

Halogen Free, High Tg and High Heat Resistance Multilayer Material

MCL-E-75G GEA-75G <Prepreg>

High Tg Glass Epoxy Multilayer Material(FR-4)

■ Features

- Environmentally friendly material. It has achieved the UL 94V-0 level of flammability without using any compound which includes halogen, antimony or red phosphorus.
- Superior heat resistance to that of our standard FR-4, and suitable for the lead free process.
- The coefficient of thermal expansion in Z-direction is 40% lower than that of our standard FR-4. Excellent through-hole reliability.

■ Applications

- Electronics for automobiles.
- Personal computer, high density electronic equipment.
- Electronic branch exchanges, mobile phones, etc.
- Main frame computers.

■ Standard Specifications

Part Number	Type	Copper Foil Thickness	Code Name	Actual Thickness and Tolerance
MCL-E-75G	—	12μm 18μm 35μm 70μm	0.06	0.06±0.03mm
			0.1	0.10±0.03mm
			0.15	0.15±0.04mm
			V0.2	0.20±0.04mm
			0.3	0.30±0.05mm
			V0.4	0.40±0.06mm
			0.5	0.50±0.07mm
			V0.6	0.60±0.08mm
			0.8	0.80(0.70)±0.09mm
			1.0	1.00(0.90)±0.10mm
			1.2	1.20(1.10)±0.11mm
1.6	1.60(1.50)±0.19mm			

Note 1) 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.

Note 2) The thickness is means that of dielectric layer. Figure in bracket () means thickness of dielectric layer of MCL using 70μm copper foil.

■ Characteristics

● Thin Laminate

(t0.8mm)

Item	Condition	Unit	Actual Value	Test Method (IPC-TM-650)
			MCL-E-75G	
Tg	TMA	°C	155~170	2.4.24
	DMA		195~215	—
CTE *1	X (30~120°C)	ppm/°C	12~15	2.4.24
	Y (30~120°C)		14~17	
	Z (<Tg) (>Tg)		30~40 180~240	
Solder Heat Resistance(260°C)	A	sec.	>300	—
T260	TMA	min.	>60	2.4.24.1
T288	TMA		>60	2.4.24.1
Decomposition Temperature(5% Weight Loss)	TGA	°C	380~390	2.3.40
Copper Peel Strength	18μm	kN/m	1.2~1.4	2.4.8
	35μm		1.5~1.8	
Flexural Modulus(Lengthwise)	A	GPa	25~29	2.4.4
Dielectric Constant	1MHz	C-96/20/65	5.0~5.2	2.5.5.1
	1GHz*2		4.4~4.6	2.5.5.5
Dissipation Factor	1MHz	C-96/20/65	0.009~0.011	2.5.5.1
	1GHz*2		0.014~0.016	2.5.5.5
Volume Resistivity	C-96/20/65+C-96/40/90	Ω·cm	1×10 ¹⁵ ~1×10 ¹⁶	2.5.17
Surface Resistance	C-96/20/65+C-96/40/90	Ω	1×10 ¹³ ~1×10 ¹⁵	
Insulation Resistance	C-96/20/65	Ω	1×10 ¹⁴ ~1×10 ¹⁶	—
	C-96/20/65+D-2/100		1×10 ¹³ ~1×10 ¹⁵	—
Water Absorption	E-24/50+D-24/23	%	0.08~0.12	2.6.2.1
Flammability(UL-94)	A	—	V-0	2.3.10

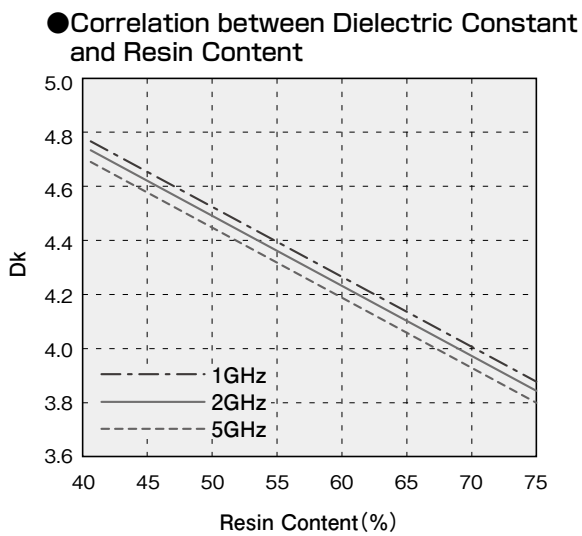
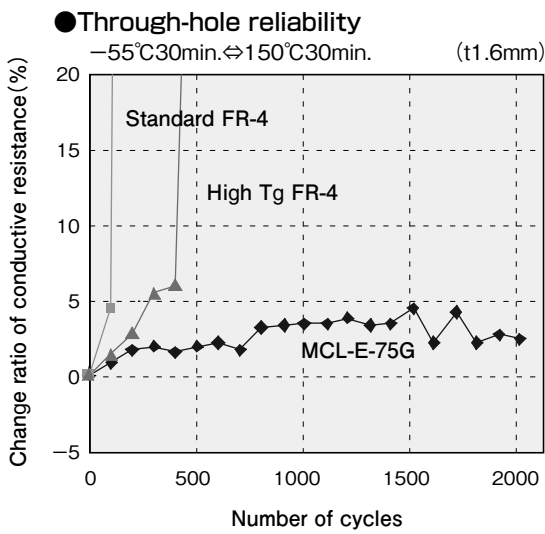
*1) Heating Rate:10°C/min.

*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.)	Dielectric Thickness after Lamination*1 (mm)
GEA-75G	0.06	(1080N65)	1080	60×48	65±2	≦1.0	145±30	0.077
	0.06	(1078N65)	1078	53×53	65±2		145±30	0.077
	0.10	(2116N56)	2116	60×58	56±2		145±30	0.128
	0.15	(1501N52)	1501	46×45	52±2		135±30	0.182
	0.20	(7628N51)	7628	44×31	51±2		135±30	0.219
Test Method(IPC-TM-650)					2.3.16	2.3.19	2.3.18	—

*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.



Note) IPC TM-650 2.5.5.5

