

Facility Takes on the Most Challenging Circuits

Drawing on the expertise and experience of its operators, this company provides printed-circuit-board fabrication and assembly services for single-layer and multilayer PCBs.

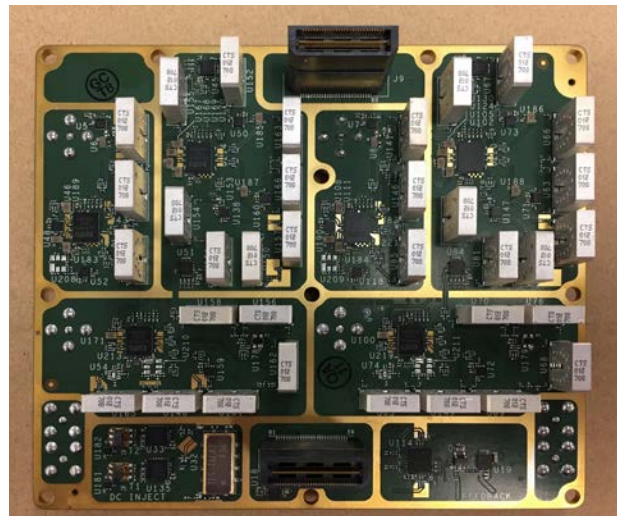
Designing a circuit is often only part of the adventure—the rest of the journey involves waiting to see how well that circuit will perform when fabricated from real-world components and printed-circuit-board (PCB) materials. Fortunately, this industry has its hotbeds of experience in constructing practical PCBs, such as San Francisco Circuits (www.SFcircuits.com). That experience not only helps in the assembly of reliable, repeatable high-frequency PCBs, but it provides invaluable guidance for the type of circuit material and assembly services that will work best in assembling a particular circuit design.

Circuit-board fabrication services include a variety of different flexible and rigid-flex circuit materials. Designers can match the performance of the circuit material to the expected performance of a circuit, whether for prototyping services or in production quantities.

The company offers single- or double-sided FR-4 circuit materials for lower-cost designs and higher-quality circuit materials, such as the RO3000 and RO4000 series from Rogers Corp. (www.rogerscorp.com), for higher-performance prototype services. Lower-volume prototype circuits can usually be turned around from a layout file in 12 to 24 hours, even with detailed circuit structures such as blind and buried vias.

For higher-volume, production quantities, the firm offers less-expensive circuit materials like Kapton as well as FR-4. Standard production processes support circuits with 1 to 12 circuit layers on Kapton or FR-4 with copper thicknesses ranging from 0.5 to 3.0 oz. Two-layer boards can be produced with minimum thickness of 0.010 in., four-layer boards with minimum thickness of 0.020 in., and 12-layer boards with minimum thickness of 0.062 in. The maximum two-layer board thickness for FR-4 or Kapton is 0.125 in.

For higher-performance circuits, more advanced circuit-manufacturing processes based on materials such as RO3000 and RO4000 can be fabricated with as many as 40 layers, with



Here's an example of San Francisco Circuits' circuit-fabrication capabilities when working with flexible, high-frequency circuit materials (and with precision housing). The firm can provide circuits on a wide range of flexible and rigid-flex commercial circuit materials.

copper-layer thicknesses ranging from 4 to 6 oz. Two-layer circuit boards have minimum thickness of 0.005 in.; four-layer boards, a minimum thickness of 0.010 in.; and eight-layer boards, a minimum thickness of 0.040 in. Maximum board thickness for these high-performance materials is 0.250 in.

HANDLING MICRO SIZES, TOO

In addition to fast-turnaround PCB fabrication services, San Francisco Circuits provides microcircuit capabilities with micron-sized circuit features as well as numerous services essential to those working with PCBs. These accessory services include: two-dimensional (2D) and three-dimensional (3D) x-ray testing; BGA x-ray testing;

automated optical inspection (AOI); in-circuit testing (ICT); functional testing at board and system levels; and even access to a flying probe for making measurements on fine-featured circuits.

Automated assembly equipment can assemble through-hole devices (THDs) and surface-mount-technology (SMT) components to PCBs; perform mixed assembly of SMTs and THDs; and assemble circuits with flip-chip underfilled CCGA housings, tiny 0201 and 1005 passive components, and PoP packages. Standard circuit dimensions on flexible circuits include 3 mil spaces and circuit traces.

San Francisco Circuits works with a network of partners to provide quick-turnaround PCB production services as well as layout design and prototyping. With such partners, they can also perform assembly of military-grade circuit boards according to certification standards such as MIL-PRF-55110, MIL-PRF-50884, and MIL-PRF-31032. The facility itself is ISO 9001-2008 certified, and the company opened a second office in San Diego, Calif., last year.

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