

# SHOOTER PACKAGE

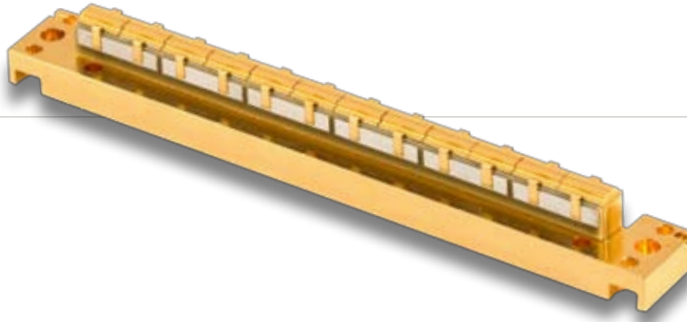
LASER DIODE ARRAY

## 240W CW

**NORTHROP GRUMMAN**

PART NUMBER: ARR175C240  
12-BAR 12-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	240	W
Operating Current	240W at 25°C Heat Sink	25	A
Threshold Current	25°C Heat Sink	8	A
Slope Efficiency	25°C Heat Sink	13.8	W/A
Electrical-Optical Efficiency	240W at 25°C Heat Sink	47	%
Center Wavelength	240W at 25°C Heat Sink	808	nm
Wavelength Tolerance	240W at 25°C Heat Sink	+/-3	nm
Spectral Width	240W 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	0.048	$\Omega$
Operating Voltage	25°C Heat Sink, 240W	20.4	V

### ABSOLUTE MAXIMUM RATINGS

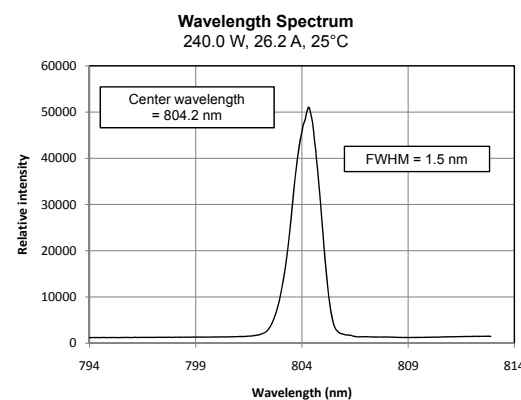
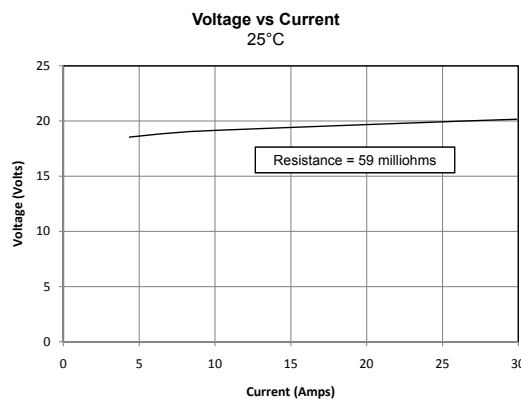
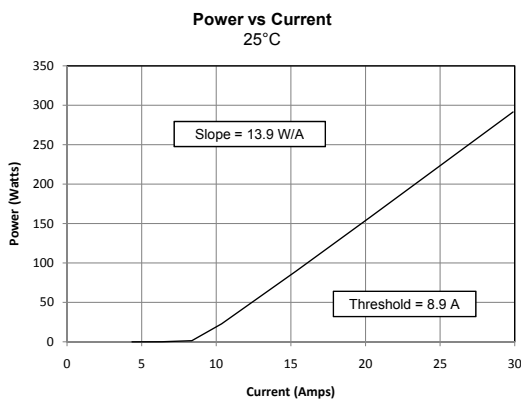
Parameter	Conditions
Reverse Current	0 A
Reverse Voltage	0 V
Operating Temperature Range	-40°C to 70°C
Storage Temperature Range	-40°C to 85°C

### NOTES

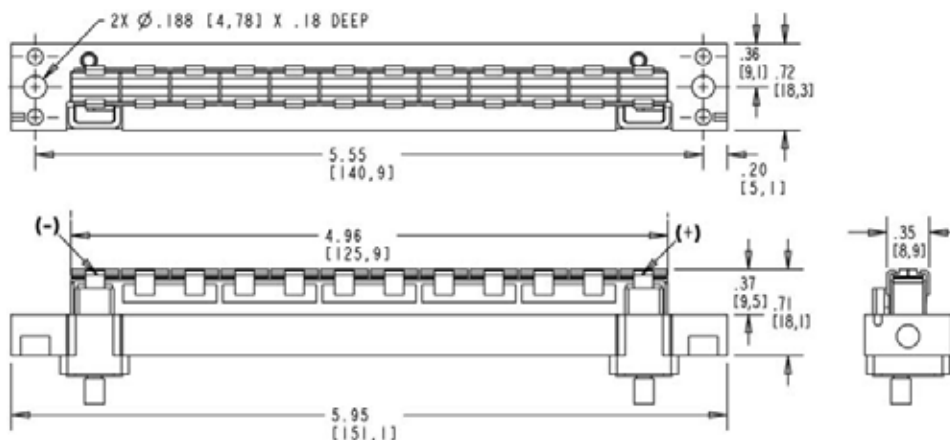
- (1) These specifications apply for operation at 808nm. Other wavelengths available upon request.
- (2) A dry nitrogen environment should be provided by the user when storing and operating at temperatures below ambient dew point.
- (3) Fast axis and slow axis lensing options are available for most NG-CEO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

## 240W 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

**⚠ WARNING ⚠**

ELECTROSTATIC DISCHARGE SENSITIVE DEVICE  
REQUIRING SPECIAL HANDLING

REV. A 10/09

# SHOOTER PACKAGE

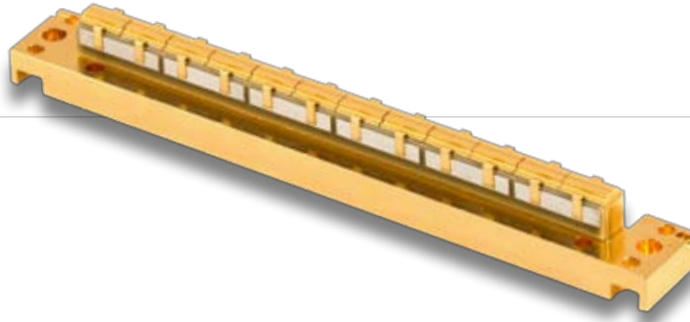
LASER DIODE ARRAY

## 480W CW

**NORTHROP GRUMMAN**

PART NUMBER: ARR175C480  
12-BAR 12-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	480	W
Operating Current	480W at 25°C Heat Sink	47	A
Threshold Current	25°C Heat Sink	12	A
Slope Efficiency	25°C Heat Sink	13.8	W/A
Electrical-Optical Efficiency	480W at 25°C Heat Sink	53	%
Center Wavelength	480W at 25°C Heat Sink	808	nm
Wavelength Tolerance	480W at 25°C Heat Sink	+/-3	nm
Spectral Width	480W 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	0.024	$\Omega$
Operating Voltage	25°C Heat Sink, 480W	20.4	V

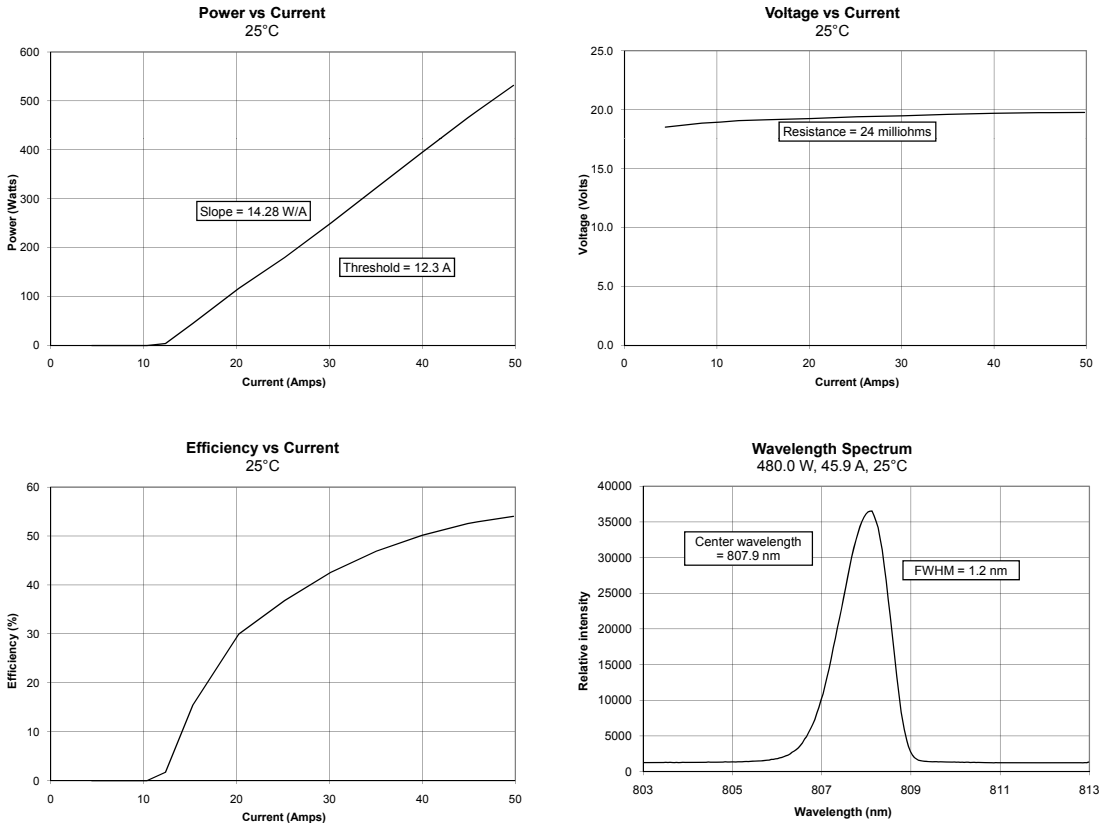
### ABSOLUTE MAXIMUM RATINGS

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

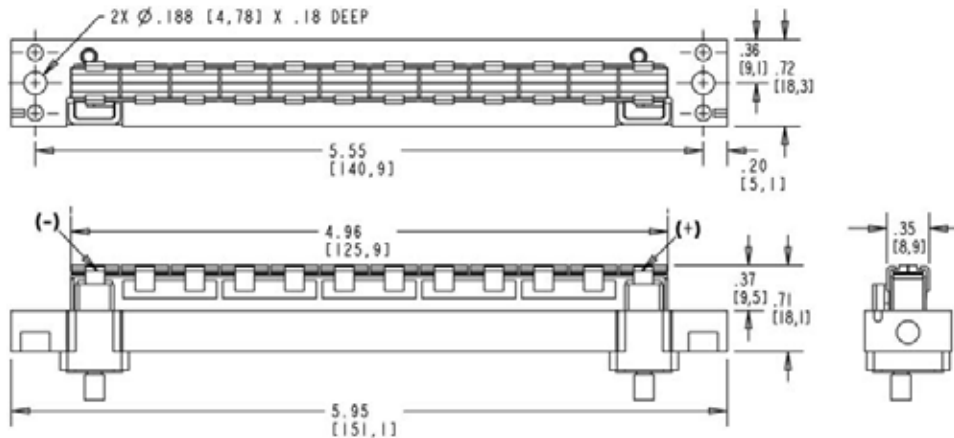
### NOTES

- (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.

> **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

**⚠ WARNING ⚠**

ELECTROSTATIC DISCHARGE SENSITIVE DEVICE  
REQUIRING SPECIAL HANDLING

REV. A 10/09

# SHOOTER PACKAGE

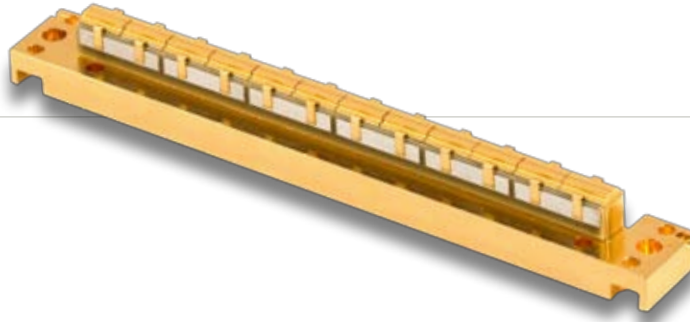
LASER DIODE ARRAY

## 1200W QCW

**NORTHROP GRUMMAN**

PART NUMBER: ARR175P1200  
12-BAR 12-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 96 Bars And A Maximum Output Power Of 19.2 kW

### OPTICAL CHARACTERISTICS

Parameter	Conditions	Typical	Units
QCW Power Output	95A at 25°C Heat Sink	1200	W
Operating Current	1200W at 25°C Heat Sink	95	A
Threshold Current	25°C Heat Sink	15	A
Slope Efficiency	25°C Heat Sink	15.0	W/A
Electrical-Optical Efficiency	1200W at 25°C Heat Sink	58	%
Center Wavelength	1200W at 25°C Heat Sink	808	nm
Wavelength Tolerance	1200W at 25°C Heat Sink	+/-3	nm
Spectral Width	1200W 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	0.024	$\Omega$
Operating Voltage	25°C Heat Sink, 1200W	21.6	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

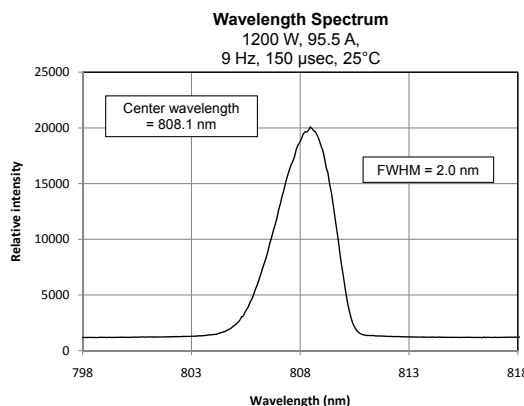
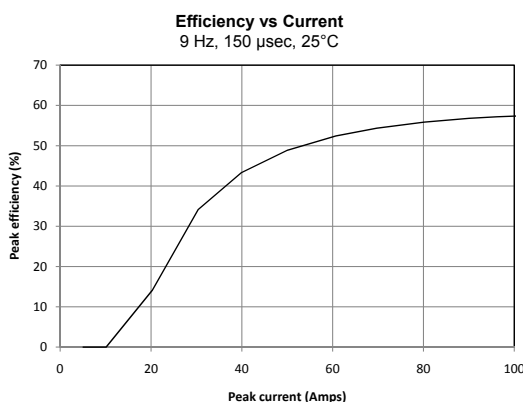
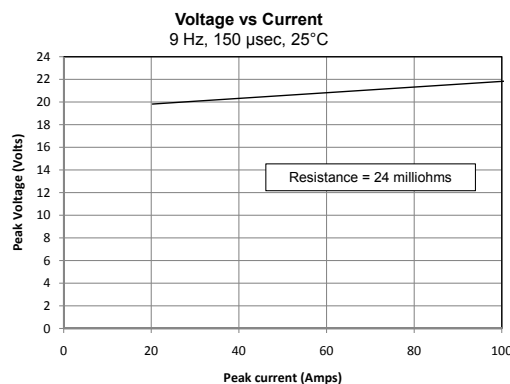
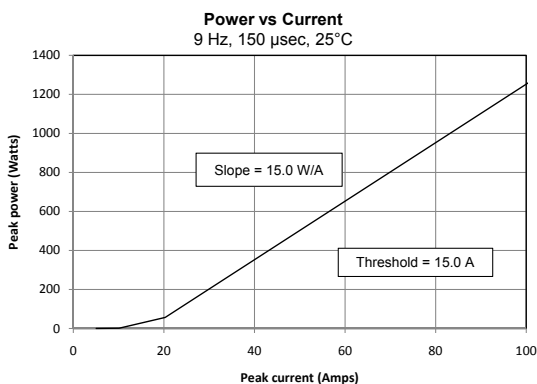
### NOTES

- (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.

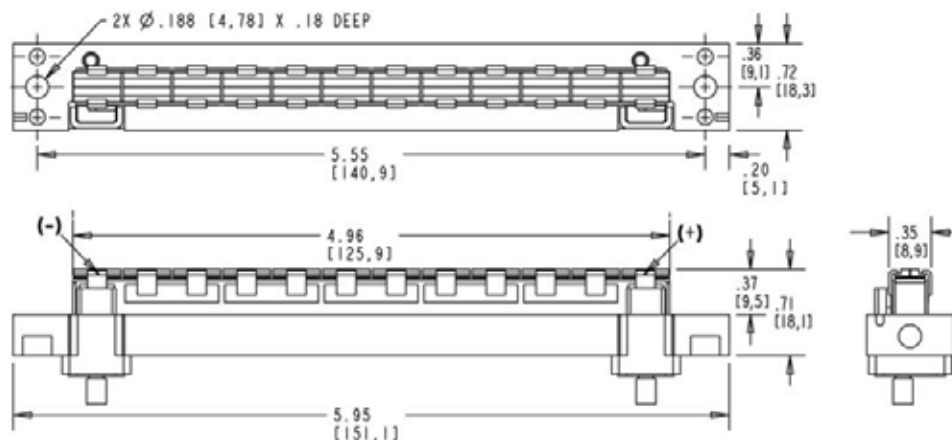


## 1200W QCW

### 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

**WARNING**

ELECTROSTATIC DISCHARGE  
SENSITIVE DEVICE  
REQUIRING SPECIAL HANDLING

REV. A 10/09

# SHOOTER PACKAGE

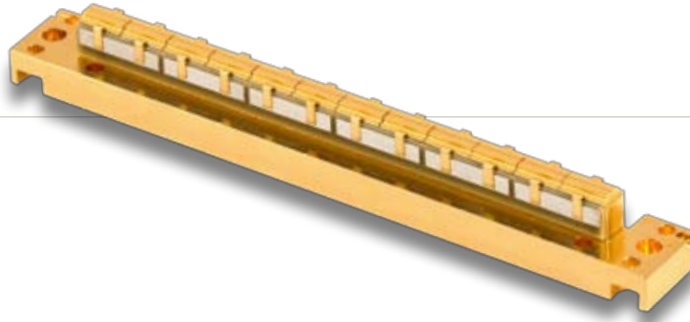
LASER DIODE ARRAY

## 2400W QCW

**NORTHROP GRUMMAN**

PART NUMBER: ARR175P2400  
24-BAR 12-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 96 Bars And A Maximum Output Power Of 19.2 kW

### OPTICAL CHARACTERISTICS

Parameter	Conditions	Typical	Units
QCW Power Output	95A at 25°C Heat Sink	2400	W
Operating Current	2400W at 25°C Heat Sink	95	A
Threshold Current	25°C Heat Sink	15	A
Slope Efficiency	25°C Heat Sink	30.0	W/A
Electrical-Optical Efficiency	2400W at 25°C Heat Sink	58	%
Center Wavelength	2400W at 25°C Heat Sink	808	nm
Wavelength Tolerance	2400W at 25°C Heat Sink	+/-3	nm
Spectral Width	2400W 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	0.048	$\Omega$
Operating Voltage	25°C Heat Sink, 2400W	43.2	V

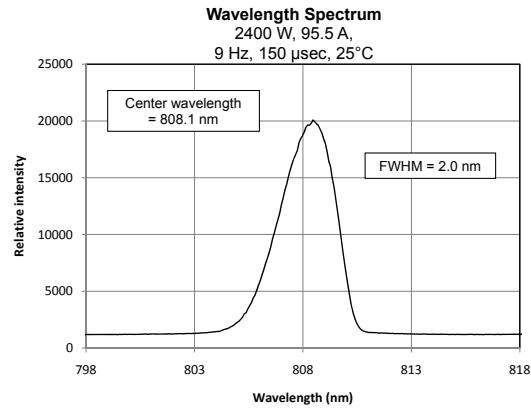
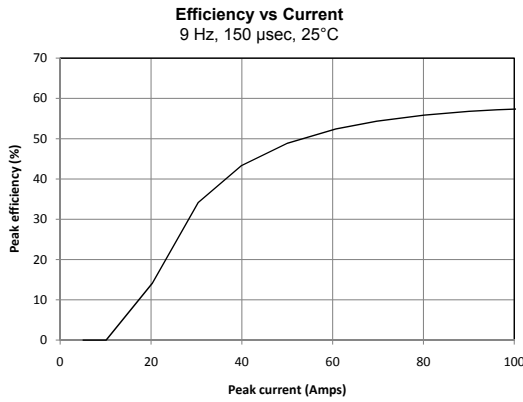
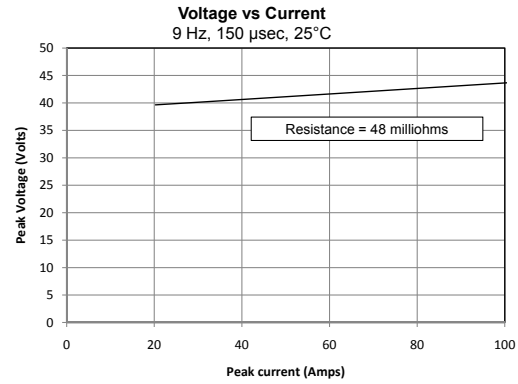
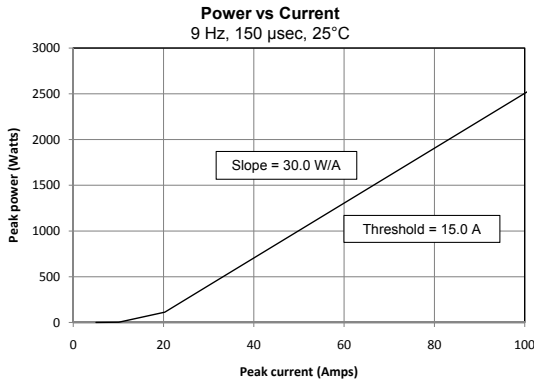
### ABSOLUTE MAXIMUM RATINGS

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

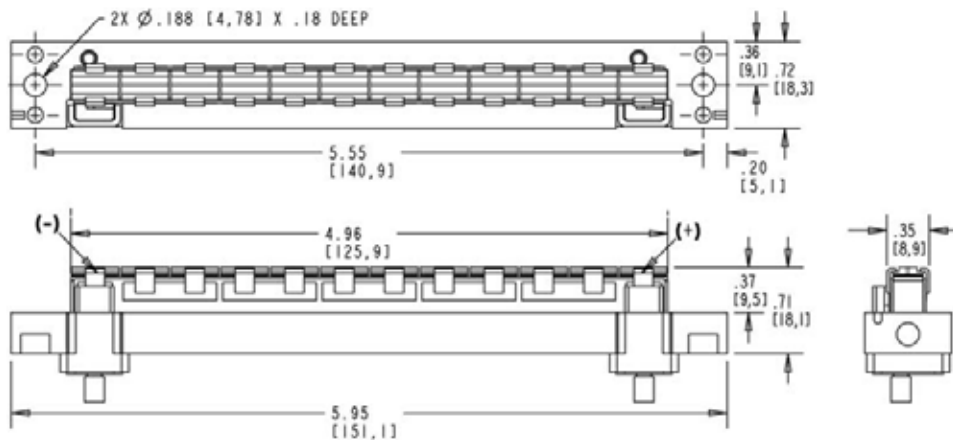
### NOTES

- (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.

> **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

**WARNING**

ELECTROSTATIC DISCHARGE  
SENSITIVE DEVICE  
REQUIRING SPECIAL HANDLING

REV. A 10/09



# SHOOTER PACKAGE

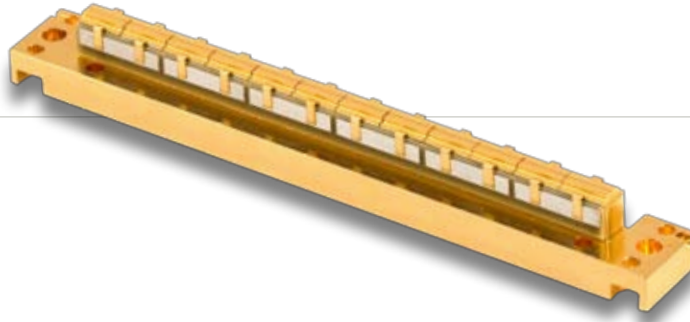
LASER DIODE ARRAY

## 3600W QCW

**NORTHROP GRUMMAN**

PART NUMBER: ARR175P3600  
36-BAR 12-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 96 Bars And A Maximum Output Power Of 19.2 kW

### OPTICAL CHARACTERISTICS

Parameter	Conditions	Typical	Units
QCW Power Output	95A at 25°C Heat Sink	3600	W
Operating Current	3600W at 25°C Heat Sink	95	A
Threshold Current	25°C Heat Sink	15	A
Slope Efficiency	25°C Heat Sink	45.0	W/A
Electrical-Optical Efficiency	3600W at 25°C Heat Sink	58	%
Center Wavelength	3600W at 25°C Heat Sink	808	nm
Wavelength Tolerance	3600W at 25°C Heat Sink	+/-3	nm
Spectral Width	3600W 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	0.072	$\Omega$
Operating Voltage	25°C Heat Sink, 3600W	64.8	V

### ABSOLUTE MAXIMUM RATINGS

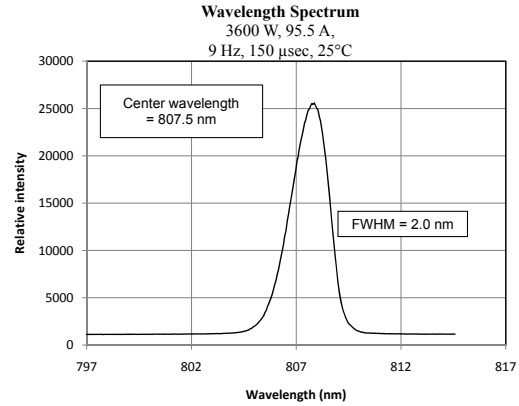
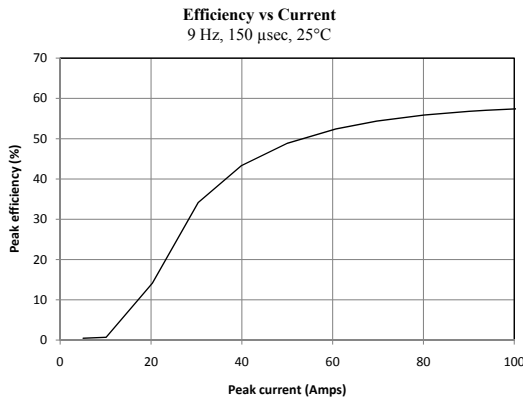
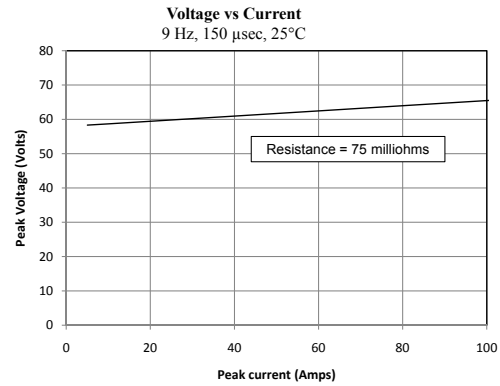
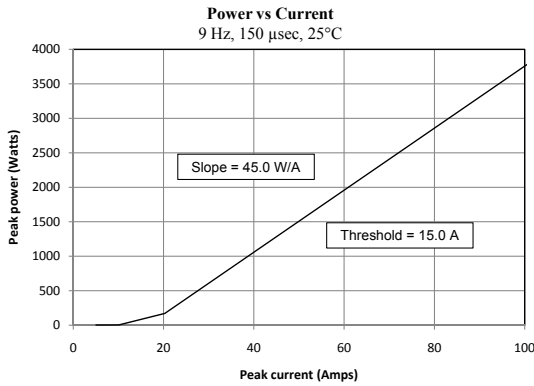
Parameter	Conditions
Reverse Current	0 A
Reverse Voltage	0 V
Operating Temperature Range	-40°C to 70°C
Storage Temperature Range	-40°C to 85°C

### NOTES

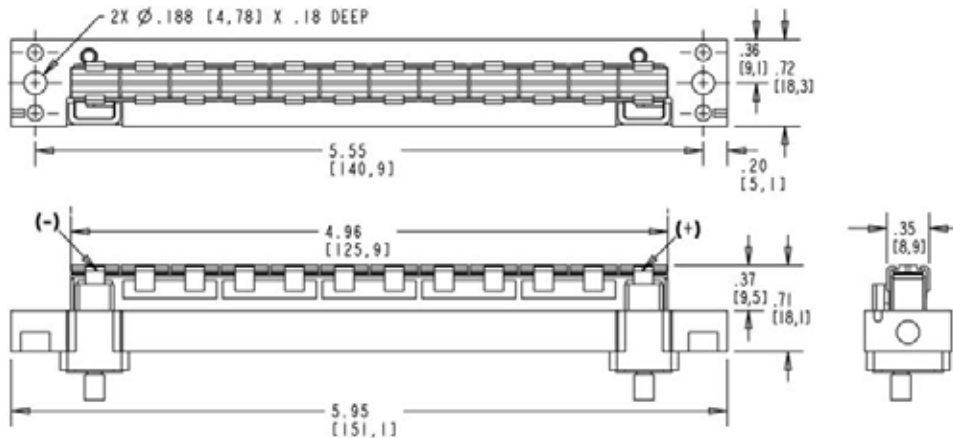
- (1) These specifications apply for operation at 808nm. Other wavelengths available upon request.
- (2) A dry nitrogen environment should be provided by the user when storing and operating at temperatures below ambient dew point.
- (3) Fast axis and slow axis lensing options are available for most NG-CEO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

## 3600W 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

WARNING

ELECTROSTATIC DISCHARGE  
SENSITIVE DEVICE  
REQUIRING SPECIAL HANDLING

REV. A 10/09 REV. 0011-1000 (Rev. 0001)

# SHOOTER PACKAGE

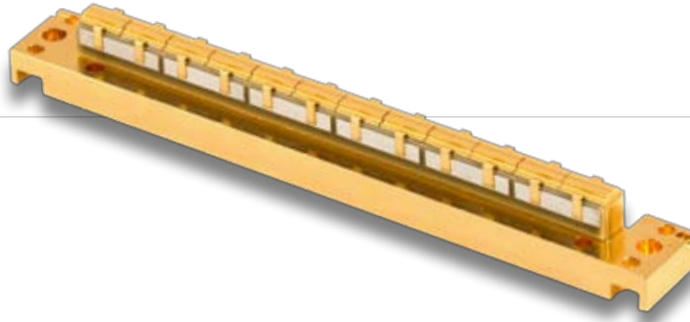
LASER DIODE ARRAY

## 9600W QCW

**NORTHROP GRUMMAN**

PART NUMBER: ARR175P9600  
48-BAR 12-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 96 Bars And A Maximum Output Power Of 19.2 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

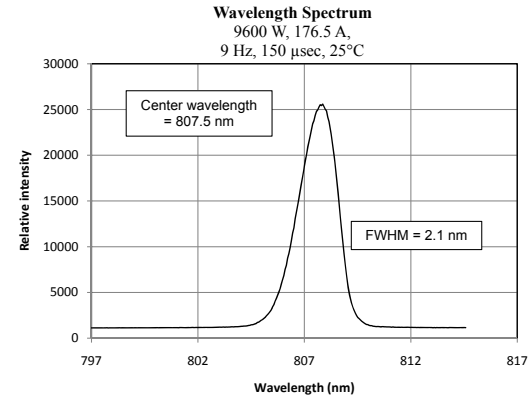
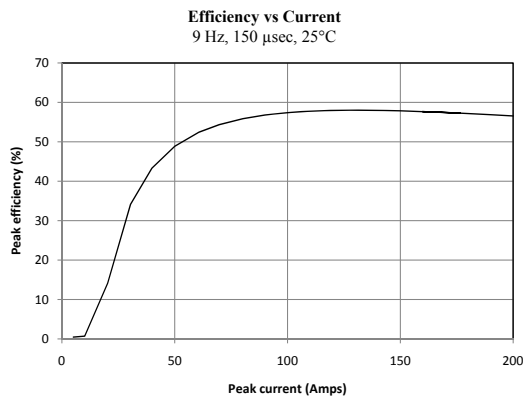
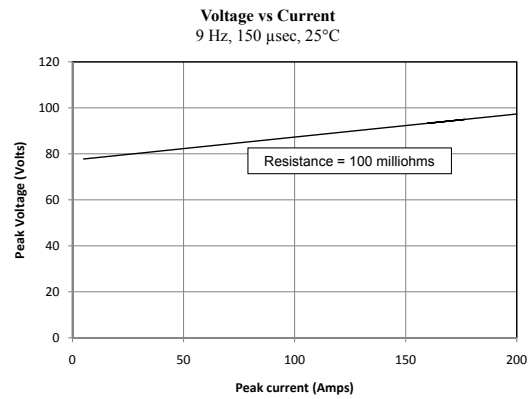
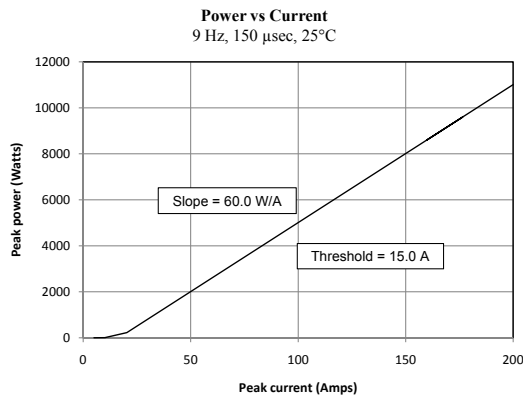
Parameter	Conditions
Reverse Current	0 A
Reverse Voltage	0 V
Operating Temperature Range	-40°C to 70°C
Storage Temperature Range	-40°C to 85°C

### NOTES

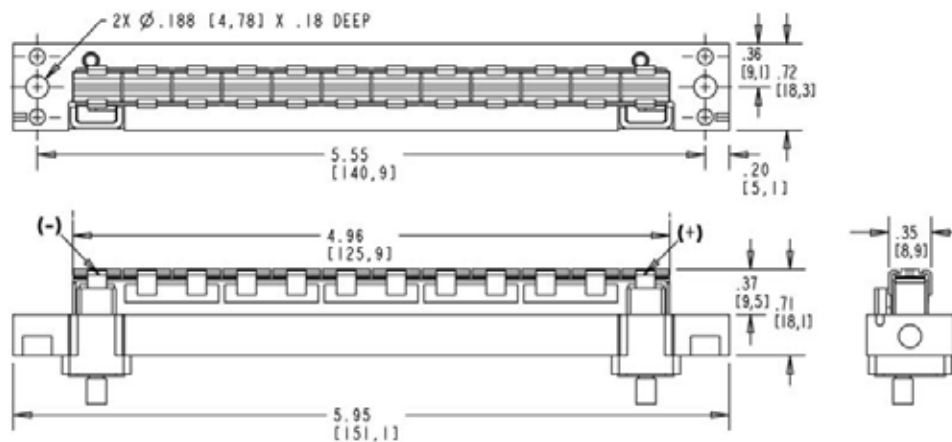
- (1) These specifications apply for operation at 808nm. Other wavelengths available upon request.
- (2) A dry nitrogen environment should be provided by the user when storing and operating at temperatures below ambient dew point.
- (3) Fast axis and slow axis lensing options are available for most NG-CEO 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      HW: 9011-1000 Rev0000

# SHOOTER PACKAGE

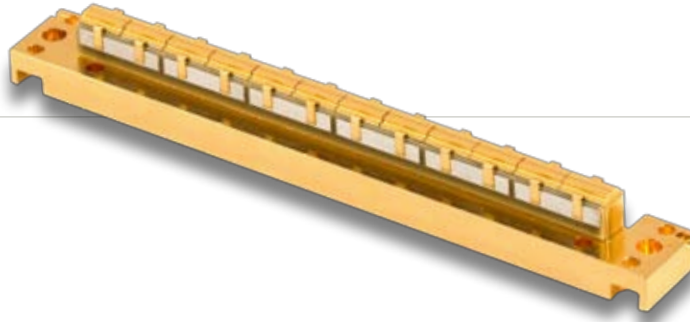
LASER DIODE ARRAY

## 12 kW QCW

**NORTHROP GRUMMAN**

PART NUMBER: ARR175P12000  
60-BAR 12-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 96 Bars And A Maximum Output Power Of 19.2 kW

### OPTICAL CHARACTERISTICS

Parameter	Conditions	Typical	Units
QCW Power Output	175A at 25°C Heat Sink	12000	W
Operating Current	12000W at 25°C Heat Sink	175	A
Threshold Current	25°C Heat Sink	15	A
Slope Efficiency	25°C Heat Sink	75.0	W/A
Electrical-Optical Efficiency	12000W at 25°C Heat Sink	57	%
Center Wavelength	12000W at 25°C Heat Sink	808	nm
Wavelength Tolerance	12000W at 25°C Heat Sink	+/-3	nm
Spectral Width	12000W 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	0.120	$\Omega$
Operating Voltage	25°C Heat Sink, 12000W	120	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

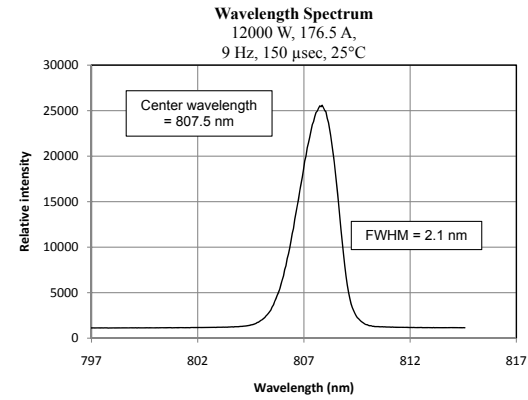
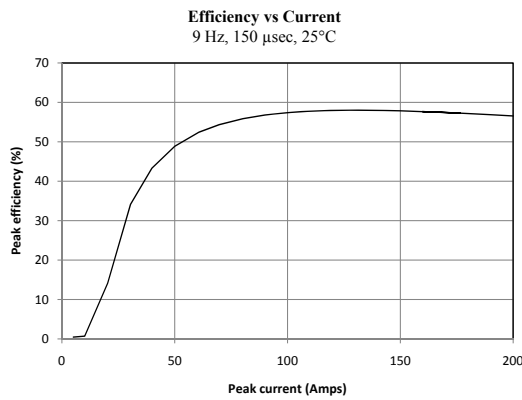
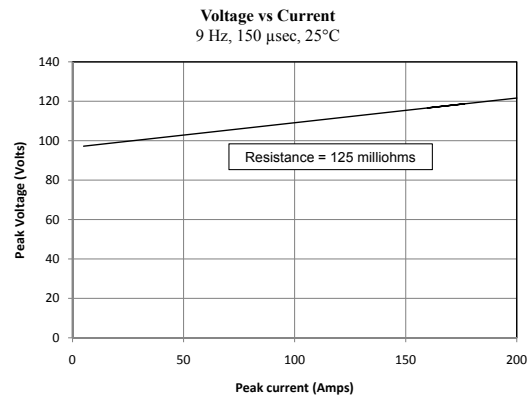
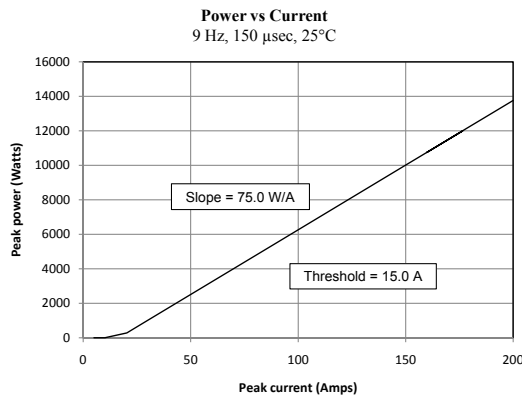
### NOTES

- (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.

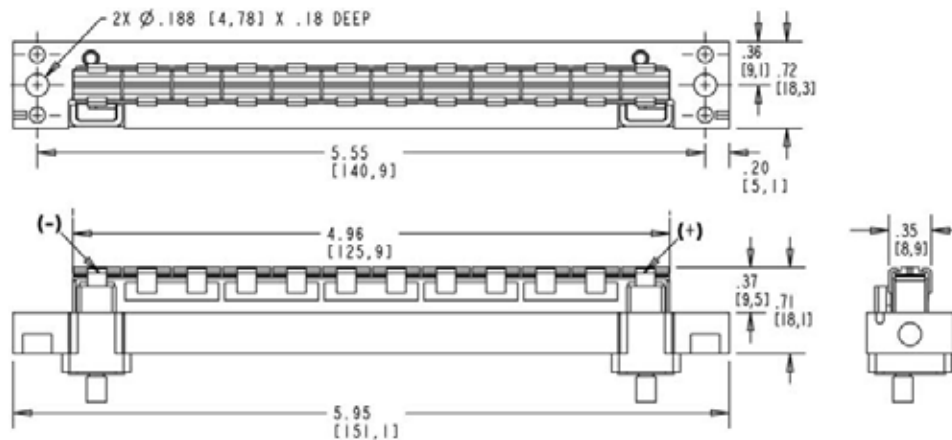


## 12.0 KW QCW

### 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      HW 9001-1000 Rev0000

# SHOOTER PACKAGE

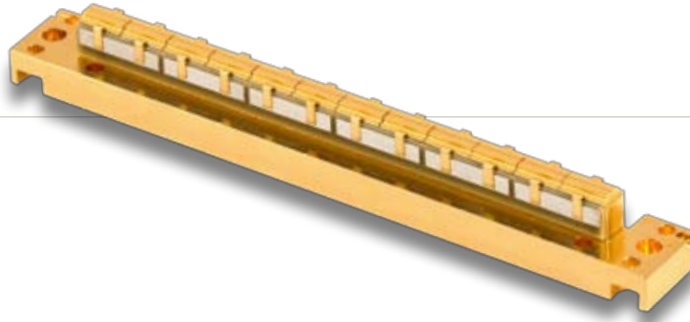
LASER DIODE ARRAY

## 19.2 kW QCW

**NORTHROP GRUMMAN**

PART NUMBER: ARR175P19200  
96-BAR 12-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 96 Bars And A Maximum Output Power Of 19.2 kW

### OPTICAL CHARACTERISTICS

Parameter	Conditions	Typical	Units
QCW Power Output	175A at 25°C Heat Sink	19200	W
Operating Current	19200W at 25°C Heat Sink	175	A
Threshold Current	25°C Heat Sink	15	A
Slope Efficiency	25°C Heat Sink	120	W/A
Electrical-Optical Efficiency	19200W at 25°C Heat Sink	57	%
Center Wavelength	19200W at 25°C Heat Sink	808	nm
Wavelength Tolerance	19200W at 25°C Heat Sink	+/-3	nm
Spectral Width	19200W 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	0.192	$\Omega$
Operating Voltage	25°C Heat Sink, 19200W	192	V

### ABSOLUTE MAXIMUM RATINGS

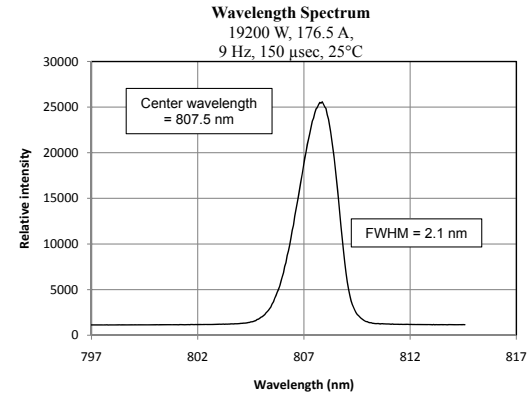
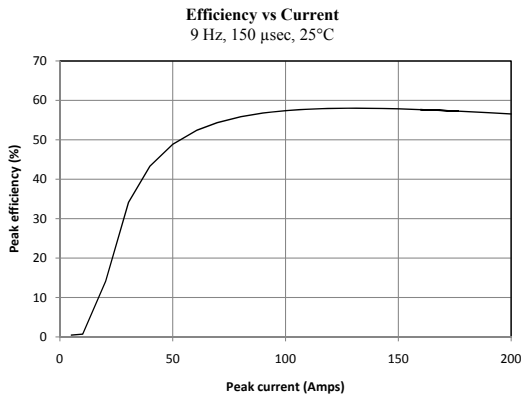
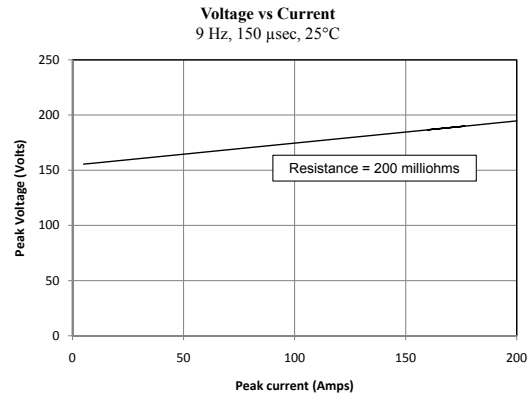
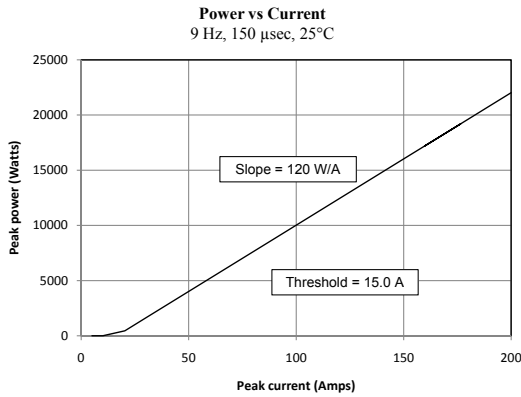
Parameter	Conditions
Reverse Current	0 A
Reverse Voltage	0 V
Operating Temperature Range	-40°C to 70°C
Storage Temperature Range	-40°C to 85°C

### NOTES

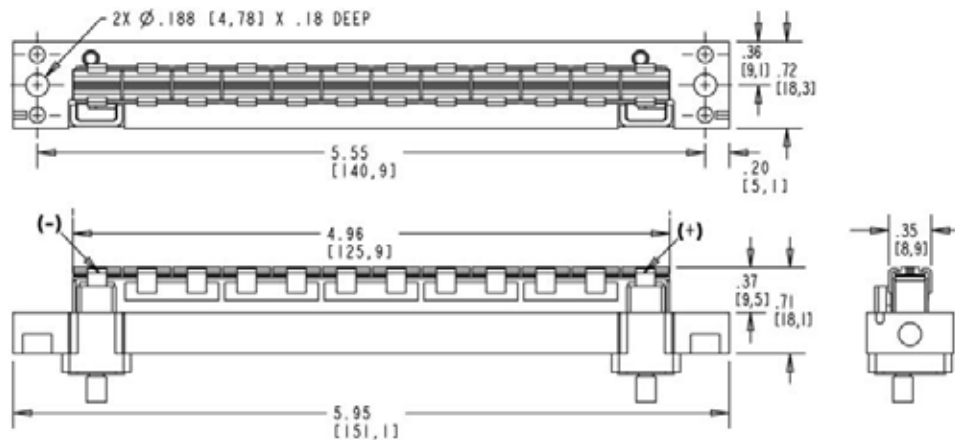
- (1) These specifications apply for operation at 808nm. Other wavelengths available upon request.
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## 19.2 KW QCW

### OPTICAL CHARACTERISTICS (SAMPLE)



### MECHANICAL CHARACTERISTICS



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