

IT-140BS/IT-140TC

Normal Tg (Tg>135°C), Tetra-functional Epoxy Resin, DICY-Curing, UL94 V-0

Specification Sheet

IT-140TC (Laminate) Property	Specification (Typical Value)		Units	Test Method	
	<0.50mm[0.0197in]	≥0.50mm[0.0197in]	Metric(English)	IPC-TM-650	Ref. Para.
1. Peel Strength, As received					
A. 17 micron [1/2 ounce/Ft2] copper and under	>4.5	>6.0	(lb/inch)	2.4.8	3.9.1.1
B. 35 micron [1-ounce/Ft2]Copper	>6.0	>8.0		2.4.8.2	3.9.1.1.1
C. 70micron [2-ounce/Ft2]Copper	>8.0	>11.0		2.4.8.3	3.9.1.1.2
D.105,140,175micron [3,4,5-ounce/Ft2] Copper and above	>9.0	>12.0			3.9.1.1.3
2. Volume Resistivity ,minimum					
A. C-96/35/90	10 ⁶	---	MΩ-cm	2.5.17.1	3.11.1.3
B. After moisture resistance	---	10 ⁴			
C. At elevated temperature E-24/125	10 ³	10 ³			
3. Surface Resistivity ,minimum					
A. C-96/35/90	10 ⁴	---	MΩ	2.5.17.1	3.11.1.4
B. After moisture resistance	---	10 ⁴			
C. At elevated temperature E-24/125	10 ³	10 ³			
4. Moisture Absorption ,	-	<0.8	%	2.6.2.1	3.12.1.1
5. Dielectric Breakdown ,minimum	-	40	kV	2.5.6	3.11.1.6
6. Permittivity at 1 MHz , (Laminate & Prepreg as laminated)	<5.4 (4.7)	<5.4 (4.7)	-	2.5.5.3 2.5.5.5 2.5.5.6	3.11.1.1 3.11.2.1
7. Loss Tangent at 1 MHz , (Laminate & Prepreg as laminated)	<0.035 (0.017)	<0.035 (0.017)	-	2.5.5.3 2.5.5.3 2.5.5.9	3.11.1.2 3.11.2.2
8. Flexural Strength, minimum					
A. Length direction	-	415(60,190)	N/mm ² (lb/in ²)	2.4.4	3.9.1.3
B. Cross direction	-	345(50,140)			
9. Flexural Strength at Elevated Temperature , length direction , minimum	-	-	N/mm ² (lb/in ²)	2.4.4.1	3.9.1.4
10. Arc Resistance ,minimum	60	60	s	2.5.1	3.11.1.5
11. Thermal Strress 10 sec at 288°C [550.4F], min	Pass Visual	Pass Visual	Rating	2.4.13.1	3.10.1.2
A. Unetched B. Etched	Pass Visual	Pass Visual			
12. Electric Strength ,minimum (Laminate & Prepreg as laminated)	30	-	kV/mm	2.5.6.2	3.11.1.7 3.11.2.3
13. Flammability (Laminate & Prepreg as laminated)	V-0	V-0	Rating	UL94	3.10.2.1 3.10.1.1
14. Glass Transition Temperature	--	>135	°C	2.4.24 2.4.25	3.10.1.6
15. Decomposition Temperature	--	(305)	°C	TBD (5% wt loss)	3.10.1.10
16. Z-Axis CTE A. Alpha 1	--	(55)	PPM/°C	2.4.24	3.10.1.11
B. Alpha 2	--	(290)	PPM/°C		
C. 50 to 260 Degrees C	--	(4.2)	%		
17. Thermal Resistance (Copper removed)					
A. T260	--	(15)	Minutes	2.4.24.1	3.10.1.12
B. T288	--	(2)	Minutes		
C. T300	--	AABUS	Minutes		
18. CAF Resistance	--	AABUS	Pass/Fail	2.6.25	3.12.1.4

Pass or Fail are determined by Fail Being ≥ 1 decade drop in the sample's initial insulation resistance value.

IT-140BS (Prepreg) Property	Specification	Units	Test Method	Ref. para
1. Shelf Life, minimum(Condition 1/Condition 2)	180/90	Days	AABUS	3.17
2. Reinforcement	As per IPC-4412 or AABUS			
3. Volatile content maximum	<1.5	%	2.3.19	3.9.2.2.8
4. Prepreg Parameters	-	AABUS	AABUS	1.1.7
5. Flammability (as laminated)	V-0 minimum	rating	UL94	3.10.2.1
6. Other	-			

*AABUS =As agreed upon between user and supplier..

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Process Guideline

1. Prepreg Handling & Storage

- (1) Shelf life is at least 3 months when Prepreg must be stored in a cool dry environment (<20°C and 50% RH)
- (2) Prepreg exposed at atmosphere should be resealed to minimize moisture of prepreg
- (3) Prepreg should be stored in dehumidifier 12 hours prior to use
- (4) Prepreg supplied in rolls or panels should be stored horizontally. To avoid damage, no stacking is recommended

2. Laminate Handling & Storage

- (1) Laminates should be stored in a dry environment
- (2) Laminate should always be stored flat

3. Oxide Treatment

- (1) Inner layers should be baked for at least 1 hour at 100-120°C, if Inner layers are not used within 24 hours after black or brown oxides treatment

4. Lamination Overview

- (1) Stacks must be prepared in dry room to avoid moisture upstack by the prepreg.
- (2) Stacks with the core and prepreg is recommended to use the vacuum process for 30 minutes before heated. Recommended pressure is as follow :

Vacuum Hydraulic	300-400 psi
ADARA Press	200-300 psi
- (3) Heating rate is 1.3-1.8°C/min from 80 °C to 140°C, cooling rate is below 3°C/min
- (4) When the board reaches 165°C during the pressing process, and hold for at least 40 minutes

5. Drilling

Drilling parameter were mainly dependent on hole size, layer thickness, layer number, copper thickness and stack height, The following drilling parameter is reference only

Typical drilling parameters for 0.4-1.0 mm drills: Drill machine: Hitachi ND-6L210E

Rotation Speed	kr/min	105-64
Feed Speed	IPM	100-149
Max. hit count	hits	1000-2000
Number of Helping up	plied	2-4 (4-6 Layers), 1-3 (> 8 Layers)

6. Desmear

The following Desmear parameter is reference only :

Horizontal (JETCHEM)

Swell : 75°C for 100 s Mn+7 : 55-65 g/l at 85°C for 180s

Vertical (ROHMHAAS)

Swell : 65°C for 365 s Mn+7 : 65-75 g/l at 75°C for 750s

If typical parameters used to desmear FR-4 product may not produce optimum hole topography for IT-140, consult with your chemistry supplier to optimize your desmear condition