

High Tg Multilayer Material MCL-E-679 Type (W) GEA-679N<Prepreg>

High Tg Glass Epoxy Multilayer Material (FR-4)

■ Features

- High Tg (>205°C: DMA) and excellent through-hole reliability.
- The thermal decomposition temperature is high and reliability at high temperature is superior. (Thermal decomposition temperature: >340°C)
- Water absorption is low and insulation degradation is small.

■ Applications

- Semiconductor packages .(BGA, CSP and MCM)
- Main frame computers.
- Telephone switchboards.
- Mobile phones.
- Semiconductor testing devices and burn-in boards.
- Electronics for automobiles.

■ Standard Specifications

Part Number	Type	Copper Foil Thickness	Code Name	Actual Thickness and Tolerance
MCL-E-679	(W)	12,18,35 μ m	0.06	0.07 \pm 0.02mm
			0.1	0.10 \pm 0.03mm
			0.15	0.15 \pm 0.03mm
		12 μ m	0.2	0.20 \pm 0.04mm
		18 μ m	0.3	0.30 \pm 0.05mm
		35 μ m	0.4	0.40 \pm 0.07mm
		70 μ m	0.6	0.60 \pm 0.07mm
		(STD,LP)	0.8	0.80(0.70) \pm 0.09mm
			1.0	1.00(0.90) \pm 0.10mm
			1.2	1.20(1.10) \pm 0.12mm

Note1) STD:12 μ m,18 μ m, 35 μ m, 70 μ m; LP:2 μ m, 3 μ m, 5 μ m, 12 μ m, 18 μ m. Please contact us for details.

Note2) In case laminate thickness lies in between two thickness figures shown above, the tolerance of such laminate would be equal to the tolerance of the thicker one.

Note3) The thickness means that of dielectric layer.

■ Characteristics

● Thin Laminate

(t0.8mm)

Item	Condition	Unit	Actual Value	Test Method(IPC-TM-650)	
			MCL-E-679 Type (W)		
Tg	TMA	°C	173~183	2.4.24	
	DMA		205~215	—	
CTE *1	X	ppm/°C	12~15	2.4.24	
	Y		14~17		
	Z		50~60		
	(<Tg)		200~300		
	(>Tg)				
Solder Heat Resistance(260°C)	A	sec.	>300	—	
T-260(Without Copper)	TMA	min.	>60	2.4.24.1	
T-288(Without Copper)			>30		
Decomposition Temperature(5% Weight Loss)	TGA	°C	340~360	2.3.40	
Copper Peel Strength	18 μ m	A	kN/m	1.2~1.4	2.4.8
	35 μ m			1.5~1.7	
Surface Roughness(Ra)	A	μ m	5~13	2.2.17	
Flexural Modulus (Lengthwise)	A	GPa	24~26	2.4.4	
Dielectric Constant	1MHz	C-96/20/65	—	4.7~4.8	2.5.5.1
	1GHz*2			4.2~4.3	2.5.5.5
Dissipation Factor	1MHz	C-96/20/65	—	0.0130~0.0150	2.5.5.1
	1GHz*2			0.0210~0.0220	2.5.5.5
Volume Resistivity	C-96/35/90	—	Ω ·cm	$1 \times 10^{15} \sim 1 \times 10^{16}$	2.5.17
Surface Resistance				$1 \times 10^{13} \sim 1 \times 10^{15}$	
Insulation Resistance	C-96/20/65	—	Ω	$1 \times 10^{14} \sim 1 \times 10^{16}$	—
	C-96/20/65+D-2/100			$1 \times 10^{13} \sim 1 \times 10^{15}$	—
Water Absorption	E-24/50+D-24/23	%	0.15~0.20	2.6.2.1	
Flammability(UL-94)	A	—	V-0	2.3.10	

*1) Heating Rate:10°C/min.

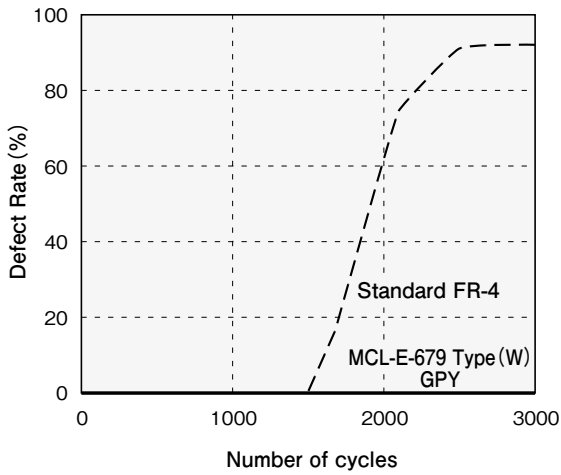
*2) Measured by Triplate-Line Resonator.

●Prepreg

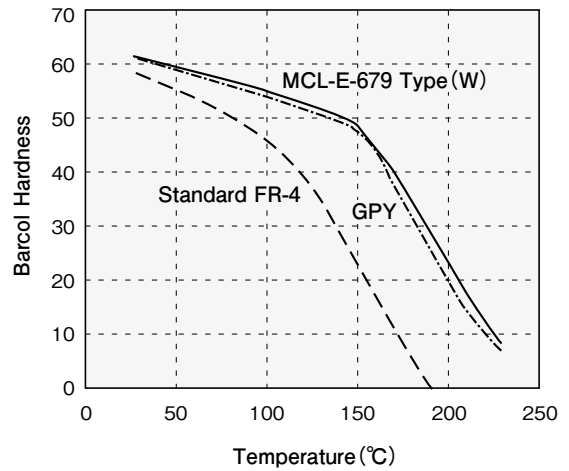
Part Number	Type		Glass Cloth		Properties				
			Style	Yarn Count (warp×fill)	Resin Content (%)	Volatile Content (%)	Gelation Time (sec.)	Resin Flow (%)	Dielectric Thickness after Lamination*1 (mm)
GEA-679N	0.03	(WOPE)	106	56×56	68±2	≤1.0	120±25	—	0.050
		(WULE)	1080	60×48	62±2				0.078
	(WUME)	65±2			0.086				
	0.1	(WSGE)	2116	60×58	52±2	≤0.75		35±5	0.126
		(WCJE)	2117	66×55	56±2			—	0.146
	0.15	(WQEE)	1501	46×45	48±2			33±5	0.174
—							—		
Test Method(IPC-TM-650)					2.3.16	2.3.19	2.3.18	2.3.17	—

*1)The dielectric thickness after lamination is defined as the thickness of one sheet of prepreg when the resin flow is 0%. This value changes depending on the press condition or inner layer pattern.

●Thermal Shock Test(MIL-STD-202 Method107E)



●Barcol Hardness



●Water Absorption

