M2PCB's CoreTechnologyArchitecture: High-Precision Flexible Printed Circuit Routing and Bend-Resistant Substrate Process

High-Precision FPC Routing and Bend-Resistant Substrate Technology for Advanced Flexible Electronics

CALIFORNIA, CA, UNITED STATES, June 30, 2026 /EINPresswire.com/ -- Shenzhen, China — M2PCB, a group company specializing in Flexible Printed Circuit (FPC) and PCBA production, has built its manufacturing capabilities around precise routing, durable substrate materials, and rigorous quality control. The company operates an 8,000m² factory with 200 employees and an annual output of 360,000 square meters, producing 1 to 14 layer flexible PCBs with a monthly delivery of 800 varieties.

M2pcb

Laser direct imaging and drilling equipment in M2PCB's production line.

High-Density Routing and Fine-Line Capabilities

M2PCB's flexible LED PCB product achieves a minimum line width of 0.05mm and minimum spacing of 3/3mil (0.076mm/0.076mm), enabling high-density circuit layouts required by compact electronic devices. The maximum panel width is 240mm, and the board is manufactured using polyimide (PI) substrate—a material selected for its thermal stability and flex endurance. These specifications are supported by automated exposure and etching processes that maintain consistent trace geometry across production runs.

The company’s fabrication process includes laser drilling, hot pressing, and PI reinforcement

steps, which are used to improve bend resistance and layer adhesion. According to M2PCB, the combination of thin-core PI material and precisely controlled lamination parameters contributes to the product's ability to withstand repeated bending cycles without conductor fatigue.

Visual inspection station for final quality assurance.

Certifications and Quality Standards

M2PCB holds multiple certifications that validate its manufacturing and safety compliance. The flexible LED PCB is certified under UL standard E530809, issued by Underwriters Laboratories Inc. (UL), covering medical aesthetics, automotive, and electronic products. The UL certification confirms compliance with safety standards including UL6950-1, UL60065, and UL62368-1. Additionally, the product meets IATF 16949:2016 (certificate T184452, issued by NQA), a quality management standard specific to the automotive industry.

For PCBA services, M2PCB supports Turnkey BOM options, program burning, X-ray testing, and 100% electrical testing. The assembly process includes fly-probe testing and automated optical inspection (AOI) to detect defects. The company's quality control system follows ISO guidelines, and all materials used meet RoHS requirements.

Production Capacity and Lead Times

M2PCB's monthly production capacity is 40,000 square meters, with typical lead times of 3–20 days depending on order complexity. The minimum order quantity (MOQ) is 1 unit, accommodating both prototyping and volume production. The company exports to Europe, the United States, South America, and Australia, with export ratio reaching 70%.

Application Case: Red Light Therapy Belt

A notable application of M2PCB's flexible LED PCB is in red light therapy belts. One ODM project produced 500,000 units for a U.S. customer over two years. The flexible circuit board is used to deliver photobiomodulation for pain relief, targeting the waist area. The design incorporates PI-based flexible PCB strips that conform to the body contour while maintaining electrical reliability during repeated flexing.

Contact Information

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