ORPHEUS | ONE

Mid-Infrared Collinear Optical Parametric Amplifier

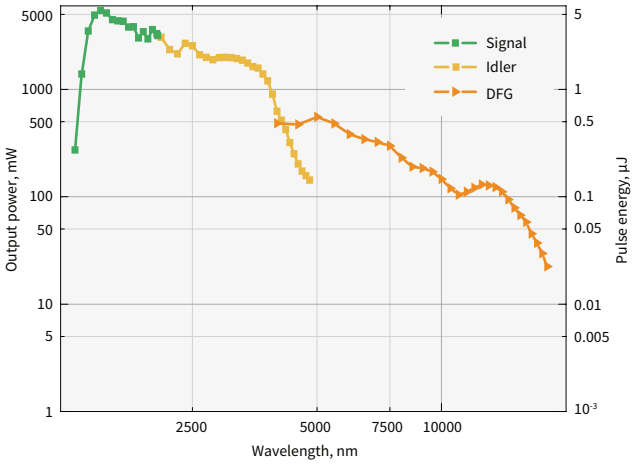
FEATURES

- High conversion efficiency in MIR, 1350 – 16000 nm
- High energy and high power models for all needs
- Single-shot – 2 MHz repetition rate
- Up to 80 W pump power
- Up to 2 mJ pump pulse energy

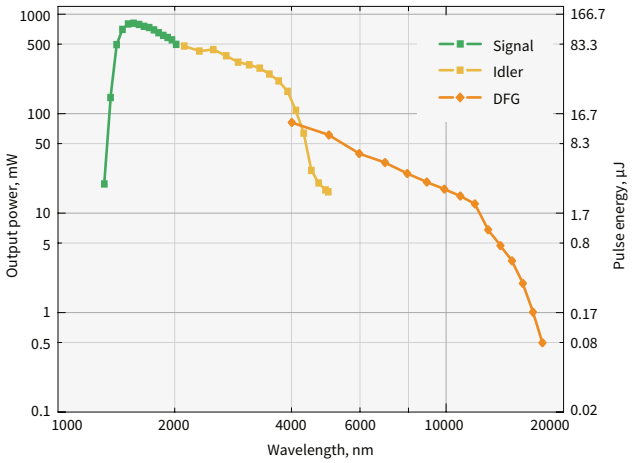
ORPHEUS-ONE is an optical parametric amplifier (OPA) designed for the mid-infrared (MIR) spectral range from 1350 to 16000 nm. Compared to ORPHEUS-HP, it has fewer wavelength extension options but provides higher pump laser conversion efficiency into MIR.

The ORPHEUS-ONE offer the same tuning range, are reliable and easy to use, but vary based on the design automation and pump parameters. The ORPHEUS-ONE-HP enables up to 80 W pump power, while the ORPHEUS-ONE-HE accepts the same pump power but also pulse energy of up to 2 mJ.

The spectral bandwidth of ORPHEUS-ONE output is defined by the pump laser pulses; thus, for sum-frequency generation (SFG) spectroscopy and other applications requiring broad-bandwidth infrared pulses – refer to ORPHEUS-MIR. For compact single-box solution, refer to I-OPA. For the PHAROS-UP ultrashort-pulse laser, refer to ORPHEUS-NEO.



Typical tuning curves of **ORPHEUS-ONE-HP**.
Pump: 40 W, 40 µJ, 1000 kHz



Typical tuning curves of **ORPHEUS-ONE-HE**.
Pump: 6 W, 1 mJ, 6 kHz

For custom tuning curves visit *http://toolbox.lightcon.com/tools/tuningcurves/*

LIGHT CONVERSION

REV. 230821

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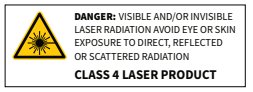
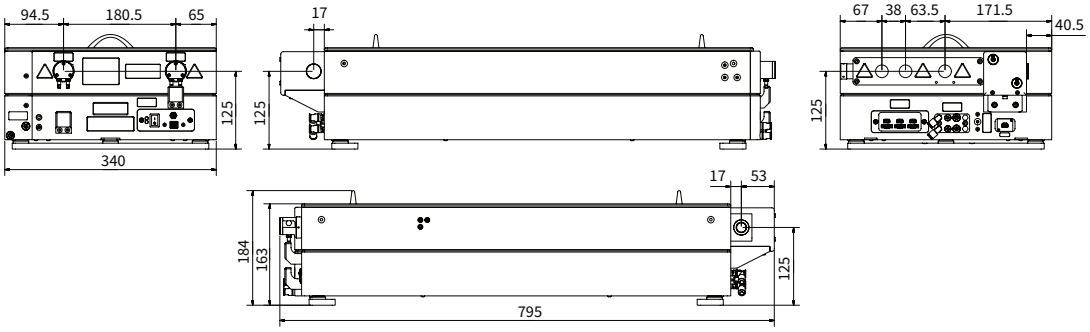
SPECIFICATIONS

Model	ORPHEUS-ONE-HP	ORPHEUS-ONE-HE
MAIN OUTPUT		
Tuning range	1350 – 2000 nm (Signal) 2100 – 4500 nm (Idler)	
Maximum pump power	80 W	
Pump pulse energy	12 – 400 µJ	400 – 2000 µJ
Conversion efficiency [1] **@ 1550 nm**	> 9%, 30 – 2000 µJ pump > 6%, 12 – 30 µJ pump	
Spectral bandwidth	60 – 150 cm^{-1} @ 1450 – 2000 nm	
Long-term power stability, 8 h [2]	< 2% @ 1550 nm	
Pulse-to-pulse energy stability, 1 min [2]	< 2% @ 1550 nm	
WAVELENGTH EXTENSION (MIR)		
Tuning range	4500 – 16000 nm (DFG)	
Conversion efficiency [1]	> 0.3% @ 10000 nm, 30 – 2000 µJ pump > 0.2% @ 10000 nm, 12 – 30 µJ pump	
Spectral bandwidth	60 – 120 cm^{-1} @ 5000 – 8000 nm	

[1] *Specified as percentage of pump power.*
[2] *Expressed as NRMSD (normalized root mean squared deviation).*



DRAWINGS



ORPHEUS-ONE-HP drawings