

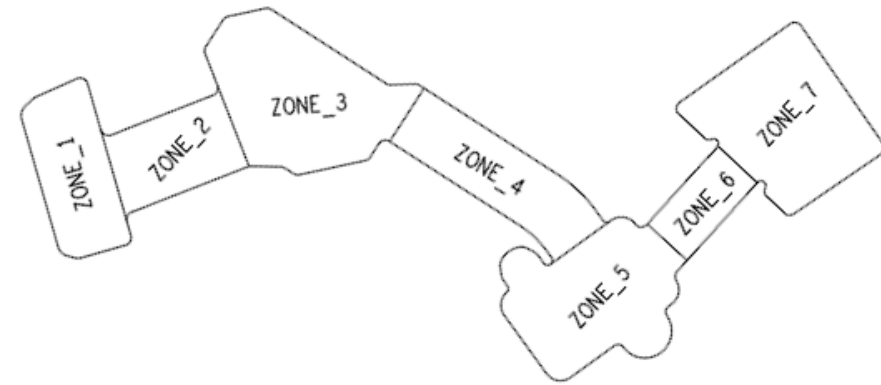
Flex module introduction



[HDI flex boards] [For all possible application fields]

- Advantages HDI flex boards which is a big advantage when compete with native FPC plants.
- Multi-zone de-cap technology on flex layers.

Type	FPC, 4L, AL HDI
Lamination Cycles	1
Inner Layer Line/Space (min)	100/110um @ 20um Cu
Outer Layer Line/Space (min)	100/110um @ 29um Cu
Laser Via Diameter	75um
Board Thickness	0.165mm at 2L part/ 0.263mm at 4L part
Flex Dielectric Thickness	25um,
Base Materials	FCCL:Nexflex E1210DNM FCCL:Nexflex E1810SPM Adhesive: Hanwha HGB-E250WGA Soldermsk:Technic LCL 1000F 410M
Surface Finish	ENIG
Others	De-cap on L1 and L4 to get a 2L area for bending purpose



Unit: um	Section1	Section2	Original	In design	
				Section1	Section2
		Soldermask	Soldermask	20	20
		Plating copper		14	14
		Base copper		18	15
		FCCL		25	25
		Bonding sheet	Bonding sheet	25	25
		Plating copper		10	10
		Base copper		12	10
		FCCL		25	25
		Base copper		12	10
		Plating copper		10	10
		Bonding sheet	Bonding sheet	25	25
		Base Polyimide		25	25
		FCCL		18	15
		Base copper		14	14
		Plating copper		14	14
		Soldermask	Soldermask	20	20
Total				273	165
				263	

[Bare-back board, special structure of flex boards] [Charging station]



- We have mass production experience for this kind of design, previous products have 2oz copper. This one is from a new customer named as Ample, the copper thickness is 4oz.



Type	FPC, 1L
Lamination Cycles	2 (for 2 side coverlay)
Inner Layer Line/Space (min)	N/A
Outer Layer Line/Space (min)	200/400um @ 130um Cu
Laser Via Diameter	N/A
Board Thickness	0.27mm at flex part/ 2.33mm at Stiffener part
Flex Dielectric Thickness	N/A
Base Materials	Copper foil:ITEQ IF-ME4ZF2 Coverlay:Aplus AHICX150X2SM
Surface Finish	ENIG
Others	No base material, such as PI, only one copper foil, but can have two sides of coverlay openings to place soldering pads, like a double-sided boards

unit:um

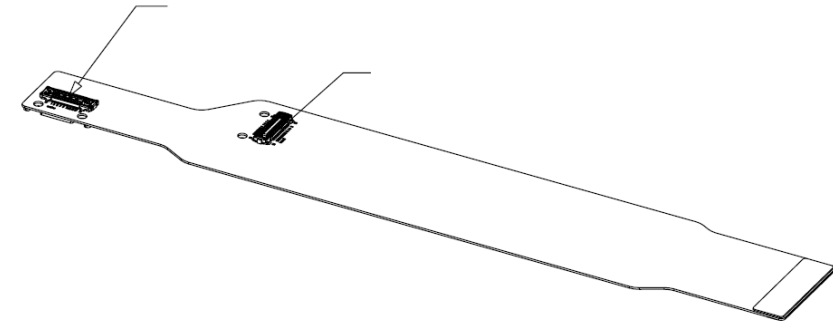
			Original	In design	In design
				Flex part	FR4 Area
Coverlay	Polyimide		25	25	25
	Adhesive		50	45	45
FCCL	Base copper (RA)		140	130	130
Coverlay	Adhesive		50	45	45
	Polyimide		25	25	25
Stiffener	Adhesive		40	0	40
	FR4		760	0	760

Total	1090	270	1070
Tolerance	/	±50	±120

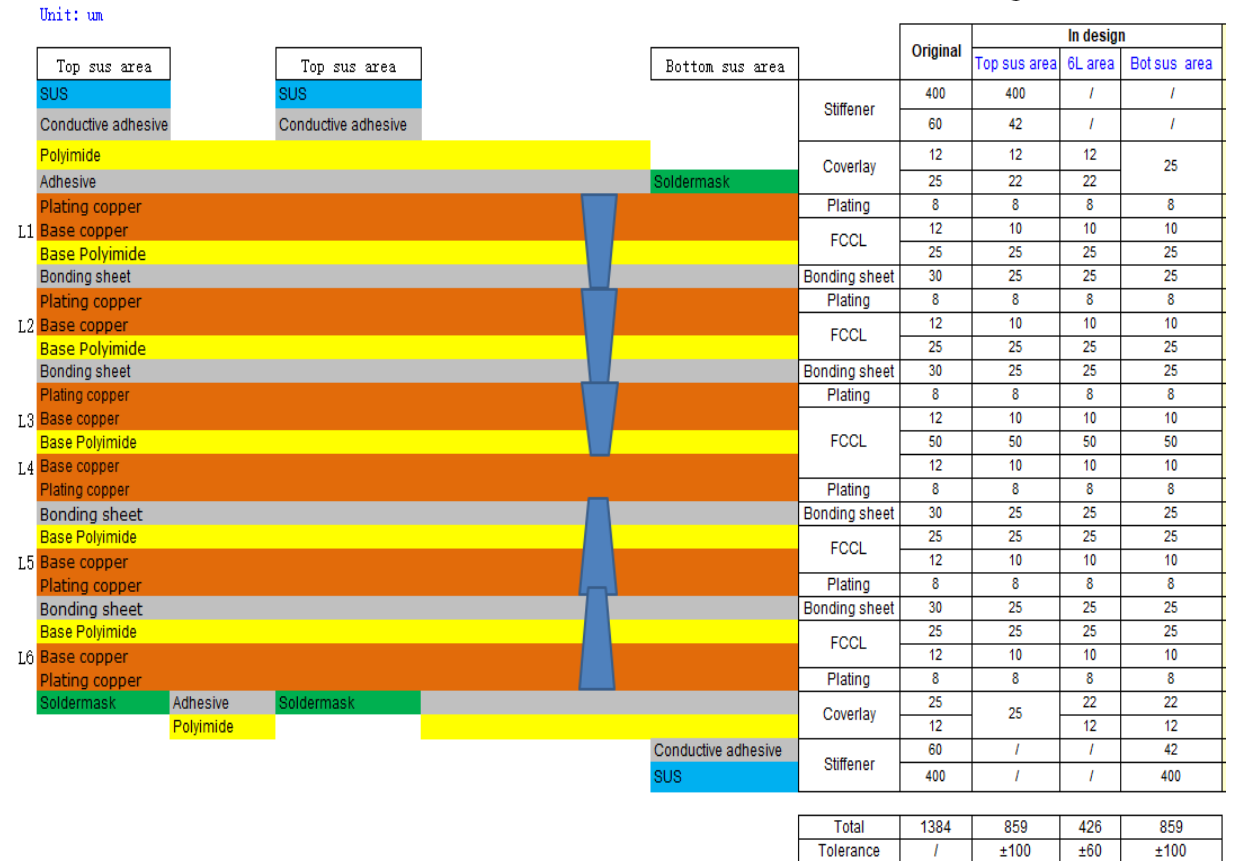
[6L any-layer design flex boards] [Test Fixture]



- Anylayer design, we have capability for mass production.



Type	FPC, 6L, AL HDI
Lamination Cycles	2
Inner Layer Line/Space (min)	92/64um @ 18um Cu
Outer Layer Line/Space (min)	140/74um @ 18um Cu
Laser Via Diameter	100um
Board Thickness	Flex area: 0.426 mm (CVL to CVL) Flex area: 0.559 mm (SM to stiff)
Flex Dielectric Thickness	50um
Base Materials	FCCL:NexFlex E1220DRF FCCL:NexFlex E1210SRF Bonding Adhesive: DuPont GFL0030 Coverlay:DuPont HXC1225 Soldermask:Technic LCL 1000F 410M
Surface Finish	ENIG
Others	Low loss FCCL, bonding sheet, Black coverlay. Any-layer design, copper filling.

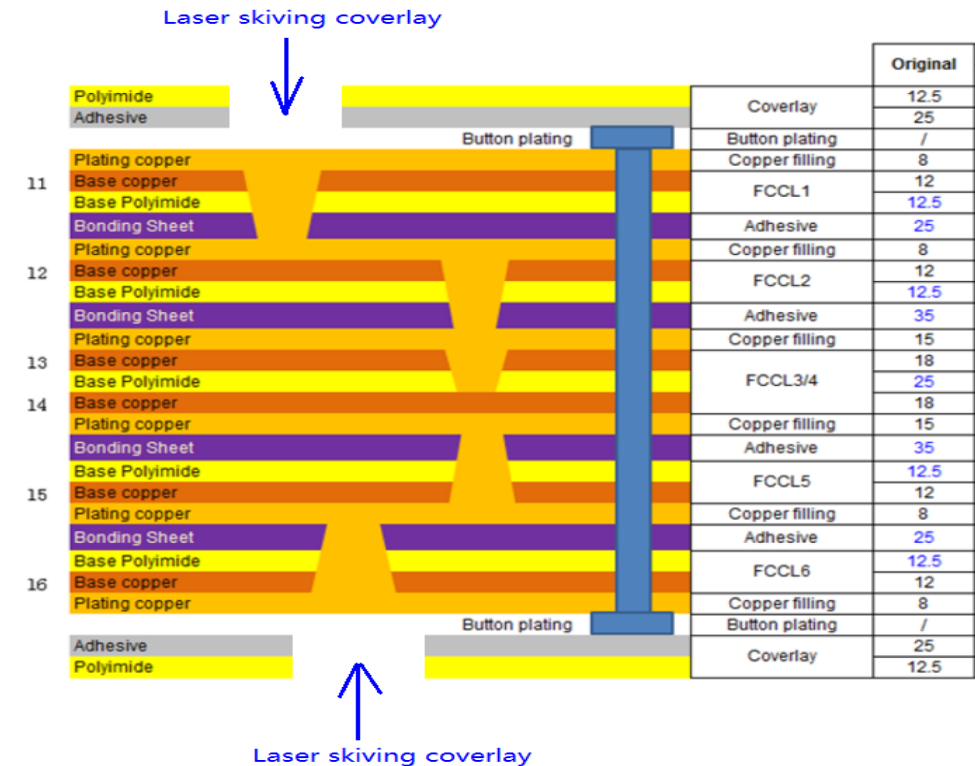
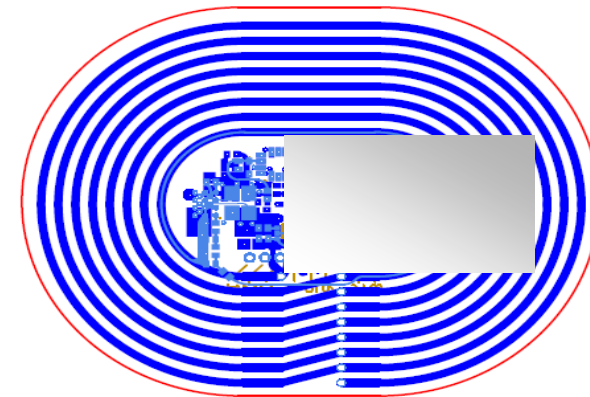




[6L HDI flex with laser skiving technology] [Medical implantable device]

- Laser skiving coverlay openings, has good tolerance better than SM ink.

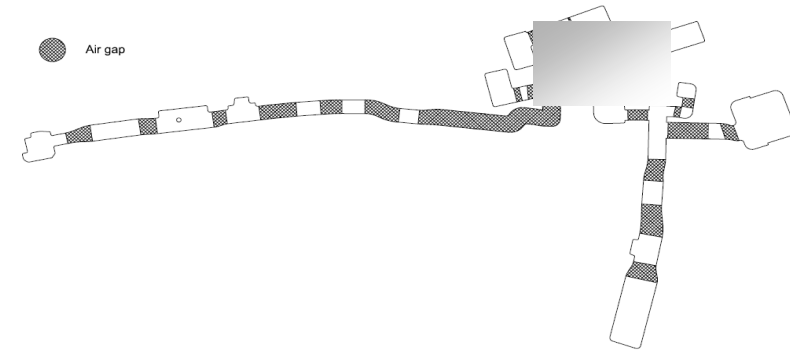
Type	FPC, 6L, AL HDI
Lamination Cycles	2
Inner Layer Line/Space (min)	76/146um @ 18um Cu
Outer Layer Line/Space (min)	76/299um @ 18um Cu
Laser Via Diameter	89um
Board Thickness	Flex area: 0.32 mm (CVL to CVL)
Flex Dielectric Thickness	25um
Base Materials	FCCL:Nexflex E1210DNM FCCL:Nexflex E1205SPM Adhesive: Hanwha HGB-E250WGA Coverlay:Taiflex FHT0525
Surface Finish	ENIG
Others	Openings designs like rigid PCB, including BGA pads, but customer refused to use solder mask to fabricate openings, insisted on using coverlay. But the shift tolerance is only 2mil. Customer said this was used on implantable device, so SM ink is not allowed.





[6L anylayer flex with air-gap] [AR glasses]

- Structure is complicated. Flex board has similar design with rigid-flex, has partial coverlay and solder mask in inner layer.



Type	FPC, 6L, AL HDI with air-gap
Lamination Cycles	2
Inner Layer Line/Space (min)	40/50um @ 18um Cu
Outer Layer Line/Space (min)	40/50um @ 18um Cu
Laser Via Diameter	85um
Board Thickness	2L zone: 0.09mm 4L zone: 0.18mm 6L zone: 0.28mm
Flex Dielectric Thickness	25um
Base Materials	FCCL:Nexflex E1210DNM FCCL:Nexflex E1205SPM Adhesive: Hanwha HGB-E250WGA Coverlay:E-Link EB000815XFA2-12 Soldermask:Technic LCL 1000F 410M
Surface Finish	ENIG
Others	De-cap for one layer and two layers.

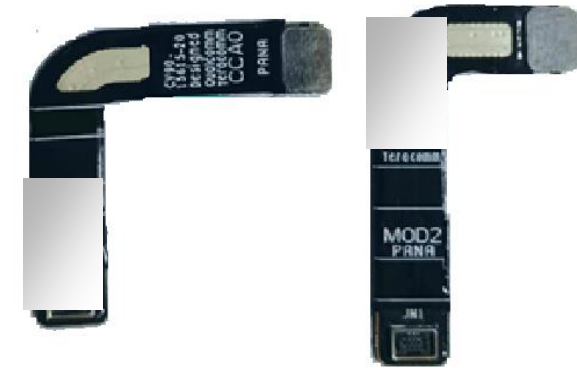
6L FP4 Top PSA Top	6L COND PSA Bot	6L FR4 Bot2	6L FPC	6L FP4 Top	6L Air-gap	6L PSA Top	6L FR4 Bot	6L PSA Bot	4L FPC	4L FP4 Top	4L Air-gap	4L FP4 Bot	2L FPC	2L FP4 Top	2L FP4 Bot PSA Bot	2L FP4 Top PSA Top	Original	Zone Name
Zone_7	Zone_5	Zone_6	Zone_6L	Zone_2		Zone_3	Zone_1	Zone_4	Zone_4L1	Zone_12		Zone_16	Zone_2L1	Zone_17	Zone_14	Zone_13	PSA	PSA
Zone_8		Zone_15		Zone_10					Zone_4L2	Zone_19			Zone_2L2				FR4 Stiffener	100
Zone_9				Zone_11					Zone_4L3								FR4 Stiffener	40
Zone_18																	FR4 Stiffener	75
																	Adhesive	25
																	Coverlay /Soldermask	7.5
																	Copper filling	15
																	FCCL-1	9
																	Bonding sheet	12
																	Coverlay /Soldermask	12.5
																	Coverlay /Soldermask	25
																	Copper filling	7.5
																	FCCL-2	15
																	Copper filling	9
																	Bonding sheet	12
																	Coverlay /Soldermask	12.5
																	Copper filling	25
																	Coverlay /Soldermask	7.5
																	FCCL-34	15
																	Copper filling	9
																	FCCL-5	12
																	Copper filling	12.5
																	Coverlay /Soldermask	9
																	Coverlay /Soldermask	15
																	Bonding sheet	7.5
																	FCCL-6	25
																	Copper filling	12.5
																	Coverlay /Soldermask	12
																	Copper filling	9
																	Coverlay /Soldermask	15
																	Bonding sheet	7.5
																	FCCL-5	25
																	Coverlay /Soldermask	75
																	FR4 Stiffener	100
																	COND PSA	100
																	PSA	100

NPI Product Show (LCP)



Type	FPC, 5L, AL HDI
Lamination Cycles	2
Inner Layer Line/Space (min)	105/80um @ 12um Cu
Outer Layer Line/Space (min)	180/60um @ 22um Cu
Laser Via Diameter	100um
Board Thickness	Flex area: 0.32 mm (CVL to CVL) Flex area: 0.61 mm (CVL to stiff)
Flex Dielectric Thickness	50um,
Base Materials	FCCL: Panasonic R-F705S 23EC Coverlay: Taiflex FHB0520
Surface Finish	ENIG
Others	LCP, Stiffener, Double sided deep blind hole, High Temperature pressing

- 5G millimeter wave



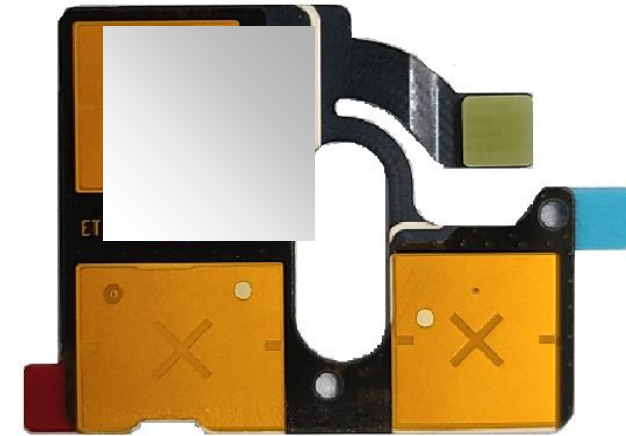
		EMI Tatsuta	45	SUS Stiffener	200
		Coverlay PI	12.5	Adhesive	45
		Coverlay Adhesive	25	BOT Soldmask	20
TOP Soldmask	20				
L1 1/3oz+Plating	22			1/3oz+Plating	22
LCP Panasonic	50			LCP Panasonic	50
L2 1/3oz	12			1/3oz	12
LCP Panasonic	50			LCP Panasonic	50
L3 1/3oz	12			1/3oz	12
LCP Panasonic	50			LCP Panasonic	50
L4 1/3oz	12			1/3oz	12
LCP Panasonic	50			LCP Panasonic	50
L5 1/3oz+Plating	22			1/3oz+Plating	22
BOT Soldmask	20			BOT Soldmask	20
Adhesive	45			Adhesive	45
		Coverlay PI	12.5		
SUS Stiffener	200	EMI Tatsuta	45	Total FPC	320
				+SUS	610

NPI Product Show (LCP)



Type	FPC, 4L, AL HDI
Lamination Cycles	1
Inner Layer Line/Space (min)	105/265um @ 12um Cu
Outer Layer Line/Space (min)	150/110um @ 12um Cu
Laser Via Diameter	100um
Board Thickness	Flex area: 0.276 mm (CVL to CVL) Flex area: 0.421mm (CVL to stiff)
Flex Dielectric Thickness	50um, 100um
Base Materials	FCCL: Panasonic R-F705S 43EC FCCL: Panasonic R-F705S 23EC Bonding Adhesive: Panasonic R-BM17 Coverlay: Taiflex FHB0520
Surface Finish	ENIG
Others	LCP, Stiffener, Double sided deep blind hole, Decap

- UWB location antenna



Coverlay PI	12.5		
Coverlay Adhesive	25		
L1 1/3oz	12		FR4 Stiffener 100
LCP Panasonic	100		Adhesive 45
Adhesive Panasonic	25	Coverlay PI	12.5
L2 1/3oz	12	Coverlay Adhesive	15
LCP Panasonic	100		1/3oz 12
L3 1/3oz	12		LCP Panasonic 100
Adhesive Panasonic	25		1/3oz 12
LCP Panasonic	50		Adhesive 25
L4 1/3oz	12		LCP Panasonic 50
			1/3oz 12
		Coverlay Adhesive	25
		Adhesive	25
		Coverlay PI	12.5
		Coverlay Taiflex	12.5
		Total FPC	276
		+SUS	421

NPI Products Show (MPI)



Type	FPCA, 8L, AL HDI
Lamination Cycles	3
Min. Inner Layer Line/Space	69/85um (diff pairs) @ 18um Cu
Min. Outer Layer Line/Space	87/85um @ 18um Cu
Laser Via Diameter	0.089mm
Flex Thickness	0.563mm+/-0.08 (CVL to CVL) 0.7mm+/-0.1 (Stiff to SM)
Base Materials	DS FCCL: Nexflex E1220D500RF SS FCCL: Nexflex E1210S500RF BA: DuPont GPL0300 CVL: DuPont HXC1225
Surface Finish	ENIG
Others	Low-loss FCCL & BA, 46 and 60-pin 350um pitch (180/170um w/s) connector assembly

Mobile Phone



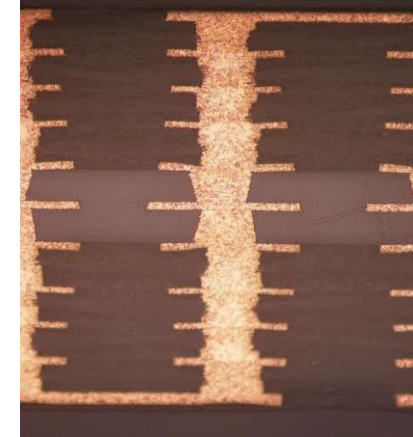
Unit: um	Top sus area	8L area	Bot sus area
Stiff SUS	100		
Ad Stiff	42		
Coverlay	12	12	
Adhesive	22	22	Soldermask 25
L1 0.33oz+Plating	18	18	18
Base Polyimide	25	25	25
Adhesive	25	25	25
L2 0.33oz+Plating	18	18	18
Base Polyimide	25	25	25
Adhesive	25	25	25
L3 0.33oz+Plating	18	18	18
Base Polyimide	25	25	25
Adhesive	25	25	25
L4 0.33oz+Plating	18	18	18
Base Polyimide	50	50	50
L5 0.33oz+Plating	18	18	18
Adhesive	25	25	25
Base Polyimide	25	25	25
L6 0.33oz+Plating	18	18	18
Adhesive	25	25	25
Base Polyimide	25	25	25
L7 0.33oz+Plating	18	18	18
Adhesive	25	25	25
Base Polyimide	25	25	25
L8 0.33oz+Plating	18	18	18
Soldermask	25	22	22
		12	12
			Ad Stiff 42
			Stiff SUS 100

NPI Product Show (LCP)—Rigid-Flex



Type	11L 4+(1F+2F)+4 , Anylayer Rigid-flex
Lamination Cycles	5x lamination
Min. Inner Layer Line/Space	86/214um @ 20um Cu
Min. Outer Layer Line/Space	134/166um @ 30um Cu
Laser Via Diameter	89um
Board Thickness	Rigid area 1.13mm Flex area 0.255mm
FCCL Thickness	100um
Base Material	Rigid: EMC EM-890K FCCL: Panasonic R-F705S, Coverlay: N/A
Surface finishing	OSP

- Antenna



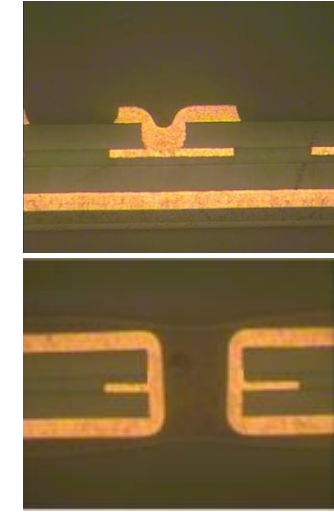
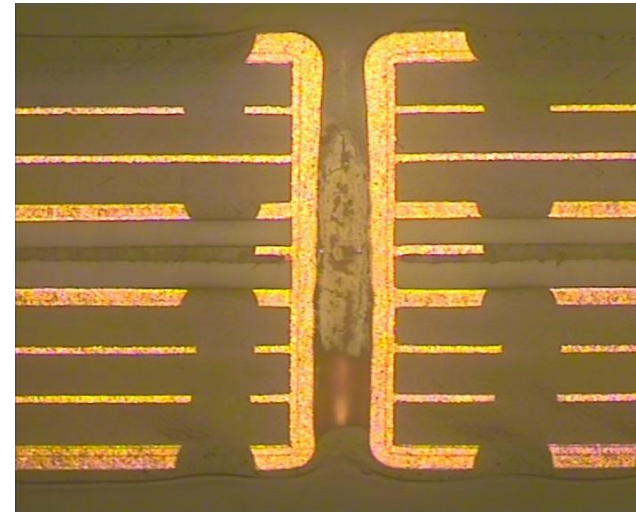
Layer	Layer Properties	Thickness (um)	Structure	Layer Properties
	TOP Soldermask	20		TOP Soldermask
L1	1/3oz+Plating	30	↓	1/3oz+Plating
	Prepreg EM-890K	76		Prepreg EM-890K
L2	1/3oz+Plating	20	↓	1/3oz+Plating
	Prepreg EM-890K	76		Prepreg EM-890K
L3	1/3oz+Plating	20	↓	1/3oz+Plating
	Prepreg EM-890K	76		Prepreg EM-890K
L4	1/3oz+Plating	20	↓	1/3oz+Plating
	Prepreg EM-890K	98		Prepreg EM-890K
L5	1/3oz+Plating	20	↓	1/3oz+Plating
	Panasonic LCP	100		Panasonic LCP
L6	1/2oz	15	↓	15
	Panasonic LCP	100		Panasonic LCP
L7	1/2oz+Plating	20	↓	1/2oz+Plating
	Prepreg EM-890K	98		Prepreg EM-890K
L8	1/3oz+Plating	20	↓	1/3oz+Plating
	Prepreg EM-890K	76		Prepreg EM-890K
L9	1/3oz+Plating	20	↓	1/3oz+Plating
	Prepreg EM-890K	76		Prepreg EM-890K
L10	1/3oz+Plating	20	↓	1/3oz+Plating
	Prepreg EM-890K	76		Prepreg EM-890K
L11	1/3oz+Plating	30	↓	1/3oz+Plating
	BOT Soldermask	20		BOT Soldermask

NPI Product Show (MPI)-- Rigid-Flex



Type	9L 3-(2F+1F)-3 Rigid-flex
Lamination cycles	2x lamination
Min. Inner Layer Line/Space	54/98um @ 16um Cu
Min. Outer Layer Line/Space	112/127um @ 40um Cu
Laser Via Diameter	75um
Board Thickness	Rigid area 0.82mm Flex area 0.265mm
FCCL Thickness	50um
Base Material	Rigid: EMC EM-390 FCCL: NEXFLEX E1820D500RF(low loss) Coverlay: HXC1225
Surface finishing	ENIG
Others	Steel stiffener

- Data Transmission



Layer	Layer Properties	Thickness (um)	Structure
	TOP Soldermask	20	
L1	1/3oz+Plating	40	
	Prepreg EM-39B	77	
L2	1/2oz	14	
	Core EM-390	76	
L3	1/2oz	14	
	Prepreg EM-39B	75	
L4	1/2oz+Plating	29	
	PI Nexflex	50	
L5	1/2oz	16	
	Adhesive Dupont	20	
	PI Nexflex	50	
L6	1/2oz+Plating	29	
	Prepreg EM-39B	75	
L7	1/2oz	14	
	Core EM-390	76	
L8	1/2oz	14	
	Prepreg EM-39B	77	
L9	1/3oz+Plating	40	
	BOT Soldermask	20	

Coverlay Dupont	12	Flex soldermask	20
Adhesive	20	1/2oz+Plating	29
1/2oz+Plating	29	PI Nexflex	50
PI Nexflex	50	1/2oz	16
1/2oz	16	Adhesive Dupont	20
Adhesive Dupont	20	PI Nexflex	50
PI Nexflex	50	1/2oz+Plating	29
1/2oz+Plating	29	Adhesive	20
Adhesive	20	Coverlay Dupont	12
Coverlay Dupont	12	Adhesive	50
Adhesive	50	SUS	100



High Volume Product Show

Application	Automotive
Structure	2L
Flex Length	470mm
Line Width/Space	300/300μm @ 35μmCu
Board Thickness	0.28mm
Base Material	FCCL: ITEQ IF-FS252035NFJ1 Coverlay: ITEQ IF-FC2535NHJ1
Surface Finish	OSP
Others	Nickel Sheet SMT

Mass Production from 2020



CVL (PI)	25	CVL (PI)	25	CVL (PI)	25
Adhesive	35	Adhesive	35	Adhesive	35
Cu	35	Cu	35	Cu	35
Adhesive	20	Adhesive	20	Adhesive	20
FCCL (PI)	25	FCCL (PI)	50	FCCL (PI)	25
Adhesive	20	Adhesive	20	Adhesive	20
Cu	35	Cu	35	Cu	35
Adhesive	35	Adhesive	35	SUS Stiffener	300
CVL (PI)	25	CVL (PI)	25		
SUS Stiffener	300				



High Volume Product Show

Type	FPC, 1L
Line/Space (min)	130/300um @ 35um Cu
Via Diameter	/
Board Thickness	0.14mm(CVL to PI)
Flex Dielectric Thickness	25um
Base Materials	FCCL: SF305 103520SRN250ALKN Coverlay:SF305C 1035NA250AT
Surface Finish	OSP
Others	FPC size: 30*1200mm

- Automobile-- New energy
- Output : 100Kpcs



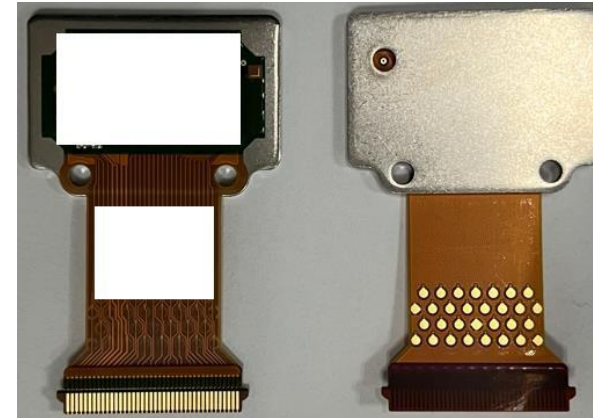
Coverlay (Orange)		25
Adhesive		35
L1 Copper 1 Oz Cu Foil	35	35
Adhesive	20	20
PI Base	25	25



High Volume Products Show

Type	FPCA, 2L, PTH
Min. Outer Layer Line/Space	75/75um @ 15um Cu
Mechanical Diameter	0.1mm PTH (laser through hole)
Flex Thickness	0.12mm (CVL to CVL) 0.3 mm (Stiff to finger)
Base Materials	Cu : Thinflex W-1005ED-N4 CVL: Taiflex FHT0525
Surface Finish	EDNG + ENIG
Others	button plating

Thermal Imaging Camera



Unit: um

			20	FR4 stiff 360		
	Soldermask	20	12.5	Adhesive 25	12.5	Soldermask 20
Base copper	15	15	20		20	15
Polyimide	25	25	0	15	15	25
Adhesive	20	20	20	20	20	20
Coverlay	12.5	12.5	12.5	12.5	12.5	12.5
Ad_Stiff	40	40	40	40		Adhesive 25
PI Stiff	175	175	175	175		Stiff SUS: 1500



High Volume Products Show

Type	FPC, 2L, PTH
Min. Outer Layer Line/Space	65/167um @ 10um Cu
Mechanical Via Diameter	0.25mm
Flex Thickness	0.139mm (CVL to CVL) 0.364 mm (CVL to stiff)
Base Materials	Cu : Taiflex 2FPDE2003MW CVL: Taiflex FHT0525
Surface Finish	EDNG + ENIG
Others	175um pitch (105/70um w/s) wire-bond region, button plating

Thermal Imaging Camera



Unit: um

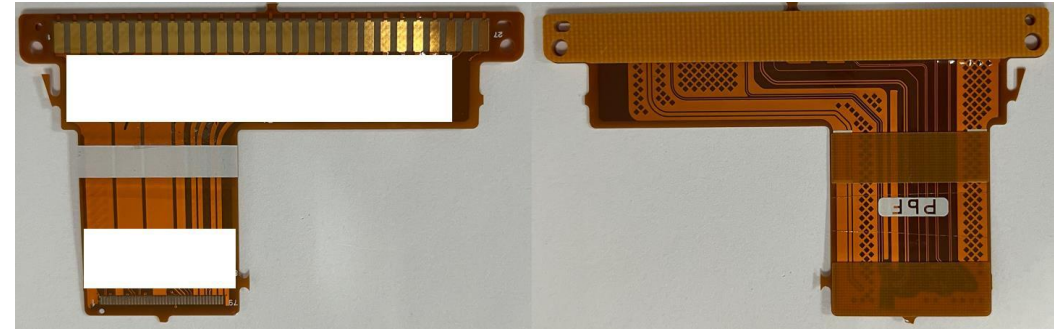
Coverlay	12.5	12.5
Adhesive	22	22
Base copper	10	10
Base Polyimide	50	50
Base copper	10	10
Adhesive	22	22
Coverlay	12.5	12.5
Adhesive		Adhesive 25
Stiff SUS		Stiff SUS 200

High Volume Products Show



Type	FPC, 3L, 2F-1F, PTH
Lamination Cycles	1
Min. Inner Layer Line/Space	380/370 um @ 18um Cu
Min. Outer Layer Line/Space	99/114um @ 30um Cu
Mechanical Via Diameter	0.2mm
Flex Thickness	0.312mm(CVL to CVL) 0.6mm (CVL to Stiff) 1.85mm (Cu to Right Stiff)
Base Materials	DS FCCL: Thinflex W-2010ED-N4 SS FCCL: Thinflex H-1010ES-N4 BA: Hanwha HGB-E250WPQ CVL: AplusAHICX150X1SMN
Surface Finish	EDNG + OSP
Others	button plating

Avionics



Unit: um

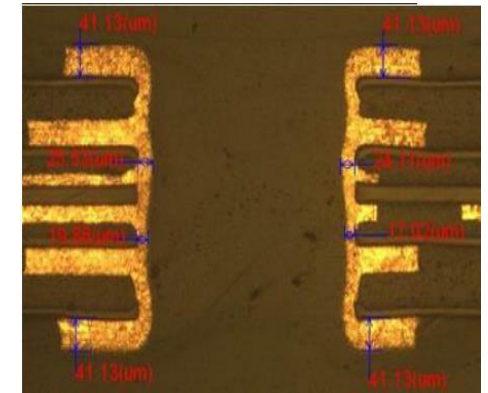
	FR4 stiff C 250	FR4 stiff D 250	FR4 stiff E 1500
Adhesive	40	40	40
Coverlay	25	25	25
Adhesive	45	45	45
Base copper	30	30	30
Base Polyimi	50	50	50
Base copper	18	18	18
Adhesive	22	22	22
Base Polyimi	25	25	25
Base copper	30	30	30
Adhesive	45	45	45
Coverlay	20	20	20



High Volume Products Show

Type	FPC, 6L, 1F-4F-1F, 1+ HDI
Lamination Cycles	2
Min. Inner Layer Line/Space	127/102 um @ 35um Cu
Min. Outer Layer Line/Space	280/220um @ 40um Cu
Mechanical Diameter	200um
Laser Via Diameter	100um
Flex Thickness)	0.124mm (2F PI to PI) 0.325mm (4F PI to PI)
Base Materials	DS FCCL: Thinflex W1010RD-C SS FCCL: X-0503ES-N4(L2/L5), X-0505ES-N4(L1/L6) BA: Hanwha HGB-E250WPQ SM: Techniflex LCL 1000F/110G
Surface Finish	ENIG
Others	mixed conventional via & micro via

Medical



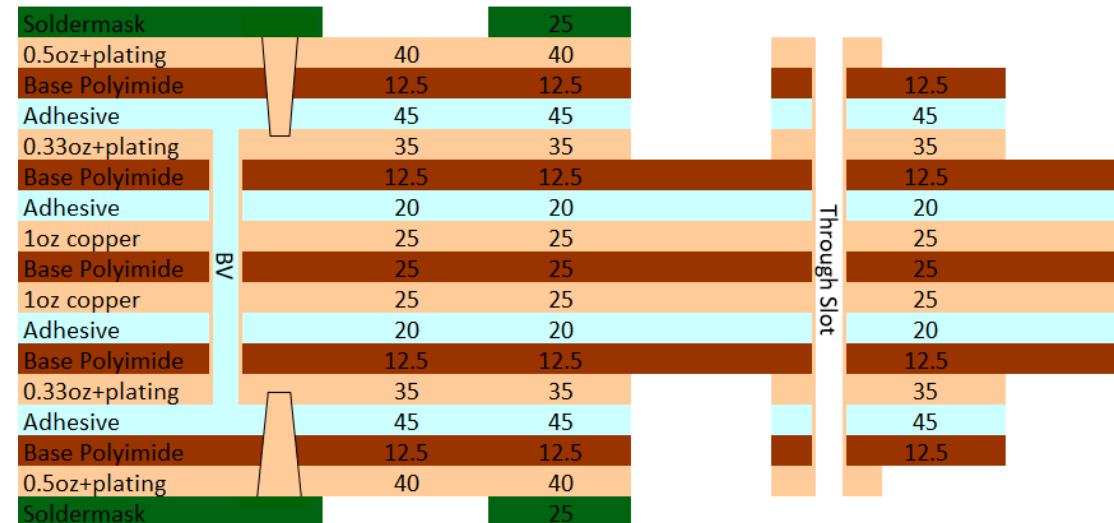
Unit: um

6L no SM

6L with SM

2F area

6L no SM 4L area

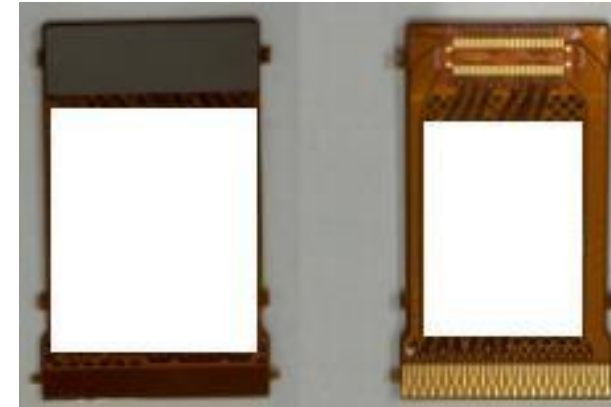




High Volume Products Show

Type	FPC, 4L, 2F-2F, PTH
Lamination Cycles	1
Min. Inner Layer Line/Space	90/76 um @ 10um Cu
Min. Outer Layer Line/Space	92/98 um @10um Cu
Laser Via Diameter	100um
Flex Thickness	0.2 mm (PI stiff to finger) 0.54mm (Steel stiff to SM)
Base Materials	DS FCCL: Nexflex E1210D500NM BA: Hanwha HGB-E125WPQ CVL: Taiflex FHT0515 (inner) CVL: Taiflex FHT0525 (outer)
Surface Finish	ENIG
Others	40-pin 350um pitch (270/80um w/s) connector assembly

Ruggedized Sport Camera



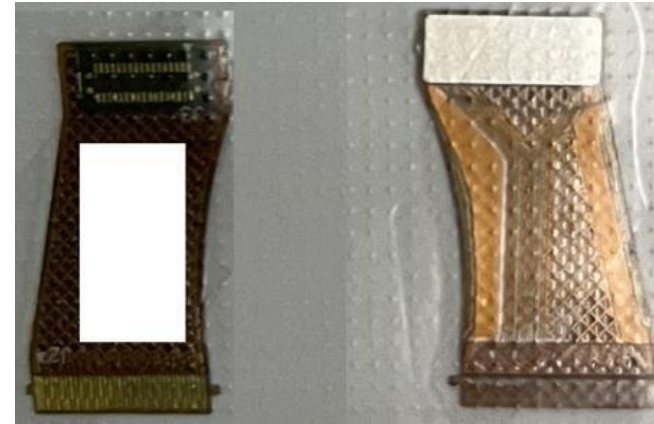
Unit: um	PI Stiff Area	Flex Area: airgap area	Stiff Area(CVL Stiff Area(SM))
	Polyimide 12.5	12.5	12.5
	Adhesive 20	20	20
			Soldermask 20
0.33oz	10	10	10
Base Polyimide	25	25	25
0.33oz	10	10	10
Adhesive	13	13	13
Polyimide	12.5	12.5	12.5
Adhesive	10	10	10
Polyimide	12.5	12.5	12.5
Adhesive	13	13	13
0.33oz	10	10	10
Base Polyimide	25	25	25
	0.33oz	10	10
Adhesive	20	20	20
Polyimide	12.5	12.5	12.5
Ad_Stiff	15		Ad_Stiff 40
PI Stiff	12.5		Stiff SUS 300



High Volume Products Show

Type	FPC, 4L, 1F-2F-1F, PTH
Lamination Cycles	1
Min. Inner Layer Line/Space	62/128 um @ 10um Cu
Min. Outer Layer Line/Space	120/90 um @28um Cu
Laser Via Diameter	100um
Flex Thickness	0.2mm (PI stiff to finger) 0.25mm (CVL to CVL non airgap area) 0.55mm (Steel stiff to SM)
Base Materials	DS FCCL: Thinflex W-0803ED-N4 SS FCCL Thinflex X-0503ES-N4 BA: Hanwha HGB-E200WPQ CVL: Grace CNVT15XMK2 (inner) CVL: Grace CNV0525XMK2 (outer)
Surface Finish	ENIG
Others	210um pitch gold finger

Ruggedized Sport Camera



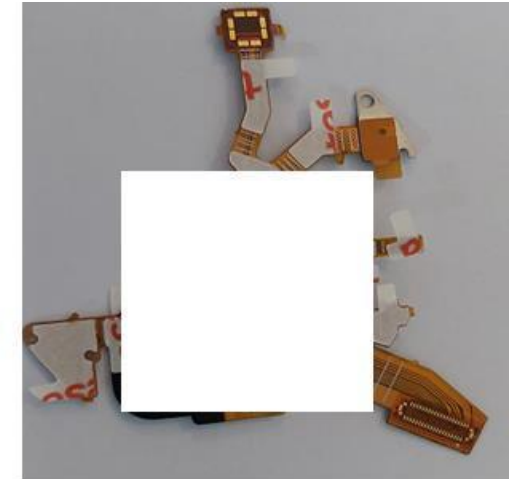
Unit: um	PI Stiff Area	Flex Area: airgap area		Stiff Area(SM)
	Polyimide	12.5	12.5	
	Adhesive	20	20	Soldermask 20
0.33oz+Plating	28	28	28	28
Base Polyimide	12	12	12	12
Adhesive	20	20	20	20
	0.33oz	10	10	10
Polyimide	20	20	20	20
0.33oz	10	10	10	10
Adhesive	10	10	10	10
Polyimide	7.5	7.5	7.5	7.5
Adhesive	20	20	20	20
Base Polyimide	12	12	12	12
	0.33oz+Plating	10	10	10
Adhesive	20	20	20	20
Polyimide	12.5	12.5	12.5	12.5
Ad Stiff	20			Ad Stiff 25
PI Stiff	12.5			Stiff SUS 300



High Volume Product Show

Type	FPC, 2L
Line/Space (min)	70/70um @ 24um Cu
Via Diameter	150um
Board Thickness	0.15mm(EMI to EMI)
Flex Dielectric Thickness	25um
Base Materials	FCCL: Taiflex 2FPDR1003JA Coverlay: Taiflex FHT0515
Surface Finish	ENIG
Others	EMI, SUS, PSA

- Smart Watch
- Output : 16.8KKpcs



SUS Stiffener	150	EMI	15		
Adhesive	25	Coverlay Taiflex	12.5	Soldermask	20
Coverlay Taiflex	12.5	Adhesive	15	1/3oz+Plating	24
Adhesive	15	1/3oz+Plating	24	PI Taiflex	25
L1 1/3oz+Plating	24	PI Taiflex	25	1/3oz+Plating	24
PI Taiflex	25	1/3oz+Plating	24	Adhesive	15
L2 1/3oz+Plating	24	Adhesive	15	Coverlay Taiflex	12.5
Adhesive	15	Coverlay Taiflex	12.5	Adhesive	40
Coverlay Taiflex	12.5	EMI	15	SUS Stiffener	300
		PSA	50		



NPI Products Show

Type	FPC, 6L, AL HDI 1F+1F+2F+1F+1F, with air-gap.
Lamination Cycles	2
Min. Inner Layer Line/Space	40/50um @ 15um Cu
Min. Outer Layer Line/Space	40/50um @ 15um Cu
Laser Via Diameter	0.085mm
Flex Thickness	2L zone: 0.09+/-0.03mm(CVL to CVL) 4L zone: 0.18+/-0.05mm(CVL to CVL) 6L zone: 0.28+/-0.05mm(CVL to CVL)
Base Materials	DS FCCL: Nexflex E1210D500NM SS FCCL: Nexflex E1205S500PM BA: Hanwha HGB-E250WGA CVL: E-Link EB000815XFA2-12 SM: Techniflex LCL1000F/410M
Surface Finish	ENIG
others	Ten more AIRGAP zone, De-cap for one layer and two layers.

- AR glasses



Unit: um

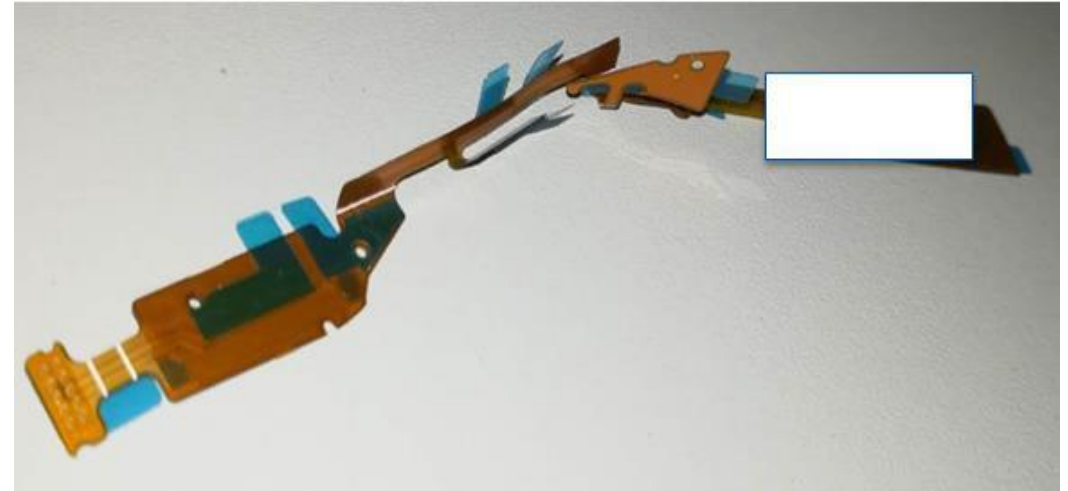
	6L FR4 Top PSA Top	6L COND PSA Bot	6L FR4 Bot2	6L FPC	6L FR4 Top	6L Air gap	6L PSA Top	6L FR4 Bot	6L PSA Bot	4L FPC	4L FR4 Top	4L Air gap	4L FR4 Bot	2L FPC	2L FR4 Top	2L FR4 Bot PSA Bot	2L FR4 Top PSA Top
PSA 100																	
FR4 stiff 75																	
Adhesive 20																	
Coverlay	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
Adhesive	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Plating copper	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Base copper	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Base Polyimide	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5
Adhesive	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
FR4 stiff 75																	
Adhesive	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
Plating copper	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Base copper	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Base Polyimide	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5
Adhesive	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
FR4 stiff 100																	
Adhesive 35																	
Soldermask 20																	
PSA 100																	
Adhesive 20																	
FR4 stiff 75																	
Adhesive	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Plating copper	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Base copper	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Base Polyimide	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5
Adhesive	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
FR4 stiff 75																	
Adhesive 20																	
FR4 stiff 75																	
Adhesive	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Soldermask 20																	
COND PSA 100																	
Adhesive 20																	
FR4 stiff 75																	
Adhesive 20																	
PSA 100																	

High Volume Product Show



Type	FPC, 3L, AL HDI
Lamination Cycles	1
Inner Layer Line/Space (min)	100/60um @ 12umCu
Outer Layer Line/Space (min)	50/70um @ 20um Cu
Laser Via Diameter	75um
Board Thickness	0.14mm
Flex Dielectric Thickness	12.5um, 25um
Base Materials	FCCL: Taiflex 2FPDR0503JA, 2LPSR0503JA Coverlay: Taiflex FHT0515
Surface Finish	ENIG
Others	PSA, SUS stiffener

- Smart Glasses
- Output : 300Kpcs



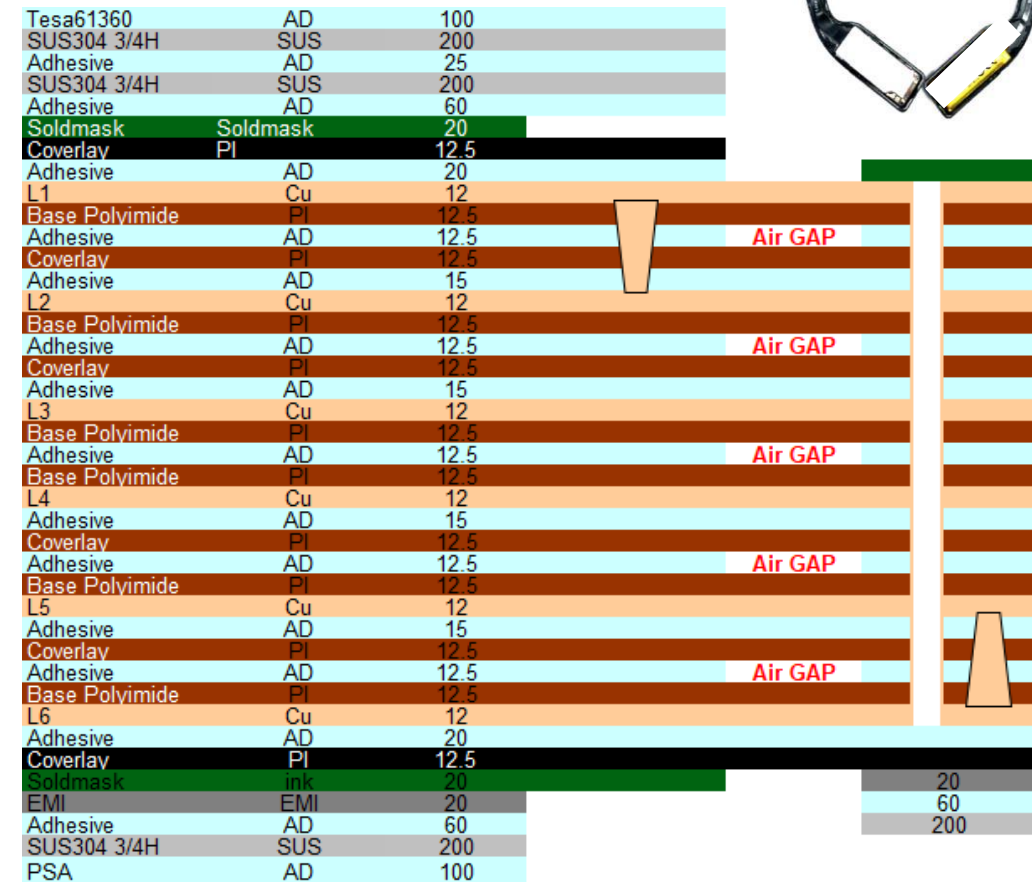
Coverlay Taiflex	12.5		Coverlay Taiflex	12.5	
Adhesive	25		Adhesive	25	
L1 1/3oz+Plating	20		PI Taiflex	25	
PI Taiflex	25		PI Taiflex	25	
L2 1/3oz	12		Adhesive	10	
Adhesive	10		PI Taiflex	12.5	
PI Taiflex	12.5		PI Taiflex	12.5	
L3 1/3oz+Plating	20		1/3oz+Plating	20	
Adhesive	25		Adhesive	25	
Coverlay Taiflex	12.5		Coverlay Taiflex	12.5	
PSA	100	Adhesive	45	PSA	50
		SUS Stiffener	200		

High Volume Product Show



Type	FPC, 6L
Lamination Cycles	2
Inner Layer Line/Space (min)	45/70um @ 12umCu
Outer Layer Line/Space (min)	70/70um @ 12um Cu
Laser Via Diameter	80um&100um
Board Thickness	0.22mm
Flex Dielectric Thickness	PI:12um, Adhesive 15um
Base Materials	FCCL: Dsflex-600 121200R(P)(C)250(NC)2LPSR0503JA Coverlay: IF-FC1315NHJ1
Surface Finish	ENIG
Others	PSA, SUS/FR4 stiffener, with Air-gap

- Wearable Device
- Output : 100Kpcs



High Volume Product Show



Type	FPC,2L
Outer Layer Line/Space (min)	75/45um @ 18umCu
Laser Via Diameter	100um
Board Thickness	0.30mm for the fingle zone
Flex Dielectric Thickness	25um
Base Materials	FCCL: 2FPDE1005BR Coverlay: FHB0525
Surface Finish	ENIG
Others	PSA

- Wearable Device
- Output : 100Kpcs



	Coverlay(black)	12.5	
	Adhesive	25	
L1	Button plating	15	
	1/2oz	18	
	PI	25	
L2	1/2 oz	18	
	Button plating	15	
	Adhesive	25	
	Coverlay(black)	12.5	



High Volume Product Show

Type	FPC,2L
Outer Layer Line/Space (min)	150/130um @ 50umCu
Laser Via Diameter	100um
Board Thickness	0.26mm
Flex Dielectric Thickness	25um
Base Materials	FCCL: IF-2LD2535CO2 Coverlay: IF-BC1350MHJ1
Surface Finish	ENIG
Others	SUS Stiffener

- Wearable Device—Battery module
- Output : 10KKpcs



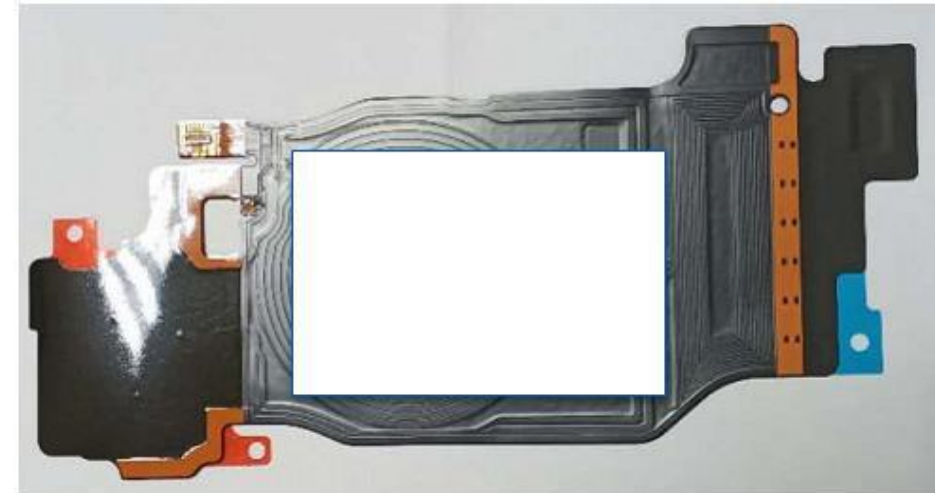
	Coverlay(Black)	12.5	
	Adhesive	50	Soldmask 20um
L1	panel plating	20	
	1/2oz	35	
	P I	25	
L2	1/2 oz	35	
	panel plating	20	
	Adhesive	50	
	Coverlay(Black)	12.5	



High Volume Product Show

Type	FPC, 2L
Line/Space (min)	400/100um @ 53um Cu
Via Diameter	120um
Board Thickness	0.14mm
Flex Dielectric Thickness	12.5um
Base Materials	FCCL: Doosan Dsflex_600 451245 Coverlay: Inktec BT013-P0/BT-010-P1 Innox MAH-0X-15NX
Surface Finish	ENIG
Others	PI stiffener, Sponge, PET spacer

- Smart Phone--Wireless charging
- Output : 3KKpcs



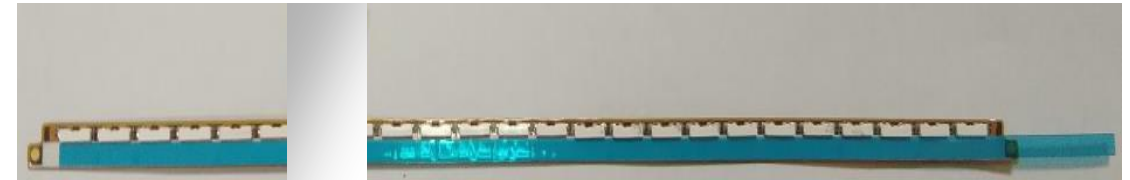
Coverlay Innox	12.5	Coverlay Inktec	7
Adhesive	25	Adhesive	5
L1 1.2oz+Plating	53	1.2oz+Plating	53
PI Doosan	12.5	PI Doosan	12.5
L2 1.2oz+Plating	53	1.2oz+Plating	53
Adhesive	5	Adhesive	5
Coverlay Inktec	5	Coverlay Inktec	5
Adhesive	40	PET	75
PI Stiffener	175	Sponge	150
		PET	28
		Sponge	100
		PET	75



High Volume Product Show

Type	FPC, 2L
Line/Space (min)	50/50um @12um Cu
Via Diameter	150um
Board Thickness	0.07mm for the finger zone
Flex Dielectric Thickness	25um
Base Materials	FCCL: 2FPDE1003MW Coverlay:FHT0515
Surface Finish	ENIG
Others	PI stiffener

- Display Module
- Output : 200Kpcs



	Coverlay(yellow)	12.5
	Adhesive	15
L1	1/3oz+Panle plating	22
	PI	25
L2	1/3oz+Panle plating	22
	Adhesive	15
	Coverlay(yellow)	12.5

NPI Product Show



Type	FPC, 5L, PTH w air-gaps
Lamination Cycles	1
Inner Layer Line/Space (min)	75/75um @ 12um Cu
Outer Layer Line/Space (min)	75/75um @ 12um Cu
PTH Via Diameter	120um
Board Thickness	Flex area: 0.282 mm
Flex Dielectric Thickness	12.5um
Base Materials	FCCL: Dsflex-600 121200R(P)(C)250(NC) Bonding Adhesive: Taiflex BT25 Coverlay: Taiflex FHB0525
Surface Finish	ENIG
Others	RA Cu, dynamic bending (200K cycles, R1.0mm @180°), SUS

- Folding Smart Phone



	SUS 100		Adhesive	150
	Adhesive		SUS	100
			Adhesive	30
PI (CVL)	PI	Solder mask	PI	13
Adhesive	Adhesive (CVL)		Adhesive (CVL)	12
Cu 1/3oz+Button plating	12 Cu 1/3oz+Button plating	Cu 1/3oz+Button plating		12
PI	PI	PI		12
Adhesive	Adhesive	Adhesive		12
PI (CVL)	PI	PI (CVL)		13
Adhesive	Adhesive (CVL)	Adhesive (CVL)		12
Cu 1/3oz	AirGAP Cu 1/3oz	Cu 1/3oz		12
PI	PI	PI		12
Adhesive	Adhesive	Adhesive		12
PI	PI	PI		12
Cu 1/3oz	12 Cu 1/3oz	Cu 1/3oz		12
Adhesive	Adhesive (CVL)	Adhesive (CVL)		12
PI (CVL)	PI	PI (CVL)		13
Adhesive	AirGAP Adhesive	Adhesive		12
PI	PI	PI		12
Cu 1/3oz	12 Cu 1/3oz	Cu 1/3oz		12
Adhesive	Adhesive (CVL)	Adhesive (CVL)		12
PI (CVL)	PI	PI (CVL)		13
Adhesive	AirGAP Adhesive	Adhesive		12
PI	12 PI	PI		12
Cu 1/3oz+Button plating	12 Cu 1/3oz+Button plating	Cu 1/3oz+Button plating		12
Adhesive (CVL)	12 Solder mask	Adhesive (CVL)		12
PI (CVL)		PI (CVL)		13
		Adhesive		30
		SUS 100		100
		Adhesive 50		50

NPI Product Show



Type	FPC, 4L, PTH w airgap
Lamination Cycles	1
Inner Layer Line/Space (min)	75/75um @ 12um Cu
Outer Layer Line/Space (min)	75/75um @ 12um Cu
PTH Via Diameter	100um
Board Thickness	Flex area: 0.18 mm
Flex Dielectric Thickness	12um
Base Materials	FCCL: AC121200RY
Surface Finish	ENIG + OSP
Others	Dynamic bending (300K cycles), SUS, EMI, air-gap,

- Folding Smart Phone



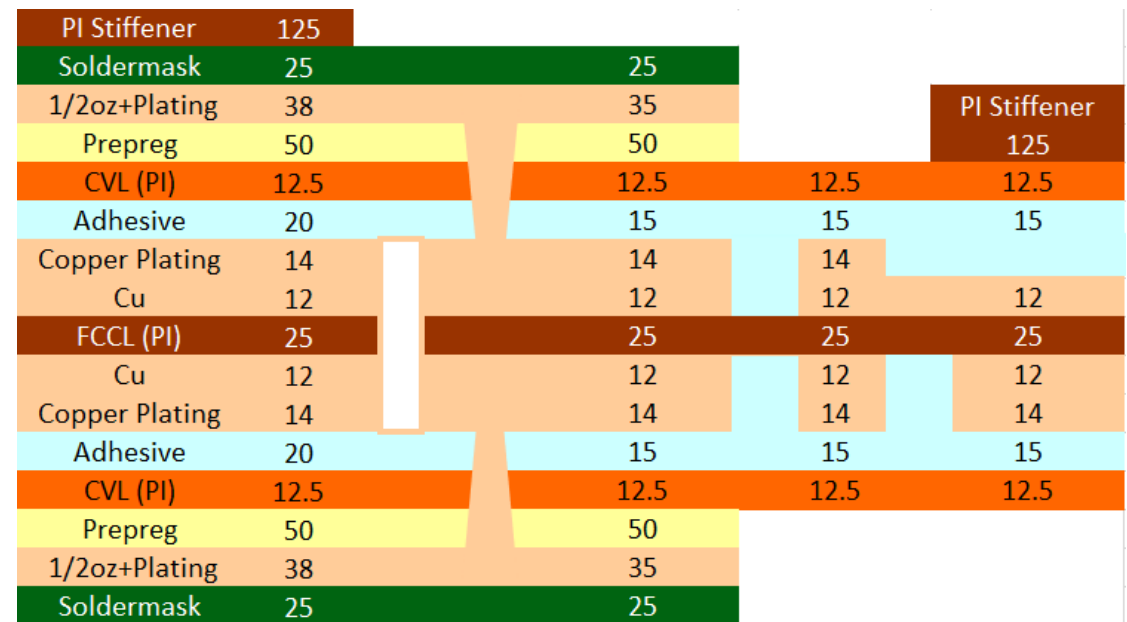
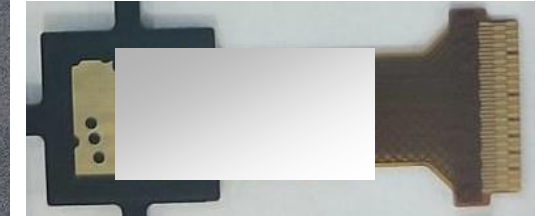
Layer	Layer Properties	Thk (um)	Structure	Connector	EMI	Air Gap	Location Area
	Adhesive	100	Adhesive				100
	FR4 Stiffener	200	FR4 Stiffener				200
	Adhesive	25	Adhesive				25
	Sliver EMI Shielding Film	10	Sliver EMI Shielding Film		10		
	Soldermask (Black)	20	Soldermask (Black)	20			
	Coverlay (Yellow)	12	Coverlay (Yellow)		12	12	12
	Adhesive	15	Adhesive		15	15	15
	Button Plating	0	Cu Plating	12	12		12
L1	Cu	12	Cu	12	12	12	12
	Polyimide (PI)	12	Polyimide (PI)	12	12	12	12
	Bonding Sheet	15	Bonding Sheet	15	15		15
	Coverlay (Yellow)	12	Coverlay (Yellow)	12	12	12	12
	Adhesive	15	Adhesive	15	15	15	15
L2	Cu	12	Cu	12	12	12	12
	Polyimide (PI)	12	Polyimide (PI)	12	12	12	12
	Bonding Sheet	15	Bonding Sheet	15	15		15
L3	Polyimide (PI)	12	Polyimide (PI)	12	12	12	12
	Cu	12	Cu	12	12	12	12
	Adhesive	15	Adhesive	15	15	15	15
	Coverlay (Yellow)	12	Coverlay (Yellow)	12	12	12	12
	Bonding Sheet	15	Bonding Sheet	15	15		15
L4	Polyimide (PI)	12	Polyimide (PI)	12	12	12	12
	Cu	12	Cu	12	12	12	12
	Button Plating	0	Cu Plating	0	0		0
	Adhesive	15	Adhesive	15	15	15	15
	Coverlay (Yellow)	12	Coverlay (Yellow)	12	12	12	12
	Sliver EMI Shielding Film	10	Sliver EMI Shielding Film		10		
	Adhesive	25	Adhesive	25			
	SUS Stiffener	250	SUS Stiffener	250			



High Volume Product Show

Application	Camera Module
Structure	RFPC, 4L, 1+2F+1,1+HDI
Lamination Cycles	1x lamination
Board Thickness	Rigid Area:0.35mm Flex Area:0.13mm
FCCL Dielectric Thickness	0.025mm
Laser Via Size	0.11mm
Blind Via Depth	0.09mm
I/L Line Width/Space	65/65µm @ 22µm Cu
O/L Line Width/Space	70/70µm @ 30µm Cu
Base Material	Rigid: Doosan DS-7402 BS DF FCCL:TaiFlex 2UPDR1003JA Coverlay:TaiFlex FHK0525
Surface Finish	Hard Gold(I/L) + ENEPIG(O/L)
Others	I/L Finger

Mass Production from 2020

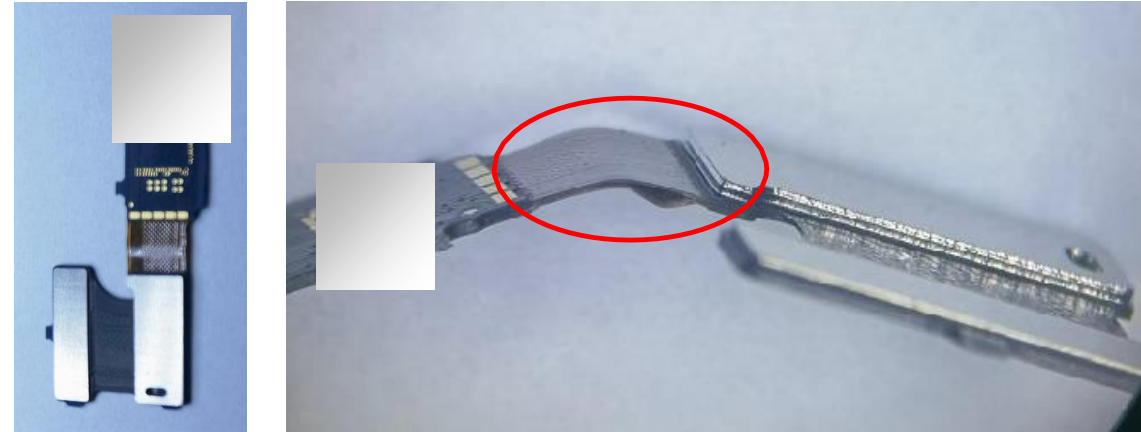




High Volume Product Show

Application	Camera Module
Structure	RFPC, 6L, 1-2F-2F-1, PTH
Lamination Cycles	1x lamination
Board Thickness	Rigid Area:0.57mm Air Gap Area:0.21mm
FCCL Dielectric Thickness	0.025mm
Through Hole Size	0.12mm
I/L Line Width/Space	50/50µm @ 18µm Cu
O/L Line Width/Space	80/60µm @ 30µm Cu
Base Material	Rigid: Doosan DS-7402 BS DF FCCL: Doosan DSflex-600 Coverlay: INNOX MAH-EX-20NX
Surface Finish	Soft Gold
Others	with Air Gap

Mass Production from 2021



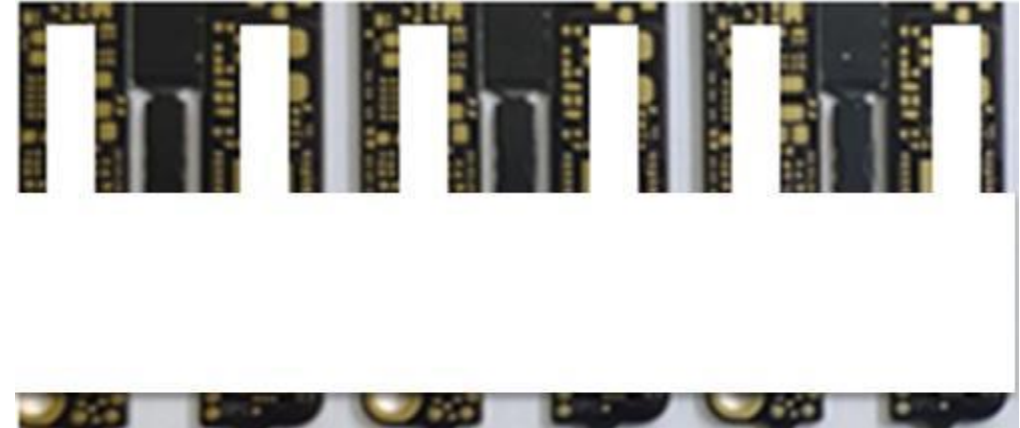
	SUS Stiffener 350/150		SUS 350	SUS 150
Adhesive	60		Adh. 40	Adh. 40
EMI Shielding	20			
Soldermask	25	25	25	25
Copper Plating	15	15	15	15
Cu	12	9	9	9
Prepreg	25	25	25	EMI 16 25
CVL (PI)	12.5	12.5	12.5	12.5
Adhesive	20	15	15	15
Cu	18	17	17	17
FCCL (PI)	25	25	25	25
Cu	18	17	17	17
Adhesive	20	15	15	15
CVL (PI)	12.5	12.5	12.5	12.5
Prepreg	25	25	Air Gap 25	25
CVL (PI)	7.5	7.5	7.5	7.5
Adhesive	20	15	15	15
Cu	18	17	17	17
FCCL (PI)	25	25	25	25
Cu	18	17	17	17
Adhesive	20	15	15	15
CVL (PI)	7.5	7.5	7.5	7.5
Prepreg	25	25	25	25
Cu	12	9	9	9
Copper Plating	15	15	15	15
Soldermask	25	25	25	25



High Volume Product Show

Type	8L 3+2F+3,AnyLayer
Lamination Cycles	3x lamination
Min. Inner Layer Line/Space	50/60um @ 23um Cu
Min. Outer Layer Line/Space	50/66um @ 25um Cu
Laser Via Diameter	100um
Board Thickness	Rigid area 0.595mm Flex area 0.126mm
FCCL Thickness	25um
Base Material	Rigid: Panasonic R-1566WN FCCL: Nippon Steel MB12-2512CEG Coverlay: Dupont HXC1220
Surface Finishing	ENIG

- Handwriting Product
- Output : 16.8KKpcs(136kft2)



Layer	Layer Properties	Thickness (um)	Structure
	TOP Soldermask	20	
L1	0.33oz+Plating	25	
	Prepreg R1551WN	58	
L2	0.33oz+Plating	25	
	Prepreg R1551WN	56	
L3	0.33oz+Plating	25	Dupont coverlay 12.5
	Prepreg R1551WN	56	Adhesive 15
L4	0.33oz+Plating	23	0.33oz+Plating 23
	PI Nippon Steel	25	PI Nippon Steel 25
L5	0.33oz+Plating	23	0.33oz+Plating 23
	Prepreg R1551WN	56	Adhesive 15
L6	0.33oz+Plating	25	Dupont coverlay 12.5
	Prepreg R1551WN	56	
L7	0.33oz+Plating	25	
	Prepreg R1551WN	58	
L8	0.33oz+Plating	25	
	BOT Soldermask	20	

High Volume Product Show



Type	6L 2+2F+2 , 2+ HDI
Lamination Cycles	2x lamination
Min. Inner Layer Line/Space	100/100um @ 16um Cu
Min. Outer Layer Line/Space	100/100um @ 41um Cu
Laser Via Diameter	100um
Board Thickness	Rigid area 0.5mm Flex area 0.11mm
FCCL Thickness	25um
Base Material	Rigid: Panasonic R-1566WN FCCL: Azotex KDD1825JAE Coverlay: Dupont HXC1220
Surface Finishing	ENIG
Others	Steel stiffener,

- Bluetooth head-mounted
- Output : 1.4KKpcs(32kft2)



Layer	Layer Properties	Thickness (um)	Structure
	SUS301	100	
	Adhesive	51	
	TOP Soldermask	20	
L1	0.33oz+Plating	41	
	Prepreg R1551WN	70	
L2	0.33oz+Plating	26	
	Prepreg R1551WN	67	
L3	0.33oz+Plating	16	
	PI Azotex	25	
L4	0.33oz+Plating	16	
	Prepreg R1551WN	67	
L5	0.33oz+Plating	26	
	Prepreg R1551WN	70	
L6	0.33oz+Plating	41	
	BOT Soldermask	20	

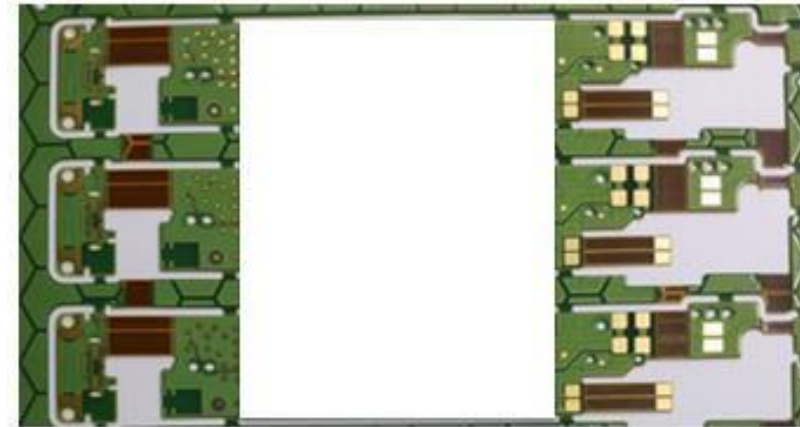
TOP Soldermask	20
0.33oz+Plating	41
Prepreg R1551WN	70
Coverlay Dupont	12.5
0.33oz+Plating	26
Adhesive	15
Prepreg R1551WN	67
0.33oz+Plating	16
PI Azotex	25
PI Azotex	25
PI Azotex	25
PI Azotex	25
PI Azotex	25
0.33oz+Plating	16
0.33oz+Plating	16
0.33oz+Plating	16
Adhesive	15
Prepreg R1551WN	67
Adhesive	15
Adhesive	15
Coverlay Dupont	12.5
0.33oz+Plating	26
Prepreg R1551WN	70
Adhesive	51
0.33oz+Plating	41
SUS301	60
BOT Soldermask	20

High Volume Product Show



Type	4L 1+2F+1,AnyLayer
Lamination Cycles	1x lamination
Min. Inner Layer Line/Space	80/100um @ 25um Cu
Min. Outer Layer Line/Space	100/100um @ 30um Cu
Laser Via Diameter	100um
Board Thickness	Rigid area 0.354mm Flex area 0.173mm
FCCL Thickness	50um
Base Material	Rigid: TUC TU-862 FCCL: Doosan DSFLEX-600125012E(U) Coverlay: Dupont FR7013
Surface Finishing	ENIG

- Electronic Cigarettes
- Output : 4.2KKpcs(194kft2)



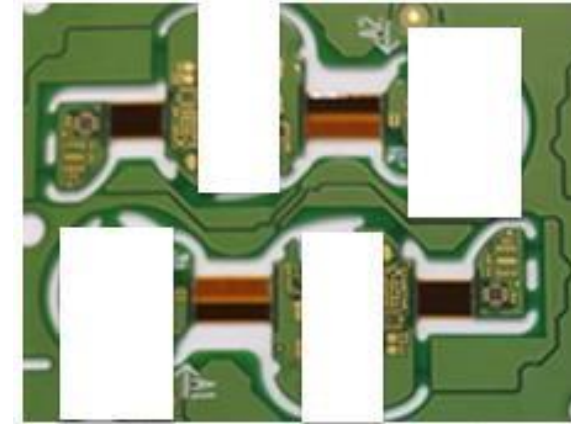
Layer	Layer Properties	Thickness (um)	Structure
	TOP Soldermask	20	
L1	1/2oz+Plating	30	Coverlay Dupont 12.5 Coverlay Dupont 12.5
	Prepreg TU-84P	72	Adhesive 19 Adhesive 19
L2	1/3oz+Plating	30	1/3oz+Plating 30 1/3oz+Plating 30
	PI Doosan	50	PI Doosan 50 PI Doosan 50
L3	1/3oz+Plating	30	1/3oz+Plating 30 1/3oz+Plating 30
	Prepreg TU-84P	72	Adhesive 19
	1/2oz+Plating	30	Coverlay Dupont 12.5
	BOT Soldermask	20	

High Volume Product Show



Type	6L 2+2F+2 , AnyLayer
Lamination Cycles	2x lamination
Min. Inner Layer Line/Space	80/80um @ 20um Cu
Min. Outer Layer Line/Space	100/100um @ 30um Cu
Laser Via Diameter	100um
Board Thickness	Rigid area 0.506mm Flex area 0.135mm
FCCL Thickness	25um
Base Material	Rigid: Panasonic R-1566WN FCCL: Nexflex E1210D500NM Coverlay: Taiflex FHT0525
Surface Finishing	ENIG

- Bluetooth Headsets
- Output : 3.2KKsets (54kft2)



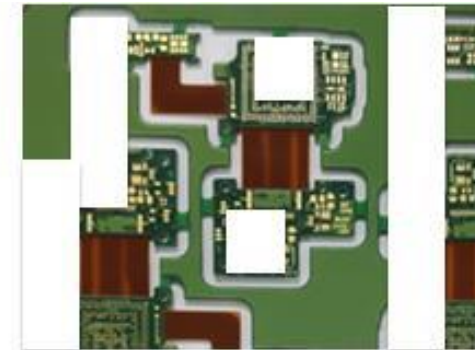
Layer	Layer Properties	Thickness (um)	Structure	Layer Properties	Thickness
	Soldermask (Green)	20		Soldermask (Green)	20
L1	1/3 Oz +Plating	30		1/3 Oz +Plating	30
	Prepreg 1551WN	74		Prepreg 1551WN	74
L2	1/3 Oz +Plating	20		1/3 Oz +Plating	20
	Prepreg 1551WN	78		Prepreg 1551WN	78
L3	1/3 Oz +Plating	20		1/3 Oz +Plating	20
	PI Nexflex	25		PI Nexflex	25
L4	1/3 Oz +Plating	20		1/3 Oz +Plating	20
	Prepreg 1551WN	75		Prepreg 1551WN	75
L5	1/3 Oz +Plating	20		1/3 Oz +Plating	20
	Prepreg 1551WN	74		Prepreg 1551WN	74
L6	1/3 Oz +Plating	30		1/3 Oz +Plating	30
	Soldermask (Green)	20		Soldermask (Green)	20

High Volume Product Show



Type	12L 2+(3-2F-3)+2, 2+HDI
Lamination Cycles	3x lamination
Min. Inner Layer Line/Space	100/100um @ 15um Cu
Min. Outer Layer Line/Space	100/100um @ 25um Cu
Laser Via Diameter	100um
Board Thickness	Rigid area 1.0mm Flex area 0.185mm
FCCL Thickness	50um
Base Material	Rigid: Panasonic: R-1566WN FCCL: Taiflex 2FPDE2005MW Coverlay: Taiflex FHT1030
Surface Finishing	ENIG+OSP

- Industry Product(Hand-held Scanner)
- Output : 487K pcs



Layer	Layer Properties	Thickness (um)	Structure
	TOP Soldermask	20	
L1	1/2oz+Plating	35	
	Prepreg R1551WN	65	
L2	1/2oz+Plating	30	
	Prepreg R1551WN	67	
L3	1/2oz+Plating	30	
	Prepreg R1551WN	59	
L4	1/2oz	15	
	Prepreg R1551WN	74	
L5	1/2oz	15	
	Prepreg R1551WN	53	
L6	1/2oz	15	
	PI Taiflex	50	
L7	1/2oz	15	
	Prepreg R1551WN	52	
L8	1/2oz	15	
	Prepreg R1551WN	74	
L9	1/2oz	15	
	Prepreg R1551WN	59	
L10	1/2oz+Plating	30	
	Prepreg R1551WN	68	
L11	1/2oz+Plating	30	
	Prepreg R1551WN	65	
L12	1/2oz+Plating	35	
	BOT Soldermask	20	

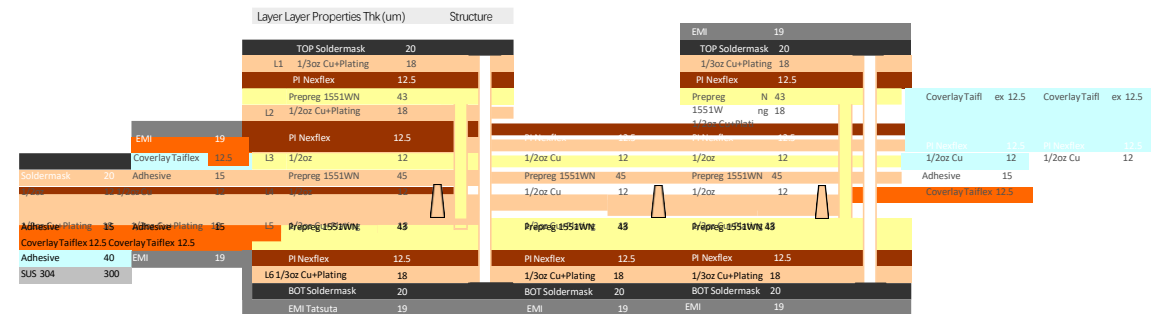
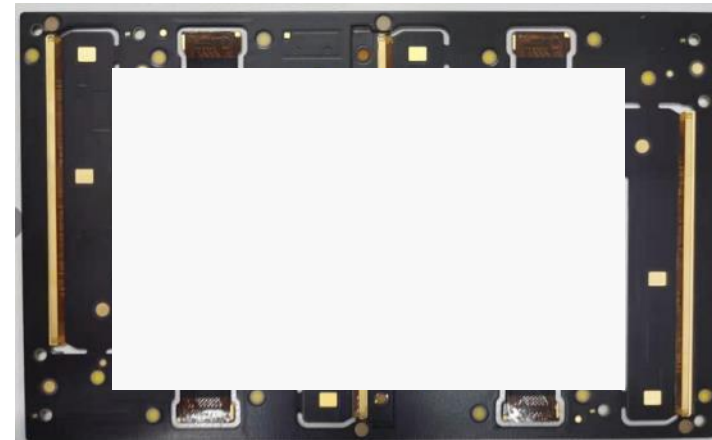
TOP Soldermask	20
1/2oz+Plating	35
Prepreg R1551WN	65
1/2oz+Plating	30
Prepreg R1551WN	67
1/2oz+Plating	30
Prepreg R1551WN	59
1/2oz	15
Prepreg R1551WN	74
1/2oz	15
Prepreg R1551WN	53
1/2oz	15
PI Taiflex	50
1/2oz	15
Prepreg R1551WN	52
1/2oz	15
Prepreg R1551WN	74
1/2oz	15
Prepreg R1551WN	59
1/2oz+Plating	30
Prepreg R1551WN	68
1/2oz+Plating	30
Prepreg R1551WN	65
1/2oz+Plating	35
BOT Soldermask	20



NPI Product Show

Type	6L 1F-(2F+2F)-1F
Lamination cycles	2x lamination
Min. Inner Layer Line/Space	50/59um @ 14um Cu
Min. Outer Layer Line/Space	50/59um @ 18um Cu
Laser Via Diameter	76um
Board Thickness	Rigid area 0.333mm Flex area 0.059mm
FCCL Thickness	12.5um
Base Material	Rigid: Panasonic R-1566WN FCCL: NEXFLEX E1805D500NM& NEXFLEX E1205S500PM Coverlay: Taiflex FHT0520& FHT0515
Surface finishing	Soft ENIG
Others	EMI, Steel stiffener, ACF finger,

- LCM Product – OLED driver

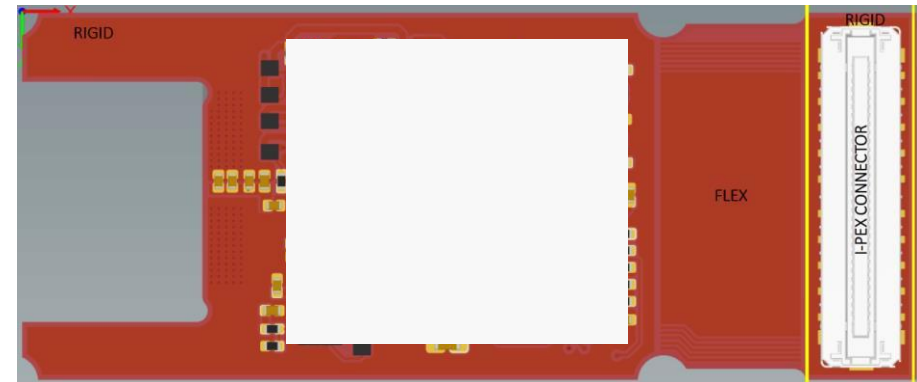


NPI Product Show



Type	10L 4+2F+4,AnyLayer
Lamination Cycles	4x lamination
Min. Inner Layer Line/Space	75/75um @ 23um Cu
Min. Outer Layer Line/Space	75/75um @ 23um Cu
Laser Via Diameter	100um
Board Thickness	Rigid area 1.0mm Flex area 0.196mm
FCCL Thickness	75um
Base Material	Rigid: TUC TU-862, Rogers RO4450T FCCL: Panasonic R-F775 33EV-M Coverlay: Taiflex FHT0525
Surface Finishing	ENEPIG

- Optical Product



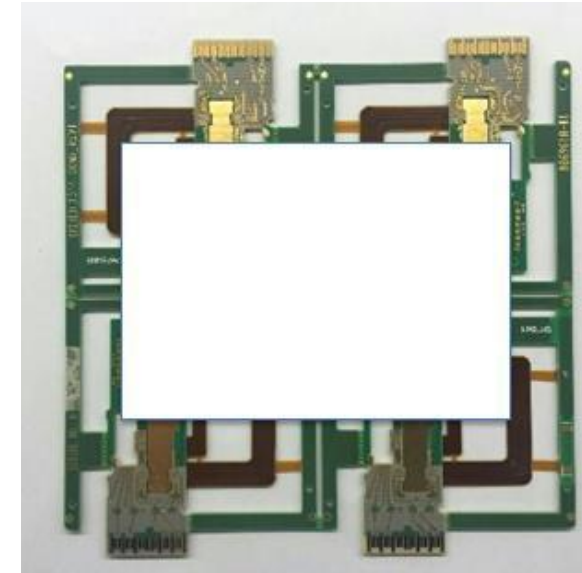
Layer	Layer Properties	Thickness (um)	Structure
TOP Soldermask		20	
L1	1/3oz+Plating	23	
	Prepreg TU-84P	75	
L2	1/3oz+Plating	23	
	Prepreg TU-84P	74	
L3	1/3oz+Plating	23	
	Prepreg TU-84P	74	
L4	1/3oz+Plating	25	Coverlay Taiflex 12.5
	Prepreg Rogers RO4450T	91	Adhesive 20
L5	1/3oz+Plating	25	1/3oz+Plating 25
	PI Panasonic	75	PI Panasonic 75
L6	1/3oz+Plating	25	1/3oz+Plating 25
	Prepreg Rogers RO4450T	91	Adhesive 20
L7	1/3oz+Plating	25	Coverlay Taiflex 12.5
	Prepreg TU-84P	71	1/3oz+Plating 25
L8	1/3oz+Plating	23	Prepreg TU-84P 71
	Prepreg TU-84P	72	1/3oz+Plating 23
L9	1/3oz+Plating	23	Prepreg TU-84P 72
	Prepreg TU-84P	75	1/3oz+Plating 23
L10	1/3oz+Plating	23	Prepreg TU-84P 75
	Prepreg TU-84P	75	1/3oz+Plating 23
BOT Soldermask		20	BOT Soldermask 20

NPI Product Show



Type	8L, 3+(1-2F-1)+1, 3+ HDI
Lamination cycles	4x lamination
Min. Inner Layer Line/Space	100/100um @ 30um Cu
Min. Outer Layer Line/Space	120/100um @ 30um Cu
Laser Via Diameter	100um
Board Thickness	Rigid area 1.00 mm Flex area 0.185 mm
FCCL Thickness	50um
Base Material	Rigid: Panasonic R-5670, R-1566WN FCCL: Dupont AK125012EM Coverlay: Grace CNV025XMK1
Surface finishing	ENEPIG+ hard gold
Others	Cavity, Un-balanced, VIPPO,

- Optical Module



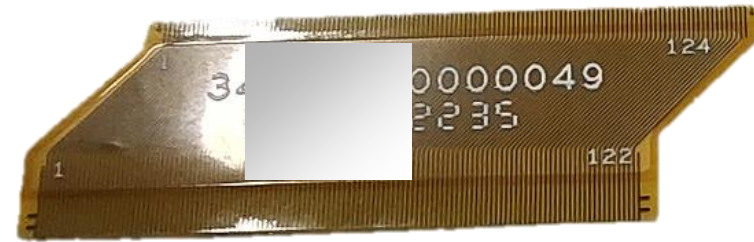
Layer	Layer Properties	Thickness (um)	Structure		
	TOP soldermask	20			
L1	1/3oz+Plating Prepreg R-5670	30 75		Cavity Depth: 0.32 +/- 0.05mm	
L2	1/3oz+Plating Prepreg R-1551WN	30 75			
L3	1/2oz+Plating Prepreg R-1551WN	30 75			
L4	1/2oz+Plating Prepreg R-1551WN Core R1566WN	30 70 76			Coverlay Grace 12.5
	Prepreg R-1551WN	70			Adhesive 25
L5	1/3oz PI Dupont	30 50			1/3oz 30 PI Dupont 50
L6	1/3oz Prepreg R1551WN	30 70			1/3oz 30 Adhesive 25
	Core R1566WN	76			Coverlay Grace 12.5
L7	1/2oz+Plating Prepreg R-5670	30 70			
L8	1/3oz+Plating	30			
	BOT soldermask	20			

High Volume Product Show



Type	1 L
Lamination cycles	2x lamination
Stack up	Cover lay + FCCL + Stiffener
Finger zone L/S	100/150um
Board Thickness	Finger zone 57.5um Cover lay zone 57.5um
FCCL properties	32um, no adhesive
Surface finishing	ENIG

- Note book LCM



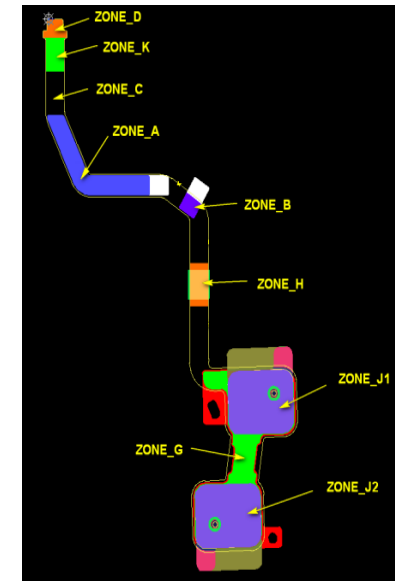
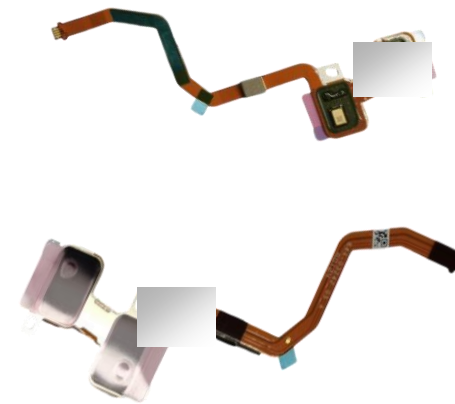
Layer	properties	Thickness (um)	Finger1	Coverlay	Finger2
Cover lay	Polyimide Film	12.5			
	Adhesive	15			
FCCL	L1 Conductor (RA)	12			
	PI base Film	20			
Stiffener	Adhesive	15			
	Polyimide Film	12.5			
Component mark	Silk ink (White)	20			

High Volume Product Show



Type	2 L
Lamination cycles	2 x lamination
Stack up	2L ,with cover lay & Stiffener *5
Inner layer L/S	61um/60um
outer layer L/S	61um/60um
Impedance	N/A
Surface finishing	ENIG
Other Flex parts	CPSA*2+PSA*5+C foam*1 +SUS*1+PI*2+Mesh*2 +MIC protective film*2+ barcode *1
SMT Component	MIC*2+Chip*14 Conformal Coating*4 zone

- Speaker Module



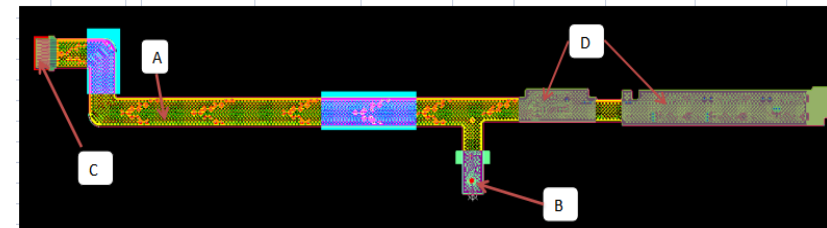
LAYER	THICK(um) Before pressed	ZONE_B	ZONE G	ZONE K	ZONE D	ZONE H	ZONE_J1,J2	ZONE_A	ZONE_C
Protective Film	83								
Liner	50								
Adhesive	250								
Foam	57								
Adhesive	250								
SUS stiffener									
Adhesive	60								
PI Stiffener	200								
Adhesive	25	Bottom PSA							
Polyimide Coverlay (Orange)	12.5								
Adhesive	25								
1/3oz+Button Plating	12								
Polyimide (PI)	25								
1/3oz+Button Plating	12								
Adhesive	25								
Polyimide Coverlay (Orange)	12.5								
Soldermask (Green)	20	Adhesive							
ENIG	4	Liner							
Adhesive 1	100								
Adhesive 2	100								
Liner	50								
Foam	3480								

High Volume Product Show



Type	2 L
Lamination cycles	2 x lamination
Stack up	2L ,with cover lay Stiffener *5
Inner layer L/S	75um/75um
outer layer L/S	100um/300um
Impedance	N/A
Surface finishing	ENIG
Other Flex parts	Stiffener FR4*3+ PI*2
SMT Component	MIC*1+Chip*3+IC*1 +DOME*3

- CMB-VOL-X2



LAYER	THICK(um) Before Pressed	Zone A	Zone B (MIC)	Zone C	Zone D
Soldermask (Green)	20				
Polyimide Coverlay (Orange)	12.5				
Adhesive	20		Soldermask		Soldermask
1/3oz+Panel Plating	22				
Polyimide (PI)	25				
1/3oz+Panel Plating	22				
Adhesive	20				
Polyimide Coverlay (Orange)	12.5				
Adhesive	25				
PI Stiffener1	150				FR4 Stiffener3
Adhesive	25				
PI Stiffener2	75				
Adhesive	35				
FR4 Stiffener3	350				

The background is a deep blue gradient. In the upper right, a large, glowing sphere transitions from blue to a light greenish-yellow. The lower half of the image is filled with a complex digital pattern of glowing blue lines and dots, resembling a data visualization or a stylized landscape of information. The overall aesthetic is high-tech and digital.

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