

Monaco 1035

Industrial Femtosecond Laser

Monaco 1035 is an industrial femtosecond laser with a MOPA architecture. Designed for high-uptime in 24/7 applications, the laser family provides $>150 \mu\text{J}/\text{pulse}$ at 1035 nm. Standard repetition rates up to 50 MHz at 150 W enable current and future throughput requirements in materials processing and microelectronics applications. Homogeneous materials such as glass and metals, as well as complex, layered structures for the FPD and mobile markets are readily addressed with Monaco's sub-400 fs pulsewidth. Additionally, on-the-fly tuning enables variable pulsewidths to $>10 \text{ ps}$.



FEATURES

- 150 $\mu\text{J}/\text{pulse}$ for processing of high ablation threshold materials
- 150 W average power for high throughput
- $<400 \text{ fs}$ standard pulsewidth for low HAZ machining
- Variable pulsewidth from $<350 \text{ fs}$ to $>10 \text{ ps}$ for process tailoring
- Repetition rate to 50 MHz for fast processing with polygon scanners
- $>450 \mu\text{J}$ seeder burst mode for glass processing
- Compact single box design for ease of integration
- HALT-designed and HASS-verified to ensure quality and reliability

APPLICATIONS

- Glass Cutting and Welding
- Thin Film/Foil Cutting
- IC Package Cutting
- Medical Device Manufacturing
- OPA Pumping for Optogenetics

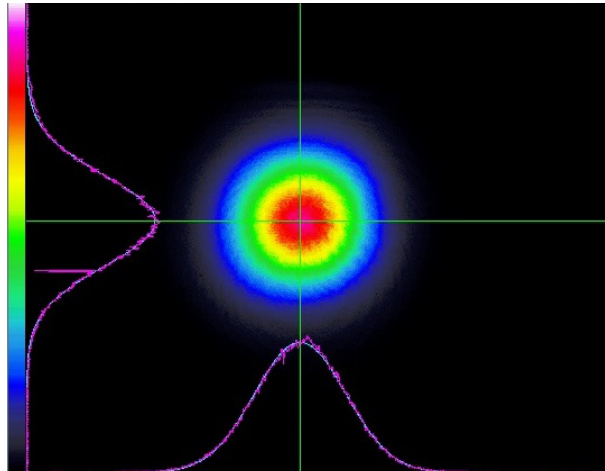
Specifications ¹	Monaco 1035-40-40	Monaco 1035-80-60	Monaco 1035-150-150
Fundamental Center Wavelength (nm)	1035	1035	1035
Output Power (W)	40	60	150
Energy (μ J)	40 (at 1 MHz)	80 (at 750 kHz)	150
Pulse Repetition Rate (kHz)	Single-shot to 1 MHz, higher rep. rates without AOM pulsepicking: 1 to 50 MHz standard		
PulseEQ Upper PRR (kHz)	1000		
Burst Mode (Pulse, PRR)			3,333
Pulse Width (fs)	<350		<400
Tuning Range	<350 fs to >10 ps		up to 10 ps
Spatial Mode (M^2)	TEM ₀₀ , $M^2 < 1.2$		<1.3
Beam Divergence (mrad, 2 θ)	<1		<1.0
Beam Diameter at Output ² (mm, 1/e ²)	2.7 \pm 0.3		3.0 \pm 0.3 (1/e ²)
Beam Circularity (%)	>85		
Polarization Ratio	100:1		
Polarization Direction	Vertical \pm 3°		Horizontal
Beam Pointing Stability (μ rad/°C)	<25		
Pulse Energy Stability (% rms)	<1.5		<2
Average Power Stability over 8 hours ³ (% rms, 2 σ)			<2
Warm-up Time (minutes)			
Cold Start	<45		60
Warm Start	<15		45
Long-Term Pointing Stability over 8 hours (μ rad/°C)	\pm 25		
Head Weight	50 kg (110 lbs.)		70 kg (154 lbs.)
Power Consumption ⁴ (typical)	48 VDC, <500 W		48 VDC, <1500 W
Operational Mode Switching Time (s)			<60
Energy Switching Time (s)			<1
External Comms	RS-232, Ethernet, USB		

Notes:

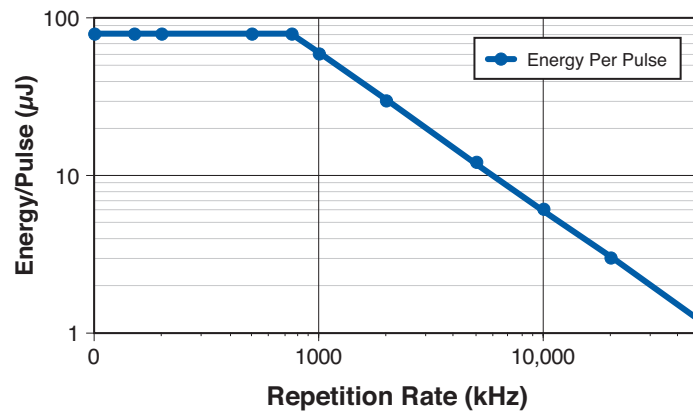
1. All specifications at maximum energy.
2. Measured at 1m from laser output window.
3. External isolation required depending on application.
4. Optional 110 to 240 VAC power supply available.

TYPICAL PERFORMANCE DATA

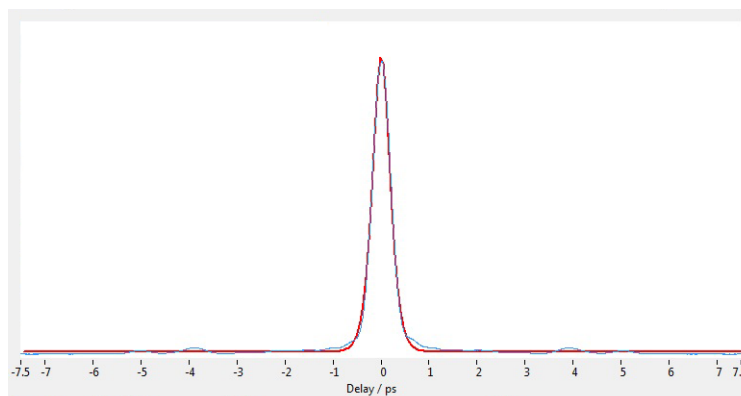
Monaco 1035 Sample Spatial Mode at 1 MHz



Monaco 1035 Energy/Pulse vs. Repetition Rate

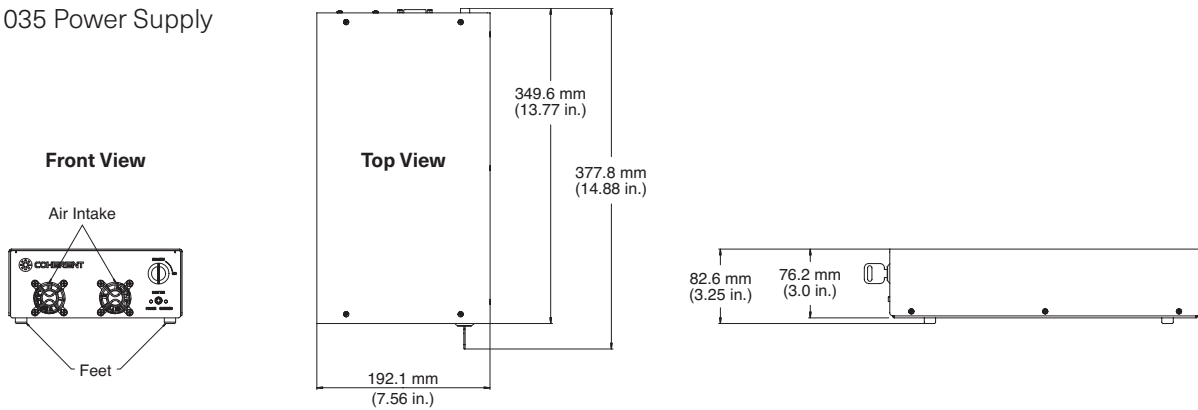


Monaco 1035 Sub-350 fs Temporal Profile (Autocorrelator)

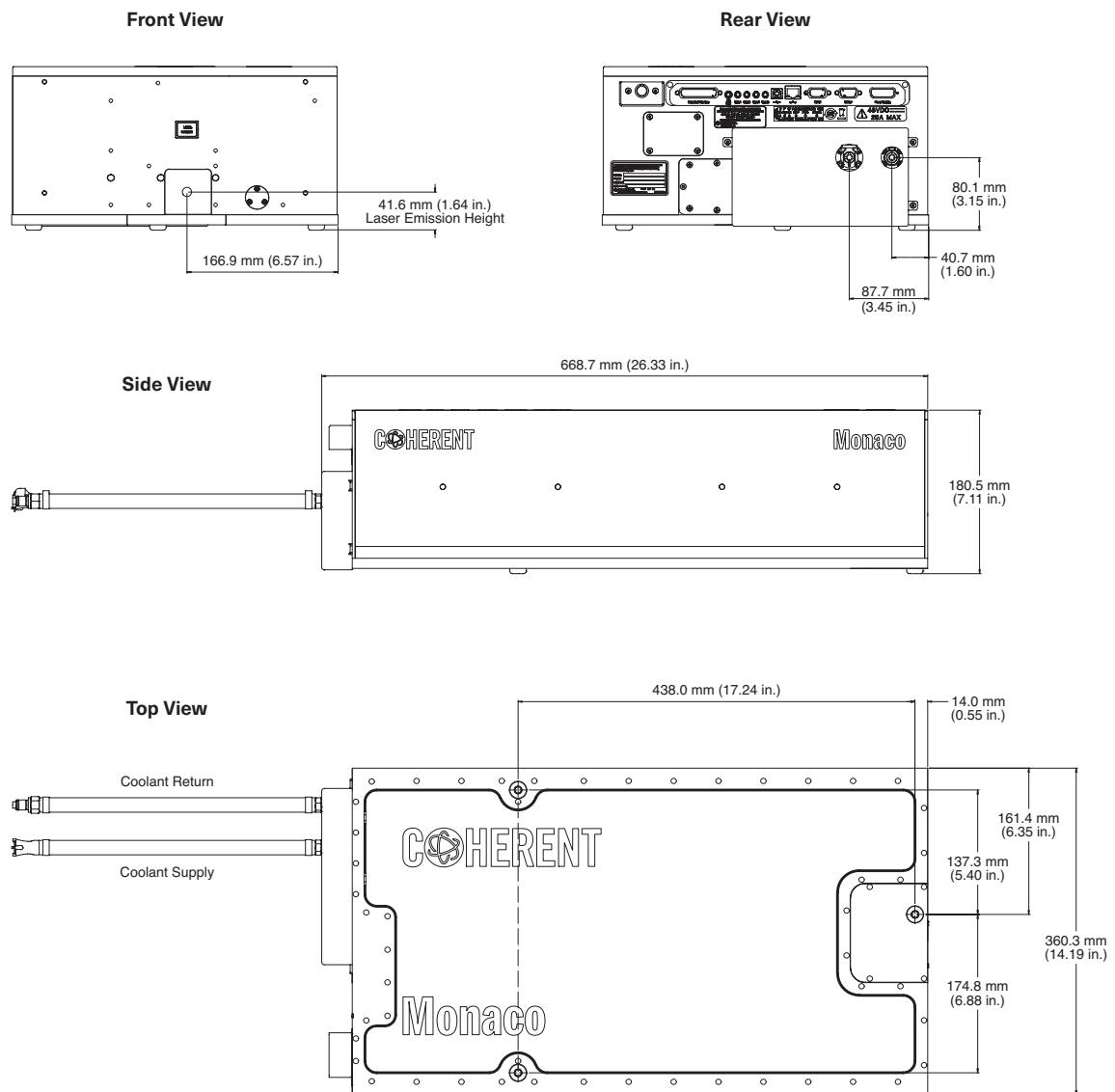


MECHANICAL SPECIFICATIONS

Monaco 1035 Power Supply



Monaco 1035-40-40/1035-80-60



MECHANICAL SPECIFICATIONS

Monaco 1035-150-150

