

# Talon®

## DISRUPTIVE COST-PERFORMANCE UV LASERS

### The Talon Advantage

- Superior combination of performance, reliability and cost
- Rugged industrial platform
- Outstanding beam parameters, performance, and stability
- ALPS cavity cleanliness control system for reliable operation
- Long-life diodes and minimal interventions over the life of the laser
- Easy-to-integrate compact laser head includes the diodes and control electronics, with simple utility hookups



Talon® is an exciting family of UV and green diode-pumped solid state (DPSS) Q-switched lasers that delivers an unprecedented combination of performance, reliability, and cost. Based on Spectra-Physics' *It's in the Box™* design, with the laser and controller combined in a single, compact package, Talon lasers use field-proven technology to output >20 W or >300  $\mu$ J per pulse of UV with a wide repetition rate range of 0 to 500 kHz, high pulse-to-pulse stability and excellent TEM<sub>00</sub> mode quality for tens of thousands of operating hours.

Talon is a rugged industrial laser capable of supplying the long-term performance and low cost of ownership necessary for a 24/7 precision manufacturing tool. Talon 355 nm lasers are ideal for a wide range of micromachining applications where extended production cycles rely on stable beam quality and high uptime. Features such as E-Pulse™, which holds pulse energy and pulse width constant over wide repetition rate ranges, ensure superb process control. For fast processing speeds, its performance at high repetition rates is ideal.

Talon is a flexible platform that allows matching the right laser to the process requirements and budget. The same features, characteristics and benefits are available in models with 20, 15, 12 or 6 W of UV output. For applications requiring green nanosecond pulses at up to 20 W of average power, Talon's reliability, performance, ease of use, and excellent value are provided with the Talon 532-20. Each of these lasers features the same interface, footprint and ease of use, making scaling existing processes or bringing up a new one straightforward and convenient.

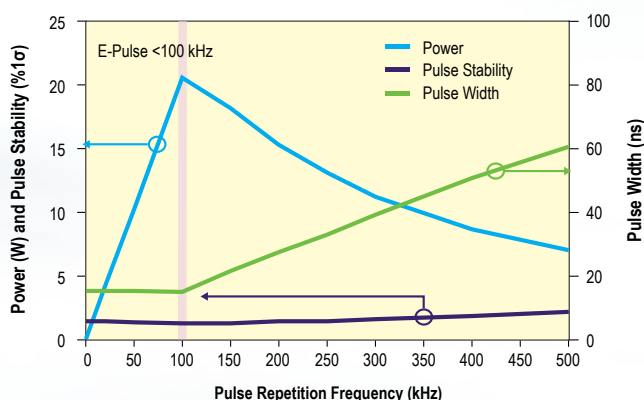
The laser can be remotely controlled via RS 232 or USB interface, and incorporates extensive on-board data logging of key parameters. Mode quality remains stable over the operating range, up to 500 kHz. The long life diodes, innovative optical and electronics design, and Spectra-Physics' experience in producing UV lasers for 24/7 applications make Talon a highly reliable laser for demanding applications.



### Applications

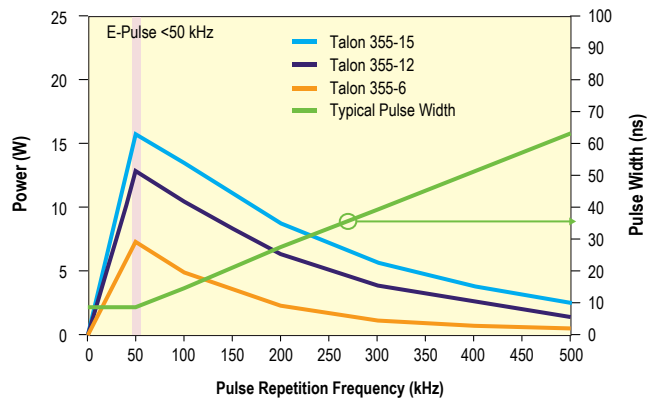
- PCB depaneling, cutting, and drilling
- Solar cell processing
- Silicon scribing
- Ceramic scribing
- ITO patterning
- Glass cutting

Typical Power and Pulse Stability – Talon 355-20<sup>1</sup>

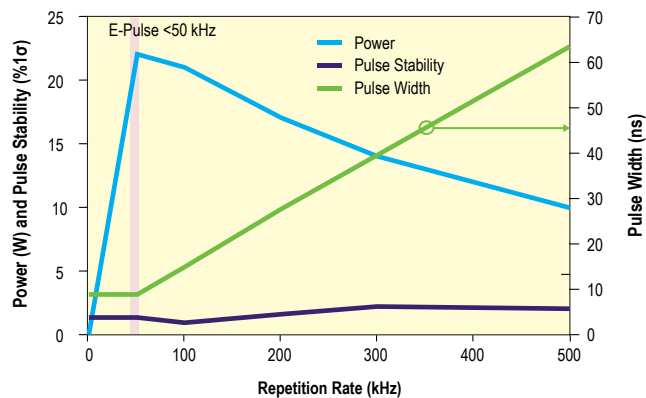


1. Typically measured performance; not a guaranteed or warranted specification.

## Typical Power and Pulse Stability – Talon 355-15, -12, -6<sup>1</sup>

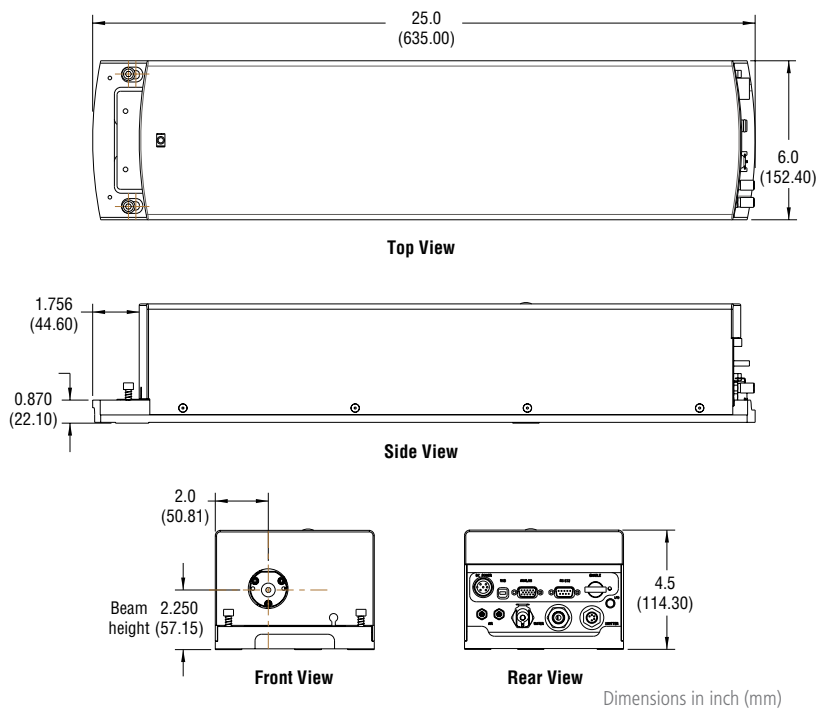


## Typical Power and Pulse Stability – Talon 532-20<sup>1</sup>

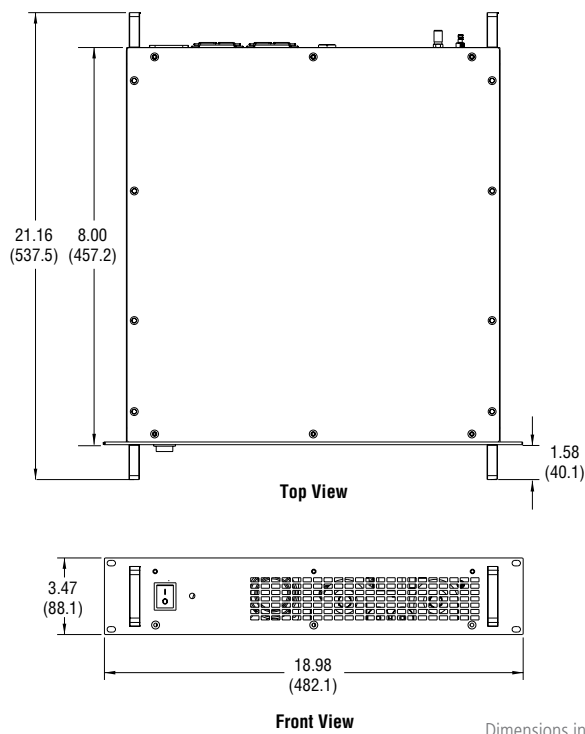


1. Typically measured performance; not a guaranteed or warranted specification.

## Talon Laser Dimensions



## Utility Module Dimensions



## Specifications<sup>1,2</sup>

	Talon 355-20	Talon 355-15	Talon 355-12	Talon-355-6	Talon-532-20
Output Characteristics					
Wavelength	355 nm	355 nm	355 nm	355 nm	532 nm
Power <sup>2, 3</sup>	10 W @ 50 kHz	15 W @ 50 kHz	12 W @ 50 kHz	6 W @ 50 kHz	20 W @ 50 kHz
	20 W @ 100 kHz	13 W @ 100 kHz	10 W @ 100 kHz	4 W @ 100 kHz	18 W @ 100 kHz
	11 W @ 300 kHz, typical	4 W @ 300 kHz, typical	3 W @ 300 kHz, typical	1 W @ 300 kHz , typical	13 W @ 300 kHz , typical
Repetition Rate	0 to 500 kHz				
Pulse Width	<25 ns @ 100 kHz				
Average Pulse-to-Pulse Stability	<2% @ 100 kHz, typical	<2% @ 100 kHz, typical	<2% @ 100 kHz, typical	<2% @ 50 kHz, typical	<2% @ 100 kHz, typical
	<3% to 300 kHz	<3% to 300 kHz	<3% to 300 kHz	<3% to 200 kHz	<3% to 300 kHz
	<5% to 500 kHz	<5% to 500 kHz	<5% to 500 kHz	<5% to 300 kHz, typical	<5% to 500 kHz
Beam Characteristics					
Spatial Mode	M <sup>2</sup> <1.2, TEM <sub>00</sub>				
Polarization Ratio	100:1 vertical				
Beam Diameter, at waist	3.5 mm ±10%	1.0 mm ±10%			
Beam Divergence (full angle)	<0.3 mrad	<0.6 mrad			<0.9 mrad
Beam Asymmetry (circularity)	<1.1 ( >90%)				
Boresighting Tolerance	<1 mm, <1 mrad				
Beam Pointing Stability <sup>4</sup>	<±10 μrad/°C				
Operating Conditions / Environmental Range					
AC Input	110/220 ±10% VAC, 50-60 Hz				
Warm-up Time	<20 min from standby <40 min from cold start				
Temperature Range	18 to 35°C operating; -20 to 50°C non-operating				
Altitude	0–3,000 m operating; 0–12,000 m non-operating				
Humidity	8–95%, non-condensing				
Water Cooling Requirements	20°C ±1°C, stable to ±0.2°C, 1.5 liter/minute minimum, 20 psi				
Thermal Load (to water)	<350 W	<300 W			
Total Power Consumption	<400 W	<300 W			
Physical Characteristics					
Dimensions (Laser) (L × W × H)	25 x 6 x 4.5 in (635 x 153 x 115 mm)				
Weight (Laser)	28 lbs (12.7 kg)				
Dimensions (Utility Module) (L x W x H)	19.6 x 19 x 3.5 in (498 x 482 x 88 mm)				
Weight (Utility Module)	22 lbs (10 kg)				
Features					
Optional Safety Shutter	Externally mounted for easy field service and customer replaceable				
Internal Power Monitor	May be calibrated against an external power meter				
E-Pulse™ Pulse Energy Control	Keeps pulse energy, pulse width, and beam parameters held constant over a wide range of repetition rates				
Data Log	Long term and short term recording for diagnostics and equipment maintenance				
CW Alignment Beam Mode	Lower power CW UV beam for installation and alignment in a tool				
Sacrificial Window	Customer replaceable to maintain power in harsh environments				
ALPS Optics Protection System	Maintains internal optics cleanliness for long term, reliable operation				
Precision Position Registration	Hardened steel receptacles for indexing pins for repeatable, precision alignment from unit to unit				

1. Due to our continuous product improvement, all specifications are subject to change without notice.

2. All specifications, except power, are at 100 kHz, unless otherwise noted.

3. Power specification and warranty is at 50 kHz and 100 kHz. Other values are for reference.

4. Pointing stability applies after 2 hour warm-up.