Panasonic
INDUSTRY

Data Sheet

High thermal conductivity Low transmission loss Halogen-free Multi-layer circuit board materials

Material for PA and Antenna application

XPEDION T1

Laminate R-5575X
Prepreg R-5470X

Any letters with parentheses ( ) at the end of a part number are for identification code in our company and are not included in the part numbers registered for UL certification.

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Partnering to go beyond.

Electronic Materials
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General Properties / Laminate R-5575X

Items			Units	Test Method	Condition	Typical Values
						R-5575X
THERMAL	Glass Transition Temp (Tg)		C	TMA	As received	205
				DMA	As received	245
	Thermal Decomposition Temp (Td)		C	TGA	As received	440
	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	> 120
	CTE : α1	X - axis	ppm / C	IPC TM-650 2.4.24	< Tg	13 - 16
		Y - axis	ppm / C	IPC TM-650 2.4.24	< Tg	13 - 16
		Z - axis	ppm / C	IPC TM-650 2.4.24	< Tg	20
	CTE : α2	Z - axis	ppm / C	IPC TM-650 2.4.24	> Tg	155
	Thermal Conductivity		W / m K	Laser flash	25C	0.60
ELECTRICAL	Volume Resistivity		MΩ - cm	IPC TM-650 2.5.17.1	C-96/35/90	1×10^{9}
	Surface Resistivity		MΩ	IPC TM-650 2.5.17.1	C-96/35/90	1×10^{8}
	Dielectric Constant (Dk)	@ 1GHz	-	IPC TM-650 2.5.5.9	C-24/23/50	3.73
		@ 13GHz	-	“ Note 1	C-24/23/50	3.60
	Dissipation Factor (Df)	@ 1GHz	-	IPC TM-650 2.5.5.9	C-24/23/50	0.002
		@ 13GHz	-	“ Note 1	C-24/23/50	0.0045
PHYSICAL	Water Absorption		%	IPC TM-650 2.6.2.1	D-24/23	0.23
	Peel Strength	1oz (RTF)	kN / m	IPC TM-650 2.4.8	As received	0.8
	Flammability		-	UL 94V	C-48/23/50	94V-0

Sample thickness : 30 mil = 0.76 mm (Core Type 30) #1078 x 9ply

Note 1 : Balanced-type Circular Disk Resonance Method [IEC 63185 (2020)]

* The data in the above table represents typical values for your reference and are not guaranteed values.

Dielectric Properties / Laminate R-5575X

1GHz ; IPC TM650-2.5.5.9
13-55GHz ; Balanced-type Circular Disk Resonance Method [IEC 63185 (2020)]

Core Type	Actual Thickness		Cloth Style	ply	Typical Resin Content (%)	Typical Dk					
	mil	mm				1GHz	13GHz	23GHz	34GHz	45GHz	55GHz
4	4.0	0.102	1078	1	75	3.60	3.49	3.49	3.49	3.49	3.49
5	5.0	0.127	3313	1	66	3.80	3.66	3.66	3.66	3.66	3.66
5	5.0	0.127	1078	1	79	3.53	3.42	3.42	3.42	3.42	3.42
6	6.0	0.152	2116	1	63	3.87	3.72	3.72	3.72	3.72	3.72
6.6	6.6	0.168	1078	2	69	3.73	3.60	3.60	3.60	3.60	3.60
6.6	6.6	0.168	1067	2	80	3.51	3.40	3.40	3.40	3.40	3.40
8	8.0	0.203	1078	2	75	3.60	3.49	3.49	3.49	3.49	3.49
10	10.0	0.254	1078	3	69	3.73	3.60	3.60	3.60	3.60	3.60
10	10.0	0.254	3313	2	66	3.80	3.66	3.66	3.66	3.66	3.66
13.3	13.3	0.338	1078	4	69	3.73	3.60	3.60	3.60	3.60	3.60
13.3	13.3	0.338	1067	4	80	3.51	3.40	3.40	3.40	3.40	3.40
16.6	16.6	0.422	1078	5	69	3.73	3.60	3.60	3.60	3.60	3.60
16.6	16.6	0.422	1067	5	80	3.51	3.40	3.40	3.40	3.40	3.40
20	20.0	0.508	1078	6	69	3.73	3.60	3.60	3.60	3.60	3.60
20	20.0	0.508	3313	4	66	3.80	3.66	3.66	3.66	3.66	3.66
30	30.0	0.762	1078	9	69	3.73	3.60	3.60	3.60	3.60	3.60
30	30.0	0.762	3313	6	66	3.80	3.66	3.66	3.66	3.66	3.66

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Dielectric Properties / Laminate R-5575X

1GHz ; IPC TM650-2.5.5.9
13-55GHz ; Balanced-type Circular Disk Resonance Method [IEC 63185 (2020)]

Core Type	Actual Thickness		Cloth Style	ply	Typical Resin Content (%)	Typical Df					
	mil	mm				1GHz	13GHz	23GHz	34GHz	45GHz	55GHz
4	4.0	0.102	1078	1	75	0.002	0.0044	0.0046	0.005	0.0053	0.0056
5	5.0	0.127	3313	1	66	0.002	0.0045	0.0048	0.0052	0.0056	0.0059
5	5.0	0.127	1078	1	79	0.002	0.0043	0.0046	0.0049	0.0052	0.0055
6	6.0	0.152	2116	1	63	0.002	0.0046	0.0049	0.0053	0.0057	0.006
6.6	6.6	0.168	1078	2	69	0.002	0.0045	0.0048	0.0051	0.0055	0.0058
6.6	6.6	0.168	1067	2	80	0.002	0.0043	0.0046	0.0049	0.0052	0.0055
8	8.0	0.203	1078	2	75	0.002	0.0044	0.0046	0.005	0.0053	0.0056
10	10.0	0.254	1078	3	69	0.002	0.0045	0.0048	0.0051	0.0055	0.0058
10	10.0	0.254	3313	2	66	0.002	0.0045	0.0048	0.0052	0.0056	0.0059
13.3	13.3	0.338	1078	4	69	0.002	0.0045	0.0048	0.0051	0.0055	0.0058
13.3	13.3	0.338	1067	4	80	0.002	0.0043	0.0046	0.0049	0.0052	0.0055
16.6	16.6	0.422	1078	5	69	0.002	0.0045	0.0048	0.0051	0.0055	0.0058
16.6	16.6	0.422	1067	5	80	0.002	0.0043	0.0046	0.0049	0.0052	0.0055
20	20.0	0.508	1078	6	69	0.002	0.0045	0.0048	0.0051	0.0055	0.0058
20	20.0	0.508	3313	4	66	0.002	0.0045	0.0048	0.0052	0.0056	0.0059
30	30.0	0.762	1078	9	69	0.002	0.0045	0.0048	0.0051	0.0055	0.0058
30	30.0	0.762	3313	6	66	0.002	0.0045	0.0048	0.0052	0.0056	0.0059

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Dielectric Properties / Prepreg R-5470X

1GHz ; IPC TM650-2.5.5.9
13-55GHz ; Balanced-type Circular Disk Resonance Method [IEC 63185 (2020)]

Cloth Style	Resin Content (%)	Typical Thickness (um)	Typical Dk					
			1GHz	13GHz	23GHz	34GHz	45GHz	55GHz
1067	78	75	3.54	3.44	3.44	3.44	3.44	3.44
	81	90	3.49	3.38	3.38	3.38	3.38	3.38
	83	100	3.45	3.35	3.35	3.35	3.35	3.35
1078	79	125	3.53	3.42	3.42	3.42	3.42	3.42

Cloth Style	Resin Content (%)	Typical Thickness (um)	Typical Df					
			1GHz	13GHz	23GHz	34GHz	45GHz	55GHz
1067	78	75	0.002	0.0043	0.0046	0.0049	0.0052	0.0055
	81	90	0.002	0.0043	0.0046	0.0049	0.0052	0.0055
	83	100	0.002	0.0042	0.0045	0.0047	0.0050	0.0052
1078	79	125	0.002	0.0043	0.0046	0.0049	0.0052	0.0055

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