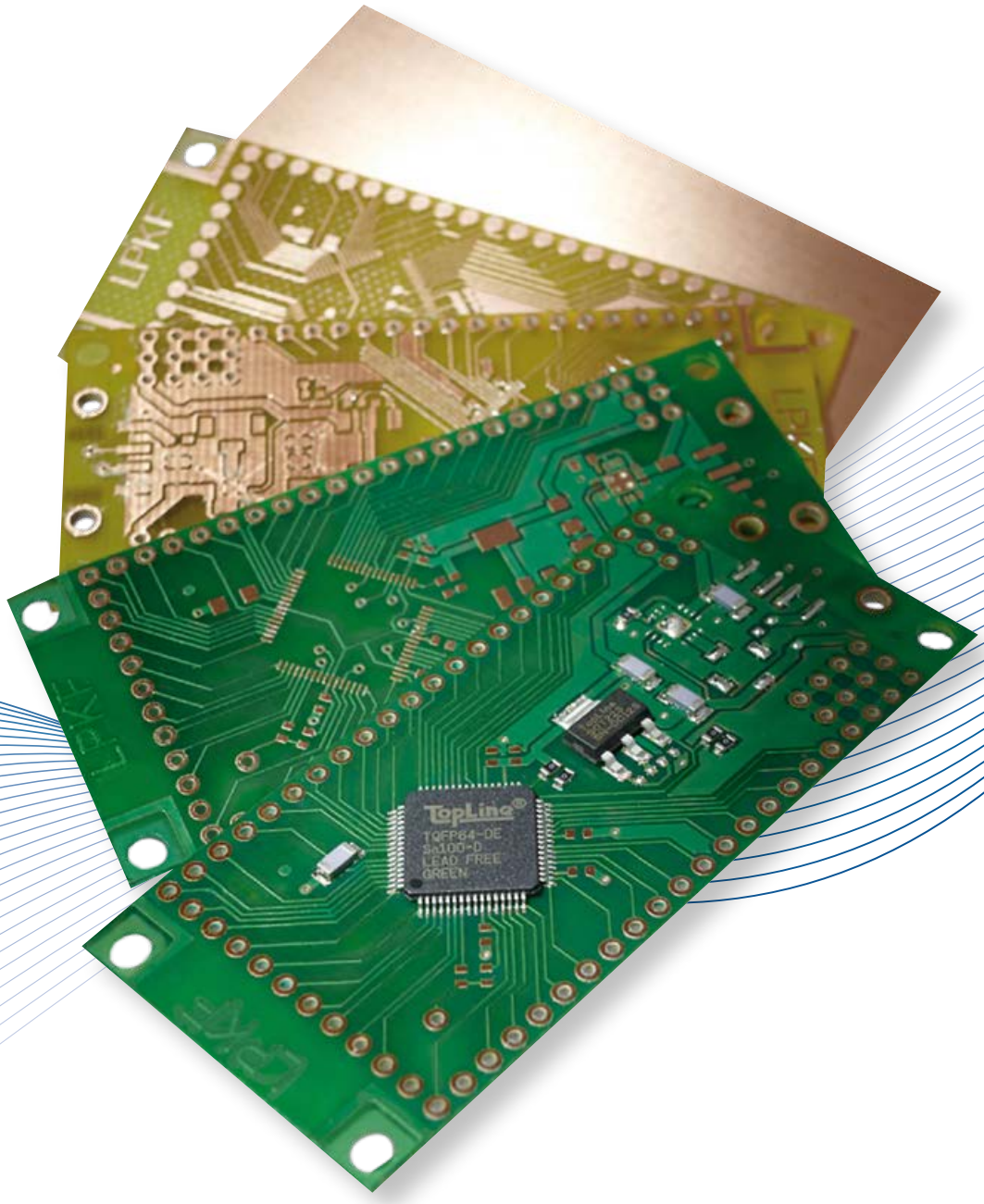
Get PCB Prototypes Sooner with
In-House Rapid PCB Prototyping



LPKF
Laser & Electronics

Save Time with In-House Prototyping

In-house circuit board prototyping eliminates waiting for external suppliers. With LPKF systems and solutions, even complex PCB prototypes can be completed and tested in a single day. Projects are completed sooner – reducing time to market.

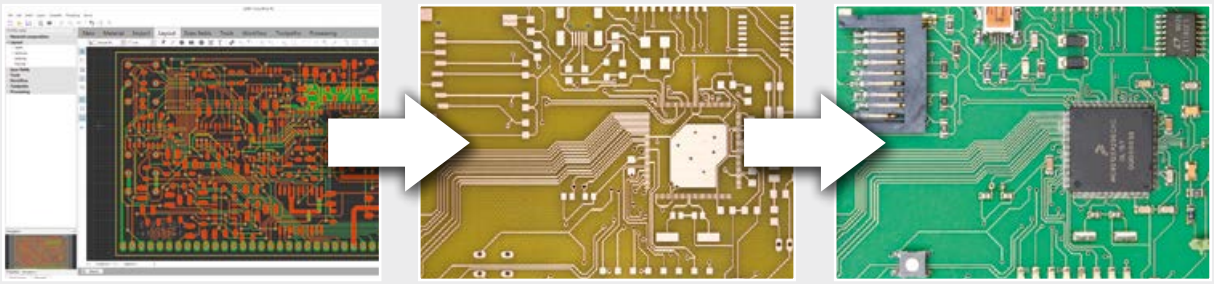
The LPKF product line fully covers every step of the prototyping process, from structuring to SMD assembly. All methods are designed for ease of use so that even inexperienced users can quickly produce high quality prototypes.

Advantages of In-House Rapid PCB Prototyping:

- Chemical-free production possible
- Development process without delays
- Quicker marketability
- Layout data remains in-house

1, 2, PCB

Finished Prototypes in Just a Few Steps:



From idea, ... to structured panel, ... to finished circuit board!

Coordinated Systems – Rapid Results

With LPKF equipment, prototype fabrication – from data preparation to assembly – takes only one day. LPKF systems can produce multilayers of up to eight layers in addition to single and double-sided circuit boards. They even handle RF and microwave circuit board manufacturing with ease.

All LPKF systems are perfectly coordinated to ensure the fastest possible production process: once the data has been imported, a LPKF circuit board plotter or ProtoLaser will start processing. The structured circuit board is then used as a substrate that can be through-plated, laminated and populated. Processes for applying solder resist and screen printing complete the product line.

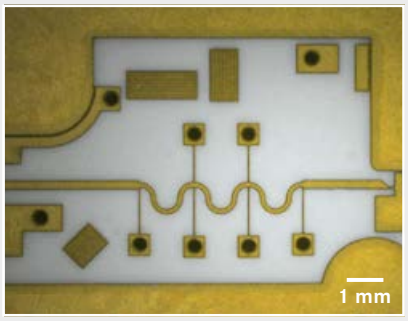
You can find more information on applications, systems and methods in our product catalog, available at www.lpkf.com. Please feel free to contact us: +49 (5131) 7095-0.

Pushing the Limits of What is Possible

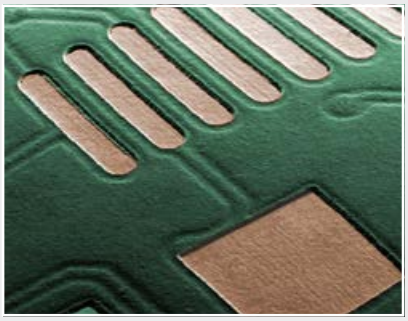
To meet future requirements in the area of fine and micro structuring, growing numbers of researchers and engineers are choosing the LPKF ProtoLaser U4. This system has been developed especially for use in electronic labs. Its UV laser source with a 355 nm wave length also processes unusual substrates and material combinations.

The new LPKF ProtoLaser U4 handles the micromaterial tasks with even more detail and precision, especially in the low energy range for particularly sensitive materials. Demanding layouts can be achieved very efficiently thanks to a new process tracking module and vision system.

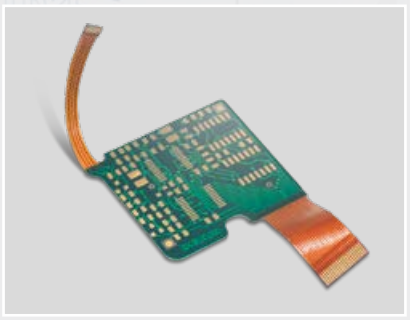
The LPKF ProtoLasers can be rolled through any standard lab door. So your ideas are in good hands – yours.



Structuring, drilling, cutting and carving of ceramic materials



Ablating solder resist and cover layers, creating pockets and blind vias



Cutting and drilling rigid and rigid-flex PCBs

Direct light exposure of photoresists e. g. chemical tin for ultra fine structures

Structuring, drilling and cutting of LTCC

TCO/ITO structuring

A Complete Line for Rapid PCB Prototyping

LPKF ProtoMat S Series

LPKF ProtoLaser H4

LPKF ProtoLaser S4 / U4

Stucturing

Mechanical Milling of PCBs

LPKF circuit board plotters create conductive tracks and pads by milling insulating paths. The insulating paths separate the electro-conductive copper surfaces, forming the network of conductive tracks. Next, all the required holes are drilled.

LPKF ProtoMat S Series

The S series comes, depending on the specific model, with automated tool exchange, fiducial-camera and a vacuum table. So everything is prepared for automated operation.

LPKF ProtoMat E44

The entry-level system E44 is designed especially for training and for the manufacturing of PCB prototypes from time to time.

Laser Structuring

Laser structuring implements conductive paths faster and more accurately than mechanical methods. It places exact geometries on various substrates such as copper-clad FR4, aluminized PET film, ceramics, Duorid or PTFE.

LPKF ProtoLaser H4

Compact desktop LPKF ProtoLaser H4 delivers the fastest speed and laser precision for standard PCB structuring and mechanical drilling and routing also of thick boards.

LPKF ProtoLaser S4

The specialist for machining laminated materials creates tracks and drill holes in minutes. Demanding applications which require exact geometries profit from an optimized laser source.

LPKF ProtoLaser U4

By implementing a UV laser the ProtoLaser becomes even more flexible and is capable of machining e. g. ceramic material, LTCC and transparent conductive oxides (TCO). Multifunctional and fast – the Swiss army knife for the electronics lab.

LPKF ProConduct

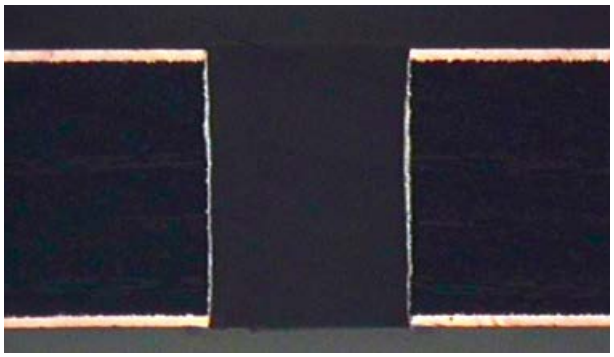
LPKF Contac S4

Through-Hole Plating

Through-hole plating is a basic requirement of double-sided or multilayer circuit boards. During this process the circuit board layers are connected by metalized drill holes.

LPKF ProConduct
LPKF ProConduct through-plates double-sided and multilayer circuit boards with a conductive paste. The method is easy to use and requires no chemical baths. Its non-chemical through-hole plating takes a fraction of the time required for electroplating. Even RF applications or ceramic substrates can be through-plated using this equipment.

LPKF Contac S4
The LPKF Contac S4 is a compact desktop system for homogeneous voltaic through-hole plating of PCB prototypes and small batches. The chemical method is self-contained and virtually maintenance-free, allowing the systems to be operated with no special knowledge. Reverse Pulse Plating ensures reliable electroplating for fine-sized drill holes.



Drill hole diameter: 1 mm. Aspect ratio: minimum 1 : 4 (substrate thickness 0.4 mm x 1.6 mm). 35 microns copper layer. Through-hole plating 20 – 70 microns.

LPKF MultiPress S4

LPKF ProMask

Laminating Multilayers

Multilayers consist of multiple stacked circuit boards with four or more circuitry layers. The LPKF multilayer press joins the individual layers to form a multilayer.

LPKF MultiPress S4
The LPKF MultiPress S4 is a movable, standalone press supported with all needed features and software guidance on a build-in computer for easy and strait forward multilayer production.

Highly complex PCBs with dimensional limits typically require circuit traces to be spread across multiple layers. The ground layer is a must for high switching signal speeds. In addition to high-density digital boards, both flexible and RF boards are increasingly turning to multilayer designs.

The newly designed MultiPress S4 now includes a higher maximum temperature (320° C/608° F), higher pressure, and an integrated vacuum chamber to open an entirely new range of multilayer flex PCB development, and high-temperature RF/MW substrate lamination.

The LPKF MultiPress S4 works seamlessly with the LPKF Contac S4 through-hole plating system as well as all ProtoLaser and ProtoMat models supported with LPKF CircuitPro.

Surface Finishing

LPKF ProMask solder resist masks prevent short circuits during soldering and protect the circuit board from outside influences. The ProLegend assembly print marks the location of components on the circuit boards and adds any markings.

LPKF ProMask and LPKF ProLegend
LPKF ProMask quickly and easily adds solder resist masks to circuit boards. Solder resist masks enable safe soldering of SMD or conventional components. LPKF ProLegend works similarly using a simple assembly print method.

Both the ProMask and ProLegend methods are based on manual paint application and a simple photo-optical exposure process making them cost-effective solutions. There are no environmental restrictions for the component disposal.

For an overview of all systems visit
www.lpkf.com

LPKF ProtoPrint S4

LPKF ProtoPlace S4

LPKF ProtoFlow S4

SMD Assembly

Component assembly begins with an accurate application of soldering paste to any contact points. Once the components have been positioned, the soldering paste is cured inside the reflow oven. LPKF systems make the entire assembly process simple and reliable.

LPKF ProtoPrint S4
The LPKF ProtoPrint S4 offers a manual stencil printer for achieving precise printing results. The device is suitable for single-sided and double-sided printing of PCB prototypes and low volumes. Thanks to the integrated clamping frame the device uses stencils made of polyimide film or stainless steel. The squeegee material is defined according to the given stencil material.

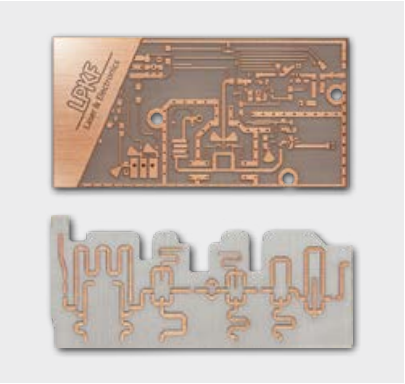
LPKF ProtoPlace S4
The LPKF ProtoPlace S4 features easy operation and high precision. In all the different models, use of standard and fine-pitch SMD components and placement of SOIC, PLCC, BGA, µBGA, CSP, QFN, and LEDs are possible. The LPKF ProtoPlace S4 has optical centering, a top camera for automatic fiducial correction, and a bottom camera for automatic component centering. The cameras can also be used for optical inspection of solder paste printing and component placement.

LPKF ProtoFlow S4
The LPKF ProtoFlow S4 compact hot-air oven is the ideal device for RoHS-compliant lead-free reflow soldering. The optimal process parameters for the respective solder can be saved in the integrated software. Apart from predefined process profiles, any custom temperature profiles and process times can be set in the software. They can be saved as custom profiles. Active cooling at the end of the soldering process with the chamber closed prevents uncontrolled temperature fluctuations in the material.

LPKF ProtoPlace E4
Manual pick & place system for PCB prototypes. Ideal for individual prototypes, since there is no programming necessary.

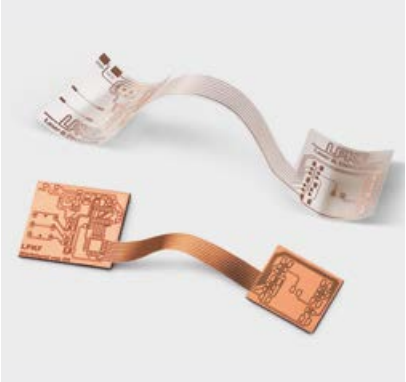
Applications

Single-sided, double-sided and multilayer circuit boards



RF- and microwave circuit boards

Milling and engraving plastic and aluminum (2.5 D)



Flexible and rigid-flex circuit boards

Laser-structured ceramic and PTFE

For more applications visit:
www.lpkf.com

Presented by:

LPKF Laser & Electronics AG sells and markets products and provides support in more than 50 countries. Find your local representative at www.lpkf.com.

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Photos may also show optional accessories.

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