

Triacs

logic level

BT136S series D

GENERAL DESCRIPTION

Passivated, sensitive gate triacs in a plastic envelope suitable for surface mounting, intended for use in general purpose bidirectional switching and phase control applications. These devices are intended to be interfaced directly to microcontrollers, logic integrated circuits and other low power gate trigger circuits.

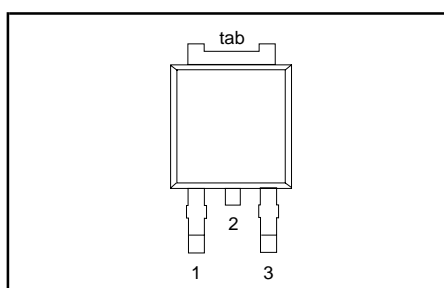
QUICK REFERENCE DATA

| SYMBOL | PARAMETER | MAX. | UNIT |
|---------------------|---|-------------|------|
| V_{DRM} | BT136S - Repetitive peak off-state voltages RMS on-state current Non-repetitive peak on-state current | 600D | V |
| $I_{\text{T(RMS)}}$ | | 600 | A |
| I_{TSM} | | 4 | A |
| | | 25 | A |

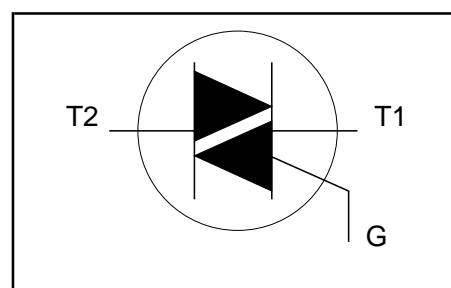
PINNING - SOT428

| PIN | DESCRIPTION |
|-----|-------------|
| 1 | MT1 |
| 2 | MT2 |
| 3 | gate |
| tab | MT2 |

PIN CONFIGURATION



SYMBOL



LIMITING VALUES

Limiting values in accordance with the Absolute Maximum System (IEC 134).

| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|---------------------|--|--|------|--------------------|------------------|
| V_{DRM} | Repetitive peak off-state voltages | | - | -600 600 | V |
| $I_{\text{T(RMS)}}$ | RMS on-state current | full sine wave; $T_{\text{mb}} \leq 107^\circ\text{C}$ | - | 4 | A |
| I_{TSM} | Non-repetitive peak on-state current | full sine wave; $T_{\text{j}} = 25^\circ\text{C}$ prior to surge | - | 25 | A |
| | | $t = 20\text{ ms}$ | - | 27 | A |
| | | $t = 16.7\text{ ms}$ | - | 3.1 | A ² s |
| | | $t = 10\text{ ms}$ | - | | |
| I^2t | I^2t for fusing | $I_{\text{TM}} = 6\text{ A}$; $I_{\text{G}} = 0.2\text{ A}$; | | | |
| di_{T}/dt | Repetitive rate of rise of on-state current after triggering | $di_{\text{G}}/dt = 0.2\text{ A}/\mu\text{s}$ | | | |
| | | T2+ G+ | - | 50 | A/ μs |
| | | T2+ G- | - | 50 | A/ μs |
| | | T2- G- | - | 50 | A/ μs |
| | | T2- G+ | - | 10 | A/ μs |
| I_{GM} | Peak gate current | | - | 2 | A |
| V_{GM} | Peak gate voltage | | - | 5 | V |
| P_{GM} | Peak gate power | | - | 5 | W |
| $P_{\text{G(AV)}}$ | Average gate power | over any 20 ms period | - | 0.5 | W |
| T_{stg} | Storage temperature | | -40 | 150 | $^\circ\text{C}$ |
| T_{j} | Operating junction temperature | | - | 125 | $^\circ\text{C}$ |

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THERMAL RESISTANCES

| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|----------------|---|---|------|------|------|------|
| $R_{th\ j-mb}$ | Thermal resistance junction to mounting base | full cycle | - | - | 3.0 | K/W |
| $R_{th\ j-a}$ | Thermal resistance junction to ambient | half cycle | - | - | 3.7 | K/W |
| | | pcb (FR4) mounted; footprint as in Fig.14 | - | 75 | - | K/W |

STATIC CHARACTERISTICS

$T_j = 25\text{ }^{\circ}\text{C}$ unless otherwise stated

| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|----------|---------------------------|---|------|------|------|------|
| I_{GT} | Gate trigger current | $V_D = 12\text{ V}$; $I_T = 0.1\text{ A}$ | - | - | - | - |
| | | T2+ G+ | - | 2.0 | 5 | mA |
| | | T2+ G- | - | 2.5 | 5 | mA |
| | | T2- G- | - | 2.5 | 5 | mA |
| | | T2- G+ | - | 5.0 | 10 | mA |
| I_L | Latching current | $V_D = 12\text{ V}$; $I_{GT} = 0.1\text{ A}$ | - | - | - | - |
| | | T2+ G+ | - | 1.6 | 10 | mA |
| | | T2+ G- | - | 4.5 | 15 | mA |
| | | T2- G- | - | 1.2 | 10 | mA |
| | | T2- G+ | - | 2.2 | 15 | mA |
| I_H | Holding current | $V_D = 12\text{ V}$; $I_{GT} = 0.1\text{ A}$ | - | 1.2 | 10 | mA |
| V_T | On-state voltage | $I_T = 5\text{ A}$ | - | 1.4 | 1.70 | V |
| V_{GT} | Gate trigger voltage | $V_D = 12\text{ V}$; $I_T = 0.1\text{ A}$ | - | 0.7 | 1.5 | V |
| | | $V_D = 400\text{ V}$; $I_T = 0.1\text{ A}$; $T_j = 125\text{ }^{\circ}\text{C}$ | 0.25 | 0.4 | - | V |
| I_D | Off-state leakage current | $V_D = V_{DRM(max)}$; $T_j = 125\text{ }^{\circ}\text{C}$ | - | 0.1 | 0.5 | mA |

DYNAMIC CHARACTERISTICS

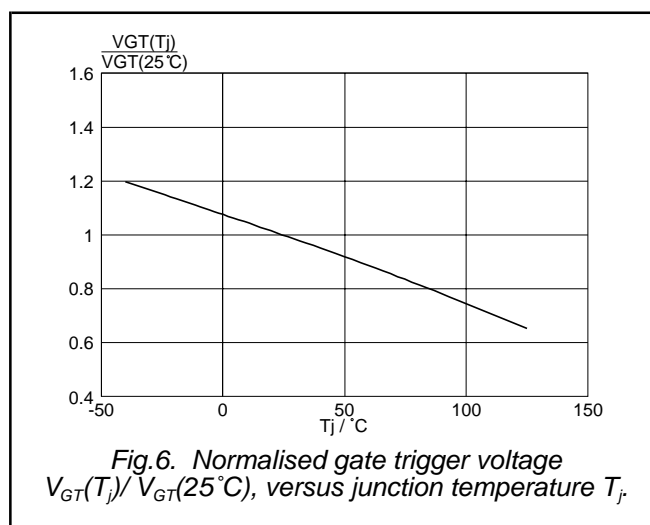
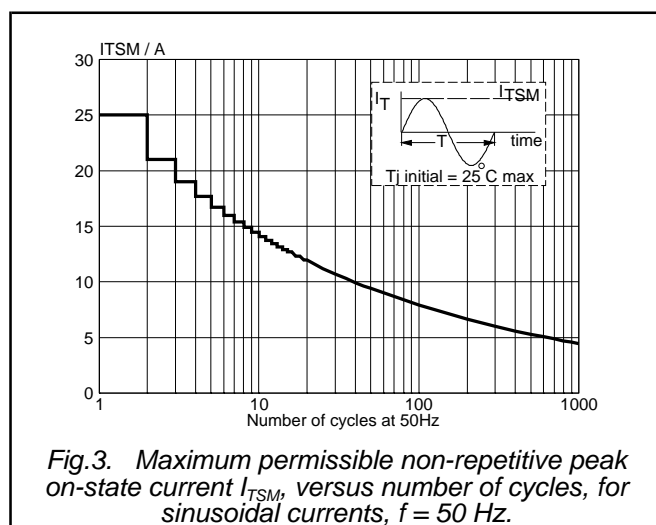
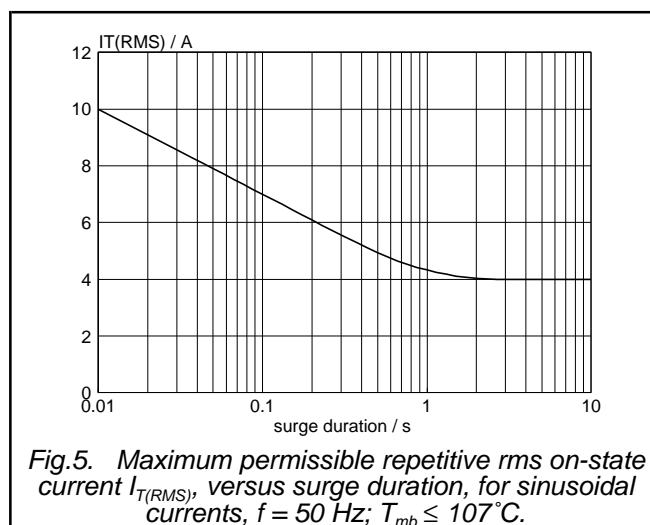
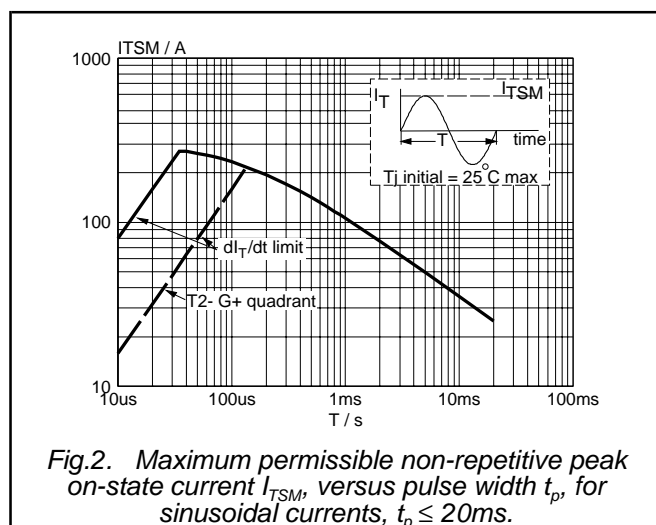
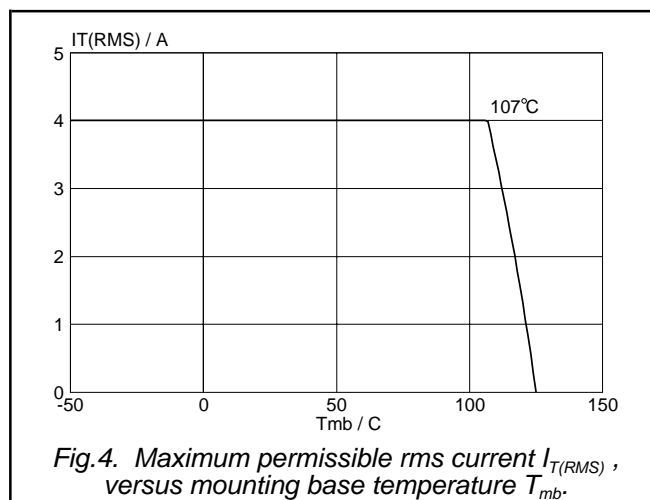
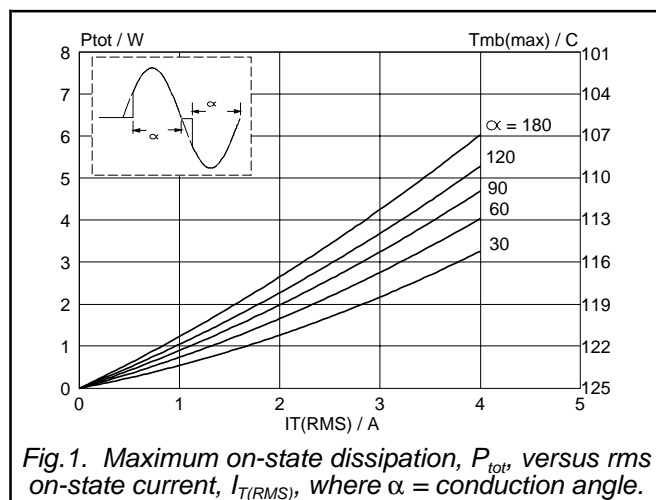
$T_j = 25\text{ }^{\circ}\text{C}$ unless otherwise stated

| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|-----------|---|---|------|------|------|------------------|
| dV_D/dt | Critical rate of rise of off-state voltage | $V_{DM} = 67\% V_{DRM(max)}$; $T_j = 125\text{ }^{\circ}\text{C}$; exponential waveform; $R_{GK} = 1\text{ k}\Omega$ | - | 5 | - | V/ μs |
| t_{gt} | Gate controlled turn-on time | $I_{TM} = 6\text{ A}$; $V_D = V_{DRM(max)}$; $I_G = 0.1\text{ A}$; $di_G/dt = 5\text{ A}/\mu\text{s}$ | - | 2 | - | μs |

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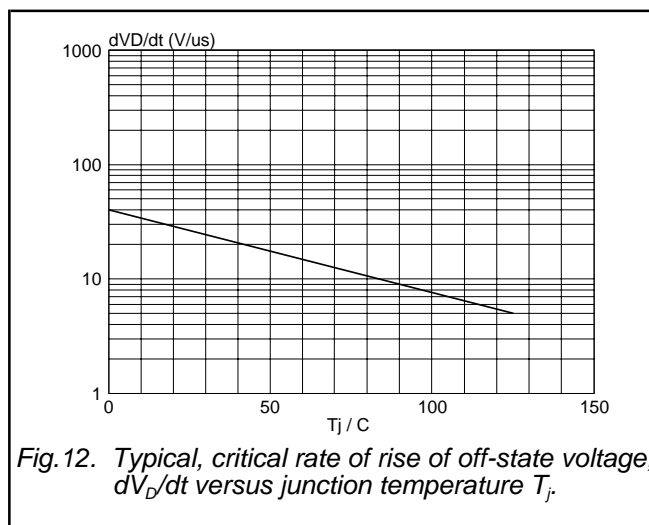
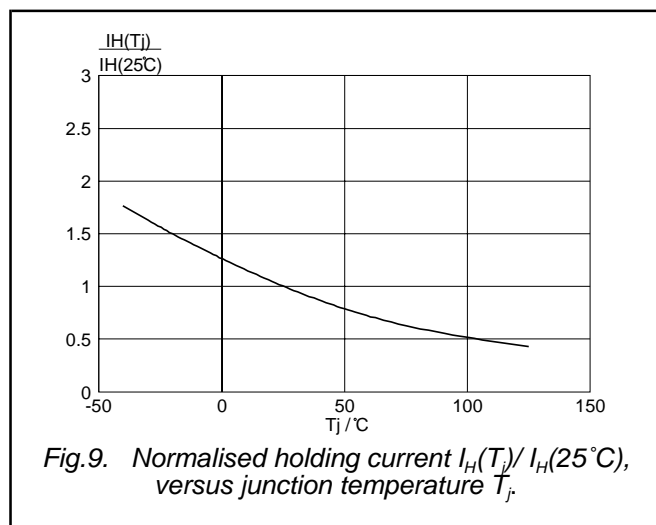
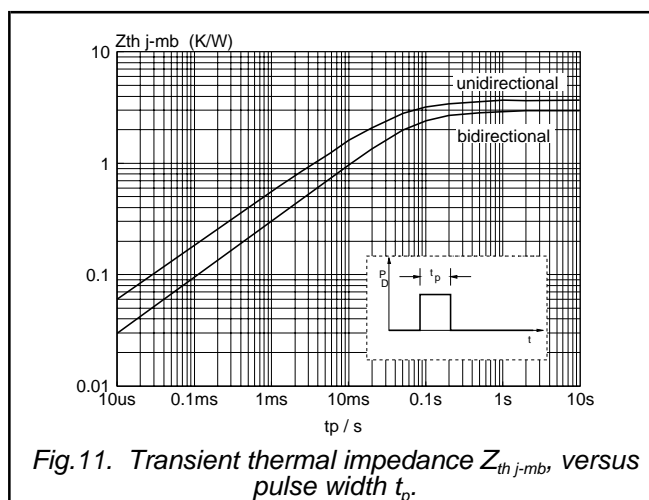
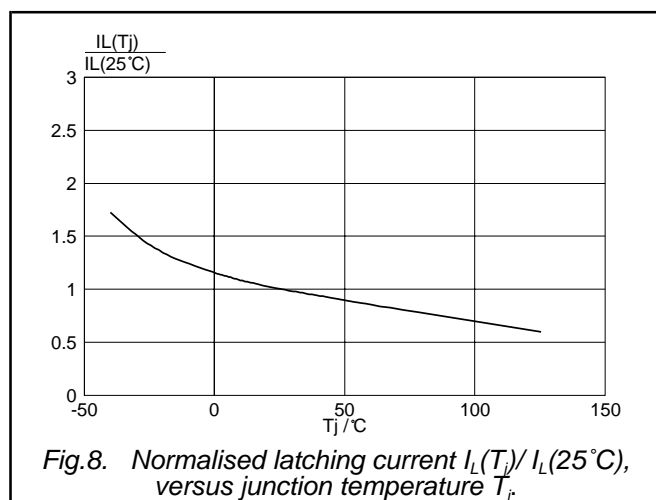
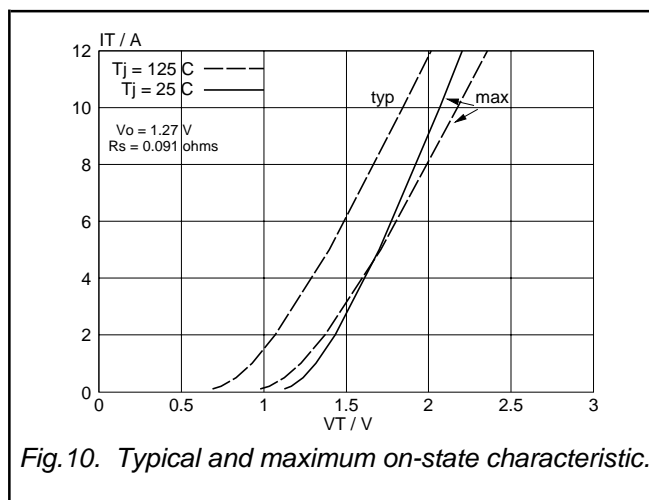
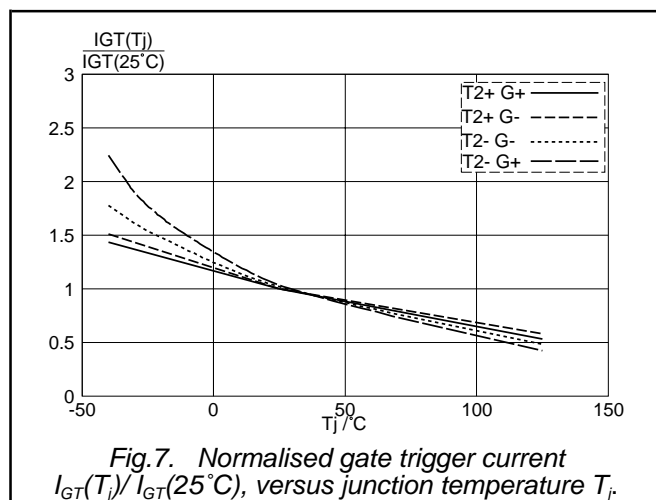
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MECHANICAL DATA

Dimensions in mm

Net Mass: 1.1 g

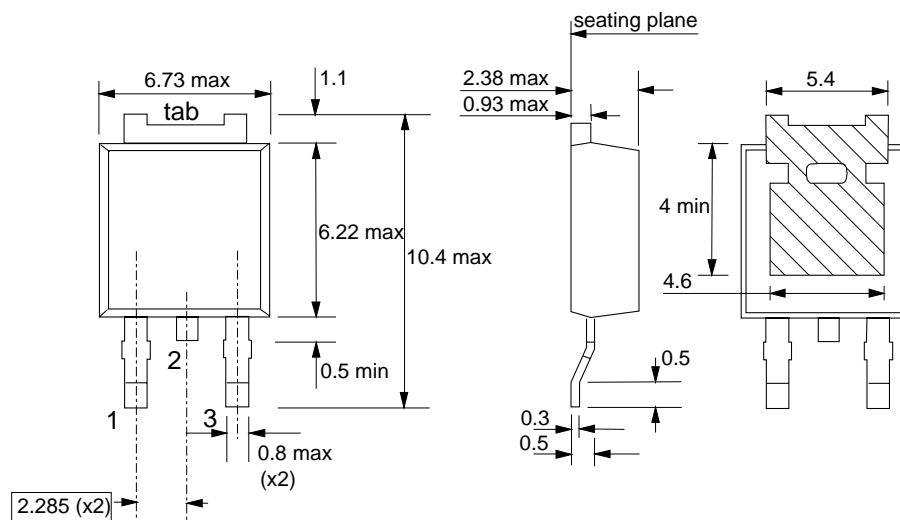


Fig.13. SOT428 : centre pin connected to tab.

MOUNTING INSTRUCTIONS

Dimensions in mm

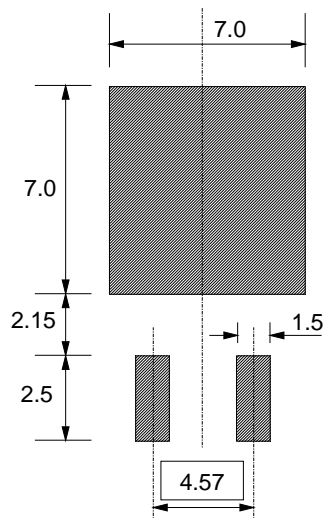


Fig.14. SOT428 : minimum pad sizes for surface mounting.

Notes

1. Plastic meets UL94 V0 at 1/8".

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DEFINITIONS

| DATA SHEET STATUS | | |
|--|-----------------------------|---|
| DATA SHEET STATUS ¹ | PRODUCT STATUS ² | DEFINITIONS |
| Objective data | Development | This data sheet contains data from the objective specification for product development. Philips Semiconductors reserves the right to change the specification in any manner without notice |
| Preliminary data | Qualification | This data sheet contains data from the preliminary specification. Supplementary data will be published at a later date. Philips Semiconductors reserves the right to change the specification without notice, in order to improve the design and supply the best possible product |
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| Limiting values | | |
| Limiting values are given in accordance with the Absolute Maximum Rating System (IEC 134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of this specification is not implied. Exposure to limiting values for extended periods may affect device reliability. | | |
| Application information | | |
| Where application information is given, it is advisory and does not form part of the specification. | | |
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