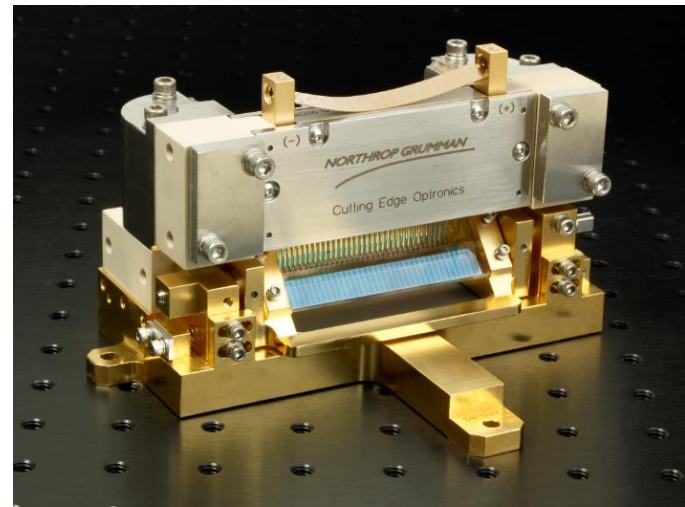


Laser Diode Array Lensing Capabilities

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Northrop Grumman – Cutting Edge Optronics

Laser Diode Packaging

Parameter	80x nm	87x-88x nm	94x nm
Max QCW Power (W)*	300	300	300+
Max CW Power (W)*	100	120	120
Efficiency @ 25° C	58%	60%	58%

*Standard Products – higher powers available

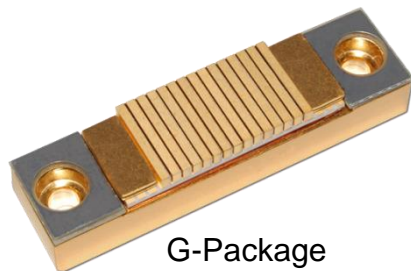


High Density Stacks

CEO has experience with additional wavelengths (available upon request)

- 630nm, 915nm, 940nm-980nm, 1120nm, 1470nm, 1530nm, etc.

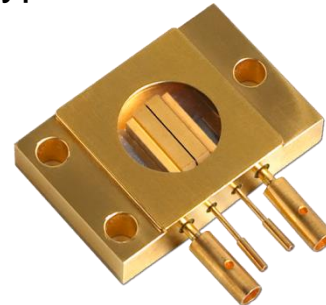
Many of these wavelengths, powers and package types are available with FAC and SAC lenses



G-Package



A-Package



Hermetically Sealed



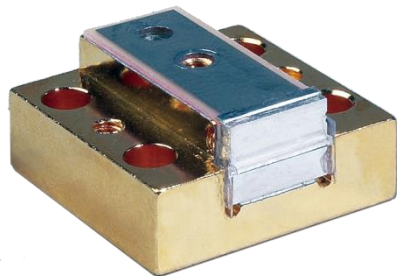
Microchannel Cooled Stacks

CEO has >20 years experience manufacturing laser diode array packages

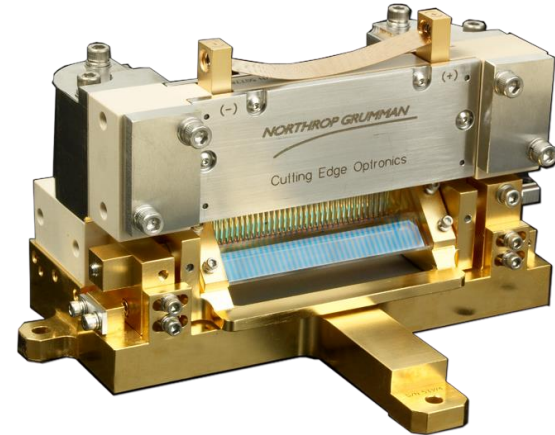
Microlensing Laser Diode Packages

CEO can collimate laser diode output for a given set of application requirements to achieve high levels of collimation and pointing.

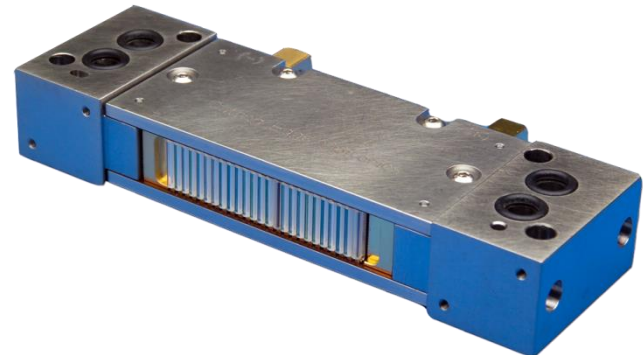
Fast-axis divergence values of $\sim 0.1^\circ$ are available. Divergence values are dependent on package type, operational mode and size. Collimation is available on 800 μm minimum pitch.



Conductively Cooled Lensed Cs Package Array



2 X 36 Bar Lensed Interleaved Array Stack



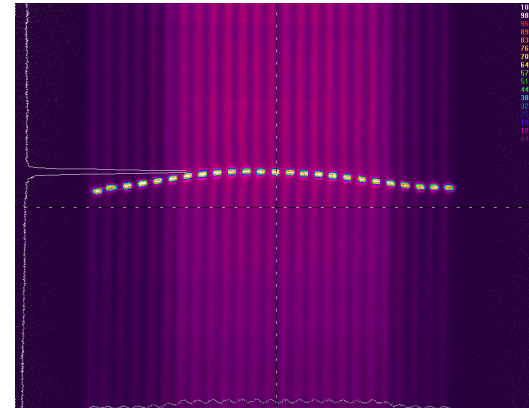
25 Bar Microchannel Cooled Lensed Array Stack

Many of CEO's laser diode packages can be collimated

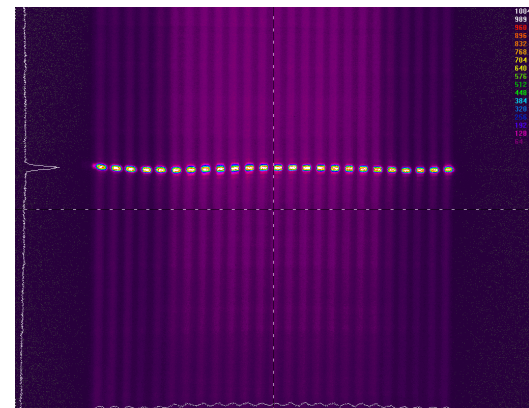
Cutting Edge Optronics is able to reliably produce industry leading fast-axis collimation values through careful selection of the laser diode bar before the laser diode package is assembled.

Depending on the required output parameters, we know the exact flatness requirements and the interaction with mechanical structures during the bonding process to produce a given collimation value.

CEO has significant experience manufacturing a variety of laser diode array packages with extremely low divergence requirements.



Laser bar with high smile $\sim 4\mu\text{m}$



Optimized low smile $\sim 0.65\mu\text{m}$

Flatter bars produce narrower divergence values on lensed packages

Active Lens Alignment

Cutting Edge Optronics actively aligns each individual laser diode bar in the packaged stack to ensure optimal focus across the entire bar to achieve the tightest far field possible.

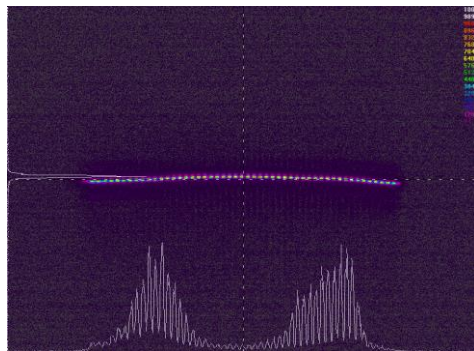
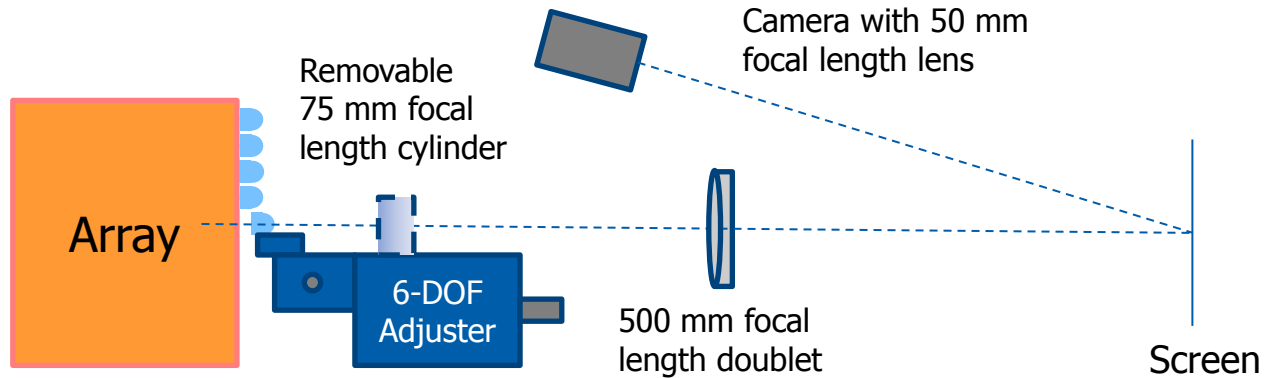


Image with cylinder In-place
"Near Field Slow-Axis"

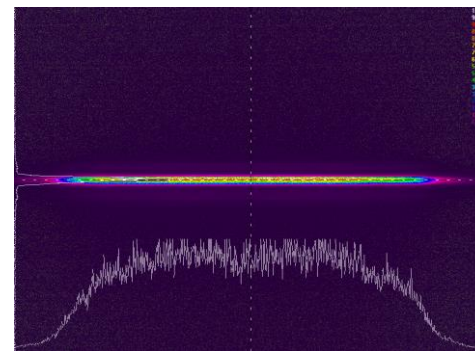


Image without cylinder
"Far Field"

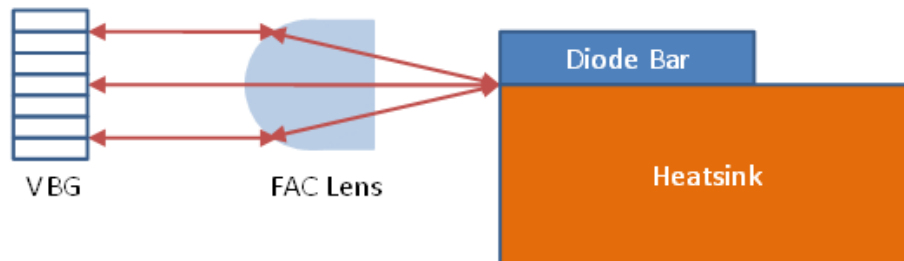
CEO achieves optimal focus across the entire bar

Wavelength Stabilization with VBG Reflectors

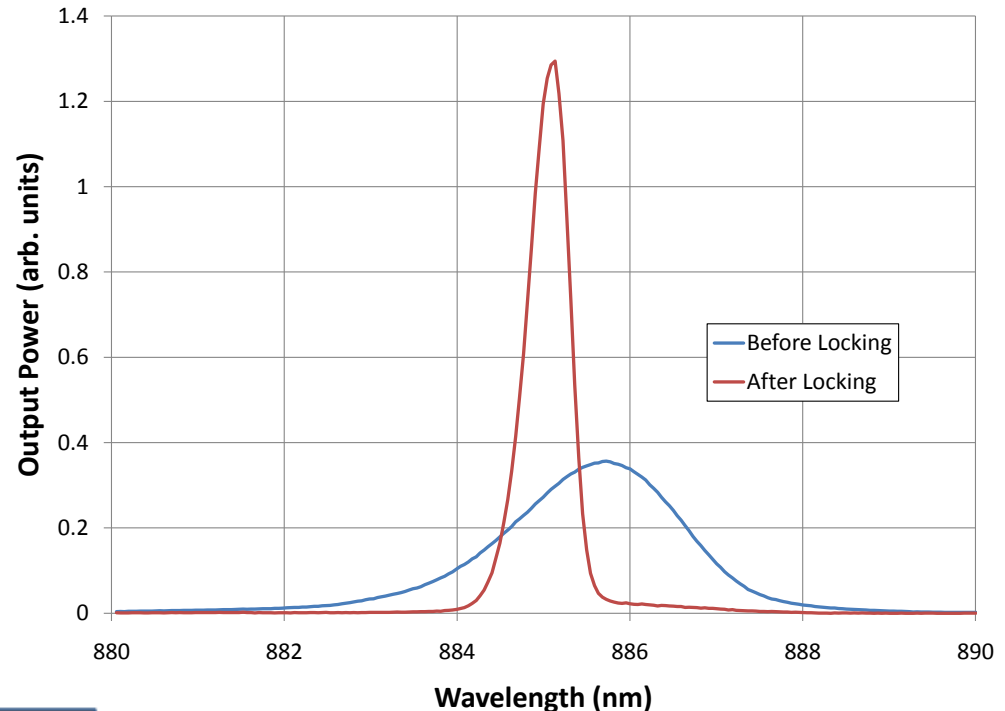
CEO has extensive experience utilizing external gratings, in addition to FAC lenses, to narrow output spectra of diode arrays

This is extremely beneficial for laser gain media with narrow absorption spectra:

- Nd:YAG ~885nm
- Yb:YAG ~975nm



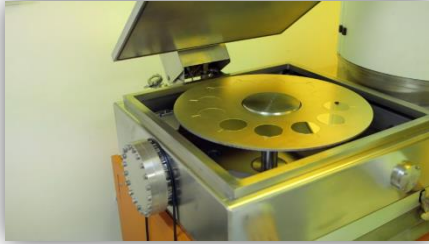
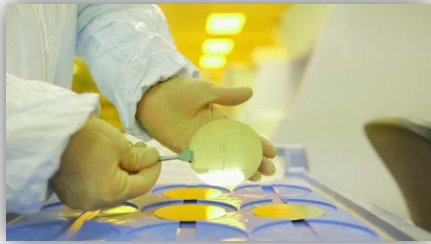
Representation of VBG attachment to lensed diode package.



Before and after spectral locking data with the addition of VBGs on a 36-bar stack operating at 100A CW.

See Also: [kW-Class, Wavelength-Stabilized Laser Diode Arrays](#)

CEO's Laser Diode Manufacturing Process



ISO 9001:2008 Certified

- Cutting Edge Optronics has >20 years experience manufacturing laser diode arrays for the commercial, industrial, medical, and military / aerospace markets.
- Through extensive laser diode packaging experience, CEO has developed significant microlensing capabilities and is able to lens multi-stack laser diode packages with high levels of pointing and collimation.
- Cutting Edge Optronics has the ability to produce wavelength stabilized laser diode array packages utilizing external gratings.

Custom Laser Diode Package and Lensing Options Available

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