

# In-line Optical Power Monitor

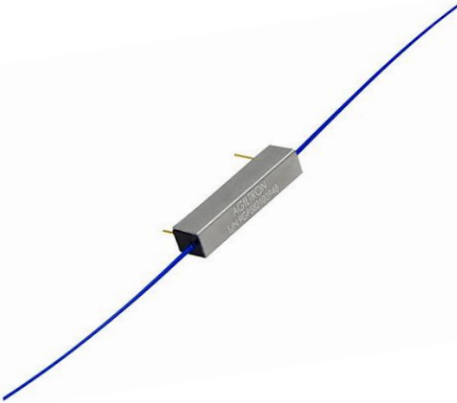
(Integral Optical Tap and PIN Photodiode)



(Protected by U.S. Patent No: 9535218)

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## Applications

- ASE light sources
- EDFA gain modules
- Raman amplifiers
- Optical channel monitoring
- Optical fiber test instruments

## Features

- Low insertion loss
- Ultra low return loss
- Flat broadband response
- Low PDL
- High directivity
- High reliability

Agiltron's ILPM Series Fiber Optic Tap Power Monitors are used for in line power measurement and precision power controlling. It is based on a patent pending design that taps light without bending and grooving fiber, or using lens and optical coating. This novel power monitor provides industrial exceptional performance in ultra-low loss, low polarization and wavelength dependence, high directivity, variable tap ratios, as well as low cost and high reliability.

The continuous fiber device is particularly suited for adapting to various types of fiber and for high power handling. This power monitor has a miniature ceramic package houses offering a stable optical tap and PIN photodiode as well as GR1209 and GR1201 compliance qualification.

## Specifications

Parameter	Min	Typical	Max	Unit
Operation Wavelength		300-2000		nm
Responsivity <sup>[1]</sup>	5	20	60	mA/W
Polarization Stability <sup>[2]</sup>	0.1	0.2	0.25	dB
Insertion Loss	0.2	0.6	0.8	dB
Polarization Dependent Loss <sup>[3]</sup>			0.01	dB
Extinction Ratio <sup>[4]</sup>	23			dB
Directivity <sup>[5]</sup>	25	28	40	dB
Return Loss		55		dB
Max Optical Power		500		mW
Dark Current@-5V, 23C			1	nA
3dB bandwidth@-5V bias	10	200	2000	MHz
Capacitance			10	pF
Max. Forward Current		10		mA
Max. Reverse Current		5		mA
Max. Reverse Voltage		10		V
Operating Temperature	-5		75	°C
Storage Temperature	-40		85	°C

### Notes:

- [1]. It is tap ratio depended.
- [2]. PDR, responsivity variation with polarization, only for polarization independent version.
- [3]. PDL for polarization independent version.
- [4]. ER for polarization maintaining version.
- [5]. The responsivity ratio between forward and backward directed light.

**Warning:** The device is extremely ESD-sensitive. Its dark current increases by unprotected handling. It is recommended to be handled under a certified ion fan once the package is removed.

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© Photonwares Corporation

+1 781-935-1200

sales@photonwares.com

www.agiltron.com

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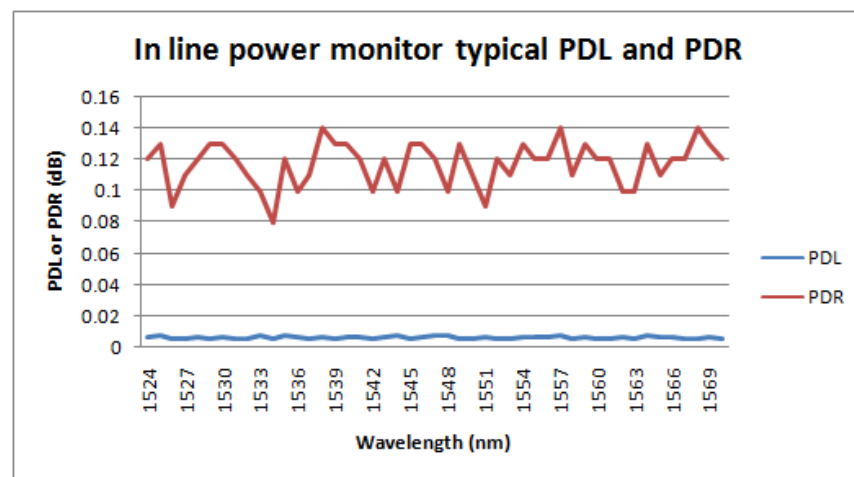
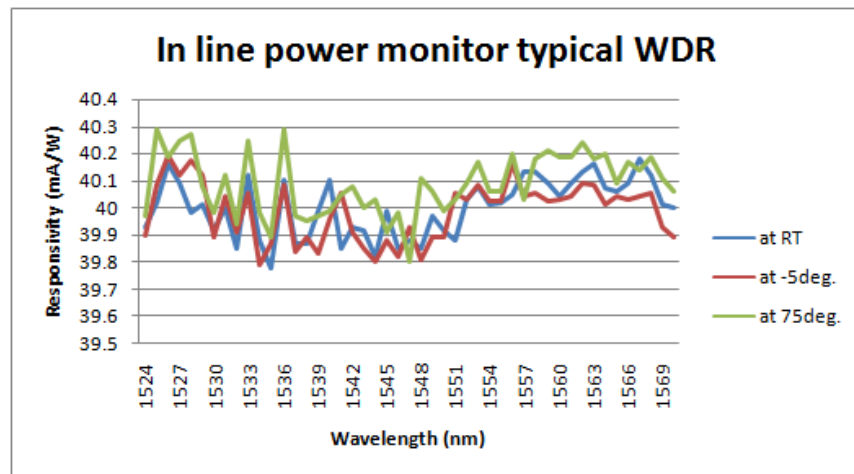
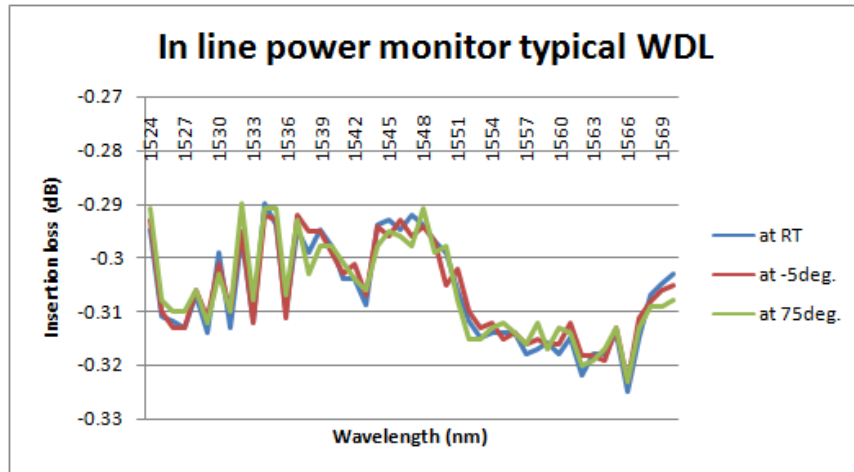
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### Typical Performance with SMF-28e Fiber



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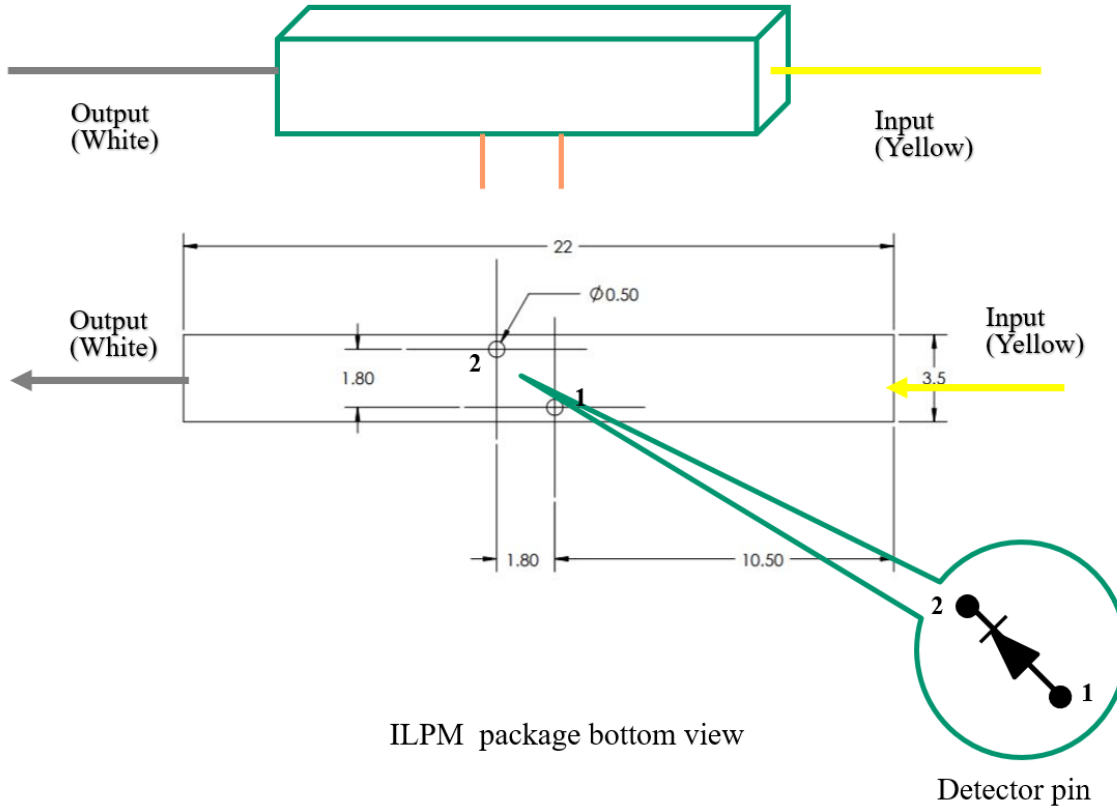
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### Mechanical Footprint Dimensions (mm)



\*Product dimensions may change without notice. This is sometimes required for non-standard specifications.

### Ordering Information

Prefix	Tap ratio	Wavelength	Directivity	Package Type	Fiber Type	Fiber Cover	Fiber Length	Connector
<b>ILPM-</b>	1% = 01 3% = 03 5% = 05 0.1% = 06 0.3% = 07 0.5% = 08 0.7% = 09 Special = 00	350 = 7 530 = 9 850 = 8 1060 = 6 1310 = 3 1550 = 5 2000 = 2 Special = 0	Standard = 1 No = 2 Special = 0	Standard = 1 Reflection <sup>[1]</sup> = 2 Special = 0	SMF28e = 1 PM250 = 2 Hi1060 = 3 PM980 = 4 MM50/125 = 5 MM62.5/125 = 6 SM850 = 8 Special = 0	Bare fiber = 1 900um tube = 3 Special = 0	0.25m = 1 0.5m = 2 1.0m = 3 Special = 0	None = 1 FC/PC = 2 FC/APC = 3 SC/PC = 4 SC/APC = 5 ST/PC = 6 LC/PC = 7 Duplex LC/PC = 8 MTP = 9 LC/APC = A LC/UPC = U Special = 0

[1]. No directivity

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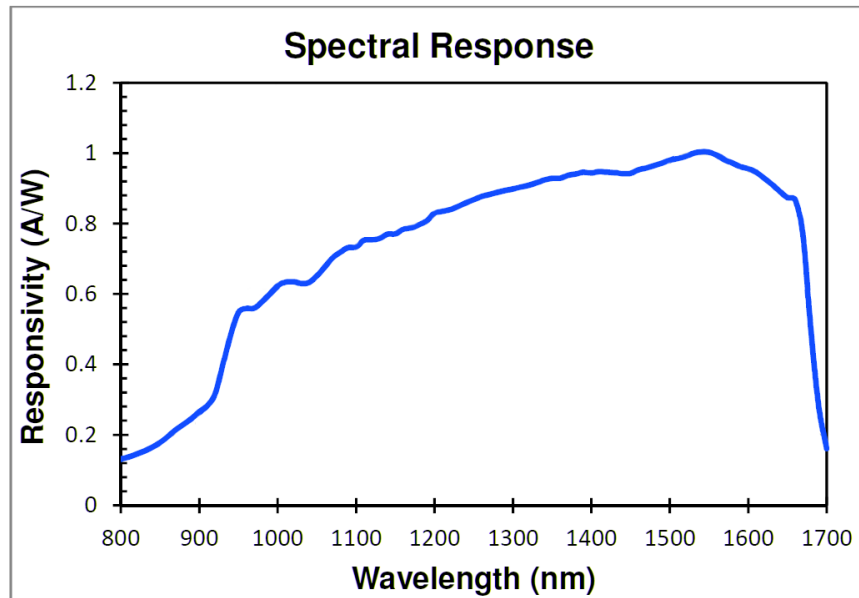
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## Spectral Response



## Application Notes

### 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  $\mu\text{m}$ ) 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 handling by expanding the core side at the fiber ends.

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### Caution Electrostatic Sensitivity



- Never touch laser diode and the module using hands
- Always use protections when handle a laser diode
- Recommend mounting the laser diode using an ionic gun and ESD finger cots



### Laser Safety

This product meets the appropriate standard in Title 21 of the Code of Federal Regulations (CFR). FDA/CDRH Class 1M laser product. This device has been classified with the FDA/CDRH under accession number 0220191. All versions of this laser are Class 1M laser products, tested according to IEC 60825-1:2007 / EN 60825-1:2007. An additional warning for Class 1M laser products. For diverging beams, this warning shall state that viewing the laser output with certain optical instruments (for example eye loupes, magnifiers, and microscopes) within a distance of 100 mm may pose an eye hazard. For collimated beams, this warning shall state that viewing the laser output with certain instruments designed for use at a distance (for example telescopes and binoculars) may pose an eye hazard.

Wavelength = 1.3/1.5  $\mu\text{m}$ .

Maximum power = 30 mW.



\*Caution - Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

\*IEC is a registered trademark of the International Electrotechnical Commission.