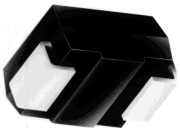
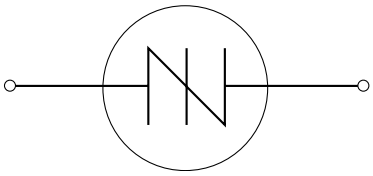
DO-15X
Axial Lead



DO-214AA
Surface Mount

TO-92
Type 70

E9



SIDAC

(95 - 280 Volts)

General Description

A sidac is a silicon bilateral voltage triggered switch, with greater power-handling capabilities than standard diacs. 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 will continue until the current is interrupted or drops below the minimum holding current of the device.

Switching voltages in the range of 95 V to 330 V, in four different packages:

- TO-92
- Axial lead DO-15X
- Surface Mount DO-214AA
- TO-202AB (190-330 volts)

Teccor's sidacs feature glass-passivated junctions that ensure long term reliability and stable characteristics by creating a rugged, reliable barrier against junction contamination.

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

Applications

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

Features

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

Type	Part No.				$I_{T(RMS)}$	V_{DRM}	V_{BO}		I_{DRM}	I_{BO}	I_H	
	 TO-92 E Package	 DO-15X G Package	TO-202AB F Package	 DO-214AA S Package	(7) (8) Amps	Volts	(1) Volts		µAmps	µAmps	(3) (4) mAmps	
	See "Package Dimensions" section for variations.				MAX	MIN	MIN	MAX	MAX	MAX	TYP	MAX
	K1050E70	**K1050G**		**K1050S**	**1**	**±90**	**95**	**113**	**5**	**10**	**60**	**150**
	K1100E70	**K1100G**		**K1100S**	**1**	**±90**	**104**	**118**	**5**	**10**	**60**	**150**
	K1200E70	**K1200G**		**K1200S**	**1**	**±90**	**110**	**125**	**5**	**10**	**60**	**150**
	K1300E70	**K1300G**		**K1300S**	**1**	**±90**	**120**	**138**	**5**	**10**	**60**	**150**
	K1400E70	**K1400G**		**K1400S**	**1**	**±90**	**130**	**146**	**5**	**10**	**60**	**150**
	K1500E70	**K1500G**		**K1500S**	**1**	**±90**	**140**	**170**	**5**	**10**	**60**	**150**
	K2000E70	**K2000G**	**K2000F1**	**K2000S**	**1**	**±180**	**190**	**215**	**5**	**10**	**60**	**150**
	K2200E70	**K2200G**	**K2200F1**	**K2200S**	**1**	**±180**	**205**	**230**	**5**	**10**	**60**	**150**
	K2400E70	**K2400G**	**K2400F1**	**K2400S**	**1**	**±190**	**220**	**250**	**5**	**10**	**60**	**150**
	K2500E70	**K2500G**	**K2500F1**	**K2500S**	**1**	**±200**	**240**	**280**	**5**	**10**	**60**	**150**
		K2501G	**K3000F1**		**1 (10)**	**±200**	**240**	**280**		**75**	**60**	**150**

Specific Test Conditions

di/dt — Critical rate-of-rise of on-state current

dv/dt — Critical rate-of-rise of off-state voltage at rated V_{DRM}; $T_J \leq 100°C$

I_{BO} — Breakover current 50/60 Hz sine wave

I_{DRM} — Repetitive peak off-state current 50/60 Hz sine wave; $V = V_{DRM}$

I_H — Dynamic holding current 50/60 Hz sine wave; $R = 100\Omega$

$I_{T(RMS)}$ — On-state RMS current $T_J \leq 125°C$ 50/60 Hz sine wave

I_{TSM} — Peak one cycle surge current 50/60 Hz sine wave (non-repetitive)

R_S — Switching resistance $R_S = \frac{(V_{BO} - V_S)}{(I_S - I_{BO})}$ 50/60 Hz sine wave

V_{BO} — Breakover voltage 50/60 Hz sine wave

V_{DRM} — Repetitive peak off-state voltage

V_{TM} — Peak on-state voltage, $I_T = 1$ Amp

General Notes

- All measurements are made at 60Hz with a resistive load at an ambient temperature of +25°C unless otherwise specified.
- Storage temperature range (T_S) is -65°C to +150°C.
- The case (T_C) or lead (T_L) temperature is measured as shown on the dimensional outline drawings. See "Package Dimensions" section of this catalog.
- Junction temperature range (T_J) is -40°C to +125°C.
- Lead solder temperature is a maximum of +230°C for 10 seconds maximum; ≥ 1/16" (1.59mm) from case.

Electrical Specification Notes

(1) See Figure 9.5 for V_{BO} change vs junction temperature.

(2) See Figure 9.6 for I_{BO} vs junction temperature.

(3) See Figure 9.2 for I_H vs case temperature.

(4) See Figure 9.13 for test circuit.

(5) See Figure 9.1 for more than one full cycle rating.

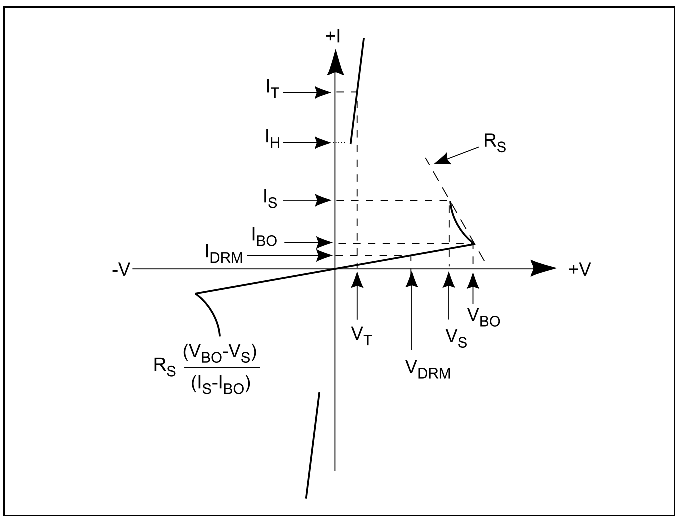
(6) $R_{\theta JA}$ for TO-202 Type 23 and Type 41 is 70° C/watt.

(7) $T_C \leq 90°C$ for TO-92 Sidac and $T_C \leq 105°C$ for TO-202 Sidacs. $T_L \leq 100°C$ for DO-15X and $T_L \leq 90°C$ for DO-214AA.

(8) See Figure 9.14 for clarification of Sidac operation.

(9) For best Sidac operation, the load impedance should be near or less than switching resistance.

V_{TM}			I_{TSM}		R_S	dv/dt	di/dt
Volts Max			(5) Amps		(9)		
Package			60Hz	50Hz	kΩ	Volts/μSec	Amps/μSec
E	G	S			MIN	MIN	TYP
1.5	**1.5**	**1.5**	**20**	**16.7**	**0.1**	**1500**	**150**
1.5	**1.5**	**1.5**	**20**	**16.7**	**0.1**	**1500**	**150**
1.5	**1.5**	**1.5**	**20**	**16.7**	**0.1**	**1500**	**150**
1.5	**1.5**	**1.5**	**20**	**16.7**	**0.1**	**1500**	**150**
1.5	**1.5**	**1.5**	**20**	**16.7**	**0.1**	**1500**	**150**
1.5	**1.5**	**1.5**	**20**	**16.7**	**0.1**	**1500**	**150**
1.5	**1.5**	**1.5**	**20**	**16.7**	**0.1**	**1500**	**150**
1.5	**1.5**	**1.5**	**20**	**16.7**	**0.1**	**1500**	**150**
1.5	**1.5**	**1.5**	**20**	**16.7**	**0.1**	**1500**	**150**
1.5	**1.5**	**1.5**	**20**	**16.7**	**0.1**	**1500**	**150**
	6.0		**20**	**16.7**	**0.1**	**1500**	**150**



V-I Characteristics

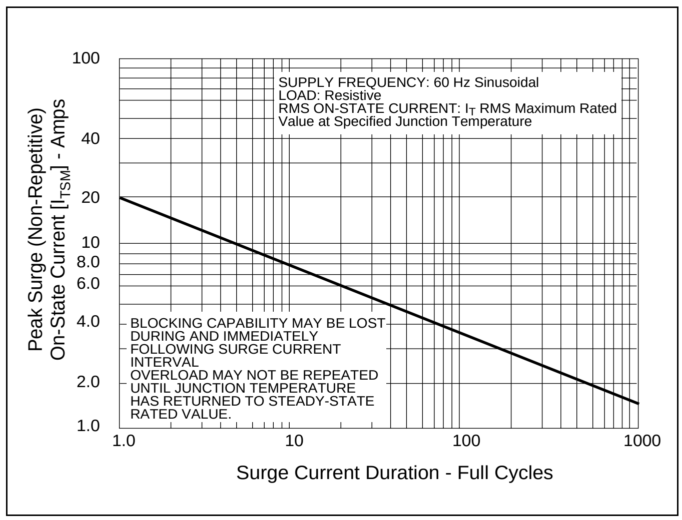
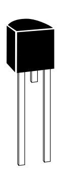
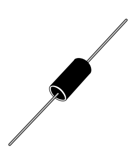
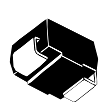


Figure 9.1 Peak Surge Current vs Surge Current Duration

THERMAL RESISTANCE (STEADY STATE) $R_{\theta JC}$ [$R_{\theta JA}$] °C/W (TYPICAL)		
 E	 G	 S
35 [95]	**18 [75]**	**30 * [85]**

* Mounted on $1cm^2$ copper foil surface. Two-ounce copper foil.

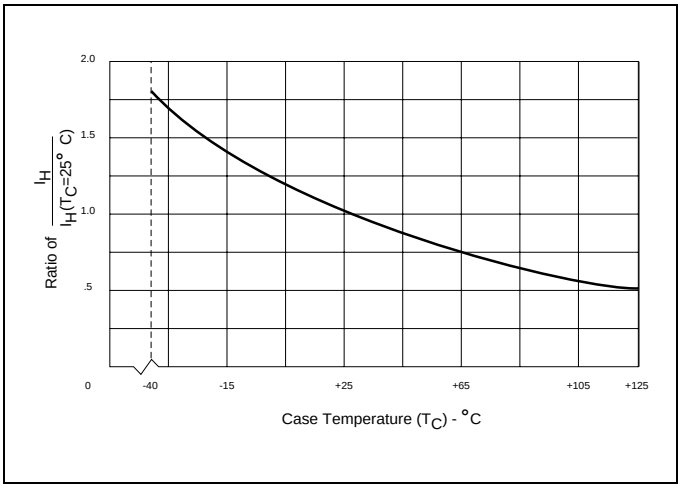


Figure 9.2 Normalized DC Holding Current vs Case/Lead Temperature

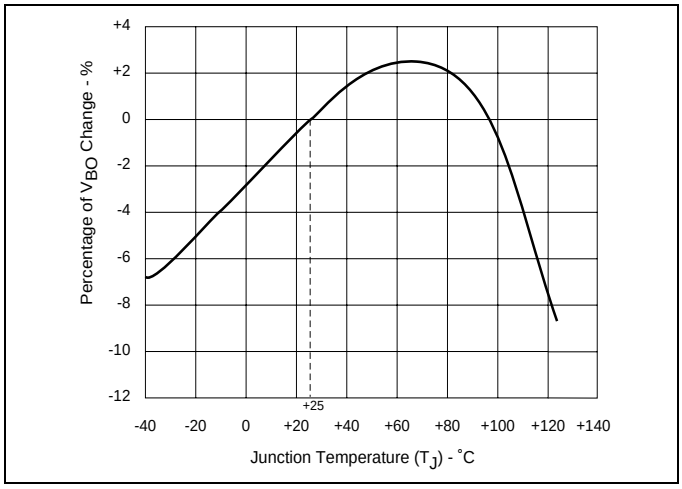


Figure 9.5 Normalized V_{BO} Change vs Junction Temperature

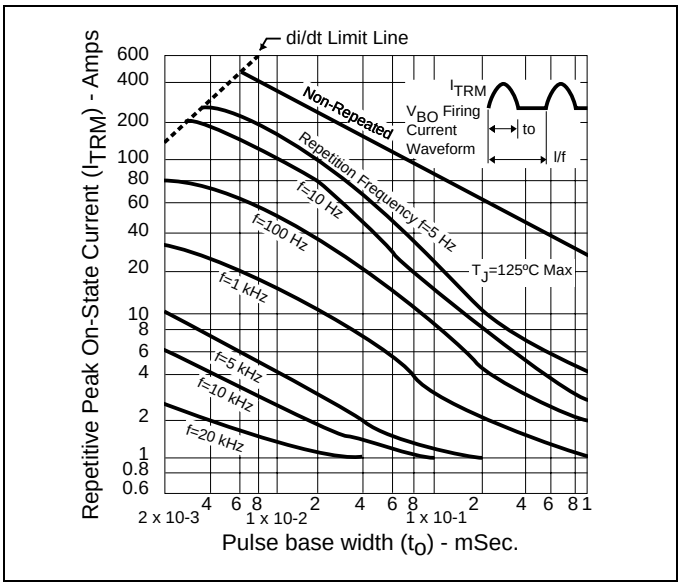


Figure 9.3 Repetitive Peak On-State Current (I_{TRM}) vs Pulse Width at Various Frequencies

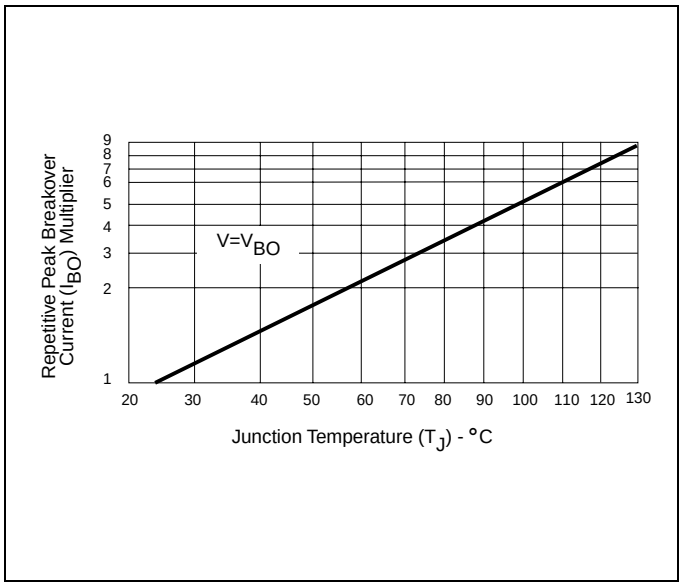


Figure 9.6 Normalized Repetitive Peak Breakover Current vs Junction Temperature

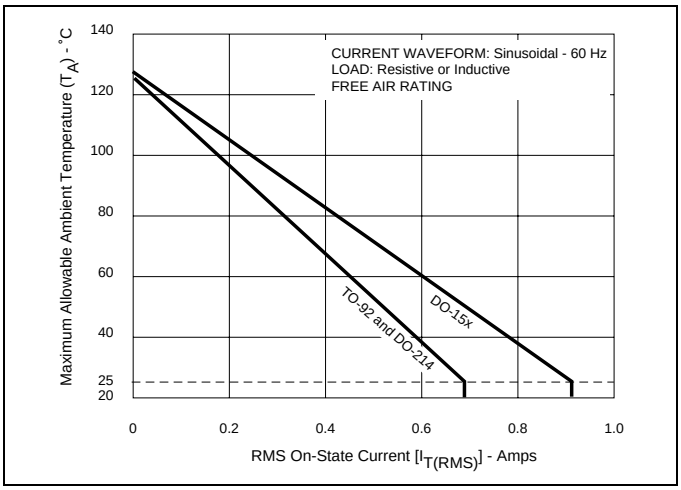


Figure 9.4 Maximum Allowable Ambient Temperature vs On-State Current

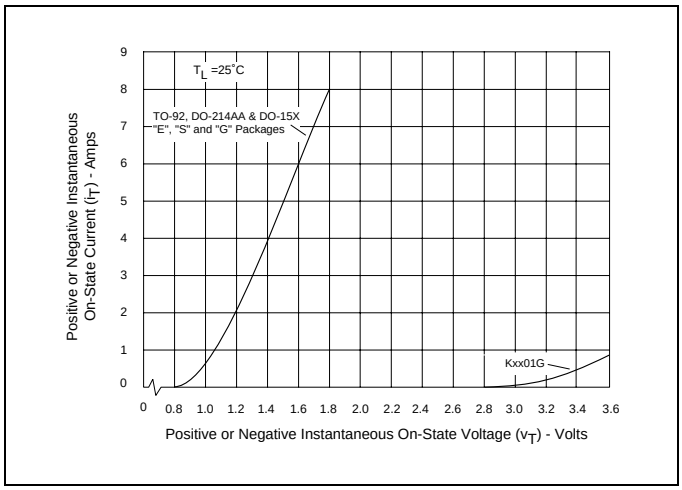


Figure 9.7 On-State Current vs On-State Voltage (Typical)

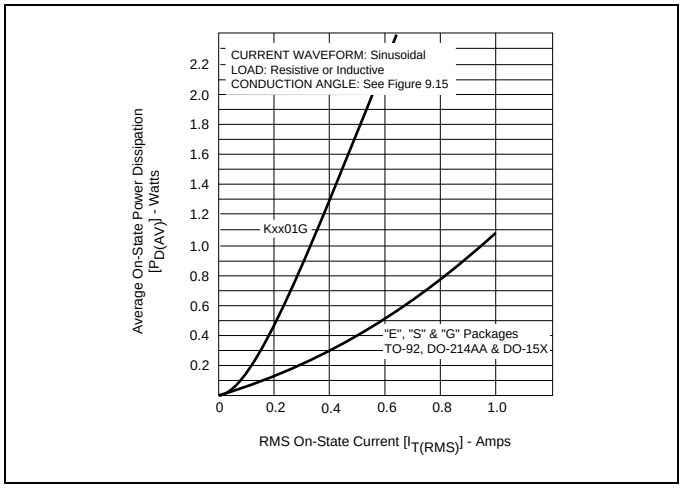


Figure 9.8 Power Dissipation (Typical) vs On-State Current

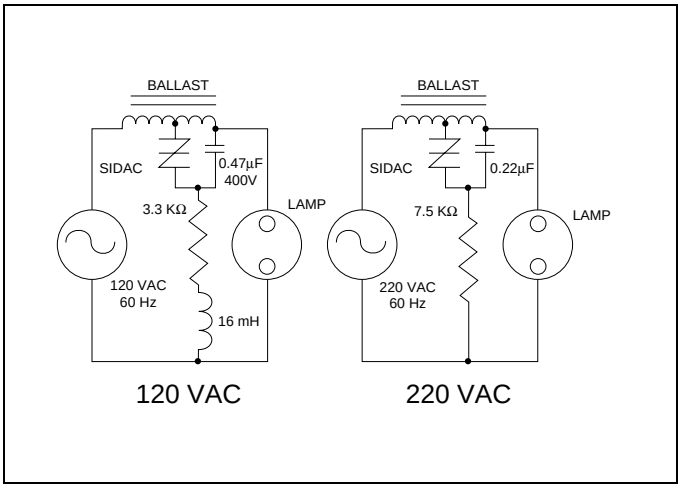


Figure 9.11 Typical High Pressure Sodium Lamp Firing Circuit

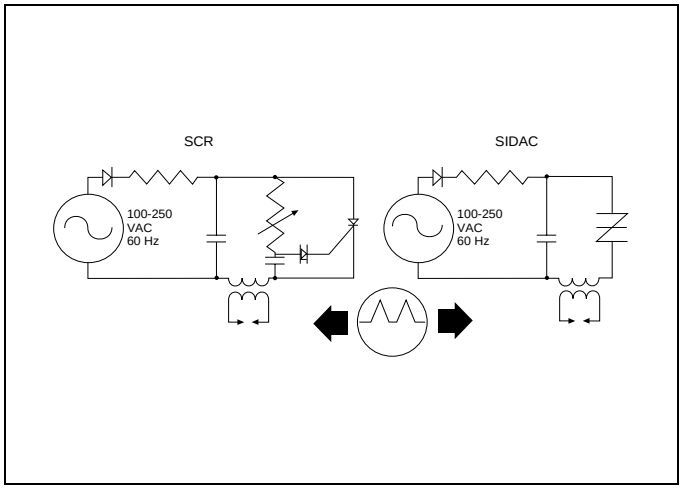


Figure 9.9 Comparison of Sidac vs SCR

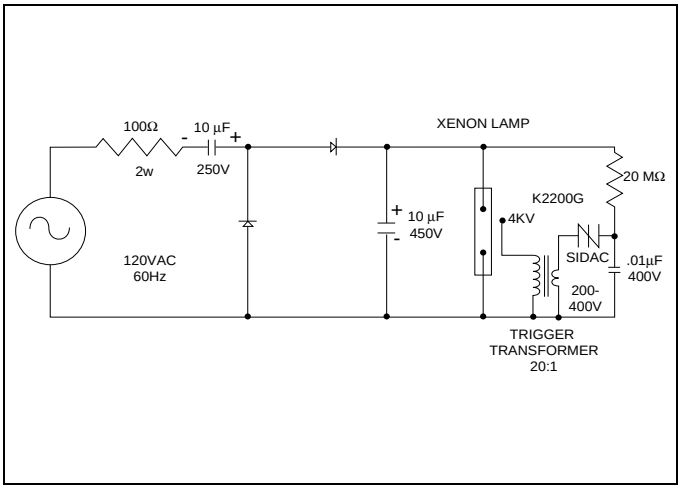


Figure 9.12 Xenon Lamp Flashing Circuit

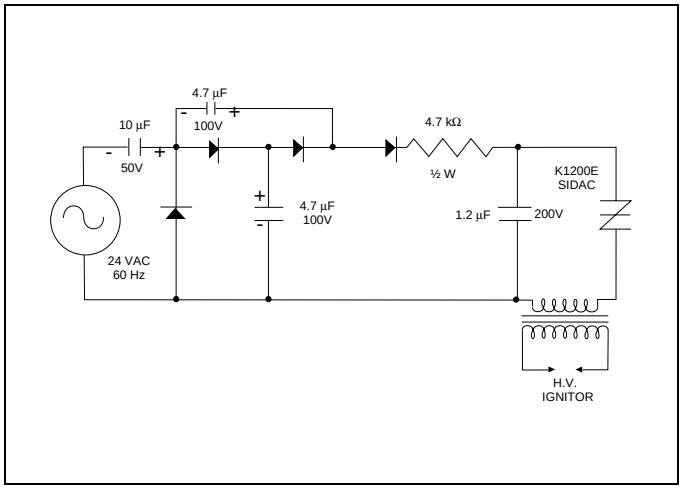


Figure 9.10 Ignitor Circuit (Low Voltage Input)

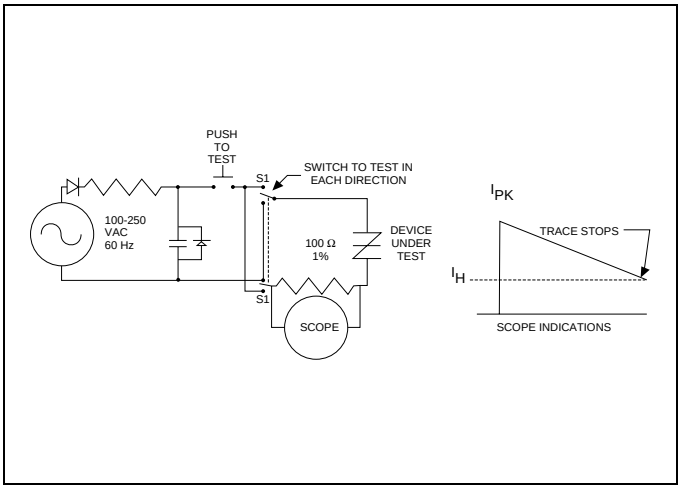


Figure 9.13 Dynamic Holding Current Test Circuit for Sidacs

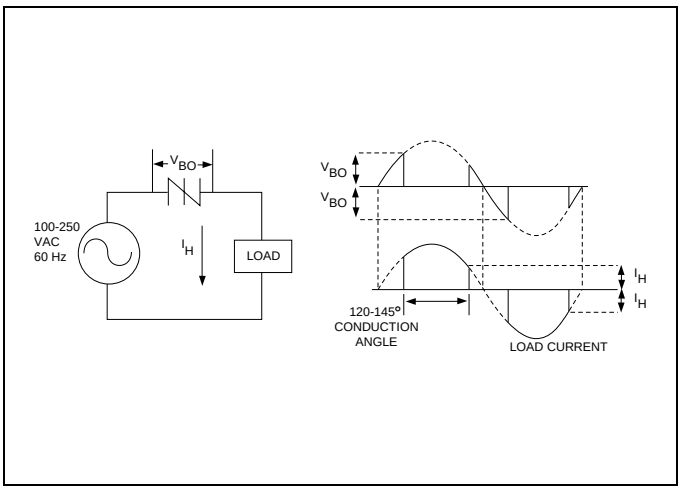


Figure 9.14 Basic Sidac Circuit

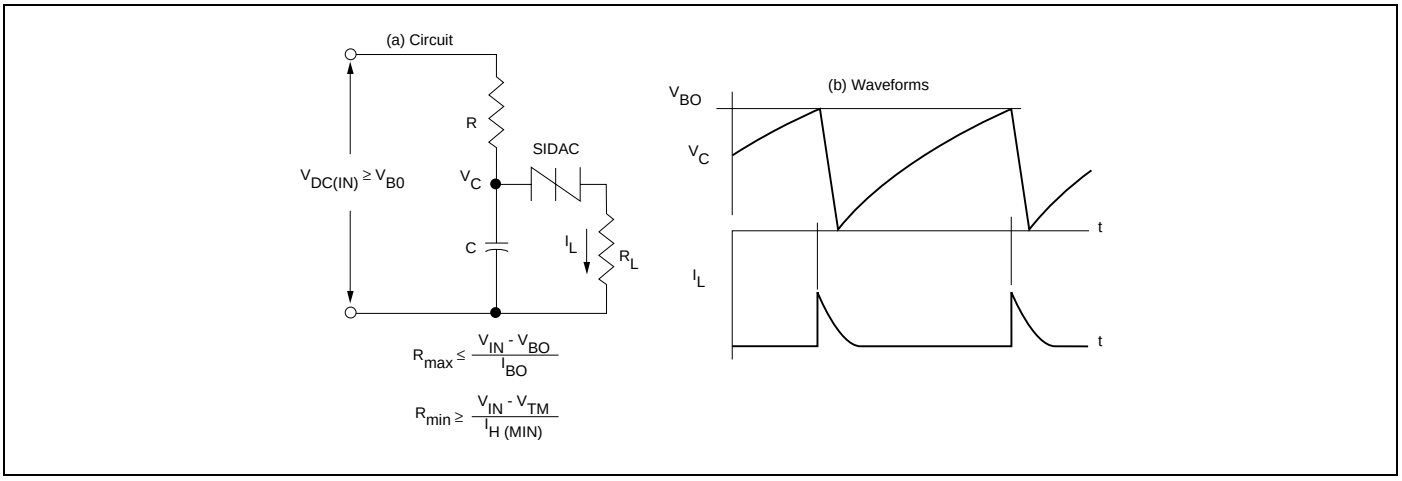
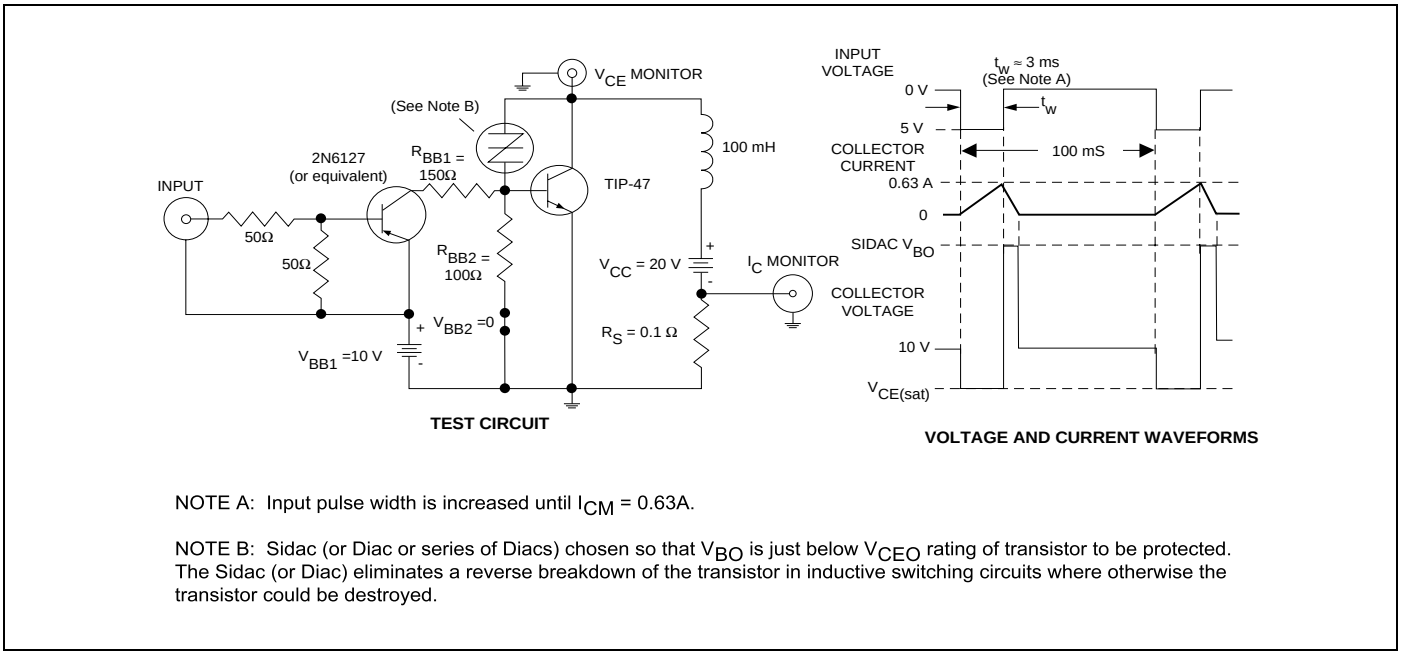


Figure 9.15 Relaxation oscillator Using a Sidac



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 9.16 Sidac Added to Protect Transistor for Typical Transistor Inductive Load Switching Requirements