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Qualification and Performance Specification for Flexible/ Rigid-Flexible Printed Boards

Supersedes IPC-6013C
December 2013

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Qualification and Performance Specification for Flexible/Rigid-Flexible Printed Boards

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Contact:

IPC
3000 Lakeside Drive, Suite 105N
Bannockburn, Illinois
60015-1219
Tel 847 615.7100
Fax 847 615.7105

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Flexible Circuits Committee

Chair
Nick S. Koop
TTM Technologies

Vice Chair
William A. Ortloff
Raytheon Company

Flexible Circuits Performance Specifications Subcommittee

Chair
Nick S. Koop
TTM Technologies

Vice-Chair
Mahendra Gandhi
Northrop Grumman Aerospace Systems

Technical Liaison of the IPC Board of Directors

Bob Neves
Microtek Laboratories

Flexible Circuits Performance Specifications Subcommittee

Allison Elizabeth, NTS - Baltimore
Amar Alisha, Lockheed Martin Space Systems Company
Arredondo Gustavo, Para Tech Coating Inc.
Auer Lance, Raytheon Missile Systems
Babyak Rick, TTM Technologies, Inc.
Ballou Chris, TTM Technologies
Bauer John, Rockwell Collins
Beauchesne Michael, BAE Systems
Boutte Alvin, NASA Goddard Space Flight Center
Bowles Scott, L-3 Fuzing and Ordnance System
Bowles Steven, ALL Flex LLC
Buechner Mark, BAE Systems
Buss Jeremy, Naval Air Warfare Center Weapons Division
Cairns Rodd, Starkey Hearing Technologies
Cardoza Donald, Cirexx International, Inc.
Case Byron, L-3 Communications
Chevalier Denise, Amphenol Printed Circuits, Inc
Clark James, Multek Flexible Circuits, Inc.
Cockcroft Duane, Cirexx International, Inc.
Collier Michael, Teledyne Printed Circuit Technologies
Connitt David, L-3 Fuzing and Ordnance Systems, Cincinnati
Corbett David, DLA Land and Maritime
Cote Andrea, UL LLC
Cox Sidney, Sidney G. Cox
Dangler John, IBM Corporation
Daniluk Kelly, NASA Goddard Space Flight Center
Dupriest [illegible], Lockheed Martin Missiles & Fire
Ferrari Gary, FTG Circuits
Finstad Mark, Flexible Circuit Technologies, Inc.
Fox William, Lockheed Martin Missile & Fire Control
Fuentes Laura, Summit Interconnect - Anaheim
Gardenour Tom, Amphenol Printed Circuits, Inc.
Gardeski Thomas, Gemini Sciences, LLC
Gleason Michael, Draper
Goolsby Josh, Lockheed Martin Missiles & Fire Control
Gragg Ty, Unicircuit Inc.
Griffith Russell, Flexible Circuits Inc.
Grinvalds Rachel, Rockwell Collins
Hammill Vicka, Honeywell Inc. Air Transport S
Henault Philip, Raytheon Company
Hill Mike, TTM Technologies
Hook Lorraine, Streamline Circuits
Hudson Emma, UL International UK Ltd.
Jawitz Michael, Orbital ATK
Kummer William, Raytheon Company
Lee Minsu, Korea Printed Circuit Association
Leeper Lynne, Lockheed Martin Space Systems Company
Leschisin John, Minco Products, Inc.
Lipps Daniel, L-3 Fuzing and Ordnance Systems, Cincinnati
Loew Dan, L-3 Fuzing and Ordnance Systems, Cincinnati
Ly Jennifer, TTM Technologies
MacFadden Todd, Bose Corporation
Maddox Clifford, Boeing Company
McCarthy Thomas, Taconic Advanced Dielectric Division
McGarry Robert, RPM Solutions
McQueen Matthew, NSWC Crane
Meath Jonas, All Flex
Menuez Peter, L-3 Communications - Cincinnat
Miedico Roger, Raytheon Company
Miyasato Keita, Taiyo Industrial Co., Ltd.
Monarchio James, TTM Technologies, Inc.

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Murray Steven, Northrop Grumman Corporation

Musante Steve, Raytheon Missile Systems

Nakajima Yoji, Asahi Glass Co., Ltd.

Nargi-Toth Kathleen, NCAB Group USA, Inc.

Neves Robert, Microtek (Changzhou) Laborator

Nguyen Thi, Lockheed Martin Missile & Fire

Oliver Glenn, Raytheon Missile Systems

Ortloff William, Raytheon Company

Pedersen Jan, Elmatica AS

Pfingston William, Miraco, Inc.

Rios Nef, Summit Interconnect - Anaheim

Romont Thomas, IFTEC

Russo Mitch, TTM Technologies

Sam Chan, Minco Products, Inc.

Sanchez Enrique, Cirexx International, Inc.

Sandor Edward, Taconic Advanced Dielectric Division

Savage Rolland, Savage Consulting

Schmitt Jeff, Coast to Coast Circuits, Inc.

Shelby Gilbert, Raytheon Systems Company

Sheldon Robert, Pioneer Circuits Inc.

Shepherd Russell, National Technical Systems Anaheim

Shepler Terry, Electro-Materials, Inc.

Stark Herb, Flexible Circuits Inc.

Steinbauer Rebecca, ALL Flex LLC

Stevens Brian, Rockwell Collins

Takahara Kunio, Japan Electronics Packaging an

Takahashi Mamoru, Asahi Glass Co., Ltd.

Takeuchi Hiroki, JX Nippon Mining and Metals

Taylor Jamin, ALL Flex LLC

Toone Bradley, L-3 Communications

Vanderpan Crystal, UL LLC

Vargas Carlos, TTM Technologies

Wasserzug Alex, Cirexx International, Inc.

Weatherford David, Teledyne Advanced Electronic Solutions

Webster Clark, ALL Flex LLC

Yoshimura Ryoichi, Nippon Mektron Ltd.

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Qualification and Performance Specification for Flexible/Rigid-Flexible Printed Boards

1 SCOPE

1.1 Statement of Scope This specification covers qualification and performance requirements of flexible printed boards. The flexible printed board may be single-sided, double-sided, multilayer, or rigid-flex multilayer. All of these constructions may or may not include stiffeners, plated-through holes (PTHs), and blind/buried vias.

The flexible or rigid-flex printed board may contain build up High Density Interconnect (HDI) layers. The printed board may contain embedded active or passive circuitry with distributive capacitive planes, capacitive or resistive components conforming to IPC-6017.

The rigid section of the printed board may contain a metal core or external metal heat frame, which may be active or non-active.

Revision level changes are described in 1.7.

1.2 Purpose The purpose of this specification is to provide requirements for qualification and performance of flexible printed boards designed to IPC-2221 and IPC-2223.

1.3 Performance Classification, Board Type, and Installation Usage

1.3.1 Classification This specification recognizes that flexible printed boards will be subject to variations in performance requirements based on end-use. These performance classes (Class 1, Class 2, and Class 3) are defined in IPC-6011.

1.3.2 Printed Board Type Performance requirements are established for the different types of flexible printed boards, classified as follows:

Type 1 – Single-sided flexible printed boards containing one conductive layer, with or without stiffeners.
Type 2 – Double-sided flexible printed boards containing two conductive layers with PTHs, with or without stiffeners.
Type 3 – Multilayer flexible printed boards containing three or more conductive layers with PTHs, with or without stiffeners.
Type 4 – Multilayer rigid and flexible material combinations containing three or more conductive layers with PTHs.
Type 5 – Flexible or rigid-flex printed boards containing two or more conductive layers without PTHs.

1.3.3 Installation Uses

Use A – Capable of withstanding flex during installation.
Use B – Capable of withstanding continuous flexing for the number of cycles as specified on the procurement documentation.
Use C – High temperature environment (over 105 °C [221 °F]).
Use D UL – Recognition. See UL 94 and UL 796F.

1.3.4 Selection for Procurement For procurement purposes, performance class and installation usage **shall** be specified in the procurement documentation.

The documentation **shall** provide sufficient information to the supplier so that the supplier can fabricate the flexible printed boards and ensure that the user receives the desired product. Information that should be included in the procurement documentation is to be in accordance with IPC-2611 and IPC-2614.

Note: If the drawing specifies the requirement in words, designators are not required.

The procurement documentation **shall** specify the thermal stress test method and the number of cycles (in relation to reflow profiles in IPC-TM-650, Method 2.6.27) to be used to meet the requirement of 3.6.1. Selection **shall** be from those depicted in 3.6.1.1, 3.6.1.2, 3.6.1.3 and 3.6.1.4. If not specified (see 5.1), the default **shall** be per Table 1-1.