
2SJ234(L), 2SJ234(S)

Silicon P-Channel MOS FET

HITACHI

November 1996

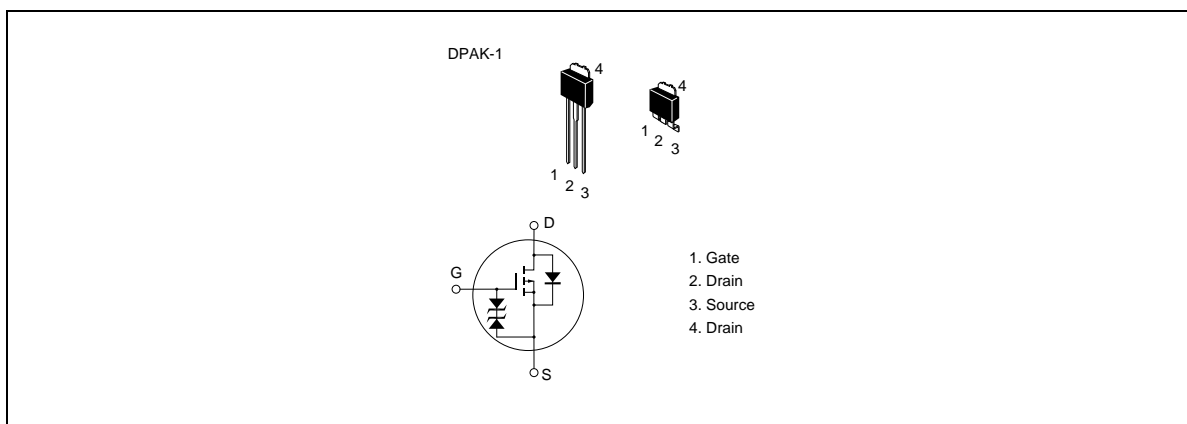
Application

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

Outline



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Absolute Maximum Ratings (Ta = 25°C)

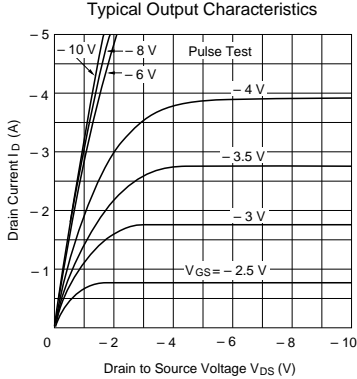
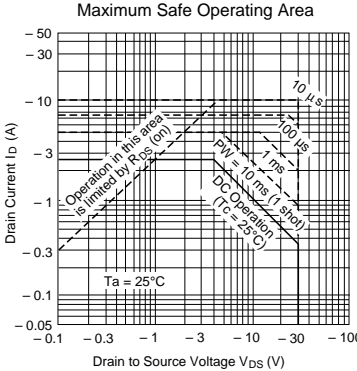
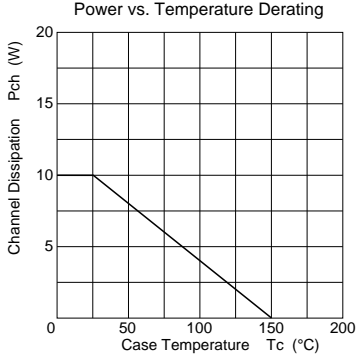
Item	Symbol	Ratings	Unit
Drain to source voltage	V_{DSS}	-30	V
Gate to source voltage	V_{GSS}	±20	V
Drain current	I_D	-2.5	A
Drain peak current	$I_{D(pulse)}^{*1}$	-10	A
Body to drain diode reverse drain current	I_{DR}	-2.5	A
Channel dissipation	Pch ^{*2}	10	W
Channel temperature	Tch	150	°C
Storage temperature	Tstg	-55 to +150	°C

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

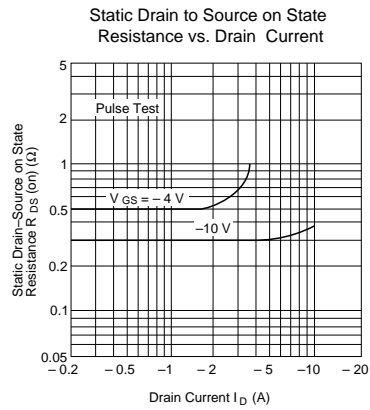
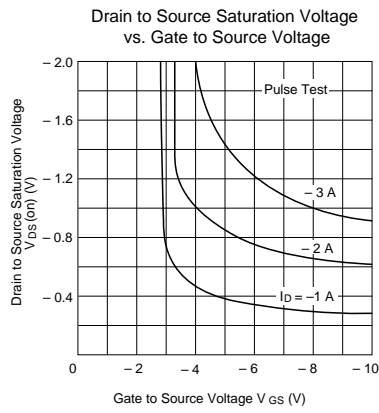
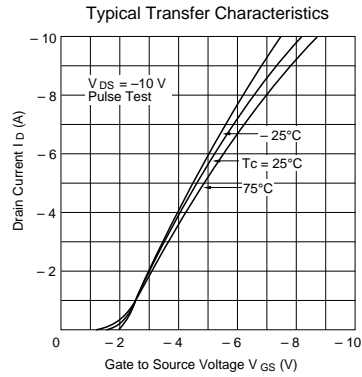
Electrical Characteristics (Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	-30	—	—	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}	—	—	-100	μA	$V_{DS} = -25 \text{ V}$, $V_{GS} = 0$
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	$R_{DS(on)}$	—	0.3	0.4	Ω	$I_D = -1.5 \text{ A}$, $V_{GS} = -10 \text{ V}^{*1}$
		—	0.5	0.7		$I_D = -1.5 \text{ A}$, $V_{GS} = -4 \text{ V}^{*1}$
Forward transfer admittance	$ y_{fs} $	1.0	1.8	—	S	$I_D = -1.5 \text{ A}$, $V_{DS} = -10 \text{ V}^{*1}$
Input capacitance	Ciss	—	245	—	pF	$V_{DS} = -10 \text{ V}$, $V_{GS} = 0$, $f = 1 \text{ MHz}$
Output capacitance	Coss	—	170	—	pF	
Reverse transfer capacitance	Crss	—	60	—	pF	
Turn-on delay time	$t_{d(on)}$	—	7	—	ns	$I_D = -1.5 \text{ A}$, $V_{GS} = -10 \text{ V}$, $R_L = 20 \Omega$
Rise time	t_r	—	25	—	ns	
Turn-off delay time	$t_{d(off)}$	—	85	—	ns	
Fall time	t_f	—	72	—	ns	
Body to drain diode forward voltage	V_{DF}	—	-1.1	—	V	$I_F = -2.5 \text{ A}$, $V_{GS} = 0$
Body to drain diode reverse recovery time	t_{rr}	—	80	—	ns	$I_F = -2.5 \text{ A}$, $V_{GS} = 0$, $di_F/dt = 50 \text{ A}/\mu s$

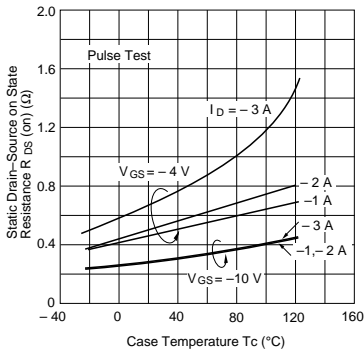
Note 1. Pulse test



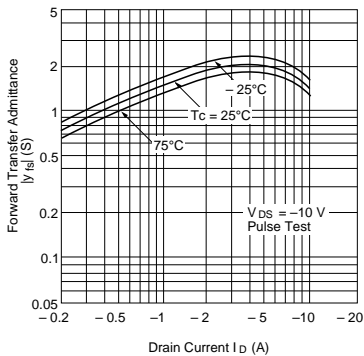
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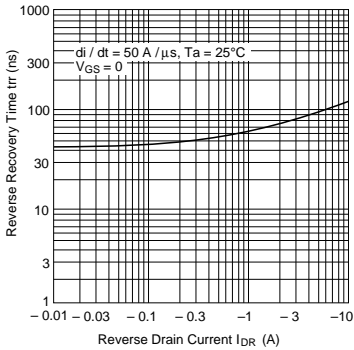
Static Drain to Source on State Resistance vs. Temperature



Forward Transfer Admittance vs. Drain Current

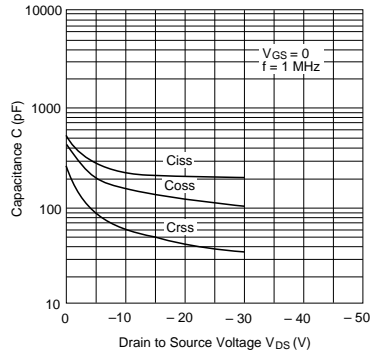


Body to Drain Diode Reverse Recovery Time

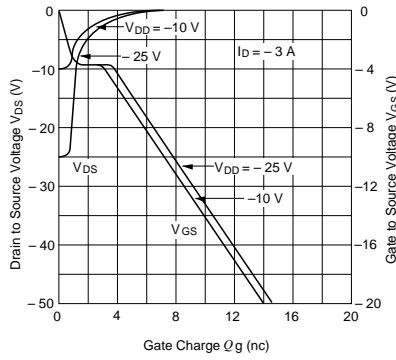


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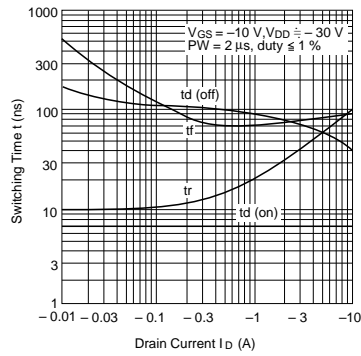
Typical Capacitance vs. Drain to Source Voltage

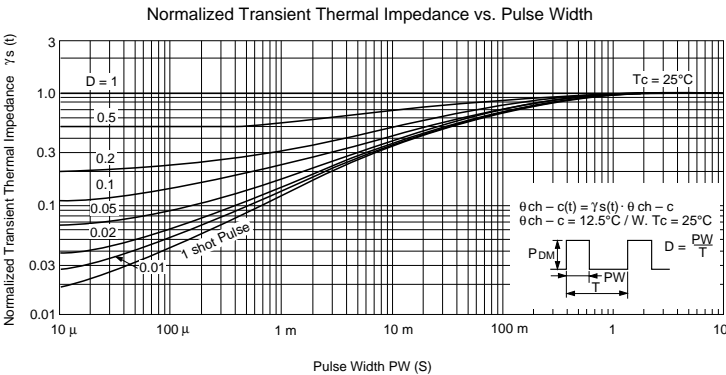
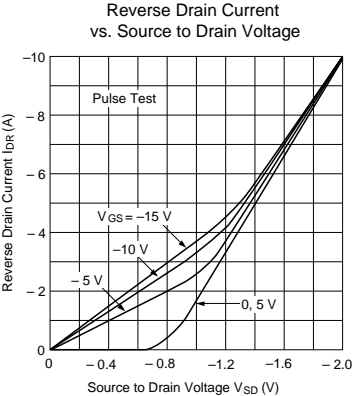


Dynamic Input Characteristics

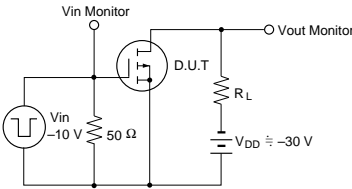


Switching Characteristics

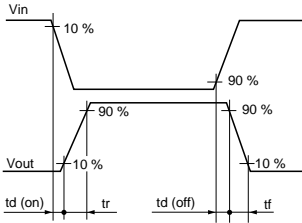




Switching Time Test Circuit



Waveforms



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