

Panasonic Industrial Devices Materials Europe GmbH

Specification Sheet

Specification sheet #	IPC-4101C/101	2: N/A
Reinforcement	1: Woven E-Glass	
Resin System:	Primary: Difunctional Epoxy	
	Secondary 1: Multifunctional Epoxy	Secondary 2: N/A
Flam retardant mechanism	Bromine	Minimum UL94 Requirement: V0
Fillers:	Inorganic fillers	
ID Reverence:	UL/ANSI: FR-4	Mil-S-13949: /04-GF,GFN,GFK,GFP,GFM
	ANSI: FR4 / 101	
	secondary: 21/97/121	
Glass transition (TG):	110°C minimum	

Product name	Laminate: R-1755C	Prepreg: R-1650C
UL - Designation	R-1755C	R-1650C

1. Laminate		IPC Specification < 0, 5mm	IPC Specification ≥ 0, 5mm	Units	Typical Values < 0, 5mm	Typical Values ≥ 0, 5mm	Methode IPC-TM-650 (or as noted)	
Physical Property								
Peel strength, minimum		0,7	0,7		-	-		
A: Low profile and very low profile copper foil, all copper foils > 18µm	18µm			N/mm	-	-	2.4.8	
B: Standard profile copper foil	35µm	-	-		-	-	2.4.8.2	
1. after thermal stress		0,8	1,05		1,5	1,6	2.4.8.3	
2. at 125°C		0,7	0,7		1,4	1,5		
3. after process solutions		0,55	0,8	1,5	1,6			
Moisture Absorptions, maximum		-	0,8	%	-	0,09	2.6.2.1	
Flexural strength, minimum	A: Length direction	-	415	N/mm ²	-	595		
	B: Cross direction	-	345		-	412	2.4.4	
Flammability (Laminate and prepreg as laminated)		V0 min	V0 min	Rating	V0	V0	UL 94	
CTE (pre / post Tg)								
Z		-	-		-	48/260		
X		-	-	ppm/°C	-	13	2.4.24	
Y		-	-		-	15		
T260 (TMA)	copper removed	-	30 min.	minutes	-	>120	2.4.24.1	
T288 / T300 (TMA)	copper removed	-	5 min.	minutes	-	35 / NA	2.4.24.1	
Density		-	-	g/cm ³	1,93	1,93		
Decomposition Temperature		-	310 min.	°C	-	364	TGA	
Electrical Property								
Volume resistivity, minimum	A: 96 / 35 / 90	1,0 E+06	-	MΩm-cm	5 E+07	-	2.5.17.1	
	B: after moisture resistance	-	1,0 E+06		-	N/A		
	C: at elevated temp. E-24/125	1,0 E+03	1,0 E+03		N/A	N/A		
Surface resistivity, minimum	A: 96 / 35 / 90	1,0 E+04	-	MΩm	5,0 E+08	-	2.5.17.1	
	B: after moisture resistance	-	1,0 E+04		-	N/A		
	C: at elevated temp. E-24/125	1,0 E+03	1,0 E+03		N/A	N/A		
Dielectric breakdown, minimum		-	40	kV	-	> 50	2.5.6	
Permittivity, maximum (laminate and prepreg as laminated)	at 1 MHz	5,4	5,4	-	N/A	4,82	2.5.5.2/3/9	
	at 1 GHz	-	-	-	N/A	4,38		
Loss tangent, maximum (laminate and prepreg as laminated)	at 1 MHz	0,035	0,035	-	0,015	0,015	2.5.5.2/3/9	
	at 1 GHz	-	-	-	0,017	0,017		
Arc resistance, minimum		60	60	sec	NI	NI	2.5.1	
Electrical strength, minimum (laminate and prepreg as laminated)		30	-	kV/mm	56	-	2.5.6.2	
CTI (comparative tracking index)		-	-	V	-	200	IEC 112	
Thermal Property								
Thermal stress 10 sec at 288°C, minimum	A: unetched	Pass	Pass	Rating	Pass	Pass	2.4.13.1	
	B: etched	Pass	Pass		Pass	Pass		
Tg by DSC (TMA / DMA)		110min	110min	°C	135,2	135(135/155)	2.4.25	
Thermal conductivity		-	-	W/mK	-	0,48	Laser flash	
Specific heat		-	-	J/kgK	-	915	DSC	
2. Prepreg Property		IPC-Specification		Units	Typical Values			
Shelf life, minimum (from date of delivery)	A: Condition <20°C, rel. H. <50%	90		Days	meets requirements		AABUS	
	B: Condition < 5°C	180			meets requirements			
Volatile content, maximum		0,75		%	< 0,3		2.3.19	
Prepreg parameters		-	-	-	AABUS		AABUS	

AABUS= As agreed between user and supplier
Note:

Text data contained in this data sheet represents typical values and does not constitute any warranty or guarantee. For review of critical specification tolerances, please contact a Panasonic Electric Works representative. Panasonic Electric Works reserve the right to change these typical values as a natural process of referring our test equipment and technics.