ASSOCIATION CONNECTING
ELECTRONICS INDUSTRIES

IPC-CI-408

Solderless Surface Mount Connector Design Characteristics and Application Guidelines

IPC-CI-408
January 1994 A standard developed by IPC

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1.0 INTRODUCTION

1.1 Scope With the present packaging trend in systems moving towards high speed, compact configurations, the use of Surface Mount Technology offers a viable approach toward achieving the desired packaging goals. The degree of advancement in packaging of electronic components is predicated on the type of product being produced; the need for miniaturization and weight savings; plus the off-the-shelf availability of different component types.

The growing popularity of surface mount technology for packaging electronics has raised a need for surface mount connectors to produce a common packaging approach.

As higher density (0.51 mm [0.020 in] centerline and below), higher electrical performance systems become more common, traditional connector manufacturing technologies such as stamped and formed contacts and associated moldings are approaching density limits that are going to have to be overcome. Solderless surface mount interconnects appear capable of overcoming many of these limitations. Additional environmental benefits include reduction of lead content in assemblies and elimination of postsolder cleaning.

This document provides guidelines for the design, selection and application of solderless surface mount connectors and interconnections for all types of printed boards, rigid, flexible-rigid and backplanes.

1.2 Purpose The purpose of this document is to provide information on design characteristics and application of solderless surface mount connectors including conductive adhesives in order to aid the designer in effectively interconnecting his package. The interconnection material, design and mounting characteristics are discussed. Land pattern, metallization, assembly techniques, rework and repair procedures are covered.

Adherence to the guidelines set forth in this document will generally assure adequate reliability for the majority of applications; however, each end use application should be evaluated on a case by case basis.

The guidelines listed herein shall not be construed as standards since the state-of-the-art is constantly changing and applications and requirements may vary beyond the scope of this publication.

1.3 Terms, Definitions and Acronyms The definition of terms and acronyms used here shall be in accordance with IPC-T-50 and the following:

ACPF Anisotropically Conducting Polymer Film

CP Course Pitch

ECL Emitter—Coupled Logic

ECPI Elastomeric Conductive Polymer Interconnection

FEC Flexible Etched Circuitry

FP Fine Pitch

GaAs Gallium Arsenide

LEE Layered Elastomeric Elements

LGA Land Grid Arrays

PSA Pressure Sensitive Adhesives

PWB Printed Wiring Board

TAB Tape Automated Bonding

TCPI Thermally Conductive Polymer Interconnection

ZAF Z-Axis Film

ZIF/LIF Zero Insertion Force/Low Insertion Force

1.4 Applicable Documents

EIA-364-B Electrical Connector Test Procedures Including Environmental Classifications

IPC-CM-770C Component Mounting Guidelines for Printed Boards

IPC-SM-782A Surface Mount Land Patterns (Configurations and Design Rules)

2.0 TECHNOLOGIES SUMMARIZED

2.1 Conductive Adhesives Adhesives in film or liquid form may be utilized for simultaneous physical attachment and electrical connections. Liquid adhesives with metal fillers are utilized for die attach and other applications. Anisotropically-conductive adhesives have proven useful as a medium for providing interconnections between flexible printed circuitry, which includes lead-frames for Tape Automated Bonding (TAB), and flat panel electronic displays. Typically these materials are tack- free films that are sparsely populated with conductive particles and are bondable with a brief application of heat or UV and pressure.