

Documentation Requirements (electronic)

The following information is required for all component purchasing / receiving / verification / inspection / programming the pick & place equipment and assembly work instructions creation.

- **BOM**
 - Component Description
 - Quantity
 - Reference Designator
 - Manufacturer Part Numbers
 - Indicate any “no load / do not install” (DNI) locations.
 - If you are supplying components, please identify as “Customer supplied”
- **CPL**
 - Reference designator
 - X / Y - Centroid location (mils / in)
 - Rotation
 - Layer / Board side / (top / bottom - component mounting not silkscreen)
- **Redline drawing for conformal coating**
- **Gerber files**
- **Assembly Drawings**
 - Component layout (top / bottom), polarity marking, special assembly instructions or any components that require special handling or processing, some examples may include:
 - Non- washable (Moisture sensitive) components - switches, sensors, modules
 - Special prep / specific height / placement requirements
 - Lead length / trim – make sure to include +/- tolerances
 - Rework wires (pin to pin routing)
 - Component mounting (top /bottom – opposite of silkscreen – polarity)
 - Adhesives
 - Labeling / Serialization – (format / location / type)
- **Solder Paste File**
 - Highly recommended to be supplied by customer.
 - **If paste layers are NOT present:** We will create a paste layer and add all SMT locations to the said layer. We will NOT be responsible for openings that the customer did not intend to be left open on the stencil (E.g.; Gold Fingers, gold wire bond pads, etc.). There MUST be a README file with any special instructions.
 - **If the paste layers are present:** We determine if the apertures need to be resized or not and we look for any cutouts accidentally left off the paste layer that need to be added. There MUST be a README file with any special instructions.
 - In the event that the customer supplied paste file is simply a copy of a solder mask layer, we will consider the paste file missing and will generate a new paste file in-house. As with a missing paste file, we will NOT be responsible for openings that the customer did not intend to be left open on the stencil (E.g.; Gold Fingers, gold wire bond pads, etc.).

CAM Specific Requirements

Please note that we require the following information to complete the assembly process, or your job will be delayed at your expense. (Note 1: Our CAM team must be notified up front that if this information is not received, the job cannot be assigned to the production floor).

- The customer must provide us with PCB Silk Screen polarity mark information on all polarized parts (cathode, anode, pin number and what the dot or plus sign indicate).
- Polarized components are Capacitors, Connectors, Diodes, LED's, IC's, Switches, Antennas, Filters, Modules, Crystals, Oscillators, Battery Clips, and Transformers).
- Polarity marks indicate the following:
 - DOT: A “Dot (0)” on or near a lead does not represent anything unless the meaning of the dot is clarified as being a “Cathode”, “Anode” or a “Pin Number Indicator”.
 - + (Plus): The (+) Plus symbol on or near a lead does not represent anything unless the meaning of the dot is clarified as being a “Cathode”, “Anode” or a “Pin Number Indicator”.

- K: The “K” symbol indicates the “Cathode”.
- A: The “A” symbol indicates the “Anode”.
- Diode Symbol: The Diode symbol (looks like an arrow head hitting a target) should have the Anode near the components anode, and the Cathode near the components cathode.
- 1: The number (1) indicates the “Pin 1” of the component.
- Other Symbols: All other symbols on or near a lead must be clarified as to what it represents.
- The Customer must provide us with special assembly instructions when required, such as: Height of components, Adhesive placement, Reflow profile for temperature sensitive components, etc.
- The customer must provide us with how they want us to handle polarity issues (DNI, Place as is, Call or Email for instructions). (Note 2: We must make it clear that if we are not provided this information, their job will be delayed or shipped without the parts in question. In doing this, we place the responsibility on the customer when their assembly issues, and any rework will need to be paid for by them. Our sales team, website, or the CAM team can provide customers with the checklist via email when they go over CPL, Files, and Technical Question inquiries).
- The customer must provide the CAM team with all drawings needed to complete the assembly process.

Customer Supplied / Consignment - Component Requirements

Lead time will be impacted if proper attrition is not supplied. We will always work with our customers when it comes to customer supplied components; the following is our standard guidelines. If you have expensive or a minimum quantity of any component on hand please contact the assembly sales team for details.

Package	Minimum BASE	Minimum OVERAGE
0201	200	100
0402	100	50
0603	50	30
SMT Diode	30	15
SMT IC	30	15
FP	20	5
LL	20	5
BGA	10	5
TH	5	2

- Each component must be individually packaged, labeled with BOM line item number / customer part number and/ or manufacturers’ part number.
- The following are acceptable packages of consignment / customer supplied components (**Bulk SMT not acceptable**):
 - SMT Reels
 - Cut tape
 - Thru-Hole bulk or tape
 - Tubes / Trays
 - Digi-Key Reels

SMT components, not supplied on reels, are required to be on **one continuous strip of tape**. Resistors, Capacitors, Diodes (0603, 0805, 1206, 2225, SOT, SOD, MELF - packages) require a minimum of 50 pcs and/or has to exceed the required quantity by 30 pcs. (E.g.; build req. 40 pcs – we will require 70 pcs –

this meets our minimum required 50 pcs plus 30 pcs above build requirement) Resistors, Capacitors, Diodes (0201, 0402, mini-melf, miniature packages) require a minimum of 100 pcs and/or has to exceed the required quantity by 50 pcs. (E.g; build req. 80 – we will require 130 - this meets our minimum required 100 pcs plus 50 pcs above build requirement).

A sample board (current revision if available) is a helpful tool for Quotation, Engineering and the assembly process.

Please ship material to the address below; place the Quote Number or Assembly Work Order on all packing slips and on the outside of the box; please email the tracking number to your assembly sales representative.

**Attn: Assembly
Advanced Circuits
21101 E 32nd PKWY
Aurora, CO 80011-8149**

Conformal Coat / Cable & Wire Harness Services

Advanced Circuits has outstanding outside suppliers for conformal coating and cable assembly / wire harnesses; detailed drawings / photographs and/or sample boards may be required for quote.

Warranty and Quality Standards

Advanced Circuits warrants its manufactured items are free from any defects in workmanship. The warranty period shall be 90 days from the date of shipment. Advanced Circuits sole obligation under its warranty is limited to the repair of the defective item provided it is returned to Advanced Circuits within the warranty period. This warranty will not extend to items subjected to accident, misuse, alterations or repairs not made by Advanced Circuits.

Advanced Circuits provides high reliable substrates to our customers for assembly and ultimately end use. Our assembly division only builds substrates fabricated internally. In some cases our customers have overruns available and on occasion inquire if we can use them for assembly. Considering that Advanced Circuits does not know if the substrates have been stored in compliance with IPC-1601 and J- Std-033 requirements we will not build any boards with a date code older than 12 months from date of manufacture. When accepting an order using any returned boards within the 6 to 12 month time period, one board or array will need to be sacrificed in order to perform reflow testing and solderability testing to insure no adverse effects of unknown storage conditions may have on the product during the assembly process. In addition a full 100% visual inspection will need to be performed to insure no handling damage has occurred. A lot charge of \$250.00 will be applied in order to cover the material evaluation testing and inspection.

Prior to any product return, please call our Assembly Sales department at 1-800-979-4722 for a Customer Action System (CAS) Authorization number.