

# MATERIAL PROPERTIES

MATERIAL OPTIONS		ELECTRICAL				THERMAL		MECHANICAL		CONDUCTOR MATERIAL	Sheet Resistance m ohms/sq of	VSS and VCC plane requirement	Firing Condition Atm/temp/vitrifying	Design Rules Available
		DIELECTRIC CONSTANT		TAN $\sigma$ ( $\times 10^{-4}$ )		T. C. E. (40-400°C)	Thermal Conductivity W/mK	Flexural Strength MPa	Young's Modulus of Elasticity GPa					
		(1MHz)	(3.2 GHz)	(1MHz)	(3.2 GHz)	( $\times 10^{-6}$ ) 1°C								
ALUMINA	A473 (92%)	9.0	8.7	5.0	9.5	7.0	19.0	310	260	W, Mo	need	mesh/solid?	need	need
	A493 (99.5%)	9.9	9.5	1.0	0.7	7.2	31.0	517	-	W, Mo, T/F	need	need	need	need
	A440 (90%)	10.0	-	13.0	need	7.0	18.0	270	250	W, Mo	need	need	need	need
	A443 (92%)	9.6	-	5.0	need	6.9	20.0	460	-	W, Mo	need	need	need	need
ALUMINUM NITRIDE	AN271 (Single Layer)	8.8	-	1.0	-	4.7	170.0	450	310	W	need	need	need	need
	AN242	8.7	8.6	1.0	60.0	4.7	150.0	400	320	W	need	need	need	need
	AN75W	8.6	8.7	6.0	110.0	4.9	75.0	400	310	W	need	need	need	need
GLASS CERAMICS	GL550 (KC-LTCC)	5.6	5.7	6.0	10.0	5.9	2.5	200	110	Cu	need	need	need	need
	GL660 (High $\epsilon$ )	9.4	9.5	2.0	16.0	6.2	1.3	200	100	Cu	need	need	need	need
	GL771 (HITCE)	5.4	5.4	7.0	20.0	12.2	2.0	200	75	Cu	need	need	Ni/900oC/Devitrious	<<??
	DUPONT 951	7.8	-	1.5	need	5.8	3.0	320	152	Au, Ag, Resistor	need	need	need	need
	FERRO A-6	5.9	-	1.0	need	7.0	2.0	210	92	Au, Ag, Resistor	need	need	need	need
Organic	BT	4.7		100	need	13.0 -16.0	0.2	580		Cu	need	need	need	need
	Build up Insulation Layer									Cu		need	need	need
	Solder Resist									-		need	need	need