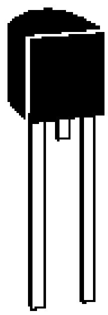
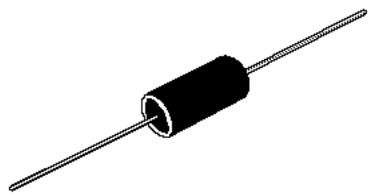
TECCOR ELECTRONICS, INC.

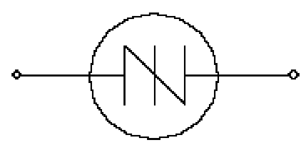


TO-92



Axial Lead Sidac

SIDAC
95-280 Volts



Features

- AC circuit oriented
- Glass passivated junctions
- High surge current capability

General Description

The Sidac is a silicon bilateral voltage-triggered switch with greater power-handling capabilities than standard diacs. Upon application of a voltage exceeding the breakover voltage point, the Sidac switches through a negative resistance region to a low on-state voltage. Conduction will continue until the current is interrupted or drops below the minimum holding current of the device.

Teccor offers the complete voltage range (95-280 volts) in two different packages: TO-92 and axial lead DO-15X for through hole mounting.

Teccor's Sidacs feature glass passivated junctions to ensure a rugged and dependable device capable of withstanding harsh environments.

Variations of devices covered in this data sheet are available for custom design applications. Please contact the factory for more information.

Applications

- High voltage lamp ignitors
- Gas oil ignitors
- Xenon ignitors
- Pulse generators
- HID lighting ignitors
- Natural gas ignitors
- High voltage power supplies
- Over voltage protector
- Fluorescent lighting ignitors

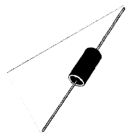
General Notes

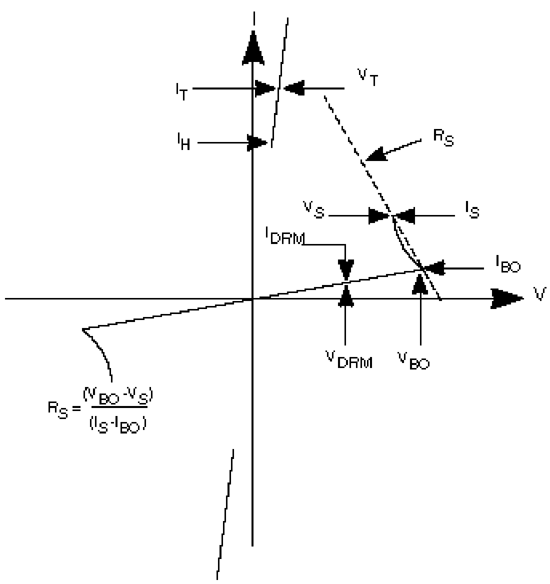
- All measurements are made at 60Hz with resistive load at an ambient temperature of + 25°C, unless otherwise specified.
- Storage temperature range (T_S) is – 65°C to + 150°C for TO-92 package.
- Storage temperature range (T_S) is – 55°C to + 125°C for DO-15X package.
- The temperature measurement points (T_C & T_L) are shown on the dimension drawings.
- Junction temperature range (T_J) is – 40°C to + 110°C.
- Lead solder temperature is a maximum of + 230°C for 10 seconds maximum; ≥ 1/16" (1.59mm) from case.

Electrical Isolation

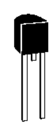
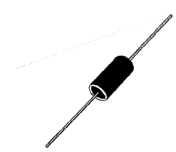
Teccor's electrically isolated E & G Sidac packages will withstand a high potential test of 1600 VAC (RMS) from leads to case over the operating temperature range.

Electrical Specifications

Part Number		$I_{T(RMS)}$	V_{DRM}	V_{BO}		I_{DRM}	I_{BO}
 E	 G	On-State RMS Current $T_J \leq 110°C$ 50/60 Hz Sine Wave (6) (7) (8) Amps	Repetitive Peak Off-State Voltage Volts	Peak Breakover Voltage (1) Volts		Repetitive Peak Off-State Current $V = V_{DRM}$ µAmps	Breakover Current µAmps
For Package Dimensions & Variations, See Page 7		MAX	MIN	MIN	MAX	MAX	MAX
K1050E70	K1050G	1.0	± 90	95	113	5	10
K1100E70	K1100G	1.0	± 90	104	118	5	10
K1200E70	K1200G	1.0	± 90	110	125	5	10
K1300E70	K1300G	1.0	± 90	120	138	5	10
K1400E70	K1400G	1.0	± 90	130	146	5	10
K1500E70	K1500G	1.0	± 90	140	170	5	10
K2000E70	K2000G	1.0	± 180	190	215	5	10
K2200E70	K2200G	1.0	± 180	205	230	5	10
	K2201G	(10)	± 180	205	230	5	10
K2400E70	K2400G	1.0	± 190	220	250	5	10
	K2401G	(10)	± 190	220	250	5	10
K2500E70	K2500G	1.0	± 190	240	280	5	10



V-I characteristicss to Electrical Specifications

THERMAL RESISTANCE (STEADY STATE) $R_{\theta JC}$ [$R_{\theta JA}$] °C/W (TYPICAL)		
Type	 E	 G
1.0 Amp	50 [105]	28 [79]

I_S	I_H		V_{TM}	I_{TSM}		R_S	dV_q/dt	dv/dt	dI/dt
Switching Current	Dynamic Holding Current (3)		Peak On-State Voltage I_T = 1A	Peak One Cycle Surge Current 50/60Hz Sine Wave (Non-Repetitive) (4) (5) Amps		Switching Resistance (9) $R_S = \frac{V_{BO} - V_S}{I_S - I_{BO}}$	Critical Rate-of-Rise of Turn-off Voltage at 8 kHz	Critical Rate-of-Rise of Off-State Voltage at Rated V_{DMR} $T_J \leq 100°C$	Critical Rate-of-Rise of On-State Current
mAmps	mAmps		Volts	60 Hz	50 Hz	kΩ	Volts/µSec	Volts/µSec	Amps/µSec
TYP	TYP	MAX	MAX			MIN	MIN	MIN	TYP
150	60	150	1.5	20	16.7	0.1	20	1500	150
150	60	150	1.5	20	16.7	0.1	20	1500	150
150	60	150	1.5	20	16.7	0.1	20	1500	150
150	60	150	1.5	20	16.7	0.1	20	1500	150
150	60	150	1.5	20	16.7	0.1	20	1500	150
150	60	150	1.5	20	16.7	0.1	20	1500	150
150	60	150	1.5	20	16.7	0.1	20	1500	150
150	60	150	1.5	20	16.7	0.1	20	1500	150
150	60	150	2.5	20	16.7	2.0	42	1500	150
150	60	150	1.5	20	16.7	0.1	20	1500	150
150	60	150	2.5	20	16.7	2.0	42	1500	150
150	60	150	1.5	20	16.7	0.1	20	1500	150

Notes to Electrical Specifications

1. See Figure 5 for V_{BO} change vs junction temperature.
2. See Figure 6 for I_{BO} vs junction temperature.
3. See Figure 2 for I_H vs case temperature.
4. See Figure 3 for Repetitive surge current capabilities.
5. See Figure 1 for more than one full cycle rating.
6. $T_L \leq 85°C$ for Axial.
7. $T_C \leq 80°C$ for TO-92 Package.
8. See Figure 14 for clarification of Sidac operation.
9. For best Sidac operation, the load impedance should be near or less than switching resistance.
10. Teccor's new, improved series of sidacs is designed to ensure good commutation at higher switching frequencies as required in ignitor circuits for high intensity discharge (HID) lighting. A typical circuit for metal halide lamp circuit is shown in the schematic, Figure 13.

    With proper component selection this circuit will produce three pulses for ignition of Osram lamp types such as HQI-T70W, HQI-T150W, and HQI-T250W which require a minimum of three pulses at 4kV magnitude and >1µs duration at a minimum repetition rate of 3.3 kHz.

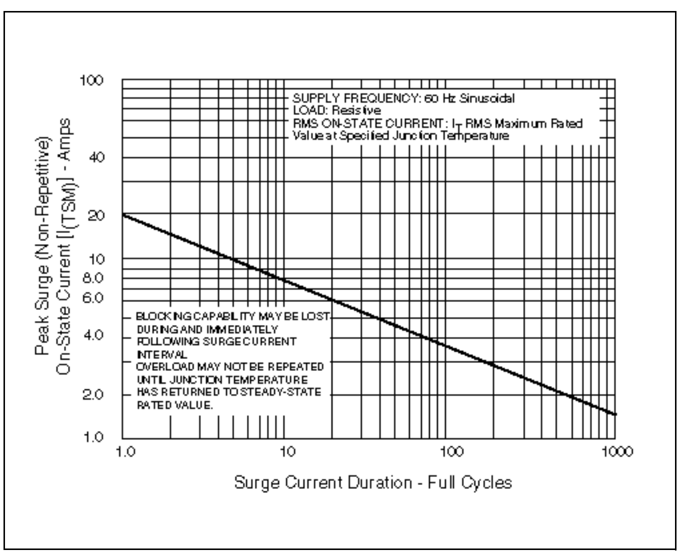


Figure 1 – Peak Surge Current vs Surge Current Duration

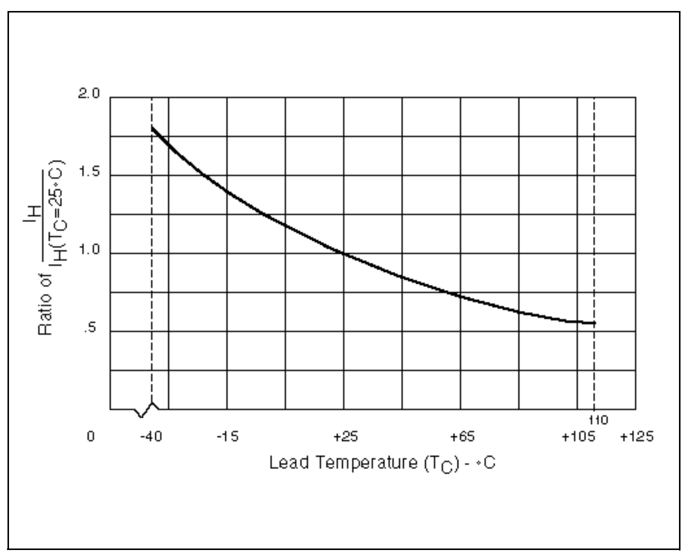


Figure 2 – Normalized DC Holding Current vs Lead Temperature

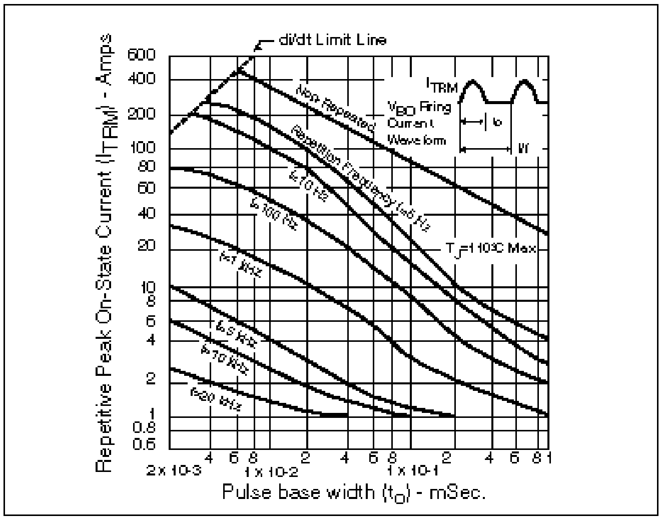


Figure 3 – Repetitive Peak On-State Current (I_{TRM}) vs Pulse Width at Various Frequencies

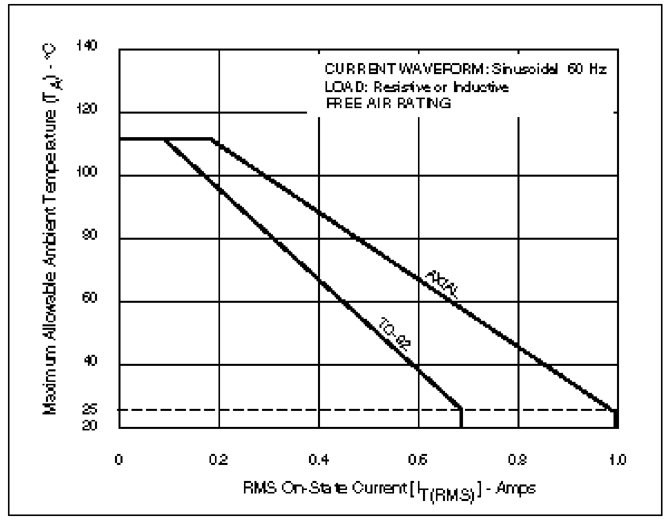


Figure 4 – Maximum Allowable Ambient Temperature vs On-State Current

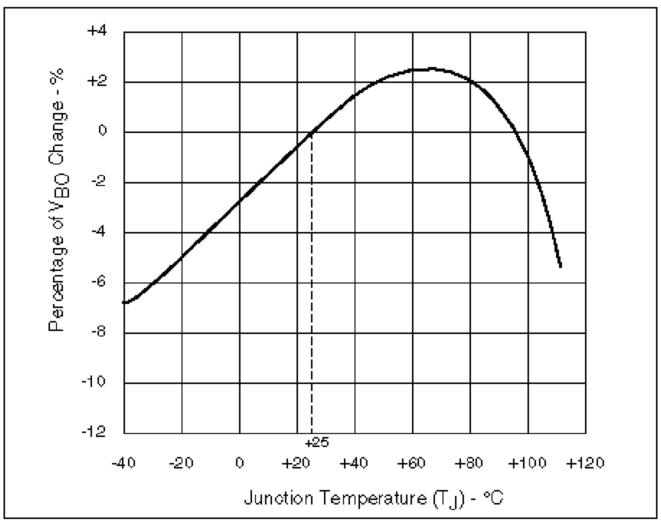


Figure 5 – Normalized V_{BO} Change vs Junction Temperature

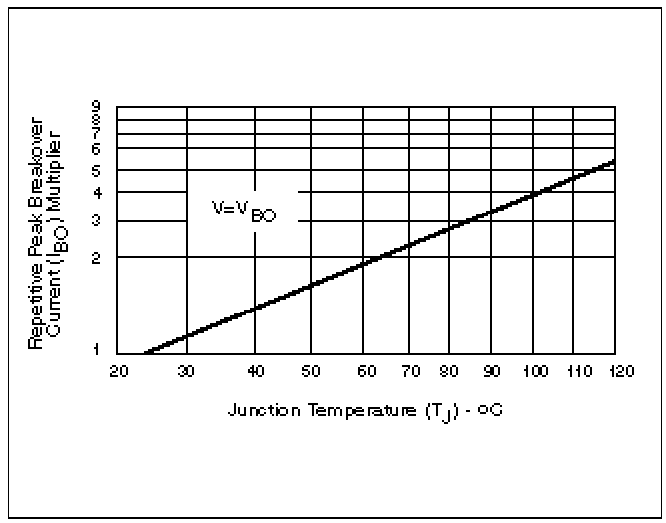


Figure 6 – Normalized Repetitive Peak Breakover Current vs Junction Temperature

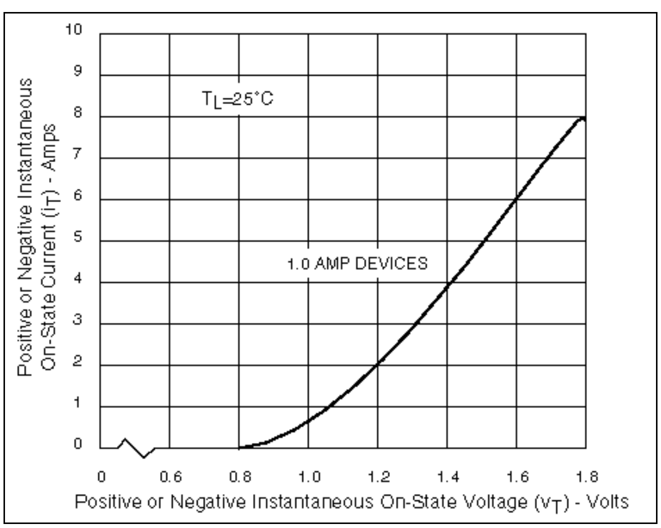


Figure 7 – On-State Current vs On-State Voltage (Typical)

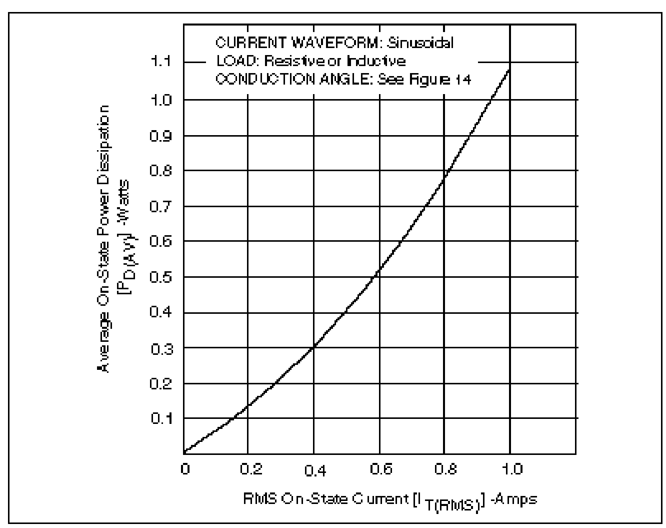


Figure 8 – Power Dissipation (Typical) vs On-State Current

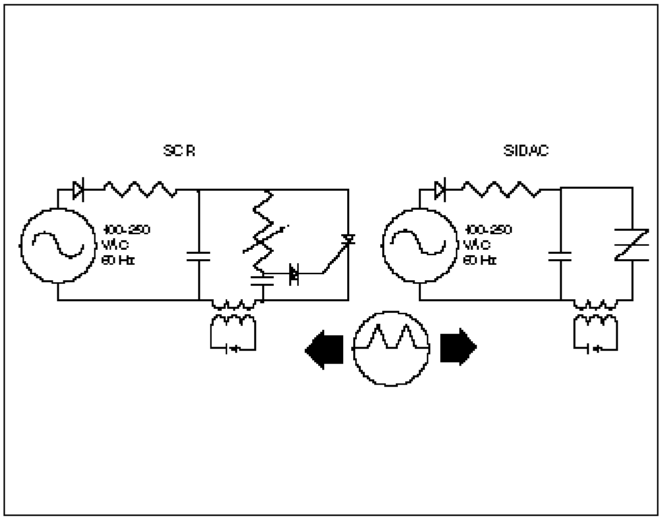


Figure 9 – Comparison of Sidac vs SCR

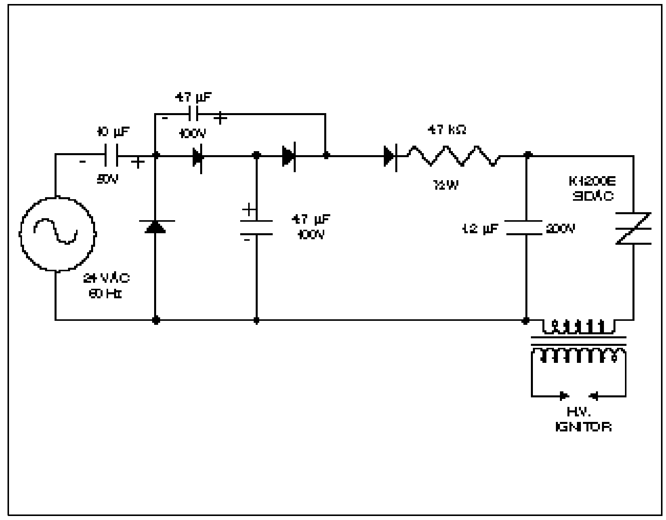


Figure 10 – Ignitor Circuit (Low Voltage Input)

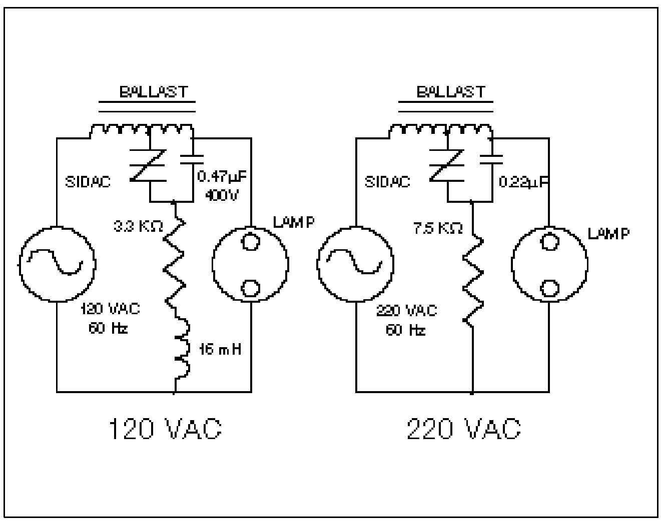


Figure 11 – Typical High Pressure Sodium Lamp Firing Circuit

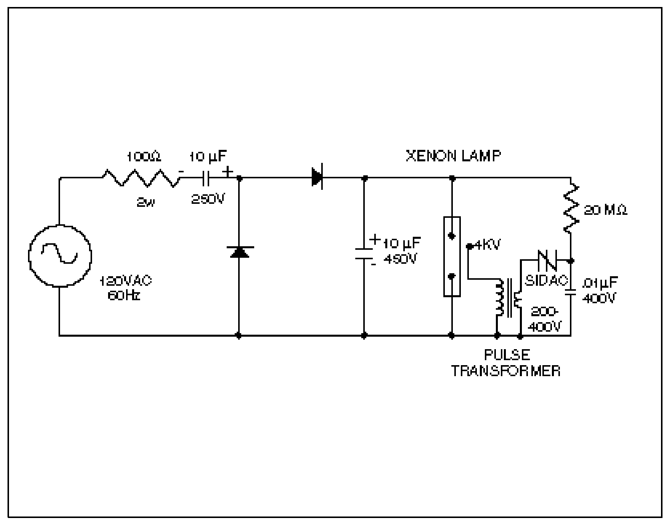


Figure 12 – Xenon Lamp Flashing Circuit

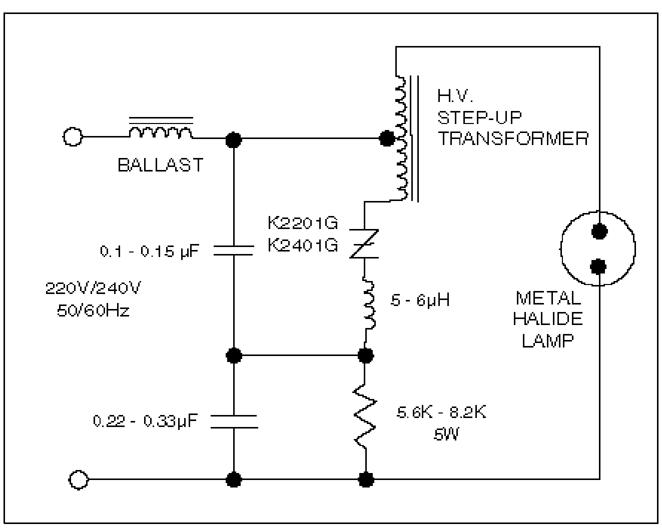


Figure 13 – Typical Metal Halide Ignitor Circuit

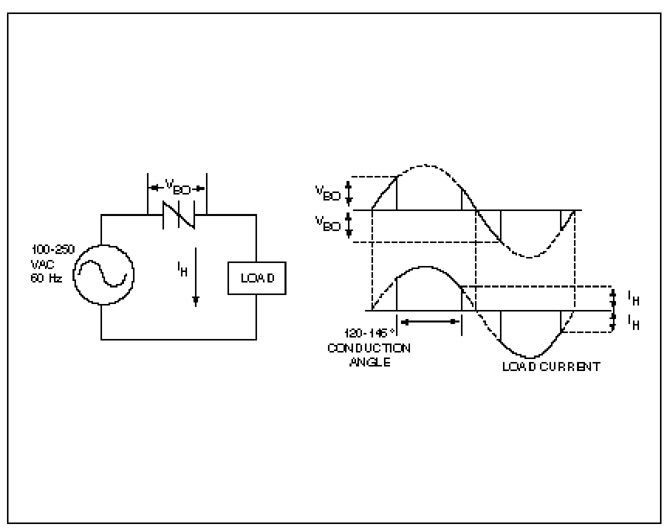


Figure 14 – Basic Sidac Circuit

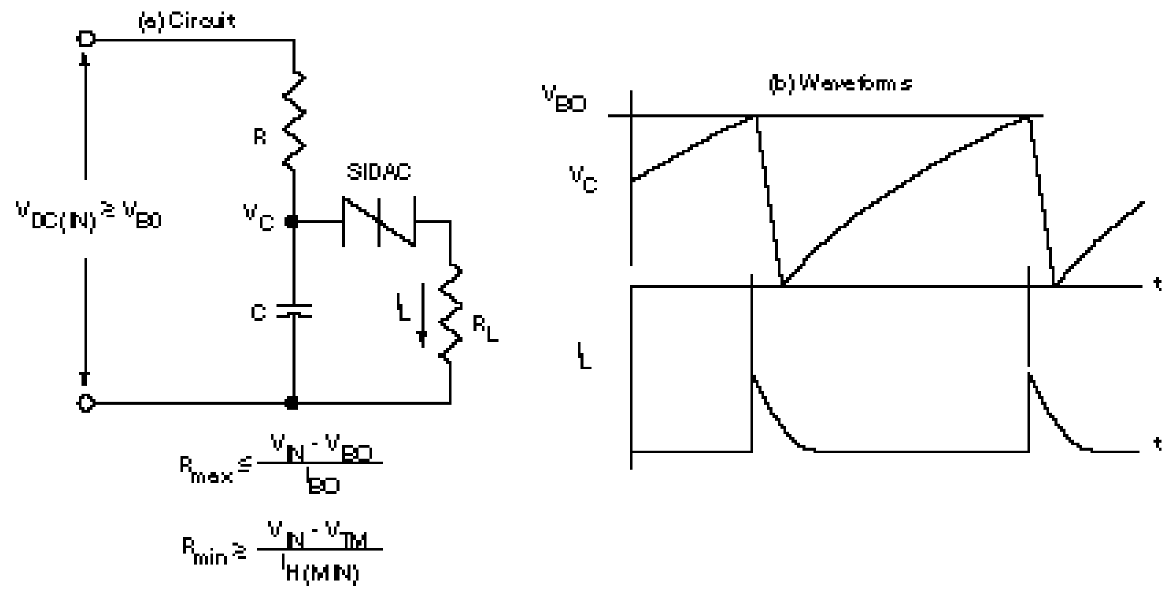
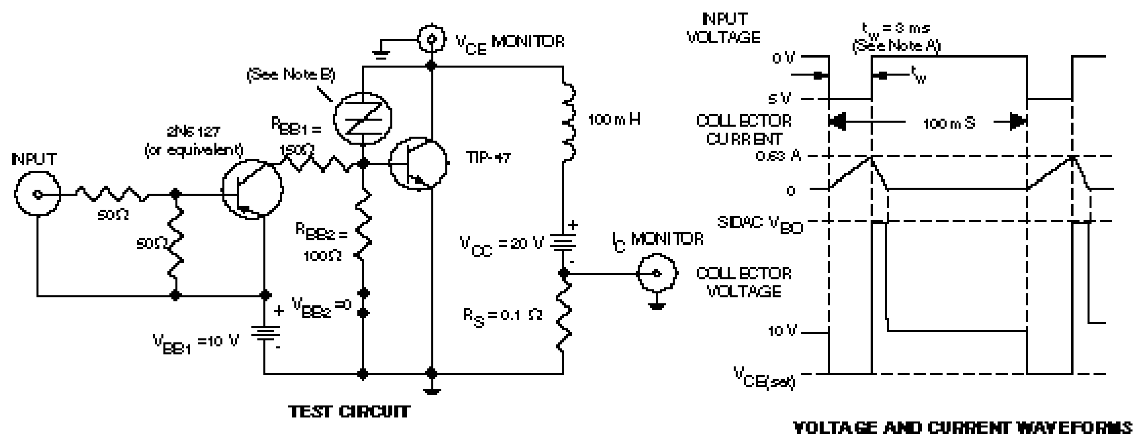


Figure 15 – Relaxation Oscillator Using a Sidac

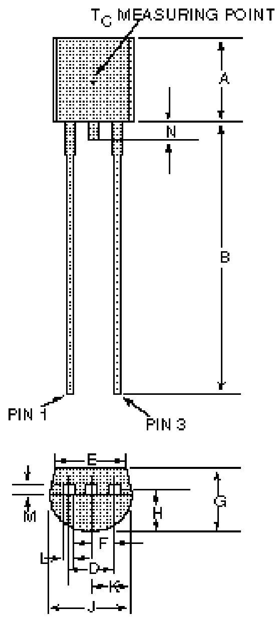


NOTE A: Input pulse width is increased until I_{CM} = 0.63A.

NOTE B: Sidac (or Diac or series of Diacs) chosen so that V_{BO} is just below V_{CEO} rating of transistor to be protected. The Sidac (or Diac) eliminates a reverse breakdown of the transistor in inductive switching circuits where otherwise the transistor could be destroyed.

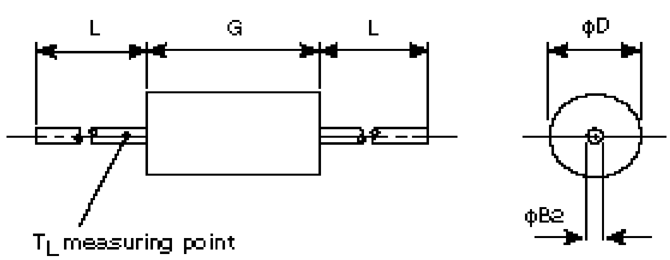
Figure 16 – Sidac Added to Protect Transistor for Typical Transistor Inductive Load Switching Requirements

"E" PACKAGE
(TYPE 70 LEADFORM)
TO-92 (ISOLATED)



DIM	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		0.152

"G" PACKAGE
DO-15X (ISOLATED)



DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
ϕB2	0.027	0.035	0.686	0.889
ϕD	0.104	0.150	2.64	3.81
G	0.230	0.300	5.84	7.62
L	1.00		25.4	

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