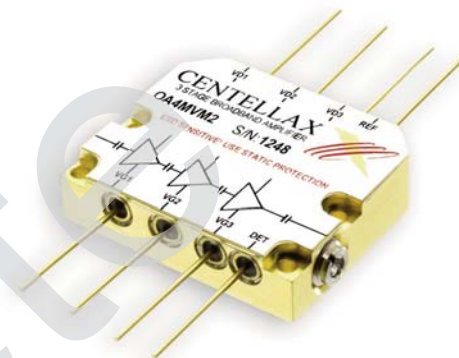


OA4MVM2 40 Gb/s Broadband Driver Amplifier

Product Highlights

- 8Vp-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

Electrical Specifications @ 25°C

Parameter	Description	0.01 – 26 GHz			26 – 45 GHz		
		Min	Typ	Max	Min	Typ	Max
S21 (dB)	Small Signal Gain	27	30	35	24	27	35
V _{out} (V)	Output Eye Amplitude ³	7	8	9			
V _{in} (V)	Input Eye Amplitude ³	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	N/A	-12	-10	N/A	-10	-8
S22 (dB)	Output Match	N/A	-12	-10	N/A	-10	-4

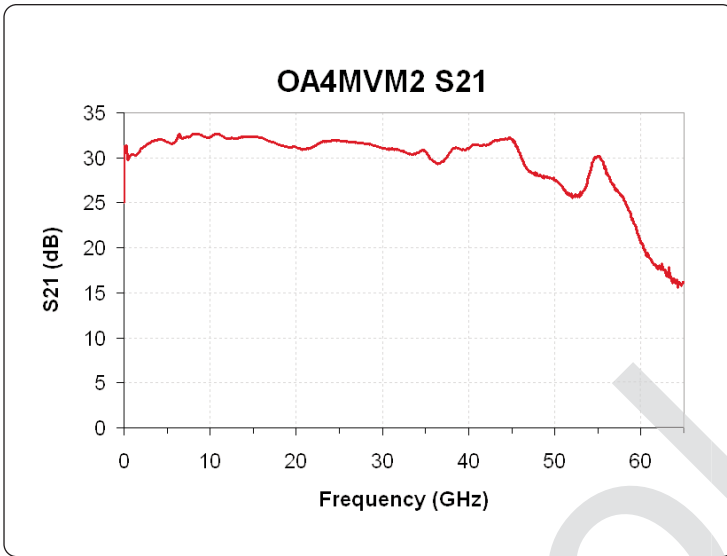
¹ $(\text{Jitter}_{\text{added}})^2 = (\text{Jitter}_{\text{output}})^2 - (\text{Jitter}_{\text{input}})^2$

² Four through holes are provided for convenient heatsink attachment.

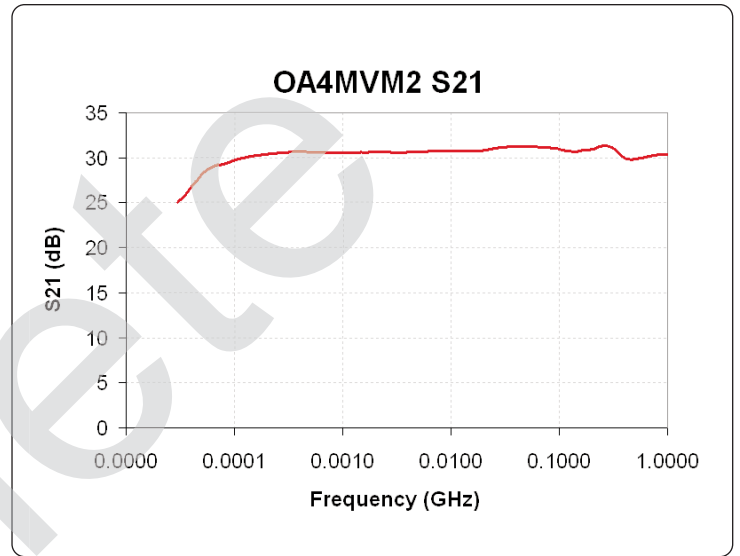
³ Under typical 400mV Input Amplitude.

⁴ Output amplitude varies with Vdd3

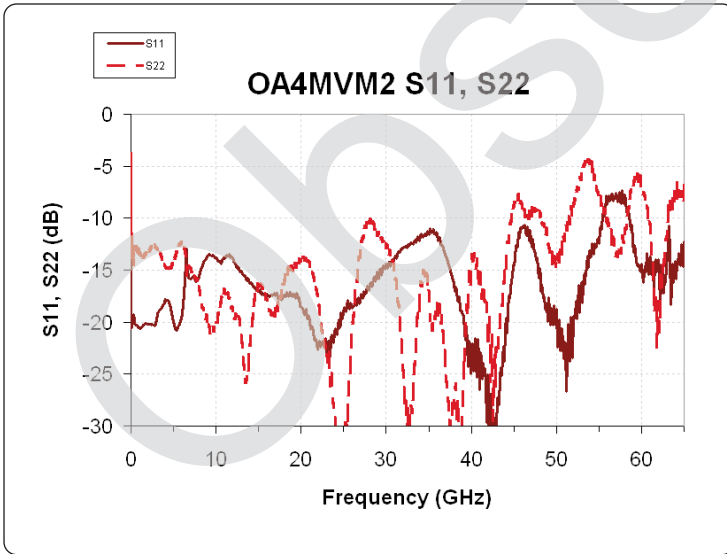
The package body temperature must not exceed T_{bs} maximum.



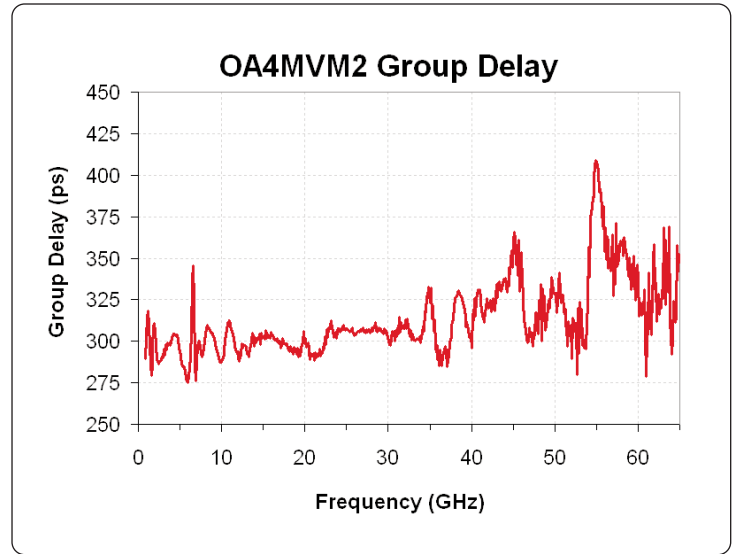
Typical Module Performance



Typical Module Performance

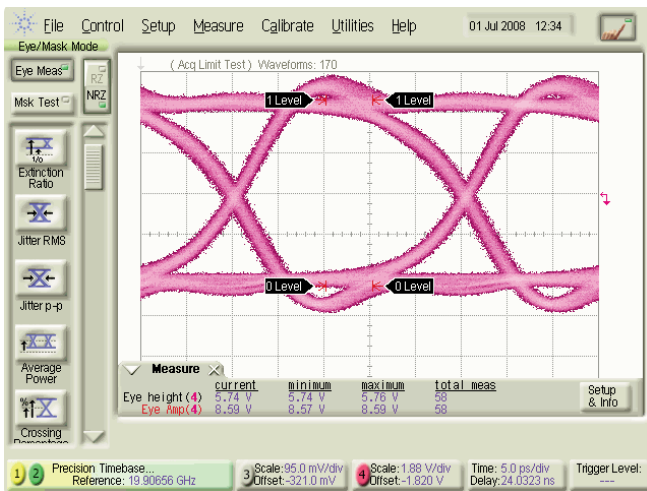


Typical Module Performance

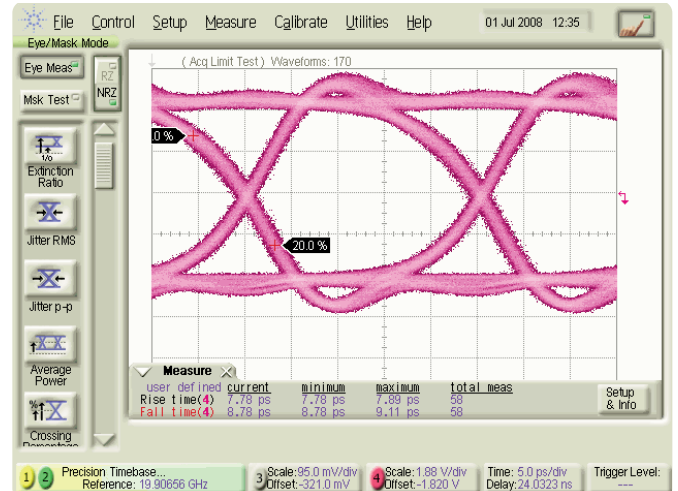


Typical Module Performance

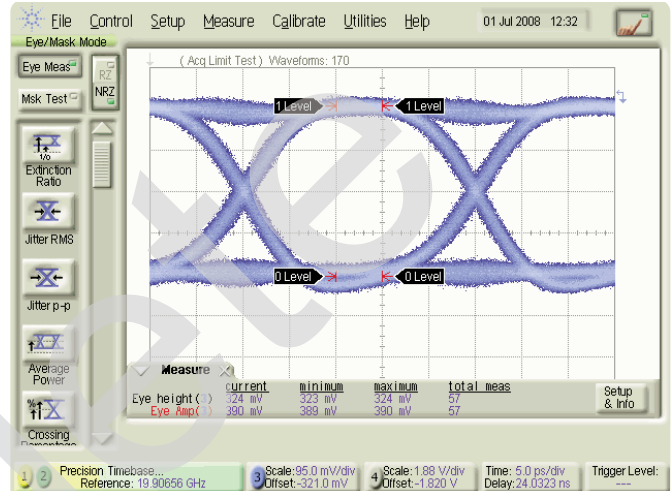
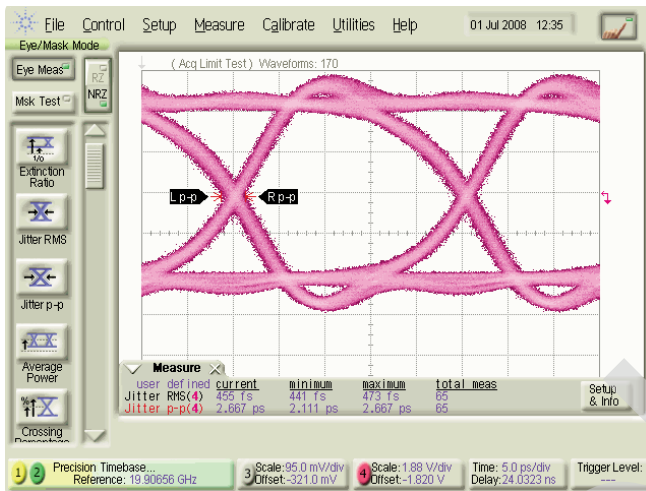
The following data has been gathered from the typical measured performance. Bias: Vd1, Vd2, Vd3 = 7V, Id1 = 85mA, Id2 = 150mA, Id3 = 240mA.



OA4MVM2 (2³¹ - 1) EYE: > 7V output (1.5V/div)



OA4MVM2 (2³¹ - 1) EYE: < 10 ps Tr/Tf (5 ps/div)



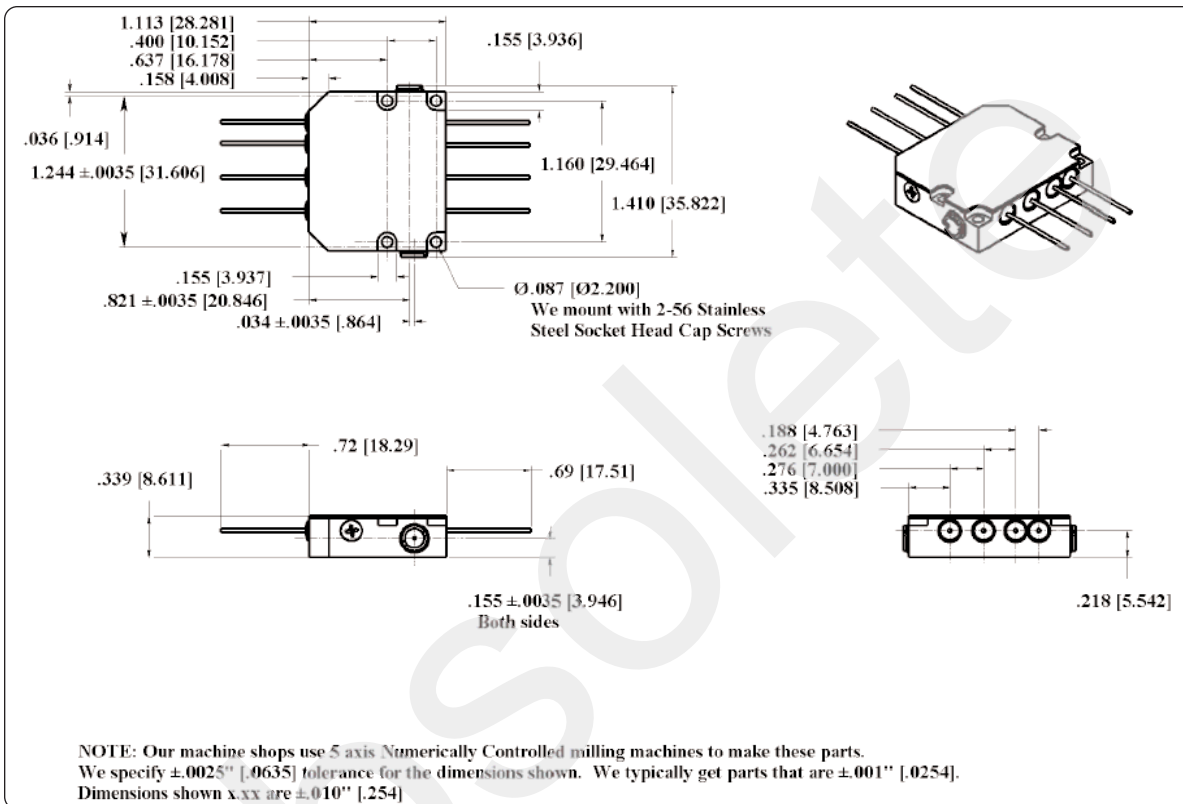
OA4MVM2 ($2^{31} - 1$) EYE: <500 fs added rms jitter (5 ps/div) Input from Centellax TG1P4A and 3dB attenuator

Operating Specifications

Absolute Maximum Ratings

Parameter	Description	Minimum	Typical	Maximum	Minimum	Maximum
Vdd1 (V)	First Drain Voltage	5	7	7.5	-1	8.5
Vdd2 (V)	Second Drain Voltage	5	7	7.5	-1	8.5
Vdd3 (V)	Third Drain Voltage	6	7	8	-1	8.5
Id1 (mA)	First Drain Current	70	85	105	-75	250*
Id2 (mA)	Second Drain Current	125	150	180	-125	325*
Id3 (mA)	Third Drain Current	180	240	280	-175	400*
Vg1 (V)	First Gate Voltage	-0.5	-0.2 to 0	+0.5	-3	1*
Vg2 (V)	Second Gate Voltage	-0.5	-0.2 to 0	+0.5	-3	1*
Vg3 (V)	Third Gate Voltage	-0.5	-0.2 to 0	+0.5	-3	1*
Pdc (W)	Power Dissipation	2.5	3.4	4.5		
Tbs (°C)	Case Temperature ²	-25	35	75	-25	85
Tstore (°C)					-30	125
Lead Soldering (°C)						180
Max Input (Vpp)						2.5

*Operation beyond the values listed under the Absolute Maximum Ratings may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the Operating Specifications is not implied. Prolonged use at the absolute maximum rating conditions may affect device reliability.



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

OA4MVM2 Options

- OPT002 - with Peak Power Detector
- OPTSBB - with Bias Board
- OPTxxx - Custom Connector Options (see website)

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