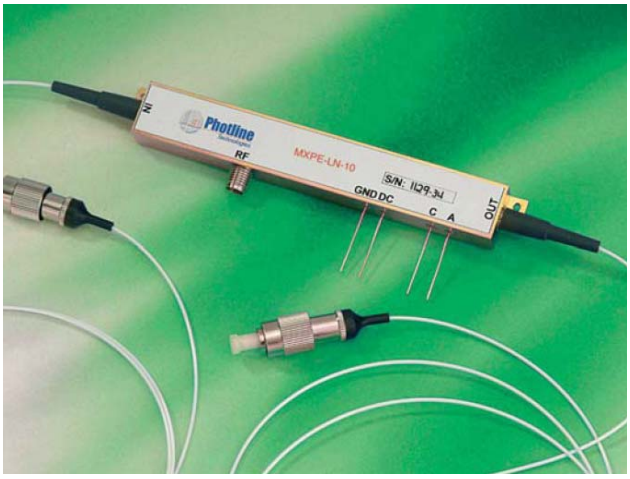
High Extinction Ratio $LiNbO_3$ Intensity Modulators

KGMXPE-LN series



Description

The KGMXPE-LN series intensity modulators are a family of high performance modulators that exhibit superior extinction ratio. Their specific design relies on Proton Exchange, a diffusion process that creates polarizing waveguides in the lithium niobate substrate and leads to Extinction Ratio higher than 40 dB.
The KGMXPE-LN series intensity modulators have proven themselves as key devices in a variety of applications: pulse shaping prior optical amplification, pulse generation and lidar based sensing systems are a few examples.

Features

• Superior Extinction Ratio: 40 dB
• High Optical Power Handling: 500 mW
• Proton Exchanged processed, polarizing waveguides
• High Bandwidth (up to > 10 GHz)
• Broad wavelength range, work in C band and L band
• Bias electrode separated from RF input for easy implementation : no need for bias T

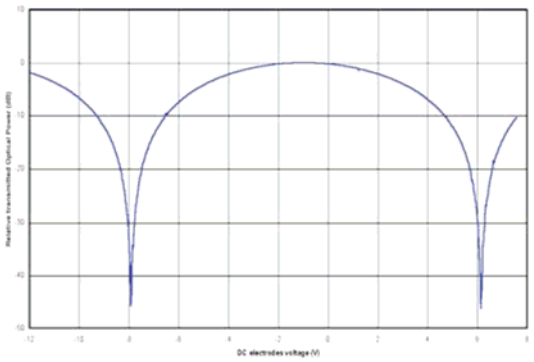
Options

• Internal monitoring photodiode
• Choice of input and output fibers
• 1300 nm and 1000 nm band versions
• Higher and lower modulation bandwidths

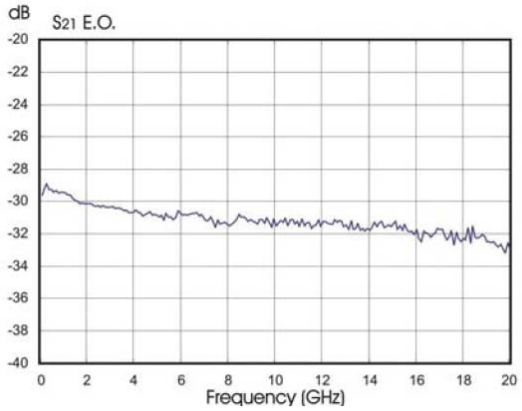
Specifications

Electrical		Min	Typ	Max
Vπ DC electrodes	V		7.0	7.5
KGMXPE-LN-10 electro- optic bandwidth S21 @-3 dB	GHz	10	12	
KGMXPE-LN-10 V_ RF electrodes @ 50 kHz	V		6	6.5
KGMXPE-LN-10 V_ RF electrodes @ 10 GHz	V		6.5	7
KGMXPE-LN-10 typical rise time for 1 ns pulse	ps		50	
Electrical return loss S11 0-High cut-off E-O bandwidth	dB		- 12	-10
Ripple	dBre		0.5	1
Input resistance RF connector	Ω		40	
Input resistance DC connector	Ω		>1 M	
Internal photodiode responsivity (ref: input power)	A/W	0.015	0.025	0.035
Optical				
Crystal	Lithium Niobate X-Cut Y-Prop			
Waveguide process	Proton Exchange			
DC extinction ratio	dB	40	43	
Insertion loss	dB		4	5
Optical return loss	dB		-40	
Wavelength dependent loss (1480-1600 nm)	dB		0.5	1
Chirp parameter		-0.1	0	0.1
Extinction ratio of internal photodiode	dB		3	6
Interfaces				
Input fiber	polarization maintaining , Panda type length : 1.5 meter, buffer diameter : 900 μm			
Output fiber	single mode type , SMF-28 length : 1.5 meter, buffer diameter : 900 μm			
Output fiber (option)	polarization maintaining , Panda type length : 1.5 meter, buffer diameter : 900 μm			
Package size	100 x 15 x 9.5 mm3			
Input RF connector	Wiltron Female K			
DC connectors	pin feed through diameter 1.0 mm			
Photodiode connectors	pin feed through diameter 1.0 mm			
Environmental				
Operating temperature	0°C to +70°C			
Storage temperature	-40°C to +85°C			
Maximum Ratings				
Maximum voltage on DC input	±20V			
Maximum RF input power	+28dBm			
Maximum optical input power	+27dBm			

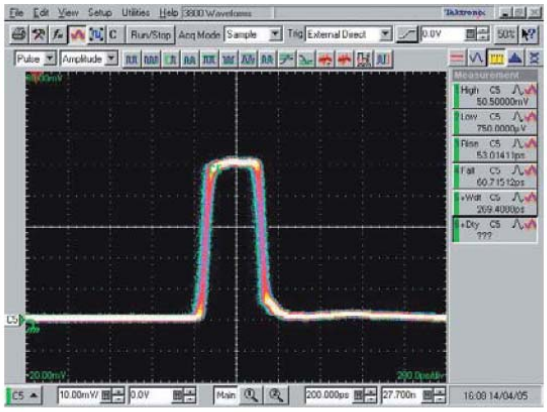
Typical curves



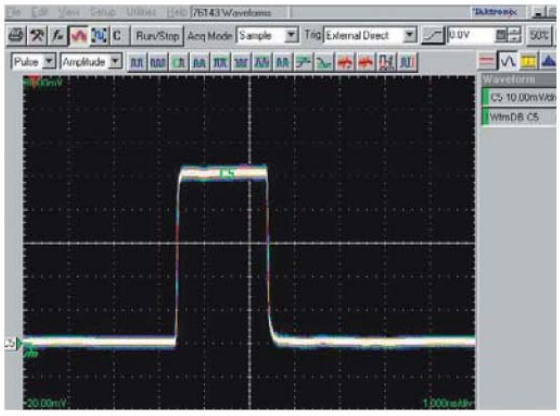
Extinction Curve



KGMXPE-LN-10 E-O bandwidth

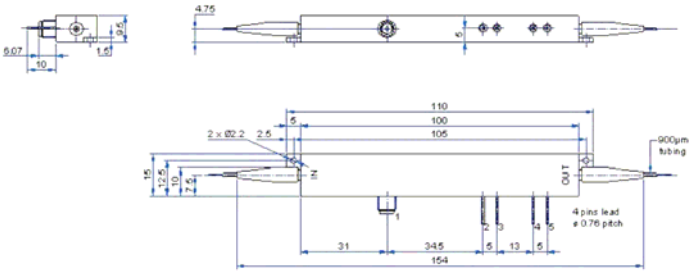


256ps pulse generated with KGMXPE-LN-10



2ns pulse generated with KGMXPE-LN-10

Package footprint



dimensions in mm

1 RF INPUT
2 GROUND
3 BIAS INPUT
4 PHOTODIODE CATHODE
5 PHOTODIODE ANODE

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