


Data Sheet

High Reliability Glass Epoxy Multi-layer Materials

HIIPERE

Laminate R-1755E
Prepreg R-1650E

UL/ANSI	FR-4	
IPC-4101	Primary:/101	
Slash Sheet	Secondary:/21 /97 /121	

Jul. 2013 No.13070141

Partnering to go beyond.

Electronic Materials
Panasonic Corporation

Specification / Laminate R-1755E

Property		Units	Test Method	Condition	Value	
THERMAL	Glass Transition Temp (Tg)	C	DSC	As received	133	
			TMA	As received	133	
			DMA	As received	153	
	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	>120
		With Cu	min	IPC TM-650 2.4.24.1	As received	25
	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	42
CTE : $\alpha 2$	Z - axis	ppm / C	IPC TM-650 2.4.24	> Tg	250	
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	5.0
		@ 1GHz	-	IPC TM-650 2.5.5.9	C-24/23/50	4.6
	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	0.013
PHYSICAL	Water Absorption		%	IPC TM-650 2.6.2.1	D-24/23	0.11
	Peel Strength	1oz	kN / m	IPC TM-650 2.4.8	As Received	1.6
	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-1755E

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
4.0	0.1	2116	46%	1	5.0	4.7	4.6	0.014	0.014	0.014
6.0	0.15	1501	44%	1	5.0	4.8	4.6	0.013	0.013	0.013
8.0	0.2	7628	47%	1	5.0	4.7	4.6	0.014	0.014	0.014
12	0.3	1501	44%	2	5.0	4.8	4.6	0.013	0.013	0.013
16	0.4	7628	47%	2	5.0	4.7	4.6	0.014	0.014	0.014
20	0.5	7628 / 2116	47%	2 / 1	5.0	4.7	4.6	0.014	0.014	0.014
24	0.6	7628	47%	3	5.0	4.7	4.6	0.014	0.014	0.014
32	0.8 1/1	7628	45%	4	5.0	4.8	4.6	0.013	0.013	0.013
39	1.0 1/1	7628	45%	5	5.0	4.8	4.6	0.013	0.013	0.013
47	1.2 1/1	7628	45%	6	5.0	4.8	4.6	0.013	0.013	0.013
62	1.6 1/1	7628	45%	8	5.0	4.8	4.6	0.013	0.013	0.013

※ Nominal Thickness (< 0.8mm) : without copper thickness

※ Nominal Thickness (>= 0.8mm) : with copper thickness

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

Specification / Laminate R-1755E

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
4.0	0.1	2116	46%	1	4.6	4.5	4.5	4.5	4.5	0.015	0.016	0.017	0.018	0.019
6.0	0.15	1501	44%	1	4.6	4.6	4.6	4.5	4.5	0.014	0.016	0.017	0.018	0.019
8.0	0.2	7628	47%	1	4.5	4.5	4.5	4.5	4.4	0.015	0.016	0.017	0.018	0.019
12	0.3	1501	44%	2	4.6	4.6	4.6	4.5	4.5	0.015	0.016	0.017	0.018	0.019
16	0.4	7628	47%	2	4.5	4.5	4.5	4.5	4.4	0.015	0.016	0.017	0.018	0.019
20	0.5	7628 / 2116	47%	2 / 1	4.5	4.5	4.5	4.5	4.4	0.015	0.016	0.017	0.018	0.019
24	0.6	7628	47%	3	4.5	4.5	4.5	4.5	4.4	0.015	0.016	0.017	0.018	0.019
32	0.8 1/1	7628	45%	4	4.6	4.6	4.5	4.5	4.5	0.015	0.016	0.017	0.018	0.019
39	1.0 1/1	7628	45%	5	4.6	4.6	4.5	4.5	4.5	0.015	0.016	0.017	0.018	0.019
47	1.2 1/1	7628	45%	6	4.6	4.6	4.5	4.5	4.5	0.015	0.016	0.017	0.018	0.019
62	1.6 1/1	7628	45%	8	4.6	4.6	4.5	4.5	4.5	0.015	0.016	0.017	0.018	0.019

※ Nominal Thickness (< 0.8mm) : without copper thickness

※ Nominal Thickness (>= 0.8mm) : with copper thickness

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

Specification / Prepreg R-1650E

1GHz ; IPC TM650-2.5.5.9

Cloth Style	Resin Content	Typical Thickness (um)	Typical Dk			Typical Df		
			1MHz	100MHz	1GHz	1MHz	1MHz	1GHz
1080	64%	74	4.6	4.3	4.2	0.017	0.017	0.017
	68%	85	4.6	4.3	4.1	0.017	0.017	0.017
1078	64%	75	4.6	4.3	4.2	0.017	0.017	0.017
	68%	87	4.6	4.3	4.1	0.017	0.017	0.017
	70%	93	4.5	4.2	4.1	0.018	0.018	0.018
2116	51%	113	4.9	4.6	4.5	0.015	0.015	0.015
	54%	122	4.8	4.6	4.4	0.016	0.016	0.016
	57%	133	4.8	4.5	4.3	0.016	0.016	0.016
1501	50%	175	4.9	4.6	4.5	0.015	0.015	0.015
	53%	189	4.9	4.6	4.4	0.015	0.015	0.015
7628	49%	216	4.9	4.7	4.5	0.014	0.014	0.014
	52%	233	4.9	4.6	4.5	0.015	0.015	0.015

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

Specification / Prepreg R-1650E

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
1080	64%	74	4.1	4.1	4.1	4.0	4.0	0.017	0.019	0.020	0.021	0.022
	68%	85	4.1	4.0	4.0	4.0	3.9	0.018	0.019	0.021	0.022	0.023
1078	64%	75	4.1	4.1	4.1	4.0	4.0	0.017	0.019	0.020	0.021	0.022
	68%	87	4.1	4.0	4.0	4.0	3.9	0.018	0.019	0.021	0.022	0.023
	70%	93	4.0	4.0	3.9	3.9	3.9	0.018	0.020	0.021	0.022	0.023
2116	51%	113	4.5	4.4	4.4	4.4	4.3	0.016	0.017	0.018	0.019	0.020
	54%	122	4.4	4.4	4.3	4.3	4.3	0.016	0.017	0.019	0.020	0.021
	57%	133	4.3	4.3	4.2	4.2	4.2	0.017	0.018	0.019	0.020	0.021
1501	50%	175	4.5	4.4	4.4	4.4	4.4	0.016	0.017	0.018	0.019	0.020
	53%	189	4.4	4.4	4.3	4.3	4.3	0.016	0.017	0.018	0.019	0.021
7628	49%	216	4.5	4.5	4.4	4.4	4.4	0.015	0.017	0.018	0.019	0.020
	52%	233	4.4	4.4	4.4	4.3	4.3	0.016	0.017	0.018	0.019	0.021

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Panasonic Corporation
 Automotive & Industrial Systems Company
 Electronic Materials Business Division
 Circuit Board Materials Division.
 Head Office :1006 Kadoma. Kadoma. Osaka 571-8506
 TEL: 81-6-6908-1101
<http://industrial.panasonic.com/>