
2SJ389(L), 2SJ389(S)

Silicon P-Channel MOS FET

HITACHI

November 1996

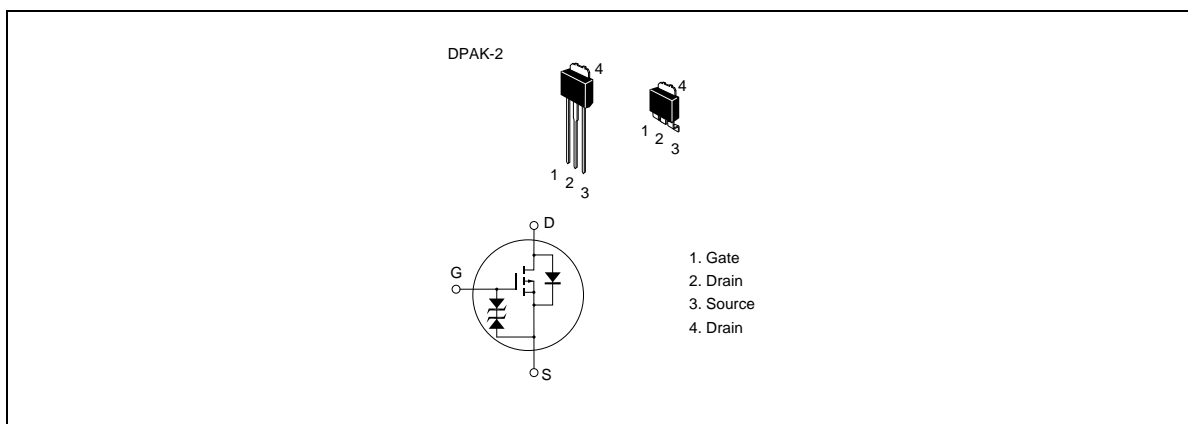
Application

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 Switching regulator, DC - DC converter
- Avalanche Ratings

Outline



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Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Ratings	Unit
Drain to source voltage	V_{DSS}	-60	V
Gate to source voltage	V_{GSS}	±20	V
Drain current	I_D	-10	A
Drain peak current	$I_{D(pulse)}^{*1}$	-40	A
Body to drain diode reverse drain current	I_{DR}	-10	A
Avalanche current	I_{AP}^{*3}	-10	A
Avalanche energy	E_{AR}^{*3}	8.5	mJ
Channel dissipation	Pch^{*2}	30	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 Tc = 25°C
 3. Value at Tch = 25°C, Rg $\geq 50 \Omega$

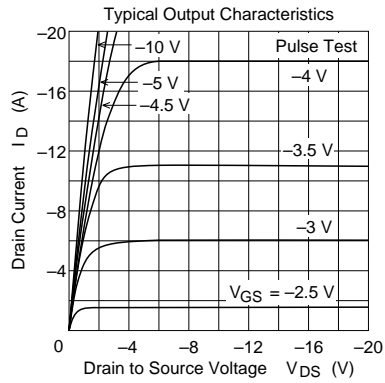
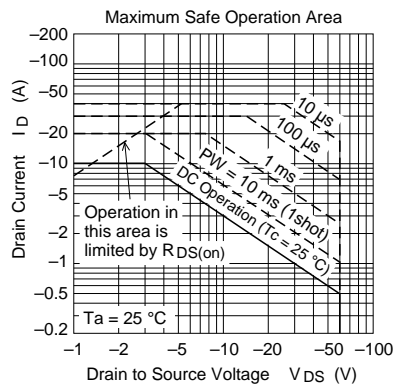
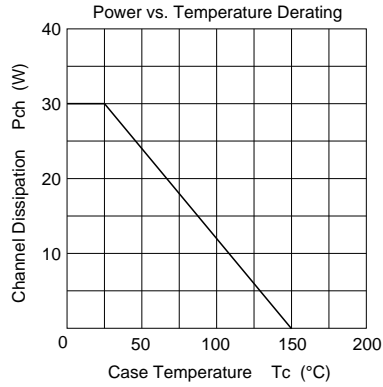
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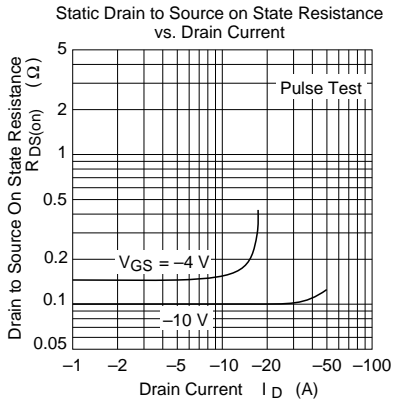
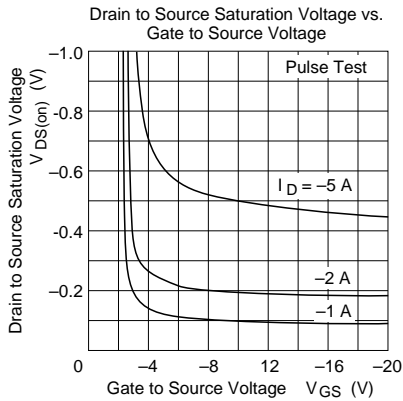
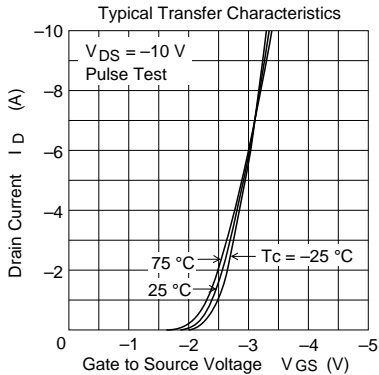
Electrical Characteristics (Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	-60	—	—	V	$I_D = -10 \text{ mA}, V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	± 20	—	—	V	$I_G = \pm 100 \text{ }\mu\text{A}, V_{DS} = 0$
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	$V_{DS} = -50 \text{ V}, V_{GS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	-1.0	—	-2.25	V	$I_D = -1 \text{ mA}, V_{DS} = -10 \text{ V}$
Static drain to source on state resistance	$R_{DS(on)}$	—	0.1	0.135	Ω	$I_D = -5 \text{ A}$ $V_{GS} = -10 \text{ V}^{*1}$
		—	0.14	0.2	Ω	$I_D = -5 \text{ A}$ $V_{GS} = -4 \text{ V}^{*1}$
Forward transfer admittance	$ y_{fs} $	4	8	—	S	$I_D = -5 \text{ A}$ $V_{DS} = -10 \text{ V}^{*1}$
Input capacitance	Ciss	—	910	—	pF	$V_{DS} = -10 \text{ V}$
Output capacitance	Coss	—	440	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	Crss	—	170	—	pF	$f = 1 \text{ MHz}$
Turn-on delay time	$t_{d(on)}$	—	15	—	ns	$I_D = -5 \text{ A}$
Rise time	t_r	—	85	—	ns	$V_{GS} = -10 \text{ V}$
Turn-off delay time	$t_{d(off)}$	—	220	—	ns	$R_L = 6 \text{ }\Omega$
Fall time	t_f	—	145	—	ns	
Body to drain diode forward voltage	V_{DF}	—	-1.0	—	V	$I_F = -10 \text{ A}, V_{GS} = 0$
Body to drain diode reverse recovery time	t_{rr}	—	170	—	μs	$I_F = -10 \text{ A}, V_{GS} = 0,$ $diF/dt = 50 \text{ A}/\mu\text{s}$

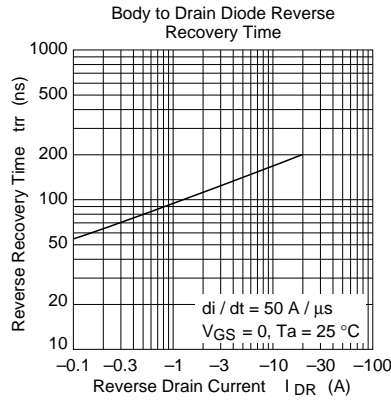
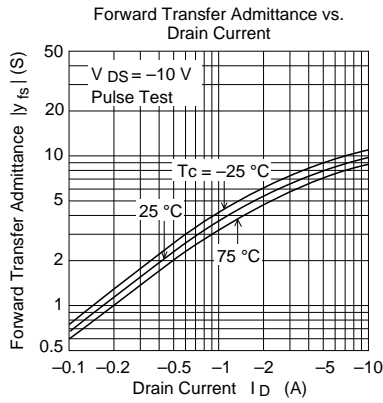
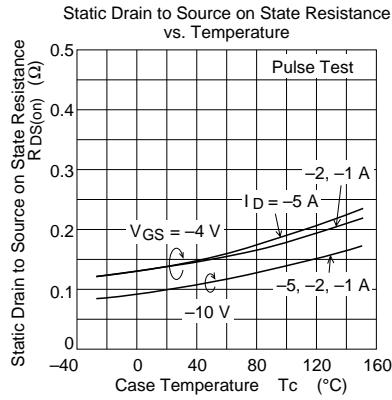
Note 1. Pulse Test

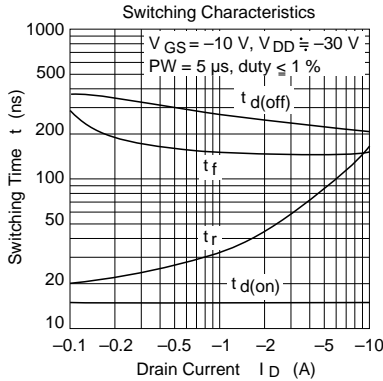
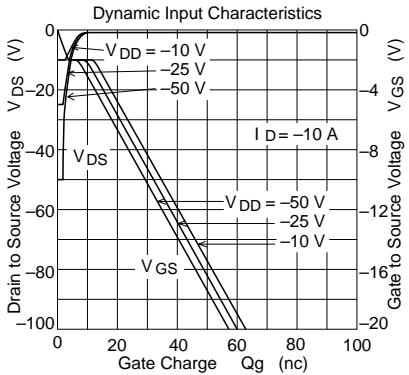
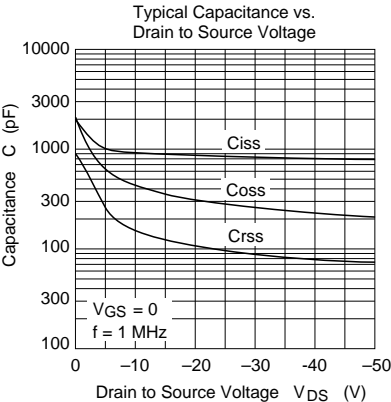
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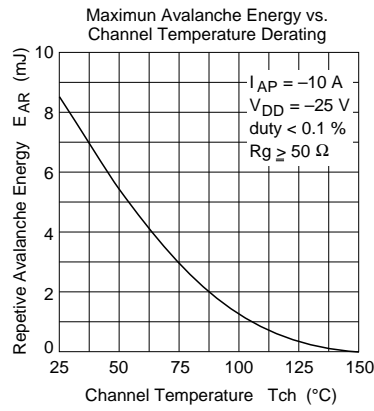
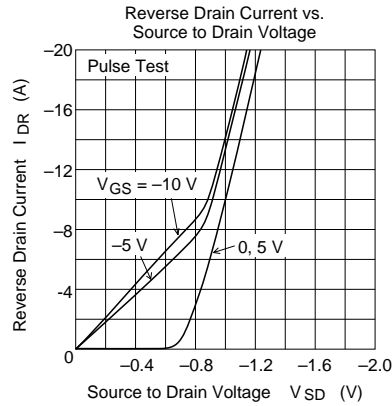


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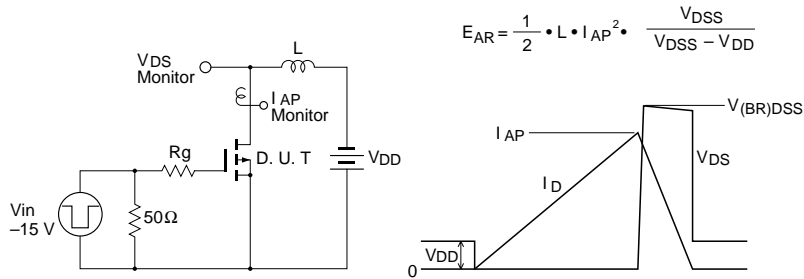


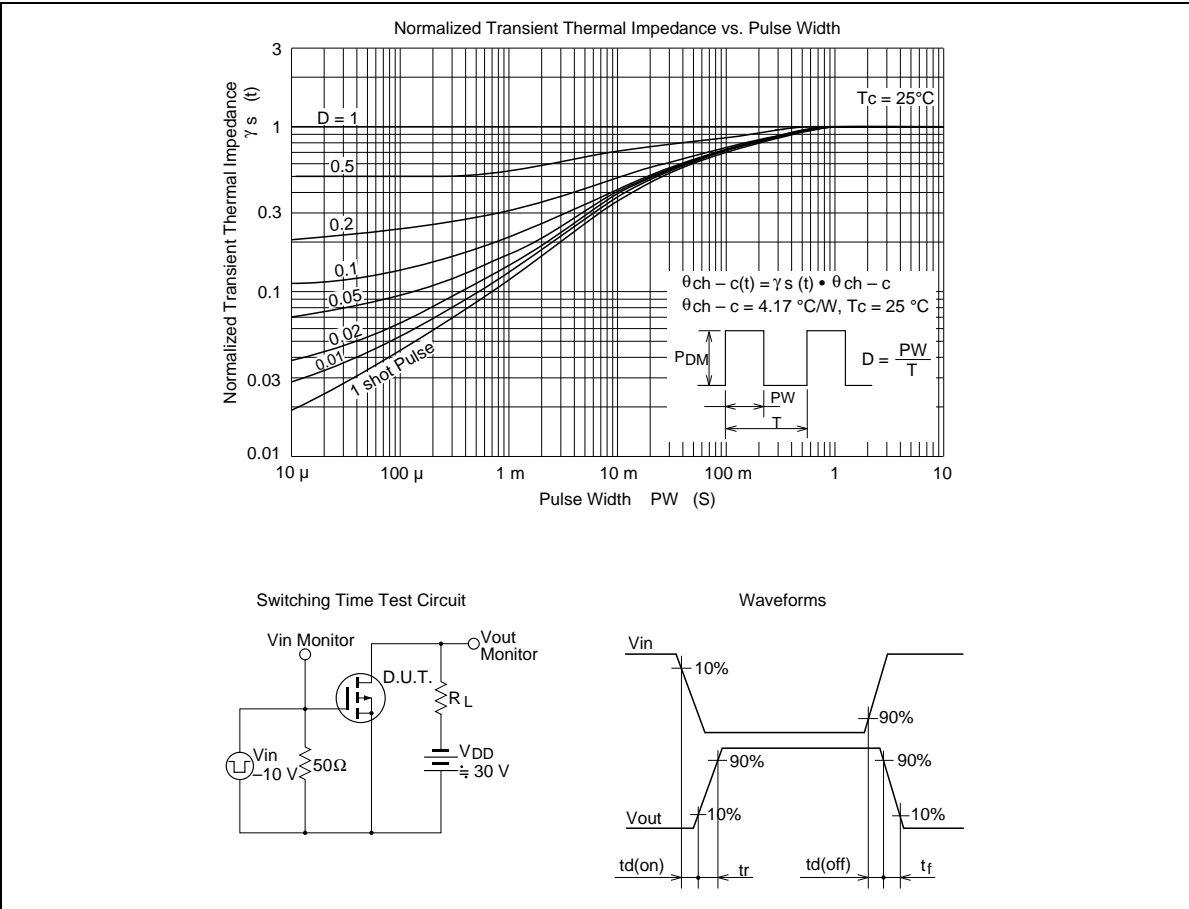


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Avalanche Test Circuit and Waveform





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