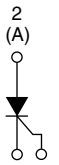
# Surface Mountable
# Phase Control SCR, 10 A



D²PAK




## DESCRIPTION/FEATURES

The 10TTS08S High Voltage Series of silicon controlled rectifiers are specifically designed for medium power switching and phase control applications. The glass passivation technology used has reliable operation up to 125 °C junction temperature.

Typical applications are in input rectification (soft start) and these products are designed to be used with Vishay HPP input diodes, switches and output rectifiers which are available in identical package outlines.

This product has been designed and qualified for industrial level.

| PRODUCT SUMMARY | |
|---|---|
| $V_T$ at 6.5 A | < 1.15 V |
| $I_{TSM}$ | 140 A |
| $V_{RRM}$ | 800 V |

| OUTPUT CURRENT IN TYPICAL APPLICATIONS | | | |
|---|---|---|---|
| **APPLICATIONS** | **SINGLE-PHASE BRIDGE** | **THREE-PHASE BRIDGE** | **UNITS** |
| NEMA FR-4 or G-10 glass fabric-based epoxy with 4 oz. (140 µm) copper | 2.5 | 3.5 | A |
| Aluminum IMS, $R_{thCA}$ = 15 °C/W | 6.3 | 9.5 | |
| Aluminum IMS with heatsink, $R_{thCA}$ = 5 °C/W | 14.0 | 18.5 | |

**Note**

- $T_A$ = 55 °C, $T_J$ = 125 °C, footprint 300 mm²

| MAJOR RATINGS AND CHARACTERISTICS | | | |
|---|---|---|---|
| **PARAMETER** | **TEST CONDITIONS** | **VALUES** | **UNITS** |
| $I_{T(AV)}$ | Sinusoidal waveform | 6.5 | A |
| $I_{RMS}$ | | 10 | |
| $V_{RRM}/V_{DRM}$ | | 800 | V |
| $I_{TSM}$ | | 140 | A |
| $V_T$ | 6.5 A, $T_J$ = 25 °C | 1.15 | V |
| dV/dt | | 150 | V/µs |
| dI/dt | | 100 | A/µs |
| $T_J$ | Range | - 40 to 125 | °C |

| VOLTAGE RATINGS | | | |
|---|---|---|---|
| **PART NUMBER** | **$V_{RRM}$, MAXIMUM PEAK REVERSE VOLTAGE V** | **$V_{DRM}$, MAXIMUM PEAK DIRECT VOLTAGE V** | **$I_{RRM}/I_{DRM}$ AT 125 °C mA** |
| 10TTS08S | 800 | 800 | 1.0 |

## ABSOLUTE MAXIMUM RATINGS

| PARAMETER | SYMBOL | TEST CONDITIONS | | VALUES | UNITS |
|---|---|---|---|---|---|
| Maximum average on-state current | $I_{T(AV)}$ | $T_C$ = 112 °C, 180° conduction half sine wave | | 6.5 | A |
| Maximum RMS on-state current | $I_{T(RMS)}$ | | | 10 | |
| Maximum peak, one-cycle, non-repetitive surge current | $I_{TSM}$ | 10 ms sine pulse, rated $V_{RRM}$ applied, $T_J$ = 125 °C | | 120 | |
| | | 10 ms sine pulse, no voltage reapplied, $T_J$ = 125 °C | | 140 | |
| Maximum $I^2t$ for fusing | $I^2t$ | 10 ms sine pulse, rated $V_{RRM}$ applied, $T_J$ = 125 °C | | 72 | $A^2s$ |
| | | 10 ms sine pulse, no voltage reapplied, $T_J$ = 125 °C | | 100 | |
| Maximum $I^2\sqrt{t}$ for fusing | $I^2\sqrt{t}$ | t = 0.1 to 10 ms, no voltage reapplied, $T_J$ = 125 °C | | 1000 | $A^2\sqrt{s}$ |
| Maximum on-state voltage drop | $V_{TM}$ | 6.5 A, $T_J$ = 25 °C | | 1.15 | V |
| On-state slope resistance | $r_t$ | $T_J$ = 125 °C | | 17.3 | mΩ |
| Threshold voltage | $V_{T(TO)}$ | | | 0.85 | V |
| Maximum reverse and direct leakage current | $I_{RM}/I_{DM}$ | $T_J$ = 25 °C | $V_R$ = Rated $V_{RRM}/V_{DRM}$ | 0.05 | mA |
| | | $T_J$ = 125 °C | | 1.0 | |
| Typical holding current | $I_H$ | Anode supply = 6 V, resistive load, initial $I_T$ = 1 A | | 30 | |
| Maximum latching current | $I_L$ | Anode supply = 6 V, resistive load | | 50 | |
| Maximum rate of rise of off-state voltage | dV/dt | $T_J$ = 25 °C | | 150 | V/µs |
| Maximum rate of rise of turned-on current | dI/dt | | | 100 | A/µs |

## TRIGGERING

| PARAMETER | SYMBOL | TEST CONDITIONS | VALUES | UNITS |
|---|---|---|---|---|
| Maximum peak gate power | $P_{GM}$ | | 8.0 | W |
| Maximum average gate power | $P_{G(AV)}$ | | 2.0 | |
| Maximum peak positive gate current | $+I_{GM}$ | | 1.5 | A |
| Maximum peak negative gate voltage | $-V_{GM}$ | | 10 | V |
| Maximum required DC gate current to trigger | $I_{GT}$ | Anode supply = 6 V, resistive load, $T_J$ = - 65 °C | 20 | mA |
| | | Anode supply = 6 V, resistive load, $T_J$ = 25 °C | 15 | |
| | | Anode supply = 6 V, resistive load, $T_J$ = 125 °C | 10 | |
| Maximum required DC gate voltage to trigger | $V_{GT}$ | Anode supply = 6 V, resistive load, $T_J$ = - 65 °C | 1.2 | V |
| | | Anode supply = 6 V, resistive load, $T_J$ = 25 °C | 1 | |
| | | Anode supply = 6 V, resistive load, $T_J$ = 125 °C | 0.7 | |
| Maximum DC gate voltage not to trigger | $V_{GD}$ | $T_J$ = 125 °C, $V_{DRM}$ = Rated value | 0.2 | |
| Maximum DC gate current not to trigger | $I_{GD}$ | | 0.1 | mA |

## SWITCHING

| PARAMETER | SYMBOL | TEST CONDITIONS | VALUES | UNITS |
|---|---|---|---|---|
| Typical turn-on time | $t_{gt}$ | $T_J$ = 25 °C | 0.8 | µs |
| Typical reverse recovery time | $t_{rr}$ | $T_J$ = 125 °C | 3 | |
| Typical turn-off time | $t_q$ | | 100 | |

| THERMAL AND MECHANICAL SPECIFICATIONS | | | | |
|---|---|---|---|---|
| **PARAMETER** | **SYMBOL** | **TEST CONDITIONS** | **VALUES** | **UNITS** |
| Maximum junction and storage temperature range | $T_J$, $T_{Stg}$ | | - 40 to 125 | °C |
| Soldering temperature | $T_S$ | For 10 s (1.6 mm from case) | 240 | |
| Maximum thermal resistance, junction to case | $R_{thJC}$ | DC operation | 1.5 | °C/W |
| Typical thermal resistance, junction to ambient (PCB mount) | $R_{thJA}$ (1) | | 40 | |
| Approximate weight | | | 2 | g |
| | | | 0.07 | oz. |
| Marking device | | Case style $D^2PAK$ (SMD-220) | 10TTS08S | |

**Note**

(1) When mounted on 1" square (650 $mm^2$) PCB of FR-4 or G-10 material 4 oz. (140 µm) copper 40 °C/W
For recommended footprint and soldering techniques refer to application note #AN-994

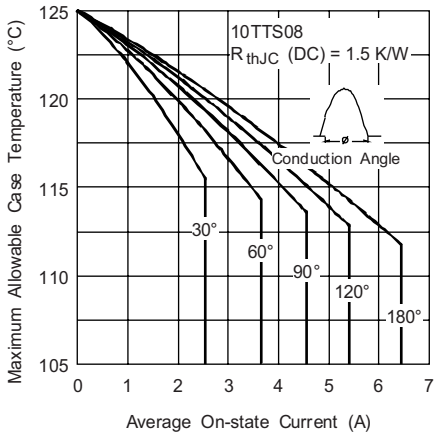



Fig. 1 - Current Rating Characteristics

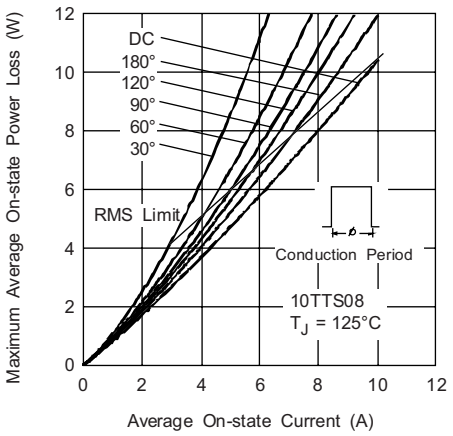



Fig. 4 - On-State Power Loss Characteristics

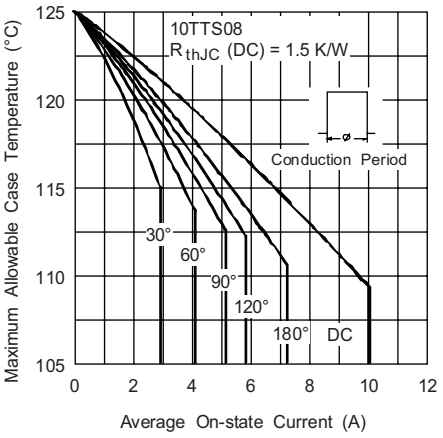



Fig. 2 - Current Rating Characteristics

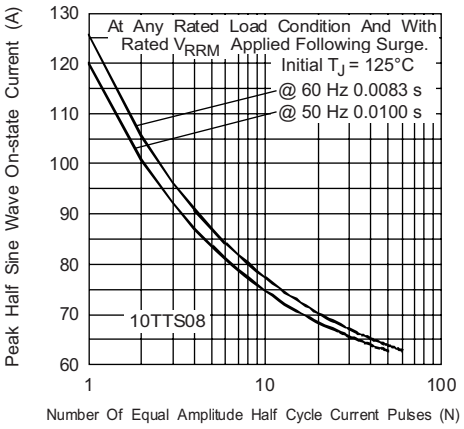



Fig. 5 - Maximum Non-Repetitive Surge Current

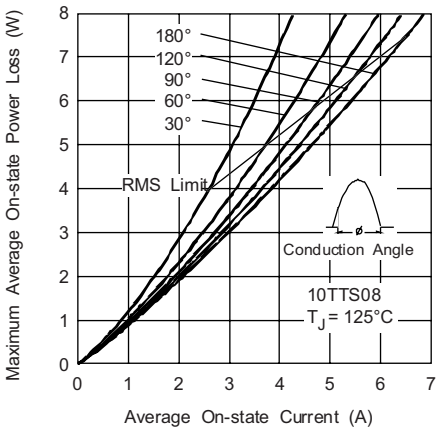



Fig. 3 - On-State Power Loss Characteristics

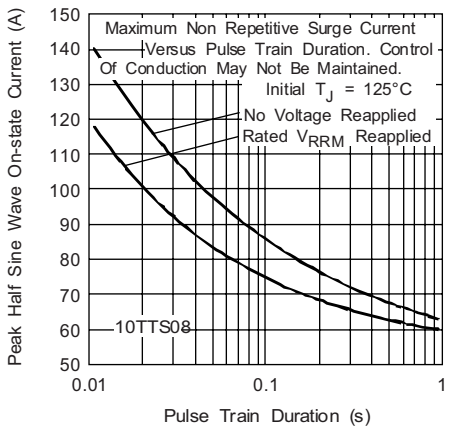



Fig. 6 - Maximum Non-Repetitive Surge Current

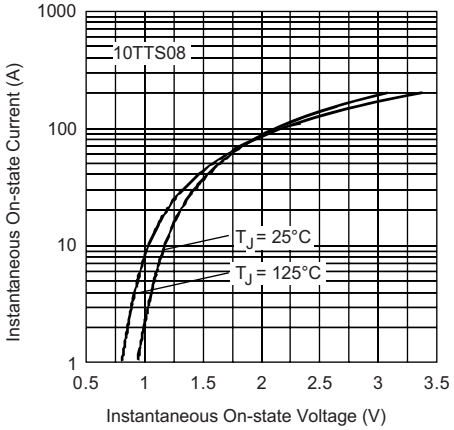



Fig. 7 - On-State Voltage Drop Characteristics

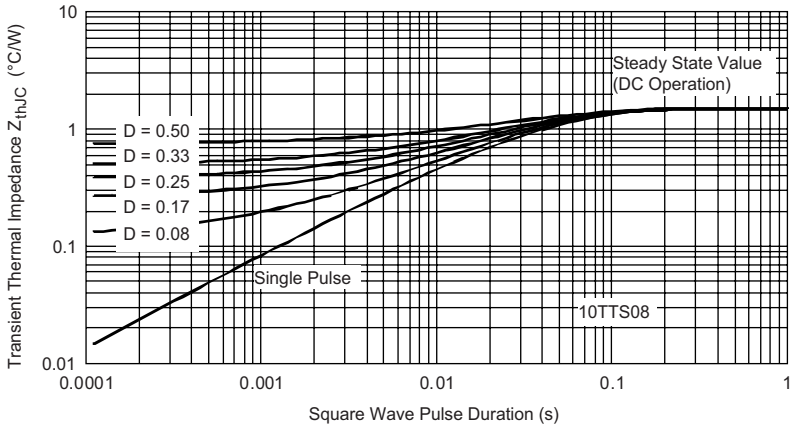



Fig. 8 - Thermal Impedance $Z_{thJC}$ Characteristics

## ORDERING INFORMATION TABLE

**Device code**

| 10 | T | T | S | 08 | S | TRL | - |
|---|---|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |

- 1 - Current rating, RMS value
- 2 - Circuit configuration:
  - T = Single thyristor
- 3 - Package:
  - T = TO-220AC
- 4 - Type of silicon:
  - S = Converter grade
- 5 - Voltage code x 100 = $V_{RRM}$
- 6 - S = TO-220 $D^2PAK$ (SMD-220) version
- 7 - Tape and reel option:
  - TRL = Left reel
  - TRR = Right orientation reel
- 8 -
  - None = Standard production
  - PbF = Lead (Pb)-free

| LINKS TO RELATED DOCUMENTS | |
|---|---|
| Dimensions | http://www.vishay.com/doc?95046 |
| Part marking information | http://www.vishay.com/doc?95054 |
| Packaging information | http://www.vishay.com/doc?95032 |

# Disclaimer

All product specifications and data are subject to change without notice.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, “Vishay”), disclaim any and all liability for any errors, inaccuracies or incompleteness contained herein or in any other disclosure relating to any product.

Vishay disclaims any and all liability arising out of the use or application of any product described herein or of any information provided herein to the maximum extent permitted by law. The product specifications do not expand or otherwise modify Vishay’s terms and conditions of purchase, including but not limited to the warranty expressed therein, which apply to these products.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications unless otherwise expressly indicated. Customers using or selling Vishay products not expressly indicated for use in such applications do so entirely at their own risk and agree to fully indemnify Vishay for any damages arising or resulting from such use or sale. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

Product names and markings noted herein may be trademarks of their respective owners.

Стандарт Электрон Связь

Мы молодая и активно развивающаяся компания в области поставок электронных компонентов. Мы поставляем электронные компоненты отечественного и импортного производства напрямую от производителей и с крупнейших складов мира.

Благодаря сотрудничеству с мировыми поставщиками мы осуществляем комплексные и плановые поставки широчайшего спектра электронных компонентов.

Собственная эффективная логистика и склад в обеспечивает надежную поставку продукции в точно указанные сроки по всей России.

Мы осуществляем техническую поддержку нашим клиентам и предпродажную проверку качества продукции. На все поставляемые продукты мы предоставляем гарантию .

Осуществляем поставки продукции под контролем ВП МО РФ на предприятия военно-промышленного комплекса России , а также работаем в рамках 275 ФЗ с открытием отдельных счетов в уполномоченном банке. Система менеджмента качества компании соответствует требованиям ГОСТ ISO 9001.

Минимальные сроки поставки, гибкие цены, неограниченный ассортимент и индивидуальный подход к клиентам являются основой для выстраивания долгосрочного и эффективного сотрудничества с предприятиями радиоэлектронной промышленности, предприятиями ВПК и научно-исследовательскими институтами России.

С нами вы становитесь еще успешнее!

**Наши контакты:**

**Телефон:** +7 812 627 14 35

**Электронная почта:** sales@st-electron.ru

**Адрес:** 198099, Санкт-Петербург, Промышленная ул, дом № 19, литера Н, помещение 100-Н Офис 331