

## 10 Gb/s Integrated Amplitude Modulator with Attenuator



### Key Features

- Wide optical bandwidth for use in C- and L-band erbium doped fiber amplifier (EDFA) DWDM links
- Separate DC bias electrode for long-term stability and reliability
- Low drive voltage for ease of use with wide range of commercially available drivers
- High modulator on/off extinction ratio
- Continuously tunable attenuation

### Applications

- Ideal for OC-192 C-band and L-band DWDM applications

### Compliance

- Telcordia GR-468-CORE

The JDSU 10 Gb/s Integrated Amplitude Modulator with Attenuator provides intrinsic attenuation flexibility for multichannel systems.

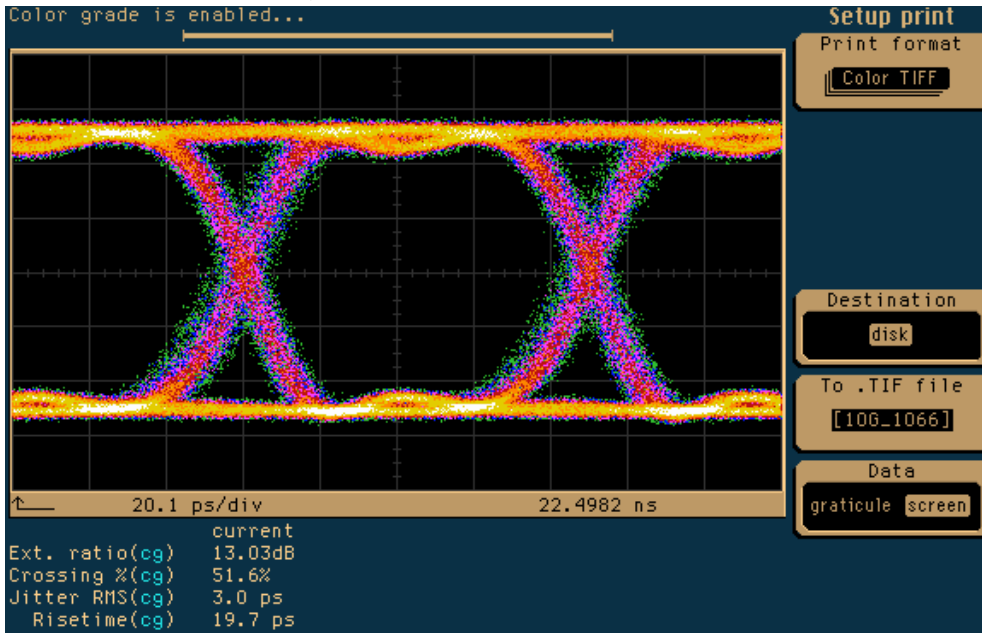
The module employs an integrated attenuator that allows pre-emphasis of all International Telecommunications Union (ITU) wavelengths in a dense wavelength division multiplexing (DWDM) optical link.

The 10 Gb/s Integrated Amplitude Modulator with Attenuator is supplied in a mini package and qualifies to Telcordia GR-468-CORE. JDSU assures high reliability and performance at all times.

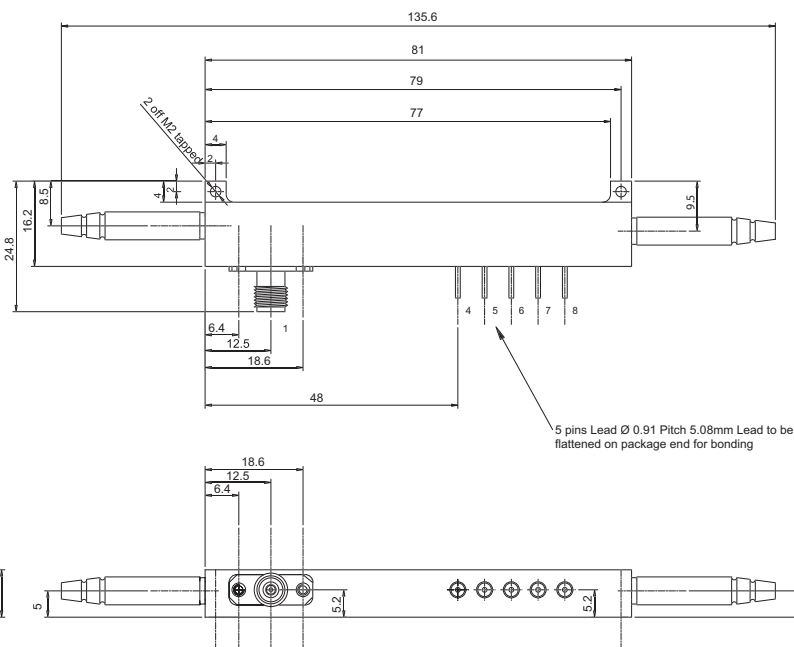
10 GB/S INTEGRATED AMPLITUDE MODULATOR  
WITH ATTENUATOR

2

Eye Diagram



10 Gb/s Integrated Amplitude Modulator with Attenuator Detail



Pinout

Pin Description

Pin	Description
1	RF input
2	No connector
3	No connector
4	Ground
5	Bias input
6	Ground
7	Attenuator
8	Ground

### 3

#### Specifications

Parameter	Specification
<b>General</b>	
Material	Lithium niobate
Crystal orientation	X-cut, y-propagating
Waveguide process	Titanium-indiffused
<b>Optical</b>	
Operating wavelength	1530 to 1605 nm
Insertion loss (with connector) (note <sup>1</sup> )	≤7 dB
On/off extinction ratio, low frequency	≥20 dB
Optical return loss	≤-45 dB
<b>Electrical</b>	
RF port	
$V\pi$ at 10 Gb/s PRBS	≤6.8 V
S21 electro-optic bandwidth (-3 dBe) (note <sup>2,3</sup> )	≥10 GHz
S11 return loss	
0.13 to 2.5 GHz (note <sup>3</sup> )	≤-14 dB
3 to 9 GHz (note <sup>3</sup> )	≤-10 dB
9 to 15 GHz (note <sup>3</sup> )	≤-6 dB
RF input power	27 dBm
Chirp, alpha parameter	±0.2
Bias port	
$V\pi$ at DC	≤5.8 V
Impedance	≥10,000 Ω
Attenuator port	
$V\pi$ attenuator	≤8.4 V
Attenuation range	≥15 dB
<b>Mechanical</b>	
Input fiber	Fujikura SM-15-P-8/125-UV/UV-400
Output fiber	SMF-28 or Fujikura SM-15-P-8/125-UV/UV-400
Input connector	FC/SPC
Output connector	FC/SPC
RF connection	K connector
Bias connection	DC feedthroughs
<b>Environmental</b>	
Operating temperature	0 to 70 °C
Storage temperature	-40 to 80 °C

1. Insertion loss is measured at the maximum of the modulator's transfer function and does not include the 3 dB loss incurred when operating at quadrature

2. Relative to 30 MHz

3. Variances with temperature and wavelength included



10 GB/S INTEGRATED AMPLITUDE MODULATOR  
WITH ATTENUATOR

**Ordering Information**

For more information on this or other products and their availability, please contact your local JDSU account manager or JDSU directly at 1-800-498-JDSU (5378) in North America and +800-5378-JDSU worldwide or via e-mail at [customer.service@jdsu.com](mailto:customer.service@jdsu.com).

**Sample: 21010278**

<b>Product Code</b>	<b>Description</b>
21010278	10Gb/s, data modulator with attenuator, PMF in & SMF out, FC/SPC

SM-15 is a registered trademark of Fujikura Europe Limited.  
SMF-28 and Fujikura SM 15-P-8/125-UV-400 are registered trademarks of Corning Incorporated.  
Telcordia is a registered trademark of Telcordia Technologies Incorporated.  
Wiltron K is a registered trademark of Anritsu Corporation.

All statements, technical information and recommendations related to the products herein are based upon information believed to be reliable or accurate. However, the accuracy or completeness thereof is not guaranteed, and no responsibility is assumed for any inaccuracies. The user assumes all risks and liability whatsoever in connection with the use of a product or its application. JDSU reserves the right to change at any time without notice the design, specifications, function, fit or form of its products described herein, including withdrawal at any time of a product offered for sale herein. JDSU makes no representations that the products herein are free from any intellectual property claims of others. Please contact JDSU for more information. JDSU and the JDSU logo are trademarks of JDS Uniphase Corporation. Other trademarks are the property of their respective holders. ©2006 JDS Uniphase Corporation. All rights reserved. 10116268 Rev.003 04/06 10GZEROCHIRPVOAMOD.DS.CC.AE

**NORTH AMERICA: 800 498-JDSU (5378)**

**WORLDWIDE: +800 5378-JDSU**

**WEBSITE: [www.jdsu.com](http://www.jdsu.com)**