

SHOOTER PACKAGE

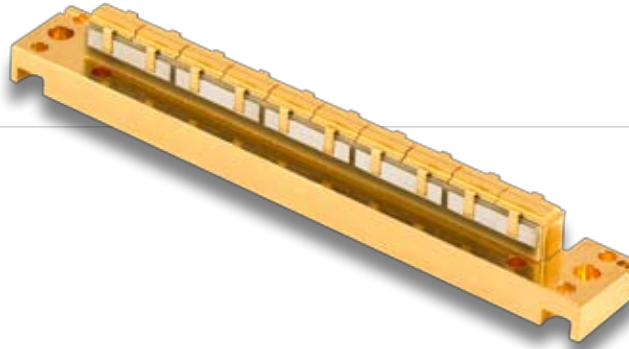
LASER DIODE ARRAY

200W CW

NORTHROP GRUMMAN

PART NUMBER: ARR153C200
10-BAR 10-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	200	W
Operating Current	200W at 25°C Heat Sink	25	A
Threshold Current	25°C Heat Sink	8	A
Slope Efficiency	25°C Heat Sink	11.5	W/A
Electrical-Optical Efficiency	200W at 25°C Heat Sink	47	%
Center Wavelength	200W at 25°C Heat Sink	808	nm
Wavelength Tolerance	200W at 25°C Heat Sink	+/-3	nm
Spectral Width	200W 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	0.040	Ω
Operating Voltage	25°C Heat Sink, 200W	17.0	V

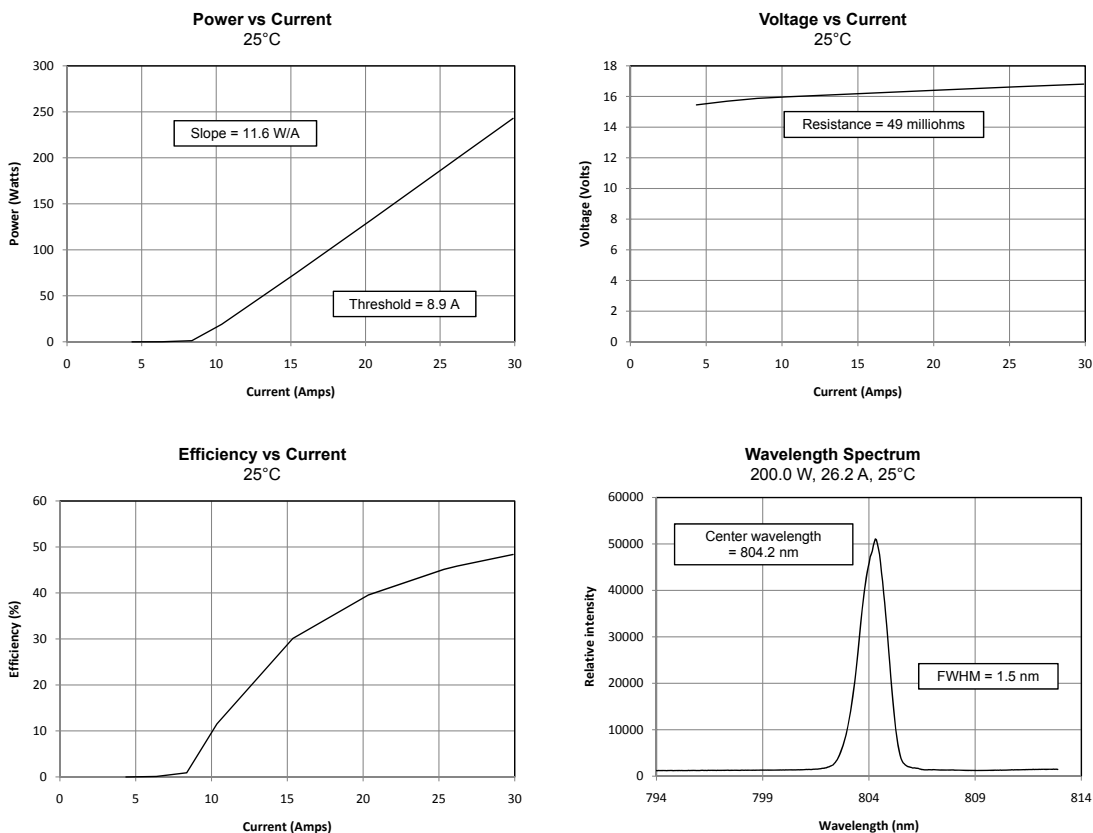
ABSOLUTE MAXIMUM RATINGS

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

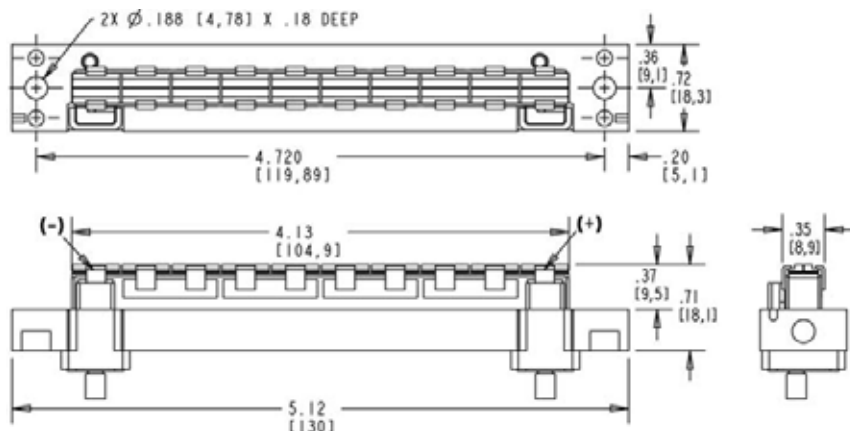
NOTES

- (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.

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, 780-1500nm
CLASS IV

⚠ WARNING

ELECTROSTATIC DISCHARGE SENSITIVE DEVICE
REQUIRING SPECIAL HANDLING

REV. A 10/09

SHOOTER PACKAGE

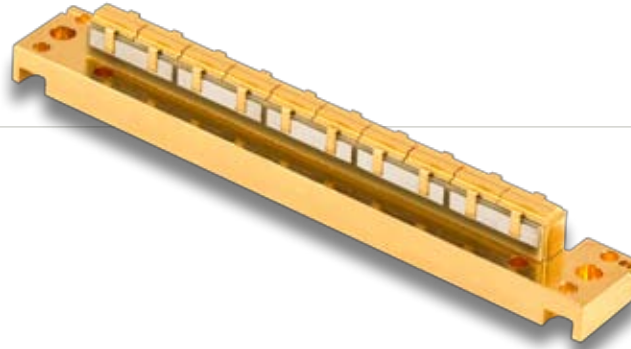
LASER DIODE ARRAY

400W CW

NORTHROP GRUMMAN

PART NUMBER: ARR153C400
10-BAR 10-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	400	W
Operating Current	400W at 25°C Heat Sink	47	A
Threshold Current	25°C Heat Sink	12	A
Slope Efficiency	25°C Heat Sink	11.5	W/A
Electrical-Optical Efficiency	400W at 25°C Heat Sink	53	%
Center Wavelength	400W at 25°C Heat Sink	808	nm
Wavelength Tolerance	400W at 25°C Heat Sink	+/-3	nm
Spectral Width	400W 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	0.020	Ω
Operating Voltage	25°C Heat Sink, 400W	17.0	V

ABSOLUTE MAXIMUM RATINGS

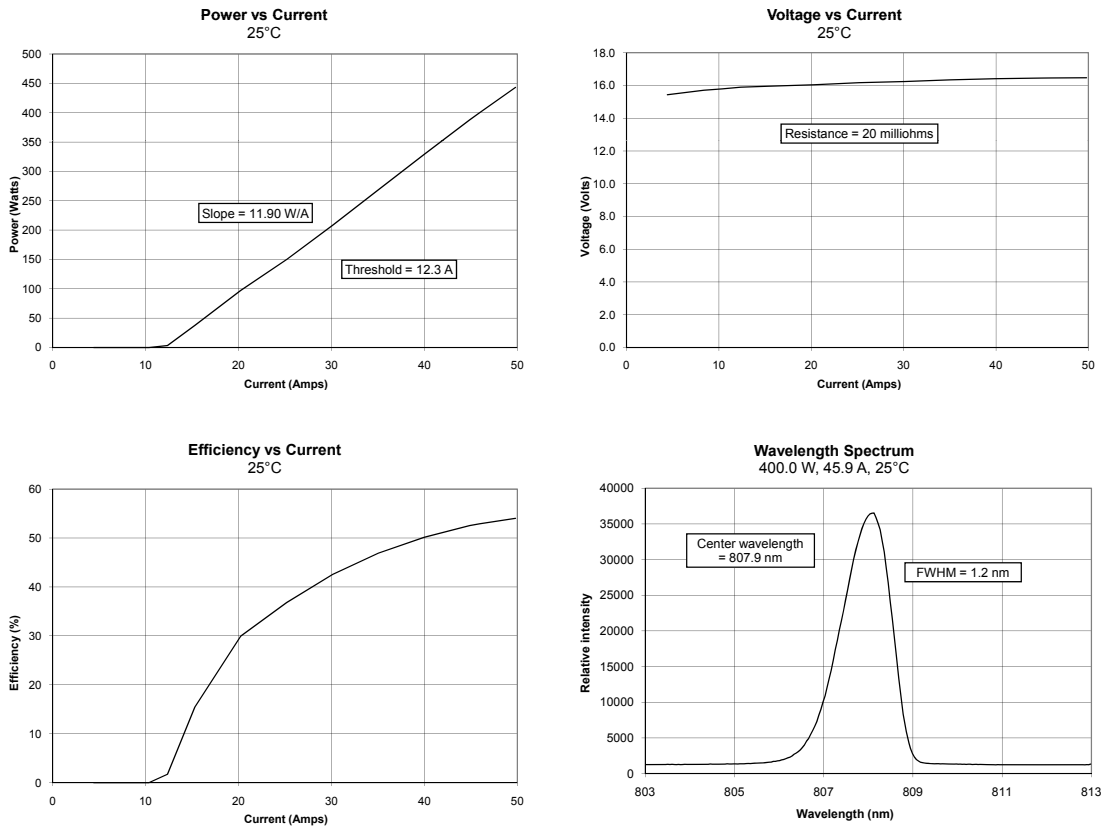
Parameter	Conditions
Reverse Current	0 A
Reverse Voltage	0 V
Operating Temperature Range	-40°C to 70°C
Storage Temperature Range	-40°C to 85°C

NOTES

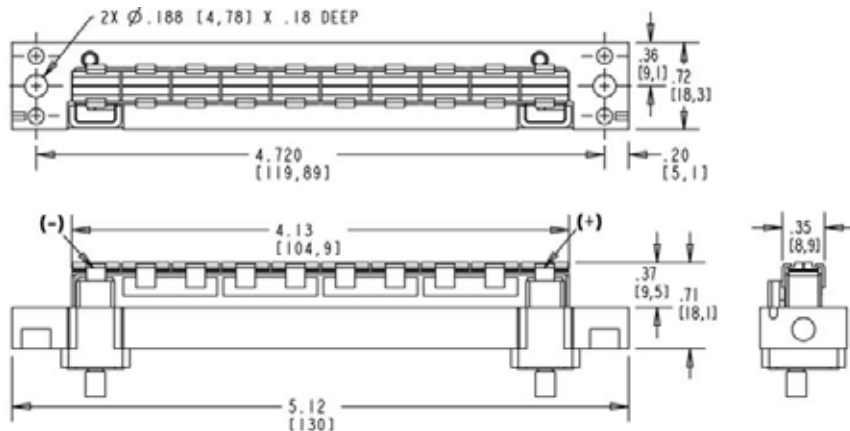
- (1) These specifications apply for operation at 808nm. Other wavelengths available upon request.
- (2) A dry nitrogen environment should be provided by the user when storing and operating at temperatures below ambient dew point.
- (3) Fast axis and slow axis lensing options are available for most NG-CEO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

400W 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

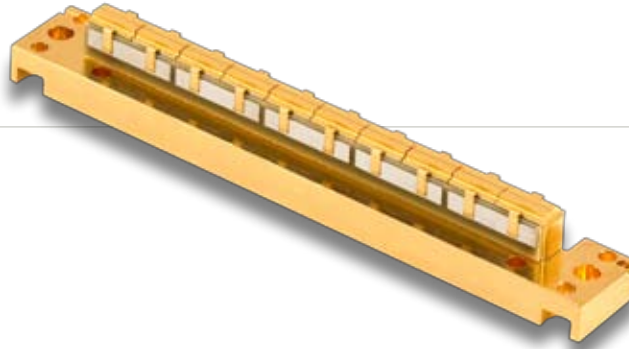
LASER DIODE ARRAY

2000W QCW

NORTHROP GRUMMAN

PART NUMBER: ARR153P2000
10-BAR 10-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 μm , 800 μm , and 1200 μm
- Small, Compact Water Cooled Design Is Ideal For Side Pumping Or Direct Diode Applications
- Shooter Package Available With Up To 80 Bars And A Maximum Output Power Of 16.0 kW

OPTICAL CHARACTERISTICS

Parameter	Conditions	Typical	Units
QCW Power Output	175A at 25°C Heat Sink	2000	W
Operating Current	2000W at 25°C Heat Sink	175	A
Threshold Current	25°C Heat Sink	15	A
Slope Efficiency	25°C Heat Sink	12.5	W/A
Electrical-Optical Efficiency	2000W at 25°C Heat Sink	57	%
Center Wavelength	2000W at 25°C Heat Sink	808	nm
Wavelength Tolerance	2000W at 25°C Heat Sink	+/-3	nm
Spectral Width	2000W 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	0.020	Ω
Operating Voltage	25°C Heat Sink, 2000W	20.0	V

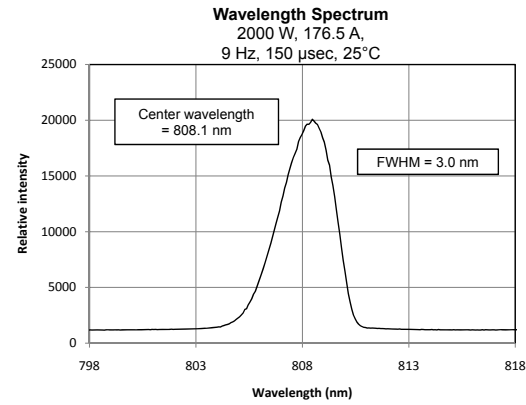
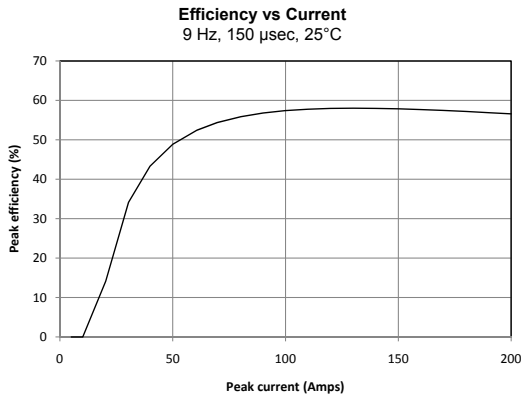
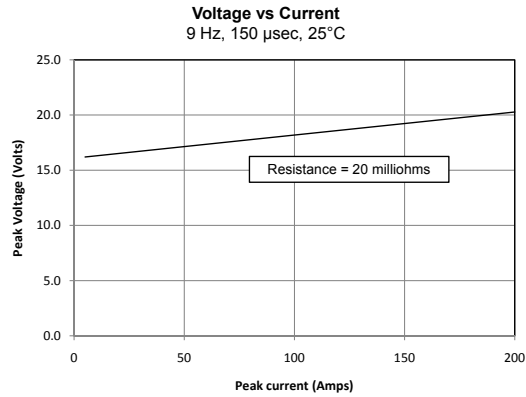
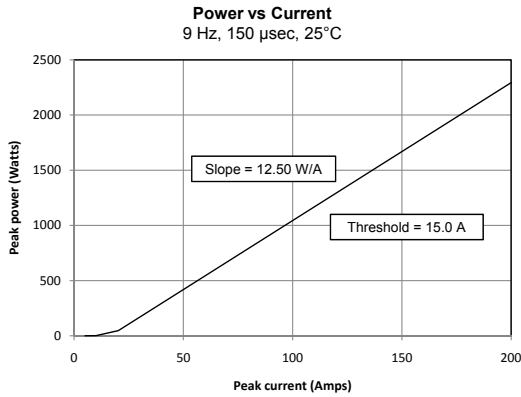
ABSOLUTE MAXIMUM RATINGS

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

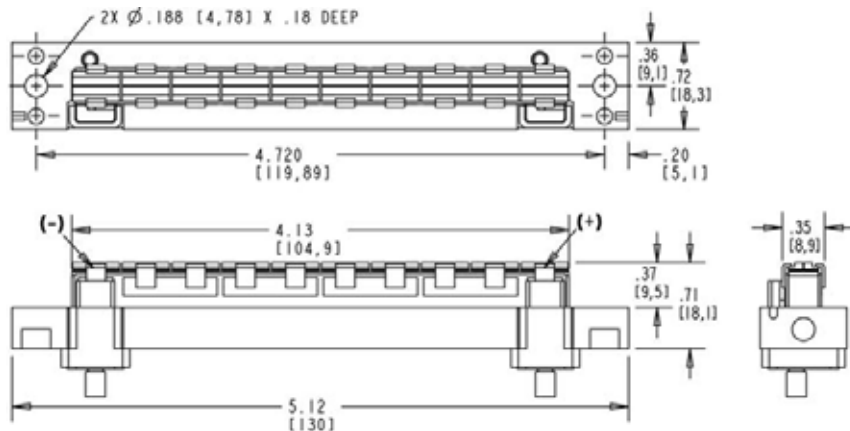
NOTES

- (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.

> **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, 780-1500nm
CLASS IV

⚠ WARNING ⚠

ELECTROSTATIC DISCHARGE SENSITIVE DEVICE
REQUIRING SPECIAL HANDLING

REV: A 10/09

SHOOTER PACKAGE

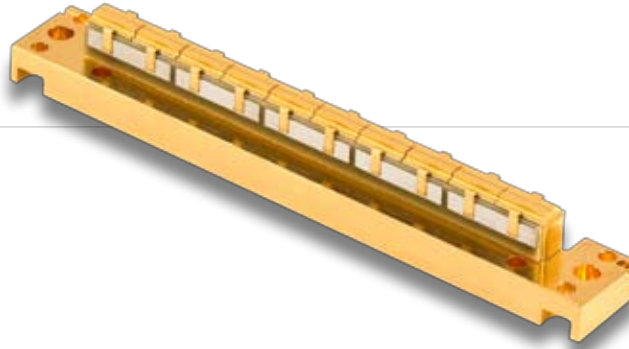
LASER DIODE ARRAY

3000W QCW

NORTHROP GRUMMAN

PART NUMBER: ARR153P3000
30-BAR 10-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 μm , 800 μm , and 1200 μm
- Small, Compact Water Cooled Design Is Ideal For Side Pumping Or Direct Diode Applications
- Shooter Package Available With Up To 80 Bars And A Maximum Output Power Of 16.0 kW

OPTICAL CHARACTERISTICS

Parameter	Conditions	Typical	Units
QCW Power Output	95A at 25°C Heat Sink	3000	W
Operating Current	3000W at 25°C Heat Sink	95	A
Threshold Current	25°C Heat Sink	15	A
Slope Efficiency	25°C Heat Sink	375	W/A
Electrical-Optical Efficiency	3000W at 25°C Heat Sink	58	%
Center Wavelength	3000W at 25°C Heat Sink	808	nm
Wavelength Tolerance	3000W at 25°C Heat Sink	+/-3	nm
Spectral Width	3000W 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	0.060	Ω
Operating Voltage	25°C Heat Sink, 3000W	54.0	V

ABSOLUTE MAXIMUM RATINGS

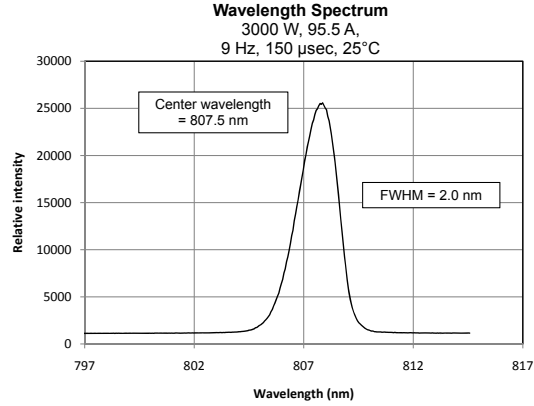
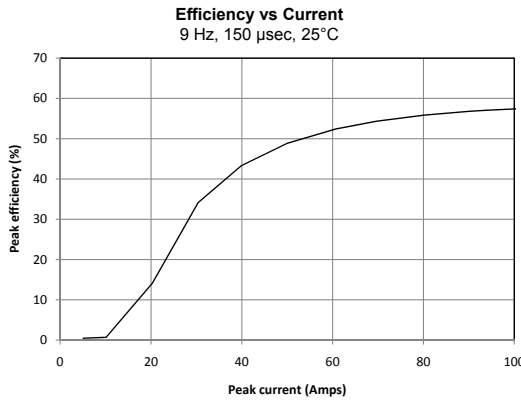
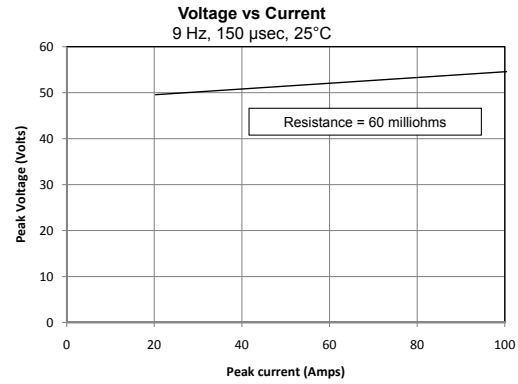
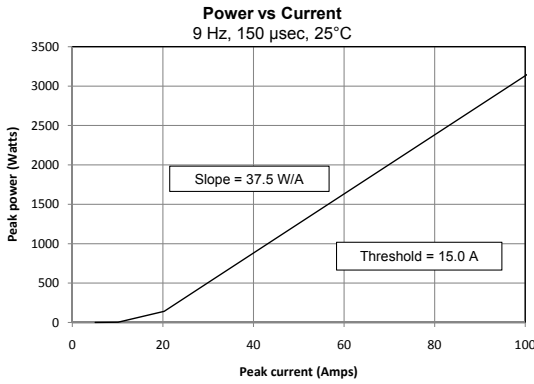
Parameter	Conditions
Reverse Current	0 A
Reverse Voltage	0 V
Operating Temperature Range	-40°C to 70°C
Storage Temperature Range	-40°C to 85°C

NOTES

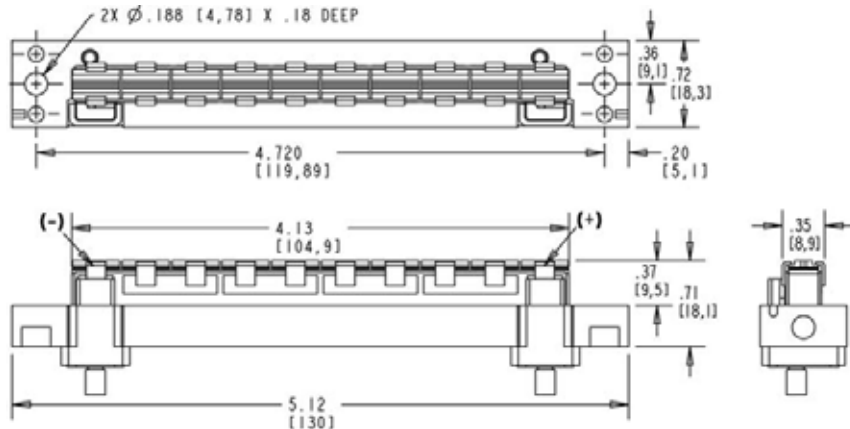
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- (2) A dry nitrogen environment should be provided by the user when storing and operating at temperatures below ambient dew point.
- (3) Fast axis and slow axis lensing options are available for most NG-CEO heat exchanger designs.

3000W 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 HW 9001-1000 Rev0000

SHOOTER PACKAGE

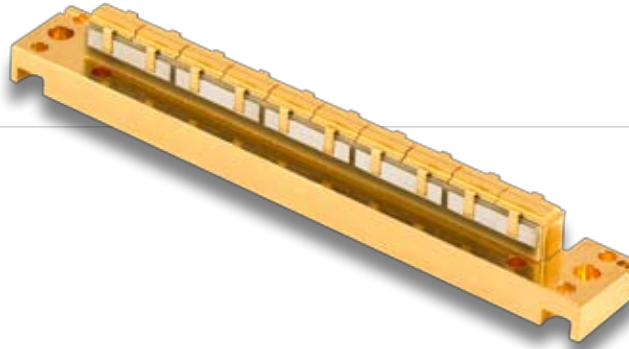
LASER DIODE ARRAY

4000W QCW

NORTHROP GRUMMAN

PART NUMBER: ARR153P4000
20-BAR 10-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 μm , 800 μm , and 1200 μm
- Small, Compact Water Cooled Design Is Ideal For Side Pumping Or Direct Diode Applications
- Shooter Package Available With Up To 80 Bars And A Maximum Output Power Of 16.0 kW

OPTICAL CHARACTERISTICS

Parameter	Conditions	Typical	Units
QCW Power Output	175A at 25°C Heat Sink	4000	W
Operating Current	4000W at 25°C Heat Sink	175	A
Threshold Current	25°C Heat Sink	15	A
Slope Efficiency	25°C Heat Sink	25.0	W/A
Electrical-Optical Efficiency	4000W at 25°C Heat Sink	57	%
Center Wavelength	4000W at 25°C Heat Sink	808	nm
Wavelength Tolerance	4000W at 25°C Heat Sink	+/-3	nm
Spectral Width	4000W 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	0.040	Ω
Operating Voltage	25°C Heat Sink, 4000W	40.0	V

ABSOLUTE MAXIMUM RATINGS

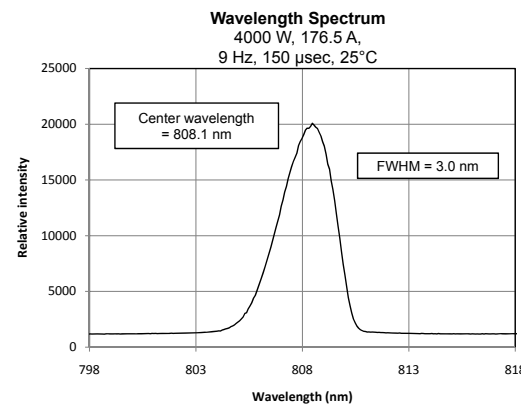
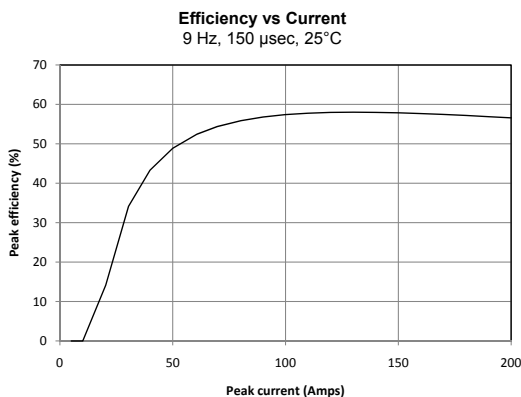
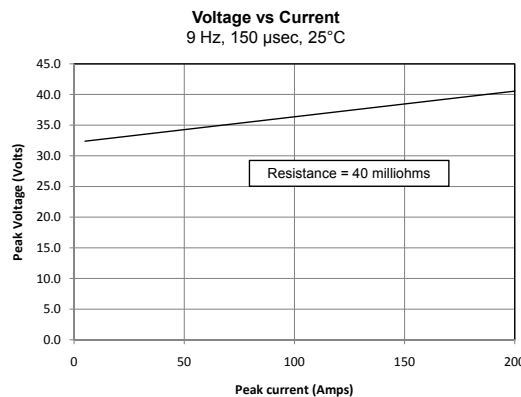
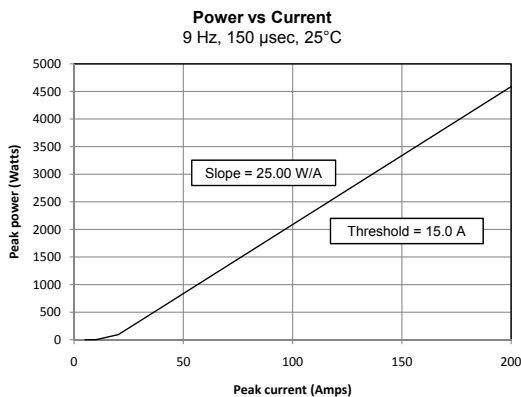
Parameter	Conditions
Reverse Current	0 A
Reverse Voltage	0 V
Operating Temperature Range	-40°C to 70°C
Storage Temperature Range	-40°C to 85°C

NOTES

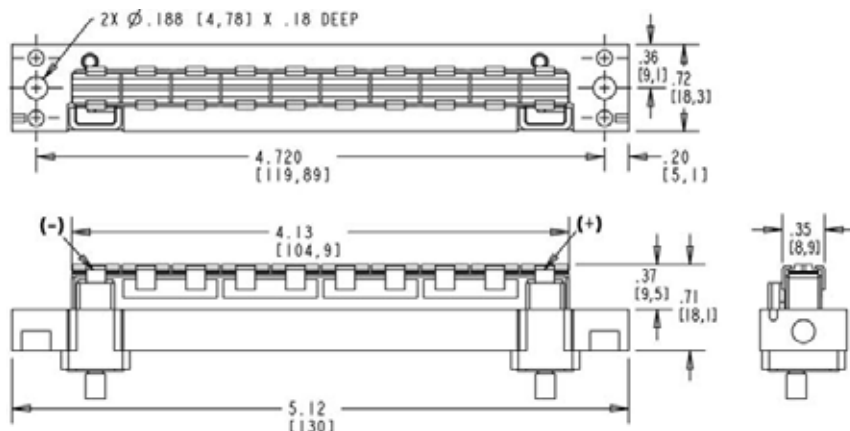
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- (3) Fast axis and slow axis lensing options are available for most NG-CEO heat exchanger designs.

4000W 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, 780-1500nm
CLASS IV

⚠ WARNING ⚠

ELECTROSTATIC DISCHARGE SENSITIVE DEVICE
REQUIRING SPECIAL HANDLING

REV. A 10/09 REV 0010 10/09 000000

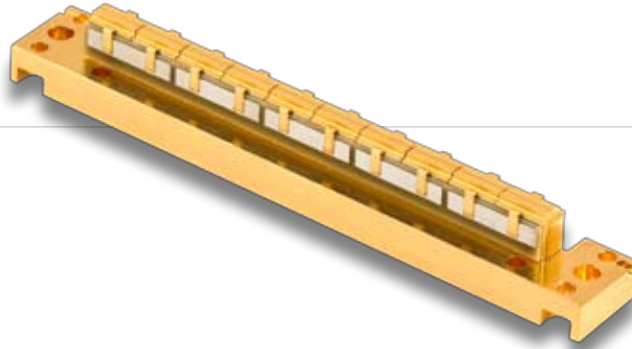
SHOOTER PACKAGE

LASER DIODE ARRAY

6000W QCW

NORTHROP GRUMMAN

PART NUMBER: ARR153P6000
30-BAR 10-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 μm , 800 μm , and 1200 μm
- Small, Compact Water Cooled Design Is Ideal For Side Pumping Or Direct Diode Applications
- Shooter Package Available With Up To 80 Bars And A Maximum Output Power Of 16.0 kW

OPTICAL CHARACTERISTICS

Parameter	Conditions	Typical	Units
QCW Power Output	175A at 25°C Heat Sink	6000	W
Operating Current	6000W at 25°C Heat Sink	175	A
Threshold Current	25°C Heat Sink	15	A
Slope Efficiency	25°C Heat Sink	375	W/A
Electrical-Optical Efficiency	6000W at 25°C Heat Sink	57	%
Center Wavelength	6000W at 25°C Heat Sink	808	nm
Wavelength Tolerance	6000W at 25°C Heat Sink	+/-3	nm
Spectral Width	6000W 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	0.060	Ω
Operating Voltage	25°C Heat Sink, 6000W	60.0	V

ABSOLUTE MAXIMUM RATINGS

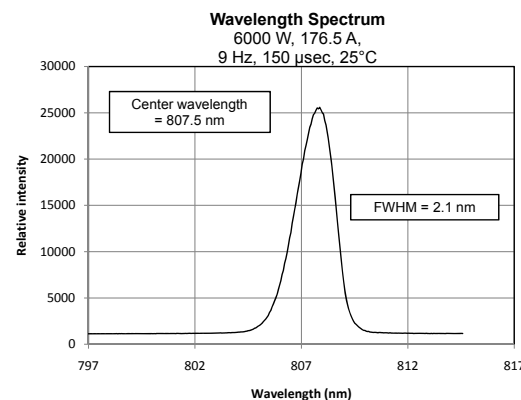
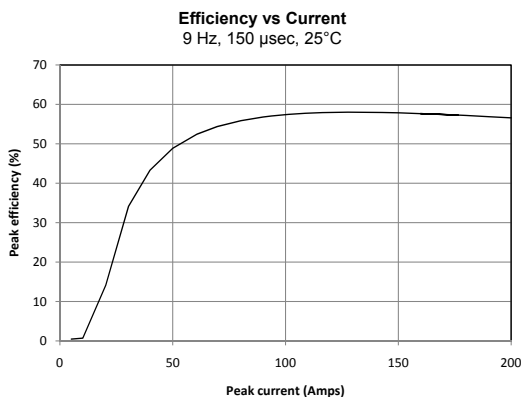
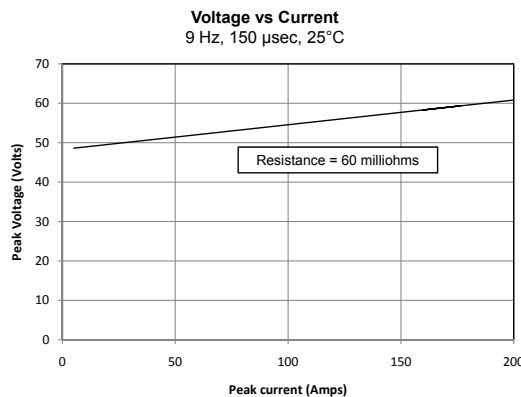
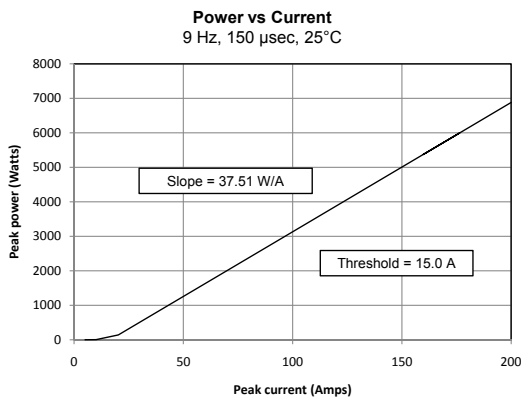
Parameter	Conditions
Reverse Current	0 A
Reverse Voltage	0 V
Operating Temperature Range	-40°C to 70°C
Storage Temperature Range	-40°C to 85°C

NOTES

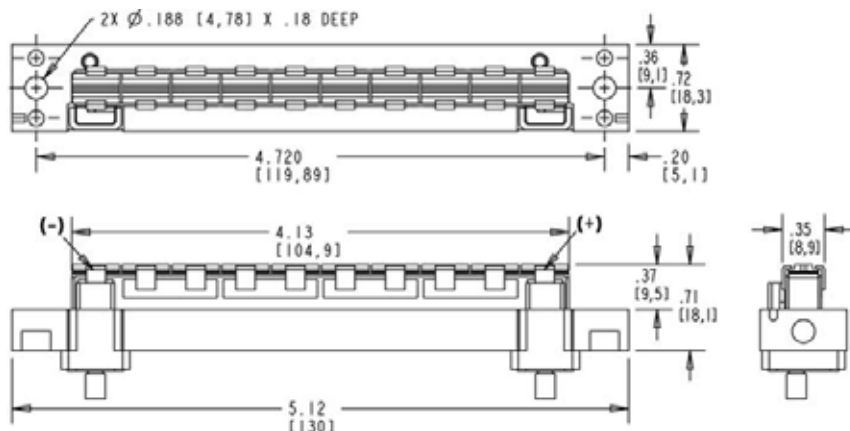
- (1) These specifications apply for operation at 808nm. Other wavelengths available upon request.
- (2) A dry nitrogen environment should be provided by the user when storing and operating at temperatures below ambient dew point.
- (3) Fast axis and slow axis lensing options are available for most NG-CEO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

6000W 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

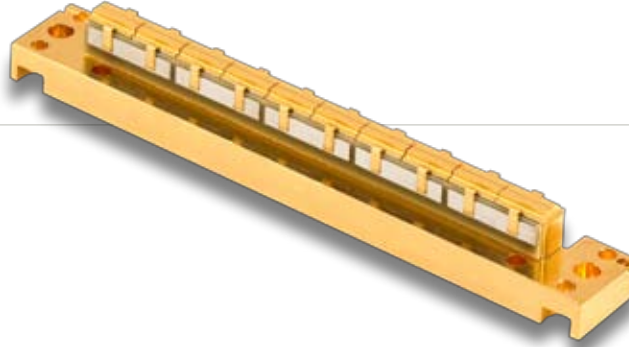
LASER DIODE ARRAY

8000W QCW

NORTHROP GRUMMAN

PART NUMBER: ARR153P8000
40-BAR 10-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 μm , 800 μm , and 1200 μm
- Small, Compact Water Cooled Design Is Ideal For Side Pumping Or Direct Diode Applications
- Shooter Package Available With Up To 80 Bars And A Maximum Output Power Of 16.0 kW

OPTICAL CHARACTERISTICS

Parameter	Conditions	Typical	Units
QCW Power Output	175A at 25°C Heat Sink	8000	W
Operating Current	8000W at 25°C Heat Sink	175	A
Threshold Current	25°C Heat Sink	15	A
Slope Efficiency	25°C Heat Sink	50.0	W/A
Electrical-Optical Efficiency	8000W at 25°C Heat Sink	57	%
Center Wavelength	8000W at 25°C Heat Sink	808	nm
Wavelength Tolerance	8000W at 25°C Heat Sink	+/-3	nm
Spectral Width	8000W 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	0.080	Ω
Operating Voltage	25°C Heat Sink, 8000W	80.0	V

ABSOLUTE MAXIMUM RATINGS

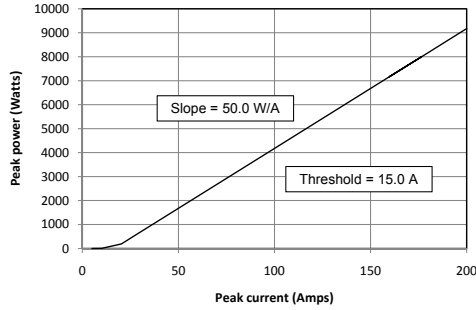
Parameter	Conditions
Reverse Current	0 A
Reverse Voltage	0 V
Operating Temperature Range	-40°C to 70°C
Storage Temperature Range	-40°C to 85°C

NOTES

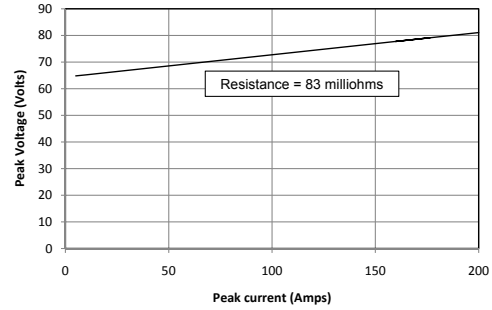
- (1) These specifications apply for operation at 808nm. Other wavelengths available upon request.
- (2) A dry nitrogen environment should be provided by the user when storing and operating at temperatures below ambient dew point.
- (3) Fast axis and slow axis lensing options are available for most NG-CEO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

OPTICAL CHARACTERISTICS (SAMPLE)

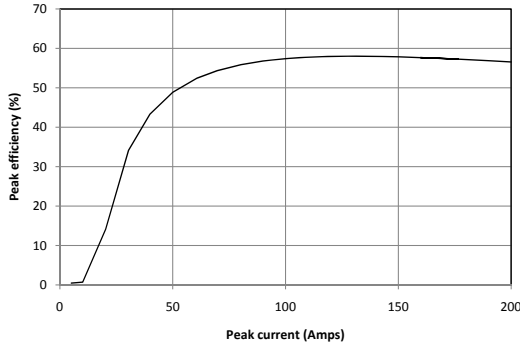
Power vs Current
9 Hz, 150 µsec, 25°C



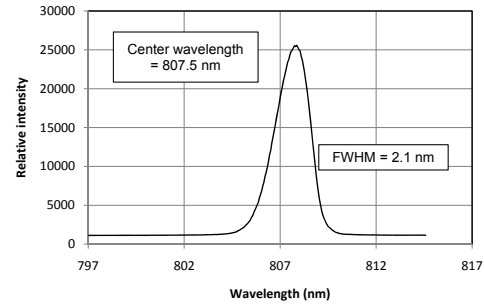
Voltage vs Current
9 Hz, 150 µsec, 25°C



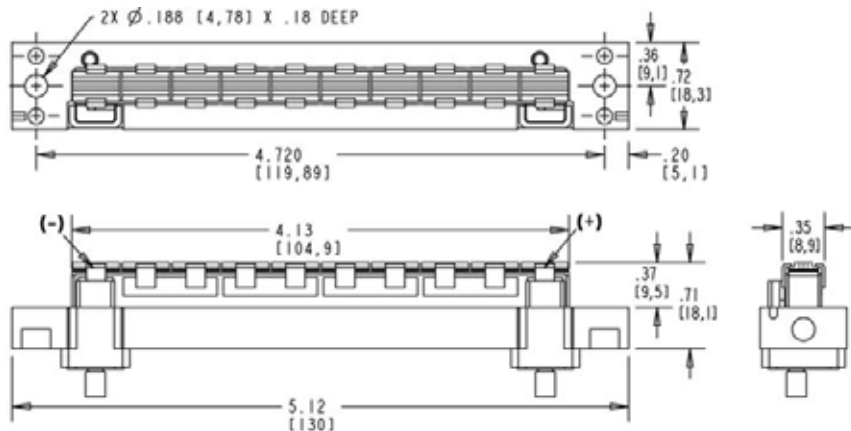
Efficiency vs Current
9 Hz, 150 µsec, 25°C



Wavelength Spectrum
8000 W, 176.5 A,
9 Hz, 150 µsec, 25°C



MECHANICAL CHARACTERISTICS



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⚠ DANGER ⚠

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* Diode laser
5W & up, 780-1500nm
CLASS IV

⚠ WARNING ⚠

ELECTROSTATIC DISCHARGE SENSITIVE DEVICE
REQUIRING SPECIAL HANDLING

REV. A 10/09 800W-1000-00000

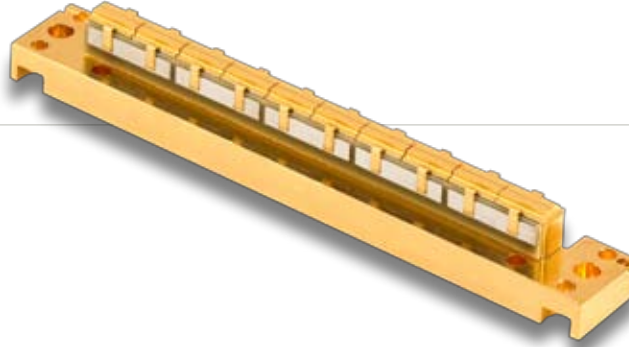
SHOOTER PACKAGE

LASER DIODE ARRAY

16 kW QCW

NORTHROP GRUMMAN

PART NUMBER: ARR153P16000
80-BAR 10-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 μm , 800 μm , and 1200 μm
- Small, Compact Water Cooled Design Is Ideal For Side Pumping Or Direct Diode Applications
- Shooter Package Available With Up To 80 Bars And A Maximum Output Power Of 16 kW

OPTICAL CHARACTERISTICS

Parameter	Conditions	Typical	Units
QCW Power Output	175A at 25°C Heat Sink	16000	W
Operating Current	16000W at 25°C Heat Sink	175	A
Threshold Current	25°C Heat Sink	15	A
Slope Efficiency	25°C Heat Sink	100	W/A
Electrical-Optical Efficiency	16000W at 25°C Heat Sink	57	%
Center Wavelength	16000W at 25°C Heat Sink	808	nm
Wavelength Tolerance	16000W at 25°C Heat Sink	+/-3	nm
Spectral Width	16000W 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	0.160	Ω
Operating Voltage	25°C Heat Sink, 16000W	160	V

ABSOLUTE MAXIMUM RATINGS

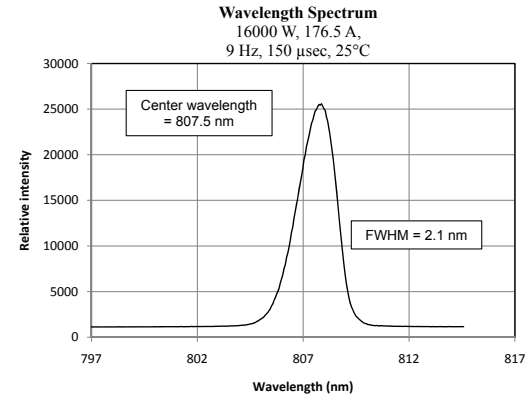
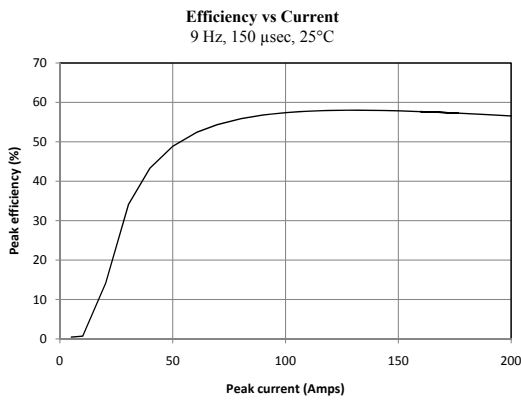
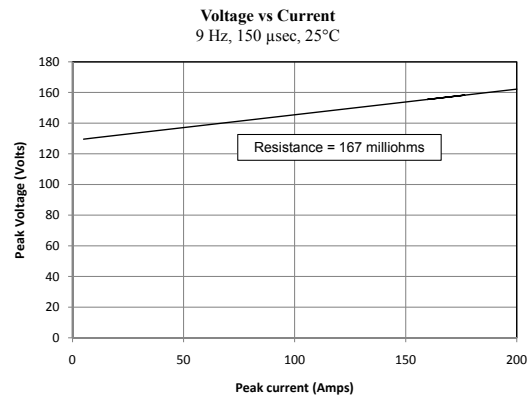
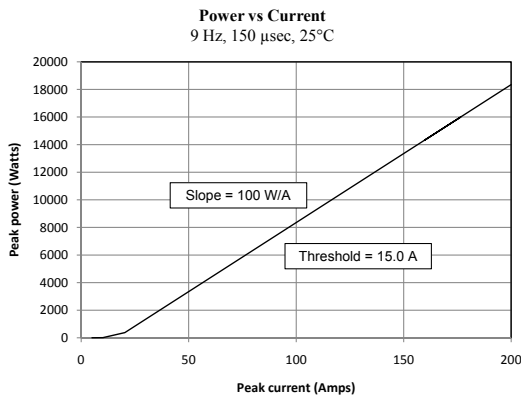
Parameter	Conditions
Reverse Current	0 A
Reverse Voltage	0 V
Operating Temperature Range	-40°C to 70°C
Storage Temperature Range	-40°C to 85°C

NOTES

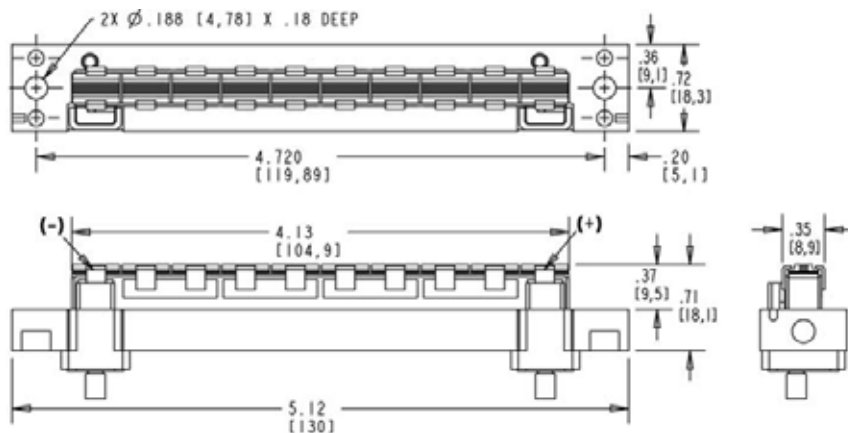
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16.0 KW QCW

OPTICAL CHARACTERISTICS (SAMPLE)



MECHANICAL CHARACTERISTICS



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5W & up, 780-1500nm
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⚠ WARNING ⚠

ELECTROSTATIC DISCHARGE SENSITIVE DEVICE
REQUIRING SPECIAL HANDLING

REV. A 10/09 805 0011-1000 Rev.0000