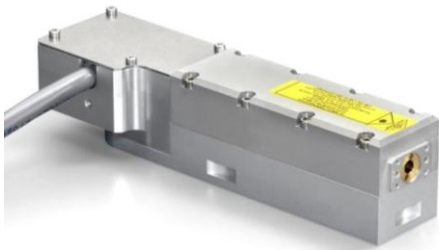


# STP High Performances IR Triggered Microchip Series



## 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



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## TECHNICAL SPECIFICATIONS

|   | New!<br>Preliminary specs |                          | New!<br>Preliminary specs | New!                     |
|---|---------------------------|--------------------------|---------------------------|--------------------------|
|   | STP-40K-1x0               | STP-07E-1x0              | STP-10E-1x0               | STP-100F-1x0             |
| <b>Wavelength</b>   | 1064nm                    | 1064nm                   | 1064nm                    | 1064 nm                  |
| <b>Maximum Repetition Rate RR<sub>max</sub><sup>(1)</sup></b> | 500Hz                     | 4 kHz                    | 4.5 kHz                   | 100 kHz                  |
| <b>Constant Pulse width (FWHM)<sup>(2)</sup></b>              | [0.3;0.4]ns               | <0.7ns                   | >8ns                      | <0.75 ns                 |
| <b>Output Energy</b>  | >12 μJ                    | >7 μJ                    | ≥14 μJ                    | >0.75 μJ                 |
| <b>Peak Power</b>   | >30kW                     | >10kW                    | >1kW                      | >1kW                     |
| <b>PCD<sup>(3)</sup></b>                                      | <160μs                    | <70μs                    | <100μs                    | <70μs                    |
| <b>PCD jitter</b>   | <±1.5μs                   | <±1.5μs                  | <±1.5μs                   | <±1.5μs                  |
| <b>Short term (1min) power stability<sup>(4)</sup></b>        | <±1%                      | <±1%                     | <±1%                      | <±2%                     |
| <b>Long term (6 hrs) power stability<sup>(4)</sup></b>        | <±3%                      | <±3%                     | <±3%                      | <±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<sup>2</sup></b>       | 15±2mrad                  | 13±5mrad                 | 4.3±0.5mrad               | 10±2mrad                 |
| <b>Vertical@1/e<sup>2</sup></b>                               | 15±2mrad                  | 13±5mrad                 | 4.3±0.5mrad               | 9±2mrad                  |
| <b>M<sup>2</sup><sup>(5)</sup></b>                            | <1.3                      | <1.3                     | <1.2                      | <1.3                     |
| <b>Beam ellipticity<sup>(6)</sup></b>                         | <1.1                      | <1.3                     | <1.2                      | <1.3                     |
| <b>Main Lobe Gaussian Fit<sup>(7)</sup></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                        |

### 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 < ± 3°C and < 3°C/hour, stability is measured with calorimeter – detector band [DC, 2Hz]  
(5) Mean average value M = √(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 $RR_{max} \leq 2kHz$ ; or [10Hz - 2kHz] if $RR_{max} > 2kHz$ ; <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

