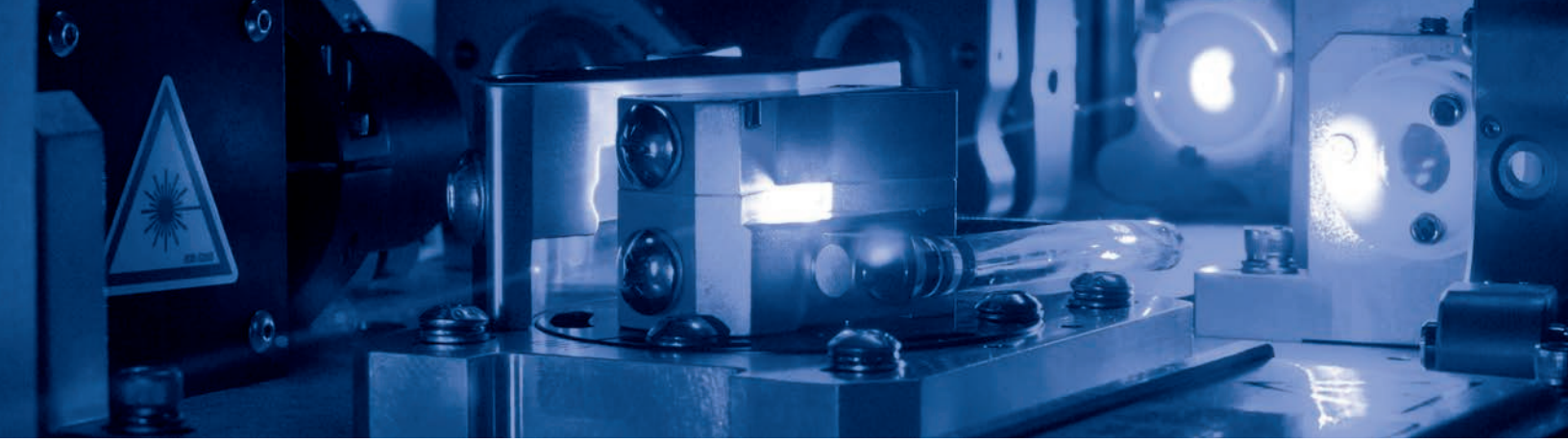


TOPAS-Prime

Computer-Controlled Femtosecond Optical Parametric Amplifier Accessory

TOPAS-Prime is the newest generation of computer-controlled optical parametric amplifiers (OPA) providing the ability to extend the tuning ranges of the Astrella and Legend Elite HE+ ultrafast amplifier families. TOPAS-Prime employs a monolithic housing for improved mechanical stability and white light seeding for lowest output noise performance. TOPAS-Prime uses a modular design of wavelength extension packages to achieve a tuning range of 190 nm to 20 µm.

The standard TOPAS-Prime model accepts pulse energies up to 3.5 mJ. Input pulse energies up to 5 mJ can be achieved with the TOPAS-Prime Plus model. HE-TOPAS-Prime and HE-TOPAS-PrimePlus can support even higher pump energies, up to 20 mJ.

FEATURES & BENEFITS

- Monolithic housing for mechanical stability
- Computer-controlled tunable output
- Optional Fresh pump channel for improved sum frequency performance
- Modular options for extending tuning range from 190 nm to 20 µm
- Configurations to accommodate Femto, USP, and USX pulse widths from Coherent kHz femtosecond amplifiers
- Multiple OPAs can be pumped by a single kHz amplifier
- High energy (HE) models available up to 20 mJ pump energy

APPLICATIONS

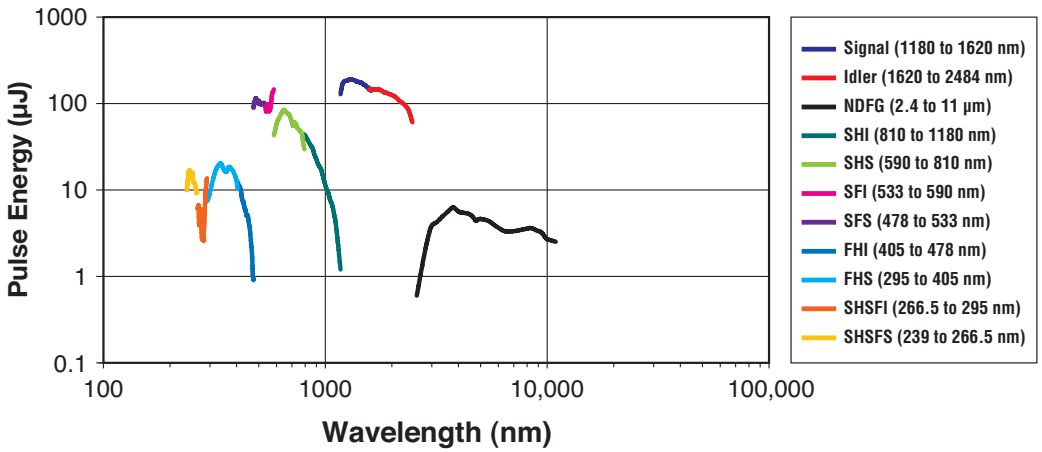
- Time-resolved Spectroscopy
- Multi-dimensional Spectroscopy
- Surface SFG/SHG

COHERENT®
Superior Reliability & Performance

SPECIFICATIONS[1,2]		Wavelength Range	Pulse Energy		Polarization
			<50 fs pump	<110 fs pump	
TOPAS-Prime[3]	Signal	1140 to 1600 nm	>250 µJ (S+I)	>250 µJ (S+I)	V
	Idler	1600 to 2600 nm			H
OPTIONS[4]					
VIS Package[5]	SHI	800 to 1150 nm	>15 µJ[6]	>30 µJ[6]	V
	SHS	580 to 800 nm	>30 µJ	>80 µJ	H[7]
BLUE Package[5]	SFI	533 to 600 nm	>30 µJ	>50 µJ	V
	SFS	475 to 533 nm	>40 µJ	>70 µJ	V
UV1 Package	FHI	400 to 480 nm	>2.5 µJ[8]	>6 µJ[8]	H
	FHS	290 to 400 nm	>5 µJ	>15 µJ	V[7]
UV2 Package	SHSFI	266 to 295 nm	>3 µJ	>7 µJ	H
	SHSFS	240 to 266 nm	>3 µJ	>8 µJ	H
DUV Package	DUV[9]	189 to 240 nm	>1 µJ	>3 µJ	V
NDFG Package	NDFG1[10,11]	2.6 to 11 µm	>2 µJ at 4 µm >0.5 µJ at 9 µm	>8 µJ at 4 µm >1.5 µJ at 10 µm	H
	NDFG1-KTA[11]	2.6 to 4.9 µm	>2 µJ at 4 µm	>8 µJ at 4 µm	H
	NDFG2[11]	4 to 20 µm	>1 µJ at 5 µm >0.1 µJ at 13 µm	>4 µJ at 5 µm >0.3 µJ at 15 µm	H

1 All specifications are based on pumping with 1 mJ from Astrella, Legend Elite, or Libra systems at 1 kHz (contact factory for other pump systems). Specifications for harmonic wavelengths pumped by Legend Elite USX and Legend Elite Duo USX models are 25% lower.
2 Energy scales linearly with pump in range 0.3 mJ to 4 mJ for <110 fs pump and 0.3 mJ to 3.5 mJ for <50 fs pump. TOPAS-PrimePlus model extends pump energy input to 5 mJ for both <50 and <110 fs models.
3 Signal pulse width is (0.7 to 1.0) x pump for <110 fs pump duration, (1 to 1.5) x pump for <50 fs pump duration.
4 Energies given at peak of tuning ranges. VIS/BLUE/UV wavelength extension options listed include all mixing crystals listed in preceding options (e.g., TOPAS-Prime-UV-2 options includes crystals, etc., to tune from 240 to 1150 nm). External mixer or integrated monolithic mixer options available.
5 With optional fresh pump package.
6 With Monolithic mixer option >50 µJ at <110 fs pump and >20 µJ at <50 fs pump.
7 Polarization switches when DUV option is included.
8 With Monolithic mixer option >15 µJ at <110 fs pump and >4 µJ at <50 fs pump.
9 Requires purchase of TOPAS-Prime-M-UV2 option, specifications assume 15 % of pump energy into DUV channel and another 15 % into fresh pump channel. DUV option reduces performance at other wavelengths, contact Coherent for details.
10 Maximum pump repetition rate – 1 kHz. Limited crystal life time of 1000 to 2000 hr.
11 For <50 fs pump NDFG tuning ranges are as follows: NDFG1- 2.6 µm to 9 µm, NDFG1-KTA - 2.6 µm to 4.5 µm and NDFG2 - 4 µm to 13 µm.

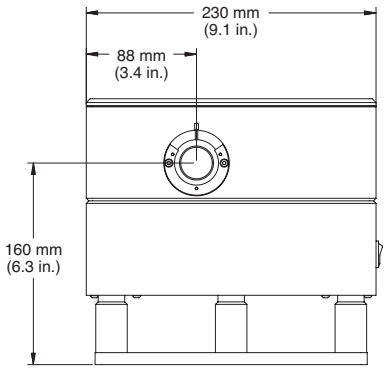
Typical Tuning Curve
(pumped by 1 mJ, 1 kHz, 800 nm Legend Elite)



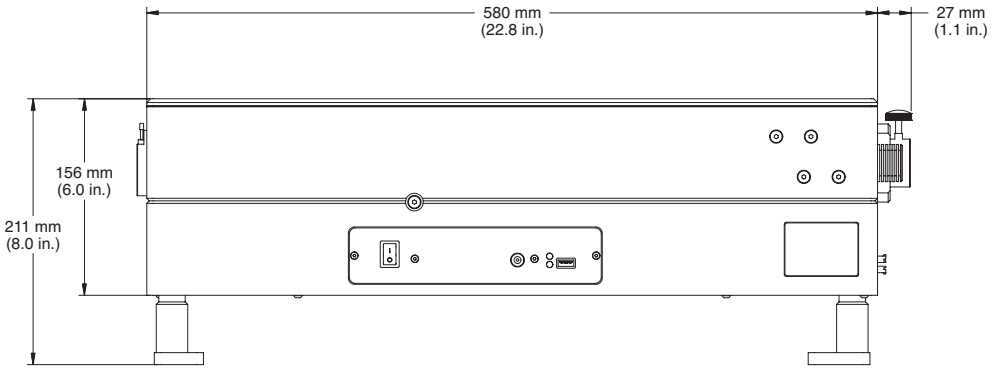
MECHANICAL SPECIFICATIONS

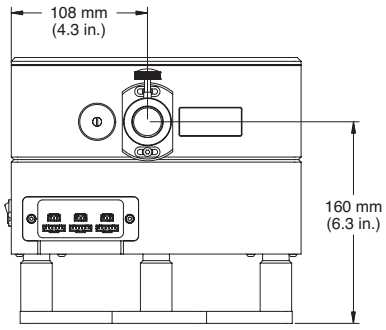
TOPAS-Prime

Input Port Location



Side View





Output Port Location

Coherent, Inc.,
5100 Patrick Henry Drive Santa Clara, CA 95054
p. (800) 527-3786 | (408) 764-4983
f. (408) 764-4646

tech.sales@coherent.com **www.coherent.com**