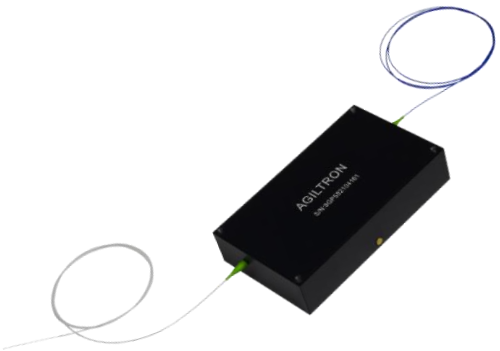
High-Speed Polarization Scrambler

0.05 to 5MHz, 450 to 2200nm, <1dB optical loss, turn-key module

DATASHEET

BUY NOW



The High-Speed Polarization Scrambler is a non-mechanical device having the industrial-leading performance of ultra-high speed, low optical loss, and longevity, providing an ultimate solution for polarization randomization. The polarization scrambler consists of three electro-optical crystals in series oriented at 0, 45, and 90 degrees that are driven at three fixed frequencies, respectively. It converts any input state of polarization to randomly polarized states at high speed, covering the entire Poincare sphere. The device is a self-contained module that needs no input control or adjustments. It is easy to use by simply connecting the input and output fibers and plugin the accompanied 12V DC power supply. It is a bidirectional device. The 300kHz version is packaged inside an aluminum enclosure. The 5MHz and 2MHz versions are PCB-based modules for OEM integration.

This module requires about 10 minutes to stabilize thermally.

Features

- No Moving Parts
- Ultra-High Speed
- Low Loss
- High Reliability
- Bidirectional
- Space/Mill Qualification

Applications

- Polarization Elimination
- Instruments

Specifications

Parameter		Min	Typical	Max	Unit
Center Wavelength		780		2400	nm
Operating Wavelength Range			100		nm
Insertion Loss [1]			0.8	1.8	dB
Return Loss		45	50	55	dB
Degree of Polarization [2]	300kHz		3	4	%
	2MHz		4	5	
	5MHz		8	12	
Three Rotator Frequencies	300kHz	70	210	300	kHz
	2MHz	230	1100	2000	
	5MHz	270	2200	5000	
Optical Power Handling [3]		100		500	mW
Polarization Dependent Loss			0.25	0.5	dB
Operating Temperature		0		60	˚C
Storage Temperature		-40		85	˚C
Power Supply (DC)			12		V
Power Consumption			4		W

Notes:

[1]. Without connectors. Each Connector adds 0.3dB. 0.8 dB is typical for 1550nm. 1.5dB is typical for 780nm

[2]. Tested using Agilent Polarimeter N7781 series with data rate 1MHz

[3]. 500mW for fiber Core >9 μm. 100mW for 750nm

Rev 03/01/24

© Photonwares Corporation

P +1 781-935-1200 E sales@photonwares.com W www.agiltron.com

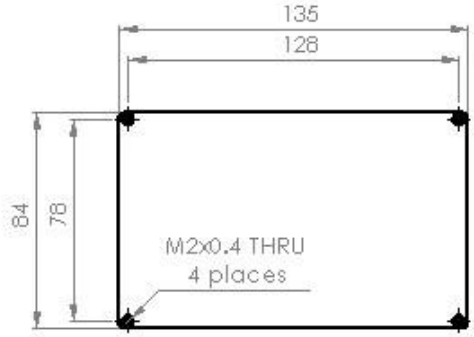
High-Speed Polarization Scrambler

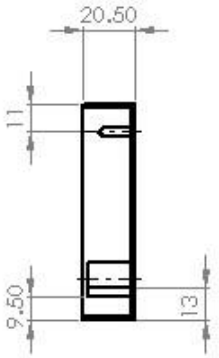
0.05 to 5MHz, 450 to 2200nm, <1dB optical loss, turn-key module

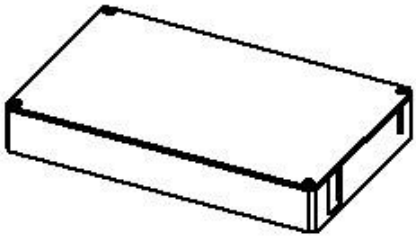
DATASHEET

Mechanical Dimensions (mm)

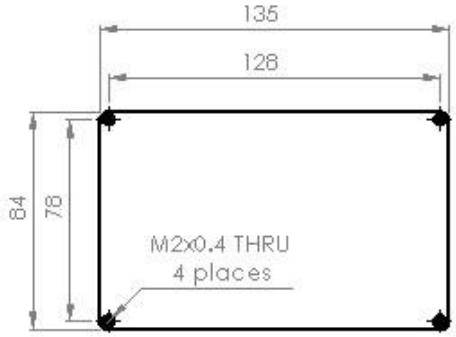
< 2MHz Package

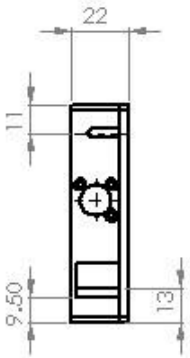


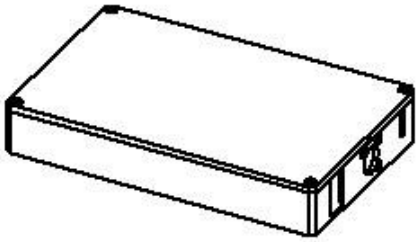




> 2MHz Package







High-Speed Polarization Scrambler

0.05 to 5MHz, 450 to 2200nm, <1dB optical loss, turn-key module

DATASHEET

Ordering Information

	1 N	☐	☐	☐	☐	☐	☐	☐
Prefix	**Type**	**Wavelength**	**Max Frequency**	**Package**	**Fiber Type**	**Fiber Cover**	**Fiber Length**	**Connector**
NOPS-		1550nm = 5 1310nm = 3 1060nm = 1 850nm = 8 750nm = 7 2000nm = 2 Special = 0	300kHz = 3 2MHz = 2 5MHz = 5 1kHz = A 500Hz = B	<2MHz Package = 3 >2MHz Package = 5 Special = 0	SMF-28 = 1 H1060 = 2 Special = 0	0.9mm tube = 3 Bare = 1 Special = 0	0.25m = 1 0.5m = 2 1.0m = 3 Special = 0	FC/PC = 2 FC/APC = 3 LC/PC = 7 LC/APC = 9 LC/UPC = U Special = 0

Red color for special order

Fiber Core Alignment
Note that the minimum attenuation for these devices depends on excellent core-to-core alignment when the connectors are mated. This is crucial for shorter wavelengths with smaller fiber core diameters that can increase the loss of many decibels above the specification if they are not perfectly aligned. Different vendors' connectors may not mate well with each other, especially for angled APC.

Fiber Cleanliness
Fibers with smaller core diameters (<5 μm) must be kept extremely clean, contamination at fiber-fiber interfaces, combined with the high optical power density, can lead to significant optical damage. This type of damage usually requires re-polishing or replacement of the connector.

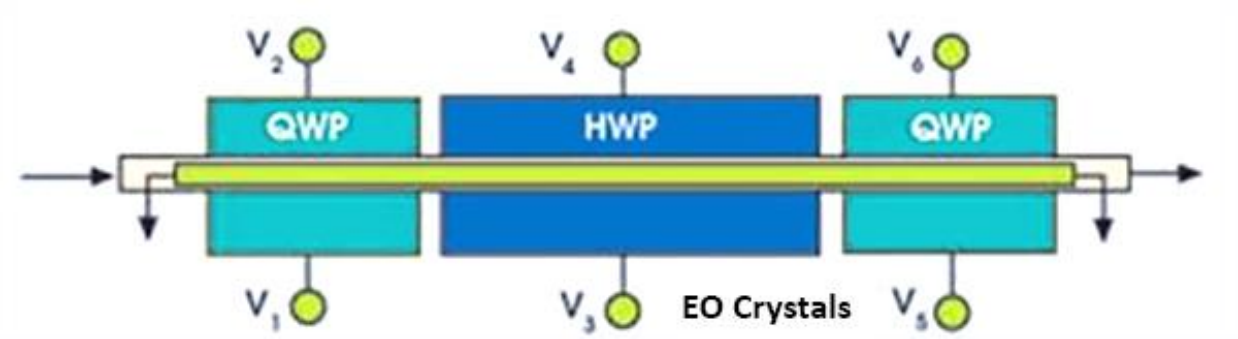
Maximum Optical Input Power
Due to their small fiber core diameters for short wavelength and high photon energies, the damage thresholds for device is substantially reduced than the common 1550nm fiber. To avoid damage to the exposed fiber end faces and internal components, the optical input power should never exceed 20 mW for wavelengths shorter 650nm. We produce a special version to increase the how handling by expanding the core side at the fiber ends.

High-Speed Polarization Scrambler

0.05 to 5MHz, 450 to 2200nm, <1dB optical loss, turn-key module

DATASHEET

Function Diagram



P +1 781-935-1200 E sales@photonwares.com W www.agiltron.com