

ORPHEUS | ONE

Mid-Infrared Collinear Optical Parametric Amplifier

FEATURES

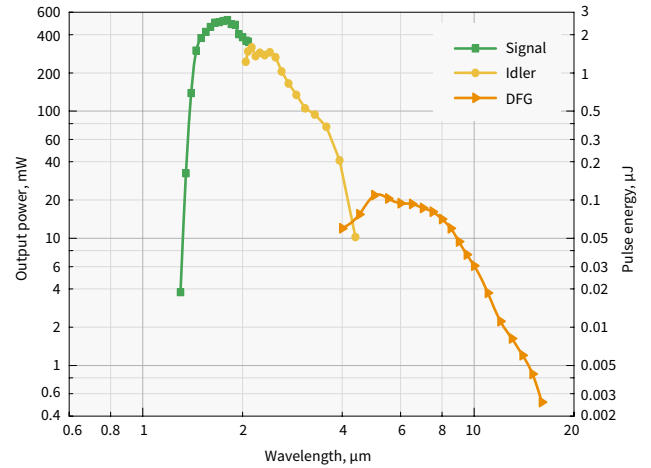
- High conversion efficiency in mid-IR
- 1350 – 16000 nm tuning range
- Single-shot – 2 MHz repetition rate
- Up to 80 W pump power
- Up to 2 mJ pump pulse energy



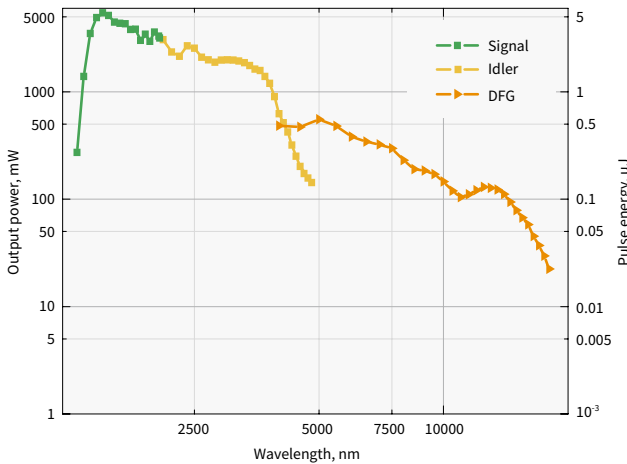
ORPHEUS-ONE is an optical parametric amplifier (OPA) designed for the mid-infrared (MIR) spectral range from 1350 to 16000 nm. Compared to ORPHEUS-HP, it has fewer wavelength extension options but provides higher pump laser conversion efficiency into MIR.

Three models of ORPHEUS-ONE offer the same tuning range, are reliable and easy to use, but vary based on the design automation and pump parameters. The basic ORPHEUS-ONE model is a cost-effective choice but is limited to 8 W pump power. 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.

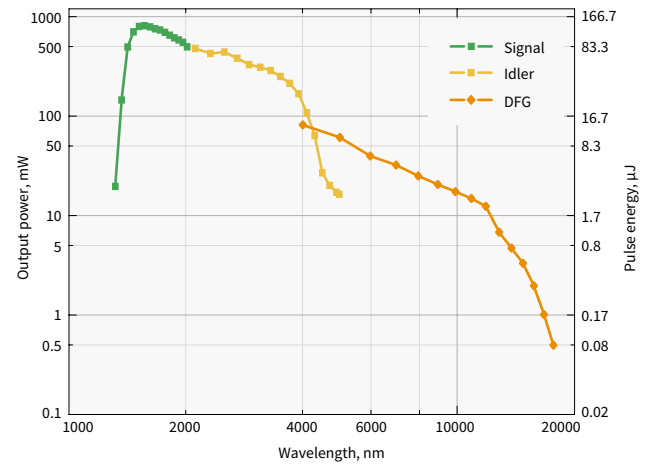
The spectral bandwidth of ORPHEUS-ONE output is defined by the pump laser pulses; thus, for sum-frequency generation (SFG) spectroscopy and other applications requiring broad-bandwidth infrared pulses – refer to ORPHEUS-MIR.



Typical tuning curves of **ORPHEUS-ONE**.
Pump: 6 W, 30 μ J, 200 kHz



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



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

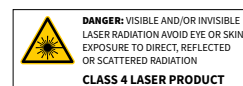
For custom tuning curves visit <http://toolbox.lightcon.com/tools/tuningcurves/>

SPECIFICATIONS

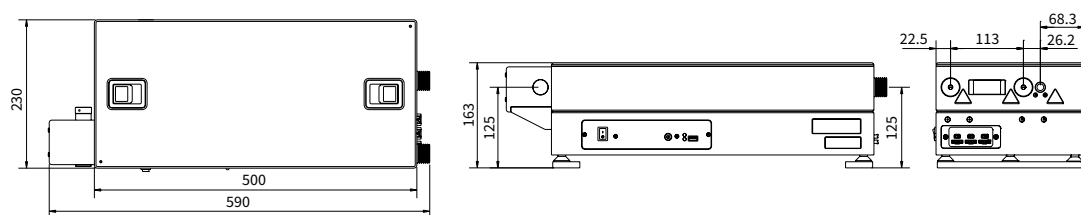
Model	ORPHEUS-ONE	ORPHEUS-ONE-HP	ORPHEUS-ONE-HE
MAIN OUTPUT (1350 – 4500 nm)			
Tuning range	1350 – 2000 nm (Signal) 2100 – 4500 nm (Idler)		
Maximum pump power	8 W	80 W	
Pump pulse energy	12 – 400 μJ	12 – 400 μJ	400 – 2000 μJ
Conversion efficiency at peak ¹⁾ (Signal @ 1550 nm)	> 9%, 30 – 2000 μJ pump > 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 (4500 – 16000 nm)			
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 – 150 cm ⁻¹ @ 5000 – 8000 nm	60 – 120 cm ⁻¹ @ 5000 – 8000 nm

¹⁾ Specified as percentage of pump power.

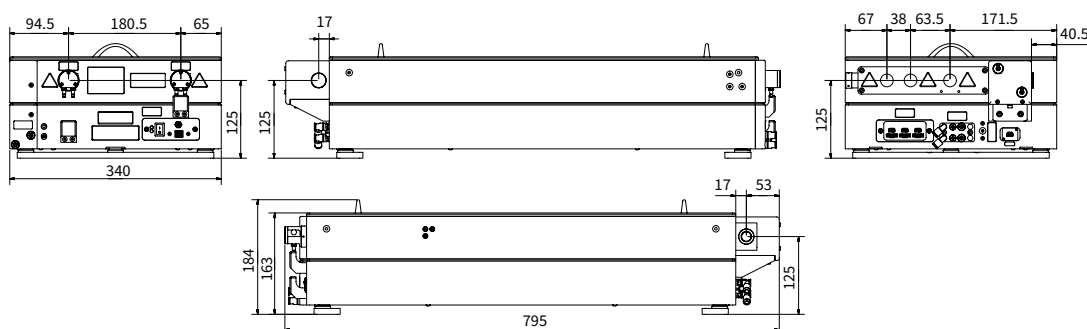
²⁾ Expressed as NRMSD (normalized root mean squared deviation).



DRAWINGS



ORPHEUS-ONE drawings



ORPHEUS-ONE-HP drawings