



## RBA Series Diode-Pumped Nd:YAG Laser Modules – 10-100W

### Features:

- High power
- Reliable
- Efficient
- Compact design
- Easy to use
- Affordable



The RBA-Series diode pumped laser module has quickly become an industry standard; thousands of these workhorse components are in use around the world. They have proven themselves to be a reliable, high-performance component in DPSS laser systems. The RBA is a second-generation model that includes new features that make it even easier to integrate and service. The RBA Diode-Pumped Laser Module is offered at power levels up to 100 Watts in a simple, compact, and affordable package.

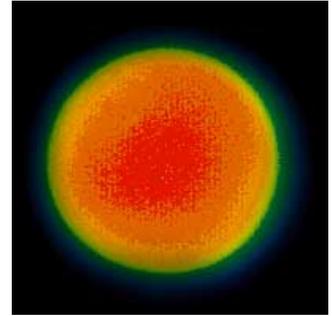
The RBA module is an ideal building block in the development or production of medium power rod laser systems, conversion of existing lamp-based laser designs to diode-pumping, or retrofit of existing arc lamp hardware to provide more stable and reliable operation.

The pump module is completely maintenance-free. It incorporates a Nd:YAG laser rod that is efficiently pumped by a radial array of long life laser diode bars, and delivers excellent gain uniformity and lensing performance. It is ideally suited for multimode applications such as laser marking, and can also provide high beam quality for more precise micro-machining and scientific applications.

The RBA is driven by low voltage electronics. Cooling of the laser is accomplished with a simple recirculating water chiller running on filtered water, eliminating the need for deionized water systems.

Model	Rod Type	Pump power(W)	Output Power <sup>4</sup>	Diode Bias Voltage <sup>5</sup>	Drive Current <sup>5</sup>	Driver
RBA20-0.33C2	2x63mm, YAG <sup>1</sup>	60W	10 W	6 VDC	0-32A (25A nominal)	LDD3006 LDD-250-30-06OEM
RBA20-0.66C2	2x63mm, YAG <sup>1</sup>	120W	20 W	12 VDC	0-32A (25A nominal)	LDD3012 LDD-600-30-12OEM
RBA20-1C2	2x63mm, YAG <sup>1</sup>	180W	35 W (TEM00)	18 VDC	0-32A (25A nominal)	LDD3018 LDD-600-30-18
RBA30-1C2	3x63mm, YAG <sup>1</sup>	180W	50 W	18 VDC	0-32A (25A nominal)	LDD3018 LDD-600-30-18OEM
RBA30-1C2	3x63mm, YLF <sup>1</sup>	180W	25 W	18 VDC	0-32A (20A nominal)	LDD3018 LDD-600-30-18OEM
RBA24-1C2	2x63mm, YAG <sup>1</sup>	240W	50 W (TEM00)	24 VDC	0-32A (25A nominal)	LDD3024 LDD-1000-30-24OEM
RBA34-1C2	3x73mm, YAG <sup>2</sup>	240W	75 W	24 VDC	0-32A (25A nominal)	LDD3024 LDD-1000-30-24OEM
RBA35-1C2	3x83mm, YAG <sup>3</sup>	300W	100 W	30 VDC	0-32A (25A nominal)	LDD3030 LDD-1000-30-30OEM

- <sup>1</sup> Rod length is 63 mm with flat/flat faces and 0.6% Nd doping  
<sup>2</sup> Rod length is 73 mm with flat/flat faces and 0.6% Nd doping  
<sup>3</sup> Rod length is 83 mm with flat/flat faces and 0.6% Nd doping  
<sup>4</sup> Minimum 1064 nm multi-mode output in a short cavity (165 ± 5 mm, 0.75mCC HR/flat 80%R OC, 90%R for RBA20-0.33C4) CW oscillator, at a maximum 25A drive current, arrangement at delivery. Here TEM00 means low-order modes and not pure TEM00.  
<sup>5</sup> Required voltage at the pump head stated w/o consideration for inefficiencies in the electrical system. Your DC power supply should be oversized by 30% to allow for these inefficiencies.  
 \*\*Pulsed versions available.



#### More Detailed Descriptions of Model Number: RBA30-1C2-FA1

**RBA** New version module replacing old RB

**30** Rod diameter (20=2.0 mm, 30 = 3.0 mm, etc.)

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**1** 1 diode bar per ASM (this is a 2 if 2 diodes are used) and 3 ASM per heat exchanger and there are 3 heat exchanger for a total of 9, 20W bars = 180W of diode pump power

**C** CW (this is a P if the module uses pulsed bars)

**2** 20W diode bar is used (this is a 4 if a 40W bar is used)

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**F** Flat rod faces are used (this is a C if curves are used)

**A** Rod dopant of 0.6% (some pulsed modules use a 1% dopant and E is used)

**1** Standard temperature testing

A less common module is the RBA20-0.33C2-FA1 and the RBA20-0.66C2-FA1

#### More Detailed Descriptions of Model Number: RBA20-0.33C2-FA1

**RBA** New version module replacing old RB

**20** Rod diameter (20=2.0 mm, 30 = 3.0 mm, etc.)

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**0.33** 1 diode bar per ASM but only 1 ASM per heat exchanger. There are 3 heat exchanger for a total of 3, 20W bars = 60W of diode pump power

**C** CW (this is a P if the module uses pulsed bars)

**2** 20W diode bar is used (this is a 4 if a 40W bar is used)

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**F** Flat rod faces are used (this is a C if curves are used)

**A** Rod dopant of 0.6% (some pulsed modules use a 1% dopant and E is used)

**1** Standard temperature testing

#### More Detailed Descriptions of Model Number: RBA20-0.66C2-FA1

**RBA** New version module replacing old RB

**20** Rod diameter (20=2.0 mm, 30 = 3.0 mm, etc.)

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**0.66** 1 diode bar per ASM but only 2 ASM per heat exchanger. There are 3 heat exchanger for a total of 6, 20W bars = 120W of diode pump power

**C** CW (this is a P if the module uses pulsed bars)

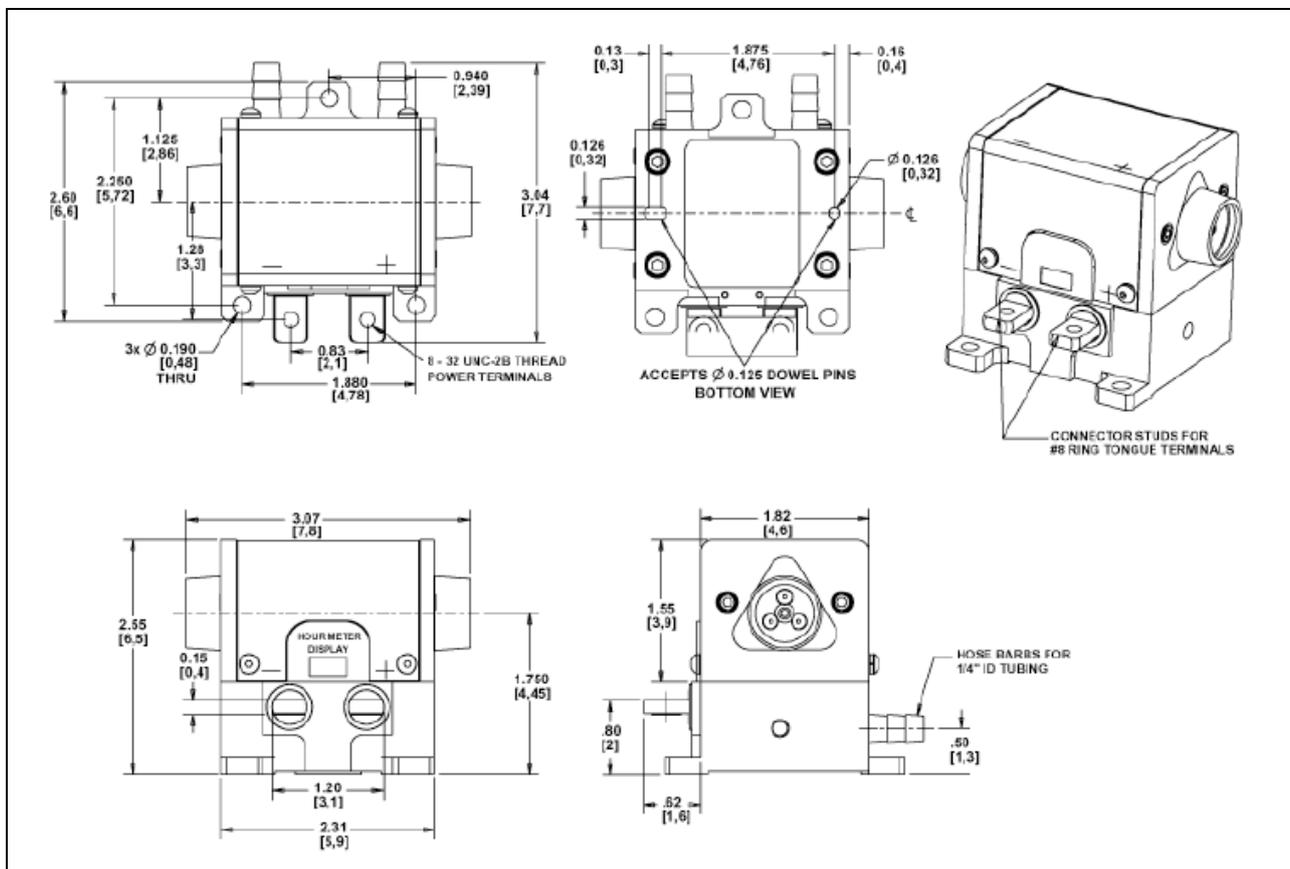
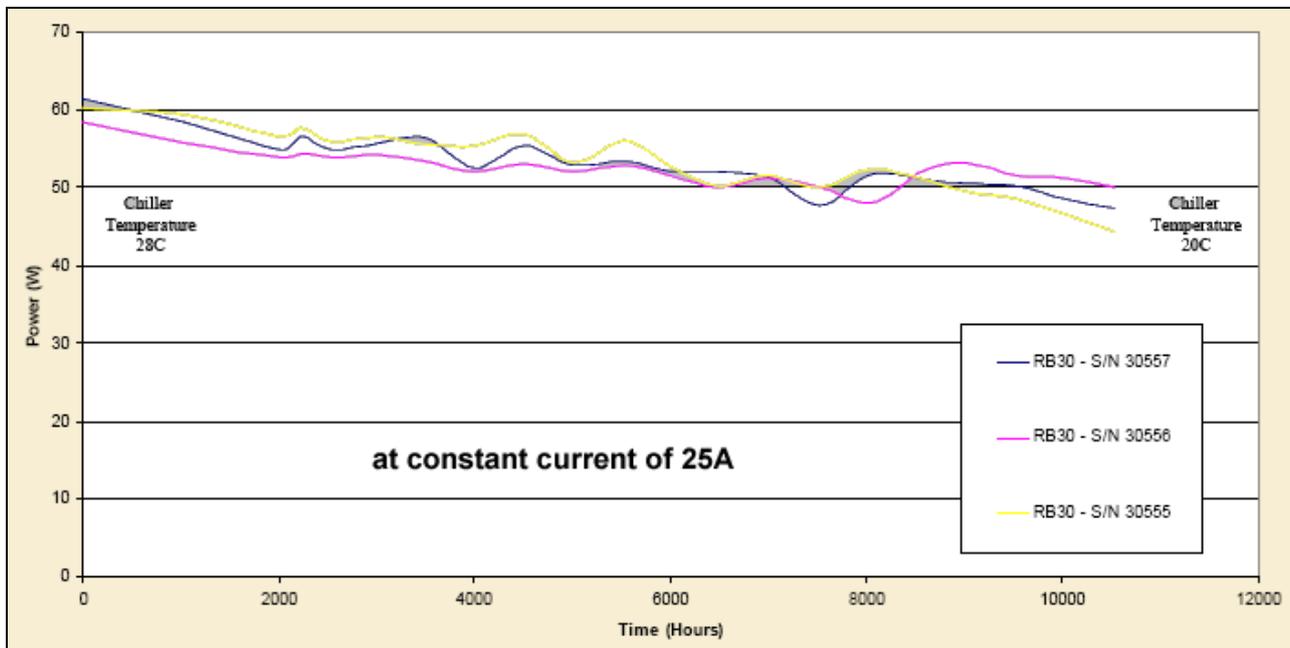
**2** 20W diode bar is used (this is a 4 if a 40W bar is used)

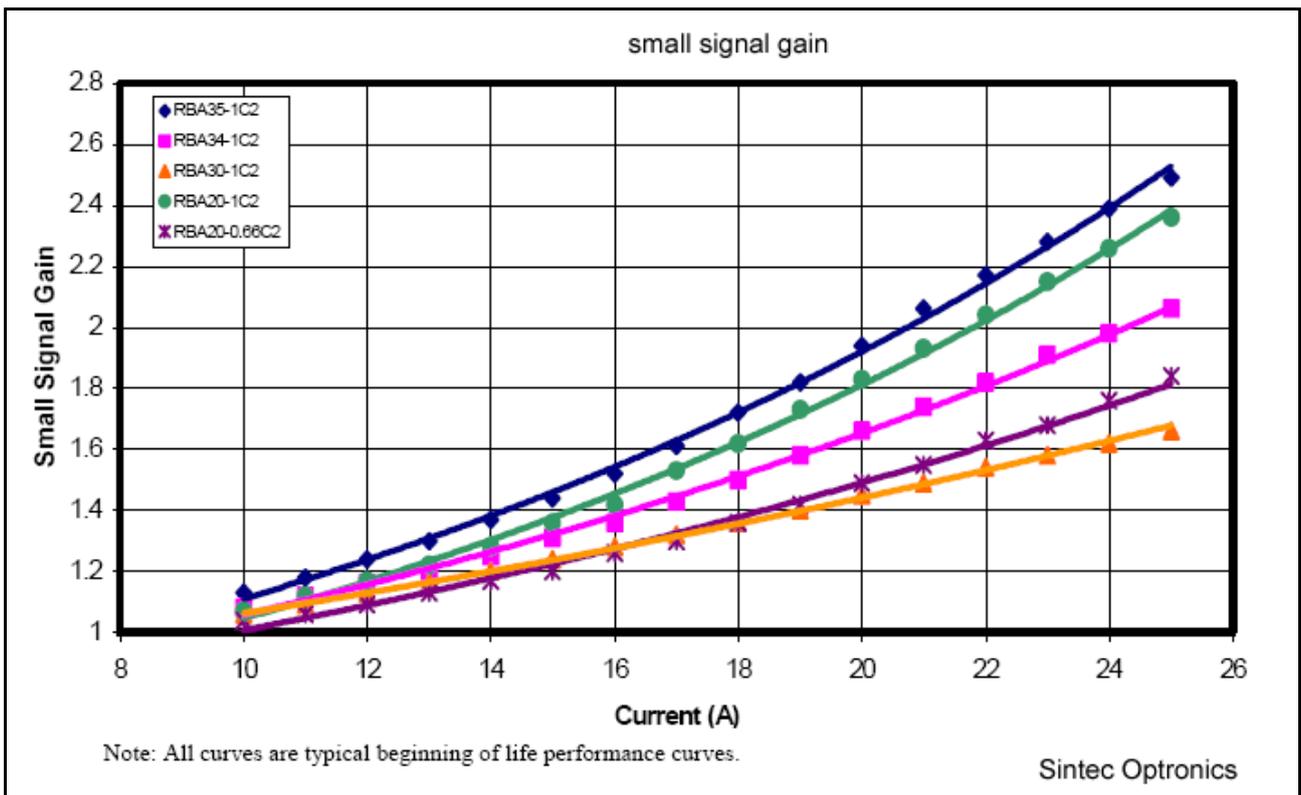
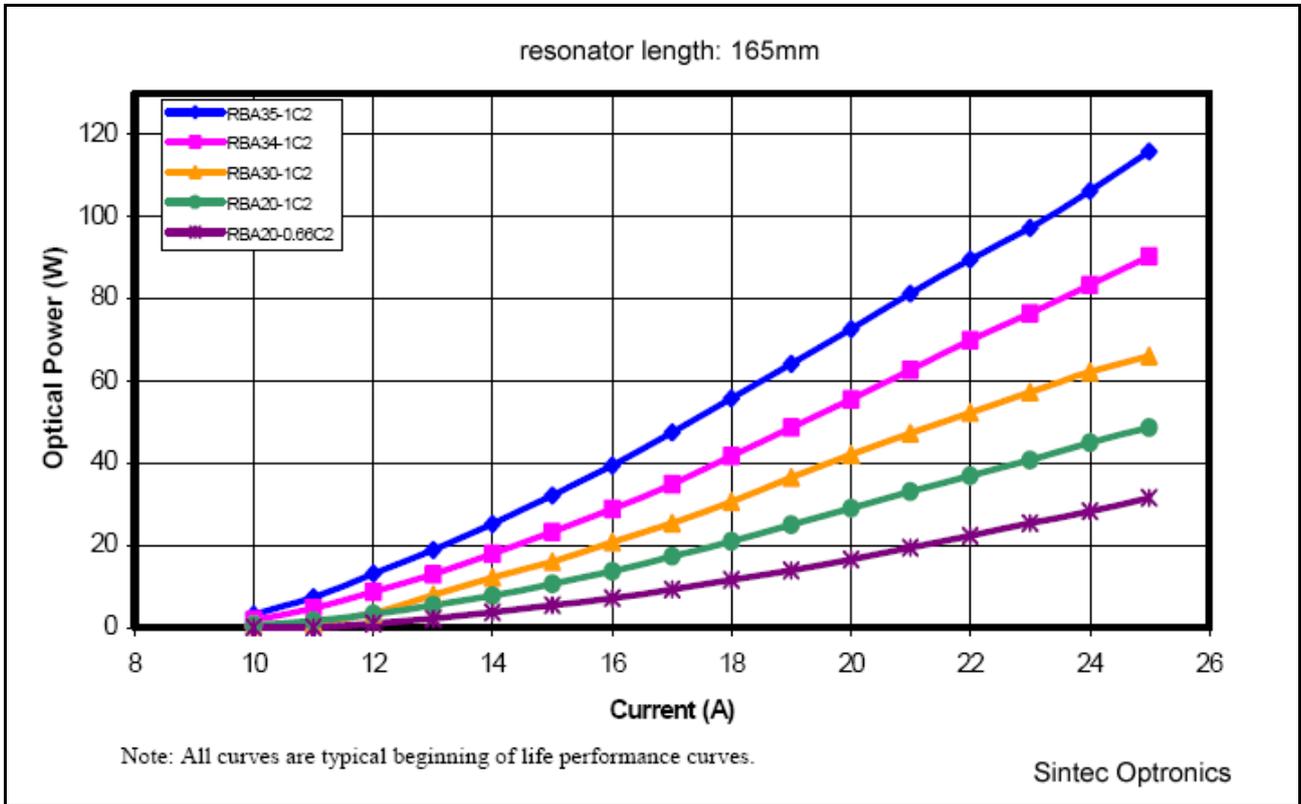
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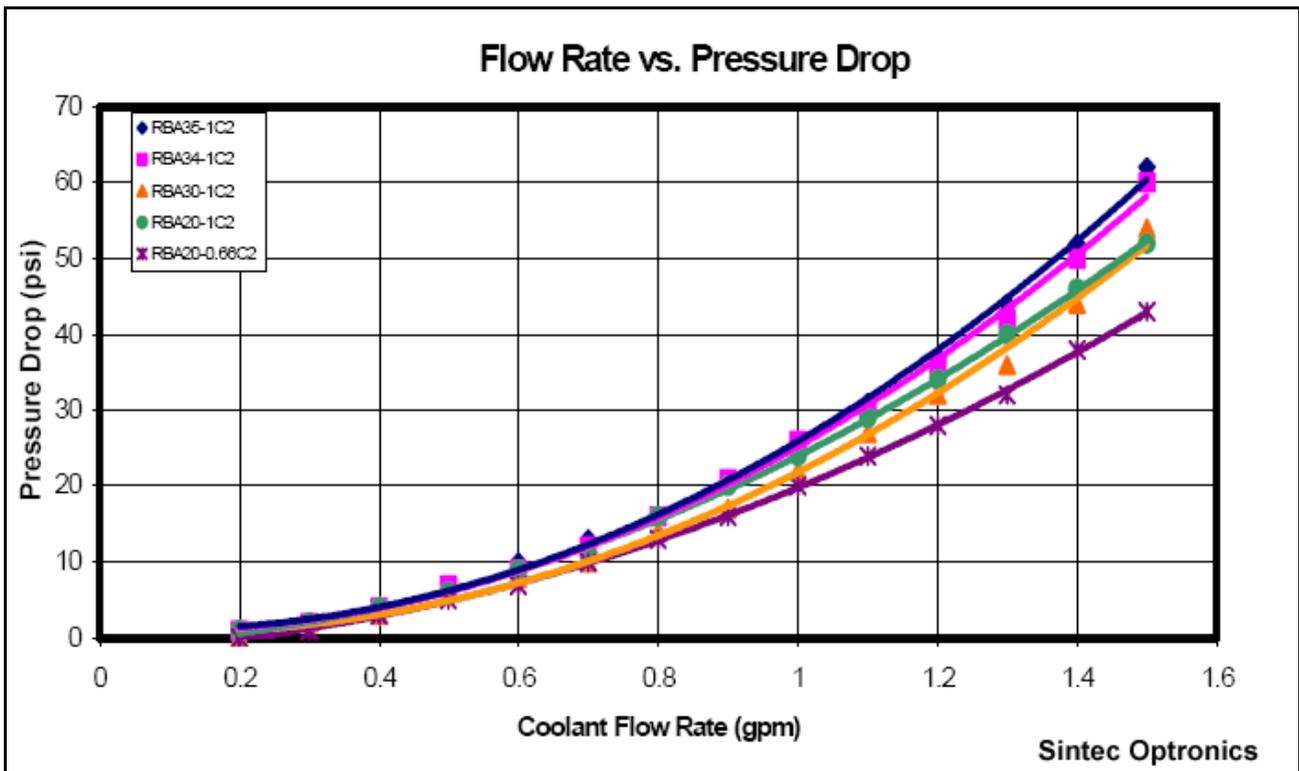
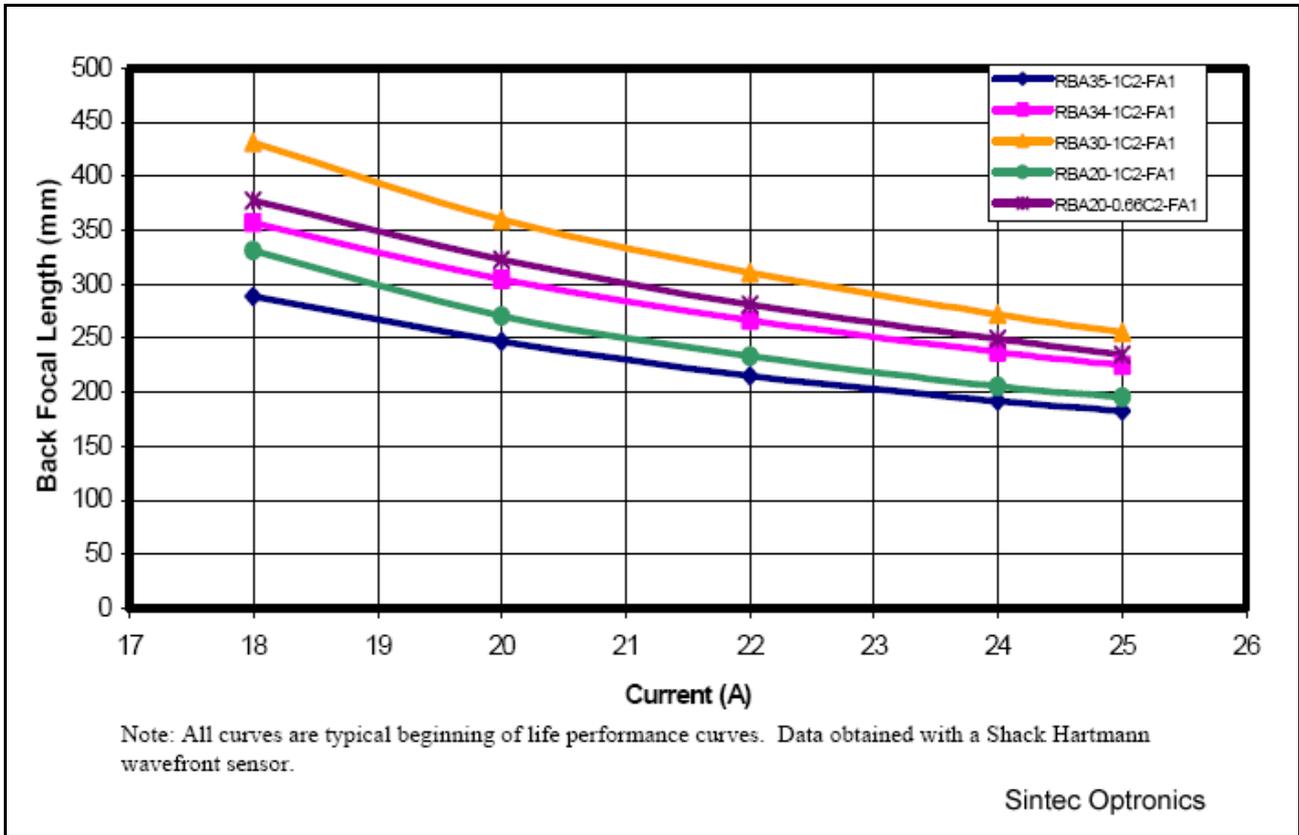
**F** Flat rod faces are used (this is a C if curves are used)

**A** Rod dopant of 0.6% (some pulsed modules use a 1% dopant and E is used)

**1** Standard temperature testing







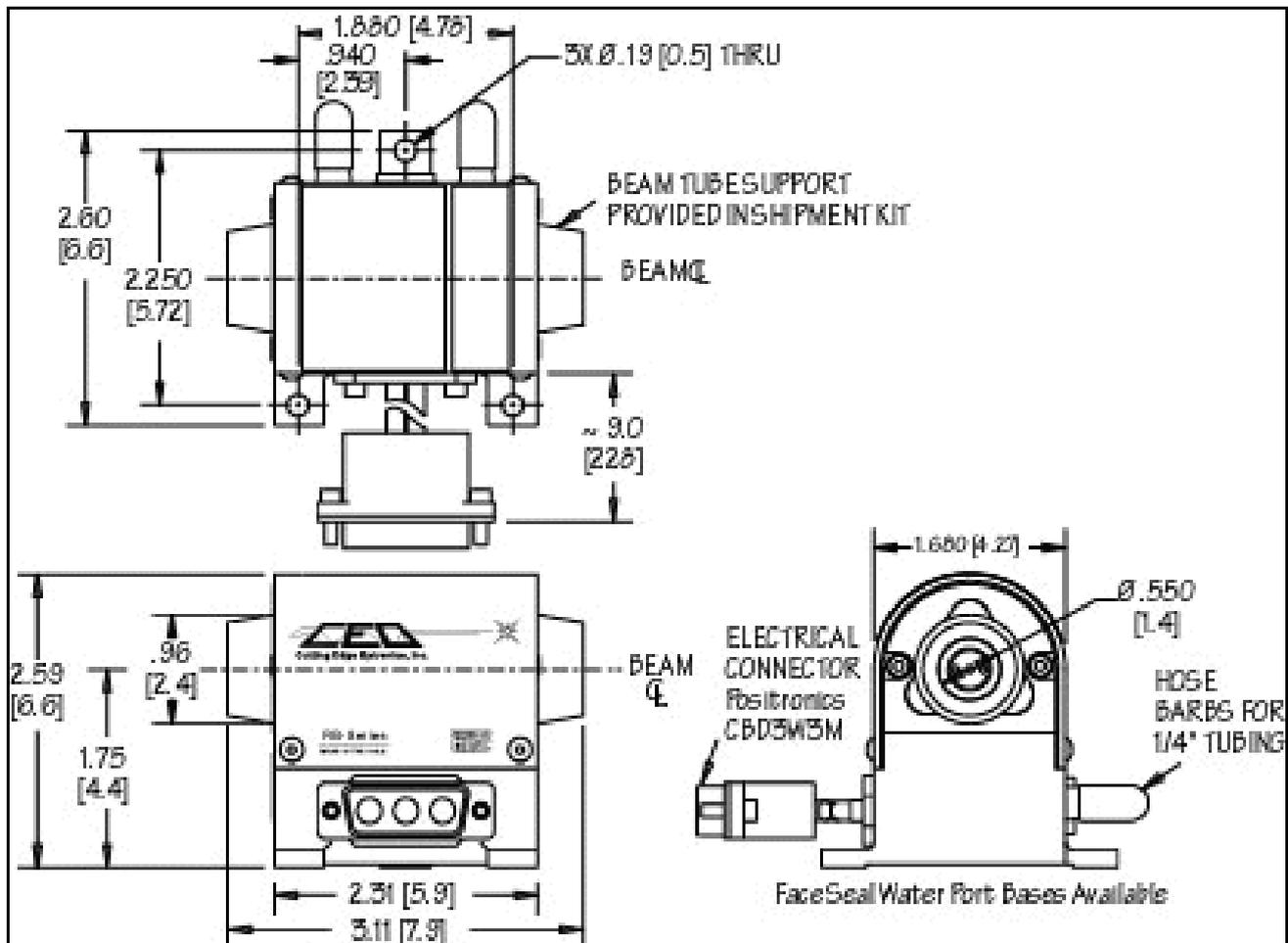
## Comparison between RB Modules and RBA Modules

The RBA is a second-generation model that includes new features that make it even easier to integrate and service. The RBA Diode-Pumped Laser Module is offered at power levels up to 100 Watts in a simple, compact, and affordable package. The RB modules can directly be replaced without any problems on electricity and mechanics. The main features of RBA modules are listed as follow:

- Longer lifetimes
- Higher electrical to optical efficiency
- Made to tighter tolerances
- Reduced stress on rod
- Increased durability of flow tube reflector
- Minimized external contamination
- Mechanically keyed for easy field replacement



Following is the drawing of RB modules.



## REA Series — 650W CW Module

The REA Series Laser Module delivers the reliability and performance of diode pumping to high power industrial and scientific laser systems, virtually eliminating the downtime experienced by older lamp-based laser technologies. Drive your laser system up to 650 watts of CW power @ 1064nm.



This reliable and efficient gain module can be used as the "engine" in new laser system development and production, or to convert your existing lamp-based designs to state-of-the-art diode pumping. The Nd:YAG laser rod is pumped by radial arrays of efficiently coupled long lifetime laser diode bars, and delivers good pump uniformity and stable lensing performance. The laser module requires between 60 - 120 VDC diode bias from a reliable solid-state driver, and is cooled by re-circulating filtered water from a simple chiller system.

Model	Rod Diameter <sup>1</sup>	Pump power(W)	Output Power <sup>2</sup>	Diode Bias Voltage <sup>3</sup>	Drive Current <sup>2</sup>
REA4006-1C2H	4 x 126mm	600W	140 W	60 VDC	0-32A (25A nominal)
REA5006-1C4H	5 x 126mm	1200W	250 W	60 VDC	0-50A (40A nominal)
REA6306-1C4H	6.35 x 126mm	1200W	275 W	60 VDC	0-50A (40A nominal)
REA5008-1C2H	5 x 146mm	800W	200 W	80 VDC	0-32A (25A nominal)
REA5008-1C4H	5 x 146mm	1600W	400 W	80 VDC	0-50A (40A nominal)
REA6308-1C4H	6.35 x 146mm	1600W	450 W	80 VDC	0-50A (40A nominal)
REA5010-1C4H	5 x 167mm	2000W	500 W	100 VDC	0-50A (40A nominal)
REA6310-1C4H	6.35 x 167mm	2000W	550 W	100 VDC	0-50A (40A nominal)
REA5012-1C4H	5 x 167mm	2400W	600 W	120 VDC	0-50A (40A nominal)
REA6312-1C4H	6.35 x 188mm	2400W	650 W	120 VDC	0-50A (40A nominal)

<sup>1</sup> 0.6% Nd doping.

<sup>2</sup> Minimum 1064 nm multi-mode output in a short cavity (280 ± 5 mm flat HR/flat 70%R OC) CW oscillator arrangement at delivery. Nominal Drive Current 25A and 40A for IC2 and IC4 respectively.

<sup>3</sup> Max current is 32A and 50A for IC2 and IC4 respectively. Required voltage at the pump head stated w/o consideration for inefficiencies in the electrical system.

\*\*Pulsed versions available.

### Descriptions of model number: REA6308-1C4-FA1

**REA** New version module covering the old style RD and RE Modules

**63** Rod diameter (40=4.0 mm, 50 = 5.0 mm, 63 = 6.35 mm, etc.)

**08** The number of ASM per heat exchanger (old RD used 6, old RE used 8 and new REA versions have 10 and 12)

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**1** 1 diode bar per ASM (this is a 2 if 2 diodes are used)

**C** CW (this is a P if the module uses pulsed bars)

**4** 40W diode bar is used (this is a 2 if a 20W bar is used)

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**F** Flat rod faces are used (this is a C if curves are used)

**A** Rod dopant of 0.6% (some pulsed modules use a 1% dopant and E is used)

**1** Standard temperature testing

## RGA-Series Diode-Pumped Nd:YAG Laser Modules — 900W CW Module



The RGA Series Laser Module delivers the reliability and performance of diode pumping to high power kilowatt industrial and scientific laser systems, virtually eliminating the downtime experienced by older lamp-based laser technologies. Drive your laser system to greater than 900W of CW power @ 1064nm.

You can use this reliable and efficient pump cavity to serve as the "engine" in new laser system development and production, or to convert your existing lamp-based designs to state-of-the-art diode pumping. The head efficiently pumps a Nd:YAG laser rod by radial arrays of efficiently coupled long lifetime laser diode bars, and delivers good pump uniformity and stable lensing performance. The laser module requires ~ 150 VDC diode bias from a reliable solid-state driver, and is cooled by re-circulating filtered water from a simple chiller system. Central cooling water is not required.

Model	Rod Diameter <sup>1</sup>	Pump power(W)	Output Power <sup>2</sup>	Diode Bias Voltage <sup>3</sup>	Drive Current <sup>2</sup>
RGA63-1C4H	6.35 mm	3400W	> 900W	145 VDC	0-50A (38A Nominal)

<sup>1</sup> Rod length is 195mm with flat/flat end faces and 0.6% Nd doping

<sup>2</sup> Minimum 1064 nm multi-mode output in a short cavity (400 ± 1 mm flat HR/flat 65%R OC) CW oscillator arrangement at delivery.

<sup>3</sup> Max current is 50A. Required voltage at the pump head stated w/o consideration for inefficiencies in the electrical system.

\*\* Pulsed version available

## DPM Series Diode Laser Modules

**Features:**

- High output
- High optical-optical conversion efficiency
- Reliable sealing
- Long life time
- Compact
- Low prices

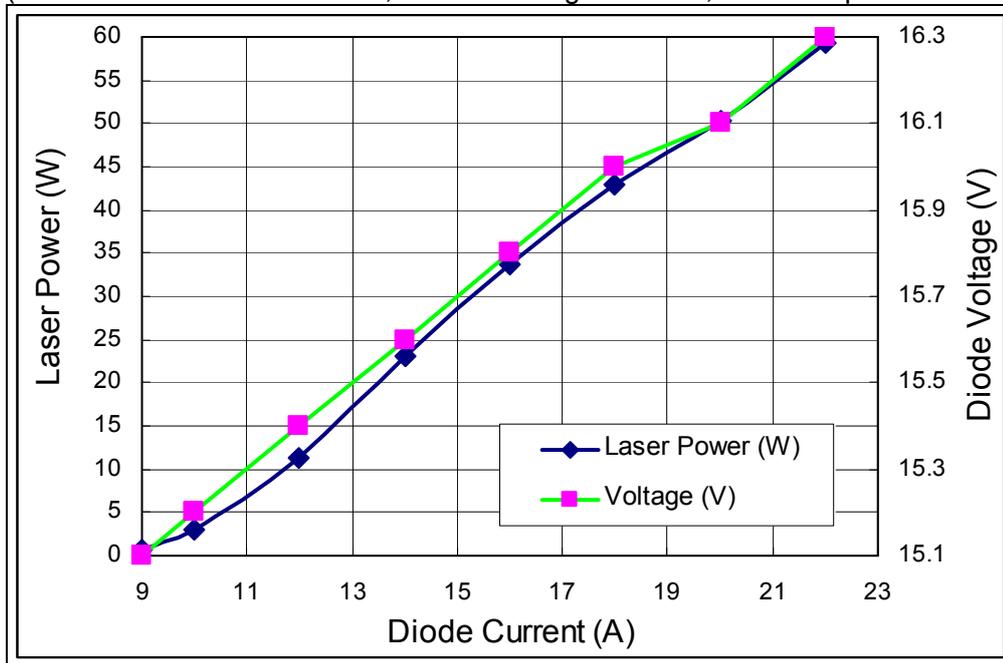


Part number	DPM30A	DPM50A	DPM75A	DPM100A	DPM130A	DPM200A
YAG rod diameter (mm)	2	3	3	4	4	5
Output laser power (W)	30	50	75	100	130	200
Typical current (A)	18	18	18	30	30	30
Typical voltage (V)	<18	<18	<24	<24	<36	<70
Required cooling (W)	1000	1000	1600	1600	2800	3500
Recommended driver	LDD2218	LDD2218	LDD2324	LDD3524	LDD3536	LDD3570

Remark: cooling water temperature: 21-24°C, flat-flat resonator, resonator length 300mm, transmission of output coupler 20%.

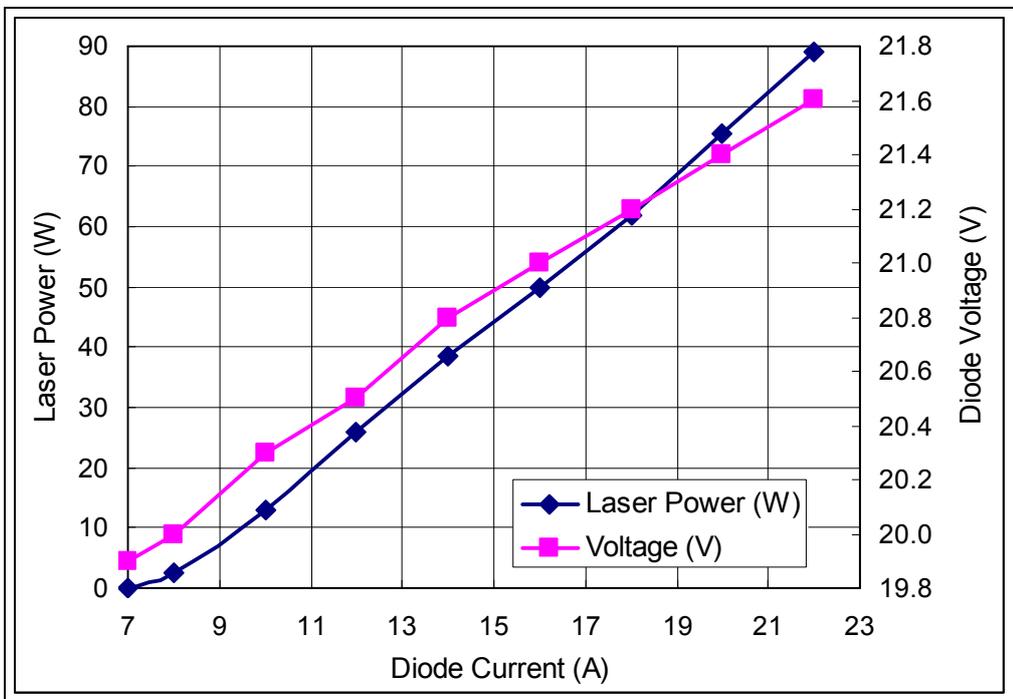
**50W Diode Module's Performance**

(Test conditions: flat resonator, resonator length 300mm, water temperature 23 °C)

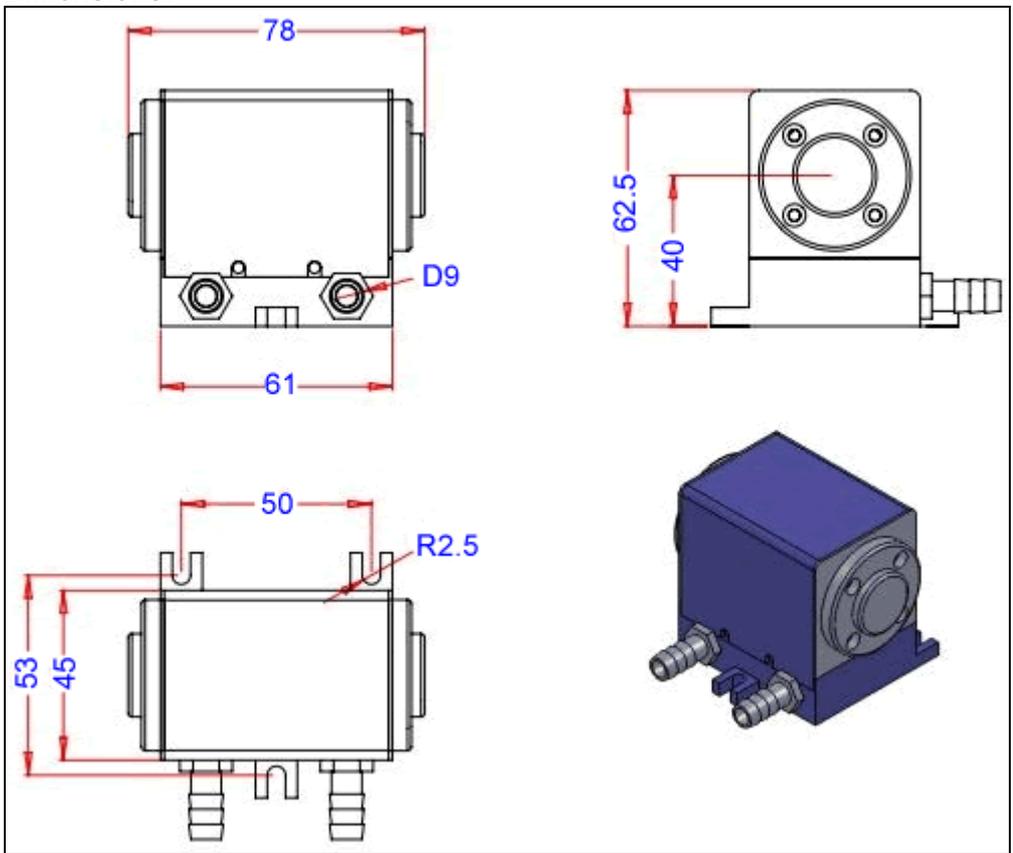


**75W Diode Module's Performance**

(Test conditions: flat resonator, resonator length 300mm, water temperature 23 °C)



**Dimensions:**



## QCW Pumped Laser Modules

For high energy pulsed laser applications, we offer the PowerPULSE family of modules to deliver output energies up to 1J per pulse. CTE matched, 'hard solder' laser diode packaging technology ensures long operating lifetimes.



### 1. RBA PowerPULSE modules

The RBA PowerPULSE series of DPSS gain module is ideally suited to high energy pulsed laser applications. It is offered with pulse energies up to 400mJ and features CTE matched 'hard solder' laser diode packaging technology for long operating lifetimes.

The RBA PowerPULSE module is an ideal building block in the development or production of medium power rod laser systems, conversion of existing lamp-based laser designs to diode-pumping, or for the retrofit of existing flash lamp pumped technology to provide more stable and reliable operations.



The RBA PowerPULSE module incorporates a Nd:YAG laser rod that is side pumped by long life diode laser bars. It delivers excellent gain uniformity and lensing performance. Other solid state media (i.e. Nd:YLF) are offered upon request.

Model	Rod Type	Output Energy <sup>3</sup>	Operating Voltage <sup>4</sup>	Peak Drive Current
RBA20-2P5	2 mm, YAG <sup>2</sup>	> 50 mJ	36 V	60A
RBA30-2P5	3 mm, YAG <sup>2</sup>	> 60 mJ	36 V	60A
RBA35-2P5	3 mm, YAG <sup>1</sup>	> 70 mJ	60 V	50A
RBA20-2P1	2 mm, YAG <sup>2</sup>	> 80 mJ	36 V	95A
RBA25-3P5	3 mm, YAG <sup>1</sup>	> 100 mJ	54 V	35A
RBA30-3P5	3 mm, YAG <sup>2</sup>	> 100 mJ	54 V	60A
RBA30-2P1	3 mm, YAG <sup>2</sup>	> 120 mJ	36 V	90A
RBA30-1P200	3 mm, YAG <sup>2</sup>	> 175 mJ	18 V	175A
RBA30-3P1	3 mm, YAG <sup>2</sup>	> 200 mJ	54 V	90A
RBA20-3P200	2 mm, YAG <sup>2</sup>	> 300 mJ	54 V	175A
RBA30-4P200	3 mm, YAG <sup>2</sup>	> 400 mJ	72 V	170A

1. Rod length is 83 mm with flat/flat faces and 0.6% Nd doping
2. Rod length is 63 mm with flat/flat faces and 0.6% Nd doping
3. Minimum pulse energy at 100Hz with a 250  $\mu$ s drive current pulsewidth. Pulse energy is measured when the module is operating in a short cavity (165  $\pm$  5 mm long, 0.75mCC HR, Flat 40%R OC) QCW oscillator
4. Required voltage at the pump module.

## Typical Measured Parameters of QCW Diode Pumped Modules

Serial Number	Model Number	Rep. Rate (Hz)	Current (A)	Pulse Width (uS)	Power (W)	Energy (mJ)
060885	RB20-2P1-FE1-0041	500	40	150	10.50	21
		500	35	150	7.50	15.00
		500	30	150	4.70	9.40
		500	35	250	15.10	30.20
		500	35	200	10.90	21.80
		500	35	100	4.00	8.00
		1000	35	150	16.20	16.20
		1000	50	160	39.90	39.90
		10	45	250	0.60	60.00
		10	50	250	0.70	70.00
		10	55	250	0.80	80.00
		100	45	250	5.20	52.00
		100	50	250	6.30	63.00
		100	55	250	7.40	74.00

Serial Number	Model Number	Rep. Rate (Hz)	Current (A)	Pulse Width (uS)	Power (W)	Energy (mJ)
080544	RBA30-3P5-NX1-0010	500	40	150	20.40	40.8
		500	35	150	14.10	28.20
		500	30	150	8.90	17.80
		500	35	250	28.70	57.40
		500	35	200	21.50	43.00
		500	35	100	7.20	14.40
		1000	35	150	28.80	28.80
		10	45	250	1.00	100.00
		10	50	250	1.20	120.00
		10	55	250	1.30	130.00
		100	45	250	9.30	93.00
		100	50	250	11.30	113.00
		100	55	250	13.30	133.00

## 2. REA PowerPULSE modules

The REA PowerPULSE series of DPSS gain module is ideally suited for applications that require up to 1 Joule per pulse. The PowerPULSE module brings the reliability and performance of diode pumping to high energy industrial and scientific laser systems. It virtually eliminates the downtime and high utility costs associated with older lamp-based laser technologies. The REA Series laser module family supports large diameter rods, up to 10mm, and high pump diode bar counts, up to 200 bars.



This reliable and efficient laser module can be used as the engine in new DPSS laser system development and production, or to convert existing lamp-based designs to state-of-the-art diode-pumping. The Nd:YAG laser rod is side pumped by long life diode laser bars, and the module is cooled by re-circulating filtered water through a simple non DI water chiller system.

Model	Rod Type	Output Energy <sup>3</sup>	Operating Voltage <sup>4</sup>	Peak Drive Current
REA5006-3P5	5 mm, YAG <sup>1</sup>	> 300 mJ	180 V	60A
REA10008-4P5	10 mm, YAG <sup>2</sup>	> 1 J	320 V	60A

1. Rod length is 126 mm with flat/flat faces and 0.6% Nd doping
2. Rod length is 146 mm with flat/flat faces and 0.6% Nd doping
3. Minimum pulse energy at 100Hz with a 250  $\mu$ s drive current pulse width. Pulse energy is measured when the module is operating in a short cavity (280  $\pm$  5 mm long, 0.75mCC HR, Flat 40%R OC) QCW oscillator
4. Required voltage at the laser module.

## Laser Diode Arrays



We offer you a full line of conductively cooled, water cooled or microchannel cooled laser diodes and stacks. Choose from our wide range of standard product offerings including our new Golden Bullet arrays for long pulse (>500  $\mu$ s) applications.

### Microchannel Cooled Laser Diodes



Copper based microchannel coolers have long proven themselves to be a highly effective means of cooling high power diode lasers. Unfortunately, the operating lifetime of these copper coolers has been limited by corrosion and erosion based wear out mechanisms of their integrated cooling water channels. DI water requirements have also added to overall system complexity and cost. While we continue to offer traditional copper based microchannel coolers to its existing customers, a transition is well underway to displace the copper based products with **ICECUBED (IC<sup>3</sup>) technology** - a ceramic material based, next generation thermal management platform for high power/brightness diode laser applications.

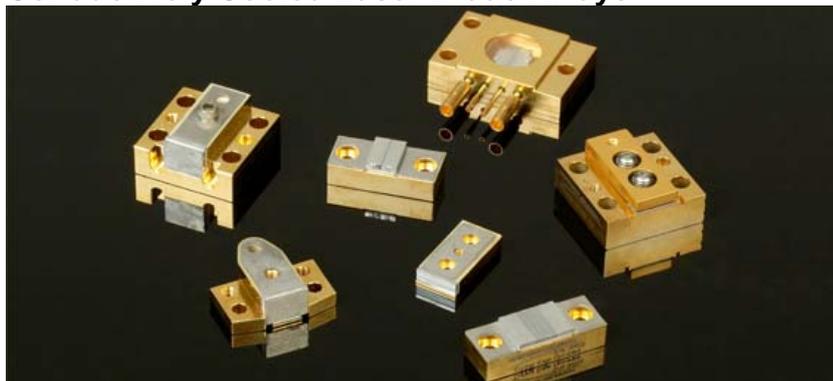
Our new, patented, IC<sup>3</sup> cooler eliminates all the of the drawbacks of its copper based predecessors. The use of proprietary ceramic materials instead of copper eliminates the requirement for de-ionized water plus the associated cost of expensive DI re-circulating water chiller system. It also offers dramatically increased operating lifetimes.

High power laser diode stacks are used in applications such as DPSS laser pumping, welding, heat-treating and therapeutic medical systems.

## Copper Based Stacks

Model	Power (W)	Wavelength (nm)	Typ. WL (nm)	Typ. Current (A)	Typ. Voltage (V)	Beam divergence (unlensed) (mrad)	Beam divergence (lensed) (mrad)	Remark
MCS056	60	790-1550	808	68	1.95	40X10	0.25X10	1 BAR
MCS056C100	100	790-1550	808	110	1.8	40X10	0.25X10	1 BAR
MCS055	180	790-1550	808	68	5.85	40X10	0.25X10	3 BAR
MCS055C300	300	790-1550	808	110	5.4	40X10	0.25X10	3 BAR
MCS051	360	790-1550	808	68	11.7	40X10	0.25X10	6 BAR
MCS051C600	600	790-1550	808	110	10.8	40X10	0.25X10	6 BAR

## Conductively Cooled Laser Diode Arrays



These Laser Diode Arrays are offered on a variety of heat sink package types that are conductively cooled. The arrays should be mounted to a heat sink with a recommended base plate temperature of 25°C. In addition to the types of packages listed here, we can customize a package to meet your specific needs.

## CW Diode Arrays

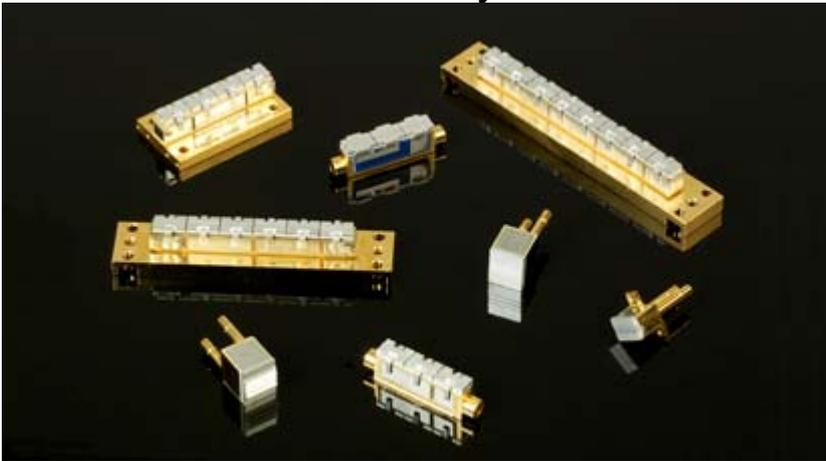
Model	Power (W)	Wavelength (nm)	Typ. WL (nm)	Typ. Current (A)	Typ. Voltage (V)	Beam divergence (mrad)	package
ARR26C020	20	790-1550	808	28	1.8	40X10	Cs
ARR18C020	20	790-1550	808	28	1.8	40X10	G
ARR76C020	20	790-1550	808	28	1.8	40X10	
ARR31C020	20	790-1550	808	28	1.8	40X10	W2
ARR26C040	40	790-1550	808	28	3.6	40X10	Cs
ARR31C040	40	790-1550	808	28	3.6	40X10	W2
ARR97C040-1	40	790-1550	808	41	1.9	35X10	Cs
ARR97C040-2	40	790-1550	808	47	1.9	35X10	Cs
ARR26C040	40	790-1550	808	55	1.9	35X10	Cs
ARR26C050	50		808	59	1.9	42X12	Cs

Remark: the ARR26 package will soon be obsolete and it has been replaced with the ARR97 directly bonded package.

## QCW Diode Arrays

Model	Peak power (W)	Wavelength (nm)	Typ. WL (nm)	Peak current (A)	Peak voltage (V)	Beam divergence (mrad)	package
ARR21P300	300	790-1550	808	60	12	40X10	A
ARR18P400	400	790-1550	808	55	16	40X10	G
ARR48P600	600	790-1550	808	60	24	40X10	AA

## Water Cooled Laser Diode Arrays



Many types of water-cooled packages are offered including linear arrays and diode stacks. In addition to the types of packages listed here, we can customize a package to meet your specific needs.

### CW Diode Arrays

Model	Power (W)	Wavelength (nm)	Typ. WL (nm)	Typ. Current (A)	Typ. Voltage (V)	Beam divergence (mrad)	package
ARR20C020	20	790-1550	808	28	1.8	40X10	E1
ARR20C020	40	790-1550	808	55	1.8	40X10	E1
ARR01C060	60	790-1550	808	28	5.4	40X10	Derringer
ARR81C060*	60	790-1550	808	27	5.4	38X10	Note (1)
ARR22C080	80	790-1550	808	28	7.2	40X10	Pepper Box
ARR01C120	120	790-1550	808	28	10.8	40X10	Derringer
ARR02C120	120	790-1550	808	28	10.8	40X10	Six-Shooter
ARR34C160	160	790-1550	808	28	14.4	40X10	Eight-shooter
MCS065C240**	240	790-1550	808	83	5.55	40X10	
ARR02C240	240	790-1550	808	28	21.6	40X10	Six-Shooter
ARR34C320	320	790-1550	808	28	28.8	40X10	Eight-shooter
ARR87C680	680	790-1550	808	28	61.2	40X10	

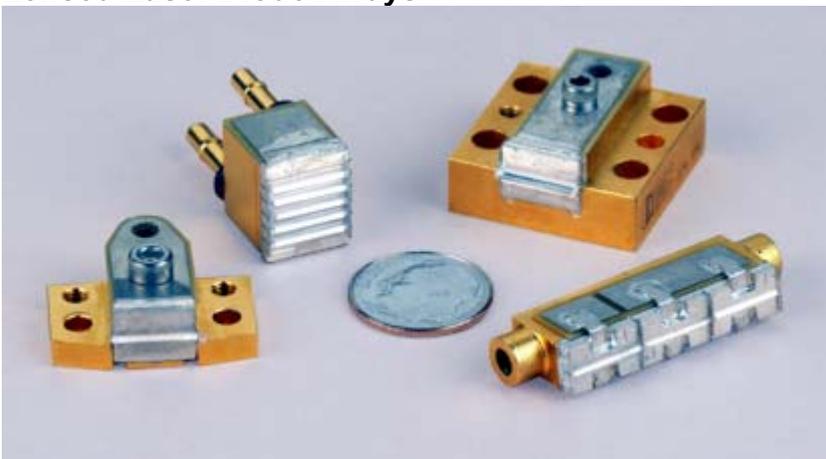
Remark: \* ARR81C060 is the replacement diode for **Lee Laser** DPSS laser systems.

\*\* MCS065C240 is the replacement diode for **Rofin Sinar** DPSS laser system.

### QCW Diode Arrays

Model	Peak power (W)	Wavelength (nm)	Typ. WL (nm)	Peak current (A)	Peak voltage (V)	Beam divergence (mrad)	package
LAR23P500	500	790-1550	808	74	26	3X10	E2

## Lensed Laser Diode Arrays



We offer a variety of lensing options to reduce divergence in the fast and/or slow axis. Please contact us with your specific requirements.

## Conductively Cooled CW Diode Arrays

Model	Power (W)	Wavelength (nm)	Typ. WL (nm)	Typ. Current (A)	Typ. Voltage (V)	Beam divergence (mrad)	package
LAR26C017	17	790-1550	808	28	1.8	1X10	Cs
LAR31C017	17	790-1550	808	28	1.8	1X10	W2

## Water Cooled CW Diode Arrays

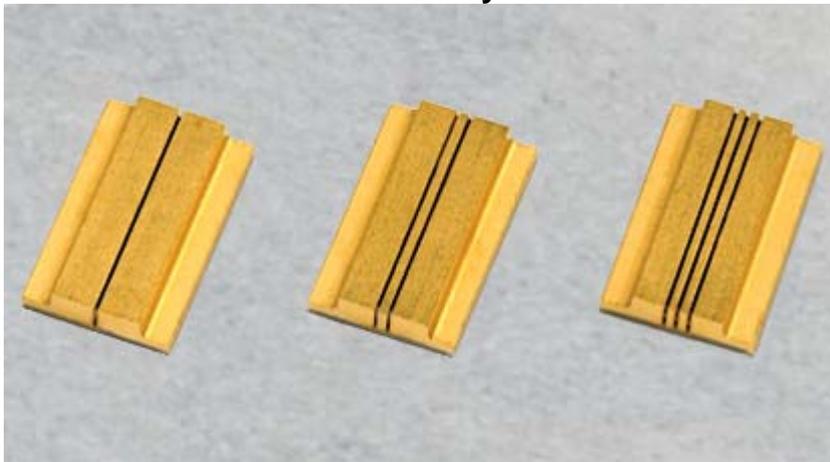
Model	Power (W)	Wavelength (nm)	Typ. WL (nm)	Typ. Current (A)	Typ. Voltage (V)	Beam divergence (mrad)	package
LAR23C045	45	790-1550	808	28	5.4	3X10	E2
LAR16C045	45	790-1550	808	28	5.4	40X10	

Remark: CW powers up to 320W and QCW powers up to 600W

## Water Cooled QCW Diode Arrays

Model	Peak power (W)	Wavelength (nm)	Typ. WL (nm)	Peak current (A)	Peak voltage (V)	Beam divergence (mrad)	package
LAR23P500	500	790-1550	808	74	26	3X10	E2

## Golden Bullet Laser Diode Array Submodules



Golden Bullet™ diode laser submodules (ASMs) feature proprietary expansion matched packaging materials and the use of hard solder - making them ideally suited for operation in demanding (>500 microsecond long) pulsed and/or high duty cycle laser applications. Golden Bullet packages show no sign of solder migration onto the diode laser facets, which is a typical failure mechanism for traditional indium based high power diode laser package designs in demanding applications.

Golden Bullet ASMs are offered on more than 150 standard diode heat sink designs and feature long life diode bars with power ratings up to 200 Watts. These standard designs include our A, AA, CS, and G packages.

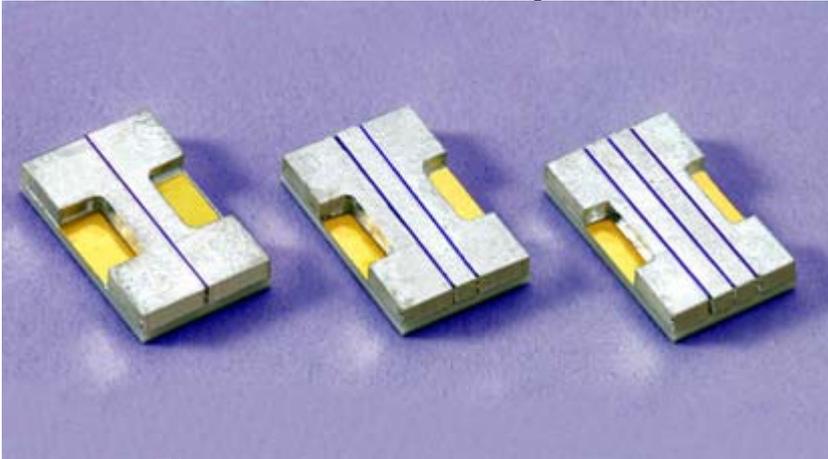
## CW Diode Arrays

Model	Power (W)	Wavelength (nm)	Typ. WL (nm)	Typ. Current (A)	Typ. Voltage (V)	Beam divergence (mrad)	Dimension (mm)
ASM232C020	20	790-1550	808	26	1.7	40X10	10x6.4x1.7
ASM232C040	40	790-1550	808	60	1.8	40X10	10x6.4x1.7

## QCW Diode Arrays

Model	Peak power (W)	Wavelength (nm)	Typ. WL (nm)	Peak current (A)	Peak voltage (V)	Beam divergence (mrad)	Dimension (mm)
ASM232P050	50	790-1550	808	54	1.8	40X10	10x6.4x1.7
ASM232P100	100	790-1550	808	98	1.8	40X10	10x6.4x1.7
ASM232P200	200	790-1550	808	180	2.0	40X10	10x6.4x1.7

## Silver Bullet Laser Diode Array Submodules



Silver Bullet™ diode laser submodules (ASMs) are offered with optional soldering kits. We can also attach Silver Bullets to customer-supplied heat exchangers to make completely packaged laser diode arrays. Extreme care should be taken when handling these components. We recommend that they be only used by customers who are experienced in the handling and packaging of laser diode bars.

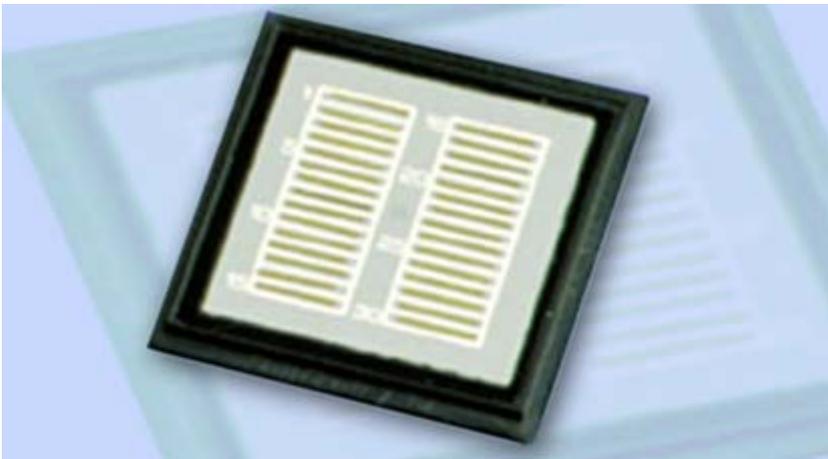
### CW Diode Arrays

Model	Power (W)	Wavelength (nm)	Typ. WL (nm)	Typ. Current (A)	Typ. Voltage (V)	Beam divergence (mrad)
ASM06C020	20	790-1550	808	26	1.8	40x10
ASM12C040	40	790-1550	808	28	3.6	40x10
ASM06C040	40	790-1550	808	55	25	40x10
ASM14C060	60	790-1550	808	30	5.5	40x10
ASM12C070	70	790-1550	808	52	25	40x10
ASM14C090	90	790-1550	808	49	25	40x10

### QCW Diode Arrays

Model	Peak power (W)	Wavelength (nm)	Typ. WL (nm)	Peak current (A)	Peak voltage (V)	Beam divergence (mrad)	Dimension (mm)
ASM01P050	50	790-1550	808	55	2.0	40X10	10x6.4x1.7
ASM01P100	100	790-1550	808	110	2.2	35x10	10x6.4x1.7
ASM03P100	100	790-1550	808	55	3.8	40X10	10x6.4x1.7
ASM05P150	150	790-1550	808	55	6.6	40X10	10x6.4x1.7

## Unmounted Laser Diode Bars



Unmounted laser diode bars are available at a variety of wavelengths in CW or QCW versions. Extreme care should be taken when handling these components. We recommend that they be only used by customers who are experienced in the handling and packaging of laser diode bars.

## CW Diode Arrays

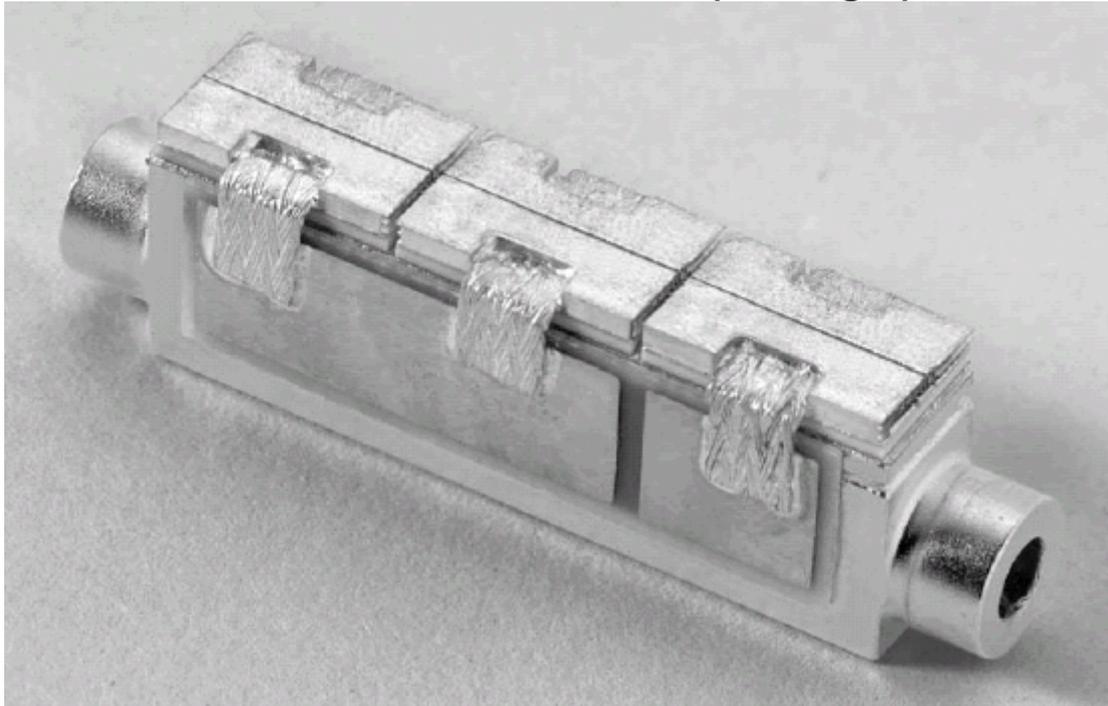
Model	Power (W)	Wavelength (nm)	Typ. WL (nm)	Typ. Current (A)	Typ. Voltage (V)	Beam divergence (mrad)	Dimension (mm)
UMB200C020	20	790-980	808	26	1.7	40X10	9.6x1x0.14
UMB500C040	40	790-980	808	60	1.8	40X10	9.6x1.2x0.14
UMB800C100	100	790-980	808	112	1.7	40X10	9.6x2x0.14

## QCW Diode Arrays

Model	Peak power (W)	Wavelength (nm)	Typ. WL (nm)	Peak current (A)	Peak voltage (V)	Beam divergence (mrad)	Dimension (mm)
UMB404P050	50	790-980	808	54	1.8	40X10	9.6x0.63x0.14
UMB700P100	100	790-980	808	98	1.8	40X10	9.6x1.0x0.14
UMB700P200	200	790-980	808	180	2.0	40X10	9.6x1.0x0.14

## 60W CW Laser Diode Array

### Part Number: ARR01C060 (Derringer)



- Packaged Laser Diode Array
- Available With Any Silver Bullet® Configuration
- Available Wavelengths (790-1550nm)

#### OPTICAL CHARACTERISTICS

PARAMETER	CONDITIONS	MIN	TPY	MAX	UNITS
CW power output	30A at 25°C Heat Sink	60			W
Operating Current	60W at 25°C Heat Sink		28	32	A
Threshold Current	25°C Heat Sink		7.5	9.0	A
Wavelength Tolerance	60W at 25°C Heat Sink		± 3		nm
Spectral Width FWHM	60W at 25°C Heat Sink		1.9	2.5	nm
Wavelength Shift		0.23	0.25	0.27	nm/°C
Beam Divergence FWHM			40x10	42x12	° x °

#### ELECTRICAL CHARACTERISTICS

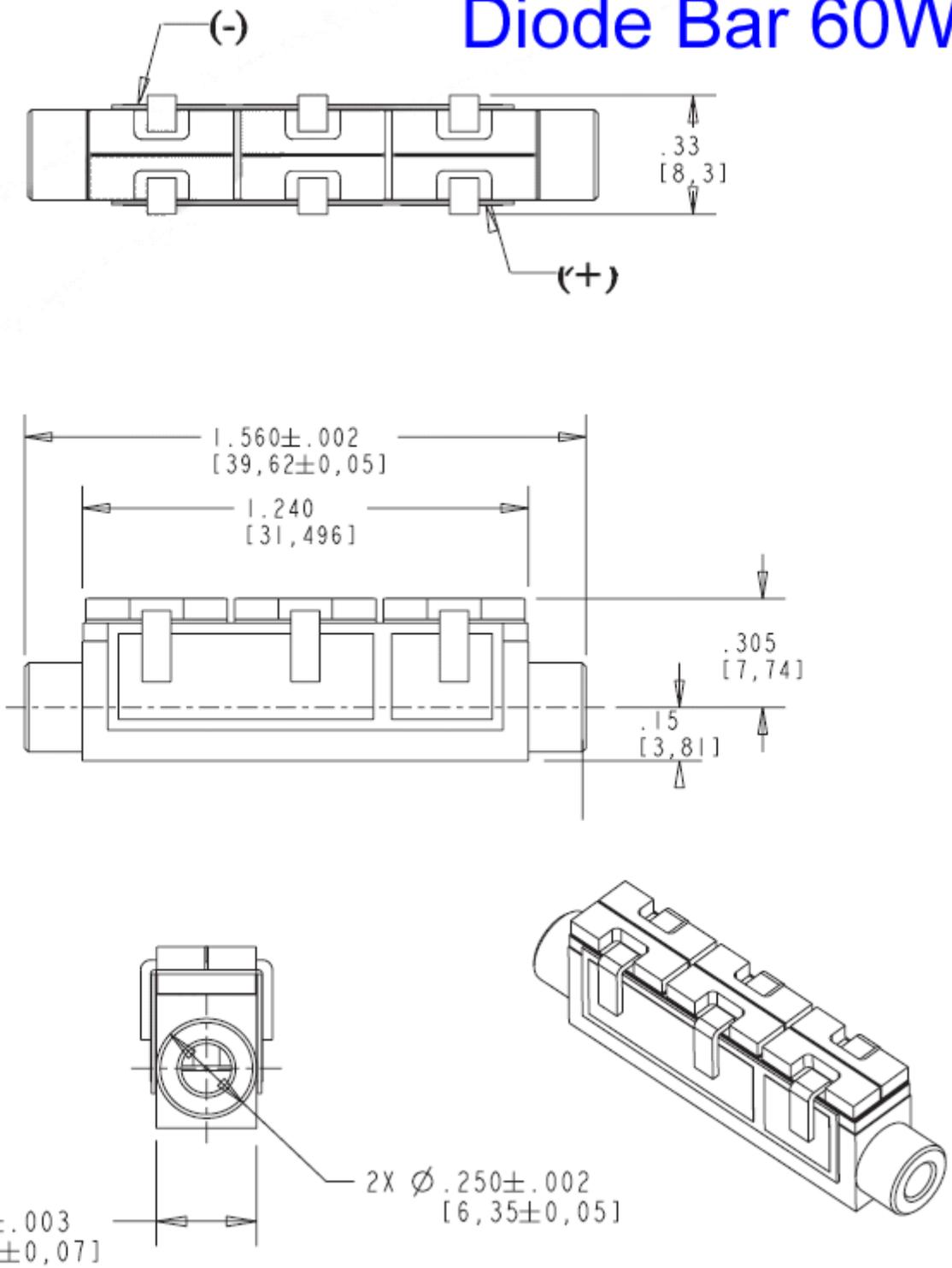
PARAMETER	CONDITIONS	MIN	TPY	MAX	UNITS
Series Resistance	25°C Heat Sink		0.024	0.036	ohms
Operating Voltage	25°C Heat Sink, 60W		5.4	6.3	V

#### ABSOLUTE MAXIMUM RATINGS

PARAMETER	CONDITIONS
Forward Current	35A
Reverse Current	25µA
Reverse Voltage	3V
Operating Temperature Range	-20°C or to 50°C
Storage Temperature Range	-40°C to 85°C

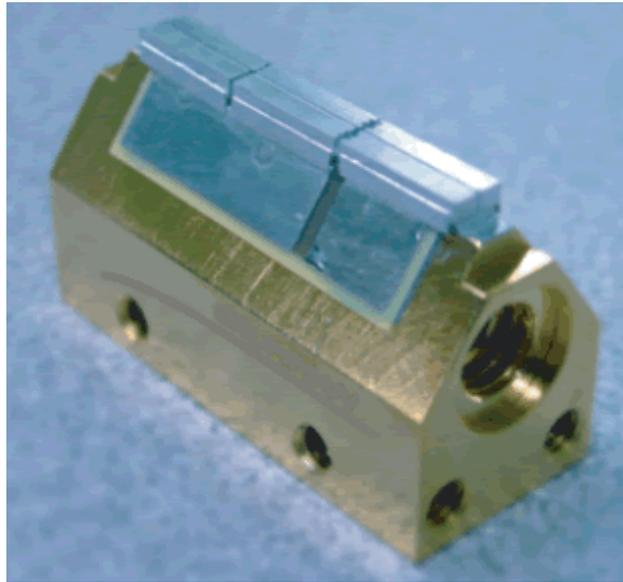
- (1) These specifications apply for operation at 808nm. Other wavelengths available upon request.
- (2) A dry nitrogen environment should be provided by the user when storing and operating at temperatures below ambient dew point.

# Diode Bar 60W



## 60W CW Laser Diode Array

### Part Number: ARR81C060 (Derringer)



- Packaged Laser Diode Array
- Replacement diode for **Lee Laser DPSS**
- Available Wavelengths (790-1550nm)

#### OPTICAL CHARACTERISTICS

PARAMETER	CONDITIONS	MIN	TPY	MAX	UNITS
CW power output	30A at 25°C Heat Sink	60			W
Operating Current	80W at 25°C Heat Sink		27	30	A
Threshold Current	25°C Heat Sink		7.5	9.0	A
Center Wavelength	80W at 25°C Heat Sink		808		nm
Wavelength Tolerance	80W at 25°C Heat Sink		± 3		nm
Spectral Width FWHM	80W at 25°C Heat Sink		1.9	3.0	nm
Wavelength Shift			0.25		nm/°C
Beam Divergence FWHM			38x10	42x12	° x °

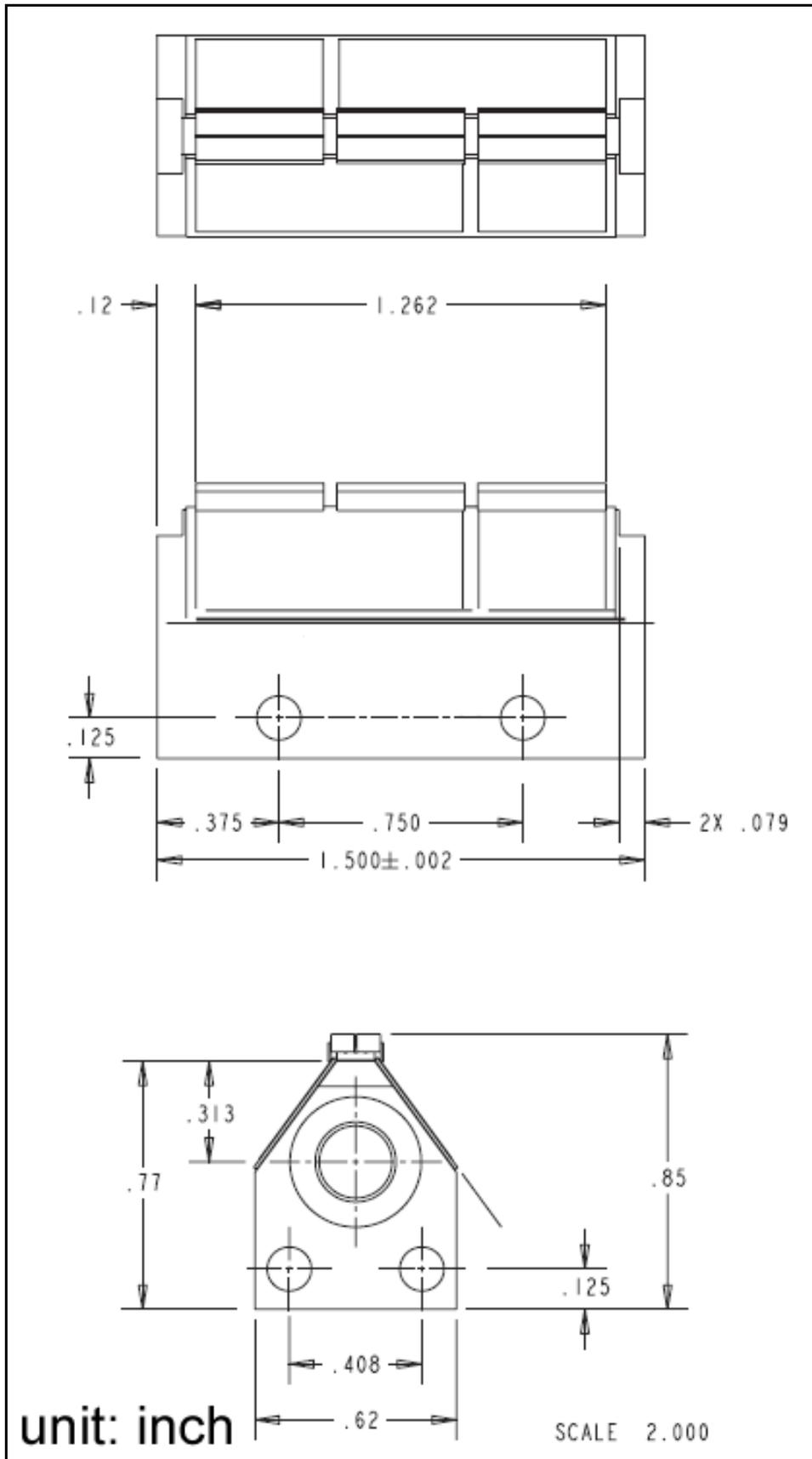
#### ELECTRICAL CHARACTERISTICS

PARAMETER	CONDITIONS	MIN	TPY	MAX	UNITS
Series Resistance	25°C Heat Sink		0.015	0.036	ohms
Operating Voltage	25°C Heat Sink, 80W		5.4	6.3	V

#### ABSOLUTE MAXIMUM RATINGS

PARAMETER	CONDITIONS
Forward Current	35A
Reverse Current	25µA
Reverse Voltage	3V
Operating Temperature Range	-20°C or to 50°C
Storage Temperature Range	-40°C to 85°C

- (1) These specifications apply for operation at 808nm. Other wavelengths available upon request.
- (2) A dry nitrogen environment should be provided by the user when storing and operating at temperatures below ambient dew point.



## QCW Diode Laser Array (Derringer)

### **1. 150W QCW Derringer (3 x 50W bars)**

1-50HZ

pulse width < 500us

pulse power (peak): 50W/bar

wavelength: 806nm +/-2nm

### **2. 300W QCW Derringer (3 x 100W bars)**

1-50HZ

pulse width < 500us

pulse power (peak): 100W/bar

wavelength: 806nm +/-2nm