EXCEL CIRCUIT

PCB Manufacturing & Assembly Capability Statement

Engineering reference for PCB fabrication, advanced constructions, PCBA, sourcing, inspection and testing.

Updated: August 2, 2026

www.excelcircuit.com · sales2@excelcircuit.com · +86 153 6401 9151

Scope: Prototype through repeat production. Standard and advanced capability values are planning references, not unconditional acceptance limits.

1. Standard PCB Capabilities

General production guidelines for common rigid PCB programs. Final values depend on the complete construction and engineering review.

Parameter	Typical capability	Engineering notes
Layer count	2–8 layers standard; up to 32 layers by review	Review stack-up, copper balance, impedance and lamination sequence.
Materials	FR-4 and high-Tg FR-4; specialty laminates by review	RF, flex, rigid-flex, HDI, aluminum and halogen-free materials require review.
Board thickness	Common constructions from 0.2–3.2 mm	Finished tolerance depends on laminate, copper, plating, mask and pressing.
Minimum trace / space	0.10 / 0.10 mm (4 / 4 mil) typical standard	Finer geometry, including 3 / 3 mil, is only by engineering review and depends on copper, layer position, density and yield.
Mechanical drill	0.20 mm typical standard minimum	Evaluate board thickness, plating, finished hole and aspect ratio.
Minimum annular ring	0.15 mm / 6 mil typical target	Depends on drill tolerance, layer registration and acceptance class.
Copper weight	1–3 oz typical; heavier copper by review	Copper affects geometry, etch compensation, thickness and thermal behavior.
Controlled impedance	Single-ended and differential	Provide target, tolerance, reference layers and stack-up constraints.
Surface finish	HASL, lead-free HASL, ENIG, OSP	Other finishes and hard-gold edge contacts by review.
Electrical test	100% bare-board electrical test	Flying probe or fixture test selected by design and quantity.

Tolerance note

Unless specifically agreed on the quotation and fabrication drawing, applicable industry-standard production tolerances are used. Board outline, thickness, hole, copper, impedance, solder-mask registration and controlled-depth features must be stated where they are critical.

2. Advanced PCB Capabilities

Technology	Available scope	Review focus
HDI PCB	1+N+1 and 2+N+2, laser microvias, blind/buried vias, via-in-pad options	Via structure, copper fill, sequential lamination, pad geometry and reliability.
RF / high frequency	Low-loss materials and controlled-impedance constructions	Laminate system, copper profile, insertion loss, impedance and surface finish.
Rigid-flex / flex	Flex layers, coverlay, stiffeners and rigid-flex transitions	Bend region, grain direction, transition geometry, assembly use and dynamic/static flex.
Heavy copper	Power-electronics constructions; >3 oz by review	Copper distribution, spacing, etch compensation, plating and thermal management.
Metal-core PCB	Aluminum and thermal-management constructions	Dielectric system, isolation, thermal path and mechanical processing.
Fine-pitch fabrication	BGA-supporting geometry and dense routing	Limits depend on copper thickness, pads, registration, mask and yield.
Multilayer PCB	Up to 32 layers by review	Copper balance, lamination cycle, stack-up, registration and impedance.

Advanced constructions are quoted only after review of the complete stack-up, material system, via structures, copper geometry, finished dimensions, quantity and acceptance requirements.

3. PCBA Capabilities

Capability	Available scope	Requirements
Assembly options	SMT, THT, mixed, single- or double-sided	Assembly drawings, centroid data, polarity and special instructions.
Fine-pitch components	Down to 01005; QFP, QFN, LGA and BGA by review	Land pattern, stencil, reflow, coplanarity and inspection method.
Sourcing models	Turnkey, partial-turnkey and consigned	BOM, approved vendors, alternates, date-code and traceability needs.
Soldering	Lead-free and leaded by requirement	State RoHS, alloy, temperature and component compatibility.
First article	Engineering first-article verification	Critical placement, polarity, workmanship and configuration approval.
Programming	Customer-defined device programming	Firmware, revision, interface, security and verification instructions.
Special processes	Coating, potting, underfill and cleaning	Material, masking, cure, thickness, rework and acceptance criteria.
Box build	Enclosure, wiring, labels and final assembly	Mechanical drawings, torque, wiring, packaging and final test.

4. Inspection & Testing

Stage	Typical methods	Project input
Incoming	Material/component identity, condition and document checks	Approved BOM, material callouts and traceability requirements.
Bare board	AOI, electrical test, impedance verification; microsection where applicable	IPC class, coupon/impedance targets and reporting needs.
Assembly	Visual inspection, AOI and X-ray for hidden joints	Package risks, workmanship criteria and inspection coverage.
Final release	Electrical or functional test, configuration, labels and packaging	Fixture, test procedure, limits, expected outputs and failure handling.

5. File Requirements

PCB fabrication: Gerber or ODB++, NC drill, fabrication drawing, stack-up, impedance requirements, material, finish, quantity and delivery target.

PCB assembly: Gerber or ODB++, BOM with manufacturer part numbers, pick-and-place/centroid file, assembly drawings, approved alternates, build quantity and polarity notes.

Programming and test: Firmware, interface and fixture details, procedures, expected outputs, limits, failure handling and report format.

Box build: Mechanical drawings, wiring instructions, connector/harness specifications, labels, torque requirements, packaging and final inspection criteria.

Preferred package: One revision-controlled ZIP or RAR archive with a file manifest and clear revision identifiers.

Capability confirmation

Final capability is subject to engineering review. Published values are planning references. The accepted quotation, approved drawings, stack-up, customer specifications and written engineering deviations control the order.

For a confirmed review, submit files at excelcircuit.com/request-a-quote.html.

Relevant services

PCB Manufacturing · HDI PCB · RF / High-Frequency PCB · Rigid-Flex PCB · Heavy Copper PCB · Turnkey PCBA · PCB Testing Services · Box Build Assembly

Excel Circuit

PCB design, fabrication, component sourcing, assembly, inspection, testing and box-build coordination for global electronics programs.

Email: sales2@excelcircuit.com
Phone / WhatsApp: +86 153 6401 9151
Website: www.excelcircuit.com