

# BILATERAL SILICON TRIGGER SWITCH (STS) HS Series

## General Description

The new "HS" series of bilateral Silicon Trigger Switch (STS) offers low breakover voltages, in economical DO-35 package, and glass-passivated junctions for reliability.

The "HS" devices switch from the blocking mode to full conduction when the applied voltage, of either polarity, exceeds the Breakover Voltage ( $V_{BO}$ ). Combined with a small capacitor, the STS will provide the necessary firing current for SCR or triac devices with its FULL BREAKBACK characteristic.

The Teccor "HS" triggers are not only bilateral but are also very symmetrical and are ideal for either full-wave or bidirectional Thyristor controls.

For applications which require very low triggering voltages, the HS-10 STS, with a triggering voltage ( $V_{BO}$ ) of 8-10 Volts, will allow even a 24VAC line to be phase controlled.

## Silicon Trigger Switch (STS) Specifications

### • Maximum Ratings, Absolute-Maximum Values

Maximum Trigger Firing Capacitance 1.0  $\mu$ F  
 Device Dissipation  
 (at  $T_A = -40^\circ$  to  $+40^\circ$ C) 250mW  
 Derate Above  $+40^\circ$ C 3.6mW/ $^\circ$ C

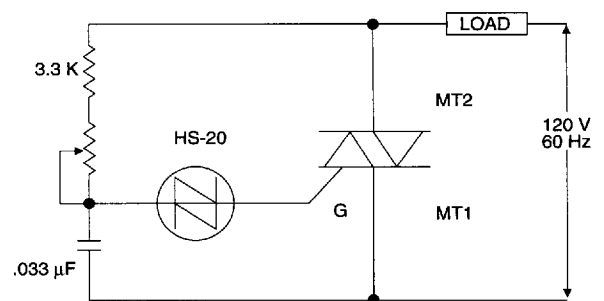
### • Temperature Ranges

Storage  $-40^\circ$ C to  $+125^\circ$ C  
 Operating (Junction)  $-40^\circ$ C to  $+100^\circ$ C

### • Thermal Resistance

Junction to Ambient ( $R_{\theta JA}$ ) =  $278^\circ$ C/W  
 Junction to Lead ( $R_{\theta JL}$ ) =  $100^\circ$ C/W  
 based on maximum lead temperature of  $85^\circ$ C at  $\leq 250$ mW

Typical STS-Triac Full-Wave Phase Control Circuit using lower Voltage Trigger



STANDARD VARIABLE OUTPUT CONTROL  
 (Light, Heat, Motor Speed)

## Features

- Low-switching voltage
- Economical DO-35 package
- Low on-state voltage
- Low off-state current

# Electrical Specifications

## ELECTRICAL SPECIFICATIONS—PART NUMBERS—HS10 AND HS20

SYMBOL	PARAMETER	MIN	TYP	MAX	UNIT
$P_D$	Power Dissipation			0.25	W
$I_F$	DC Forward Current			0.15	A
$I_{FM}$ (REP)	Repetitive Peak Forward Current (1% DUTY CYCLE, 10 ms Pulse Width, $T_A = 25^\circ\text{C}$ )			3	A
$I_{FN}$ (NON-REP)	Non-Repetitive Forward Current (Peak One Cycle, $T_A = 25^\circ\text{C}$ , 60Hz)			1	A
$V_{S1}$ or $V_{S2}$	Switching Voltage HS 10 HS 20	8 18	10 21	12 24	VDC
$I_{S1}$ or $I_{S2}$	Switching Current		100	400	$\mu\text{ADC}$
$V_{S1}-V_{S2}$	Differential Switching Voltage			2	VDC
$I_H$	Holding Current (1)			0.5	mADC
$I_B$	Off-State Blocking Current ( $V_F = 6\text{VDC}$ , $T_A = 25^\circ\text{C}$ ) ( $V_F = 6\text{VDC}$ , $T_A = 80^\circ\text{C}$ )			1 10	$\mu\text{ADC}$
$V_F$	Forward On-State Voltage ( $I_F = 10\text{mA}$ )			1.8	VDC
$V_O$	Peak Output Voltage ( $C_T = 0.1\mu\text{F}$ , $R_L = 20\Omega$ , FIG. 5)	3.5	5		V <sub>PK</sub>
$T_{COEF}$	Temperature Coefficient Of Switching Current		.045		%/°C
$t_{on}$	Turn-On Time (2)		1		$\mu\text{SEC}$

### GENERAL NOTES

- Lead solder temperature is maximum of +230°C for 10 seconds maximum;  $\geq 1/16"$  (1.59mm) from case
- See "Package Dimensions" section of this catalog on Page 95.

### NOTES TO ELECTRICAL SPECIFICATIONS

- Initial on-state current  $\geq 1\text{mA}$
- Turn-on time is measured from the time  $V_S$  is achieved to the time when main terminal voltage drops to within 90% of the difference between  $V_S$  and  $V_F$

Figure 1 — V-I Characteristics

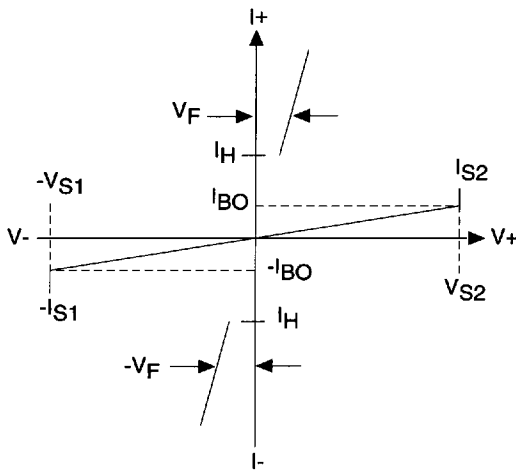


Figure 2 — Normalized  $V_{BO}$  Change vs. Junction Temperature

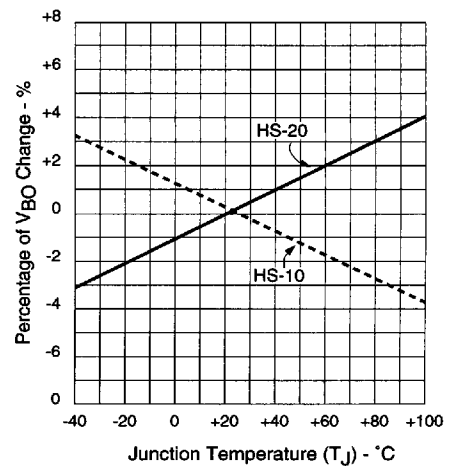


Figure 3 — Repetitive Peak On-State Current vs. Pulse Duration

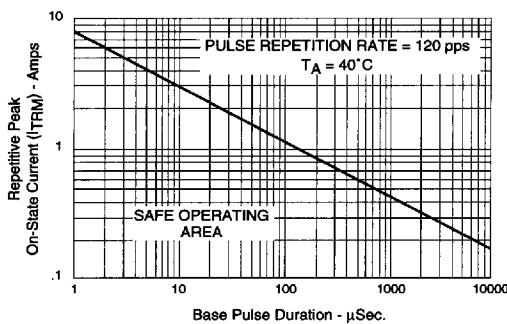


Figure 4 — Normalized DC Holding Current vs. Junction Temperature

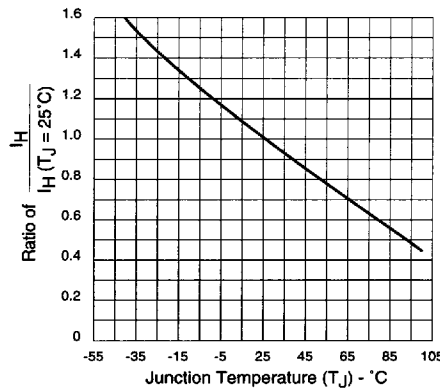


Figure 5 — Circuit Used to Measure  $V_O$  Characteristic

