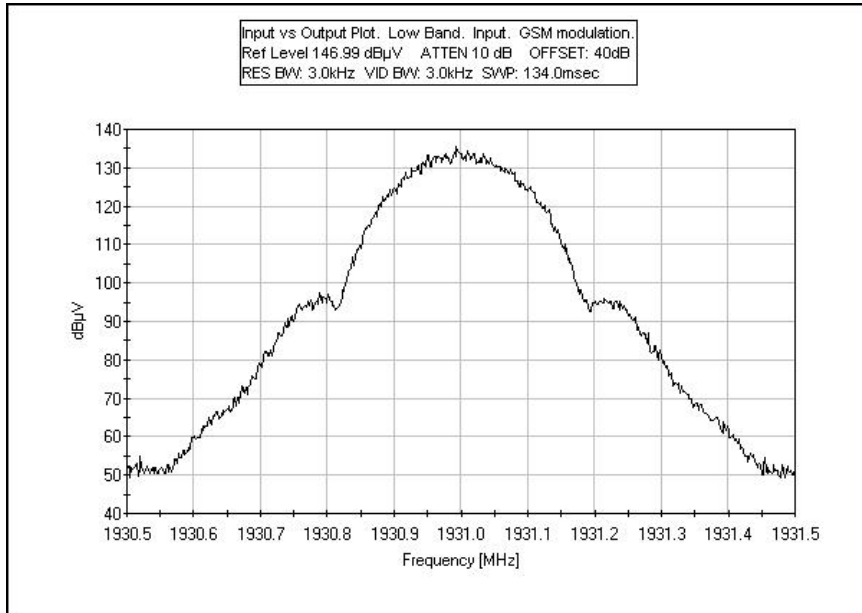
INPUT PLOT - EDGE MIDDLE BAND



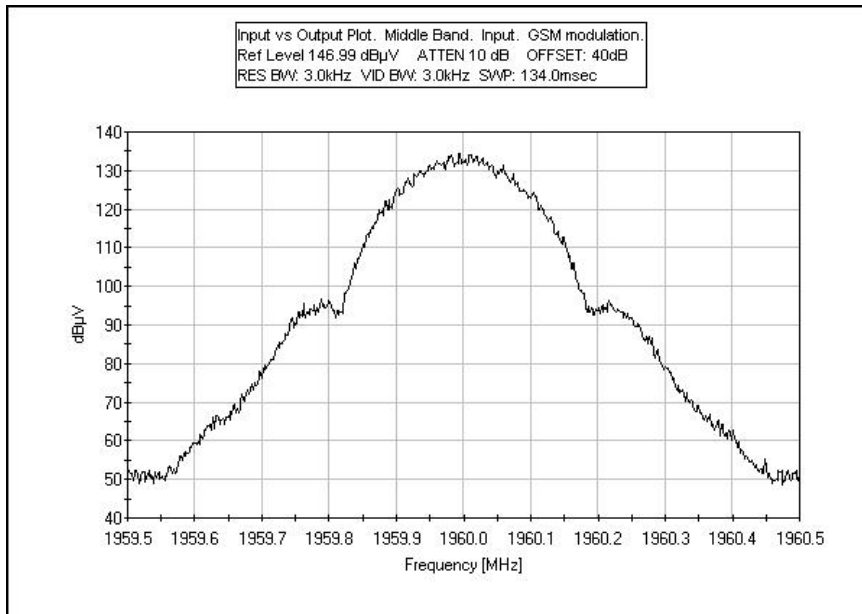
INPUT PLOT - EDGE HIGH BAND



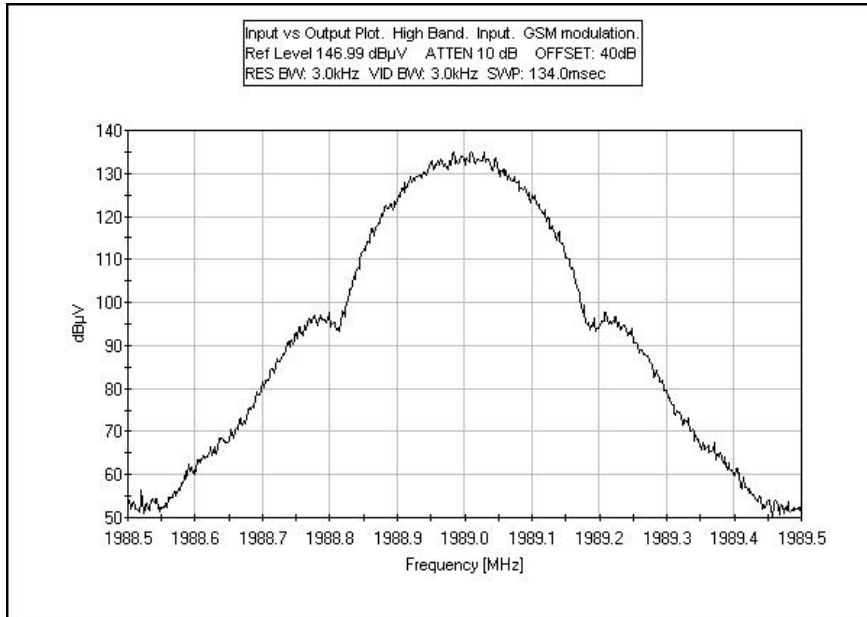
INPUT PLOT - GSM LOW BAND



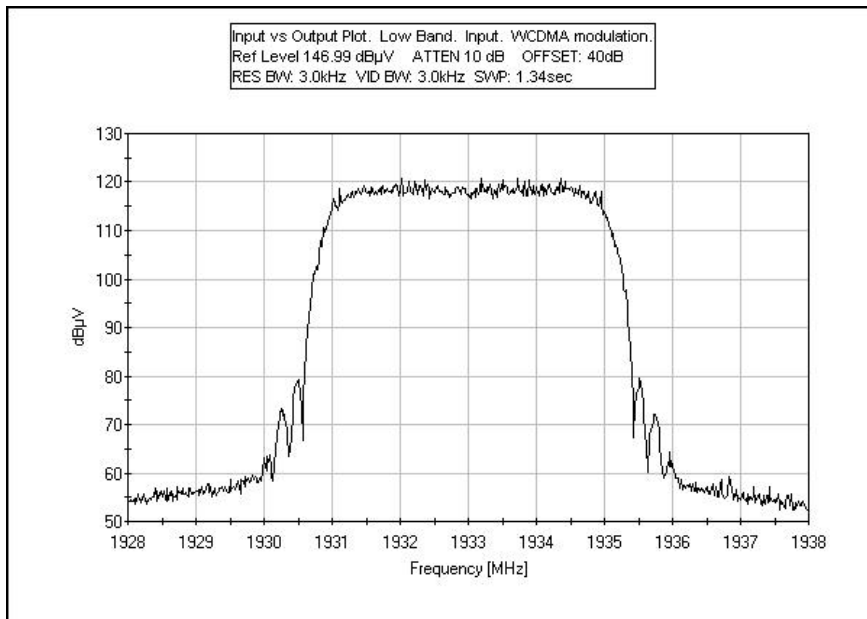
INPUT PLOT - GSM MIDDLE BAND



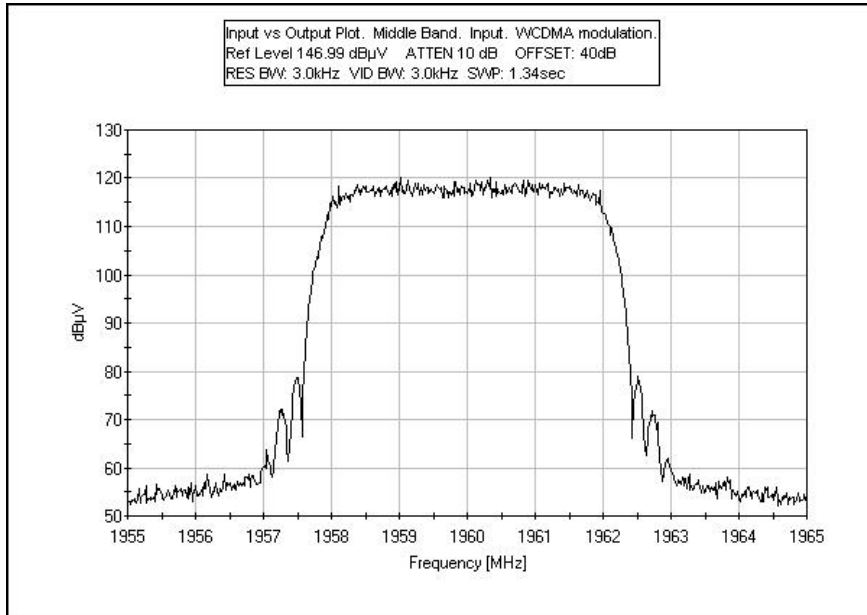
INPUT PLOT - GSM HIGH BAND



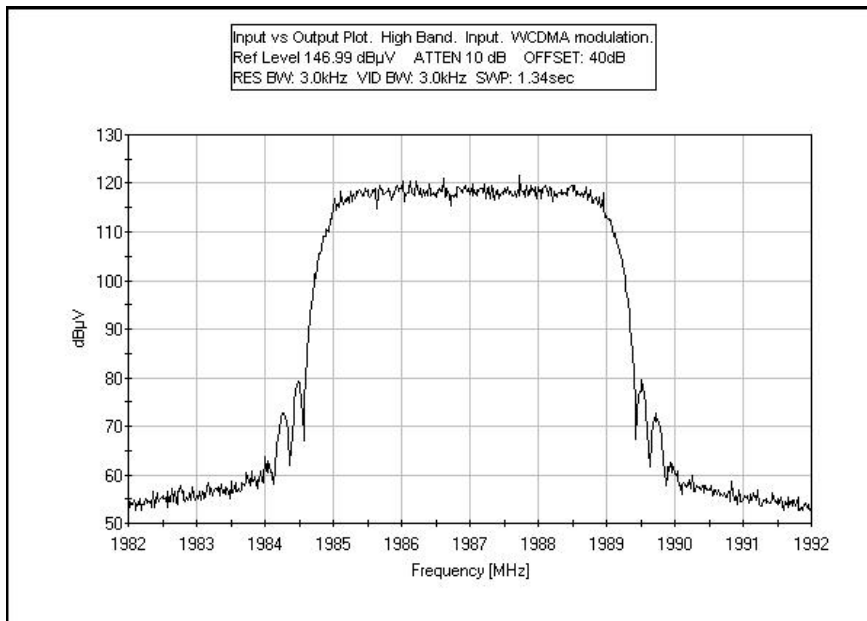
INPUT PLOT - WCDMA LOW BAND



INPUT PLOT - WCDMA MIDDLE BAND



INPUT PLOT - WCDMA HIGH BAND



FCC 2.1033(c)(14)/2.1049(i)- OUTPUT PLOTS

Test Equipment

Equipment	Asset #	Manufacturer	Model #	Serial #	Cal Date	Cal Due
Spectrum Analyzer	02672	Agilent	E4446A	US44300438	072308	072309
Coaxial Cable	P02945	Astrolab	32022-2-2909K-36TC	(none)	091807	091809

Test Conditions

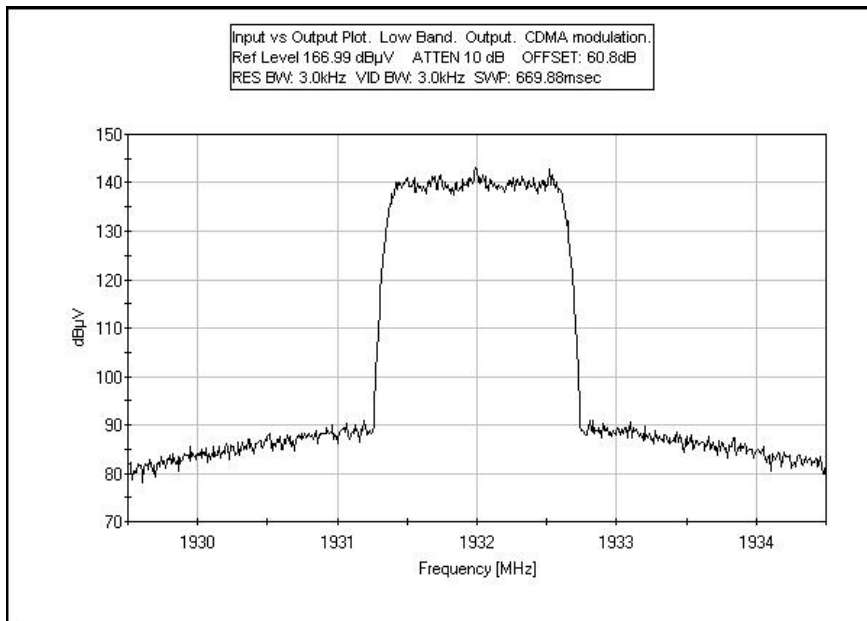
The equipment under test (EUT) is placed stand alone on the table top. One of the EUT's Tx1/BTS ports is connected to a remotely located drive amplifier. A signal generator is providing the signal to the EUT through the drive amplifier. For the input plot, the output of the drive amplifier is sent to the input of the spectrum analyzer through power attenuators. A plot of the input signal signature is made. For the output plot, one of the EUT's Tx/Rx ANT ports is connected to the input of the spectrum analyzer and a plot is made of the output signal signature. Temperature: 22°C, Humidity: 48%, Pressure: 100kPa. Voltage to the EUT is 230Vac 60Hz. Plots were made with the signal generator set to low, middle, and high channels using GSM, EDGE, CDMA, and WCDMA modulations. Output of the EUT is set to its rated output power of 51.6dBm. The frequency range tested was 1931MHz to 1989MHz. The operating range of the device tested is 1930MHz to 1990MHz. The actual operating frequencies of the device used were 1931MHz, 1960MHz, and 1989MHz for GSM and EDGE. The actual operating frequencies of the device used on this datasheet are 1932MHz, 1960MHz, and 1988MHz for CDMA. The actual operating frequencies of the device used on this datasheet are 1933MHz, 1960MHz, and 1987MHz for WCDMA. Bandwidth settings: SA RES BW=3kHz, SA VID BW=3kHz.

Test Setup Photos

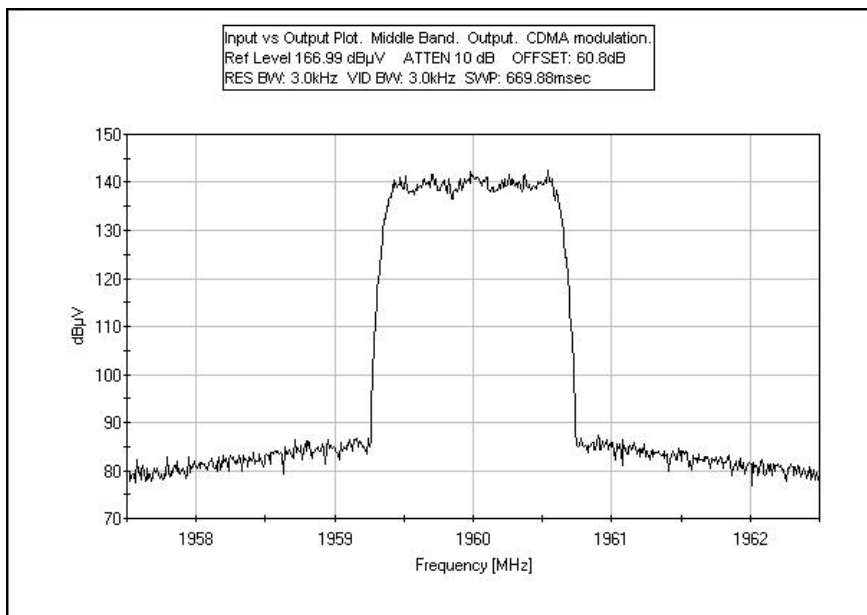


Test Plots

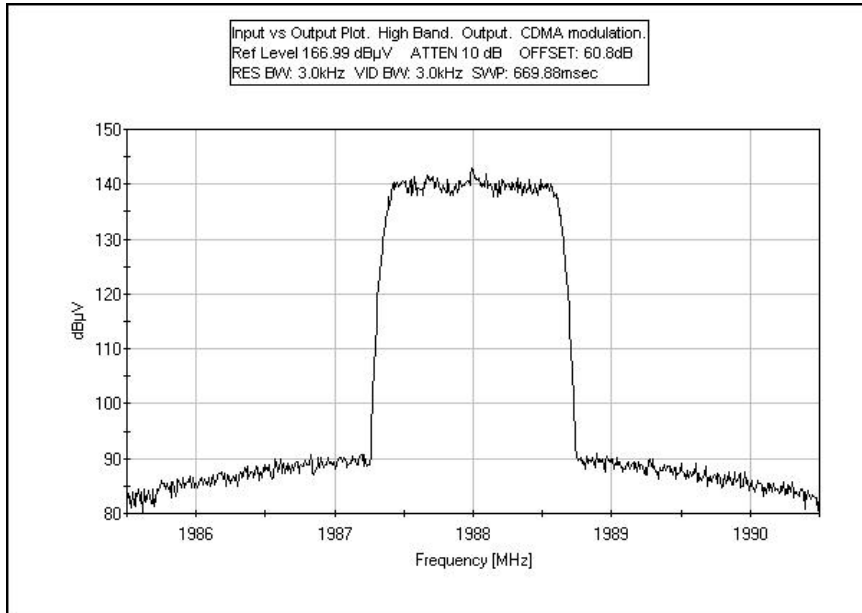
OUTPUT PLOT - CDMA LOW BAND



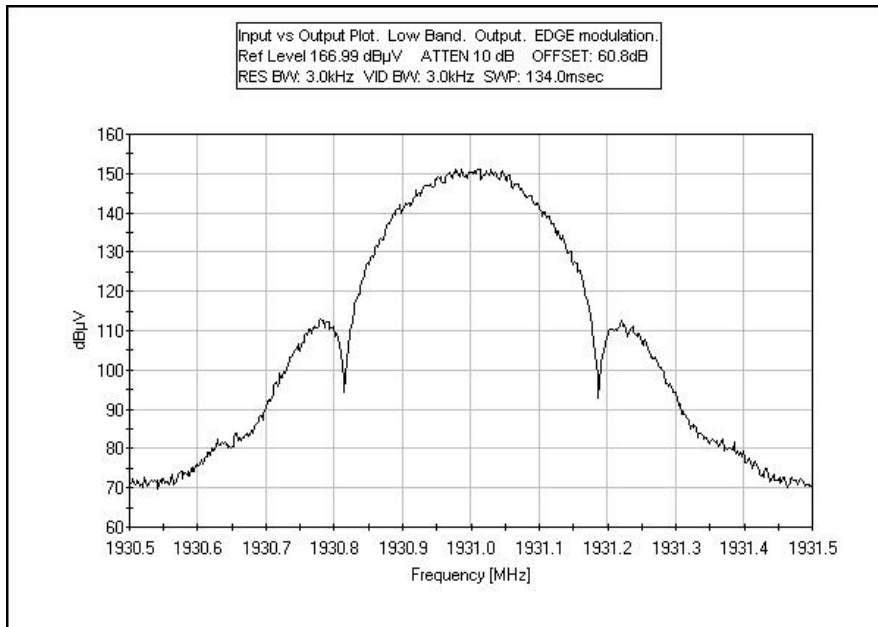
OUTPUT PLOT - CDMA MIDDLE BAND



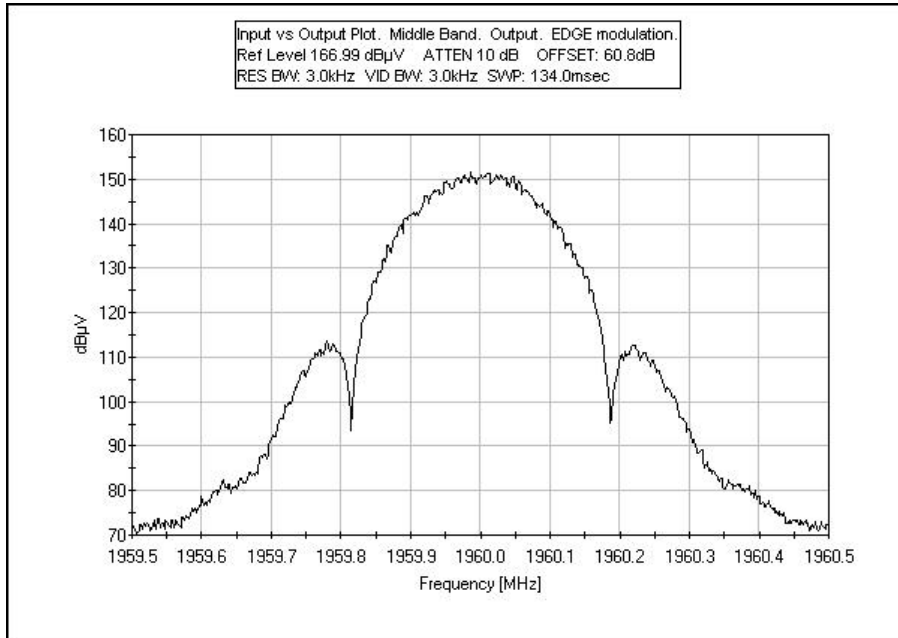
OUTPUT PLOT - CDMA HIGH BAND



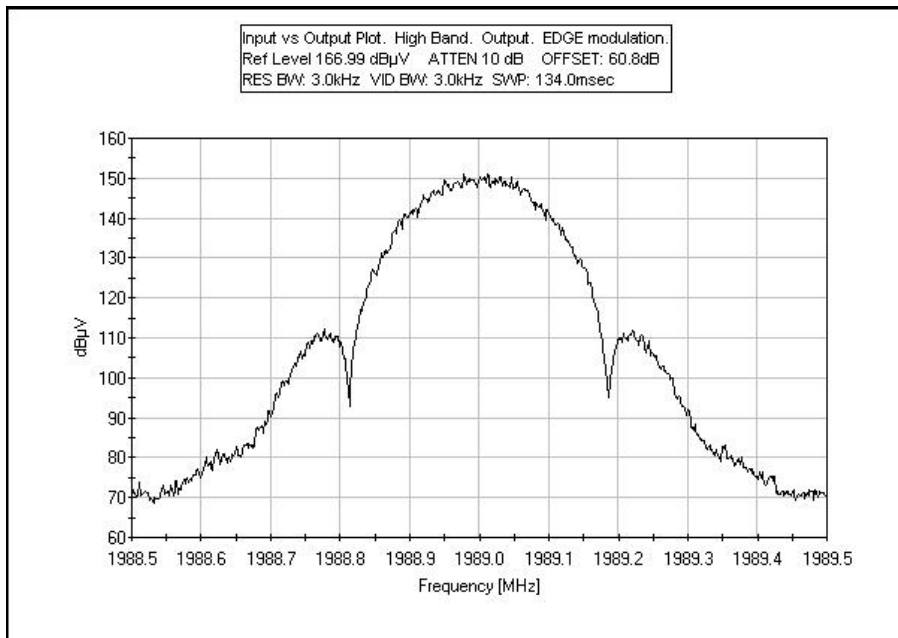
OUTPUT PLOT - EDGE LOW BAND



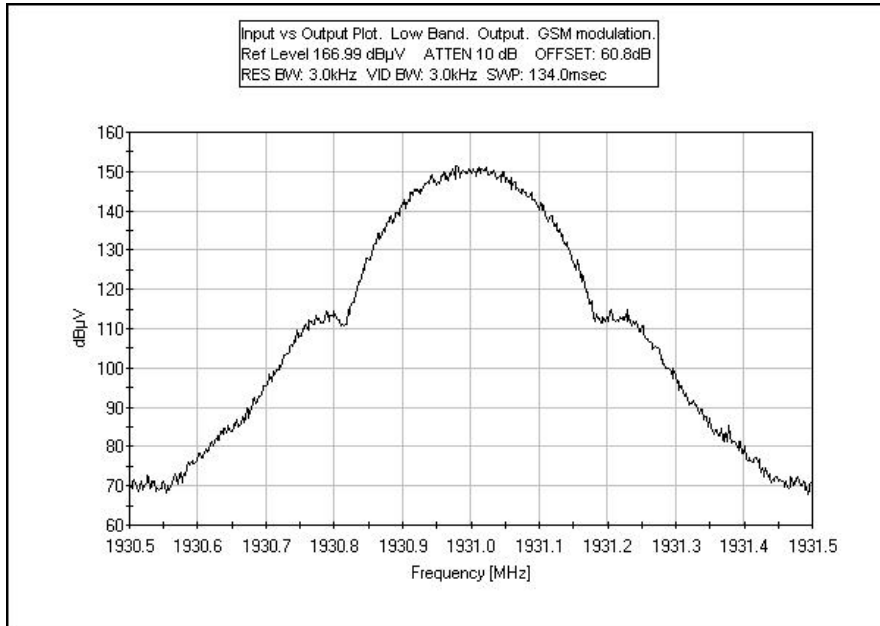
OUTPUT PLOT - EDGE MIDDLE BAND



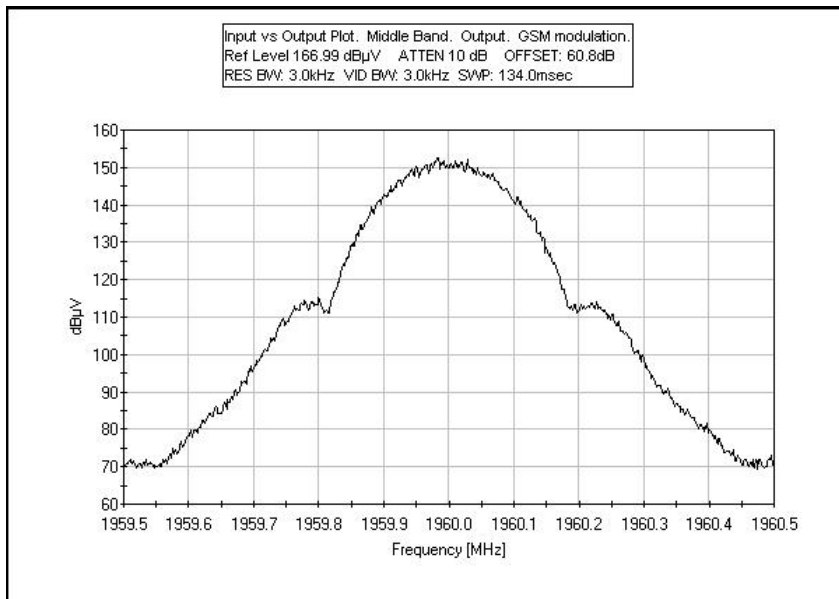
OUTPUT PLOT - EDGE HIGH BAND



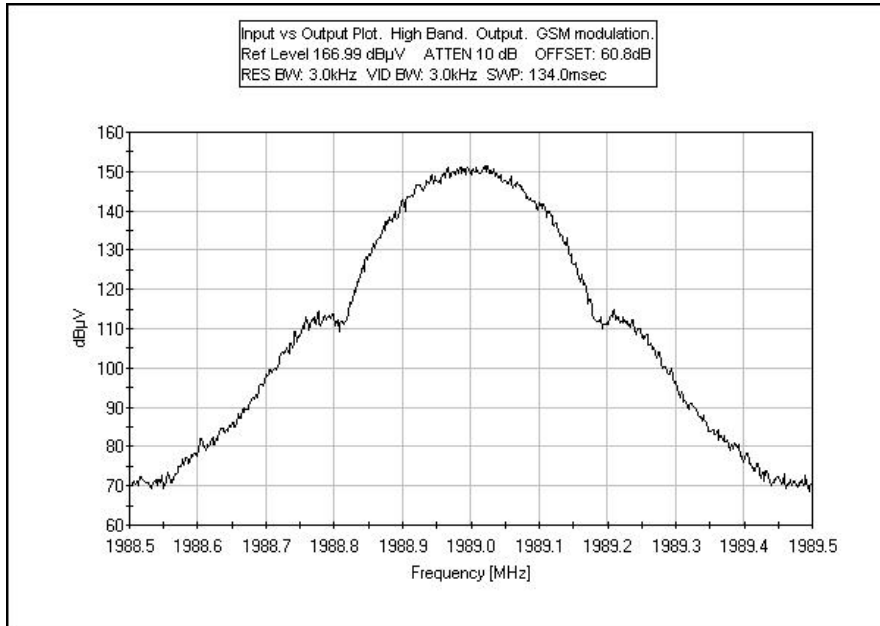
OUTPUT PLOT - GSM LOW BAND



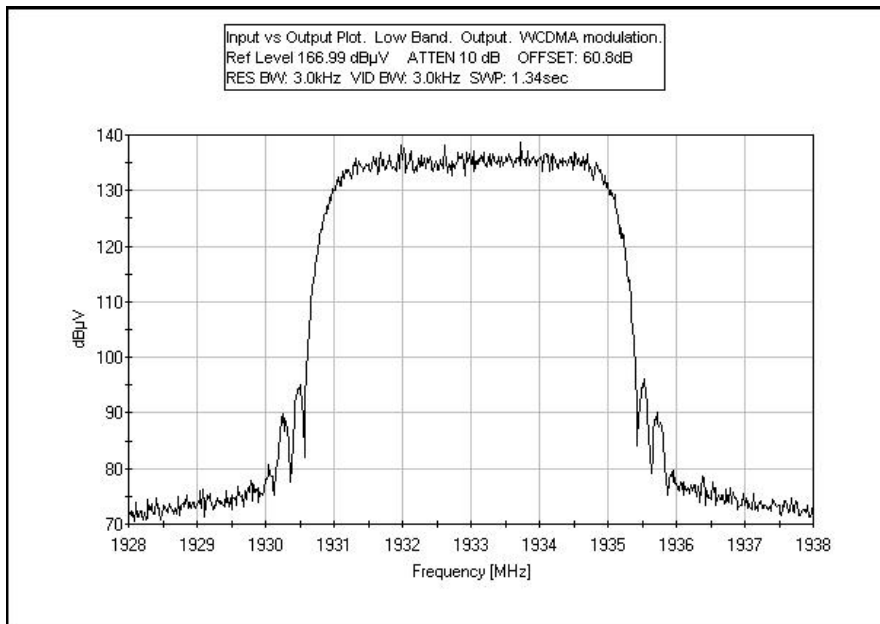
OUTPUT PLOT - GSM MIDDLE BAND



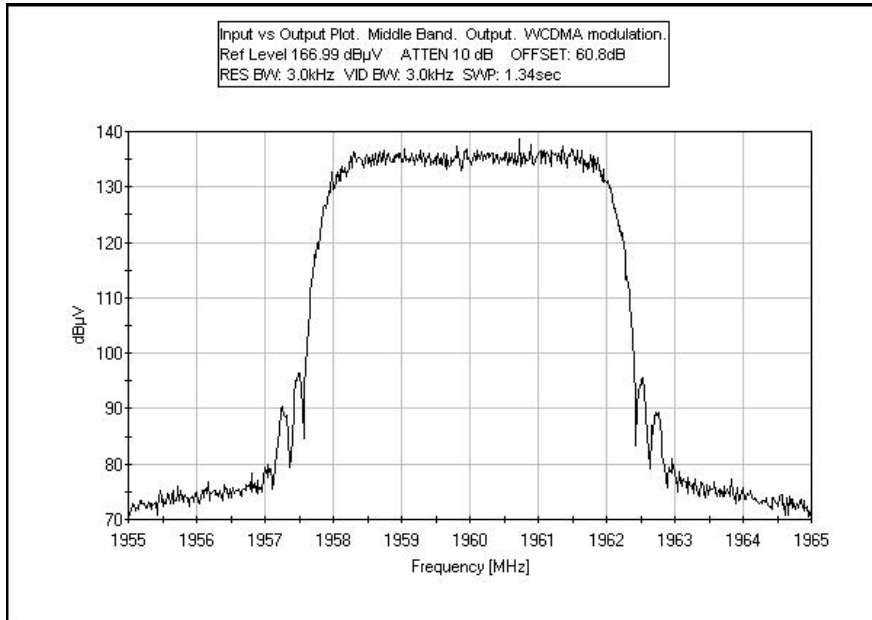
OUTPUT PLOT - GSM HIGH BAND



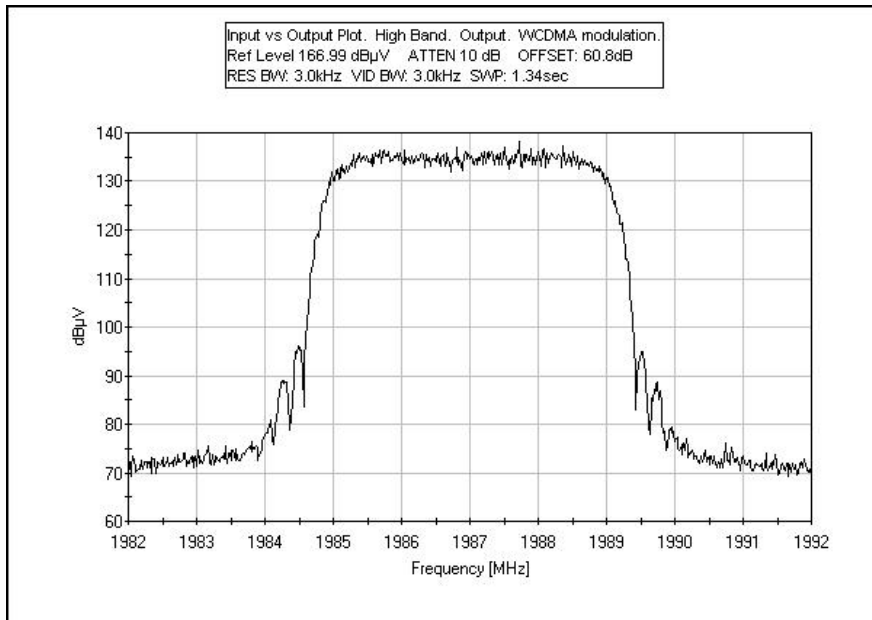
OUTPUT PLOT - WCDMA LOW BAND



OUTPUT PLOT - WCDMA MIDDLE BAND



OUTPUT PLOT - WCDMA HIGH BAND



FCC 2.1033(c)(14)/2.1051/24.238(a) - SPURIOUS EMISSIONS AT ANTENNA TERMINAL

Test Setup Photos



Test Data

Limit line for Spurious Conducted Emission

$$\underline{\text{Required Attenuation}} = \underline{43+10 \text{ Log } P \text{ dB}}$$

$$\text{Limit line (dBuV)} = V_{\text{dBuV}} - \text{Attenuation}$$

$$\begin{aligned} V_{\text{dBuV}} &= 20 \text{ Log } \frac{V}{1 \times 10^{-6}} \\ &= 20 (\text{Log } V - \text{Log } 1 \times 10^{-6}) \\ &= 20 \text{ Log } V - 20 \text{ Log } 1 \times 10^{-6} \\ &= 20 \text{ Log } V - 20 (-6) \\ &= 20 \text{ Log } V + 120 \end{aligned}$$

$$\begin{aligned} \text{Attenuation} &= 43 + 10 \text{ Log } P \\ &= 43 + 10 \text{ Log } \frac{V^2}{R} \\ &= 43 + 10 (\text{Log } V^2 - \text{Log } R) \\ &= 43 + 10 (2 \text{ Log } V - \text{Log } R) \\ &= 43 + 20 \text{ Log } V - 10 \text{ Log } R \end{aligned}$$

$$\begin{aligned} \text{Limit line} &= V_{\text{dBuV}} - \text{Attenuation} \\ &= 20 \text{ Log } V + 120 - (43 + 20 \text{ Log } V - 10 \text{ Log } R) \\ &= 20 \text{ Log } V + 120 - 43 - 20 \text{ Log } V + 10 \text{ Log } R \\ &= 20 \text{ Log } V + 120 - 43 - 20 \text{ Log } V + 10 \text{ Log } R \\ &= 120 - 43 + 10 \text{ Log } 50 \quad \text{Note : } R = 50 \Omega \\ &= 120 - 43 + 16.897 \\ &= 94 \text{ dBuV at any power level} \end{aligned}$$



Test Location: CKC Laboratories, Inc. • 110. N. Olinda Place. • Brea, CA 92821 • (714) 993-6112

Customer: **Powerwave Technologies, Inc.**
 Specification: **FCC 24.238(a) (2007) Conducted Spurious Emissions**
 Work Order #: **88265** Date: 8/4/2008
 Test Type: **Conducted Emissions** Time: 16:36:18
 Equipment: **Booster Amplifier Assembly** Sequence#: 2
 Manufacturer: Powerwave Technologies, Inc. Tested By: Stuart Yamamoto
 Model: OS-1933-E0-001 230Vac 60Hz
 S/N:

Test Equipment:

Function	S/N	Calibration Date	Cal Due Date	Asset #
Spectrum Analyzer	US44300438	01/03/2007	01/03/2009	02672
Coaxial Cable		09/18/2007	09/18/2009	02945
3.0 GHz HPF	1	03/25/2008	03/25/2010	02744

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Booster Amplifier Assembly*	Powerwave Technologies, Inc.	OS-1933-E0-001	

Support Devices:

Function	Manufacturer	Model #	S/N
Signal Generator	Agilent	E4433B	US40051207
Signal Generator	Agilent	E4433B	US40052093
Signal Generator	Agilent	E4433B	US40051852
Amplifier Driver	Powerwave Technologies, Inc.	G3L-1929-160-001	PD00000FUP
Amplifier Driver	Powerwave Technologies, Inc.	G3L-1929-160-001	CL07080003
Amplifier Driver	Powerwave Technologies, Inc.	G3L-1929-160-001	CL07080007
Laptop Computer	HP	compaqnc60000	CNUS1121KN
DC Power Supply	HP	6683A	US36420334

Test Conditions / Notes:

The equipment under test (EUT) is stand alone on the table top. All support equipment is located remote from the test site. Three signal generators along with three driver amplifiers are used to provide the three input signals to the EUT. The three outputs of the EUT are then routed to high power attenuators and loads. Temperature: 29°C, Humidity: 46%, Pressure: 100kPa. Output for the amplifier under test is set to the rated output power of 145.0 Watts (51.6dBm). Frequency range scanned and maximized, 9kHz to 20GHz. Operating range of the device under test is 1930MHz to 1990MHz. Bandwidth used 9kHz-20GHz = RBW=1MHz, VBW=8MHz. EDGE modulation: low (1931MHz), middle (1960MHz), and high (1989MHz). GSM modulation: low (1931MHz), middle (1960MHz), and high (1989MHz). CDMA modulation: low (1932MHz), middle (1960MHz), and high (1988MHz). WCDMA modulation: low (1933MHz), middle (1960MHz), and high (1987MHz).

Transducer Legend:

T1=Hi Freq 40GHz 3ft CAB-ANP02945-091809	T2=HPF 3GHz-AN02744-032510
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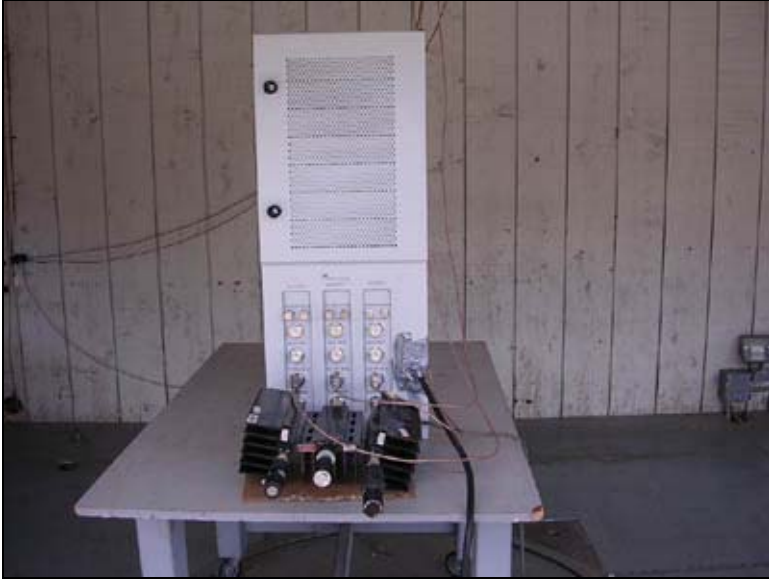
Measurement Data: Reading listed by margin. Test Lead: Antenna Terminal

#	Freq MHz	Rdng dBμV	T1 dB	T2 dB	Dist dB	Corr dBμV	Spec dBμV	Margin dB	Polar Ant
1	5966.888M	87.5	+0.8	+0.4	+0.0	88.7	94.0	-5.3	Anten
EDGE modulation									
2	5795.250M	86.3	+0.8	+0.4	+0.0	87.5	94.0	-6.5	Anten
CDMA Modulation									

3	5966.712M	84.4	+0.8	+0.4	+0.0	85.6	94.0	-8.4	Anten
							GSM Modulation		
4	5880.238M	82.4	+0.8	+0.4	+0.0	83.6	94.0	-10.4	Anten
							GSM Modulation		
5	5964.220M	82.0	+0.8	+0.4	+0.0	83.2	94.0	-10.8	Anten
							CDMA Modulation		
6	5792.928M	81.1	+0.8	+0.4	+0.0	82.3	94.0	-11.7	Anten
							EDGE modulation		
7	5793.200M	81.0	+0.8	+0.4	+0.0	82.2	94.0	-11.8	Anten
							GSM Modulation		
8	5879.530M	80.5	+0.8	+0.4	+0.0	81.7	94.0	-12.3	Anten
							CDMA Modulation		
9	5879.802M	80.3	+0.8	+0.4	+0.0	81.5	94.0	-12.5	Anten
							EDGE modulation		
10	5801.580M	78.4	+0.8	+0.4	+0.0	79.6	94.0	-14.4	Anten
							WCDMA Modulation		
11	5880.650M	77.8	+0.8	+0.4	+0.0	79.0	94.0	-15.0	Anten
							WCDMA Modulation		
12	3863.946M	77.5	+0.7	+0.4	+0.0	78.6	94.0	-15.4	Anten
							CDMA Modulation		
13	5960.655M	77.2	+0.8	+0.4	+0.0	78.4	94.0	-15.6	Anten
							WCDMA Modulation		
14	3919.630M	76.7	+0.7	+0.4	+0.0	77.8	94.0	-16.2	Anten
							WCDMA Modulation		
15	3920.136M	76.6	+0.7	+0.4	+0.0	77.7	94.0	-16.3	Anten
							GSM Modulation		
16	3976.060M	76.2	+0.7	+0.4	+0.0	77.3	94.0	-16.7	Anten
							CDMA Modulation		
17	3862.152M	75.0	+0.7	+0.4	+0.0	76.1	94.0	-17.9	Anten
							GSM Modulation		
18	3978.042M	75.0	+0.7	+0.4	+0.0	76.1	94.0	-17.9	Anten
							EDGE modulation		
19	3866.580M	74.7	+0.7	+0.4	+0.0	75.8	94.0	-18.2	Anten
							WCDMA Modulation		
20	3919.865M	74.4	+0.7	+0.4	+0.0	75.5	94.0	-18.5	Anten
							CDMA Modulation		
21	3974.550M	74.2	+0.7	+0.4	+0.0	75.3	94.0	-18.7	Anten
							WCDMA Modulation		
22	3978.100M	74.1	+0.7	+0.4	+0.0	75.2	94.0	-18.8	Anten
							GSM Modulation		
23	3920.013M	73.9	+0.7	+0.4	+0.0	75.0	94.0	-19.0	Anten
							EDGE modulation		
24	3861.995M	73.5	+0.7	+0.4	+0.0	74.6	94.0	-19.4	Anten
							EDGE modulation		

FCC 2.1033(c)(14)/2.1053/24.238(a) - FIELD STRENGTH OF SPURIOUS RADIATION

Test Setup Photos





Test Data Sheets

Test Location: CKC Laboratories, Inc. • 110. N. Olinda Place. • Brea, CA 92821 • (714) 993-6112

Customer: **Powerwave Technologies, Inc.**
 Specification: **FCC 24.238(a) (2007) Radiated Spurious Emission**
 Work Order #: **88265** Date: 8/4/2008
 Test Type: **Maximized Emissions** Time: 11:14:07
 Equipment: **Booster Amplifier Assembly** Sequence#: 1
 Manufacturer: Powerwave Technologies, Inc. Tested By: Stuart Yamamoto
 Model: OS-1933-E0-001
 S/N:

Test Equipment:

Function	S/N	Calibration Date	Cal Due Date	Asset #
Spectrum Analyzer	US44300438	01/03/2007	01/03/2009	02672
18-26.5 GHz Horn Antenna	3643A00027	11/27/2006	11/27/2008	02112
Horn Antenna	6246	06/06/2008	06/06/2010	00849
Coaxial Cable		09/18/2007	09/18/2009	02945
3.0 GHz HPF	1	03/25/2008	03/25/2010	02744
Heliac Antenna Cable	P5565	09/18/2006	09/18/2008	P05565
Bilog Antenna	2451	01/21/2008	01/21/2010	01995
Pre amp to SA Cable	Cable #10	05/16/2007	05/16/2009	P05050
Cable	Cable15	01/05/2007	01/05/2009	P05198
Pre Amp	1937A02548	05/02/2008	05/02/2010	00309
Microwave Preamplifier	3123A00282	06/05/2007	06/05/2009	00787
Loop Antenna	2014	06/16/2008	06/16/2010	00314

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Booster Amplifier Assembly*	Powerwave Technologies, Inc.	OS-1933-E0-001	

Support Devices:

Function	Manufacturer	Model #	S/N
Signal Generator	Agilent	E4433B	US40051207
Signal Generator	Agilent	E4433B	US40052093
Signal Generator	Agilent	E4433B	US40051852
Amplifier Driver	Powerwave Technologies, Inc.	G3L-1929-160-001	PD00000FUP
Amplifier Driver	Powerwave Technologies, Inc.	G3L-1929-160-001	CL07080003
Amplifier Driver	Powerwave Technologies, Inc.	G3L-1929-160-001	CL07080007
Laptop Computer	HP	compaqnc60000	CNUS1121KN
DC Power Supply	HP	6683A	US36420334

Test Conditions / Notes:

The equipment under test (EUT) is stand alone on the table top. All support equipment is located remote from the test site. Three signal generators along with three driver amplifiers are used to provide the three input signals to the EUT. The three outputs of the EUT are then routed to high power attenuators and loads. Voltage to EUT is 230Vac 60Hz. Temperature: 29°C, Humidity: 46%, Pressure: 100kPa. One of the EUT's amplifiers is set to 1931MHz, another is set to 1960MHz, and the third one is set to 1989MHz. EDGE Modulation is being used for all signals. Output for each amplifier is set to the rated output power of 145.0 Watts (51.6dBm). Frequency range scanned and maximized, 9kHz to 20GHz. Operating range of the device under test is 1930MHz to 1990MHz. Bandwidth used 1GHz-20GHz = RBW=1MHz, VBW=8MHz; 30MHz-1GHz = RBW=120 kHz, VBW=120 kHz; 150kHz-30MHz = RBW=9 kHz, VBW=9 kHz; 9kHz-150kHz = RBW= 200 Hz, VBW=200 Hz.

Transducer Legend:

T1=Horn Ant AN00849 060610	T2=54' Heliac Cable 091808 P05565_091808
T3=HPF_3GHz-AN02744-032510	T4=Hi Freq_40GHz_3ft_CAB-ANP02945-091809
T5=Preamplifier 83017A 00787	

Operating Frequency: 1930MHz - 1990MHz
 Channels: Low, Mid and High
 Highest Measured Output
 Power: 51.61 ERP(dBm)= 145 ERP(Watts)
 Distance: 3 meters
 Limit: $43+10\text{Log}(P)=$ 64.61 dBc

Freq. (MHz)	Reference Level (dBm)	Antenna Polarity (H/V)	dBc
5,880.00	-20.7	Horiz	72.31
5,966.95	-22.3	Vert	73.91
5,966.96	-22.6	Horiz	74.21
5,880.05	-22.6	Vert	74.21
7,724.06	-22.8	Horiz	74.41
5,793.05	-24.2	Horiz	75.81
7,956.05	-24.3	Horiz	75.91
7,839.99	-24.7	Horiz	76.31
5,792.87	-25.8	Vert	77.41
7,839.89	-26.1	Vert	77.71
7,955.87	-27	Vert	78.61
7,723.99	-27	Vert	78.61
3,920.07	-28.9	Horiz	80.51
3,978.00	-29.2	Horiz	80.81
3,920.04	-31	Vert	82.61
3,861.92	-31.7	Horiz	83.31
3,978.06	-34.6	Vert	86.21
3,861.95	-42.3	Vert	93.91

FCC 24.238 – BLOCK EDGE

Test Equipment

Equipment	Asset #	Manufacturer	Model #	Serial #	Cal Date	Cal Due
Spectrum Analyzer	02672	Agilent	E4446A	US44300438	072308	072309
Coaxial Cable	P02945	Astrolab	32022-2-2909K-36TC	(none)	091807	091809

Test Conditions

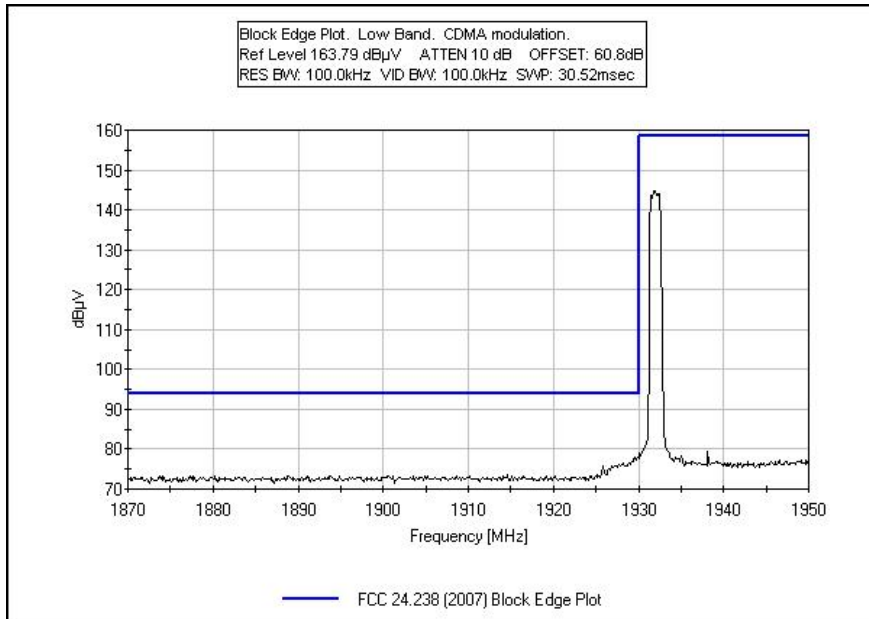
The equipment under test (EUT) is placed stand alone on the table top. One of the EUT’s Tx1/BTS ports is connected to a remotely located drive amplifier. A signal generator is providing the signal to the EUT through the drive amplifier. One of the EUT’s Tx/Rx ANT ports is connected to the input of the spectrum analyzer through high power attenuators and a plot is made. Temperature: 22°C, Humidity: 48%, Pressure: 100kPa. Voltage to the EUT is 230Vac 60Hz. Plots were made with the signal generator set to the low and high channels using GSM, EDGE, CDMA, and WCDMA modulations. Output of the EUT is set to its rated output power of 51.6dBm. The frequency range tested was 1931MHz to 1989MHz. The operating range of the device tested is 1930MHz to 1990MHz. The actual operating frequencies of the device used were 1931MHz and 1989MHz for GSM and EDGE. The actual operating frequencies of the device used on this datasheet is 1932MHz and 1988MHz for CDMA. The actual operating frequencies of the device used on this datasheet is 1933MHz and 1987MHz for WCDMA. Bandwidth settings: SA RES BW=100kHz, SA VID BW=100kHz. Note: A bandwidth correction factor was applied for the measurements performed with a RBW of 100kHz.

Test Setup Photos

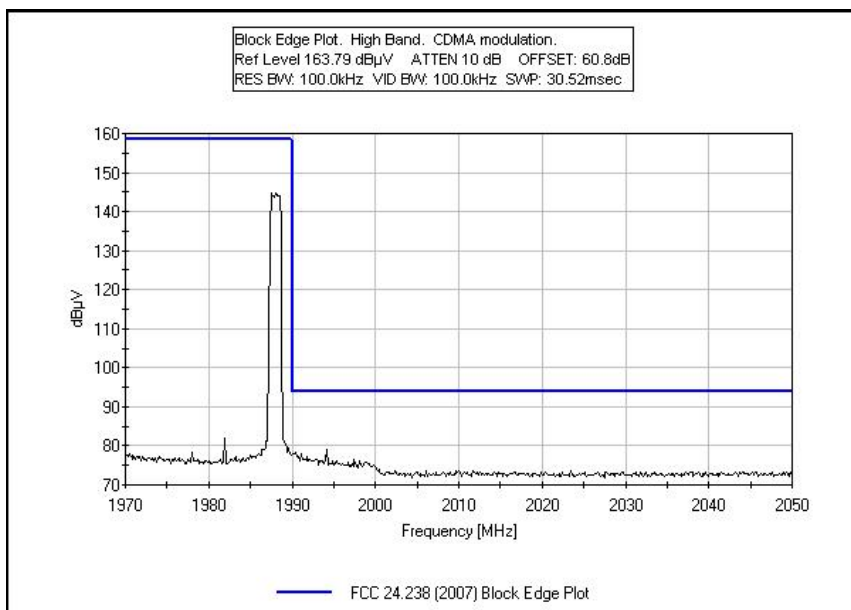


Test Plots

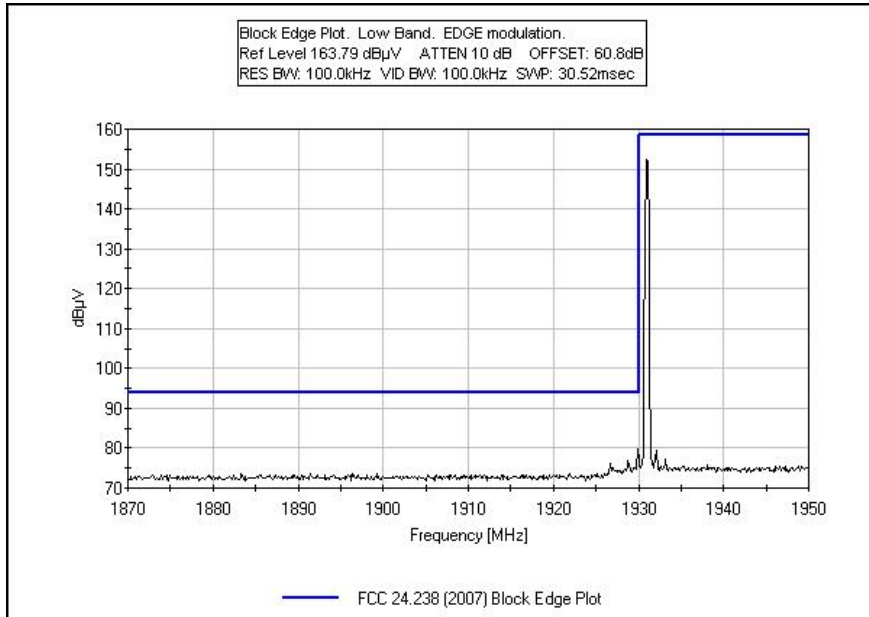
FCC 24.238 BLOCK EDGE - CDMA LOW CHANNEL



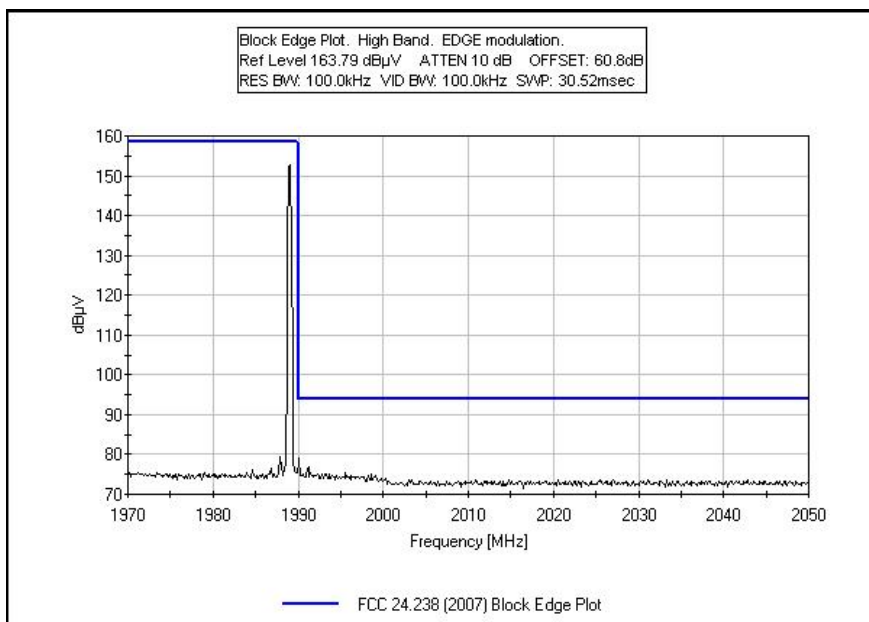
FCC 24.238 BLOCK EDGE - CDMA HIGH CHANNEL



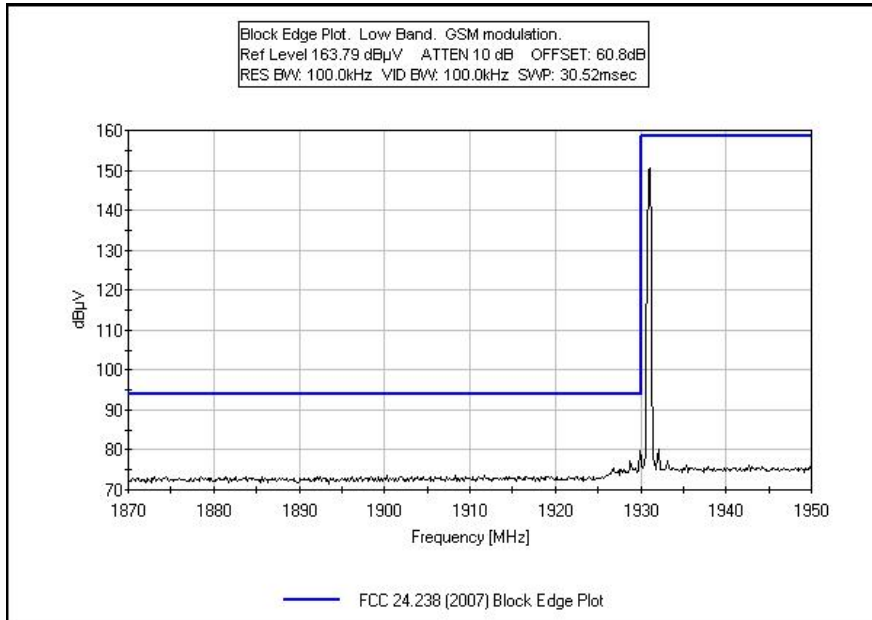
FCC 24.238 BLOCK EDGE - EDGE LOW CHANNEL



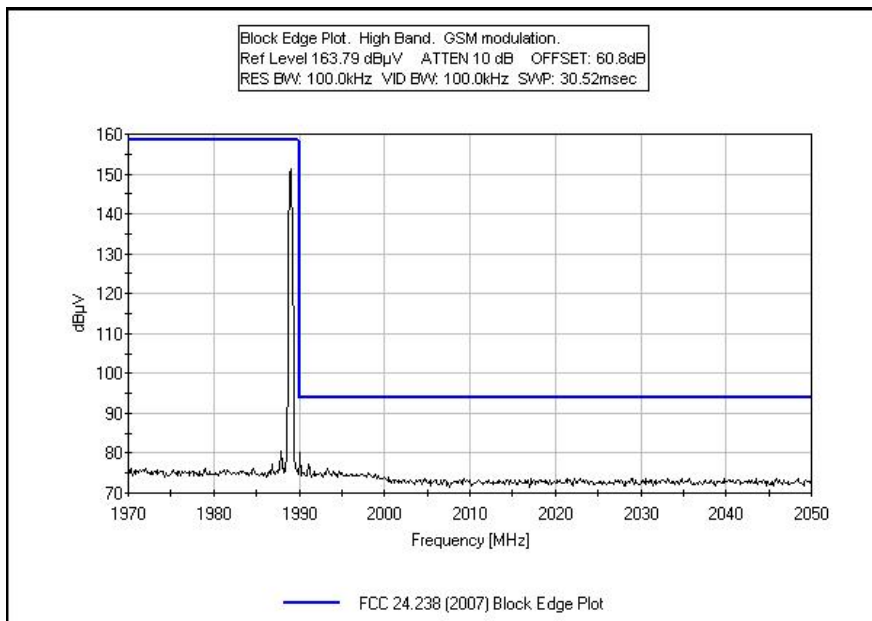
FCC 24.238 BLOCK EDGE - EDGE HIGH CHANNEL



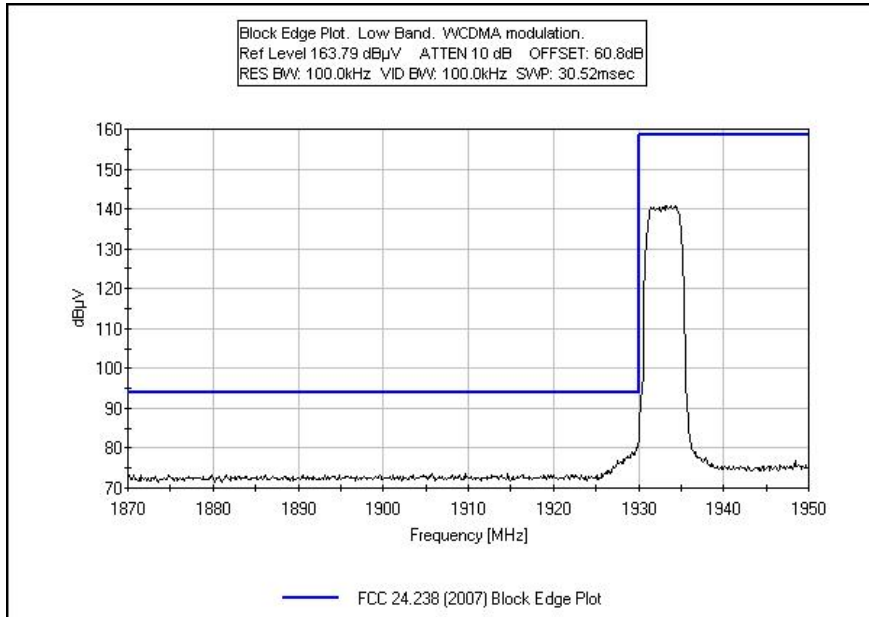
FCC 24.238 BLOCK EDGE - GSM LOW CHANNEL



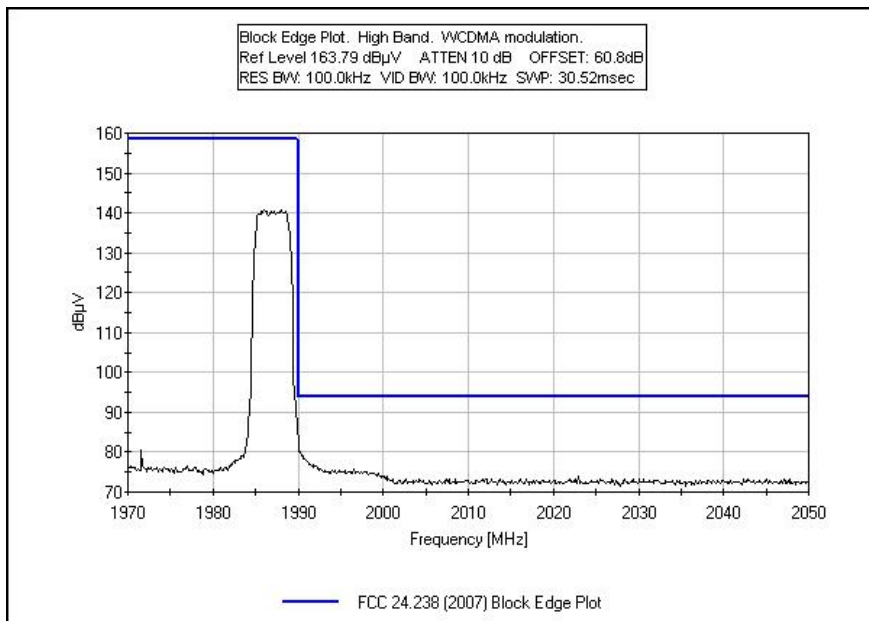
FCC 24.238 BLOCK EDGE - GSM HIGH CHANNEL



FCC 24.238 BLOCK EDGE - WCDMA LOW CHANNEL



FCC 24.238 BLOCK EDGE - WCDMA HIGH CHANNEL



INTERMODULATION

Test Equipment

Equipment	Asset #	Manufacturer	Model #	Serial #	Cal Date	Cal Due
Spectrum Analyzer	02672	Agilent	E4446A	US44300438	072308	072309
Coaxial Cable	P02945	Astrolab	32022-2-2909K-36TC	(none)	091807	091809

Test Conditions

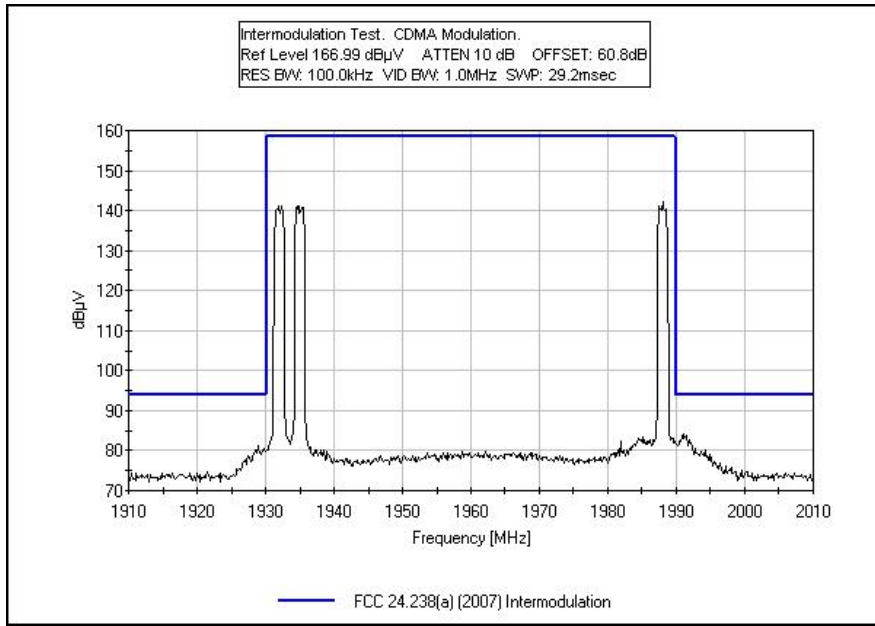
The equipment under test (EUT) is placed stand alone on the table top. One of the EUT's Tx1/BTS ports is connected to a three remotely located drive amplifiers. Three signal generators are providing the signals to the EUT through the drive amplifiers and combiner. For the intermodulation plots, one of the EUT's Tx/Rx ANT port was connected to the spectrum analyzer through high power attenuators and plots were made of the from 20MHz below the band to 20MHz above the band edge. Temperature: 22°C, Humidity: 48%, Pressure: 100kPa. Voltage to the EUT is 230Vac 60Hz. Plots were made with two signal generators set to the low band and one signal generator set to the high band using GSM, EDGE, CDMA, and WCDMA modulations. Output of the EUT is set to its rated output power of 51.6dBm. The frequency range tested was 1931MHz to 1989MHz. The operating range of the device tested is 1930MHz to 1990MHz. Bandwidth settings: SA RES BW=100kHz, SA VID BW=1MHz.

Test Setup Photos

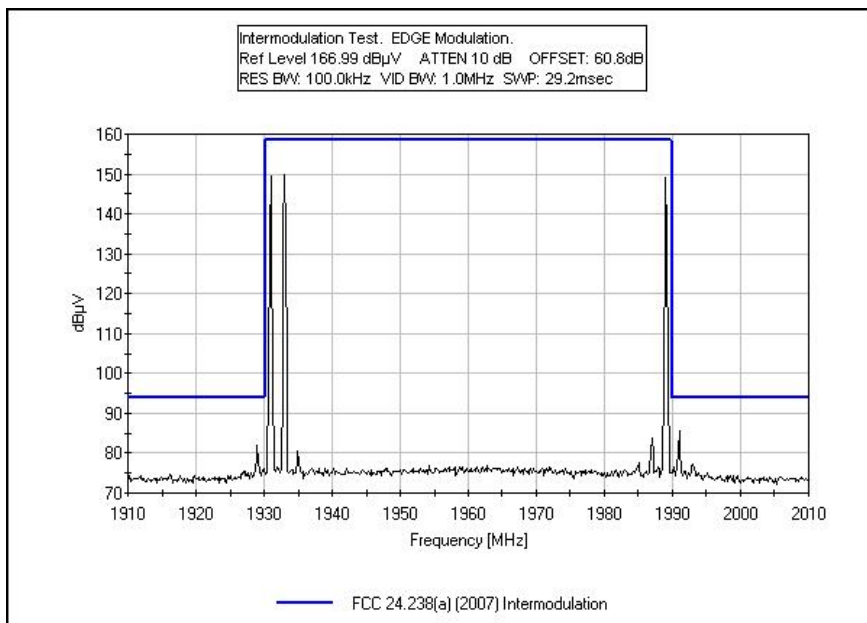


Test Plots

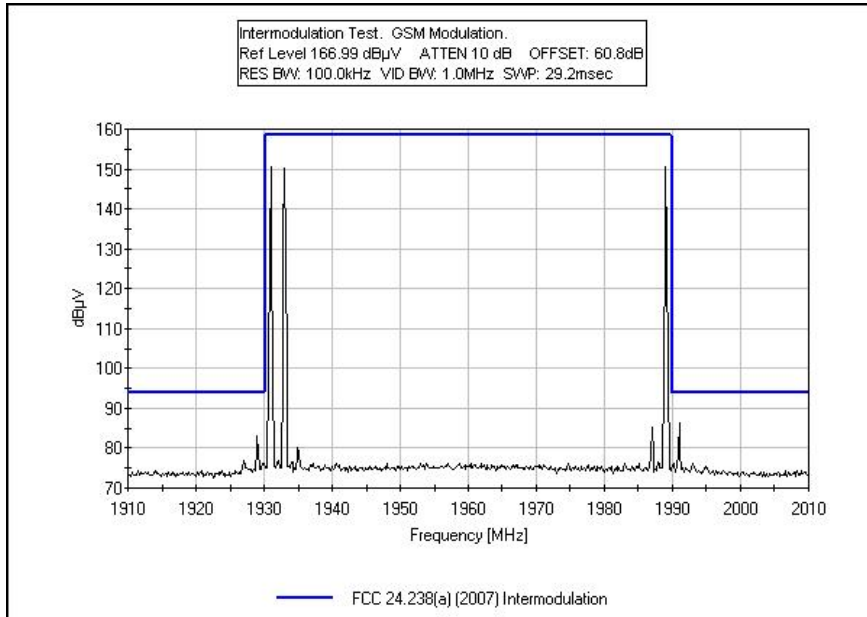
INTERMODULATION - CDMA



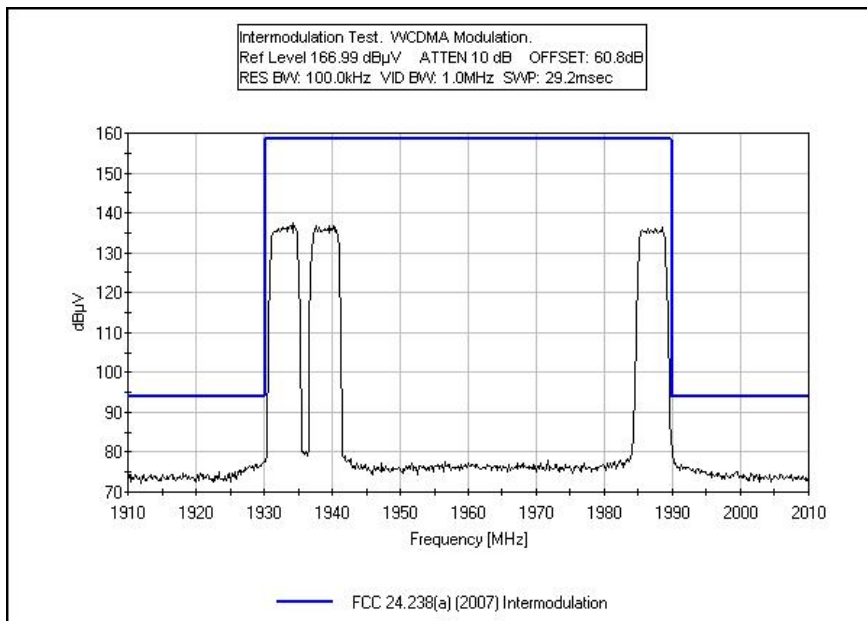
INTERMODULATION - EDGE



INTERMODULATION - GSM



INTERMODULATION - WCDMA



OUT OF BAND REJECTION

Test Equipment

Equipment	Asset #	Manufacturer	Model #	Serial #	Cal Date	Cal Due
Spectrum Analyzer	02672	Agilent	E4446A	US44300438	072308	072309
Coaxial Cable	P02945	Astrolab	32022-2-2909K-36TC	(none)	091807	091809

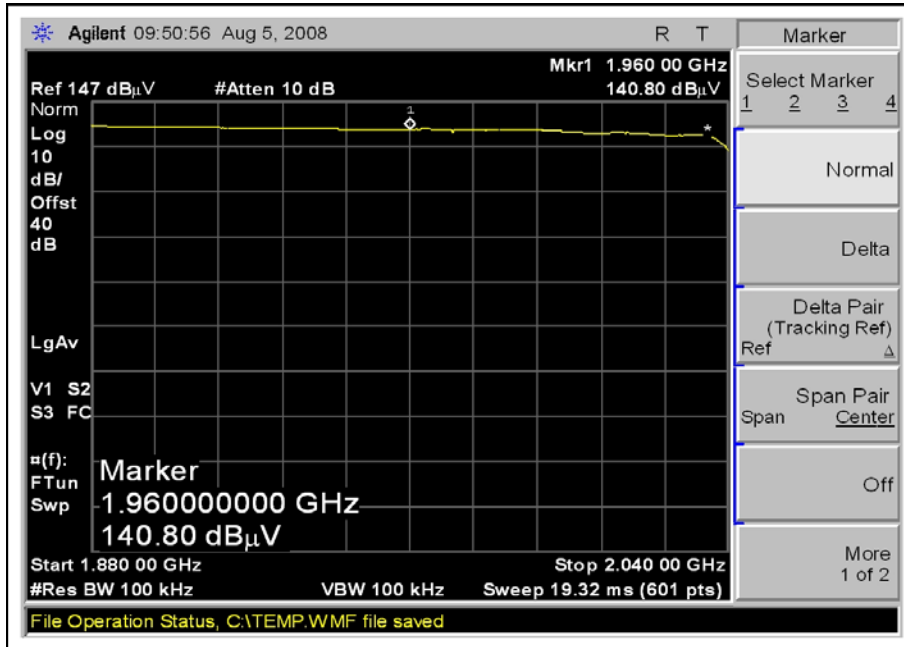
Test Conditions

The equipment under test (EUT) is placed stand alone on the table top. For the input plot, the output of the drive amplifier was fed to the input of the spectrum analyzer through power attenuators. The signal generator providing the input to the drive amplifier was set to produce the rated output of the EUT when the drive amplifier is connected to the EUT. A signal generator was swept from 50MHz below the band to 50MHz above the band edge and a screen capture was made. For the output plot, the EUT's Tx/Rx ANT port was connected to the spectrum analyzer through high power attenuators. The signal generator providing the input to the drive amplifier was left at the same output as when the input plot was made. The signal generator was swept from 50MHz below the band to 50MHz above the band edge and a screen capture was made. Temperature: 22°C, Humidity: 48%, Pressure: 100kPa. Voltage to the EUT was 230Vac 60Hz. Plots were made with the signal generator set to sweep from 1880MHz to 2040MHz using no modulation. Output of the EUT is set to its rated output power of 51.6dBm. The frequency range tested was 1880MHz to 2040MHz. The operating range of the device tested is 1930MHz to 1990MHz. Bandwidth settings: SA RES BW=30kHz and 100kHz, SA VID BW=30kHz and 100kHz.

Test Setup Photos



OUT OF BAND REJECTION - INPUT



OUT OF BAND REJECTION - OUTPUT

