

## APE™ Phase Modulators



### Key Features

- 500 MHz and 10 GHz bandwidth options
- High optical power operation
- Low optical loss
- Single-polarization operation
- Minimal back reflections

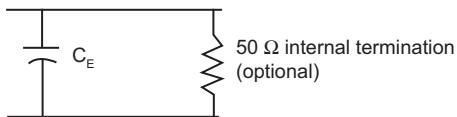
### Applications

- Optical chirping
- Coherent communication links
- Optical sensors

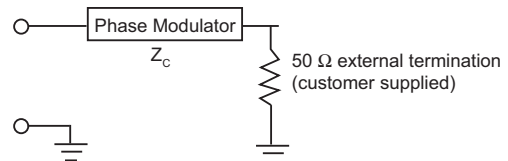
JDSU APE phase modulators are low loss, simple, and operationally efficient devices for optical chirping, optical delays, and sensors.

APE optical waveguides are polarizing, so no external polarizers are required in systems that use these devices. Polarization-maintaining optical fiber is used at both the input and output ports, making it straightforward to cascade these devices with other optical components.

### 500 MHz Lumped Element Device



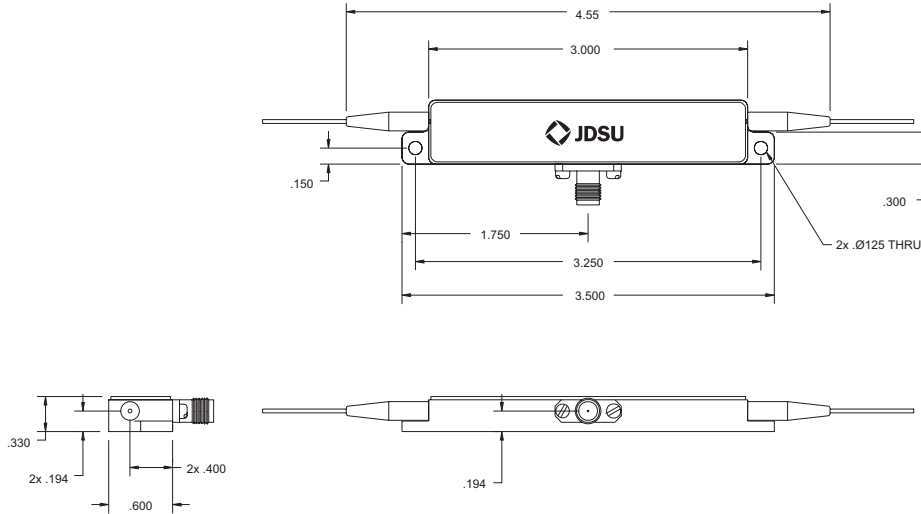
### 10 GHz Traveling Wave Device



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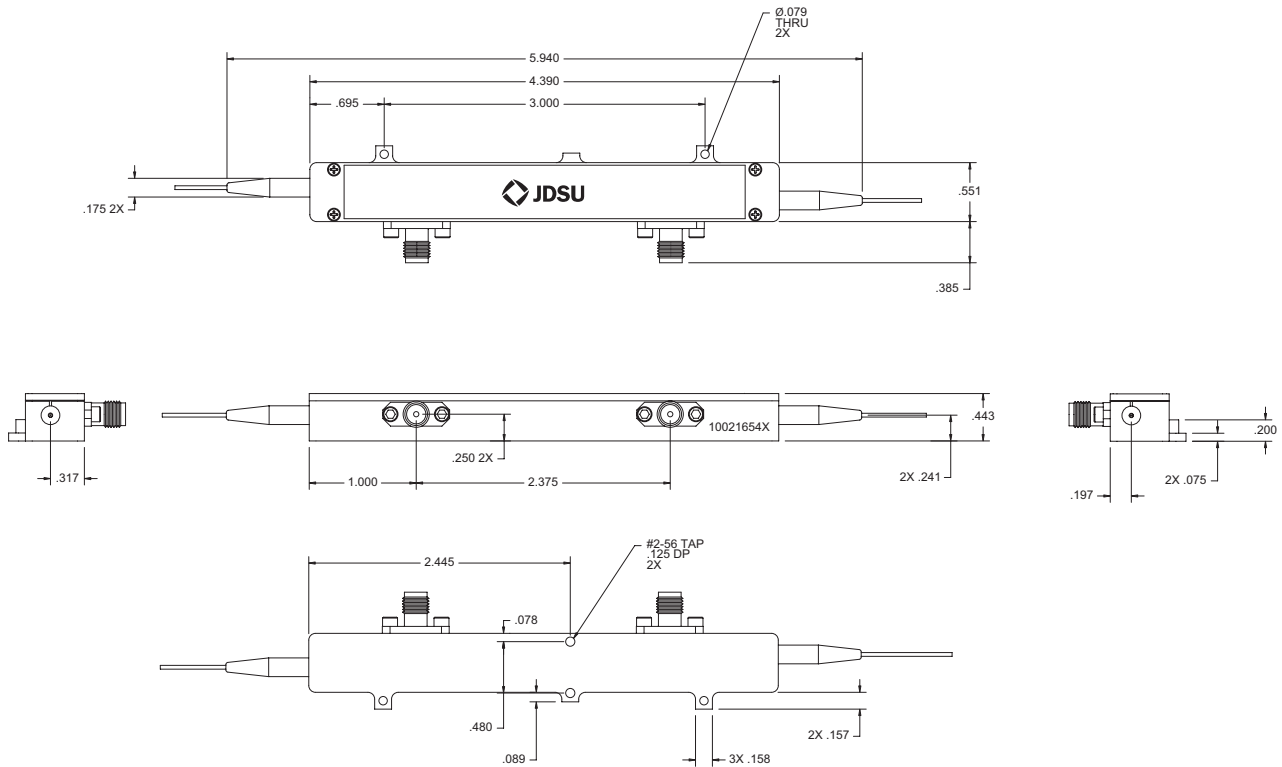
**500 MHz Lumped Element Device  
Package Dimensions**

(Specifications in inches unless otherwise noted.)



**10 GHz Traveling Wave Device  
Package Dimensions**

(Specifications in inches unless otherwise noted.)



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#### Specifications

Parameter		1320 nm 500 MHz PM	1550 nm 500 MHz PM	1550 nm High Speed PM
<b>Model Description</b>		<b>PM-130-005</b>	<b>PM-150-005</b>	<b>PM-150-080</b>
<b>Optical (note<sup>1</sup>)</b>				
Operating wavelength	Minimum	1280 nm	1510 nm	1530 nm
	Maximum	1340 nm	1570 nm	1565 nm
Insertion loss	Maximum	3.5 dB	3.5 dB	4.5 dB
Polarization extinction ratio, chip	Typical	>50 dB	>50 dB	>50 dB
Polarization crosstalk, fiber	Maximum	-20 dB	-20 dB	-20 dB
Input power	Maximum	200 mW	200 mW	200 mW
Intensity modulation (by design)	Typical	<0.1 %	<0.1 %	<0.1 %
<b>Electrical (note<sup>1</sup>)</b>				
RF port				
Bandwidth (note <sup>2</sup> )	Typical	0.5 GHz	0.5 GHz	10 GHz
$V_{\pi}$ at 10 GHz	Maximum	-	-	11 V
Impedance	Typical	(See note <sup>3</sup> )	(See note <sup>3</sup> )	45 to 50 $\Omega$
$V_{\pi}$ at DC	Maximum	3.5 V	4.5 V	6.0 V
RF power, unterminated option	Maximum	27 dBm	27 dBm	-
RF power, terminated option	Maximum	24 dBm	24 dBm	27 dBm (See note <sup>4</sup> )
Device capacitance	Maximum	13 pF	13 pF	-
S11, 0.13 to 14 GHz, terminated	Maximum	-	-	-8 dB
<b>Mechanical</b>				
Electrical connectors (package)		SMA connector	SMA connector	K-connectors
Fibers				
	1320 nm device, PM input and output		Fujikura SM 13-P-7/125-UV/UV-400	
	1550 nm device, PM input and output		Fujikura SM 15-P-8/125-UV/UV-400	
<b>General</b>				
Material			Lithium niobate	
Crystal orientation			X-cut, y-propagating	
<b>Environmental</b>				
Operating temperature			0 to 70 °C	
Storage temperature			-40 to 85 °C	

1. All measurements made at 23°C unless otherwise noted.

2. Measured with 50  $\Omega$  termination.

3. Characteristic impedance determined by R and Ce at frequency.

4. 10 GHz traveling wave device requires customer supplied 50  $\Omega$  external termination.

Note: This device is designed and manufactured to meet the specification contained in this data sheet. All device specifications are beginning of life at room temperature. This device uses, wherever possible, design rules, materials, and manufacturing processes incorporated in similar modulator products that have been qualified by JDSU.

However, this device is manufactured in low volumes and has not been formally qualified to a specific telecommunications standard. Further device qualification is not implied by these specifications. Please contact a JDSU salesperson for more information on high volume device purchases.

**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: 10022360**

<b>Product Code</b>	<b>Description</b>
10027001	500 MHz APE PM, 1320 nm, 50 $\Omega$ termination, no optical connectors
21007176	500 MHz APE PM, 1320 nm, no termination, no optical connectors
21002078	500 MHz APE PM, 1550 nm, 50 $\Omega$ termination, no optical connectors
10027019	500 MHz APE PM, 1550 nm, no termination, no optical connectors
10022360	500 MHz APE PM, 1550 nm, 50 $\Omega$ termination, FC/PC optical connectors
10024520	500 MHz APE PM, 1550 nm, no termination, FC/PC optical connectors
21004570	10 GHz APE PM, 1550 nm, no optical connectors
10023874	10 GHz APE PM, 1550 nm, FC/PC optical connectors