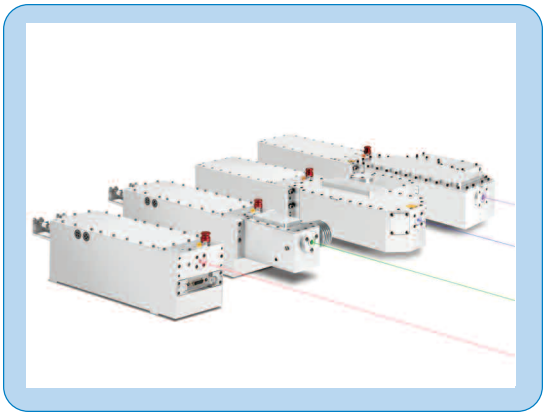
HIPPO™ Mid-Power Q-Switched Lasers

RUGGED DESIGN FOR HIGH UPTIME



The HIPPO Advantage

- OEM/Industrial design for 24/7 operation
- Single platform for 4 output wavelengths: 1064 nm, 532 nm, 355 nm, 266 nm
- High output power for fast throughput
- High peak power minimizes thermal damage to your parts
- Superior pulse-to-pulse stability for clean, consistent processing
- TEM_{00} beam characteristics for large depth of field
- Long life diodes mean low cost of operation and high uptime
- Modular design allows easy field replacement of key components
- Active Laser Purification System™ (ALPS) keeps laser running clean to extend laser life
- EternAlign™ - stable optical alignment over life of laser

The Spectra-Physics HIPPO lasers are a family of high power diode-pumped solid state (DPSS) Q-switched lasers with available outputs of 1064, 532, 355 and 266 nm wavelengths. They are used primarily in 24/7 industrial applications such as solar cell manufacturing, LED scribing and other microelectronics applications.

The HIPPO Q-switched laser has a strong track record and large installed base around the world. The laser's modular design allows easy field replacement of key components including diodes and fibers, laser output window, and the harmonic module without costly tool realignment. Rugged and proven, the HIPPO is the tool of choice in applications where uptime is critical.

EXCELLENT PERFORMANCE

HIPPO Q-switched lasers are characterized by extremely short pulse width (as low as <11 ns). High peak power and short pulse widths minimize undesirable thermal damage, such as heat affected zones, recast material, kerfs, and micro-cracking of the substrate.

All HIPPO Q-switched lasers have excellent TEM_{00} beam quality, which ensure a large depth of field and guarantee consistent and reliable scribing results over a wider range of material flatness, thickness, and surface variations.

HIPPO lasers have stable power, low pulse-to-pulse energy variation, and stable beam pointing over a wide range of operating conditions, including time, temperature, and pulse repetition rate.

HIGH RELIABILITY

HIPPO lasers have a number of unique design features that significantly increase both the laser life and uptime. Our diodes typically last twice the industry average. The HIPPO lasers' modular design isolates known wear components and key failure mechanisms into small components (such as diodes, fibers, output window, shutters, and harmonic modules) that are easy to change in the field without costly tool realignment. This lowers service inventory holding costs while shortening mean time to repair (MTTR).

Our proprietary optical alignment system (EternAlign™) and rugged laser housing virtually eliminate alignment failures that can occur with vibration and shock during shipping. The sealed laser resonator and unique filtration system (ALPS) significantly extends the life of the laser by keeping the air inside the laser clean, dry, and free of volatile organic compounds from out-gassing.

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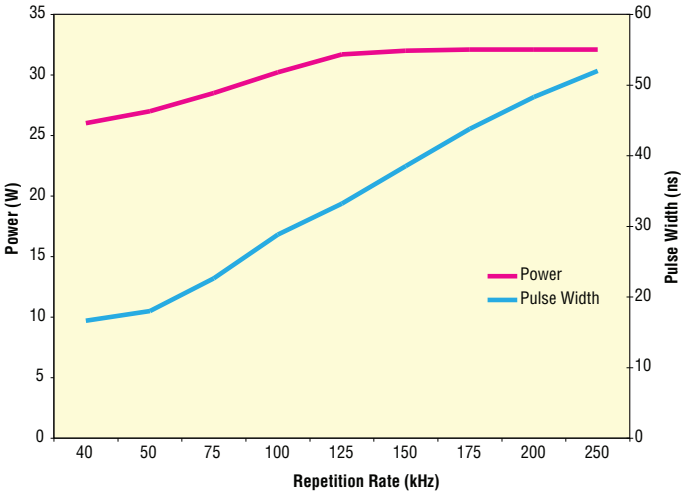
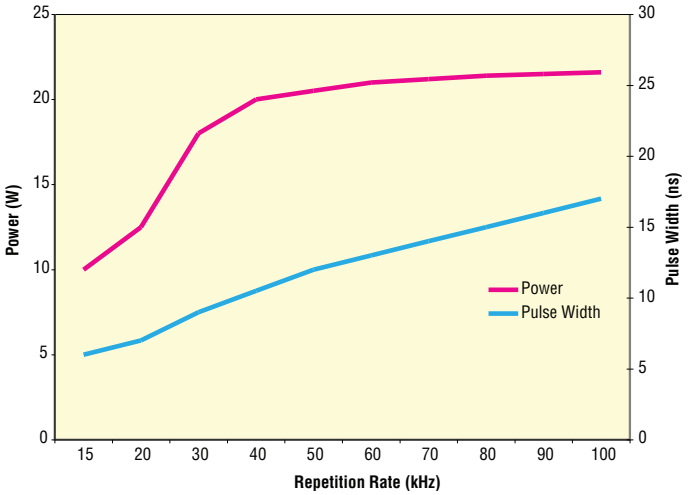
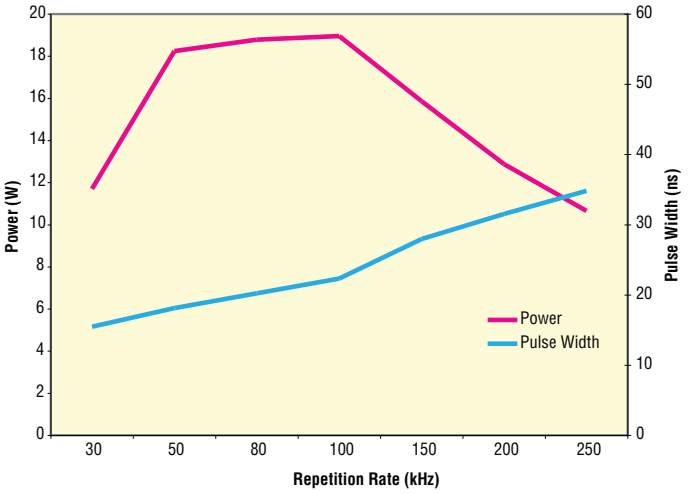
HIPPO 1064-27 Performance



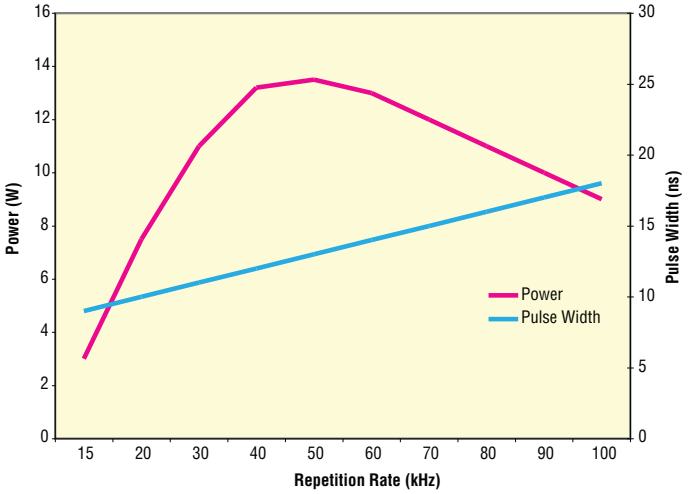
HIPPO 1064-17 Performance



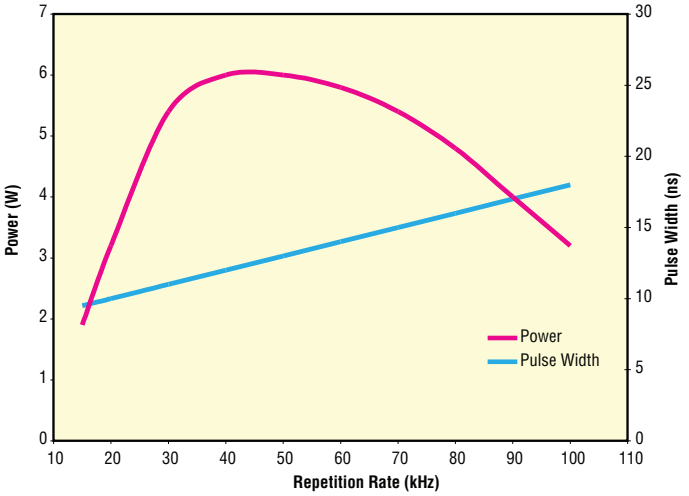
HIPPO 532-15 Performance



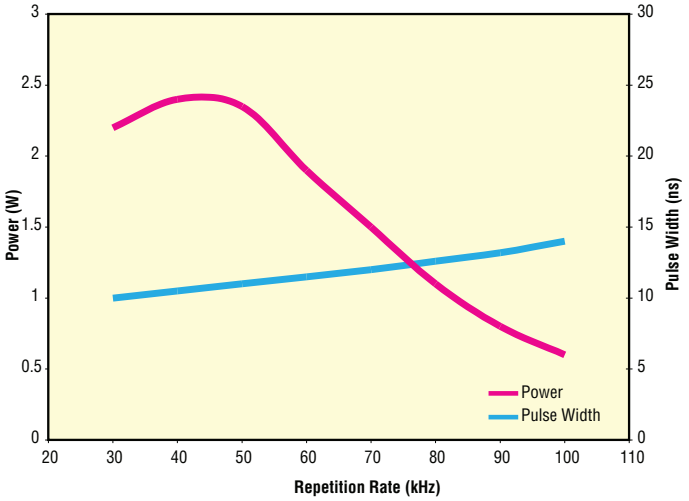
HIPPO 532-11 Performance



HIPPO 355-5 Performance



HIPPO Prime 266-2 Performance



APPLICATIONS

HIPPO 1064

- Laser scribing of P1 thin film solar cells
- c-Si solar cell edge isolation
- Laser deflashing electronics package leads
- Flexible circuit laser processing
- Laser marking on various metals and plastics
- Si wafer scribing

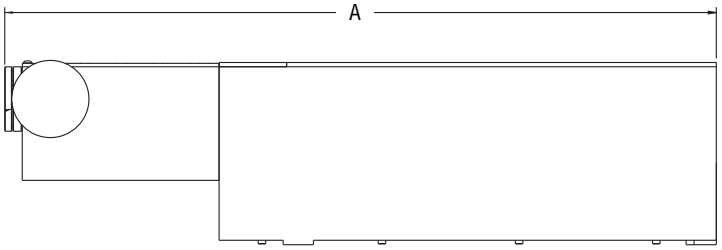
HIPPO 532

- Laser scribing of P2, P3 thin film solar cells
- c-Si solar cell edge isolation
- Laser glass cutting
- PCB laser structuring and laser singulation
- Si wafer laser marking

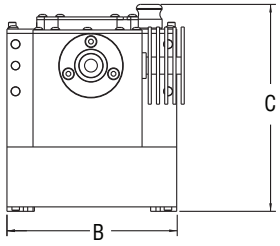
HIPPO 355/266

- c-Si solar cell edge isolation
- Flexible circuit laser processing
- Laser glass cutting
- Laser marking on various metals and plastics
- Laser ITO patterning
- Sapphire (LED) laser scribing
- LED laser lift-off
- Si wafer laser scribing
- Via hole drilling for flip chips, flexible circuits and PCBs

HIPPO Laser Dimensions



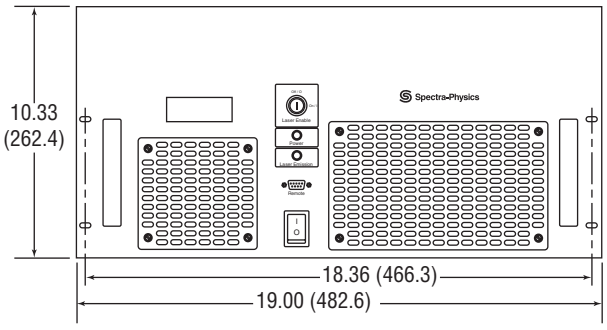
Side View



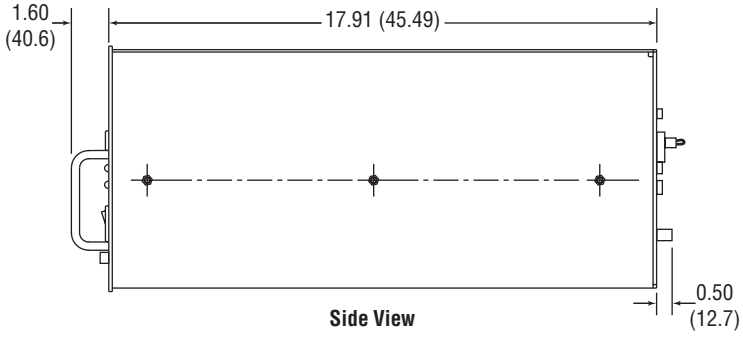
Front View

		HIPPO 1064-27 HIPPO 1064-17	HIPPO 532-15 HIPPO 532-11	HIPPO 355-5 HIPPO Prime 266-2
A	Length	14.6 in (371 mm)	20.8 in (528 mm)	28.5 in (724 mm)
B	Width	5.0 in (127 mm)	5.0 in (127 mm)	9.0 in (229 mm)
C	Height	6.0 in (152 mm)	6.0 in (152 mm)	6.0 in (152 mm)

Power Supply Dimensions



Front View



Side View

All dimensions in inches (mm)

HIPPO™ Mid-Power Q-Switched Lasers

Specifications

General Characteristics	HIPPO 1064-27	HIPPO 1064-17	HIPPO 532-15	HIPPO 532-11	HIPPO 355-5	HIPPO Prime 266-2
Wavelength	1064 nm	1064 nm	532 nm	532 nm	355 nm	266 nm
Power	27 W at 100 kHz	17 W at 50 kHz	15 W at 100 kHz	11 W at 50 kHz	5 W at 50 kHz	2 W at 50 kHz
Repetition Rate	30–250 kHz	15–300 kHz	30–250 kHz	15–300 kHz	15–300 kHz	30–300 kHz
Pulse Width, nominal	<30 ns at 100 kHz	<15 ns at 50 kHz	<25 ns at 100 kHz	<13 ns at 90 kHz	<12 ns at 50 kHz	<12 ns at 50 kHz
Peak Power	~9 kW	~22.7 kW	~6 kW	~16.9 kW	~8.3 kW	~3.3 kW
Beam Characteristics						
Spatial Mode	TEM_{00}					
M^2	<1.2	<1.2	<1.3	<1.3	<1.3	<1.4
Polarization	>100:1, vertical	>100:1, vertical	>100:1, horizontal	>100:1, horizontal	>100:1, vertical	>100:1, vertical
Beam Diameter, at waist	0.6 mm nominal	0.6 mm nominal	0.8 mm nominal	1 mm nominal	1 mm nominal	2 mm nominal
Waist Location, nominal	-17 cm from output	-17 cm from output	at output	-30 cm from output	at output	at output
Beam Divergence, full angle	<3.0 mrad	<3.0 mrad	<1.2 mrad	<1.0 mrad	<0.65 mrad	<0.28 mrad
Beam Ellipticity	<10%	<10%	<10%	<10%	<10%	<20%
Beam Pointing Stability	<±50 µrad/°C					
Pulse-to-Pulse Stability	<2% rms	<2% rms	<4% rms	<5% rms	<5% rms	<8% rms
Operating Conditions						
Warm-up Time	<10 min	<10 min	<20 min	<20 min	<20 min	<30 min
Temperature Range	18–35 °C					
Altitude[3]	0–3,000 m					
Humidity	8–95%, non-condensing					
Water Cooling	Yes					
Water Temperature	20°C ±0.1°C					
Water Flow Rate	1.5 liter per minute at 3 psi					
Thermal Load	100 W					
Non-operating Conditions						
Temperature Range	0–50 °C					
Altitude, Non-operating	0–12,000 m					
Humidity, Non-operating	8–95%, non-condensing					
Physical Characteristics						
Dimensions (Laser Head) (L x W x H)	14.6 x 5.0 x 6.0 in (341 x 127 x 152 mm)	14.6 x 5.0 x 6.0 in (341 x 127 x 152 mm)	20.8 x 5.0 x 6.0 in (525 x 127 x 152 mm)	20.8 x 5.0 x 6.0 in (525 x 127 x 152 mm)	28.5 x 9.0 x 6.0 in (724 x 229 x 152 mm)	28.5 x 9.0 x 6.0 in (724 x 229 x 152 mm)
Weight (Laser Head)	17.6 lbs (8.0 kg)	16.8 lbs (7.6 kg)	21.9 lbs (9.9 kg)	20.9 lbs (9.5 kg)	33.1 lbs (15.0 kg)	35.0 lbs (15.9 kg)
Dimensions (Power Supply) (L x H x W)	19.0 x 10.3 x 17.9 in (482.6 x 262.3 x 455 mm)					
Weight (Power Supply)	55 lbs (24.9 kg)					

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