

# RkP-576a Silicon Power Probe



- **UV - Enhanced Response**
- **pW Sensitivity**
- **Large Area Detector**
- **Built-in Optical Chopper**

The RkP-576a is a UV-Enhanced Silicon Power Probe designed specifically for measuring low intensity, cw or quasi-cw sources, from the UV to near-IR. Picowatt sensitivity, a low-noise preamplifier, and a 1 cm<sup>2</sup> active area combine for unprecedented versatility and accuracy. The integrated Rk-570C optical chopper supports synchronous detection, resulting in superior S/N ratio and background rejection compared to other non-chopped semiconductor detectors.

The RkP-576a is suitable for measuring a number of lasers - HeNe, Argon, Nd:YAG (fundamental and harmonics), and Dye - just to name a few. It works equally well with other light sources, such as Xenon lamps, LEDs, and laser diodes. Use the RkP-576a as a reference standard to monitor the output of a monochromator when measuring a detector's responsivity as a function of wavelength.

Bioluminescence, non-linear optics, photometry (with the appropriate filter), and germicidal studies are a few examples of the diverse range of applications for the RkP-576a. Use it with a pyroelectric or thermopile probe and a dual-channel instrument to measure the throughput of filters and attenuators over 6 decades.

Silicon detectors operate on the photoelectric principle - when a photon of sufficient energy strikes the doped silicon lattice it is absorbed, and its energy forces an electron to be freed from the lattice. When the silicon detector is wired in a circuit the liberated electrons become charge carriers, resulting in an electric current whose magnitude is proportional to the number of photons striking the detector. Because of this direct

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SPECIFICATIONS

Spectral response	200 - 1100 nm
Maximum total power	1 mW
Maximum average power density	5 mW/cm <sup>2</sup>
Noise equivalent power	1 pW
Calibration accuracy	±5%
Linearity	±0.5%
Detector active area dimensions	11.3 mm (1.0 cm <sup>2</sup> )
Full scale ranges	6; 20 (30) nW - 1 mW (instrument dependent)
Probe dimensions (l x w x h)	17.0 cm x 9.0 cm x 5.0 cm (6.7" x 3.6" x 2.0")
Probe and chopper (l x w x h)	19.0 cm x 9.0 cm x 10.5 cm (7.5" x 3.6" x 4.2")
Probe weight	0.7 kg (1.5 lb)
Probe and chopper weight	1.6 kg (3.5 lb)

photon-to-electron conversion silicon detectors can be used in dc (non-chopped) or ac (chopped) probes.

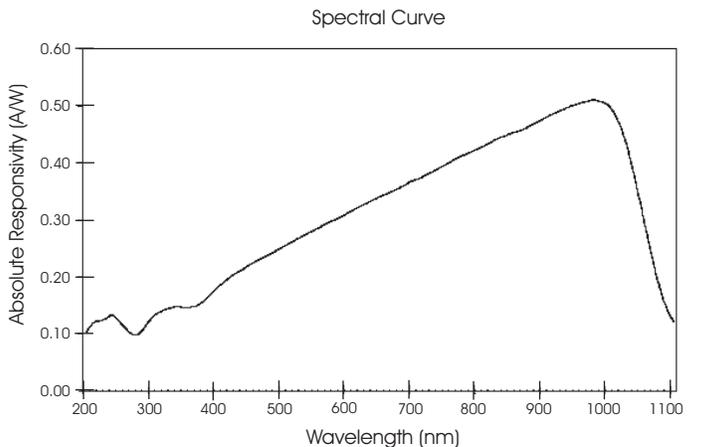
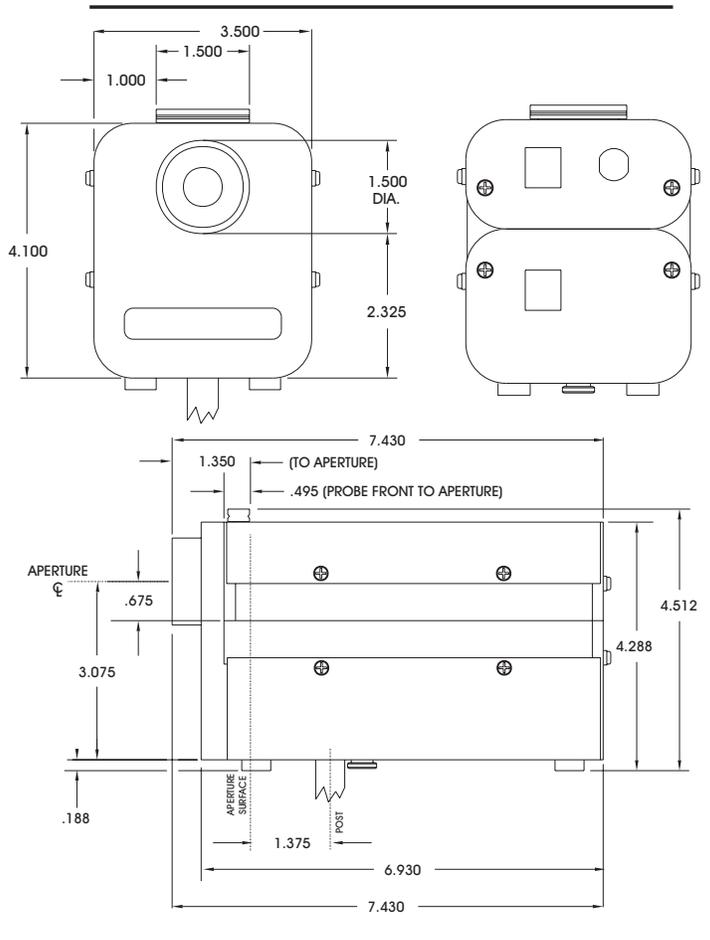
The RkP-576a is designed for use with an optical chopper and a suitable instrument to take advantage of synchronous detection. Synchronous detection requires two signals - an optical signal and an electrical reference signal. The optical signal is generated when the chopped light strikes the detector. The chopper itself produces the reference signal. The advantage of synchronous detection is that only the optical signal with the same frequency as the reference signal will be measured - all other optical signals are ignored. Positioning the chopper so that just the source is chopped minimizes background noise, yielding the maximum S/N ratio. With this technique it is possible to measure a signal level that is smaller than the background.

The RkP-576a is calibrated for absolute power measurement at 950 nm (the wavelength of peak spectral response). The typical wavelength response curve, normalized to 100% relative responsivity at 950 nm, is provided. Two absolute wavelength calibration options are available, VIS-IR (350 - 1100 nm) and UV (200 - 350 nm).

The RkP-500 Series probes are designed to work with the Rk-570C Optical Chopper. The probe's detector assembly and preamplifier are in one housing, the chopper's motor and control circuitry in another. The probe housing mates to the chopper housing, aligning the detector aperture directly behind the chopper aperture. Electrical connections to the instrument are made via a short jumper cable from the probe. A longer jumper is provided for remote chopping.

There are several accessories available for the RkP-500 Series, including probe extension cables, the kTA-141 support stand, and various filters and windows. The options and accessories are detailed in a separate data sheet.

All RkP-500 Series probes are provided with a certificate of calibration showing traceability to the National Institute of Standards and Technology (NIST) and compliance with MIL-45662 and ANSI-Z540 Sections 7-18.



As a result of our ongoing commitment to product improvement specifications are subject to change without notice. REV 019801js