



Micro Systems Technologies

Full Flex & Flex Rigidized for Folding

HIGHLIGHTS

- Multilayer flex material
- 3D miniaturization by folding
- Microvia and ultra-fine line technology
- Reduced overall thickness
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DYCONEX

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Full Flex & Flex Rigidized for Folding

Full Flex & Rigidized Circuit Boards

Description	Production capability
Lines/spaces	35/40 µm
Microvias/pads Ø	50/150 µm
Thinnest starting material	25 µm
Thinnest dielectric thickness	12 µm
Conductor width tolerance	+/- 20%
Artwork to soldermask tolerance (rigid)	+/- 25 µm
Layer count	< 8

Description	Leading edge capability
Lines/spaces	25/35 µm
Microvias/pads Ø	40/100 µm
Thinnest starting material	12 µm
Thinnest dielectric thickness	5 µm
Conductor width tolerance	+/- 10%
Artwork to soldermask tolerance (rigid)	+/- 15 µm
Layer count	< 12

Technical Data

Full flex PCBs for folding are built with flexible acrylic or epoxy adhesive in comparison to standard rigid-flex PCBs with prepregs. This offers thinner constructions and smaller bending zones. The rigid area can have multiple layers of flex material or a single layer of glass reinforced material to rigidize the assembly area.

The flexible materials are very thin and therefore higher packaging densities are possible. The bend zones can be manufactured with mechanical or laser routing. With these technologies very small bend zones are achievable. Such foldable full flex constructions are a perfect match for small, reliable, microelectronic systems.

Due to the thin construction more advanced assembly know-how is needed to handle the delivery panels. Specific assembly trays can help to handle the PCB through the assembly line. The temperature range for processing is specified between +25°C to +125°C.

The full flex build-up can be done with depth routing technology in an asymmetric construction, which means the bending zone is only on one side of the build-up. The standard bend zone is between 0.6 to 2.6 mm.

The second method for bending zone formation is the pre-routing technology. In this case the build-up is symmetric and the bend zone is on the top and bottom side of the flex. Therefore larger bend zone areas can be designed.

Asymmetric construction



Symmetric construction



Technological Highlights

- Thin multilayer full flex for 3D miniaturization with flex only material
- Ultra-fine line down to 25/35 µm lines/spaces
- Ultra-HDI microvia technology down to 40 µm blind via
- Anylayer stacked blind vias and vias in pad
- Small bend zones in multiple shapes with laser technology
- Higher packaging density compared to classical rigid-flex PCB with prepregs
- Combination of PI or LCP flex and rigid materials possible
- Wide range of reflow assembly technologies possible such as flip chip, Chip on board (COB), Chip Scale Package (CSP), Ball grid array (BGA)
- Combination of reflow and wire bonding technology possible such as Al wire wedge-wedge bonding or thermosonic ball-wedge gold wire bonding
- Wide range of surface finishes are available, such as ENIG, ENEPIG, E-Ni/Au, OSP, DIG

Based in Switzerland, DYCONEX has been in the PCB business for more than 50 years and delivers leading edge interconnect solutions in flex, rigid-flex and rigid technology. DYCONEX core competence lies in the production of highly complex HDI, high-frequency and high-reliability circuit boards for medical, defense, aerospace, industrial and semiconductor applications. DYCONEX is an MST company.



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