

# STx High Performances Triggered Microchip Series



## KEY FEATURES

- Ultra-short pulses down to 350ps
- 1064nm, 532nm, 355nm and 266nm
- 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. Visible and UV wavelength are generated from the harmonic conversion of an IR passively Q-switched Nd:YAG microchip engine, 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, and span the full wavelength spectrum down to 266nm. With these devices, the user is able to trigger pulse emission on demand from single-shot to 4kHz and 100kHz for 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

**New!**

|                                                                    | STP-07E-1x0     | STP-100F-1x0    | STG-03E-1x0     | STV-01E-1x0     | STV-02E-1x0 <sup>(9)</sup> | STU-01E-1x0     |
|--------------------------------------------------------------------|-----------------|-----------------|-----------------|-----------------|----------------------------|-----------------|
| <b>Wavelength</b>                                                  | 1064nm          | 1064 nm         | 532nm           | 355nm           | 355nm                      | 266nm           |
| <b>Maximum Repetition Rate</b><br>RR <sub>max</sub> <sup>(1)</sup> | 4 kHz           | 100 kHz         | 4 kHz           | 4 kHz           | 4 kHz                      | 4 kHz           |
| <b>Constant Pulse width (FWHM)</b> <sup>(2)</sup>                  | <0.7ns          | <0.75 ns        | <0.5ns          | <0.4ns          | <0.6ns                     | <0.4ns          |
| <b>Output Energy</b>                                               | >7 μJ           | >0.75 μJ        | >3 μJ           | >1 μJ           | >2 μJ                      | >1 μJ           |
| <b>Peak Power</b>                                                  | >10kW           | >1kW            | >6kW            | >2.5kW          | >4kW                       | >2kW            |
| <b>PCD</b> <sup>(3)</sup>                                          | <70μs           | <70μs           | <70μs           | <100μs          | <100μs                     | <100μs          |
| <b>PCD jitter</b>                                                  | <±1.5μs         | <±1.5μs         | <±1.5μs         | <±1.5μs         | <±1.5μs                    | <±1.5μs         |
| <b>Short term (1min) power stability</b> <sup>(4)</sup>            | <±1%            | <±2%            | <±1%            | <±2%            | <±2%                       | <±2%            |
| <b>Long term (6 hrs) power stability</b> <sup>(4)</sup>            | <±3%            | <±5%            | <±3%            | <±5%            | <±5%                       | <±5%            |
| <b>Beam profile</b>                                                | Gaussian TEM00  | Gaussian TEM00  | Gaussian TEM00  | Gaussian TEM00  | Gaussian TEM00             | See note (8)    |
| <b>Full angle divergence</b>                                       |                 |                 |                 |                 |                            |                 |
| <b>Horizontal @1/e<sup>2</sup></b>                                 |                 |                 |                 |                 |                            | 11.5±2mrad      |
| <b>Vertical @1/e<sup>2</sup></b>                                   | 13±5mrad        | 10±2mrad        | 10±2mrad        | 11±2mrad        | 11±2mrad                   | 0.65±0.25mrad   |
| <b>M<sup>2</sup>(5)</b>                                            | 13±5mrad        | 9±2mrad         | 9±2mrad         | 7±2mrad         | 7±2mrad                    | <1.4            |
| <b>Beam ellipticity</b> <sup>(6)</sup>                             | <1.3            | <1.3            | <1.3            | <1.3            | <1.3                       | N/A             |
| <b>Main Lobe Gaussian Fit</b> <sup>(7)</sup>                       | <1.3            | <1.3            | <1.3            | <1.3            | <1.3                       | >85%            |
| <b>Polarization</b>                                                | Linear PER>20dB | Linear PER>20dB | Linear PER>20dB | Linear PER>20dB | Linear PER>20dB            | Linear PER>20dB |
| <b>Package dimensions</b>                                          | 144x42x36mm     | 144x42x36mm     | 144x42x36mm     | 186x60x36mm     | 186x60x36mm                | 210x60x36mm     |
| <b>Package weight</b>                                              | 300g            | 300g            | 300g            | 500g            | 500g                       | 500g            |
| <b>Options (table p3)</b>                                          | 0,1,2,3,4,F,M   | 0,1,2,3,4,F,M   | 0,1,2,3,4       | 0,1,2,3,4,C     | 0,1,2,3,4,C                | 0,1,2,3,4,C     |
| <b>Options included</b>                                            | S               | S               | S               | S               | S                          | S               |

(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  $M = \sqrt{XY}$ , 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

(8) Beam exhibits different profile in horizontal (Gaussian) and vertical ((sin x / x)<sup>2</sup> in far-field) plans

(9) Contact factory for availability

## COMPLEMENTARY INFORMATION & OPTIONS

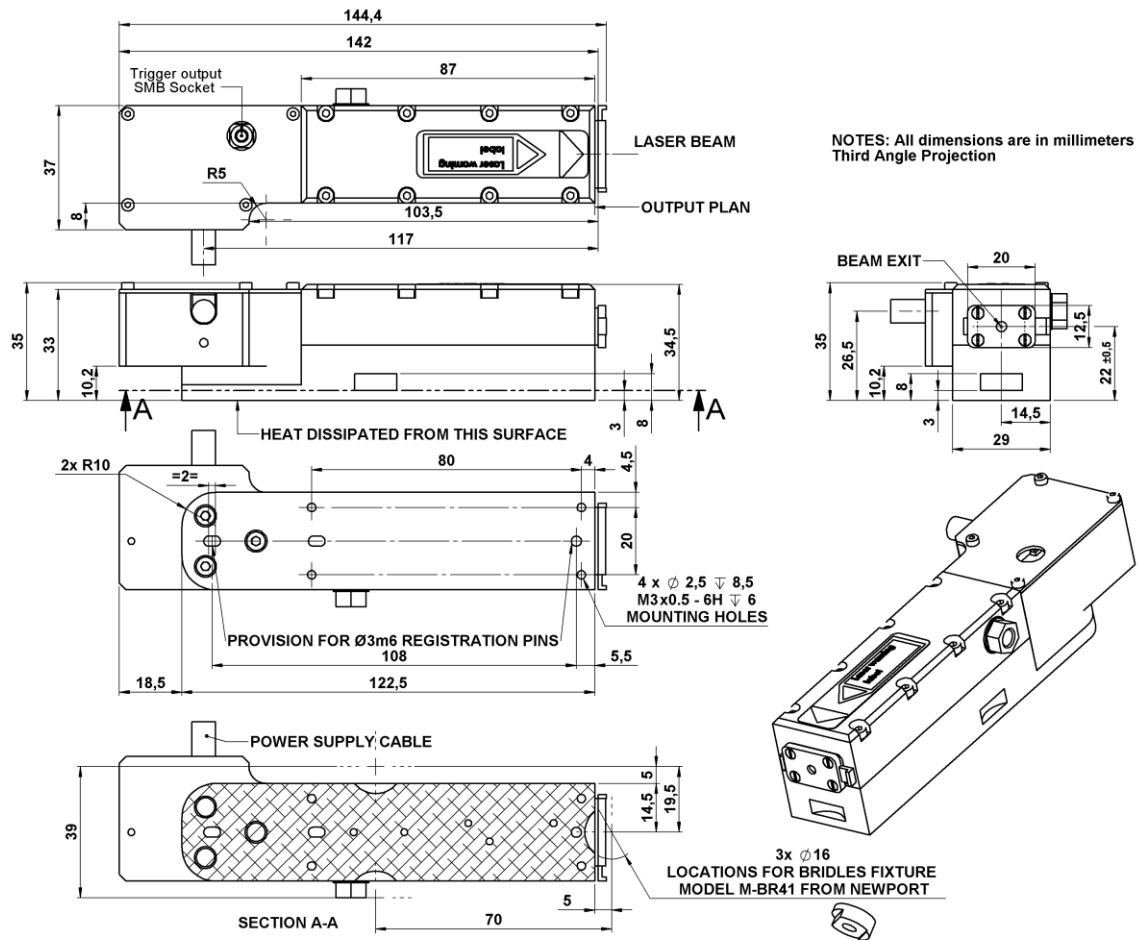
| Environment Parameters                                    |                                                   |
|-----------------------------------------------------------|---------------------------------------------------|
| Operating Temperature Range                               | 0-50°C for STP and STG<br>15-35°C for STV and STU |
| Maximum Laser Head Baseplate Temperature                  | 50°C for STP and STG<br>40°C for STV and STU      |
| 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 Except STU-01E : 4               |
| CDRH                                               | Yes, if used with a -DP1 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  |
| External Variable Multi-Repetition Rate      | -13x version ; single shot to $RR_{max}$ , 3 optimized RR values |
| External Continuous Variable Repetition Rate | -14x version ; optimized over [10Hz; 2kHz] range                 |
| Multimode fibering (M)                       | Contact factory for availability                                 |
| Single mode fibering (F)                     | Contact factory for availability                                 |
| Collimation (C)                              | With collimated beam                                             |
| Synchronization output (S)                   | TTL compatible output signal for synchronization/monitoring      |

| Available Controller Types |         |              |      |
|----------------------------|---------|--------------|------|
| Model                      | Type    | Input Power  | CDRH |
| MLC-03A-DP1                | Desktop | 100-240 V AC | Yes  |
| MLC-03A-MP1                | Module  | 12 V DC      | No   |
| MLC-03A-BP1                | Board   | 12 V DC      | No   |

# CDRH LASER HEAD MECHANICAL DRAWINGS: STP-07E-1X0, STG-03E-1X0



# CDRH LASER HEAD MECHANICAL DRAWINGS: STV-01E-1X0, STV-02E-1X0

