

# Panasonic Electric Works Electronic Materials Europe GmbH Specification Sheet

Specification sheet #

IPC-4101B/126

Reinforcement

1: Woven E-Glass

2: N/A

Resin System:

Primary: Epoxy

Secondary 1: Multifunctional Epoxy

Secondary 2: Modified Epoxy

Flam retardant mechanism

Bromine

Minimum UL94 Requirement: V0

Fillers:

Inorganic fillers

ID Reverence:

UL/ANSI: FR-4

Mil-S-13949: /

ANSI: FR4 / 126

Glass transition (TG):

170°C minimum

Product name UL - Designation	Laminate: R-1755V R-1755V	Prepreg: R-1650V R-1650V					
<b>1. Laminate</b>							
	IPC Specification < 0, 5mm	IPC Specification >= 0, 5mm	Units	Typical Values < 0, 5mm	Typical Values >= 0, 5mm	Methode IPC-TM-650 (or as noted)	
<b>Physical Property</b>							
<b>Peel strength, minimum</b>		0,7	0,7		-	-	
A: Low profile and very low profile copper foil, all copper foils > 18µm	18µm			N/mm		2.4.8 2.4.8.2 2.4.8.3	
B: Standard profile copper foil	35µm	-	-				
1. after thermal stress		0,8	1,05		1,25		1,40
2. at 125°C		0,7	0,7		1,15		1,30
3. after process solutions		0,55	0,8		1,25		1,40
<b>Moisture Absorptions, maximum</b>		-	0,5	%	-	0,09	
<b>Flexural strength, minimum</b>	A: Length direction	-	415	N/mm2	-	595	
	B: Cross direction	-	345		-	412	
<b>Flammability</b> (Laminate and prepreg as laminated)		V0 min	V0 min	Rating	V0	V0	
<b>CTE (pre / post Tg)</b>							
Z		-	60/300 max.	ppm/°C	-	43/240	
X		-	-		-	13	
Y		-	-		-	15	
<b>T260 (TMA)</b>	copper removed	-	30 min.	minutes	-	65	
<b>T288 / T300 (TMA)</b>	copper removed	-	15 / 2 min.	minutes	-	16 / N/A	
<b>Density</b>		-	-	g/cm3	1,96	1,96	
<b>Decomposition Temperature</b>		-	340 min.	°C	-	340	
<b>Electrical Property</b>							
<b>Volume resistivity, minimum</b>	A: 96 / 35 / 90	1,0 E+06	-	MOhm-cm	5 E+07	-	
	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		5 E+08	-	
<b>Surface resistivity, minimum</b>	A: 96 / 35 / 90	1,0 E+04	-	MOhm	5,0 E+08	-	
	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	
<b>Dielectric breakdown, minimum</b>		-	40	kV	-	> 50	
<b>Permittivity, maximum</b> ( laminate and prepreg as laminated)	at 1 MHz	5,4	5,4	-	N/A	4,82	
	at 1 GHz	5,2	5,2	-	N/A	4,40	
<b>Loss tangent, maximum</b> ( laminate and prepreg as laminated)	at 1 MHz	0,035	0,035	-	0,012	0,012	
	at 1 GHz	-	-	-	0,014	0,014	
<b>Arc resistance, minimum</b>		60	60	sec	NI	NI	
<b>Electrical strength, minimum</b> (laminated and prepreg as laminated)		30	-	kV/mm	56	-	
<b>CTI (comparative tracking index)</b>		-	-	V	-	200	
<b>Thermal Property</b>							
<b>Thermal stress 10 sec at 288°C, minimum</b>	A: unetched	Pass	Pass	Rating	Pass	Pass	
	B: etched	Pass	Pass		Pass	Pass	
<b>Tg by DSC (TMA / DMA)</b>		170min	170min	°C	172	172(175/190)	
<b>Thermal conductivity</b>		-	-	W/mK	-	0,53	
<b>Specific heat</b>		-	-	J/kgK	-	915	
<b>2. Prepreg Property</b>							
		IPC-Specification		Units	Typical Values		
<b>Shelf life, minimum</b> (from date of delivery)	A: Condition <20°C, rel. H. <50%	90		Days	meets requirements		
	B: Condition < 5°C	180			meets requirements		
<b>Volatile content, maximum</b>		1,5		%	< 0,3		
<b>Prepreg parameters</b>		-	-	-	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 refining our test equipment and technics.