
2SK2096

Silicon N-Channel MOS FET

HITACHI

Application

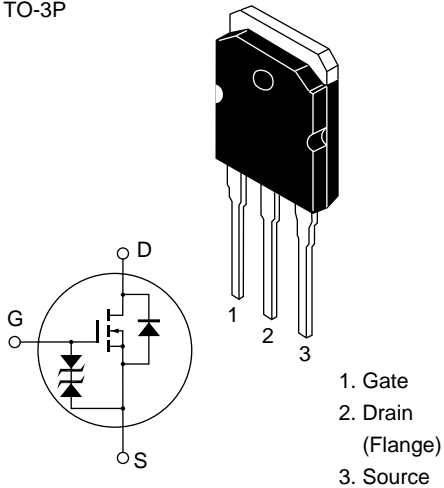
High speed power switching

Features

- Low on-resistance
- High speed switching
- Low drive current
- 4 V gate drive device can be driven from 5 V source
- Suitable for switching regulator, DC-DC converter
- Avalanche ratings

Outline

TO-3P



Absolute Maximum Ratings ($T_a = 25^\circ\text{C}$)

| Item | Symbol | Ratings | Unit |
|---|---------------------|----------------|------------------|
| Drain to source voltage | V_{DSS} | 60 | V |
| Gate to source voltage | V_{GSS} | ± 20 | V |
| Drain current | I_D | 45 | A |
| Drain peak current | $I_{D(pulse)}^{*1}$ | 180 | A |
| Body to drain diode reverse drain current | I_{DR} | 45 | A |
| Avalanche current | I_{AP}^{*3} | 45 | A |
| Avalanche energy | E_{AR}^{*3} | 173 | mJ |
| Channel dissipation | P_{ch}^{*2} | 100 | W |
| Channel temperature | Tch | 150 | $^\circ\text{C}$ |
| Storage temperature | Tstg | -55 to +150 | $^\circ\text{C}$ |

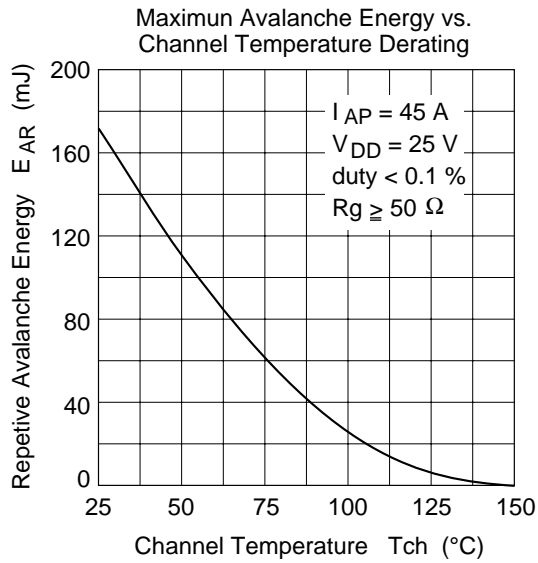
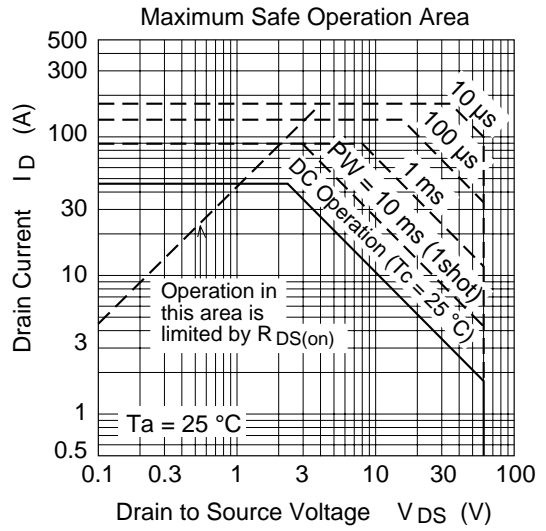
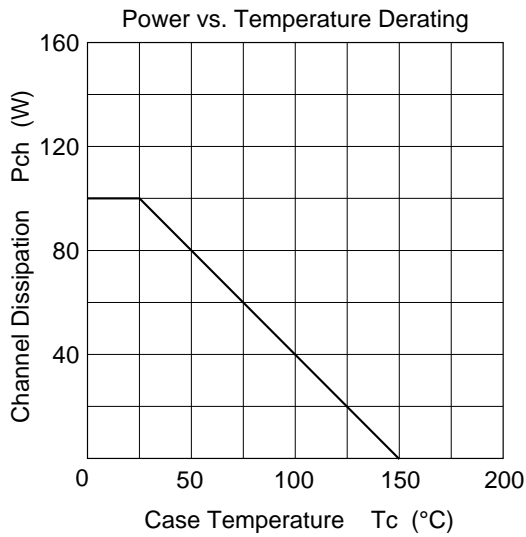
- Notes
1. $PW \leq 10 \mu\text{s}$, duty cycle $\leq 1 \%$
 2. Value at $T_c = 25^\circ\text{C}$
 3. Value at $T_{ch} = 25^\circ\text{C}$, $R_g \geq 50 \Omega$

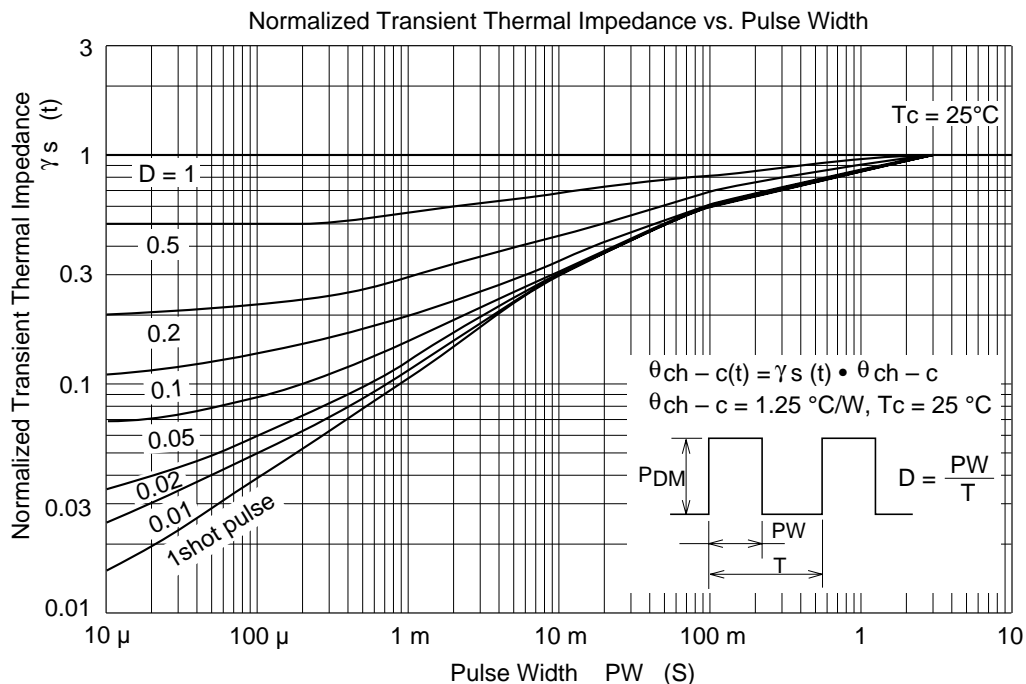
Electrical Characteristics (Ta = 25°C)

| Item | Symbol | Min | Typ | Max | Unit | Test conditions |
|--|---------------|----------|-------|----------|---------------|---|
| Drain to source breakdown voltage | $V_{(BR)DSS}$ | 60 | — | — | V | $I_D = 10 \text{ mA}$, $V_{GS} = 0$ |
| Gate to source breakdown voltage | $V_{(BR)GSS}$ | ± 20 | — | — | V | $I_G = \pm 100 \text{ }\mu\text{A}$, $V_{DS} = 0$ |
| Gate to source leak current | I_{GSS} | — | — | ± 10 | μA | $V_{GS} = \pm 16 \text{ V}$, $V_{DS} = 0$ |
| Zero gate voltage drain current | I_{DSS} | — | — | 250 | μA | $V_{DS} = 50 \text{ V}$, $V_{GS} = 0$ |
| Gate to source cutoff voltage | $V_{GS(off)}$ | 1.0 | — | 2.25 | V | $I_D = 1 \text{ mA}$, $V_{DS} = 10 \text{ V}$ |
| Static drain to source on state resistance | $R_{DS(on)}$ | — | 0.018 | 0.022 | Ω | $I_D = 25 \text{ A}$ $V_{GS} = 10 \text{ V}^{*1}$ |
| | | — | 0.023 | 0.028 | Ω | $I_D = 25 \text{ A}$ $V_{GS} = 4 \text{ V}^{*1}$ |
| Forward transfer admittance | $ y_{fs} $ | 25 | 37 | — | S | $I_D = 25 \text{ A}$ $V_{DS} = 10 \text{ V}^{*1}$ |
| Input capacitance | C_{iss} | — | 3530 | — | pF | $V_{DS} = 10 \text{ V}$ |
| Output capacitance | C_{oss} | — | 1480 | — | pF | $V_{GS} = 0$ |
| Reverse transfer capacitance | C_{rss} | — | 300 | — | pF | $f = 1 \text{ MHz}$ |
| Turn-on delay time | $t_{d(on)}$ | — | 33 | — | ns | $I_D = 25 \text{ A}$ |
| Rise time | t_r | — | 160 | — | ns | $V_{GS} = 10 \text{ V}$ |
| Turn-off delay time | $t_{d(off)}$ | — | 450 | — | ns | $R_L = 1.5 \text{ }\Omega$ |
| Fall time | t_f | — | 230 | — | ns | |
| Body to drain diode forward voltage | V_{DF} | — | 1.3 | — | V | $I_F = 45 \text{ A}$, $V_{GS} = 0$ |
| Body to drain diode reverse recovery time | t_{rr} | — | 130 | — | ns | $I_F = 45 \text{ A}$, $V_{GS} = 0$, $di_F / dt = 50 \text{ A} / \mu\text{s}$ |

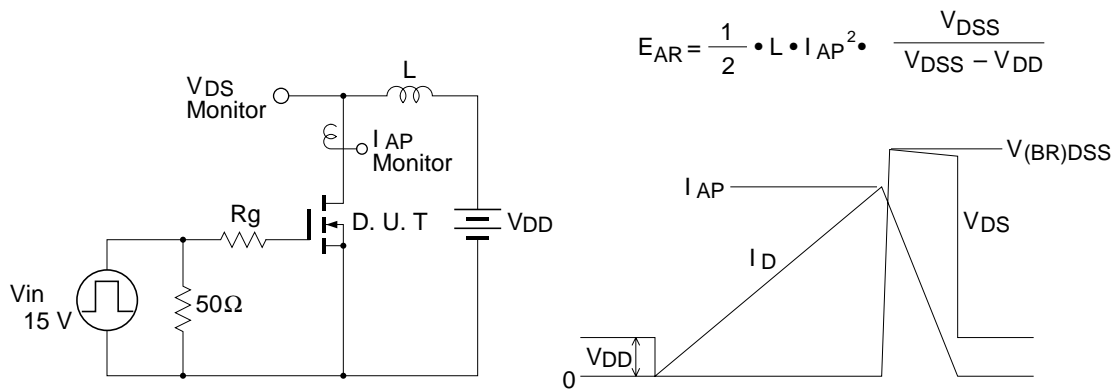
Note 1. Pulse Test

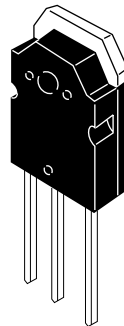
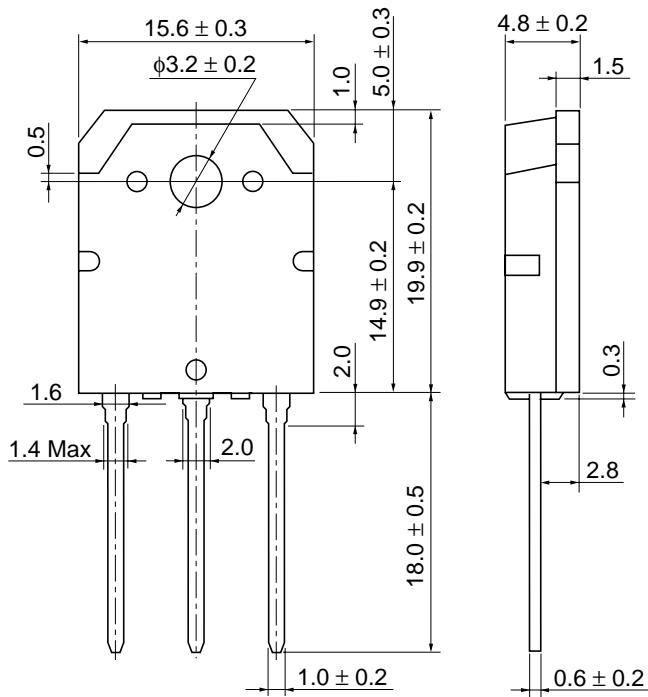
See characteristic curve of 2SK1911.





Avalanche Test Circuit and Waveform





| | |
|--------------------------|----------|
| Hitachi Code | TO-3P |
| JEDEC | — |
| EIAJ | Conforms |
| Weight (reference value) | 5.0 g |

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Hitachi, Ltd.

Semiconductor & Integrated Circuits.
Nippon Bldg., 2-6-2, Ohte-machi, Chiyoda-ku, Tokyo 100-0004, Japan
Tel: Tokyo (03) 3270-2111 Fax: (03) 3270-5109

URL North America : <http://semiconductor.hitachi.com/>
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For further information write to:

Hitachi Semiconductor
(America) Inc.
179 East Tasman Drive,
San Jose, CA 95134
Tel: <1> (408) 433-1990
Fax: <1> (408) 433-0223

Hitachi Europe GmbH
Electronic components Group
Dornacher Straße 3
D-85622 Feldkirchen, Munich
Germany
Tel: <49> (89) 9 9180-0
Fax: <49> (89) 9 29 30 00

Hitachi Europe Ltd.
Electronic Components Group.
Whitebrook Park
Lower Cookham Road
Maidenhead
Berkshire SL6 8YA, United Kingdom
Tel: <44> (1628) 585000
Fax: <44> (1628) 778322

Hitachi Asia Pte. Ltd.
16 Collyer Quay #20-00
Hitachi Tower
Singapore 049318
Tel: 535-2100
Fax: 535-1533

Hitachi Asia Ltd.
Taipei Branch Office
3F, Hung Kuo Building, No.167,
Tun-Hwa North Road, Taipei (105)
Tel: <886> (2) 2718-3666
Fax: <886> (2) 2718-8180

Hitachi Asia (Hong Kong) Ltd.
Group III (Electronic Components)
7/F., North Tower, World Finance Centre,
Harbour City, Canton Road, Tsim Sha Tsui,
Kowloon, Hong Kong
Tel: <852> (2) 735 9218
Fax: <852> (2) 730 0281
Telex: 40815 HITEC HX

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