
2SK1836, 2SK1837

Silicon N-Channel MOS FET

HITACHI

ADE-208-1326 (Z)

1st. Edition

Mar. 2001

Application

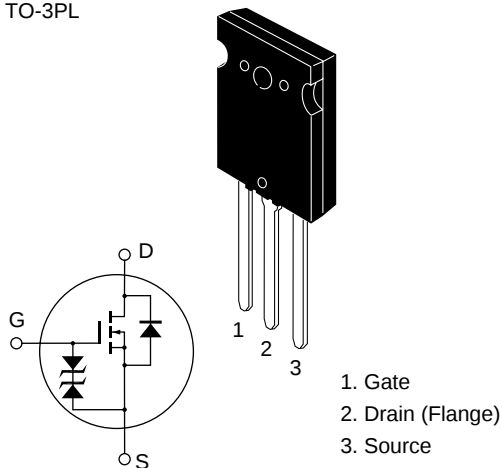
High speed power switching

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		T_{ch}	150	°C
Storage temperature		T_{stg}	-55 to +150	°C

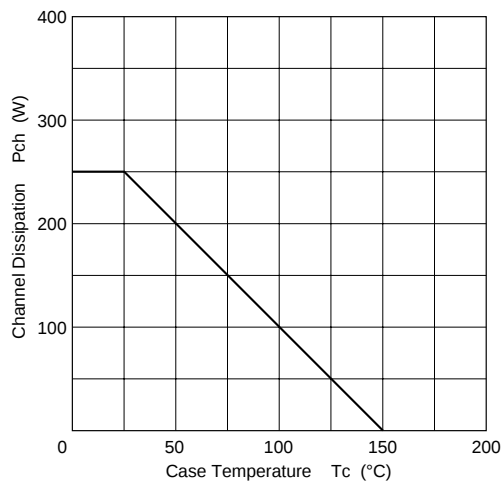
Notes 1. $PW \leq 10 \mu s$, duty cycle $\leq 1 \%$
2. Value at $T_c = 25 \text{ }^\circ\text{C}$

Electrical Characteristics (Ta = 25°C)

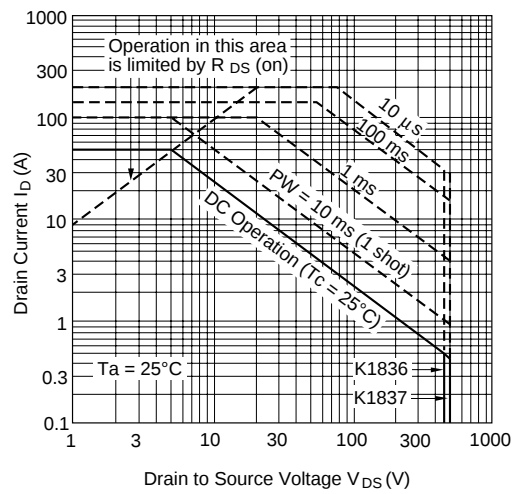
Item		Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	K1836 K1837	$V_{(BR)DSS}$	450 500	— —	— —	V	$I_D = 10 \text{ mA}$, $V_{GS} = 0$
Gate to source breakdown voltage		$V_{(BR)GSS}$	±30	—	—	V	$I_G = \pm 100 \mu\text{A}$, $V_{DS} = 0$
Gate to source leak current		I_{GSS}	—	—	±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	$R_L = 1.2 \Omega$
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

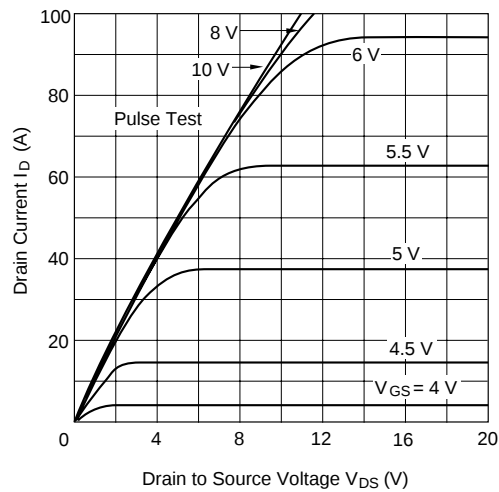
Power vs. Temperature



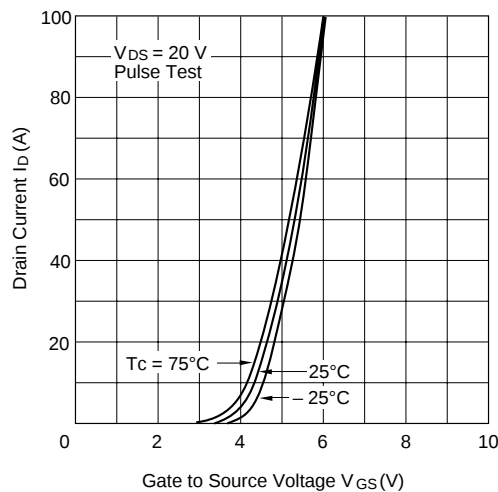
Maximum Safe Operation Area



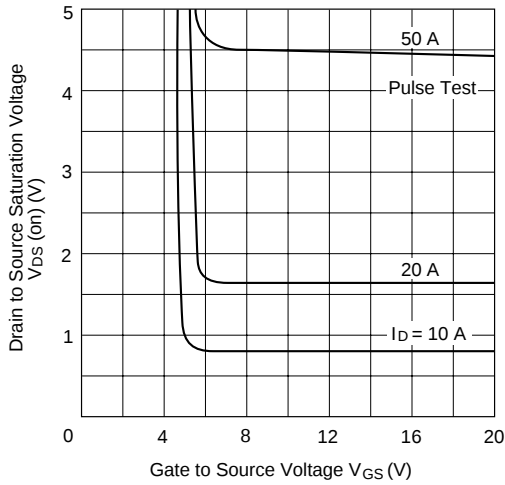
Typical Output Characteristics



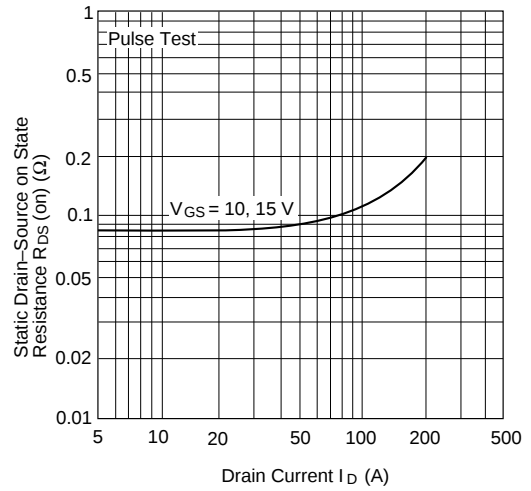
Typical Transfer Characteristics



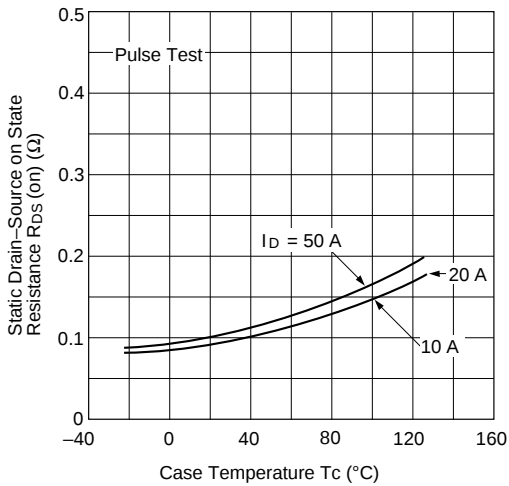
Drain to Source Saturation Voltage
vs. Gate to Source Voltage



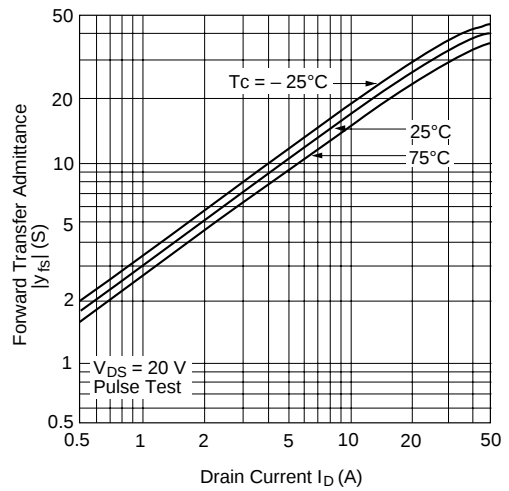
Static Drain to Source on State
Resistance vs. Drain Current



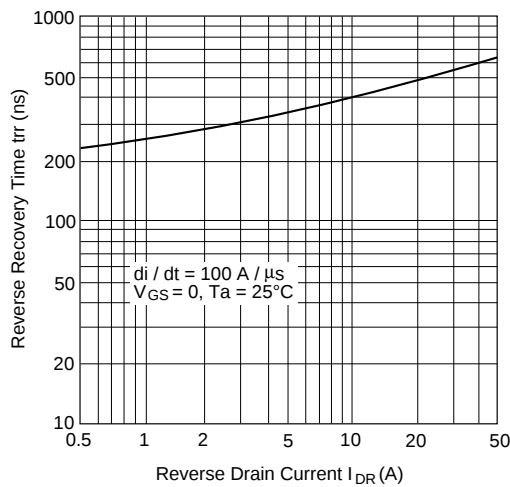
Static Drain to Source on State
Resistance vs. Temperature



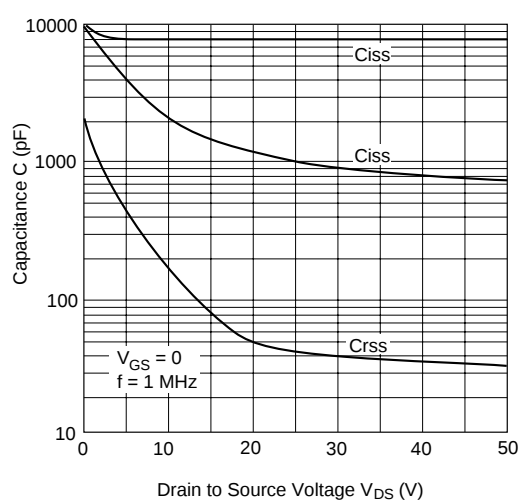
Forward Transfer Admittance
vs. Drain Current



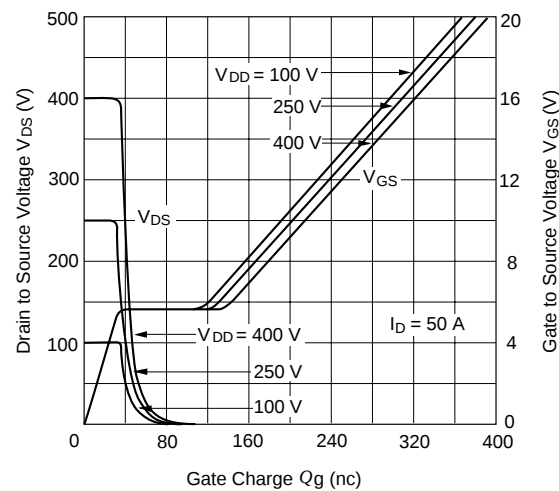
Body to Drain Diode Reverse
Recovery Time



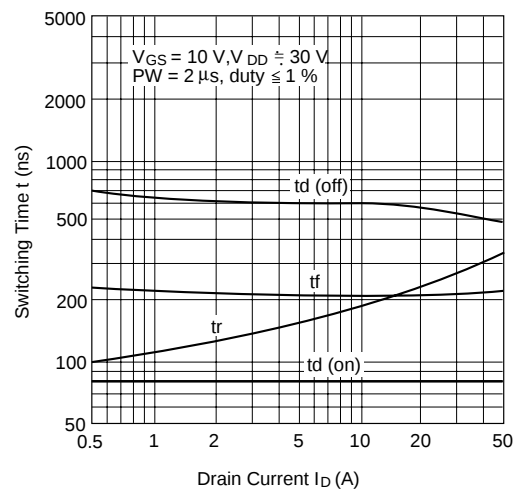
Typical Capacitance
vs. Drain to Source Voltage

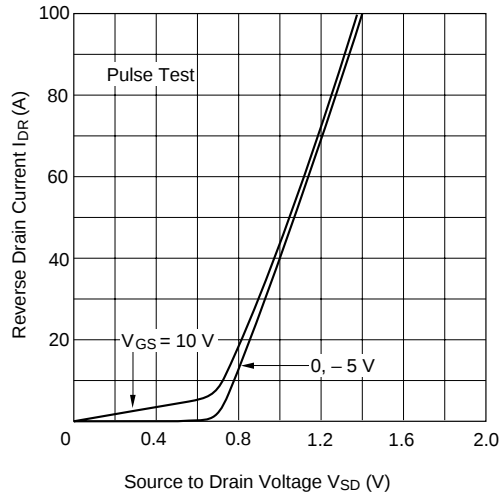


Dynamic Input Characteristics

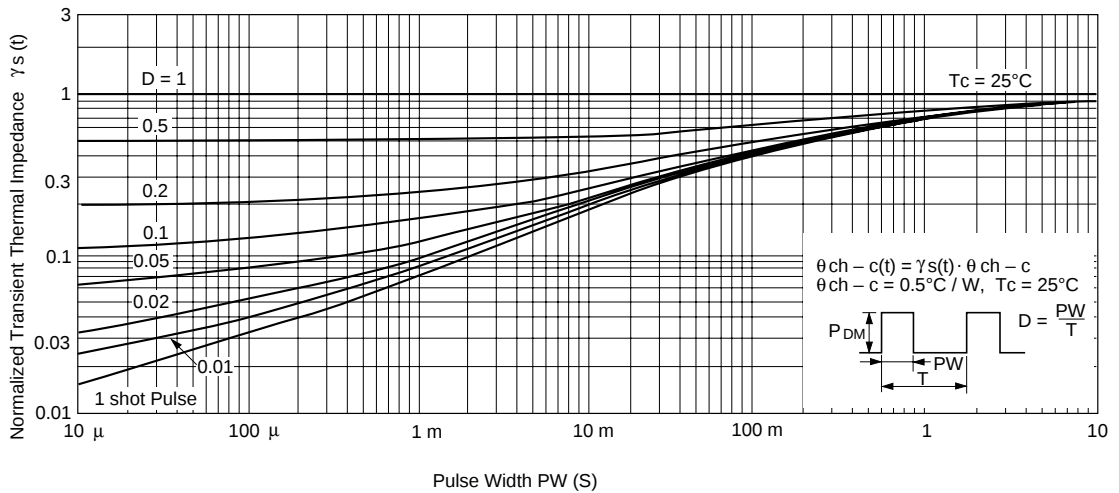


Switching Characteristics

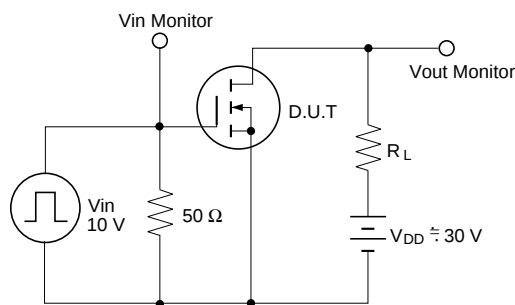


Reverse Drain Current
vs. Source Drain Voltage

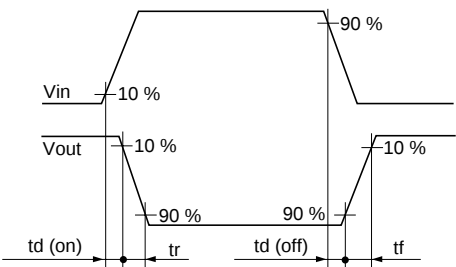
Normalized Transient Thermal Impedance vs. Pulse Width



Switching Time Test Circuit



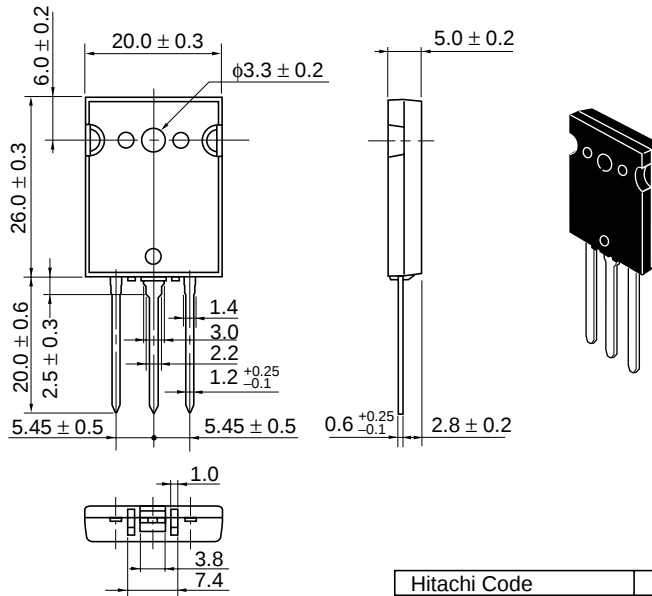
Waveforms



Package Dimensions

As of January, 2001

Unit: mm



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

Cautions

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