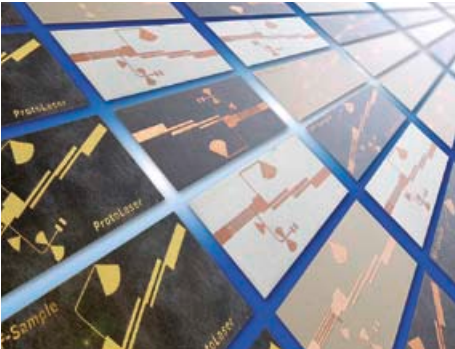


The Next Generation of In-House Prototyping
LPKF ProtoLaser S





PCBs at the Press of a Button

Getting your hands on prototype PCBs quickly is a crucial advantage in electronics development. This is what the new LPKF ProtoLaser S is all about. The laser system opens up a new dimension in in-house prototyping: it transfers the layout onto the PCB with unprecedented speed and precision – easily and with no chemicals.

Slashing Development Times

At the same time as circuit layouts become increasingly complex, with the frequent involvement of numerous iteration steps and several prototypes, there is also increasing pressure to shorten development times. Companies gain a vital advantage here if they are able to make prototype PCBs themselves, so they don't have to wait on external service providers. In the same time it takes to prepare an order for external prototype PCB production, the ProtoLaser S can already transfer the complete layout onto the PCB. This slashes development times and cuts time in the production pipeline. The confidential data also stays in-house and away from prying eyes.

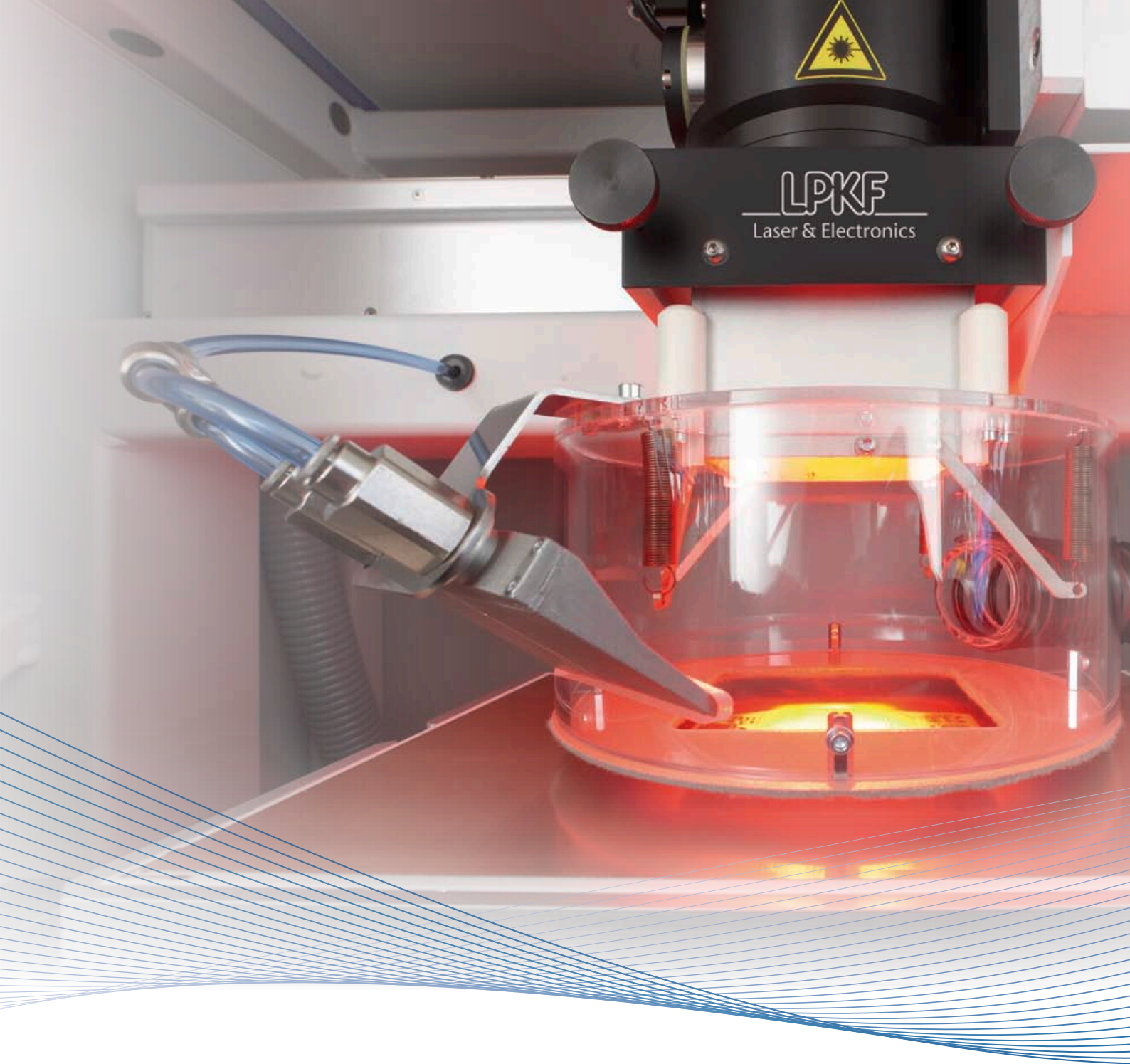
Produce Small Batches on Demand

The high processing speed and the simple data handling also make it possible to produce customized small batches on demand. All of the usual PCB materials can be used.

Equipped for the Future

The revolutionary tool-less laser processing method can be used to produce lines and spaces, as well as corner radii, which far exceed today's ultrafine technology standards. Process parameters for new materials can be easily established.





Another Dimension of Prototyping

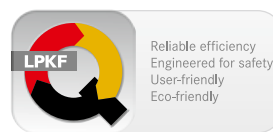
Short Tooling Times

PCBs are securely held on the integrated vacuum table – including thin and flexible substrates. The integrated software safely and simply converts the usual layout data formats into production data. Pre-set processing parameters for standard materials make operations even easier.

Fully Automatic Production

The optimal focus of the laser is adjusted automatically. No tool changes or other modifications are required during production. All that is required is loading new material or flipping the PCB material for double-sided projects. A camera uses fiducials to localize the position of the PCB and align the laser processing accordingly. Double-sided and multilayer PCBs can therefore be manufactured simply and precisely.

- High speed laser structuring
- Easy operation
- Minimal line/space width of 50/25 μm^*



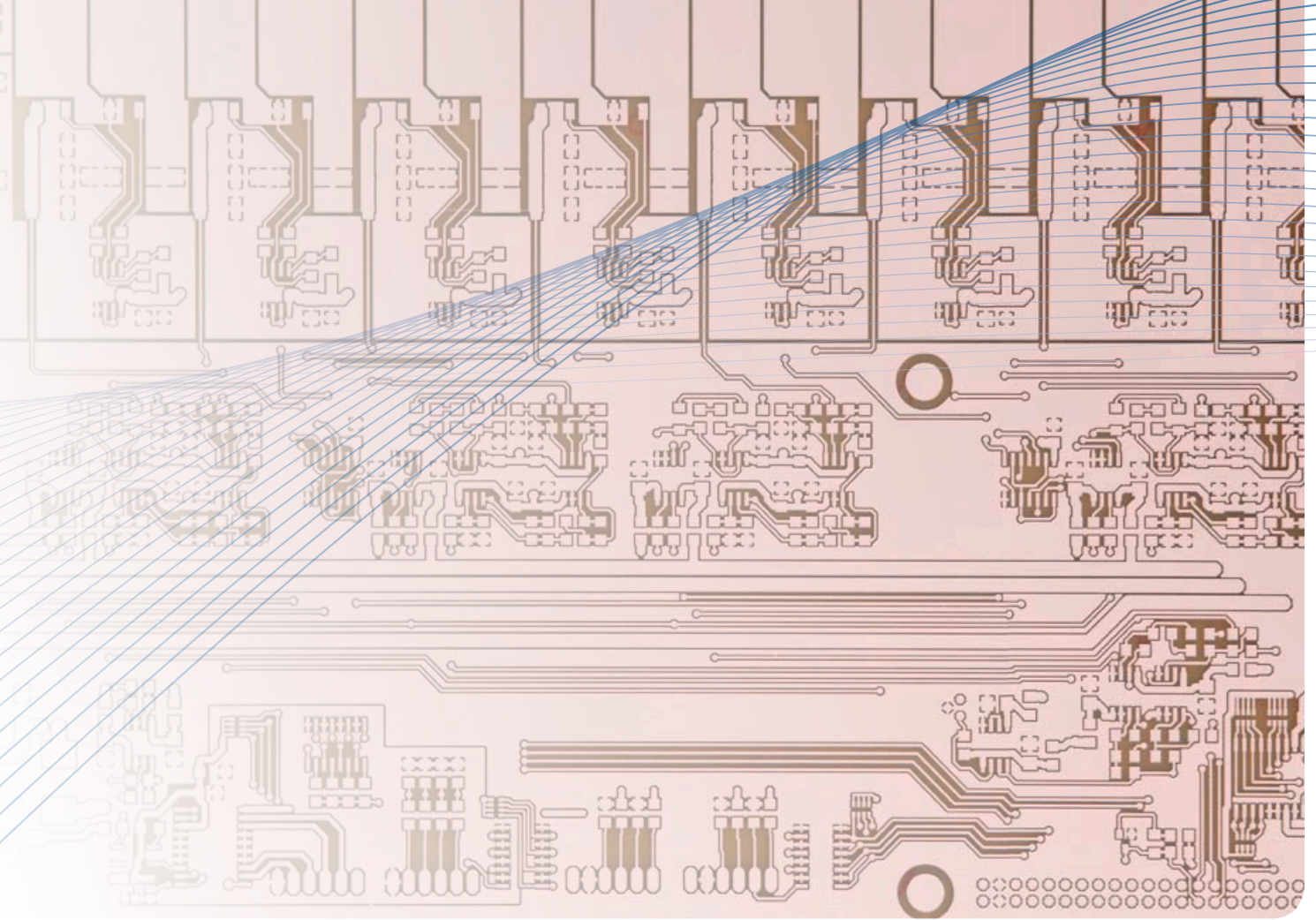
Compact and Safe

The ProtoLaser S was specially developed for laboratory use. It is compact and easy to operate. The hood protects the users from noise emissions, and prevents any accidental interference in the operational process. The laser switches off immediately when the hood is opened. The system is classified as Laser Class 1 when in operation.

Intuitive Software Operation

The software is designed for easy operation of the machine and the smooth import of the usual data formats such as Gerber or DXF files. A whole range of applications can be handled using the pre-set and customized profiles. The software also enables communication with other LPKF systems such as LPKF circuit board plotters.

* with ceramic substrates



Works with all Types of PCB Materials

Circuit Layouts Structured by Laser

The LPKF ProtoLaser S selectively ablates the conductive layer, usually copper, from the substrate. This cuts the insulation channels to precisely create the planned tracks and pad surfaces.

Areas of Application

The ProtoLaser S is ideal for the efficient prototyping of complex digital and analogue circuits, and HF and microwave PCBs, up to 229 x 305 mm in size. The potential to produce highly precise geometries in almost any material makes the ProtoLaser S the perfect system for the production of antennas, filters, and numerous other applications which require precise, steep edge quality.

High Repetition Accuracy

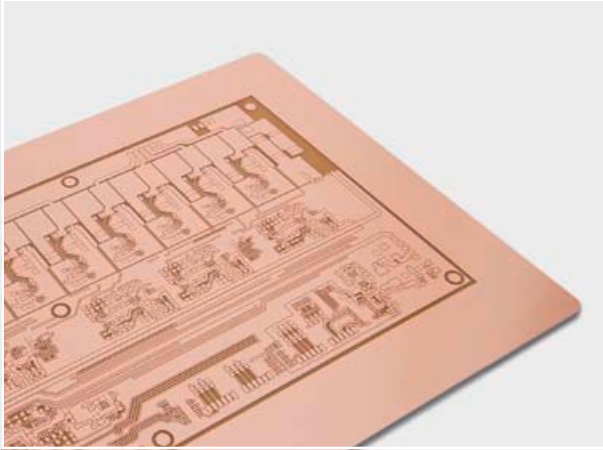
The repeatability of the results far exceeds the ability of mechanical or chemical methods, which are also negatively affected by wear and process fluctuations. The ProtoLaser S guarantees constant properties even where many iteration steps are required, and for complete small batches.

PCB Materials

The ProtoLaser S processes a whole range of different substrates, e.g. copper-coated FR4, aluminium-coated PET films, ceramics, TMM, Duorid or PTFE. The contact-free process demonstrates its special benefits when flexible and sensitive materials are involved – which it processes reliably and without causing any damage.

Mass-Production Quality In-House

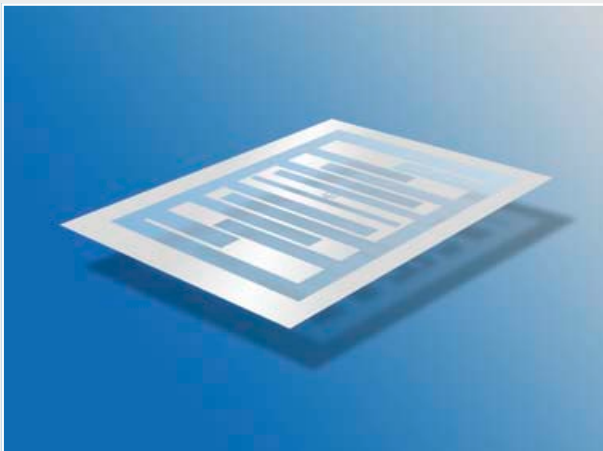
Sophisticated applications – fabricated from substrates in mere minutes with the LPKF ProtoLaser S.



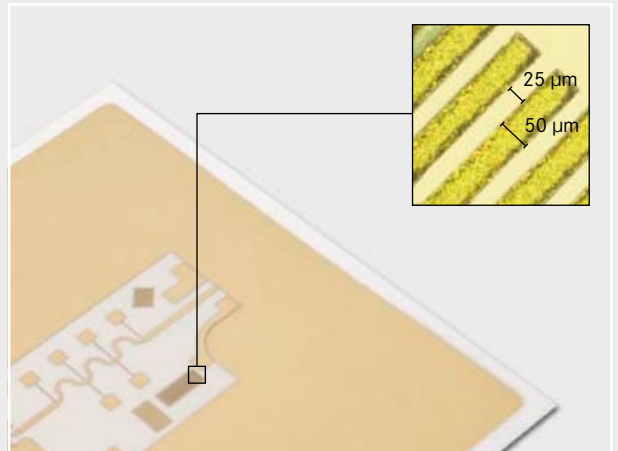
Cu (18 μm) on FR4



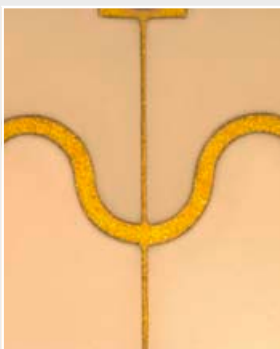
PTFE



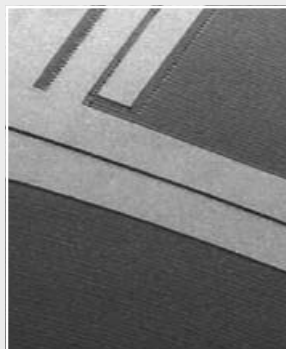
Al (15 μm) on PET film



Ceramic



RF structure, Au on Al_2O_3 ceramic



Semi-Flex material, Cu layer thickness 18 μm

Technical Specifications: LPKF ProtoLaser S	
Max. material size and layout area (X/Y/Z)	229 mm x 305 mm x 10 mm (9" x 12" x 0.4")
Structuring speed	Ø 6 cm ² /min ^a (Ø on laminated substrate)
Diameter of focused laser beam	25 µm (1 mil)
Minimum line/space	50 µm/25 µm (2 mil /1 mil) ^a
Accuracy*	2 µm (0.08 mil)
Repeatability	± 2 µm (± 0.08 mil) ^b
Laser pulse frequency	15 – 200 kHz
Dimensions (W x H x D)	875 mm x 1,430 mm x 750 mm (34.4" x 56.3" x 29.5") ^c
Weight	260 kg (573.2 lbs)
Operating conditions	
Power supply	110/230 V, 50 – 60 Hz, 1.4 kW
Compressed air supply	8 bar (116 psi), 160 l/min (5.66 cfm)
Cooling	Air-cooled (internal cooling cycle)
Ambient temperature	22 °C ± 2 °C (71.6 °F ± 4 °F)
Exhaust	
Power supply	230 V, 50/60 Hz, 1.2 kW
Air flow rate	320 m ³ /h, max. vacuum pressure 21,000 PA
Filter	Active carbon filter and HEPA filter
Dimensions (W x H x D)	365 mm x 740 mm x 501 mm (14.4" x 29.1" x 19.7")
Weight	80 kg (176.4 lbs)
Required accessories	Exhaust, compressor, standard PC
Hardware and software requirements	Microsoft® Windows® XP or 7, 1.2 GHz processor or higher, min. 2 GB RAM, screen resolution min. 1024 x 768 pixels, USB 2.0

a Depending on material and laser beam parameters

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

b Direct repeat of laser beam movement

* Resolution scanfield



This machine is designed as a Class I Laser Product during normal operation.
In maintenance mode this system becomes a Class IV Laser Product.

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