

# STP High Performances IR Triggered Microchip Series



## KEY FEATURES

- Ultra-short pulses down to 300ps
- Single-shot to 100kHz
- Multi-kW peak power
- Excellent beam quality
- Efficient, air-cooled
- Sealed package, extremely long life

For generating high peak power pulses of a few hundred picoseconds, microchip lasers are economical, compact, and reliable, within a sealed package ensuring incredibly long lifetime even in harsh industrial environment.

The triggered series offer the highest peak power and shortest pulses of the entire Microchip family. With these devices, the user is able to trigger pulse emission on demand from single-shot to 100kHz with the STP-100F.

## APPLICATIONS

- Instrumentation
  - Ranging
  - Differential absorption LIDAR
  - Super-continuum generation
  - Distributed temperature sensing
  - Raman spectroscopy
- Biophotonics
  - Micro-dissection of cells
  - Brain nanosurgery
  - Protein cross-linking

## TECHNICAL SPECIFICATIONS

	STP-40K-1x0	STP-07E-1x0	STP-10E-1x0 *	STP-100F-1x0 *
<b>Wavelength</b>	1064nm	1064nm	1064nm	1064 nm
<b>Maximum Repetition Rate <math>RR_{max}^{(1)}</math></b>	500Hz	4 kHz	4.5 kHz	100 kHz
<b>Constant Pulse width (FWHM) <math>^{(2)}</math></b>	[0.3;0.4]ns	<0.7ns	>8ns	<0.75 ns
<b>Output Energy</b>	>12 $\mu$ J	>7 $\mu$ J	$\geq$ 14 $\mu$ J	>0.75 $\mu$ J
<b>Peak Power</b>	>30kW	>10kW	>1kW	>1kW
<b>PCD<math>^{(3)}</math></b>	<160 $\mu$ s	<70 $\mu$ s	<100 $\mu$ s	<70 $\mu$ s
<b>PCD jitter</b>	< $\pm$ 1.5 $\mu$ s	< $\pm$ 1.5 $\mu$ s	< $\pm$ 1.5 $\mu$ s	< $\pm$ 1.5 $\mu$ s
<b>Short term (10min) power stability<math>^{(4)}</math></b>	< $\pm$ 1%	< $\pm$ 1%	< $\pm$ 1%	< $\pm$ 2%
<b>Long term (6 hrs) power stability<math>^{(4)}</math></b>	< $\pm$ 3%	< $\pm$ 3%	< $\pm$ 3%	< $\pm$ 5%
<b>Spectral properties</b>	Single Longitudinal Mode	Single Longitudinal Mode	Single Longitudinal Mode	Single Longitudinal Mode
<b>Beam profile</b>	Gaussian TEM00	Gaussian TEM00	Gaussian TEM00	Gaussian TEM00
<b>Full angle divergence Horizontal@1/e<math>^2</math></b>	15 $\pm$ 2mrad	13 $\pm$ 5mrad	4.3 $\pm$ 0.5mrad	10 $\pm$ 2mrad
<b>Vertical@1/e<math>^2</math></b>	15 $\pm$ 2mrad	13 $\pm$ 5mrad	4.3 $\pm$ 0.5mrad	9 $\pm$ 2mrad
<b>M<math>^2</math><math>^{(5)}</math></b>	<1.3	<1.3	<1.2	<1.3
<b>Beam ellipticity<math>^{(6)}</math></b>	<1.1	<1.3	<1.2	<1.3
<b>Main Lobe Gaussian Fit <math>^{(7)}</math></b>	N/A	N/A	N/A	N/A
<b>Polarization</b>	Linear PER>20dB	Linear PER>20dB	Linear PER>20dB	Linear PER>20dB
<b>Package dimensions</b>	144x42x36mm	144x42x36mm	144x42x36mm	144x42x36mm
<b>Package weight</b>	300g	300g	300g	300g
<b>Options (table p3)</b>	0,1,2,3,4,F,M	0,1,2,3,4,F,M	0,1,2,F,M	0,1,2,3,F,M
<b>Options included</b>	S	S	S	S

- The specifications will be confirmed after the Beta phase only. For the moment, the specifications are preliminary, which means that the final laser parameters might be different than the current specifications.

### NOTES

- (1) See options p3
- (2) Measured with 1Ghz photodiode and 1GHz/10GS/s oscilloscope.
- (3) PCD = Pulse Creation Delay, the delay between the trigger command and the effective pulse firing
- (4) For temperature variation  $\leq \pm 3^\circ\text{C}$  and  $< 3^\circ\text{C}/\text{hour}$ , stability is measured with calorimeter – detector band [DC, 2Hz]
- (5) Mean average value  $M = \sqrt{(XY)}$ , X and Y being respectively the major and minor axis of the ellipse
- (6) Beam ellipticity is calculated as the ratio of the main axis far field divergence
- (7) Measurement performed in the far field with a WincamTD-U series camera

## COMPLEMENTARY INFORMATION & OPTIONS

Environment Parameters	
Operating Temperature Range	0-50°C; 15-35°C for STP-10E-1x0
Maximum Laser Head Baseplate Temperature	50°C
Maximum Power Consumption	<40W
Laser Head Thermal Dissipation	<15W
Storage Temperature	0-50°C
Shock of 11ms according to IEC 68-2-27, non operating	25g
Vibration 5Hz to 500Hz sinusoidal according to IEC 68-2-6	2g

Certification	
Laser classification according to IEC 60825-1:2007	3B
CDRH	Yes, if used with a MLC-03A-DP1 or -DP2 controller
RoHS	Yes

Options	
Fixed Repetition Rate = $RR_{max}$	-10x version
Fixed Repetition Rate $\neq RR_{max}$	-11x version ; RR to be chosen over 10Hz- $RR_{max}$
External Variable Repetition Rate	-12x version ; single shot to $RR_{max}$ , 1 optimized RR value; <i>exception for the STP-100F-1x0 laser: tunability possible in the [RR-10%;RR] range only</i>
External Variable Multi-Repetition Rate	-13x version ; single shot to $RR_{max}$ , 3 optimized RR values; <i>exception for the STP-100F-1x0 laser: tunability possible in the [RR-10%;RR] range only for each RR</i>
External Continuous Variable Repetition Rate	-14x version ; optimized over [10Hz- $RR_{max}$ ] if $RR_{max} \leq 2\text{kHz}$ ; or [10Hz - 2kHz] if $RR_{max} > 2\text{kHz}$ ; <i>not available for the STP-100F-1x0</i>
Multimode fibering (M)	Contact factory for availability
Single mode fibering (F)	Contact factory for availability
Collimation (C)	Contact factory for availability
Synchronization output (S)	TTL compatible output signal for synchronization/monitoring

Available Controller Types				
Model for the STP-100F-1x0	Model for the other STP lasers	Type	Input Power	CDRH
MLC-03A-DP2	MLC-03A-DP1	Desktop	100-240 V AC	Yes
MLC-03A-MP2	MLC-03A-MP1	Module	12 V DC	No
MLC-03A-BP2	MLC-03A-BP1	Board	12 V DC	No

# CDRH LASER HEAD MECHANICAL DRAWINGS: STP LASERS

