



**CALIFORNIA AMPLIFIER, INC.  
ADDENDUM TO REPORT FC01-068**

**FOR THE**

**MMDS/MMDS LOW TX IN-BAND TRANSCEIVER, 520031-1 AND 520031-2**

**FCC PART 21 AND  
FCC PART 15 SUBPART B SECTION 15.107**

**COMPLIANCE**

**DATE OF ISSUE: SEPTEMBER 28, 2001**

**PREPARED FOR:**

California Amplifier, Inc.  
460 Calle San Pablo  
Camarillo, CA 93033

P.O. No.: 24035  
W.O. No.: 77604

**PREPARED BY:**

Joyce Walker  
CKC Laboratories, Inc.  
5473A Clouds Rest  
Mariposa, CA 95338

Date of test: September 19, 2001

**Report No.: FC01-068A**

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**CKC Laboratories, Inc. has received Certificates of Accreditation from the following agencies:**

A2LA (USA); DATech (Germany); BSMI (Taiwan); Nemko (Norway); and GOST (Russia).

**CKC Laboratories, Inc has received test site Registration Acceptance from the following agencies:**

FCC (USA); VCCI (Japan); and Industry Canada.

**CKC Laboratories, Inc. has received Letters of Acceptance through an MRA for the following agencies:**

ACA/NATA (Australia); SABS (South Africa); SWEDAC (Sweden); Radio Communications Agency (RA); HOKLAS (Hong Kong); Bakom (Swiss); BIPT (Belgium); Denmark Telestyrelsen; RvA (Netherlands); SEE (Luxembourg) SITTEL (Bolivia); and UKAS (UK).

## ADMINISTRATIVE INFORMATION

**DATE OF TEST:** September 19, 2001

**DATE OF RECEIPT:** September 19, 2001

**PURPOSE OF TEST:** To demonstrate the compliance of the MMDS/MMDS Low TX In-Band Transceiver, 520031-1 and 520031-2 with the requirements for FCC Part 21 and FCC Part 15 Subpart B Section 15.107 Class B devices. This addendum is to correct minor errors in the report on pages 6, 8, 9 and 20-22.

**TEST METHOD:** Part 21 and ANSI C63.4 (1992)

**MANUFACTURER:** California Amplifier, Inc.  
460 Calle San Pablo  
Camarillo, CA 93033

**REPRESENTATIVE:** Shawn Aleman

**TEST LOCATION:** CKC Laboratories, Inc.  
5473A Clouds Rest  
Mariposa, CA 95338

## SUMMARY OF RESULTS

As received, the California Amplifier, Inc. MMDS/MMDS Low TX In-Band Transceiver, 520031-1 and 520031-2 was found to be fully compliant with the following standards and specifications:

### United States

- FCC Part 21
- FCC Part 15 Subpart B Section 15.107 Class B
  - ANSI C63.4 (1992) method

The results in this report apply only to the items tested, as identified herein.

## MODIFICATIONS REQUIRED FOR COMPLIANCE

No modifications were required for compliance

## APPROVALS

### QUALITY ASSURANCE:

A handwritten signature in cursive script that reads "Dennis Ward".

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Dennis Ward, Quality Manager

### TEST PERSONNEL:

A handwritten signature in cursive script that reads "Randy Clark".

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Randy Clark, EMC Engineer

## **EQUIPMENT UNDER TEST (EUT) DESCRIPTION**

The MMDS/MMDS Low TX In-Band Transceivers tested by CKC Laboratories were production units. The difference between the two models is that the 520031-1 has an antenna connector and the 520031-2 does not have an antenna connector. Both models operate using the same circuit boards.

## **EQUIPMENT UNDER TEST**

### **MMDS/MMDS Low TX In-Band Transceiver**

Manuf: California Amplifier, Inc.  
Model: 520031-2  
Serial: 002  
FCC ID: J26520031-2 (pending)

## **PERIPHERAL DEVICES**

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

### **Signal Generator**

Manuf: HP  
Model: E4437B  
Serial: US39260147  
FCC ID: DoC

### **Power Supply**

Manuf: California Amplifier, Inc.  
Model: 71441  
Serial: N/A  
FCC ID: J26520031-2 (pending)

## **TEMPERATURE AND HUMIDITY DURING TESTING**

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

### **2.1033(c)(3) USER'S MANUAL**

The necessary information is contained in a separate document.

### **2.1033(c)(4) TYPE OF EMISSIONS**

The emissions designator for the MMDS/MMDS Low TX In-Band Transceiver is 5M00M1D.

### **2.1033(c)(5) FREQUENCY RANGE**

The transmitter operates at 2500-2542 MHz and the receiver operates at 2584-2686 MHz.

### **2.1033(c)(6) OPERATING POWER**

The minimum operating power is -47dBm at the input with a maximum of 25 dBm.

### **2.1033(c)(7) MAXIMUM POWER RATING**

The maximum power rating as defined in the applicable rule part is +63.26 dBm.

### **2.1033(c)(8) DC VOLTAGES**

The DC voltage applied is 550mA at 6V.

### **2.1033(c)(9) TUNE-UP PROCEDURE**

No tuning is required for specific power levels.

### **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**

Not applicable to this device.

## **2.1033(c)(14)/2.1046/21.904(d) - RF POWER OUTPUT**

**The average channel power is calculated as follows;**

The power is measured using a power meter and a peak detector in dBm/Hz. The channel power is then calculated as follows:

$$\text{dBm/channel} = \text{dBm/Hz} + 10 \cdot \text{LOG}(\text{channel bandwidth in Hz})$$

In this case, the channel bandwidth is 1.6MHz, therefore  
 $10 \cdot \text{LOG}(1.6 \times 10^6) = 62.04\text{dB}$  for all channels.

The limit stated in 21.904 for non-omni-directional antennas is calculated as follows:  
 $\text{EIRP} = 33 \text{ dBW} + 10 \log(X/6) \text{ dBW} + 10 \log(360/\text{beamwidth}) \text{ dBW}$ , where X is the channel width in MHz and  $10 \log(360/\text{beamwidth}) \leq 6 \text{ dB}$ .

The channel bandwidth is 1.6MHz, and the beamwidth of the antenna is  $18^\circ$ , so

$$10 \text{LOG}(1.6\text{MHz}/6\text{MHz}) = -5.74$$

$$10 \text{LOG}(360/18^\circ) = 13.01 \text{ (which is greater than 6dB therefore the maximum of 6dB is used)}$$

$$\begin{aligned} \text{EIRP} &= 33\text{dBW} - 5.74\text{dB} + 6\text{dB} \\ &= 33.26\text{dBW} \\ &= 63.26\text{dBm} \\ &= \mathbf{170.26\text{dBuV}} \end{aligned}$$



## Power Output Calculations

### Radiated Measurements

Channel	Transmit Antenna Polarity	Channel Frequency (MHz)	Channel Power (Watts)
Low	H	2501.70	89.6
Middle	H	2520.77	62.0
High	H	2540.12	59.2
Low	V	2501.88	56.5
Middle	V	2520.85	45.9
High	V	5240.71	48.1

### Antenna Conducted Measurements

Channel	Channel Frequency (MHz)	RF Output Power (dBm)	RF Output Power (Watts)
Low	2501.45	20.9	0.123
Middle	2520.76	20.8	0.120
High	2540.26	21.2	0.133

Maximum Allowable Output Power is:  
33.26dBW (63.2dBm) = 2089 Watts

Power Calculations:

Power=(E\*D)^2/30 G

Channel Power =dBm/Hz + 10\*LOG(channel BW is Hz)

Equipment used:

<b>Equipment</b>	<b>Manufacturer</b>	<b>Model #</b>	<b>Serial #</b>	<b>Asset #</b>	<b>Cal Date</b>	<b>Cal Due</b>
2.4GHz High Pass Filter	K&L Microwave, INC	91H31-3000	00001	01440	10/03/00	10/3/01
2.4GHz Low Pass Filter	K&L Microwave, INC.	10L121-2200/T2400-0/0	1	01439	10/03/00	10/3/01
Antenna, Horn	EMCO	3115	4085	00656	02/28/01	2/28/02
Attenuator	Pasternack	PE7014-40			03/29/01	3/29/02
Cable #8 (6')	Andrew	FSJ1-50A	N/A	N/A	4/16/01	4/16/02
QP Adapter	HP	85650A	2811A01267	00478	11/03/00	11/3/01
S/A Display	HP	8566B	2403A08241	00489	11/3/00	11/3/01
Spectrum Analyzer	HP	8566B	2209A01404	00490	11/3/00	11/3/01
Spectrum Analyzer	HP	8564E	3623A00539	01406	12/12/00	12/12/01



Photograph Showing Direct Connect Test Setup

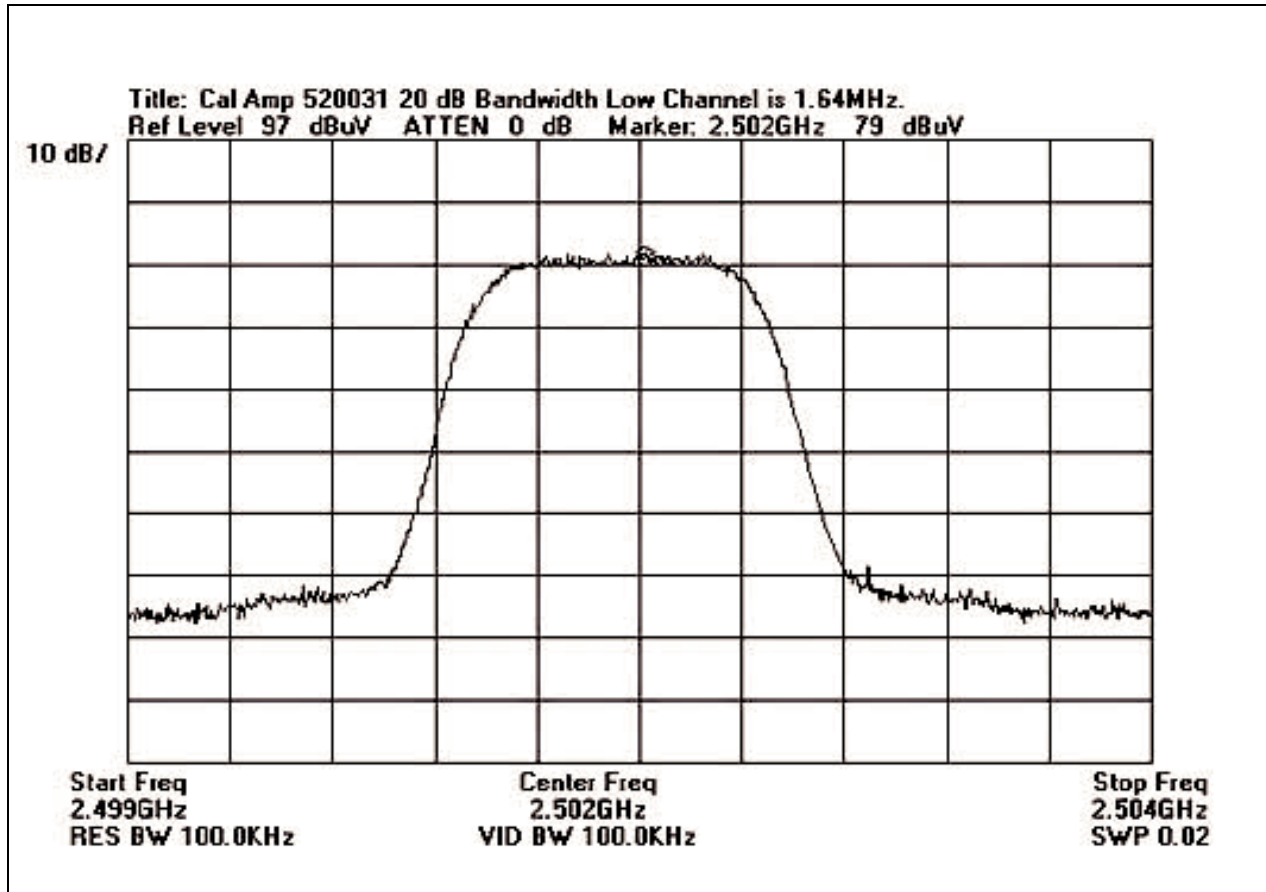
**2.1033(c)(14)/2.1047(a) - MODULATION CHARACTERISTICS - AUDIO FREQUENCY RESPONSE**

Not applicable to this unit.

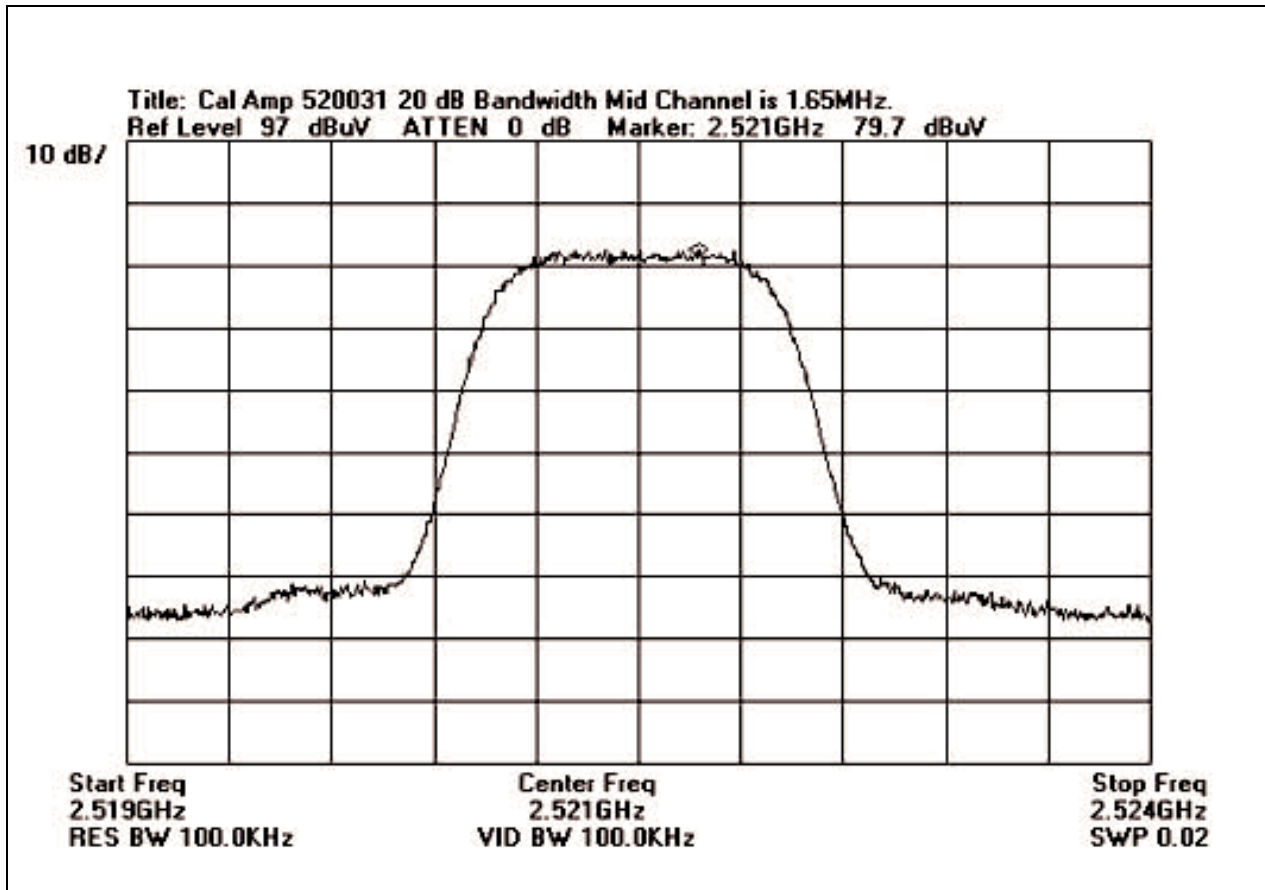
**2.1033(c)(14)/2.1047(b) MODULATION CHARACTERISTICS – Modulation Limiting Response**

Not applicable to this unit.

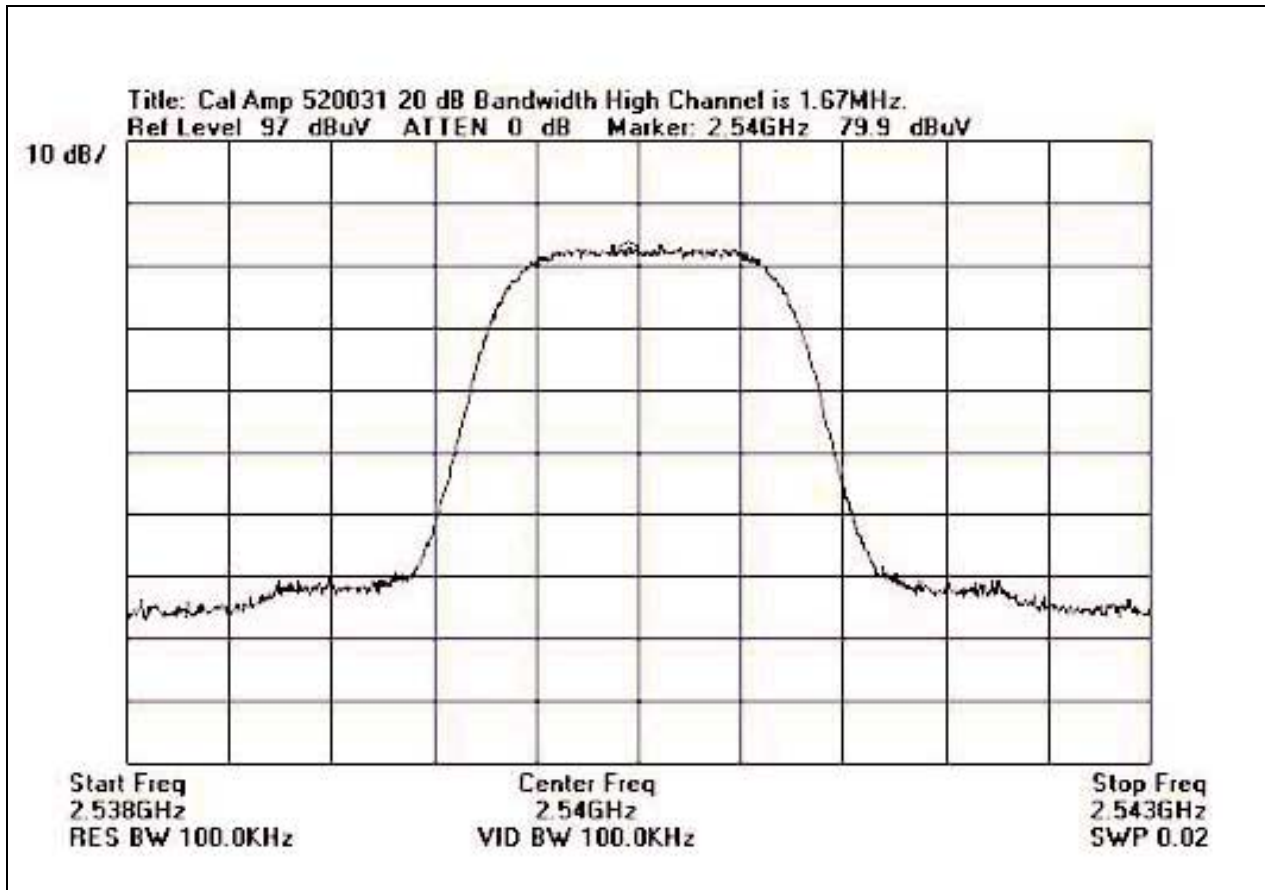
**2.1033(c)(14)/2.1049(i)/21.908(d)- OCCUPIED BANDWIDTH**



Bandwidth Plot - Low Channel



Bandwidth Plot - Middle Channel



Bandwidth Plot - High Channel

Equipment used:

<b><i>Equipment</i></b>	<b><i>Manufacturer</i></b>	<b><i>Model #</i></b>	<b><i>Serial #</i></b>	<b><i>Asset #</i></b>	<b><i>Cal Date</i></b>	<b><i>Cal Due</i></b>
2.4GHz High Pass Filter	K&L Microwave, INC	91H31-3000	00001	01440	10/03/00	10/3/01
2.4GHz Low Pass Filter	K&L Microwave, INC.	10L121-2200/T2400-0/0	1	01439	10/03/00	10/3/01
Antenna, Horn	EMCO	3115	4085	00656	02/28/01	2/28/02
Attenuator	Pasternack	PE7014-40			03/29/01	3/29/02
Cable #8 (6')	Andrew	FSJ1-50A	N/A	N/A	4/16/01	4/16/02
QP Adapter	HP	85650A	2811A01267	00478	11/03/00	11/3/01
S/A Display	HP	8566B	2403A08241	00489	11/3/00	11/3/01
Spectrum Analyzer	HP	8566B	2209A01404	00490	11/3/00	11/3/01
Spectrum Analyzer	HP	8564E	3623A00539	01406	12/12/00	12/12/01



Photograph Showing Direct Connect Test Setup



## **2.1033(c)(14)/2.1051/21.908(d) - SPURIOUS EMISSIONS AT ANTENNA TERMINAL**

Test Location: CKC Laboratories, Inc. • 5473A Clouds Rest • Mariposa, CA 95338 • 800-500-4362  
 Customer: **California Amplifier**  
 Specification: **21.106 / 2.1053**  
 Work Order #: **77604**  
 Test Type: **Maximized Emissions**  
 Equipment: **MMDS Transceiver**  
 Manufacturer: California Amplifier  
 Model: 520031-1  
 S/N: 001

Date: 09/19/2001  
 Time: 11:08:26  
 Sequence#: 2  
 Tested By: Randal Clark

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

Function	Manufacturer	Model #	S/N
MMDS Transceiver*	California Amplifier	520031-1	001

### ***Support Devices:***

Function	Manufacturer	Model #	S/N
Signal Generator	HP	E4437B	US39260147
Power Supply	Cal Amp	71441	N/A

### ***Test Conditions / Notes:***

EUT is a MMDS transceiver with QPSK modulation of 1.2MSps with a bandwidth of 1.6MHz. EUT is set to transmit on the low channel. Antenna conducted measurements. Spurious emissions limit calculated at 60dB down from the carrier. Frequency Range Tested: 30MHz - 26GHz.

<b>Measurement Data:</b>		Reading listed by margin.				Test Distance: None					
#	Freq MHz	Rdng dBμV	Cable dB	Filte dB	Filte dB	Dist dB	Table	Corr dBμV	Spec dBμV	Margin dB	Polar Ant
1	2277.960M	39.0	+0.6	+19.7	+0.0	+0.0		59.3	68.0	-8.7	None
2	15945.880M	42.5	+2.4	+0.0	+9.7	+0.0		54.6	68.0	-13.4	None
3	4555.976M	52.3	+1.6	+0.0	+0.5	+0.0		54.4	68.0	-13.6	None
4	11389.980M	49.7	+1.7	+0.0	+1.3	+0.0		52.7	68.0	-15.3	None
5	13667.970M	37.9	+1.3	+0.0	+11.6	+0.0		50.8	68.0	-17.2	None
6	9325.136M	32.2	+1.4	+0.0	+2.7	+0.0		36.3	68.0	-31.7	None
7	9111.993M	32.3	+1.2	+0.0	+2.1	+0.0		35.6	68.0	-32.4	None
8	11656.400M	30.5	+1.9	+0.0	+1.6	+0.0		34.0	68.0	-34.0	None
9	4662.580M	30.6	+1.6	+0.0	+0.6	+0.0		32.8	68.0	-35.2	None
10	6833.951M	30.3	+2.5	+0.0	-0.3	+0.0		32.5	68.0	-35.5	None



Test Location: CKC Laboratories, Inc. • 5473A Clouds Rest • Mariposa, CA 95338 • 800-500-4362  
 Customer: **California Amplifier**  
 Specification: **21.106 / 2.1053**  
 Work Order #: **77604** Date: 09/19/2001  
 Test Type: **Maximized Emissions** Time: 11:37:30  
 Equipment: **MMDS Transceiver** Sequence#: 3  
 Manufacturer: California Amplifier Tested By: Randal Clark  
 Model: 520031-1  
 S/N: 001

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

Function	Manufacturer	Model #	S/N
MMDS Transceiver*	California Amplifier	520031-1	001

**Support Devices:**

Function	Manufacturer	Model #	S/N
Signal Generator	HP	E4437B	US39260147
Power Supply	Cal Amp	71441	N/A

**Test Conditions / Notes:**

EUT is a MMDS transceiver with QPSK modulation of 1.2MSps with a bandwidth of 1.6MHz. EUT is set to transmit on the middle channel. Antenna conducted measurements. Spurious emissions limit calculated at 60dB down from the carrier. Frequency Range Tested: 30MHz - 26GHz.

<i>Measurement Data:</i>		Reading listed by margin.				Test Distance: None				
#	Freq MHz	Rdng dBμ V	Cable dB	Filte dB	Filte dB	Dist Table	Corr dBμ V	Spec dBμ V	Margin dB	Polar Ant
1	2277.900M	39.0	+0.6	+19.7	+0.0	+0.0	59.3	68.0	-8.7	None
2	15945.830 M	33.1	+2.4	+0.0	+9.7	+0.0	45.2	68.0	-22.8	None
3	11389.980 M	38.4	+1.7	+0.0	+1.3	+0.0	41.4	68.0	-26.6	None
4	4556.130M	39.2	+1.6	+0.0	+0.5	+0.0	41.3	68.0	-26.7	None
5	4662.630M	24.8	+1.6	+0.0	+0.6	+0.0	27.0	68.0	-41.0	None

Test Location: CKC Laboratories, Inc. • 5473A Clouds Rest • Mariposa, CA 95338 • 800-500-4362  
 Customer: **California Amplifier**  
 Specification: **21.106 / 2.1053**  
 Work Order #: **77604**  
 Test Type: **Maximized Emissions**  
 Equipment: **MMDS Transceiver**  
 Manufacturer: **California Amplifier**  
 Model: **520031-1**

Date: 09/19/2001  
 Time: 11:57:45  
 Sequence#: 4  
 Tested By: Randal Clark  
 S/N: 001

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

Function	Manufacturer	Model #	S/N
MMDS Transceiver*	California Amplifier	520031-1	001

**Support Devices:**

Function	Manufacturer	Model #	S/N
Signal Generator	HP	E4437B	US39260147
Power Supply	Cal Amp	71441	N/A

**Test Conditions / Notes:**

EUT is a MMDS transceiver with QPSK modulation of 1.2MSps with a bandwidth of 1.6MHz. EUT is set to transmit on the high channel. Antenna conducted measurements. Spurious emissions limit calculated at 60dB down from the carrier. Frequency Range Tested: 30MHz - 26GHz.

**Measurement Data:**

Reading listed by margin.

Test Distance: None

#	Freq MHz	Rdng dBμV	Cable dB	Filte dB	Filte dB	Dist dB	Table	Corr dBμV	Spec dBμV	Margin dB	Polar Ant
1	2277.900M	39.5	+0.6	+19.7	+0.0	+0.0		59.8	68.0	-8.2	None
2	15945.850M	43.0	+2.4	+0.0	+9.7	+0.0		55.1	68.0	-12.9	None
3	4556.050M	52.2	+1.6	+0.0	+0.5	+0.0		54.3	68.0	-13.7	None
4	13987.600M	33.7	+1.1	+0.0	+16.2	+0.0		51.0	68.0	-17.0	None
5	11389.900M	47.4	+1.7	+0.0	+1.3	+0.0		50.4	68.0	-17.6	None
6	13667.850M	36.9	+1.3	+0.0	+11.6	+0.0		49.8	68.0	-18.2	None
7	9111.900M	32.2	+1.2	+0.0	+2.1	+0.0		35.5	68.0	-32.5	None
8	9325.050M	31.3	+1.4	+0.0	+2.7	+0.0		35.4	68.0	-32.6	None
9	6993.850M	30.9	+2.4	+0.0	+1.6	+0.0		34.9	68.0	-33.1	None
10	4662.550M	32.7	+1.6	+0.0	+0.6	+0.0		34.9	68.0	-33.1	None
11	11656.450M	29.4	+1.9	+0.0	+1.6	+0.0		32.9	68.0	-35.1	None
12	5080.700M	29.2	+1.4	+0.0	+1.4	+0.0		32.0	68.0	-36.0	None
13	6833.950M	29.0	+2.5	+0.0	-0.3	+0.0		31.2	68.0	-36.8	None

**VIDEO BANDWIDTH AND RESOLUTION BANDWIDTH SETTINGS:**

BEGINNING FREQUENCY	ENDING FREQUENCY	BANDWIDTH SETTING
30 MHz	1000 MHz	120 kHz
1000 MHz	26 GHz	1 MHz

Equipment	Manufacturer	Model #	Serial #	Asset #	Cal Date	Cal Due
2.4GHz High Pass Filter	K&L Microwave, INC	91H31-3000	00001	01440	10/03/00	10/3/01
2.4GHz Low Pass Filter	K&L Microwave, INC.	10L121-2200/T2400-0/0	1	01439	10/03/00	10/3/01
Antenna, Horn	EMCO	3115	4085	00656	02/28/01	2/28/02
Attenuator	Pasternack	PE7014-40			03/29/01	3/29/02
Cable #8 (6')	Andrew	FSJ1-50A	N/A	N/A	4/16/01	4/16/02
QP Adapter	HP	85650A	2811A01267	00478	11/03/00	11/3/01
S/A Display	HP	8566B	2403A08241	00489	11/3/00	11/3/01
Spectrum Analyzer	HP	8566B	2209A01404	00490	11/3/00	11/3/01
Spectrum Analyzer	HP	8564E	3623A00539	01406	12/12/00	12/12/01



Photograph Showing Direct Connect Test Setup

## **2.1033(c)(14)/2.1053/21.908(d) - FIELD STRENGTH OF SPURIOUS RADIATION**

### **Calculation of Emissions Mask for OATS Measurements:**

Emissions Mask calculated using the relative measurement technique IAW 21.908(e) using the peak detector function of a spectrum analyzer. The resolution bandwidth of the peak “flat top” reading of the digital signal is 100kHz. Radiated spurious emissions are also measured at 100kHz. Therefore attenuation (dBc) at each spectral point of concern ( $A + 10 \cdot \log(RBW1/RBW2)$  where A is 25, 40 and 60dBc) is calculated as follows;

$$10 \cdot \log(RBW1/RBW2) =$$

$$10 \cdot \log(100\text{kHz}/100\text{kHz}) = 0$$

Thus the attenuation (dBc) is 25, 40 and 60.

The median peak flattop level of fundamental is 28.3dBm (135.3dBuV)

The attenuation is as follows:

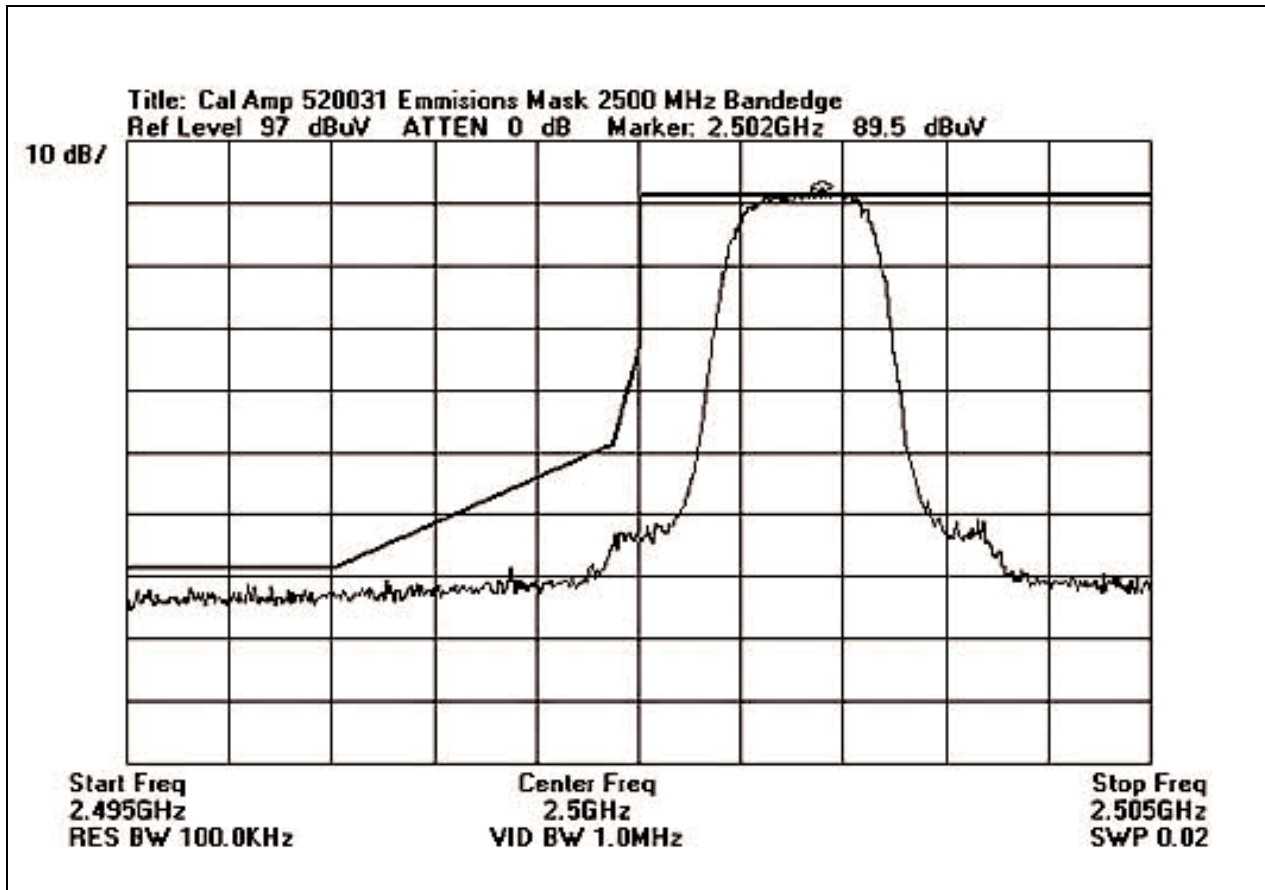
25dBc or 3.3dBm ( 110.3dBuV) at the channel edge

From that point on a linear slope to 40dBc or –11.7dBm (95.3dBuV) at 250kHz removed from the channel edge.

From that point on a linear slope to 60dBc or –31.7 (75.3dBuV) at 3MHz removed from the channel edge.

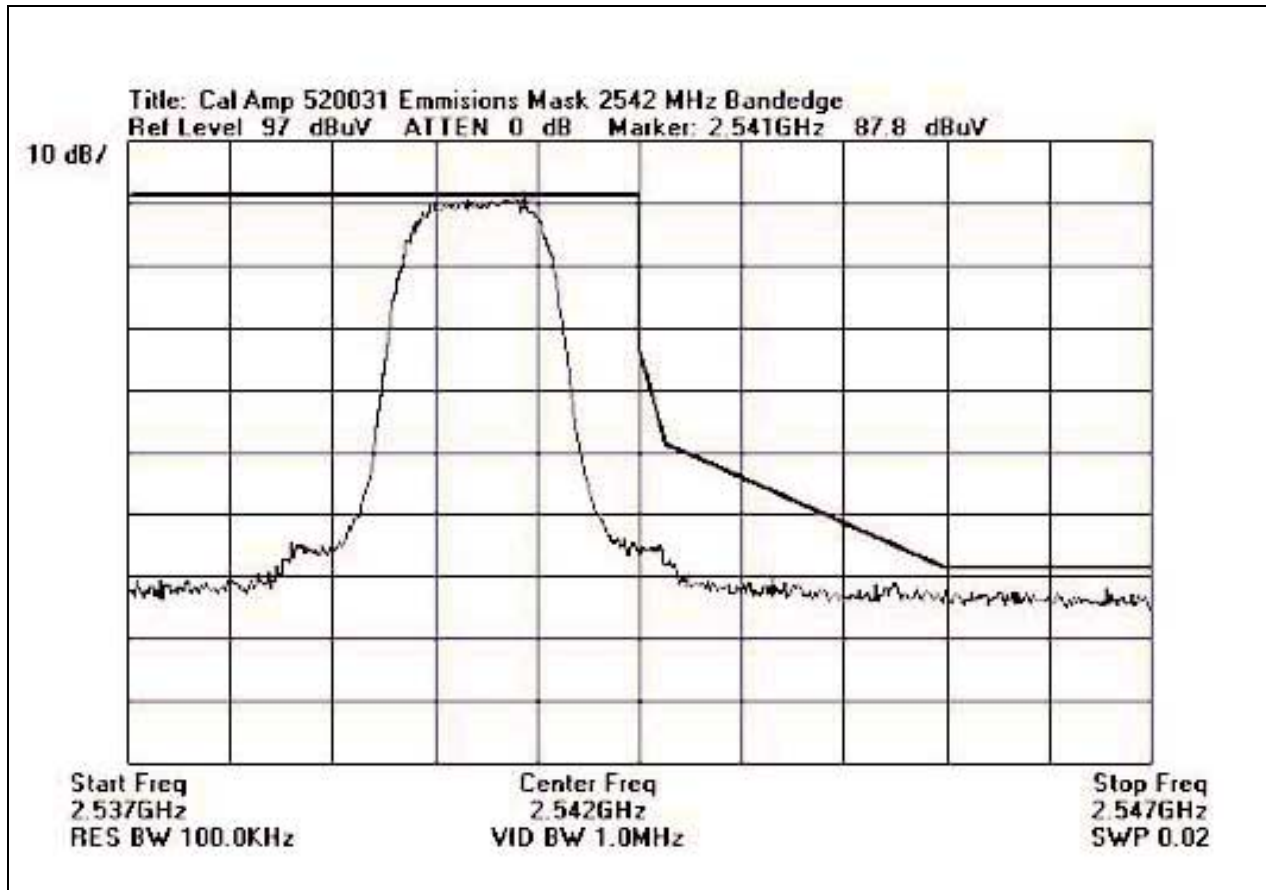
60dBc or –31.7dBm (75.3dBuV) at all other frequencies.

**Note:** The following plots are uncorrected for antenna factors, amplifiers or cable factors. The above mask was adjusted to the uncorrected reading so it could be shown graphically. The highest output power was recorded from the lowest channel at 89.5 dBuV (uncorrected).



Bandedge - 2500 MHz

Note: Limit line shown has been adjusted for the factors associated with the test equipment.



Bandedge - 2542 MHz

Note: Limit line shown has been adjusted for the factors associated with the test equipment.

Test Location: CKC Laboratories, Inc. • 5473A Clouds Rest • Mariposa, CA 95338 • 800-500-4362

Customer: **California Amplifier**

Specification: **FCC 21.904(b)**

Work Order #: **77604**

Date: 09/20/2001

Test Type: **Maximized Emissions**

Time: 08:10:47

Equipment: **MMDS Transceiver**

Sequence#: 5

Manufacturer: California Amplifier

Tested By: Randal Clark

Model: 520031-2

S/N: 002

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

Function	Manufacturer	Model #	S/N
MMDS Transceiver*	California Amplifier	520031-2	002

**Support Devices:**

Function	Manufacturer	Model #	S/N
Signal Generator	HP	E4437B	US39260147
Power Supply	Cal Amp	71441	N/A

**Test Conditions / Notes:**

EUT is a MMDS transceiver with QPSK modulation of 1.2MSps with a bandwidth of 1.6MHz. EUT is set to transmit on the indicated channel. Antenna polarity is horizontal. Frequency Range Tested: 2500-2542MHz .

**Measurement Data:**

Reading listed by margin.

Test Distance: 3 Meters

#	Freq MHz	Rdng dBμV	Cable dB	Horn Norma dB	dBm t dB	Cable dB	Dist Table	Corr dBμV/m	Spec dBμV/m	Margin dB	Polar Ant
1	2501.695M	-69.0	+2.8	+28.8 +62.0	+107.0	+5.3	+10.0	146.9	170.2 dBm per Hz converted to dBuV/1.6MHz	-23.3	Horiz
2	2520.765M	-70.6	+2.8	+28.8 +62.0	+107.0	+5.3	+10.0	145.3	170.2 dBm per Hz converted to dBuV/1.6MHz	-24.9	Horiz
3	2540.115M	-70.9	+2.9	+28.8 +62.0	+107.0	+5.3	+10.0	145.1	170.2 dBm per Hz converted to dBuV/1.6MHz	-25.1	Horiz
4	2501.440M	89.8	+2.8	+28.8 +0.0	+0.0	+5.3	+10.0	136.7	170.2 Flat top measurement.	-33.5	Horiz
5	2520.865M	89.2	+2.8	+28.8 +0.0	+0.0	+5.3	+10.0	136.1	170.2 Flat top measurement.	-34.1	Horiz
6	2540.250M	88.3	+2.9	+28.8 +0.0	+0.0	+5.3	+10.0	135.3	170.2 Flat top measurement.	-34.9	Horiz

7	2502.005M	-92.6	+2.8	+28.8	+62.0	+107.0	+5.3	+10.0	123.3	170.2	-46.9	Vert
										dBm per Hz converted to dBuV/1.6MHz		
8	2520.655M	-94.5	+2.8	+28.8	+62.0	+107.0	+5.3	+10.0	121.4	170.2	-48.8	Vert
										dBm per Hz converted to dBuV/1.6MHz		
9	2540.425M	-97.4	+2.9	+28.8	+62.0	+107.0	+5.3	+10.0	118.6	170.2	-51.6	Vert
										dBm per Hz converted to dBuV/1.6MHz		



Test Location: CKC Laboratories, Inc. • 5473A Clouds Rest • Mariposa, CA 95338 • 800-500-4362

Customer: **California Amplifier**

Specification: **21.908 / 2.1053**

Work Order #: **77604**

Date: 09/20/2001

Test Type: **Maximized Emissions**

Time: 08:33:52

Equipment: **MMDS Transceiver**

Sequence#: 6

Manufacturer: California Amplifier

Tested By: Randal Clark

Model: 520031-2

S/N: 002

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

Function	Manufacturer	Model #	S/N
MMDS Transceiver*	California Amplifier	520031-2	002

**Support Devices:**

Function	Manufacturer	Model #	S/N
Signal Generator	HP	E4437B	US39260147
Power Supply	Cal Amp	71441	N/A

**Test Conditions / Notes:**

EUT is a MMDS transceiver with QPSK modulation of 1.2MSps with a bandwidth of 1.6MHz. EUT is set to transmit on the low channel. Antenna polarity is horizontal. Frequency Range Tested: 30 MHz - 26GHz. Harmonics of the fundamental are below the noise floor shown.

**Measurement Data:**

Reading listed by margin.

Test Distance: 3 Meters

#	Freq MHz	Rdng dBμV	Amp Cable dB	Horn Filt dB	Cable Filt dB	Cable dB	Dist Table	Corr dBμV/m	Spec dBμV/m	Margin dB	Polar Ant
1	2277.987M	39.6	-34.7 +2.5	+27.8 +0.0	+0.3 +19.7	+5.0	+10.0	70.2	75.3	-5.1	Vert
2	4556.010M	46.8	-32.3 +2.9	+32.3 +0.5	+0.9 +0.0	+7.0	+10.0	68.1	75.3	-7.2	Horiz
3	7504.520M Ambient	30.9	-33.2 +4.1	+35.3 +5.4	+0.9 +0.0	+8.9	+10.0	62.3	75.3 3rd Harmonic (Noise Floor)	-13.0	Horiz
4	6833.970M	36.2	-33.3 +3.2	+34.9 -0.3	+1.9 +0.0	+8.4	+10.0	61.0	75.3	-14.3	Horiz
5	10006.060 M Ambient	29.4	-34.5 +4.6	+36.8 +3.6	+0.8 +0.0	+8.3	+10.0	59.0	75.3 4th Harmonic (Noise Floor)	-16.3	Horiz
6	4555.986M	36.5	-32.3 +2.9	+32.3 +0.5	+0.9 +0.0	+7.0	+10.0	57.8	75.3	-17.5	Vert
7	5003.120M Ambient	25.8	-33.0 +3.7	+33.2 +0.9	+1.0 +0.0	+7.3	+10.0	48.9	75.3 2nd Harmonic (Noise Floor)	-26.4	Horiz

Test Location: CKC Laboratories, Inc. • 5473A Clouds Rest • Mariposa, CA 95338 • 800-500-4362

Customer: **California Amplifier**

Specification: **21.908 / 2.1053**

Work Order #: **77604**

Date: 09/20/2001

Test Type: **Maximized Emissions**

Time: 08:32:30

Equipment: **MMDS Transceiver**

Sequence#: 7

Manufacturer: California Amplifier

Tested By: Randal Clark

Model: 520031-2

S/N: 002

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

Function	Manufacturer	Model #	S/N
MMDS Transceiver*	California Amplifier	520031-2	002

**Support Devices:**

Function	Manufacturer	Model #	S/N
Signal Generator	HP	E4437B	US39260147
Power Supply	Cal Amp	71441	N/A

**Test Conditions / Notes:**

EUT is a MMDS transceiver with QPSK modulation of 1.2MSps with a bandwidth of 1.6MHz. EUT is set to transmit on the middle channel. Antenna polarity is horizontal. Frequency Range Tested: 30 MHz - 26GHz. Harmonics of the fundamental are below the noise floor shown.

**Measurement Data:**

Reading listed by margin.

Test Distance: 3 Meters

#	Freq MHz	Rdng dBμV	Amp Cable dB	Horn Filt dB	Cable Filt dB	Cable dB	Dist Table	Corr dBμV/m	Spec dBμV/m	Margin dB	Polar Ant
1	2277.988M	39.5	-34.7 +2.5	+27.8 +0.0	+0.3 +19.7	+5.0	+10.0	70.1	75.3	-5.2	Horiz
2	4555.970M	47.1	-32.3 +2.9	+32.3 +0.5	+0.9 +0.0	+7.0	+10.0	68.4	75.3	-6.9	Horiz
3	6834.000M	37.4	-33.3 +3.2	+34.9 -0.3	+1.9 +0.0	+8.4	+10.0	62.2	75.3	-13.1	Horiz
4	10084.070 M Ambient	30.8	-34.2 +4.6	+37.0 +3.3	+0.9 +0.0	+8.8	+10.0	61.2	75.3 4th Harmonic (Noise Floor)	-14.1	Horiz
5	7563.000M Ambient	27.6	-33.3 +4.1	+35.3 +5.2	+1.0 +0.0	+8.7	+10.0	58.6	75.3 3rd Harmonic (Noise Floor)	-16.7	Horiz
6	4555.992M	36.3	-32.3 +2.9	+32.3 +0.5	+0.9 +0.0	+7.0	+10.0	57.6	75.3	-17.7	Vert
7	5042.000M Ambient	25.9	-33.1 +3.7	+33.4 +1.2	+1.0 +0.0	+7.3	+10.0	49.4	75.3 2nd Harmonic (Noise Floor)	-25.9	Horiz

Test Location: CKC Laboratories, Inc. • 5473A Clouds Rest • Mariposa, CA 95338 • 800-500-4362

Customer: **California Amplifier**

Specification: **21.908 / 2.1053**

Work Order #: **77604**

Date: 09/20/2001

Test Type: **Maximized Emissions**

Time: 08:31:20

Equipment: **MMDS Transceiver**

Sequence#: 8

Manufacturer: California Amplifier

Tested By: Randal Clark

Model: 520031-2

S/N: 002

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

Function	Manufacturer	Model #	S/N
MMDS Transceiver*	California Amplifier	520031-2	002

**Support Devices:**

Function	Manufacturer	Model #	S/N
Signal Generator	HP	E4437B	US39260147
Power Supply	Cal Amp	71441	N/A

**Test Conditions / Notes:**

EUT is a MMDS transceiver with QPSK modulation of 1.2MSps with a bandwidth of 1.6MHz. EUT is set to transmit on the high channel. Antenna polarity is horizontal. Frequency Range Tested: 30 MHz - 26GHz. Harmonics of the fundamental are below the noise floor shown.

**Measurement Data:**

Reading listed by margin.

Test Distance: 3 Meters

#	Freq MHz	Rdng dBμV	Amp Cable dB	Horn Filt dB	Cable Filt dB	Cable dB	Dist Table	Corr dBμV/m	Spec dBμV/m	Margin dB	Polar Ant
1	2277.998M	39.7	-34.7 +2.5	+27.8 +0.0	+0.3 +19.7	+5.0	+10.0	70.3	75.3	-5.0	Horiz
2	4555.968M	46.3	-32.3 +2.9	+32.3 +0.5	+0.9 +0.0	+7.0	+10.0	67.6	75.3	-7.7	Horiz
3	10160.720 M Ambient	30.3	-34.0 +4.7	+37.1 +3.1	+0.9 +0.0	+9.2	+10.0	61.3	75.3	-14.0	Horiz
									4th Harmonic (Noise Floor)		
4	7620.480M Ambient	27.5	-33.3 +4.0	+35.2 +5.0	+1.1 +0.0	+8.5	+10.0	58.0	75.3	-17.3	Horiz
									3rd Harmonic (Noise Floor)		
5	4555.952M	35.8	-32.3 +2.9	+32.3 +0.5	+0.9 +0.0	+7.0	+10.0	57.1	75.3	-18.2	Vert
6	5080.320M Ambient	24.8	-33.1 +3.6	+33.6 +1.4	+0.9 +0.0	+7.3	+10.0	48.5	75.3	-26.8	Horiz
									2nd Harmonic (Noise Floor)		

Test Location: CKC Laboratories, Inc. • 5473A Clouds Rest • Mariposa, CA 95338 • 800-500-4362

Customer: **California Amplifier**

Specification: **FCC 21.904(b)**

Work Order #: **77604**

Date: 09/20/2001

Test Type: **Maximized Emissions**

Time: 09:12:02

Equipment: **MMDS Transceiver**

Sequence#: 9

Manufacturer: California Amplifier

Tested By: Randal Clark

Model: 520031-2

S/N: 002

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

Function	Manufacturer	Model #	S/N
MMDS Transceiver*	California Amplifier	520031-2	002

**Support Devices:**

Function	Manufacturer	Model #	S/N
Signal Generator	HP	E4437B	US39260147
Power Supply	Cal Amp	71441	N/A

**Test Conditions / Notes:**

EUT is a MMDS transceiver with QPSK modulation of 1.2MSps with a bandwidth of 1.6MHz. EUT is set to transmit on the indicated channel. Antenna polarity is vertical. Frequency Range Tested: 2500-2542MHz.

**Measurement Data:**

Reading listed by margin.

Test Distance: 3 Meters

#	Freq MHz	Rdng dBμV	Cable dB	Horn Norma dB	dBm t dB	Cable dB	Dist Table	Corr dBμV/m	Spec dBμV/m	Margin dB	Polar Ant
1	2501.875M	-71.0	+2.8	+28.8 +62.0	+107.0	+5.3	+10.0	144.9	170.2 dBm per Hz converted to dBuV/1.6MHz	-25.3	Vert
2	2540.705M	-71.8	+2.9	+28.8 +62.0	+107.0	+5.3	+10.0	144.2	170.2 dBm per Hz converted to dBuV/1.6MHz	-26.0	Vert
3	2520.845M	-71.9	+2.8	+28.8 +62.0	+107.0	+5.3	+10.0	144.0	170.2 dBm per Hz converted to dBuV/1.6MHz	-26.2	Vert
4	2501.820M	87.1	+2.8	+28.8 +0.0	+0.0	+5.3	+10.0	134.0	170.2 Flat top measurement.	-36.2	Vert
5	2520.620M	85.3	+2.8	+28.8 +0.0	+0.0	+5.3	+10.0	132.2	170.2 Flat top measurement.	-38.0	Vert
6	2540.540M	85.0	+2.9	+28.8 +0.0	+0.0	+5.3	+10.0	132.0	170.2 Flat top measurement.	-38.2	Vert

Test Location: CKC Laboratories, Inc. • 5473A Clouds Rest • Mariposa, CA 95338 • 800-500-4362

Customer: **California Amplifier**

Specification: **21.908 / 2.1053**

Work Order #: **77604**

Date: 09/20/2001

Test Type: **Maximized Emissions**

Time: 09:47:28

Equipment: **MMDS Transceiver**

Sequence#: 10

Manufacturer: California Amplifier

Tested By: Randal Clark

Model: 520031-2

S/N: 002

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

Function	Manufacturer	Model #	S/N
MMDS Transceiver*	California Amplifier	520031-2	002

**Support Devices:**

Function	Manufacturer	Model #	S/N
Signal Generator	HP	E4437B	US39260147
Power Supply	Cal Amp	71441	N/A

**Test Conditions / Notes:**

EUT is a MMDS transceiver with QPSK modulation of 1.2MSps with a bandwidth of 1.6MHz. EUT is set to transmit on the low channel. Antenna polarity is vertical. Frequency Range Tested: 30 MHz - 26GHz. Harmonics of the fundamental are below the noise floor shown.

**Measurement Data:**

Reading listed by margin.

Test Distance: 3 Meters

#	Freq MHz	Rdng dBμV	Amp Cable dB	Horn Filt dB	Cable Filt dB	Cable dB	Dist Table	Corr dBμV/m	Spec dBμV/m	Margin dB	Polar Ant
1	4555.976M	49.1	-32.3 +2.9	+32.3 +0.5	+0.9 +0.0	+7.0	+10.0	70.4	75.3	-4.9	Vert
2	2277.990M	37.4	-34.7 +2.5	+27.8 +0.0	+0.3 +19.7	+5.0	+10.0	68.0	75.3	-7.3	Vert
3	6833.977M	34.2	-33.3 +3.2	+34.9 -0.3	+1.9 +0.0	+8.4	+10.0	59.0	75.3	-16.3	Vert
4	4555.983M	35.7	-32.3 +2.9	+32.3 +0.5	+0.9 +0.0	+7.0	+10.0	57.0	75.3	-18.3	Horiz
5	10006.160 M	22.3	-34.5 +4.6	+36.8 +3.6	+0.8 +0.0	+8.3	+10.0	51.9	75.3	-23.4	Vert
									4th Harmonic (Noise Floor)		
6	7504.620M	17.6	-33.2 +4.1	+35.3 +5.4	+0.9 +0.0	+8.9	+10.0	49.0	75.3	-26.3	Vert
									3rd Harmonic (Noise Floor)		
7	5003.080M	21.6	-33.0 +3.7	+33.2 +0.9	+1.0 +0.0	+7.3	+10.0	44.7	75.3	-30.6	Vert
									2nd Harmonic (Noise Floor)		

Test Location: CKC Laboratories, Inc. • 5473A Clouds Rest • Mariposa, CA 95338 • 800-500-4362

Customer: **California Amplifier**

Specification: **21.908 / 2.1053**

Work Order #: **77604**

Date: 09/20/2001

Test Type: **Maximized Emissions**

Time: 09:48:37

Equipment: **MMDS Transceiver**

Sequence#: 11

Manufacturer: California Amplifier

Tested By: Randal Clark

Model: 520031-2

S/N: 002

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

Function	Manufacturer	Model #	S/N
MMDS Transceiver*	California Amplifier	520031-2	002

**Support Devices:**

Function	Manufacturer	Model #	S/N
Signal Generator	HP	E4437B	US39260147
Power Supply	Cal Amp	71441	N/A

**Test Conditions / Notes:**

EUT is a MMDS transceiver with QPSK modulation of 1.2MSps with a bandwidth of 1.6MHz. EUT is set to transmit on the middle channel. Antenna polarity is vertical. Frequency Range Tested: 30 MHz - 26GHz. Harmonics of the fundamental are below the noise floor shown.

**Measurement Data:**

Reading listed by margin.

Test Distance: 3 Meters

#	Freq MHz	Rdng dBμV	Amp Cable dB	Horn dB	Cable Filt dB	Cable dB	Dist Table	Corr dBμV/m	Spec dBμV/m	Margin dB	Polar Ant
1	4555.971M	48.8	-32.3 +2.9	+32.3	+0.9 +0.0	+7.0	+10.0	69.6	75.3	-5.7	Vert
2	2278.008M	37.1	-34.7 +2.5	+27.8	+0.3 +19.7	+5.0	+10.0	67.7	75.3	-7.6	Vert
3	6833.998M	32.3	-33.3 +3.2	+34.9	+1.9 +0.0	+8.4	+10.0	57.4	75.3	-17.9	Vert
4	4555.947M	34.5	-32.3 +2.9	+32.3	+0.9 +0.0	+7.0	+10.0	55.3	75.3	-20.0	Horiz
5	10084.000 M	20.2	-34.2 +4.6	+37.0	+0.9 +0.0	+8.8	+10.0	47.3	75.3	-28.0	Vert
6	7563.000M	17.7	-33.3 +4.1	+35.3	+1.0 +0.0	+8.7	+10.0	43.5	75.3 3rd Harmonic (Noise Floor)	-31.8	Vert
7	5042.000M	20.5	-33.1 +3.7	+33.4	+1.0 +0.0	+7.3	+10.0	42.8	75.3 2nd Harmonic (Noise Floor)	-32.5	Vert

Test Location: CKC Laboratories, Inc. • 5473A Clouds Rest • Mariposa, CA 95338 • 800-500-4362

Customer: **California Amplifier**

Specification: **21.908 / 2.1053**

Work Order #: **77604**

Date: 09/20/2001

Test Type: **Maximized Emissions**

Time: 09:51:12

Equipment: **MMDS Transceiver**

Sequence#: 12

Manufacturer: California Amplifier

Tested By: Randal Clark

Model: 520031-2

S/N: 002

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

Function	Manufacturer	Model #	S/N
MMDS Transceiver*	California Amplifier	520031-2	002

**Support Devices:**

Function	Manufacturer	Model #	S/N
Signal Generator	HP	E4437B	US39260147
Power Supply	Cal Amp	71441	N/A

**Test Conditions / Notes:**

EUT is a MMDS transceiver with QPSK modulation of 1.2MSps with a bandwidth of 1.6MHz. EUT is set to transmit on the high channel. Antenna polarity is vertical. Frequency Range Tested: 30 MHz - 26GHz. Harmonics of the fundamental are below the noise floor shown.

**Measurement Data:**

Reading listed by margin.

Test Distance: 3 Meters

#	Freq MHz	Rdng dBμV	Amp Cable dB	Horn Filtre dB	Cable Filtre dB	Cable dB	Dist Table	Corr dBμV/m	Spec dBμV/m	Margin dB	Polar Ant
1	4555.975M	49.8	-32.3 +2.9	+32.3 +0.5	+0.9 +0.0	+7.0	+10.0	71.1	75.3	-4.2	Vert
2	2277.988M	37.6	-34.7 +2.5	+27.8 +0.0	+0.3 +19.7	+5.0	+10.0	68.2	75.3	-7.1	Vert
3	6833.965M	31.6	-33.3 +3.2	+34.9 -0.3	+1.9 +0.0	+8.4	+10.0	56.4	75.3	-18.9	Vert
4	4555.981M	34.4	-32.3 +2.9	+32.3 +0.5	+0.9 +0.0	+7.0	+10.0	55.7	75.3	-19.6	Horiz
5	10162.000 M	21.9	-34.0 +4.7	+37.1 +3.1	+0.9 +0.0	+9.3	+10.0	53.0	75.3	-22.3	Vert
									4th Harmonic (Noise Floor)		
6	7621.500M	21.4	-33.3 +4.0	+35.2 +5.0	+1.1 +0.0	+8.5	+10.0	51.9	75.3	-23.4	Vert
									3rd Harmonic (Noise Floor)		
7	5081.000M	23.0	-33.1 +3.6	+33.6 +1.4	+0.9 +0.0	+7.3	+10.0	46.7	75.3	-28.6	Vert
									2nd Harmonic (Noise Floor)		

**VIDEO BANDWIDTH AND RESOLUTION BANDWIDTH SETTINGS:**

BEGINNING FREQUENCY	ENDING FREQUENCY	BANDWIDTH SETTING
30 MHz	1000 MHz	120 kHz
1000 MHz	26 GHz	1 MHz

Equipment	Manufacturer	Model #	Serial #	Asset #	Cal Date	Cal Due
18-26GHz Horn Antenna	HP	84125-80008	942126-003	01413	7/9/01	7/9/02
2.4GHz High Pass Filter	K&L Microwave, INC	91H31-3000	00001	01440	10/03/00	10/3/01
2.4GHz Low Pass Filter	K&L Microwave, INC.	10L121-2200/T2400-0/0	1	01439	10/03/00	10/3/01
3/10 meter Cable	Andrews	Hardline	N/A	N/A	02/27/01	2/27/02
Antenna, Bicon	A&H	SAS-200/542	156	00225	12/8/00	12/8/01
Antenna, Horn	EMCO	3115	4085	00656	02/28/01	2/28/02
Antenna, Log	A&H	SAS-200/510	154	01330	05/07/01	5/7/02
Cable #2 (2')	Andrew	FSJ1-50A	N/A	N/A	4/16/01	4/16/02
Cable #4 (50')	Andrew	FSJ1-50A	N/A	N/A	4/16/01	4/16/02
Cable #7 (25')	Andrew	FSJ1-50A	N/A	N/A	4/16/01	4/16/02
Preamp	HP	8447D	1937A02604	00099	03/29/01	3/29/02
Preamp	HP	8449B	3008A00301	02010	10/13/00	10/13/01
QP Adapter	HP	85650A	2811A01267	00478	11/03/00	11/3/01
S/A Display	HP	8566B	2403A08241	00489	11/3/00	11/3/01
Spectrum Analyzer	HP	8566B	2209A01404	00490	11/3/00	11/3/01
Spectrum Analyzer	HP	8564E	3623A00539	01406	12/12/00	12/12/01





Front View, Horizontal Position



Back View, Horizontal Position



Front View, Vertical Position



Back View, Vertical Position

**2.1033(c)(14)/2.1055/21.101- FREQUENCY STABILITY**

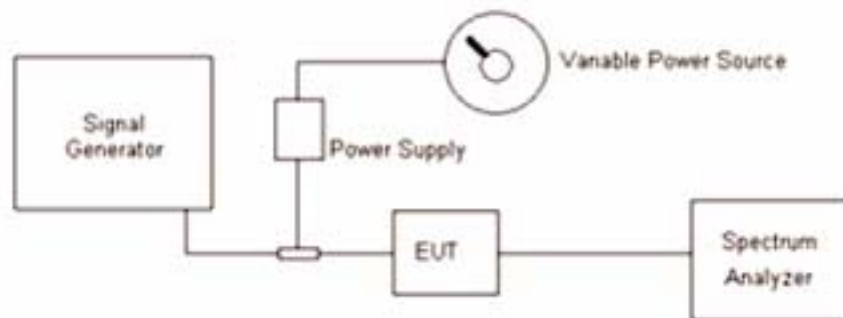
**AC Mains Variations**

**Temperature      23°C**

Voltage	Frequency (MHz)	Delta
102	2331.2884	5.7
120	2331.2885	5.6
138	2331.2884	5.7

Voltage Variation Equipment	Manufacturer	Model #	Serial #	Asset #	Cal Date	Cal Due
Digital Multimeter	Radio Shack	22-183	NA	1241	8/30/01	8/30/02
Power Stat	Superior Electric	126	N/A	2037	3/29/01	3/29/02
QP Adapter	HP	85650A	2811A01267	478	11/3/00	11/3/01
S/A Display	HP	8566B	2403A08241	489	11/3/00	11/3/01
Spectrum Analyzer	HP	8566B	2209A01404	490	11/3/00	11/3/01

**Notes:** 1) Frequency stability test was performed on the TX reference clock. A spectrum analyzer was used in lieu of a frequency counter because the fundamental has a much higher output. 2) Temperature testing has been performed by Cal Amp and will be provided as a separate document.



**California Amplifier setup diagram for voltage variations.**

## 15.207 – AC CONDUCTED EMISSIONS

Test Location: CKC Laboratories, Inc. • 5473A Clouds Rest • Mariposa, CA 95338 • 800-500-4362

Customer: **California Amplifier**

Specification: **FCC 15.107 Class B**

Work Order #: **77604**

Date: 09/20/2001

Test Type: **Conducted Emissions**

Time: 12:12:33 PM

Equipment: **MMDS Transceiver**

Sequence#: 13

Manufacturer: California Amplifier

Tested By: Randal Clark

Model: 520031-2

S/N: 002

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

Function	Manufacturer	Model #	S/N
MMDS Transceiver*	California Amplifier	520031-2	002

### Support Devices:

Function	Manufacturer	Model #	S/N
Signal Generator	HP	E4437B	US39260147
Power Supply	Cal Amp	71441	N/A

### Test Conditions / Notes:

EUT is a MMDS transceiver with QPSK modulation of 1.2MSps with a bandwidth of 1.6MHz. EUT is turned on and all clocks are active. EUT is not transmitting. Antenna is terminated in a 50Ohm load.

### Measurement Data:

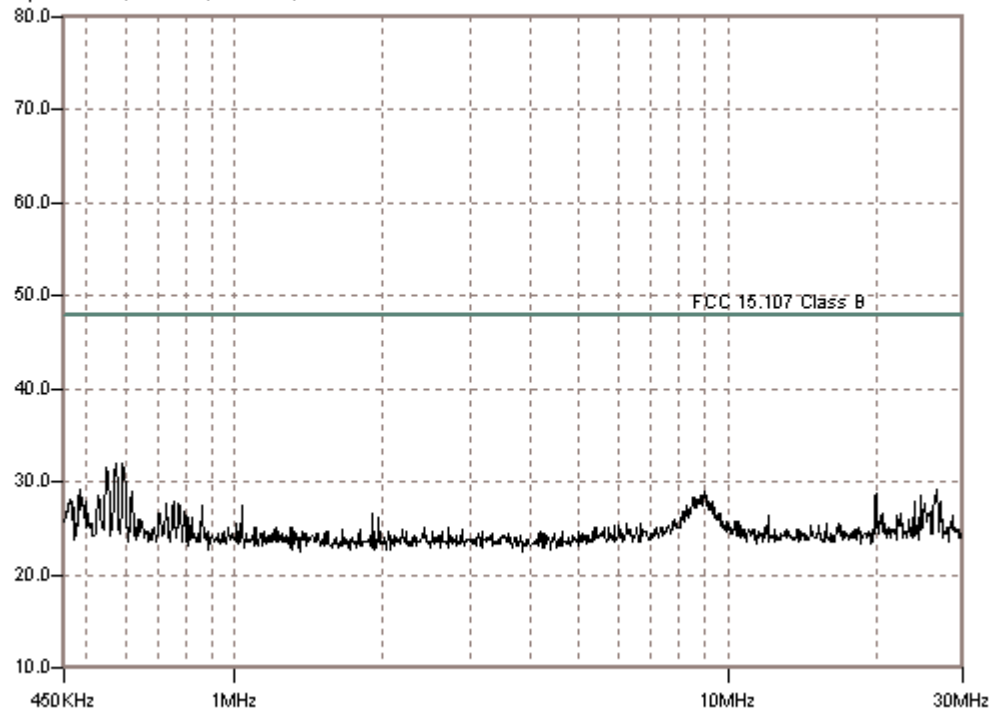
Reading listed by margin.

Test Lead: Black

#	Freq MHz	Rdng dBμV	Cable		LISN		Dist Table	Corr dBμV	Spec dBμV	Margin dB	Polar Ant
			dB	dB	dB	dB					
1	575.370k	31.5	+0.1	+0.4			+0.0	32.0	48.0	-16.0	Black
2	593.758k	31.4	+0.1	+0.4			+0.0	31.9	48.0	-16.1	Black
3	550.296k	31.1	+0.1	+0.4			+0.0	31.6	48.0	-16.4	Black
4	26.644M	28.3	+0.3	+0.6			+0.0	29.2	48.0	-18.8	Black
5	486.775k	28.7	+0.1	+0.4			+0.0	29.2	48.0	-18.8	Black
6	9.038M	23.8	+0.2	+5.0			+0.0	29.0	48.0	-19.0	Black
7	618.832k	28.5	+0.1	+0.4			+0.0	29.0	48.0	-19.0	Black
8	20.011M	27.9	+0.3	+0.6			+0.0	28.8	48.0	-19.2	Black
9	24.576M	27.6	+0.4	+0.6			+0.0	28.6	48.0	-19.4	Black
10	481.760k	28.1	+0.1	+0.4			+0.0	28.6	48.0	-19.4	Black

11	8.833M	23.7	+0.2	+4.6	+0.0	28.5	48.0	-19.5	Black
12	530.237k	28.0	+0.1	+0.4	+0.0	28.5	48.0	-19.5	Black
13	8.526M	24.4	+0.2	+3.7	+0.0	28.3	48.0	-19.7	Black
14	8.710M	23.7	+0.2	+4.3	+0.0	28.2	48.0	-19.8	Black
15	461.701k	27.7	+0.1	+0.4	+0.0	28.2	48.0	-19.8	Black

CKC Laboratories, Inc. Date: 09/20/2001 Time: 12:12:33 PM W/O#: 77604  
FCC 15.107 Class B Test Lead: Black Sequence#: 13  
dBµV Cal Amp 520031 powered by 120VAC60.



Test Location: CKC Laboratories, Inc. • 5473A Clouds Rest • Mariposa, CA 95338 • 800-500-4362

Customer: **California Amplifier**

Specification: **FCC 15.107 Class B**

Work Order #: **77604**

Date: 09/20/2001

Test Type: **Conducted Emissions**

Time: 12:16:01 PM

Equipment: **MMDS Transceiver**

Sequence#: 14

Manufacturer: California Amplifier

Tested By: Randal Clark

Model: 520031-2

S/N: 002

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

Function	Manufacturer	Model #	S/N
MMDS Transceiver*	California Amplifier	520031-2	002

**Support Devices:**

Function	Manufacturer	Model #	S/N
Signal Generator	HP	E4437B	US39260147
Power Supply	Cal Amp	71441	N/A

**Test Conditions / Notes:**

EUT is a MMDS transceiver with QPSK modulation of 1.2MSps with a bandwidth of 1.6MHz. EUT is turned on and all clocks are active. EUT is not transmitting. Antenna is terminated in a 50Ohm load.

**Measurement Data:**

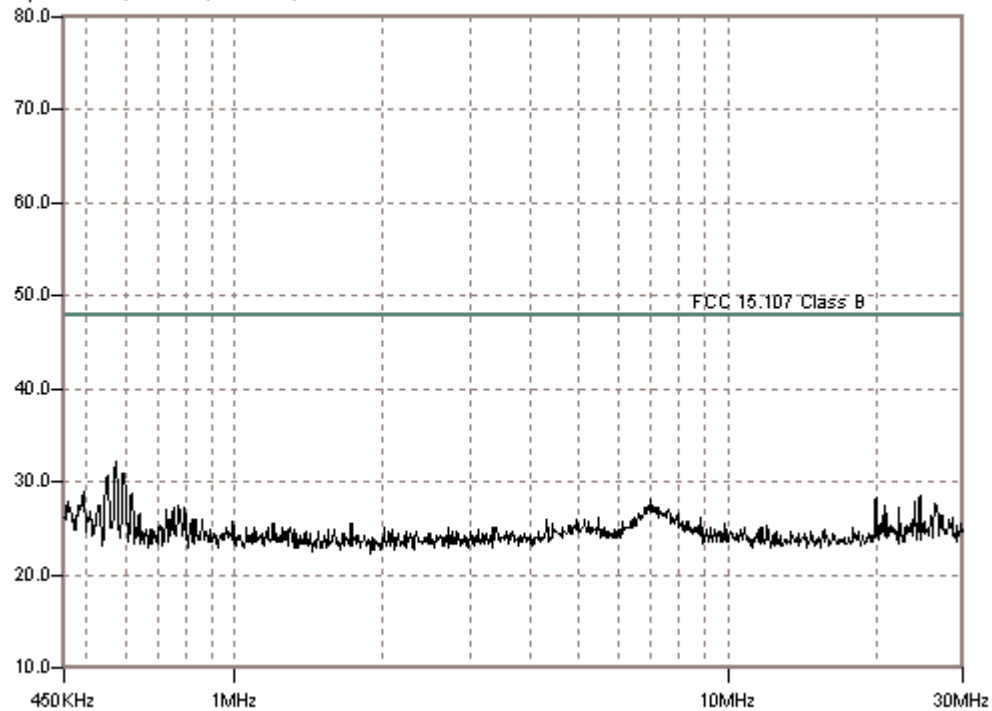
Reading listed by margin.

Test Lead: White

#	Freq MHz	Rdng dBμV	Cable		LISN		Dist Table	Corr dBμV	Spec dBμV	Margin dB	Polar Ant
			dB	dB	dB	dB					
1	577.042k	31.6	+0.1		+0.5		+0.0	32.2	48.0	-15.8	White
2	597.101k	30.4	+0.1		+0.5		+0.0	31.0	48.0	-17.0	White
3	553.639k	30.1	+0.1		+0.5		+0.0	30.7	48.0	-17.3	White
4	493.462k	28.2	+0.1		+0.6		+0.0	28.9	48.0	-19.1	White
5	618.832k	28.1	+0.1		+0.5		+0.0	28.7	48.0	-19.3	White
6	24.576M	27.6	+0.4		+0.6		+0.0	28.6	48.0	-19.4	White
7	20.011M	27.7	+0.3		+0.4		+0.0	28.4	48.0	-19.6	White
8	6.950M	24.1	+0.2		+3.8		+0.0	28.1	48.0	-19.9	White
9	458.358k	27.2	+0.1		+0.6		+0.0	27.9	48.0	-20.1	White
10	23.991M	26.8	+0.4		+0.6		+0.0	27.8	48.0	-20.2	White
11	26.391M	26.6	+0.3		+0.7		+0.0	27.6	48.0	-20.4	White

12	20.908M	26.8	+0.3	+0.4	+0.0	27.5	48.0	-20.5	White
13	769.276k	26.9	+0.1	+0.5	+0.0	27.5	48.0	-20.5	White
14	530.237k	26.8	+0.1	+0.6	+0.0	27.5	48.0	-20.5	White
15	480.089k	26.8	+0.1	+0.6	+0.0	27.5	48.0	-20.5	White

CKC Laboratories, Inc. Date: 09/20/2001 Time: 12:16:01 PM W/O#: 77604  
FCC 15.107 Class B Test Lead: White Sequence#: 14  
dBµV Cal Amp 520031 powered by 120VAC60.





**VIDEO BANDWIDTH AND RESOLUTION BANDWIDTH SETTINGS:**

BEGINNING FREQUENCY	ENDING FREQUENCY	BANDWIDTH SETTING
450 kHz	30 MHz	9 kHz

Equipment	Manufacturer	Model #	Serial #	Asset #	Cal Date	Cal Due
QP Adapter	HP	85650A	2811A01267	00478	11/03/00	11/3/01
S/A Display	HP	8566B	2403A08241	00489	11/3/00	11/3/01
Spectrum Analyzer	HP	8566B	2209A01404	00490	11/3/00	11/3/01
LISN	Solar	8028-50-TS-24-BNC	814493, 474	02056	5/22/01	5/22/02



AC Conducted, Font View



AC Conducted, Back View