

**R-1755V and R-1650V**

Multifunctional Epoxy Resin System

Panasonic's **R-1755V** is a non-dicy, FILLED FR-4 Laminate system with good heat resistance. It has an advanced high Tg blend for high layer count applications and was specifically designed to reduce Z-axis expansion during heat cycling encountered in multiple-pass solder operations. **R-1755V** meets Specification IPC 4101B 21/24/26/97/98/101/126 (Thickness Class "C" and Surface Class "C").

R-1755V Laminate Constructions					
Thickness (inches)	Thickness (mm)	Thickness Tolerance (inches)	Laminate Construction	Dielectric Constant @ 1MHz	Resin Content (%)
.0020	0.050	.0005	1-106	3.9	72.0
<b>.0020</b>	<b>0.050</b>	<b>.0005</b>	<b>1-1067</b>	<b>4.1</b>	<b>64.0</b>
.0027	0.068	.0005	1-1080	4.1	61.0
.0030	0.075	.0005	1-1080	4.1	65.0
<b>.0030</b>	<b>0.075</b>	<b>.0005</b>	<b>1-1078</b>	<b>4.1</b>	<b>65.0</b>
.0032	0.081	.0005	1-3313	4.4	48.0
.0035	0.089	.0005	1-3313	4.3	52.0
.0035	0.089	.0005	2-106	4.0	69.0
.0037	0.094	.0005	2-106	4.0	69.0
.0040	0.100	.0005	1-2116	4.5	48.0
.0040	0.100	.0005	2-106	3.9	72.0
.0045	0.114	.0007	1-2116	4.3	52.0
.0045	0.117	.0007	2-1080	4.1	57.0
<b>.0045</b>	<b>0.117</b>	<b>.0007</b>	<b>2-1078</b>	<b>4.2</b>	<b>55.0</b>
.0050	0.125	.0007	1-1504	4.6	41.0
<b>.0050</b>	<b>0.125</b>	<b>.0007</b>	<b>2-1078</b>	<b>4.2</b>	<b>58.0</b>
.0053	0.135	.0007	2-1080	4.1	61.0
.0060	0.150	.0007	2-1080	4.1	65.0
.0060	0.150	.0007	1-1506	4.5	45.0
<b>.0060</b>	<b>0.150</b>	<b>.0007</b>	<b>2-1078</b>	<b>4.1</b>	<b>65.0</b>
.0070	0.175	.0010	2-3313	4.3	52.0
.0075	0.191	.0010	1-7628	4.5	44.0
.0080	0.203	.0010	2-2116	4.5	48.0
.0100	0.250	.0010	2-1504	4.5	41.0
.0120	0.300	.0015	2-1506	4.5	45.0
.0145	0.368	.0020	2-7628	4.7	42.0
.0155	0.394	.0020	2-7628	4.7	47.0
.0180	0.460	.0020	2-7628/2116	4.5	42.0
.0210	0.530	.0025	3-7628	4.7	41.0
.0280	0.710	.0025	4-7628	4.7	41.0
.0350	0.889	.0036	5-7628	4.7	41.0
.0390	0.990	.0050	5-7628/1080	4.5	42.0
.0470	1.194	.0050	6-7628/2116	4.5	42.0
.0590	1.500	.0070	8-7628	4.5	42.0

Laminate thicknesses published measure the laminate base material without the metal cladding. Panasonic utilizes low profile HTE copper foil on all laminates. Both standard HTE and Reverse Treat Copper Foils are available. The enclosed data is for reference only. For more information, please contact our Customer Service or Technical Service Groups.

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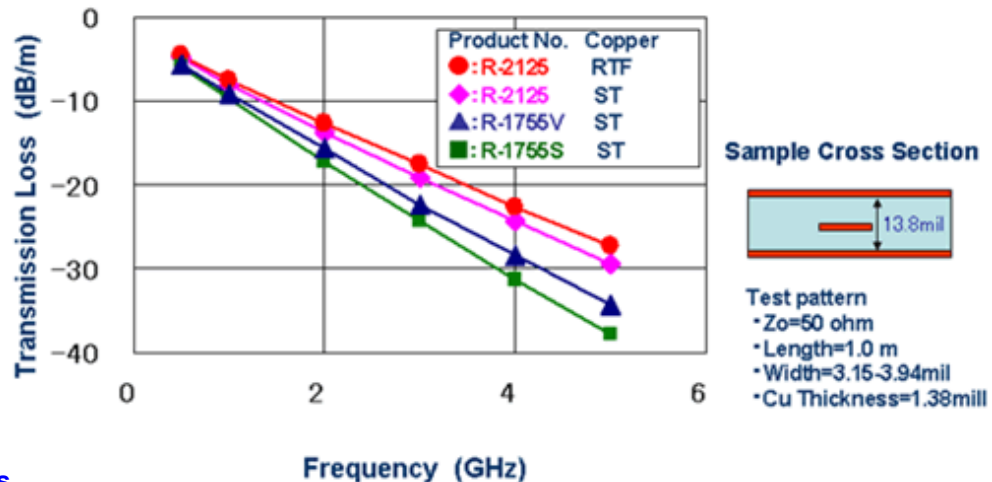
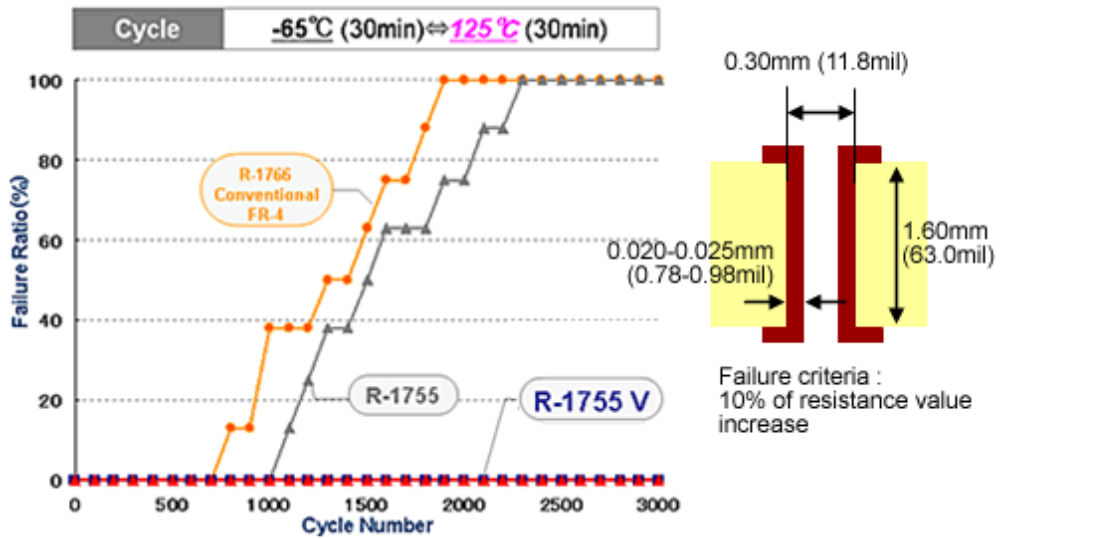
R-1755V Laminate Specifications					
Property		Units	Test Method	Condition	Min Value
THERMAL	Glass Transition Temp	°C	TMA	As received	190
	Thermal Decomposition Temp	°C	TGA	As received	350
	CTE ( $\alpha_1$ ) Z-axis	ppm/°C	IPC-TM-650 2.4.41	As received (50 to 260°C)	45
		(%)			2.8
	Time to Delam (T260)	min	IPC TM-650 2.4.24.1	As received	65
Time to Delam (T288)	min	IPC TM-650 2.4.24.1	As received	16	
ELECTRICAL	Volume Resistivity	M $\Omega$ -cm	IPC TM-650 2.5.17.1	C-96/35/90	5x10 <sup>7</sup>
	Surface Resistivity	M $\Omega$	IPC TM-650 2.5.17.1	C-96/35/90	5x10 <sup>8</sup>
	Insulation Resistivity				1x10 <sup>8</sup>
	Dielectric Constant (Dk)	@ 1 MHz	IPC TM-650 2.5.5.3	C-24/23/50	4.7
	Dissipation Factor (Df)	@ 1 MHz	IPC TM-650 2.5.5.3	C-40/23/50	.013
PHYSICAL	Moisture Absorption	%	IPC TM-650 2.6.2.1	D-24/23	0.29
	Peel Strength	kN/m~lb/in	IPC TM-650 2.4.8	1 oz (35 $\mu$ m)	1.3 ~ 7.43
				H oz (18 $\mu$ m)	1.4 ~ 8.00
	Flammability	UL94	IPC TM-650 2.4.39	C-48/23/50	V-0

R-1755V Laminate Specifications				
Test Sample RC 42.5%		Dielectric Constant (Dk)	Dissipation Factor (Df)	Test Method Used
FREQUENCY	1 MHz	4.68	0.0153	IPC TM 650 2.5.5.2
	1 GHz	4.31	0.0153	IPC TM 650 2.5.5.9
	2 GHz	4.27	0.0170	IPC TM 650 2.5.5.5
	4 GHz	4.23	0.0180	
	6 GHz	4.21	0.0200	
	8 GHz	4.19	0.0210	
	10 GHz	4.16	0.0220	

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R-1650V Prepreg Specifications					
Glass Style	Scale Flow Thickness (inches)	Scale Flow (mm)	Resin Content (%)	Gel Time (sec)	Dk (@ 1 GHz)
106	.0018	0.046 +/- .02	74.0 +/- 3.0	140 +/- 30	3.9
1080	.0023	0.058 +/- .02	64.0 +/- 3.0	140 +/- 30	4.0
3313	.0034	0.086 +/- .02	56.0 +/- 3.0	140 +/- 30	4.2
2116	.0040	0.102 +/- .02	54.0 +/- 3.0	140 +/- 30	4.2
7628	.0067	0.170 +/- .02	44.0 +/- 3.0	140 +/- 30	4.5

**Through Hole Reliability**



**Transmission Loss**