

Data Sheet

High Reliability Glass Epoxy Multi-layer Materials



Laminate R-1755C
Prepreg R-1650C

UL/ANSI	FR-4	<p>RoHS Compliant</p>
IPC-4101	Primary:/101	
Slash Sheet	Secondary:/21 /97 /121	

Jan. 2012 No.12012039

Partnering to go beyond.

Electronic Materials
Panasonic Corporation

Specification / Laminate R-1755C

Property		Units	Test Method	Condition	Value	
THERMAL	Glass Transition Temp (Tg)	°C	DSC	As received	135	
			TMA	As received	135	
			DMA	As received	155	
	Thermal Decomposition Temp (Td)		°C	TGA	As received	370
	Time to Delam (T288)	Without Cu	min	IPC TM-650 2.4.24.1	As received	60
		With Cu	min	IPC TM-650 2.4.24.1	As received	35
	CTE : $\alpha 1$	X - axis	ppm / °C	IPC TM-650 2.4.24	< Tg	11 - 13
		Y - axis	ppm / °C	IPC TM-650 2.4.24	< Tg	13 - 15
		Z - axis	ppm / °C	IPC TM-650 2.4.24	< Tg	50
CTE : $\alpha 2$	Z - axis	ppm / °C	IPC TM-650 2.4.24	> Tg	260	
ELECTRICAL	Volume Resistivity		M Ω - cm	IPC TM-650 2.5.17.1	C-96/35/90	1 x 10 ⁹
	Surface Resistivity		M Ω	IPC TM-650 2.5.17.1	C-96/35/90	1 x 10 ⁸
	Dielectric Constant (Dk)	@1MHz	-	IPC TM-650 2.5.5.9	C-24/23/50	4.7
		@ 1GHz	-	IPC TM-650 2.5.5.9	C-24/23/50	4.3
	Dissipation Factor (Df)	@1MHz	-	IPC TM-650 2.5.5.9	C-24/23/50	0.013
		@ 1GHz	-	IPC TM-650 2.5.5.9	C-24/23/50	0.015
PHYSICAL	Water Absorption		%	IPC TM-650 2.6.2.1	D-24/23	0.12
	Peel Strength	1oz	kN / m	IPC TM-650 2.4.8	As Received	1.5
	Flammability		-	UL	C-48/23/50	94V-0

Sample thickness ; 32 mil (0.8 mm)

*The data above show actual values and are not guaranteed.

Specification / Laminate R-1755C

1MHz - 1GHz ; IPC TM650-2.5.5.9

Nominal Thickness		Cloth Style	Typical Resin Content (%)	Typical Dk			Typical Df		
mil	mm			1MHz	100MHz	1GHz	1MHz	100MHz	1GHz
2.5	0.06	1080 x 1ply	56	4.4	4.1	4.0	0.014	0.016	0.017
4	0.1	2116 x 1ply	46	4.7	4.4	4.3	0.013	0.015	0.015
6	0.15	1501 x 1ply	42	4.8	4.5	4.4	0.013	0.015	0.015
8	0.2	7628 x 1ply	46	4.7	4.4	4.3	0.013	0.015	0.015
12	0.3	1501 x 2ply	42	4.8	4.5	4.4	0.013	0.015	0.015
16	0.4	7628 x 2ply	46	4.7	4.4	4.3	0.013	0.015	0.015
20	0.5	7628/2116/7628	46	4.7	4.4	4.3	0.013	0.015	0.015
24	0.6	7628 x 3ply	46	4.7	4.4	4.3	0.013	0.015	0.015

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Specification / Laminate R-1755C

2GHz-10GHz ; IPC TM650-2.5.5.5

Nominal Thickness		Cloth Style	Resin Contents (%)	Typical Dk					Typical Df				
mil	mm			2GHz	4GHz	6GHz	8GHz	10GHz	2GHz	4GHz	6GHz	8GHz	10GHz
2.5	0.06	1080 x 1ply	56	4.0	4.0	3.9	3.9	3.9	0.018	0.018	0.019	0.019	0.020
4	0.1	2116 x 1ply	46	4.3	4.3	4.3	4.2	4.2	0.016	0.017	0.017	0.018	0.019
6	0.15	1501 x 1ply	42	4.4	4.4	4.4	4.3	4.3	0.015	0.016	0.017	0.018	0.019
8	0.2	7628 x 1ply	46	4.3	4.3	4.3	4.2	4.2	0.016	0.017	0.017	0.018	0.019
12	0.3	1501 x 2ply	42	4.4	4.4	4.4	4.3	4.3	0.015	0.016	0.017	0.018	0.019
16	0.4	7628 x 2ply	46	4.3	4.3	4.3	4.2	4.2	0.016	0.017	0.017	0.018	0.019
20	0.5	7628/2116/7628	46	4.3	4.3	4.3	4.2	4.2	0.016	0.017	0.017	0.018	0.019
24	0.6	7628 x 3ply	46	4.3	4.3	4.3	4.2	4.2	0.016	0.017	0.017	0.018	0.019

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Specification / Prepreg R-1650C

1MHz - 1GHz ; IPC TM650-2.5.5.9

Cloth Style	Resin Contents (%)	Typical Thickness (μm)	Typical Dk			Typical Df		
			1MHz	100MHz	1GHz	1MHz	100MHz	1GHz
1078	63	75	4.3	4.0	3.8	0.015	0.017	0.018
	65	80	4.3	3.9	3.8	0.015	0.017	0.019
	68	89	4.2	3.8	3.7	0.015	0.017	0.019
1080	63	73	4.3	4.0	3.8	0.015	0.017	0.018
	65	78	4.3	3.9	3.8	0.015	0.017	0.019
	68	87	4.2	3.8	3.7	0.015	0.017	0.019
2116	45	99	4.7	4.4	4.3	0.013	0.015	0.015
	48	107	4.6	4.3	4.2	0.013	0.015	0.015
	52	118	4.5	4.2	4.1	0.014	0.016	0.016
1501	44	154	4.7	4.4	4.3	0.013	0.015	0.015
	48	170	4.6	4.3	4.2	0.013	0.015	0.015
	52	188	4.5	4.2	4.1	0.014	0.016	0.016
7628	45	200	4.7	4.4	4.3	0.013	0.015	0.015
	48	215	4.6	4.3	4.2	0.013	0.015	0.015
	52	238	4.5	4.2	4.1	0.014	0.016	0.016

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Specification / Prepreg R-1650C

2GHz-10GHz ; IPC TM650-2.5.5.5

Cloth Style	Resin Contents %	Typical Thickness (μm)	Typical Dk					Typical Df				
			2GHz	4GHz	6GHz	8GHz	10GHz	2GHz	4GHz	6GHz	8GHz	10GHz
1078	63	75	3.8	3.8	3.8	3.7	3.7	0.019	0.019	0.020	0.020	0.021
	65	80	3.7	3.7	3.6	3.6	3.6	0.020	0.020	0.020	0.021	0.021
	68	89	3.6	3.6	3.6	3.6	3.6	0.020	0.020	0.021	0.021	0.021
1080	63	73	3.8	3.8	3.8	3.7	3.7	0.019	0.019	0.020	0.020	0.021
	65	78	3.7	3.7	3.6	3.6	3.6	0.020	0.020	0.020	0.021	0.021
	68	87	3.6	3.6	3.6	3.6	3.6	0.020	0.020	0.021	0.021	0.021
2116	45	99	4.3	4.3	4.3	4.2	4.2	0.016	0.016	0.017	0.018	0.019
	48	107	4.2	4.2	4.1	4.1	4.1	0.016	0.017	0.018	0.018	0.019
	52	118	4.0	4.0	4.0	3.9	3.9	0.017	0.017	0.018	0.019	0.020
1501	44	154	4.3	4.3	4.3	4.3	4.2	0.016	0.016	0.017	0.018	0.019
	48	170	4.2	4.2	4.1	4.1	4.1	0.016	0.017	0.018	0.018	0.019
	52	188	4.0	4.0	4.0	3.9	3.9	0.017	0.017	0.018	0.019	0.020
7628	45	200	4.3	4.3	4.3	4.2	4.2	0.016	0.016	0.017	0.018	0.019
	48	215	4.2	4.2	4.2	4.1	4.1	0.016	0.017	0.018	0.018	0.019
	52	238	4.0	4.0	4.0	3.9	3.9	0.017	0.017	0.018	0.019	0.020

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