

High Power Single-Bar Packages for Pumping and Direct-Diode Applications

Based on Coherent's legendary Aluminum-free Active Area (AAA™) epitaxy, Coherent 780-830 nm conduction cooled laser bar packages (CCPs) provide unsurpassed reliability and performance. Standard options include 808 nm 60W 18% fill factor bars and 808 nm 80W 28% fill factor bars rated to >20k hours lifetime. Coherent's PulseLife™ technology option, based on AuSn telecom-grade solder, is available for applications requiring hard-pulsed operation or high temperatures. Low smile configurations are available upon request. Specifications and options—including power, wavelength, and optical delivery—can be tailored to your demands.

Please contact Coherent to discuss your unique requirements.

# Conduction-Cooled Bar Packages, 780-830 nm Features:

- Unique AAA epitaxial technology for highest reliability and lifetime
- PulseLife technology option for hard pulsed operation
- Up to 80W from a 28% fill factor bar
- Up to 60W from an 18% fill factor bar
- Low smile options available
- Lifetime >20,000 hours
- ROHS compliant

# Conduction-Cooled Bar Packages, 780-830 nm Applications:

- Laser Pumping
- Medical
- Materials Processing
- Illumination



www.Coherent.com/CCP780-830

High Power Single-Bar Packages for Pumping and Direct-Diode Applications -

	18% fill factor bars (19 x 90 μm emitters)		
Device Specifications <sup>1,2,3,4,5</sup>	60W 18FF	60W 18FF PulseLife	
Intended Operation Mode	CW or QCW	Hard pulsed, CW, or QCW	
Optical Output Power (W)	60	60	
Pulsewidth (µs)	-	-	
Duty Cycle (%)	-	-	
Fill Factor (%)	18	18	
Number of Emitters	19	19	
Emitter Width (µm)	90	90	
Emitter-to-Emitter Pitch (µm)	500	500	
Centroid Wavelength Available <sup>6</sup> (nm)	780 to 830	780 to 830	
Centroid Wavelength, Standard (nm)(at 25°C)	808 ±3	808 ±3	
Spectral Width, Standard (nm)(FWHM)	<3	<3	
Wavelength Temperature Coefficient (nm/°C)	0.28	0.28	
Polarization	TE	TE	
Fast Axis Divergence (degrees)(unlensed)(FWHM)	29	29	
Fast Axis Divergence (degrees)(lensed)(FWHM)	<1	<1	
Slow Axis Divergence (degrees)(FWHM)	<10	<10	
Threshold Current (A)	8 typical	8 typical	
Operating Current (A)	<61 (56 typical)	<62 (58 typical)	
Operating Voltage (V)	<2.0	<2.0	
Operating Temperature <sup>7</sup>	25°C	25°C	
Operating Temperature Range	15 to 35°C	15 to 35°C	
Storage Temperature Range	-40 to +60°C	-40 to +60°C	

<sup>1</sup> Specifications listed here are at beginning of life. Operating current at end of life is 120% the operating current at beginning of life.

#### **Operation Notes**

Unit requires an adequate heat sink. Failure to supply an adequate heat sink will destroy the unit.

Indium foil should be used between base of diode and heatsink to ensure good thermal contact.

Torque applied to mounting screws should be controlled carefully, using a torque wrench. For 6-32 mounting screws, use 8 in-lbs (with Indium foil). For M4 mounting screws, use 9 in-lbs (with Indium foil).

ESD precautions must be taken when handling unit.

Negative current transients greater than 25  $\mu A$  and/or reverse voltages >3V can destroy the unit.

A dry environment should be provided when storing or operating a device with an open diode laser facet at temperatures below the ambient dew point. Failure to do so will cause condensation on the unit and can destroy it.

Operation in excess of rated power will accelerate device aging.

Operation at higher temperatures will accelerate device aging, increase threshold current, and lower the slope efficiency.

Care should be taken to avoid back-reflections into the device. Failure to do so can destroy the unit.



 $<sup>^{2}\,</sup>$  CW operation refers to an operating mode in which the diode lases continuously for multiple minutes at a time or longer

QCW (quasi-continuous wave) operation refers to an operating mode in which the diode lases only in very short pulses, i.e., <1 ms long, typically at repetition rates of several Hz to kHz.

<sup>4</sup> Hard pulsed operation refers to an operating mode in which the diode is repeatedly turned on and off - full current to zero current - with pulsewidths longer than several milliseconds.

 $<sup>^{\</sup>rm 5}$   $\,$  Please consult the factory for any needs not listed here, including the following options:

<sup>-</sup> Centroid wavelength and spectral width requirements other than listed here

<sup>-</sup> Optical output powers other than listed here

<sup>-</sup> Low smile options.

<sup>&</sup>lt;sup>6</sup> Contact factory for availability.

Operating temperature is measured at the base of the package. The recommended operating temperature range is 15-35°C.

High Power Single-Bar Packages for Pumping and Direct-Diode Applications

	28-30% fill factor bars (19 x 140-150 μm emitters)				
Device Specifications <sup>1,2,3,4,5</sup>	40W 30FF	40W 30FF PulseLife	50W 30FF	80W 28FF	80W 28FF PulseLife
Intended Operation Mode	CW or QCW	Hard pulsed, CW, or QCW	CW or QCW	CW or QCW	Hard pulsed, CW, or QCW
Optical Output Power (W)	40	40	50	80	80
Pulsewidth (µs)	-	-	-	-	-
Duty Cycle (%)	-	-	-	-	-
Fill Factor (%)	30	30	30	28	28
Number of Emitters	19	19	19	19	19
Emitter Width (µm)	150	150	150	140	140
Emitter-to-Emitter Pitch (µm)	500	500	500	500	500
Centroid Wavelength Available <sup>6</sup> (nm)	780 to 830	780 to 830	780 to 830	780 to 830	780 to 830
Centroid Wavelength, Standard (nm)(at 25°	C) 808 ±3	808 ±3	808 ±3	808 ±3	808 ±3
Spectral Width, Standard (nm)(FWHM	<3	<3	<3	<3	<3
Wavelength Temperature Coefficient (nm/	°C) 0.28	0.28	0.28	0.28	0.28
Polarization	TM	TM	TM	TE	TE
Fast Axis Divergence (degrees)(unlensed)(F	WHM) 31	31	31	29	29
Fast Axis Divergence (degrees)(lensed)(FWI	HM) <1	<1	<1	<1	<1
Slow Axis Divergence (FWHM)	<10	<10	<10	<10	<10
Threshold Current (A)	8 typical	8 typical	10 typical	12 typical	12 typical
Operating Current (A)	<45 (40 typical)	<47 (42 typical)	<55 (50 typical)	<81 (76 typical)	<83 (79 typical)
Operating Voltage (V)	<2.0	<2.1	<2.0	<2.0	<2.0
Operating Temperature <sup>7</sup>	25°C	25°C	25°C	25°C	25°C
Operating Temperature Range	15 to 35°C	15 to 35°C	15 to 35°C	15 to 35°C	15 to 35°C
Storage Temperature Range	-40 to +60°C	-40 to +60°C	-40 to +60°C	-40 to +60°C	-40 to +60°C

Specifications listed here are at beginning of life. Operating current at end of life is 120% the operating current at beginning of life.

#### **Operation Notes**

Unit requires an adequate heat sink. Failure to supply an adequate heat sink will destroy the unit.

Indium foil should be used between base of diode and heatsink to ensure good thermal contact.

Torque applied to mounting screws should be controlled carefully, using a torque wrench. For 6-32 mounting screws, use 8 in-lbs (with Indium foil). For M4 mounting screws, use 9 in-lbs (with Indium foil).

ESD precautions must be taken when handling unit.

Negative current transients greater than 25  $\mu A$  and/or reverse voltages >3V can destroy the unit.

A dry environment should be provided when storing or operating a device with an open diode laser facet at temperatures below the ambient dew point. Failure to do so will cause condensation on the unit and can destroy it.

Operation in excess of rated power will accelerate device aging.

Operation at higher temperatures will accelerate device aging, increase threshold current, and lower the slope efficiency.

Care should be taken to avoid back-reflections into the device. Failure to do so can destroy the unit.



<sup>&</sup>lt;sup>2</sup> CW operation refers to an operating mode in which the diode lases continuously for multiple minutes at a time or longer

<sup>3</sup> QCW (quasi-continuous wave) operation refers to an operating mode in which the diode lases only in very short pulses, i.e., <1 ms long, typically at repetition rates of several Hz to kHz.

<sup>4</sup> Hard pulsed operation refers to an operating mode in which the diode is repeatedly turned on and off - full current to zero current - with pulsewidths longer than several milliseconds.

<sup>&</sup>lt;sup>5</sup> Please consult the factory for any needs not listed here, including the following options:

<sup>-</sup> Centroid wavelength and spectral width requirements other than listed here

<sup>-</sup> Optical output powers other than listed here

<sup>-</sup> Low smile options.

<sup>&</sup>lt;sup>6</sup> Contact factory for availability.

 $<sup>^{7} \ \ \</sup>text{Operating temperature is measured at the base of the package. The recommended operating temperature range is 15-35 ^{\circ}\text{C}.}$ 

High Power Single-Bar Packages for Pumping and Direct-Diode Applications -

Device Specifications 1.2.3.4.5	90% fill factor bars (60 x 150 μm emitters) 250W QCW PulseLife		
Intended Operation Mode	QCW .		
Optical Output Power (W)	250 QCW		
Pulsewidth (μs)	<500		
Duty Cycle (%)	<10		
Fill Factor (%)	90		
Number of Emitters	60		
Emitter Width (µm)	150		
Emitter-to-Emitter Pitch (µm)	160		
Centroid Wavelength Available <sup>6</sup> (nm)	780 to 830		
Centroid Wavelength, Standard (nm)(at 25°C)	808±3		
Spectral Width, Standard (nm)(FWHM)	⟨3		
Wavelength Temperature Coefficient (nm/°C)	0.28		
Polarization	TE		
Fast Axis Divergence (degrees)(unlensed)(FWHM)	31		
Fast Axis Divergence (degrees)(lensed)(FWHM)	<1		
Slow Axis Divergence (FWHM)	<10		
Threshold Current (A)	30 typical		
Operating Current (A)	<265 (250 typical)		
Operating Voltage (V)	<2.4		
Operating Temperature <sup>7</sup>	25°C		
Operating Temperature Range	15 to 35°C		
Storage Temperature Range	-40 to +60°C		
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- 4 Hard pulsed operation refers to an operating mode in which the diode is repeatedly turned on and off full current to zero current with pulsewidths longer than several milliseconds.
- $^{\rm 5}$   $\,$  Please consult the factory for any needs not listed here, including the following options:
  - Centroid wavelength and spectral width requirements other than listed here Optical output powers other than listed here
  - Low smile options.
- 6 Contact factory for availability.
- Operating temperature is measured at the base of the package. The recommended operating temperature range is 15-35°C.

#### **Operation Notes**

Unit requires an adequate heat sink. Failure to supply an adequate heat sink will destroy the unit.

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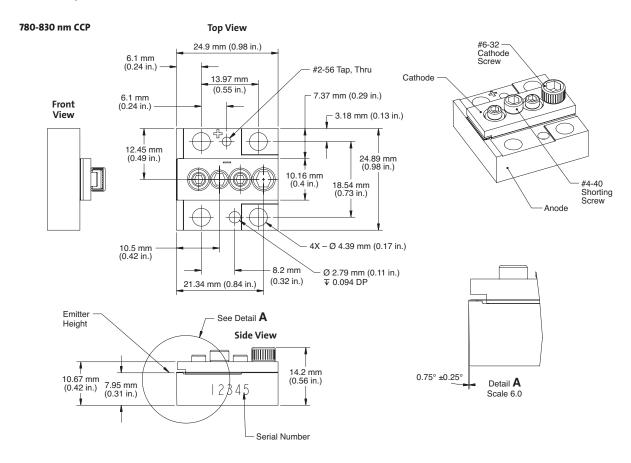
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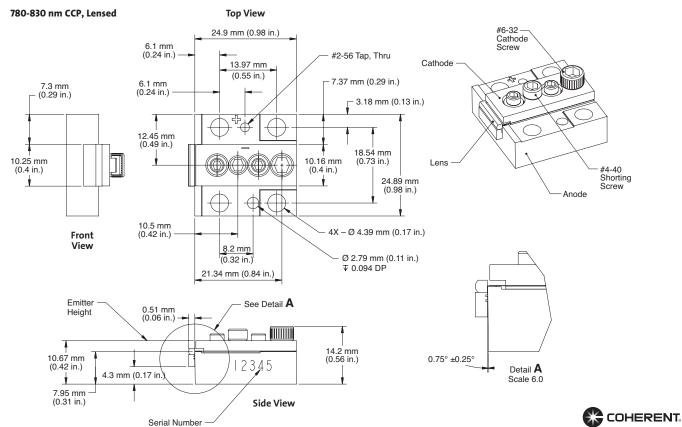
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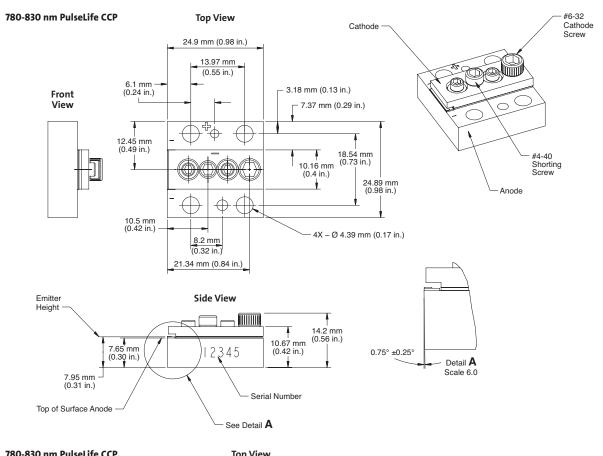
#### **Mechanical Specifications**

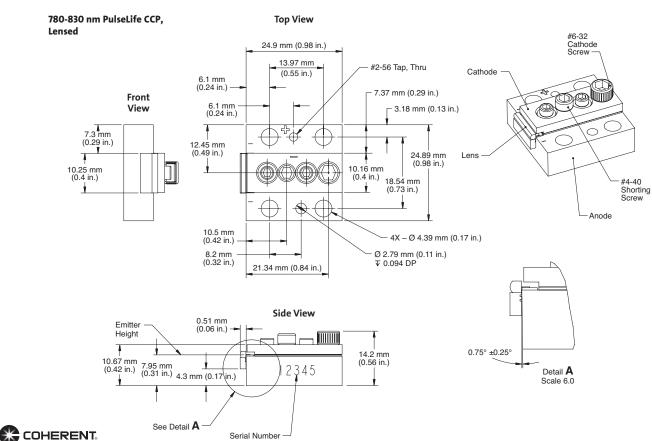




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#### **Mechanical Specifications**





High Power Single-Bar Packages for Pumping and Direct-Diode Applications



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Coherent follows a policy of continuous product improvement. Specifications are subject to change without notice.

Coherent's scientific and industrial lasers are certified to comply with the Federal Regulations (21 CFR Subchapter J) as administered by the Center for Devices and Radiological Health on all systems ordered for shipment after August 2, 1976.

Coherent offers a limited warranty for all Conduction-Cooled Bar Packages. For full details of this warranty coverage, please refer to the Service section at www.Coherent.com or contact your local Sales or Service Representative.

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