


## Data Sheet

### High Speed, Low Loss Multi-layer Materials

# MEGTRON4

Laminate R-5725  
Prepreg R-5620

UL/ANSI	FR-4.0	
IPC-4101	Primary:/91	
Slash Sheet	Secondary:/102(*)	

Jan. 2014 No.14012432

Partnering to go beyond.

**Electronic Materials**  
Panasonic Corporation

# Specification / Laminate R-5725

Property		Units	Test Method	Condition	Value	
THERMAL	Glass Transition Temp ( Tg )	C	DSC	As received	176	
			TMA	As received	170	
			DMA	As received	210	
	Thermal Decomposition Temp ( Td )		C	TGA	As received	360
	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	30
	CTE : $\alpha 1$	X - axis	ppm / C	IPC TM-650 2.4.24	< Tg	12 - 14
		Y - axis	ppm / C	IPC TM-650 2.4.24	< Tg	13 - 15
		Z - axis	ppm / C	IPC TM-650 2.4.24	< Tg	35
	CTE : $\alpha 2$	Z - axis	ppm / C	IPC TM-650 2.4.24	> Tg	265
ELECTRICAL	Volume Resistivity		M $\Omega$ - cm	IPC TM-650 2.5.17.1	C-96/35/90	$1 \times 10^9$
	Surface Resistivity		M $\Omega$	IPC TM-650 2.5.17.1	C-96/35/90	$1 \times 10^8$
	Dielectric Constant ( Dk )	@ 1MHz	-	IPC TM-650 2.5.5.9	C-24/23/50	3.9
		@ 1GHz	-	IPC TM-650 2.5.5.9	C-24/23/50	3.8
	Dissipation Factor ( Df )	@ 1MHz	-	IPC TM-650 2.5.5.9	C-24/23/50	0.005
		@ 1GHz	-	IPC TM-650 2.5.5.9	C-24/23/50	0.005
PHYSICAL	Water Absorption		%	IPC TM-650 2.6.2.1	D-24/23	0.14
	Peel Strength	1oz	kN / m	IPC TM-650 2.4.8	As Received	1.2
	Flammability		-	UL	C-48/23/50	94V-0

Sample thickness ; 32 mil ( 0.8 mm ) #3313  $\times$  8ply

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

# Specification / Laminate R-5725

1MHz - 1GHz ; IPC TM650-2.5.5.9

Core Type	Actual Thickness		Cloth Style	Typical Resin Content (%)	Typical Dk			Typical Df		
	mil	mm			1MHz	100MHz	1GHz	1MHz	100MHz	1GHz
2	2.0	0.050	106 X 1	72	3.39	3.39	3.38	0.005	0.005	0.006
2	2.0	0.050	1067 X 1	66	3.58	3.56	3.56	0.005	0.005	0.005
2.5	2.4	0.060	1080 X 1	59	3.82	3.79	3.77	0.005	0.005	0.005
3	3.1	0.080	1080 X 1	65	3.64	3.61	3.60	0.005	0.005	0.005
3.4	3.5	0.090	1078 X 1	68	3.54	3.50	3.47	0.005	0.005	0.006
3.5	3.5	0.090	106 X 2	69	3.51	3.48	3.46	0.005	0.005	0.006
3.5	3.5	0.090	3313 X 1	51	4.10	4.05	4.01	0.004	0.005	0.005
4	3.9	0.100	3313 X 1	57	3.89	3.85	3.83	0.005	0.005	0.005
4	3.9	0.100	1067 X 2	66	3.58	3.56	3.56	0.005	0.005	0.005
4.5	4.3	0.110	2116 X 1	51	4.10	4.05	4.01	0.004	0.005	0.005
4.7	4.7	0.120	1080 X 2	57	3.89	3.85	3.83	0.005	0.005	0.005
5	5.1	0.130	2116 X 1	56	3.93	3.88	3.86	0.005	0.005	0.005
5	5.1	0.130	1080 X 2	60	3.80	3.76	3.73	0.005	0.005	0.005
5	5.1	0.130	1078 X 2	59	3.82	3.79	3.77	0.005	0.005	0.005
5.5	5.5	0.140	1080 X 2	63	3.69	3.66	3.65	0.005	0.005	0.005
6	5.9	0.150	1080 X 2	65	3.64	3.61	3.60	0.005	0.005	0.005
6	5.9	0.150	1504 X 1	49	4.14	4.10	4.07	0.004	0.005	0.005
6	5.9	0.150	1078 X 2	65	3.64	3.61	3.60	0.005	0.005	0.005

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

# Specification / Laminate R-5725

1MHz - 1GHz ; IPC TM650-2.5.5.9

Core Type	Actual Thickness		Cloth Style	Typical Resin Content (%)	Typical Dk			Typical Df		
	mil	mm			1MHz	100MHz	1GHz	1MHz	100MHz	1GHz
7	7.1	0.180	3313 X 2	52	4.05	4.01	3.98	0.005	0.005	0.005
7	7.1	0.180	1067 X 3	70	3.47	3.46	3.45	0.005	0.005	0.006
7.5	7.5	0.190	7628 × 1	45	4.26	4.23	4.19	0.004	0.005	0.005
8	7.9	0.200	3313 × 2	57	3.89	3.85	3.83	0.005	0.005	0.005
8	7.9	0.200	2116 × 2	47	4.21	4.17	4.14	0.004	0.005	0.005
9	9.1	0.230	2116 × 2	52	4.05	4.01	3.98	0.005	0.005	0.005
10	9.8	0.250	2116 × 2	56	3.93	3.88	3.86	0.005	0.005	0.005
12	11.8	0.300	1504 × 2	49	4.14	4.10	4.07	0.004	0.005	0.005
15	15.0	0.380	7628 × 2	45	4.26	4.23	4.19	0.004	0.005	0.005
18	18.1	0.460	7628 × 2 + 3313 × 1	45	4.26	4.23	4.19	0.004	0.005	0.005
20	20.1	0.510	7628 × 2 + 1080 × 2	49	4.14	4.10	4.07	0.004	0.005	0.005
20	20.1	0.510	7628 × 2 + 2116 × 1	48	4.18	4.14	4.11	0.004	0.005	0.005
22	22.0	0.560	7628 × 3	44	4.29	4.26	4.22	0.004	0.005	0.005
24	24.0	0.610	7628 × 3	48	4.18	4.14	4.11	0.004	0.005	0.005
26	26.0	0.660	7628 × 3 + 2116 × 1	45	4.26	4.23	4.19	0.004	0.005	0.005
28	28.0	0.710	7628 × 4	42	4.36	4.33	4.29	0.004	0.005	0.005
31	31.1	0.790	7628 × 4	47	4.21	4.17	4.14	0.004	0.005	0.005
40	39.4	1.000	7628 × 5	47	4.21	4.17	4.14	0.004	0.005	0.005
47	47.2	1.200	7628 × 6	47	4.21	4.17	4.14	0.004	0.005	0.005

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

# Specification / Laminate R-5725

## 2GHz-10GHz ; IPC TM650-2.5.5.5

Core Type	Actual Thickness		Cloth Style	Typical Resin Content (%)	Typical Dk					Typical Df				
	mil	mm			2GHz	4GHz	6GHz	8GHz	10GHz	2GHz	4GHz	6GHz	8GHz	10GHz
2	2.0	0.050	106 X 1	72	3.38	3.37	3.37	3.37	3.37	0.006	0.006	0.007	0.008	0.008
2	2.0	0.050	1067 X 1	66	3.56	3.56	3.56	3.56	3.55	0.006	0.006	0.007	0.008	0.008
2.5	2.4	0.060	1080 X 1	59	3.76	3.76	3.75	3.75	3.74	0.006	0.006	0.006	0.007	0.007
3	3.1	0.080	1080 X 1	65	3.59	3.58	3.57	3.57	3.57	0.006	0.006	0.007	0.008	0.008
3.4	3.5	0.090	1078 X 1	68	3.47	3.46	3.45	3.45	3.45	0.006	0.006	0.007	0.008	0.008
3.5	3.5	0.090	106 X 2	69	3.46	3.44	3.44	3.44	3.44	0.006	0.006	0.007	0.008	0.008
3.5	3.5	0.090	3313 X 1	51	4.00	3.99	3.97	3.97	3.96	0.006	0.006	0.006	0.007	0.007
4	3.9	0.100	3313 X 1	57	3.82	3.82	3.81	3.80	3.80	0.006	0.006	0.006	0.007	0.007
4	3.9	0.100	1067 X 2	66	3.56	3.56	3.56	3.56	3.55	0.006	0.006	0.007	0.008	0.008
4.5	4.3	0.110	2116 X 1	51	4.00	3.99	3.97	3.97	3.96	0.006	0.006	0.006	0.007	0.007
4.7	4.7	0.120	1080 X 2	57	3.82	3.82	3.81	3.80	3.80	0.006	0.006	0.006	0.007	0.007
5	5.1	0.130	2116 X 1	56	3.85	3.85	3.84	3.83	3.83	0.006	0.006	0.006	0.007	0.007
5	5.1	0.130	1080 X 2	60	3.71	3.70	3.69	3.68	3.67	0.006	0.006	0.007	0.007	0.007
5	5.1	0.130	1078 X 2	59	3.76	3.76	3.75	3.75	3.74	0.006	0.006	0.006	0.007	0.007
5.5	5.5	0.140	1080 X 2	63	3.65	3.65	3.64	3.64	3.64	0.006	0.006	0.007	0.007	0.007
6	5.9	0.150	1080 X 2	65	3.59	3.58	3.57	3.57	3.57	0.006	0.006	0.007	0.008	0.008
6	5.9	0.150	1504 X 1	49	4.04	4.02	4.00	3.99	3.98	0.006	0.006	0.006	0.007	0.007
6	5.9	0.150	1078 X 2	65	3.59	3.58	3.57	3.57	3.57	0.006	0.006	0.007	0.008	0.008

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

# Specification / Laminate R-5725

2GHz-10GHz ; IPC TM650-2.5.5.5

Core Type	Actual Thickness		Cloth Style	Typical Resin Content (%)	Typical Dk					Typical Df				
	mil	mm			2GHz	4GHz	6GHz	8GHz	10GHz	2GHz	4GHz	6GHz	8GHz	10GHz
7	7.1	0.180	3313 X 2	52	3.95	3.93	3.92	3.9	3.9	0.006	0.006	0.006	0.007	0.007
7	7.1	0.180	1067 X 3	70	3.44	3.43	3.42	3.42	3.41	0.006	0.006	0.007	0.008	0.008
7.5	7.5	0.190	7628 × 1	45	4.16	4.13	4.11	4.10	4.09	0.006	0.006	0.006	0.007	0.007
8	7.9	0.200	3313 × 2	57	3.82	3.82	3.81	3.80	3.80	0.006	0.006	0.006	0.007	0.007
8	7.9	0.200	2116 × 2	47	4.10	4.08	4.06	4.05	4.04	0.006	0.006	0.006	0.007	0.007
9	9.1	0.230	2116 × 2	52	3.95	3.93	3.92	3.90	3.90	0.006	0.006	0.006	0.007	0.007
10	9.8	0.250	2116 × 2	56	3.85	3.85	3.84	3.83	3.83	0.006	0.006	0.006	0.007	0.007
12	11.8	0.300	1504 × 2	49	4.04	4.02	4.00	3.99	3.98	0.006	0.006	0.006	0.007	0.007
15	15.0	0.380	7628 × 2	45	4.16	4.13	4.11	4.10	4.09	0.006	0.006	0.006	0.007	0.007
18	18.1	0.460	7628 × 2 + 3313 × 1	45	4.16	4.13	4.11	4.10	4.09	0.006	0.006	0.006	0.007	0.007
20	20.1	0.510	7628 × 2 + 1080 × 2	49	4.04	4.02	4.00	3.99	3.98	0.006	0.006	0.006	0.007	0.007
20	20.1	0.510	7628 × 2 + 2116 × 1	48	4.08	4.05	4.04	4.02	4.01	0.006	0.006	0.006	0.007	0.007
22	22.0	0.560	7628 × 3	44	4.19	4.16	4.14	4.12	4.11	0.006	0.006	0.006	0.007	0.007
24	24.0	0.610	7628 × 3	48	4.08	4.05	4.04	4.02	4.01	0.006	0.006	0.006	0.007	0.007
26	26.0	0.660	7628 × 3 + 2116 × 1	45	4.16	4.13	4.11	4.10	4.09	0.006	0.006	0.006	0.007	0.007
28	28.0	0.710	7628 × 4	42	4.25	4.22	4.20	4.18	4.17	0.006	0.006	0.006	0.007	0.007
31	31.1	0.790	7628 × 4	47	4.10	4.08	4.06	4.05	4.04	0.006	0.006	0.006	0.007	0.007
40	39.4	1.000	7628 × 5	47	4.10	4.08	4.06	4.05	4.04	0.006	0.006	0.006	0.007	0.007
47	47.2	1.200	7628 × 6	47	4.10	4.08	4.06	4.05	4.04	0.006	0.006	0.006	0.007	0.007

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

# Specification / Prepreg R-5620

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
106	72	51	3.39	3.39	3.38	0.005	0.005	0.006
	75	58	3.33	3.33	3.32	0.005	0.005	0.006
1067	66	52	3.58	3.56	3.56	0.005	0.005	0.005
	70	59	3.47	3.46	3.45	0.005	0.005	0.006
	74	70	3.34	3.34	3.33	0.005	0.005	0.006
1080	65	76	3.64	3.61	3.60	0.005	0.005	0.005
	69	87	3.51	3.48	3.46	0.005	0.005	0.006
	73	102	3.38	3.38	3.37	0.005	0.005	0.006
	77	122	3.32	3.32	3.31	0.005	0.005	0.006
1078	64	75	3.65	3.63	3.62	0.005	0.005	0.005
	69	89	3.51	3.48	3.46	0.005	0.005	0.006
3313	57	103	3.89	3.85	3.83	0.005	0.005	0.005
	63	123	3.69	3.66	3.65	0.005	0.005	0.005
2116	53	118	4.03	3.98	3.95	0.005	0.005	0.005
	56	128	3.93	3.88	3.86	0.005	0.005	0.005
	59	139	3.82	3.79	3.77	0.005	0.005	0.005
1504	51	160	4.10	4.05	4.01	0.004	0.005	0.005
1501	51	178	4.10	4.05	4.01	0.004	0.005	0.005
7628	44	190	4.29	4.26	4.22	0.004	0.005	0.005

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

# Specification / Prepreg R-5620

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	72	51	3.38	3.37	3.37	3.37	3.37	0.006	0.006	0.007	0.008	0.008
	75	58	3.32	3.31	3.31	3.31	3.31	0.006	0.007	0.007	0.008	0.009
1067	66	52	3.56	3.56	3.56	3.56	3.55	0.006	0.006	0.007	0.008	0.008
	70	59	3.44	3.43	3.42	3.42	3.41	0.006	0.006	0.007	0.008	0.008
	74	70	3.33	3.32	3.32	3.32	3.32	0.006	0.007	0.007	0.008	0.008
1080	65	76	3.59	3.58	3.57	3.57	3.57	0.006	0.006	0.007	0.008	0.008
	69	87	3.46	3.44	3.44	3.44	3.44	0.006	0.006	0.007	0.008	0.008
	73	102	3.37	3.36	3.36	3.36	3.36	0.006	0.006	0.007	0.008	0.008
	77	122	3.31	3.31	3.30	3.30	3.30	0.006	0.007	0.008	0.008	0.009
1078	64	75	3.62	3.62	3.61	3.61	3.61	0.006	0.006	0.007	0.007	0.008
	69	89	3.46	3.44	3.44	3.44	3.44	0.006	0.006	0.007	0.008	0.008
3313	57	103	3.82	3.82	3.81	3.80	3.80	0.006	0.006	0.006	0.007	0.007
	63	123	3.65	3.65	3.64	3.64	3.64	0.006	0.006	0.007	0.007	0.007
2116	53	118	3.94	3.92	3.90	3.88	3.87	0.006	0.006	0.006	0.007	0.007
	56	128	3.85	3.85	3.84	3.83	3.83	0.006	0.006	0.006	0.007	0.007
	59	139	3.76	3.76	3.75	3.75	3.74	0.006	0.006	0.006	0.007	0.007
1504	51	160	4.00	3.99	3.97	3.97	3.96	0.006	0.006	0.006	0.007	0.007
1501	51	178	4.00	3.99	3.97	3.97	3.96	0.006	0.006	0.006	0.007	0.007
7628	44	190	4.19	4.16	4.14	4.12	4.11	0.006	0.006	0.006	0.007	0.007

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