

# GA-HF-17 / GA-HFB-17

無鹵素環氧樹脂覆銅箔基板及半固化片

Halogen free epoxy resin CCL and prepreg

## ■ 產品特點

- 無鹵素阻燃, 高 Tg170°C (DSC).
- 燃燒過程中不放出高毒性的 Dioxins.
- 無銻, 燃燒時無毒性物質產生.
- 優良的耐熱性能和低 Z 軸膨脹系數.
- 耐金屬離子遷移性.

## Features

- Halogen-free and High Tg170°C (DSC).
- Absence of highly toxic dioxins during waste burning.
- Antimony-free, no toxic evolution during waste burning.
- Outstanding Thermal resistance and Low Z-CTE.
- CAF resistanc

## ■ 規格說明 Specification Introduction

GA-HF-17	無鹵單雙面板及多層線路板用芯板 Halogen free single or double side CCL and thin core for multi-layer PCB	ANSI 等級: FR-4 ANSI grade: FR-4
GA-HFB-17	無鹵多層線路板用半固化片 Halogen free prepreg for multi-layer PCB	

## ■ 產品(GA-HF-17/GA-HFB-17)性能表 (符合 IPC-4101/94)

Performance List for GA-HF-17/GA-HFB-17 (Specification: IPC-4101/94)

Characteristic	Unit	Conditioning	Typical Values	SPEC.	
Laminate					
Permittivity (RC43.5%)	1MHz	-	C-24/23/50	4.5-4.9	5.4↓
	1GHz			4.3-4.7	
Loss Tangent (RC43.5%)	1MHz	-	C-24/23/50	0.008-0.010	0.035↓
	1GHz			0.010-0.012	
Water Absorption	%	D-24/23	0.08-0.13	0.35↓	
Flammability	---	C-24/23/50+E-24/125	94 V-0	94 V-0	
Peel Strength	HTE 1OZ	Lb/in (N/mm)	288°C×10sec solder floating	8-10 (1.20-1.80)	6↑ (1.05↑)
	RTF 1OZ			6-8 (1.05-1.40)	40↑ (0.70↑)
Flexural strength	LW	N/mm <sup>2</sup>	A	600-700	415↑
	CW	N/mm <sup>2</sup>	A	500-600	345↑
Z-axis Coefficient of Thermal Expansion	before Tg (α1)	ppm/°C	TMA	30-50	-
	after Tg (α2)	ppm/°C		180-250	-
Total Z-axis CTE(50~260°C)	%		2.8	-	
T288	Min	TMA	60↑	-	
Td(5% weight loss)	°C	TGA (IPC-TM-6502.4.24.6)	360	-	
Glass Transition Temperature	°C	DSC	170↑	-	
Cl Content (Resin Content=43.0%)	ppm	-	350↓	900↓	
Br Content (Resin Content=43.0%)	ppm	-	Below instrumentation threshold	900↓	
Prepreg					
Volatile Content	%	IPC-TM-650	Meets requirements	0.75↓	
Storage Condition(Condition1/2)	Days	IPC-TM-650	Meets requirements	180/90	

Note: For GA-HF-17, the average value in the table refers to samples of 0.040" 1/1.

## ■ UL 認證申請中(Under UL Certification)

## ■ 基板標準規格 Normal Product Size & Thickness

THICKNESS INCH(mm)	COPPER CLADDING		SIZE		THICKNESS TOLERANCE
	OZ (μm)		INCH	mm	
0.002 (0.051)	1/3(12)	0.5(17)	36.8×48.5	0930×1240	IPC4101B Class C/M
to	1.0(35)	2.0(70)	40.5×48.5	1030×1240	
0.125 (3.2)	3.0(103)	4.0(137)	42.5×48.5	1080×1240	

Note: The effective area of laminate is 36"(Grain)×48", 40"(Grain)×48", 42"(Grain)×48".