# 2SK1836, 2SK1837

Silicon N-Channel MOS FET

HITACHI

## Application

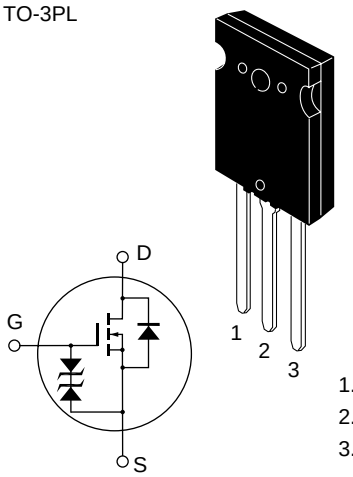
High speed power switching

## Features

- Low on-resistance
- High speed switching
- Low drive current
- No secondary breakdown
- Suitable for switchingregulator, DC-DC converter

## Outline

TO-3PL




1. Gate
2. Drain (Flange)
3. Source

Hitachi semiconductor

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

| Item | | Symbol | Ratings | Unit |
|---|---|---|---|---|
| Drain to source voltage | K1836 | $V_{DSS}$ | 450 | V |
| | K1837 | | 500 | |
| Gate to source voltage | | $V_{GSS}$ | ±30 | V |
| Drain current | | $I_D$ | 50 | A |
| Drain peak current | | $I_{D(pulse)}$*[1] | 200 | A |
| Body to drain diode reverse drain current | | $I_{DR}$ | 50 | A |
| Channel dissipation | | Pch*[2] | 250 | W |
| Channel temperature | | Tch | 150 | °C |
| Storage temperature | | Tstg | –55 to +150 | °C |

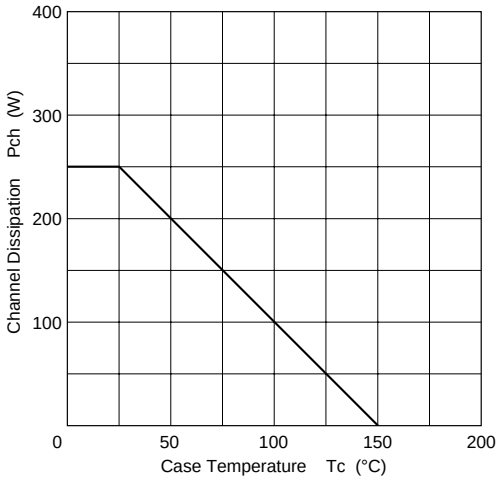
Notes 1. PW 10 µs, duty cycle 1 %
2. Value at Tc = 25 °C

## Electrical Characteristics (Ta = 25°C)

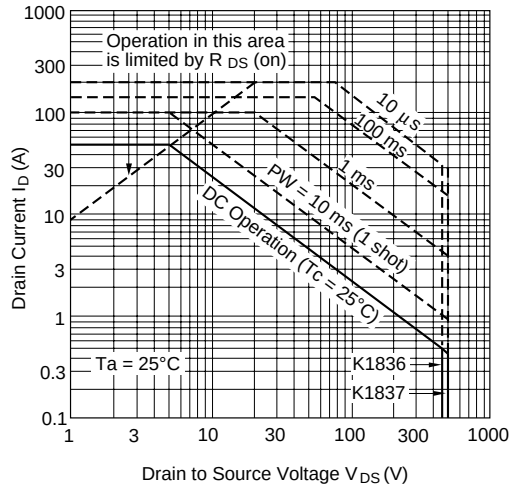
| Item | | Symbol | Min | Typ | Max | Unit | Test conditions |
|---|---|---|---|---|---|---|---|
| Drain to source breakdown voltage | K1836 | $V_{(BR)DSS}$ | 450 | — | — | V | $I_D$ = 10 mA, $V_{GS}$ = 0 |
| | K1837 | | 500 | — | — | | |
| Gate to source breakdown voltage | | $V_{(BR)GSS}$ | ±30 | — | — | V | $I_G$ = ±100 µA, $V_{DS}$ = 0 |
| Gate to source leak current | | $I_{GSS}$ | — | — | ±10 | µA | $V_{GS}$ = ±25 V, $V_{DS}$ = 0 |
| Zero gate voltage drain current | K1836 | $I_{DSS}$ | — | — | 250 | µA | $V_{DS}$ = 360 V, $V_{GS}$ = 0 |
| | K1837 | | | | | | $V_{DS}$ = 400 V, $V_{GS}$ = 0 |
| Gate to source cutoff voltage | | $V_{GS(off)}$ | 2.0 | — | 3.0 | V | $I_D$ = 1 mA, $V_{DS}$ = 10 V |
| Static drain to source on state resistance | K1836 | $R_{DS(on)}$ | — | 0.08 | 0.10 | | $I_D$ = 25 A |
| | K1837 | | — | 0.085 | 0.11 | | $V_{GS}$= 10 V*[1] |
| Forward transfer admittance | | $\|y_{fs}\|$ | 22 | 35 | — | S | $I_D$ = 25 A<br>$V_{DS}$ = 10 V*[1] |
| Input capacitance | | Ciss | — | 8150 | — | pF | $V_{DS}$ = 10 V |
| Output capacitance | | Coss | — | 2100 | — | pF | $V_{GS}$ = 0 |
| Reverse transfer capacitance | | Crss | — | 180 | — | pF | f = 1 MHz |
| Turn-on delay time | | $t_{d(on)}$ | — | 80 | — | ns | $I_D$ = 25 A |
| Rise time | | $t_r$ | — | 250 | — | ns | $V_{GS}$ = 10 V |
| Turn-off delay time | | $t_{d(off)}$ | — | 550 | — | ns | $R_L$ = 1.2 |
| Fall time | | $t_f$ | — | 220 | — | ns | |
| Body to drain diode forward voltage | | $V_{DF}$ | — | 1.1 | — | V | $I_F$ = 50 A, $V_{GS}$ = 0 |
| Body to drain diode reverse recovery time | | $t_{rr}$ | — | 620 | — | ns | $I_F$ = 50 A, $V_{GS}$ = 0,<br>$di_F$ / dt = 100 A / µs |

Note 1. Pulse Test

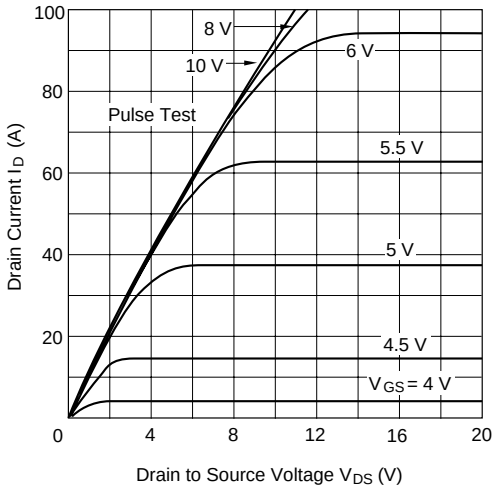
Power vs. Temperature



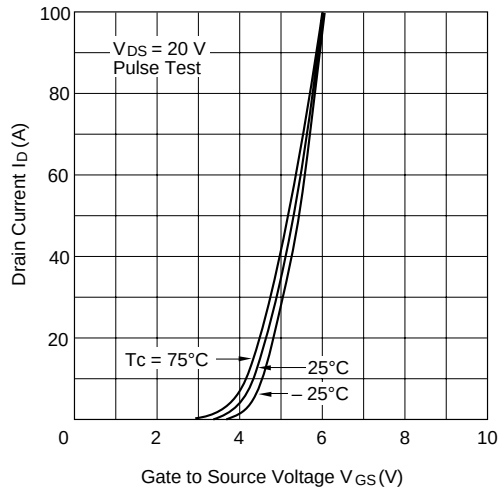

Maximum Safe Operation Area



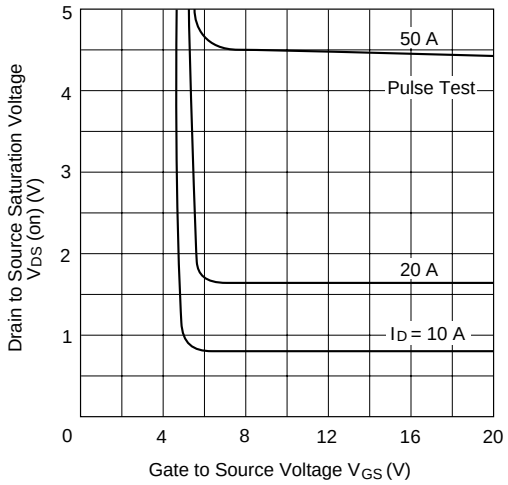

Typical Output Characteristics



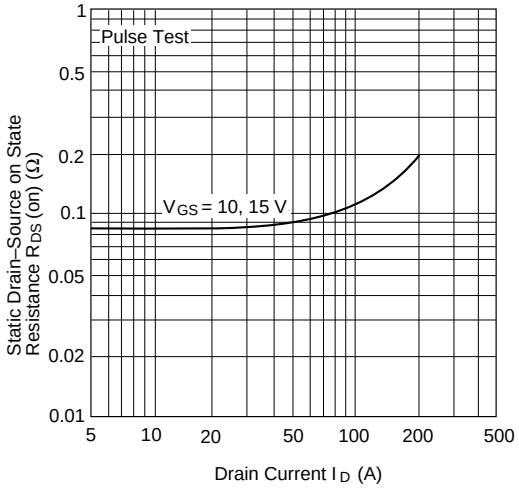

Typical Transfer Characteristics



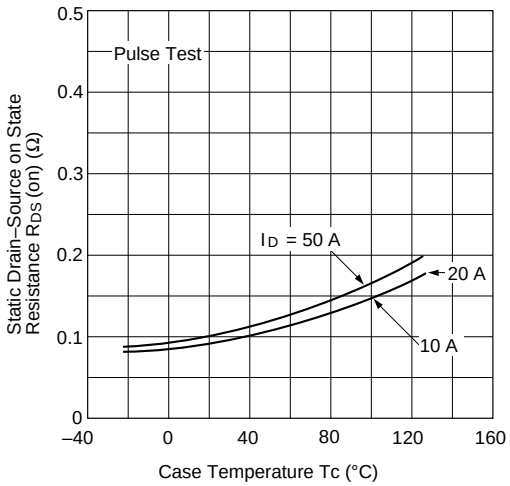
Drain to Source Saturation Voltage vs. Gate to Source Voltage



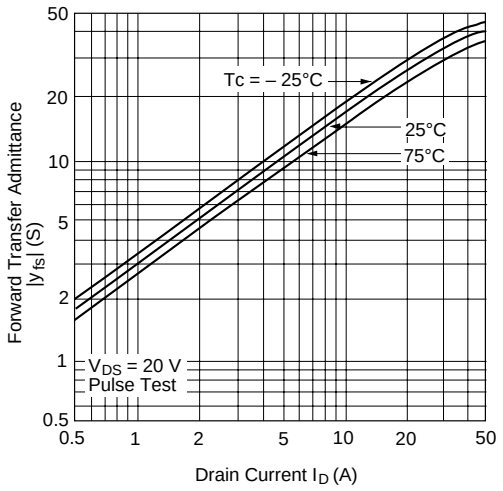

Static Drain to Source on State Resistance vs. Drain Current



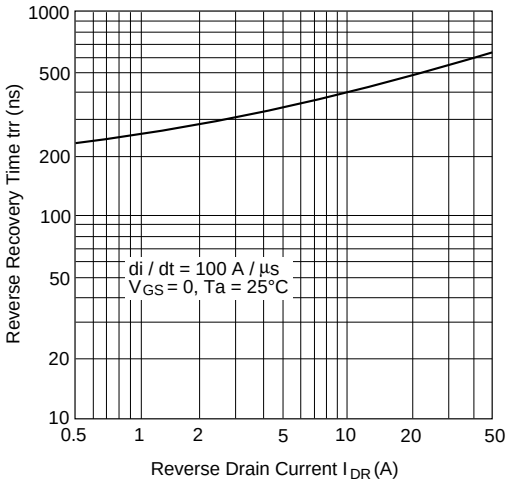

Static Drain to Source on State Resistance vs. Temperature



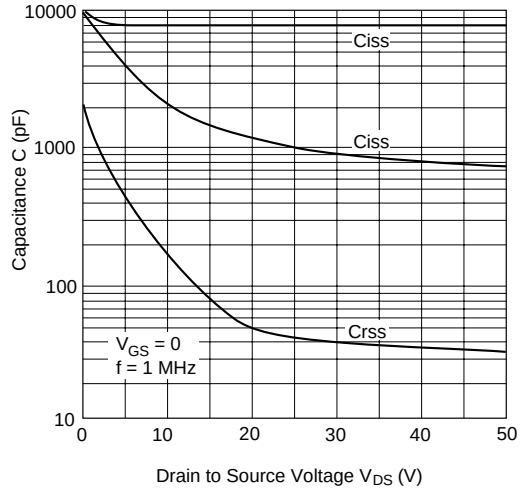

Forward Transfer Admittance vs. Drain Current



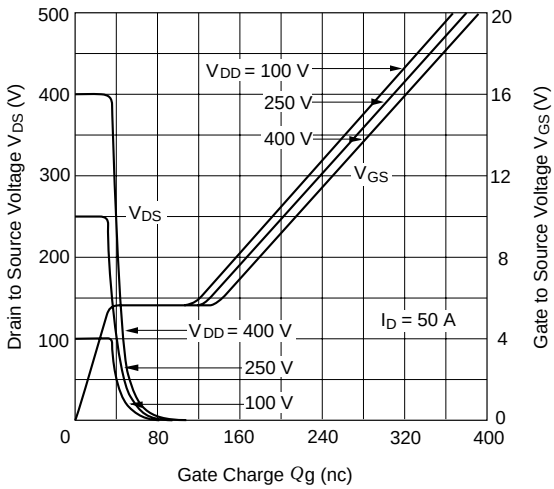
Body to Drain Diode Reverse Recovry Time



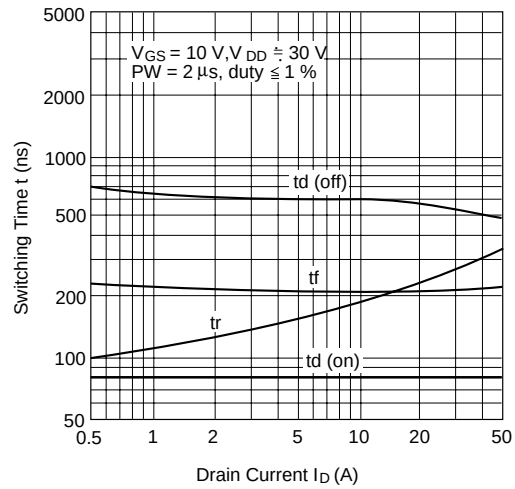

Typical Capacitance vs. Drain to Source Voltage



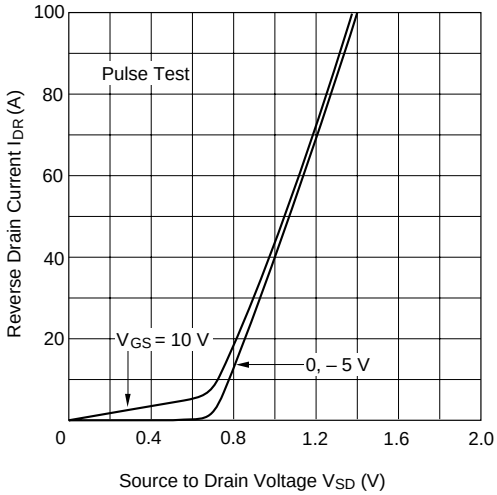

Dynamic Input Characteristics



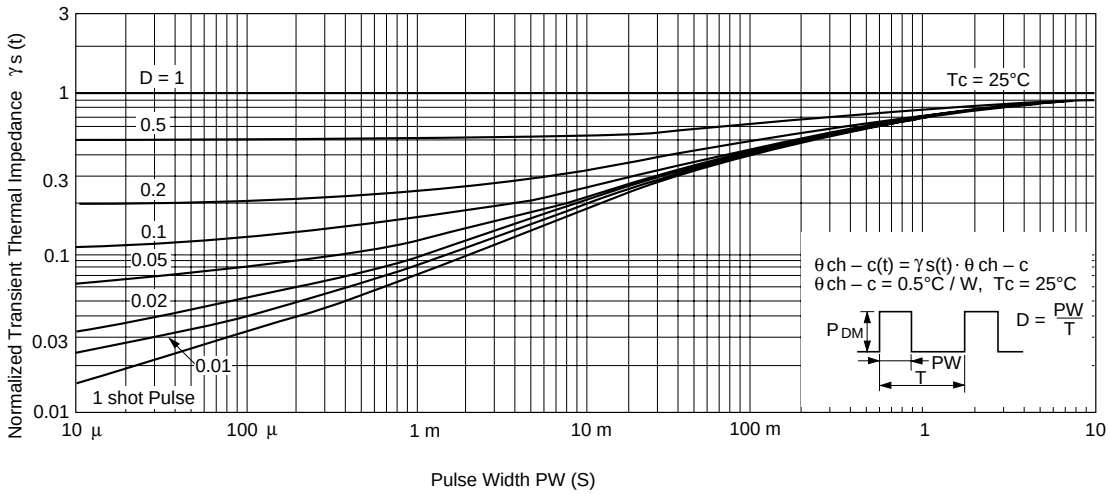

Switching Characteristics



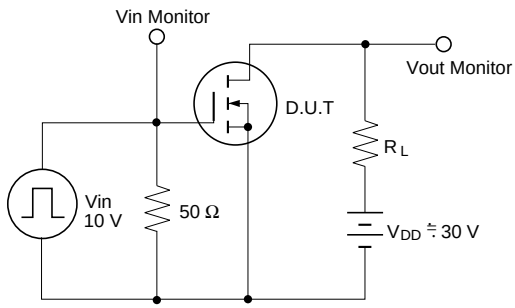
Reverse Drain Current
vs. Source Drain Voltage



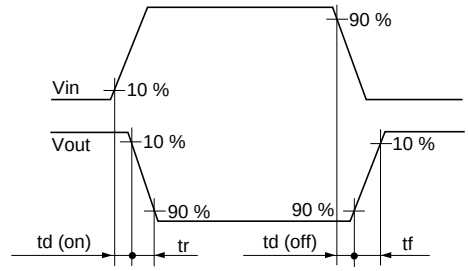

Normalized Transient Thermal Impedance vs. Pulse Width



Switching Time Test Circuit




Waveforms



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HITACHI

**Hitachi, Ltd.**
Semiconductor & IC Div.
Nippon Bldg., 2-6-2, Ohte-machi, Chiyoda-ku, Tokyo 100, Japan
Tel: Tokyo (03) 3270-2111
Fax: (03) 3270-5109

**For further information write to:**

Hitachi America, Ltd.
Semiconductor & IC Div.
2000 Sierra Point Parkway
Brisbane, CA. 94005-1835
U S A
Tel: 415-589-8300
Fax: 415-583-4207

Hitachi Europe GmbH
Electronic Components Group
Continental Europe
Dornacher Straße 3
D-85622 Feldkirchen
München
Tel: 089-9 91 80-0
Fax: 089-9 29 30 00

Hitachi Europe Ltd.
Electronic Components Div.
Northern Europe Headquarters
Whitebrook Park
Lower Cookham Road
Maidenhead
Berkshire SL6 8YA
United Kingdom
Tel: 0628-585000
Fax: 0628-778322

Hitachi Asia Pte. Ltd.
16 Collyer Quay #20-00
Hitachi Tower
Singapore 0104
Tel: 535-2100
Fax: 535-1533

Hitachi Asia (Hong Kong) Ltd.
Unit 706, North Tower,
World Finance Centre,
Harbour City, Canton Road
Tsim Sha Tsui, Kowloon
Hong Kong
Tel: 27359218
Fax: 27306071