ITEQ IT-158

UL File Number: E178114
Data Sheet Rev.: 030411

Lead-Free Compatible, Mid-Tg, Multifunctional Filled Epoxy

IPC-4101C /99

Laminate Properties	Values	Units	Specifications	Test Methods	
				IPC-TM-650	Ref. Para.
1. **Glass Transition Temperature** (Tg)- DSC	155	°C	*150 minimum*	2.4.25 2.4.24	3.10.1.6
2. **Decomposition Temperature** (Td)	345	°C	*325 minimum*	2.4.24.6 (5% wt loss)	3.10.1.10
3. **Coefficient of Thermal Expansion** (CTE)				2.4.24	3.10.1.11
A. X/ Y Axis: [40°C to 125°C]	11-13	ppm/°C	*AABUS*		
B. Z- Axis: Alpha 1	40	ppm/°C	*60 max*		
C. Z-Axis: Alpha 2	240	ppm/°C	*300 max*		
D. Z-Axis: 50 to 260°C	3.3	%	*3.5 max*		
4. **Thermal Resistance-** (Time to Delam)		Minutes		2.4.24.1	3.10.1.12
A. T_{260}	>60		*30 minimum*		
B. T_{288}	>30		*5 minimum*		
5. **Thermal Stress-** 10 Sec @ 288°C, minimum		Rating	*Pass Visual*	2.4.13.1	3.10.1.2
A. Unetched	Pass				
B. Etched	Pass				
6. **Permittivity** (Dk)		---	*<5.4*		
A. 1 MHz (HP4291B 50%)	4.4				
B. 1 GHz (HP4291B 50%)	4.3			2.5.5.9	3.11.1.1
C. 2 GHz (Resonate Cavity 53%)	4.2			2.5.5.13	3.11.2.1
D. 5 GHz (Resonate Cavity 53%)	4.1				
E. 10 GHz (Resonate Cavity 53%)	4.0				
7. **Loss Tangent** (Df)		---	*<.035*		
A. 1 MHz (HP4291B 50%)	0.016				
B. 1 GHz (HP4291B 50%)	0.016			2.5.5.9	3.11.1.1
C. 2 GHz (Resonate Cavity 53%)	0.017			2.5.5.13	3.11.2.1
D. 5 GHz (Resonate Cavity 53%)	0.018				
E. 10 GHz (Resonate Cavity 53%)	0.018				
8. **Volume Resistivity,** minimum		MΩ-cm		2.5.17.1	3.11.1.3
A. C-96/ 35/ 90	$3.0x10^{10}$		10^6		
B. After Moisture Resistance	$5.0x10^{10}$		10^4		
C. At Elevated Temperature: E- 24/ 125	$5.0x10^{10}$		10^3		
9. **Surface Resistivity,** minimum		MΩ		2.5.17.1	3.11.1.4
A. C-96/ 35/ 90	10^{10}		10^4		
B. After Moisture Resistance	10^{10}		10^4		
C. At Elevated Temperature: E- 24/ 125	$5.0x10^{10}$		10^3		
10. **Electric Strength,** minimum	45	kV/ mm	*30*	2.5.6.2	3.11.1.7
11. **Arc Resistance,** minimum	125	Sec	*60*	2.5.1	3.11.1.5
12. **Dielectric Breakdown,** minimum	60	kV	*40*	2.5.6	3.1.11.6
13. **Flexural Strength,** minimum		lb/ in^2		2.4.4	3.9.1.3
A. Length Direction	70,000		*60,190*		
B. Cross Direction	67,000		*50,140*		
14. **Peel Strength,** minimum		lb/ in^2			
A. Low & Very Low Profile Cu Foil- Wts< 17µm	5		*4*		3.9.1.1
B. Standard Profile Cu Foil					
1. After Thermal Stress	9.5		*6*	2.48	3.9.1.1.1
2. At 125°C	8		*4*	2.4.8.2	3.9.1.1.2
3. After Process Solutions	7		*4.57*	2.4.8.3	3.9.1.1.3
15. **Moisture Absorption,** maximum	0.08	%	*0.5*	2.6.2.1	3.12.1.1
16. **Flammability**	V-0	Rating	*V-0*	UL 94	3.10.2.1
17. **Maximum Operating Temperature** (MOT)	130	°C	*AABUS*	UL Tested	

Meets or Exceeds IPC-4101C /21,/24,/98,/101,/121,/124 and /99

AABUS = As agreed upon between user and supplier.

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