



# TAIWAN LEADER ADVANCED TECHNOLOGY CORP.

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## Technical Data

### STANDARD FR-4: FR4135

#### n Features:

1. Applicable to Single, Double sided and Multilayer Printed Circuit Board Manufacturing.
2. High luminance contrast between epoxy and copper for laser type A.O.I.
3. UV blocking and Automatic Optical Inspection (A.O.I.) function.
4. UV solder masks may be applied simultaneously.
5. Reverse Treated or Double Treated copper foils also apply.

#### n Laminate Performance List:

Test Items		Test Condition	Typical Value	Unit		
T H E R M A L	Glass Transition Temperature (Tg)	DSC (As received)	130 ~ 140	°C		
		TMA (As received)	120 ~ 130	°C		
	Degradation Temperature	TGA (5% Weight Loss)	> 300	°C		
	Arc resistance	D-48/50 + D-0.5/23	> 120	sec		
	Pressure Cooker- 2 Hours	288°C Solder dip 10 sec	> 3	min		
	T <sub>260</sub> (minutes)	260°C Solder dip 10 sec	> 8	min		
	Maximum Operating Temperature	-	130	°C		
P H Y S I C A L	Peel Strength	As received	H oz. Cu 1 oz. Cu. 2 oz. Cu.	> 6 > 8 > 10	lbs/in	
			X/Y - axis CTE	25°C~130°C	14/16	ppm/°C
			Z - axis CTE	50°C~288°C	4~5	%
	Flexural Strength	Lengthwise (As received)	75000	lbs/in		
		Crosswise (As received)	63000	lbs/in		
	Moisture Absorption	D-24/23	< 0.1	%		
E L E C T R I C A L	Dielectric Constant (Dk)	@ 1 MHz (50% resin content)	4.2 ~ 4.8	-		
	Dissipation Factor (Df)	@ 1 MHz (50% resin content)	0.015 ~ 0.022	-		
	Volume Resistivity	C-96/35/90	1 x 10 <sup>8</sup>	MΩ.cm		
		E-24/125	1 x 10 <sup>7</sup>	MΩ.cm		
	Surface Resistivity	C-96/35/90	1 x 10 <sup>7</sup>	MΩ		
		E-24/125	1 x 10 <sup>7</sup>	MΩ		
	Electric Strength	Amb. Temp. (23°C± 5°C)	1300	Volts / Mil		
Dielectric Breakdown	D-48/50	> 60	kVolts			

1. The average value in the table refers to samples of 0.062" thickness of laminate.
2. All tests follow the procedure of IPC-TM-650 and are measured in accordance with IPC-4101A /21.