BS08D-T112

Silicon Bilateral Switch

Description:
The BS08D-T112 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:
BS08D-T112 is tape and fancil packaged (2500/box).
BS08D-T112
Silicon Bilateral Switch

Absolute Maximum Ratings, $T_J = 25^\circ C$ unless otherwise specified

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Symbol</th>
<th>BS08D-T112</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC Forward Anode Current</td>
<td>$I_T$</td>
<td>175</td>
<td>mA</td>
</tr>
<tr>
<td>Repetitive Peak Forward Current</td>
<td></td>
<td>1.0</td>
<td>Amperes</td>
</tr>
<tr>
<td>(1% Duty Cycle, 10 µs Pulsewidth), $T_a = 100^\circ C$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-repetitive Peak Forward Current (10 µs Pulsewidth)</td>
<td></td>
<td>2.0</td>
<td>Amperes</td>
</tr>
<tr>
<td>Power Dissipation</td>
<td>$P_T$</td>
<td>450</td>
<td>mW</td>
</tr>
<tr>
<td>DC Gate Current</td>
<td>$I_Q$</td>
<td>5</td>
<td>mA</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>$T_{stg}$</td>
<td>-55 to 125</td>
<td>°C</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>$T_J$</td>
<td>-55 to 125</td>
<td>°C</td>
</tr>
</tbody>
</table>

Electrical and Mechanical Characteristics, $T_J = 25^\circ C$ unless otherwise specified

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Symbol</th>
<th>Test Conditions</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max.</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switching Voltage</td>
<td>$V_S$</td>
<td>$T_a = 25^\circ C$</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>Volts</td>
</tr>
<tr>
<td>Switching Current</td>
<td>$I_S$</td>
<td>$T_a = 25^\circ C$</td>
<td>—</td>
<td>—</td>
<td>200</td>
<td>µA</td>
</tr>
<tr>
<td>Absolute Switching Voltage Difference</td>
<td>$</td>
<td>V_{S1} - V_{S2}</td>
<td>$</td>
<td>$T_a = 25^\circ C$</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Absolute Switching Current Difference</td>
<td>$</td>
<td>I_{S1} - I_{S2}</td>
<td>$</td>
<td>$T_a = 25^\circ C$</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Holding Current</td>
<td>$I_H$</td>
<td>$T_a = 25^\circ C$</td>
<td>—</td>
<td>—</td>
<td>1.5</td>
<td>mA</td>
</tr>
<tr>
<td>Off-state Current</td>
<td>$I_D$</td>
<td>$V_D = 5V, T_a = 25^\circ C$</td>
<td>—</td>
<td>—</td>
<td>1.0</td>
<td>µA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$V_D = 5V, T_a = 85^\circ C$</td>
<td>—</td>
<td>—</td>
<td>10</td>
<td>µA</td>
</tr>
<tr>
<td>Temperature Coefficient of Switching Voltage</td>
<td>—</td>
<td>$T_a = -55$ to $85^\circ C$</td>
<td>-0.01</td>
<td>—</td>
<td>—</td>
<td>%/°C</td>
</tr>
<tr>
<td>Peak On-state Voltage</td>
<td>$V_T$</td>
<td>$I_T = 175mA, T_a = 25^\circ C$</td>
<td>—</td>
<td>—</td>
<td>1.4</td>
<td>Volts</td>
</tr>
<tr>
<td>Gate Trigger Current</td>
<td>$I_{GT}$</td>
<td>$V_D = 5V, T_a = 25^\circ C$</td>
<td>10</td>
<td>—</td>
<td>200</td>
<td>µA</td>
</tr>
<tr>
<td>Gate Non-trigger Voltage</td>
<td>$V_{GD}$</td>
<td>$V_D = 5V, T_a = 85^\circ C$</td>
<td>0.2</td>
<td>—</td>
<td>—</td>
<td>Volts</td>
</tr>
</tbody>
</table>
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- **Off-State Current vs. Junction Temperature**
  - Typical
  - $V_D = 5V$

- **On-State Voltage vs. Junction Temperature**
  - Typical
  - $I_T = 175mA$

- **Gate Trigger Voltage vs. Junction Temperature**
  - Typical
  - $V_D = 5V$

- **Holding Current vs. Junction Temperature**
  - Typical

- **Switching Voltage vs. Junction Temperature**
  - Typical

- **Switching Current vs. Junction Temperature**
  - Typical

- **Typical Distribution**
  - Typical Value
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APPLICATION EXAMPLES

THYRISTOR TRIGGER CIRCUIT

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

EQUIVALENT CIRCUIT

STATIC CHARACTERISTICS

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

TRIAC TRIGGER CIRCUIT

CIRCUIT SYMBOL

GATE CHARACTERISTICS

MEASUREMENT CIRCUIT

AC INPUT 100VAC

LOAD

D

VR 1MΩ

CR2AM-8

CR

SBS BS08D

R2 1kΩ

AC INPUT 100VAC

LOAD

D1

VR 220kΩ

R1 100Ω 0.25W

Triac

SBS HM-8

C1 0.47 µF 25W

C2 0.1 µF 400WV

R2 100Ω 0.5W

AC INPUT 100VAC

LOAD

D2

VR 220kΩ

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