

## Optical Parametric Amplifier

Continuous tunability from UV to MIR, 190 – 16 000 nm

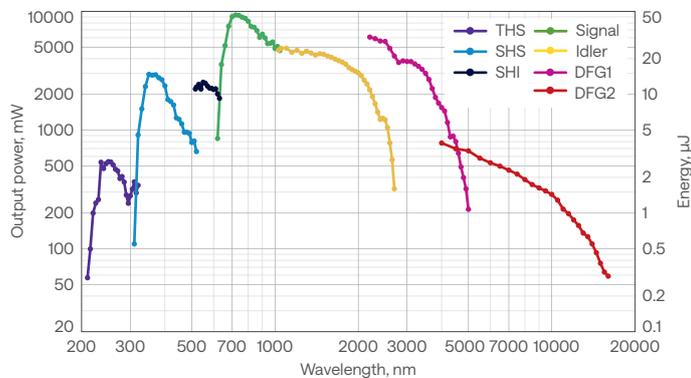
Single-shot – 2 MHz repetition rate

Up to 80 W pump power

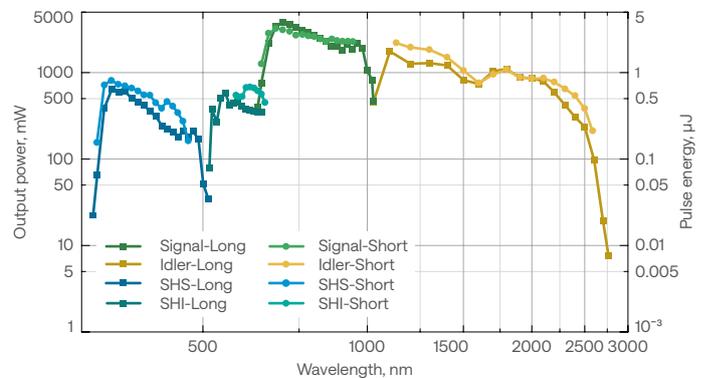
Up to 0.4 mJ pump pulse energy



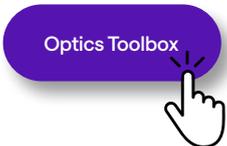
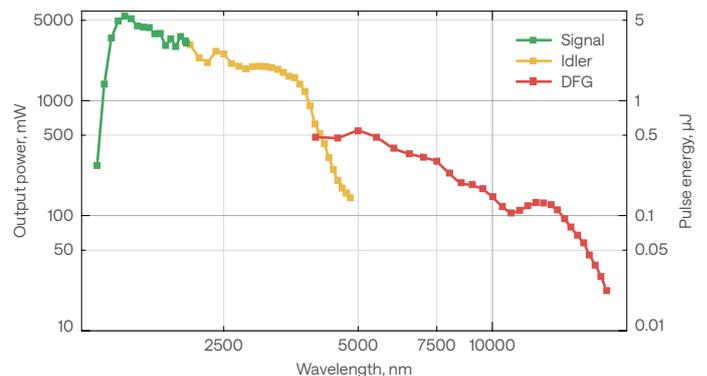
ORPHEUS typical tuning curves  
Pump: 80 W, 400  $\mu$ J, 200 kHz



ORPHEUS-F typical tuning curves  
Pump: 40 W, 40  $\mu$ J, 1000 kHz



ORPHEUS-ONE typical tuning curves  
Pump: 40 W, 40  $\mu$ J, 1000 kHz



# Specifications

Model	ORPHEUS		ORPHEUS-F	ORPHEUS-ONE
Tuning range <sup>1)</sup>	630 – 1030 nm (signal) 1030 – 2600 nm (idler)		650 – 900 nm (signal) 1200 – 2500 nm (idler) <sup>2)</sup>	1400 – 2000 nm (signal) 2100 – 4200 nm (idler)
Pump power	Up to 80 W			
Repetition rate	Up to 2 MHz			
Pump pulse energy <sup>3)</sup>	8 – 20 µJ	20 – 400 µJ	10 – 400 µJ	12 – 400 µJ
Conversion efficiency	> 4.5% @ peak (signal) > 2% @ peak (idler)	> 9% @ peak (signal) > 4% @ peak (idler)	> 7% @ 700 nm <sup>4)</sup>	> 9%, 30 – 40 µJ pump @ 1550 nm > 6%, 12 – 30 µJ pump @ 1550 nm
Pulse duration	120 – 400 fs		< 55 fs @ 800 – 900 nm <sup>5)</sup> < 70 fs @ 650 – 800 nm <sup>5)</sup> < 100 fs @ 1200 – 2000 nm <sup>5)</sup>	100 – 300 fs
Spectral bandwidth	60 – 220 cm <sup>-1</sup>		200 – 750 cm <sup>-1</sup> @ 650 – 900 nm	50 – 150 cm <sup>-1</sup> @ 1450 – 2000 nm
Long-term power stability, 8 h <sup>6)</sup>	< 2% @ 800 nm			< 2% @ 1550 nm
Pulse-to-pulse energy stability, 1 min <sup>6)</sup>	< 2% @ 800 nm			< 2% @ 1550 nm
Compressor transmission	n/a		65% @ 650 – 900 nm 80% @ 1200 – 2000 nm	n/a

## WAVELENGTH EXTENSIONS

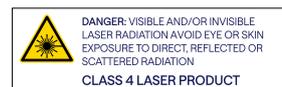
DUV	n/a	190 – 215 nm: > 0.3% @ 200 nm <sup>7)</sup>	n/a	n/a
THS	210 – 315 nm: > 0.4% @ 250 nm <sup>8)</sup>	210 – 315 nm: > 0.8% @ 250 nm <sup>8)</sup>	n/a	n/a
SHS, SHI	315 – 630 nm: > 1.2% @ 350 nm	315 – 630 nm: > 2.4% @ 350 nm	325 – 450 nm: > 1% @ peak 600 – 650 nm: 0.5% @ peak	n/a
DFG	2200 – 4200 nm: > 1.5% @ 3000 nm 4000 – 16 000 nm: > 0.1% @ 10 000 nm	2200 – 4200 nm: > 3% @ 3000 nm 4000 – 16 000 nm: > 0.2% @ 10 000 nm	n/a	4000 – 16 000 nm: > 0.3% @ 10 000 nm, 30 – 2000 µJ pump > 0.2% @ 10 000 nm, 12 – 30 µJ pump

## PUPM LASER, ENVIRONMENTAL & UTILITY REQUIREMENTS

Refer to [lightcon.com](http://lightcon.com)

- <sup>1)</sup> Dual output model (-TWINS) available, providing two optically synchronized and simultaneous outputs.
- <sup>2)</sup> Long pulse mode is optional, providing 650 – 1010 nm (signal) and 1050 – 2500 nm (idler) range at < 290 fs.
- <sup>3)</sup> Pump pulse energy up to 5 mJ applicable, refer to ORPHEUS-HE.
- <sup>4)</sup> Specified before pulse compressor. Conversion efficiency at peak is 10% for signal and idler combined.
- <sup>5)</sup> After pulse compression. Typical pulse duration before compression: 120 – 250 fs, after compression: 25 – 70 fs @ 650 – 920 nm, 40 – 100 fs @ 1200 – 2000 nm.

- <sup>6)</sup> Expressed as normalized root mean squared deviation (NRMSD).
- <sup>7)</sup> DUV conversion efficiency is specified for pump power up to 10 W and frequencies up to 200 kHz. In the case of higher pump power, conversion efficiency decreases. The maximum output power is 40 mW at 200 nm.
- <sup>8)</sup> For > 15 µJ pump pulse energy.



## Drawings

### ORPHEUS

