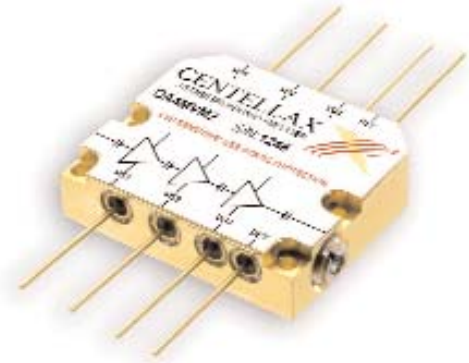


## OA4MVM2 40 Gb/s Broadband Driver Amplifier

### Features

- 7.5 Vp-p (23 dBm saturated output power)
- < 8 ps rise/fall time
- <0.5 ps added rms jitter
- 27 dB gain (to 45 GHz)
- 3.4 W Power Dissipation
- Useful gain to 65 GHz
- Small Size Package



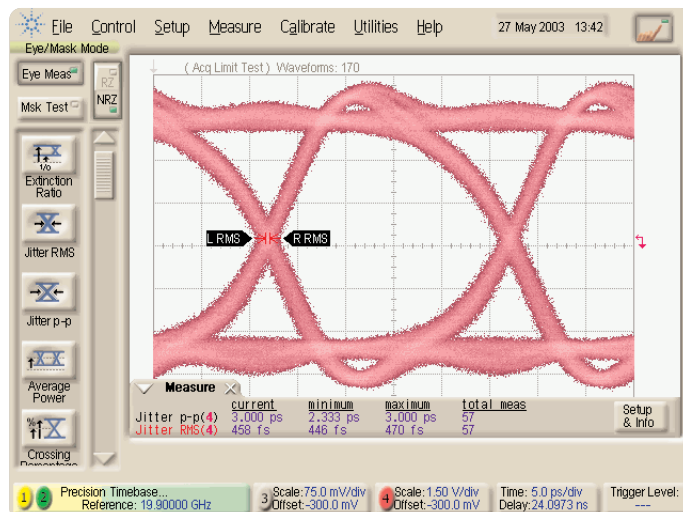
### Description

The OA4MVM2 Driver Amplifier is a general-purpose broadband amplifier designed especially for SONET OC-768 Mach-Zehnder optical modulator driver applications. Its exceptional performance and small size make it an easy addition to your Intermediate Reach, Long Haul, or Ultra Long Haul network infrastructure design.

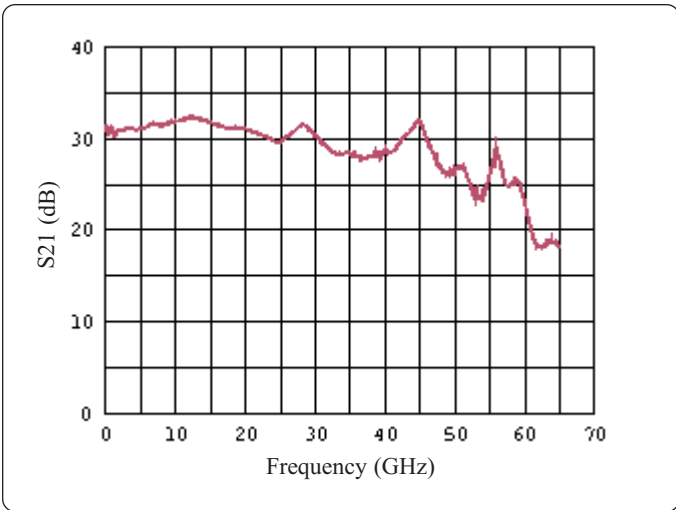
The OA4MVM2 provides a complete driver module package with a wide frequency range of 30 kHz to 45 GHz, low power dissipation, ample drive signal, very low added-jitter, fast rise time, and external control.

### Applications

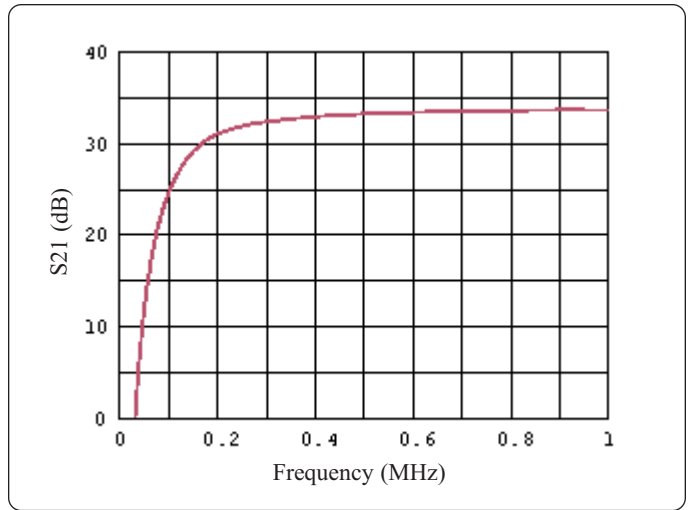
- SONET OC-768/SDH-256 equipment
- Mach-Zehnder optical modulator driver
- High frequency/optical communications test instrumentation
- General purpose gain block



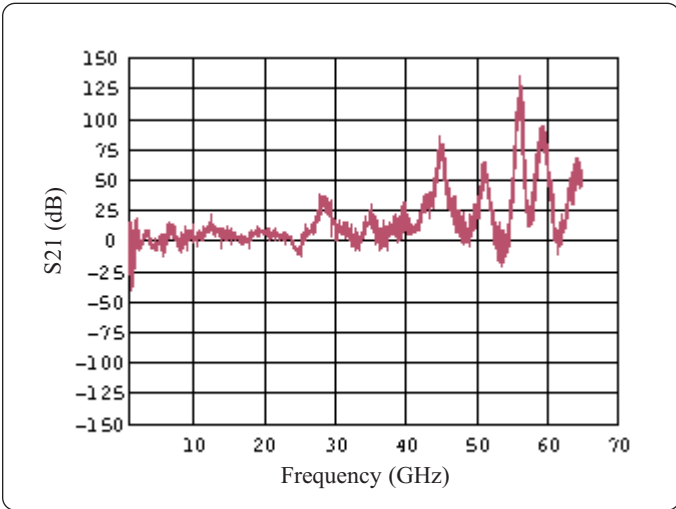
OA4MVM2 (2<sup>31</sup> - 1) EYE: <500 fs added rms jitter (5 ps/div)



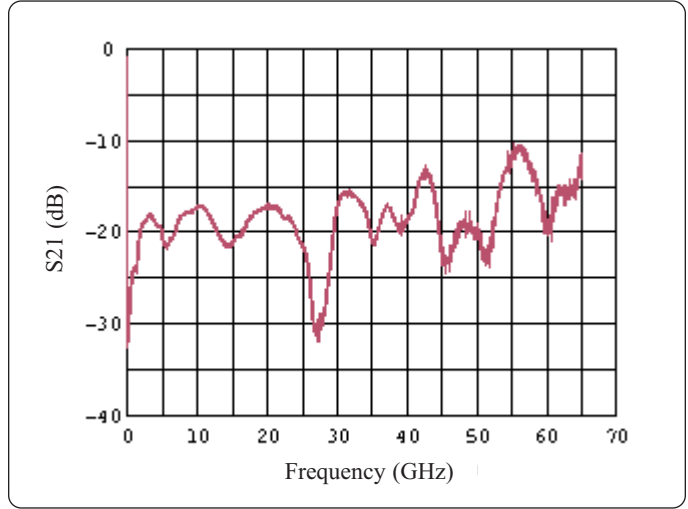
OA4MVM2 typical measured performance  
 Bias: Vd1 = 7V, Vd2 = 7V, Vd3 = 7V,  
 Vg1/Vg2/Vg3 = -0.05 V, Vb1/Vb2/Vb3 = float



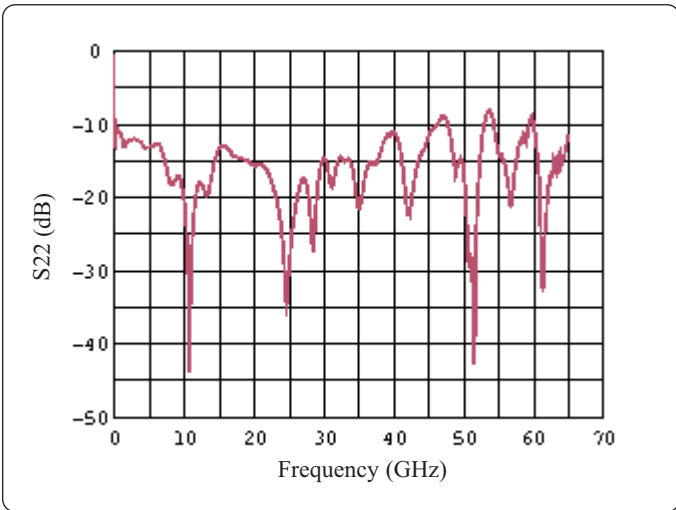
Low frequency S21 measurement



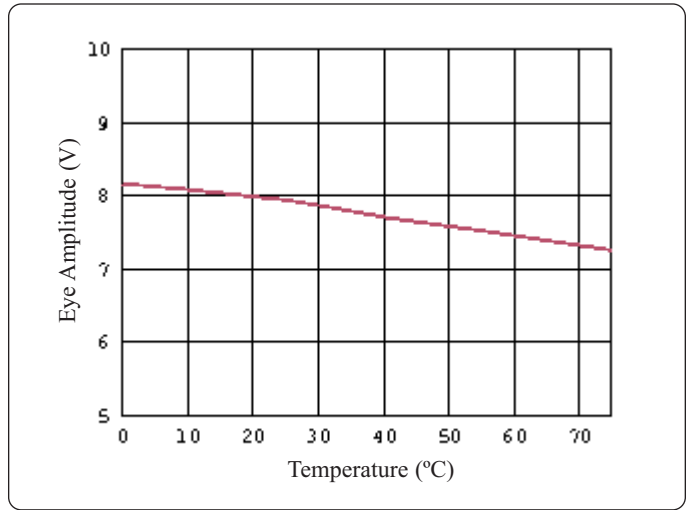
OA4MVM2 typical measured performance  
 Bias: Vd1 = 7V, Vd2 = 7V, Vd3 = 7V,  
 Vg1/Vg2/Vg3 = -0.05 V, Vb1/Vb2/Vb3 = float



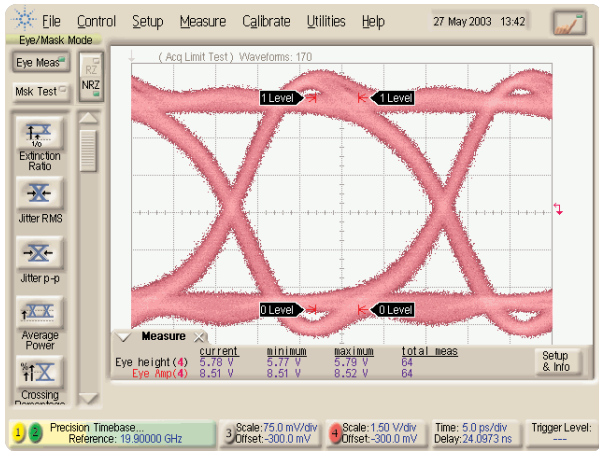
OA4MVM2 typical measured performance  
 Bias: Vd1 = 7V, Vd2 = 7V, Vd3 = 7V,  
 Vg1/Vg2/Vg3 = -0.05 V, Vb1/Vb2/Vb3 = float



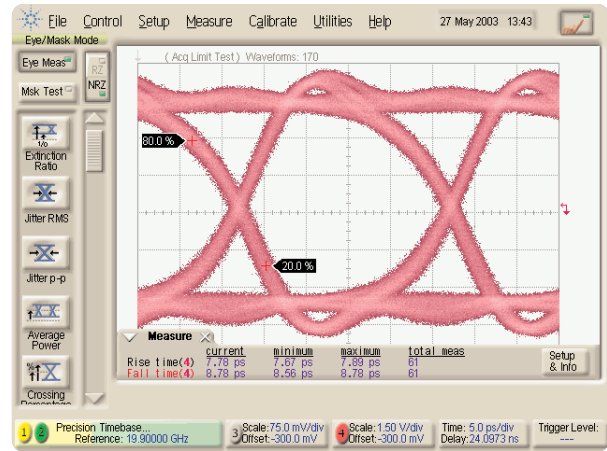
OA4MVM2 typical measured performance  
 Bias: Vd1 = 7V, Vd2 = 7V, Vd3 = 7V,  
 Vg1/Vg2/Vg3 = -0.05 V, Vb1/Vb2/Vb3 = float



EYE amplitude vs. temperature



OA4MVM2 (2<sup>21</sup> - 1) EYE: > 7V output (1.5V/div)



OA4MVM2 (2<sup>31</sup> - 1) EYE: < 10 ps Tr/Tf (5 ps/div)

## Electrical Specifications @ 25°C

Parameter	Description	Minimum	Typical	Maximum
S21 (dB)	Small Signal Gain			
	0.01 – 26 GHz	27	30	35
	26 – 45 GHz	24	27	35
V <sub>out</sub> (V)	Output Eye Amplitude <sup>3</sup>	7	7.5	9
V <sub>in</sub> (V)	Input Eye Amplitude <sup>3</sup>	0.3	0.4	0.6
Jitter rms (ps)	Added jitter (rms method)(1,3)	0.2	< 0.5	< 1
Tr/Tf (ps)	Rise/Fall Time	5	< 8	< 10
S11 (dB)	Input Match			
	0.01 – 26 GHz	N/A	-12	-10
	26 – 45 GHz	N/A	-10	-8
S22 (dB)	Output Match			
	0.01 – 26 GHz	N/A	-12	-10
	26 – 45 GHz	N/A	-10	-4

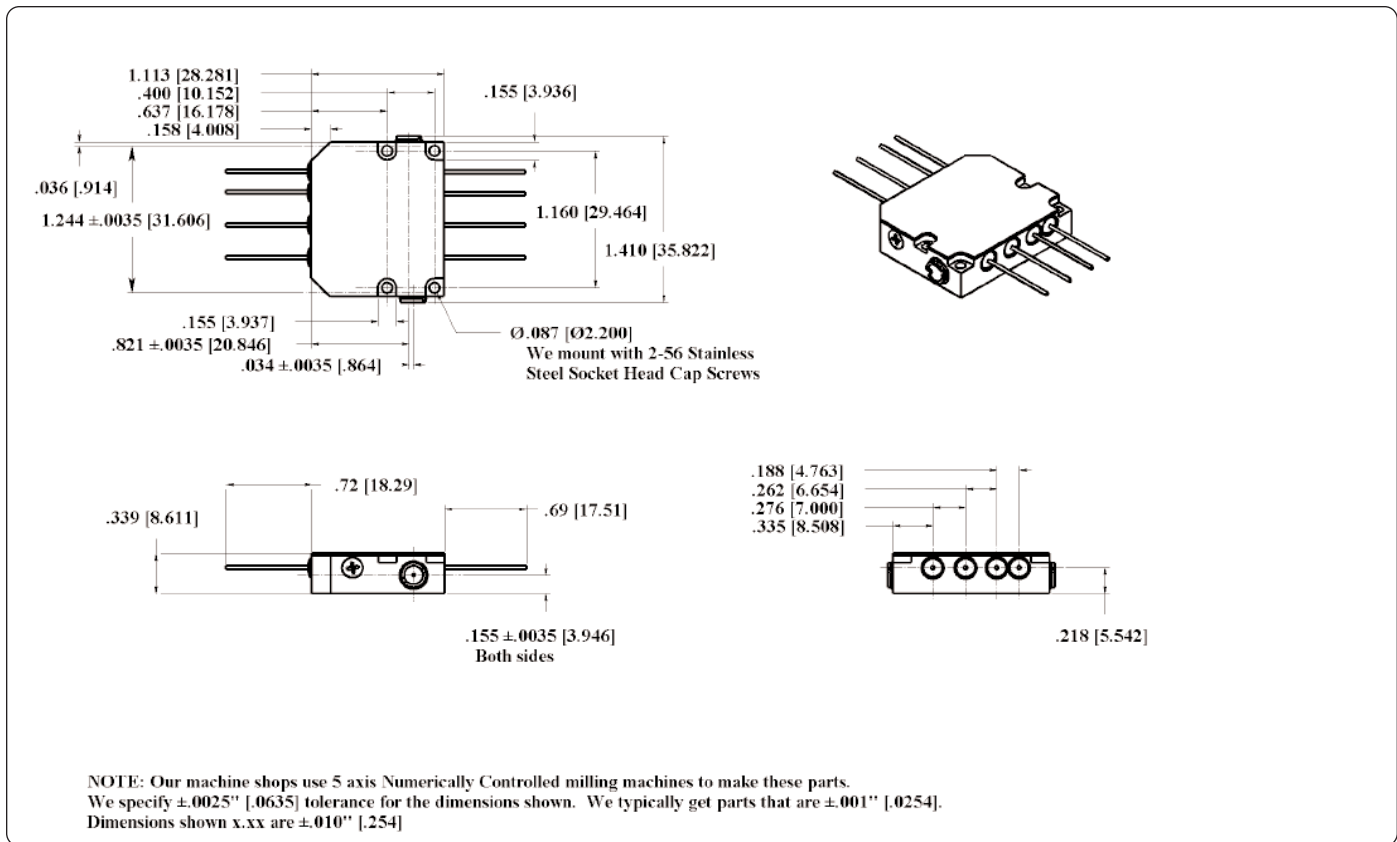
## Operating Specifications

Parameter	Description	Minimum	Typical	Maximum
Vdd1 (V)	First Drain Voltage	5	7	8
Vdd2 (V)	Second Drain Voltage	5	7	8
Vdd3 (V)	Third Drain Voltage	6	7	8
Id1 (mA)	First Drain Current	70	85	100
Id2 (mA)	Second Drain Current	125	150	180
Id3 (mA)	Third Drain Current	200	240	280
Vg1 (V)	First Gate Voltage	-0.5	-0.2 to 0	+0.5
Vg2 (V)	Second Gate Voltage	-0.5	-0.2 to 0	+0.5
Vg3 (V)	Third Gate Voltage	-0.5	-0.2 to 0	+0.5
Pdc (W)	Power Dissipation	2.5	3.4	4.5
Tbs (°C)	Case Temperature <sup>2</sup>	-25	35	75

$$1 \text{ (Jitter}_{\text{added}})^2 = (\text{Jitter}_{\text{output}})^2 - (\text{Jitter}_{\text{input}})^2$$

<sup>2</sup> Four through holes are provided for convenient heatsink attachment. The package body temperature must not exceed Tbs maximum.

<sup>3</sup> Under typical 400mV Input Amplitude.



- Physical Characteristics (all measurements in mm [inches])
- DC pin diameter is 0.03in [0.76mm]

## OA4MVM2 Pin Definition

Pin	Function	Operational Notes
RFin	RF Input	GPPO (m)
RFout	RF Output	GPPO (m)
1 (Vg1)	1st stage gate bias	Set at typical operating specification.
2 (Vg2)	2nd stage gate bias	Set at typical operating specification, adjust for desired EYE
3 (Vg3)	3rd stage gate bias	Set at typical operating specification, adjust for desired EYE
4 (Det)	RF Power Detector	(option)
5 (Vd1)	1st stage drain bias	Set at typical operating specification
6 (Vd2)	2nd stage drain bias	Set at typical operating specification, adjust for desired amplitude
7 (Vd3)	3rd stage drain bias	Set at typical operating specification, adjust for desired amplitude
8 (Ref)	RF Power Reference	(option)

### Bias Recommendations (in order):

- 1) Bias gates; 2) Bias Drains; 3) Adjust for EYE amplitude and cross-over