

TCLAD SFL Dielectric

Material Characteristic

Test Method

THERMAL PROPERTIES

Product Thermal Conductivity [W/m-K] *		In-house TO-220
Product Thermal Impedance [°C/W]		In-house TO-220
Dielectric Thermal Conductivity [W/m-K]		ASTM D5470
Dielectric Thermal Resistance [°C-in ² /W]	100um	ASTM D5470
Tg (Glass Transition Temperature) [°C]		IPC-TM-650 2.4.25
Decomposition Temperature (Td) [°C]	2%	IPC-TM-650 2.4.24.6
	5%	IPC-TM-650 2.4.24.6
Specific Heat [J/gK]		ASTM E1269
Thermal Stress	T260 (mins)	IPC TM-650 2.4.13.1
	T288 (mins)	IPC TM-650 2.4.13.1
RTI (Relative Temperature Index) (MOT)		UL746
Solder Limit		UL746

ELECTRICAL PROPERTIES

Dielectric Constant		IPC-TM-650 2.5.5.3
Dissipation Factor (Dielectric Loss Tangent)		IPC-TM-650 2.5.5.3
Capacitance [pF/m ²]		IPC-TM-650 2.5.5.3
Volume Resistance [$\Omega \cdot \text{cm}$]		IPC-TM-650 2.5.17.1
Surface Resistance [Ω]		IPC-TM-650 2.5.17.1
	50um	
	60um	
Breakdown Voltage (kv AC)	80um	ASTM D149
	100um	
	150um	

MECHANICAL PROPERTIES

Typical Peeling Strength [Kg/cm]		IPC TM-650 2.4.8
Thermal Expansion CTE [PPM/°C]	>Tg	IPC-TM-650 2.4.24.5
	<Tg	IPC-TM-650 2.4.24.5
Storage Modulus (Gpa)		ASTM 4065
Poisson's ratio		ASTM D638

CHEMICAL PROPERTIES

Water Absorption [%]	IPC-TM-650 2.6.2.1
Out-Gassing Total Mass Loss [%]	ASTM E595
Collect Volatile Condensable Material [%]	ASTM E595
Specific Gravity [g/cm ³]	ASTM D792

AGENCY RATINGS & DURABILITY

Relative Temperature Index (MOT)	UL746
Flammability	UL 94
Comparative Tracking Index (CTI)	UL 746E
Solder Limit	UL746

* product performance is based on 1.5mm Al and 2oz copper

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Material Characteristics



Dielectric Product Family

SFL-2A

SFL-3

SFL-3E

SFL-4

SFL-8

2.7	3	3	4	8
0.37	0.33	0.33	0.25	0.13
1.65	1.7	1.60	2.5	2.75
<0.13	<0.12	<0.13	0.11	0.08
130	140	55	150	150
350	350	350	350	350
380	400	380	400	400
0.929	0.925	0.934	0.904	0.894
>60	>60	>60	>60	>60
>30	>30	>30	>30	>30
110	130	-	110	130
300°C/60sec	300°C/60sec	-	300°C/60sec	300°C/60sec

4.8	5.1	7.9	4.9	5.2
0.021	0.023	0.025	0.022	0.024
0.43	0.45	0.70	0.43	0.46
>10 ¹⁵	>10 ¹⁵	>10 ¹⁵	>10 ¹⁵	>10 ¹⁵
>10 ¹³	>10 ¹³	>10 ¹³	>10 ¹³	>10 ¹³
-	3	-	-	3
-	-	-	-	-
5	5	5	4	4
6	6	7	5	5
8	8	9	7	7

>1.4	>1.4	>1.4	>1.4	>1.4
30	32	37	25	35
20	25	24	16	28
-	-	0.5	-	-
0.04	0.06	0.1	0.04	0.08

<0.5	<0.5	<0.5	<0.5	<0.5
<0.1	<0.1	<0.1	<0.1	<0.1
<0.1	<0.1	<0.1	<0.1	<0.1
2.70	2.70	2.66	2.93	3.02

110	130	-	110	130
V-0	V-0	-	V-0	V-0
600	600	-	600	600
300°C/60sec	300°C/60sec	-	300°C/60sec	300°C/60sec

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12
0.08
3.2
0.06
180
370
400
0.876
>60
>30
130
300°C/60sec

8.27
0.022
0.73
>10¹³
>10¹³
-
3
4
5
7

>1.3
18
15
-
0.13

<0.5
<0.1
<0.1
2.78

130

V-0

600

300°C/60sec

