

### Halogen-free/Normal Tg/Low CTE

#### 特性 (Feature)

- 无卤，无锑，无红磷 Tg140°C  
Halogen, antimony and red phosphorous free
- 优良的耐热性  
Excellent thermal reliability
- 低的Z轴热膨胀系数  
Low Z-CTE
- 良好的耐CAF性能  
Anti-CAF capability

#### 应用 (Application)

- 电脑及笔记本电脑  
Computer and NB
- 仪器仪表  
Instruments
- 消费电子  
Consumer electronics
- 汽车电子  
Automotive electronics

#### 板材性能 (Laminate Properties)

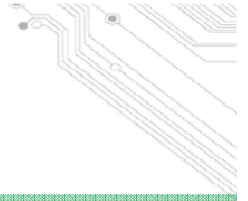
Test Item 测试项目	Test Method (IPC-TM- 650) 测试方法	Test Condition 处理条件	Unit 单位	Specification 规格值 (IPC-4101E/127)	Typical Value 典型值		
Thermal 热性能	Thermal Stress 热应力	2.4.13.1	Float 288 °C/ Unetched	Sec	≥10	≥240	
	Glass Transition (Tg) 玻璃化转变温度	2.4.25	E-2/105 DSC	°C	≥140	141	
	CTE/ Z-Axis Expansion Z-轴热膨胀系数	2.4.24	Alpha 1	ppm/°C	≤60	45	
			Alpha 2		≤300	254	
			50 - 260 °C	%	≤4.0	3.3	
	X/Y CTE X/Y-轴热膨胀系数	2.4.24	40 °C - 125 °C	ppm/°C	—	12/15	
	T-260	2.4.24.1	TMA	min	≥30	>60	
	T-288	2.4.24.1	TMA	min	≥5	>5	
TD(5% weight loss)	2.4.24.6	TGA	°C	≥310	350		
Flammability 燃烧性	UL94	E-24/ 23	Rating	V-0	V-0		
Electrical 电性能	Surface Resistivity 表面电阻	2.5.17.1	C-96/35/90	MΩ	≥10 <sup>4</sup>	2.7×10 <sup>8</sup>	
	Volume Resistivity 体积电阻	2.5.17.1	C-96/35/90	MΩ-cm	≥10 <sup>6</sup>	5.3×10 <sup>9</sup>	
	Dielectric Breakdown 击穿电压	2.5.6	D-48/ 50+D0.5/ 23	kV	≥40	≥45	
	Dielectric Constant 介电常数	2.5.5.2	Etched (RC50%)	@ 1 MHz	—	≤5.4	4.8
				@ 1 GHz			4.6
	Loss Tangent 介质损耗	2.5.5.2	Etched (RC50%)	@ 1 MHz	—	≤0.035	0.012
				@ 1 GHz			0.013
CTI 相对漏电起痕指数	IEC60112	A	V	—	>175		
Arc Resistance 耐电弧性	2.5.1	D-48/ 50+D-0.5/ 23	Sec	≥60	120		
Mechanical 机械性能	Peel Strength (1 oz.) 铜箔剥离强度	2.4.8	125 °C	N/mm	≥0.70	1.3	
			Float 288 °C/ 10 Sec		≥1.05	1.4	
			After Process Solution		≥0.80	1.1	
	Flexural Strength 抗弯强度	2.4.4	Length Direction	N/mm <sup>2</sup>	≥415	550	
			Cross Direction		≥345	490	
Moisture Absorption 吸水率	2.6.2.1	D-24/23	%	≤0.5	0.11		

Remarks:

- Typical Values for reference only.
- Standard Values according to IPC-4101E/127
- Typical Value of Specimen thickness is 1.6mm (8\*7628)

注:

- 典型值只供参考
- 规格值参照 IPC-4101E/127
- 样品的厚度为 1.6mm (8\*7628)



### HF-140 板材清单 (Laminate List)

Thickness 厚度(mm)	Size 尺寸(Inch)	Copper foil Type 铜箔类型
0.05-3.20	37" ×49" , 41" ×49" , 43" ×49" 74" ×49" , 82" ×49" , 86" ×49"	Reverse treated copper foil RTF铜箔: 1/3OZ—3OZ HTE copper foil HTE铜箔: 1/3OZ—3OZ

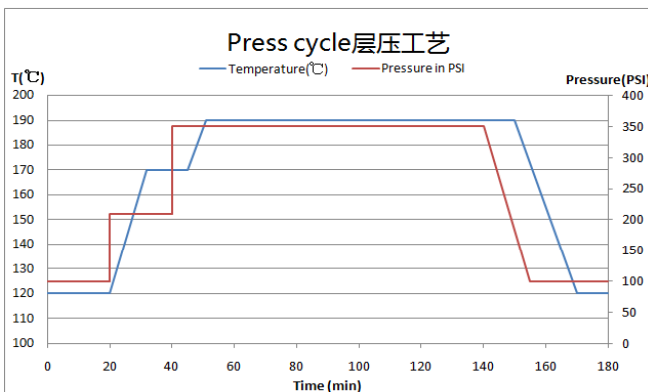
### PP-HF140 半固化片清单 (Prepreg List)

UL Designation UL型号	PP style 类型	R/C(%) 树脂含量	Dk±0.2(1GHz) 介电常数	Df±10%(1GHz) 介质损耗	Thickness(mil) 压合厚度
PP-HF140	106	74±2	4.2	0.017	1.9±0.30
		76±2	4.1	0.018	2.4±0.40
	1067	72±2	4.2	0.017	2.4±0.30
		74±2	4.1	0.018	2.8±0.40
	1080	62±2	4.3	0.014	2.8±0.30
		65±2	4.2	0.014	3.1±0.30
		68±2	4.2	0.014	3.4±0.30
	3313	52±2	4.5	0.013	3.5±0.30
		55±2	4.4	0.013	3.8±0.30
		58±2	4.4	0.013	4.0±0.30
	2116	52±2	4.5	0.013	4.6±0.30
		55±2	4.5	0.013	5.1±0.30
		58±2	4.4	0.013	5.4±0.30
	1506	48±2	4.6	0.012	6.9±0.50
		50±2	4.5	0.012	7.3±0.50
	7628	42±2	4.7	0.012	7.1±0.50
		45±2	4.6	0.012	7.5±0.50
		48±2	4.6	0.012	8.0±0.50

### PP-HF140 半固化片储存 (Prepreg Storage)

储存条件(Condition)	有效期(Shelf Life)
Max. 50%RH & Max. 23°C 湿度 < 50% 及 温度 < 23°C	90 days
Max. 5°C(Normal in room temperature for at least 4h before using) 温度 < 5°C (拆包装前需在室温下回温至少4小时)	180 days

### 压合参数 (Recommended Process)



- Heat-up rate: 1.5-2.5°C/min (80°C-140°C)  
热压升温速率: 1.5-2.5°C/min (80°C-140°C)
- Curing time: >50min(>180°C)  
固化时间: >50min(>180°C)
- Curing pressure: 350±50 PSI  
(vacuum hydraulic press)  
固化压力: 350±50 PSI  
(真空液压压机)

Remarks:  
This Technical Information only lists the typical values of particular specification. If the customer needs other specifications, please contact your sales representative for more information.

注:  
本产品技术资料只列出指定规格的典型值, 如客户需要其他规格的资料, 请与您的销售代表联系