ADDENDUM TO FC02-057

FOR THE

AMPLIFIER MODULE, G3L-1900-31A (AC) & G3L-1900-31 (DC)

FCC PART 24 AND PART 15 SUBPART B SECTIONS 15.107 AND 15.109 COMPLIANCE

DATE OF ISSUE: JULY 8, 2002

PREPARED FOR:

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

P.O. No.: 58080
W.O. No.: 78909

PREPARED BY:

Mary Ellen Clayton
CKC Laboratories, Inc.
5473A Clouds Rest
Mariposa, CA 95338

Date of test: May 17-22, 2002

Report No.: FC02-057A

TABLE OF CONTENTS

ADMINISTRATIVE INFORMATION

DATE OF TEST:	May 17-22, 2002
DATE OF RECEIPT:	May 17, 2002
PURPOSE OF TEST:	To demonstrate the compliance of the Amplifier, G3L-1900-31A (AC) & G3L-1900-31 (DC) with the requirements for FCC Part 24 and Part 15 Subpart B Sections 15.107 and 15.109 devices. The purpose of Addendum A is to revise the EIRP power to show that three channels were tested.
TEST METHOD:	ANSI C63.4 (1992) and FCC Part 24
FREQUENCY RANGE TESTED:	9 kHz – 20 GHz
MANUFACTURER:	Powerwave Technologies, Inc. 1801 E. St. Andrew Place Santa Ana, CA 92705
REPRESENTATIVE:	Farokh Etemadieh
TEST LOCATION:	CKC Laboratories, Inc. 110 Olinda Place Brea, CA 92621

SUMMARY OF RESULTS

As received, the Powerwave Technologies, Inc. Amplifier, G3L-1900-31A was found to be fully compliant with the following standards and specifications:

United States

- FCC Part 24 and Part 15 Subpart B Sections 15.107 and 15.109

ANSI C63.4 (1992) method

CONDITIONS FOR COMPLIANCE

No modifications to the EUT were necessary to comply.

APPROVALS

QUALITY ASSURANCE:

Steve Behm, Director of Engineering Services

Joyce Walker, Quality Assurance Administrative Manager

Septimiu Apahidean, EMC/Lab Manager

TEST PERSONNEL:

Eddie Wong, EMC Engineer

EQUIPMENT UNDER TEST (EUT) DESCRIPTION

The 1900 MHz Power Amplifier tested by CKC Laboratories was representative of a production unit. The WPA unit will be used in WCDMA Base Station (BS). Its main functions are to provide linear amplification for single or multi carrier WCDMA signal and communicate with BS and receive control information from BS.

EQUIPMENT UNDER TEST

Amplifier Module
Manuf: Powerwave Technologies, Inc.
Model: G3L-1900-31A
Serial: PW021700165 & PW02170155
FCC ID: E675J50060 (pending)

PERIPHERAL DEVICES

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

Combiner
Manuf: Anaren
Model: 44000
Serial: 416
FCC ID: DoC

Pre Amp
Manuf: Mini Circuits
Model: ZHL-1724HLN-SMA
Serial: D0202801-06
FCC ID: DoC

DC Power Supply
Manuf: Xanrex
Model: XTS30-2X
Serial: NA
FCC ID: NA

Signal Generator
Manuf: Agilent
Model: E4433B
Serial: US40051593 & US39341067
FCC ID: DoC

Signal Generator
Manuf: Agilent
Model: E4432B
Serial: US40053285
FCC ID: DoC

DC Power Supply
Manuf: Agilent
Model: 6674A
Serial: US36371542
FCC ID: NA

2.1033(c)(3) USER'S MANUAL

The necessary information is contained in a separate document.

2.1033 (c)(4) TYPE OF EMISSIONS

The necessary information is contained in a separate document.

2.1033(c)(5) FREQUENCY RANGE
The frequency range is 1930-1990 MHz.

2.1033(c)(6) OPERATING POWER
The EUT operates at 31 W output nominal.

2.1033(c)(7) MAXIMUM POWER RATING
Per the applicable standard, Base Stations are limited to 1640 Watts.

2.1033(c)(8) DC VOLTAGES

The necessary information is contained in a separate document.

2.1033(c)(9) TUNE-UP PROCEDURE

The necessary information is contained in a separate document.

2.1033(c)(10) SCHEMATICS AND CIRCUITRY DESCRIPTION

The necessary information is contained in a separate document.

2.1033(c)(11) LABEL AND PLACEMENT

The necessary information is contained in a separate document.

2.1033(c)(12) SUBMITTAL PHOTOS

The necessary information is contained in a separate document.

2.1033(c)(13) MODULATION INFORMATION

The necessary information is contained in a separate document.

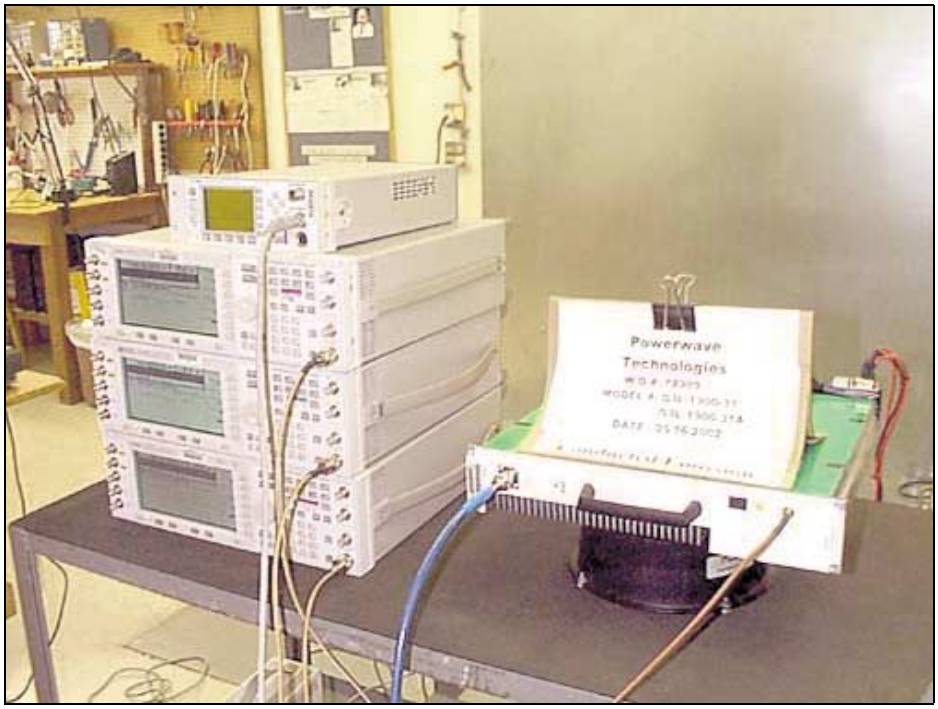
2.1033(c)(14)/2.1046/24.232(a) - RF POWER OUTPUT

(a) Base Stations are limited to 1640 watts peak equivalent isotropic power.
Rack mount EUT is placed on the test bench. 3 WCDMA signals from 3 different signal generators are combined and fed into the TXin of the EUT. TXout of the EUT is connected to a power meter via a series of an attenuator and a directional coupler. The amplitude of the input signal is adjusted (Approximately 10.3 watts each) such that the output power at the antenna terminal measured with a power meter is 31 watts. The EUT is an amplifier. Antennas will not be a part of the EUT. Since the antenna gain is unknown, only the conducted power at the antenna terminal was measured. The EUT satisfies the above requirement by demonstrating the measured conducted power is below the *1640* Watts EIRP peak power limit. Transmit power at antenna terminal of G3L-1900-31/ G3L-1900-31A was measured with a power meter.

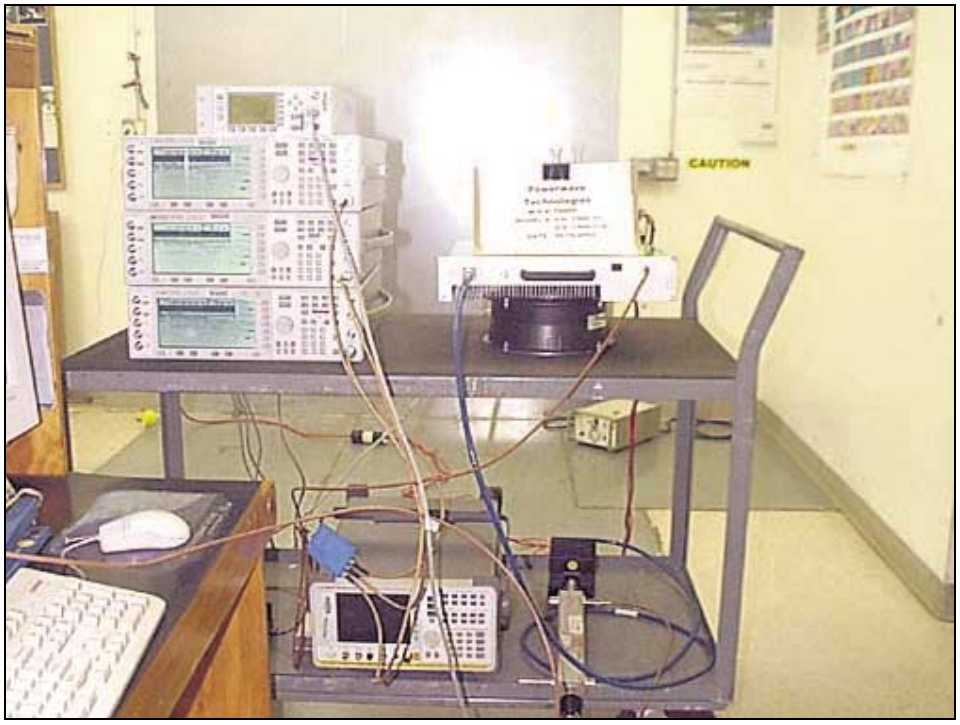
Measured power = 31 watts for both sets of measurements.
3 channels measured simultaneously with two sets of measurements:
Set 1 1935.76 MHz 1943.40 MHz 1954.24 MHz
Set 2 1965.76 MHz 1973.40 MHz 1984.24 MHz

Test Equipment:

Equipment	Asset #	Manufacturer	Model #	Serial #	Cal Date	Cal Due
Power Meter	NA	Agilent	E4419B	GB40202073	051702	051703
Power Sensor	NA	HP	8481A	US37296672	051702	051703
Directional Coupler	NA	HP	778D	06724	NA	NA



Direct Connect Antenna Test Setup



Direct Connect Antenna Test Setup

Direct Connect Antenna Test Setup

2.1033(c)(14)/2.1047(a) - MODULATION CHARACTERISTICS - AUDIO FREQUENCY RESPONSE

Not applicable to this unit.

2.1033(c)(14)/2.1047(b) MODULATION CHARACTERISTICS – Modulation Limiting Response

Not applicable to this unit.

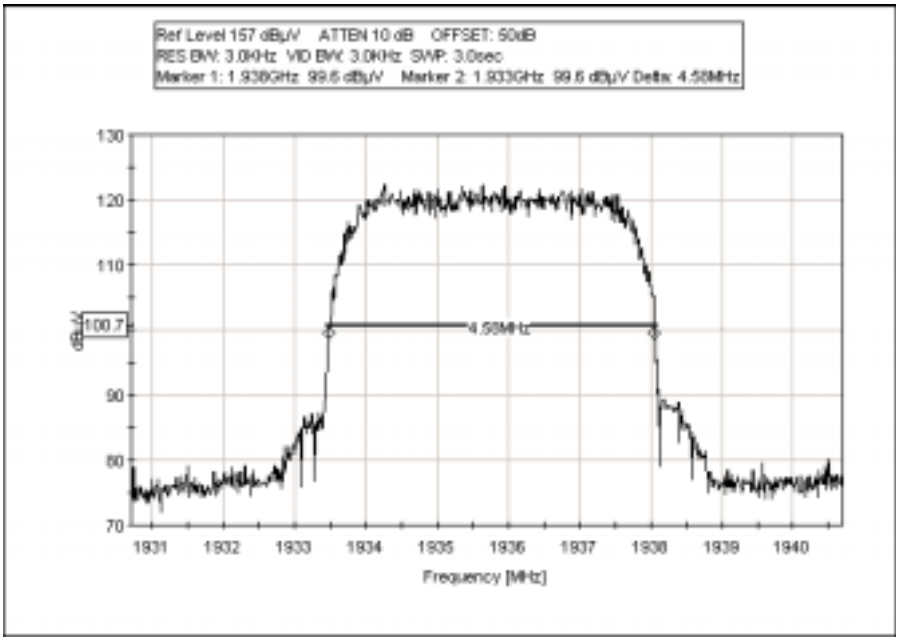
2.1033(c)(14)/2.1049(i)- OCCUPIED BANDWIDTH

Test Conditions: Antenna port connected to the spectrum analyzer. Since the customer selected 6 frequencies to cover all the blocks, a low, mid and high frequency within block A- F were selected for OBW plots.

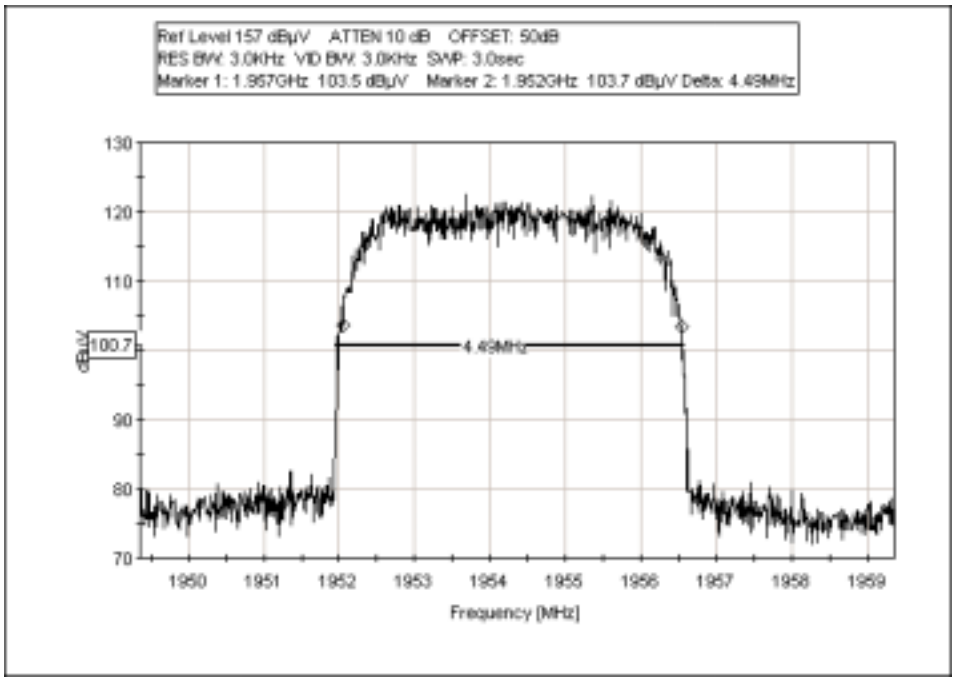
Low = 1935.76 MHz
Mid = 1954.24 MHz
High = 1984.24 MHz

OBW is measured at 20 dB points, RBW=VBW=3 kHz.

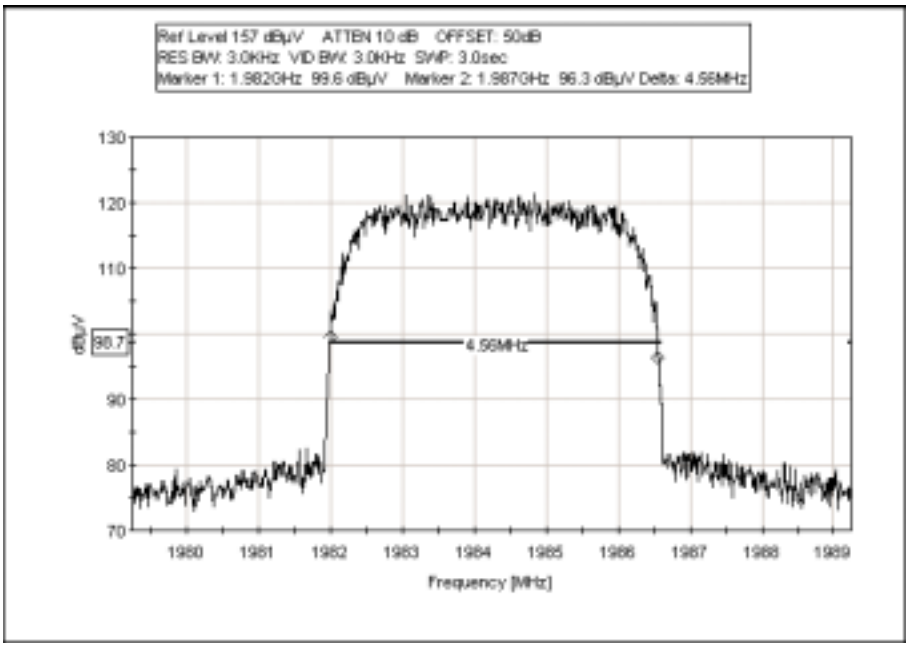
Occupied Bandwidth - 1935 MHz



Occupied Bandwidth - 1954 MHz



Occupied Bandwidth - 1984 MHz

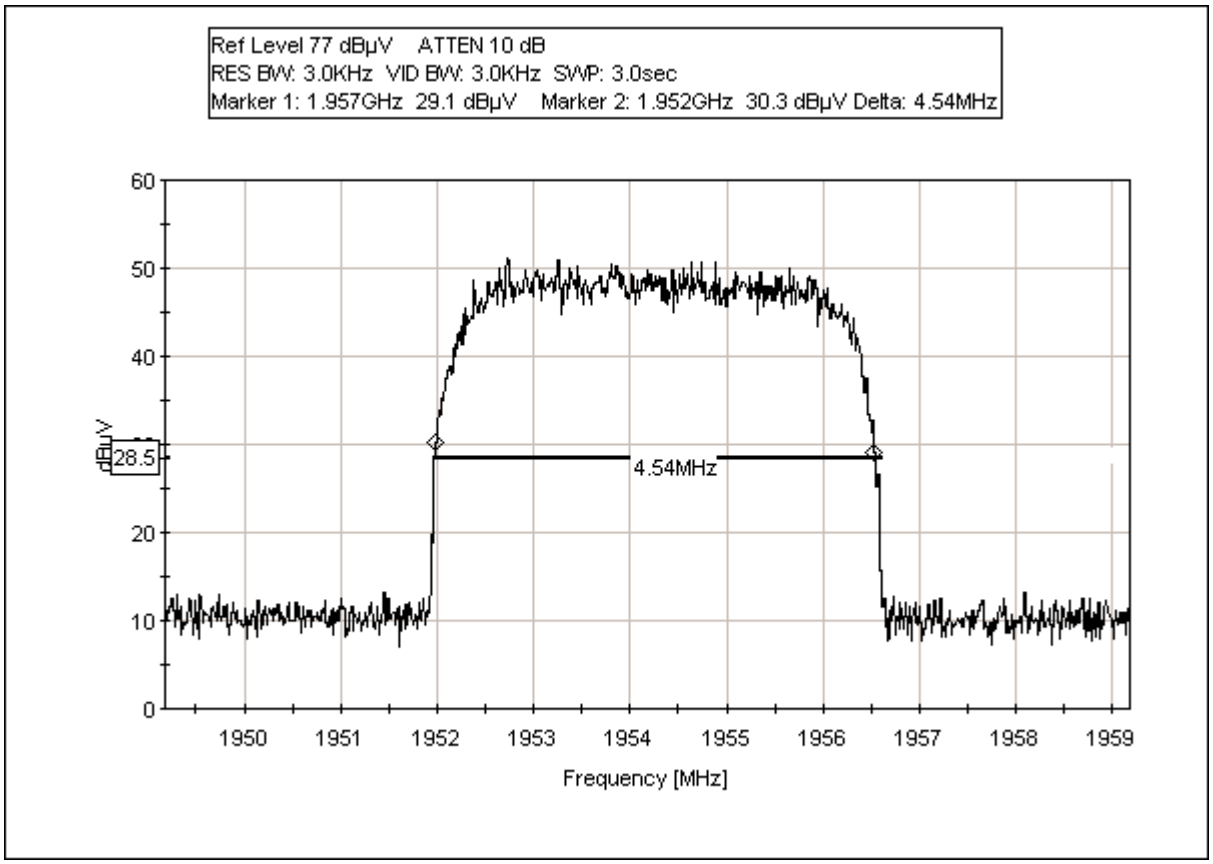


Test Equipment:

Spectrum Analyzer	01865	HP	8566B	2532A02509	092801	092802
QP Adapter	01437	HP	85650A	3303A01884	092801	092802

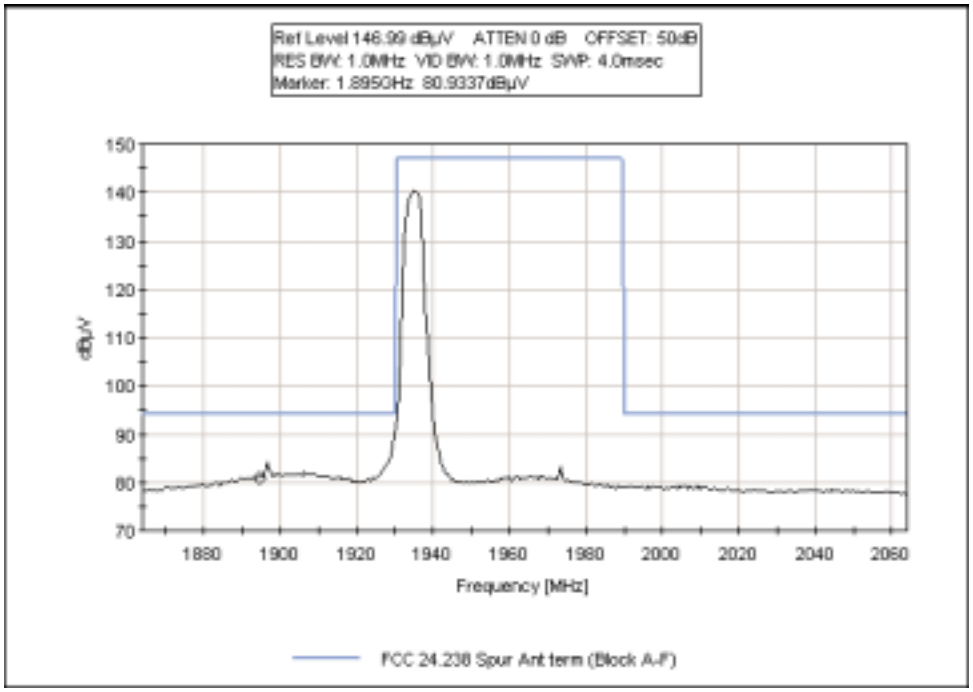
Input vs. Output Plot - 1945 MHz

Test Conditions: Antenna port connected to the spectrum analyzer.

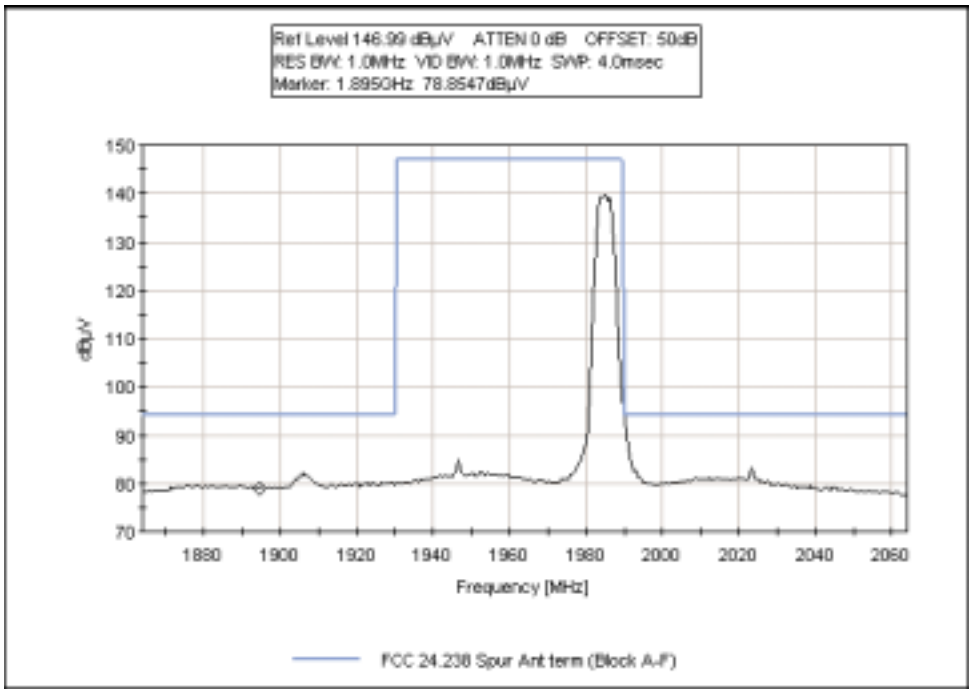


Intermodulation - 1 Tone Block A-F - Low

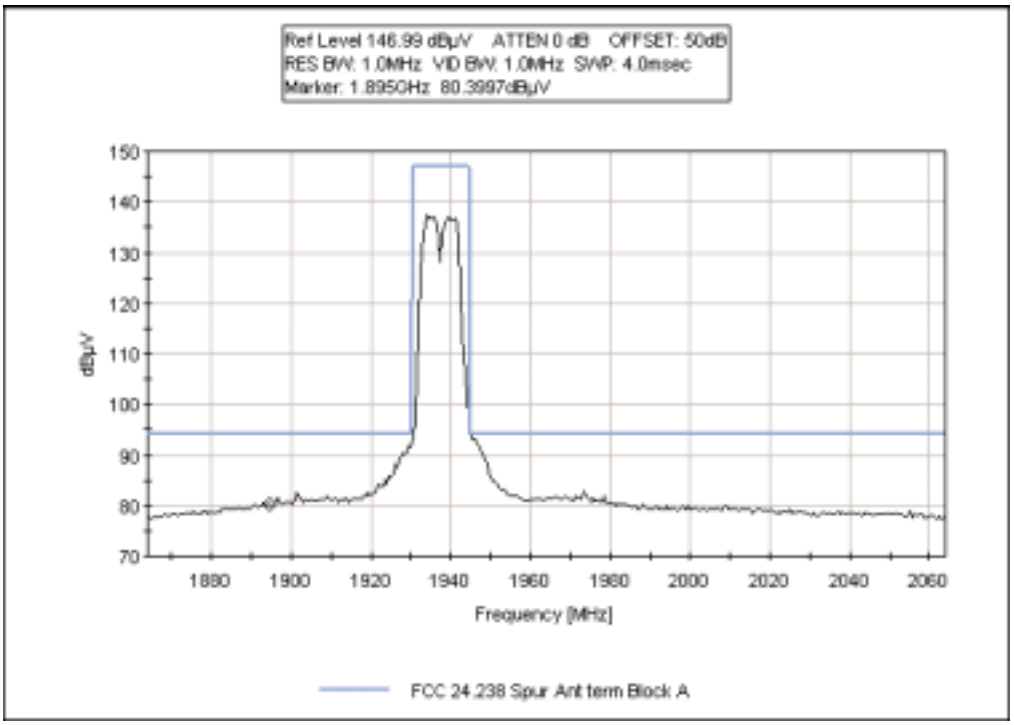
Test Conditions: Antenna port connected to the spectrum analyzer.



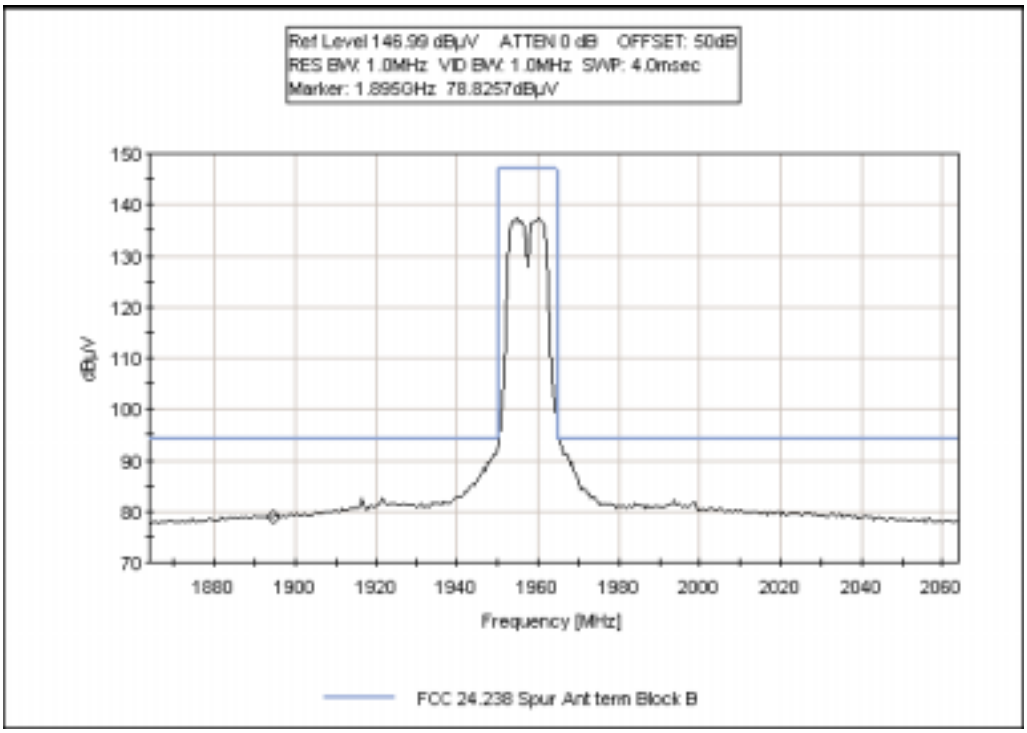
Intermodulation - 1 Tone Block A-F - High



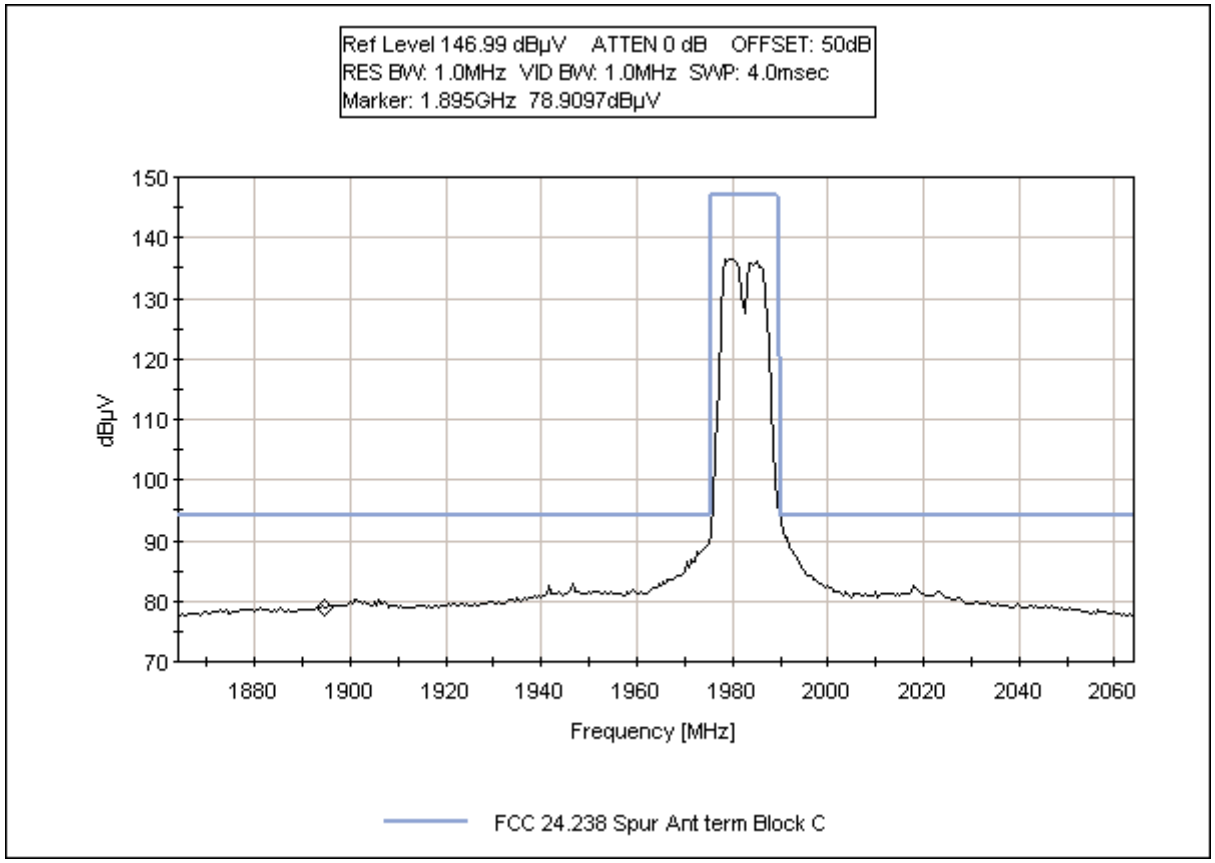
Intermodulation - 2 Tone Block A



Intermodulation - 2 Tone Block B



Intermodulation - 2 Tone Block C

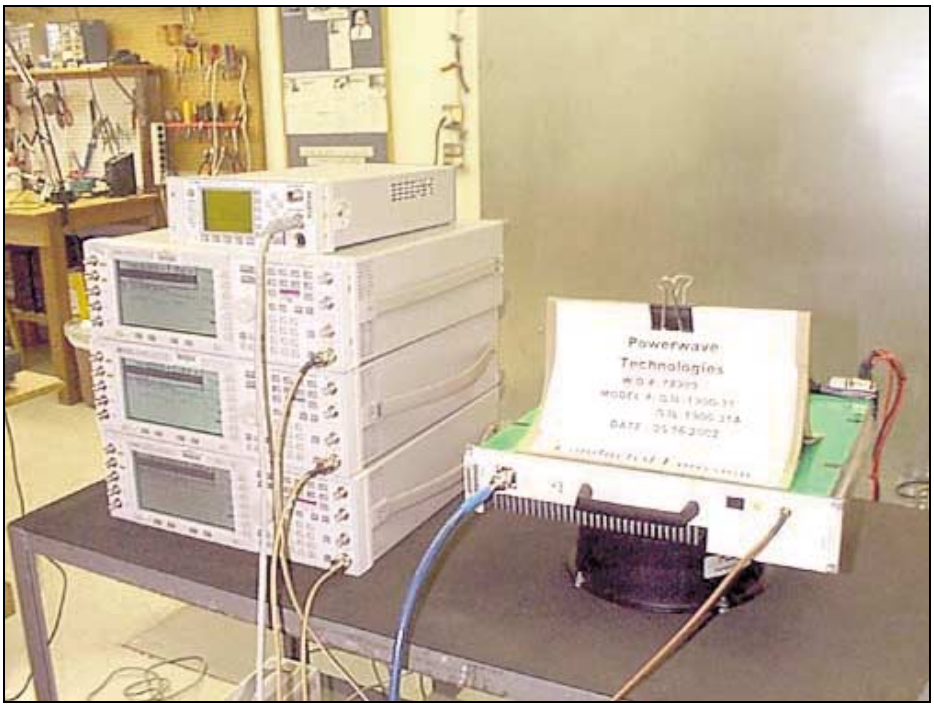


Test Equipment:

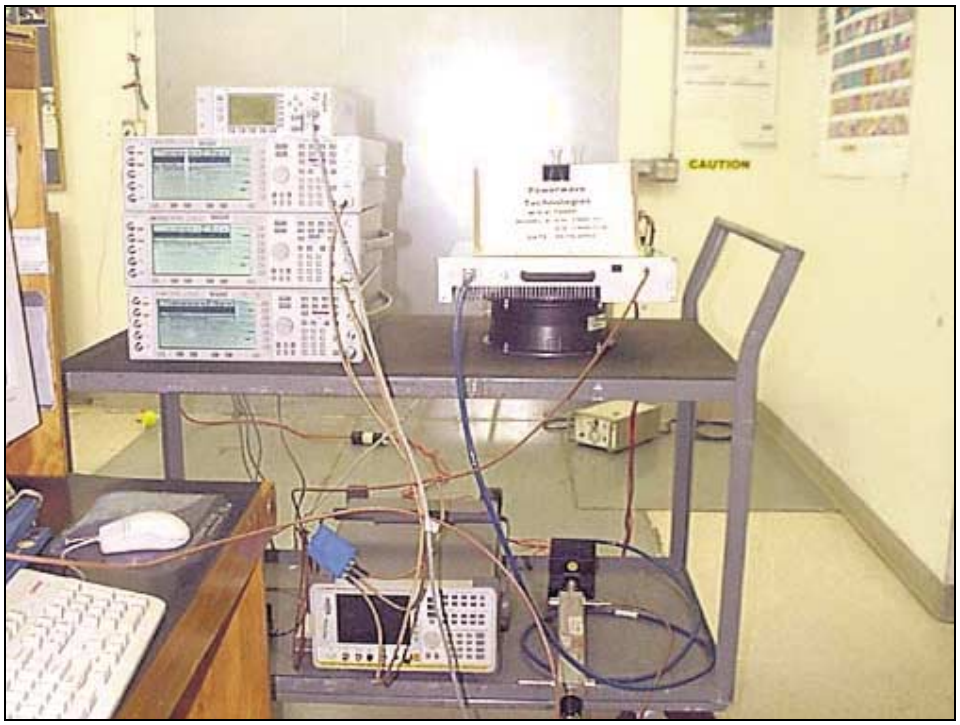
Spectrum Analyzer	01865	HP	8566B	2532A02509	092801	092802
QP Adapter	01437	HP	85650A	3303A01884	092801	092802
Spectrum Analyzer	02467	Agilent	E7405A	US40240225	032902	032903

The following photographs represent test setup for all of the previous plots.

Direct Connect Antenna Test Setup



Direct Connect Antenna Test Setup



Direct Connect Antenna Test Setup

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

"On any frequency outside a licensee's frequency block the power of any emission shall be attenuated below the transmitter power (p) by at least 43 + 10 Log (P) dB "

Limit line for Spurious Emission

Required Attenuation = 43+10 Log P

Limit line (dBuV) = V_{dBuv} - Attenuation

$V_{dBuV} = 20 \text{ Log } \frac{V}{1 \text{ x } 10^{-6}}$

$= 20 \left(\text{Log } V - \text{Log } 1 \text{ x } 10^{-6} \right)$

$= 20 \text{ Log } V - 20 \text{ Log} 1 \text{ x } 10^{-6}$

$= 20 \text{ Log } V - 20 (-6)$

$= 20 \text{ Log } V + 120$

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

$= 43 + 10 \text{ Log } \frac{V^2}{R}$

$= 43 + 10 \left(\text{Log } V^2 - \text{Log } R \right)$

$= 43 + 10 \left(2 \text{ Log } V - \text{Log } R \right)$

$= 43 + 20 \text{ Log } V - 10 \text{ Log } R$

Limit line = V_{dBuv} - Attenuation

= 20 Log V + 120 – (43 + 20 Log V – 10Log R)

= 20 Log V + 120 – 43 – 20 Log V + 10Log R

= 20 Log V + 120 – 43 – 20 Log V + 10Log R

= 120 – 43 + 10 Log 50 Note : R = 50 Ω

= 120 –43 + 16.897

= 94 dBuV at any power level

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

Customer: **Powerwave Technologies**
Specification: **FCC 24.238 Spur Ant term**
Work Order #: **78909** Date: 05/19/2002
Test Type: **Conducted Emissions** Time: 20:41:57
Equipment: **Amplifier** Sequence#: 2
Manufacturer: Powerwave Technologies Tested By: Eddie Wong
Model: G3L-1900-31A 230V 60Hz
S/N: PW021700165

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

Function	Manufacturer	Model #	S/N
Amplifier*	Powerwave Technologies	G3L-1900-31A	PW021700165

Support Devices:

Function	Manufacturer	Model #	S/N
Combiner	Anaren	44000	416
Pre Amp	Mini Circuits	ZHL-1724HLN-SMA	D0202801-06
DC power Supply	Xanrex	XTS30-2X	NA
Signal Generator	Agilent	E4433B	US40051593
Signal Generator	Agilent	E4433B	US39341067
Signal Generator	Agilent	E4432B	US40053285

Test Conditions / Notes:

Rack mount EUT is placed on the test bench. 3 WCDMA signal from 3 different signal generator are combined and fed into the TX in of the EUT. TX out of the EUT is connected to a power meter via a series of attenuator and a directional coupler. The amplitude of the input signal is adjusted (Approximately 10.3 watts each) such that the measured output power of the EUT is 31 watts. Range of measurement: 9 kHz - 20 GHz. Measurement BW: RBW=VBW=1 MHz. Channel High: 1965.76 MHz, 1973.40 MHz, 1984.24 MHz. 230Vac, 60 Hz, 20°C, 54% relative humidity.

Transducer Legend:

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

#	Freq MHz	Rdng dBµV	dB	dB	dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	164.500M	90.0					+0.0	90.0	94.0	-4.0	Anten
2	158.700M	88.9					+0.0	88.9	94.0	-5.1	Anten
3	880.600M	88.1					+0.0	88.1	94.0	-5.9	Anten
4	9.500M	88.1					+0.0	88.1	94.0	-5.9	Anten
5	18.100M	87.7					+0.0	87.7	94.0	-6.3	Anten
6	154.900M	87.1					+0.0	87.1	94.0	-6.9	Anten
7	3958.700M	82.6					+0.0	82.6	94.0	-11.4	Anten

8	3968.900M	82.3	+0.0	82.3	94.0	-11.7	Anten
9	3951.000M	81.6	+0.0	81.6	94.0	-12.4	Anten
10	1146.900M Ave	80.3	+0.0	80.3	94.0	-13.7	Anten
^	1146.900M	105.5	+0.0	105.5	94.0	+11.5	Anten
12	1160.100M Ave	77.2	+0.0	77.2	94.0	-16.8	Anten
^	1160.100M	101.4	+0.0	101.4	94.0	+7.4	Anten
14	169.000M Ave	77.0	+0.0	77.0	94.0	-17.0	Anten
^	169.000M	91.4	+0.0	91.4	94.0	-2.6	Anten
16	174.000M Ave	74.4	+0.0	74.4	94.0	-19.6	Anten
^	174.000M	93.6	+0.0	93.6	94.0	-0.4	Anten
18	1165.800M Ave	73.8	+0.0	73.8	94.0	-20.2	Anten
^	1165.800M	105.2	+0.0	105.2	94.0	+11.2	Anten

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

Customer: **Powerwave Technologies**
Specification: **FCC 24.238 Spur Ant term**
Work Order #: **78909** Date: 05/20/2002
Test Type: **Conducted Emissions** Time: 23:29:08
Equipment: **Amplifier** Sequence#: 3
Manufacturer: Powerwave Technologies Tested By: Eddie Wong
Model: G3L-1900-31A 48Vdc
S/N: PW021700165

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

Function	Manufacturer	Model #	S/N
Amplifier*	Powerwave Technologies	G3L-1900-31A	PW021700165

Support Devices:

Function	Manufacturer	Model #	S/N
Combiner	Anaren	44000	416
Pre Amp	Mini Circuits	ZHL-1724HLN-SMA	D0202801-06
DC power Supply	Xanrex	XTS30-2X	NA
Signal Generator	Agilent	E4433B	US40051593
Signal Generator	Agilent	E4433B	US39341067
Signal Generator	Agilent	E4432B	US40053285

Test Conditions / Notes:

Rack mount EUT is placed on the test bench. 3 WCDMA signal from 3 different signal generator are combined and fed into the TX in of the EUT. TX out of the EUT is connected to a power meter via a series of attenuator and a directional coupler. The amplitude of the input signal is adjusted (Approximately 10.3 watts each) such that the measured output power of the EUT is 31 watts. Range of measurement: 9 kHz - 20 GHz. Measurement BW : RBW=VBW=1 MHz. Channel High: 1965.76 MHz, 1973.40 MHz, 1984.24 MHz. 48Vdc (230Vac), 60 Hz, 20°C, 54% relative humidity.

Transducer Legend:

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

#	Freq MHz	Rdng dBµV	dB	dB	dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	164.038M	89.1					+0.0	89.1	94.0	-4.9	Anten
2	873.000M	88.6					+0.0	88.6	94.0	-5.4	Anten
3	3957.000M	87.4					+0.0	87.4	94.0	-6.6	Anten
4	2150.500M	84.2					+0.0	84.2	94.0	-9.8	Anten
5	29.980M	76.5					+0.0	76.5	94.0	-17.5	Anten
6	1145.038M Ave	75.5					+0.0	75.5	94.0	-18.5	Anten
^	1145.038M	105.3					+0.0	105.3	94.0	+11.3	Anten

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

Customer: **Powerwave Technologies**
Specification: **FCC 24.238 Spur Ant term**
Work Order #: **78909** Date: 05/16/2002
Test Type: **Conducted Emissions** Time: 23:47:28
Equipment: **Amplifier** Sequence#: 1
Manufacturer: Powerwave Technologies Tested By: Eddie Wong
Model: G3L-1900-31A 230V 60Hz
S/N: PW021700165

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

Function	Manufacturer	Model #	S/N
Amplifier*	Powerwave Technologies	G3L-1900-31A	PW021700165

Support Devices:

Function	Manufacturer	Model #	S/N
Combiner	Anaren	44000	416
Pre Amp	Mini Circuits	ZHL-1724HLN-SMA	D0202801-06
DC power Supply	Xanrex	XTS30-2X	NA
Signal Generator	Agilent	E4433B	US40051593
Signal Generator	Agilent	E4433B	US39341067
Signal Generator	Agilent	E4432B	US40053285

Test Conditions / Notes:

Rack mount EUT is placed on the test bench. 3 WCDMA signal from 3 different signal generator are combined and fed into the TX in of the EUT. TX out of the EUT is connected to a power meter via a series of attenuator and a directional coupler. The amplitude of the input signal is adjusted (Approximately 10.3 watts each) such that the measured output power of the EUT is 31 watts. Range of measurement: 9 kHz- 20 GHz. Measurement BW: RBW=VBW=1 MHz. Channel Low: 1935.76 MHz, 1943.40 MHz, 1954.24 MHz. 230Vac, 60 Hz, 20°C, 54% relative humidity.

Transducer Legend:

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

#	Freq MHz	Rdng dBµV	dB	dB	dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	128.980M	90.8					+0.0	90.8	94.0	-3.2	Anten
2	10.064M	90.0					+0.0	90.0	94.0	-4.0	Anten
3	18.464M	86.4					+0.0	86.4	94.0	-7.6	Anten
4	1916.348M Ave	83.3					+0.0	83.3	94.0	-10.7	Anten
^	1916.348M	100.2					+0.0	100.2	94.0	+6.2	Anten
6	1106.034M Ave	82.8					+0.0	82.8	94.0	-11.2	Anten
^	1106.034M	110.2					+0.0	110.2	94.0	+16.2	Anten

8 Ave	1111.434M	78.9	+0.0	78.9	94.0	-15.1	Anten
^	1111.434M	111.0	+0.0	111.0	94.0	+17.0	Anten
10 Ave	134.200M	78.3	+0.0	78.3	94.0	-15.7	Anten
^	134.200M	91.6	+0.0	91.6	94.0	-2.4	Anten
12 Ave	1106.348M	78.0	+0.0	78.0	94.0	-16.0	Anten
^	1106.348M	94.1	+0.0	94.1	94.0	+0.1	Anten
14 Ave	138.120M	77.4	+0.0	77.4	94.0	-16.6	Anten
^	138.180M	90.9	+0.0	90.9	94.0	-3.1	Anten
16	828.850M	77.2	+0.0	77.2	94.0	-16.8	Anten
17 Ave	143.640M	76.6	+0.0	76.6	94.0	-17.4	Anten
^	143.620M	94.5	+0.0	94.5	94.0	+0.5	Anten

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

Customer:	**Powerwave Technologies**		
Specification:	**FCC 24.238 Spur Ant term**		
Work Order #:	**78909**	Date:	05/20/2002
Test Type:	**Conducted Emissions**	Time:	23:16:58
Equipment:	**Amplifier**	Sequence#:	2
Manufacturer:	Powerwave Technologies	Tested By:	Eddie Wong
Model:	G3L-1900-31A		48Vdc
S/N:	PW021700165		

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

Function	Manufacturer	Model #	S/N
Amplifier*	Powerwave Technologies	G3L-1900-31A	PW021700165

Support Devices:

Function	Manufacturer	Model #	S/N
Combiner	Anaren	44000	416
Pre Amp	Mini Circuits	ZHL-1724HLN-SMA	D0202801-06
DC power Supply	Xanrex	XTS30-2X	NA
Signal Generator	Agilent	E4433B	US40051593
Signal Generator	Agilent	E4433B	US39341067
Signal Generator	Agilent	E4432B	US40053285

Test Conditions / Notes:

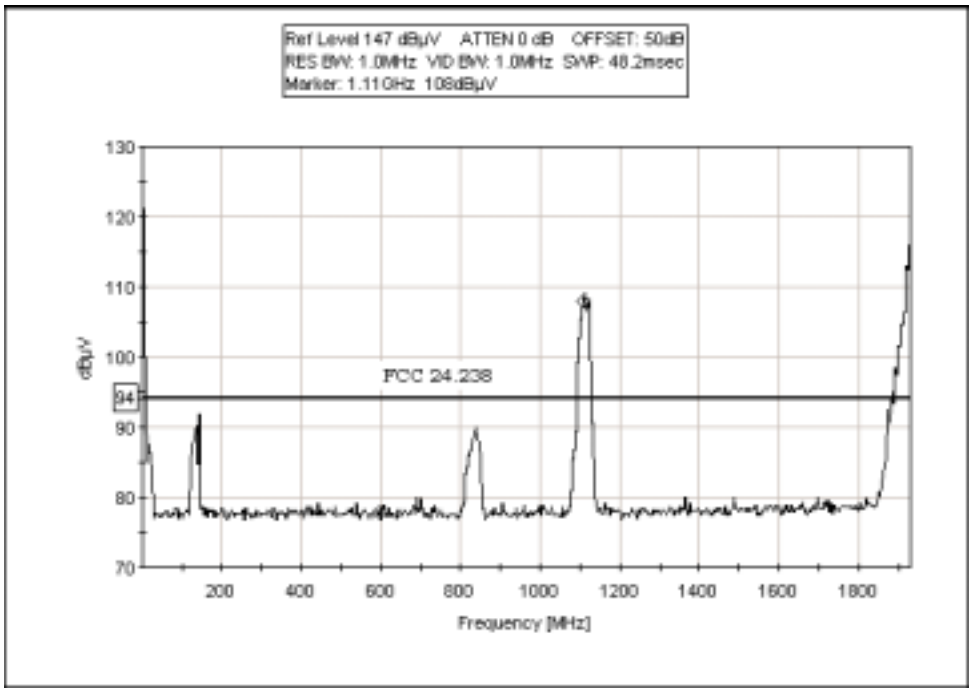
Rack mount EUT is placed on the test bench. 3 WCDMA signal from 3 different signal generator are combined and fed into the TX in of the EUT. TX out of the EUT is connected to a power meter via a series of attenuator and a directional coupler. The amplitude of the input signal is adjusted (Approximately 10.3 watts each) such that the measured output power of the EUT is 31 watts. Range of measurement: 9 kHz - 20 GHz. Measurement BW: RBW=VBW=1 MHz. Channel Low: 1935.76 MHz, 1943.40 MHz, 1954.24 MHz. 48Vdc (230Vac), 60 Hz, 20°C, 54% relative humidity.

Transducer Legend:

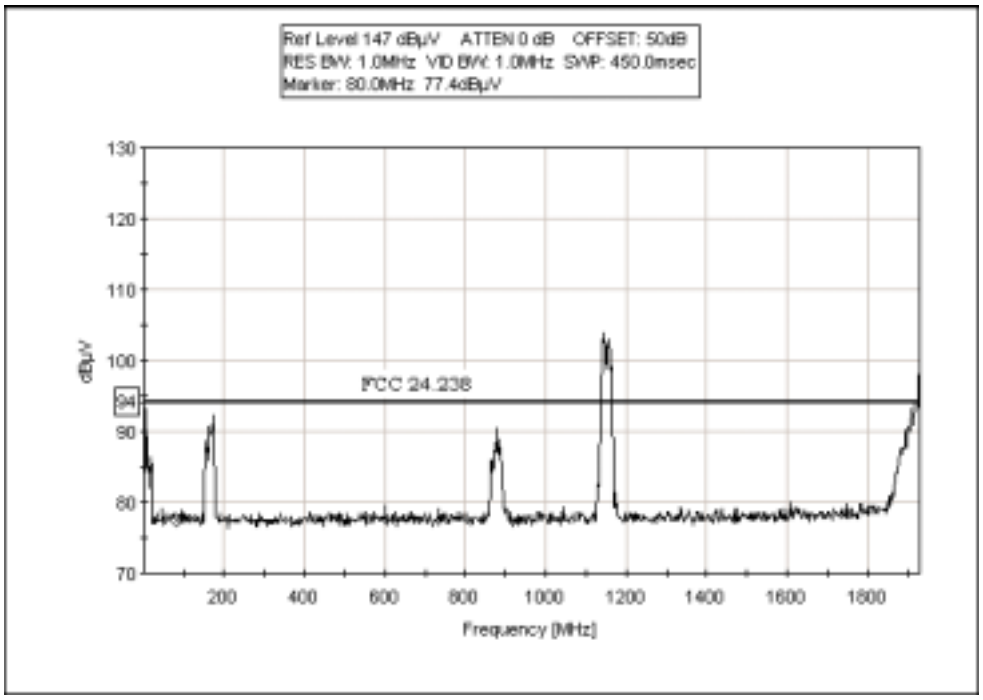
Measurement Data: Reading listed by margin. Test Lead: Antenna Port

#	Freq MHz	Rdng dBµV	dB	dB	dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	826.310M	89.0					+0.0	89.0	94.0	-5.0	Anten
2	3896.700M	88.0					+0.0	88.0	94.0	-6.0	Anten
3	2150.700M	82.4					+0.0	82.4	94.0	-11.6	Anten
4	1103.600M Ave	78.2					+0.0	78.2	94.0	-15.8	Anten
^	1103.600M	106.5					+0.0	106.5	94.0	+12.5	Anten

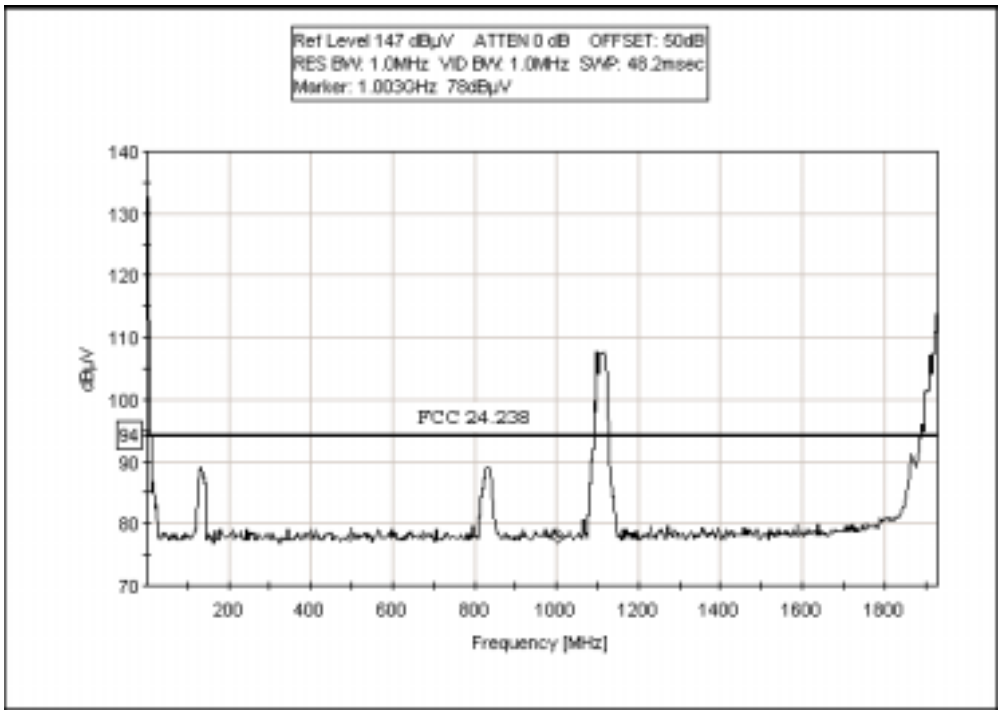
Antenna Terminal - 9kHz - 1930MHz - Low



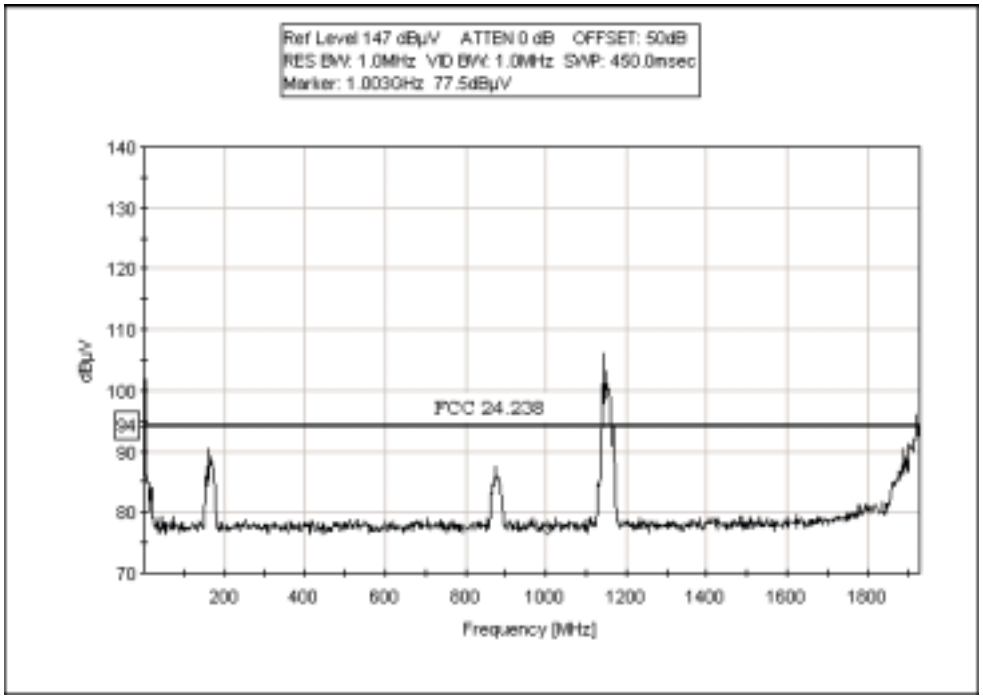
Antenna Terminal - 9kHz - 1930MHz - High



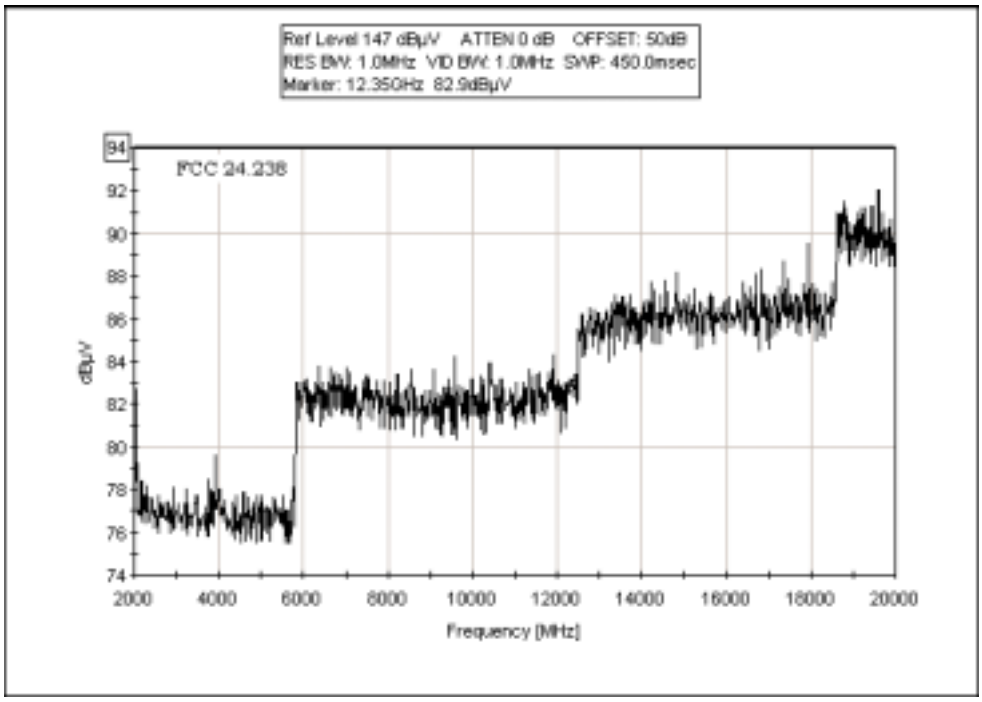
Antenna Terminal - 9kHz - 1930MHz - Low - DC



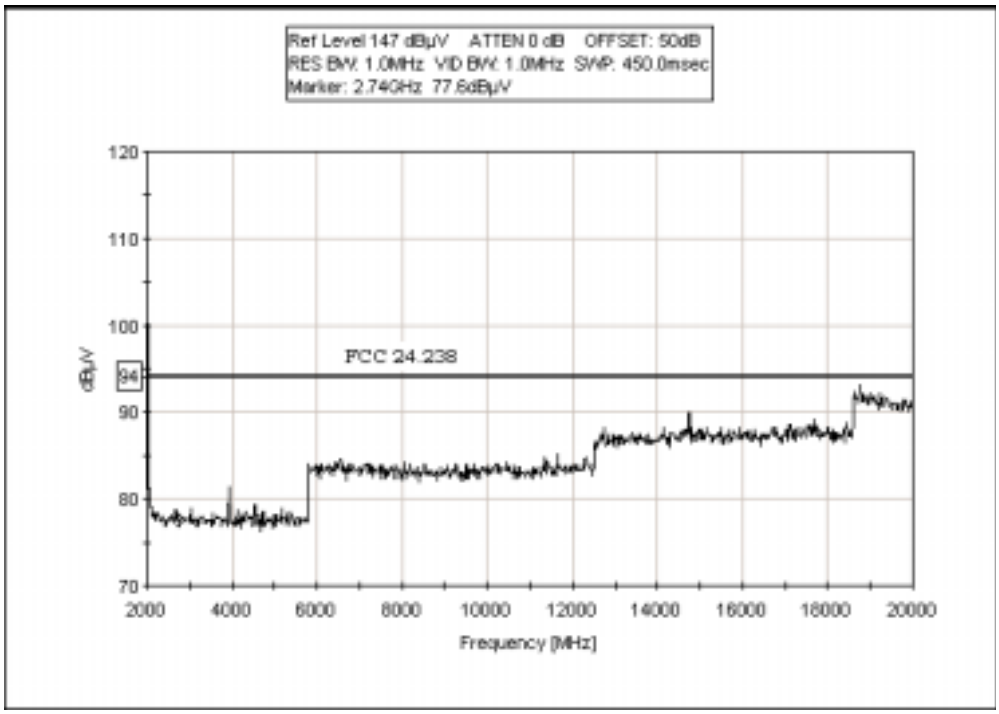
Antenna Terminal - 9kHz - 1930MHz - High - DC



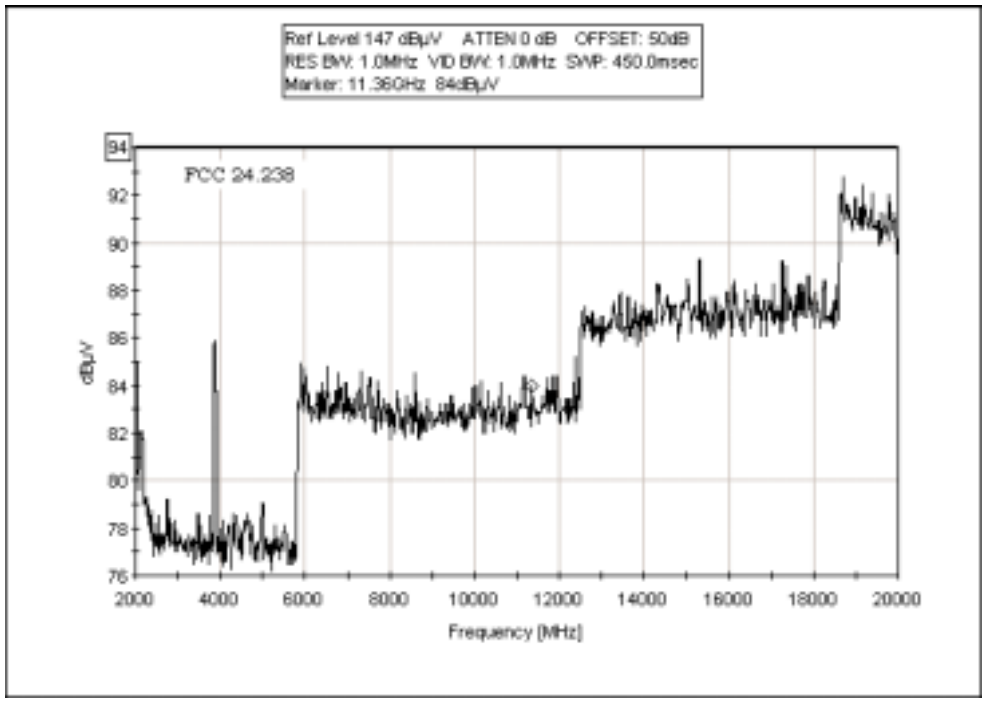
Antenna Terminal - 1990MHz - 20 GHz - Low



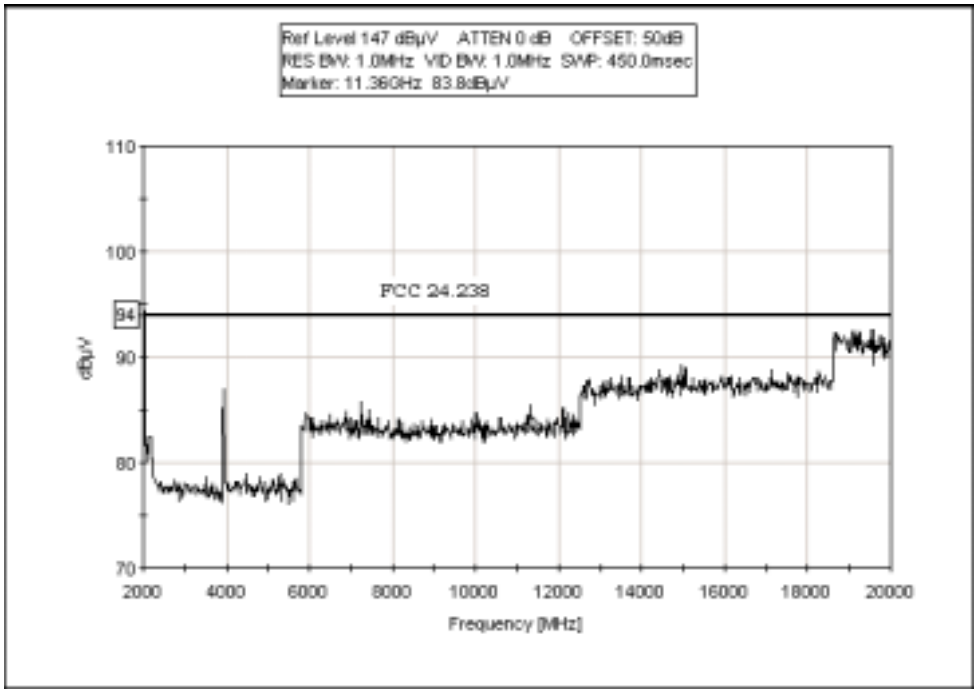
Antenna Terminal - 1990MHz - 20 GHz - High



Antenna Terminal - 1990MHz - 20 GHz - Low - DC



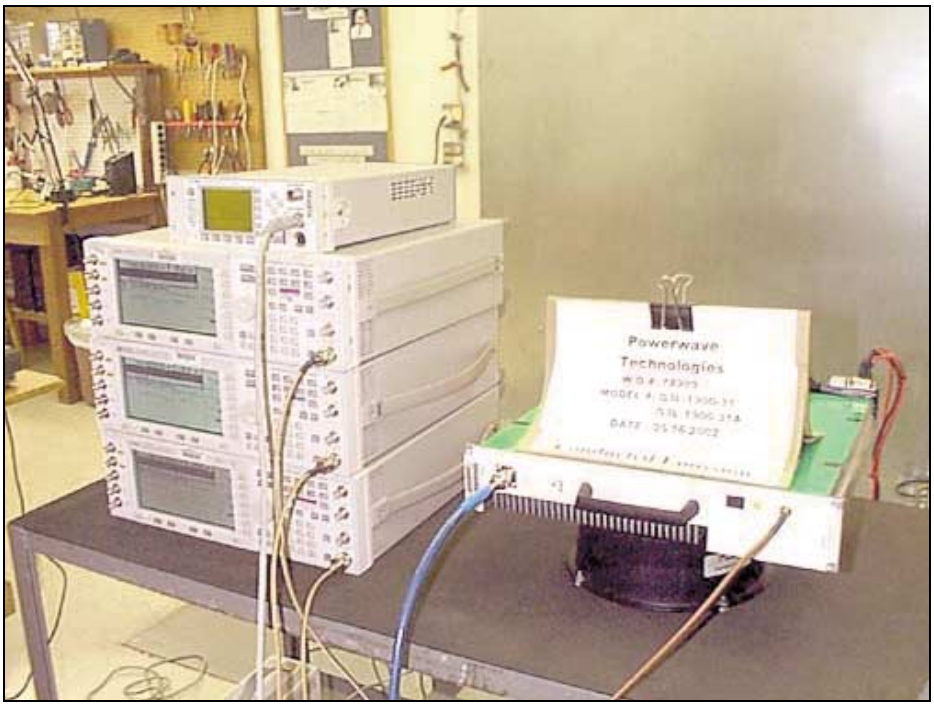
Antenna Terminal - 1990MHz - 20 GHz - High - DC



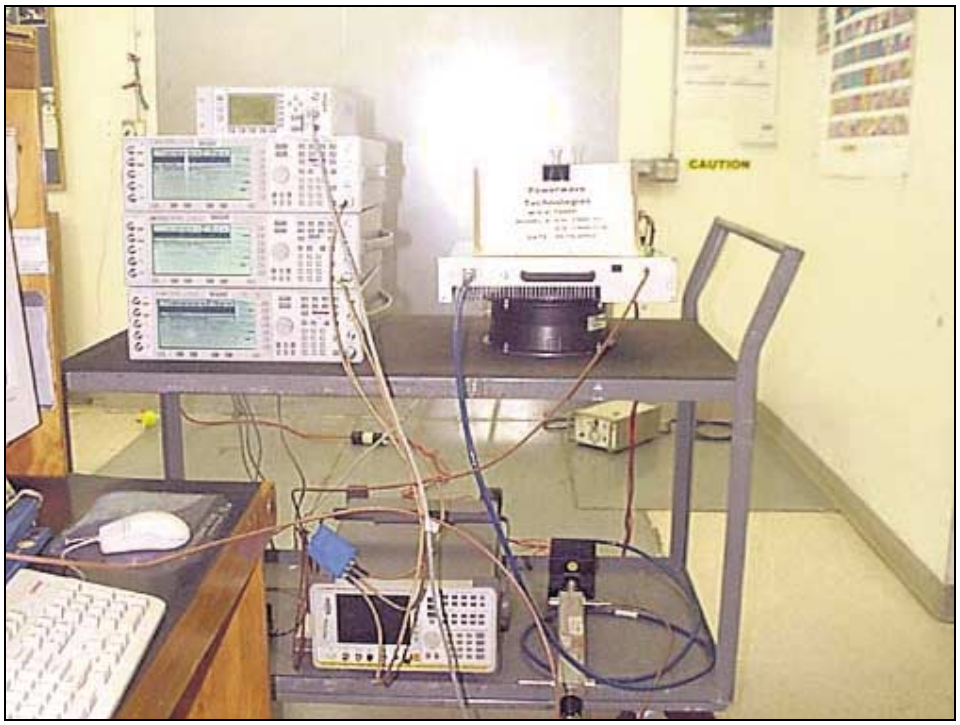
Test Equipment:

Spectrum Analyzer	01865	HP	8566B	2532A02509	092801	092802
QP Adapter	01437	HP	85650A	3303A01884	092801	092802

Direct Connect Antenna Test Setup



Direct Connect Antenna Test Setup



Direct Connect Antenna Test Setup

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

Operating Frequency: 1935.76 MHz, 1954.24 MHz & 1984.24 MHz
Channel: Low, middle, high
Highest Measured Output Power: 44.91 ERP(dBm)= 31 ERP(Watts)
Distance: 3 meters
Limit: 43+10Log(P) 57.91 dBc

Freq. (MHz)	Reference Level (dBm)	Antenna Polarity (H/V)	dBc
1,135.80	-44.4	Vert	89.31
2,179.30	-45.90	Vert	90.81
1,111.60	-46.10	Horiz	91.01
38.20	-47.60	Vert	92.51
3,968.70	-51.80	Horiz	96.71
5,865.00	-52.10	Vert	97.01
4,324.40	-54.50	Vert	99.41
2,343.60	-54.50	Horiz	99.41
2,333.70	-55.20	Horiz	100.11
3,328.20	-57.50	Vert	102.41
2,322.60	-57.80	Vert	102.71
848.80	-59.60	Vert	104.51
1,539.20	-59.60	Horiz	104.51
24.94	-60.30		105.21
1,413.20	-60.60	Horiz	105.51
543.80	-65.80	Horiz	110.71

Note: Radiated Spurious Emissions Measured by Substitution Method According to ANSI/TIA/EIA-603-A-2001, August 15, 2001.

Operating Frequency: 1935.76 MHz, 1954.24 MHz & 1984.24 MHz
Channel: Low, middle, high
Highest Measured Output Power: 44.91 ERP(dBm)= 31 ERP(Watts)
Distance: 3 meters
Limit: 43+10Log(P) 57.91 dBc

Freq. (MHz)	Reference Level (dBm)	Antenna Polarity (H/V)	dBc
1,135.90	-45.2	Vert	90.11
2,034.80	-46.60	Horiz	91.51
5,874.90	-46.70	Horiz	91.61
1,905.70	-47.20	Horiz	92.11
5,903.67	-49.50	Vert	94.41
2,179.30	-50.80	Horiz	95.71
2,002.80	-50.80	Horiz	95.71
2,061.10	-50.90	Horiz	95.81
6,858.40	-51.50	Horiz	96.41
6,850.87	-51.50	Vert	96.41
350.50	-54.10	Horiz	99.01
2,334.20	-54.70	Horiz	99.61
413.30	-55.30	Horiz	100.21
3,170.80	-55.70	Horiz	100.61
2,709.00	-55.80	Horiz	100.71
3,366.20	-55.90	Horiz	100.81
2,344.20	-56.50	Horiz	101.41
411.50	-57.10	Vert	102.01
530.50	-57.80	Vert	102.71
2,322.60	-57.80	Horiz	102.71
243.00	-59.30	Vert	104.21
112.40	-60.50	Horiz	105.41
19.32	-60.60	Horiz	105.51
2,344.65	-64.10	Vert	109.01

Note: Radiated Spurious Emissions Measured by Substitution Method According to ANSI/TIA/EIA-603-A-2001, August 15, 2001.

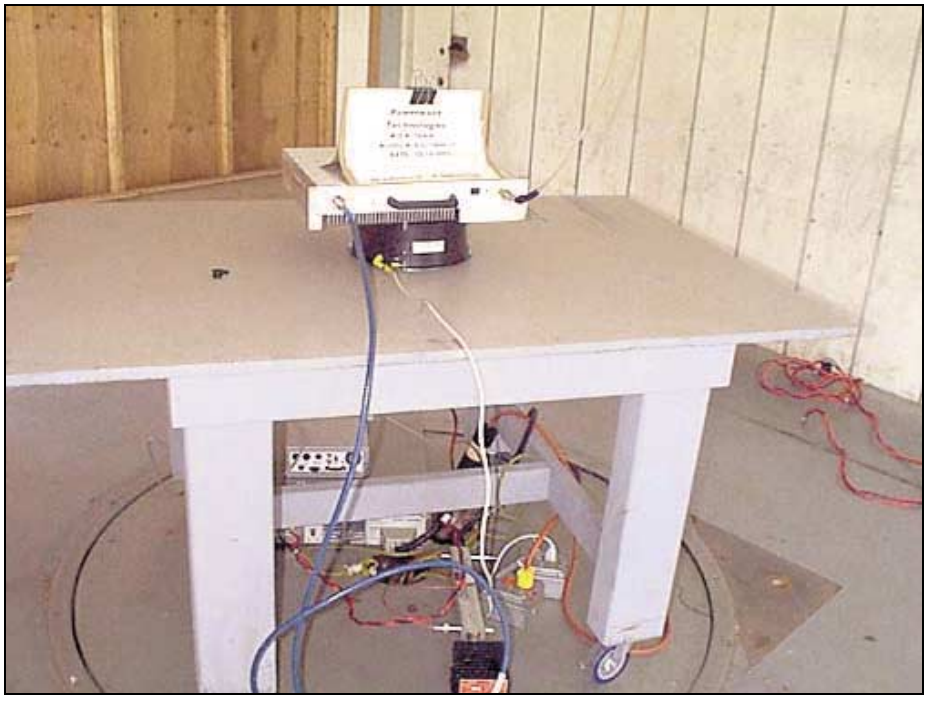
Test Equipment:

Spectrum Analyzer	01865	HP	8566B	2532A02509	092801	092802
QP Adapter	01437	HP	85650A	3303A01884	092801	092802
9KHz-30MHz						
Loop Antenna	00314	EMCO	6502	2014	73101	73102
Antenna cable	NA	NA	RG214	Cable#15	122001	122002
30-1000MHz						
Bicon Antenna	306	AH	SAS200/540	220	092401	092402
Log Periodic Antenna	331	AH	SAS 00/516	330	092401	092402
Pre-amp	00309	HP	8447D	1937A02548	090501	090502
Antenna cable	NA	NA	RG214	Cable#15	122001	122002
Pre-amp to SA cable	NA	Harbour	RG223/U	Cable#10	071601	071602
1-18GHz						
Horn Antenna	0849	EMCO	3115	6246	091201	091202
Microwave Pre-amp	00786	HP	83017A	3123A00281	091201	091202
¼" Heliax Coaxial Cable	NA	Andrew	LDF1-50	Cable#18 (70 ft)	091101	091102
High Pass Filter	02117	HP	84300-80038	3643A000027	060801	060802
18-20 GHz						
Horn Antenna	2112	HP	84125-80008	961178-006	070901	070902
Microwave Pre-amp	00786	HP	83017A	3123A00281	091201	091202

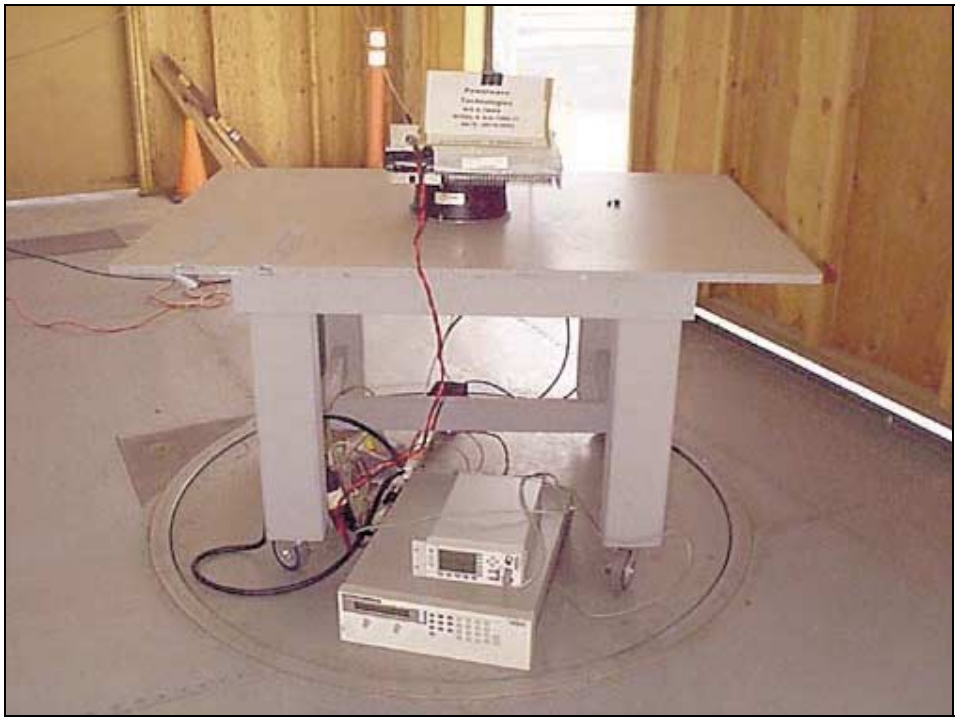
OATS Test Setup - Front View - AC

OATS Test Setup - Back View - AC

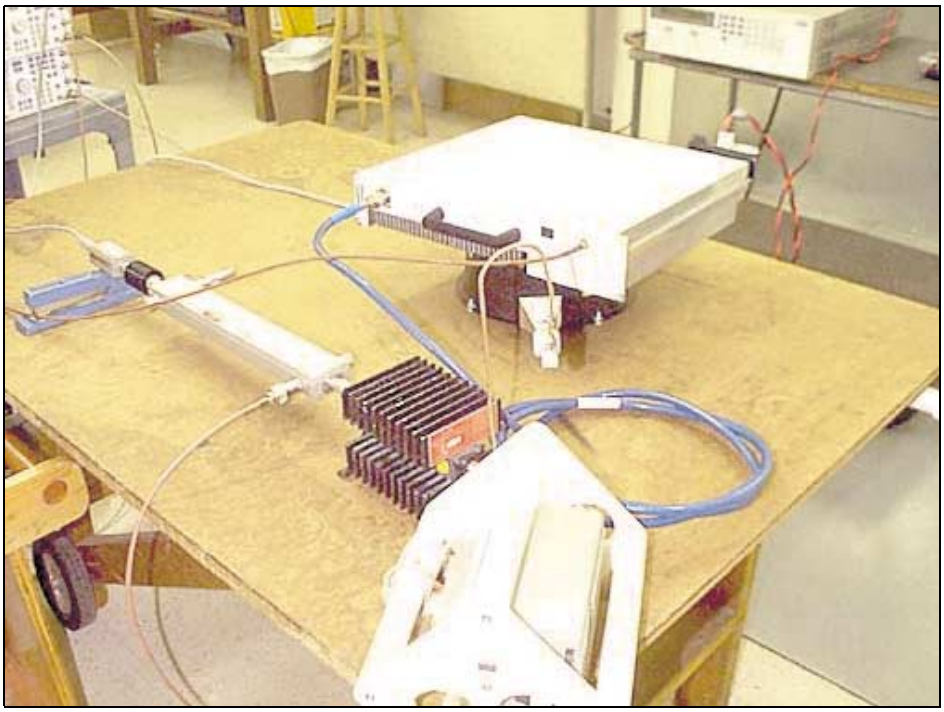
OATS Test Setup - Back View - AC 18-20GHz



OATS Test Setup - Front View - DC



OATS Test Setup - Back View - DC



OATS Test Setup - Back View - DC 18-20 GHz

2.1033(c)(14)/2.1055 - FREQUENCY STABILITY

Not applicable to this unit. Responsibility falls on the input transmitter.

15.107 – CONDUCTED EMISSIONS – DIGITAL

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

Customer:	**Powerwave Technologies**		
Specification:	**FCC 15.107 Class B**		
Work Order #:	**78909**	Date:	05/22/2002
Test Type:	**Conducted Emissions**	Time:	4:06:57 AM
Equipment:	**Amplifier**	Sequence#:	6
Manufacturer:	Powerwave Technologies	Tested By:	Eddie Wong
Model:	G3L-1900-31A		230V 60Hz
S/N:	PW021700165		

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

Function	Manufacturer	Model #	S/N
Amplifier*	Powerwave Technologies	G3L-1900-31A	PW021700165

Support Devices:

Function	Manufacturer	Model #	S/N
Combiner	Anaren	44000	416
Pre Amp	Mini Circuits	ZHL-1724HLN-SMA	D0202801-06
DC power Supply	Xanrex	XTS30-2X	NA
Signal Generator	Agilent	E4433B	US40051593
Signal Generator	Agilent	E4433B	US39341067
Signal Generator	Agilent	E4432B	US40053285

Test Conditions / Notes:

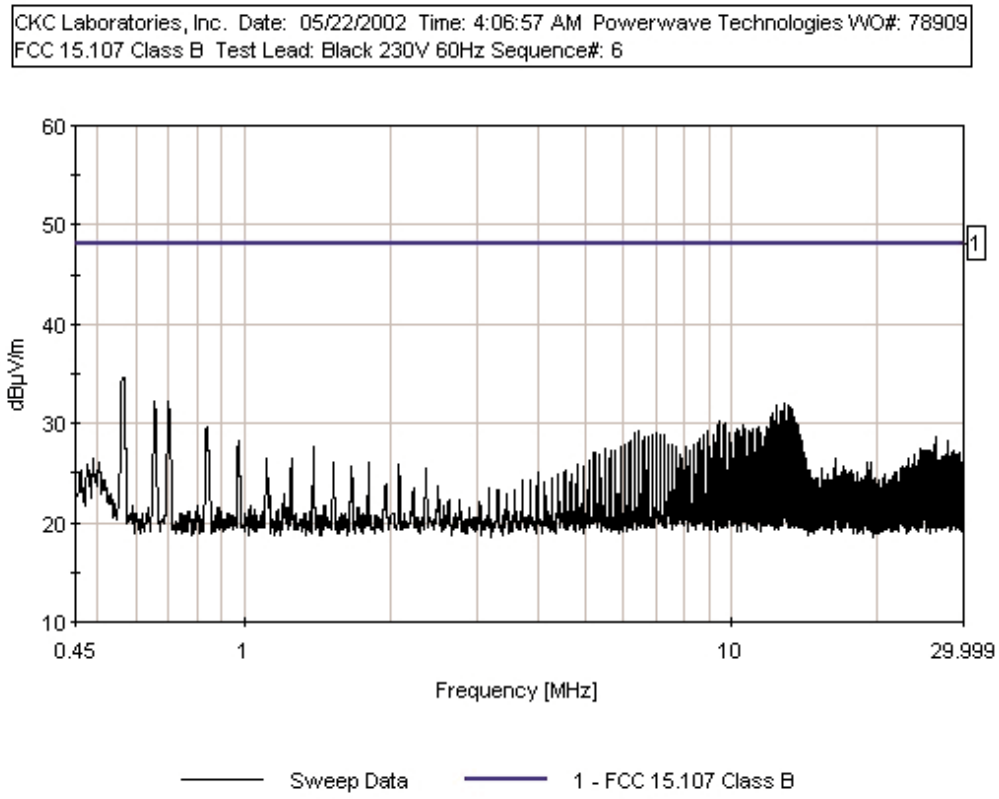
Rack mount EUT is placed on the test bench. 3 WCDMA signal from 3 different signal generator are combined and fed into the TX in of the EUT. TX out of the EUT is connected to a power meter via a series of attenuator and a directional coupler. The amplitude of the input signal is adjusted (Approximately 10.3 watts each) such that the measured output power of the EUT is 31 watts. Range of measurement: 450 kHz-30 MHz Measurement BW :RBW=VBW=9KHz Channels 1935.76 MHz 1954.24 MHz 1984.24 MHz. 230Vac, 60 Hz, 20°C, 54% relative humidity.

Transducer Legend:

Measurement Data: Reading listed by margin. Test Lead: Black

#	Freq MHz	Rdng dBµV	dB	dB	dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	561.294k	34.7					+0.0	34.7	48.0	-13.3	Black
2	697.320k	32.3					+0.0	32.3	48.0	-15.7	Black

3	654.726k	32.2	+0.0	32.2	48.0	-15.8	Black
4	12.903M	32.0	+0.0	32.0	48.0	-16.0	Black
5	12.353M	31.9	+0.0	31.9	48.0	-16.1	Black
6	13.038M	31.8	+0.0	31.8	48.0	-16.2	Black
7	13.173M	31.6	+0.0	31.6	48.0	-16.4	Black
8	13.317M	31.4	+0.0	31.4	48.0	-16.6	Black
9	12.623M	31.2	+0.0	31.2	48.0	-16.8	Black
10	12.758M	31.2	+0.0	31.2	48.0	-16.8	Black
11	12.209M	31.1	+0.0	31.1	48.0	-16.9	Black
12	12.074M	30.7	+0.0	30.7	48.0	-17.3	Black
13	13.452M	30.6	+0.0	30.6	48.0	-17.4	Black
14	9.470M	30.2	+0.0	30.2	48.0	-17.8	Black
15	13.587M	30.1	+0.0	30.1	48.0	-17.9	Black


CKC Laboratories, Inc. Date: 05/22/2002 Time: 4:06:57 AM Powerwave Technologies WO#: 78909
FCC 15.107 Class B Test Lead: Black 230V 60Hz Sequence#: 6
60
50
40
30
20
10
dBµV/m
1
0.45
1
10
29.999
Frequency [MHz]
Sweep Data
1 - FCC 15.107 Class B

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

Customer:	**Powerwave Technologies**		
Specification:	**FCC 15.107 Class B**		
Work Order #:	**78909**	Date:	05/22/2002
Test Type:	**Conducted Emissions**	Time:	4:10:05 AM
Equipment:	**Amplifier**	Sequence#:	7
Manufacturer:	Powerwave Technologies	Tested By:	Eddie Wong
Model:	G3L-1900-31A		230V 60Hz
S/N:	PW021700165		

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

Function	Manufacturer	Model #	S/N
Amplifier*	Powerwave Technologies	G3L-1900-31A	PW021700165

Support Devices:

Function	Manufacturer	Model #	S/N
Combiner	Anaren	44000	416
Pre Amp	Mini Circuits	ZHL-1724HLN-SMA	D0202801-06
DC power Supply	Xanrex	XTS30-2X	NA
Signal Generator	Agilent	E4433B	US40051593
Signal Generator	Agilent	E4433B	US39341067
Signal Generator	Agilent	E4432B	US40053285

Test Conditions / Notes:

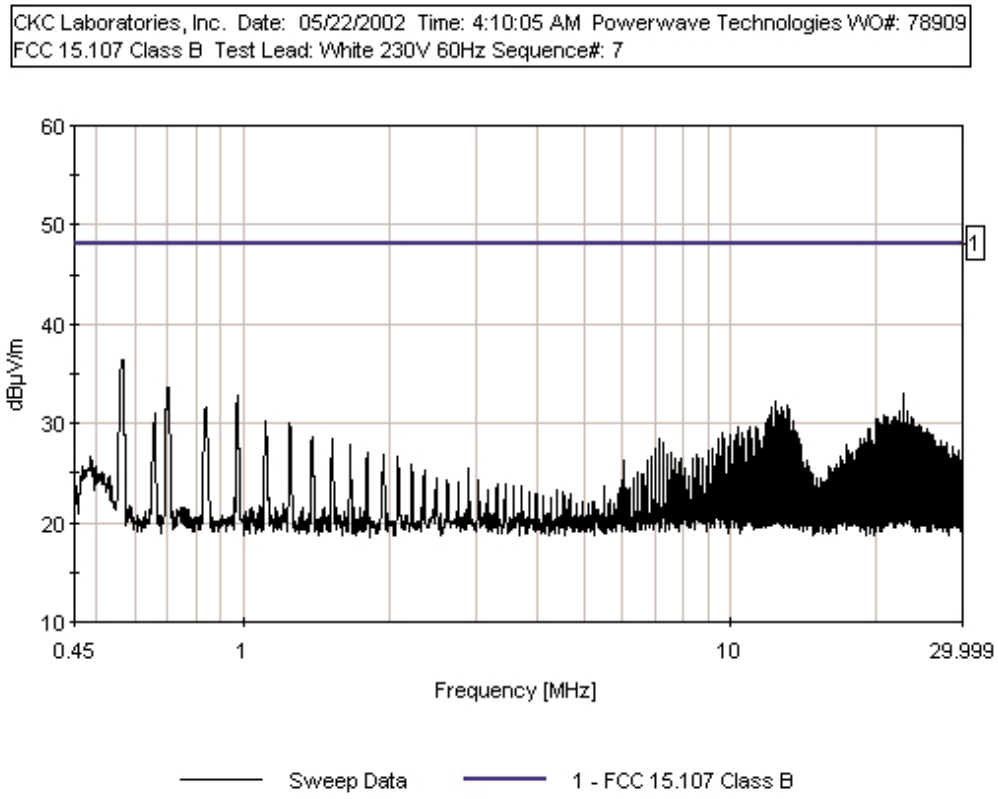
Rack mount EUT is placed on the test bench. 3 WCDMA signal from 3 different signal generator are combined and fed into the TX in of the EUT. TX out of the EUT is connected to a power meter via a series of attenuator and a directional coupler. The amplitude of the input signal is adjusted (Approximately 10.3 watts each) such that the measured output power of the EUT is 31 watts. Range of measurement: 450 kHz-30 MHz. Measurement BW: RBW=VBW=9kHz. Channels 1935.76 MHz, 1954.24 MHz, 1984.24 MHz. 230Vac, 60 Hz, 20°C, 54% relative humidity.

Transducer Legend:

Measurement Data: Reading listed by margin. Test Lead: White

#	Freq MHz	Rdng dBµV	dB	dB	dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	564.042k	36.3					+0.0	36.3	48.0	-11.7	White
2	698.694k	33.7					+0.0	33.7	48.0	-14.3	White
3	22.614M	33.0					+0.0	33.0	48.0	-15.0	White
4	973.494k	32.8					+0.0	32.8	48.0	-15.2	White
5	12.344M	32.2					+0.0	32.2	48.0	-15.8	White
6	13.038M	31.8					+0.0	31.8	48.0	-16.2	White
7	837.468k	31.7					+0.0	31.7	48.0	-16.3	White

8	12.758M	31.7	+0.0	31.7	48.0	-16.3	White
9	12.209M	31.6	+0.0	31.6	48.0	-16.4	White
10	13.173M	31.4	+0.0	31.4	48.0	-16.6	White
11	23.029M	31.3	+0.0	31.3	48.0	-16.7	White
12	12.488M	31.2	+0.0	31.2	48.0	-16.8	White
13	12.903M	31.2	+0.0	31.2	48.0	-16.8	White
14	22.335M	31.2	+0.0	31.2	48.0	-16.8	White
15	452.000k	24.2	+0.0	24.2	48.0	-23.8	White



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

Customer: **Powerwave Technologies**
Specification: **FCC 15.107 Class B**
Work Order #: **78909** Date: 05/22/2002
Test Type: **Conducted Emissions** Time: 6:25:57 AM
Equipment: **Amplifier** Sequence#: 7
Manufacturer: Powerwave Technologies Tested By: Eddie Wong
Model: G3L-1900-31 DC 48V
S/N: PW021700155

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

Function	Manufacturer	Model #	S/N
Amplifier*	Powerwave Technologies	G3L-1900-31	PW021700155

Support Devices:

Function	Manufacturer	Model #	S/N
Combiner	Anaren	44000	416
Pre Amp	Mini Circuits	ZHL-1724HLN-SMA	D0202801-06
DC power Supply	Xanrex	XTS30-2X	NA
Signal Generator	Agilent	E4433B	US40051593
Signal Generator	Agilent	E4433B	US39341067
Signal Generator	Agilent	E4432B	US40053285
DC Power Supply	Agilent	6674A	US36371542

Test Conditions / Notes:

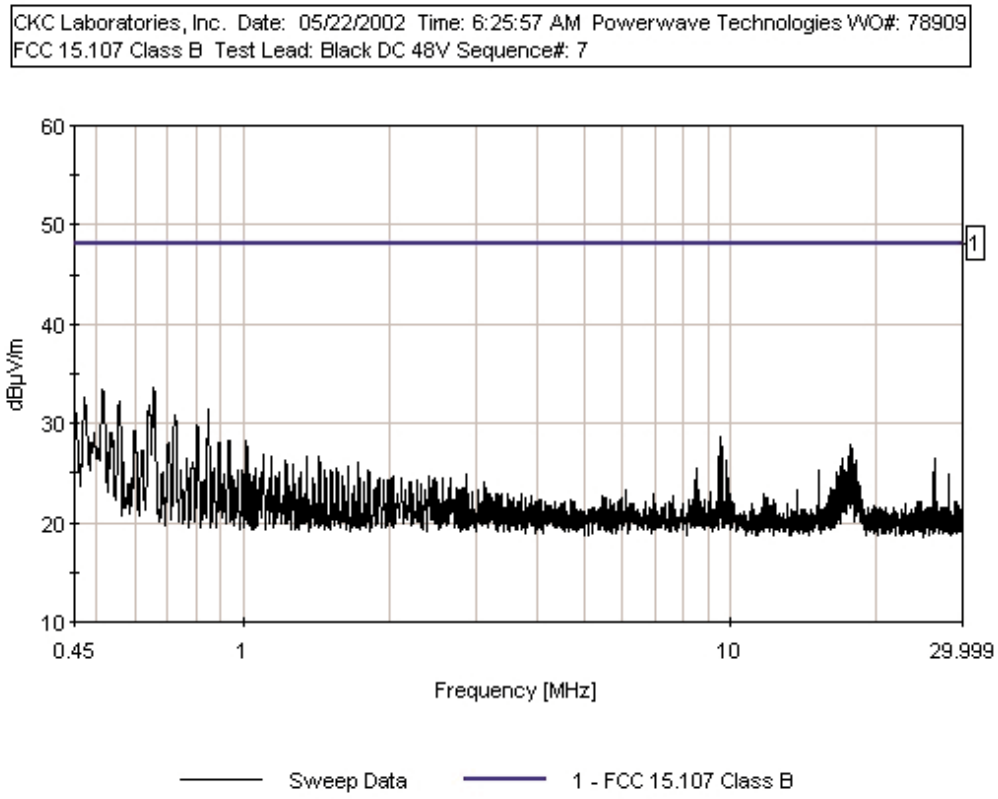
Rack mount EUT is placed on the test bench. 3 WCDMA signal from 3 different signal generator are combined and fed into the TX in of the EUT. TX out of the EUT is connected to a power meter via a series of attenuator and a directional coupler. The amplitude of the input signal is adjusted (Approximately 10.3 watts each) such that the measured output power of the EUT is 31 watts. Range of measurement: 450 kHz-30 MHz. Measurement BW :RBW=VBW=9KHz Channels 1935.76 MHz, 1954.24 MHz, 1984.24 MHz. Measurement taken at the AC main of the 48 Vdc Power Supply. 48Vdc (230Vac, 60 Hz), 20°C, 54% relative humidity.

Transducer Legend:

Measurement Data: Reading listed by margin. Test Lead: Black

#	Freq MHz	Rdng dBµV	dB	dB	dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	656.100k	33.6					+0.0	33.6	48.0	-14.4	Black
2	513.204k	33.5					+0.0	33.5	48.0	-14.5	Black
3	471.984k	32.6					+0.0	32.6	48.0	-15.4	Black
4	555.798k	32.2					+0.0	32.2	48.0	-15.8	Black
5	847.086k	31.5					+0.0	31.5	48.0	-16.5	Black
6	452.748k	31.1					+0.0	31.1	48.0	-16.9	Black
7	720.678k	30.8					+0.0	30.8	48.0	-17.2	Black

8	804.492k	29.8	+0.0	29.8	48.0	-18.2	Black
9	599.766k	29.3	+0.0	29.3	48.0	-18.7	Black
10	532.440k	29.0	+0.0	29.0	48.0	-19.0	Black
11	9.578M	28.6	+0.0	28.6	48.0	-19.4	Black
12	1.015M	28.3	+0.0	28.3	48.0	-19.7	Black
13	933.648k	28.2	+0.0	28.2	48.0	-19.8	Black
14	701.442k	28.0	+0.0	28.0	48.0	-20.0	Black
15	888.306k	28.0	+0.0	28.0	48.0	-20.0	Black



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

Customer: **Powerwave Technologies**
Specification: **FCC 15.107 Class B**
Work Order #: **78909** Date: 05/22/2002
Test Type: **Conducted Emissions** Time: 6:33:46 AM
Equipment: **Amplifier** Sequence#: 8
Manufacturer: Powerwave Technologies Tested By: Eddie Wong
Model: G3L-1900-31 DC 48V
S/N: PW021700155

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

Function	Manufacturer	Model #	S/N
Amplifier*	Powerwave Technologies	G3L-1900-31	PW021700155

Support Devices:

Function	Manufacturer	Model #	S/N
Combiner	Anaren	44000	416
Pre Amp	Mini Circuits	ZHL-1724HLN-SMA	D0202801-06
DC power Supply	Xanrex	XTS30-2X	NA
Signal Generator	Agilent	E4433B	US40051593
Signal Generator	Agilent	E4433B	US39341067
Signal Generator	Agilent	E4432B	US40053285
DC Power Supply	Agilent	6674A	US36371542

Test Conditions / Notes:

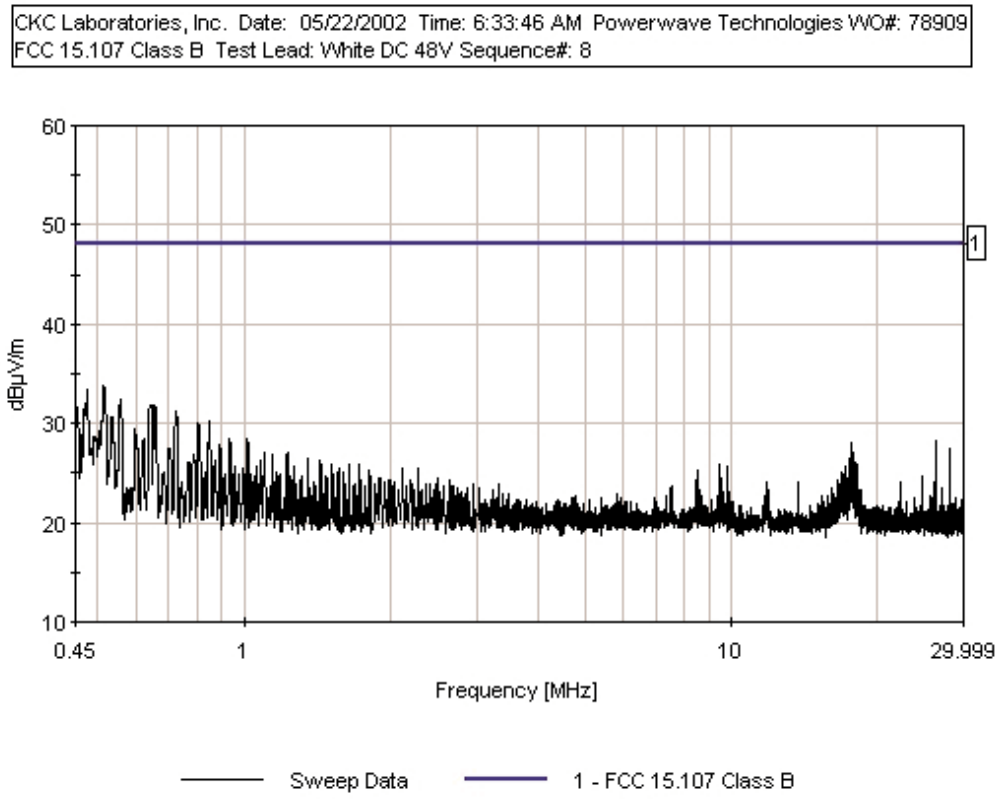
Rack mount EUT is placed on the test bench. 3 WCDMA signal from 3 different signal generator are combined and fed into the TX in of the EUT. TX out of the EUT is connected to a power meter via a series of attenuator and a directional coupler. The amplitude of the input signal is adjusted (Approximately 10.3 watts each) such that the measured output power of the EUT is 31 watts. Range of measurement: 450 kHz-30 MHz. Measurement BW :RBW=VBW=9KHz Channels 1935.76 MHz, 1954.24 MHz, 1984.24 MHz. Measurement taken at the AC main of the 48 Vdc Power Supply. 48Vdc (230Vac, 60 Hz), 20°C, 54% relative humidity.

Transducer Legend:

Measurement Data: Reading listed by margin. Test Lead: White

#	Freq MHz	Rdng dBµV	dB	dB	dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	513.204k	33.8					+0.0	33.8	48.0	-14.2	White
2	477.480k	33.5					+0.0	33.5	48.0	-14.5	White
3	559.920k	32.4					+0.0	32.4	48.0	-15.6	White
4	452.000k	32.3					+0.0	32.3	48.0	-15.7	White
5	640.986k	31.9					+0.0	31.9	48.0	-16.1	White
6	656.100k	31.8					+0.0	31.8	48.0	-16.2	White
7	722.052k	31.3					+0.0	31.3	48.0	-16.7	White

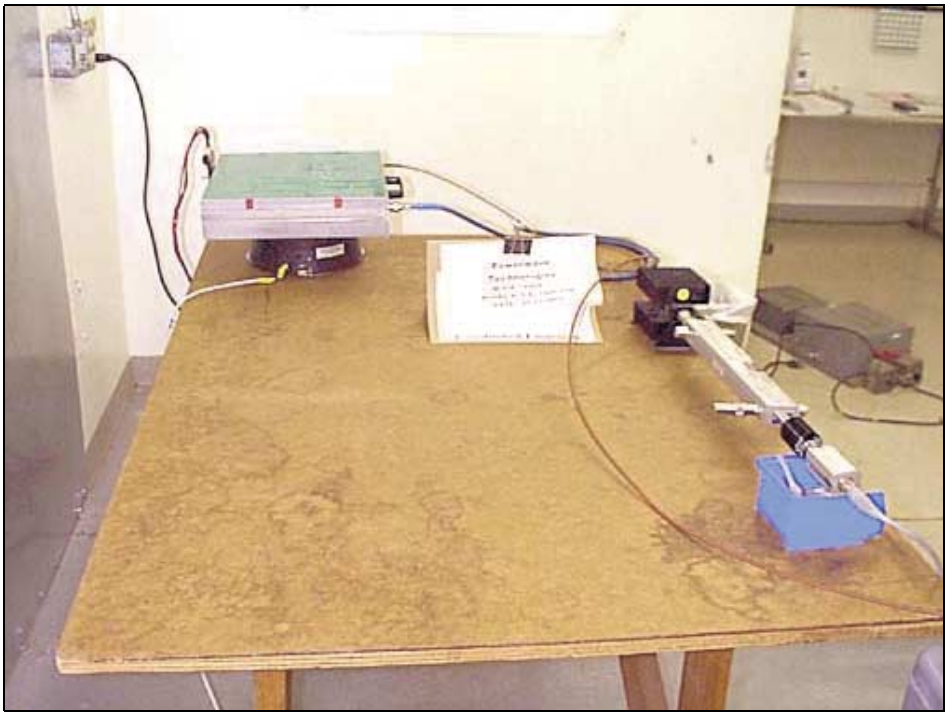
8	533.814k	30.6	+0.0	30.6	48.0	-17.4	White
9	847.086k	30.3	+0.0	30.3	48.0	-17.7	White
10	804.492k	30.0	+0.0	30.0	48.0	-18.0	White
11	595.644k	29.5	+0.0	29.5	48.0	-18.5	White
12	932.274k	28.5	+0.0	28.5	48.0	-19.5	White
13	621.750k	28.4	+0.0	28.4	48.0	-19.6	White
14	1.015M	28.4	+0.0	28.4	48.0	-19.6	White
15	26.292M	28.3	+0.0	28.3	48.0	-19.7	White



Test Equipment:

Equipment	Asset #	Manufacturer	Model #	Serial #	Cal Date	Cal Due
Spectrum Analyzer	01865	HP	8566B	2532A02509	092801	092802
QP Adapter	01437	HP	85650A	3303A01884	092801	092802
LISN	02128	EMCO	3816/2NM	9809-1090	032002	032003
LISN	00847	EMCO	3816/2NM	1104	101501	101502
LISN	0278	Solar	8028-50-TS-24_BNC	B2	100201	100202

Mains Conducted Emissions - Front View - AC



Mains Conducted Emissions - Side View - AC

Mains Conducted Emissions - Front View - DC

15.109 – RADIATED EMISSIONS – DIGITAL

Test Location:	CKC Laboratories, Inc. •110 N. Olinda Place • Brea, CA 92823 • (714) 993-6112		
Customer:	**Powerwave Technologies**		
Specification:	**FCC 15.109 Class B**		
Work Order #:	**78909**	Date:	05/20/2002
Test Type:	**Maximized Emission**	Time:	04:13:14
Equipment:	**Amplifier**	Sequence#:	3
Manufacturer:	Powerwave Technologies	Tested By:	Eddie Wong
Model:	G3L-1900-31A	S/N:	PW021700165

Support Devices:

Function	Manufacturer	Model #	S/N
Combiner	Anaren	44000	416
Pre Amp	Mini Circuits	ZHL-1724HLN-SMA	D0202801-06
DC power Supply	Xanrex	XTS30-2X	NA
Signal Generator	Agilent	E4433B	US40051593
Signal Generator	Agilent	E4433B	US39341067
Signal Generator	Agilent	E4432B	US40053285

Test Conditions / Notes:

Rack mount EUT is placed on the test bench. 3 WCDMA signal from 3 different signal generator are combined and fed into the TX in of the EUT. TX out of the EUT is connected to a power meter via a series of attenuators and a directional coupler. The amplitude of the input signal is adjusted (Approximately 10.3 watts each) such that the measured output power of the EUT is 31 watts. Range of measurement: 30 MHz - 20 GHz. Measurement BW 30 MHz - 1000MHz: RBW=VBW=120 kHz. 1 GHz - 20 GHz: RBW=VBW=1 MHz. Channels 1935.76 MHz, 1954.24 MHz, 1984.24 MHz. 230Vac, 60 Hz, 20°C, 54% relative humidity.

Transducer Legend:

T1=Bicon 092401	T2=Log 331 092401
T3=Cable #10 071601	T4=Cable #15 120602
T5=Preamp 8447D 090501	T6=Horn Antenna sn6246
T7=Heliax #18 70' 11Sept2001	T8=HP3017A sn3123A00281 11-Sept-01
T9=3.5 GHz High-Pass	

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq	Rdng	T1 T5 T9	T2 T6	T3 T7	T4 T8	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	1135.800M	64.0	+0.0	+0.0	+0.0	+0.0	+0.0	50.9	54.0	-3.1	Vert
	Ave		+0.0	+24.1	+2.8	-40.0					
^	1135.800M	77.4	+0.0	+0.0	+0.0	+0.0	+0.0	64.3	54.0	+10.3	Vert
			+0.0	+24.1	+2.8	-40.0					
3	2179.300M	56.6	+0.0	+0.0	+0.0	+0.0	+0.0	49.3	54.0	-4.7	Vert
			+0.0	+26.9	+4.1	-38.3					
4	1111.600M	62.4	+0.0	+0.0	+0.0	+0.0	+0.0	49.2	54.0	-4.8	Horiz
	Ave		+0.0	+24.1	+2.8	-40.1					
^	1111.600M	75.3	+0.0	+0.0	+0.0	+0.0	+0.0	62.1	54.0	+8.1	Horiz
			+0.0	+24.1	+2.8	-40.1					

6	127.600M	45.9	+16.0 -28.4	+0.0	+0.2	+2.0	+0.0	35.7	43.5	-7.8	Horiz
7	136.097M	42.9	+16.8 -28.4	+0.0	+0.2	+2.1	+0.0	33.6	43.5	-9.9	Vert
8	136.097M	42.9	+16.8 -28.4	+0.0	+0.2	+2.1	+0.0	33.6	43.5	-9.9	Vert
9	3968.700M	42.6	+0.0 +0.0 +0.4	+0.0 +31.9	+0.0 +6.1	+0.0 -37.6	+0.0	43.4	54.0	-10.6	Horiz
10	5865.000M	39.0	+0.0 +0.0 +0.1	+0.0 +33.6	+0.0 +7.4	+0.0 -37.0	+0.0	43.1	54.0	-10.9	Vert
11	140.130M	41.2	+17.1 -28.4	+0.0	+0.2	+2.1	+0.0	32.2	43.5	-11.3	Vert
12	140.130M	41.2	+17.1 -28.4	+0.0	+0.2	+2.1	+0.0	32.2	43.5	-11.3	Vert
13	675.331M	35.0	+0.0 -27.9	+21.8	+0.5	+5.2	+0.0	34.6	46.0	-11.4	Vert
14	130.130M	41.3	+16.2 -28.4	+0.0	+0.2	+2.0	+0.0	31.3	43.5	-12.2	Vert
15	127.578M	41.3	+16.0 -28.4	+0.0	+0.2	+2.0	+0.0	31.1	43.5	-12.4	Vert
16	360.099M	39.5	+0.0 -28.2	+18.1	+0.3	+3.6	+0.0	33.3	46.0	-12.7	Vert
17	4324.400M	39.6	+0.0 +0.0 +0.2	+0.0 +32.1	+0.0 +6.1	+0.0 -37.3	+0.0	40.7	54.0	-13.3	Vert
18	2343.600M	47.5	+0.0 +0.0	+0.0 +27.4	+0.0 +4.2	+0.0 -38.4	+0.0	40.7	54.0	-13.3	Horiz
19	147.710M	38.8	+17.3 -28.4	+0.0	+0.2	+2.2	+0.0	30.1	43.5	-13.4	Vert
20	147.710M	38.8	+17.3 -28.4	+0.0	+0.2	+2.2	+0.0	30.1	43.5	-13.4	Vert
21	135.051M	39.2	+16.7 -28.4	+0.0	+0.2	+2.1	+0.0	29.8	43.5	-13.7	Horiz
22	283.380M	36.1	+20.8 -28.3	+0.0	+0.3	+3.2	+0.0	32.1	46.0	-13.9	Vert
23	2333.700M	46.8	+0.0 +0.0	+0.0 +27.4	+0.0 +4.2	+0.0 -38.4	+0.0	40.0	54.0	-14.0	Horiz
24	139.324M	37.6	+17.0 -28.4	+0.0	+0.2	+2.1	+0.0	28.5	43.5	-15.0	Horiz
25	250.097M	37.7	+17.8 -28.2	+0.0	+0.3	+2.9	+0.0	30.5	46.0	-15.5	Vert
26	186.136M	36.1	+17.1 -28.3	+0.0	+0.3	+2.5	+0.0	27.7	43.5	-15.8	Vert
27	851.080M	29.2	+0.0 -27.7	+22.3	+0.6	+5.8	+0.0	30.2	46.0	-15.8	Vert
28	3328.200M	38.8	+0.0 +0.0	+0.0 +30.7	+0.0 +5.7	+0.0 -37.5	+0.0	37.7	54.0	-16.3	Vert
29	214.938M	35.3	+17.1 -28.3	+0.0	+0.3	+2.7	+0.0	27.1	43.5	-16.4	Vert

30	70.145M	43.6	+6.9 -28.6	+0.0	+0.1	+1.5	+0.0	23.5	40.0	-16.5	Vert
31	2322.600M	44.3	+0.0 +0.0	+0.0 +27.3	+0.0 +4.2	+0.0 -38.4	+0.0	37.4	54.0	-16.6	Vert
32	266.719M	34.5	+19.4 -28.3	+0.0	+0.3	+3.0	+0.0	28.9	46.0	-17.1	Vert
33	115.156M	38.1	+14.4 -28.4	+0.0	+0.2	+1.9	+0.0	26.2	43.5	-17.3	Vert
34	315.090M	31.7	+0.0 -28.3	+21.3	+0.3	+3.4	+0.0	28.4	46.0	-17.6	Vert
35	216.726M	36.3	+17.2 -28.3	+0.0	+0.3	+2.7	+0.0	28.2	46.0	-17.8	Vert
36	1539.200M	46.3	+0.0 +0.0	+0.0 +24.7	+0.0 +3.4	+0.0 -38.8	+0.0	35.6	54.0	-18.4	Horiz
37	330.068M	31.7	+0.0 -28.2	+20.2	+0.3	+3.4	+0.0	27.4	46.0	-18.6	Vert
38	350.058M	32.6	+0.0 -28.2	+18.7	+0.3	+3.5	+0.0	26.9	46.0	-19.1	Vert
39	233.410M	34.6	+17.5 -28.3	+0.0	+0.3	+2.8	+0.0	26.9	46.0	-19.1	Vert
40	1413.200M	46.0	+0.0 +0.0	+0.0 +24.4	+0.0 +3.2	+0.0 -39.0	+0.0	34.6	54.0	-19.4	Horiz
41	264.104M	32.4	+19.1 -28.3	+0.0	+0.3	+3.0	+0.0	26.5	46.0	-19.5	Horiz
42	432.144M	34.6	+0.0 -28.6	+16.0	+0.4	+3.9	+0.0	26.3	46.0	-19.7	Vert
43	589.799M	30.5	+0.0 -28.2	+18.7	+0.4	+4.8	+0.0	26.2	46.0	-19.8	Horiz
44	258.402M	32.3	+18.6 -28.2	+0.0	+0.3	+3.0	+0.0	26.0	46.0	-20.0	Vert
45	282.066M	29.1	+20.7 -28.3	+0.0	+0.3	+3.2	+0.0	25.0	46.0	-21.0	Horiz
46	240.075M	32.4	+17.6 -28.2	+0.0	+0.3	+2.8	+0.0	24.9	46.0	-21.1	Horiz
47	228.100M	32.6	+17.4 -28.3	+0.0	+0.3	+2.7	+0.0	24.7	46.0	-21.3	Horiz
48	220.060M	32.7	+17.2 -28.3	+0.0	+0.3	+2.7	+0.0	24.6	46.0	-21.4	Horiz
49	420.094M	32.4	+0.0 -28.5	+15.8	+0.4	+3.9	+0.0	24.0	46.0	-22.0	Vert
50	397.594M	31.0	+0.0 -28.3	+15.6	+0.4	+3.8	+0.0	22.5	46.0	-23.5	Vert
51	429.072M	30.3	+0.0 -28.5	+15.9	+0.4	+3.9	+0.0	22.0	46.0	-24.0	Vert
52	446.826M	29.6	+0.0 -28.7	+16.2	+0.4	+4.0	+0.0	21.5	46.0	-24.5	Horiz
53	390.077M	29.2	+0.0 -28.3	+16.1	+0.4	+3.7	+0.0	21.1	46.0	-24.9	Vert

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

Customer: **Powerwave Technologies**
Specification: **FCC 15.109 Class B**
Work Order #: **78909** Date: 05/20/2002
Test Type: **Maximized Emission** Time: 03:57:45
Equipment: **Amplifier** Sequence#: 4
Manufacturer: Powerwave Technologies Tested By: Eddie Wong
Model: G3L-1900-31
S/N: PW021700155

***Test Equipment*:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
spectrum analyzer	hp	12/28/2001	12/28/2001	5566

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

Function	Manufacturer	Model #	S/N
Amplifier*	Powerwave Technologies	G3L-1900-31	PW021700155

Support Devices:

Function	Manufacturer	Model #	S/N
Combiner	Anaren	44000	416
Pre Amp	Mini Circuits	ZHL-1724HLN-SMA	D0202801-06
DC power Supply	Xanrex	XTS30-2X	NA
Signal Generator	Agilent	E4433B	US40051593
Signal Generator	Agilent	E4433B	US39341067
Signal Generator	Agilent	E4432B	US40053285
DC Power Supply	Agilent	6674A	US36371542

Test Conditions / Notes:

Rack mount EUT is placed on the test bench. 3 WCDMA signal from 3 different signal generator are combined and fed into the TX in of the EUT. TX out of the EUT is connected to a power meter via a series of attenuators and a directional coupler. The amplitude of the input signal is adjusted (Approximately 10.3 watts each) such that the measured output power of the EUT is 31 watts. Range of measurement: 30 MHz - 20 GHz. Measurement BW 30 MHz- 1000MHz: RBW=VBW=120 kHz. 1 GHz - 20 GHz: RBW=VBW=1 MHz. Channels 1935.76 MHz, 1954.24 MHz, 1984.24 MHz. 48 Vdc (230Vac, 60 Hz), 20°C, 54% relative humidity.

Transducer Legend:

T1=Bicon 092401	T2=Log 331 092401
T3=Cable #10 071601	T4=Cable #15 120602
T5=Preamp 8447D 090501	T6=Horn Antenna sn6246
T7=Heliax #18 70' 11Sept2001	T8=HP3017A sn3123A00281 11-Sept-01
T9=3.5 GHz High-Pass	T10=18-26 HP Horn Antenna #2112

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq	Rdng	T1 T5 T9	T2 T6 T10	T3 T7	T4 T8	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	1135.800M	77.4	+0.0 +0.0 +0.0	+0.0 +24.1 +0.0	+0.0 +2.8	+0.0 -40.0	+0.0	64.3	54.0	+10.3	Horiz

2	1135.900M	63.1	+0.0	+0.0	+0.0	+0.0	+0.0	50.0	54.0	-4.0	Vert
	Ave		+0.0	+24.1	+2.8	-40.0					
^	1135.900M	75.6	+0.0	+0.0	+0.0	+0.0	+0.0	62.5	54.0	+8.5	Vert
			+0.0	+24.1	+2.8	-40.0					
4	2034.800M	56.6	+0.0	+0.0	+0.0	+0.0	+0.0	48.6	54.0	-5.4	Horiz
			+0.0	+26.5	+3.9	-38.4					
			+0.0	+0.0							
5	5874.900M	44.5	+0.0	+0.0	+0.0	+0.0	+0.0	48.5	54.0	-5.5	Horiz
			+0.0	+33.6	+7.4	-37.1					
			+0.1	+0.0							
6	1905.700M	56.6	+0.0	+0.0	+0.0	+0.0	+0.0	48.0	54.0	-6.0	Horiz
			+0.0	+26.1	+3.6	-38.3					
			+0.0	+0.0							
7	210.116M	45.5	+17.0	+0.0	+0.3	+2.6	+0.0	37.0	43.5	-6.5	Horiz
			-28.4								
8	134.098M	45.8	+16.6	+0.0	+0.2	+2.1	+0.0	36.3	43.5	-7.2	Horiz
			-28.4								
9	5903.670M	41.7	+0.0	+0.0	+0.0	+0.0	+0.0	45.7	54.0	-8.3	Vert
			+0.0	+33.6	+7.4	-37.1					
			+0.1								
10	140.152M	43.7	+17.1	+0.0	+0.2	+2.1	+0.0	34.7	43.5	-8.8	Horiz
			-28.4								
11	162.144M	42.7	+17.6	+0.0	+0.3	+2.3	+0.0	34.6	43.5	-8.9	Horiz
			-28.3								
12	342.187M	42.0	+0.0	+19.3	+0.3	+3.5	+0.0	36.9	46.0	-9.1	Vert
			-28.2								
13	142.091M	43.3	+17.2	+0.0	+0.2	+2.1	+0.0	34.4	43.5	-9.1	Horiz
			-28.4								
14	2179.300M	51.7	+0.0	+0.0	+0.0	+0.0	+0.0	44.4	54.0	-9.6	Horiz
			+0.0	+26.9	+4.1	-38.3					
			+0.0	+0.0							
15	2002.800M	52.5	+0.0	+0.0	+0.0	+0.0	+0.0	44.4	54.0	-9.6	Horiz
			+0.0	+26.4	+3.9	-38.4					
			+0.0	+0.0							
16	2061.100M	52.1	+0.0	+0.0	+0.0	+0.0	+0.0	44.3	54.0	-9.7	Horiz
			+0.0	+26.6	+4.0	-38.4					
			+0.0	+0.0							
17	136.097M	42.9	+16.8	+0.0	+0.2	+2.1	+0.0	33.6	43.5	-9.9	Vert
			-28.4								
18	6858.400M	38.0	+0.0	+0.0	+0.0	+0.0	+0.0	43.7	54.0	-10.3	Horiz
			+0.0	+35.1	+8.0	-37.8					
			+0.4	+0.0							
19	6850.870M	38.0	+0.0	+0.0	+0.0	+0.0	+0.0	43.7	54.0	-10.3	Vert
			+0.0	+35.1	+8.0	-37.8					
			+0.4								
20	152.102M	41.5	+17.4	+0.0	+0.2	+2.2	+0.0	32.9	43.5	-10.6	Horiz
			-28.4								
21	327.823M	39.1	+0.0	+20.3	+0.3	+3.4	+0.0	34.9	46.0	-11.1	Vert
			-28.2								
22	145.171M	41.2	+17.2	+0.0	+0.2	+2.2	+0.0	32.4	43.5	-11.1	Horiz
			-28.4								

23	210.147M	40.9	+17.0 -28.4	+0.0	+0.3	+2.6	+0.0	32.4	43.5	-11.1	Vert
24	336.171M	39.5	+0.0 -28.2	+19.7	+0.3	+3.4	+0.0	34.7	46.0	-11.3	Horiz
25	140.130M	41.2	+17.1 -28.4	+0.0	+0.2	+2.1	+0.0	32.2	43.5	-11.3	Vert
26	130.130M	41.8	+16.2 -28.4	+0.0	+0.2	+2.0	+0.0	31.8	43.5	-11.7	Vert
27	420.095M	42.5	+0.0 -28.5	+15.8	+0.4	+3.9	+0.0	34.1	46.0	-11.9	Vert
28	270.141M	39.2	+19.7 -28.3	+0.0	+0.3	+3.1	+0.0	34.0	46.0	-12.0	Horiz
29	186.120M	39.9	+17.1 -28.3	+0.0	+0.3	+2.5	+0.0	31.5	43.5	-12.0	Horiz
30	156.106M	39.7	+17.5 -28.3	+0.0	+0.2	+2.3	+0.0	31.4	43.5	-12.1	Horiz
31	195.135M	39.8	+16.9 -28.4	+0.0	+0.3	+2.6	+0.0	31.2	43.5	-12.3	Horiz
32	325.304M	37.6	+0.0 -28.2	+20.5	+0.3	+3.4	+0.0	33.6	46.0	-12.4	Vert
33	355.319M	39.5	+0.0 -28.2	+18.4	+0.3	+3.5	+0.0	33.5	46.0	-12.5	Horiz
34	357.855M	39.2	+0.0 -28.2	+18.2	+0.3	+3.5	+0.0	33.0	46.0	-13.0	Vert
35	835.724M	32.0	+0.0 -27.7	+22.1	+0.6	+5.8	+0.0	32.8	46.0	-13.2	Horiz
36	460.436M	40.5	+0.0 -28.7	+16.4	+0.4	+4.1	+0.0	32.7	46.0	-13.3	Vert
37	114.132M	42.2	+14.3 -28.4	+0.0	+0.2	+1.9	+0.0	30.2	43.5	-13.3	Horiz
38	594.050M	36.7	+0.0 -28.2	+18.8	+0.4	+4.9	+0.0	32.6	46.0	-13.4	Horiz
39	330.186M	36.9	+0.0 -28.2	+20.2	+0.3	+3.4	+0.0	32.6	46.0	-13.4	Vert
40	147.710M	38.8	+17.3 -28.4	+0.0	+0.2	+2.2	+0.0	30.1	43.5	-13.4	Vert
41	2334.200M	47.3	+0.0 +0.0 +0.0	+0.0 +27.4 +0.0	+0.0 +4.2	+0.0 -38.4	+0.0	40.5	54.0	-13.5	Horiz
42	325.318M	36.5	+0.0 -28.2	+20.5	+0.3	+3.4	+0.0	32.5	46.0	-13.5	Horiz
43	390.092M	40.4	+0.0 -28.3	+16.1	+0.4	+3.7	+0.0	32.3	46.0	-13.7	Horiz
44	345.365M	37.6	+0.0 -28.2	+19.1	+0.3	+3.5	+0.0	32.3	46.0	-13.7	Vert
45	282.147M	36.4	+20.7 -28.3	+0.0	+0.3	+3.2	+0.0	32.3	46.0	-13.7	Horiz
46	110.152M	42.6	+13.5 -28.4	+0.0	+0.2	+1.9	+0.0	29.8	43.5	-13.7	Horiz

47	315.299M	35.5	+0.0 -28.3	+21.3	+0.3	+3.4	+0.0	32.2	46.0	-13.8	Vert
48	155.145M	38.1	+17.5 -28.4	+0.0	+0.2	+2.2	+0.0	29.6	43.5	-13.9	Horiz
49	120.139M	40.5	+15.3 -28.4	+0.0	+0.2	+2.0	+0.0	29.6	43.5	-13.9	Horiz
50	294.186M	35.1	+21.7 -28.3	+0.0	+0.3	+3.3	+0.0	32.1	46.0	-13.9	Vert
51	660.561M	32.9	+0.0 -27.8	+21.3	+0.4	+5.1	+0.0	31.9	46.0	-14.1	Horiz
52	324.129M	35.7	+0.0 -28.2	+20.6	+0.3	+3.4	+0.0	31.8	46.0	-14.2	Vert
53	305.279M	34.4	+0.0 -28.3	+22.1	+0.3	+3.3	+0.0	31.8	46.0	-14.2	Vert
54	342.160M	36.8	+0.0 -28.2	+19.3	+0.3	+3.5	+0.0	31.7	46.0	-14.3	Horiz
55	444.179M	39.8	+0.0 -28.7	+16.2	+0.4	+4.0	+0.0	31.7	46.0	-14.3	Vert
56	317.819M	35.2	+0.0 -28.3	+21.1	+0.3	+3.4	+0.0	31.7	46.0	-14.3	Vert
57	330.353M	35.9	+0.0 -28.2	+20.2	+0.3	+3.4	+0.0	31.6	46.0	-14.4	Horiz
58	408.414M	40.2	+0.0 -28.4	+15.6	+0.4	+3.8	+0.0	31.6	46.0	-14.4	Vert
59	312.799M	34.7	+0.0 -28.3	+21.5	+0.3	+3.4	+0.0	31.6	46.0	-14.4	Vert
60	3170.800M	41.4	+0.0 +0.0 +0.0	+0.0 +30.3 +0.0	+0.0 +5.3	+0.0 -37.5	+0.0	39.5	54.0	-14.5	Horiz
61	600.516M	35.4	+0.0 -28.1	+18.9	+0.4	+4.9	+0.0	31.5	46.0	-14.5	Vert
62	2709.000M	44.6	+0.0 +0.0 +0.0	+0.0 +28.7 +0.0	+0.0 +4.4	+0.0 -38.3	+0.0	39.4	54.0	-14.6	Horiz
63	314.165M	34.6	+0.0 -28.3	+21.4	+0.3	+3.4	+0.0	31.4	46.0	-14.6	Vert
64	3366.200M	40.2	+0.0 +0.0 +0.0	+0.0 +30.8 +0.0	+0.0 +5.8	+0.0 -37.5	+0.0	39.3	54.0	-14.7	Horiz
65	136.070M	38.1	+16.8 -28.4	+0.0	+0.2	+2.1	+0.0	28.8	43.5	-14.7	Horiz
66	335.302M	35.9	+0.0 -28.2	+19.8	+0.3	+3.4	+0.0	31.2	46.0	-14.8	Horiz
67	429.099M	39.5	+0.0 -28.5	+15.9	+0.4	+3.9	+0.0	31.2	46.0	-14.8	Vert
68	350.315M	36.7	+0.0 -28.2	+18.7	+0.3	+3.5	+0.0	31.0	46.0	-15.0	Vert
69	415.364M	39.3	+0.0 -28.4	+15.7	+0.4	+3.9	+0.0	30.9	46.0	-15.1	Horiz
70	385.379M	38.7	+0.0 -28.3	+16.4	+0.4	+3.7	+0.0	30.9	46.0	-15.1	Vert

71	320.162M	34.5	+0.0 -28.3	+20.9	+0.3	+3.4	+0.0	30.8	46.0	-15.2	Vert
72	2344.200M	45.5	+0.0 +0.0 +0.0	+0.0 +27.4 +0.0	+0.0 +4.2	+0.0 -38.4	+0.0	38.7	54.0	-15.3	Horiz
73	310.140M	33.6	+0.0 -28.3	+21.7	+0.3	+3.3	+0.0	30.6	46.0	-15.4	Vert
74	190.108M	36.6	+17.0 -28.3	+0.0	+0.3	+2.5	+0.0	28.1	43.5	-15.4	Horiz
75	335.332M	35.2	+0.0 -28.2	+19.8	+0.3	+3.4	+0.0	30.5	46.0	-15.5	Vert
76	295.317M	33.3	+21.8 -28.3	+0.0	+0.3	+3.3	+0.0	30.4	46.0	-15.6	Horiz
77	240.096M	37.9	+17.6 -28.2	+0.0	+0.3	+2.8	+0.0	30.4	46.0	-15.6	Horiz
78	178.910M	36.1	+17.3 -28.2	+0.0	+0.3	+2.4	+0.0	27.9	43.5	-15.6	Horiz
79	344.178M	35.5	+0.0 -28.2	+19.2	+0.3	+3.5	+0.0	30.3	46.0	-15.7	Vert
80	202.901M	36.4	+16.9 -28.4	+0.0	+0.3	+2.6	+0.0	27.8	43.5	-15.7	Horiz
81	835.693M	29.4	+0.0 -27.7	+22.1	+0.6	+5.8	+0.0	30.2	46.0	-15.8	Vert
82	412.872M	38.6	+0.0 -28.4	+15.7	+0.4	+3.9	+0.0	30.2	46.0	-15.8	Vert
83	215.270M	35.9	+17.1 -28.3	+0.0	+0.3	+2.7	+0.0	27.7	43.5	-15.8	Horiz
84	296.147M	33.0	+21.9 -28.3	+0.0	+0.3	+3.3	+0.0	30.2	46.0	-15.8	Vert
85	186.136M	36.1	+17.1 -28.3	+0.0	+0.3	+2.5	+0.0	27.7	43.5	-15.8	Vert
86	620.572M	33.0	+0.0 -28.0	+19.7	+0.4	+5.0	+0.0	30.1	46.0	-15.9	Horiz
87	320.328M	33.8	+0.0 -28.3	+20.9	+0.3	+3.4	+0.0	30.1	46.0	-15.9	Horiz
88	208.122M	36.1	+17.0 -28.4	+0.0	+0.3	+2.6	+0.0	27.6	43.5	-15.9	Vert
89	420.080M	38.4	+0.0 -28.5	+15.8	+0.4	+3.9	+0.0	30.0	46.0	-16.0	Horiz
90	340.326M	35.0	+0.0 -28.2	+19.4	+0.3	+3.5	+0.0	30.0	46.0	-16.0	Horiz
91	302.806M	32.4	+0.0 -28.3	+22.3	+0.3	+3.3	+0.0	30.0	46.0	-16.0	Vert
92	285.289M	33.7	+21.0 -28.3	+0.0	+0.3	+3.2	+0.0	29.9	46.0	-16.1	Vert
93	490.438M	36.8	+0.0 -28.5	+16.8	+0.4	+4.3	+0.0	29.8	46.0	-16.2	Vert
94	347.843M	35.2	+0.0 -28.2	+18.9	+0.3	+3.5	+0.0	29.7	46.0	-16.3	Vert

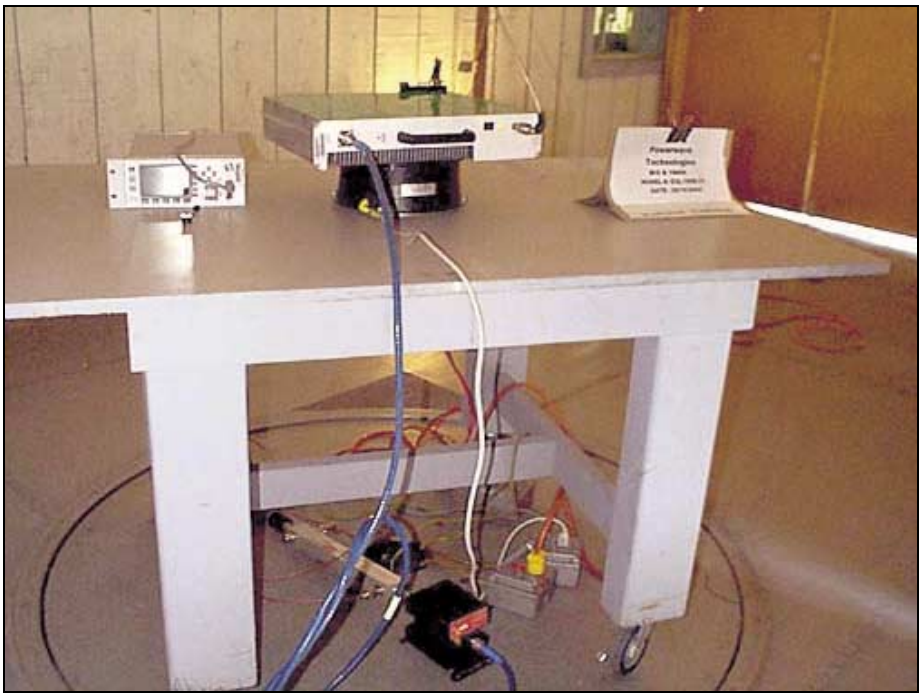
95	459.215M	37.3	+0.0 -28.7	+16.4	+0.4	+4.1	+0.0	29.5	46.0	-16.5	Vert
96	2322.600M	44.3	+0.0 +0.0 +0.0	+0.0 +27.3 +0.0	+0.0 +4.2	+0.0 -38.4	+0.0	37.4	54.0	-16.6	Horiz
97	480.226M	36.8	+0.0 -28.6	+16.6	+0.4	+4.2	+0.0	29.4	46.0	-16.6	Vert
98	367.611M	36.1	+0.0 -28.2	+17.6	+0.3	+3.6	+0.0	29.4	46.0	-16.6	Vert
99	292.141M	32.6	+21.6 -28.3	+0.0	+0.3	+3.2	+0.0	29.4	46.0	-16.6	Vert
100	470.464M	36.8	+0.0 -28.6	+16.5	+0.4	+4.2	+0.0	29.3	46.0	-16.7	Vert
101	423.818M	37.6	+0.0 -28.5	+15.9	+0.4	+3.9	+0.0	29.3	46.0	-16.7	Vert
102	363.853M	35.8	+0.0 -28.2	+17.8	+0.3	+3.6	+0.0	29.3	46.0	-16.7	Vert
103	137.688M	36.0	+16.9 -28.4	+0.0	+0.2	+2.1	+0.0	26.8	43.5	-16.7	Horiz
104	422.874M	37.6	+0.0 -28.5	+15.8	+0.4	+3.9	+0.0	29.2	46.0	-16.8	Vert
105	416.368M	37.4	+0.0 -28.4	+15.8	+0.4	+3.9	+0.0	29.1	46.0	-16.9	Vert
106	219.137M	37.2	+17.2 -28.3	+0.0	+0.3	+2.7	+0.0	29.1	46.0	-16.9	Horiz
107	410.343M	37.4	+0.0 -28.4	+15.7	+0.4	+3.8	+0.0	28.9	46.0	-17.1	Vert
108	365.381M	35.5	+0.0 -28.2	+17.7	+0.3	+3.6	+0.0	28.9	46.0	-17.1	Vert
109	324.076M	32.6	+0.0 -28.2	+20.6	+0.3	+3.4	+0.0	28.7	46.0	-17.3	Horiz
110	360.354M	34.9	+0.0 -28.2	+18.0	+0.3	+3.6	+0.0	28.6	46.0	-17.4	Horiz
111	181.306M	34.3	+17.3 -28.3	+0.0	+0.3	+2.5	+0.0	26.1	43.5	-17.4	Horiz
112	222.109M	36.4	+17.3 -28.3	+0.0	+0.3	+2.7	+0.0	28.4	46.0	-17.6	Horiz
113	444.165M	36.4	+0.0 -28.7	+16.2	+0.4	+4.0	+0.0	28.3	46.0	-17.7	Horiz
114	171.942M	33.9	+17.4 -28.2	+0.0	+0.3	+2.4	+0.0	25.8	43.5	-17.7	Horiz
115	400.372M	36.8	+0.0 -28.3	+15.5	+0.4	+3.8	+0.0	28.2	46.0	-17.8	Horiz
116	340.299M	33.2	+0.0 -28.2	+19.4	+0.3	+3.5	+0.0	28.2	46.0	-17.8	Vert
117	194.107M	34.3	+16.9 -28.4	+0.0	+0.3	+2.6	+0.0	25.7	43.5	-17.8	Vert
118	435.366M	36.4	+0.0 -28.6	+16.0	+0.4	+3.9	+0.0	28.1	46.0	-17.9	Horiz

119	278.125M	32.6	+20.4 -28.3	+0.0	+0.3	+3.1	+0.0	28.1	46.0	-17.9	Horiz
120	456.210M	35.9	+0.0 -28.7	+16.3	+0.4	+4.1	+0.0	28.0	46.0	-18.0	Horiz
121	427.569M	36.2	+0.0 -28.5	+15.9	+0.4	+3.9	+0.0	27.9	46.0	-18.1	Vert
122	531.316M	33.9	+0.0 -28.6	+17.6	+0.4	+4.5	+0.0	27.8	46.0	-18.2	Vert
123	615.306M	30.8	+0.0 -28.0	+19.5	+0.4	+5.0	+0.0	27.7	46.0	-18.3	Vert
124	446.190M	35.7	+0.0 -28.7	+16.2	+0.4	+4.0	+0.0	27.6	46.0	-18.4	Horiz
125	382.573M	34.9	+0.0 -28.3	+16.6	+0.4	+3.7	+0.0	27.3	46.0	-18.7	Horiz
126	430.399M	35.5	+0.0 -28.5	+16.0	+0.4	+3.9	+0.0	27.3	46.0	-18.7	Vert
127	418.687M	35.7	+0.0 -28.5	+15.8	+0.4	+3.9	+0.0	27.3	46.0	-18.7	Vert
128	260.107M	33.4	+18.8 -28.2	+0.0	+0.3	+3.0	+0.0	27.3	46.0	-18.7	Horiz
129	290.147M	30.7	+21.4 -28.3	+0.0	+0.3	+3.2	+0.0	27.3	46.0	-18.7	Vert
130	547.801M	32.9	+0.0 -28.6	+17.9	+0.4	+4.6	+0.0	27.2	46.0	-18.8	Horiz
131	417.851M	35.4	+0.0 -28.4	+15.8	+0.4	+3.9	+0.0	27.1	46.0	-18.9	Vert
132	380.367M	34.6	+0.0 -28.3	+16.7	+0.4	+3.7	+0.0	27.1	46.0	-18.9	Vert
133	122.094M	35.1	+15.5 -28.4	+0.0	+0.2	+2.0	+0.0	24.4	43.5	-19.1	Horiz
134	540.465M	32.5	+0.0 -28.6	+17.8	+0.4	+4.6	+0.0	26.7	46.0	-19.3	Horiz
135	262.140M	32.6	+18.9 -28.2	+0.0	+0.3	+3.0	+0.0	26.6	46.0	-19.4	Horiz
136	395.345M	34.7	+0.0 -28.3	+15.8	+0.4	+3.8	+0.0	26.4	46.0	-19.6	Vert
137	421.837M	34.7	+0.0 -28.5	+15.8	+0.4	+3.9	+0.0	26.3	46.0	-19.7	Vert
138	516.241M	32.0	+0.0 -28.5	+17.3	+0.4	+4.5	+0.0	25.7	46.0	-20.3	Vert
139	492.175M	32.0	+0.0 -28.5	+16.8	+0.4	+4.3	+0.0	25.0	46.0	-21.0	Vert
140	397.557M	33.3	+0.0 -28.3	+15.6	+0.4	+3.8	+0.0	24.8	46.0	-21.2	Horiz
141	230.096M	32.5	+17.4 -28.3	+0.0	+0.3	+2.7	+0.0	24.6	46.0	-21.4	Vert

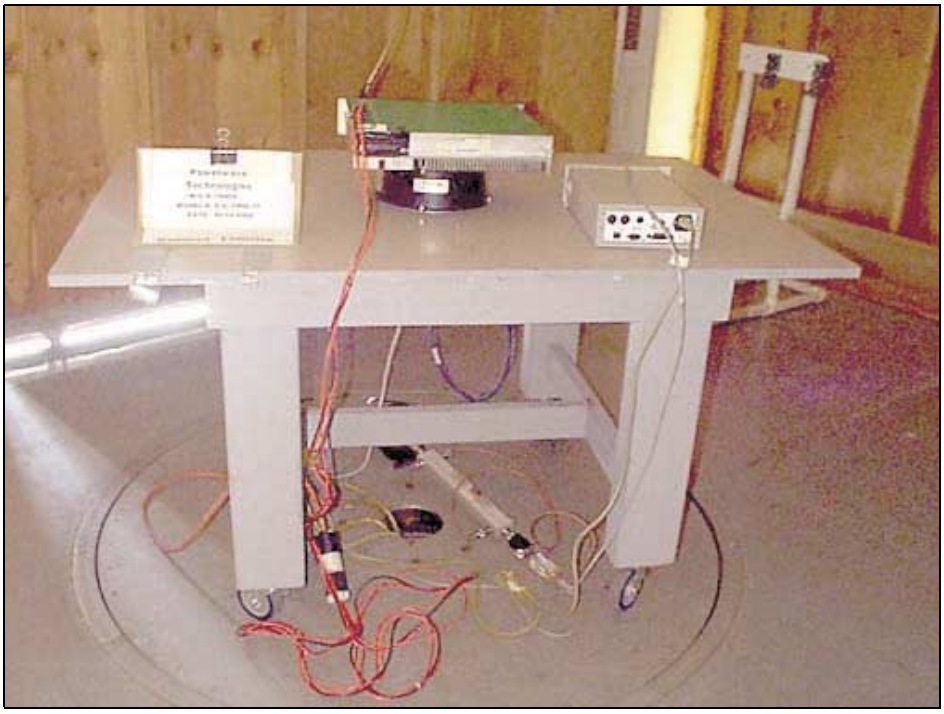
142	429.094M	32.8	+0.0 -28.5	+15.9	+0.4	+3.9	+0.0	24.5	46.0	-21.5	Horiz
143	440.429M	31.9	+0.0 -28.6	+16.1	+0.4	+4.0	+0.0	23.8	46.0	-22.2	Vert
144	2344.650M	37.9	+0.0 +0.0	+0.0 +27.4	+0.0 +4.2	+0.0 -38.4	+0.0	31.1	54.0	-22.9	Vert

Test Equipment:

Equipment	Asset #	Manufacturer	Model #	Serial #	Cal Date	Cal Due
Spectrum Analyzer	01865	HP	8566B	2532A02509	092801	092802
QP Adapter	01437	HP	85650A	3303A01884	092801	092802
Spectrum Analyzer	02467	Agilent	E7405A	US40240225	032902	032903
Bicon Antenna	306	AH	SAS200/540	220	092401	092402
Log Periodic Antenna	331	AH	SAS 00/516	330	092401	092402
Pre-amp	00309	HP	8447D	1937A02548	090501	090502
Antenna cable	NA	NA	RG214	Cable#15	122001	122002
Pre-amp to SA cable	NA	Harbour	RG223/U	Cable#10	071601	071602
Horn Antenna	0849	EMCO	3115	6246	091201	091202
Microwave Pre-amp	00786	HP	83017A	3123A00281	091201	091202
¼" Heliax Coaxial Cable	NA	Andrew	FSJ-50A-4	Cable#7 (6 ft)	071701	071702
¼" Heliax Coaxial Cable	NA	Andrew	LDF1-50	Cable#18 (70 ft)	091101	091102
Antenna cable (from bulkhead to antenna, high frequency hardline) (25ft)	NA	Andrew	FSJ1-50A	Cable#13	07/17/01	07/17/02
SMA Cable	2212	Beldon	9273	NA	101701	101702
Dipole Antenna	NA	CKC	CKC	Set 4	110901	110902
Loop Antenna	00314	EMCO	6502	2014	73101	73102

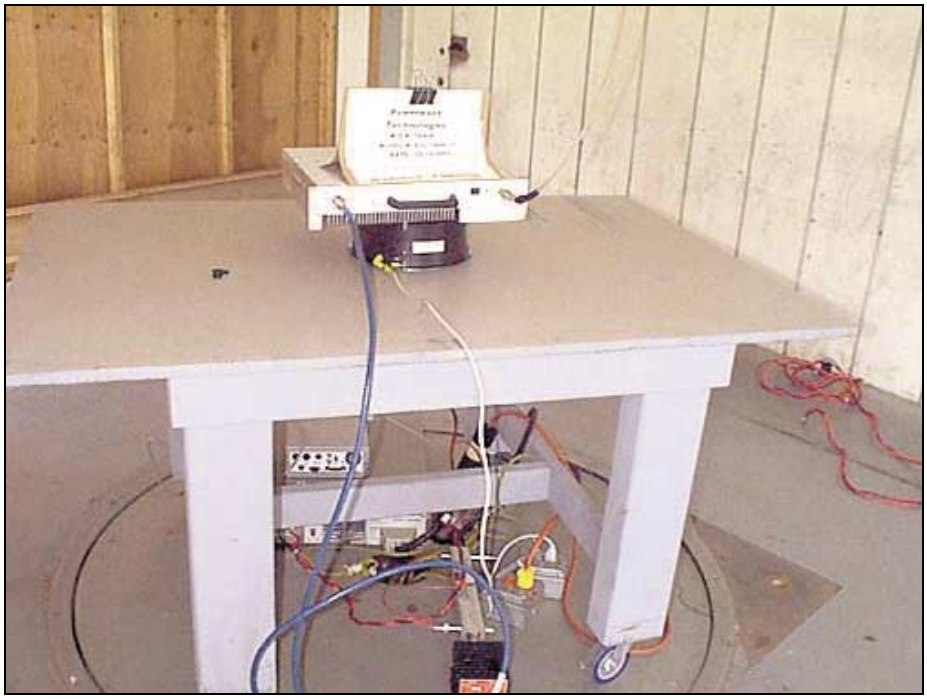


OATS Test Setup - Front View - AC

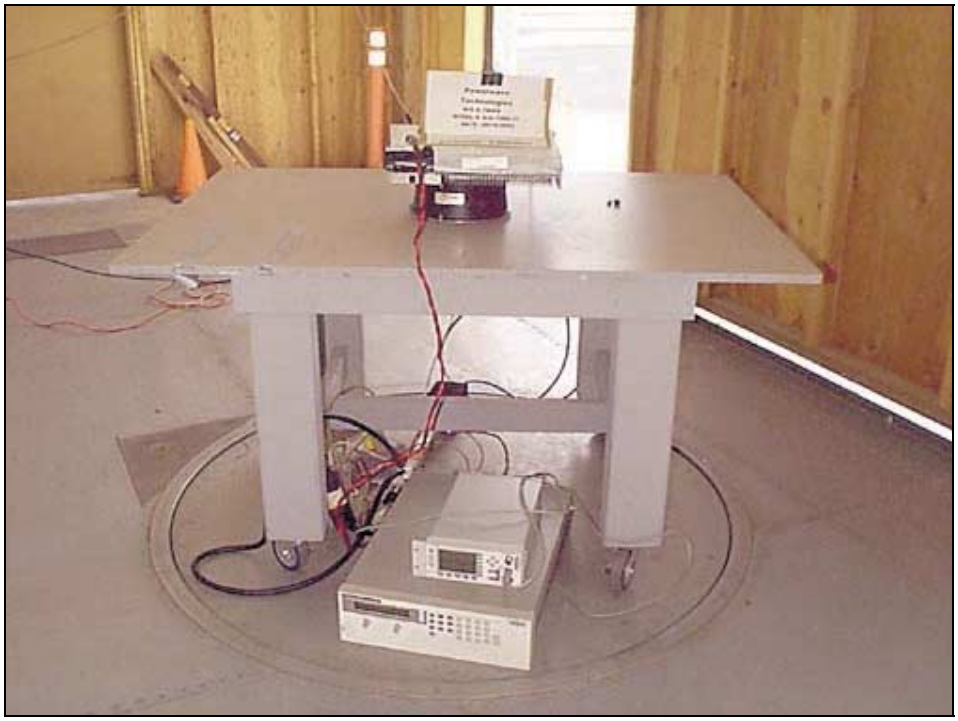


OATS Test Setup - Back View - AC

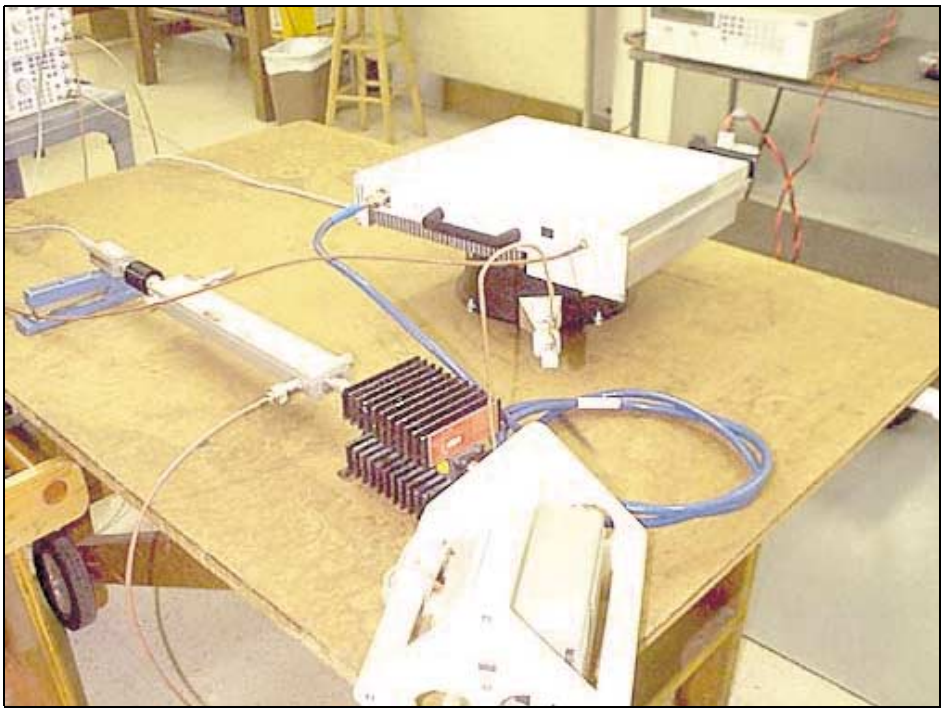
OATS Test Setup - Back View - AC 18-20GHz



OATS Test Setup - Front View - DC



OATS Test Setup - Back View - DC



OATS Test Setup - Back View - DC 18-20 GHz