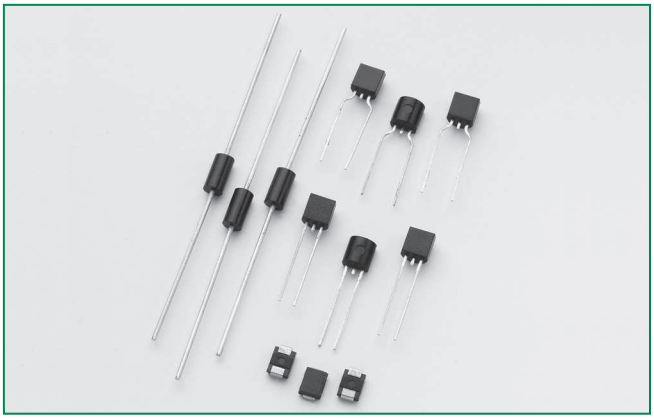
RoHS

Kxxxzy SIDAC



Description

The SIDAC is a silicon bilateral 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

- A
- R
- Ti Vb

Schematic Symbol

Applications

Suitable for high voltage power supplies, natural gas igniters, high-pressure Sodium lamps, and Xenon flash ignition.

Electrical Specifications (T_J = 25°C, unless otherwise specified)

Symbol	Parameters	Test Conditions	Min	Max	Unit
V_{BO}	Br ov Tr ig Vb g	0	9	9	V
		K 0	9	113	
		K 100	104	118	
		K 20	110	125	
		K 30	120	138	
		K 40	130	146	
		K 60	140	7 0	
		K 80	165	9 5	
		0	9 0	215	
			205	230	
			220	250	
			240	280	
		0	0	330	
V_{BR}	Rv Pe D fs e Vb g	0	0		V
		K 0	9		
		K 100	9		
		K 20	9		
		K 30	9		
		K 40	9		
		K 60	9		
		K 80	140		
		0	180		
			180		
			9 0		
			200		
		0	200		

b g

Electrical Specifications (T_J = 25°C, unless otherwise specified)

Symbol	Parameters	Test Conditions		Min	Max	Unit
I_{BO}	[illegible]	[illegible] T_J < 125°C			1	A
I_{BO}	[illegible]	[illegible] Wave			5	µA
V_{TM}	[illegible]	I_T = 1A	[illegible]		1.5	V
			[illegible]		3.0	
I_H	[illegible]	R_L = 100Ω [illegible] Wave			150	mA
R_S	[illegible] $_S = \frac{(V_{BO} - V_S)}{(I_S - I_{BO})}$	[illegible] Wave		100		Ω
I_{BO}	Breakover Current	[illegible] Wave			10	µA
I_{TM}	[illegible]	t_p = 10µs	[illegible]		80	A
			[illegible]		160	
I_{TSM}	Peak Non-repetitive Surge Current [illegible]	[illegible]	[illegible]		20	A
			[illegible]		16[illegible]	
di/dt	[illegible]				150	A/µs
dv/dt	[illegible]			1500		[illegible]
T_S	[illegible]			-40	150	°C
T_J	[illegible]			-40	125	°C
$R_{\theta JL}$	[illegible]	D[illegible]5			18	[illegible]/W
		D[illegible]4			30	
$R_{\theta JC}$	[illegible]	T[illegible]			35	[illegible]/W
$R_{\theta JA}$	[illegible]	D[illegible]5			[illegible]	[illegible]/W
		T[illegible]			[illegible]	

[illegible]
[illegible] [2] copper foil surface; two-ounce copper foil

Figure 1: V-I Characteristics

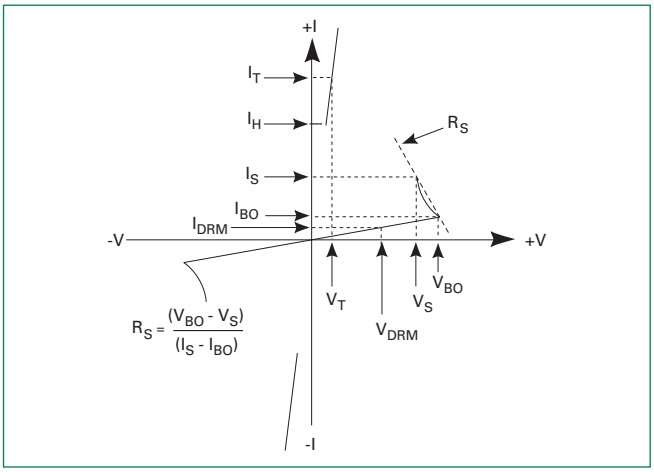


Figure 2: On-state Current vs. On-state Voltage (Typical)

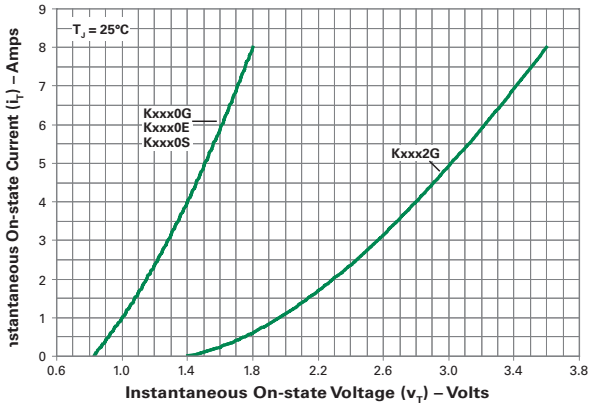


Figure 3: Power Dissipation vs. On-state Current (Typical)

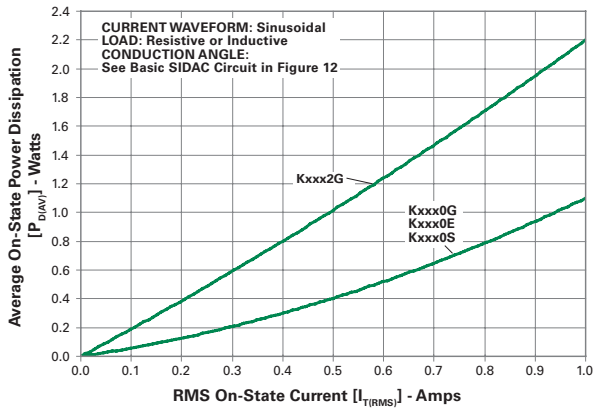


Figure 4: Repetitive Peak On-state Current (I_{TRM}) vs. Pulse Width at Various Frequencies

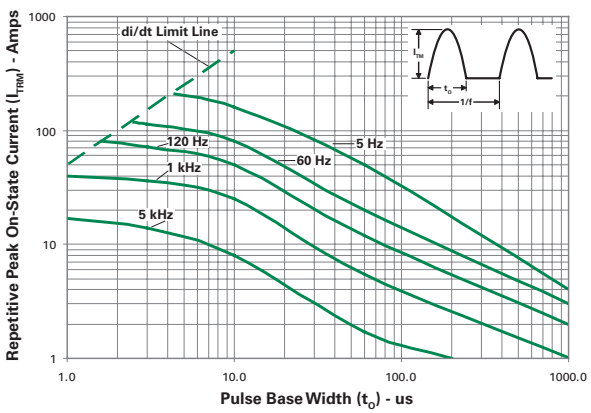


Figure 5: Peak Non-repetitive Surge Current (I_{TSM}) vs. Number of Cycles

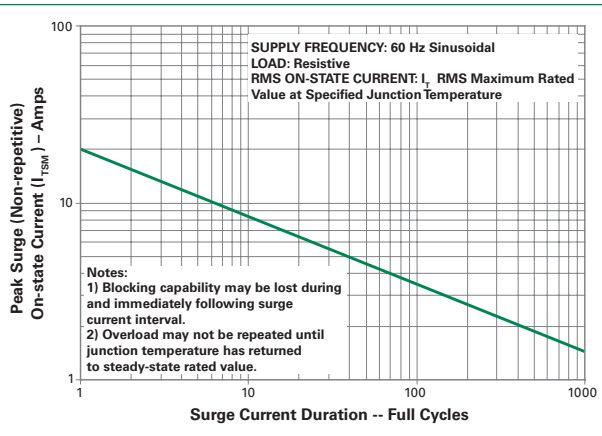


Figure 6: Normalized V_{BO} Change vs. Junction Temperature

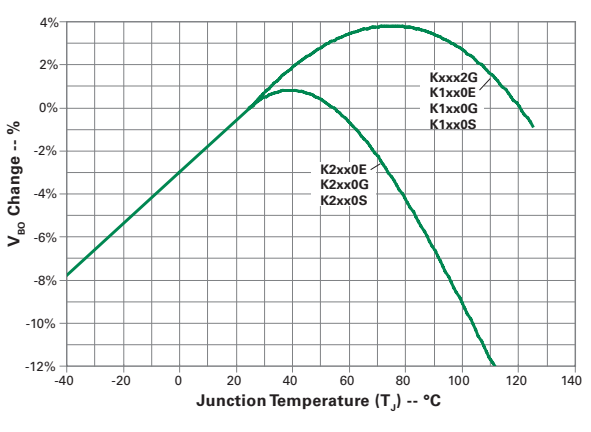


Figure 7: Normalized DC Holding Current vs. Junction Temperature

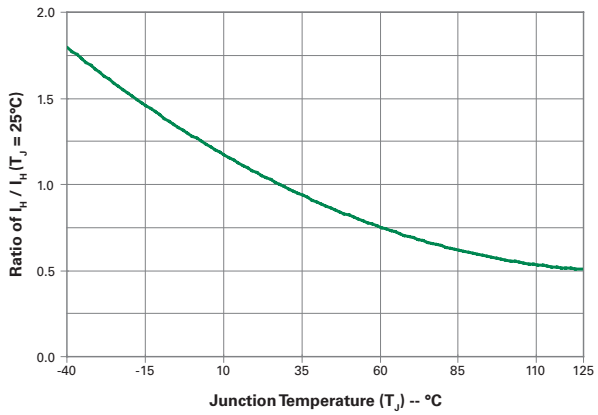


Figure 8: Maximum Allowable Case Temperature vs. RMS On-State Current

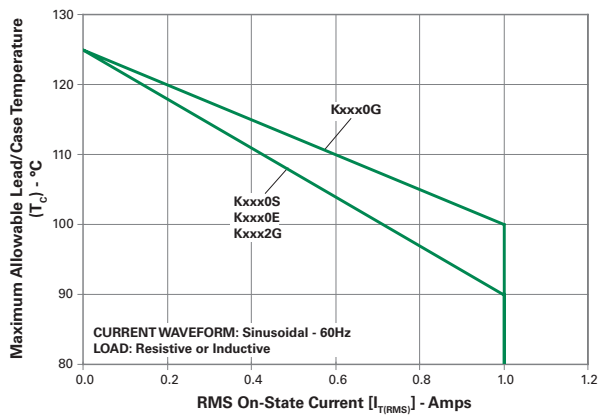


Figure 9: Maximum Allowable Ambient Temperature vs. RMS On-State Current

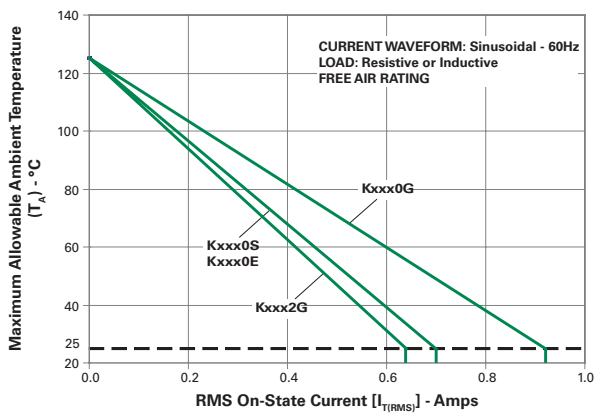


Figure 10: Normalized Repetitive Peak Breakover Current (I_{BO}) vs. Junction Temperature

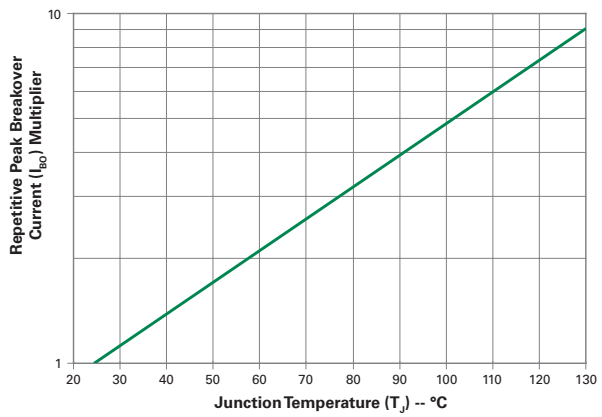


Figure 11: Dynamic Holding Current Test Circuit for SIDACs

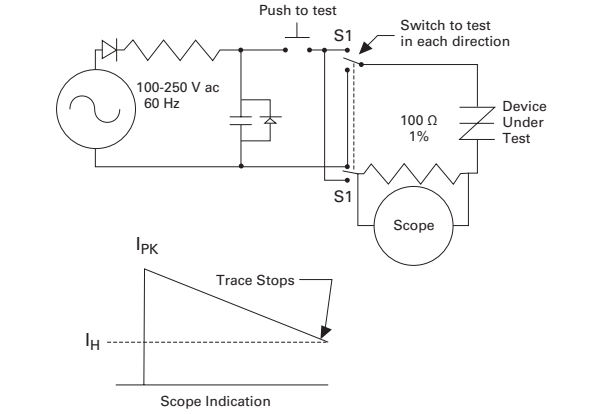


Figure 12: Basic SIDAC Circuit

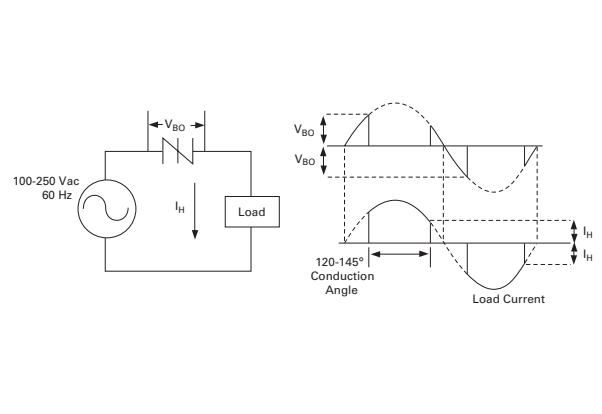


Figure 13: Relaxation Oscillator Using a SIDAC

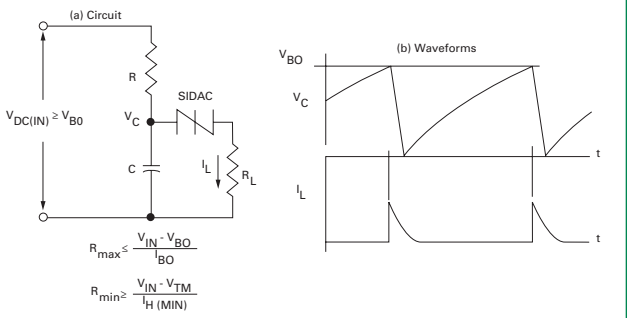


Figure 14: Low-voltage Input Circuit for Gas Ignition

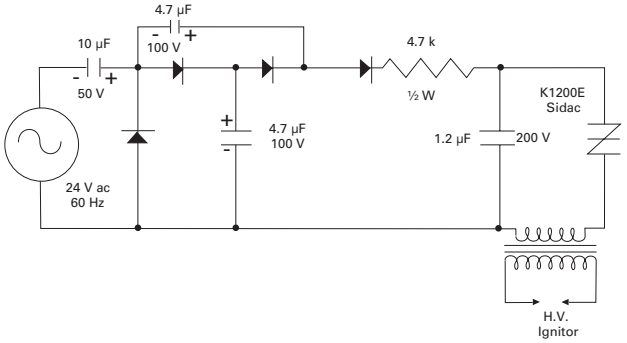


Figure 15: Comparison of SIDAC versus SCR for Gas Ignitor Circuit

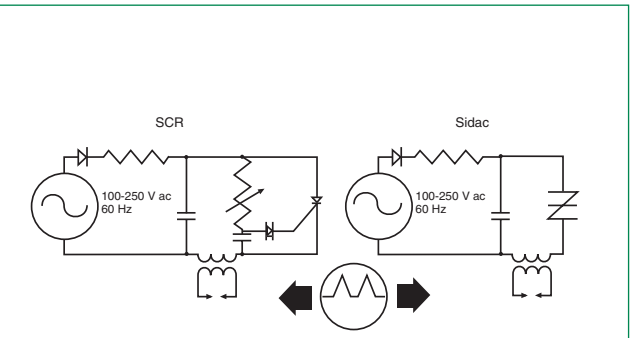


Figure 16: Xenon Lamp Flashing Circuit

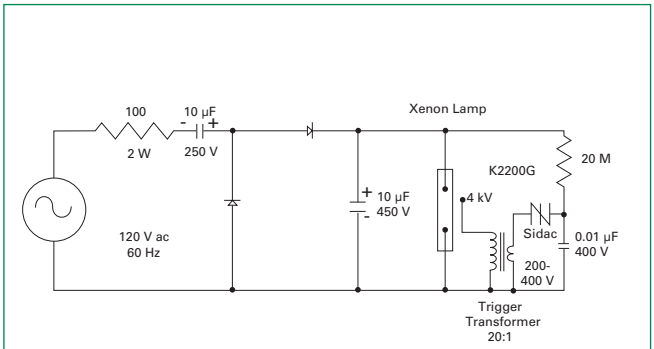
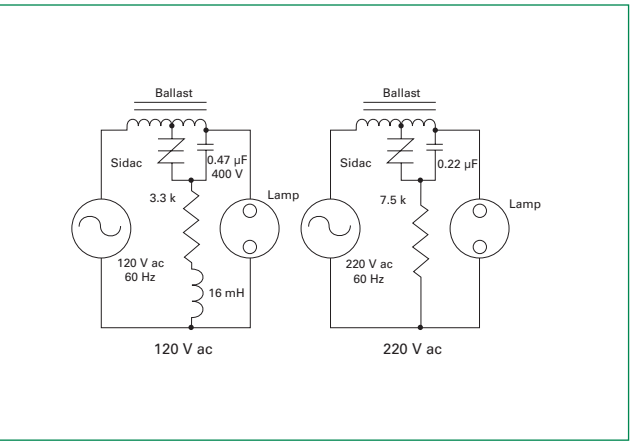
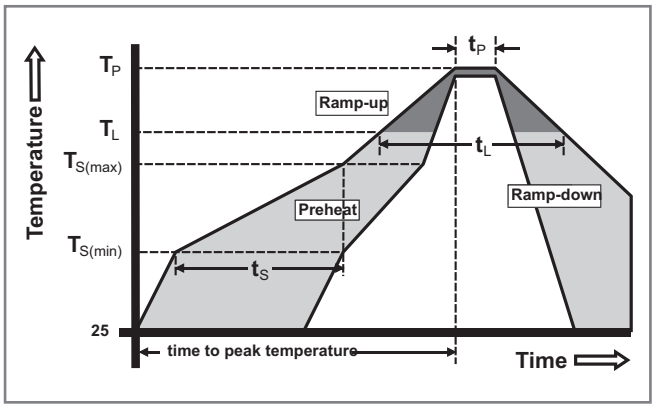


Figure 17: Typical High-pressure Sodium Lamp Firing Circuit



Soldering Parameters

Reflow Condition		[illegible]
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)	[illegible]
	-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)		[illegible]
Do not exceed		280°C



Physical Specifications

Terminal Finish	10[illegible] e [illegible] Dipped
Body Material	[illegible] e [illegible] y [illegible] 0
Lead Material	[illegible] A y

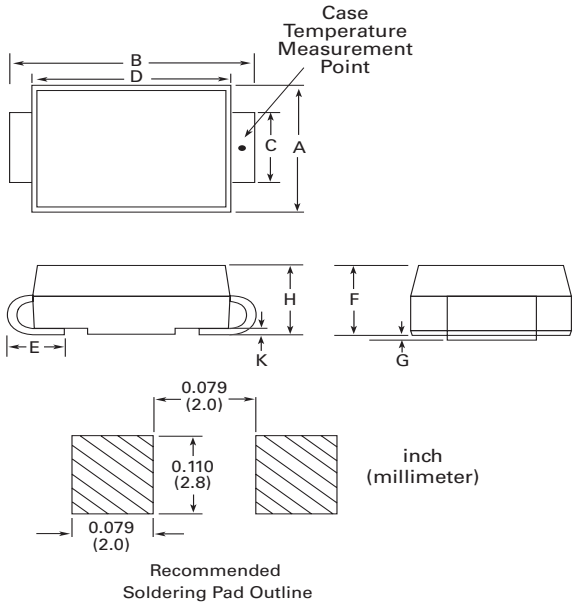
Design Considerations

Careful selection of the correct device for the application's operating parameters and environment will go a long wa[illegible] w[illegible] [illegible] [illegible] e [illegible] Thi[illegible] . Ov[illegible] [illegible] SIDACs. Correct mounting, soldering, and forming of the leads also help protect against component damage.

Reliability/Environmental Tests

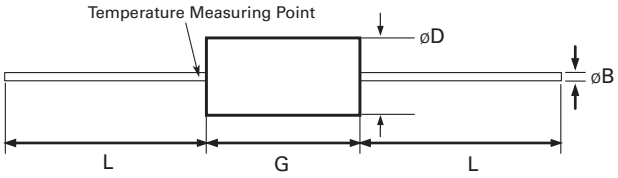
Test	Specifications and Conditions
High Temperature Voltage Blocking	M S [illegible] [illegible] A [illegible] V$_{BR}$ V A[illegible] [illegible] 0[illegible] hours
Temperature Cycling	M S [illegible] [illegible] -40°C to 150°C, 15-minute dwell, 100 y [illegible]
Biased Temperature & Humidity	EIA/JEDEC: JESD22-A101 [illegible] V$_B$ V$_{DC}$ [illegible] 0[illegible] hours
High Temp Storage	M S [illegible] [illegible] 150°C, 1008 hours
Low-Temp Storage	-40°C, 1008 hours
Thermal Shock	M S [illegible] [illegible] 0°C to 100°C, 5-minute dwell, 1[illegible] e ,1 [illegible]
Autoclave (Pressure Cooker Test)	EIA/JEDEC: JESD22-A102 1[illegible] 0[illegible] [illegible]
Resistance to Solder Heat	M S [illegible] 260°C, 10 seconds
Solderability	[illegible] D [illegible] [illegible]
Lead Bend	M S [illegible]

Dimensions — DO-214



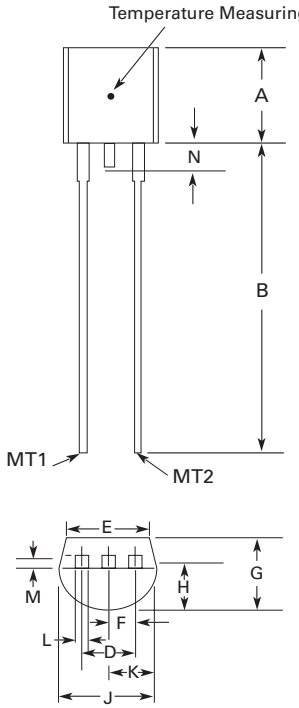
Dimension	Inches		Millimeters	
	Max	Max	Min	Max
A	0.130	0.156	3.30	3
B	0.201	0.220	5.10	5.60
C	0	8	19	2.20
D	0 9	0.181	4.05	4.60
E	0.030	0.063	0	1.60
F	0	0	19	2.45
G	0.002	0.008	0.05	0.20
H	0	0.104	19	2.65
K	0.006	0.016	0.15	0.41

Dimensions — DO-15



Dimension	Inches		Millimeters	
	Max	Max	Min	Max
øB	0.028	0.034	0 1	0.864
øD	0.120	0.140	3.048	3.556
G	0.235	0	9	6.858
L	1.000		25.400	

Dimensions — TO-92 with Type 70 Lead Form



Dimension	Inches		Millimeters	
	Max	Max	Min	Max
A	0 76	0 9	4	8
B	0.500		12	
D	9	0.105	2.41	2
E	0.150		3.81	
F	0.046	0.054	1.16	13
G	0.135	0.145	3.43	3.68
H	0.088	9	2.23	2.44
J	0 76	0.186	4	3
K	0.088	9	2.23	2.44
L	0.013	0 19	0.33	0.48
M	0.013	0 17	0.33	0.43
N		0.060		1.52

Notes:
1. T
2 0 0

Product Selector

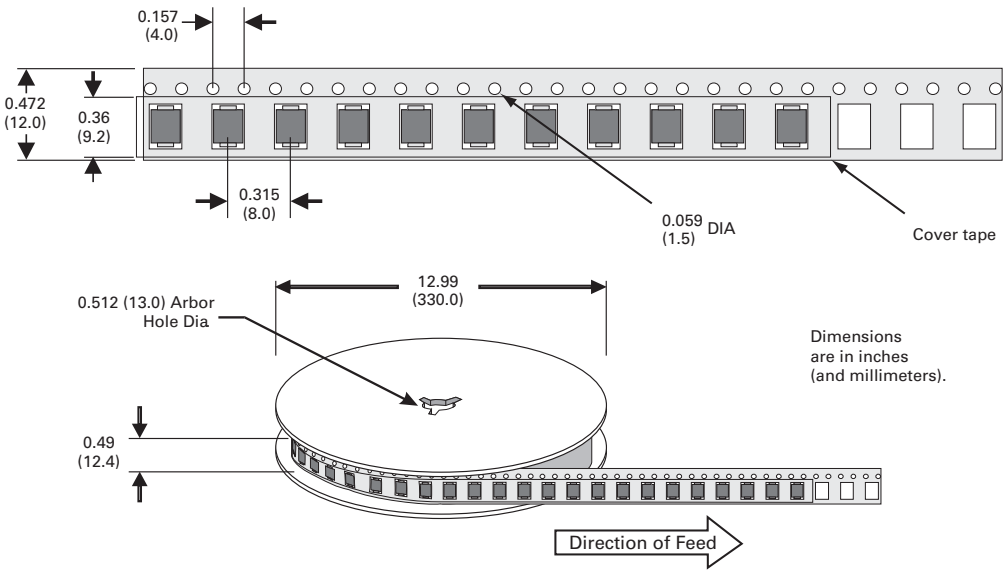
Part Number	Switching Voltage Range		Blocking Voltage	Packages		
	V_{BO} Minimum	V_{BO} Maximum	V_{DRM}	DO-15	DO-214	TO-92
0 Q	9	9	0	0 G	0 S	0 7
K 6	5	1 3V	9	K1050G	K1050S	K 6
K 100	10	1 8V	9	K1100G	K1100S	K 100
K 2 Q	1 0V	15	9	K1200G	K1200S	K 2 7
K 3 Q	12	18	9	K1300G	K1300S	K 3 7
K 4 Q	13	16	9	K1400G	K1400S	K 4 7
K 5 Q	14	17	9	K1500G	K1500S	K 5 7
K 8 Q	16	15	10		K1800S	
0 0Q	19	2 5	18	K2000G	K2000S	0 07
0 Q	19	2 5	18	K2002G		
0 Q	9	9	18	K2200G	K2200S	0 7
0	9	9	18	K2202G		
0 Q	0	9	19	K2400G	K2400S	0 7
0	0	9	19	K2402G		
0 Q	0	9	0 0	K2500G	K2500S	0 7
0	0	9	0 0	K2502G		
0 Q	0	9	0 0	K3002G		

Packing Options

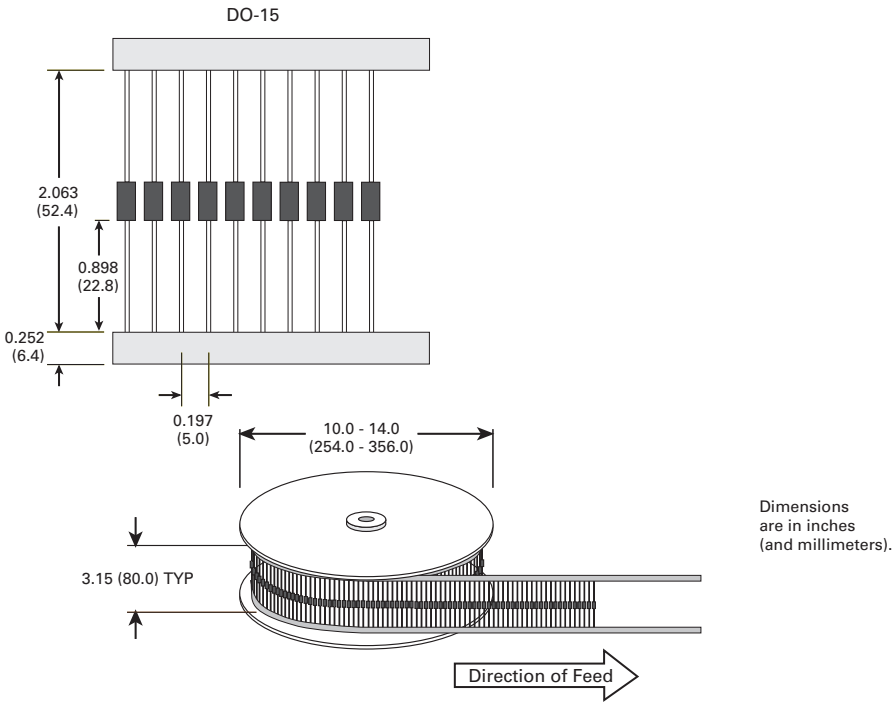
Part Number	Marking	Weight	Packaging Mode	Base Quantity
Kxxx0G	Kxxx0G	0.38g	Bulk	1000
[illegible]	Kxxx0G	0.38g	[illegible]	5000
Kxxx2G	Kxxx2G	0.38g	Bulk	1000
[illegible]	Kxxx2G	0.38g	[illegible]	5000
[illegible]	KxxS	0.1g	[illegible]	2500
[illegible]	Kxxx0E	0.1g	Bulk	2000
[illegible]	Kxxx0E	0.1g	Ammo Pack	2000
[illegible]	Kxxx0E	0.1g	[illegible]	2000
[illegible]	Kxxx0E	0.1g	[illegible]	2000

Note: xxx or xx = voltage

DO-214 Embossed Carrier Reel Pack (RP) Specifications

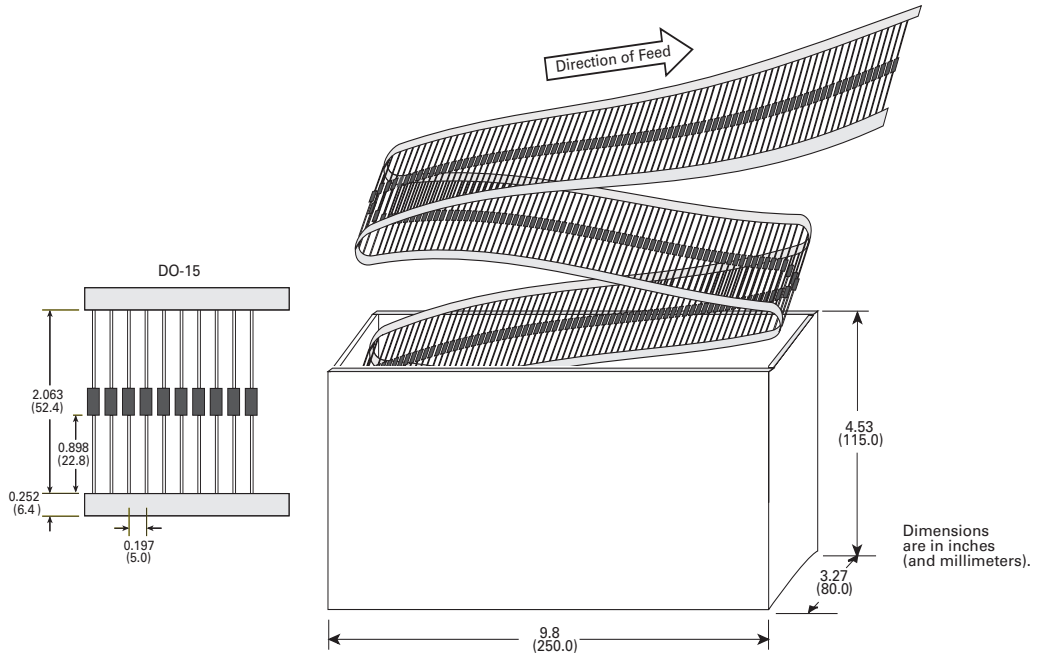


DO-15 Reel Pack (RP) Specifications



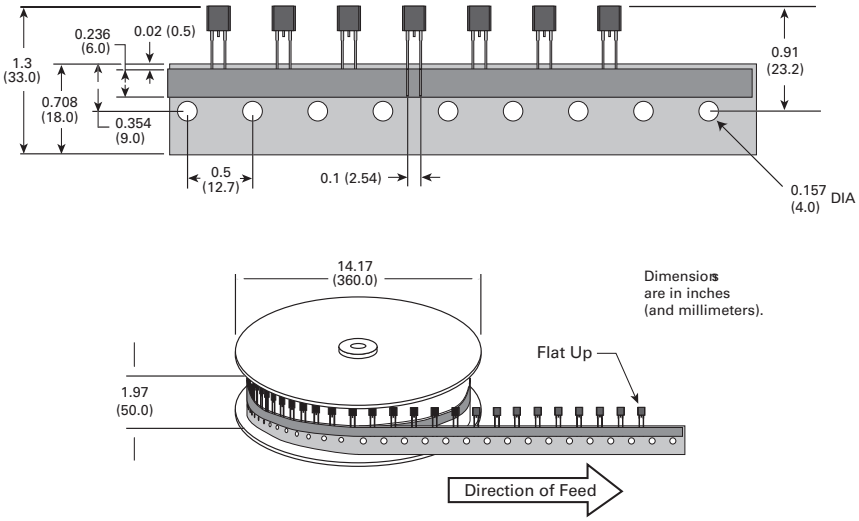
Dimensions
are in inches
(and millimeters).

DO-15 Ammo Pack (AP) Specifications

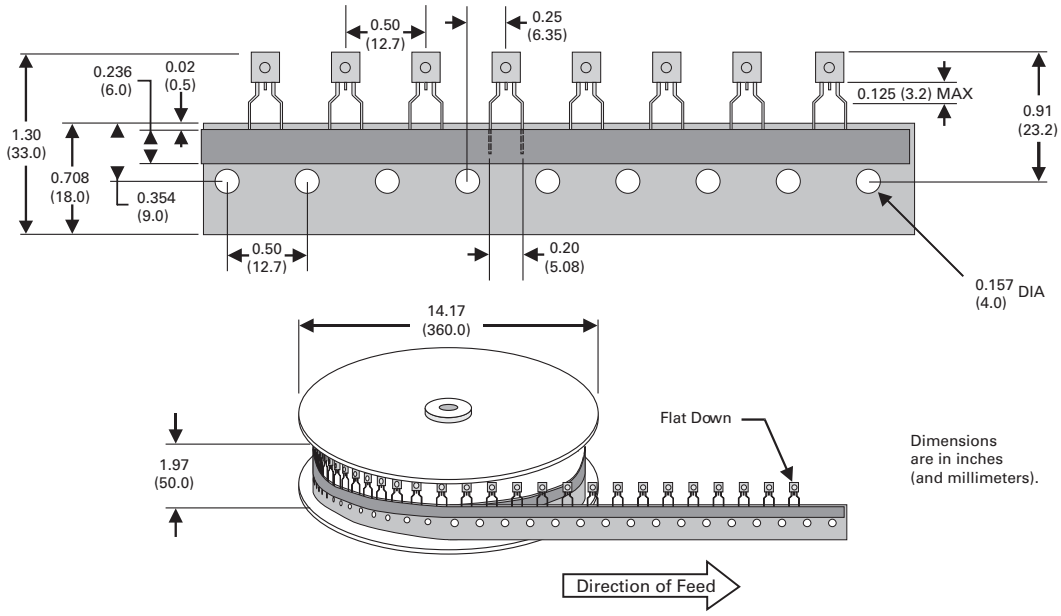


Dimensions
are in inches
(and millimeters).

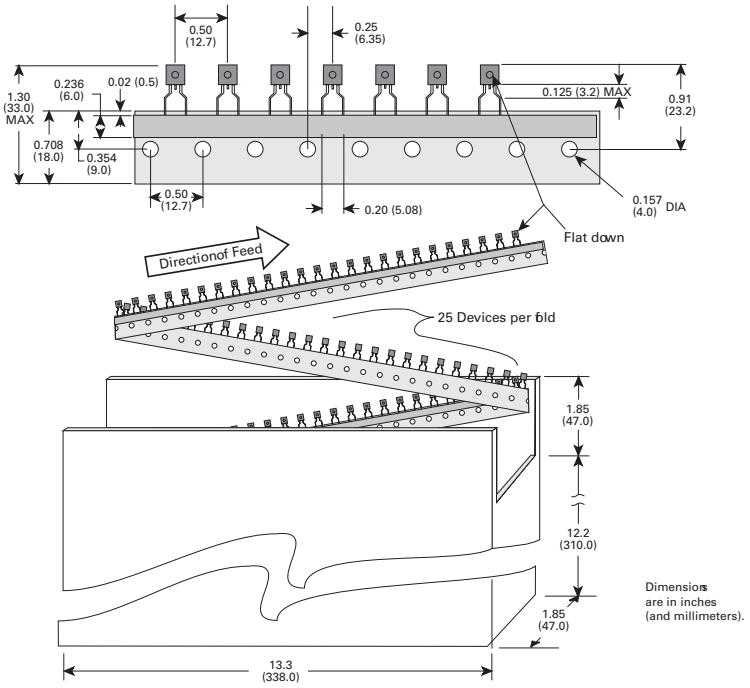
TO-92 Type 70 Reel Pack (RP3) Radial Leaded Specifications



TO-92 Type 70 Reel Pack (RP2) Radial Leaded Specifications



TO-92 Type 70 Ammo Pack (AP) Radial Leaded Specifications



Part Numbering System

K 240 0 E 70 RP

DEVICE TYPE
K: Sidac

VOLTAGE RATING
090: 79 – 97V
105: 95 – 113V
110: 104 – 118V
120: 110 – 125V
130: 120 – 138V
140: 130 – 146V
150: 140 – 170V
180: 165 – 195V
200: 190 – 215V
220: 205 – 230V
240: 220 – 250V
250: 240 – 280V
300: 270 – 330V

CIRCUIT FUNCTION
0: Standard
2: Two Series Die

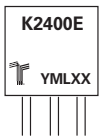
PACKAGE TYPE
G: DO-15
S: DO-214
E: TO-92

LEAD FORM DIMENSIONS
xx: Lead Form Option

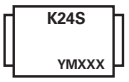
PACKAGING OPTIONS
[blank]: Bulk
AP: Ammo
RP: Reel

Part Marking System

TO-92



DO-214AA



DO-15