

## WHY MKS?

### CRITICAL TECHNOLOGIES

World-class technology and development capabilities for leading-edge processes



### PROVEN PARTNER

Recognized leader delivering innovative, reliable solutions for our customers' most complex problems



### OPERATIONAL EXCELLENCE

Consistent execution across all aspects of our business



### COMPREHENSIVE PORTFOLIO

Largest breadth of product and service solutions for the markets we serve



#### MKS|ESI Japan

Moriichi Building 2F  
14-3 Takabashi, Koto-ku  
Tokyo, 135-0005 Japan  
Phone: +81.3.5625.5100  
Fax: +81.3.5625.5229  
MKS|ESI Division Headquarters

#### ESI World Headquarters

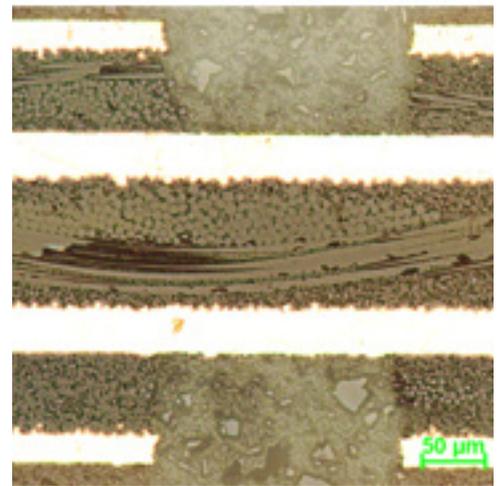
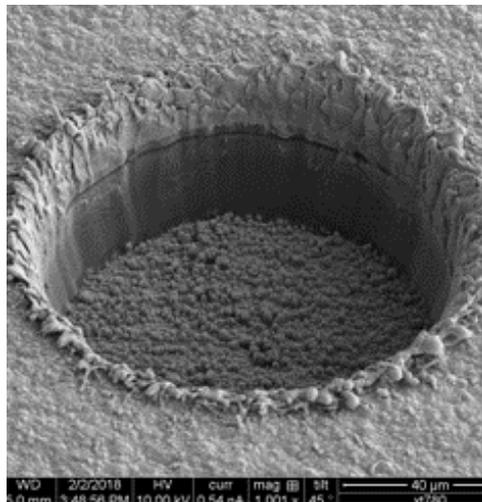
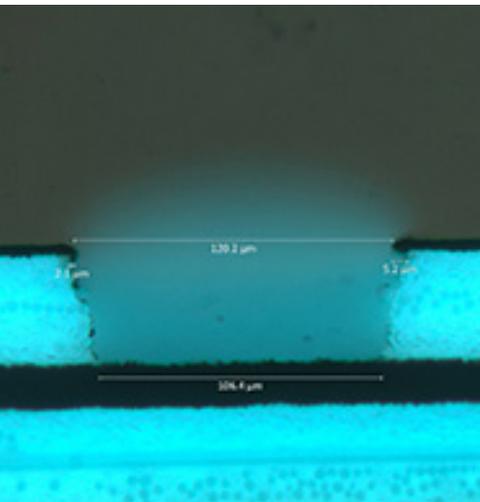
14523 SW Millikan Way  
Beaverton, OR 97005 USA  
Toll-Free: 833-374-5273  
Phone: 503.641.4141  
esi.info@mksinst.com

**ESI** is a brand within the MKS Instruments Photonics Solutions Division. ESI systems deliver market-leading solutions for Flexible PCB laser processing, high-speed MLCC testing, and CO<sub>2</sub>-laser-based systems for HDI PCB and IC substrate manufacturing. ESI solutions help manufacturers optimize production of the materials, components and systems that are an integral part of the electronic devices in use today. They deliver greater flexibility and a higher degree of processing control, enabling customers to incorporate a wider range of materials into their production processes. The result is higher production quality, increased throughput and higher yields at a lower total cost of ownership. For more information, visit [www.esi.com](http://www.esi.com).

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# ELEVATE YOUR PRODUCTION

DELIVER COMPONENTS THAT ENABLE  
THE NEXT GENERATION OF DEVICES

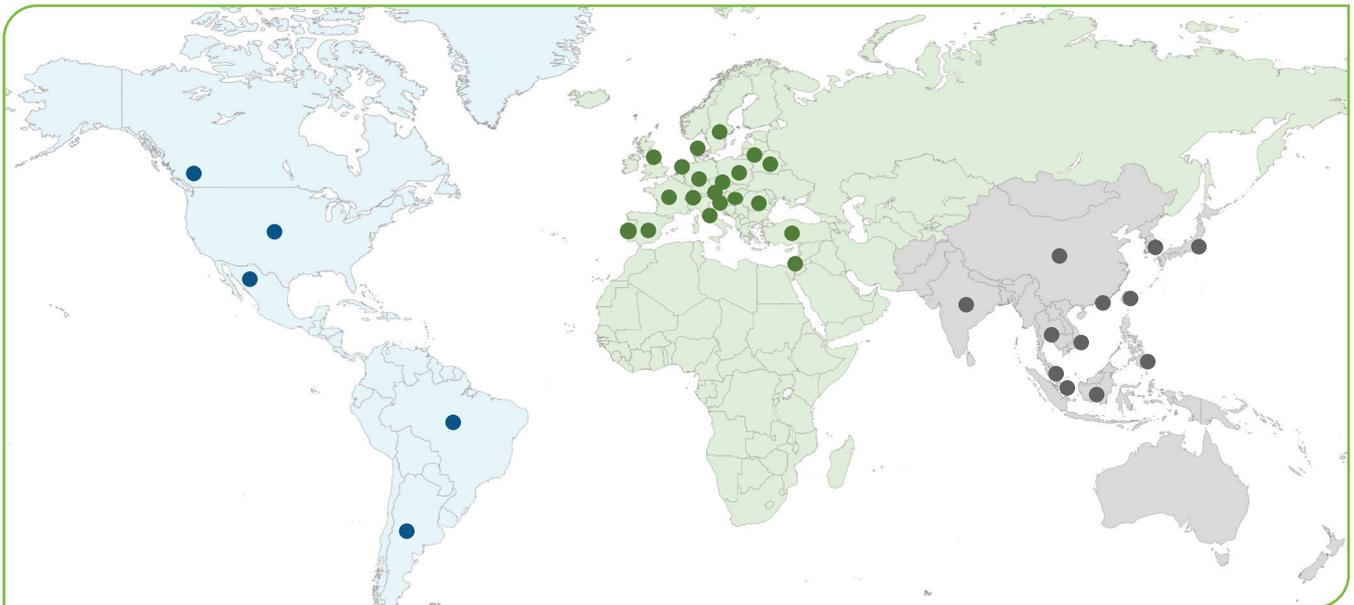


# PRECISION AND ACCURACY TO DRIVE INNOVATION AND OPTIMIZE PRODUCTION

Innovation continues to drive the market for technology products. The primary challenges manufacturers face are related to processing materials and components at an ever-smaller scale and at ever-higher levels of precision.

ESI is a brand within the MKS Instruments Photonics Solutions Division. ESI systems deliver market-leading solutions for Flexible PCB laser processing, high-speed MLCC testing, and CO<sub>2</sub>-laser-based systems HDI PCB and IC substrate manufacturing. ESI solutions help manufacturers optimize production of the materials, components, and systems that are an integral part of the electronic devices in use today. They deliver greater flexibility and a higher degree of processing control, enabling customers to incorporate a wider range of materials into their production processes.

## Global Support, Collaboration and Training



## Stronger Together with Resources to Accelerate your Roadmap



## FLEX PCB LASER SYSTEMS

### Via drilling solutions to meet the evolving challenges faced in flexible PCB fabrication

As a leading provider of flex laser via drilling solutions, MKS applies decades of innovation and laser processing expertise to the challenges faced by customers focused on optimizing their production capabilities and lowering production costs.

#### Flex Applications

- Blind via drilling (BHV)
- Through via drilling (THV)
- Routing
- Patterning
- Skiving
- Cover overlay routing

### CAPSTONE™ FLEX PCB LASER DRILL SYSTEM

#### Increase throughput up to 2X & reduce overall processing costs by up to 30%

As a part of MKS' market-leading family of flex PCB processing systems, CapStone™ leverages laser technology, fluence control and beam positioning. This combination delivers the fastest blind via processing times in the industry and enables FPC processors to process a wider range of materials at high yields and high productivity with minimum process development and maximum uptime.



### 5335™ FLEX PCB LASER DRILL SYSTEM

#### High productivity laser via drilling and laser micromanufacturing

The 5335™ is a perfect flex PCB laser processing solution for leading-edge flex circuit manufacturing customers. Now in service at the leading flex PCB manufacturing companies, the 5335 laser via drilling machine is a good fit for customers requiring production-oriented flex PCB via drilling for PCB laser processing.



### REDSTONE™ FLEX PCB LASER PROCESSING SYSTEM

#### Easily address most flex and rigid-flex PCB processing needs

RedStone™ flex PCB laser system is ideal for processing applications that can be developed with large process windows. Large process window applications examples include through-cut routing, through via applications, larger blind vias on robust flex materials and removing easily-ablated materials from a durable substrate.



## ESI REDSTONE XP™ FLEX PCB LASER PROCESSING SYSTEM

### Increase your yield for challenging depth-limited processes using Precision Pulse™ power control

The RedStone XP™ flex PCB laser system adopts proven design innovations from our premier products to deliver the ideal FPC processing solution for job shops facing significant product mix uncertainty. Process blind and through vias, rout and skive coverlay and thin printed circuit boards at high speeds and yields using ESI's compound beam positioning and patented Precision Pulse™ technology.



## LODESTONE™ FLEX PCB LASER PROCESSING SYSTEM

### Efficient laser cutting of coverlay and flexible circuits

The LodeStone™ flex PCB laser system is a more accurate and flexible processing alternative for the efficient cutting and drilling of flexible materials. Its short pulse-width femtosecond laser results in low levels of carbonization and minimal heat-affected zones, delivering the exceptional accuracy and tight tolerances required by processors driving new solutions to market.



## ROLLMASTER PLUS™ MATERIAL AUTOMATION

### Maintain high-volume manufacturing with flex PCB materials

RollMaster Plus™ by Northfield Automation extracts maximum performance out of your ESI flexible circuit laser drilling tools. Reduce your cycle time with RollMaster Plus' high-speed web indexing. Its responsive ultra-light dancer design avoids web wrinkle and reduces web distortion with even your thinnest flexible circuit materials. Air turn bars enable no-touch, no-damage motion even at the highest speeds and acceleration.



# HDI & IC SUBSTRATE LASER SYSTEMS

High-volume manufacturing of PCBs requires blind (BHV) and through-hole (LTH) via processing; these vias are typically created with laser drills, which offer fast, reliable, and cost-effective processing at a miniaturized scale. MKS' PCB laser drill systems enable manufacturers to drill vias in a broad range of copper-clad base materials such as glass-woven reinforced epoxy resins (FR4) or other specialty materials. Our solutions are engineered to provide great reliability at high-quality output with the industry's lowest cost of ownership.

## Applications

- PCB Manufacturing
- Integrated circuit packaging
- Substrate processing
- System level packaging
- FCBGA-IC Substrate

## GEODE™ PCB LASER DRILL

**Laser processing and engineering expertise that delivers breakthrough levels of productivity and yield**

MKS' most advanced HDI microvia drilling solution for precision processing of your HDI, SLP and ICP applications. The Geode™ laser drilling system combines a powerful CO2 laser with a set of control capabilities that leverage MKS' decades of laser-material interaction experience and application expertise to help you innovate and stay ahead.



## GEODE™ A PCB LASER DRILL

**The industry's most Innovative CO2 via drilling system powered by quasi-continuous wave laser and AOD technology for maximum performance**

The Geode™ A PCB laser drill combines special laser/optics configuration with precision pulse shaping and steering specifically designed for ABF materials. Geode's technology enables a greener manufacturing solution through 21% less floor space 72% less weight and up to 65% less power consumption than the competition. The combination of QCW laser and AOD technology also ensures highest throughput and lowest cost of ownership for our customers.



# MLCC TESTING SOLUTIONS

## High-Volume MLCC Testing Systems From a Technology Pioneer in MLCC Test

To stay competitive, industry-leading manufacturers of multi-layer ceramic capacitors (MLCCs) require testing solutions that provide high throughput, high reliability and high precision. The ESI MLCC testing systems deliver all three. Incorporating technologies pioneered by ESI, the Allegro™ line of MLCC testing systems sets the standard.

### ALLEGRO™ MLCC TESTING SYSTEM

#### High-Throughput MLCC Testing

Allegro performs high-throughput production-level electrical testing of (MLCC) and is designed to meet the testing challenges faced by MLCC manufacturers. Allegro allows customers to verify quality and ensure accurate specifications for MLCCs used in a variety of applications, in the manufacture of high-quality printed circuit boards used in nearly every type of electronic device.



### ALLEGRO XP™ MLCC TESTING SYSTEM

#### Ultra-High Throughput MLCC Testing of Large Chips

With its unique 8-track testing configuration, Allegro XP performs production-level electrical testing of larger size multi-layer ceramic capacitors—in a range of 0603 (1608 metric) to 1210 (3225 metric)—at productivity rates of up to one million parts per hour: the highest testing throughput in the industry.



# GLOBAL SUPPORT & SERVICES

Worldwide service reach to maximize up-time and better leverage your investment

Service is provided by the world's largest, most experienced laser via drilling Field Service team. Over 30 years of experience supporting the world's leading products in the PCB manufacturing and MLCC testing industries.

Backed by the

**ESI** Confidence Service Program



**Quality Service**

We ensure our customers are delighted with our services. Customer experience scores are tracked, measured, responded to and improved continuously.



**Updates and Improvements**

We ensure customer systems have current updates as product improvements are implemented.



**Certified FSEs**

Trained Field Service Personnel with over 30 years of experience supporting products in our industry.



**Coverage Plans**

Coverage plans available to support your operational requirements.



**HVM Support**

Tailored service plans that provide uptime assurance for our High-Volume Manufacturing customers.



**Performance Management**

Communication and performance management tailored to your business.



**Trusted Partner**

Our technicians are trained to be compliant with customers IP protection policies.



**Application Services**

Application services available to optimize system performance or expand application capabilities.

