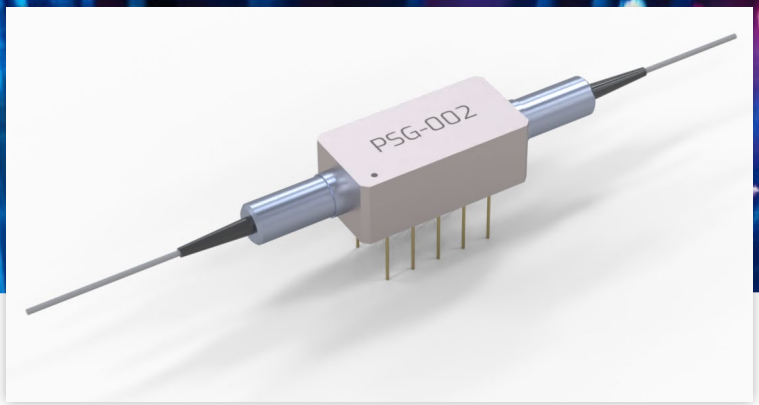


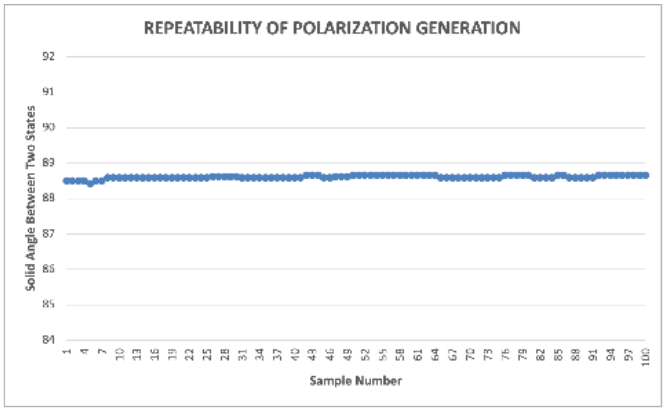
PSG-002

High-Speed Polarization State Generator

Luna Innovations' high-speed polarization state generator (PSG) module enables quick generation of up to six distinctive polarization states (LCP, RCP, Linear ±22.5°, Linear ±67.5°) across a Poincaré sphere in less than 50 µs between two consecutive states, with high repeatability of less than 0.1 degrees.

The new compact packaging is ideal for integration into systems that require precise generation of these 6 polarization states or precise 90° polarization rotation. The PSG-002 uses a new self-latching technique which reduces power consumption and heat generation. In addition, its predictable wavelength and temperature dependence allows for easy calibration, making it a perfect choice in swept wavelength component measurement systems.

Other applications include Mueller matrix-based measurements, polarization OTDR, performance monitoring, medical imaging, material birefringence measurements, and fiber sensors.



KEY FEATURES

- Switches between 6 polarization states: LCP, RCP, Linear ±22.5°, Linear ±67.5°
- Typical switching time 45 µs
- SOP repeatability 0.1°
- Self-latching
- Zero static power dissipation
- 4-bit control
- Compact
- Minimal heat generation

APPLICATIONS

- Swept-frequency measurement
- Polarization OTDR
- Polarization rotation
- Mueller matrix-based polarization analysis
- Material birefringence
- Optical imaging

High-speed deterministic polarization state generation with improved performance, increased reliability, and reduced footprint

PERFORMANCE

PARAMETER	MIN.	TYPICAL	MAX.	UNITS
Optical Characteristics				
Operation Wavelength[1]	1480	1550	1620	nm
Insertion Loss[2]			1.0	dB
Return Loss			–55	dB
Number of Distinct Polarization States		6		
SOP Relative Angle Accuracy (Deviation from 90° of angle between output SOPs on Poincaré Sphere)[3,4]			±5	deg
SOP Repeatability (on Poincaré Sphere)[3]		±0.1		deg
SOP Accuracy to Target (on Poincaré Sphere at λc and 23°C)[1,3]			±5	deg
SOP Switching Time[5]				
At Bias Voltage 10 V	40	45	50	µs
At Bias Voltage 5 V	70	80	100	µs
At Bias Voltage 3.3 V	90	120	150	µs
Optical Power Handling			300	mW
Physical Operating Conditions				
Operating Temperature	0		50	°C
Storage Temperature	-40		85	°C
Mechanical Properties				
Dimension	60 mm (L) x 14.6 mm (W) x 11 mm (H)			
Mounting Holes	4X #0-80 UNF-28, 3 mm DEEP			
Fiber Jacket	900 µm loose tube			

Notes: Values are referenced without connectors

1. Center wavelength λc=1550 nm. Calibrated wavelength range 1500-1580 nm standard.
2. With input polarization aligned to polarizer transmission axis.
3. Relative angles on the Poincaré sphere are twice the electrical field rotation angles in real space.
4. Over all wavelengths and temperatures in the operational ranges.
5. Time interval between drive signal pulse leading edge and completion of SOP transition at room temperature (~23 °C) using an H-bridge driver circuit.

ORDERING

Catalog #	Wavelength	Input Fiber Type	Pigtail Length	Connector Type
PSG - 002	☐☐ 15 – 1550 nm 13 – 1310 nm[1]	☐ S – SM fiber[2] P – PM fiber	☐ 1.0 – 1.0 m Specify	☐☐ NC – no connector FC/PC FC/APC SC/PC SC/APC

Notes:

1. 1310 nm coming soon
2. SM fiber input may result in higher loss due to input polarizer

CUSTOM AND OEM OPTIONS

Contact Luna for configuration details.

NOTES

*For more detailed specification, refer to PSG-002 technical specification sheet.

LUNA

+1.866.586.2682
solutions@lunainc.com
www.lunainc.com

PSG-002 REV.1 06.24.2021