

## Glass Epoxy Double sided Materials for PCB

Test item		Condition	Unit	ELC-4762	ELC-4970	ELC-4972R&S	ELC-4970GS
				FR-4	CEM-3	CEM-3	CEM-3
Coefficient of thermal expansion	X( $\alpha$ 1)	10°C/min	ppm/°C	14	20	20	20
	Y( $\alpha$ 1)			16	24	24	24
	Z( $\alpha$ 1)			65	47	47	47
	Z( $\alpha$ 2)			270	300	300	300
Glass transition temperature	TMA	10°C/min	°C	135	125	125	120
	DMA	5°C/min		150	150	150	140
	DSC	20°C/min		145	130	110	110
Solder heat esistance		D-2/100+260°Cdip20"	-	No delamination	No delamination	No delamination	No delamination
		PCT-2/121+260°CFloat20"		No delamination	No delamination	No delamination	No delamination
Peel strength	18umCF	A	kN/m	1.5	1.5	1.4	1.4
		S-20"/260		1.5	1.5	1.4	1.4
Flexural strength	MD	A	MPa	539	350	350	350
	TD			470	300	300	300
Flexural modulus	MD	A	GPa	16	18	18	19
	TD			15	16	16	16
Tnsile strength	MD	A	MPa	260	160	160	130
	TD			260	100	100	90
Tesile modulus	MD	A	Gpa	15	14	14	14
	TD			15	12	12	12
Dielectric constant	1MHz	C-96/20/65	-	4.7	4.5	4.5	4.5
		C-96/20/65+D-24/23		4.7	4.5	4.5	4.5
	1GHz	C-96/20/65		4.5	4.1	4.1	4.4
		C-96/20/65+D-24/23		4.6	4.2	4.2	4.2
Dissipation factor	1MHz	C-96/20/65	-	0.018	0.020	0.020	0.020
		C-96/20/65+D-24/23		0.019	0.022	0.022	0.022
	1GHz	C-96/20/65		0.014	0.018	0.018	0.018
		C-96/20/65+D-24/23		0.020	0.019	0.019	0.019
Volume resistivity	A	C-96/40/90	$\Omega \cdot \text{cm}$	5E+15	1E+15	1E+15	1E+15
				1E+15	5E+14	5E+14	5E+14
Surface resistivity	A	C-96/40/90	$\Omega$	1E+15	1E+14	1E+14	1E+14
				2E+14	1E+13	1E+13	1E+13
Water absorption		E-24/50+D-24/23	%	0.10	0.09	0.09	0.09
Flame resistance	UL-94V	-	-	94V-0	94V-0	94V-0	94V-0
Thermal conductivity	Laser flash	-	W/mK	0.4	0.7	1.0	1.0

\*The data mentioned above is not guaranteed value but representative.