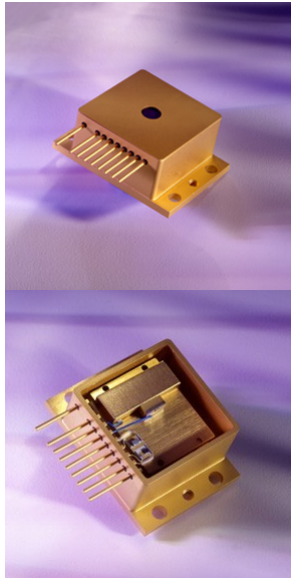


Packages / Options

CW PACKAGES (see below for fibered packages, cw packages, package options)

HHL



The HHL(High Heat Load) package is the largest standard package available. It is a hermetically sealed package approximately 1.5" square. The package is available with a standard TEC which will stabilize the temperature of a 5 W laser or with a high performance TEC (HPTEC) when a larger temperature tuning range is required. The HHL package is typically used when there is a large heat load (>2W diode) or when a large temperature tuning range is desired.

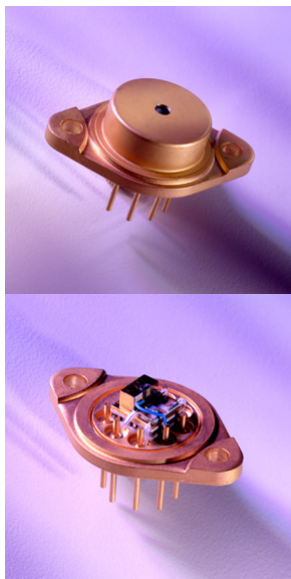
This package is the preferred package for fibered applications. A modified version of this package is used for our visible modules (see fibered packages below)

Options available: Photodiode, Thermistor, FAC, Fibering, TEC, HPTEC

Package Drawings/Pin Outs are available on request for the following package/ option combinations:

- HHL (HHL with no internal TEC)
- HHL-FAC (HHL with fast axis collimator)
- HHL-TEC (HHL with standard TEC, photodiode, thermistor)
- HHL-HPTEC (HHL with high performance TEC, photodiode, thermistor, photodiode)
- HHLF-TEC (Fibered HHL see fibered packages)
- HHLF-HPTEC (Visible module package)
- DUAL-HHLF (Visible module, 14 fibers)

TO3



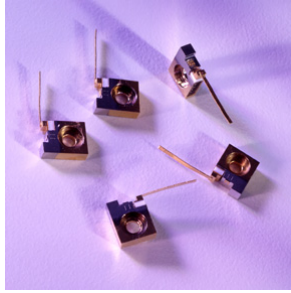
The TO3 is an eight pin diamond base hermetically sealed package. It may be used with devices up to 5W without a TEC. The TO3 package can include a standard TEC for 1W devices or a high performance TEC for 2W devices.

Options available: Photodiode, Thermistor, FAC, Fibering, TEC, HPTEC

Package Drawings/Pin Outs are available on request for the following package/ option combinations:

- TO3 (TO3 with no internal TEC)
- TO3-FAC (TO3 with fast axis collimator)
- TO3-TEC (TO3 with standard TEC, photodiode, thermistor, 1W diode maximum)
- TO3-HPTEC (TO3 with high performance TEC, photodiode, thermistor, photodiode, 2W diode maximum)
- TO3F-TEC (Fibered TO3 see fibered packages)

C-Mount



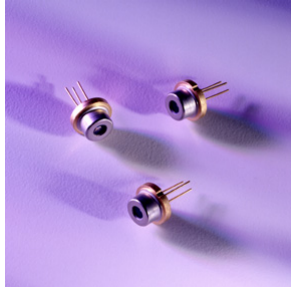
The C-mount is an open package suitable for devices with up to 5W output power with suitable heatsinking. This package is typically used by OEM's who wish to take advantage of the package's small size and the ability to place objects such as lens very close to the laser facet. The disadvantage of this package is that the diode is exposed and therefore subject to mechanical damage. As a result HPD does not warrant open packages.

Options available: FAC

Package Drawings/Pin Outs are available on request for the following package/option combinations:

- C
- C-FAC (C-mount with FAC)

9MM



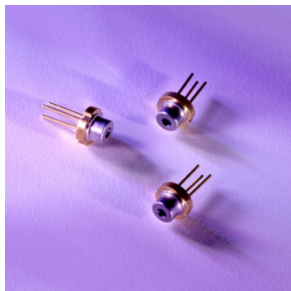
The 9MM package is a sealed copper package suitable for devices up to 2W output power. This is an ideal low cost package for mid power applications where internal cooling is not required. This package is also well suited for high volume applications.

Options available: photodiode, FAC

Package Drawings/Pin Outs are available on request for the following package/option combinations:

- 9MM
- 9MM-D (9mm with monitor photodiode)
- 9MM-FAC (9mm with FAC lens)
- 9MM-CN (case negative for short pulse devices)

TO56



The TO56 (5.6 mm) package is a hermetically sealed steel package suitable for low power (<50mW) single mode devices such as HPD's 4000 series.

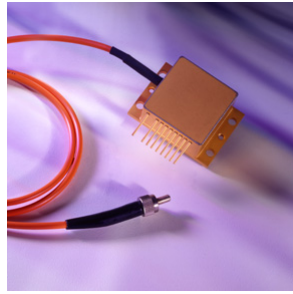
Options available: photodiode

Package Drawings/Pin Outs are available for the following package/option combinations:

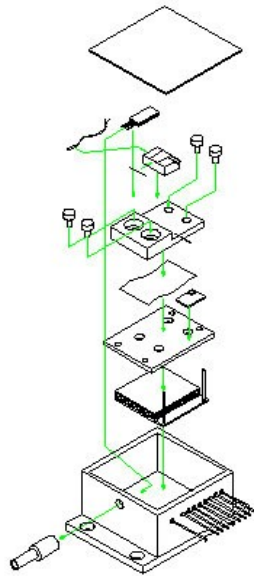
- TO56
- TO56-D (5.6 mm with monitor photodiode)

FIBERED PACKAGES (see also cw packages, pulsed packages, package options)

HHLF



The HHLF(High Heat Load, fibered) package is the largest fibered package available. It is a sealed package approximately 1.5" square. The package is available with a standard TEC which will stabilize the temperature of a 5 W laser or a high performance TEC (HPTEC) when a larger temperature tuning range is required. Fibered packages typically use a fiber core diameter equal to the laser source size (see data sheets) with a reduction in power of approximately 30%. This package is used for visible modules (5200 and 5300 series lasers)

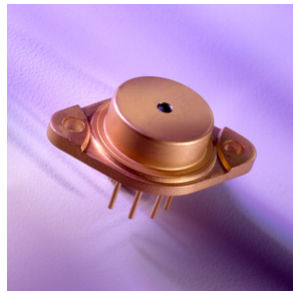


Options available: Photodiode, Thermistor, FAC, Fibering, TEC, HPTEC

Package Drawings/Pin Outs are available on request for the following package/ option combinations:

- HHLF (HHLF with no internal TEC)
- HHLF-TEC (HHLF with TEC, monitor photodiode and thermistor)
- HHLF-HPTEC (Visible module package with TEC, monitor photodiode and thermistor)
- DUAL-HHLF-HPTEC (Visible module package ,14 fibers, with TEC, monitor photodiode and thermistor)
- HHLF Assembly Drawing (Visible module package)

T03F



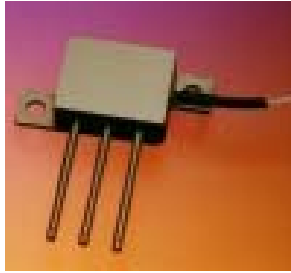
The T03F is an eight pin diamond base sealed package. It may be used with devices up to 5W without a TEC or up to 2W with a high performance TEC. Fibered packages typically use a fiber core diameter equal to the laser source size (see data sheets) with a reduction in power of approximately 30%.

Options available: Photodiode, Thermistor, Fibering, TEC, HPTEC

Package Drawings/Pin Outs are available on request for the following package/ option combinations:

- T03F (T03 with no internal TEC)
- T03F-TEC (T03F with standard TEC, photodiode, thermistor, 1W diode maximum)
- T03F-HPTEC (T03F with high performance TEC, photodiode, thermistor, photodiode, 2W diode maximum)

T0259



The TO259 is a three pin sealed package. It may be used with devices up to 5W. This package is available in a hermetically sealed version. It is ideal for low cost fibered applications where an internal TEC is not required.

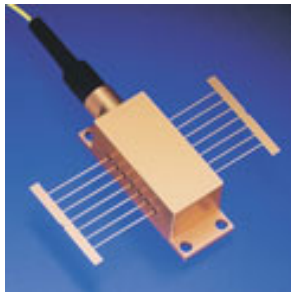
Fibered packages typically use a fiber core diameter equal to the laser source size (see data sheets) with a reduction in power of approximately 30%.

Options available: Photodiode, [Thermistor](#),

Package Drawings/Pin Outs are available on request for the following package/ option combinations:

- TO259
- TO259-D (TO259 with monitor photodiode)
- TO259-TH (TO259 with thermistor)

BUTF



The Butterfly (BUTF) package is an industry standard 14 pin DIP package/ It may be used with devices up to 1W with a standard TEC or up to 2W with a high performance TEC. This package is available in a hermetically sealed version. It is ideal for low power fibered applications where an internal TEC is required.

Fibered packages typically use a fiber core diameter equal to the laser source size (see data sheets) with a reduction in power of approximately 30%.

Options available: [photodetector](#), [thermistor](#), FAC, [Fibering](#), TEC, HPTEC

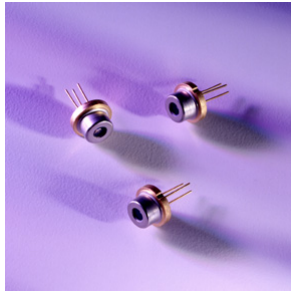
Package Drawings/Pin Outs are available on request for the following package/ option combinations:

- BUTF
- BUTF-TEC (BUTF with standard TEC, photodiode, thermistor, 1W diode maximum)
- BUTF-HPTEC (BUTF with high performance TEC, photodiode, thermistor, 2W diode maximum)

PULSED PACKAGES

(designed for 200ns, 2kHz, low power dissipation) (see also [fibered packages](#), [cw packages](#), [package options](#))

9MM



The 9MM package is a low cost hermetically sealed package. This package is well suited for high volume applications.

Options available: [photodetector](#), Stacks

Package Drawings/Pin Outs are available on request for the following package/option combinations:

- 9MM
- 9MM-D (9mm with monitor photodiode)

T05



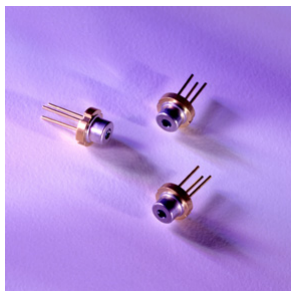
The T05 package is a two pin hermetically sealed steel package with the low inductance. The laser leads are isolated from the case. The case has a threaded block for mounting purposes.

Options available: Stacks

Package Drawings/Pin Outs are available on request for the following package/option combinations:

- T05

T056



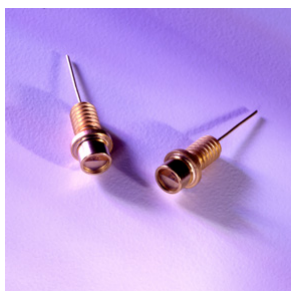
The T056 (5.6 mm) package is a hermetically sealed steel package with the lowest inductance of our standard packages.

Options available: [photodetector](#), Stacks

Package Drawings/Pin Outs are available on request for the following package/option combinations:

- T056
- T056-D (5.6 mm with monitor photodiode)

T018



The T018 is a hermetically sealed coaxial package with a single lead. The threaded case makes it extremely easy to mount into a heatsink.

Options Available: Stacks

Package Drawings/Pin Outs are available on request for the following package/option combinations:

- T018

Package Options

(not all options are available with every package. See above for details, see also cw packages, fibered packages, pulsed packages)

D

Monitor Photodiode: A photodiode is used to measure the light out of the laser by monitoring scattered light inside the package. This can be used in a power feedback loop for CW devices and a range zero pulse for pulsed devices. Since the signal level is dependent on scattered light, the value of the responsivity in any given package can vary widely (see device specifications). The use of a monitor photodiode should be verified in each new application.

Additional Information (on request):

- Detector Parameters
- HPD4005 Detector Current Histogram
- HPD4050 Detector Current Histogram

TH

A thermistor is a temperature measuring device which is typically used in a feedback loop to stabilize the temperature of the laser. HPD uses a NTC (negative temperature coefficient) thermistor with a 10,000 Ohm resistance at 25C.

Additional Information (on request):

- TEC/Thermistor Parameters

FAC

A Fast axis colimator (FAC) is a cylindrical lens mounted directly to the laser submount which decreases the fast axis of the laser emission from 40 degrees to approximately 2 degrees. Coupling loss through a FAC is typically 5%.

Additional Information (on request):

- Typical Farfield of FAC

Fibering

Fibered packages typically use a fiber core diameter equal to the laser source size (see data sheets) with a reduction in power of approximately 30%. Fibering provides a method of transmitting light to a remote location. It also provides a method of obtaining a uniform round beam.

Additional Information (on request):

- List of Standard Fibers

TEC

Thermoelectric coolers (TEC's) are electronic devices which can either cool or heat a device when current is applied. They are typically used in conjunction with a thermistor to stabilize the temperature of a laser. In most laser applications the TEC is used to cool the device. In this case the hot side of the TEC (typically the laser case) must have sufficient heatsink to remove both the heat from the laser and from the TEC.

High Performance TEC's (HPTEC) are specially manufactured to provide greater performance from the same size device. These devices are more expensive than a standard TEC but are valuable when an application requires an extended temperature tuning range.

Additional Information (on request):

- TEC/Thermistor parameters
- HPTEC vs Standard TEC performance (TO3)

#S

Vertical Stack (2S, 3S, 4S, 5S). Applies to short pulse devices only. The specified number of laser chips are stacked one on top of another to linearly increase the output power. The vertical separation of the chips is typically 150um. Larger stack sizes may introduce duty cycle limitations due to thermal effects.