

Short Pulse Thermal Power Head



S470C

Description

The S470C power head is designed for optical power measurements over a broad wavelength range from UV to Mid-IR. The head is optimized for measurements of high-energy and high-peak-power pulses with high resolution, low thermal drift, fast response, and small size. Its high sensitivity of >100 mV/W enables pulsed (and CW) average power measurements from 100 μ W to 5 W in free-space and fiber-based applications.

When operating the sensor, allow it to settle to room temperature and afterwards perform a zero adjustment. Though the sensor will correct for ambient temperature changes, we recommend post-mounted rather than handheld operation to avoid thermal contact with body heat.

The S470C housing contains a SM1 thread aligned with the axis of the input aperture that is compatible with any number of Thorlabs' internally SM1-threaded (1.035"-40) accessories. This allows convenient mounting of external optics, fiber adapters, light shields, and apertures. A combined 8-32- & M4-threaded mounting hole is provided to accommodate posts and post holders.

The S470C is compatible with all currently available Thorlabs power meter consoles. A non-volatile memory in the sensor connector contains sensor information data and the NIST- and PTB-traceable calibration data that include an absolute calibration at one wavelength and an individual spectral absorption correction table.

Specifications

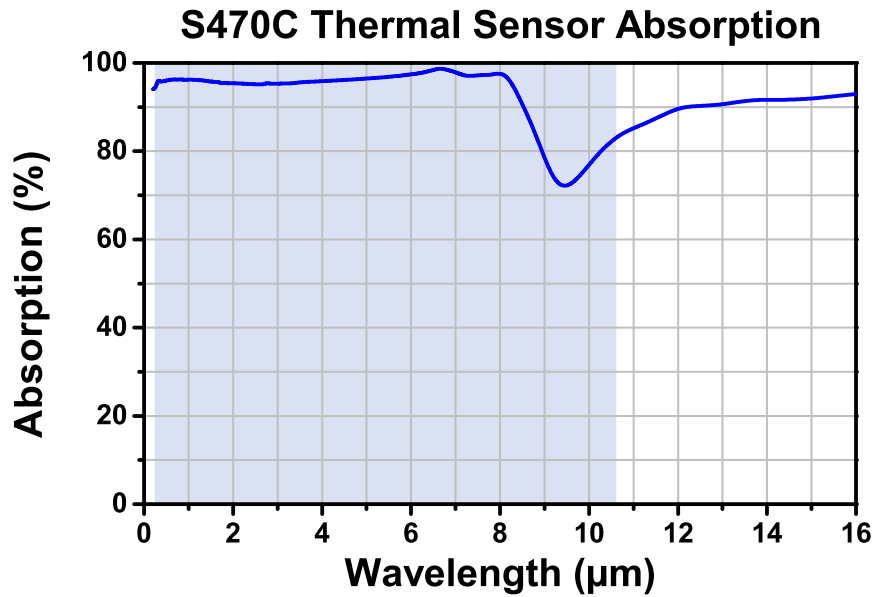
S470C	
Detector Type	Thermal Volume Absorber
Wavelength Operating Range	250 nm - 10.6 μ m
Optical Power Working Range	100 μ W - 5 W
Max Average Power Density	35 W/cm ²
Max Peak Power Density	100 GW/cm ² (1 ns Pulse)
Max Pulse Energy Density	1 J/cm ² (1 ns Pulse)
Linearity	\pm 0.5%
Resolution ^a	10 μ W
Measurement Uncertainty	\pm 3% @ 1064 nm; \pm 5% @ 250 nm - 10.6 μ m
Typical Application	Short Pulse Laser Power Measurement
Laser Types	Short pulse (YAG, Ruby, Alexandrite, Holmium, Erbium)
Absorber	Broadband Volume (Schott NG1)
Cooling	Convection
Console Compatibility	PM100D, PM100A, PM100USB, PM200, PM320E
Response Time with Display ^b	<2 s
Sensor Dimensions	45 mm x 45 mm x 18 mm
Active Detector Area	\varnothing 16 mm
Input Aperture	\varnothing 15 mm
Distance to Detector ^c	5.1 mm
Cable Length	1.5 m
Connector	Sub-D 9p Male
Weight	0.1 kg (0.22 lb)
Post Mounting	Universal 8-32 / M4 Tap
Aperture Thread	External SM1 (1.035"-40)
Compatible Fiber Adapters (Available Separately)	S120-FC, S120-SC, S120-LC, S120-SMA, and S120-ST

a. Measured with the PM200 Console

b. Measured with display (0 - 90%).

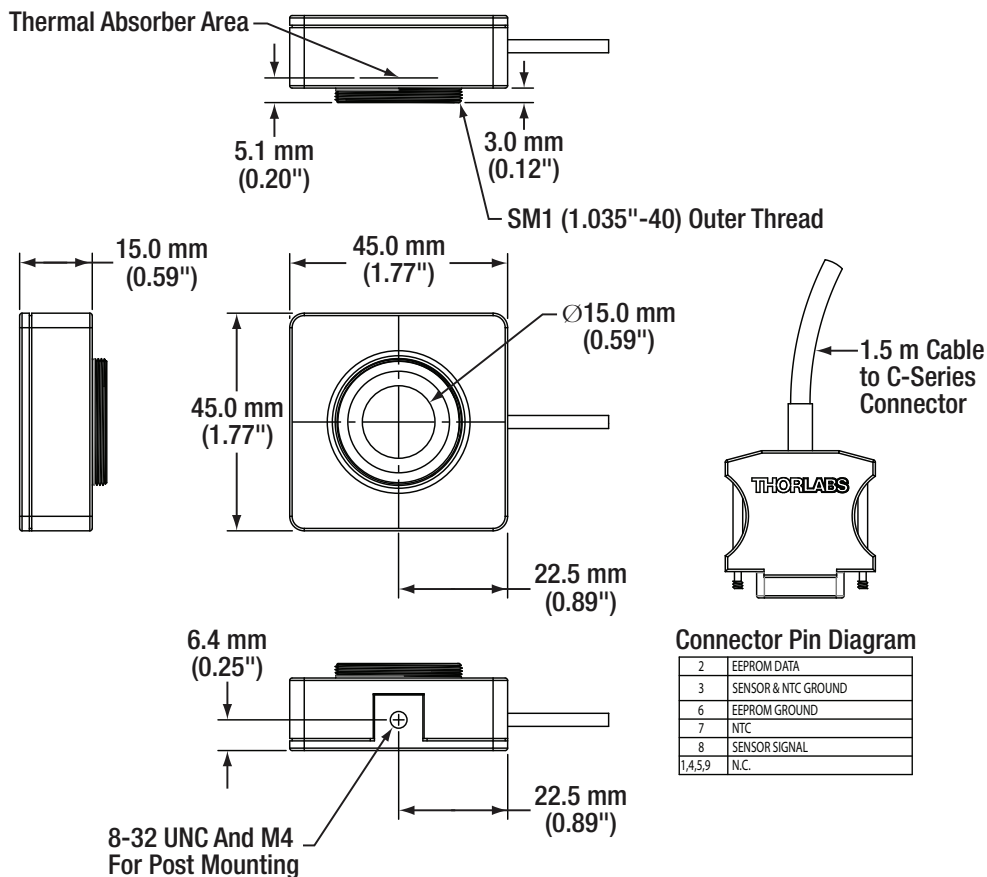
c. Distance is measured from the sensor surface to the front face of the housing.

Typical Absorption Curve



The graph above shows the absorption of the S470C thermal sensor with respect to wavelength. The operating wavelength range is indicated by the blue shaded region.

Drawings



Cleaning and Maintenance

There are no serviceable parts in the S470C head. The housing may be cleaned by wiping with a soft damp cloth. Do not touch or wipe the absorber surface or use any solvents to clean it! Gently blow off any debris using compressed air. If you suspect a problem with your S470C, please call Thorlabs and an engineer will be happy to assist you.

As long as the sensor has not been exposed to excessive optical power (please pay attention to the maximum ratings in the technical specifications), the calibration should be very stable over long periods of time (well over a year). To maintain the accuracy and performance of the S470C, Thorlabs recommends a yearly recalibration, starting one year after purchase.

Precautions and Warranty Information

These products are ESD (electro static discharge) sensitive and as a result are not covered under warranty. In order to ensure the proper functioning, care must be given to maintain the highest standards of compliance to the maximum electrical specifications when handling such devices. The sensors are particularly sensitive to any value that exceeds the absolute maximum ratings of the product. Any applied voltage in excess of the maximum specification will cause damage and possible complete failure to the product. The user must use handling procedures that prevent any electro static discharges or other voltage surges when handling or using these devices.

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- 2. A critical component is any component in a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system or to affect its safety or effectiveness.*
- 3. The Thorlabs products described in this document are not intended nor warranted for usage in Military Applications.*

