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# 2SK1337

Silicon N-Channel MOS FET

# HITACHI

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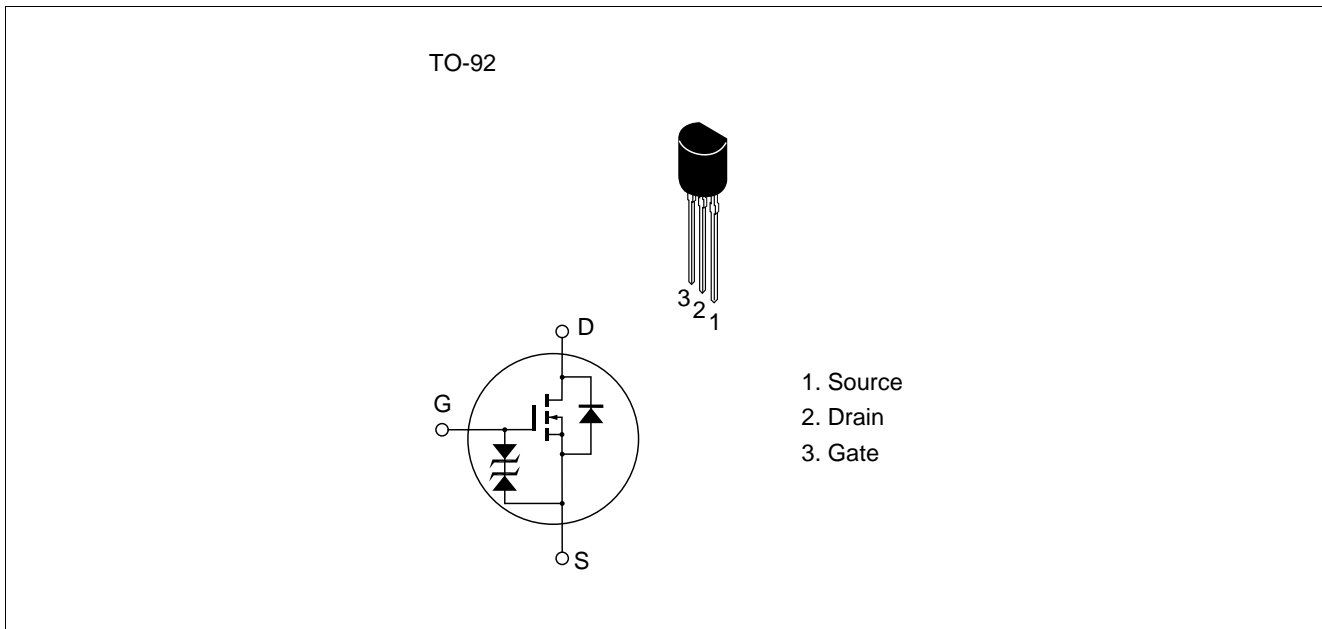
## Application

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 motor drive, DC-DC converter, power switch and solenoid drive

## Outline



## Absolute Maximum Ratings (Ta = 25°C)

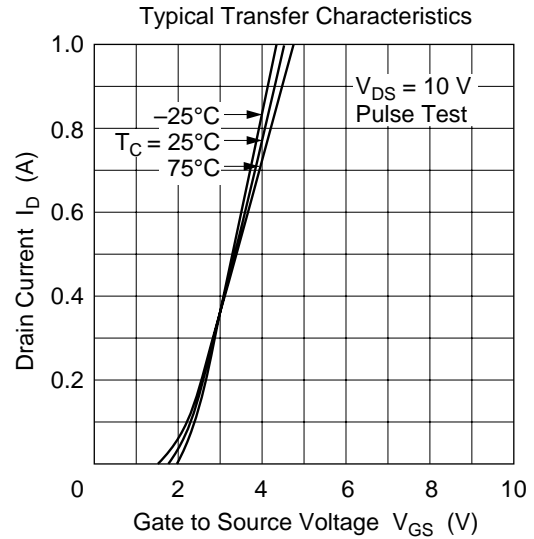
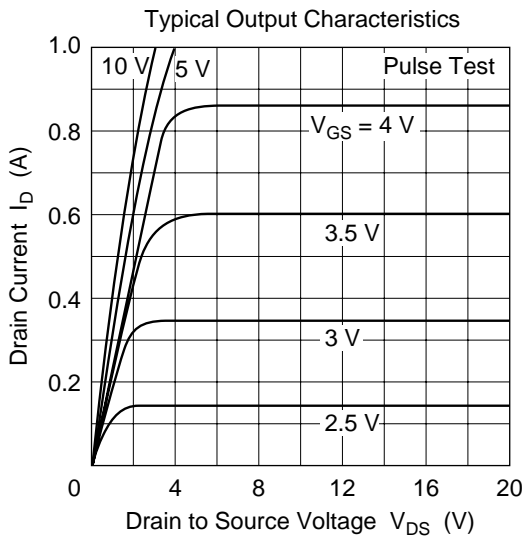
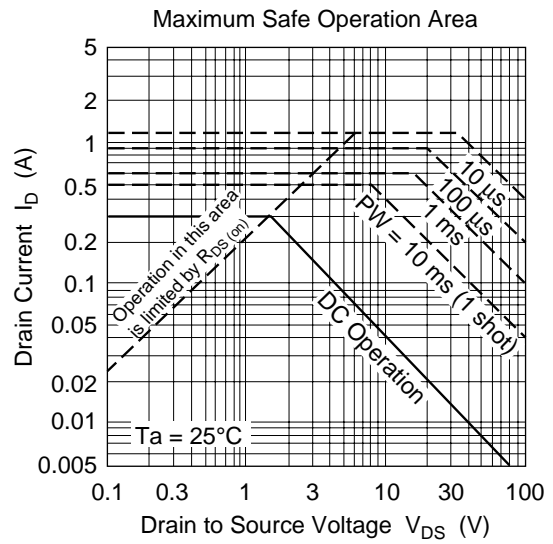
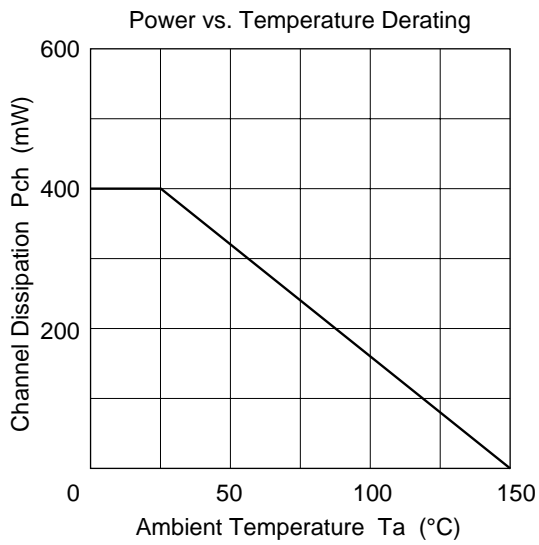
| Item                                      | Symbol              | Ratings     | Unit |
|---|---------------------|-------------|------|
| Drain to source voltage                   | $V_{DSS}$           | 100         | V    |
| Gate to source voltage                    | $V_{GSS}$           | ±20         | V    |
| Drain current                             | $I_D$               | 0.3         | A    |
| Drain peak current                        | $I_{D(pulse)}^{*1}$ | 1.2         | A    |
| Body to drain diode reverse drain current | $I_{DR}$            | 0.3         | A    |
| Channel dissipation                       | Pch                 | 400         | mW   |
| Channel temperature                       | Tch                 | 150         | °C   |
| Storage temperature                       | Tstg                | -55 to +150 | °C   |

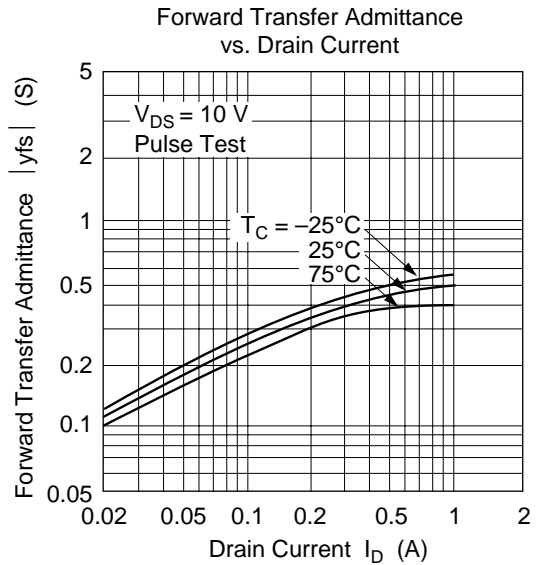
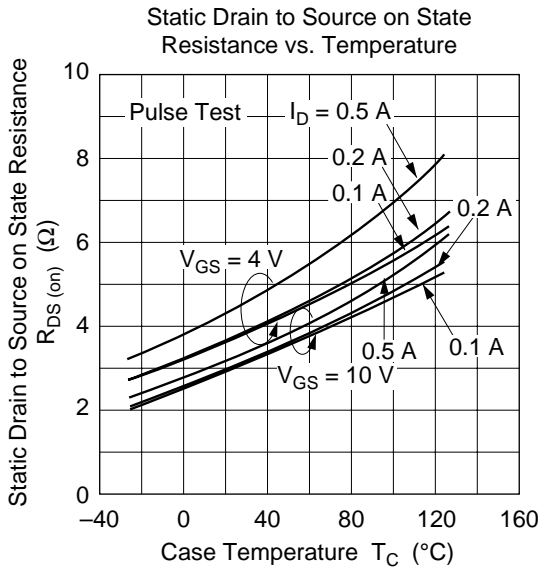
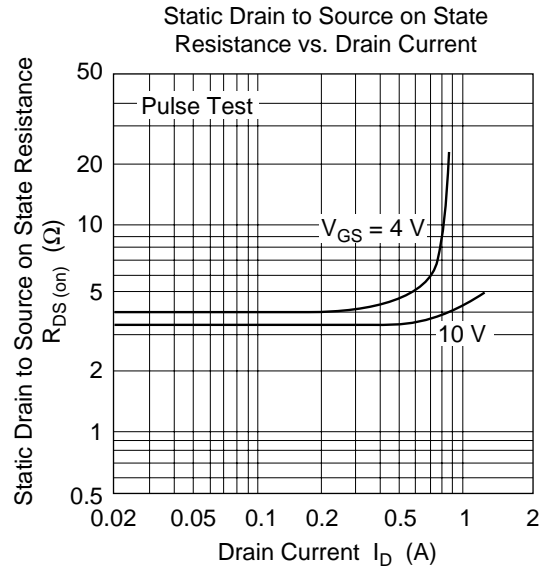
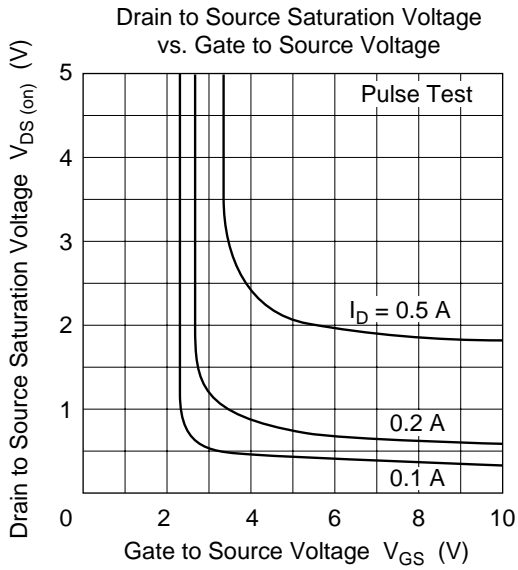
Note: 1.  $PW \leq 10 \mu s$ , duty cycle  $\leq 1\%$

## Electrical Characteristics (Ta = 25°C)

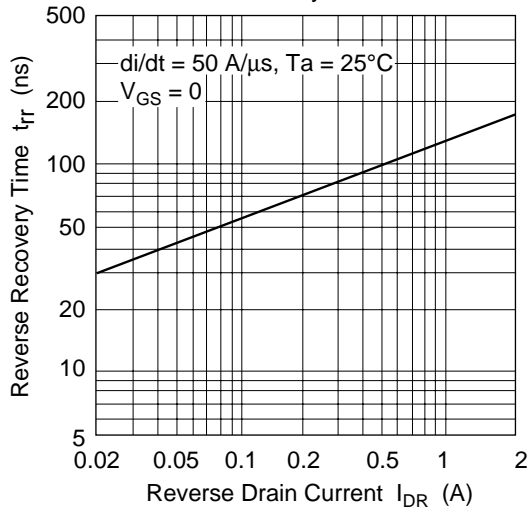
| Item                                       | Symbol        | Min  | Typ  | Max | Unit | Test conditions  |
|--|---------------|------|------|-----|------|--|
| Drain to source breakdown voltage          | $V_{(BR)DSS}$ | 100  | —    | —   | V    | $I_D = 10 \text{ mA}$ , $V_{GS} = 0$                                     |
| Gate to source breakdown voltage           | $V_{(BR)GSS}$ | ±20  | —    | —   | V    | $I_G = \pm 100 \mu A$ , $V_{DS} = 0$                                     |
| Gate to source leak current                | $I_{GSS}$     | —    | —    | ±10 | μA   | $V_{GS} = \pm 16 \text{ V}$ , $V_{DS} = 0$                               |
| Zero gate voltage drain current            | $I_{DSS}$     | —    | —    | 50  | μA   | $V_{DS} = 80 \text{ V}$ , $V_{GS} = 0$                                   |
| Gate to source cutoff voltage              | $V_{GS(off)}$ | 1.0  | —    | 2.0 | V    | $I_D = 1 \text{ mA}$ , $V_{DS} = 10 \text{ V}$                           |
| Static drain to source on state resistance | $R_{DS(on)}$  | —    | 3.5  | 4.5 | Ω    | $I_D = 0.2 \text{ A}$ , $V_{GS} = 10 \text{ V}^{*1}$                     |
|  |               | —    | 4.0  | 6.5 | Ω    | $I_D = 0.2 \text{ A}$ , $V_{GS} = 4 \text{ V}^{*1}$                      |
| Forward transfer admittance                | yfs           | 0.22 | 0.35 | —   | S    | $I_D = 0.2 \text{ A}$ , $V_{DS} = 10 \text{ V}^{*1}$                     |
| Input capacitance                          | Ciss          | —    | 35   | —   | pF   | $V_{DS} = 10 \text{ V}$ , $V_{GS} = 0$ ,                                 |
| Output capacitance                         | Coss          | —    | 14   | —   | pF   | $f = 1 \text{ MHz}$  |
| Reverse transfer capacitance               | Crss          | —    | 3.5  | —   | pF   |  |
| Turn-on delay time                         | $t_{d(on)}$   | —    | 2    | —   | ns   | $I_D = 0.2 \text{ A}$ , $V_{GS} = 10 \text{ V}$ ,                        |
| Rise time                                  | $t_r$         | —    | 4    | —   | ns   | $R_L = 150 \Omega$   |
| Turn-off delay time                        | $t_{d(off)}$  | —    | 17   | —   | ns   |  |
| Fall time                                  | $t_f$         | —    | 15   | —   | ns   |  |
| Body to drain diode forward voltage        | $V_{DF}$      | —    | 0.9  | —   | V    | $I_F = 0.3 \text{ A}$ , $V_{GS} = 0$                                     |
| Body to drain diode reverse recovery time  | $t_{rr}$      | —    | 80   | —   | ns   | $I_F = 0.3 \text{ A}$ , $V_{GS} = 0$ ,<br>$di_F/dt = 50 \text{ A}/\mu s$ |

Note: 1. Pulse test

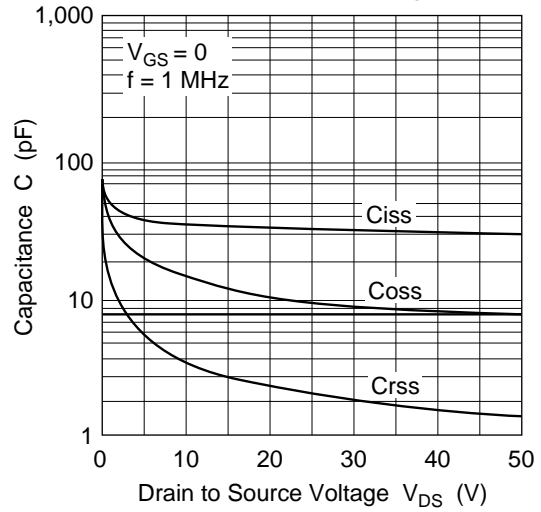




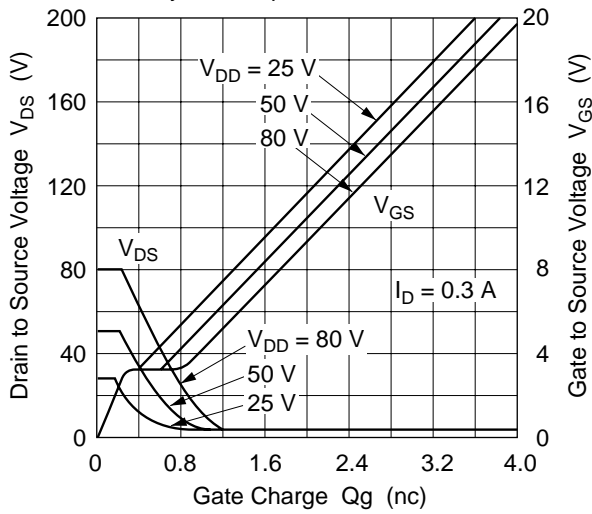
Body to Drain Diode Reverse Recovery Time



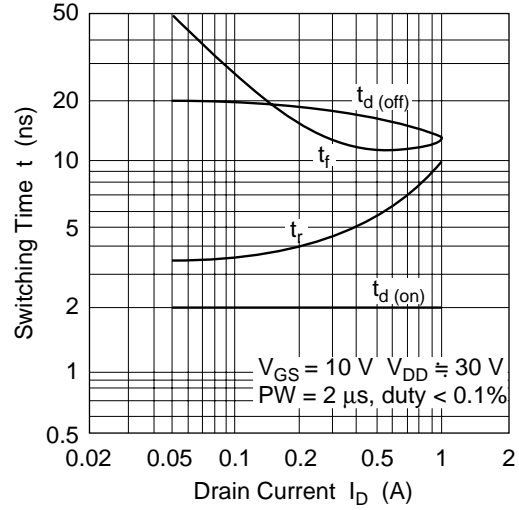
Typical Capacitance vs. Drain to Source Voltage

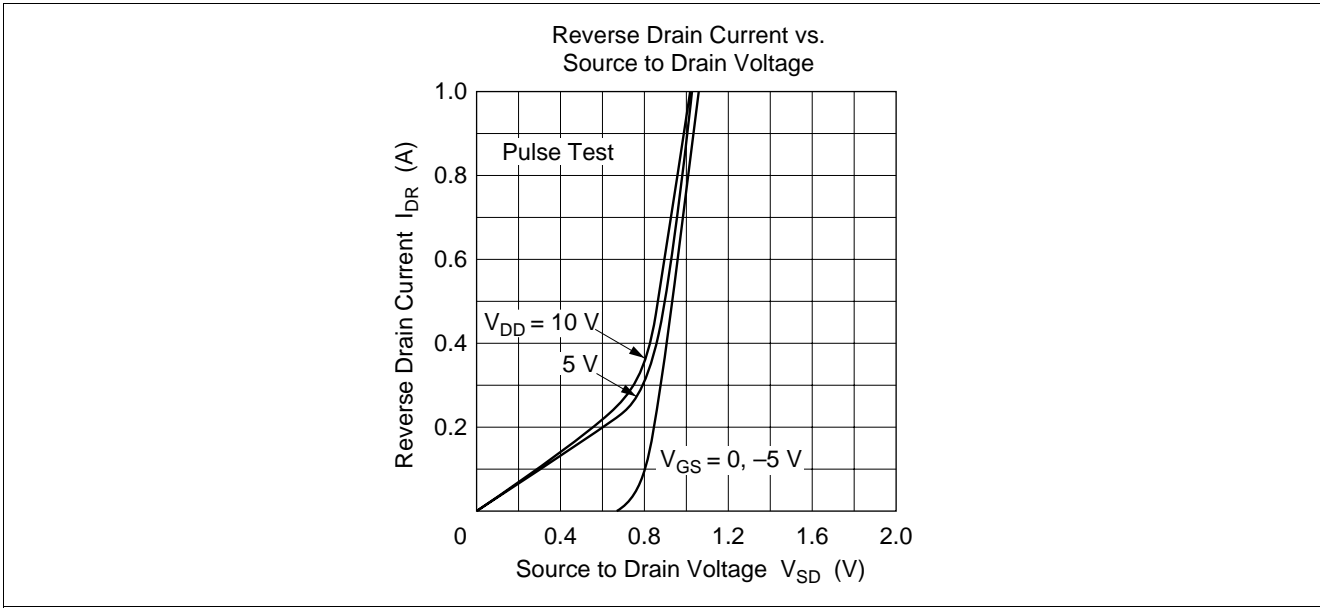


Dynamic Input Characteristics

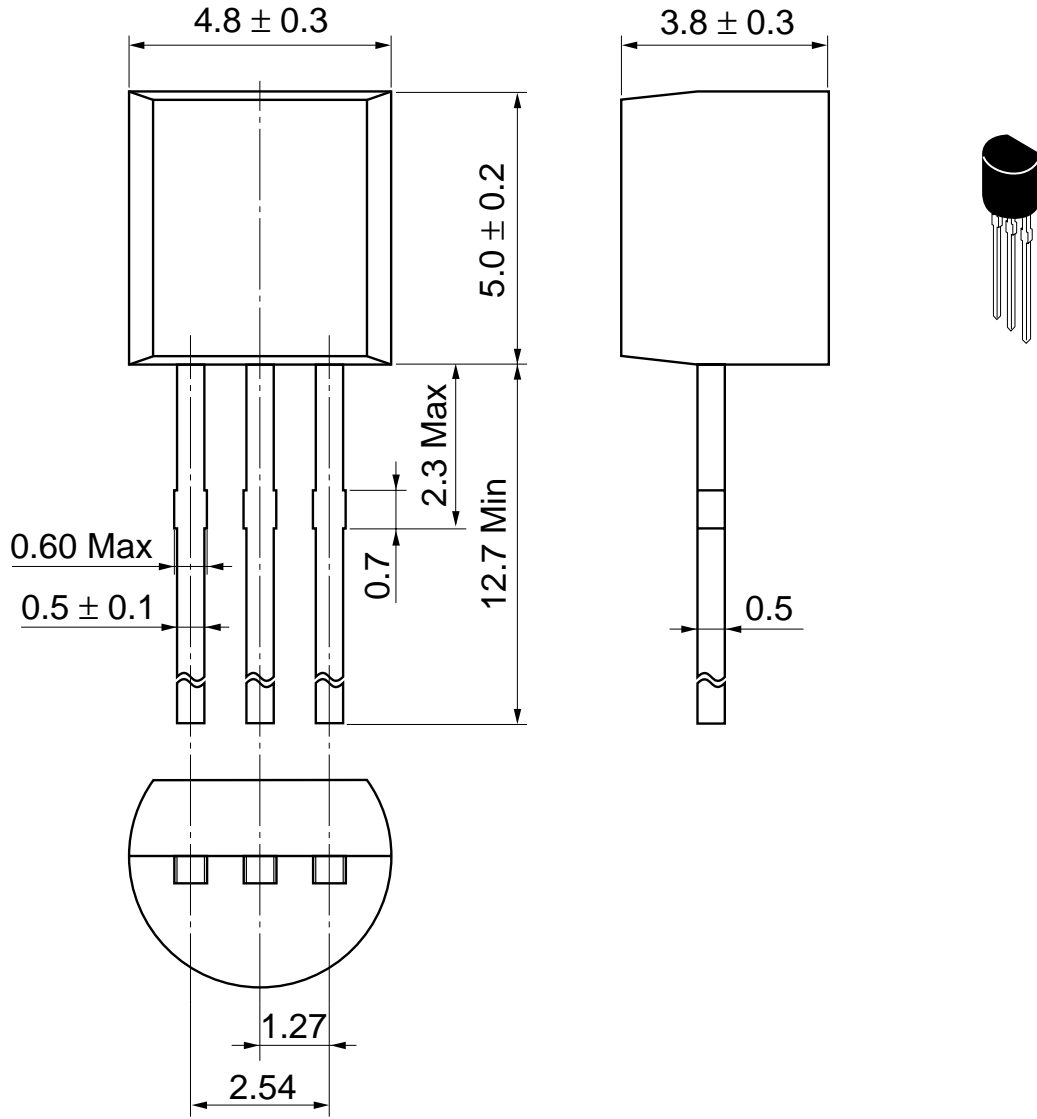


Switching Characteristics





Unit: mm



|                          |           |
|--------------------------|-----------|
| Hitachi Code             | TO-92 (1) |
| JEDEC                    | Conforms  |
| EIAJ                     | Conforms  |
| Weight (reference value) | 0.25 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      NorthAmerica      : <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 StraÙe 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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