

Reduction of Solder Crack/Low Elastic Modulus Material TD-002 [Prepreg]

Low Elastic Modulus Thermosetting Resin Multilayer Material

■ Features

- Applied to PWBs surface of standard material, 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 [Prepreg]	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

*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)

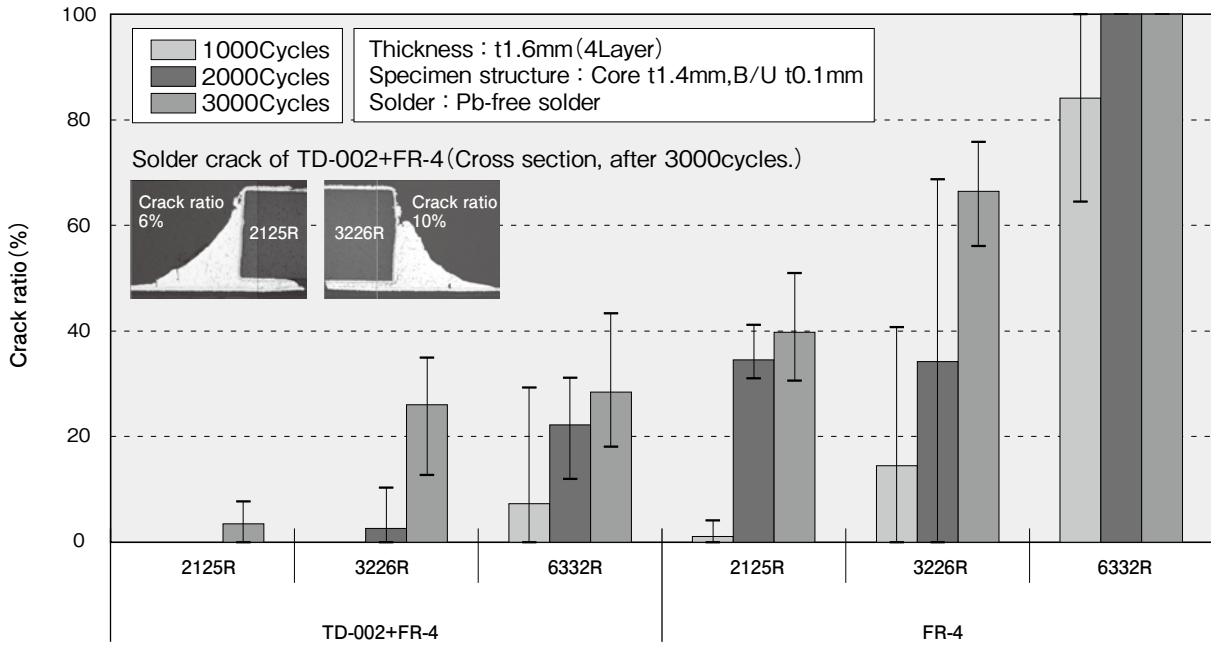
Item	Condition	Unit	Actual Value	Test Method (IPC TM-650)	
			TD-002		
Tg	TMA	°C	155-170	2.4.24	
CTE *1	X	(30~120°C)	6~9	2.4.24	
	Y		6~9		
	Z	(<Tg)	80~130		
		(>Tg)	200~300		
Solder Heat Resistance(260°C)	A	sec.	>300	—	
T260(Without Copper)	TMA	min.	>50	2.4.24.1	
T288(Without Copper)			>5	2.4.24.1	
Decomposition Temperature(5% Weight Loss)	TGA	°C	345~360	2.3.40	
Copper Peel Strength	18μm	A	0.8~0.9	2.4.8	
	35μm		0.9~1.1		
Flexural Modulus(Lengthwise)	A	GPa	5~8	2.4.4	
Elastic Modulus(Lengthwise) Tensile	A	GPa	7~10	—	
Dielectric Constant *2	1GHz	C-96/20/65	—	3.6~3.8	2.5.5.5
Dissipation Factor *2	1GHz	C-96/20/65	—	0.011~0.013	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 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(UL-94)	A		—	V-0	2.3.10

*1) Heating Rate : 10°C/min.

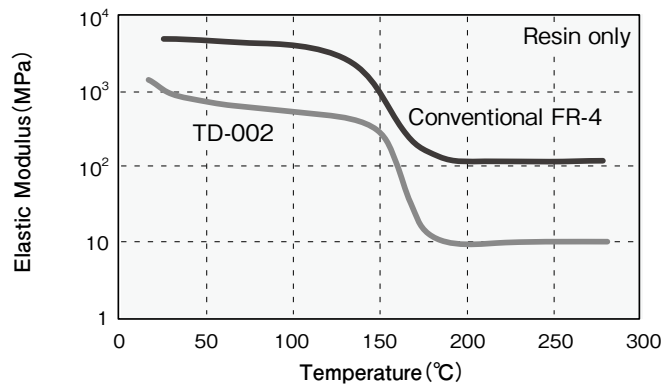
*2) Measured by cavity resonator.

0.1mm thickness core is used depending on test item.

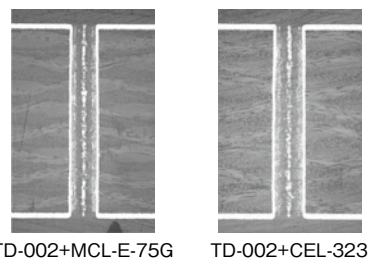
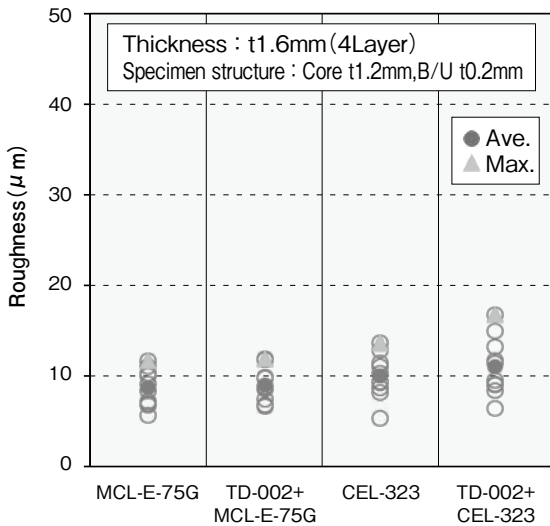
●Connection reliability of Pb-free solder (Thermal condition:-40°C(30min.)⇔125°C(30min.))



●Elastic modulus



●Mechanical drilling processing (After 3000hits)



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