

Reduction of Solder Crack/Low Elastic Modulus Material TD-002 <Prepreg>

Low Elastic Modulus Thermosetting Resin Multilayer Material

■ Features

- Applied to PWB surface of standard material to absorb soldering stress and inhibit solder crack.
- Elastic modulus is 1/4 of that of standard FR-4.
- Enables to reduce solder crack without using high functional material, by combining TD-002 with standard material.

■ Applications

- Electronic equipment for automobiles.
- Engine room set board.
- PCB on component packagings.

■ Standard Specifications [Prepreg]

Part Number	Type		Glass Cloth		Properties		
			Style	Yarn Count (warp×fill)	Resin Content (%)	Volatile Content (%)	Dielectric Thickness after Lamination*1 (mm)
TD-002	0.06	(1037N77)	1037	69×72	77±2	≤2.0	0.069
	0.08	(1078N66)	1078	53×53	66±2		0.088
	0.10	(3313N58)	3313	60×62	58±2		0.115
	0.20	(1501N54)	1501	46×45	54±2		0.208
Test Method (IPC-TM-650)					2.3.16	2.3.19	—

*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.

■ Characteristics

● Thin Laminate

(3313N58, t0.4mm)

Item	Condition *3	Unit	Actual Value	Test Method (IPC TM-650)	
			TD-002		
Tg	TMA	°C	155~170	2.4.24	
CTE *1	(30~120°C)	ppm/°C	6~9	2.4.24	
			6~9		
			80~130		
			200~300		
Solder Heat Resistance (260°C)	A	sec.	>300	—	
T-260 (Without Copper)	TMA	min.	>50	2.4.24.1	
T-288 (Without Copper)			>5	2.4.24.1	
Decomposition Temperature (5% Weight Loss)	TGA	°C	345~360	2.3.40	
Copper Peel Strength	A	kN/m	0.8~0.9	2.4.8	
			0.9~1.1		
Flexural Modulus (Lengthwise)	A	GPa	5~8	2.4.4	
Elastic Modulus (Lengthwise) Tensile	A	GPa	7~10	—	
Dielectric Constant	1 GHz *2	C-96/20/65	—	3.6~3.8	—
Dissipation Factor	1 GHz *2	C-96/20/65	—	0.011~0.013	—
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 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	%	0.1~0.3	2.6.2.1	
Flammability	A	—	V-0	UL94	

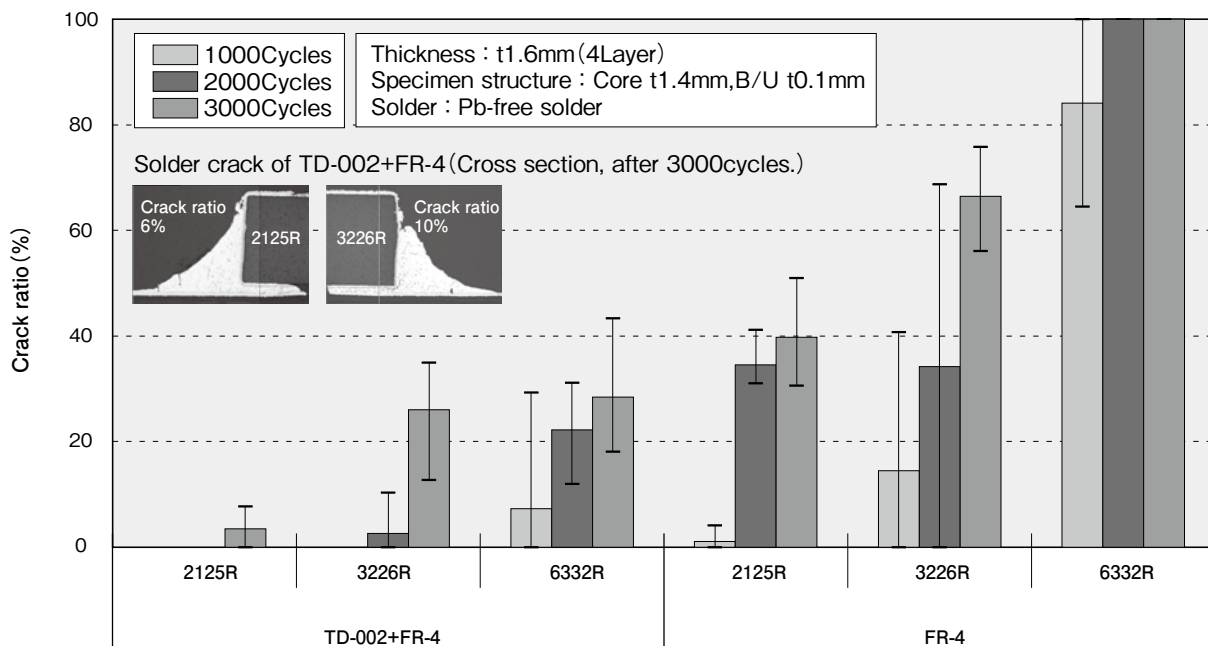
*1) Heating Rate : 10°C/min.

*2) Measured by cavity resonator.

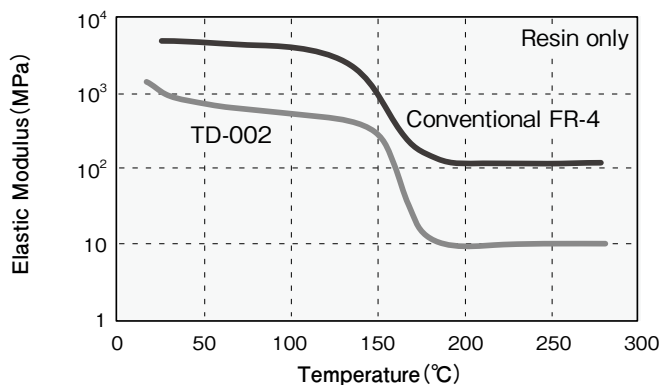
0.1mm thickness core is used depending on test item.

*3) Refer to last page "Condition Note"

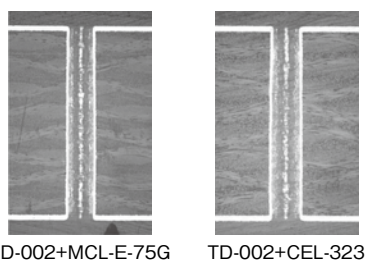
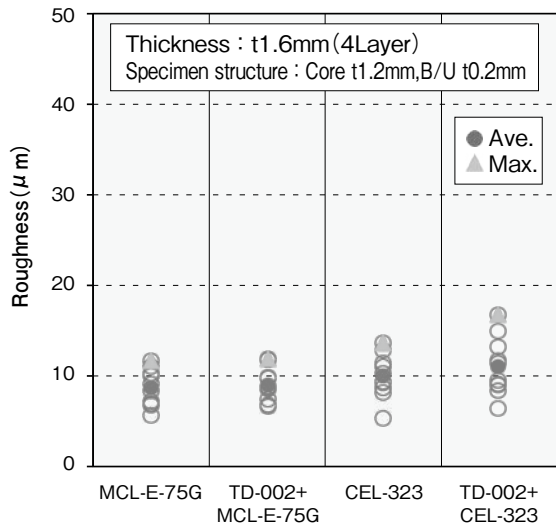
●Connection reliability of Pb-free solder (Thermal condition:-40°C(30min.)⇔125°C(30min.))



●Elastic modulus



●Mechanical drilling processing (After 3000 hits)



《Condition of mechanical drilling》
 •Stack-up : 3 panels •E/B : Al t0.15mm
 •Revolution : 120krpm •Feeding Speed : 2.4m/min.
 •Drill bit : φ0.3mm