

Data Sheet

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

HIPER **M**

Laminate R-1755M
Prepreg R-1650M

Jun. 2017 No.17061638

Specification / Laminate R-1755M

Property		Units	Test Method	Condition	Value	
THERMAL	Glass Transition Temp (Tg)	°C	DSC	As received	153	
			TMA	As received	150	
			DMA	As received	175	
	Thermal Decomposition Temp (Td)		°C	TGA	As received	355
	Time to Delam (T288)	Without Cu	min	IPC TM-650 2.4.24.1	As received	110
		With Cu	min	IPC TM-650 2.4.24.1	As received	18
	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	40
CTE : $\alpha 2$	Z - axis	ppm / °C	IPC TM-650 2.4.24	> Tg	240	
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	0.014
		@ 1GHz	-	IPC TM-650 2.5.5.9	C-24/23/50	0.014
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	1.5
	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-1755M

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	0.05	106	72%	1	4.5	4.2	4.0	0.018	0.018	0.018
2.5	0.06	1080	59%	1	4.7	4.4	4.3	0.016	0.016	0.016
4.0	0.1	2116	46%	1	5.0	4.7	4.6	0.015	0.015	0.015
5.0	0.13	1504	41%	1	5.1	4.8	4.7	0.013	0.013	0.013
6.0	0.15	1501	44%	1	5.0	4.7	4.6	0.014	0.014	0.014
7.0	0.18	7628	42%	1	5.1	4.8	4.7	0.013	0.013	0.013
8.0	0.2	7628	47%	1	4.9	4.7	4.5	0.015	0.015	0.015
10	0.25	1504	41%	2	5.1	4.8	4.7	0.013	0.013	0.013
12	0.3	1501	44%	2	5.0	4.7	4.6	0.014	0.014	0.014
14	0.36	7628	42%	2	5.1	4.8	4.7	0.013	0.013	0.013
15	0.38	7628	44%	2	5.0	4.7	4.6	0.014	0.014	0.014
16	0.4	7628	47%	2	4.9	4.7	4.5	0.015	0.015	0.015
18	0.46	7628 / 2116	43%	2 / 1	5.0	4.8	4.6	0.014	0.014	0.014
20	0.5	7628 / 2116	47%	2 / 1	4.9	4.7	4.5	0.015	0.015	0.015
21	0.53	7628	42%	3	5.1	4.8	4.7	0.013	0.013	0.013
24	0.6	7628	47%	3	4.9	4.7	4.5	0.015	0.015	0.015
28	0.7	7628	42%	4	5.1	4.8	4.7	0.013	0.013	0.013
31	0.8	7628 / 1080	43%	4 / 1	5.0	4.8	4.6	0.014	0.014	0.014
36	0.9	7628	44%	5	5.0	4.7	4.6	0.014	0.014	0.014
39	1.0	7628 / 2116	42%	5 / 1	5.1	4.8	4.7	0.013	0.013	0.013
41	1.04	7628	42%	6	5.1	4.8	4.7	0.013	0.013	0.013
45	1.14	7628	44%	6	5.0	4.7	4.6	0.014	0.014	0.014
47	1.2	7628 / 2116	42%	6 / 1	5.1	4.8	4.7	0.013	0.013	0.013
59	1.5	7628	44%	8	5.0	4.7	4.6	0.014	0.014	0.014

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

Specification / Laminate R-1755M

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	0.05	106	72%	1	3.9	3.9	3.8	3.8	3.8	0.019	0.020	0.021	0.022	0.024
2.5	0.06	1080	59%	1	4.2	4.1	4.1	4.1	4.0	0.018	0.019	0.020	0.021	0.022
4.0	0.1	2116	46%	1	4.5	4.4	4.4	4.4	4.4	0.016	0.017	0.018	0.019	0.020
5.0	0.13	1504	41%	1	4.6	4.6	4.6	4.5	4.5	0.015	0.016	0.017	0.018	0.019
6.0	0.15	1501	44%	1	4.5	4.5	4.4	4.4	4.4	0.015	0.016	0.017	0.018	0.019
7.0	0.18	7628	42%	1	4.6	4.5	4.5	4.5	4.5	0.015	0.016	0.017	0.018	0.019
8.0	0.2	7628	47%	1	4.5	4.4	4.4	4.4	4.3	0.016	0.017	0.018	0.019	0.020
10	0.25	1504	41%	2	4.6	4.6	4.6	4.5	4.5	0.015	0.016	0.017	0.018	0.019
12	0.3	1501	44%	2	4.5	4.5	4.4	4.4	4.4	0.015	0.016	0.017	0.018	0.019
14	0.36	7628	42%	2	4.6	4.5	4.5	4.5	4.5	0.015	0.016	0.017	0.018	0.019
15	0.38	7628	44%	2	4.5	4.5	4.4	4.4	4.4	0.015	0.016	0.017	0.018	0.019
16	0.4	7628	47%	2	4.5	4.4	4.4	4.4	4.3	0.016	0.017	0.018	0.019	0.020
18	0.46	7628 / 2116	43%	2 / 1	4.6	4.5	4.5	4.4	4.4	0.015	0.016	0.017	0.018	0.019
20	0.5	7628 / 2116	47%	2 / 1	4.5	4.4	4.4	4.4	4.3	0.016	0.017	0.018	0.019	0.020
21	0.53	7628	42%	3	4.6	4.5	4.5	4.5	4.5	0.015	0.016	0.017	0.018	0.019
24	0.6	7628	47%	3	4.5	4.4	4.4	4.4	4.3	0.016	0.017	0.018	0.019	0.020
28	0.7	7628	42%	4	4.6	4.5	4.5	4.5	4.5	0.015	0.016	0.017	0.018	0.019
31	0.8	7628 / 1080	43%	4 / 1	4.6	4.5	4.5	4.4	4.4	0.015	0.016	0.017	0.018	0.019
36	0.9	7628	44%	5	4.5	4.5	4.4	4.4	4.4	0.015	0.016	0.017	0.018	0.019
39	1.0	7628 / 2116	42%	5 / 1	4.6	4.5	4.5	4.5	4.5	0.015	0.016	0.017	0.018	0.019
41	1.04	7628	42%	6	4.6	4.5	4.5	4.5	4.5	0.015	0.016	0.017	0.018	0.019
45	1.14	7628	44%	6	4.5	4.5	4.4	4.4	4.4	0.015	0.016	0.017	0.018	0.019
47	1.2	7628 / 2116	42%	6 / 1	4.6	4.5	4.5	4.5	4.5	0.015	0.016	0.017	0.018	0.019
59	1.5	7628	44%	8	4.5	4.5	4.4	4.4	4.4	0.015	0.016	0.017	0.018	0.019

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

Specification / Prepreg R-1650M

1GHz ; IPC TM650-2.5.5.9

Cloth Style	Resin Content (%)	Typical Thickness (um)	Typical Dk			Typical Df		
			1MHz	100MHz	1GHz	1MHz	1MHz	1GHz
106	71%	49	4.5	4.2	4.0	0.018	0.018	0.018
	75%	58	4.4	4.1	3.9	0.018	0.018	0.018
1080	64%	74	4.6	4.3	4.1	0.017	0.017	0.017
	68%	84	4.6	4.2	4.1	0.017	0.017	0.017
	72%	98	4.5	4.2	4.0	0.018	0.018	0.018
2116	51%	112	4.8	4.6	4.4	0.016	0.016	0.016
	54%	122	4.8	4.5	4.4	0.016	0.016	0.016
1501	50%	174	4.9	4.6	4.5	0.016	0.016	0.016
	53%	188	4.8	4.5	4.4	0.016	0.016	0.016
7628	44%	191	5.0	4.7	4.6	0.014	0.014	0.014
	47%	205	4.9	4.7	4.5	0.015	0.015	0.015
	50%	221	4.9	4.6	4.5	0.016	0.016	0.016
	53%	238	4.8	4.5	4.4	0.016	0.016	0.016

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

Specification / Prepreg R-1650M

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
106	71%	49	3.9	3.9	3.8	3.8	3.8	0.019	0.020	0.021	0.022	0.023
	75%	58	3.9	3.8	3.8	3.7	3.7	0.019	0.020	0.021	0.022	0.024
1080	64%	74	4.0	4.0	3.9	3.9	3.9	0.018	0.019	0.020	0.021	0.022
	68%	84	4.0	3.9	3.9	3.9	3.8	0.019	0.019	0.020	0.021	0.023
	72%	98	3.9	3.9	3.8	3.8	3.8	0.019	0.020	0.021	0.022	0.024
2116	51%	112	4.4	4.3	4.3	4.3	4.3	0.017	0.018	0.019	0.020	0.021
	54%	122	4.3	4.3	4.2	4.2	4.2	0.017	0.018	0.019	0.020	0.021
1501	50%	174	4.4	4.4	4.3	4.3	4.3	0.017	0.018	0.019	0.020	0.021
	53%	188	4.3	4.3	4.3	4.2	4.2	0.017	0.018	0.019	0.020	0.021
7628	44%	191	4.5	4.5	4.4	4.4	4.4	0.015	0.016	0.017	0.018	0.019
	47%	205	4.5	4.4	4.4	4.4	4.3	0.016	0.017	0.018	0.019	0.020
	50%	221	4.4	4.4	4.3	4.3	4.3	0.017	0.018	0.019	0.020	0.021
	53%	238	4.3	4.3	4.3	4.2	4.2	0.017	0.018	0.019	0.020	0.021

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++ Before purchase ++

【Notes before you use】

- Prior to adoption and use of a product contained in the datasheet, please verify the suitability for your application by your quality testing, evaluation, etc.
- We would like to have a delivery specifications mutually agreed for the product that you have decided to use. The agreements defined in the delivery specifications are assigned higher priority.
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- Before using the product, please read the delivery specifications carefully or contact the distributor from which you purchased the product or our sales department in order to use the product correctly.
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