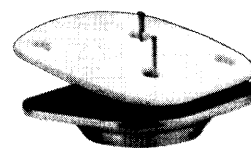


ALUMINUM OXIDE CERAMIC

Aluminum oxide insulating washers have a dielectric strength of approximately 21.7×10^3 volts/mm for .76mm material (550 volts/mil for 0.030 inch material) and 16.9×10^3 volts/mm for 1.57mm material (430 volts/mil for 0.062 inch material.) The thermal conductivity of aluminum oxide is 0.036 cal/cm-sec-°C at 75° (167°F) [8.71 Btu./hr-ft-°F].

Aluminum oxide has unique thermal conductivity qualities and features low loss factors at high frequencies. It has high compressive strengths, high volume resistivity, low thermal expansion, and it resists radiation.

Note: Hole diameters are $\pm .13\text{mm}$ (.005"), angularity is $\pm 1^\circ$, and flatness is .05mm (.002") TIR unless otherwise specified.

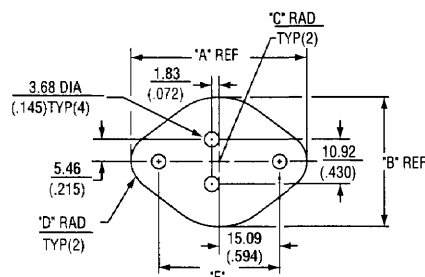


INSULATORS

ALUMINUM OXIDE		
PROPERTY	TYPICAL VALUE	TEST METHOD
CHEMICAL		
Al ₂ O ₃ content	94% nominal	Spectrographic Analysis (100%-% by wt. of total metallic impurity)
ELECTRICAL		
Dielectric Constant 25°C (77°F)	8.9(1 MHz) 8.9(10 GHz)	ASTM D150-70 ASTM D2520-70
Dissipation Factor 25°C (77°F)	0.0001(1 MHz) 0.0010(10 GHz)	ASTM D150-70 ASTM D2520-70
Electrical Resistivity 25°C (77°F)	$>10^{14}$ ohm-cm	ASTM D1829-66
Dielectric Strength (AC)	8.66 x 10 ³ volts/mm (6.35mm) [220 volts/mil(0.250" thick)] 16.73 x 10 ³ volts/mm (1.27mm) [425 volts/mil(0.050" thick)] 28.35 x 10 ³ volts/mm (0.25mm) [720 volts/mil(0.010" thick)]	ASTM D116-69
PHYSICAL		
Density	3.62 g/cm ³ (226 Lb./ft ³)	ASTM C20-70
Hardness	78(Rockwell 45 N)	ASTM E18-67
MECHANICAL		
Flexural Strength 25°C (77°F)	3.17 x 10 ⁸ Pa (minimum) [46,000 psi (minimum)] 3.52 x 10 ⁸ Pa (typical) [51,000 psi (typical)]	ACMA Test #2
Modulus of Elasticity	2.83 x 10 ¹¹ Pa (41 x 10 ⁶ psi)	ASTM C623-69T
Poisson's Ratio	0.21	ASTM C623-69T
Tensile Strength 25°C (77°F)	1.93 x 10 ⁸ Pa (28,000 psi)	ACMA Test #4
Compressive Strength 25°C (77°F)	2.10 x 10 ⁹ Pa (305,000 psi)	ASTM C528-63T
THERMAL		
Coefficient of Thermal Expansion	7.9 x 10 ⁻⁶ /°C (4.4 x 10 ⁻⁶ /°F)	ASTM C372-56
Thermal Conductivity	18.0067 Wm ⁻¹ K ⁻¹ [10.40 Btu/hr-ft ² °F(68°F)] 14.2379 Wm ⁻¹ K ⁻¹ [8.22 Btu/hr-ft ² °F(212°F)] 79.564 Wm ⁻¹ K ⁻¹ [4.60 Btu/hr-ft ² °F(752°F)]	ASTM C408-58
Specific Heat (100°C)	8.79x10 ⁻⁴ KJ/Kg-°C [2.1 x 10 ⁻⁴ Btu/Lb-°F]	ASTM C351-61
Melting Point	$>3600^\circ\text{C}$ (6512° F)	
Maximum Temperature for Continuous Use	1700° C(3100° F)	

FOR T0-3					
Part No.	A	B	C	D	E
4103 *	39.70 (1.563)	26.67 (1.050)	13.34 (.525)	4.75 (.187)	30.40 (1.197)
4104 *	44.45 (1.750)	31.75 (1.250)	15.88 (.625)	7.16 (.282)	30.15 (1.187)

*Thickness 1.78mm $\pm .25$ (.070" $\pm .010$ ")



FOR T0-218, T0-247, AND T0-3P					
Part No.	A	B	C	D	E
4180 *	23.24 (.915)	18.80 (.740)	6.98 (.275)	9.40 (.370)	3.96 (.156)

*Thickness 1.78mm $\pm .25$ (.070" $\pm .010$ ")

FOR T0-220					
Part No.	A	B	C	D	E
4169 *	19.30 (.760)	13.97 (.550)	4.78 (.188)	6.98 (.275)	3.68 (.145)
4170 **	19.30 (.760)	13.97 (.550)	4.78 (.188)	6.98 (.275)	3.68 (.145)
4171 **	16.51 (.650)	12.70 (.500)	4.32 (.170)	6.35 (.250)	3.81 (.150)
4177 **	17.45 (.687)	14.27 (.562)	5.54 (.218)	7.14 (.281)	3.18 (.125)

*Thickness 1.57mm $\pm .08$ (.062" $\pm .003$ "); surface flatness is .10mm (.004") TIR

**Thickness 1.78mm $\pm .25$ (.070" $\pm .010$ ")

