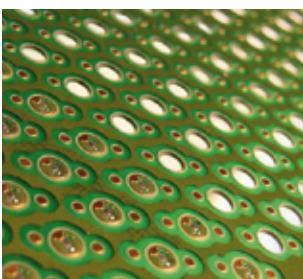
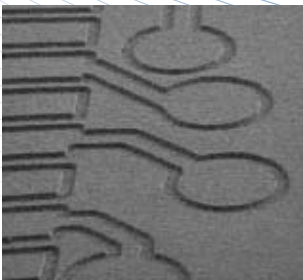


Laser Micromaterial Processing

LPKF ProtoLaser U



- Cutting rigid, rigid-flex and flexible materials
- Drilling and cutting ceramics
- Reworking printed circuit boards
- TCO/ITO structuring
- LTCC cutting



The Multipurpose Tool for Micromaterial Processing

One system. Many applications. That's laser technology. What was previously only possible using large industrial systems, can now be done with a compact system, the LPKF ProtoLaser U. The integrated UV laser is able to process almost all types of material. It is also easy to install, and very simple to operate – a great R & D team member with an affordable price.

The Faster Route to Products

The ProtoLaser U showcases how fast applications can be processed. A UV laser beam, for instance, eliminates physical stress to the board or components and can precisely depanel separate PCBs from a large panel array. Beyond depaneling, the system can be used for cutting LTCC and prepregs, drilling holes and microvias, and for opening up solder resists. The high pulse energy of the UV laser ablates without leaving any residues – to create geometrically precise contours. Converting the system to produce different products couldn't be easier: just load the new project file and the ProtoLaser U is ready for action – that's maximum flexibility laser-style!

Broad Spectrum of Materials

Ceramics, LTCC (Greentape), FR4, protective films and metal foils, or flex and rigid-flex materials: the LPKF ProtoLaser U processes a whole range of materials quickly, cleanly and precisely. Tooling costs are a thing of the past. The ProtoLaser U operates using a non-contact process.

Sophisticated Laser Technology

LPKF bundles expertise in laser technology and laser-based material processing. Its sophisticated machines are a product of over 30 years experience in the manufacture of small and large scale production systems.

Broad Application Spectrum

Cutting

The ProtoLaser U cuts numerous different materials: stress-free, with flexible contours, assembled or unassembled. The precisely focused laser beam produces very clean edges – and the laser ablated material evaporates in a fraction of a second, leaving no residues. It can score or cut through single layers or thin compound materials.



Precision cutting of assembled or unassembled materials – even with complex shapes: ceramics, polyimide and FR4.

Drilling

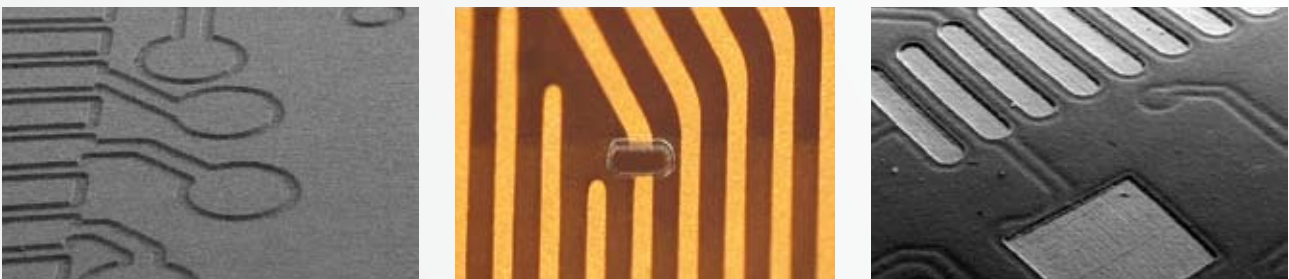
The laser beam in the ProtoLaser U can drill holes or microvias with a minimum diameter of only 50 μm in HDI boards. The laser beam cuts through the copper layer first, followed by the substrate made of epoxy resin and fiberglass. The ProtoLaser U controls the energy so precisely during the process that the interior layer is only slightly roughened.



The LPKF ProtoLaser U produces excellent results when structuring 50 μm microvias or holes in HF material or FR4.

Structuring

The LPKF ProtoLaser U is ideal for structuring metallic and organic resists. The precisely regulated power of the laser beam produces ultra fine structures with the highest levels of accuracy. It also opens up solder resists and protective films.



A multitasking tool: the ProtoLaser U structures etching resists (e. g. chemical tin) for ultra fine conductors, is perfect for further processing PCBs, and opens up solder resists without photo masks.

LPKF ProtoLaser U



Invisible in use: ITO structures on glass only become visible by breathing on the surface.



- Simple job preparation
- Quiet and compact
- Multifunctional applications

Simple Operation

This is the paradigm guiding the development of all LPKF laser systems and software interfaces. LPKF CircuitCAM software quickly and simply converts all standard layout data formats into production data. It takes just one push of a button to operate the LPKF ProtoLaser U – process parameters are already loaded for numerous applications. Administrator mode gives full control of all the system settings.

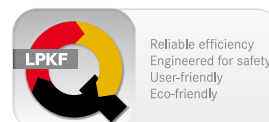
Compact and Safe

The compact ProtoLaser U was developed having high operational safety in mind. The laser switches off automatically when the machine hood is opened; preventing any accidents that could occur. The system has the highest possible laser safety rating of Class 1 while operating.

Mini Series and Prototypes

Besides outstanding flexibility, the ProtoLaser U is characterized by an effective production process. The laser is automatically adjusted for optimal focus, and a camera uses fiducials to locate the position of the workpiece. The integrated vacuum table safely holds down even flexible and thin substrates.

Therefore, the LPKF ProtoLaser U is the recommended system for small batches, allowing for production on demand.



Technical Data: LPKF ProtoLaser U

Max. layout area	229 x 305 x 10 mm (9" x 12" x 0.4")
Laser wavelength	355 nm
Power	4 W
Beam diameter in focus	20 µm (0.8 mil)
Resolution scan field	2 µm (0.08 mil)
Repeatability	± 2 µm (± 0.08 mil) ^a
Machine dimensions (W x H x D)	875 mm x 1,430 mm x 750 mm (34.5" x 56.3" x 29.5") ^b
Machine weight	260 kg (573 pounds)
Operation environment specifications	
Electric supply	110/230 V, 50-60 Hz, 1.4 kW
Cooling	Air cooled (internal cooling cycle)
Ambient temperature	22 ± 2 °C (68 °F ± 4 °F)
Additional accessories required	Exhaust unit, PC
Hardware and software specifications	Microsoft® Windows® 2000/XP, 700 MHz processor or higher, min. 512 MB RAM (1 GB recommended), screen resolution min. 1024 x 768 pixels, USB 2.0

a This value reflects direct repeated movements of the laser beam

b Height with open working door 1,730 mm (68.1")



In normal operation, the system is classified as a Class 1 laser product.

In maintenance mode, it is classified as a Class 4 laser product.

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