

LEXINGTON[®]

Printed Circuit Technology

**STATE-OF-THE-ART PCB TECHNOLOGIES
FOR SOPHISTICATED
ELECTRONICS**

**Flex PCB,
Rigid-Flex
PCB Solutions**



Introduction

- Intro LEXINGTON®
- Application Area
- Product Review
- Stack up And Process
- Raw materials
- Capacity
- Design Rule
- Certified Technology
- Contact



THE WORLD OF PCB

Development and production of circuit boards and printed circuit boards for industry

Intro

LEXINGTON®

INNOVATIVE CIRCUIT BOARDS
FOR **AUTOMOTIVE, MEDICAL,
LIGHTING, AEROSPACE,
COMPUTING and STORAGE,
AND MORE...**

- LEXINGTON® is a Manufacture and design printed circuit board to the highest and support our customer supply chain with outstanding quality and on time delivery

- Communications

We specialize in design and manufacture of carrier- and enterprise-class communications equipment, wireless, optical networking, wireless transmission and enterprise networking.

- Aerospace

We bring competitive advantage to aerospace customers by improving time-to-market, scalability and manufacturing efficiency. We are leaders in quality, technology, supply chain management and lean manufacturing principles.

- Medical

LEXINGTON® medical manufacturing capabilities meet the most stringent standards that regulatory bodies mandate. Quality and reliability is critical in this field, and LEXINGTON® is structured to support the high-mix, low-volume needs specific to the industry.

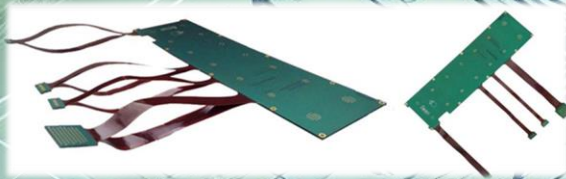
- Automotive

LEXINGTON® has provided the highest quality products and services for the automotive industry. In today's automotive business environment, operational challenges have become increasingly more complex. To address these challenges, our dedicated team is committed to creating and managing high-quality automotive supply chains and delivering competitive results to customers.

Application Areas

Aerospace

Instrumentation
Temperature sensors
Radio communication systems
Control tower systems
Radar systems



Automotive

Transmission controls
Running lights
Rear LED lights
LCD displays
Comfort control units



Medical

imaging equipment
wireless controllers



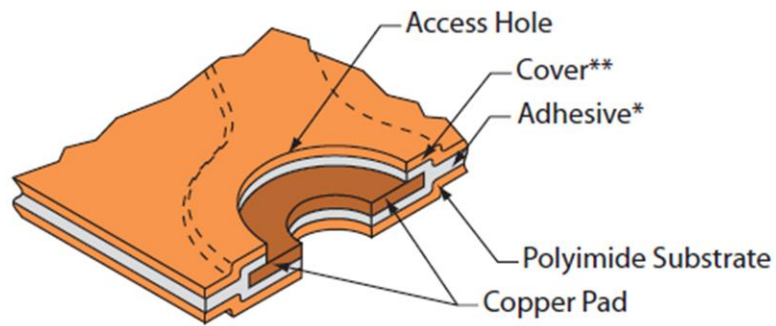
Computing and Storage

Routers and servers
Phone switching systems
Large communication systems

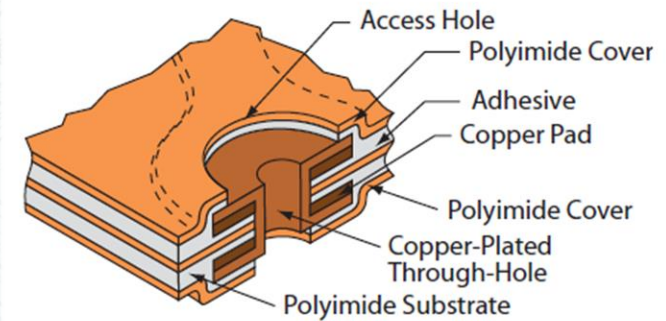


Product:

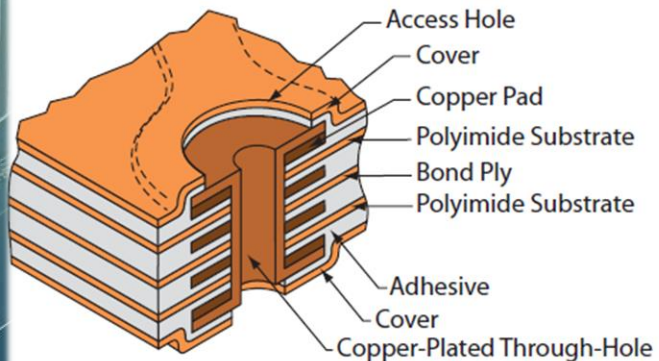
Single Layer FPC



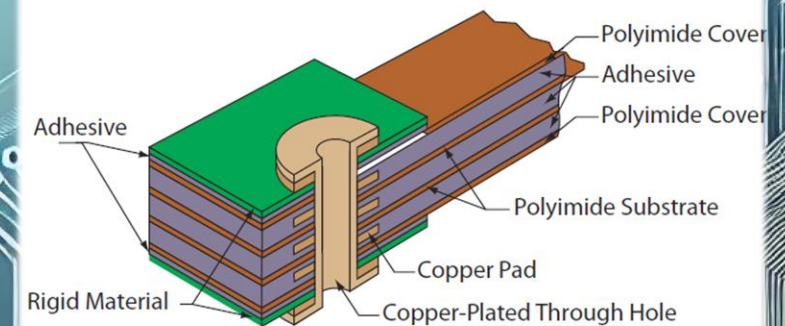
Double Layer FPC



Flex-Rigid PCB



Flex-Rigid PCB



Product-Automotive

Application: Rotary sensor control board

Type: Single Sided FPC



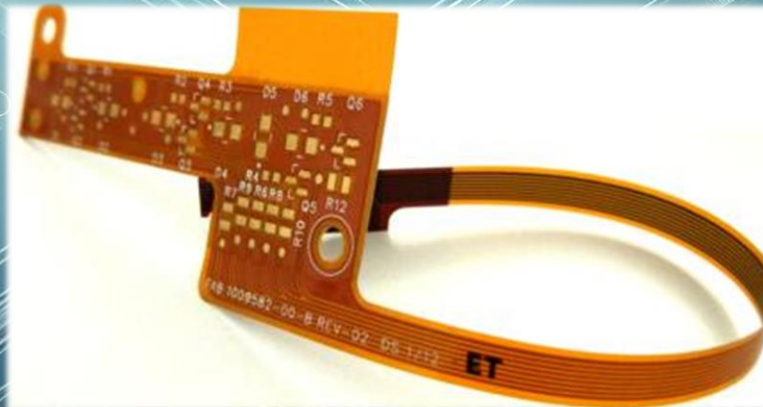
Application: Direction axis control board

Type: Single Sided FPC



Application: Steering wheel switch control board

Type: Single Sided FPC

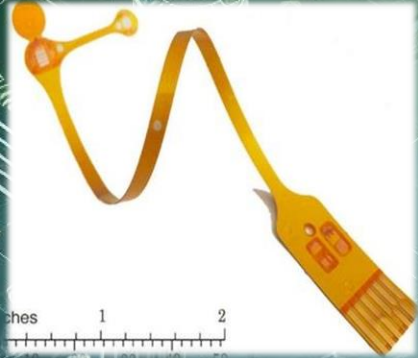


Product-Medical

Application: Blood oxygen meter

Type: Single-sided Double Access
FPC

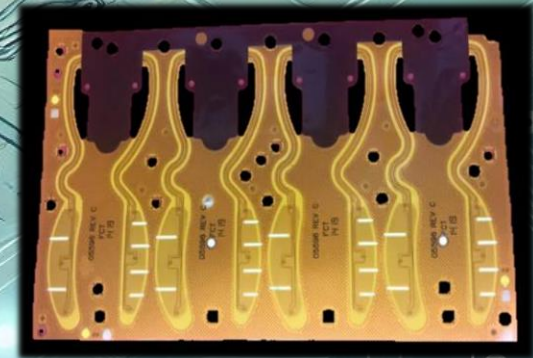
Characteristic: Double side
Shielding, Suspended pads,
Super long



Application: Eye Treatment

Type: Single-Sided FPC

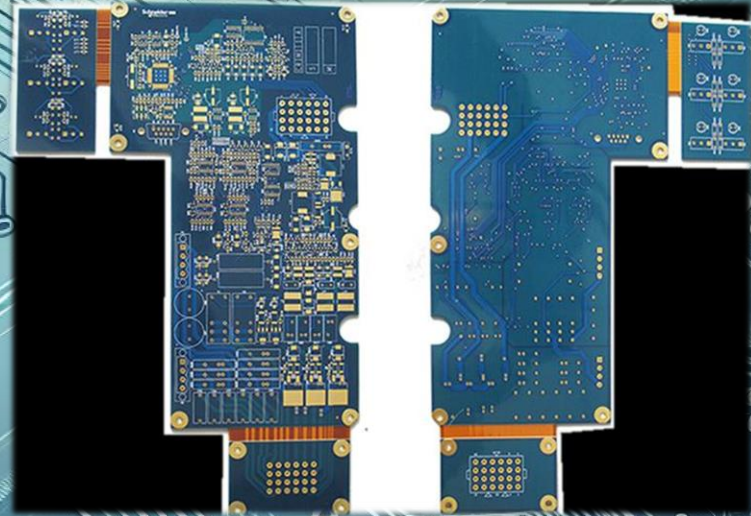
Characteristic: Fine Line Width/Spacing.
Super Flexibility.



Product-Industrial

Application: Metal detector

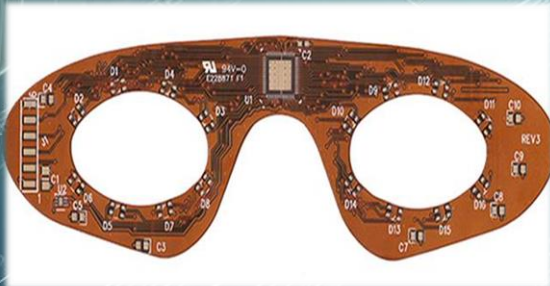
Type: 4-Layers Rigid-flex, Blue solder mark



Product-Wearable

Application: VR Glasses

Type: 3-layer FPC,BGA design



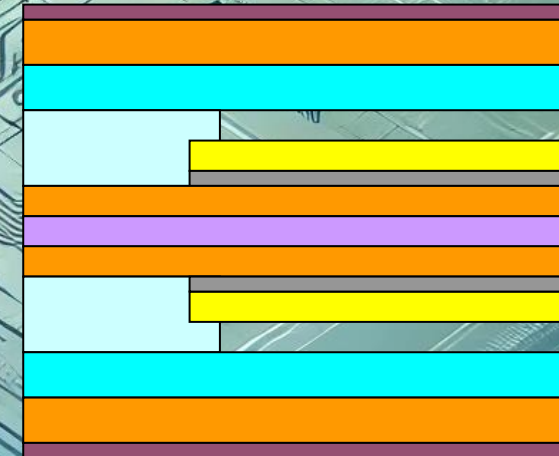
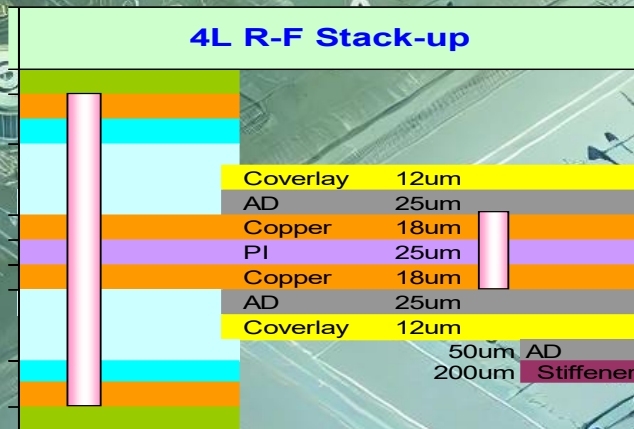
Application: Pilot costume

Type: 2layer FPC, Super Long size



Stack-UP and Process

1R+2F+1R---4layer Flex-Rigid



L2-L3

Board cutting – Mech. drill –Shadow–Button image -- Button Plating – I/L D/F – I/L exposure – DES –AOI – B.O. – Sticking Cover lay – Pressing cover lay – Measuring expansion Coefficient – PE Punch -- FQC

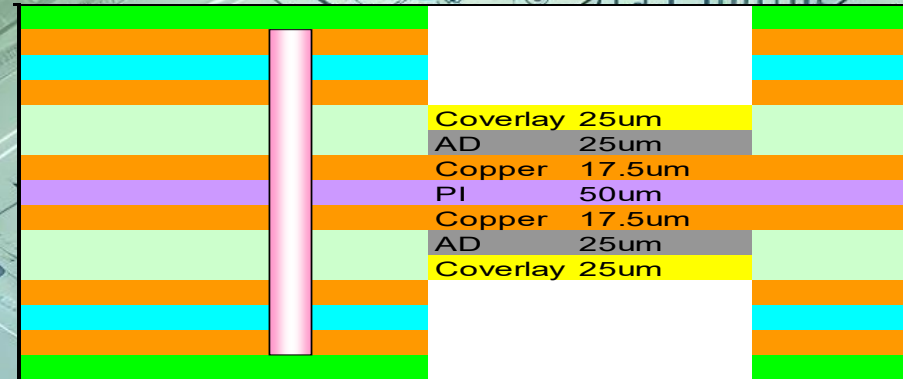
L1-L4

NF PP Open – Plasma – B.O. – Pressing(L1&L4 is Single copper core) – Mech. Drill – De-burr – De-smear – PTH+ Flash – Panel Plating – OL D/F – OL exposure – DES – AOI – S/M – C/M – ENIG - Pre- Routing – Laser De-cap – Laser Routing – Routing – ET – Pressing stiffener– FQC – Packing

Stack UP and Process

2R+2F+2R ---6layer Flex-Rigid

Stack-up



L3-L4

Board cutting –I/L D/F – I/L exposure – DES – AOI – B.O. – Sticking Cover lay – Pressing cover lay – Measuring expansion Coefficient – PE Punch --FQC

L12/L56

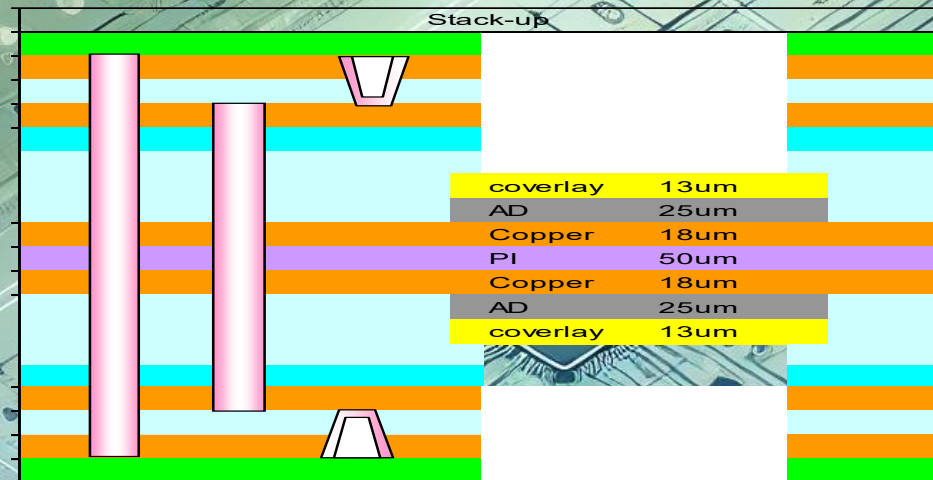
Board cutting—I/L D/F—DES— PE Punch—AOI—B/O

L1-L6

NF PP Open – Plasma – B.O. – Pressing(L12&&L34&L56) – Mech. Drill – De-burr – De-smear – PTH+ Flash –OL D/F – OL exposure –Pattern plate—SES – AOI – S/M – C/M – ENIG –Pre-Routing – Laser De-cap – Laser Routing – Routing – ET – Pressing stiffener– FQC – Packing

Stack UP and Process

1+1R+2F+1R+1 ---1+HDI 6layer



L3-L4

Board cutting —I/L D/F — I/L exposure — DES --- AOI— B.O. — Sticking Cover lay — Pressing cover lay —
Measuring expansion Coefficient — PE Punch --FQC

L2/L5

Board cutting— I/L D/F—DES— PE Punch—AOI—B/O

L25

NF PP Open — Plasma — B.O. — Pressing(L2&&L34&L5) — Mech. Drill — De-burr — De-smear — PTH+
Flash —Panel Plate—IL D/F — DES — AOI —B/O

L16

Pressing—Laser Drill—Mech. Drill — De-burr — De-smear — PTH+ Flash —ODF—Pattern Plate—SES—
AOI—S/M — C/M — ENIG —Pre-Routing — Laser De-cap — Laser Routing — Routing — ET — Pressing
stiffener— FQC — Packing

Stack UP and Process

1+1F+2F+1F+1 ---2+HDI 6layer



L3-L4	Board cutting –Mech. Drill–Shadow-- Button Image– Button plate -- I/L D/F – I/L exposure – DES — AOI– B.O. – Sticking Cover lay – Pressing cover lay – ENIG– Punch Finger--Measuring expansion Coefficient –PE Punch -- FQC
L2/L5	Board cutting (Single side FCCL Preparation)
L25	NF PP Open – Plasma – B.O. – Pressing(L2&&L34&L5) – Laser Drill — De-smear – PTH+ Flash – Panel Plate—IL D/F – DES –UV Cut PI -- AOI – B/O
L16	Pressing—Laser Drill—Mech. Drill – De-burr – De-smear – PTH+ Flash —Panel Plate—D/F--- DES—AOI—S/M – C/M – ENIG –Pre-Routing – Laser De-cap – Laser Routing – Routing – ET – Pressing stiffener– FQC – Packing

Stack UP and Process

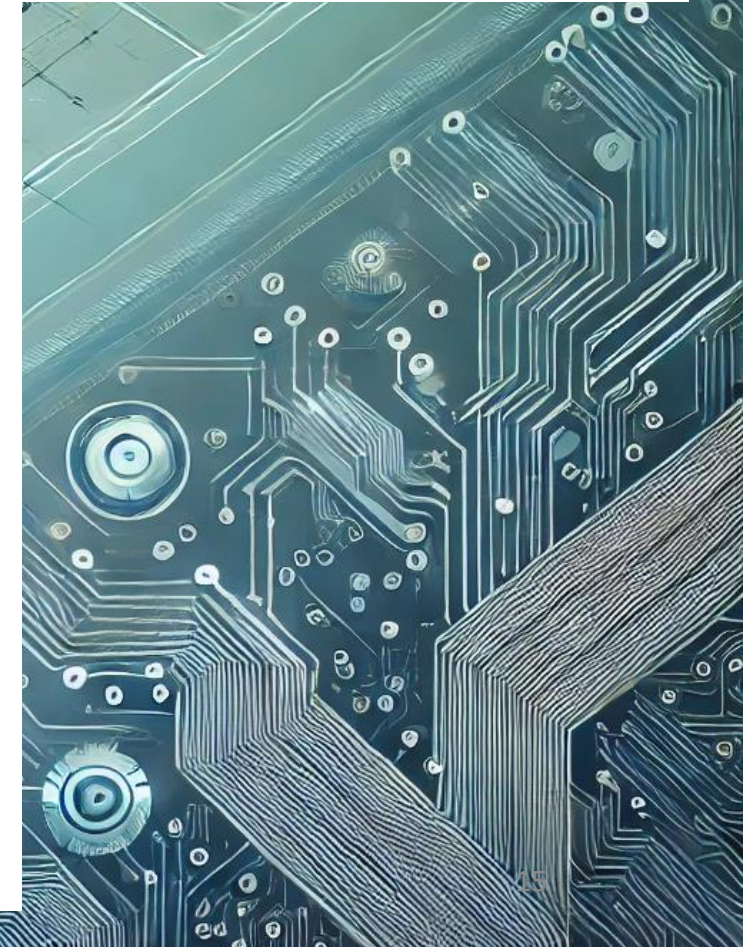
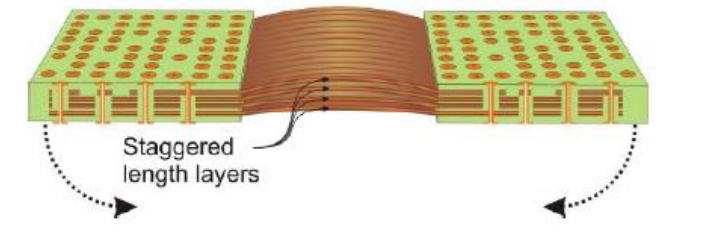
1+1F+4F+1F+1 ---2+HDI 8layer



L4-L5	Board cutting—I/L D/F—I/L exposure—DES—AOI—B.O.—Sticking Cover lay—Pressing cover lay—Measuring expansion Coefficient --- PE Punch—FQC
L3/L6	Board cutting—I/L D/F—DES（蚀刻单面）—PE Punch—AOI—B/O
L25	NF PP Open—Plasma—B.O.—Pressing(L2&&L34&L5)—Mech. Drill—De-burr—De-smear—PTH+Flash—Panel Plate—IL D/F—DES—AOI—B/O
L27	Pressing—Laser Drill—De-burr—De-smear—PTH+Flash--Panel Plate—IDF--DES—AOI—B.O
L16	Pressing—Laser Drill—Mech. Drill—De-burr—De-smear—PTH+Flash—Panel plate--DF—DES—AOI—S/M—C/M—ENIG ---Pre-Routing—Laser De-cap --Adhere Shielding Film--- Press shielding film-- Laser Routing—Routing—ET—FQC—Packing

Rigid Flex stack up – Air Gap

layer1	12	um	Soldmask (LPI)		
	61.3	um	base copper(18)um+plated:		
	50	um	IT-180A rigid		
non-flow pp	141		106 *2	coverlay PI:	25 um
non-flow pp			106 *1	coverlay adhesive:	25 um
layer2	18	um	inner copper		
	50	um	Polyimide(double side)		0.186 mm
layer3	18	um	inner copper		
			106 *1	coverlay adhesive:	25 um
non-flow pp				coverlay PI:	25 um
non-flow pp	132		106 *1	no prepreg between flex	
non-flow pp			106 *1	coverlay PI:	25 um
			106 *1	coverlay adhesive:	25 um
layer4	18	um	inner copper		
	50	um	Polyimide(double side)		0.186 mm
layer5	18	um	inner copper		
			106 *1	coverlay adhesive:	25 um
non-flow pp				coverlay PI:	25 um
non-flow pp	132		106 *1	no prepreg between flex	
non-flow pp			106 *1	coverlay PI:	25 um
			106 *1	coverlay adhesive:	25 um
layer6	18	um	inner copper		
	50	um	Polyimide(double side)		0.186 mm
layer7	18	um	inner copper		
			106 *1	coverlay adhesive:	25 um
non-flow pp				coverlay PI:	25 um
non-flow pp	132		106 *1	no prepreg between flex	
non-flow pp			106 *1	coverlay PI:	25 um
			106 *1	coverlay adhesive:	25 um
layer8	18	um	inner copper		
	50	um	Polyimide(double side)		0.186 mm
layer9	18	um	inner copper		
			106 *1	coverlay adhesive:	25 um
non-flow pp				coverlay PI:	25 um
non-flow pp	141	um	106 *2	coverlay PI:	25 um
layer10	50	um	IT-180A rigid		
	61.3	um	base copper(18)um+plated:		
	12	um	Soldmask (LPI)		
total thickness:		1269	um		
the flex part thickness:		0.186	mm+/-0.05mm		



Stack UP and Process

1Layer Flex PCB –According to choose the different PI ,Copper, Stiffener thickness to determine the finish board thickness to meet different product.

PI: 1mil Panasonic Stiffener: PI Copper: 1oz

Stack-up of Panasonic's material

layer1	12.5	um	coverlay PI: coverlay adhesive: base copper(35)um+no plating: Polyimide	0.1mm																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
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PI:1MIL SHENGYI WITH ADHENSIVE, FR4 Stiffener, Copper 1oz

Stack-up of Shenyi's material:

layer1	25	um	coverlay Pt:	25	0.755 mm				0	0.295 mm	
	25	um	coverlay adhesive:	25					0		
	35	um	base copper(35um+no plating	35					35		
	20	um	adhesive	20					20		
	25	um	Polyimide	25					25		
		um	adhesive	um	25	25		adhesive	um	40	40
		um	stiffener	FR4 um	600	600		stiffener	PI um	175	175
total thickness:	130	um									

the flex part thickness:	0.13	mm+/-0.05mm
the finger part thickness:	0.30	mm+/-0.05mm
the flex+stiffener part thickness:	0.78	mm+/-0.1mm

Stack UP and Process

2Layer Flex PCB –WITH 3M TAPE AND FR4 STIFFENER

Stack-up of Shenyi's material:

	um	panel frame	P	C	B	panel frame	
	50	coverlay PI:	50				50
	30	coverlay adhesive:	30				30
	10	Adhesive	10				10
layer1	35	base copper(35)um+no plating	35				35
	20	adhesive	20				20
	50	Polyimide	50				50
	20	adhesive	20				20
layer2	35	base copper(35)um+no plating	35				35
	10	Adhesive	10				10
	30	coverlay adhesive:	30				30
	50	coverlay PI:	50				50
		3m 6677	50um				
		stiffener-FR4	1564				
total thickness:	340						

the flex part thickness: 0.34 mm+/-0.05mm
the stiffener part thickness: 1.95 mm+/-10%mm

0.340 mm

1.954 mm

Stack-up of Shenyi's material:

	um	coverlay PI:	25					
	25	coverlay adhesive:	25					0
	18	base copper(18)um+no plating	18					12
	20	adhesive	20					18
	25	Polyimide	25					20
	20	adhesive	20					25
layer1	18	base copper(18)um+no plating	18					20
	25	coverlay adhesive:	25					18
	25	coverlay PI:	25					25
			0					25
			0					25
								13
total thickness:	201							

the flex part thickness: 0.20 mm+/-0.05mm
the finger part thickness: 0.20 mm+/-0.05mm

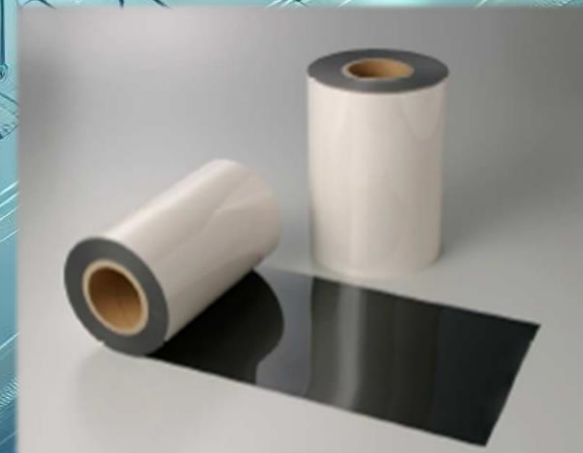
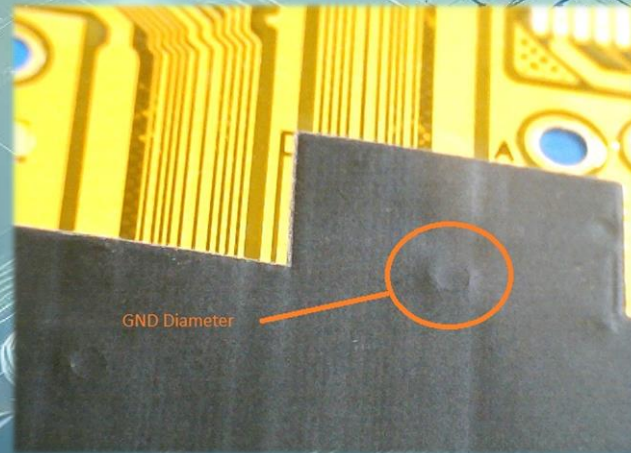
0.201 mm

adhesive um 25
stiffener PI um 12.5

Flex EMI Shielding - Conductive Film Stack-Up

SF-PC6000 is kind of Conductive film and can be connect with other
copper in the design

		SF-PC 6000(16um)			
layer1	16				
	25	um	coverlay PI:	25	0
	25	um	coverlay adhesive:	25	0
	35	um	base copper(35um+no plating	35	35
	20	um	adhesive	20	20
	25	um	Polyimide	25	25
			SF-PC 600		
				adhesive um	40
				stiffener PI um	75
Total thickness:		162	0.146 mm		
Flex part thickness:		0.16	mm+/-0.05mm		
Total Flex thickness:		0.20	mm+/-0.05mm		



Flex material Introduction

Flex Materials included PI, Coverlay, adhesive, Stiffener, 3M etc.

PI: Polyimide

The Performance of Adhesive and No adhesive PI

Type Items	Adhesive PI	No adhesive PI
Bending resistance	Limit times of bending, Static bending	Many times of bending, Dynamic bending
High temperature resistance	Tg 110°C, Easy aging under high temperature.	Tg $\geq 260^{\circ}\text{C}$, using life is long under high temperature.
Delamination resistance	Expansion coefficient of Z direction is 30 times of No adhesive PI, easy delamination under high temperature.	Expansion coefficient of Z direction is similar with FR-4, delamination resistance performance is perfect.

Flex material Introduction

PI: Polyimide with FR4

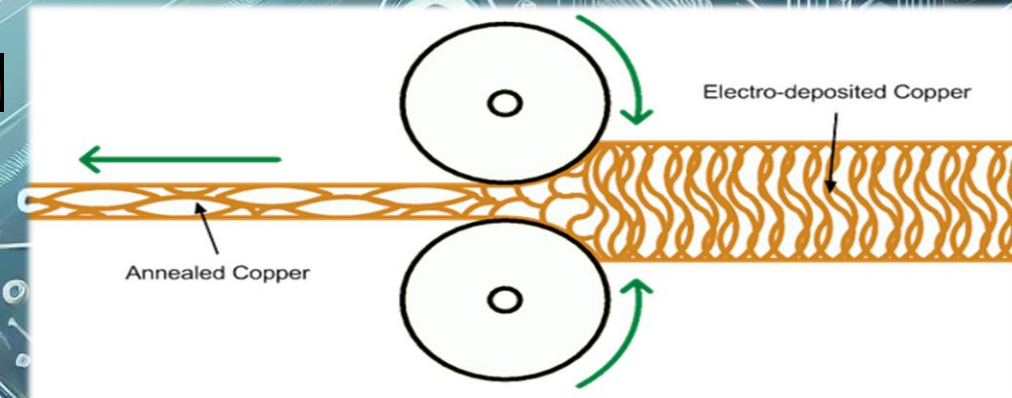
■ The Performance of PI and FR-4

Type Items	Polyimide (PI)	FR-4
Tg	$\geq 260^{\circ}\text{C}$	140 or 170 $^{\circ}\text{C}$
Td	$> 500^{\circ}\text{C}$	310 $^{\circ}\text{C}$
DK	3.2	4.3
DF	0.002	0.015

Copper: Flex come with ED copper or RA copper

Rolled Annealed (RA) copper – Low tensile /higher Elongation strength

Electro Deposited (ED) copper – High tensile /lower elongation strength



Flex Circuits - Coverlay

Coverlay:

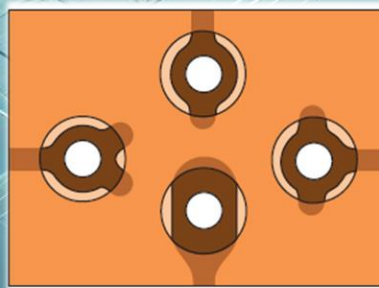
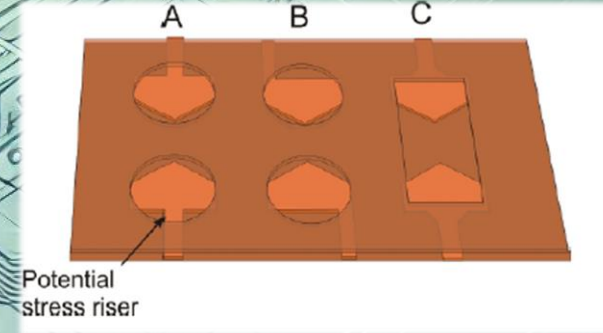
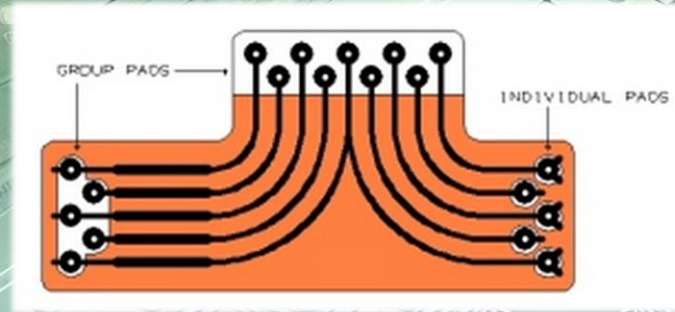
Coverlay is similar with Solder mask oil function

Coverlay=PI+Adhesive, Adhesive thickness is chosen according to copper thickness

Coverlayer as mechanical support

Hold down tabs

Coverlay comes in Orange, White and Black
Can combined Solder mask with cover lay



Flex material Introduction-2

Cost of raw materials

DuPont > Panasonic > SHENGYI

PI: Thickness: 0.5mil, 1mil, 2mil, 3mil

The cost will be increased as per the increased thickness of PI

Items	Brand and spec.	Limited
Flex PI(Adhesive)	Shengyi SF302 : PI=0.5mil, 1mil, 2mil ; Cu=0.5oz, 1oz	/
	Shenghi SF305 : PI=0.5mil, 1mil ; Cu=0.33oz	
Flex PI No adhesive	Panasonic RF-775(电解) : PI=1mil, 2mil ; Cu=0.5oz, 1oz	Cu=2oz
	Dupont AP : PI=1mil, 2mil, 3mil, 4mil ; Cu=0.5oz, 1oz	Cu=2oz
Coverlay	Shengyi SF302C : 0515, 0525, 1025, 2030	/
	Taiflex FHK series : 1025, 1035	/
adhensive	Taiflex BT series : AD=10um, 25um, 40um ;	/
PI stiffener	Taiflex MHK series : PI=3mil, 5mil, 7mil, 9mil ;	/
Low flow PP	Ventec : VT-47N ; EM-285B	Ventec : VT-901

Flex material Introduction-2

Below is Panasonic PI and DuPont Materials

Panasonic	Spec.
R-F775 11EH-M	ED copper, 1.0mil PI, 35/35um Cu
R-F775 12EV-M	ED copper, 1.0mil PI, 18/18um Cu
R-F775 21EH-M	ED copper, 2.0mil PI, 35/35um Cu
R-F775 22EV-M	ED copper, 2.0mil PI, 18/18um Cu

Product Code	Dielectric Thickness, mil	Copper Thickness, μm (oz/ft ²)
AP 7163E**	1.0	9 (.25)
AP 7164E**	1.0	12 (.33)
AP 8515R	1.0	18 (0.5)
AP 9111R	1.0	35 (1.0)
AP 9212R	1.0	70 (2.0)
AP 7156E**	2.0	9 (.25)
AP 7125E**	2.0	12 (.33)
AP 8525R	2.0	18 (0.5)
AP 9121R	2.0	35 (1.0)
AP 9222R	2.0	70 (2.0)
AP 8535R	3.0	18 (0.5)
AP 9131R	3.0	35 (1.0)
AP 9232R	3.0	70 (2.0)
AP 8545R	4.0	18 (0.5)
AP 9141R	4.0	35 (1.0)
AP 9242R	4.0	70 (2.0)
AP 8555R	5.0	18 (0.5)
AP 9151R	5.0	35 (1.0)
AP 9252R	5.0	70 (2.0)
AP 8565R	6.0	18 (0.5)
AP 9161R	6.0	35 (1.0)
AP 9262R	6.0	70 (2.0)

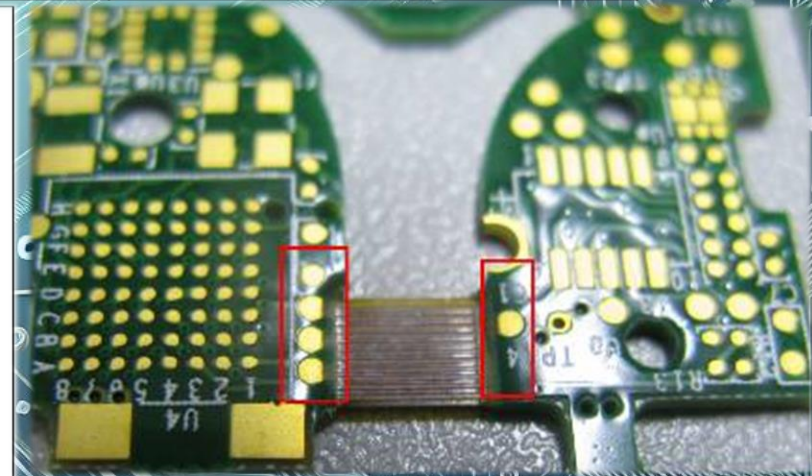
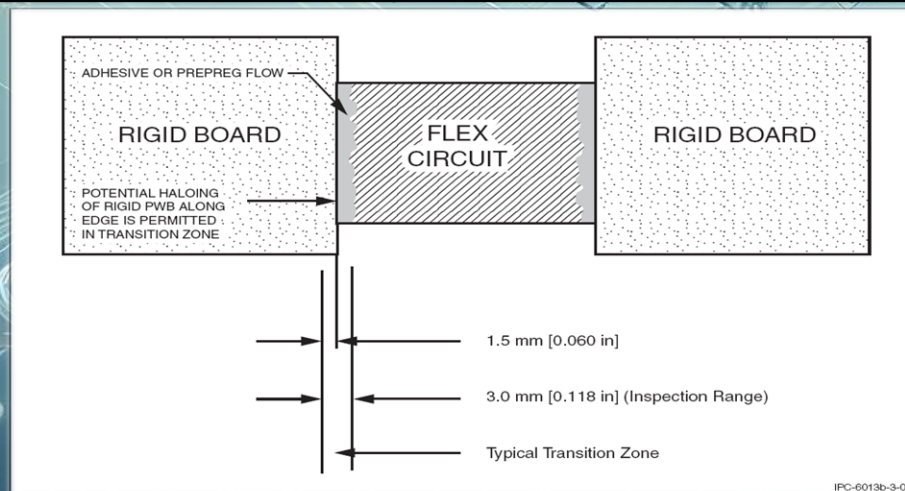
Rolling: 500mm Width

Capability-Flex PCB

Items	Capacity	advanced
layer	1-4L	5-8L
Finish board thickness not include stiffener	0.1-0.5mm	0.6-0.8mm
Single layer board thickness tolerance	±0.03mm	/
2Layer THK tolerance (≤0.3mm)	±0.05mm	±0.03mm
Multilayer thk tolerace (< 0.3mm)	±0.05mm	±0.03mm
Multilayer thk tolerace (0.3mm-0.8mm)	±0.1mm	±10%
Finish board thickness include PI stiffener	±0.05mm	±10%
Finish board thickness include FR4 stiffener	±0.1mm	±10%
Max. board size	228,6*355,6	228,6*584,2 (Base PI≥1mil)
Coverlay shift tolerance	±3mil	±2mil
Min.space from Coverlay to Conductor	4mil	3mil
Min. coverlay bridge	8mil	/

Capability-Flex-Rigid PCB

item	capacity	advanced
Layer (flex part Layer)	2-10L(8L)	11-20L(18L)
Finished board thickness	0.2-3.0mm	3.0-4.0mm
Tolerance for THK (> 1.0mm)	Board thickness $\pm$ 10%	/
Tolerance for THK ($\leq$ 1.0mm)	$\pm$ 0.1mm	/
Max. finish board size	406,4mm*558,8mm	406,4mm*736,6mm
Min. bow and twist	0.75% (Symmetry) , 2% (Dissymmetry)	1.5% (Dissymmetry)
Min. pp flow width	Joint between flex and part edge 1.0mm	Joint between flex and part edge 0.5mm
Min. spaces from conductor to joint between flex and rigid	0.5mm	0.3mm



Capability-SM and Finish

Items	capacity	advanced
Min. solder mask openings for rigid-flex	2.5mil(partial 2.0mil)	2.0mil(partial 1.5mil)
Min. solder mask openings for flex	3mil(partial 2.5mil)	/
Solder mask color for flex	Green	White Black
Silver plug vias	Hole size≤0.5mm , THK≥0.3mm	/
Min. spaces from silver plug to conductor	20mil	/

Items	capacity	advanced
Flex-rigid	HASL/LF HASL、 ENIG、 ENEPIG、 Plating Flash gold、 Soft gold、 hard gold、 Immersion silver 、 Immersion Tin、 OSP	/
flex	HASL/LF HASL、 ENIG、 ENEPIG、 Plating Flash gold、 hard gold、 Immersion silver、 OSP	Immersion Tin

Capability-Outer Layer For Flex-Rigid

Outer layer for rigid-flex:

item	capacity	advanced
Min. trace/space(18um finish copper)	3.5/3.5mil (partial 3.2/3.2mil)	3.2/3.2mil (partial 3.0/3.0mil)
Min. trace/space(35um finish copper)	4.0/4.0mil (partial 3.5/3.5mil)	3.5/3.5mil (partial 3.3/3.3mil)
Min. trace/space(48um finish copper)	5.0/5.0mil (partial 4.8/4.8mil)	4.8/4.8mil (partial 4.5/4.5mil)
Min. trace/space(70um finish copper)	6.5/6.5mil (partial 6.0/6.0mil)	6.0/6.0mil (partial 5.5/5.5mil)
Min. trace/space(105um finish copper)	10.0/10.0mil (partial 9.5/9.5mil)	9.0/9.0mil (partial 8.5/8.5mil)

Outer layer for flex part of flex-rigid:

item	capacity	advanced
Min. trace/space(18um finish copper)	5.0/5.0mil (partial 4.5/4.5mil)	4.5/4.5mil (partial 4.0/4.0mil)
Min. trace/space(35um finish copper)	5.5/5.5mil (partial 5.0/5.0mil)	5.0/5.0mil (partial 4.5/4.5mil)
Min. trace/space(48um finish copper)	6.0/6.0mil (partial 5.5/5.5mil)	5.5/5.5mil (partial 5.0/5.0mil)

Capability-Outer Layer For Flex PCB

Outer layer for flex boards:

item	capacity	advanced
Min. trace/spaces(18um finished copper)	3.0/3.0mil (zigzag traces whole boards 5.0/5.0mil)	2.5/2.5mil (zigzag traces whole boards 4.5/4.5mil)
Min. trace/spaces(35um finished copper)	4.0/4.0mil (zigzag traces whole boards 6.0/6.0mil)	3.5/3.5mil (zigzag traces whole boards 5.5/5.5mil)
Min. trace/spaces(48um finished copper)	5.0/5.0mil (zigzag traces whole boards 7.0/7.0mil)	4.5/4.5mil (zigzag traces whole boards 6.5/6.5mil)
Min. trace/spaces(70um finished copper)	6.0/6.0mil (zigzag traces whole boards 8.0/8.0mil)	5.5/5.5mil (zigzag traces whole boards 7.5/7.5mil)
Min. trace/spaces(105um finished copper)	10.0/11.0mil (zigzag traces whole boards 12.0/13.0mil)	9.5/10.5mil (zigzag traces whole boards 11.5/12.5mil)

Capability-Inner Layer

Inner layer for rigid-flex:

items for inner layer	capacity	advanced
Min. Trace/spaces (12&18um finished copper)	3.5/3.5mil (partial 3.2/3.2mil)	3.0/3.0mil (partial 2.5/2.5mil)
Min. Trace/spaces (35um finished copper)	4.0/4.0mil (partial 3.6/3.6mil)	3.5/3.5mil (partial 3.0/3.0mil)
Min. Trace/spaces (70um finished copper)	6.0/7.0mil (partial 5.5/6.5mil)	5.0/6.5mil (partial 4.5/6mil)

Inner layer for flex :

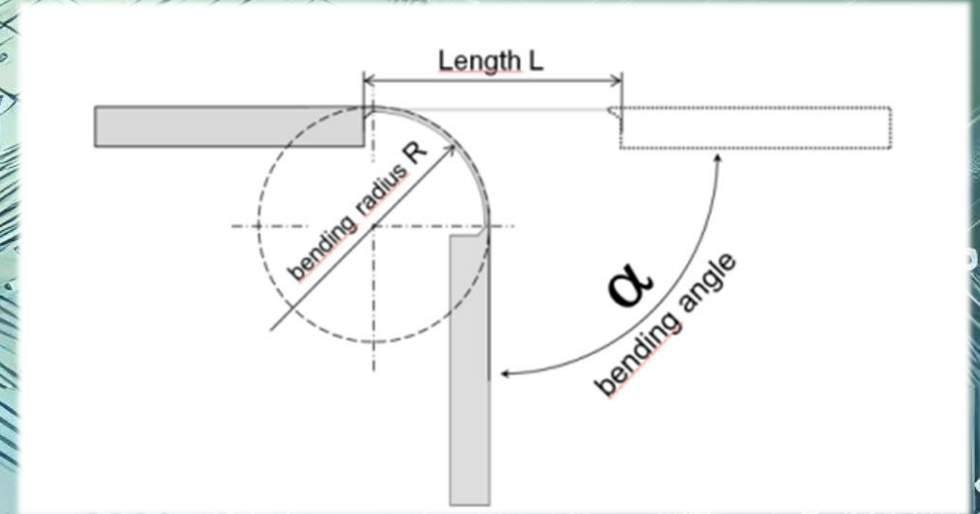
items for inner layer	capacity	advanced
Min. Trace/spaces (12&18um base copper)	3.0/3.0mil (Zigzag traces 6.0/6.0mil)	2.5/2.5mil (Zigzag traces 5.0/5.0mil)
Min. Trace/spaces (35um base copper)	4.0/4.0mil (Zigzag traces 8.0/8.0mil)	3.5/3.5mil (Zigzag traces 7.0/7.0mil)
Min. Trace/spaces (70um base copper)	6.0/7.0mil (Zigzag traces 10/10mil)	5.0/6.5mil (Zigzag traces 9.0/10mil)

Design Rule: Flex – Bend Radius

Min Length to achieve bend radius

$$L = 2\pi R + \text{bend angle}/360$$

Min bend radius as function of thickness



Flex Circuit Type	Minimum Bend Radius
Single Metal Layer	3-6 x circuit THK
Double sided Flex	6-10x circuit THK
Multilayer Flex	10-15 circuit THK
Dynamic application – single sided	20-40 circuit THK

Design Rule: Flex - Design considerations

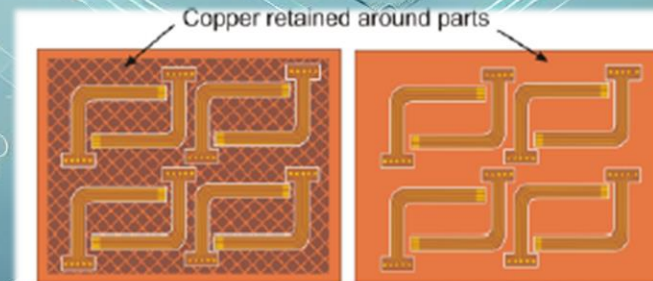
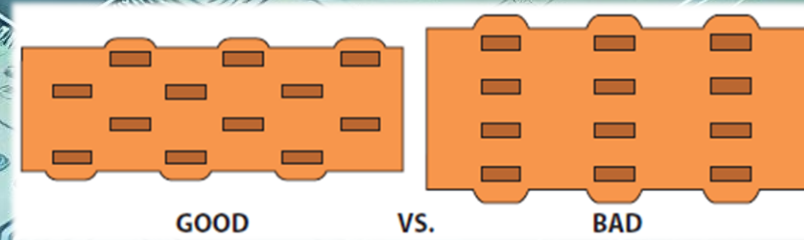
Copper weight

Trace to trace and trace to pad
tear drops

Increase angular ring

I beaming – balanced routing

Use copper Bias

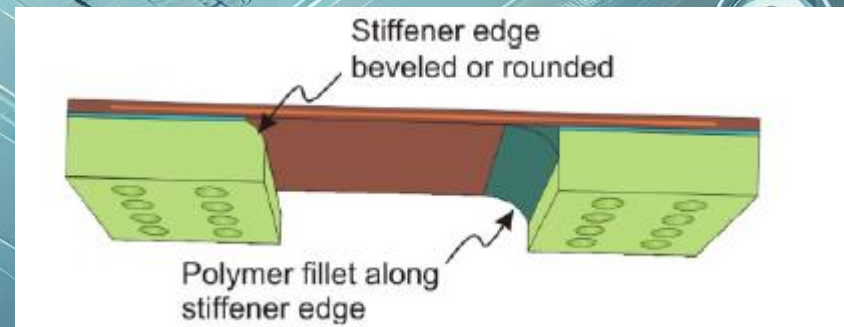


Design Rule: Stiffener

Overlap



Use of Polymer to be specified on FAB drawing



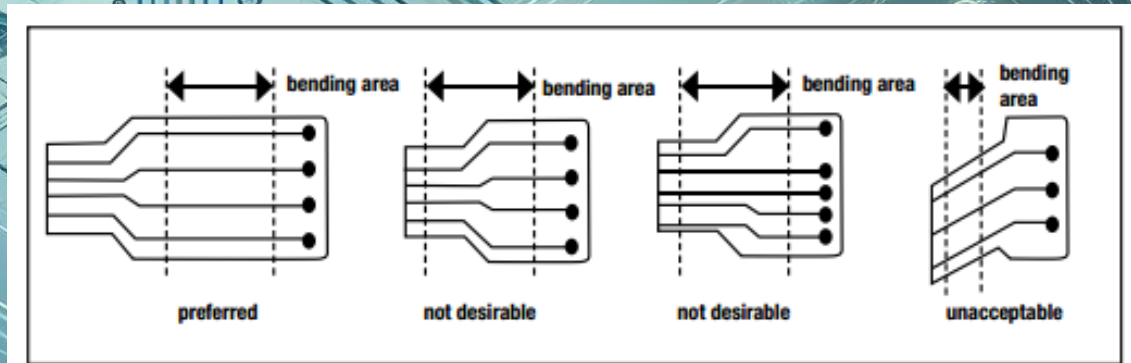
Design Rule: Basic Design considerations

Avoid sharp corners



Tear drops

Routing in the bend area



(Source IPC-2223)

How flexible is my Flex – Copper in Bend Radius



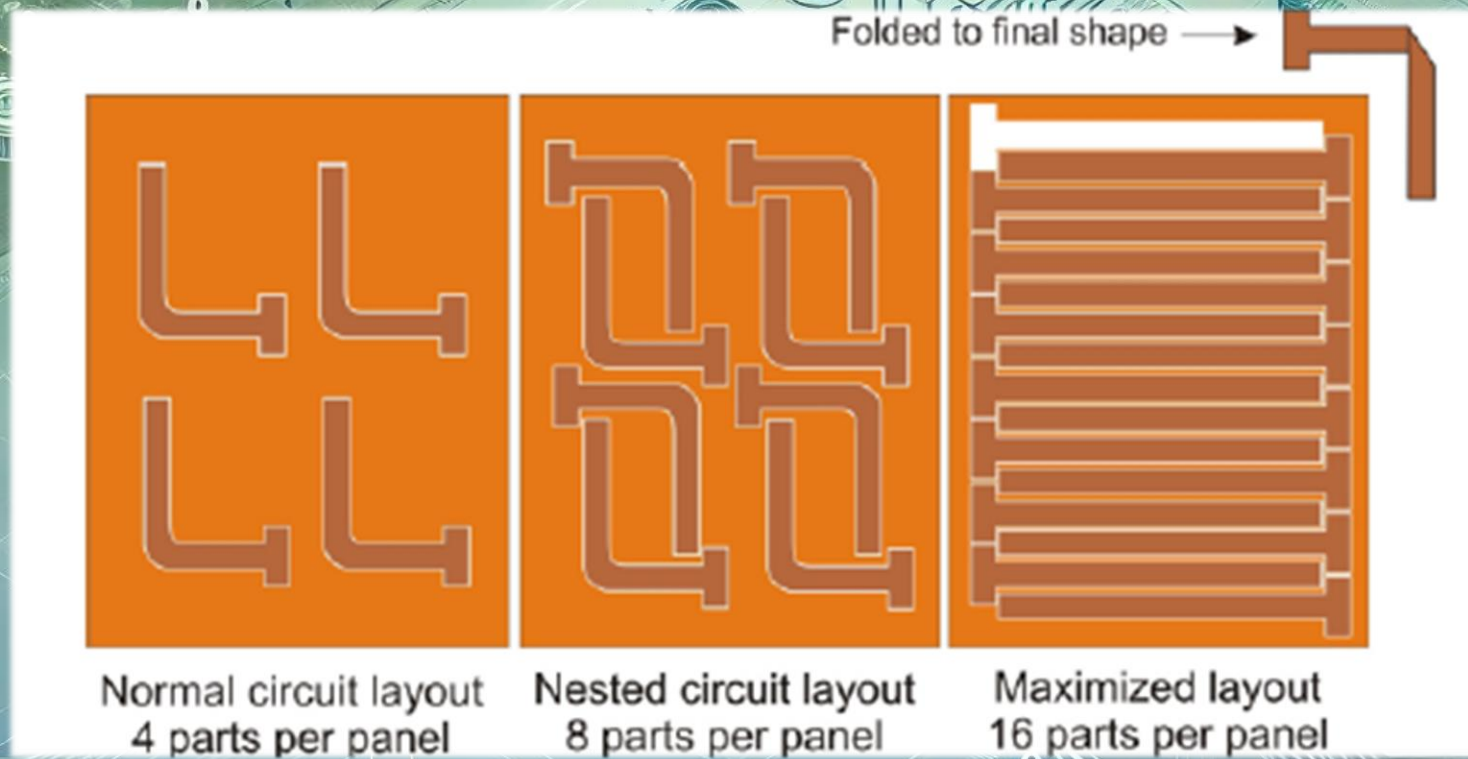
Standard Design Approach

$$\leftarrow 2r \times \pi \times \frac{\text{bend angle}}{360} \rightarrow$$



Alternative Design Approach

Penalization – plan with end use in mind



Why Rigid Flex?

Miniaturization - 2D and 3D

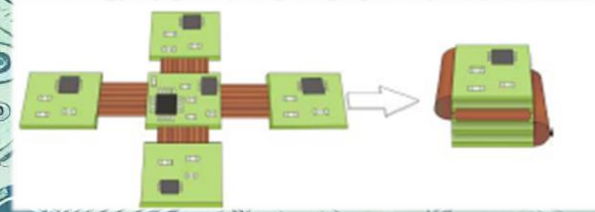
Weight

High speed data interconnects (matched lines)

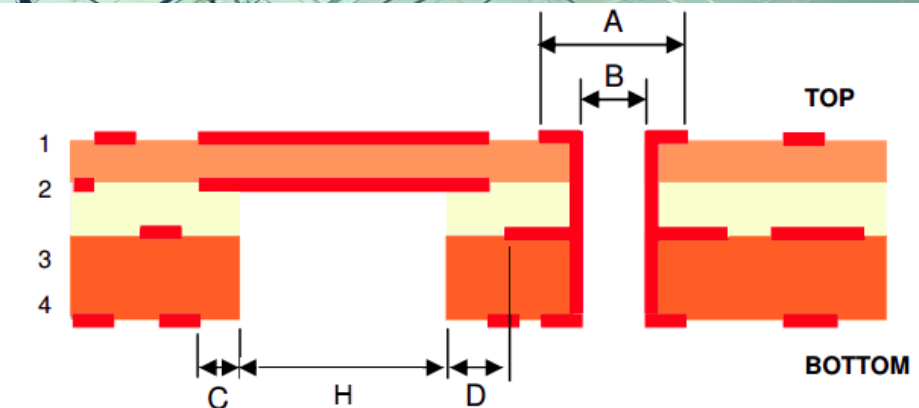
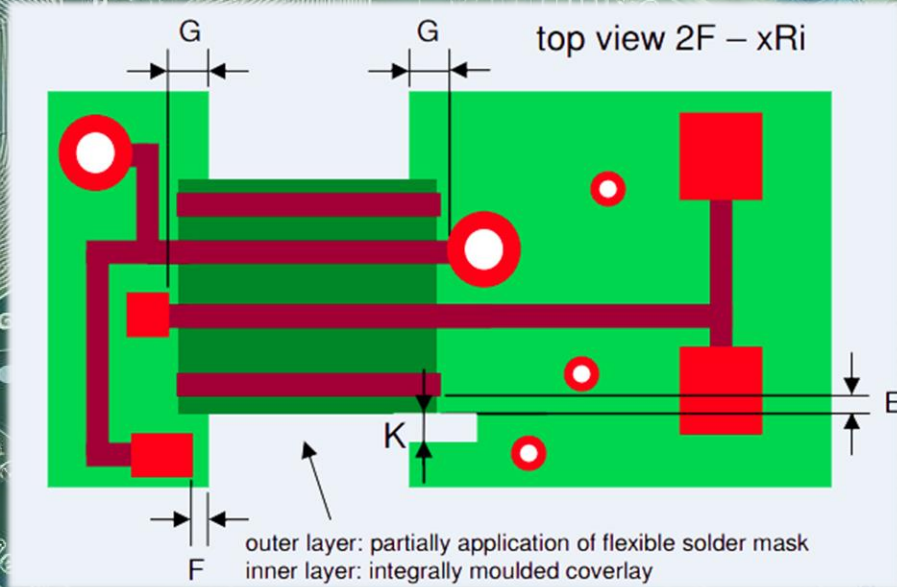
Cost reduction **

- Parts
- Labor

Improve quality in Dynamic systems



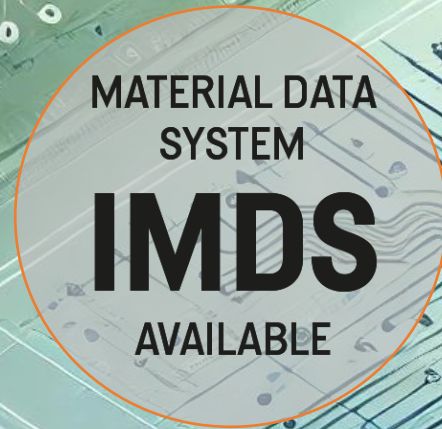
Design Guide – 2F+xRi



Symbol	Feature	Std Requirement [mils]
A	Minimum pad diameter → → teardrops recommended ! ← ←	16
B	via diameter	8
C	distance Cu → outer layer to rigid flex intersection (bottom)	12
D	distance Cu → inner layer to rigid flex intersection	20
E	distance track / flex outline	8
F	distance of exposed Cu - outlying of rigid-flex intersection	8
G	Flexible soldermask: distance of exposed Cu to flex-rigid intersection (Top)	20
G	PI Coverlay film: distance of exposed Cu to flex-rigid intersection (Top)	20
G2	Flexible soldermask: distance viapad to flex-rigid intersection (Top)	20
G2	PI Coverlay film: distance viapad to flex-rigid intersection (Top)	20
H	length of flex area	20
K	Minimum width for „cut-in“	80
„K“	Outline manufacturing of flexible area: No scoring allowed!	

CERTIFIED TECHNOLOGY

The quality of our printed circuit boards is reflected in the following certifications and memberships.



Questions?

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