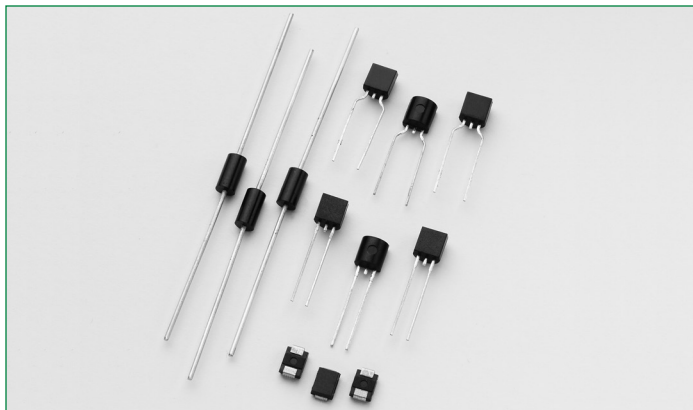


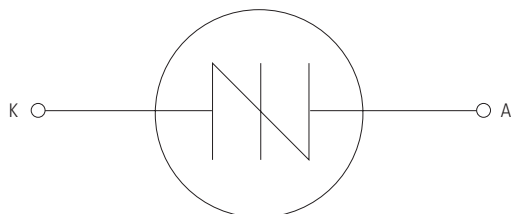
Kxxxzy SIDAC Series

Standard Bidirectional SIDACs Thyristor

RoHS



Pinout Diagram



K: Cathode; **A:** Anode

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

Features:

- Breakover voltage from 79 V to 330 V
- Bidirectional voltage-triggered switching
- Peak repetitive pulse current capability up to 160 A
- High dv/dt capability of 1500 V/μs
- Low breakover current of 10 μA

Benefits:

- Supports diverse triggering requirements
- Simplifies AC circuit design
- Enhances pulse handling capability
- Improves transient immunity
- Minimizes control circuit loading

Applications:

- Suitable for high voltage power supplies
- Natural gas igniters
- High-pressure Sodium lamps
- Xenon flash ignition

Maximum Ratings ($T_{vj} = 25\text{ }^{\circ}\text{C}$ unless otherwise specified)

Symbol	Characteristics	Conditions		Value	Units
I_{BO}	Breakover Current	50 / 60 Hz Sine Wave		10	μA
I_{TRM}	Peak Repetitive Pulse Current	$t_p = 10\text{ }\mu\text{s}$	60 Hz	80	A
			5 Hz	160	
I_{TSM}	Non-Repetitive Surge On-State Current	Single Cycle	60 Hz	20	A
			5 Hz	16.7	
T_{stg}	Storage Temperature Range	–		-40 to 150	$^{\circ}\text{C}$
T_{vj}	Virtual Junction Temperature Range	–		-40 to 125	$^{\circ}\text{C}$

Note : xxx = voltage, z = circuit function, y = package

Electrical Characteristics - Static ($T_{vj} = 25\text{ }^{\circ}\text{C}$ unless otherwise specified)

Symbol	Characteristics	Conditions		Value			Units
				Min.	Typ.	Max.	
V_T	On-State Voltage	$I_T = 1\text{ A}$	Kxxx0y	–	–	1.5	V
			Kxxx2y	–	–	3.0	
I_H	Holding current	$R_L = 100\text{ }\Omega$, 50 / 60 Hz Sine Wave		10	–	150	mA
V_{BO}	Breakover Voltage	K0900y		79	–	97	V
		K1050y		95	–	113	
		K1100y		104	–	118	
		K1200y		110	–	125	
		K1300y		120	–	138	
		K1400y		130	–	146	
		K1500y		140	–	170	
		K1800y		165	–	195	
		K200zy		190	–	215	
		K220zy		205	–	230	
		K230zy		220	–	240	
		K240zy		220	–	250	
		K250zy		240	–	280	
		K300zy		270	–	330	
$I_{T(RMS)}$	R.M.S On-State Current	50 / 60 Hz, $T_{vj} < 125\text{ }^{\circ}\text{C}$		–	–	1	A
I_{DRM}	Repetitive Peak Off-state Current	$V = V_{DRM}$, 50 / 60 Hz Sine Wave		–	–	5	μA
R_S	Switching Resistance, $R_S = \frac{(V_{BO} - V_S)}{(I_S - I_{BO})}$	50 / 60 Hz Sine Wave		100	–	–	Ω

Electrical Characteristics - Static ($T_{vj} = 25\text{ }^{\circ}\text{C}$ unless otherwise specified)

Symbol	Characteristics	Conditions	Value			Units
			Min.	Typ.	Max.	
V_{RRM} / V_{DRM}	Repetitive Peak Reverse / Peak Off-State Voltage	K0900y	70	—	—	V
		K1050y	90	—	—	
		K1100y	90	—	—	
		K1200y	90	—	—	
		K1300y	90	—	—	
		K1400y	90	—	—	
		K1500y	90	—	—	
		K1800y	140	—	—	
		K200zy	180	—	—	
		K220zy	180	—	—	
		K230zy	190	—	—	
		K240zy	190	—	—	
		K250zy	200	—	—	
		K300zy	200	—	—	
V_T	On-State Voltage	$I_T = 1\text{ A}$	Kxxx0y	—	—	V
			Kxxx2y	—	—	
I_H	Holding current	$R_L = 100\text{ }\Omega$, 50 / 60 Hz Sine Wave	10	—	150	mA

Electrical Characteristics - Dynamic ($T_{vj} = 25\text{ }^{\circ}\text{C}$ unless otherwise specified)

Symbol	Characteristics	Conditions	Value			Units
			Min.	Typ.	Max.	
dv/dt	Rate Of Rise Of Off-State Voltage	—	1500	—	—	V/ μs
di/dt	Rate Of Rise Of Off-State Current	—	—	—	150	A/ μs

Thermal Characteristics

Symbol	Characteristics	Conditions	Value			Units
			Min.	Typ.	Max.	
$R_{th(j-l)}$	Thermal Resistance Junction to Lead	DO-15	—	—	18	K/W
		DO-114 (1)	—	—	30	
$R_{th(j-a)}$	Thermal Resistance Junction to Ambient	DO-15	—	—	75	K/W
		TO-92	—	—	95	
$R_{th(j-c)}$	Thermal Resistance Junction to Case	TO-92	—	—	35	K/W

Characteristic Curves

Fig. 1. V-I Characteristics

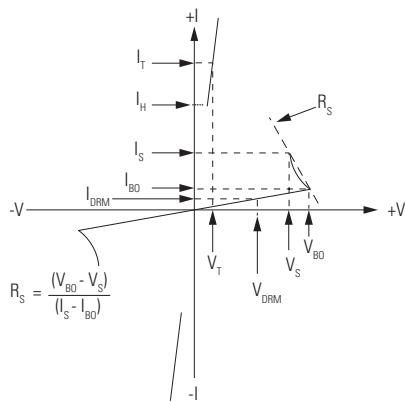


Fig. 2. Typical On-State Current vs. On-State Voltage

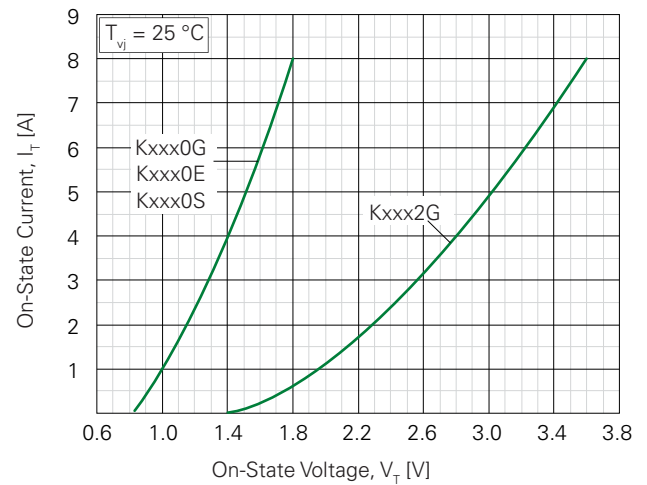


Fig. 3. Typical On-State Power Dissipation vs. RMS On-State Current

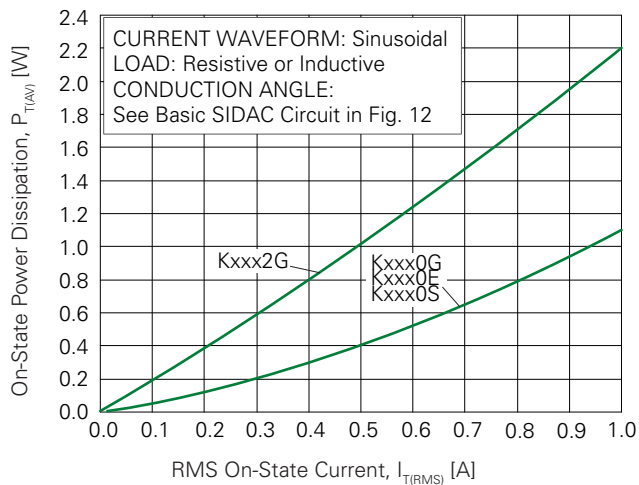


Fig. 4. Repetitive Peak On-state Current vs. Pulse Width at Various Frequencies

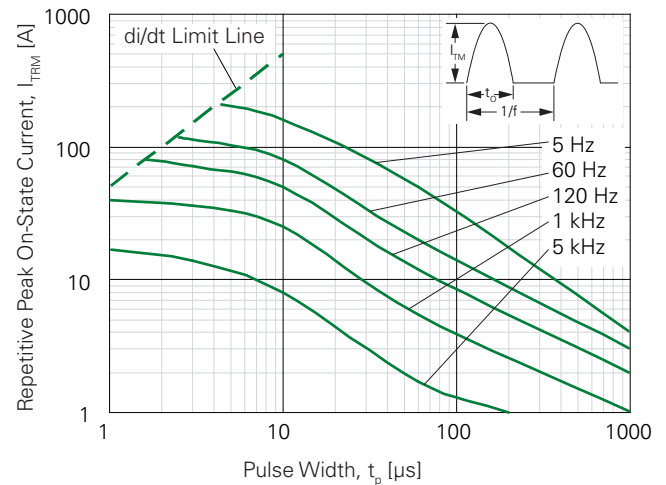


Fig. 5. Non-Repetitive Surge Peak On-State Current vs. Number of Cycles

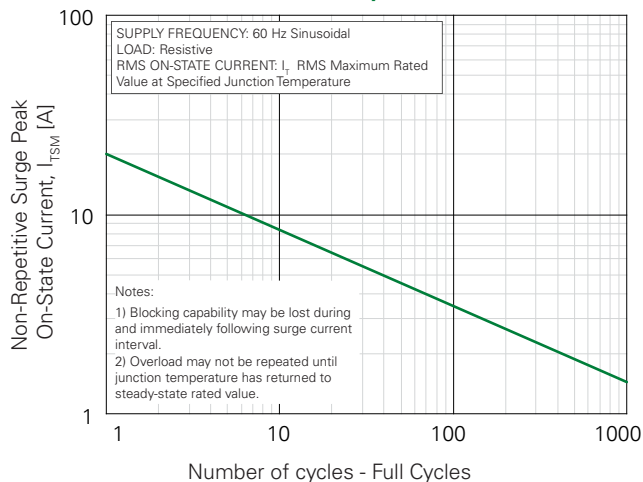
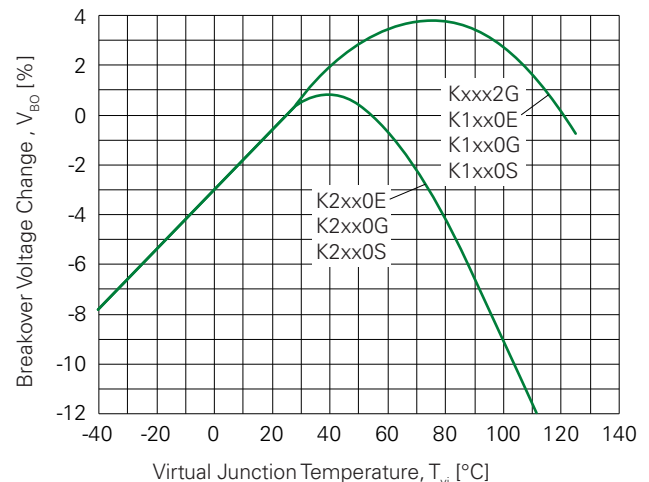


Fig. 6. Normalized V_{BO} Change vs. Virtual Junction Temperature



Characteristic Curves

Fig. 7. Normalized Holding Current vs. Virtual Junction Temperature

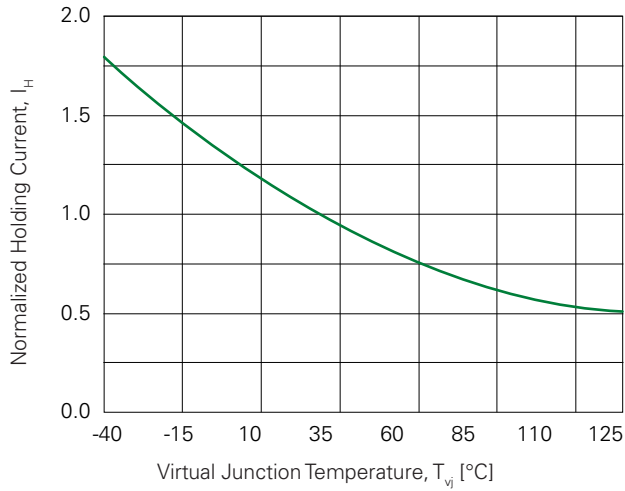


Fig. 8. Maximum Allowable Case Temperature vs. RMS On-State Current

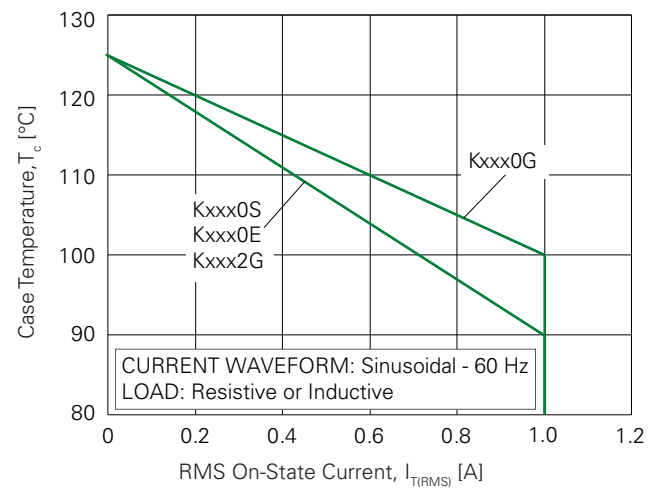


Fig. 9. Maximum Allowable Ambient Temperature vs. RMS On-State Current

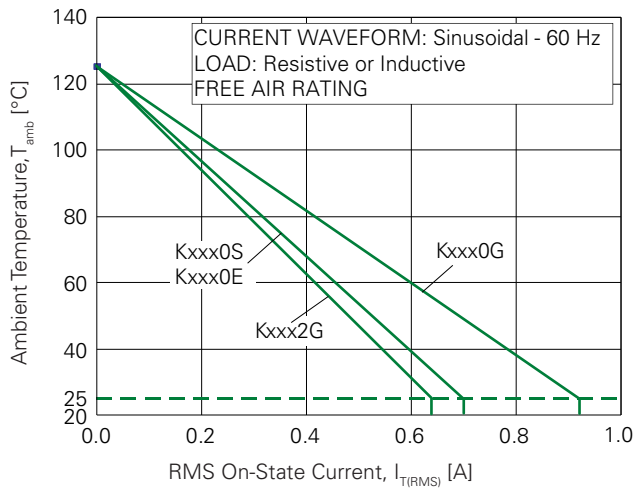


Fig. 10. Normalized Repetitive Peak Breakover Current vs. Virtual Junction Temperature

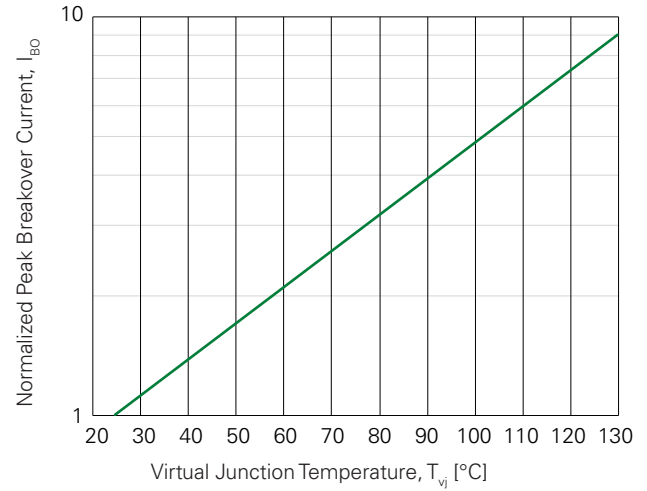


Fig. 11. Dynamic Holding Current Test Circuit for SIDACs

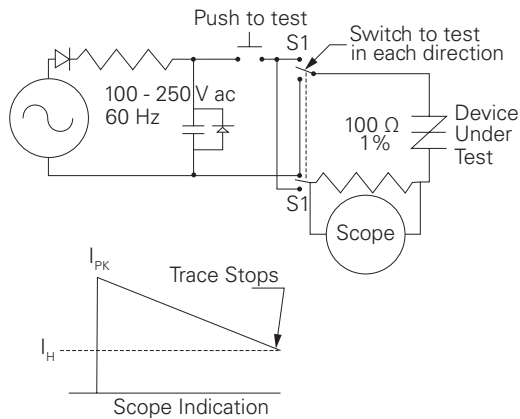
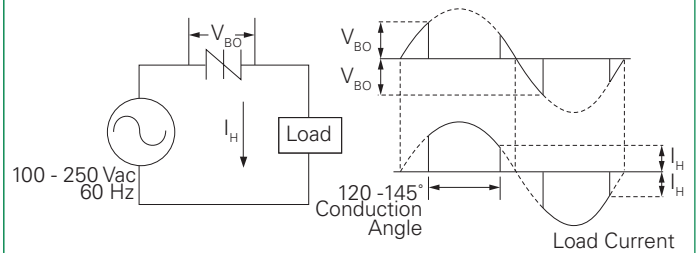


Fig. 12. Basic SIDAC Circuit



Characteristic Curves

Fig. 13. Relaxation Oscillator Using a SIDAC

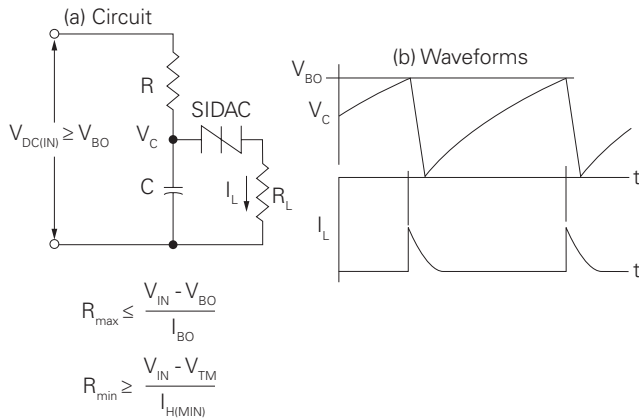


Fig. 14. Low-Voltage Input Circuit for Gas Ignition

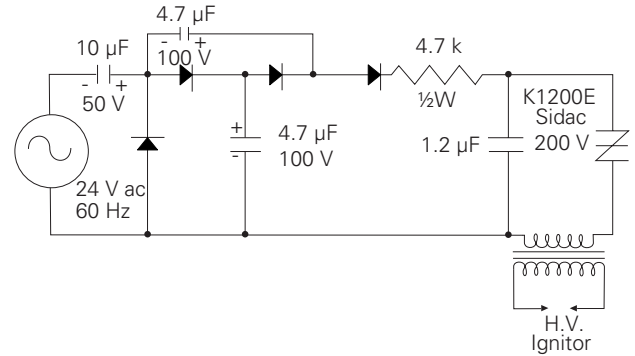


Fig. 15. Comparison of SIDAC versus SCR for Gas Ignitor Circuit

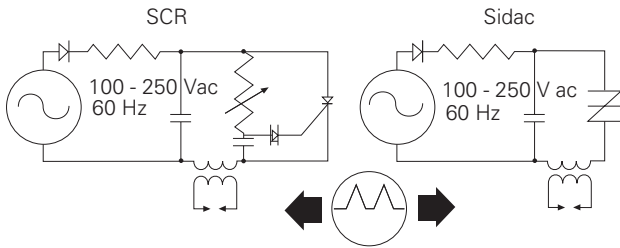


Fig. 16. Xenon Lamp Flashing Circuit

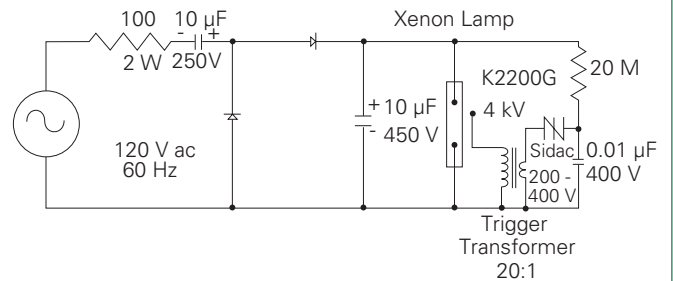
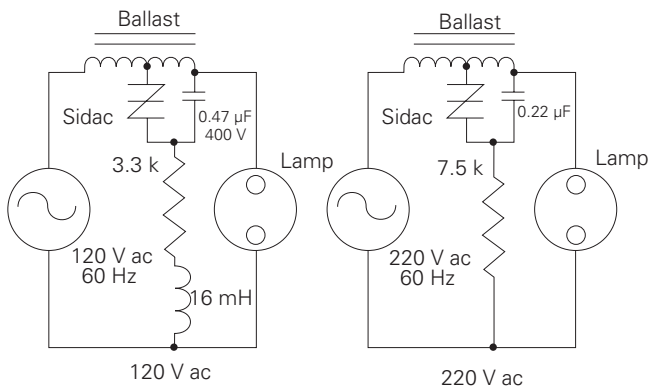
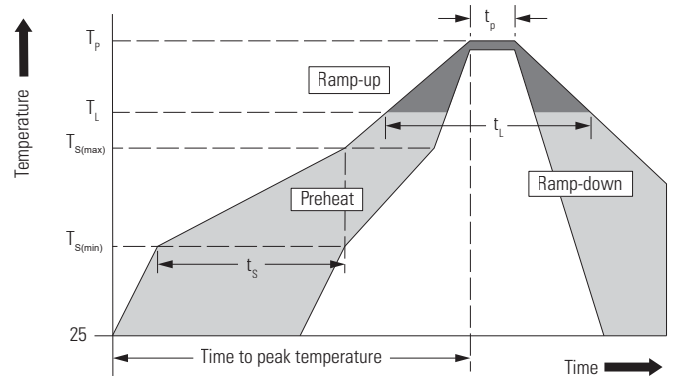


Fig. 17. Typical High-pressure Sodium Lamp Firing Circuit



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 K/s max
$T_{s(max)}$ to T_L - Ramp-up Rate		5 K/s max
Reflow	- Temperature (T_L) (Liquidus)	217 °C
	- Time (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 K/s 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 / Pb-free Solder Dipped
Body Material	UL Recognized compound meeting flammability rating V-0
Lead Material	Copper Alloy

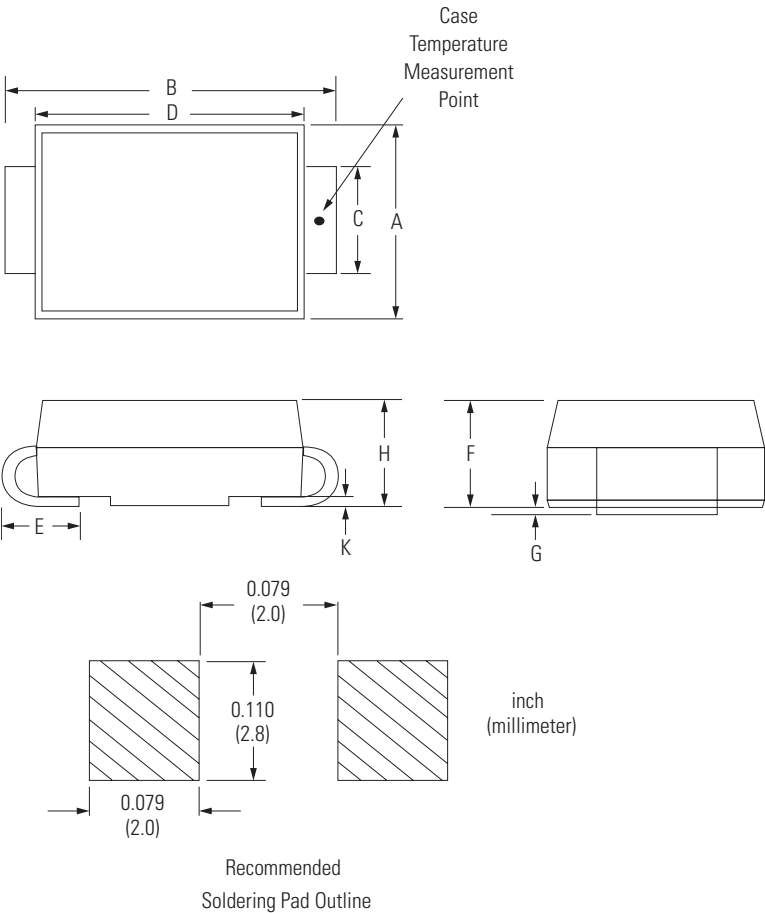
Design Considerations

Careful selection of the correct component 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 VDRM (VAC-peak), 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 VBO (VDC), 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

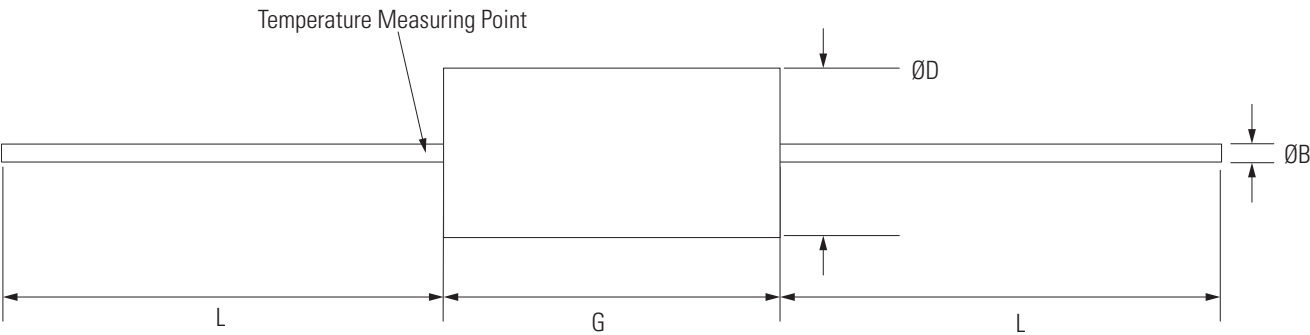
Dimensions - DO-214



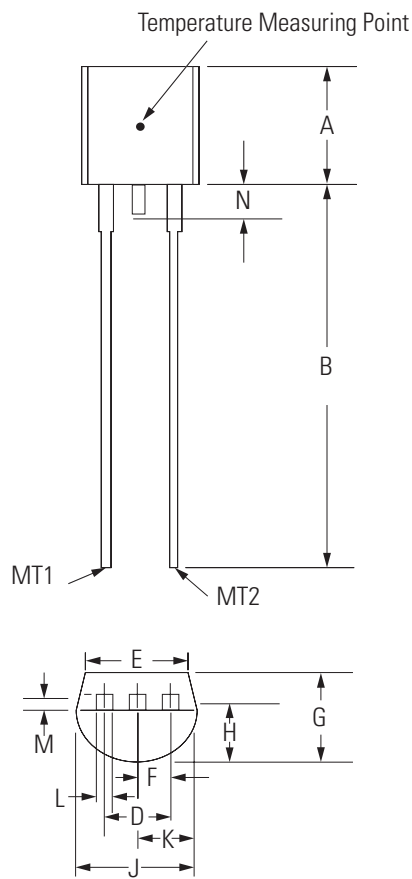
Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
A	0.130	0.156	3.30	3.95
B	0.201	0.220	5.10	5.60
C	0.077	0.087	1.95	2.20
D	0.159	0.181	4.05	4.60
E	0.030	0.063	0.75	1.60
F	0.075	0.096	1.90	2.45
G	0.002	0.008	0.05	0.20
H	0.077	0.104	1.95	2.65
K	0.006	0.016	0.15	0.41

Dimensions - DO-15

Dimension	Inches		Millimeters	
	Min	Max	Min	Max
øB	0.028	0.034	0.711	0.864
øD	0.120	0.140	3.048	3.556
G	0.235	0.270	5.969	6.858
L	1.000	–	25.400	–



Dimensions - TO-92 with Type 70 Lead Form



Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
A	0.176	0.196	4.47	4.98
B	0.500	–	12.70	–
D	0.095	0.105	2.41	2.67
E	0.150	–	3.81	–
F	0.046	0.054	1.16	1.37
G	0.135	0.145	3.43	3.68
H	0.088	0.096	2.23	2.44
J	0.176	0.186	4.47	4.73
K	0.088	0.096	2.23	2.44
L	0.013	0.019	0.33	0.48
M	0.013	0.017	0.33	0.43
N	–	0.060	–	1.52

Notes:

1. Type 70 lead form as shown is standard for the E package.
2. All leads are insulated from case. Case is electrically nonconductive (rated at 16000 V ac rms for one minute from leads to case over the operating temperature range.)
3. Mold flash shall not exceed 0.13 mm per side.

Product Selector

Part Number	Switching Voltage Range		Blocking Voltage	Packages		
	V _{BO} Minimum	V _{BO} Maximum	V _{DRM}	DO-15	DO-214	TO-92
K0900y	79 V	97 V	70 V	K0900G	K0900S	K0900E70
K1050y	95 V	113 V	90 V	K1050G	K1050S	K1050E70
K1100y	104 V	118 V	90 V	K1100G	K1100S	K1100E70
K1200y	110 V	125 V	90 V	K1200G	K1200S	K1200E70
K1300y	120 V	138 V	90 V	K1300G	K1300S	K1300E70
K1400y	130 V	146 V	90 V	K1400G	K1400S	K1400E70
K1500y	140 V	170 V	90 V	K1500G	K1500S	K1500E70
K1800y	165 V	195 V	140 V	–	K1800S	–
K2000y	190 V	215 V	180 V	K2000G	K2000S	K2000E70
K2002y	190 V	215 V	180 V	K2002G	–	–
K2200y	205 V	230 V	180 V	K2200G	K2200S	K2200E70
K2202y	205 V	230 V	180 V	K2202G	–	–
K2300y	220 V	240 V	190 V	K2300G	K2300S	K2300E70
K2400y	220 V	250 V	190 V	K2400G	K2400S	K2400E70
K2402y	220 V	250 V	190 V	K2402G	–	–
K2500y	240 V	280 V	200 V	K2500G	K2500S	K2500E70
K2502y	240 V	280 V	200 V	K2502G	–	–
K3002y	270 V	330 V	200 V	K3002G	–	–

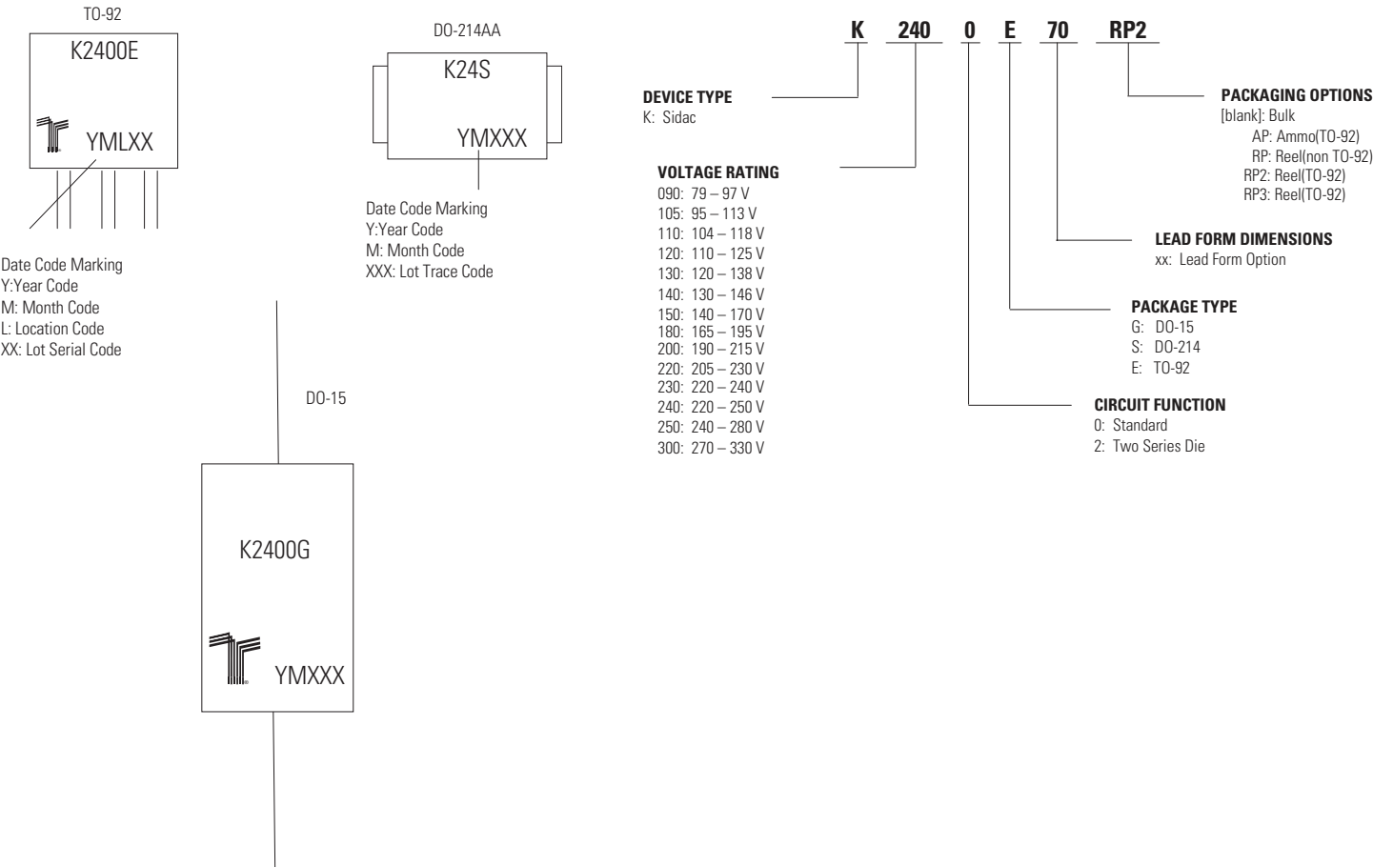
Note: y = package

Packing Options

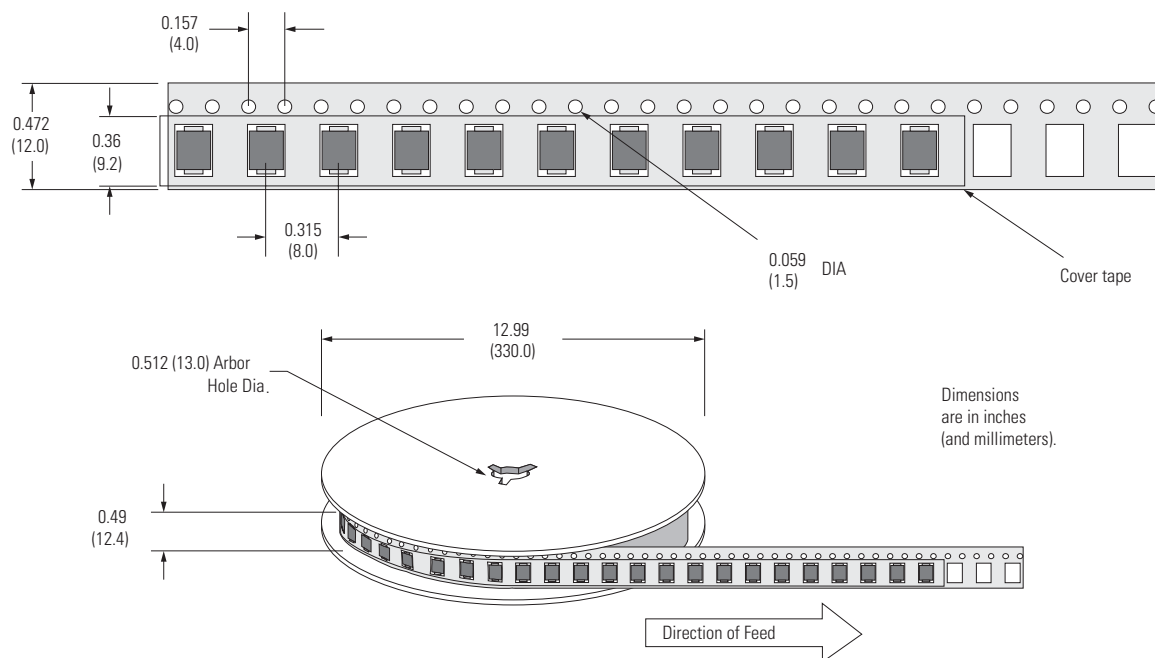
Part Number	Marking	Weight	Package Mode	Base Quantity
Kxxx0G	Kxxx0G	0.38g	Bulk	1000
Kxxx0GRP	Kxxx0G	0.38g	Reel Pack	5000
Kxxx2G	Kxxx2G	0.38g	Bulk	1000
Kxxx2GRP	Kxxx2G	0.38g	Reel Pack	5000
Kxxx0SRP	KxxS	0.1g	Reel Pack	2500
Kxxx0E70	Kxxx0E	0.17g	Bulk	2000
Kxxx0E70AP	Kxxx0E	0.17g	Ammo Pack	2000
Kxxx0E70RP2	Kxxx0E	0.17g	Reel Pack	2000
Kxxx0E70RP3	Kxxx0E	0.17g	Reel Pack	2000

Note: xxx or xx = voltage

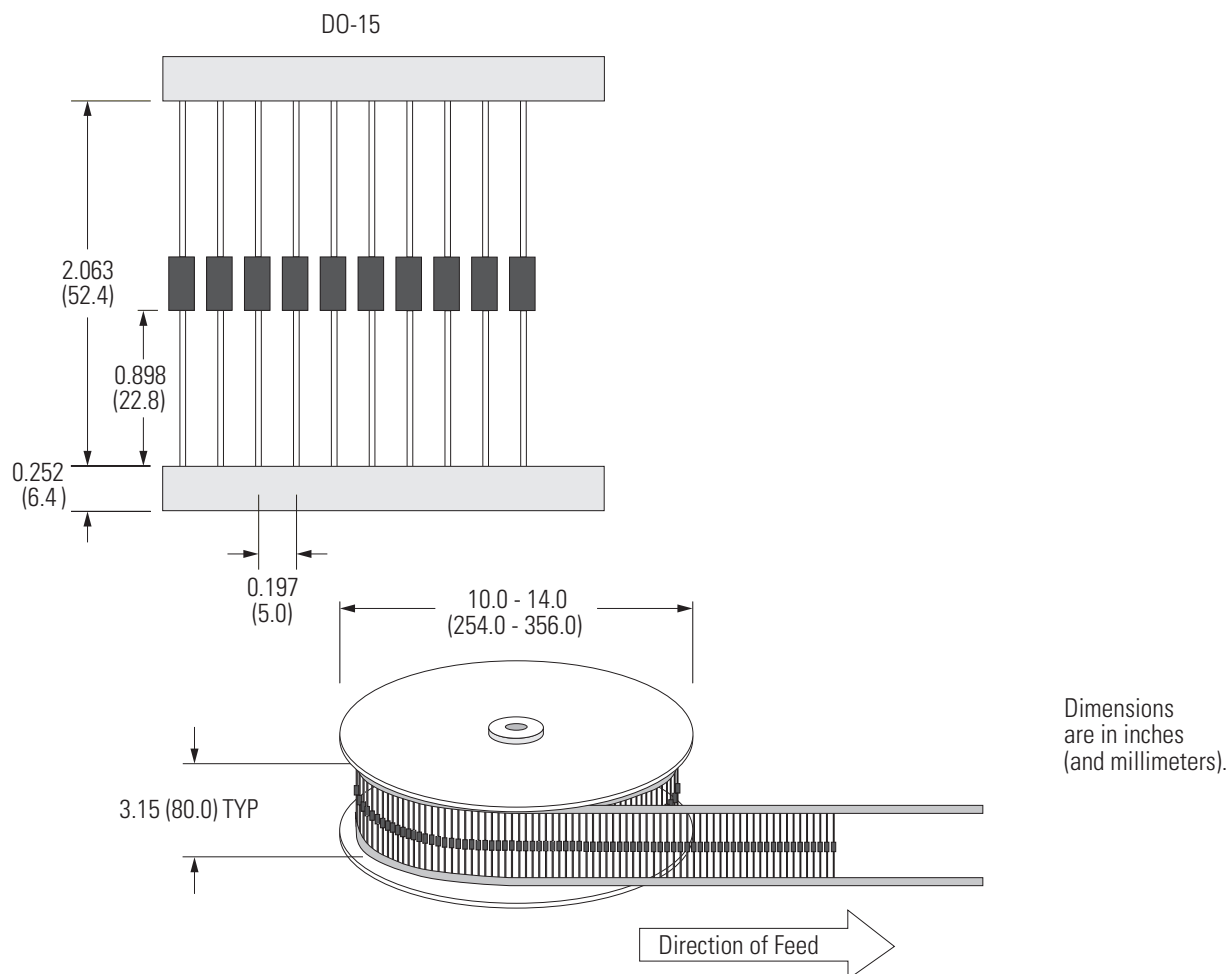
Part Marking and Numbering



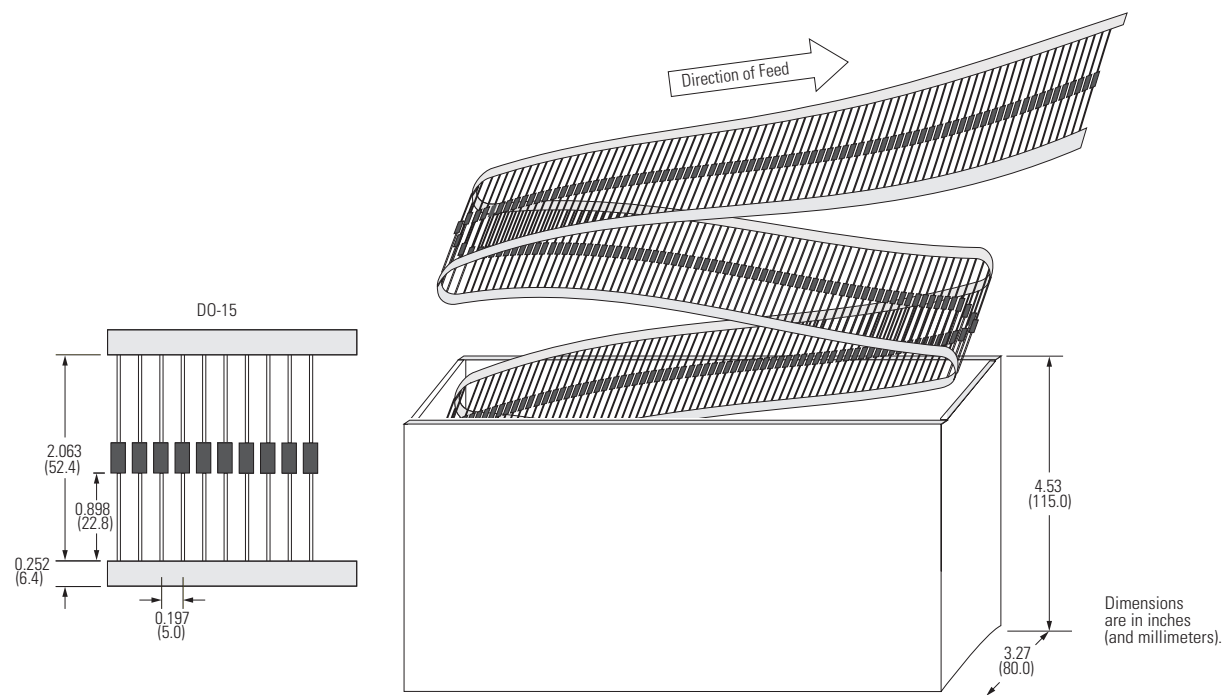
DO-214 Embossed Carrier Reel Pack (RP) Specifications



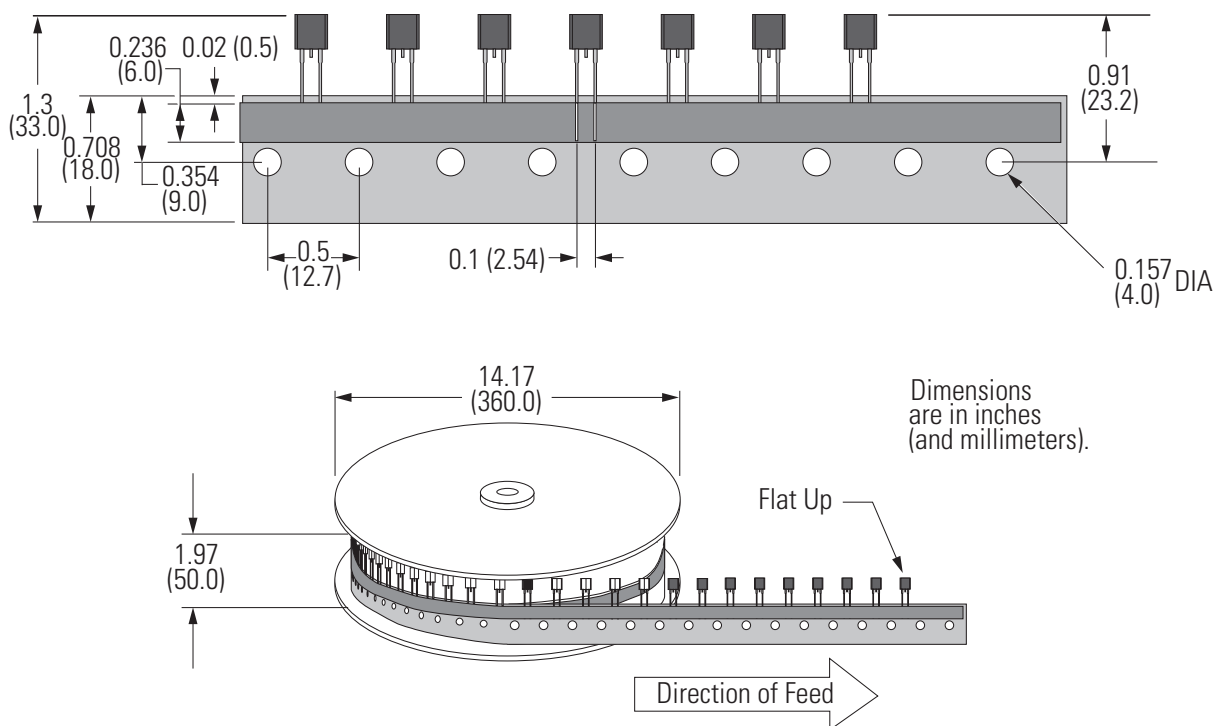
DO-15 Reel Pack (RP) Specifications



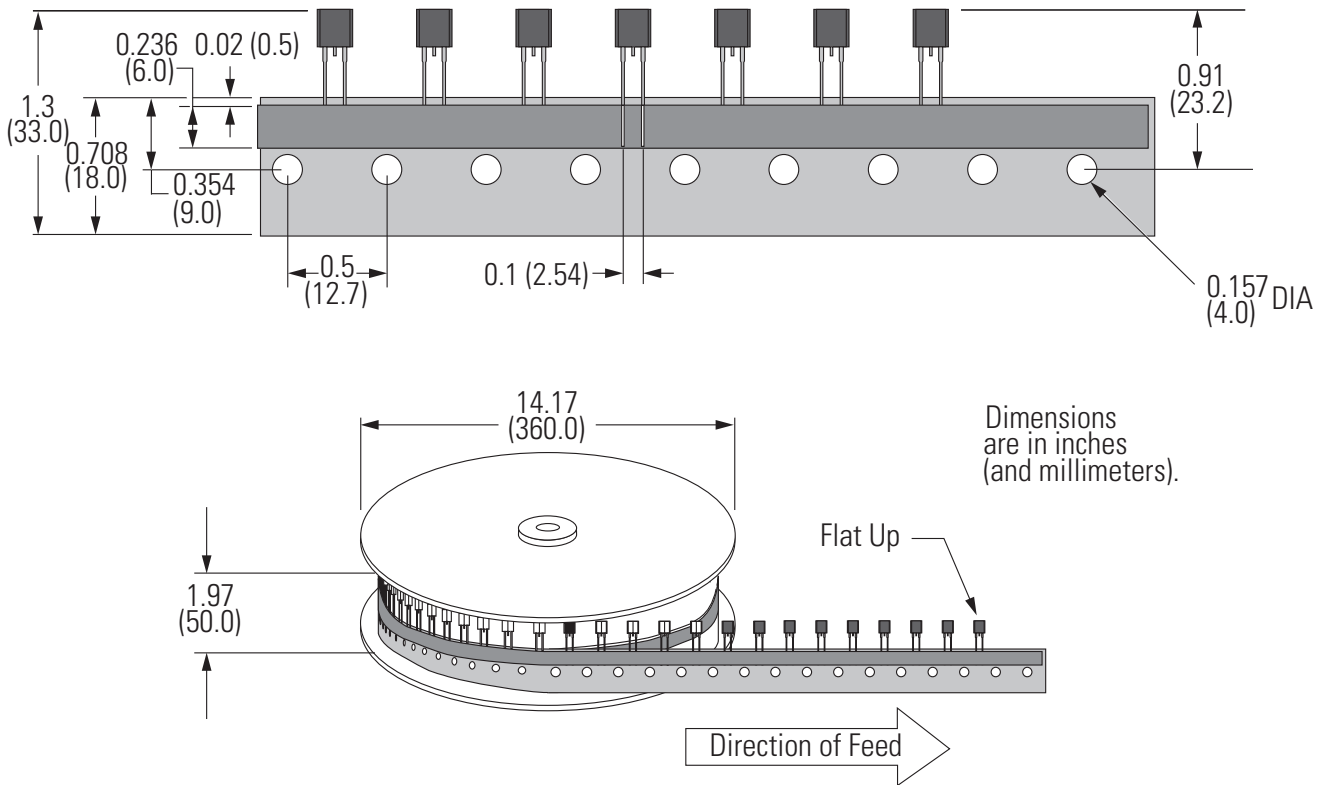
DO-15 Ammo Pack (AP) Specifications



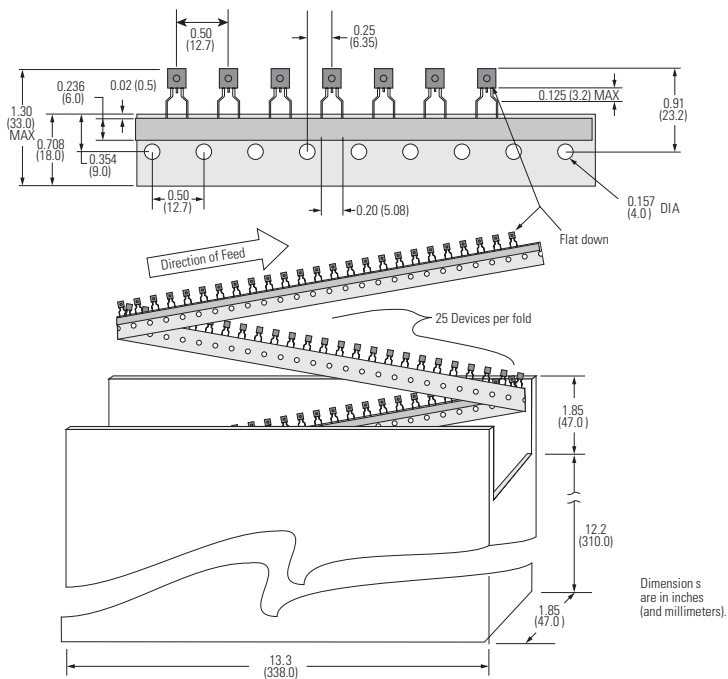
TO-92 Type 70 Reel Pack (RP3) Radial Leaded Specifications



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



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



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