

## HF-140 Halogen-free FR-4

## 无卤素玻纤布覆铜层压板

## 特点

- 无卤素，溴及氯元素含量小于 0.09%；  
溴+氯含量小于 0.15%
- 不含锑，燃烧时不残留有毒成分
- 符合 IPC-4101C/92 的规范要求

## Features

- Halogen-free, Br/Cl content below 0.09%; Br + Cl content below 0.15%
- Antimony-free, Absence of highly toxic dioxins in burning exhaust gas
- IPC-4101C/92 specification is applicable

## General Properties 一般特性

Test Item 测试项目	Unit 单位	Test Method (IPC-TM-650) 测试方法	Test Condition 处理条件	Specification (IPC-4101C) 规格值	Typical Value 典型值
Peel Strength (1 oz.) 铜箔剥离强度	N/mm	2.4.8	A	≥0.70	1.32
			Float 288°C/ 10 Sec	≥1.05	1.45
Thermal Stress 热应力	Sec	2.4.13.1	Float 288°C/ unetched	≥10	160
Bow / Twist 弯弓度/翘曲度	%	2.4.22.1	A	≤ 1.0	0.18 / 0.21
Flexural Strength 抗弯强度	N/mm <sup>2</sup>	2.4.4	Warp	≥415	575
			Fill	≥345	420
Flammability 燃烧性	Rating	UL94	E-24/23	UL94 V-0	V-0
Glass Transition (Tg) 玻璃转化温度	°C	2.4.25	E-2/105 DSC	≥130	140
Surface Resistivity 表面电阻	MΩ	2.5.17.1	C-96/35/90	≥1.0×10 <sup>4</sup>	1.5×10 <sup>7</sup>
Volume Resistivity 体积电阻	MΩ-cm	2.5.17.1	C-96/35/90	≥1.0×10 <sup>6</sup>	1.8×10 <sup>9</sup>
Dielectric Breakdown 介质击穿	KV	2.5.6	D-48/50+D0.5/23	≥40	55
Dielectric strength 介质强度	KV/mm	2.5.6.2	D-48/50+D0.5/23	≥29	41
Dielectric Constant 介电常数	—	2.5.5.2	Etched/@1 MHZ	≤5.4	4.93
Loss Tangent 介质损耗	—	2.5.5.2	Etched/@1 MHZ	≤0.035	0.021
Arc Resistance 耐电弧性	Sec	2.5.1	D-48/50+D-0.5/23	≥60	126
TD	°C	2.4.24.6	TGA	—	340
Moisture Absorption 吸水率	%	2.6.2.1	D-24/23	≤0.35 (min0.51)	0.21
				≤0.80 (max0.51)	0.52
CTE/ Z-Axis Expansion Z-轴热膨胀系数	ppm /°C	2.4.24	E-2/105 TMA	--	56/280
	% (50-260°C)			--	3.2

Remarks: Specimen Thickness: 1.6 mm 样品厚度: 1.6 mm

A = Keep the specimen originally without any process 保持原样, 不作处理

C = Temperature and humidity conditioning 在恒温恒湿的空气中处理

D = Immersing in distilled water with temperature control 浸在恒温的水中处理

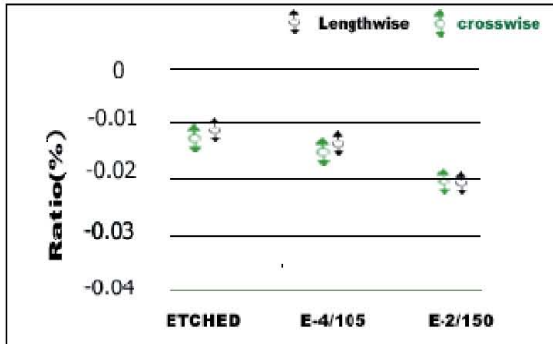
E = Temperature conditioning 在恒温的空气中处理

## HF-140 Halogen-free FR-4

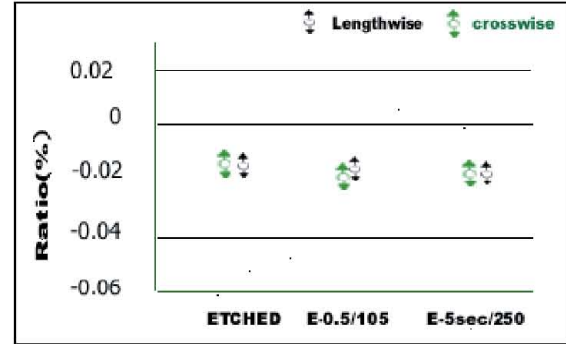
### 无卤素玻纤布覆铜层压板

#### Speciality Chart 板材特性图

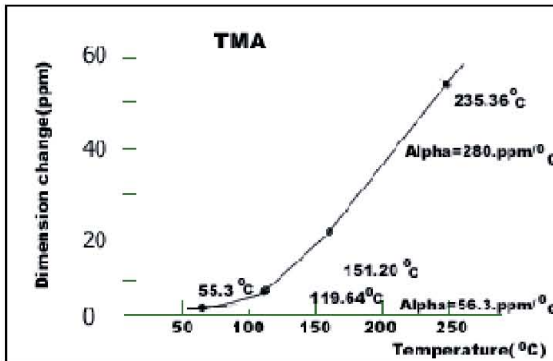
##### Dimensional stability 尺寸稳定性



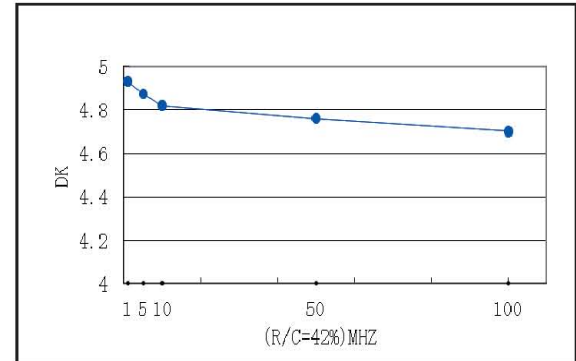
##### Dimensional stability-PCB process (size:360\*310mm)



##### CTE Z 轴热膨胀系数 (test by TMA)



##### Dielectric constant 介电常数



#### Applications 应用领域

- 计算机及外围设备、通讯设备、仪器仪表、办公自动设备等  
Computer, communication equipment, instrument, OA equipment, etc.

#### Purchasing Information 采购信息

Base Color 基材颜色	Thickness 厚度	Copper Cladding 铜箔厚度	Regular Size (mm) 常规尺寸	CTI Value CTI 值
淡黄色 Pale Yellow	0.2mm ~ 1.6mm	18μm 35μm 70μm	915*1220mm (36"*48") 1020*1220mm (40"*48") 1067*1220mm (42"*48")	175V

Note: Other sheet size and thickness could be available upon request.

可根据客户要求提供其它尺寸和厚度.