



DK-DALEBA
Printed Circuits

FLEX AND RIGID-FLEX PCBS

PCBS WITH THE ULTIMATE VERSATILITY



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Weight reduction

Flex construction with materials such as Polyimide are much lighter than conventional substrates. Further reduction is offered by not using traditional connectors making them ideal for 'carry' or 'wearable' products.



Reduced overall costs

Using thin polyimide films allows these boards to easily fit in small packaging making product costs less. Faster assembly without as many connectors also offer lower box build costs.



Dynamic Flex

Standard Flex are only flexed at install. Dynamic Flex boards can be flexed repeatedly making them suitable for laptops, robots, printers etc.



Increased product reliability

The need for traditional connectors can be removed thus increasing reliability re assembly issues or connector failures. The use of polyimide materials also aids the thermal stability of the circuits.



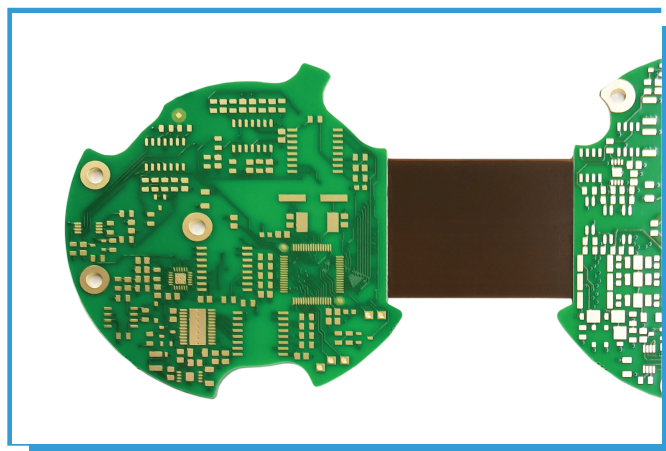
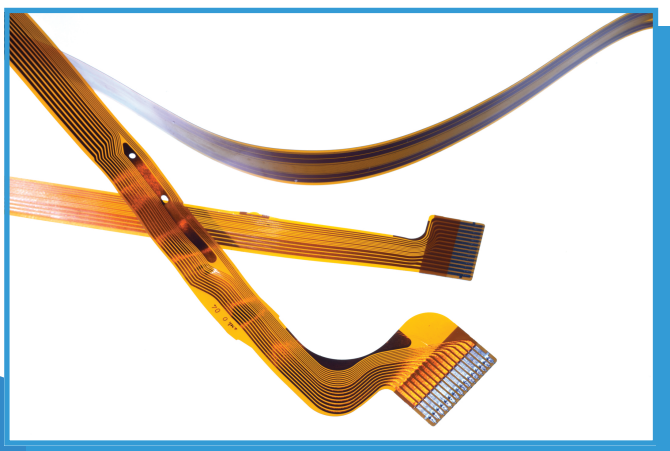
Ultimate use of packaging space

The circuits are thin and can be easily creased or folded and bent to fit the smallest of available spaces. They are ideal to be formed in the geometry of 3D packaging solutions where rigid boards would not fit.



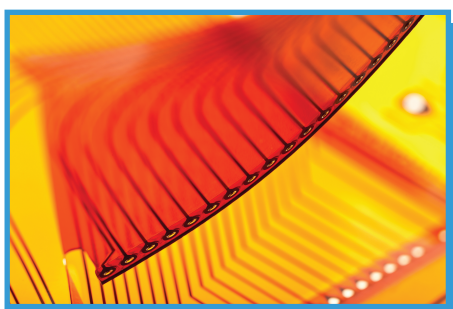
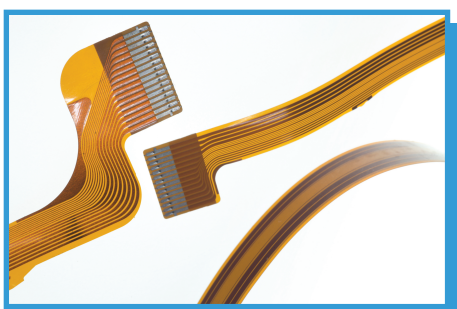
High vibration or shock environments

Extremely shock resistant for high-stress environments



FLEX PCBS (FCB)(FPC)

Flex circuits or Flexible Printed Circuits consist of a thin insulating polymer film encapsulating the conductor circuit. Polyimides are popular for construction as they offer high temperature opportunities for assembly or product environment. Flex circuits can be manufactured as a connector or designed for use with components. Rigid stiffeners can be included. They can be constructed as single sided, double sided or multi-layered.



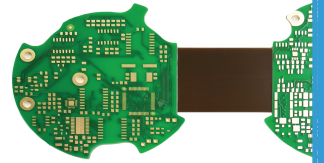
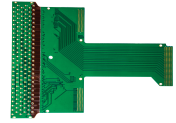
FLEXIBLE PRINTED CIRCUIT (FPC) CAPABILITIES

Item	Sample (Order Area <3m ²)	Batch (Order Area ≥3m ²)
Main Materials		
Insulation Layer	CVL, Ink	CVL, Ink
Colour of coverlay	Yellow, Black, White	Yellow, Black, White
Colour of ink	Yellow, Green	Yellow, Green
Dielectric layer	0.012mm-0.1mm	0.025-0.1mm
Additional Materials		
FR-4 Stiffener	0.1-3.2mm	0.1-3.2mm
PI Stiffener	0.075-0.225mm	0.075-0.225mm
Steel reinforcement	0.2-0.6mm	0.2-0.4mm
Other Materials	3M tape, snap dome, electromagnetic shielding, lid-off film, micro-sticking film	3M tape, snap dome, electromagnetic shielding, lid-off film, micro-sticking film
Structure	1+n+1 ; 1+1+n+1+1 ; 2+n+2 (needs review)	1+n+1 ; 1+1+n+1+1 ; 2+n+2 (needs review)
	F+R (needs review), cu+F+cu (needs review), R+F+R+F+R (needs review), R+F+R	R+F+R
Layers	≤14L	≤8L
Board Thickness	0.06-0.35mm	0.1-0.35mm
Tolerance of Board Thickness	Flexible Area 0.03mm;PI Stiffener Area 0.05mm;FR-4 Stiffener Area 0.1mm	Flexible Area 0.03mm;PI Stiffener Area 0.05mm;FR-4 Stiffener Area 0.1mm
Min single unit Size	PCB Size: 5mm*15mm-310mm*510mm	PCB Size: 5mm*15mm-310mm*510mm
Copper Thickness	Outer layer 2oz, Inner layer 2oz	Outer layer 1oz, Inner layer 1oz
Outline	Breakaway Tab, Single PCB	Breakaway Tab, Single PCB
Surface Treatment	HASL, HASL lead free (single-side FPC only), ENIG, OSP (no-stiffener only)	ENIG

RIGID-FLEX PCBS

Rigid Flex are hybrid boards and by definition consist of a Flex board with a Rigid circuit component incorporated in the design. These hybrid circuits can be a Flex with an FR4 stiffener, or two or more rigids connected with Flex circuits. Rigid Flex circuits offer the best of both flexible circuits and rigid boards combined in one PCB.

Rigid Flex circuits are extremely versatile and can be used in a wide range of applications. Designers often consider they are ultimate solution for making use of the available packaging space. Increased product reliability and overall reduced assembly costs are also drivers for this technology.



RIGID FLEX PRINTED CIRCUIT - CAPABILITIES

Item		Sample (Order Area <3m ²)	Batch (Order Area ≥3m ²)
Material			
Tg170		S1000-2M, IT180A	S1000-2M, IT180A
Hi-Tg FR4 (halogen-free)		S1165	S1165
Hi-speed material:		needs review	needs review
		1+n+1 ; 1+1+n+1+1 ; 2+n+2 (needs review)	0.025-0.1mm
Structure		F+R (needs review), cu+F+cu (needs review), R+F+R+F+R (needs review), R+F+R	R+F+R
Layer		≤18L	≤16L
Board Thickness		0.5-3.2mm	0.5-3.2mm
Copper Thickness		Outer layer 2oz, Inner layer 2oz	Outer layer 2oz , Inner layer 2oz
Outline			
Processes	Rigid Area	Single PCB; V-Cut; Breakaway Tab; Breakaway Tab+Stamp Holes; Breakaway Tab+V-Cut; Breakaway Tab+V-Cut+Stamp Holes	Single PCB;V-Cut; Breakaway Tab; Breakaway Tab+Stamp Holes; Breakaway Tab+V-Cut; Breakaway Tab+V-Cut+Stamp Holes
	Flexible Area	Breakaway Tab, Single PCB	Breakaway Tab, Single PCB
Tolerance of Size	Rigid Area	0.1mm	0.15mm
	Flexible Area	0.05mm	0.1mm
Outline			
Drill bit(min) for mechanical drill		0.15(Board Thk≤1.2mm)-6.2mm	0.2-6.2mm
The gap between hole wall for different webs (CAF):	IPC standard	12mil	12mil
	Military standard	16mil	16mil
Hole to trace distance (after compensation) for one lamination		4L-5.5mil; 6L-6.5mil; 8L-7mil; 10L-8mil; 12-18L-10mil	4L-6mil; 6L-7mil; 8L-8mil; 10L-10mil; 12-18L-12mil
Surface treatment		HASL, HASL lead free, ENIG, Immersion Tin (needs review), Immersion Silver (needs review), OSP, HASL+Gold Finger (needs review), ENIG+Gold Finger, ENEPIG OSP+Gold, Finger (needs review), ENIG+OSP (needs review)	HASL, HASL lead free, ENIG, Immersion Tin (needs review), Immersion Silver (needs review), OSP, HASL+Gold Finger(needs review), ENIG+Gold Finger, ENEPIG, OSP+Gold,Finger (needs review), ENIG+OSP (needs review)
Solder Mask	Colour	Green, Yellow, Black, Blue, Red, White, Matt Green, Matt Black	Green, Yellow, Black, Blue, Red, White, Matt Green, Matt Black
Silkscreen	Colour	White, Yellow, Black	White, Yellow, Black