

IPC-CI-408

Solderless Surface Mount Connector Design Characteristics and Application Guidelines

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Table of Contents

1.0 INTRODUCTION	1	Figure 3.3-2 LEE—redundant contact.....	14
1.1 Scope.....	1	Figure 3.3-3 LEE—Example of potential connector skew ...	15
1.2 Purpose	1	Figure 3.4-1 ECPI structure. ECPI is a composite of vertical Ag or Au plated conductors in a silicone rubber matrix.	16
1.3 Terms, Definitions and Acronyms	1	Figure 3.4-2 ECPI interconnect. ECPI interconnects two arrays when pressure is applied.	17
1.4 Applicable Documents	1	Figure 3.4-3 Resistance versus load curve for a typical coarse pitch ECPI sample	19
2.0 TECHNOLOGIES SUMMARIZED	1	Figure 3.4-4 Surface mount chip carrier test vehicle for ECPI	20
2.1 Conductive Adhesives	1	Figure 3.4-5 Land Grid Array (LGA) demonstration vehicle.....	21
2.2 Elastomerics—Metal on Elastomer Type	2	Figure 3.4-6 ECPI-based backplane connector using an ECPI-LGA interconnection.....	23
2.3 Layered Elastomeric Elements.....	2	Figure 3.5-1 Example of pressure clip interconnection	24
2.4 Elastomeric Conductive Polymer Interconnection (ECPI).....	2	Figure 3.6-1 Electromicrograph of a single button illustrating the random weave.....	26
2.5 Pressure Clip Interconnections.....	2	Figure 3.6-2 Carrier with 68 perimeter button contacts and 20 center contacts	27
2.6 Button Board	2	Figure 3.6-3 Suggested target pad pattern for typical PWB substrate application	28
3.0 TECHNOLOGIES EXPANDED	3	Figure 3.6-4 Load vs. displacement for 0.51 mm [0.020 in] dia x 1.14 mm [0.045 in] Long Mo/Au buttons.....	29
3.1 Conductive Adhesives	3	Figure 3.6-5 Contact resistance vs. displacement for 0.51 mm [0.020 in] dia x 1.02 mm [0.040in] long Mo/Au buttons.....	29
3.2 Elastomerics—Metal on Elastomer Type	8	Figure 3.6-6 Contact resistance vs. load for 0.51 mm [0.020 in] dia x 1.02 mm [0.040 in] long Mo/Au buttons.....	30
3.3 Layered Elastomeric Elements.....	11		
3.4 Elastomeric Conductive Polymer Interconnection (ECPI).....	16		
3.5 Pressure Clip Interconnection	22		
3.6 Button Board	25		

Figures

Figure 3.1-1 Flexible circuit to board	3
Figure 3.1-2 Component on printed board.....	4
Figure 3.1-3 ZAF Interconnect	4
Figure 3.1-4 Adhesive bonding	5
Figure 3.1-5 Rework sequence	6
Figure 3.2-1 Sketch of Metal as Elastomer Interconnector Parallel Planes	9
Figure 3.2-2 Flex-to-board metal on elastomer connector assembly	9
Figure 3.2-3 Metal on elastomer connectors display 0.18 mm [0.007 in] and 0.08 mm [0.003 in] centerline densities	10
Figure 3.2-4 Example of metal on elastomer, low-profile connector assembly.....	12
Figure 3.2-5 Example of metal-on-elastomer, low-profile connector assembly	13
Figure 3.2-6 Metal elastomer connection possibilities	14
Figure 3.3-1 Layered elastomeric element	14

Tables

Table 3.1-1 Example of Adhesive Material Properties	7
Table 3.1-2 Conductive Adhesives	8
Table 3.1-3 Dead Load Aging Results—Minimum Hours Survived at 100°C [212°F]	8
Table 3.4-1 List of Typical ECPI Properties	18
Table 3.4-2 ECPI Test Specifications	22
Table 3.4-3 Comparison Backplane I/O Count	23
Table 3.4-4 Comparison of ECPI to Other Thermal Conductors	23
Table 3.6-1 Acceptable Environments for Button Assembly Applications.....	28
Table A-1 Physical and Electrical Characteristics	33
Table A-2 Environmental Requirements.....	34
Table A-3 Assembly Requirements	34

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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.