

# SHOOTER PACKAGE

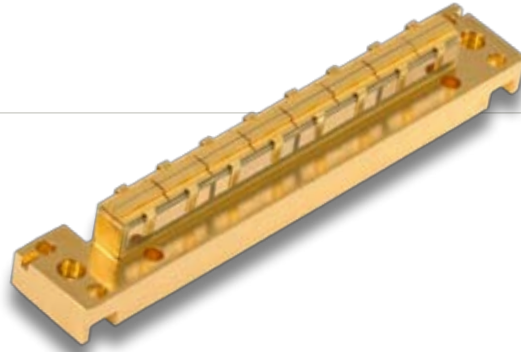
LASER DIODE ARRAY

## 160W CW

***NORTHROP GRUMMAN***

PART NUMBER: ARR134C160  
8-BAR 8-SHOOTER PACKAGE

### FEATURES AND BENEFITS



- Assembled With Hard Solder & Expansion Matched Materials
- Small, Compact Design
- Water Cooled
- Ideal For Side Pumping Or Direct Diode Applications
- Available Wavelengths: 790-1550nm
- Multi-wavelength Configurations Available

### OPTICAL CHARACTERISTICS

Parameter	Conditions	Typical	Units
CW Power Output	25A at 25°C Heat Sink	160	W
Operating Current	160W at 25°C Heat Sink	25	A
Threshold Current	25°C Heat Sink	8	A
Slope Efficiency	25°C Heat Sink	9.20	W/A
Electrical-Optical Efficiency	160W at 25°C Heat Sink	47	%
Center Wavelength	160W at 25°C Heat Sink	808	nm
Wavelength Tolerance	160W at 25°C Heat Sink	+/-3	nm
Spectral Width	160W at 25°C Heat Sink	1.8	nm
Wavelength Shift	—	0.25	nm/°C
Beam Divergence FWHM	—	38x7	x°
Beam Divergence FWHM (Lensed)	—	1x7	x°

### ELECTRICAL CHARACTERISTICS

Parameter	Conditions	Typical	Units
Series Resistance	25°C Heat Sink	0.032	$\Omega$
Operating Voltage	25°C Heat Sink, 160W	13.6	V

### ABSOLUTE MAXIMUM RATINGS

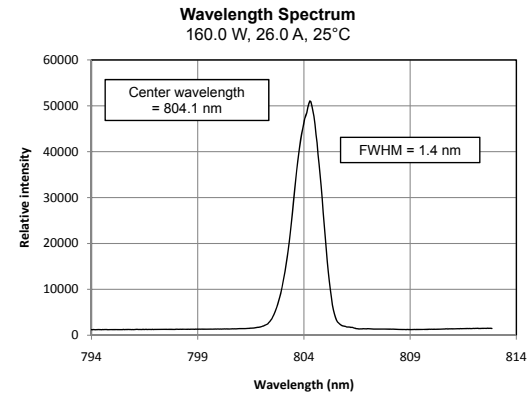
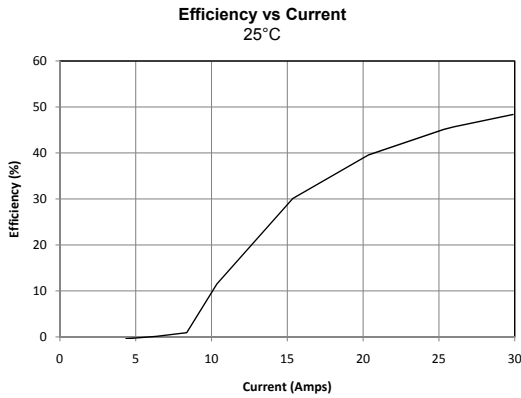
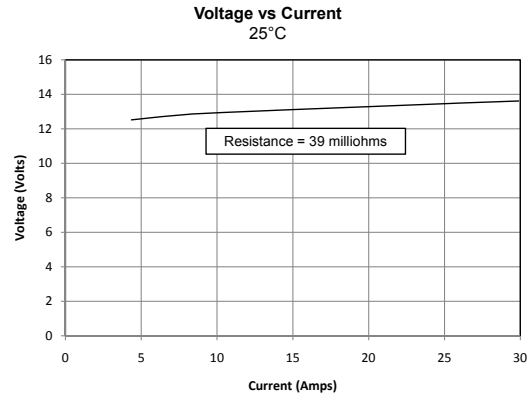
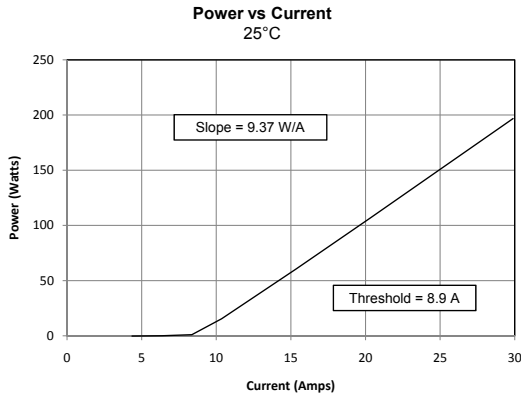
Parameter	Conditions
Reverse Current	0 A
Reverse Voltage	0 V
Operating Temperature Range	-40°C to 70°C
Storage Temperature Range	-40°C to 85°C

### NOTES

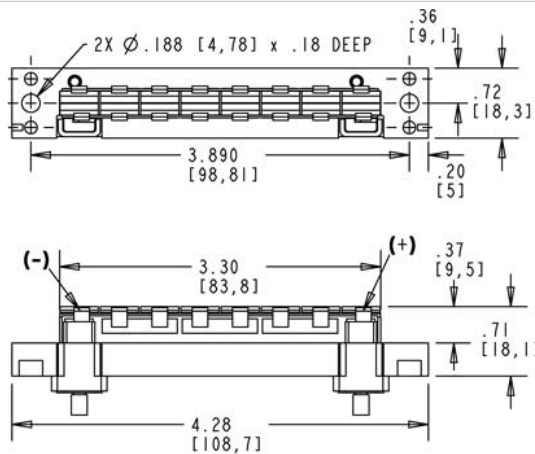
- (1) These specifications apply for operation at 808nm. Other wavelengths available upon request.
- (2) A dry nitrogen environment should be provided by the user when storing and operating at temperatures below ambient dew point.
- (3) Fast axis and slow axis lensing options are available for most NG-CEO heat exchanger designs.

## 160W CW

### OPTICAL CHARACTERISTICS (SAMPLE)



### MECHANICAL CHARACTERISTICS



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**⚠ DANGER ⚠**

**INVISIBLE LASER RADIATION**

AVOID EYE OR SKIN EXPOSURE TO DIRECT OR SCATTERED RADIATION.

\* Diode laser  
5W & up, 780-1560nm  
CLASS IV

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**⚠ WARNING ⚠**

ELECTROSTATIC DISCHARGE SENSITIVE DEVICE  
REQUIRING SPECIAL HANDLING

REV: A 10/09      HW: 0011-1000 Rev0000

# SHOOTER PACKAGE

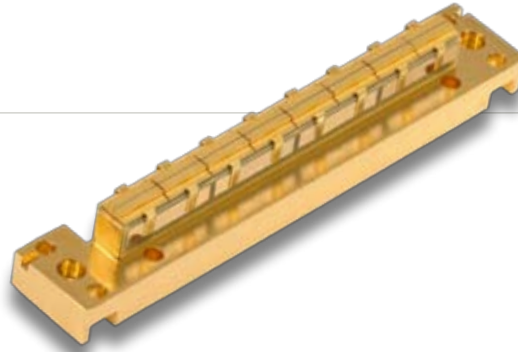
LASER DIODE ARRAY

## 320W CW

**NORTHROP GRUMMAN**

PART NUMBER: ARR134C320  
8-BAR 8-SHOOTER PACKAGE

### FEATURES AND BENEFITS



- Assembled With Hard Solder & Expansion Matched Materials
- Small, Compact Design
- Water Cooled
- Ideal For Side Pumping Or Direct Diode Applications
- Available Wavelengths: 790-1550nm
- Multi-wavelength Configurations Available

### OPTICAL CHARACTERISTICS

Parameter	Conditions	Typical	Units
CW Power Output	47A at 25°C Heat Sink	320	W
Operating Current	320W at 25°C Heat Sink	47	A
Threshold Current	25°C Heat Sink	12	A
Slope Efficiency	25°C Heat Sink	9.20	W/A
Electrical-Optical Efficiency	320W at 25°C Heat Sink	53	%
Center Wavelength	320W at 25°C Heat Sink	808	nm
Wavelength Tolerance	320W at 25°C Heat Sink	+/-3	nm
Spectral Width	320W at 25°C Heat Sink	1.8	nm
Wavelength Shift	—	0.25	nm/°C
Beam Divergence FWHM	—	38x7	x°
Beam Divergence FWHM (Lensed)	—	1x7	x°

### ELECTRICAL CHARACTERISTICS

Parameter	Conditions	Typical	Units
Series Resistance	25°C Heat Sink	0.016	$\Omega$
Operating Voltage	25°C Heat Sink, 320W	13.6	V

### ABSOLUTE MAXIMUM RATINGS

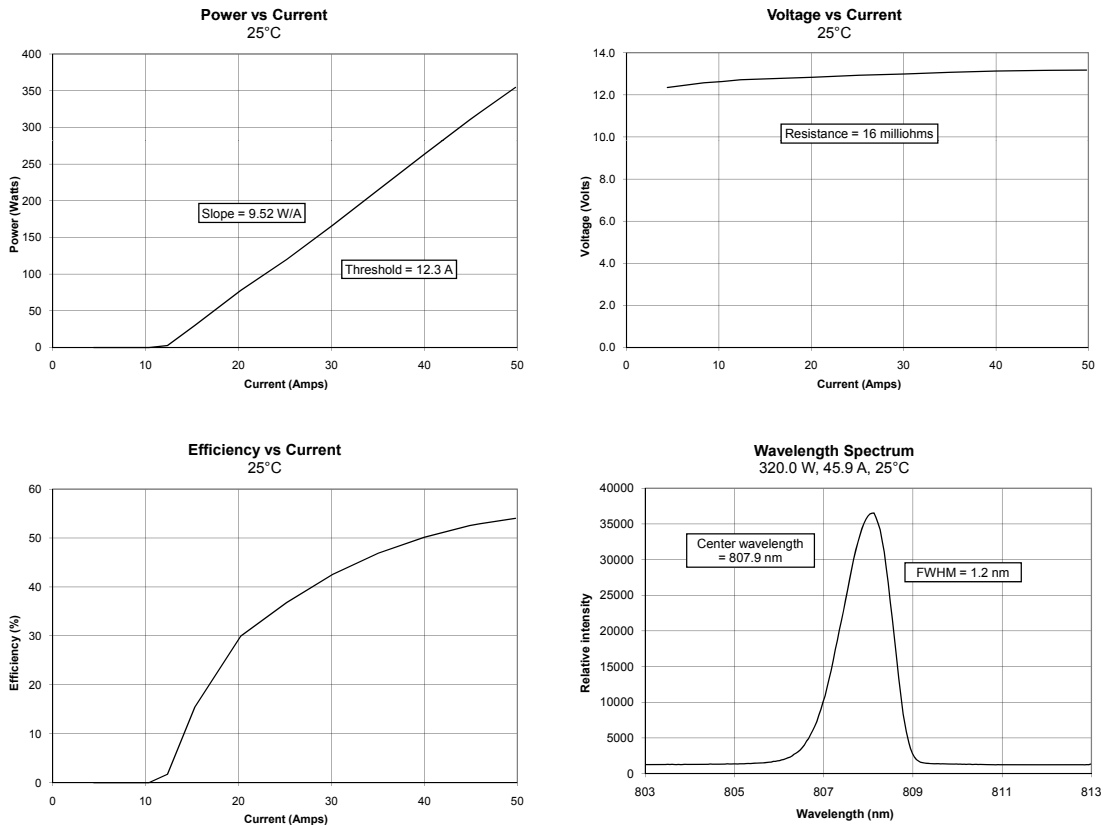
Parameter	Conditions
Reverse Current	0 A
Reverse Voltage	0 V
Operating Temperature Range	-40°C to 70°C
Storage Temperature Range	-40°C to 85°C

### NOTES

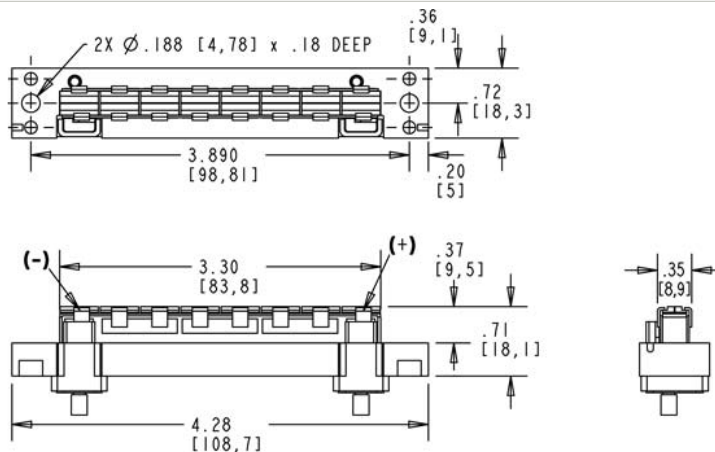
- (1) These specifications apply for operation at 808nm. Other wavelengths available upon request.
- (2) A dry nitrogen environment should be provided by the user when storing and operating at temperatures below ambient dew point.
- (3) Fast axis and slow axis lensing options are available for most NG-CEO heat exchanger designs.

## 320W CW

### OPTICAL CHARACTERISTICS (SAMPLE)



### MECHANICAL CHARACTERISTICS



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**⚠ DANGER ⚠**

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Diode laser  
5W & up, 780-1560nm  
CLASS IV

**⚠ WARNING ⚠**

ELECTROSTATIC DISCHARGE SENSITIVE DEVICE  
REQUIRING SPECIAL HANDLING

REV. A 10/09

# SHOOTER PACKAGE

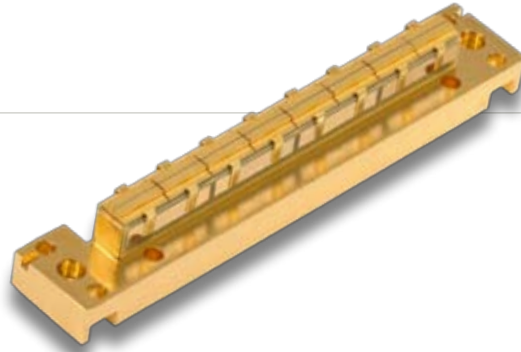
LASER DIODE ARRAY

## 1600W QCW

**NORTHROP GRUMMAN**

PART NUMBER: ARR134P1600  
8-BAR 8-SHOOTER PACKAGE

### FEATURES AND BENEFITS



- Assembled With Hard Solder & Expansion Matched Materials
- Ideal For Long Pulse And/Or High Duty Cycle Applications
- Multi-wavelength Configurations Available From 790-1550nm
- Standard Bar Pitch Options Include 400  $\mu\text{m}$ , 800  $\mu\text{m}$ , and 1200  $\mu\text{m}$
- Small, Compact Water Cooled Design Is Ideal For Side Pumping Or Direct Diode Applications
- Shooter Package Available With Up To 64 Bars And A Maximum Output Power Of 12.8 kW

### OPTICAL CHARACTERISTICS

Parameter	Conditions	Typical	Units
QCW Power Output	175A at 25°C Heat Sink	1600	W
Operating Current	1600W at 25°C Heat Sink	175	A
Threshold Current	25°C Heat Sink	15	A
Slope Efficiency	25°C Heat Sink	10.0	W/A
Electrical-Optical Efficiency	1600W at 25°C Heat Sink	57	%
Center Wavelength	1600W at 25°C Heat Sink	808	nm
Wavelength Tolerance	1600W at 25°C Heat Sink	+/-3	nm
Spectral Width	1600W at 25°C Heat Sink	3.0	nm
Wavelength Shift	—	0.25	nm/°C
Beam Divergence FWHM	—	38x7	x°
Beam Divergence FWHM (Lensed)	—	1x7	x°

### ELECTRICAL CHARACTERISTICS

Parameter	Conditions	Typical	Units
Series Resistance	25°C Heat Sink	0.016	$\Omega$
Operating Voltage	25°C Heat Sink, 1600W	16.0	V

### ABSOLUTE MAXIMUM RATINGS

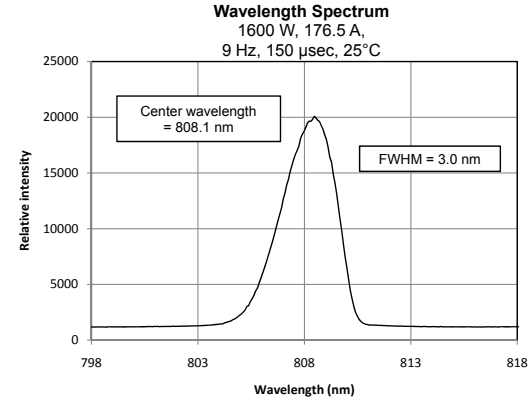
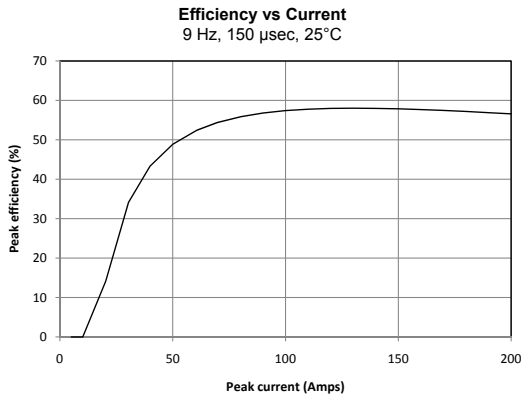
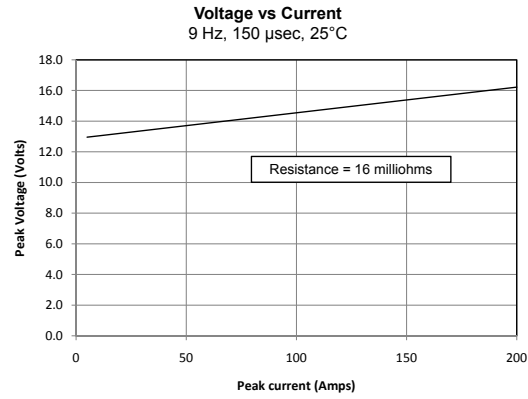
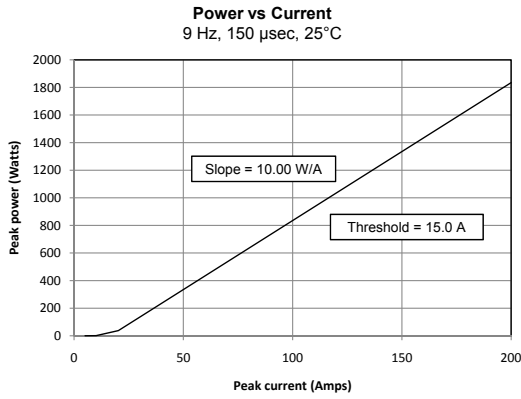
Parameter	Conditions
Reverse Current	0 A
Reverse Voltage	0 V
Operating Temperature Range	-40°C to 70°C
Storage Temperature Range	-40°C to 85°C

### NOTES

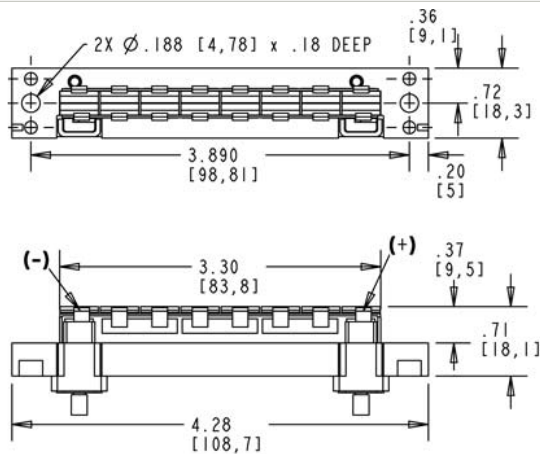
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- (3) Fast axis and slow axis lensing options are available for most NG-CEO heat exchanger designs.

## 1600W QCW

### OPTICAL CHARACTERISTICS (SAMPLE)



### MECHANICAL CHARACTERISTICS



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**⚠ DANGER ⚠**

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AVOID EYE OR SKIN EXPOSURE TO DIRECT OR SCATTERED RADIATION.

\* Diode laser  
5W & up, 780-1560nm  
CLASS IV

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**⚠ WARNING ⚠**

ELECTROSTATIC DISCHARGE SENSITIVE DEVICE  
REQUIRING SPECIAL HANDLING

REV. A 10/09

# SHOOTER PACKAGE

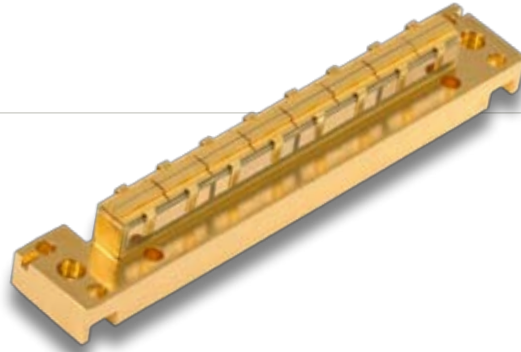
LASER DIODE ARRAY

## 3200W QCW

**NORTHROP GRUMMAN**

PART NUMBER: ARR134P3200  
16-BAR 8-SHOOTER PACKAGE

### FEATURES AND BENEFITS



- Assembled With Hard Solder & Expansion Matched Materials
- Ideal For Long Pulse And/Or High Duty Cycle Applications
- Multi-wavelength Configurations Available From 790-1550nm
- Standard Bar Pitch Options Include 400  $\mu\text{m}$ , 800  $\mu\text{m}$ , and 1200  $\mu\text{m}$
- Small, Compact Water Cooled Design Is Ideal For Side Pumping Or Direct Diode Applications
- Shooter Package Available With Up To 64 Bars And A Maximum Output Power Of 12.8 kW

### OPTICAL CHARACTERISTICS

Parameter	Conditions	Typical	Units
QCW Power Output	175A at 25°C Heat Sink	3200	W
Operating Current	3200W at 25°C Heat Sink	175	A
Threshold Current	25°C Heat Sink	15	A
Slope Efficiency	25°C Heat Sink	20.0	W/A
Electrical-Optical Efficiency	3200W at 25°C Heat Sink	57	%
Center Wavelength	3200W at 25°C Heat Sink	808	nm
Wavelength Tolerance	3200W at 25°C Heat Sink	+/-3	nm
Spectral Width	3200W at 25°C Heat Sink	3.0	nm
Wavelength Shift	—	0.25	nm/°C
Beam Divergence FWHM	—	38x7	x°
Beam Divergence FWHM (Lensed)	—	1x7	x°

### ELECTRICAL CHARACTERISTICS

Parameter	Conditions	Typical	Units
Series Resistance	25°C Heat Sink	0.032	$\Omega$
Operating Voltage	25°C Heat Sink, 3200W	32.0	V

### ABSOLUTE MAXIMUM RATINGS

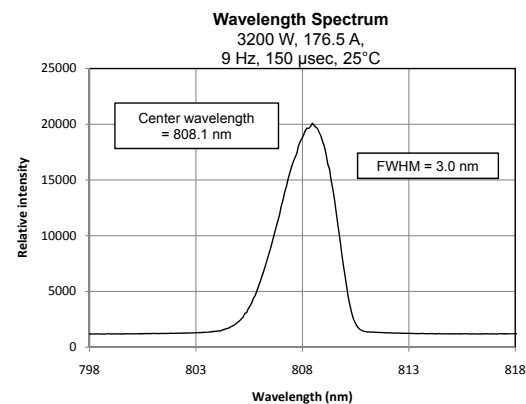
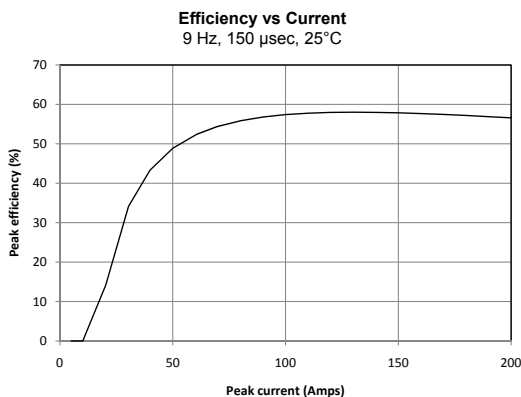
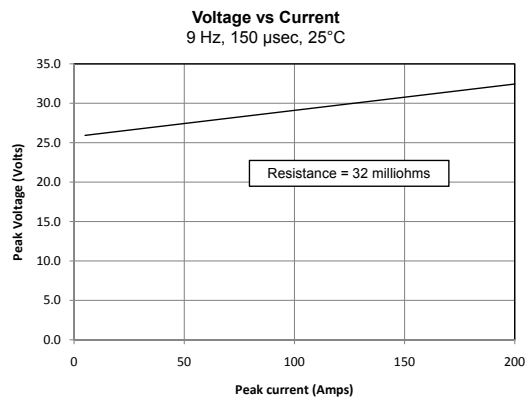
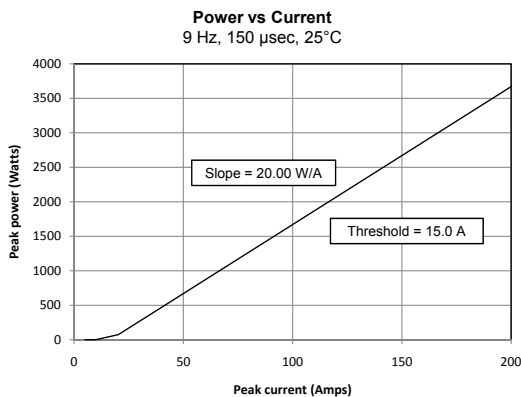
Parameter	Conditions
Reverse Current	0 A
Reverse Voltage	0 V
Operating Temperature Range	-40°C to 70°C
Storage Temperature Range	-40°C to 85°C

### NOTES

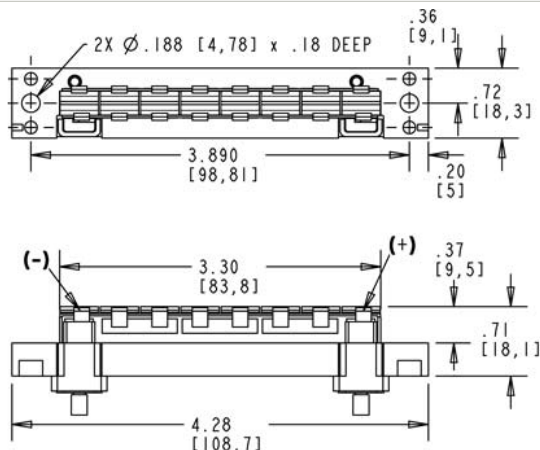
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- (2) A dry nitrogen environment should be provided by the user when storing and operating at temperatures below ambient dew point.
- (3) Fast axis and slow axis lensing options are available for most NG-CEO heat exchanger designs.

## 3200W QCW

### OPTICAL CHARACTERISTICS (SAMPLE)



### MECHANICAL CHARACTERISTICS



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**⚠ DANGER ⚠**

**INVISIBLE LASER RADIATION**

AVOID EYE OR SKIN EXPOSURE TO DIRECT OR SCATTERED RADIATION.

\* Diode laser  
5W & up, 780-1560nm  
CLASS IV

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**⚠ WARNING ⚠**

ELECTROSTATIC DISCHARGE SENSITIVE DEVICE  
REQUIRING SPECIAL HANDLING

REV. A 10/09



# SHOOTER PACKAGE

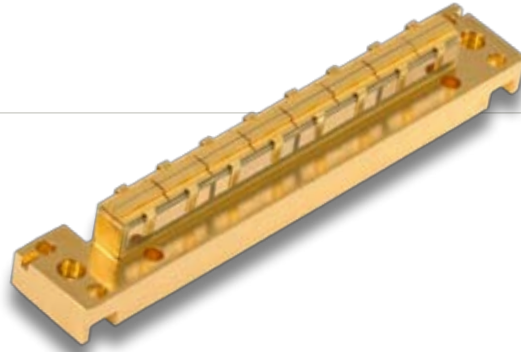
LASER DIODE ARRAY

## 4800W QCW

**NORTHROP GRUMMAN**

PART NUMBER: ARR134P4800  
48-BAR 8-SHOOTER PACKAGE

### FEATURES AND BENEFITS



- Assembled With Hard Solder & Expansion Matched Materials
- Ideal For Long Pulse And/Or High Duty Cycle Applications
- Multi-wavelength Configurations Available From 790-1550nm
- Standard Bar Pitch Options Include 400  $\mu\text{m}$ , 800  $\mu\text{m}$ , and 1200  $\mu\text{m}$
- Small, Compact Water Cooled Design Is Ideal For Side Pumping Or Direct Diode Applications
- Shooter Package Available With Up To 64 Bars And A Maximum Output Power Of 12.8 kW

### OPTICAL CHARACTERISTICS

Parameter	Conditions	Typical	Units
QCW Power Output	95A at 25°C Heat Sink	4800	W
Operating Current	4800W at 25°C Heat Sink	95	A
Threshold Current	25°C Heat Sink	15	A
Slope Efficiency	25°C Heat Sink	60.0	W/A
Electrical-Optical Efficiency	4800W at 25°C Heat Sink	58	%
Center Wavelength	4800W at 25°C Heat Sink	808	nm
Wavelength Tolerance	4800W at 25°C Heat Sink	+/-3	nm
Spectral Width	4800W at 25°C Heat Sink	2.0	nm
Wavelength Shift	—	0.25	nm/°C
Beam Divergence FWHM	—	38x7	x°
Beam Divergence FWHM (Lensed)	—	1x7	x°

### ELECTRICAL CHARACTERISTICS

Parameter	Conditions	Typical	Units
Series Resistance	25°C Heat Sink	0.096	$\Omega$
Operating Voltage	25°C Heat Sink, 4800W	86.4	V

### ABSOLUTE MAXIMUM RATINGS

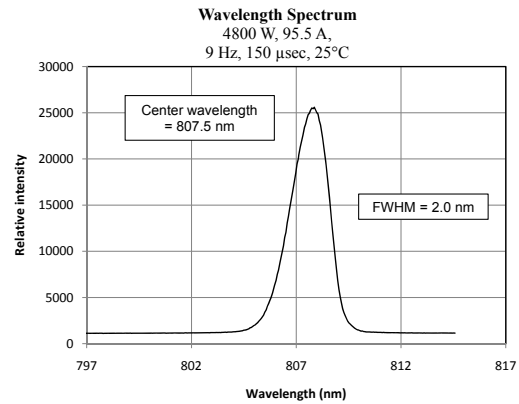
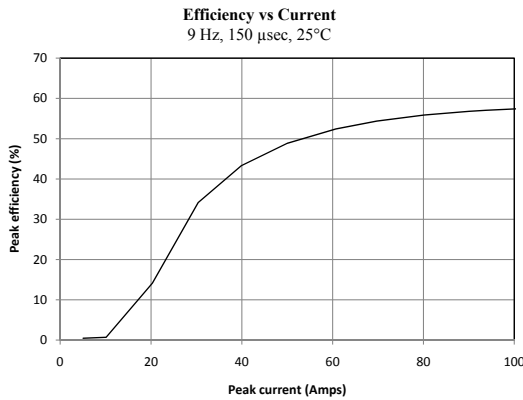
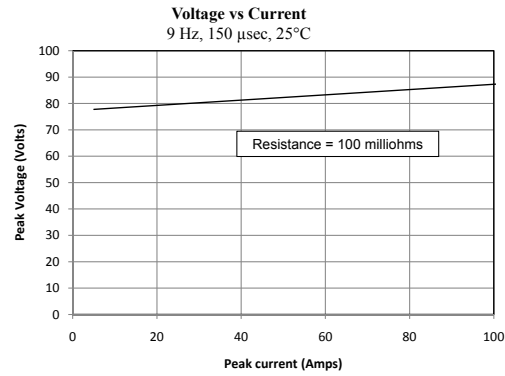
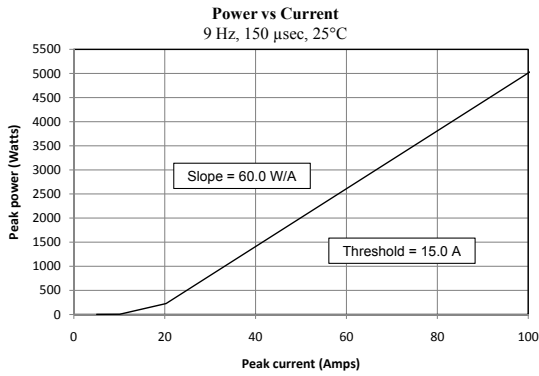
Parameter	Conditions
Reverse Current	0 A
Reverse Voltage	0 V
Operating Temperature Range	-40°C to 70°C
Storage Temperature Range	-40°C to 85°C

### NOTES

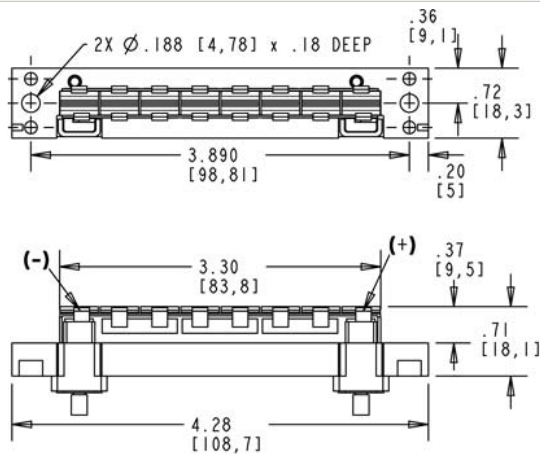
- (1) These specifications apply for operation at 808nm. Other wavelengths available upon request.
- (2) A dry nitrogen environment should be provided by the user when storing and operating at temperatures below ambient dew point.
- (3) Fast axis and slow axis lensing options are available for most NG-CEO heat exchanger designs.

## 4800W QCW

### OPTICAL CHARACTERISTICS (SAMPLE)



### MECHANICAL CHARACTERISTICS



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**⚠ DANGER ⚠**

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AVOID EYE OR SKIN EXPOSURE TO DIRECT OR SCATTERED RADIATION.

\* Diode laser  
5W & up, 780-1560nm  
CLASS IV

---

**⚠ WARNING ⚠**

ELECTROSTATIC DISCHARGE SENSITIVE DEVICE  
REQUIRING SPECIAL HANDLING

REV. A 10/09      4800W-1000-00000

# SHOOTER PACKAGE

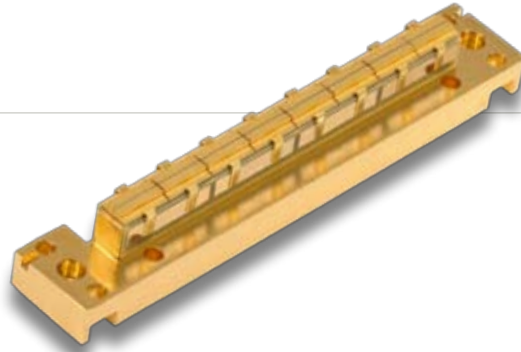
LASER DIODE ARRAY

## 5600W QCW

***NORTHROP GRUMMAN***

PART NUMBER: ARR134P5600  
56-BAR 8-SHOOTER PACKAGE

### FEATURES AND BENEFITS



- Assembled With Hard Solder & Expansion Matched Materials
- Ideal For Long Pulse And/Or High Duty Cycle Applications
- Multi-wavelength Configurations Available From 790-1550nm
- Standard Bar Pitch Options Include 400  $\mu\text{m}$ , 800  $\mu\text{m}$ , and 1200  $\mu\text{m}$
- Small, Compact Water Cooled Design Is Ideal For Side Pumping Or Direct Diode Applications
- Shooter Package Available With Up To 64 Bars And A Maximum Output Power Of 12.8 kW

### OPTICAL CHARACTERISTICS

Parameter	Conditions	Typical	Units
QCW Power Output	95A at 25°C Heat Sink	5600	W
Operating Current	5600W at 25°C Heat Sink	95	A
Threshold Current	25°C Heat Sink	15	A
Slope Efficiency	25°C Heat Sink	70.0	W/A
Electrical-Optical Efficiency	5600W at 25°C Heat Sink	58	%
Center Wavelength	5600W at 25°C Heat Sink	808	nm
Wavelength Tolerance	5600W at 25°C Heat Sink	+/-3	nm
Spectral Width	5600W at 25°C Heat Sink	2.0	nm
Wavelength Shift	—	0.25	nm/°C
Beam Divergence FWHM	—	38x7	x°
Beam Divergence FWHM (Lensed)	—	1x7	x°

### ELECTRICAL CHARACTERISTICS

Parameter	Conditions	Typical	Units
Series Resistance	25°C Heat Sink	0.112	$\Omega$
Operating Voltage	25°C Heat Sink, 5600W	101	V

### ABSOLUTE MAXIMUM RATINGS

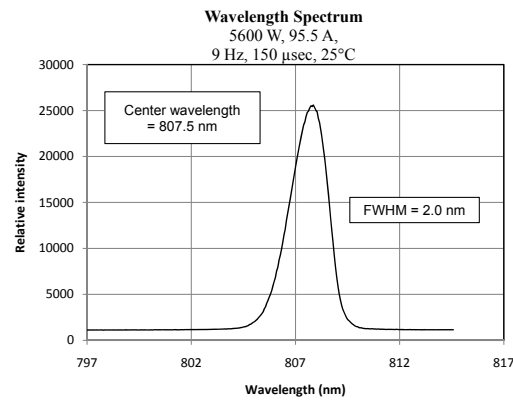
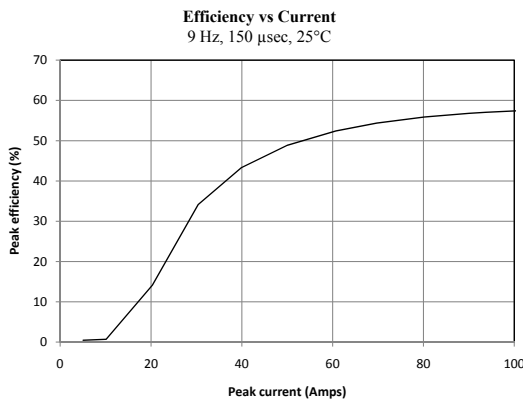
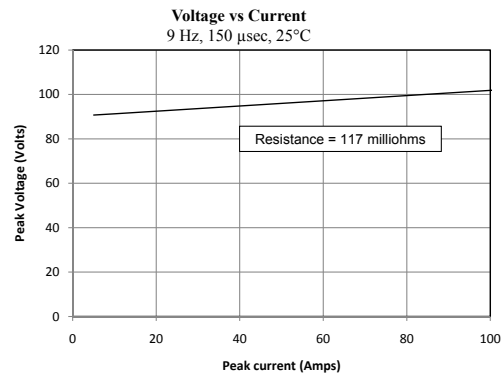
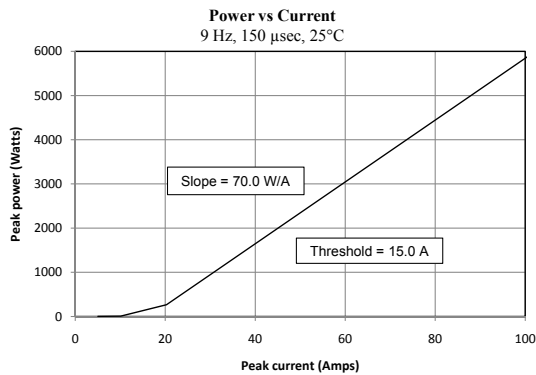
Parameter	Conditions
Reverse Current	0 A
Reverse Voltage	0 V
Operating Temperature Range	-40°C to 70°C
Storage Temperature Range	-40°C to 85°C

### NOTES

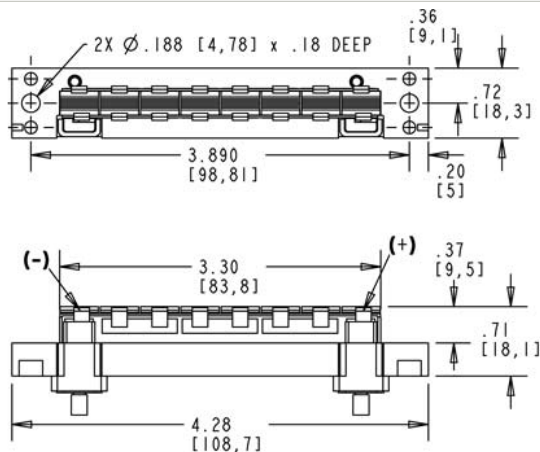
- (1) These specifications apply for operation at 808nm. Other wavelengths available upon request.
- (2) A dry nitrogen environment should be provided by the user when storing and operating at temperatures below ambient dew point.
- (3) Fast axis and slow axis lensing options are available for most NG-CEO heat exchanger designs.

## 5600W QCW

### OPTICAL CHARACTERISTICS (SAMPLE)



### MECHANICAL CHARACTERISTICS



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DANGER

INVISIBLE LASER RADIATION

AVOID EYE OR SKIN EXPOSURE TO DIRECT OR SCATTERED RADIATION.

\* Diode laser  
5W & up, 780-1560nm  
CLASS IV

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WARNING

ELECTROSTATIC DISCHARGE SENSITIVE DEVICE  
REQUIRING SPECIAL HANDLING

REV. A 10/09 REV 0010 10/09 (Rev. 0010)

# SHOOTER PACKAGE

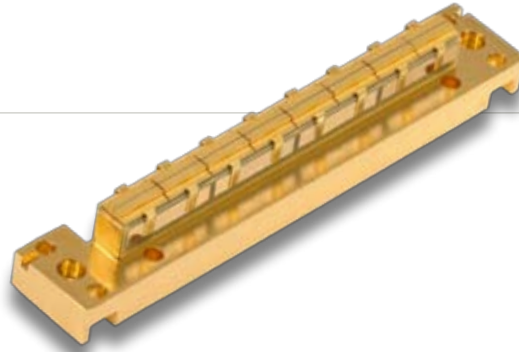
LASER DIODE ARRAY

## 9600W QCW

**NORTHROP GRUMMAN**

PART NUMBER: ARR134P9600  
48-BAR 8-SHOOTER PACKAGE

### FEATURES AND BENEFITS



- Assembled With Hard Solder & Expansion Matched Materials
- Ideal For Long Pulse And/Or High Duty Cycle Applications
- Multi-wavelength Configurations Available From 790-1550nm
- Standard Bar Pitch Options Include 400  $\mu\text{m}$ , 800  $\mu\text{m}$ , and 1200  $\mu\text{m}$
- Small, Compact Water Cooled Design Is Ideal For Side Pumping Or Direct Diode Applications
- Shooter Package Available With Up To 64 Bars And A Maximum Output Power Of 12.8 kW

### OPTICAL CHARACTERISTICS

Parameter	Conditions	Typical	Units
QCW Power Output	175A at 25°C Heat Sink	9600	W
Operating Current	9600W at 25°C Heat Sink	175	A
Threshold Current	25°C Heat Sink	15	A
Slope Efficiency	25°C Heat Sink	60.0	W/A
Electrical-Optical Efficiency	9600W at 25°C Heat Sink	57	%
Center Wavelength	9600W at 25°C Heat Sink	808	nm
Wavelength Tolerance	9600W at 25°C Heat Sink	+/-3	nm
Spectral Width	9600W at 25°C Heat Sink	3.0	nm
Wavelength Shift	—	0.25	nm/°C
Beam Divergence FWHM	—	38x7	x°
Beam Divergence FWHM (Lensed)	—	1x7	x°

### ELECTRICAL CHARACTERISTICS

Parameter	Conditions	Typical	Units
Series Resistance	25°C Heat Sink	0.096	$\Omega$
Operating Voltage	25°C Heat Sink, 9600W	96.0	V

### ABSOLUTE MAXIMUM RATINGS

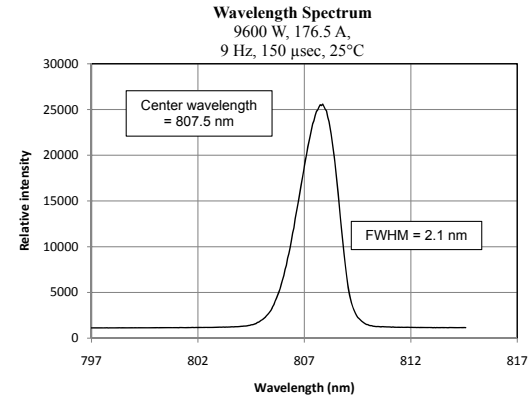
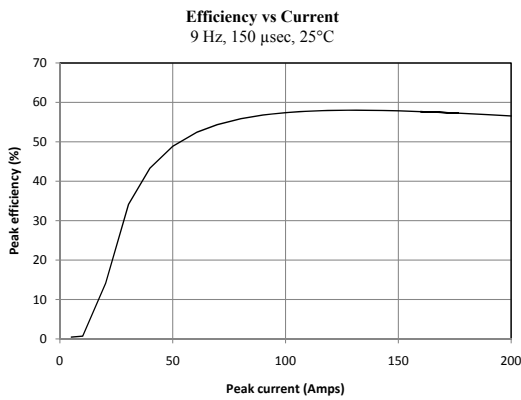
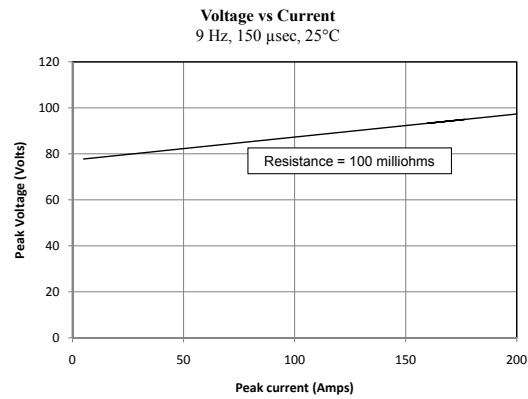
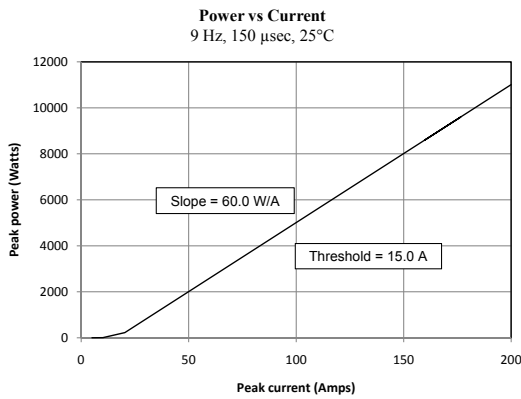
Parameter	Conditions
Reverse Current	0 A
Reverse Voltage	0 V
Operating Temperature Range	-40°C to 70°C
Storage Temperature Range	-40°C to 85°C

### NOTES

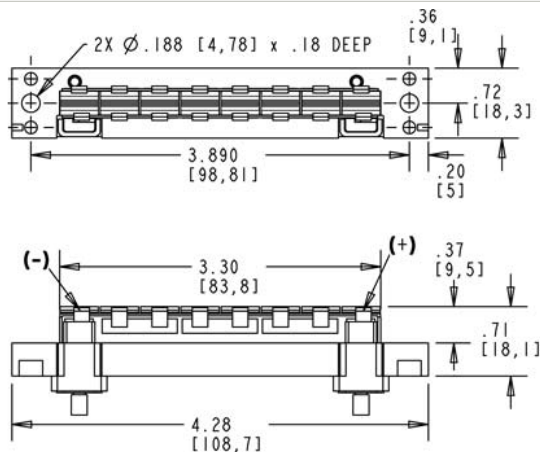
- (1) These specifications apply for operation at 808nm. Other wavelengths available upon request.
- (2) A dry nitrogen environment should be provided by the user when storing and operating at temperatures below ambient dew point.
- (3) Fast axis and slow axis lensing options are available for most NG-CEO heat exchanger designs.

## 9600W QCW

### OPTICAL CHARACTERISTICS (SAMPLE)



### MECHANICAL CHARACTERISTICS



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**⚠ DANGER ⚠**

**INVISIBLE LASER RADIATION**

AVOID EYE OR SKIN EXPOSURE TO DIRECT OR SCATTERED RADIATION.

\* Diode laser  
5W & up, 780-1560nm  
CLASS IV

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**⚠ WARNING ⚠**

ELECTROSTATIC DISCHARGE SENSITIVE DEVICE  
REQUIRING SPECIAL HANDLING

REV. A 10/09      9600W-1000 Rev.0000

# SHOOTER PACKAGE

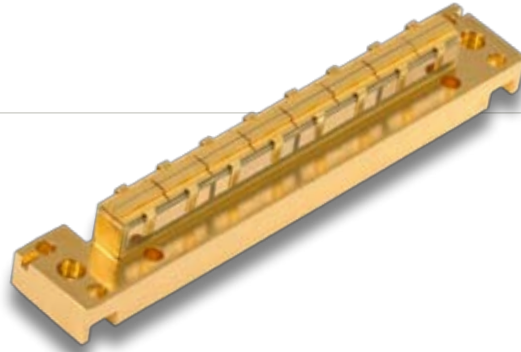
LASER DIODE ARRAY

## 12.8 KW QCW

**NORTHROP GRUMMAN**

PART NUMBER: ARR134P12800  
64-BAR 8-SHOOTER PACKAGE

### FEATURES AND BENEFITS



- Assembled With Hard Solder & Expansion Matched Materials
- Ideal For Long Pulse And/Or High Duty Cycle Applications
- Multi-wavelength Configurations Available From 790-1550nm
- Standard Bar Pitch Options Include 400  $\mu\text{m}$ , 800  $\mu\text{m}$ , and 1200  $\mu\text{m}$
- Small, Compact Water Cooled Design Is Ideal For Side Pumping Or Direct Diode Applications
- Shooter Package Available With Up To 64 Bars And A Maximum Output Power Of 12.8 kW

### OPTICAL CHARACTERISTICS

Parameter	Conditions	Typical	Units
QCW Power Output	175A at 25°C Heat Sink	12800	W
Operating Current	12800W at 25°C Heat Sink	175	A
Threshold Current	25°C Heat Sink	15	A
Slope Efficiency	25°C Heat Sink	80.0	W/A
Electrical-Optical Efficiency	12800W at 25°C Heat Sink	57	%
Center Wavelength	12800W at 25°C Heat Sink	808	nm
Wavelength Tolerance	12800W at 25°C Heat Sink	+/-3	nm
Spectral Width	12800W at 25°C Heat Sink	3.0	nm
Wavelength Shift	—	0.25	nm/°C
Beam Divergence FWHM	—	38x7	x°
Beam Divergence FWHM (Lensed)	—	1x7	x°

### ELECTRICAL CHARACTERISTICS

Parameter	Conditions	Typical	Units
Series Resistance	25°C Heat Sink	0.128	$\Omega$
Operating Voltage	25°C Heat Sink, 12800W	128	V

### ABSOLUTE MAXIMUM RATINGS

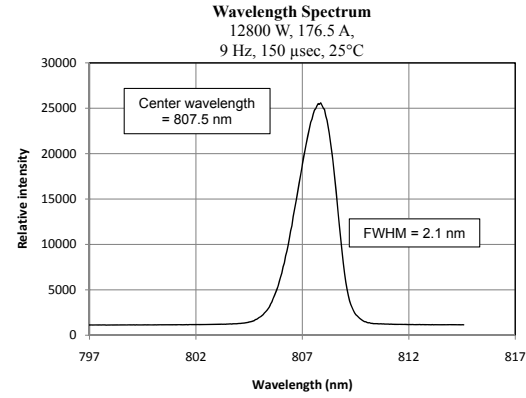
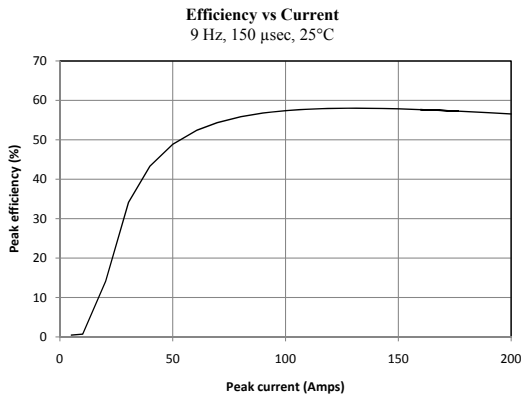
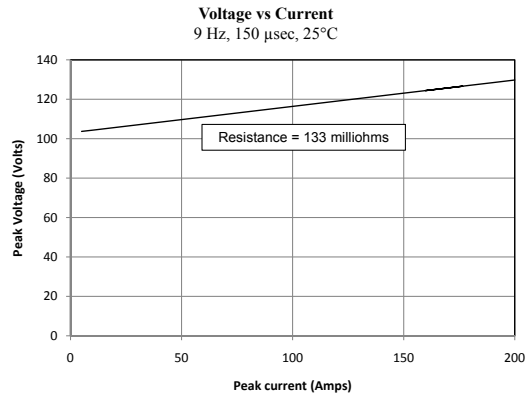
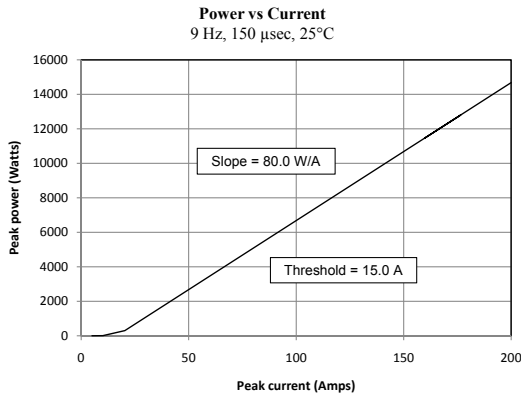
Parameter	Conditions
Reverse Current	0 A
Reverse Voltage	0 V
Operating Temperature Range	-40°C to 70°C
Storage Temperature Range	-40°C to 85°C

### NOTES

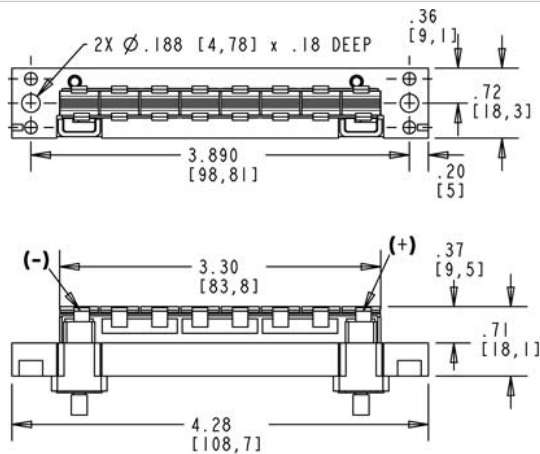
- (1) These specifications apply for operation at 808nm. Other wavelengths available upon request.
- (2) A dry nitrogen environment should be provided by the user when storing and operating at temperatures below ambient dew point.
- (3) Fast axis and slow axis lensing options are available for most NG-CEO heat exchanger designs.

## 12.8 KW QCW

### OPTICAL CHARACTERISTICS (SAMPLE)



### MECHANICAL CHARACTERISTICS



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**⚠ DANGER ⚠**

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\* Diode laser  
5W & up, 780-1560nm  
CLASS IV

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**⚠ WARNING ⚠**

ELECTROSTATIC DISCHARGE SENSITIVE DEVICE  
REQUIRING SPECIAL HANDLING

REV. A 10/09      807-0011-1000 (Rev.09/08)