


Data Sheet

HIPER (HighTg type)

Laminate R-1755V

Prepreg R-1650V

High Reliability Glass Epoxy Multi-layer Materials

UL/ANSI	FR-4	
IPC-4101	Primary:/98	
Slash Sheet	Secondary:/97 /99 /101 /126	

Matsushita Electric Works, Ltd.
Electronic & Plastic Materials Business Unit.
Electronic Materials Division.

Core Material Specifications

Nominal Thickness		Laminate Construction	Typical Dk	Typical Df	Typical Resin Content
(mil)	(mm)	-	(@ 1GHz)	(@ 1GHz)	(%)
2	0.050	1-106	3.9	0.019	71
2.5	0.065	1-1080	4.1	0.018	60
3.5	0.084	1-3313	4.4	0.016	49
3.5	0.085	2-106	4.0	0.019	67
3.5	0.089	2-1067	4.1	0.018	60
4	0.100	1-2116	4.4	0.016	46
4	0.100	2-106	3.9	0.019	71
4	0.105	2-1067	4.0	0.019	66
5	0.129	1-1504	4.6	0.014	41
5	0.130	2-1080	4.1	0.018	60
5.6	0.150	1-1501	4.5	0.014	45
8	0.200	2-2116	4.4	0.016	46
8	0.201	1-7628	4.4	0.016	46
11.8	0.300	2-1501	4.5	0.014	44
12	0.300	2-1501	4.5	0.014	45

Standard Availability

Copper Foil Cladding : 0.012, 0.018, 0.035 and 0.070 mm (0.5, 0.7, 1.4 and 2.8 mil)

Resin Content (%) ; Reference Value

Laminate Specifications

Property		Units	Test Method	Condition	Value	
THERMAL	Glass Transition Temp	°C	DSC	As received	173	
			TMA	As received	165	
	Thermal Decomposition Temp	°C	TGA	As received	350	
	Time to Delam (T260)	min	IPC TM-650 2.4.24.1	As received	120 \leq	
	Time to Delam (T288)	min	IPC TM-650 2.4.24.1	As received	20	
CTE (α_1) z-axis		ppm/°C	IPC TM-650 2.4.24	below Tg	44	
ELECTRICAL	Volume Resistivity		M Ω -cm	IPC TM-650 2.5.17.1	C-96/35/90	1x10 ⁹
	Surface Resistivity		M Ω	IPC TM-650 2.5.17.1	C-96/35/90	1x10 ⁸
	Dielectric Constant (Dk)		@ 1GHz	IPC TM-650 2.5.5.9	C-24/23/50	4.4
	Dissipation Factor (Df)		@ 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 1 oz (35 μ m)	ST	kN/m	IPC TM-650 2.4.8	As Received	1.5
	Flammability		-	UL	C-48/23/50	94V-0

The above are reference values only.

Prepreg Specifications

Glass Style	Typical Resin Content	Typical Thickness	Typical Dk	Typical Df
-	(%)	(μm)	(@1GHz)	(@1GHz)
1037	72	48	3.9	0.019
106	67	43	4.0	0.019
	71	49	3.9	0.019
	74	58	3.8	0.019
1067	66	54	4.0	0.019
	70	62	4.0	0.019
1080	64	74	4.0	0.018
	68	85	4.0	0.019
	72	100	3.9	0.019
1078	63	73	4.0	0.018
	71	67	3.9	0.019
3313	56	100	4.2	0.017
	59	110	4.1	0.018
	62	120	4.1	0.018
2116	54	122	4.3	0.017
	57	133	4.2	0.016
1504	50	160	4.4	0.016
1501	50	175	4.4	0.016
7628	44	192	4.6	0.014
	47	206	4.5	0.014

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Line Up/Laminate R-1755V

1MHz-1GHz : IPC TM-650 2.5.5.9

Nominal Thickness		Cloth Style	Typical Resin Content	ply	Typical Dk			Typical Df		
mil	(mm)				(%)	1 MHz	100 MHz	1 GHz	1 MHz	100 MHz
2	0.050	106	71	1	4.2	4.0	3.9	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	0.016	0.017
4	0.100	2116	46	1	4.7	4.5	4.4	0.013	0.015	0.016
4	0.100	106	71	2	4.2	4.0	3.9	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	45	1	4.8	4.6	4.5	0.013	0.014	0.014
8	0.200	2116	46	2	4.7	4.5	4.4	0.013	0.015	0.016
8	0.201	7628	46	1	4.7	4.5	4.4	0.013	0.015	0.016
12	0.300	1501	45	2	4.8	4.6	4.5	0.013	0.014	0.014

The above are reference values only.

Line Up/Laminate R-1755V

2GHz-10GHz : IPC TM-650 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	71	2	4.0	4.0	4.0	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	4.0	4.0	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	45	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	45	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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Line Up/Prepreg R-1650V

1MHz-1GHz : IPC TM-650 2.5.5.9

Cloth Style	Resin Content (%)	Typical Dk			Typical Df		
		1MHz	100MHz	1GHz	1MHz	100MHz	1GHz
-	(%)						
106	74	4.1	3.9	3.8	0.015	0.018	0.019
1080	64	4.3	4.1	4.0	0.015	0.017	0.018
	72	4.2	4.0	3.9	0.015	0.017	0.019
3313	56	4.4	4.3	4.2	0.014	0.016	0.017
2116	54	4.5	4.4	4.3	0.014	0.016	0.017
1506	50	4.6	4.5	4.4	0.014	0.015	0.016

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2GHz-10GHz : IPC TM-650 2.5.5.5

Cloth Style	Resin Content (%)	Typical Dk					Typical Df				
		2GHz	4GHz	6GHz	8GHz	10GHz	2GHz	4GHz	6GHz	8GHz	10GHz
-	(%)										
106	74	3.7	3.6	3.6	3.7	3.7	0.020	0.021	0.022	0.023	0.025
1080	64	4.0	3.9	3.9	3.9	3.9	0.019	0.020	0.021	0.022	0.023
	72	3.8	3.7	3.7	3.8	3.8	0.020	0.021	0.022	0.023	0.024
3313	56	4.2	4.1	4.1	4.1	4.1	0.018	0.019	0.020	0.021	0.022
2116	54	4.2	4.2	4.1	4.1	4.1	0.018	0.019	0.020	0.021	0.022
1506	50	4.3	4.3	4.3	4.3	4.2	0.017	0.018	0.019	0.020	0.021

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++Safety precautions++

- * Before use, read the Operating Manual carefully or consult with your dealer or our sales representative for proper use.
- * Products contained in this catalog are materials for wiring on printed circuits for electronic devices and appliances. Do not use the products for any purposes other than those specified.

++Before purchase++

- * If delivery specifications have been agreed upon, descriptions in the delivery specifications take precedence.
- * Specifications and appearances are subject to change without prior notice for product improvement.
- * For details of the products contained in this catalog, contact your dealer or our sales representative.
- * ALL data are our actual values and not assured values.

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