

Thinned multi-layer
Simplify the build-up process
Good coplanarity

Applications
Mobile
 Smartphone (Main/Sub board, Module board), etc.



FELIOS FRCC

R-FR10

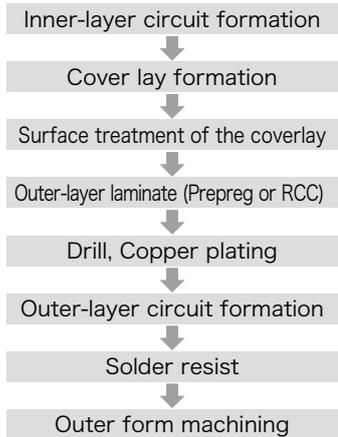
Flexible circuit board materials Resin coated copper foil

Possible to make board thinner and simplify the build-up process. Contribute to thinner and smaller of mobile product and module.
 Excellent moldability realizes 3-layer flexible circuit boards with smoother surface layers.

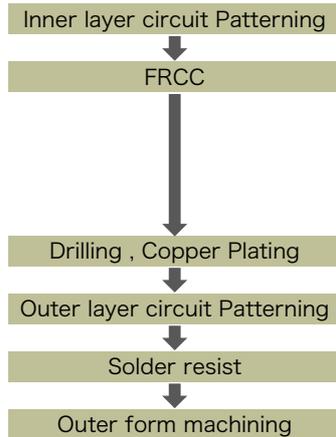
Concept

R-FR10 enables thinner, multi-layered circuit boards and simplified manufacturing processes.

General flex rigid wiring board



FELIOS (FRCC)



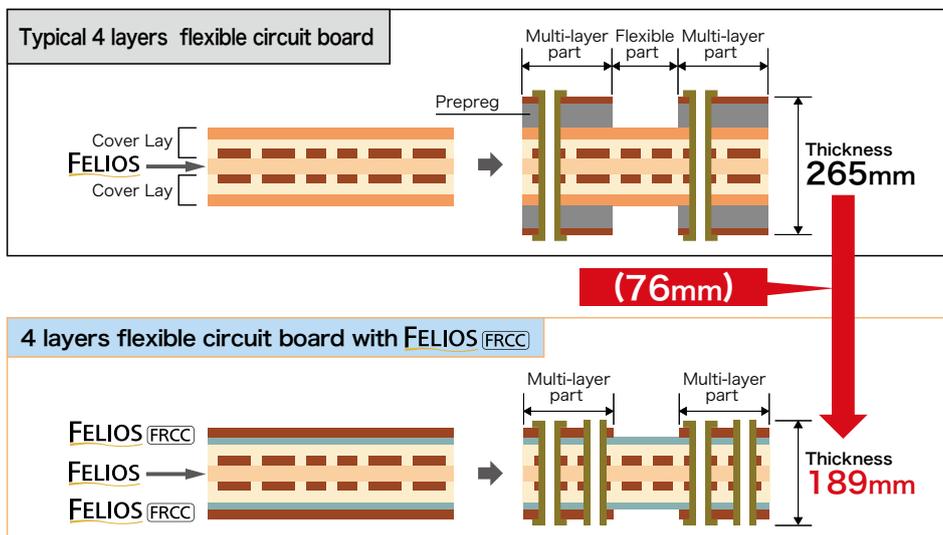
Surface smoothness

Surface smoothness after molding

	FELIOS (FRCC)	Conventional process
Surface		
Cross section		

Thin multi-layer

Thinning of rigid flex is possible.



Our Halogen-free materials are based on JPCA-ES-01-2003 standard and others. The above data are typical values and not guaranteed values.

General properties

Item		Test method	Condition	Unit	FELIOS ^{FRCC} R-FR10
Glass transition temp. (Tg)		Internal method (DMA)	A	°C	70,210(Ad) / 320(PI)
		Internal method (TMA)			190(Ad) / 270(PI)
CTE x, y-axis	α1	Internal method (TMA)	A	ppm/°C	80(Ad) / 25(PI)
	α2				580(Ad) / 25(PI)
CTE z-axis	α1	Internal method (TMA)	A	ppm/°C	210(Ad) / - (PI)
	α2				210(Ad) / - (PI)
Dielectric constant(Dk)	1GHz	IPC-TM-650 2.5.5.9	A	-	3.0(Ad) / 3.3(PI)
	2GHz				3.0(Ad) / 3.2(PI)
Dissipation factor(Df)	1GHz	IPC-TM-650 2.5.5.9	A	-	0.019(Ad) / 0.010(PI)
	2GHz				0.020(Ad) / 0.010(PI)
Solder heat resistance		JIS C 6481	A	-	No abnormality
			260°C solder float for 1min		
Peel strength Copper:0.012mm(12μm)		JIS C 6481	A	N/mm	0.8
Volume resistivity		JIS C 6481	C-96/20/65	MΩ·m	1×10 ⁸
			C-96/20/65+C-96/40/90		9×10 ⁷
Surface resistance		JIS C 6481	C-96/20/65	MΩ	3×10 ⁸
			C-96/20/65+C-96/40/90		1×10 ⁸
Water absorption		Internal method	E-24/50+D-24/23	%	1.2
Flammability		UL	A and E-168/70	-	94VTM-0*1
Alkali resistance		Internal method	Dipping 3minutes in 3%NaOH at 40°C	-	No abnormality
Elastic modulus		Internal method	C-24/23/50	GPa	1.0(Ad) / 4.0(PI)
Bending property		MIT method*2	0.5kg φ 0.38, 175cpm, 135°	times	>150

The sample thickness is Copper12μm, PI3μm, Ad17μm.

*1 Measured by R-FR10/R-F775 25um/R-FR10 construction

*2 Measured 18um ED copper on R-F775 25um covered by R-FR10 for both side

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Please see our website for Notes before you use.

industrial.panasonic.com/ww/electronic-materials

Panasonic Industry R-FR10 

Panasonic Industry Co., Ltd. Electronic Materials Business Division

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