

Halogen Free, Low Elastic Modulus, Ultra Low CTE Multilayer Material

GEA-775G <Prepreg>

High Tg Glass Epoxy Multilayer Materials

■ Features

- Reduce warpage in coreless PKG by ultra Low CTE and Low modulus material.
- GEA-775G with low CTE, high density glass has ultra low CTE value (less than 3.2 ppm/°C).
- GEA-775G has good laser and desmear processability for small laser via.

■ Applications

- Semiconductor packages.
(FC-BGA, FC-CSP, PoP, SiP)
- Prepreg for thinner module.

■ Standard Specifications [Prepreg]

Part Number	Type		Glass Cloth		Properties				
			Style	Yarn Count (warp X fill)	Resin Content (%)	Volatile Content (%)	Gelation Time (sec.)	Dielectric Thickness after Lamination ^{*1} (mm)	
GEA-775G	(L)	0.020	(L1010F66)	1010	95×95	66±2	≤2.0	230±40 ^{*2}	0.018
		0.020	(L1010F75)	1010	95×95	75±2			0.026
		0.020	(L1010F82)	1010	95×95	82±2			0.038
		0.025	(L1017F72)	1017	95×95	72±2			0.027
		0.025	(L1017F78)	1017	95×95	78±2			0.037
		0.035	(L1024F66)	1024	90×90	66±2			0.043
		0.035	(L1024F70)	1024	90×90	70±2			0.050
		0.045	(L1030F65)	1030	90×90	65±2			0.052
		0.045	(L1030F69)	1030	90×90	69±2	0.060		
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.

■ General properties

● Properties of prepreg after press

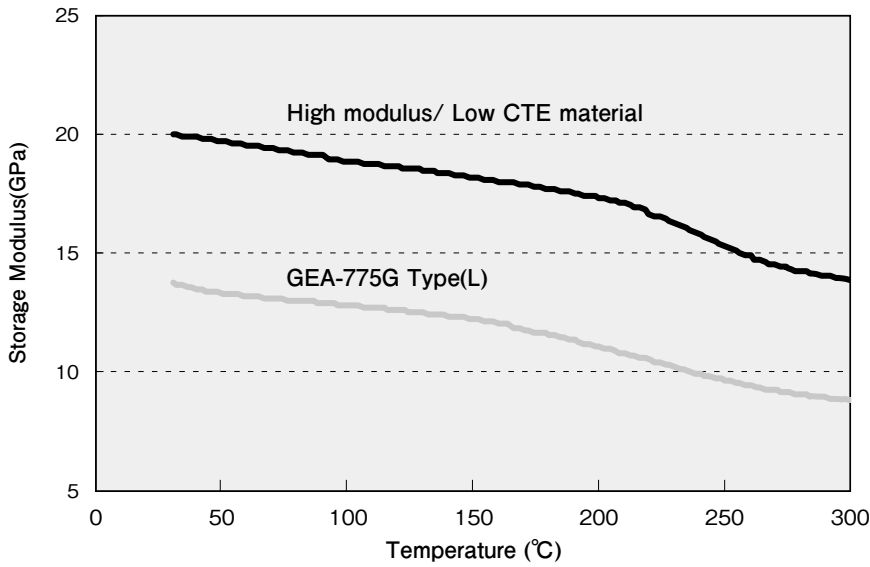
(L1024F66, t0.035mm)

Item	Condition ^{*3}	Unit	Actual Value	Test Method (IPC-TM-650)
			GEA-775G Type(L)	
Tg	TMA	°C	210~240	2.4.24
	DMA		250~280	—
CTE ^{*1}	(30~120°C)	ppm/°C	X 3.0~4.0	2.4.24
			Y 3.0~4.0	
Solder Heat Resistance (260°C)	A	sec.	>300	—
T260 (Without copper)	TMA	min.	>50	2.4.24.1
T288 (Without copper)			>5	2.4.24.1
Decomposition Temperature (5% Weight Loss)	TGA	°C	380~400	2.3.40
Copper Peel Strength	A	kN/m	12μm 0.5~0.7	2.4.8
			18μm 0.6~0.8	
Flexural Modulus (Lengthwise)	A	GPa	13~15	2.4.4
Elastic Modulus (Lengthwise) Tensile	A	GPa	14~16	—
Dielectric Constant ^{*2}	1GHz	C-96/20/65	—	3.5~3.7
Dissipation Factor ^{*2}	1GHz	C-96/20/65	—	0.007~0.009
Volume Resistivity	C-96/20/65+C-96/40/90		Ω·cm	1×10 ¹⁴ ~1×10 ¹⁶
Surface Resistance	C-96/20/65+C-96/40/90		Ω	1×10 ¹⁴ ~1×10 ¹⁵
Insulation Resistance	C-96/20/65+D-2/100		Ω	1×10 ¹⁴ ~1×10 ¹⁵
Water Absorption	E-24/50+D-24/23		%	0.2~0.4

*1) Heating Rate: 10°C/min. *2) Measured by cavity resonator.

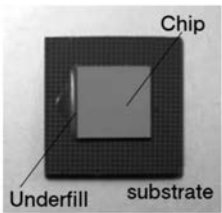
*3) Refer to last page "Condition Note"

●Storage Modulus



- 1.Evaluation Samples
 1) GEA-775G Type(L) : #1017 Resin Content 70 %
 2) High Modulus/Low CTE material: #1017 Resin Content 72 %
- 2.Condition
 1) Equipment : DVE
 2) Heating Rate : 5°C/min
 3) Frequency : 10 Hz
 4) Sample direction : X

●Warpage of 4 layer Coreless TEG



TEG Chip
 *Chip size : 7.3mm × 7.3mm
 *Chip thickness : 100μm
 TEG Substrate
 *Structure : 4L Coreless
 *Substrate construction :
 (L1-2) 45 μm, (L2-3) 80μm, (L3-4) 45μm
 *SR thickness : 20μm

