

Input Document Guidelines for Board Layout

General

- Mark all documents with date and revision level.
- Preferred format for drawings is PDF.
- Preferred format for BOM is Excel.
- Preferred format for instructions is Word.

Outline Drawing

- Show a top-side view. If required for clarity, add bottom and/or side views.
- Show all dimensions for external perimeter and any internal cutouts.
- Indicate the board thickness.
- Show all board mounting holes. Indicate hole size or size of fasteners.
- Show position of all fixed-location parts (connectors, LEDs, switches, etc).
- Show all keep-out areas. Indicate the restriction type: "no parts, no copper", and indicate board side: "top, bottom, both".
- If tall components must be positioned to avoid interference with adjacent assemblies, add dimensioned height zones.

BOM or Part List

- List every part used in the assembly, including electrical parts and non-electrical parts (heatsinks, etc). Include any testpoints which are soldered components.
- For each part, show manufacturer's COMPLETE part number. For parts not found on Digikey/Mouser/Newark, include manufacturer name.
- Exception: common ceramic chip components may use "0402, 0603, 0805" in place of the complete part number.

Schematic Drawing

- Every electrical part and connection must appear on the schematic. If device power/ground connections are omitted, be absolutely certain that these appear on the netlist.
- If mounting holes must have copper rings to bond the board ground to chassis ground, these mounting holes MUST appear on the schematic.
- Show all component-style (solder-in) test points. Do not add hundreds of numbered test points to indicate ATE test points. These test points will be vias added during layout.
- Show anode (+) at polarized capacitors.
- Indicate nets with high-current (>1A) or high-voltage (> ± 20 V). Or provide list in instructions.

- Indicate nets requiring special routing (differential, shielded, controlled-Z, etc.).
- If using single-point grounding, use separate ground nets and indicate a junction location.
- Run the checking routines in your schematic capture tool to wring out any errors.

Netlist

1. Output a netlist from your schematic tool. Preferred format is "PADS-Ascii" or "PADS-2000". An example of this format is [here](#). Other formats can be translated.
2. If analog and digital grounds are to be kept separate and joined at a single point, ensure these are shown as two separate nets.
3. Ideally, set your schematic tool to output manufacturer part numbers in the part description field. Doing so will avoid having to update these fields from the BOM later.

Instructions

- **Drawings:** Decide if our standard drawings format is acceptable or provide us your company drawing template. Provide drawing numbers for fab & assembly drawings.
- **EMC:** If the assembly must meet emissions standards, mitigation features must be discussed prior to layout.
- **Floorplan** (optional): The positioning of circuit blocks is driven by several factors: (1) schematic flow (2) isolation/segregation goals (3) specific customer requests (4) realities of available area. If you want a specific layout, provide a simple block diagram.
- **Grounding:** Describe any special grounding requirements, especially single point grounding.
- **Hi-Speed:** Describe any signal integrity requirements, such as differential pairs, matched lengths, and controlled impedance.
- **Isolation:** Describe any voltage isolation requirements.
- **Part Numbers:** Provide the board part number, assembly number, rev numbers/letters, and company name/logo. Unless otherwise specified, we place the board part number in bottom side copper, the assembly number and company name on the top side silkscreen.
- **Safety:** If the board assembly will be used in any class of device for which specific safety criteria are mandated, provide details.
- **Segregation:** Describe circuit segregation requirements, such as separation of low-level analog from noisy switching circuits. Identify sensitive circuitry and noise generators.
- **Test:** Decide whether the board must have 100% nodal test access for ATE.
- **Text Items:** Describe any text items to appear in silkscreen ink. Examples: connectors' pin 1, functional labels at pots, at option jumpers, and at connector pins.
- **Thermal:** Describe any thermal management requirements, such as heatsink areas for specific components.

