

Data Sheet

High Reliability Glass Epoxy Multi-layer Materials (High Tg & Low CTE type)

HiPER V

Laminate R-1755V
Prepreg R-1650V

UL/ANSI	FR-4	
IPC-4101	Primary:/126	
Slash Sheet	Secondary:/21/24/26 /97/98/99/101 /121/124/129	

Jan. 2012 No.12012036

Partnering to go beyond.

Electronic Materials
Panasonic Corporation

Specification / Laminate R-1755V

Property			Units	Test Method	Condition	Value
THERMAL	Glass Transition Temp (Tg)		°C	DSC	As received	173
				TMA	As received	165
				DMA	As received	190
	Thermal Decomposition Temp (Td)		°C	TGA	As received	350
	Time to Delam (T288)	Without Cu	min	IPC TM-650 2.4.24.1	As received	> 120
		With Cu	min	IPC TM-650 2.4.24.1	As received	20
	CTE : α 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	44
	CTE : α 2	Z - axis	ppm / °C	IPC TM-650 2.4.24	> Tg	255
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	4.4
	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	0.016
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-1755V

1MHz - 1GHz ; IPC TM650-2.5.5.9

Nominal Thickness		Cloth Style	Typical Resin Content	ply	Typical Dk			Typical Df		
mil	mm				1MHz	100MHz	1GHz	1MHz	100MHz	1GHz
2	0.050	106	71%	1	4.2	4.1	4.0	0.015	0.017	0.019
2.5	0.065	1080	60%	1	4.4	4.2	4.1	0.015	0.017	0.018
3.5	0.084	3313	49%	1	4.7	4.5	4.4	0.014	0.015	0.016
3.5	0.085	106	67%	2	4.3	4.1	4.0	0.015	0.017	0.019
3.5	0.089	1067	60%	2	4.4	4.2	4.1	0.015	0.017	0.018
4	0.100	2116	46%	1	4.7	4.6	4.5	0.013	0.015	0.016
4	0.100	106	71%	2	4.2	4.1	4.0	0.015	0.017	0.019
4	0.105	1067	66%	2	4.3	4.1	4.0	0.015	0.017	0.019
5	0.129	1504	41%	1	4.9	4.7	4.6	0.013	0.014	0.014
5	0.130	1080	60%	2	4.4	4.2	4.1	0.015	0.017	0.018
6	0.150	1501	44%	1	4.8	4.6	4.5	0.013	0.014	0.014
8	0.200	2116	46%	2	4.7	4.6	4.5	0.013	0.015	0.016
8	0.201	7628	46%	1	4.7	4.6	4.5	0.013	0.015	0.016
12	0.300	1501	44%	2	4.8	4.6	4.5	0.013	0.014	0.014

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Specification / Laminate R-1755V

2GHz-10GHz ; IPC TM650-2.5.5.5

Nominal Thickness		Cloth Style	Typical Resin Content	ply	Typical Dk					Typical Df				
mil	mm				2GHz	4GHz	6GHz	8GHz	10GHz	2GHz	4GHz	6GHz	8GHz	10GHz
2	0.050	106	71%	1	3.9	3.8	3.8	3.8	3.8	0.020	0.021	0.022	0.023	0.024
2.5	0.065	1080	60%	1	4.1	4.0	4.0	4.0	3.9	0.019	0.020	0.021	0.022	0.023
3.5	0.084	3313	49%	1	4.3	4.3	4.3	4.3	4.2	0.017	0.018	0.019	0.020	0.021
3.5	0.085	106	67%	2	4.0	3.9	3.9	3.9	3.9	0.020	0.021	0.022	0.023	0.024
3.5	0.089	1067	60%	2	4.1	4.0	4.0	4.0	3.9	0.019	0.020	0.021	0.022	0.023
4	0.100	2116	46%	1	4.4	4.4	4.4	4.3	4.3	0.016	0.017	0.018	0.019	0.020
4	0.100	106	71%	2	3.9	3.8	3.8	3.8	3.8	0.020	0.021	0.022	0.023	0.024
4	0.105	1067	66%	2	4.0	3.9	3.9	3.9	3.9	0.020	0.021	0.022	0.023	0.024
5	0.129	1504	41%	1	4.6	4.5	4.5	4.5	4.4	0.016	0.017	0.018	0.019	0.020
5	0.130	1080	60%	2	4.1	4.0	4.0	4.0	3.9	0.019	0.020	0.021	0.022	0.023
6	0.150	1501	44%	1	4.4	4.4	4.4	4.4	4.3	0.016	0.017	0.018	0.019	0.020
8	0.200	2116	46%	2	4.4	4.4	4.4	4.3	4.3	0.016	0.017	0.018	0.019	0.020
8	0.201	7628	46%	1	4.4	4.4	4.4	4.3	4.3	0.016	0.017	0.018	0.019	0.020
12	0.300	1501	44%	2	4.4	4.4	4.4	4.4	4.3	0.016	0.017	0.018	0.019	0.020

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Specification / Prepreg R-1650V

1MHz - 1GHz ; IPC TM650-2.5.5.9

Cloth Style	Resin Content (%)	Typical Thickness (um)	Typical Dk			Typical Df		
			1MHz	100MHz	1GHz	1MHz	100MHz	1GHz
1037	72	48	4.2	4.0	3.9	0.015	0.017	0.019
106	67	43	4.3	4.1	4.0	0.015	0.017	0.019
	71	49	4.2	4.1	4.0	0.015	0.017	0.019
	75	58	4.1	3.9	3.8	0.015	0.018	0.019
1067	66	52	4.3	4.1	4.0	0.015	0.017	0.019
	70	60	4.2	4.1	4.0	0.015	0.017	0.019
1080	64	74	4.3	4.1	4.0	0.015	0.017	0.018
	68	85	4.3	4.1	4.0	0.015	0.017	0.019
	72	99	4.2	4.0	3.9	0.015	0.017	0.019
1078	63	73	4.3	4.2	4.0	0.015	0.017	0.018
	71	97	4.2	4.1	4.0	0.015	0.017	0.019
3313	56	101	4.4	4.3	4.2	0.014	0.016	0.017
	59	110	4.4	4.3	4.2	0.015	0.017	0.018
	62	121	4.3	4.2	4.1	0.015	0.017	0.018
2116	54	122	4.5	4.4	4.3	0.014	0.016	0.017
	57	133	4.4	4.3	4.2	0.014	0.016	0.017
1504	50	157	4.6	4.5	4.4	0.014	0.015	0.016
1501	50	175	4.6	4.5	4.4	0.014	0.015	0.016
7628	44	192	4.8	4.6	4.5	0.013	0.014	0.014
	47	206	4.7	4.5	4.4	0.013	0.015	0.016

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Specification / Prepreg R-1650V

2GHz-10GHz ; IPC TM650-2.5.5.5

Cloth Style	Resin Content (%)	Typical Thickness (um)	Typical Dk					Typical Df				
			2GHz	4GHz	6GHz	8GHz	10GHz	2GHz	4GHz	6GHz	8GHz	10GHz
1037	72	48	3.9	3.8	3.7	3.7	3.7	0.020	0.021	0.022	0.023	0.024
106	67	43	4.0	3.9	3.9	3.9	3.9	0.020	0.021	0.022	0.023	0.024
	71	49	3.9	3.8	3.8	3.8	3.8	0.020	0.021	0.022	0.023	0.024
	75	58	3.8	3.8	3.7	3.7	3.7	0.020	0.021	0.022	0.023	0.025
1067	66	52	4.0	3.9	3.9	3.9	3.9	0.020	0.021	0.022	0.023	0.024
	70	60	3.9	3.8	3.8	3.8	3.8	0.020	0.021	0.022	0.023	0.024
1080	64	74	4.0	3.9	3.9	3.9	3.9	0.019	0.020	0.021	0.022	0.023
	68	85	3.9	3.9	3.8	3.8	3.8	0.020	0.021	0.022	0.023	0.024
	72	99	3.9	3.8	3.7	3.7	3.7	0.020	0.021	0.022	0.023	0.024
1078	63	73	4.0	4.0	3.9	3.9	3.9	0.019	0.020	0.021	0.022	0.023
	71	97	3.9	3.8	3.8	3.8	3.8	0.020	0.021	0.022	0.023	0.024
3313	56	101	4.2	4.1	4.1	4.1	4.1	0.018	0.019	0.020	0.021	0.022
	59	110	4.1	4.1	4.0	4.0	4.0	0.019	0.020	0.021	0.022	0.023
	62	121	4.0	4.0	4.0	3.9	3.9	0.019	0.020	0.021	0.022	0.023
2116	54	122	4.2	4.2	4.1	4.1	4.1	0.018	0.019	0.020	0.021	0.022
	57	133	4.1	4.1	4.1	4.1	4.0	0.018	0.019	0.020	0.021	0.022
1504	50	157	4.3	4.3	4.3	4.3	4.2	0.017	0.018	0.019	0.020	0.021
1501	50	175	4.3	4.3	4.3	4.3	4.2	0.017	0.018	0.019	0.020	0.021
7628	44	192	4.4	4.4	4.4	4.4	4.3	0.016	0.017	0.018	0.019	0.020
	47	206	4.4	4.4	4.3	4.3	4.3	0.016	0.017	0.018	0.019	0.021

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