

IPC-7721	
Number: 6.1	Subject: Jumper Wires
Revision: B Date: 11/07	

PC BOARD PREPARATION

1. Clean the area.

NOTE

When wires are in place cleaning will often be more difficult.

2. Remove coating material or oxidization as necessary from the component leads, pads, or conductors where wire terminations will be soldered. Clean the area.
3. Remove solder from the connection point if needed. Clean the area.
4. Measure approximately the length of each wire needed.

JUMPER WIRE SELECTION

1. Bare conductor jumper wires longer than 25 mm [0.984 in] should not be used. Bare conductor jumper wires shorter than 25 mm [0.984 in] must not violate the minimum electrical clearance.

NOTE

The 25 mm [0.984 in] dimension refers to the length between terminations.

2. Previous versions of this guide stated that silver plated wire isn't acceptable for jumper wires because of the possibility of corrosion. However, there are instances where silver-plated wire is appropriate to use because of other desirable characteristics.
3. The smallest diameter wire that will carry the required current should be selected.
4. Insulation requirements of the wire should withstand soldering temperatures, have some resistance to abrasion, have a dielectric resistance equal to or better than the board insulation material.
5. Recommended wire is solid, insulated, plated copper wire, 22 to 32 AWG with a heat-resistant insulation. Wire with tin-lead plating may be restricted due to environmental laws.

JUMPER WIRE PREPARATION

1. Cut the jumper wires approximately 12.7 mm [0.50 in] longer than the estimated length needed.

NOTE

The length and gauge of the jumper wire may be critical. All wires have an electrical resistance (impedance) to the flow of electricity. This impedance is important to electronic circuitry. Always refer to wiring lists for specific jumper wire requirements.

2. Strip insulation from each end of the jumper wire.

NOTE

Strip length is dependent on the termination style.

3. If required, tin the stripped ends with solder. Clean if necessary.

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JUMPER WIRE TERMINATING

1. Form the wire as needed and place the wire in position depending on the termination style. Center the wire on the component lead or pad, do not overhang sides. If the wire is soldered to a pin, terminal or component lead, wrap the wire a minimum of 90°.
2. Solder one end of the wire. Clean if necessary.

NOTE

Solder joint length needs to meet acceptability requirements, see IPC-A-610D Clause 11.2.

CAUTION

The insulation should not be stripped back more than two wire diameters from the solder joint. Wire insulation must not interfere with formation of the required solder fillet.

3. Bend the wire as needed and run the wire along board surface. Route the jumper wire using the shortest route in an XY direction with the fewest possible bends to the second termination point.
4. After routing the jumper wire, solder the opposite end. Clean if necessary.

CAUTION

Wires soldered to lifted or clipped components leads may require insulation to prevent shorting.

JUMPER WIRE BONDING

1. After the wire has been soldered at both ends and cleaned if necessary, the wire should be bonded to the board surface.

NOTE

Bonding is not required if wire is insulated and insulated length is less than 25 mm [1.00 in].

2. Bond the jumper wire using one of the following methods.
 - A. Tape Dots or Tape Strips. (See Figure 4.)
 - B. Quick Set Adhesive. (See Figure 5.)
 - C. Hot Melt Adhesive. (See Figure 5.)
 - D. Hot Bonding. Some jumper wires are manufactured with a special thermo-set adhesive coating and are thermally bonded to the board surface with a special bonding tool. (See Figure 6.)
3. Bond the jumper wire within 6.0 mm [0.25 in] of each solder joint.
4. Bond the jumper wire within 6.0 mm [0.25 in] of each bend in the wire.
5. Bond the jumper wire at intervals not less than 25 mm [1.00 in] on straight runs.