AURORA-IR

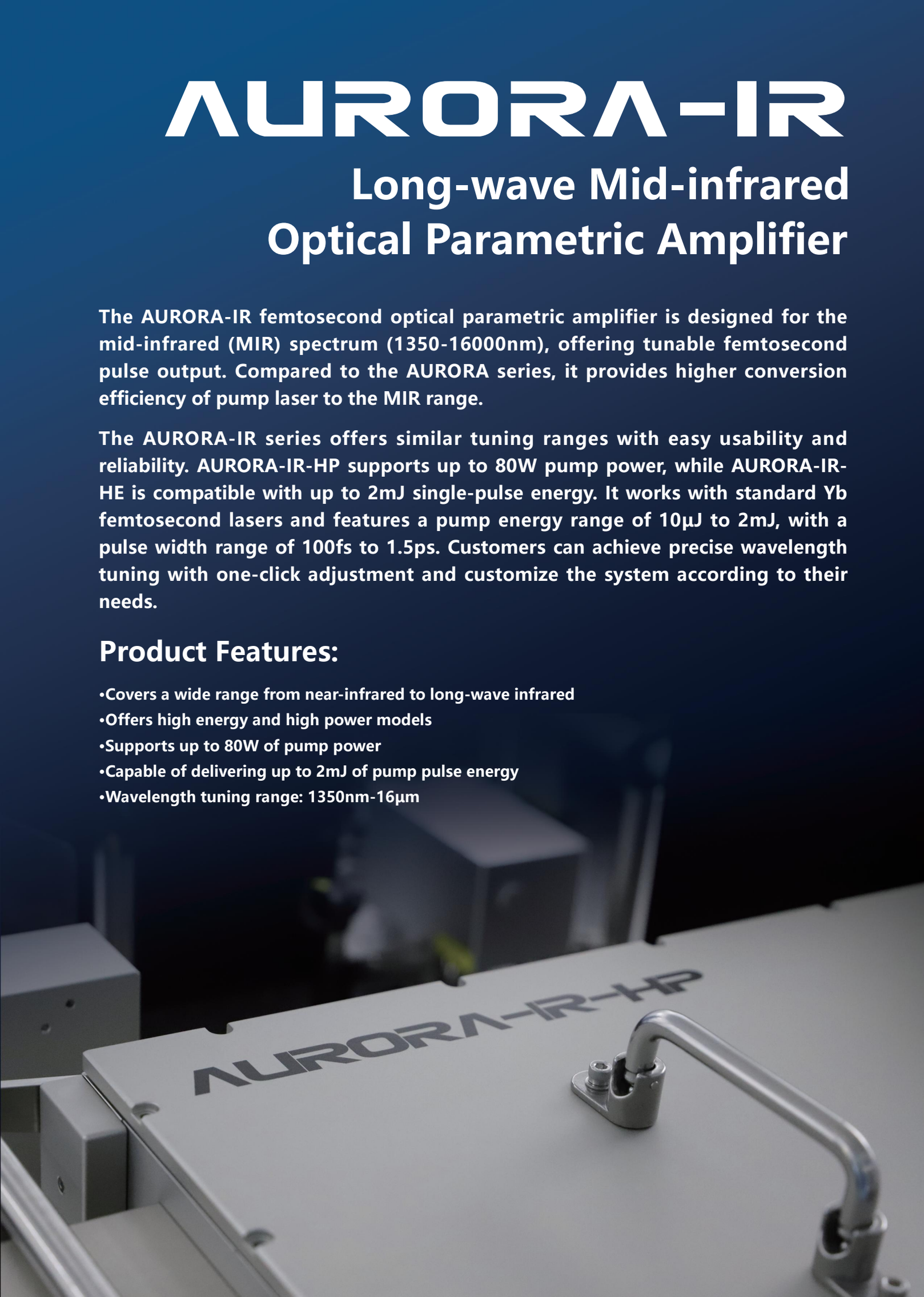
Long-wave Mid-infrared Optical Parametric Amplifier

The AURORA-IR femtosecond optical parametric amplifier is designed for the mid-infrared (MIR) spectrum (1350-16000nm), offering tunable femtosecond pulse output. Compared to the AURORA series, it provides higher conversion efficiency of pump laser to the MIR range.

The AURORA-IR series offers similar tuning ranges with easy usability and reliability. AURORA-IR-HP supports up to 80W pump power, while AURORA-IR-HE is compatible with up to 2mJ single-pulse energy. It works with standard Yb femtosecond lasers and features a pump energy range of 10μJ to 2mJ, with a pulse width range of 100fs to 1.5ps. Customers can achieve precise wavelength tuning with one-click adjustment and customize the system according to their needs.

Product Features:

- **Covers a wide range from near-infrared to long-wave infrared**
- **Offers high energy and high power models**
- **Supports up to 80W of pump power**
- **Capable of delivering up to 2mJ of pump pulse energy**
- **Wavelength tuning range: 1350nm-16μm**



Yb Laser Pumped Mid-Infrared Collinear Optical Parametric Amplifier

Application Areas

- Transient Absorption Spectroscopy
- Pulse Characterization
- 2D Infrared Spectroscopy
- Sum Frequency Generation Spectroscopy
- High Harmonic Generation

Parameter Specifications

Parameter	AURORA-IR-HP	AURORA-IR-HE
Tuning range	1350 – 2000 nm (Signal)	
	2100 – 4500 nm (Idler)	
Maximum pump power	80W	
Pump pulse energy	12 – 400 μJ	400 – 2000 μJ
Conversion efficiency[1]@ 1550 nm	> 9%, 30 – 2000 μJ	
	> 6%, 12 – 30 μJ	
Spectral bandwidth	60 – 150 cm^{-1}@ 1450 – 2000 nm	
Long-term power stability, 8 h[2]	< 2% @ 1550 nm	
Pulse-to-pulse energy stability, 1min[2]	< 2% @ 1550 nm	

1) Specified as a percentage of pump power
2) Expressed as NRMSD (Normalized Root Mean Square Deviation)

Dimensions (L×W×H)	797 x 394 x 251mm (LxWxH)
Weight (kg)	47kg
Remaining weight (kg)	24kg (Water-cooled machine) +17kg (frequency doubling)
Power supply requirements	AC 220V/10A; 24V DC power supply, motor drive power supply, total power ≤ 150
Power supply requirements for the water-cooled machine	CWUP-10AI; operating voltage 220V; operating current 0.6-5.6A; rated power 1.02kW; cooling capacity 0.75kW

Wavelength Expansion (DFG)

Parameter	AURORA-IR-HP	AURORA-IR-HE
Tuning range	4500 – 16000 nm (DFG)	
Conversion efficiency[1]	> 0.3% @ 10000 nm, 30 – 2000 μJ	
	> 0.2% @ 10000 nm, 12 – 30 μJ	
Spectral bandwidth	60 – 120 cm^{-1}@ 5000 – 8000 nm	

1) Specified as a percentage of pump power

AURORA-IR Long-Wave Mid-Infrared OPA

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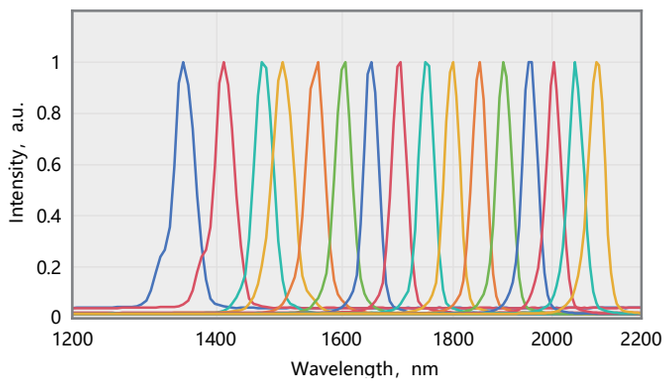
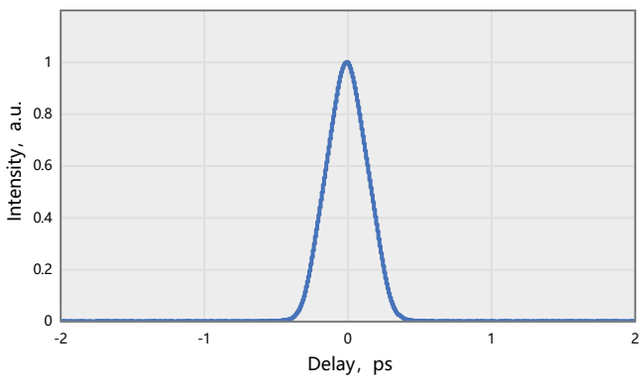
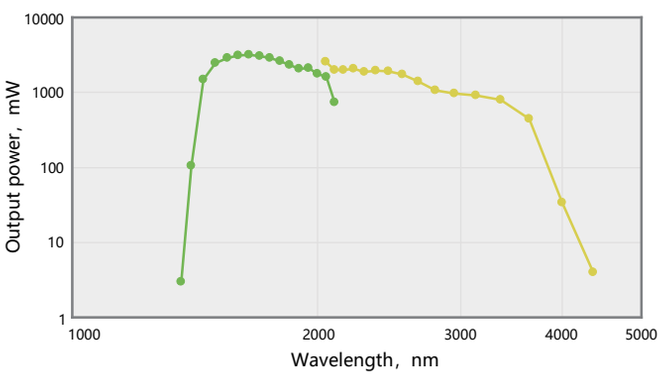
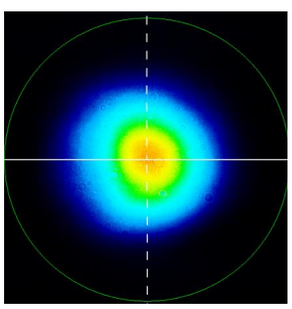


AURORA-IR series signal light tuning spectrum（1350nm-2100nm）

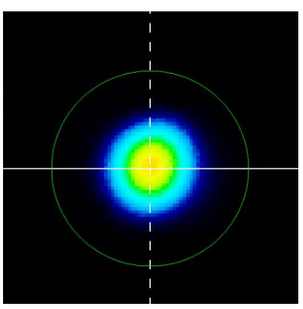


Typical pulse duration of AURORA-IR FWHM=158fs@1600nm





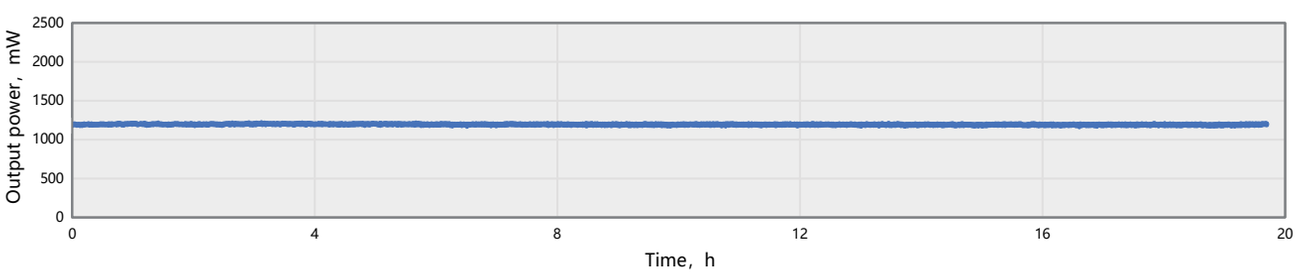
Typical near-field beam profile



Typical far-field beam profile

Typical AURORA-IR tuning curves（Pump:50kHz/400uJ/257fs@HELIOS-20W-HP）

Stability Measurement



Power stability of AURORA-IR
RMS=0.6127%@1600nm

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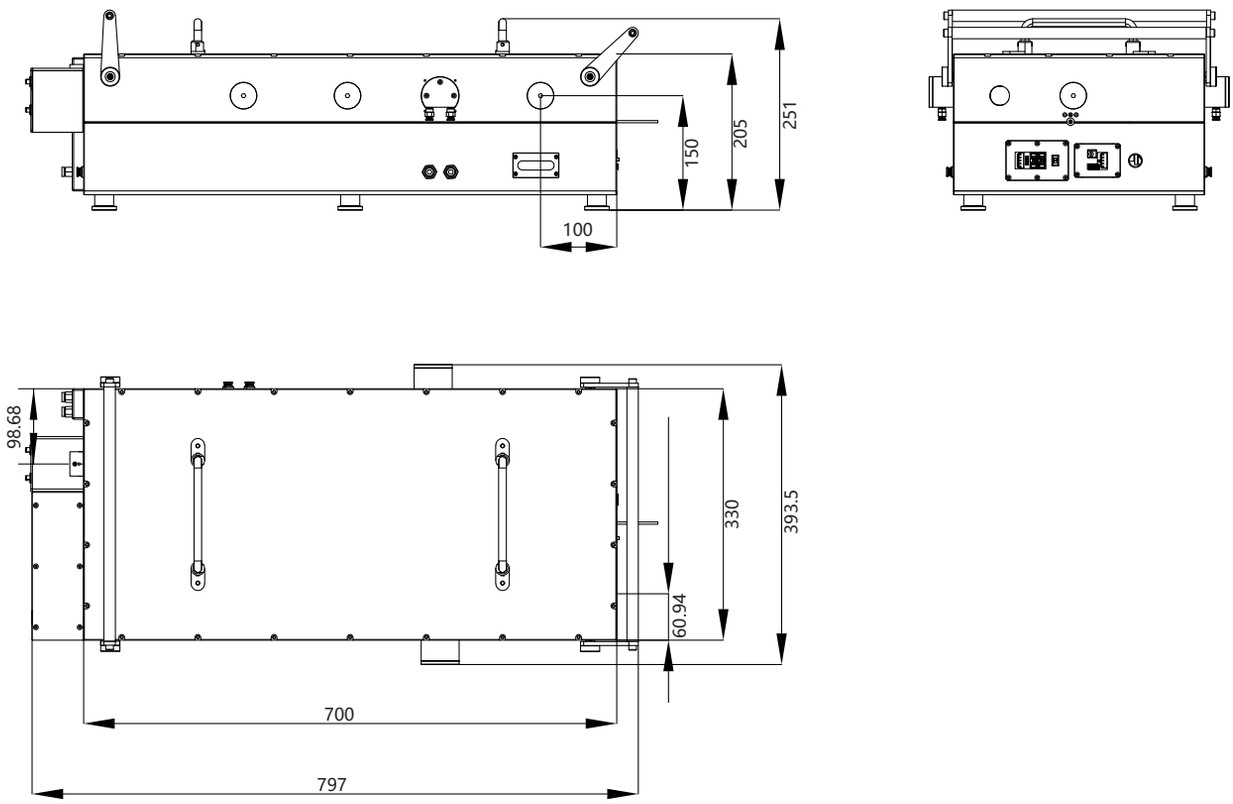
Drawings



AURORA-IR outline drawing