1N6519 Power Dissipation in Oil

10kV, 500mA, 70ns, Hermetically-sealed, Axial-leaded, Multi-junction Diode

Twenty 1N6519 diodes successfully completed 1000-hours of continuous, $1A_{d.c.}$ forward current testing while immersed in a dielectric fluid. A constant temperature of 70°C was maintained by recirculating and cooling the dielectric fluid.

Figure 1 illustrates the basic block diagram of the diode test set-up. Figure 2 shows the diode ratings.

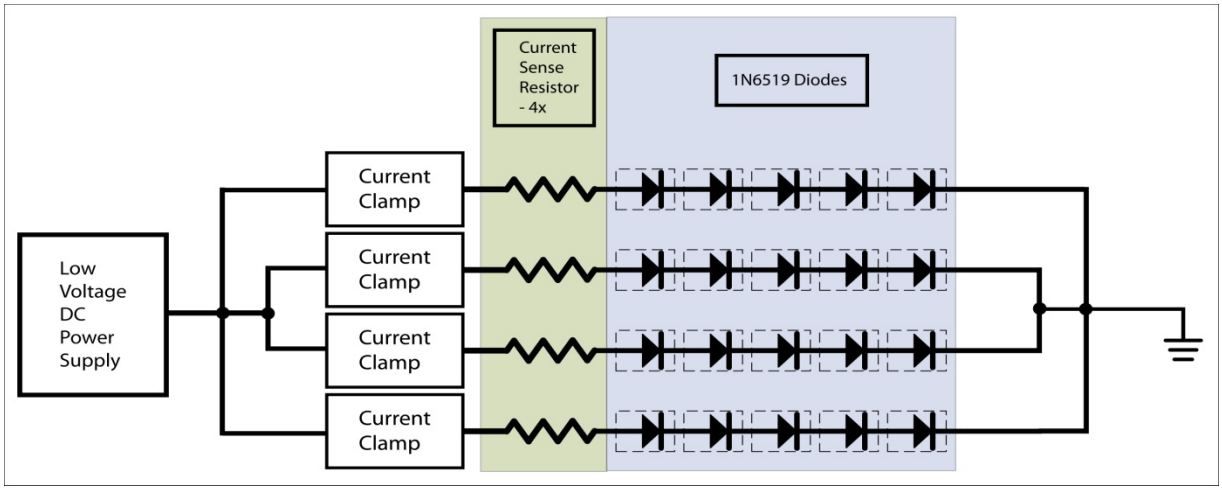
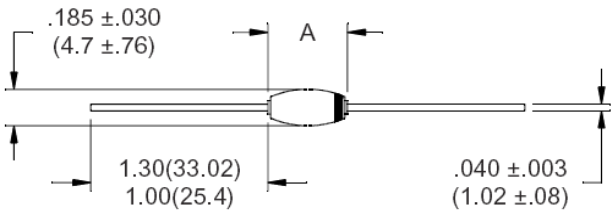


Figure 1

Part Number	Working Reverse Voltage (Vrwm)	Average Rectified Current (Io)		Reverse Current @ Vrwm (Ir)		Forward Voltage (Vf)		1 Cycle Surge Current tp=8.3ms (Ifsm)	Repetitive Surge Current (Ifrm)	Reverse Recovery Time (3) (Trr)	Thermal Impedance RθJ-L			Junction Cap. @50VDC @ 1kHZ (Cj)
		55°C(1)	100°C(2)	25°C	100°C	25°C		25°C	25°C	25°C	L=.000	L=.125	L=.250	25°C
	Volts	Amps	Amps	µA	µA	Volts	Amps	Amps	Amps	ns	°C/W	°C/W	°C/W	pF
1N6519	10000	0.50	0.25	1.0	25	13.0	.05	25	5	70	3	6	12	8



Part	A
1N6513	.310(7.82) MAX. .250(7.6) MIN.
1N6515	.330(8.38) MAX. .270(6.85) MIN.
1N6517	.350(8.89) MAX. .290(7.37) MIN.
1N6519	.400(10.16) MAX. .340(8.64) MIN.

Figure 2

The current clamps were added to limit the current to 1A ± .01A through each string of series diodes. The current sense resistors served as validation of the forward current through the diodes.

Multiple parallel paths were used to keep any diode failures from halting testing on all parts.

Monitoring average power dissipation, along with thermal imaging during testing, revealed the 10kV-rated 1N6519 diode was able to dissipate approximately 8 Watts continuously while maintaining a maximum junction temperature at, or below, 150°C.

This suggests that high voltage diodes may be operated at higher-than-stated-ratings as long as sufficient cooling is provided and the junction temperature does not exceed 150°C. Since results will depend on environmental operating conditions, it is important to validate device performance under conditions specific to the application.

Daniel Deschenes
VMI Application Sales Engineer