2SK1836, 2SK1837

Silicon N Channel MOS FET

Application

High speed power switching

Features

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

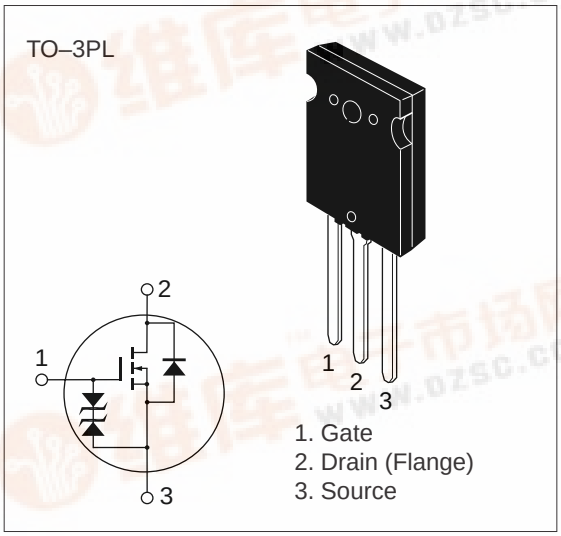


Table 1 Ordering Information

Type No	V_{DSS}
2SK1836	450V
2SK1837	500V

Table 2 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		$I_{D(pulse)}$*	200	A
Body–drain diode reverse drain current		I_{DR}	50	A
Channel dissipation		Pch**	250	W
Channel temperature		Tch	150	°C
Storage temperature		Tstg	–55 to +150	°C

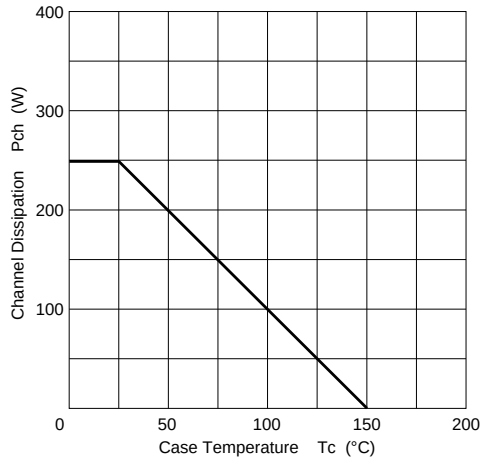
* PW ≤ 10 µs, duty cycle ≤ 1 %
** Value at Tc = 25 °C

Table 3 Electrical Characteristics (Ta = 25°C)

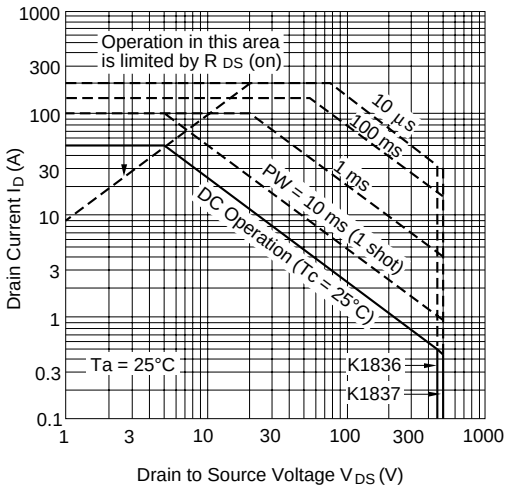
Item		Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	K1836	$V_{(BR)DSS}$	450	—	—	V	I_D = 10 mA, V_{GS} = 0
	K1837		500	—	—		
Gate to source breakdown voltage		$V_{(BR)GSS}$	±30	—	—	V	I_G = ±100 µA, V_{DS} = 0
Gate to source leak current		I_{GSS}	—	—	±10	µA	V_{GS} = ±25 V, V_{DS} = 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	Ω	I_D = 25 A V_{GS}= 10 V *
	K1837		—	0.085	0.11		
Forward transfer admittance		$\|y_{fs}\|$	22	35	—	S	I_D = 25 A V_{DS} = 10 V *
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 Ω
Fall time		t_f	—	220	—	ns	
Body–drain diode forward voltage		V_{DF}	—	1.1	—	V	I_F = 50 A, V_{GS} = 0
Body–drain diode reverse recovery time		t_{rr}	—	620	—	ns	I_F = 50 A, V_{GS} = 0, di_F / dt = 100 A / µs

* Pulse Test

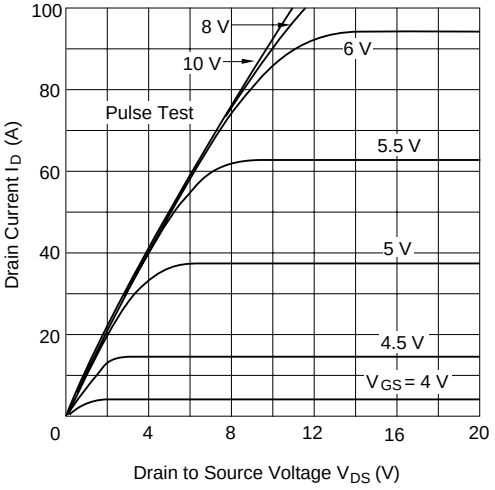
Power vs. Temperature Derating



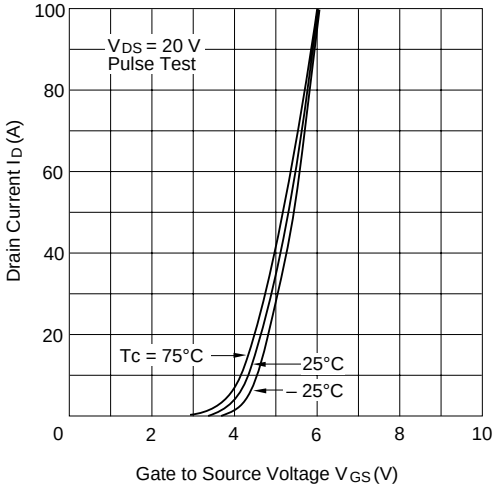
Maximum Safe Operation Area



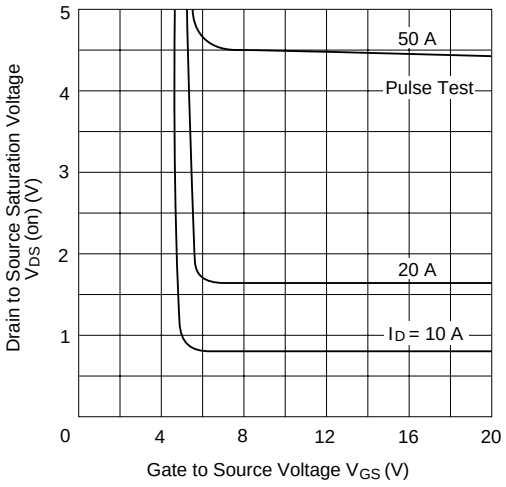
Typical Output Characteristics



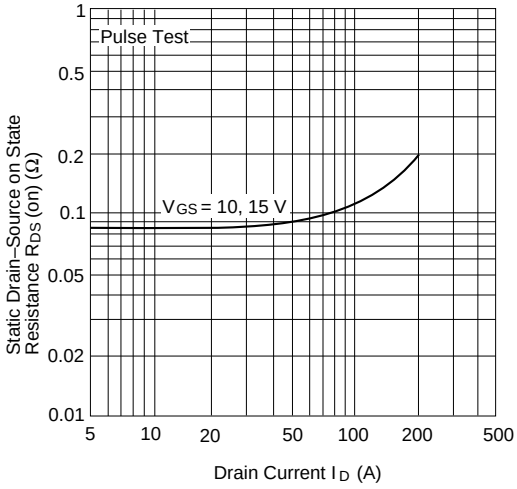
Typical Transfer Characteristics



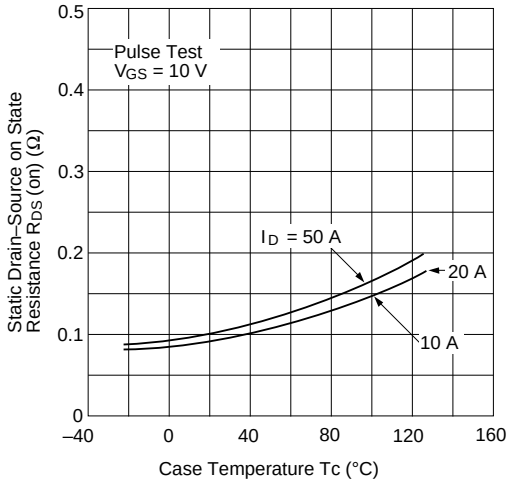
Drain-Source Saturation Voltage vs. Gate-Source Voltage



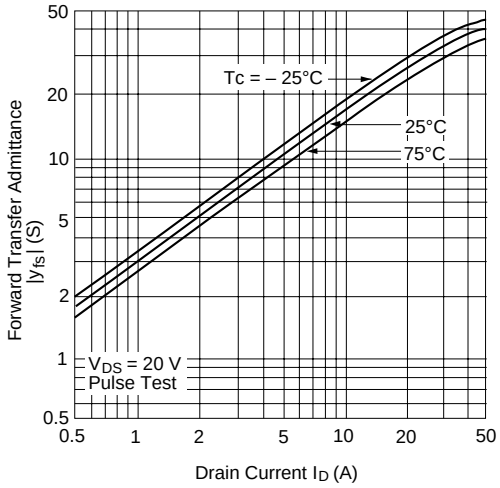
Static Drain-Source on State Resistance vs. Drain Current



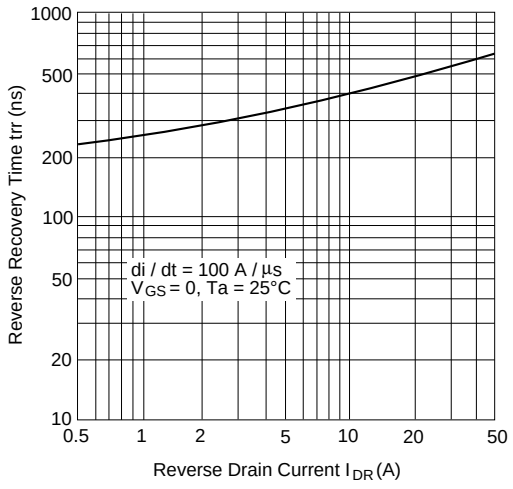
Static Drain-Source on State Resistance vs. Temperature



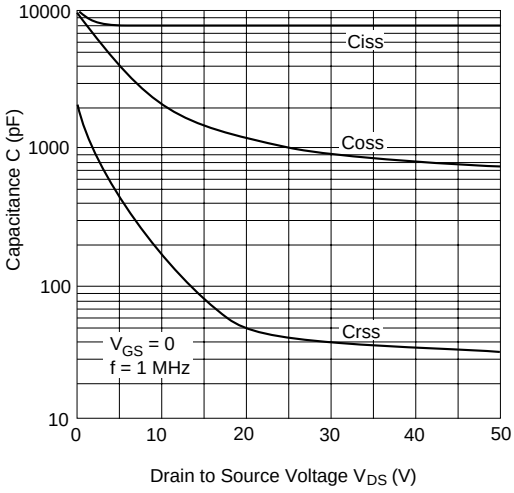
Forward Transfer Admittance vs. Drain Current



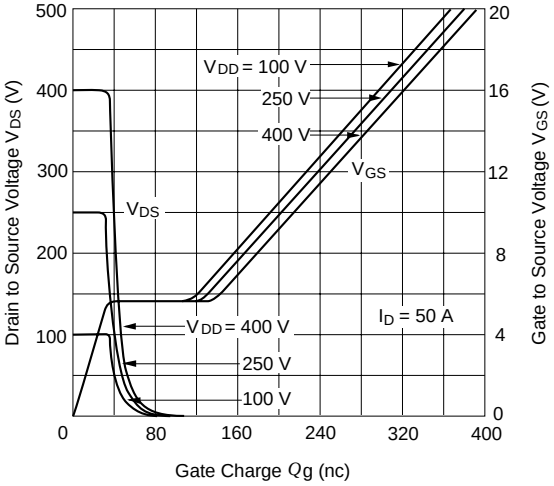
Body-Drain Diode Reverse Recovery Time



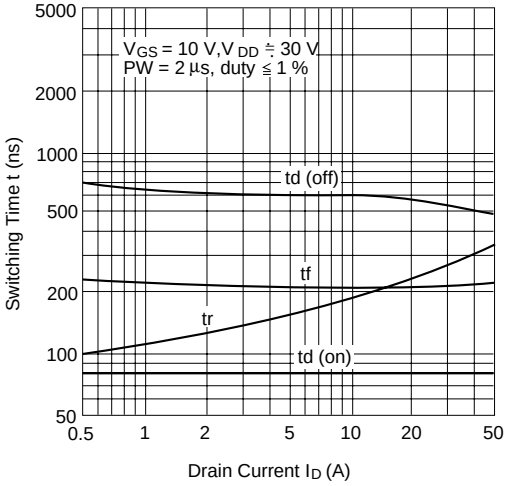
Typical Capacitance vs. Drain-Source Voltage



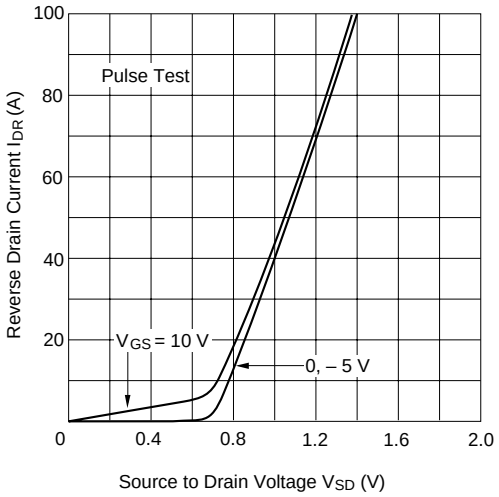
Dynamic Input Characteristics



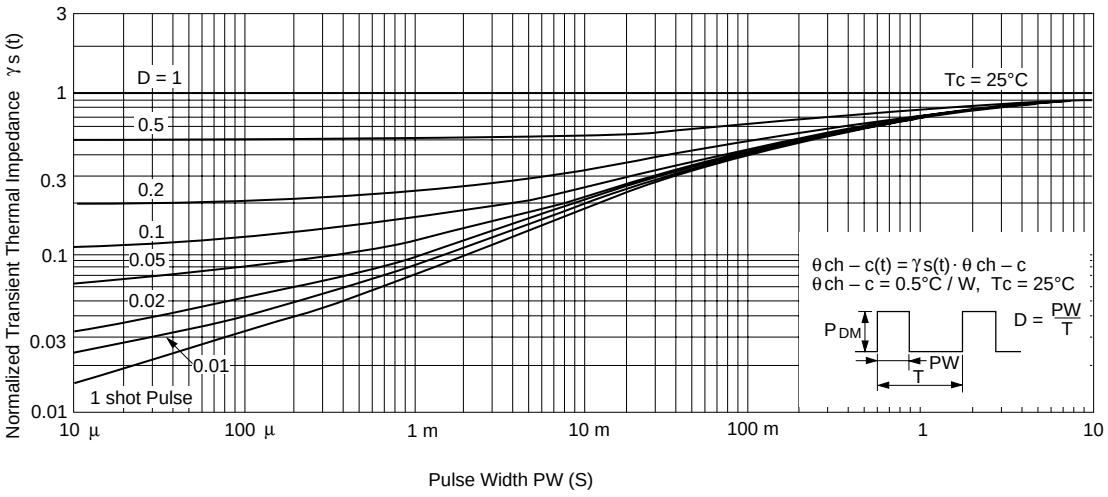
Switching Characteristics



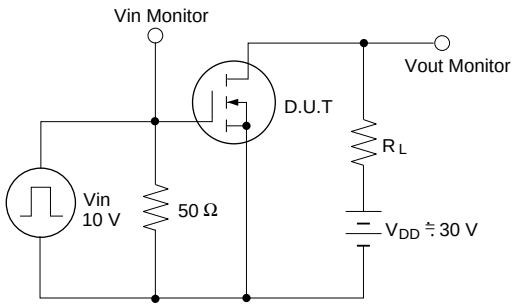
Reverse Drain Current vs. Source to Drain Voltage



Normalized Transient Thermal Impedance vs. Pulse Width



Switching Time Test Circuit



Waveforms