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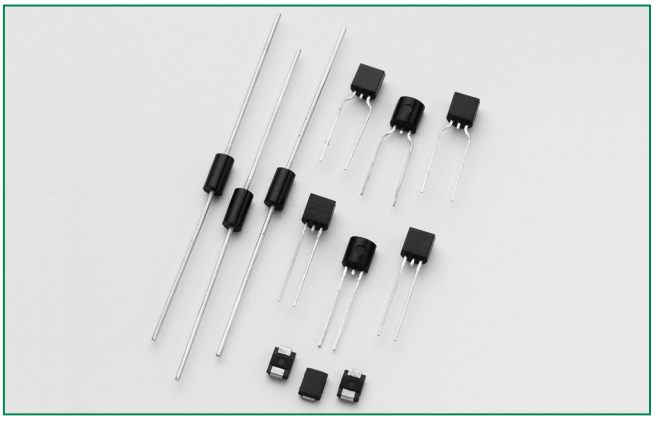
Teccor® brand Thyristors
High Energy Bidirectional SIDACs

Kxxx0yH Series

RoHS



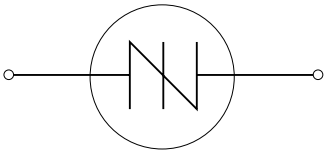
Description

The new Kxxx0yH is a higher energy SIDAC switch for gas ignition applications requiring higher current pulse current especially at low repetition rate. It is offered in a DO-15 and TO-92 leaded packages as well as DO-214 surface mount package. Voltage activation of this solid state switch is accomplished with peak voltage level of 190 to 280Volts. The SIDAC is a silicon bilateral voltage triggered Thyristor switch that switches on through a negative resistance region to a low on-state voltage. Conduction will continue until current is interrupted or lowered below minimum holding current of the device.

Features

- AC Circuit Oriented
- Triggering Voltage of 190 to 280V
- 280A Pulse Current Capability
- RoHS Compliant

Schematic Symbol



Applications

Suitable for high voltage power supplies, natural gas igniters, and Xenon flash ignition.

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

Symbol	Parameters	Test Conditions		Min	Max	Unit
V_{BO}	Breakover/Trigger Voltage	K2000yH		190	215	V
		K2200yH		205	230	
		K2400yH		220	250	
		K2500yH		240	280	
V_{DRM}	Repetitive Peak Off-state Voltage	K2000yH		180		V
		K2200yH		180		
		K2400yH		190		
		K2500yH		200		
$I_{T(RMS)}$	On-state RMS Current	50/60Hz, T_J < 125°C			1	A
V_{TM}	Peak On-state Voltage	I_T = 1A			1.5	V
I_H	Dynamic Holding Current	R_L = 100Ω 50/60Hz Sine Wave			150	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			50	µA
I_{TRM}	Peak Repetitive Pulse Current (refer to figure 4)	t_p = 10µs	60Hz		120	A
			5Hz		280	
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	°C
T_J	Junction Temperature Range			-40	125	°C
$R_{\theta JL}$	Thermal Resistance, Junction to Lead	DO-15			18	°C/W
		DO-214			30	
$R_{\theta JC}$	Thermal Resistance, Junction to Case	TO-92			35	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	DO-15			75	°C/W
		TO-92			95	

Note: xxx - voltage, y = package

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Figure 1: V-I Characteristics

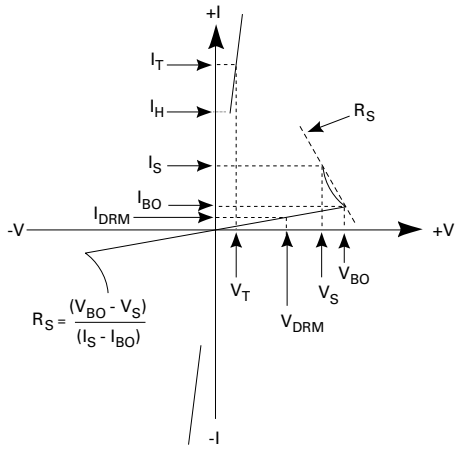

Figure 2: On-state Current vs. On-state Voltage (Typical)

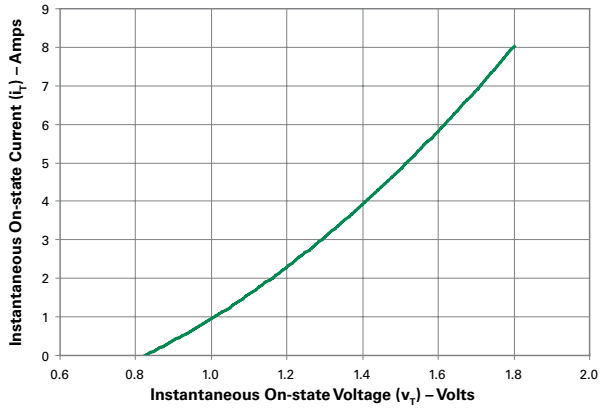

Figure 3: Power Dissipation vs. On-state Current (Typical)

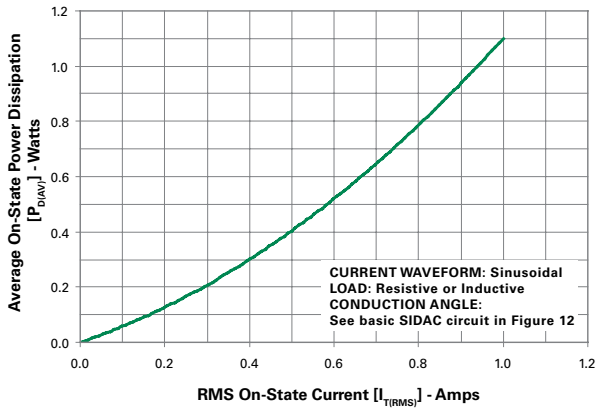

Figure 4: Repetitive Peak On-state Current (I_{TRM}) vs. Pulse Width at Various Frequencies

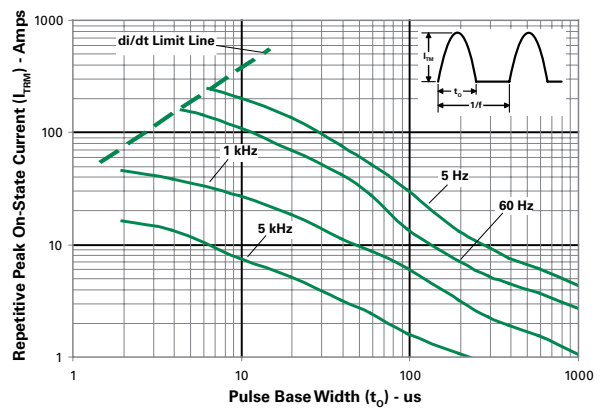

Figure 5: Surge Peak On-state Current vs. Number of Cycles

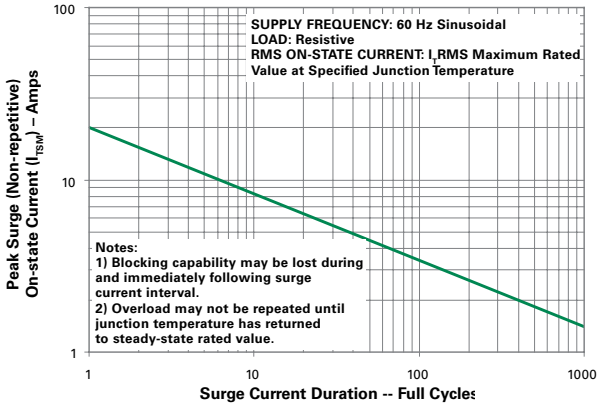

Figure 6: Normalized V_{BO} Change vs. Junction Temperature

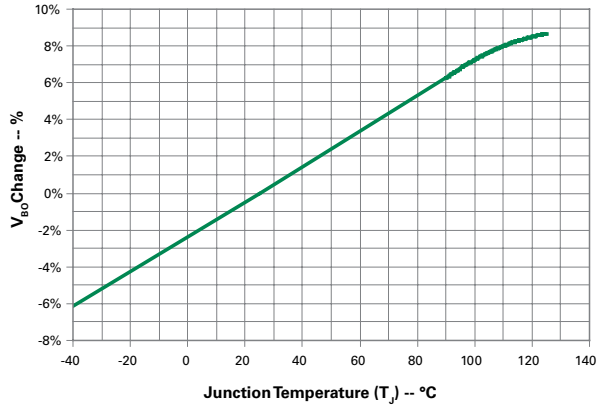

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Figure 7: Normalized DC Holding Current vs. Junction Temperature



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

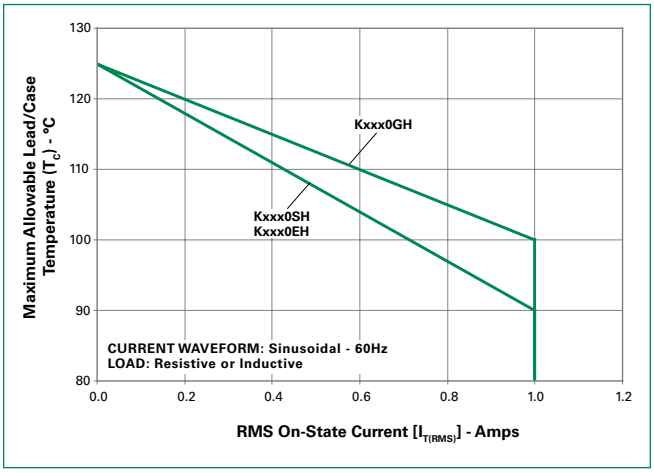

Figure 9: Maximum Allowable Ambient Temperature vs. RMS On-State Current

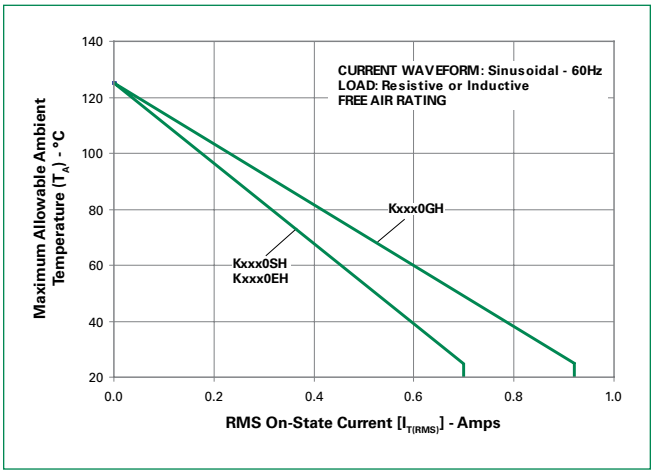

Figure 10: Normalized Repetitive Peak Breakover Current (I_{BO}) vs. Junction Temperature

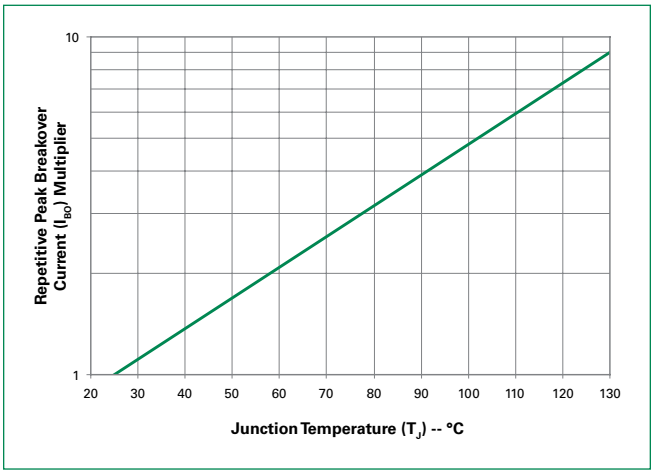

Figure 11: Dynamic Holding Current Test Circuit for SIDACs

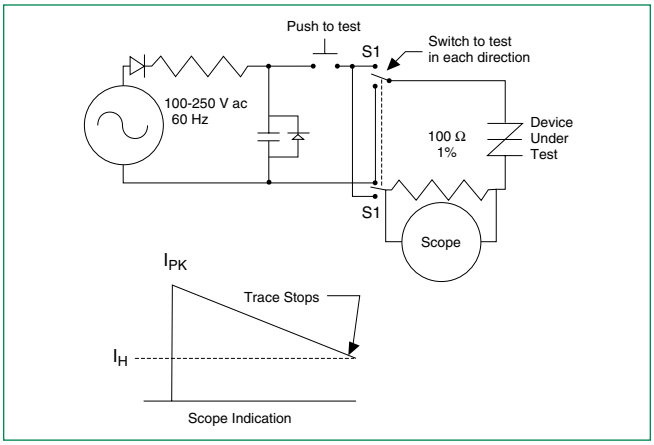

Figure 12: Basic SIDAC Circuit

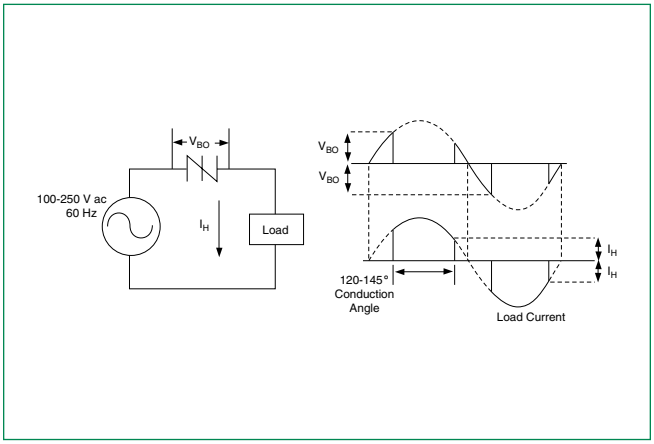

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Figure 13: Relaxation Oscillator Using a SIDAC

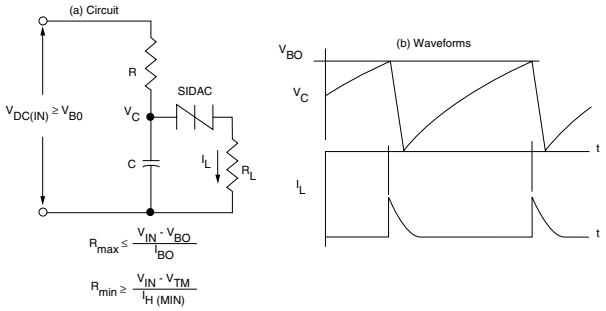
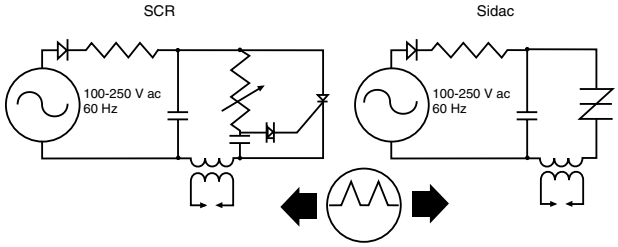
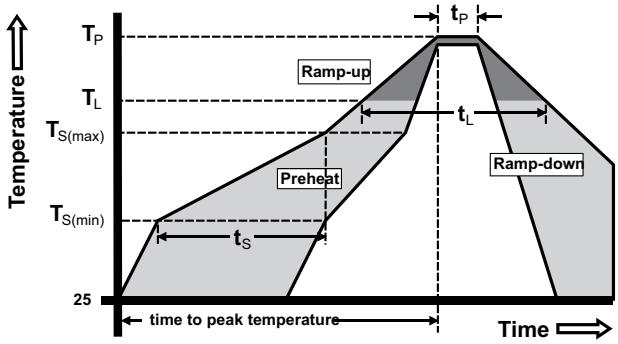


Figure 14: General Gas Ignitor Circuit



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



Additional Information

Datasheet | Resources | Samples

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Teccor® brand Thyristors
High Energy Bidirectional SIDACs

Physical Specifications

Terminal Material	Copper Alloy
Terminal Finish	100% Matte Tin-plated /Pb Free solder dipped.
Body Material	UL recognized epoxy meeting flammability classification 94V-0.

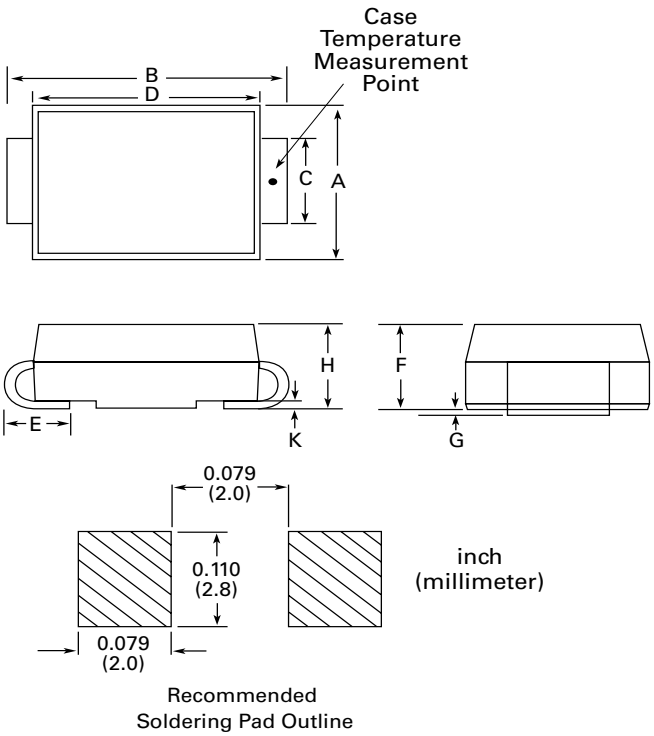
Design Considerations

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), 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 (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
Repetitive Surge Life Testing	MIL-STD-750: Method 2036, Condition E

Dimensions — DO-214



Dimension	Inches		Millimeters	
	Max	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

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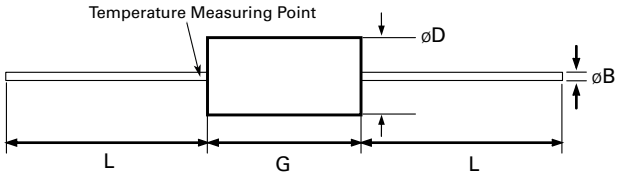
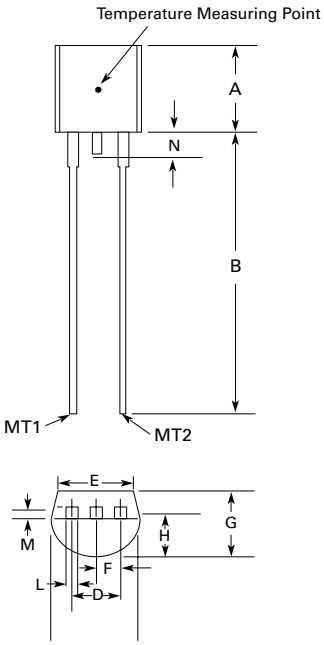
Dimensions — DO-15



Dimension	Inches		Millimeters	
	Max	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



Dimension	Inches		Millimeters	
	Max	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 16000V 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
K2000yH	190V	215V	180V	K2000GH	K2000SH	K2000EH70
K2200yH	205V	230V	180V	K2200GH	K2200SH	K2200EH70
K2400yH	220V	250V	190V	K2400GH	K2400SH	K2400EH70
K2500yH	240V	280V	200V	K2500GH	K2500SH	K2500EH70

Note: y = package

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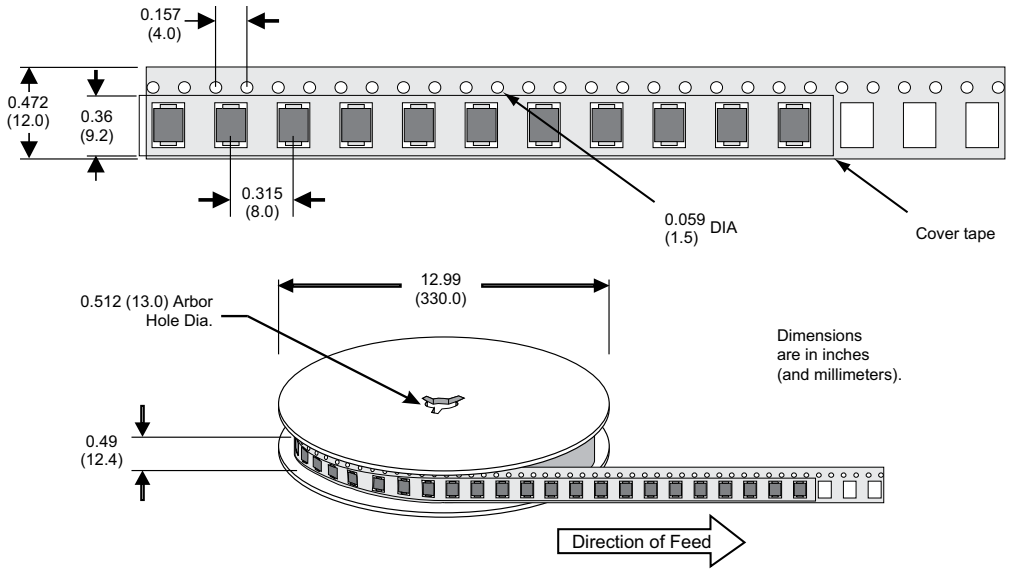
Packing Options

Part Number	Marking	Weight	Packaging Mode	Base Quantity
Kxxx0GH	Kxxx0GH	0.38g	Bulk	1000
Kxxx0GHRP	Kxxx0GH	0.38g	Reel Pack	5000
Kxxx0SHRP	KxxSH	0.1g	Reel Pack	2500
Kxxx0EH70	Kxxx0EH	0.17g	Bulk	2000
Kxxx0EH70AP	Kxxx0EH	0.17g	Ammo Pack	2000
Kxxx0EH70RP2	Kxxx0EH	0.17g	Reel Pack	2000
Kxxx0EH70RP3	Kxxx0EH	0.17g	Reel Pack	2000

Note: xxx or xx = voltage

DO-214 Embossed Carrier Reel Pack (RP) Specifications

Meets all EIA-481-1 Standards



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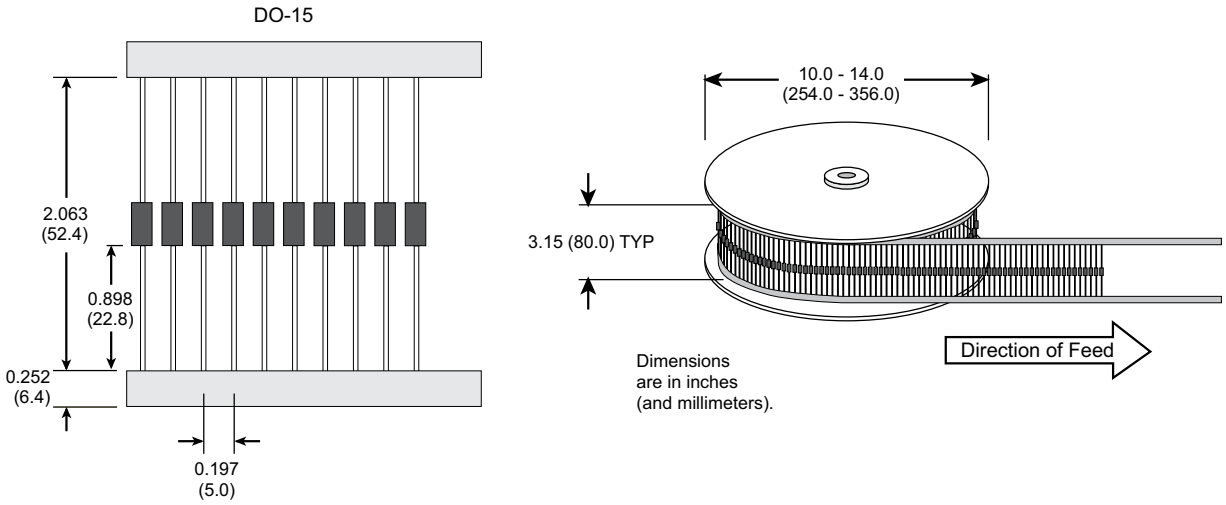
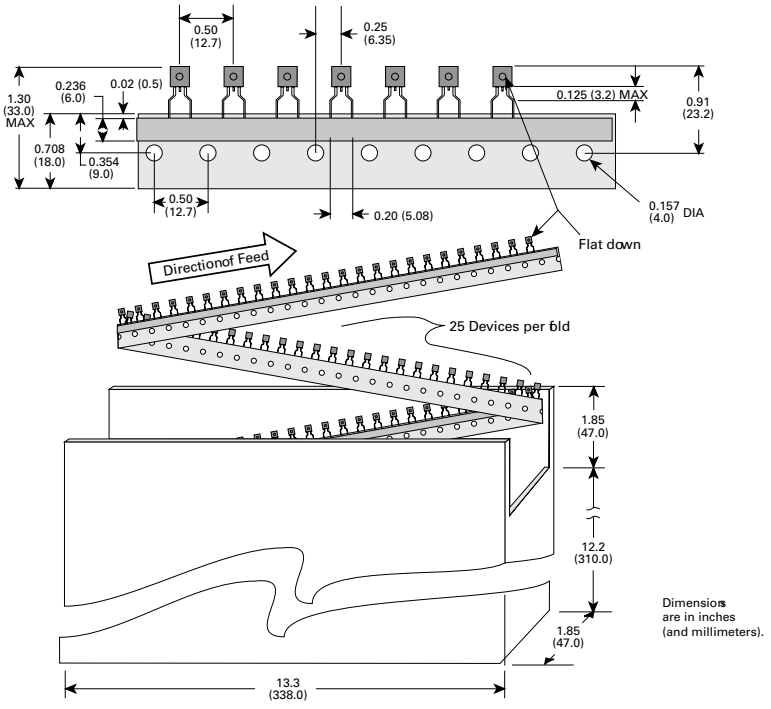
DO-15 Reel Pack (RP) Specifications

Meets all EIA RS-296 Standards



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

Meets all EIA-468-C Standards



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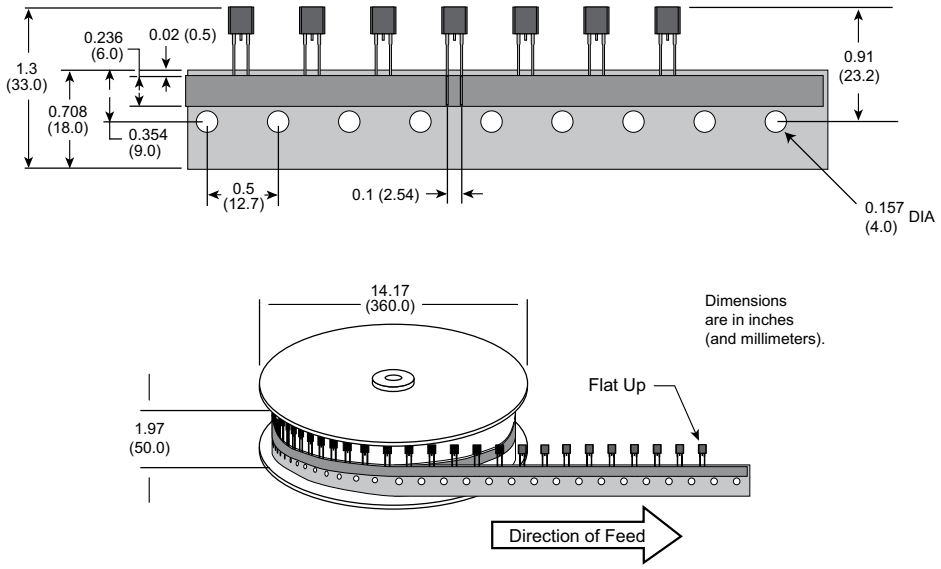
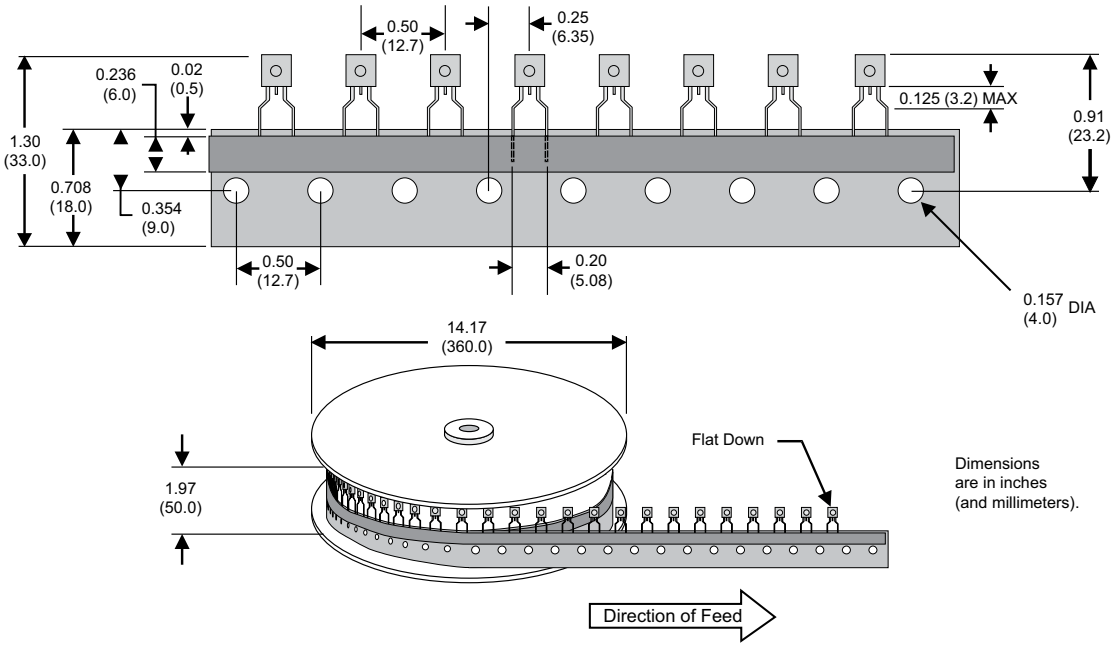
TO-92 Type 70 Reel Pack (RP3) Optional Specifications



TO-92 Type 70 Reel Pack (RP2) Standard Specifications



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Part Numbering System

K 240 0 E H 70 RP2

DEVICE TYPE
K: Sidac

VOLTAGE
200: 190 to 215V
220: 205 to 230V
240: 220 to 250V
250: 240 to 280V

CURRENT FUNCTION
0: Standard

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

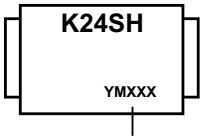
HIGH-ENERGY SIDAC

LEAD FORM DIMENSIONS
xx: Lead Form Option

PACKAGING OPTIONS
[Blank]: Bulk
AP: Ammo (TO-92)
RP: Reel (non TO-92)
RP2: Reel (TO-92)
RP3: Reel (TO-92)

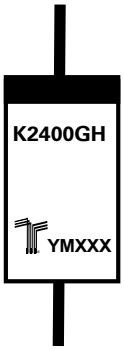
Part Marking System

DO-214AA

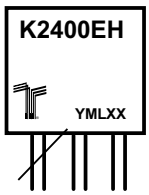


Date Code Marking
Y:Year Code
M: Month Code
XXX: Lot Trace Code

DO-15



TO-92



Date Code Marking
Y:Year Code
M: Month Code
L: Location Code
XX: Lot Serial Code

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