

Data Sheet

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

HiPER **M**

Laminate R-1755M
Prepreg R-1650M

Jul. 2019 No.19070538

Specification / Laminate R-1755M

Property		Units	Test Method	Condition	Typical 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 in the above table are not guaranteed values.

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

* The data in the above table are not guaranteed values.

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
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 in the above table are not guaranteed values.

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

* The data in the above table are not guaranteed values.

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
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 in the above table are not guaranteed values.

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 in the above table are not guaranteed values.

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

* The data in the above table are not guaranteed values.

++ Before purchase ++

【Notes before you use】

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