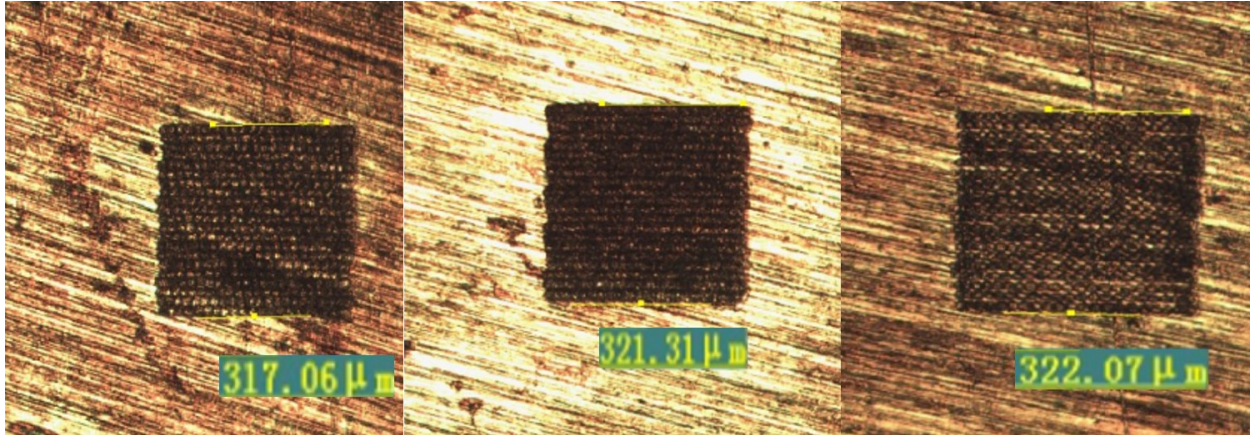


# Sapphire Marking

Utilizing Photonics Industries' SN Series Sub-Nanosecond Laser



## Sample Information

The material type is sapphire. The specific thickness of the sapphire plate is 0.35mm.

The sub-nanosecond laser marking follow a 0.30mm square matrix formation with line spacing equal to the pulse spacing. The sample has high temperature tolerance, is translucent, and has high hardness.

## System Information

Laser Source: SN 532-40

Wavelength: 532nm

Power: 40W

Processing Equipment: Beam Expander 10x, F-Theta Lens Linos 100mm, Scanning Galvanometer setup

## Test Data

Power range used on sample:

0.5W to ~2.5W

Optimal parameters for marking ranged from:

Frequency of 50-20kHz, 50-100% PEC (Pulse Energy Control), Scanning Speed set to 100-400mm/s, Processing times equal to one, and to ensure optimal matrix marking, power level set to <1W.



# SN Series Sub-Nanosecond Lasers

Available in the Infrared, Green, and Ultraviolet wavelengths.

## Broadest range of Sub-ns Lasers fulfilling high intensity needs in the ps through ns pulse widths...

Photronics Industries' SN Series sub-nanosecond lasers provide the industry with the broadest product selection in the sub-nanosecond range (~50ps to 5ns). SN Series lasers are used in a variety of applications, differing in the market through its ability to fulfill high intensity (brightness/peak power), high power needs for sub-ns pulse widths.

Ranging from nanosecond to picosecond, the flexibility in pulse energy in relation to repetition rate allows the SN Series sub-nanosecond lasers to be the ideal choice for scientific applications, like LIDAR or Bathymetry, and industrial applications in material processing, like micromachining, diverting from conventional techniques restricted to a purely nanosecond or picosecond range.



## Features

- High power sub-nanosecond laser:  
Up to 100 W for IR
- Specifiable pulse width:  
From ~50 ps to 5 ns
- High pulse energy:  
Up to 3 mJ for IR
- Small and ideally compact, rugged, All-in-One sub-nanosecond laser
- High repetition rates:  
Single shot up to 8 MHz
- Diode-pumped technology
- Excellent TEM<sub>00</sub> beam:  
Typical M<sup>2</sup> ≤ 1.3
- Very low jitter:  
< 500 ps
- Exceptional and Versatile Pulse Control:  
PEC (Power or Pulse Energy Control)  
POD (Pulse on Demand) allowing for specifiable sequence of pulses
- Available in both air-cooled and water-cooled versions

## Applications

- Metal, Ceramic, Glass, & Sapphire - Cutting, Drilling, Marking, Ablation
- Solar Cells (PERC, CIGS, etc.) - Scribing, Patterning
- LED Substrates, Low K wafers - Scribing, Dicing
- PCB & FPCB Processing
- Intra-glass, Subsurface - Processing, Marking
- Indium Tin Oxide (ITO) - Processing, Patterning
- Via hole drilling
- Bathymetry CZMIL
- LIDAR
- Cryosphere & Biomass Measurements

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