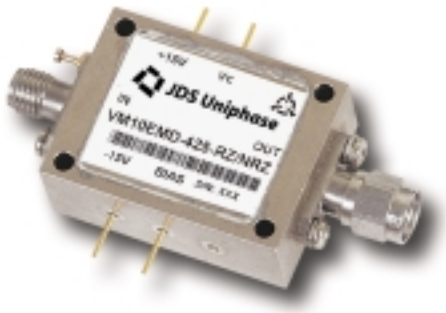
JDS Uniphase

Product Bulletin



VM10EMD Series
10 Gb/s Drivers for M-Z Light Modulators or EMLs

These rugged, low-cost, high performance modulator-drivers utilize single-substrate COPLANAR MIC thin-film technology and state-of-art GaAs active devices. Systems using these drivers will achieve improved EYE opening, increased phase margin over time and temperature, higher extinction ratios, and lower BER.

Designed to drive Mach-Zehnder external modulators from ECL/SCFL inputs levels, they feature (a) a built-in bias terminal, (b) a "digitized" output for very high extinction ratios even when the input data is relatively "dirty", (c) constant output over temperature, and (d) well-matched input and output impedances.

The output, though "saturated", is electrically adjustable over a wide range. Typical output rise and fall times at nominal input and output approach 20ps. Pulse parameters such as rise and fall times and EYE opening at 10 Gb/s are guaranteed. Supplied with solderable contact pins for DC and removable SMA-F RF connectors.

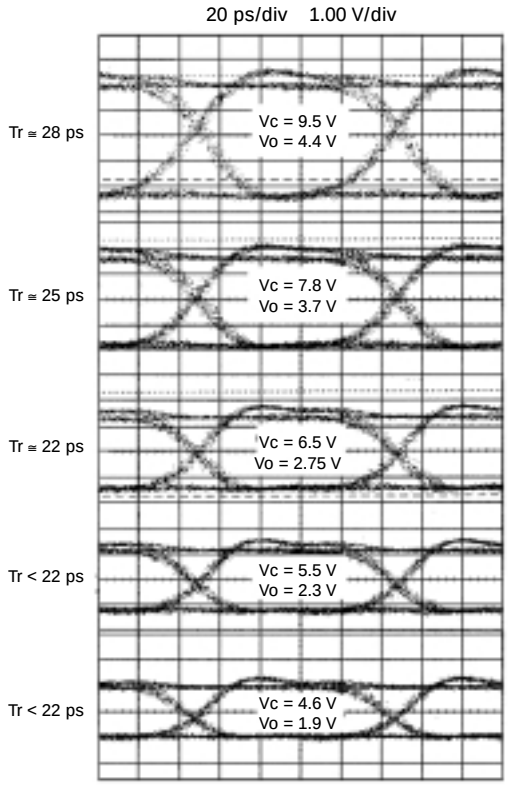
Key features
- Advanced GaAs technology
- SCFL input levels, outputs up to 8.2 Vp-p
- Saturating mode "repairs" input deficiencies
- Adjustable output voltage Vp-p
- Rise and fall times <30 ps
- Guaranteed EYE and step responses
- Internal DC regulation and protection
- Small package
- Integrated bias terminal for modulator (High-Z, 3 mA max current)

Applications
- Driver electronics for high quality 10 Gb/s terrestrial fiber-optic communication systems
- High speed data links

Operating Characteristics

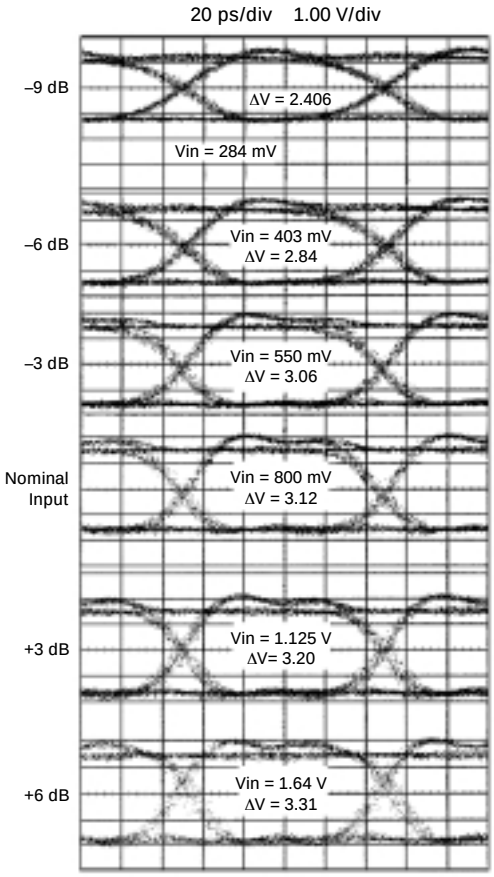
Control Voltage, Vc

Varied to adjust Vout
Input fixed at 0.9 Vp-p
Note transition times decrease to near 20 ps



Input Level

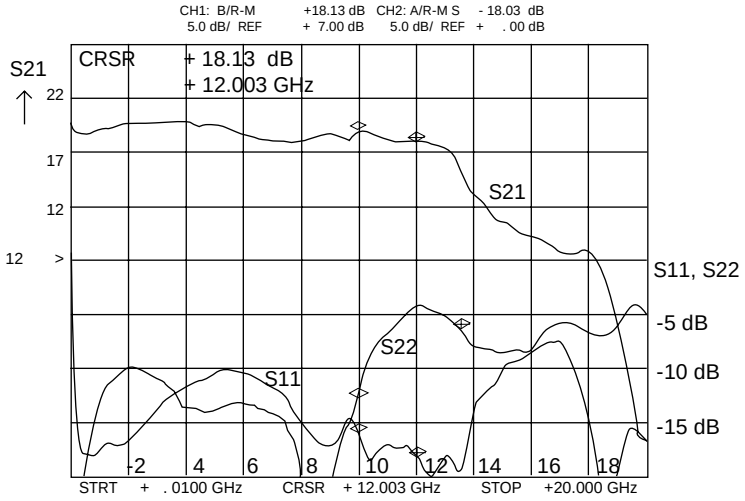
Varied from 284 mV to 1.64 V in 3 dB steps;
900 mV is nominal.
Vc fixed at +7 V. Note output stays constant;
symmetry is good over a 15 dB input range.



Frequency Response
(small signal)

Swept from .01-20 GHz

2GHz/DIV; 5dB/DIV



10 Gb/s Modulator Driver Performance Specifications

Model # VM10EMD - xxx	Vin, p-p Volts p-p	Vo Vp-p[1]	3-dB BW GHz MIN[2]	Idc MAX/TYP mA@ +15V	Idc max mA@ –15V	Vc Volts
- 418	0.9 - 1.1	4.0 - 7.2	9.0	400/320	20	0 to +15
- 425**	0.35 - .50	4.0 - 7.2	9.0	440/370	20	0 to +15

1. Adjustable electrically over at least this range.
2. Small-signal: operating bandwidth is larger due to saturation.

Other Specifications

- Minimum EYE opening 85% at 10 Gbps, 95% TYP
- Tr, Tf < 35 ps, 28 ps TYP
- S11< –10 dB from 10 MHz to 8GHz; S22 < –10 dB from 100 KHz to 8 GHz (see *and**)
- Input and output ports are DC blocked to ±20 V (capacitively coupled)
- MAX input level 2 Vpp
- DC requirement +15 V; –15 V (internal regulation)
- Reverse voltage protection 50 V
- Output level control terminal: 0 to +Vc at 10 mA MAX; V out largest at +Vc
- Bias terminal ±10V MAX AT 3 mA MAX (High-Z, 1k-ohm)

Reliability

High reliability screening, visual inspections and other screening per VMI Level III, including centrifuge, burn-in, temperature cycle, seal and final test are optional at extra cost.

Factory Testing Technique

Pattern generator with 30 ps rise/fall time, 10 Gbs/s (NRZ), 2.0 Vpp fixed output. Variable attenuator. Sampling oscilloscope with 12 GHz bandwidth (29ps). Input to DUT is ($2^{31}-1$) word length. Observed Tr, Tf corrected for system speed, using sum of squares rule.

Mechanical Data

Aluminum 6061T6, nickel plate. RF pins .015” dia. gold plated KOVAR with SMA–F replaceable shells. DC pins are 0.03” dia. Heat removal through case (conduction). Wire harness/connector available. All VM10EMD packages are 0.5” thick and 0.99” wide.

Bias Terminal

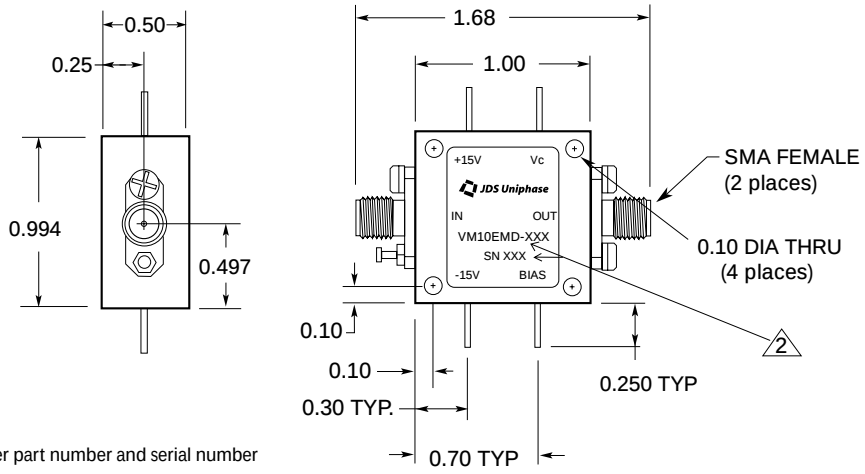
The integrated bias terminal permits application of a DC voltage bias to the output of the device; this may be needed to operate modulators at 1/2 of V-pi. The internal circuit is high impedance (about 1k-ohm) and will not pass current. Low-level, low-frequency AC may also be applied to this terminal.

* S22: < –8dB from 100 kHz to 8 GHz
**S11: < –13 dB from 0.01-3GHz, < –10dB from 3 GHz to 10 GHz, S22: < –10 dB from 100kHz to 5.7 GHz

Package Dimensions

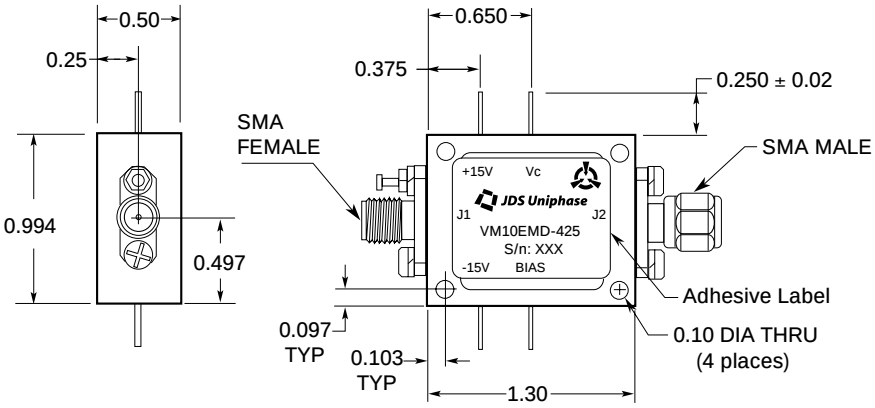
Dimensions in inches except where indicated

VM10EMD-418X
Standard Package



(1) Use ESD precaution
(2) Refer to Traveler for proper part number and serial number

VM10EMD-425X
Standard Package



Ordering information

For more information on this or other products and their availability, please contact your local JDS Uniphase sales representative or JDS Uniphase directly at 732 465-2800, or by fax 732 465-2801, or via email at sales.nj@us.jdsuniphase.com. Visit our Web site at www.jdsuniphase.com.

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