

# LiNbO<sub>3</sub> Polarization Rotators

## KGEOM-PS-LN series

### Features

- No moving parts
- High switching frequencies: up to 20 GHz
- Low insertion loss : < 3 dB
- Low control voltage : < 5 V
- Available at 1300 nm and 1550 nm

### Applications

- Polarization control
- Polarization scrambling
- Fiber Sensors
- Test and Measurement



### Accessories

- Optimized external RF drivers :
- DR-GA series

### Description

The KGEOM-PS-LN Polarization Rotators are integrated optics waveguide devices that switch the polarization state of an input light between two linear orthogonal output states at frequencies up to 10 GHz. Practically, the output light is transmitted on either the fast or slow axis of the output polarization maintaining fiber of the component, operating then as a TE to TM converter.

Principle: the KGEOM-PS-LN Rotators are based on a birefringent LiNbO<sub>3</sub> phase modulator whose waveguide is illuminated at 45 ° of its main axes. The input state of polarization (SOP) is thus split up in two orthogonal TE and TM polarization states. When an RF modulation signal is applied via the control electrodes, an optical path difference between the TE and TM components is produced resulting in a new state of polarization (SOP) for the output light.

Ultimately, the phase modulation signal can be adjusted to provide a highly linear SOP on either axis of the output fiber. This polarization rotation provides an efficient means for high speed Polarization Switching or Polarization Scrambling.

### Specifications

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Electrical		Min	Typ	Max
Electro-optic bandwidth S21 @-3 dB	GHz	/	0.5 / 5.0 / 10	/
Switching voltage @ 50 kHz	V	/	5 / 10 / 15	/
Electrical return loss S11 0- cut-off bandwidth	dB	/	- 12	-10
Ripple	dB	/	0.25	/
Input resistance RF connector	Ω	/	/	/
Optical				
Crystal	Lithium Niobate y-propagating			
Operating wavelength	nm	/	1550	/
Insertion loss	dB	/	3.5	4.0
Optical return loss	dB	-45	-50	/
Polarization extinction ratio	dB	18	20	/
Interfaces				
Input and output fibers	polarization maintaining 1550 nm , Panda type, length : 1.5 meter buffer diameter : 900 μm			
Output fiber (option)	single mode type SMF 28,length : 1.5 meter buffer diameter : 900 μm			
Package size	100 x 15 x 9.5 mm <sup>3</sup>			
Input RF connector	Wiltron Female K type			
Environmental				
Operating temperature	-40°C – 85°C (PS-LN-0.1)			
Storage temperature	-40°C – 85°C			
Maximum ratings				
Maximum RF input power	+28dBm			
Maximum optical input power	+27dBm			

\* For low bandwidth applications, PS-LN is delivered with a high impedance termination charge. The impedance miss adaptation then prevents modulation above typically 100 MHz, but the electrical control is made easier and does not require a 50  $\Omega$  impedance adaptation.

## Ordering information

KGEOM-PS-LN- BW- P - Y-AB-CD

BW	bandwidth : 0.1 or 05 or 10
Z	output fiber : <b>P</b> polarization maintaining; <b>S</b> standard single mode
AB	input connector : <b>00</b> bare fiber; <b>FA</b> : FC/APC; <b>FC</b> : FC/SPC
CD	output connector : <b>00</b> bare fiber; <b>FA</b> : FC/APC; <b>FC</b> : FC/SPC