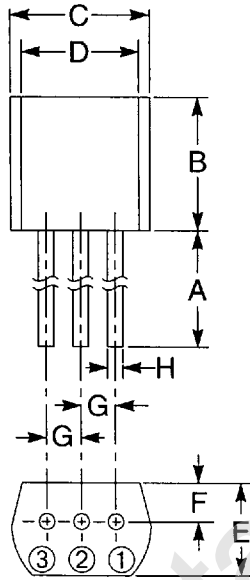


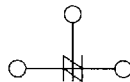
### Silicon Bilateral Switch

#### OUTLINE DRAWING



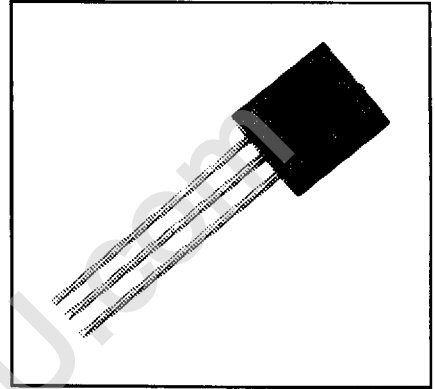
#### CONNECTION DIAGRAM

- ① TERMINAL 1
- ② GATE
- ③ TERMINAL 2



#### Outline Drawing

Dimensions	Inches	Millimeters
A	0.492 Min.	12.5 Min.
B	0.13 Max.	3.3 Max.
C	0.17	4.3
D	0.14	3.55
E	0.098 Max.	2.5 Max.
F	0.035	0.9
G	0.049 ± 0.012	1.25
H	0.018	0.45



#### Description:

The BS08A bilateral switch is a silicon planar monolithic integrated circuit with the electrical characteristics of a bilateral thyristor. The device is designed to switch at 7 to 9 volts with a 0.01%/°C temperature coefficient and have excellently matched characteristics in both directions.

#### Features:

- ☐ Low Switching Voltage of 7 to 9 Volts
- ☐ Excellent Switching Voltage Temperature Characteristics (0.01%/°C)
- ☐ High Reliability Devices
- ☐ Gate Electrode Facilitating Switching Operation Control and Synchronization.

#### Applications:

- ☐ Trigger Circuits for Thyristor or Triac, Oscillators, Timers

#### Ordering Information:

Example: Select the complete five digit part number you desire from the table. i.e. BS08A is a 175mA Silicon Bilateral Switch.

Type
BS08A



Powerex, Inc., 200 Hillis Street, Youngwood, Pennsylvania 15697-1800 (412) 925-7272

**BS08A**

**Silicon Bilateral Switch**

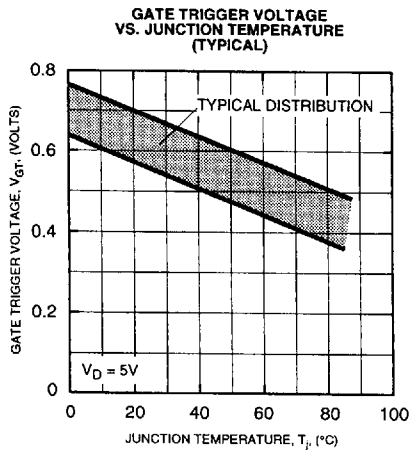
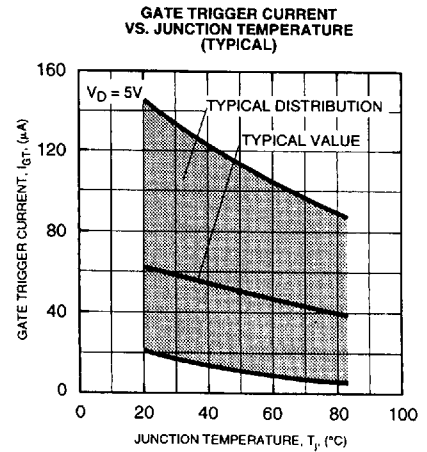
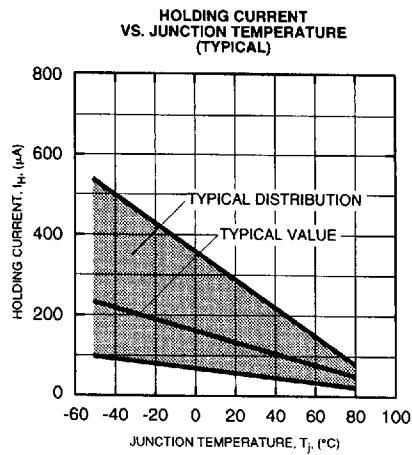
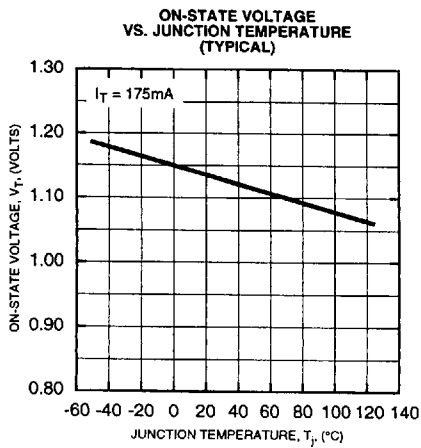
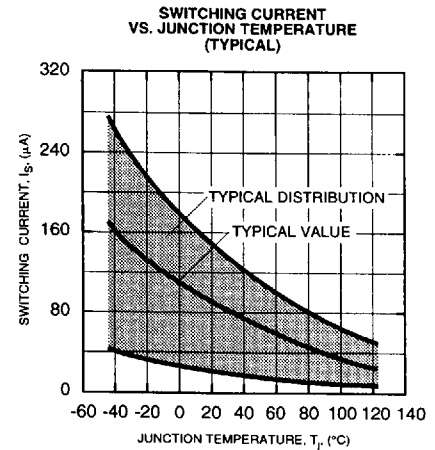
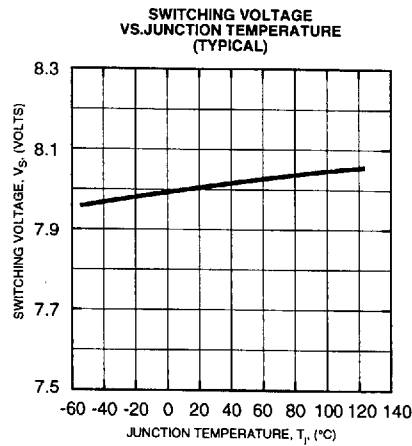
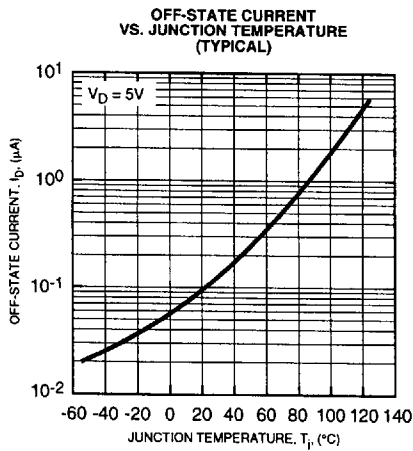
**Absolute Maximum Ratings,  $T_a = 25^\circ\text{C}$  unless otherwise specified**

Ratings	Symbol	BS08A	Units
DC Forward Anode Current	$I_T$	175	mA
Repetitive Peak Forward Current (1% Duty Cycle, 10 $\mu$ s Pulsewidth), $T_a = 100^\circ\text{C}$	—	1.0	Amperes
Non-repetitive Peak Forward Current (10 $\mu$ s Pulsewidth)	—	2.0	Amperes
Power Dissipation	$P_T$	250	mW
DC Gate Current	$I_G$	5	mA
Storage Temperature	$T_{stg}$	-55 to 125	$^\circ\text{C}$
Operating Temperature	$T_j$	-55 to 125	$^\circ\text{C}$

**Electrical and Thermal Characteristics,  $T_j = 25^\circ\text{C}$  unless otherwise specified**

Characteristics	Symbol	Test Conditions	BS08A			Units
			Min.	Typ.	Max.	
Switching Voltage	$V_S$	$T_a = 25^\circ\text{C}$	7	8	9	Volts
Switching Current	$I_S$	$T_a = 25^\circ\text{C}$	—	—	200	$\mu\text{A}$
Absolute Switching Voltage Difference	$ V_{S1} - V_{S2} $	$T_a = 25^\circ\text{C}$	—	—	0.5	Volts
Absolute Switching Current Difference	$ I_{S1} - I_{S2} $	$T_a = 25^\circ\text{C}$	—	—	100	$\mu\text{A}$
Holding Current	$I_H$	$T_a = 25^\circ\text{C}$	—	—	1.5	mA
Off-state Current	$I_D$	$V_D = 5\text{V}, T_a = 25^\circ\text{C}$	—	—	1.0	$\mu\text{A}$
		$V_D = 5\text{V}, T_a = 85^\circ\text{C}$	—	—	10	$\mu\text{A}$
Temperature Coefficient of Switching Voltage	—	$T_a = -55$ to $85^\circ\text{C}$	—	$\pm 0.01$	—	$\%/^\circ\text{C}$
Peak On-state Voltage	$V_T$	$I_T = 175\text{mA}, T_a = 25^\circ\text{C}$	—	—	1.4	Volts
Gate Trigger Current	$I_{GT}$	$V_D = 5\text{V}, T_a = 25^\circ\text{C}$	10	—	200	$\mu\text{A}$
Gate Non-trigger Voltage	$V_{GD}$	$V_D = 5\text{V}, T_a = 85^\circ\text{C}$	0.2	—	—	Volts

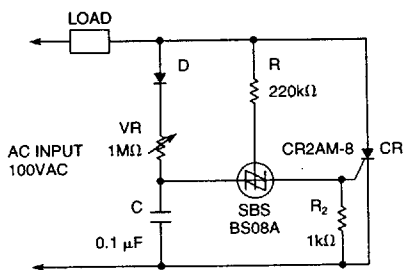
**BS08A**  
**Silicon Bilateral Switch**



**BS08A**  
Silicon Bilateral Switch

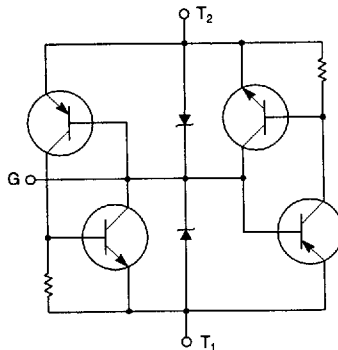
## APPLICATION EXAMPLES

### THYRISTOR TRIGGER CIRCUIT

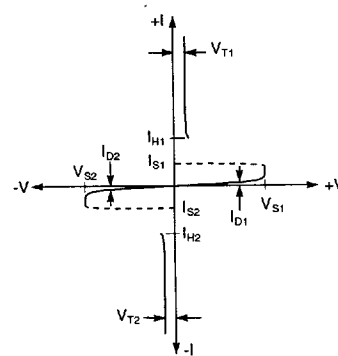


This circuit is widely used in DC motor control and other control applications.

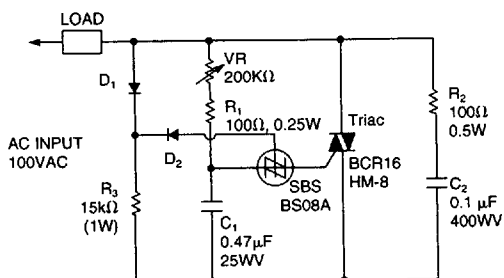
### EQUIVALENT CIRCUIT



## STATIC CHARACTERISTICS

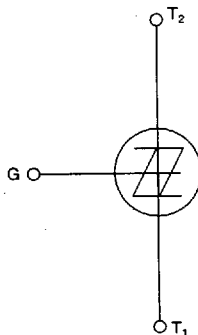


### TRIAC TRIGGER CIRCUIT

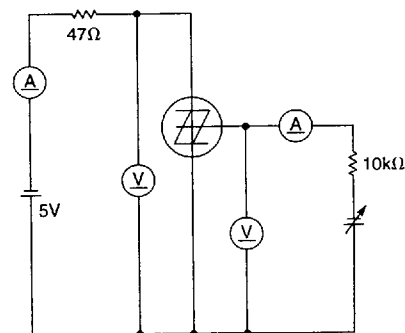


This circuit is useable in such applications as lighting control circuits, electric heater control, and other load control applications.

### CIRCUIT SYMBOL



### GATE CHARACTERISTICS MEASUREMENT CIRCUIT





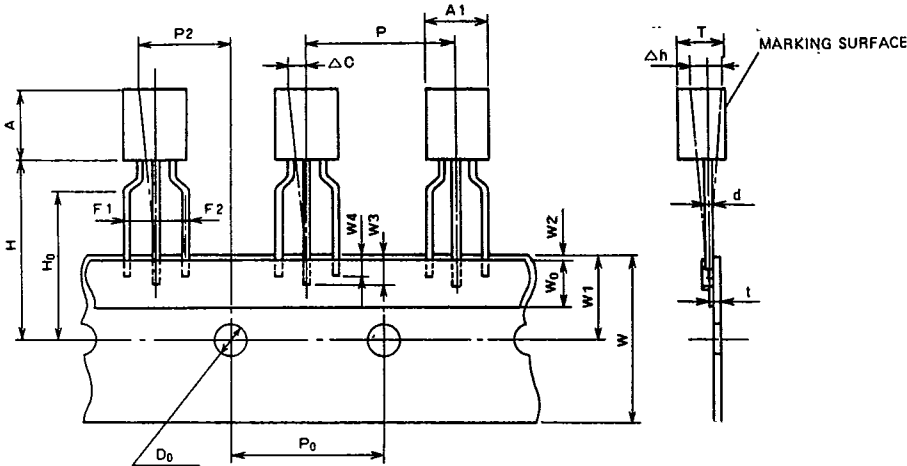
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Powerex Europe, S.A., 428 Avenue G. Durand, BP107, 72003 Le Mans, France (43) 41.14.14

Taping

STANDARD SPECIFICATIONS  
FOR TAPING OF MOLDED  
PACKAGE THYRISTORS AND  
TRIACS

TO-92 Package

Thyristor  
CR02AM, CR03AM, CR04AM  
Triac  
BCR1AM



Taping dimensions

Description of symbol	Symbol	Dimensions (Unit:mm)	Remark
Product width	A1	5.0 MAX	
Product height	A	5.0 MAX	
Product thickness	T	3.7 MAX	
Lead wire diameter	d	0.6 MAX	
Sticker lead wire length (1)	W3	2.5 MIN	
Sticker lead wire length (2)	W4	2.0 MIN	
Pitch between products	P	12.7 ± 1.0	
Feed hole pitch	P0	12.7 ± 0.3	The cumulative pitch error is ± 1mm per 20 pitches.
Feed hole deviation (1)	P2	6.35 ± 1.3	
Distance between lead wires	F1, F2	2.5 ± 0.4	
Defective product (1)	Δh	0 ± 2.0	
Tape width	W	18.0 ± <sup>1.0</sup> <sub>0.5</sub>	
Sticker tape width	W0	6.0 ± 0.5	
Feed hole deviation (2)	W1	9.0 ± 0.5	
Sticker tape deviation	W2	0.5 MAX	
Position of product bottom surface	H	17.5 MIN	
Lynch height of lead wire	H0	16.0 ± 0.5	
Feed hole diameter	D0	4.0 ± 0.2	
Tape thickness	t	0.7 ± 0.2	
Defective product (2)	ΔC	0 ± 1.0	

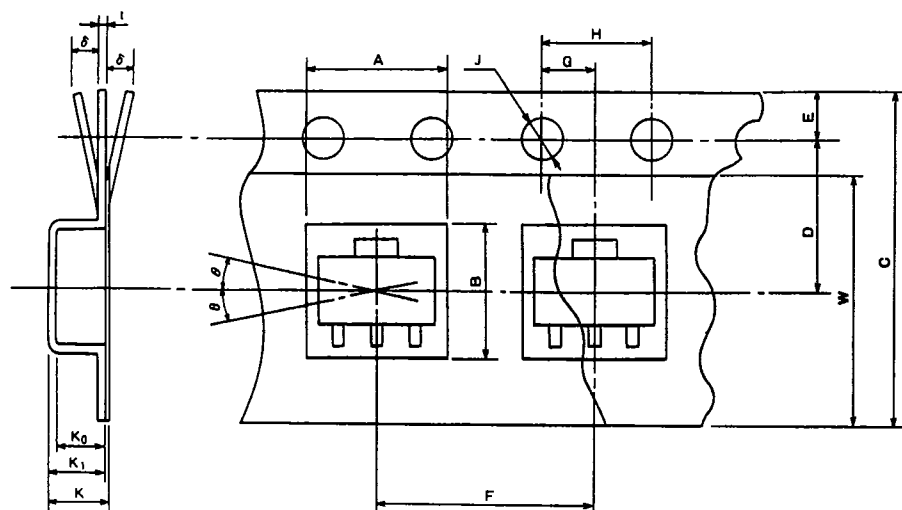


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Powerex Semiconductor Data Book

Taping



SOT-89 Package

Thyristor  
CR08AS

Taping dimensions

Description of symbol		Symbol	Dimensions/angles Unit:mm	Remark
Parts Insertion	Height	A	$5.0 \pm 0.1$	Cross-section of the surface 0.5mm above the inner bottom
	Width	B	$4.6 \pm 0.1$	Cross-section of the surface 0.5mm above the inner bottom
Concave square hole	Depth	K <sub>0</sub>	$1.8 \pm 0.1$	Inner space
	Pitch	F	$8.0 \pm 0.1$	Cumulative error +0.1/-0.3 MAX/10 pitches
Round feed hole	Diameter	J	$\phi 1.5 \pm 0.05$	
	Pitch	H	$4.0 \pm 0.1$	Cumulative error +0.1/-0.3 MAX/10 pitches
	Position	E	$1.5 \pm 0.1$	Distance between the tape edge and the hole center
Distance between center lines	Vertical	G	$2.0 \pm 0.5$	Center line of concave square hole and round feed hole
	Horizontal	D	$5.65 \pm 0.05$	Center line of concave square hole and round feed hole
Cover tape	Width	W	$9.5 + 0.3/-0$	Thickness: 0.1 MAX
Carrier tape	Width	C	$12 \pm 0.2$	Warp $\pm 0.3$ MAX
	Thickness	t	$0.3 \pm 0.05$	
	Package hole depth	K <sub>1</sub>	$2.1 \pm 0.1$	
Device	Package dimensions	—	—	As shown in (e)
	Inclination	$\theta$	30° MAX.	
Total Thickness		K	$2.3 \pm 0.1$	Total thickness including cover and carrier tapes