Flex and rigid flex specification standards

GLENAIR FLEX AND RIGID-FLEX

Manufacturing **Formats** and **Specifications**

The following tables describe, in brief, Glenair flex and rigid-flex manufacturing formats and specifications. Glenair recommends commercial customers specify IPC-6012/6013 standards of workmanship which are fully supported by Glenair. Military customers may alternatively cite specifications IAW MIL-PRF-31032.

FLEX ASSEMBLIES	
Design Formats	PADS • PADS PRO • Pro E / Creo • SolidWorks • Autodesk Inventor • CAM 350 • Altium • Valor • POLAR • XPedition
Manufacturing Formats	DXF • Gerber • ODB++ • IPC 2581
Layer Count	Max typ. up to 8
Termination	Thru hole • Reverse bare • Floating fingers • ZIF • Surface-mount
Conductor Width/Space	Lines: .003" • Spacing: .003" (dependent on copper weight)
Bend Radius (military)	Single Metal Layer: 4–6X overall flex thickness• Double Metal Layers: 6–10X overall flex thickness • Multi Layer Metal: 12–15X overall flex thickness
Materials / Tg	Substrate: DuPont™ Kapton® polyimide flex adhesive and adhesiveless -60°C to 125°C Cover layer: DuPont™ Kapton® Stiffener: FR4 or DuPont™ Kapton® (metal stiffeners available upon request) Conductor: Copper, Constantan High-temperature materials and more available
Surface Finish	ENIG • HASL • Immersion Tin and Silver • Soft and Hard Gold
Specs and Quality Management	IPC-6013 Class I, II, III, types 1-3 • ISO 9001, AS 9100J-STD-001 Space

RIGID-FLEX ASSEMBLIES	
Design Formats	PADS • PADS PRO • Pro E / Creo • SolidWorks • Autodesk Inventor • CAM 350 • Altium • Valor • POLAR • XPedition
Manufacturing Formats	DXF • Gerber • ODB++ • IPC 2581
Max Panel Thickness	Range of thicknesses from .010" to as thick as .250"
Layer Count	27 +
Via Technology	Blind, buried • Thru hole • Filled (conductive and non-conductive)
Conductor Width/Space	Lines: .003" • Spacing: .003" (dependent on copper weight)
Materials / Tg	Substrate: Nelco 4000, Rogers, Megtron, Polyimide, and more
Surface Finish	ENIG • HASL • Immersion Tin and Silver • Soft and Hard Gold
Specs and Quality Management	IPC-6013 Class I, II, III, type 4 • ISO 9001, AS 9100, J-STD-001 Space

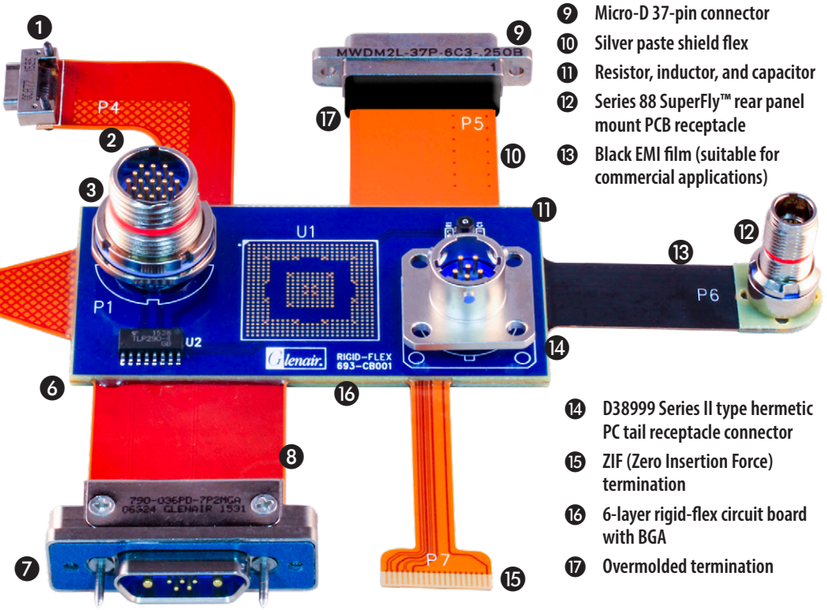
DuPont™ and Kapton® are trademarks or registered trademarks of E.I. du Pont de Nemours and Company.

Design options, flex, rigid flex, and rigid PCB

STANDARD DESIGN OPTIONS

Integrated **Flex / Rigid-flex** assemblies

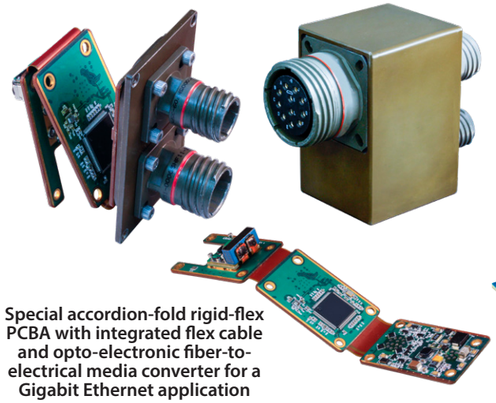
Properly designed flex and rigid-flex assemblies offer significant space and weight savings compared to wire harnesses. Many design options are available, including integrated stiffeners, shielding, factory forming, selective bonding, termination, layer count and so on.



1. Right-angle surface mount Nanominiature plug connector
2. Hatch shield and solid copper shield flex
3. Series 801 Mighty Mouse receptacle with PC tails
4. AlphaLink® SL spring-loaded contact connector
5. Cross-hatch shield flex
6. Board-mount transceiver
7. Series 79 Micro-Crimp® right-angle PCB panel-mount receptacle
8. Solid copper shield flex
9. Micro-D 37-pin connector
10. Silver paste shield flex
11. Resistor, inductor, and capacitor
12. Series 88 SuperFly™ rear panel mount PCB receptacle
13. Black EMI film (suitable for commercial applications)
14. D38999 Series II type hermetic PC tail receptacle connector
15. ZIF (Zero Insertion Force) termination
16. 6-layer rigid-flex circuit board with BGA
17. Overmolded termination

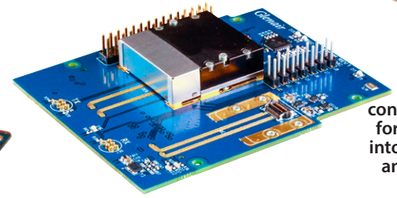
SMALL FORM-FACTOR PCBAs AND FLEX-TO-INSTALL ASSEMBLIES

Integrated Design Examples



Special accordion-fold rigid-flex PCBA with integrated flex cable and opto-electronic fiber-to-electrical media converter for a Gigabit Ethernet application

Complex double-sided PCBA and interconnect assembly with programmable electronics for a high-speed data aggregation application



Ruggedized FMC connectivity PCBA designed for modular incorporation into Ethernet, Fibrechannel, and/or DVI, SMPTE video system applications