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Insulating Hardware

Insulating hardware includes a diverse range of harder, thermally conductive materials with higher insulating capabilities.

Aluminum Oxide Ceramic
These washers feature a high dielectric strength and unique thermal conductivity attributes.

Bushings
Insulated devices for mounting and to allow electrical conductors to pass through product design safely.

Hard Anodized Aluminum
Unique hard coating process with high dielectric capabilities and high thermal conductivity.

Insulating Covers
Designed to provide increased protection from shock during field service and repair.

Mica
Ideal for use in applications with extremely high operating temperatures.

Beryllium Oxide Ceramic
Unique design prevents circuit de-tuning and loss of signal power.

Aluminum Oxide Ceramic

Aluminum oxide insulating washers have a dielectric strength of approximately 21.7 x 10⁵ volts/mm for 0.76mm material (550 volts/mil for 0.030 inch material) and 16.9 x 10⁵ volts/mm for 1.57mm material (430 volts/mil for 0.062 inch material). The thermal conductivity of aluminum oxide is 15.06 W/mK @ 75° (8.71 BTU/hr-ft-°F @ 167°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 +/- 0.13mm (0.005"), angularity is +/- 1° and flatness is 0.05mm (0.002") TIR unless otherwise specified.

For TO-3

Part Number	A	B	C	D	E	Thickness	Buy Now
4103G	39.70 (1.563)	26.67 (1.050)	13.34 (0.525)	4.75 (0.187)	1.78(0.070) to 2.03 (0.080)	30.40 (1.197)	

For TO-220

Part Number	A	B	C	D	E	Surface Flatness	Thickness	Buy Now
4169G	19.30 (0.760)	13.97 (0.550)	4.78 (0.188)	6.98 (0.275)	3.68 (0.145)	0.10 (0.004) TIR	1.57mm +/- 0.08 (0.062 +/- 0.003)	
4170G*	19.30 (0.760)	13.97 (0.550)	4.78 (0.188)	6.98 (0.275)	3.68 (0.145)	0.05 (0.002) TIR	1.57mm +0.51/- 0.08 (0.062 + 0.020/- 0.003)	
4171G*	16.51 (0.650)	12.70 (0.500)	4.32 (0.170)	6.35 (0.250)	3.81 (0.150)	0.05 (0.002) TIR	1.778mm +/- 0.254 (0.070 +/- 0.010)	
4177G*	17.45 (0.687)	14.27 (0.562)	5.54 (0.218)	7.14 (0.281)	3.18 (0.125)	0.05 (0.002) TIR	1.778 +/- 0.254 (0.070 +/- 0.010)	

For TO-218, TO-247, and TO-3P

Part Number	A	B	C	D	E	Thickness	Buy Now
4180G	23.24 (0.915)	18.80 (0.740)	6.98 (0.275)	9.40 (0.370)	3.96 (0.156)	2.03 +/- .25 (0.080 +/- .010)	

Insulating Covers

Hard plastic covers designed to fit over TO-3 devices that protect from electrical shock during field service and repair. Aavid covers are available in screw-on and snap-on attachment methods for easy use and installation.

8903 Screw Mounted Cover

Pan head screws not provided - MS51957-30 or equivalent recommended - secure the cover to the TO-3. At the typical mounting screw torque of 68 - 90 Nm (6-8 inch pounds), the TO-3 cover material cold-flows around the screw head to securely fasten the cover.

Included are No.6 split washers as inserts to provide electrical connection of mounting screws to the TO-3 collector and an insulating snap-in cover for the screw heads. A test probe hole is provided in the top of the cover.

The 8903VB is made from thermoplastic polyester that meets the requirements of UL Bulletin 94 V-O. In addition to its excellent flammability rating, thermoplastic polyester offers resistance to most chemical environments, heat deflection temperature to 215.6° C (420° F) and UL continuous use temperature of 130 °C (266 °F).

Part Number	Material	Color	Flammability Standards	Buy Now
8903NWG	Nylon	White	Self-extinguishing UL 94 V-2	
8903VBG	Thermoplastic Polyester	Black	Self-extinguishing UL 94 V-0 UL 492 Type 1	

8909 Snap on Cover

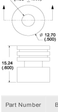
Aavid 8909 Snap on Cover is designed to prevent accidental electrical shock, the 8909 fits TO-3 case styles. A test probe hole in top eliminates the need to remove cover for testing. Recommended for low vibration applications. A precise friction fit is required for proper assembly. Please read the engineering information release for more details on the fit problems that can arise.
The 8903 cover shown above is recommended for most applications due to the typical size variation of the TO-3 package.

Part Number	Material	Color	Flammability Standards	Buy Now
8909NBG	Nylon	Black	UL 94 V-2	

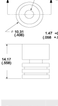
Bushings - Insulating Hardware

PTFE-Filled Acetal Insulators

Electrically insulating liners designed to enable electrical connectors to pass through grounded barriers. Aavid bushings are made of a variety of thermoplastic polymers and designed for easy use and optimized electrical insulation.



Part Number	FITS Notch	A Dim	Buy Now
103G	4.83 (0.190)	4.90 (0.193)	
109G	6.35 (0.250)	6.35 (0.250)	



Part Number	Buy Now
110500F00000G	

Part Number	Buy Now
110700F00000G	

PTFE-Filled Acetal Bushings

Part Number	I.D.	O.D.	T	Buy Now
110G	5.08 / 5.21 (0.198 / 0.205)	6.86 / 6.98 (0.269 / 0.275)	1.57 / 1.40 (0.062 / 0.055)	
113G	6.48 / 6.60 (0.253 / 0.260)	7.87 / 8.00 (0.308 / 0.315)	1.57 / 1.40 (0.062 / 0.055)	

Nylon Bushings - Material is Nylon type 6

Part Number	A	B	C	Buy Now
114*	4.50 / 4.63 (0.177 / 0.182)	3.56 / 3.81 (0.140 / 0.150)	1.40 / 1.66 (0.055 / 0.065)	
116**	9.19 / 9.45 (0.362 / 0.372)	6.71 / 6.96 (0.264 / 0.274)	1.45 / 1.70 (0.057 / 0.067)	

*Formerly Motorola Part Number 8515477002
**Formerly Motorola Part Number 8515477013