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# 2SK1836, 2SK1837

Silicon N-Channel MOS FET

# HITACHI

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## Application

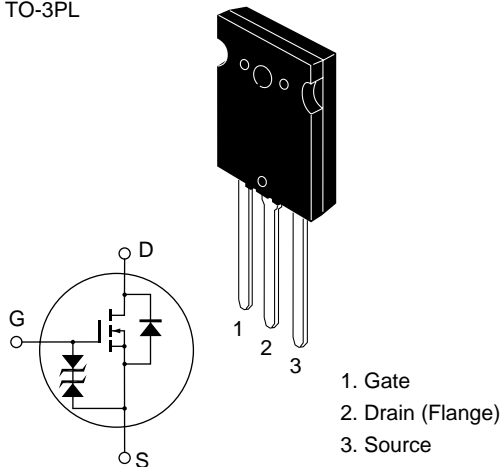
High speed power switching

## Features

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

## Outline

TO-3PL



## 2SK1836, 2SK1837

### 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		$P_{ch}^{*2}$	250	W
Channel temperature		Tch	150	°C
Storage temperature		Tstg	-55 to +150	°C

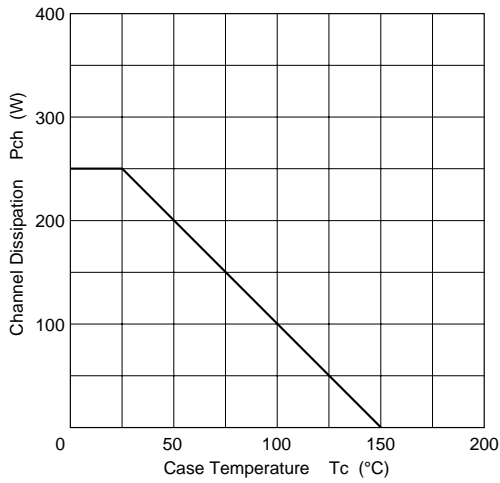
- Notes 1.  $PW \leq 10 \mu s$ , duty cycle  $\leq 1 \%$   
2. Value at  $T_c = 25 \text{ }^\circ\text{C}$

**Electrical Characteristics (Ta = 25°C)**

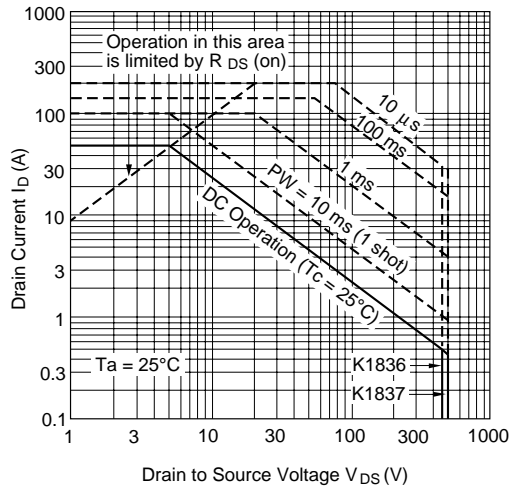
Item		Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	K1836 K1837	$V_{(BR)DSS}$	450 500	—	—	V	$I_D = 10 \text{ mA}, V_{GS} = 0$
Gate to source breakdown voltage		$V_{(BR)GSS}$	±30	—	—	V	$I_G = \pm 100 \text{ } \mu\text{A}, V_{DS} = 0$
Gate to source leak current		$I_{GSS}$	—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

Note 1. Pulse Test

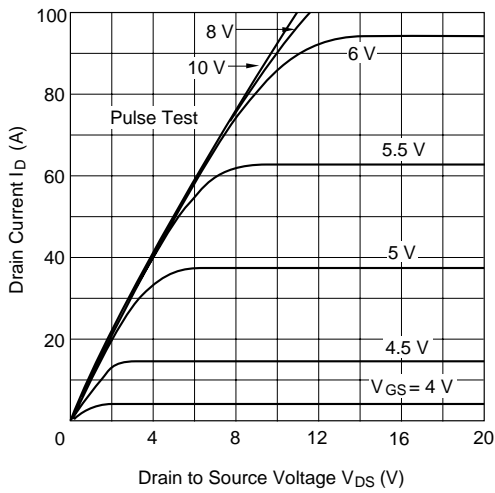
### Power vs. Temperature



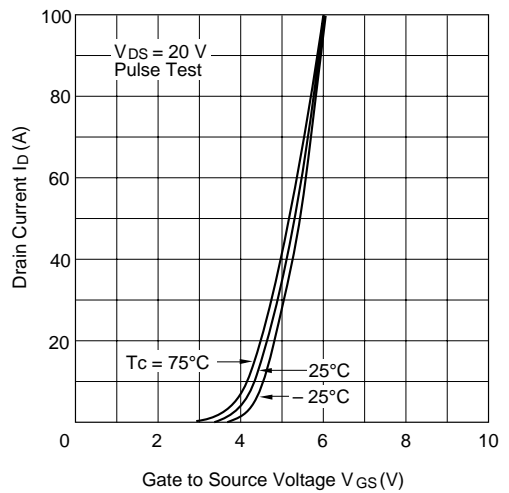
### Maximum Safe Operation Area



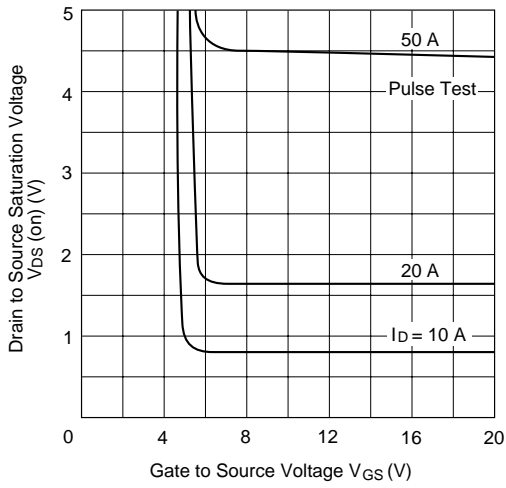
### Typical Output Characteristics



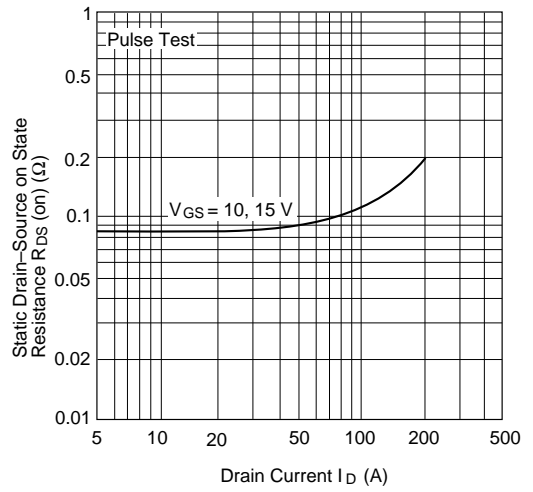
### Typical Transfer Characteristics



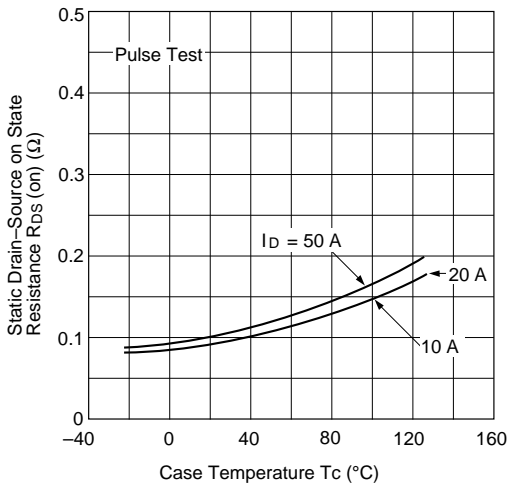
Drain to Source Saturation Voltage vs. Gate to Source Voltage



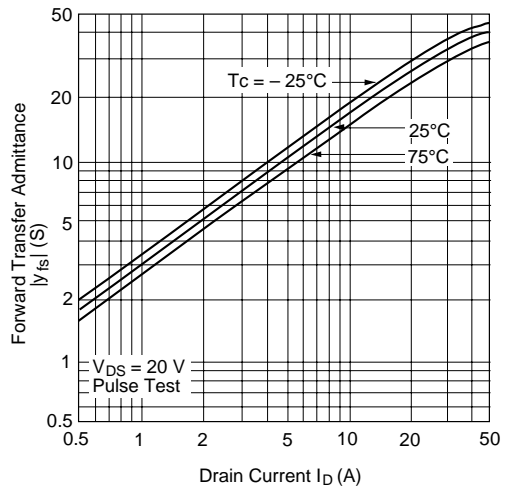
Static Drain to Source on State Resistance vs. Drain Current



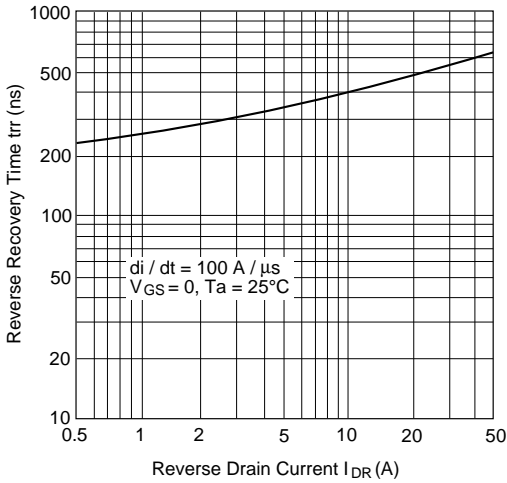
Static Drain to Source on State Resistance vs. Temperature



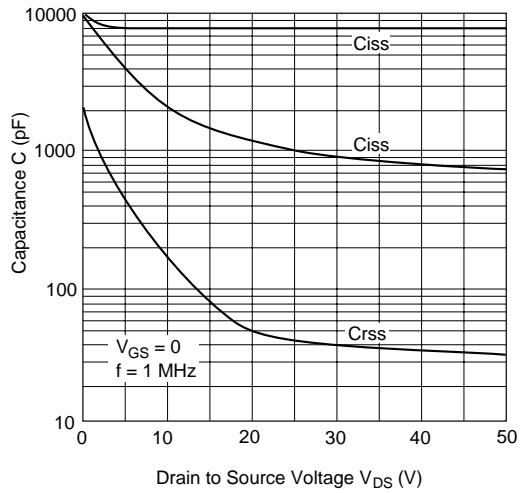
Forward Transfer Admittance vs. Drain Current



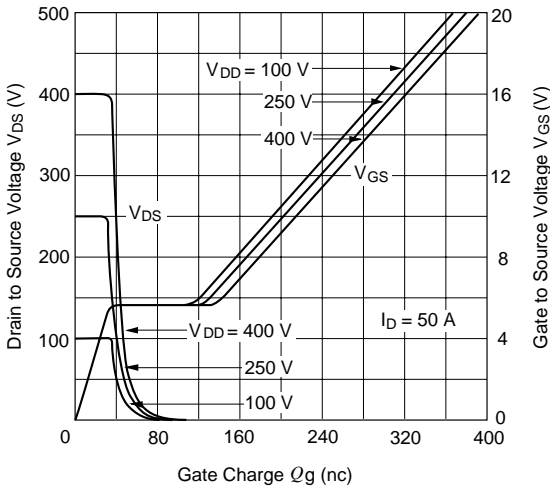
Body to Drain Diode Reverse Recovery Time



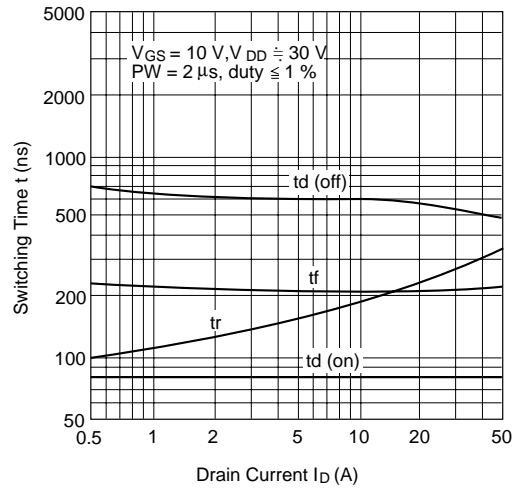
Typical Capacitance vs. Drain to Source Voltage

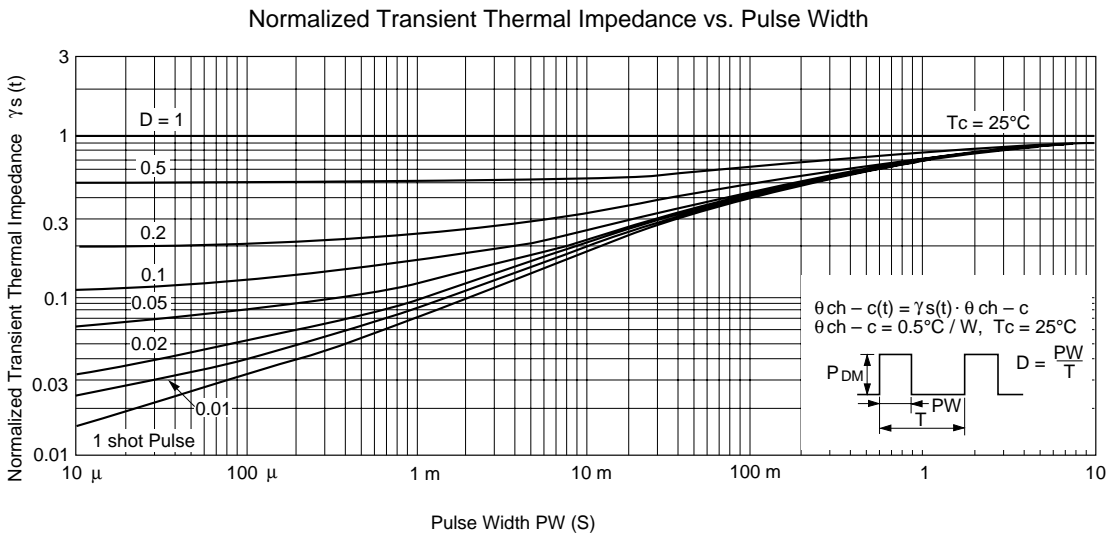
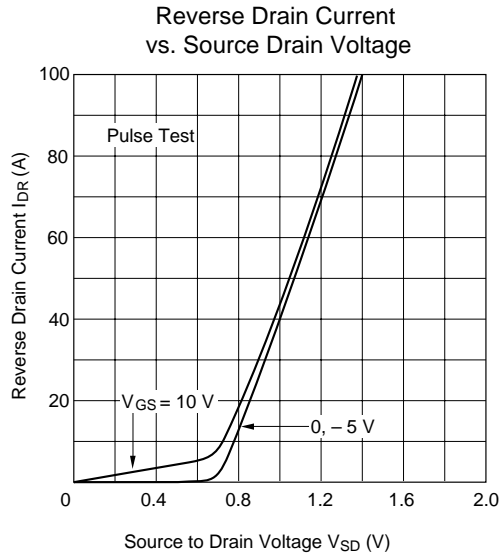


Dynamic Input Characteristics

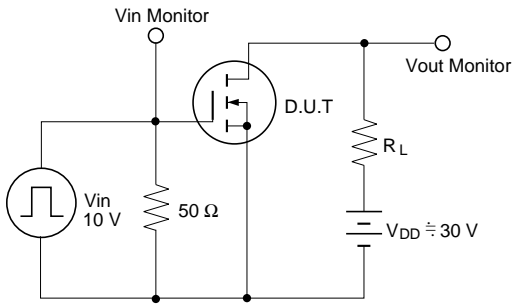


Switching Characteristics

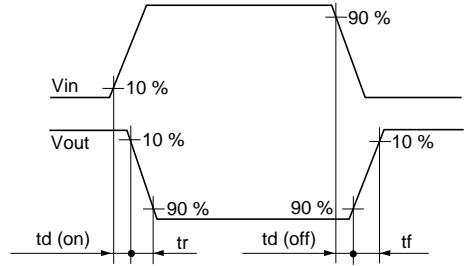




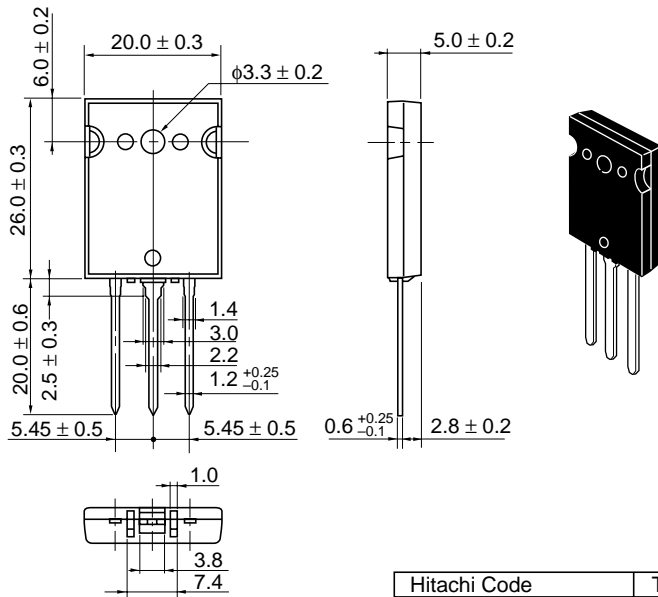
Switching Time Test Circuit



Waveforms







Hitachi Code	TO-3PL
JEDEC	—
EIAJ	—
Weight (reference value)	9.9 g

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