K2PHOTONICS

K2-OPO-mini

Compact and powerful ultralow-noise laser

Any wavelength*
1 GHz repetition rate
High power operation
Ultrashort pulses
Dual-comb option

- Compact solution for spectroscopy
- Wide range of wavelengths
- Ultra-low RIN and timing noise

DESCRIPTION

K2-OPO-mini is a powerful low noise turn-key fixed-wavelength optical parametric oscillator. The output wavelength is defined at the factory allowing it to serve a wide range of applications throughout the infrared. K2-OPO-mini emits femtosecond pulses at 1 GHz repetition rate with a dual-comb option. This light source is ideal for optical frequency comb applications, precision ranging, gas sensing, time-resolved spectroscopy, nonlinear microscopy and reaction kinetics studies.

CUSTOM OPTIONS

- Fiber coupled output
- Integrated pump laser output
- Signal & Idler pair output
- Tunable configuration

APPLICATIONS

- Time-resolved spectroscopy
- Multi-species gas sensing
- Reaction kinetics
- Nonlinear microscopy

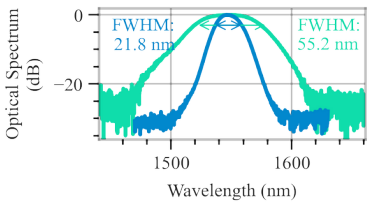
Related publications

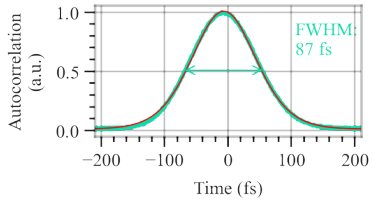
THz Power Scaling up to 1.6 mW in Fiber-Coupled ASOPS THz TDS with a 1 GHz Dual-Comb Laser
Dohms et al., IEEE Transactions on Terahertz Science and Technology (2026)

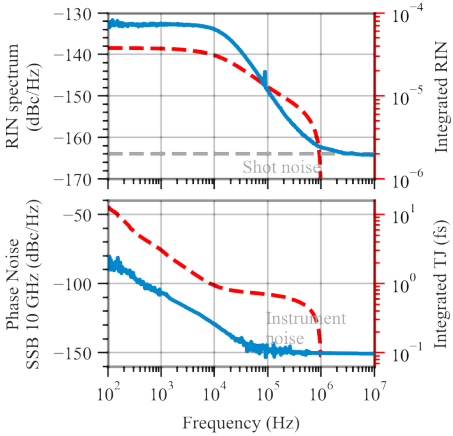
Ultrafast 1-GHz repetition rate dual-comb optical parametric oscillator
Bauer et al., Optics Express 33, 39130 (2025)

High-sensitivity dual-comb and cross-comb spectroscopy across the infrared using a widely tunable and free-running optical parametric oscillator
Bauer et al., Nature Communications 15, 7211 (2024)

EXAMPLE CHARACTERIZATION







SPECIFICATIONS

Output wavelength*	**1550 nm**	**1645 nm**	**1800 nm**	**2400 nm**	**3300 nm**	**4100 nm**
Output power per comb	>400 mW	>350 mW	>250 mW	>200 mW	>120 mW	>60 mW
Wavelength tuning	Factory fixed, inquire for tunable options					
Repetition rate	1 GHz +/- 0.1 GHz					
Pulse duration (FWHM)	<250 fs, inquire for <100 fs option					
Individual comb RIN	<-160 dBc/Hz for frequencies above 1 MHz					
Pump laser	Integrated K2-1000-mini					

DUAL-COMB SPECIFICATIONS (OPTION)

Implementation method	spatially-multiplexed single-cavity dual-comb design
Repetition rate difference	tunable between -100 kHz and +100 kHz
Relative timing noise	<10 fs [100 Hz, 100 kHz]

CONTROLS

Repetition rate	f_{rep} actuation via piezo (option)
Wavelength shift control	OPO cavity length control via piezo (option)
Repetition rate difference	Δf_{rep} actuation via piezo and motor (option)

DIMENSIONS

Size (L x W x H)	275 x 210 x 95 mm³ (all-in-one system)
Output height	60 mm on (W) side

REQUIREMENTS

Operating temperature	15 – 30°C with <25°C baseplate (contact cooling)
Relative humidity	20 – 70% (non-condensing)
Power consumption	<75 W
Electrical requirements	24 VDC, 5 A

Product specifications and descriptions in this document are subject to change without notice.
Specifications are for temperature of ± 1°C and humidity of ± 10% variation.
*Wavelength can be customized within the range: 1350 - 4500 nm.

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