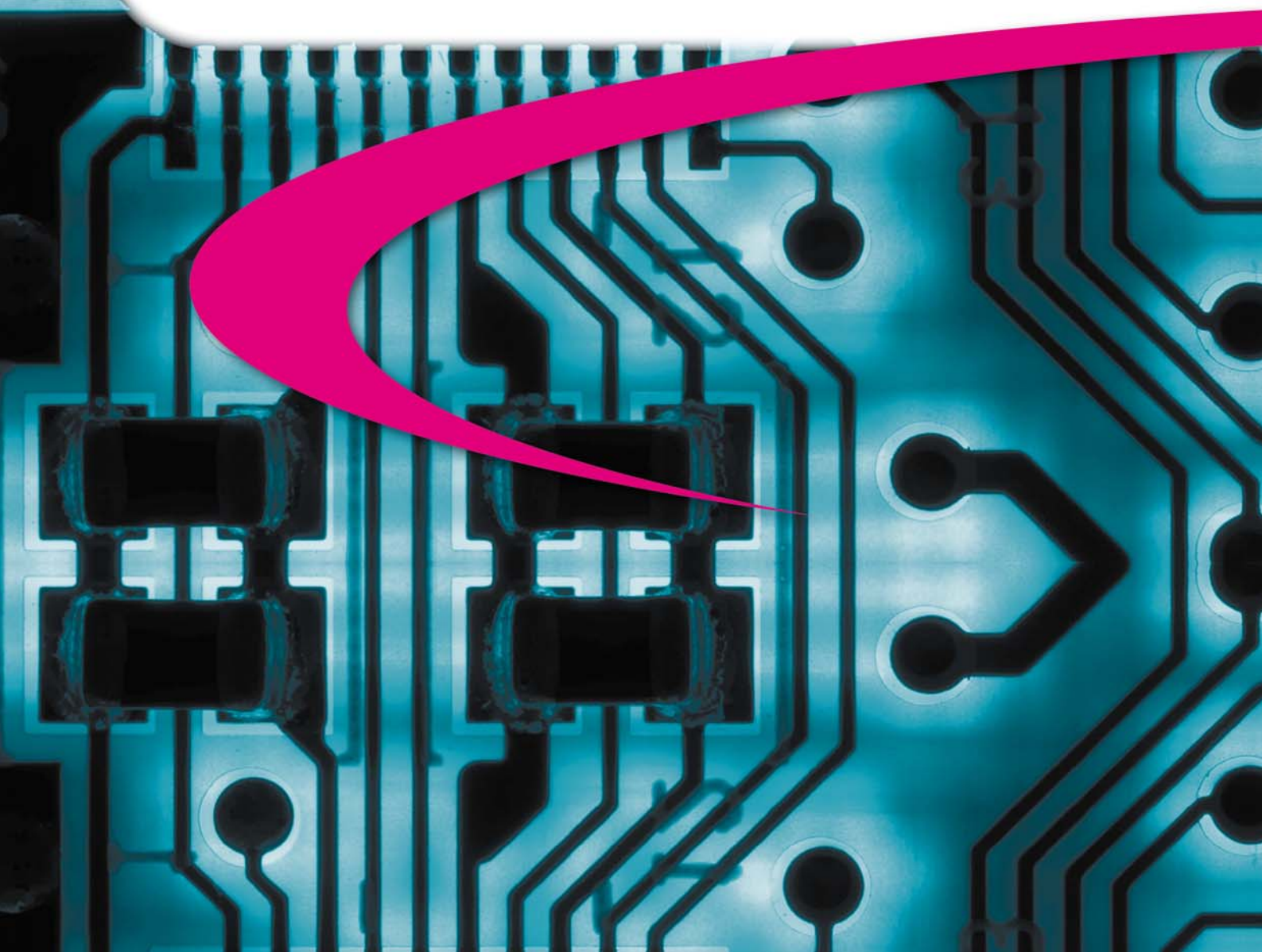
TECHNOLAM®
the laminate company

Data Sheet

CEM-1-97

- Composite Laminates with glass cloth outer layers and Cellulose paper core
- Exceptional consistent laminate quality due to exclusive use of Nan Ya's raw materials
- Superior thermal stability during IR fusing or Hot Air Leveling
- Cold punchability, low warpage, high dimensional stability
- IPC-4101C / 10



CEM-1-97

Revision Date: May 2010

NAN YA SPECIFICATION SHEET FOR CEM-1-97 - Composite laminates with woven glass fabric surfaces and cellulose paper core

SPECIFICATION SHEET #:	IPC-4101 / 10
CURING AGENT:	Dicy
FLAME RETARDANT MECHANISM:	RoHS compliant Bromine, UL94 V-0
FILLERS:	N/A
ID REFERENCE:	UL/ANSI: CEM-1 / 10

LAMINATE DATA SHEET

Laminate Properties	Specification < 0,50 mm [0,0197 in] 50% RC		Specification ≥ 0,50 mm [0,0197 in] 40% RC		Units metric [English]	Test Method (IPC-TM-650)	Ref. Para.
	Typical Value	Specification	Typical Value	Specification			
Glass Transition Temperature (Tg) by DSC / TMA			120 ± 5 / 110	≥ 100	°C	2.4.25	3.10.1.6
Decomposition Temperature (Td) TGA 5% wt. loss				-	°C	ASTM D3850	3.10.1.10
Decomposition Temperature (Td) TGA onset wt. loss				-			
CTE, z-axis prior Tg				-	ppm/°C	2.4.24	3.10.1.11
CTE, z-axis above Tg				-			
CTE, x/y-axis prior Tg				-	ppm/°C	2.4.24	3.10.1.11
CTE, x/y-axis above Tg				-			
Thermal Expansion (50 °C - 260 °C) z-axis TE				-	%	2.4.24	3.10.1.11
Thermal Conductivity λ			0,48	-	W/mK	Laser Flash	-
Thermal Resistance: Time to Delamination T260				-	minutes	2.4.24.1	3.10.1.12
Thermal Resistance: Time to Delamination T288				-			
Pressure Cooker Test - 2 hours (10 s solder dip @ 288 °C)				-	pass visual	-	-
Thermal Stress 10 s at 288 °C [550,4 °F], minimum							
A. unetched			pass	pass visual	rating	2.4.13.1	3.10.1.2
B. etched			pass	pass visual			
CAF Resistance				-	pass / fail	2.6.25	3.12.1.4
Peel Strength, minimum							3.9.1.1
A. Low profile copper foil and very low profile copper foil - all copper foil >17µm [0,669 mil]					N/mm [lb/in]	2.4.8	
B. Standard profile copper foil							
1. after thermal stress (35 µm)			1,93 [11,00]	1,05 [6,00]	N/mm [lb/in]	2.4.8.2	3.9.1.1.1
2. at 125 °C [257 °F]					N/mm [lb/in]	2.4.8.3	3.9.1.1.2
3. after process solutions					N/mm [lb/in]	2.4.8	3.9.1.1.3
C. all other foil - composite			-	AABUS			
Volume Resistivity, minimum							
A. C-96/35/90			$5{,}0*10^{8}$	10^{6}	MΩcm	2.5.17.1	3.11.1.3
B. after moisture resistance			-	-			
C. at elevated temperature E-24/125			-	10^{3}			
Surface Resistivity, minimum							
A. C-96/35/90			$5{,}0*10^{7}$	10^{4}	MΩ	2.5.17.1	3.11.1.4
B. after moisture resistance			-	-			
C. at elevated temperature E-24/125			-	10^{3}			
Dielectric Breakdown, minimum			60	40	kV	2.5.6	3.11.1.6
Electric Strength, minimum			-	-	kV/mm	2.5.6.2	3.11.1.7
(laminate & prepreg as laminated)			-	-	[V/mil]		3.11.2.3
Arc Resistance, minimum			120	60	s	2.5.1	3.11.1.5
Comparative Tracking Index (CTI)			0 / ≥ 600	AABUS	PLC / V	ASTM D3638	-
Permittivity, spec. maximum A. @ 1MHz			4,40	5,40	-	2.5.5.2	3.11.1.1
(laminate & prepreg as laminated) B. @ 100MHz			-	-	-	2.5.5.3	3.11.2.11
C. @ 1 GHz			-	-	-	2.5.5.9	
D. @ 2 GHz			-	-	-	2.5.5.5	
E. @ 5 GHz			-	-	-		
Loss Tangent, spec. maximum A. @ 1MHz			0,030	0,035	-	2.5.5.2	3.11.1.2
(laminate & prepreg as laminated) B. @ 100MHz			-	-	-	2.5.5.3	3.11.2.2
C. @ 1 GHz			-	-	-	2.5.5.9	
D. @ 2 GHz			-	-	-	2.5.5.5	
E. @ 5 GHz			-	-	-		
Flexural Strength, minimum							
A. Length direction			300	242 [35100]	N/mm^2 [lb/in^2]	2.4.4	3.9.1.3
B. Cross direction			200	172 [24950]			
Flexural Strength at elevated temperature, length direction, minimum			-	-	N/mm^2 [lb/in^2]	2.4.4.1	3.9.1.4
Dimensional stability x/y-axis E-0,5/170(R)/E-4/105(TL)			-	-	%	2.4.39	3.9.1.2
Moisture Absorption, maximum			0,15	0,50	%	2.6.2.1	3.12.1.1
Flammability (laminate & prepreg as laminated)			V-0	V-0 minimum	rating	UL94	3.10.1.1
Density (50 % resin content)			1,95	-	g/cm^3	-	-

PREPREG DATA SHEET

Prepreg Requirements	Typical Value	Specification	Unit	Test Method	Ref. Para.
1. Shelf Life, minimum (Condition 1/ Condition 2)			Days	AABUS	3.17
2. Reinforcement			-	-	-
3. Volatile content maximum			%	2.3.19	3.9.2.8
4. Prepreg Parameters			AABUS	AABUS	1.1.7
5. Flammability (as laminated)			rating	UL94	3.10.2.1
6. Other					

Data shown are nominal values for reference only

*AABUS = As Agreed upon Between User and Supplier.

all Nan Ya laminates are in conformance with RoHS regulations