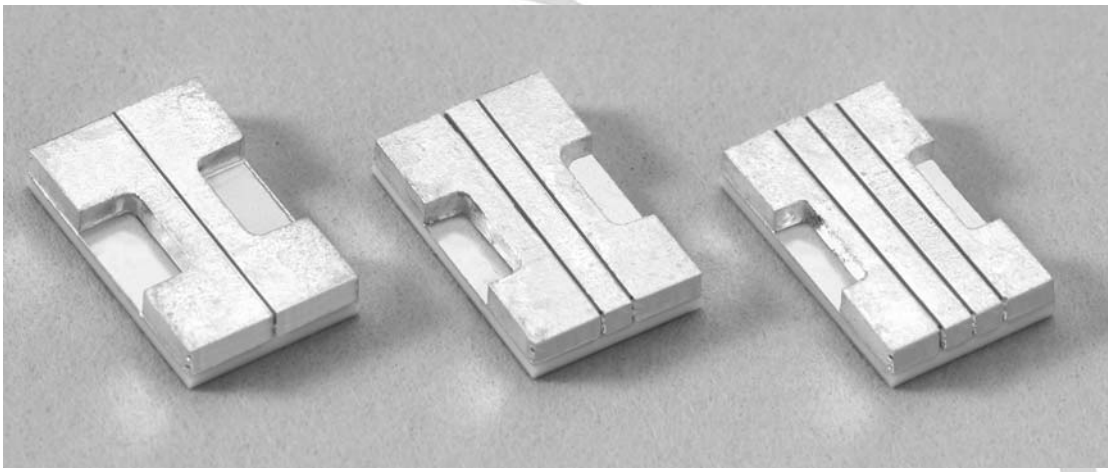
Laser Diode Array Submodules

SILVER BULLET™

- Packaged 1, 2, 3 Bar Laser Diode Array
- Easily Soldered to a Heat Exchanger
- Available Wavelengths 790-1550nm

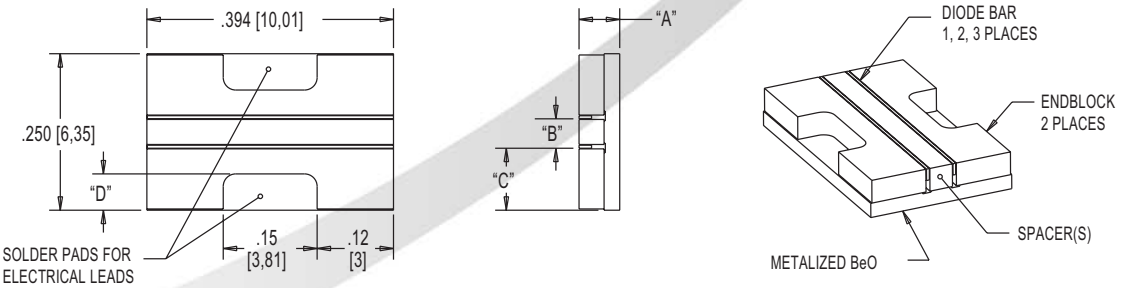


PRODUCT CHARACTERISTICS

The Silver Bullet™ is a fundamental building block for constructing high-power diode laser arrays. Each Silver Bullet™ consists of one to three mounted, CW laser diode bars on a BeO substrate. These modules can be either mounted on customer supplied heat exchangers or on a variety of heat exchangers offered by us. For customers who wish to build their own arrays using these modules, a soldering kit is available which contains a complete set of instructions. The Silver Bullet™ was designed to be a viable option for those developing new systems and to offer the flexibility to be retrofitted into existing systems.

Every Silver Bullet™ comes with a complete data packet which includes, P-I, V-I, power conversion efficiency and wavelength spectrum. This data packet offers customers the unique opportunity to have their own bars packaged, characterized, and prescreened according to customer supplied specification before being mounted on heat exchangers. Laser diode bar cavity lengths of up to 1 mm can be packaged in the current configuration, and the package is easily adapted to custom applications.

The Silver Bullet™ family consists of 20W CW and 40W CW 1-bar arrays; 40W CW and 70W CW 2-bar arrays; and 60W CW and 90W CW 3-bar arrays.



For A, B, C, D reference mechanical characteristics

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OPTICAL CHARACTERISTICS

PARAMETER	ASM06C020 MIN	ASM06C020 TYP	ASM06C020 MAX	ASM12C040 MIN	ASM12C040 TYP	ASM12C040 MAX	ASM14C060 MIN	ASM14C060 TYP	ASM14C060 MAX
CW Power Outputs (W)	20	---	---	40	---	---	60	---	---
Operating Current (A)	---	26	30	---	28	32	---	30	34
Threshold Current (A)	---	7.5	9.0	---	7.5	9.0	---	7.5	9.0
		25°C Heat Sink			25°C Heat Sink			25°C Heat Sink	
Slope Efficiency (W/A)	0.9	1.1	---	1.7	2.2	---	2.3	3.3	---
		25°C Heat Sink			25°C Heat Sink			25°C Heat Sink	
Efficiency (%)	32	42	---	30	40	---	28	36	---
		20W at 25°C Heat Sink			40W at 25°C Heat Sink			60W at 25°C Heat Sink	
Number of Emitters per bar	---	46	---	---	46x2	---	---	46x3	---
Emitter Size (µm)	---	80x1	---	---	80x1	---	---	80x1	---
Emitter Pitch (µm)	---	200	---	---	200	---	---	200	---
Center Wavelength (nm)	---	808	---	---	808	---	---	808	---
		20W at 25°C Heat Sink			40W at 25°C Heat Sink			60W at 25°C Heat Sink	
Wavelength Tolerance (nm)		± 3			± 3			± 3	
		20W at 25°C Heat Sink			40W at 25°C Heat Sink			60W at 25°C Heat Sink	
Spectral Width (nm) FWHM	---	1.9	2.5	---	2.5	3.2	---	3.1	4.0
		20W at 25°C Heat Sink			40W at 25°C Heat Sink			60W at 25°C Heat Sink	
Wavelength Shift (nm/°C)	0.23	0.25	0.27	0.23	0.25	0.27	0.23	0.25	0.27
Beam Divergence FWHM (°x°)	---	40x10	43x12	---	40x10	43x12	---	40x10	43x12

ELECTRICAL CHARACTERISTICS

Series Resistance (ohms)	---	0.005	0.012	---	0.010	0.024	---	0.015	0.036
		25°C Heat Sink			25°C Heat Sink			25°C Heat Sink	
Operating Voltage (V)	---	1.8	2.1	---	3.6	4.2	---	5.5	6.3
		25°C Heat Sink, 40W			25°C Heat Sink, 40W			25°C Heat Sink, 60W	
Max Reverse Current (µA)		25			25			25	
Max Reverse Voltage (V)		3			3			3	

MECHANICAL CHARACTERISTICS

"A" Package Height (in) ±.003	0.083	0.081	0.081
"B" Bar Pitch (in/mm) ±.003	---	0.047/1.19	0.047/1.19
"C" Outside to Bar (in) ±.004	0.08	0.099	0.076
"D" Soldering Pad Width (in) ±.01	0.123	0.06	0.05

NOTES

(1) These specifications apply for operation at 808nm. Other wavelenghts available upon request

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OPTICAL CHARACTERISTICS

PARAMETER	ASM06C040 MIN	ASM06C040 TYP	ASM06C040 MAX	ASM12C070 MIN	ASM12C070 TYP	ASM12C070 MAX	ASM14C090 MIN	ASM14C090 TYP	ASM14C090 MAX
CW Power Outputs (W)	40	---	---	70	---	---	90	---	---
	60A at 25°C Heat Sink			57A at 25°C Heat Sink			54A at 25°C Heat Sink		
Operating Current (A)	---	55	60	---	52	57	---	49	54
	40W at 25°C Heat Sink			70W at 25°C Heat Sink			90W at 25°C Heat Sink		
Threshold Current (A)	---	14	20	---	14	20	---	14	20
	25°C Heat Sink			25°C Heat Sink			25°C Heat Sink		
Slope Efficiency (W/A	0.8	1.0	---	1.6	2.0	---	1.8	2.3	---
	25°C Heat Sink			25°C Heat Sink			25°C Heat Sink		
Efficiency (%)	29	38	---	27	35	---	25	32	---
	40W at 25°C Heat Sink			70W at 25°C Heat Sink			90W at 25°C Heat Sink		
Number of Emitters	---	46	---	---	46x2	---	---	46x3	---
Emitter Size (µm)	---	80x1	---	---	80x1	---	---	80x1	---
Emitter Pitch (µm)	---	200	---	---	200	---	---	200	---
Center Wavelength (nm)		808			808			808	
		40W at 25°C Heat Sink			70W at 25°C Heat Sink			90W at 25°C Heat Sink	
Wavelength Tolerance (nm)		± 3			± 3			± 3	
		40W at 25°C Heat Sink			70W at 25°C Heat Sink			90W at 25°C Heat Sink	
Spectral Width (nm) FWHM	---	2.0	2.6	---	3.0	3.8	---	4.0	5.0
	40W at 25°C Heat Sink			70W at 25°C Heat Sink			90W at 25°C Heat Sink		
Wavelength Shift (nm/°C)	0.23	0.25	0.27	0.23	0.25	0.27	0.23	0.25	0.27
Beam Divergence FWHM (°x°)	---	40x10	43x12	---	40x10	43x12	---	40x10	43x12

ELECTRICAL CHARACTERISTICS

Series Resistance (ohms)	---	0.006	0.010	---	0.012	0.020	---	0.018	0.030
	25°C Heat Sink			25°C Heat Sink			25°C Heat Sink		
Operating Voltage (V)	---	1.9	2.3	---	3.8	4.5	---	5.7	6.7
	25°C Heat Sink, 40W			25°C Heat Sink, 70W			25°C Heat Sink, 90W		
Max Reverse Current (µA)		25			25			25	
Max Reverse Voltage (V)		3			3			3	

MECHANICAL CHARACTERISTICS

"A" Package Height (in) ±.003	0.083	0.081	0.081
"B" Bar Pitch (in/mm) ±.003	---	0.047/1.19	0.047/1.19
"C" Outside to Bar (in) ±.004	0.123	0.099	0.076
"D" Soldering Pad Width (in) ±.01	0.08	0.06	0.05

NOTES

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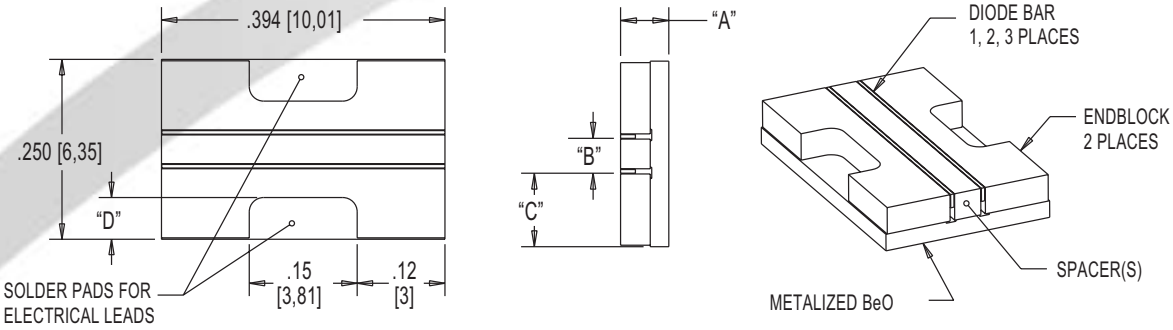
MECHANICAL CHARACTERISTICS

PARAMETER	DIMENSIONS
Operating Temperature Range[2]	-20°C to 50°C
Storage Temperature Range[2]	-40°C to 85°C



For A, B, C, D reference mechanical characteristics

PACKAGING CHARACTERISTICS

PARAMETER	DIMENSIONS
Metalization	100 µ inch Au over TiW barrier
Soldering [3]	Detailed instructions provided
Heat Exchanger Capacity [4]	2.5 times the output power
Heat Exchanger Thermal Resistance	< 0.25°C -cm^2/W

ORDERING SPECIFICATIONS

ASM01 C020 W0808 03

- ASM01 — Package Type
- C020 — CW Power (Watts)
- W0808 — Wavelength (nm)
- 03 — ± Wavelength Tolerance (nm)

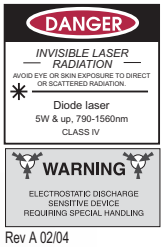
NOTES

(2) A dry nitrogen environment should be provided by the user when storing and operating at temperatures below ambient dew point.

(3) Maximum solder temperature is 100°C. Indalloy 8 or Ostalloy 200 (44In42Sn14Cd) are recommended solders.

(4) Several heat exchangers and heatsinking application notes are offered.

Laser diode product components are intended for use in a user-devised end system. However, these products are capable of emitting Class IV radiation. Extreme care must be exercised during their operation. Only persons familiar with the appropriate safety precautions should operate a laser product. Directly viewing the laser beam or exposure to specular reflections must be avoided. Serious injury may result if any part of the body is exposed to the beam. The eye is extremely sensitive to the infrared radiation and therefore, proper eyewear must be worn at all times. Use of optical instruments with these products may increase eye hazard. Always were proper eye protection when operating.



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