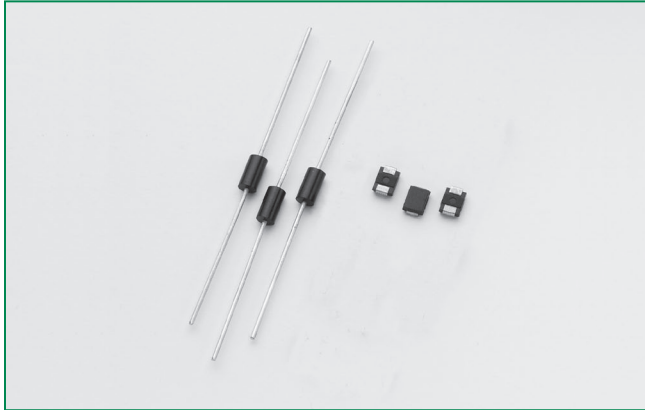


KxxxzyU SIDAC Series

RoHS



Schematic Symbol



Description

The SIDAC is a silicon unilateral voltage triggered switch. Upon application of a voltage exceeding the SIDAC breakover voltage point, the SIDAC switches on through a negative resistance region to a low on-state voltage. Conduction continues until the current is interrupted or drops below the minimum holding current of the device.

SIDACs feature glass-passivated junctions to ensure a rugged and dependable device capable of withstanding harsh environments.

Features

- AC/DC Circuit Oriented
- RoHS Compliant
- Triggering Voltage of 75V to 210V

Applications

Suitable for capacitor-discharge HV generator circuit

Electrical Specifications ($T_J = 25^\circ\text{C}$, unless otherwise specified)

Symbol	Parameters	Test Conditions	min	max	Unit
V_{BO}	Breakover/Trigger Voltage	K0820yURP	75	90	V
		K0900yURP	79	97	
		K1050yURP	95	110	
		K1100yURP	104	118	
		K1200yURP	110	125	
		K1300yURP	120	138	
		K1400yURP	130	146	
		K1500yURP	142	157	
		K2000yURP	190	210	
V_{DRM}	Repetitive Peak Off-state Voltage	K0820yURP	70		V
		K0900yURP	70		
		K1050yURP	90		
		K1100yURP	90		
		K1200yURP	100		
		K1300yURP	110		
		K1400yURP	115		
		K1500yURP	120		
		K2000yURP	170		

Electrical Specifications ($T_J = 25^\circ\text{C}$, unless otherwise specified)

Symbol	Parameters	Test Conditions	Min	Max	Unit
$I_{T(RMS)}$	On-state RMS Current	50/60Hz, $T_J < 125^\circ\text{C}$		1	A
I_{DRM}	Repetitive Peak Off-state Current	$V = V_{DRM}$ 50/60Hz Sine Wave		5	μA
V_{TM}	Peak On-state Voltage	$I_T = 1\text{A}$		1.5	V
I_H	Dynamic Holding Current	$R_L = 100\Omega$ 50/60Hz Sine Wave	10	80	mA
R_S	Switching Resistance, $R_S = \frac{(V_{BO} - V_S)}{(I_S - I_{BO})}$	50/60Hz Sine Wave	100		Ω
I_{BO}	Breakover Current	50/60Hz Sine Wave		10	μA
I_{TRM}	Peak Repetitive Pulse Current (refer to figure 4)	$t_p = 10\mu\text{s}$ 60Hz 5Hz		80 160	A
I_{TSM}	Peak Non-repetitive Surge Current (refer to figure 5)	Single Cycle 60Hz 50Hz		20 16.7	A
di/dt	Critical Rate of Rise of On-state Current			150	A/ μs
dv/dt	Critical Rate of Rise of Off-state Voltage		1500		V/ μs
T_S	Storage Temperature Range		-40	150	$^\circ\text{C}$
T_J	Junction Temperature Range		-40	125	$^\circ\text{C}$
$R_{\theta JL}$	Thermal Resistance, Junction to Lead	DO-214 DO-15		30 18	$^\circ\text{C/W}$

Figure 1: V-I Characteristics

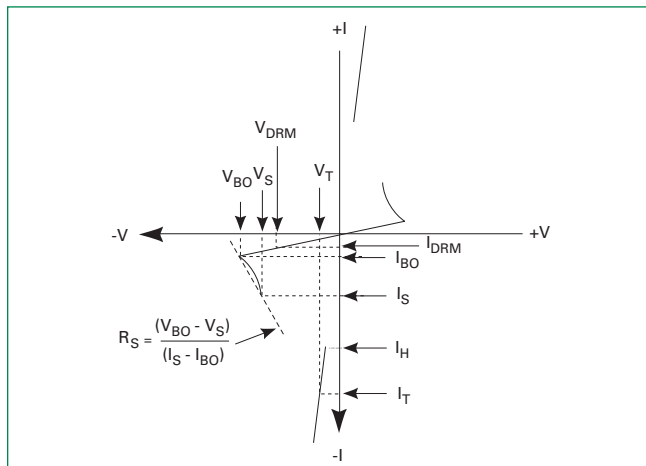


Figure 2: On-state Current vs. On-state Voltage (Typical)

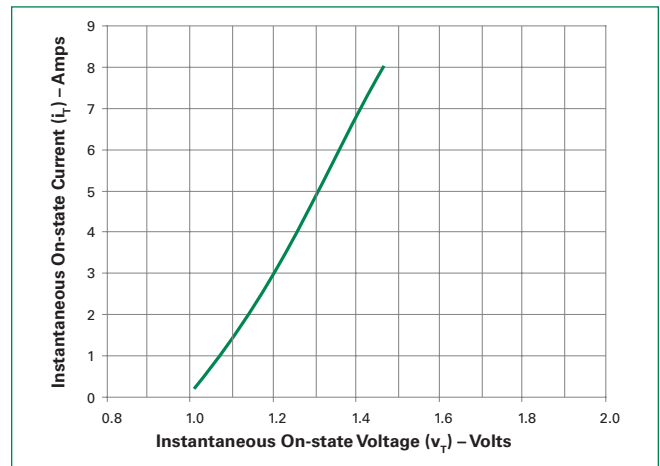


Figure 3: Power Dissipation vs. On-state Current (Typical)

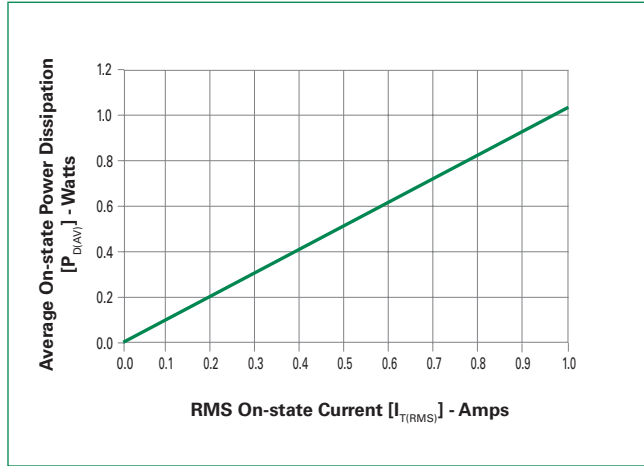


Figure 4: Repetitive Peak On-state Current (I_{TRM}) vs. Pulse Width at Various Frequencies

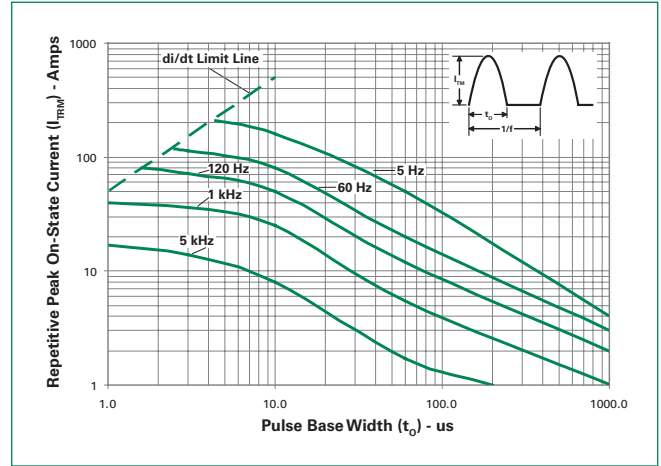


Figure 5: Peak Non-repetitive Surge Current (I_{TSM}) vs. Number of Cycles

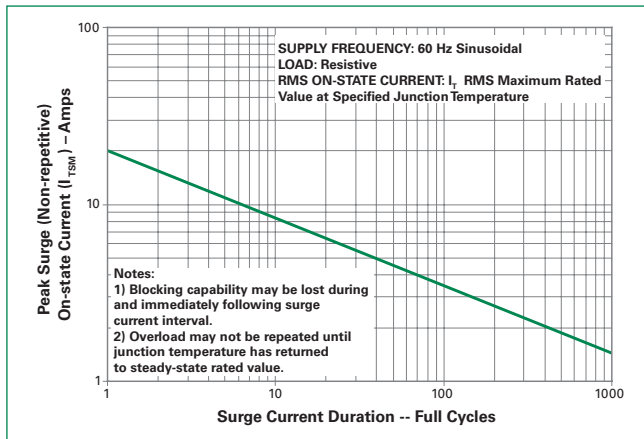


Figure 6: Normalized V_{BO} Change vs. Junction Temperature

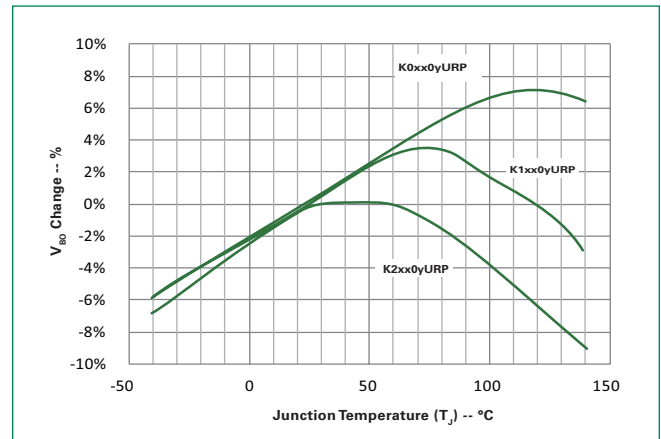


Figure 7: Normalized DC Holding Current vs. Junction Temperature

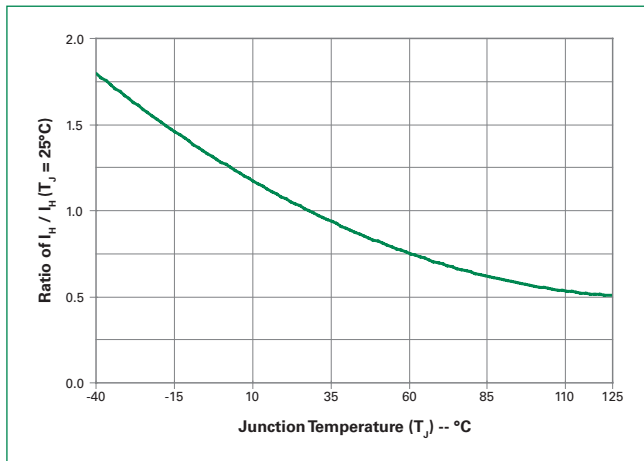


Figure 8: Maximum Allowable Case Temperature vs. RMS On-State Current

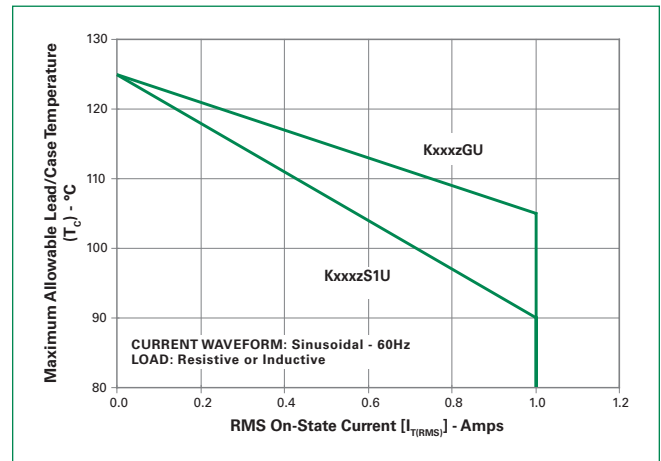


Figure 9: Maximum Allowable Ambient Temperature vs. RMS On-State Current

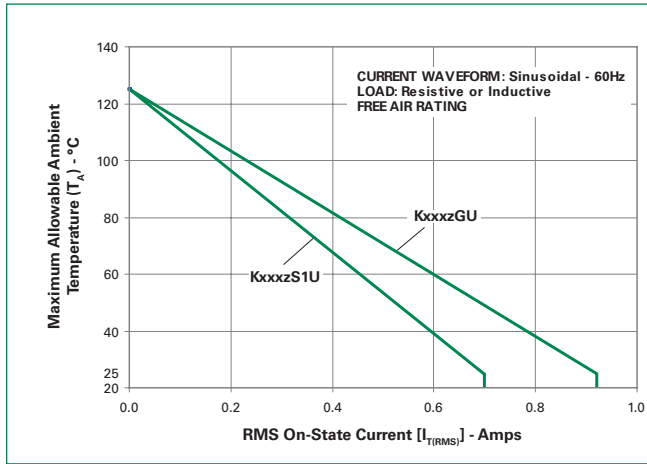


Figure 10: Normalized Repetitive Peak Breakover Current (I_{BO}) vs. Junction Temperature

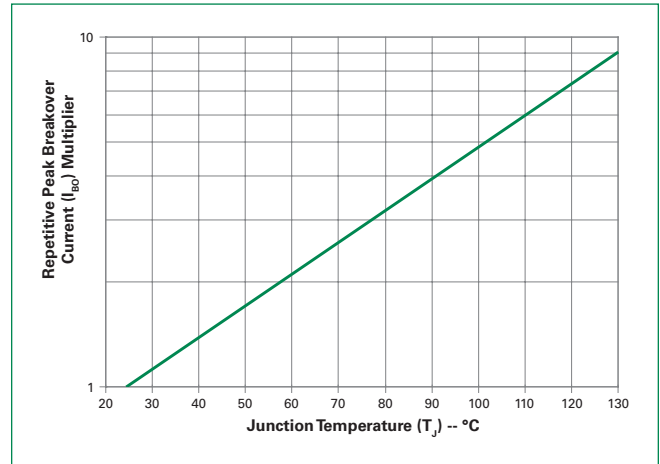


Figure 11: Dynamic Holding Current Test Circuit for SIDACs

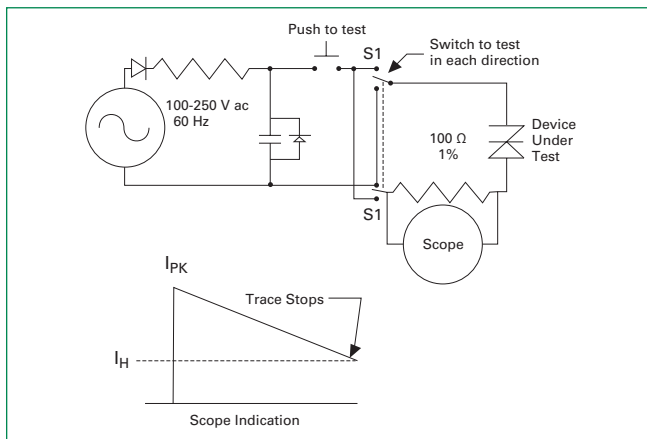


Figure 12: Basic SIDAC Circuit

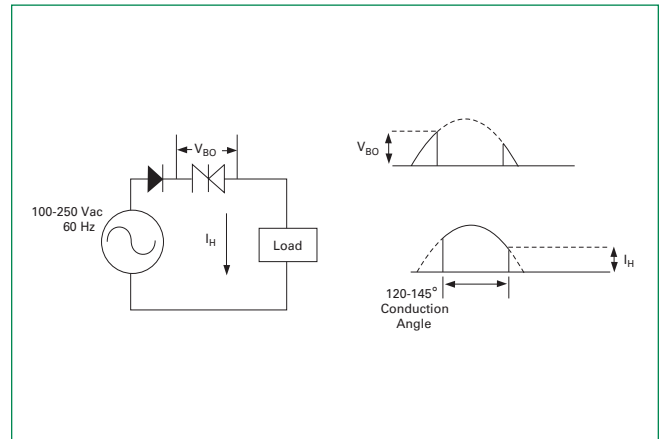


Figure 13: Relaxation Oscillator Using a SIDAC

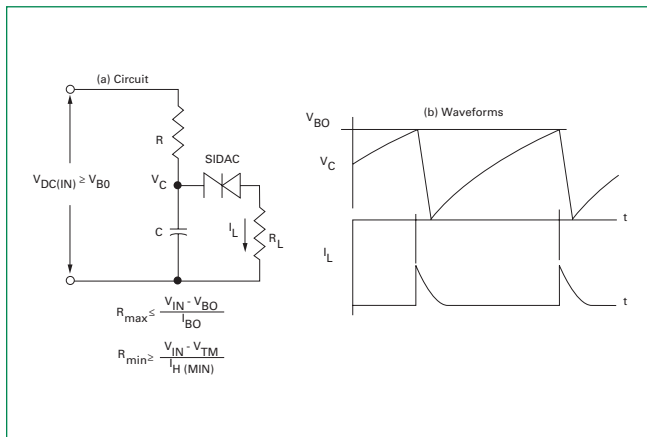


Figure 14: Low-voltage Input Circuit for Gas Ignition

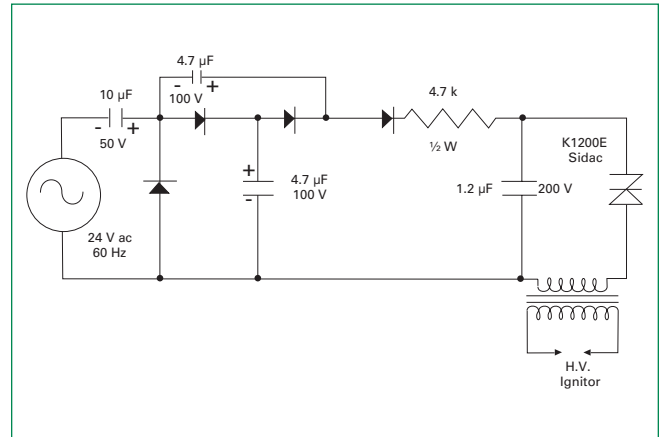
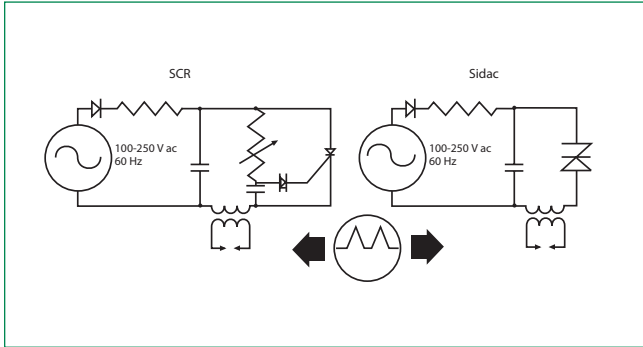
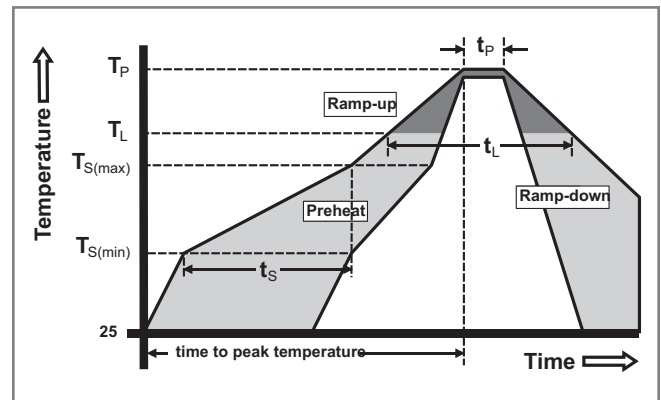


Figure 15: Comparison of SIDAC versus SCR for Gas Ignitor Circuit



Soldering Parameters

Reflow Condition		Pb – Free assembly
Pre Heat	- Temperature Min ($T_{s(min)}$)	150°C
	- Temperature Max ($T_{s(max)}$)	200°C
	- Time (min to max) (t_s)	60 – 180 secs
Average ramp up rate (Liquidus Temp) (T_L) to peak		5°C/second max
$T_{s(max)}$ to T_L - Ramp-up Rate		5°C/second max
Reflow	- Temperature (T_L) (Liquidus)	217°C
	- Temperature (t_L)	60 – 150 seconds
Peak Temperature (T_p)		260 ^{+0/-5} °C
Time within 5°C of actual peak Temperature (t_p)		20 – 40 seconds
Ramp-down Rate		5°C/second max
Time 25°C to peak Temperature (T_p)		8 minutes Max.
Do not exceed		280°C



Physical Specifications

Terminal Finish	100% Matte Tin Plated / Dipped
Body Material	UL recognized epoxy meeting flammability classification 94V-0
Lead Material	Copper Alloy

Design Considerations

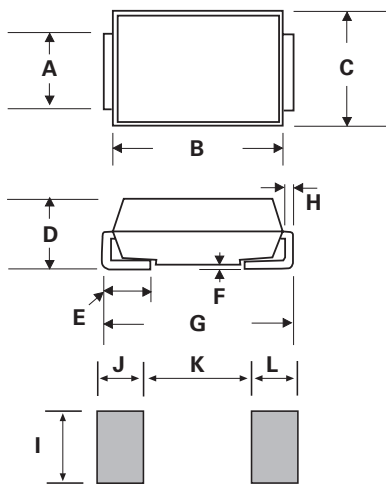
Careful selection of the correct device for the application's operating parameters and environment will go a long way toward extending the operating life of the Thyristor. Overheating and surge currents are the main killers of SIDACs. Correct mounting, soldering, and forming of the leads also help protect against component damage.

Reliability/Environmental Tests

Test	Specifications and Conditions
High Temperature Voltage Blocking	MIL-STD-750: Method 1040, Condition A Rated V_{DRM} (VAC-peak for thyristor), 125°C, 1008 hours
Temperature Cycling	MIL-STD-750: Method 1051 -40°C to 150°C, 15-minute dwell, 100 cycles
Biased Temperature & Humidity	EIA/JEDEC: JESD22-A101 80% min V_{BO} (V_{DC}), 85°C, 85%RH, 1008 hours
High Temp Storage	MIL-STD-750: Method 1031 150°C, 1008 hours
Low-Temp Storage	-40°C, 1008 hours
Thermal Shock	MIL-STD-750: Method 1056 0°C to 100°C, 5-minute dwell, 10-second transfer, 10 cycles
Autoclave (Pressure Cooker Test)	EIA/JEDEC: JESD22-A102 121°C, 100%RH, 2atm, 168 hours
Resistance to Solder Heat	MIL-STD-750: Method 2031 260°C, 10 seconds
Solderability	ANSI/J-STD-002: Category 3
Lead Bend	MIL-STD-750: Method 2036, Condition E

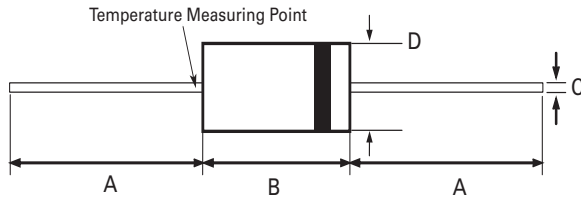
Dimensions

DO-214AC (SMA)



Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
A	0.049	0.065	1.250	1.650
B	0.157	0.177	3.990	4.500
C	0.100	0.110	2.540	2.790
D	0.078	0.090	1.980	2.290
E	0.030	0.060	0.780	1.520
F	-	0.008	-	0.203
G	0.194	0.208	4.930	5.280
H	0.006	0.012	0.152	0.305
I	0.070	-	1.800	-
J	0.082	-	2.100	-
K	-	0.090	-	2.300
L	0.082	-	2.100	-

Dimensions — DO-15



Dimension	Inches		Millimeters	
	Max	Max	Min	Max
A	1.000	-	25.40	-
B	0.230	0.300	5.80	7.60
C	0.028	0.034	0.71	0.86
D	0.104	0.140	2.60	3.60

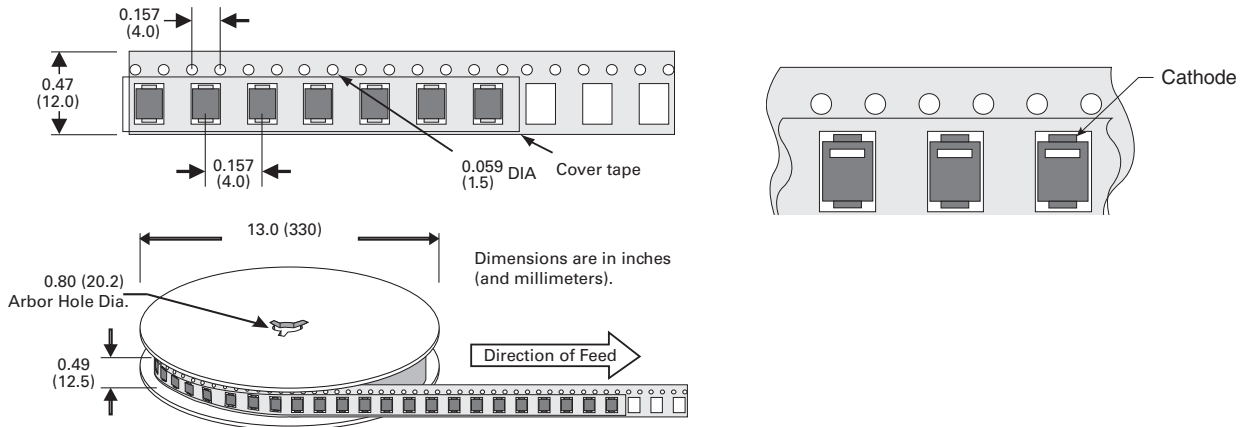
Product Selector

Part Number	Switching Voltage Range		Blocking Voltage	Packages	
	V _{BO} Minimum	V _{BO} Maximum	V _{DRM}	DO-15	DO-214
K0820yURP	75	90	70	K0820GURP	K0820S1URP
K0900yURP	79	97	70	K0900GURP	K0900S1URP
K1050yURP	95	110	90	K1050GURP	K1050S1URP
K1100yURP	104	118	90	K1100GURP	K1100S1URP
K1200yURP	110	125	100	K1200GURP	K1200S1URP
K1300yURP	120	138	110	K1300GURP	K1300S1URP
K1400yURP	130	146	115	K1400GURP	K1400S1URP
K1500yURP	142	157	120	K1500GURP	K1500S1URP
K2000yURP	190	210	170	K2000GURP	K2000S1URP

Packing Options

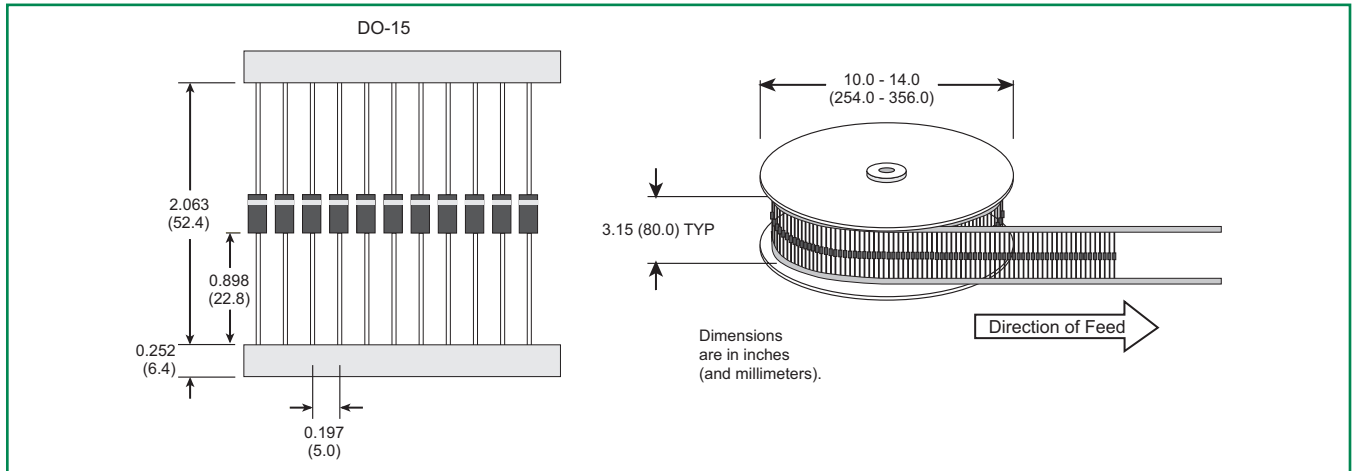
Part Number	Marking	Weight	Package Mode	Packages	Base Quantity
KxxxzS1URP	Kxxx	0.062g	Reel Pack	DO-214AC	5000
KxxxzGURP	Kxxx	0.38g	Reel Pack	DO-15	5000

Tape and Reel Specification — DO-214AC

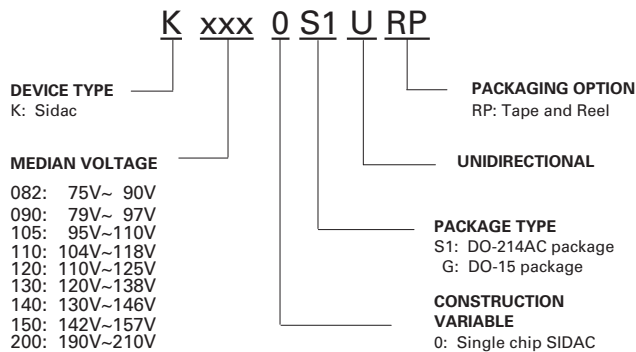


DO-15 Reel Pack (RP) Specifications

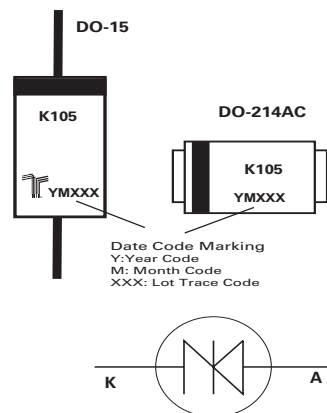
Meets all EIA RS-296 Standards



Part Numbering System



Part Marking System



Mouser Electronics

Authorized Distributor

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Littelfuse:

[K1500S1URP](#) [K0820GURP](#) [K1300GURP](#) [K1200GURP](#) [K1400S1URP](#) [K0900GURP](#) [K1100S1URP](#) [K1200S1URP](#)
[K1400GURP](#) [K1500GURP](#) [K1300S1URP](#) [K2000S1URP](#) [K1050GURP](#) [K1100GURP](#) [K2000GURP](#) [K0900S1URP](#)
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