



# aeroGAIN ROD

High-power PM ytterbium rod fiber gain module

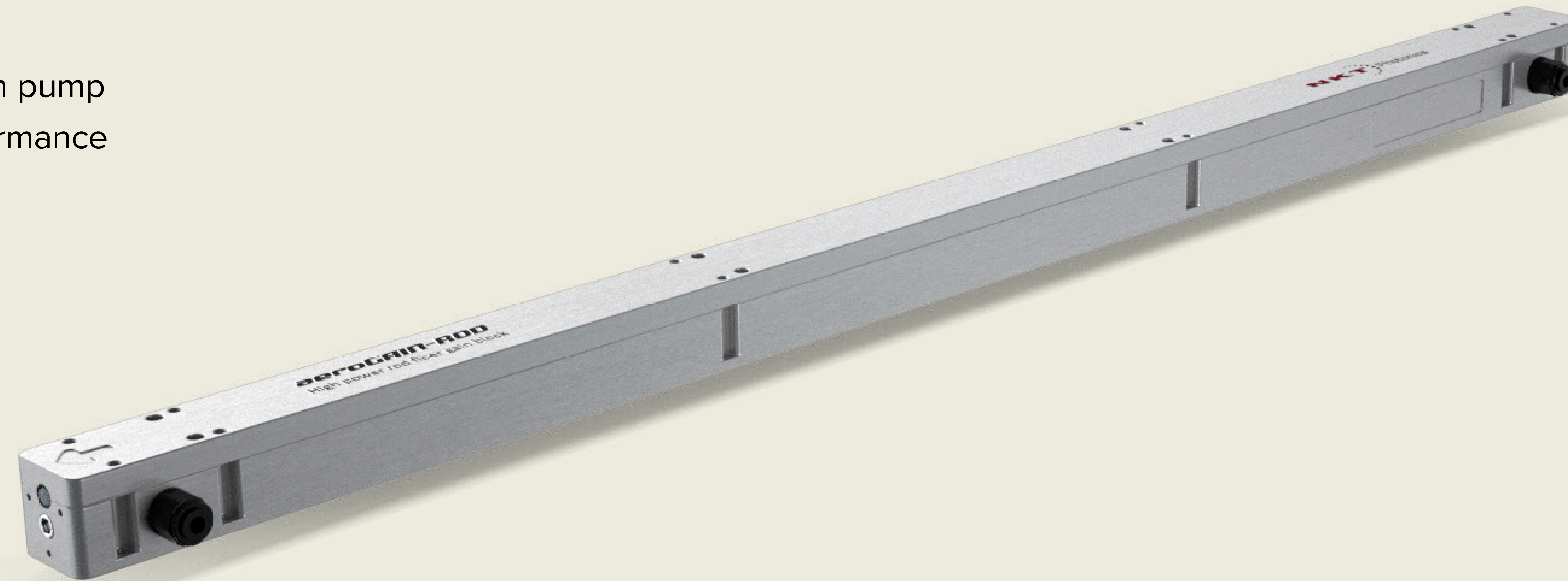


# High power fiber amplification system for ultrafast lasers

Ideal for manufacturing of ultrafast high-power pulsed lasers

The aeroGAIN-ROD is the ultimate fiber amplifier module for pulsed lasers. It exhibits an exceptional power handling previously only available in solid-state configurations.

With an approximate 3300  $\mu\text{m}^2$  mode field area and high pump absorption, the aeroGAIN-ROD module offers high performance for demanding peak power applications.



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### Applications

Ultrafast high-power pulsed lasers

# Benefits

## **Ideal gain medium for ultrafast high-power amplifiers**

The excellent mode quality and easy coupling make the aeroGAIN-ROD module an ideal gain medium for ultrafast high-power amplifiers.

## **Large numerical aperture and reduced reflections**

The pump light is guided by our proven airclad technology which boasts high reliability, high damage threshold, and a large NA.

The modules come with high-power AR coated endcaps. The output endcap is slightly angled to prevent reflections.

## **Robust design optimized for OEM integration**

The rugged aluminum body makes the module easy to handle and mount for both OEM integration and scientific laboratory set-ups.

## **Thermal management ensures high performance**

Integrated water cooling with quick coupling ensures efficient thermal management and a long, maintenance-free lifetime of thousands of hours.

## **Diffraction-limited gain modules**

Both aeroGAIN-ROD models are diffraction-limited gain modules which gives several advantages compared to standard multimode Large Mode Area fibers:

- Better output beam stability
- Excellent beam quality
- No coiling-induced mode area compression

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## **FEATURES**

**Diffraction-limited beam quality**  
**High peak power damage threshold**

**High NA pump cladding**  
**AR coated endcaps**

**Optimized for 1030 - 1040 nm**  
**Compact and robust industrial format**

**Long lifetime**

# Specifications

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## Optical

Model	2.1	3.1
Signal core diameter [ $\mu\text{m}$ ]	$\approx 85$	$\approx 85$
Signal wavelength [nm]	1030 - 1040	1030 - 1040
Pump cladding NA (FWHM @ 950 nm)	$\geq 0.5$	$\geq 0.5$
Gain fiber length [mm]	$804 \pm 3$	$804 \pm 3$
<b>Cladding absorption [dB]</b>		
@ 915 nm	$5 \pm 0.7$	$5.7 \pm 0.7$
@ 976 nm, nominal	$\approx 15$	$\approx 17$
PER [dB] <sup>1</sup>	$\geq 15$	$\geq 15$
Optical efficiency [%] <sup>1</sup>	$\geq 60$	$\geq 60$
Beam quality <sup>1</sup>	$M^2 \leq 1.3$	$M^2 \leq 1.2$
Mode-field diameter, $1/e^2$ [ $\mu\text{m}$ ] <sup>2</sup>	$65 \pm 10\%$	$65 \pm 10\%$
Signal average power [W]	$\leq 100$	$\leq 250$
Pump cladding diameter [ $\mu\text{m}$ ]	$260 \pm 15$	$260 \pm 15$

<sup>1</sup> Under nominal operation: Seed level 5 W @ 1030 nm, 976 nm pumping, signal power  $\geq 100$  W

<sup>2</sup> MFD decreases with thermal load. The actual reduction will depend on the system parameters. A typical reduction is less than 0.1 %/W (signal power).

## Water cooling

Water cooling connection [mm / ”]	8 mm x 1/4” BSPP
Recommended water flow <sup>3</sup> [liter/minute]	> 1
Recommended water temperature <sup>3</sup> [°C]	$\approx 25$
Operating temperature [°C]	+20 to +30 (ambient)
Storage temperature [°C]	-20 to +60

<sup>3</sup> We recommend DI water containing an anti-corrosive additive to protect the aluminum cooling circuit. Required water flow and water temperature depend on the actual optical system parameters.



# Specifications

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## Mechanical

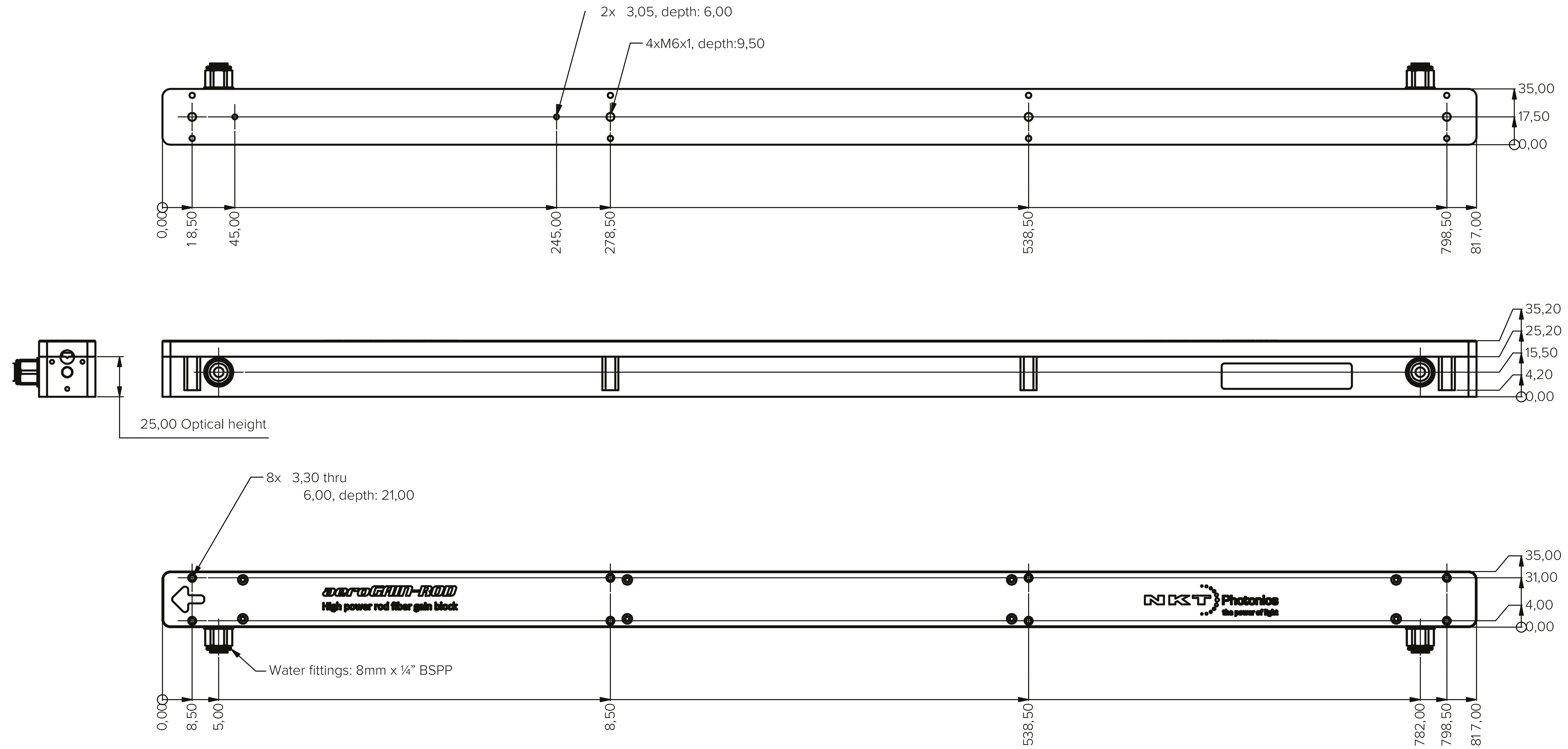
<b>Dimensions (WxHxL) [mm<sup>3</sup>]</b>	35 x 35.2 x 817
<b>Weight [kg]</b>	2.5
<b>Endcap length [mm]</b>	5
<b>Endcap diameter [mm]</b>	6
<b>Endcap coating R @ 1030 nm [%]</b>	≤ 0.2
<b>Endcap coating R @ 976 nm [%]</b>	≤ 0.3
<b>Endcap angle, input [ °]</b>	≤ 0.5
<b>Endcap angle, output [ °]</b>	2 ± 0.7
<b>Optical height [mm]</b>	25



# Mechanical Drawings

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All NKT Photonics products are produced under our quality management system certified in accordance with the ISO 9001:2015 standard.





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