Panasonic

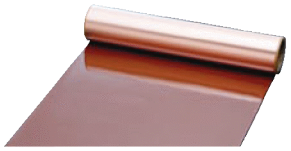
Flexible Circuit Board Materials
Resin Coated Copper Foil

FELIOS FRCC R-FR10

Material for thinner and multilayed

It is possible to make board thickness thinner and to reduce a manufacture process

Features

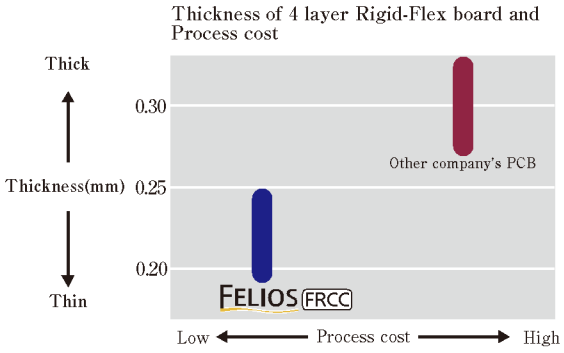


1. Bendable due to the use of low modulus resin technology
2. It is possible to make board thinner and multilayed
3. Excellent Insulation resistance between layer to layer
4. Halogen-free

Applications

Smartphone (Main board, Subboard, Module etc.), HDI board

Concept



Coplanarity of lamination

General Properties

Test item	Unit	Treatment conditions	R-FR10 Actual value
Volume resistivity	MΩ・m	C-96/20/65	1×10^{8}
		C-96/20/65+C-96/40/90	9×10^{7}
Surface resistance	MΩ	C-96/20/65	3×10^{8}
		C-96/20/65+C-96/40/90	1×10^{8}
Dielectric constant (1MHz)	—	C-96/20/65	3.2
		C-96/20/65+D-24/23	3.2
Dielectric constant (1GHz)	—	C-24/23/50	3.1
Dissipation factor (1MHz)	—	C-96/20/65	0.018
		C-96/20/65+D-24/23	0.018
Dissipation factor (1GHz)	—	C-24/23/50	0.016
Solder heat resistance (260℃)	second	A	60
Peel strength Copper foil : 0.012mm (12μm)	N/mm	A	0.8
		S_4	0.8
Water absorption	%	E-24/50+D-24/23	1.2
Flammability (UL method)	—	A and E-168/70	94VTM-0
Alkali resistance	—	Immersion (3 minutes)	no abnormality
Tensile Modulus	GPa	DMA	20

Note : Test piece thickness is 0.04mm.
However, test piece thickness of Flammability is 0.1mm of 4 layer board (core meterial is 0.025mm PI)

The above data is actual values and not guaranteed values.

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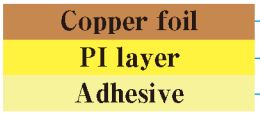
Line-up

Standard Specification



● Copper foil

	12μm(1/3oz)
Electrolytic	○

● PI layer

5μm
○

● Product size

Type	TD(mm)
Roll	Max.520
Sheet	Max.520

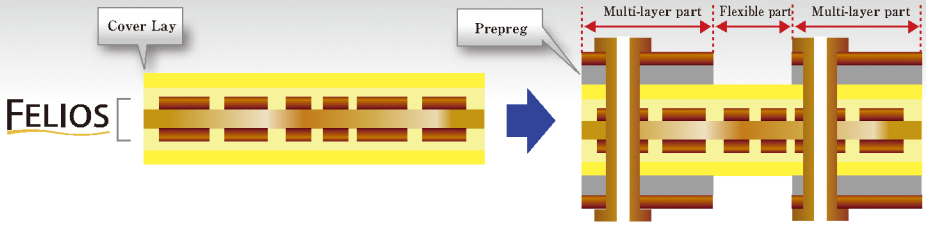
● Adhesive

15μm	20μm	25μm	28μm
○	○	○	○

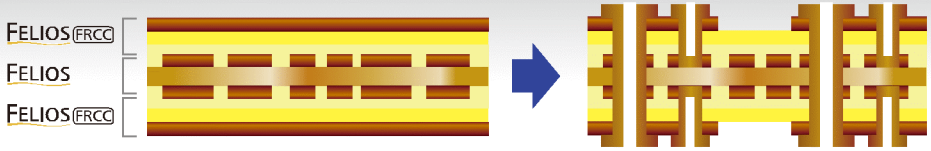
Characteristics

Feature of layer construction

Typical 4 layers flexible circuit board



4 layers flexible circuit board with FELIOS FRCC



Manufacture Process of 4 layers flexible circuit board

Typical 4 layers flexible circuit board

- Pattering(Inner Layer)
- Cover Lay Lamination
- Cover-Lay Surface treatment
- Copper Foil Lamination
- Drilling Cu Plating
- Pattering(Outer Layer)
- Solder Resist Coating
- Punching, Routing

Process Simplification
Material Reduction

4 layers flexible circuit board with FELIOS FRCC

- Pattering(Inner Layer)
- Felios FRCC Lamination
- ~~Cover-Lay Surface treatment~~
- ~~Copper Foil Lamination~~
- Drilling Cu Plating
- Pattering(Outer Layer)
- Solder Resist Coating
- Punching, Routing

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