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# 2SJ246(L), 2SJ246(S)

Silicon P-Channel MOS FET

## HITACHI

November 1996

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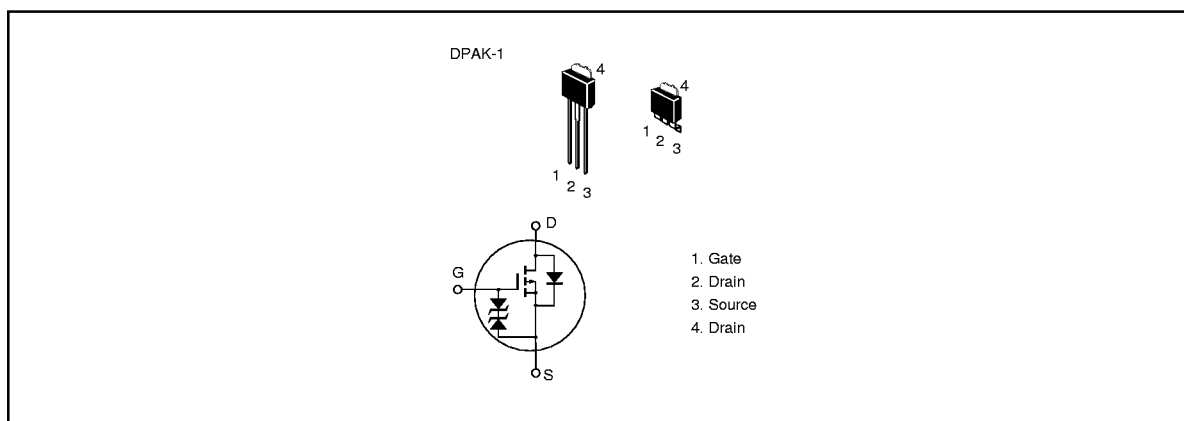
### Application

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

### Outline



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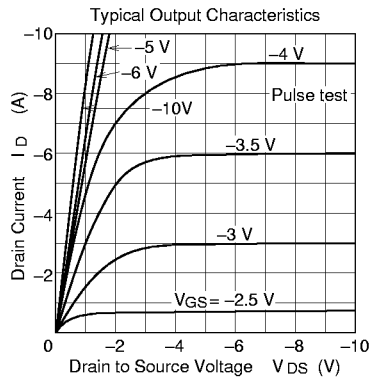
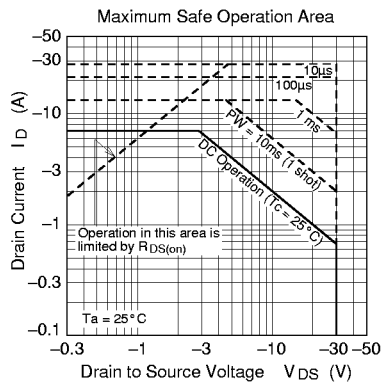
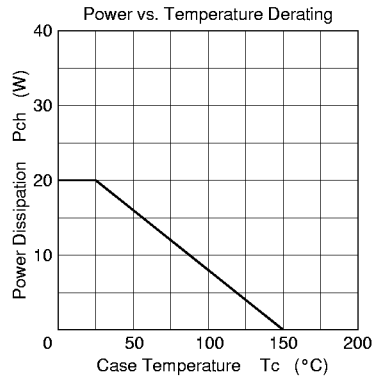
### Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Ratings	Unit
Drain to source voltage	$V_{DSS}$	-30	V
Gate to source voltage	$V_{GSS}$	±20	V
Drain current	$I_D$	-7	A
Drain peak current	$I_{D(pulse)}^{*1}$	-28	A
Body to drain diode reverse drain current	$I_{DR}$	-7	A
Channel dissipation	$Pch^{*2}$	20	W
Channel temperature	$T_{ch}$	150	°C
Storage temperature	$T_{stg}$	-55 to +150	°C

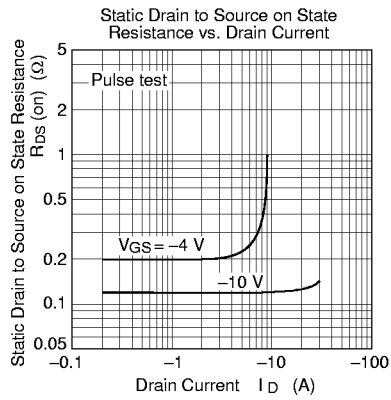
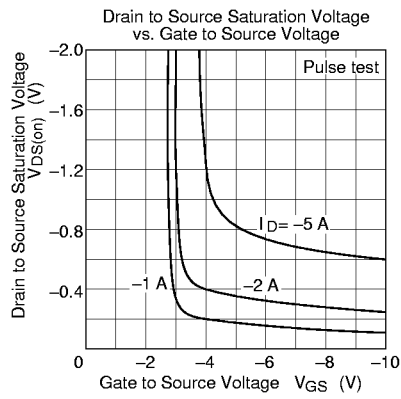
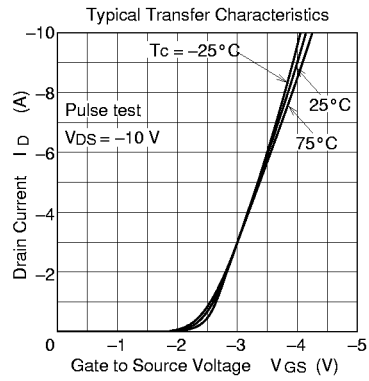
- Notes 1.  $PW \leq 10 \mu s$ , duty cycle  $\leq 1\%$   
 2. Value at  $T_c = 25^\circ C$

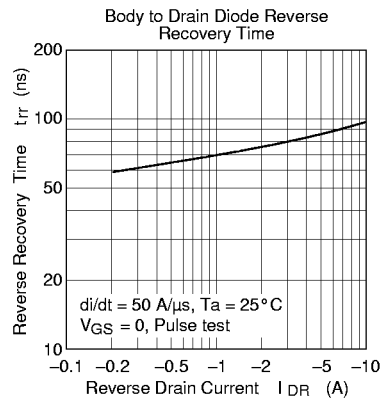
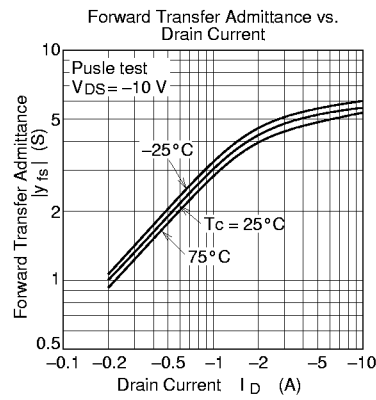
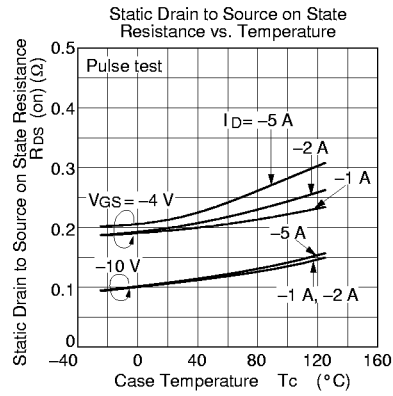
### Electrical Characteristics (Ta = 25°C)

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	—	-2.5	V	$I_D = -1 \text{ mA}$ , $V_{DS} = -10 \text{ V}$
Static drain to source on state resistance	$R_{DS(on)}$	—	0.12	0.17	Ω	$I_D = -4 \text{ A}$ , $V_{GS} = -10 \text{ V}$
		—	0.21	0.31	Ω	$I_D = -4 \text{ A}$ , $V_{GS} = -4 \text{ V}$
Forward transfer admittance	$ y_{fs} $	3.0	5.0	—	S	$I_D = -4 \text{ A}$ , $V_{DS} = -10 \text{ V}$
Input capacitance	$C_{iss}$	—	660	—	pF	$V_{DS} = -10 \text{ V}$ , $V_{GS} = 0$ , $f = 1 \text{ MHz}$
Output capacitance	$C_{oss}$	—	465	—	pF	
Reverse transfer capacitance	$C_{rss}$	—	180	—	pF	
Turn-on delay time	$t_{d(on)}$	—	10	—	ns	$I_D = -4 \text{ A}$ , $V_{GS} = -10 \text{ V}$ , $R_L = 7.5 \Omega$
Rise time	$t_r$	—	55	—	ns	
Turn-off delay time	$t_{d(off)}$	—	135	—	ns	
Fall time	$t_f$	—	135	—	ns	
Body to drain diode forward voltage	$V_{DF}$	—	-1.2	—	V	$I_F = -7 \text{ A}$ , $V_{GS} = 0$
Body to drain diode reverse recovery time	$t_{rr}$	—	90	—	μs	$I_F = -7 \text{ A}$ , $V_{GS} = 0$ , $di_F/dt = 50 \text{ A}/\mu s$

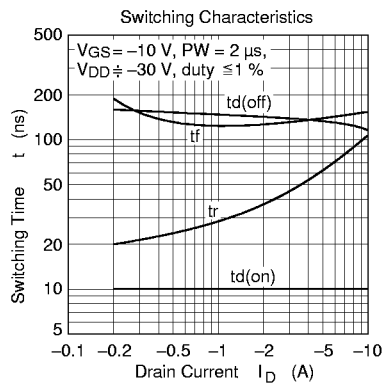
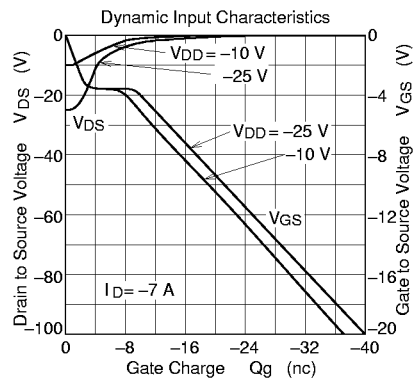
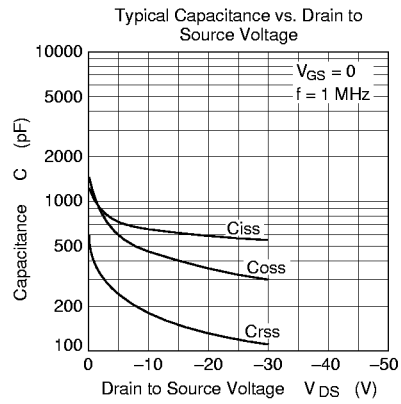


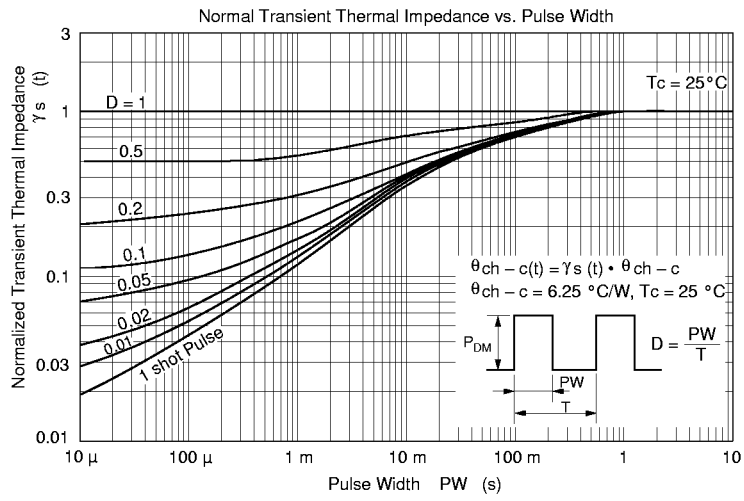
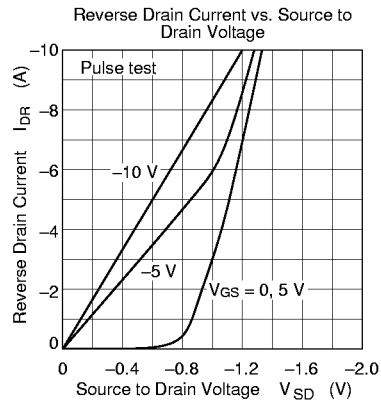
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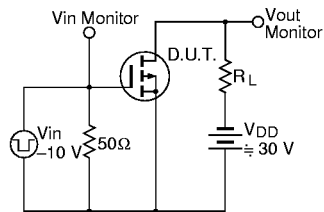


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Switching Time Test Circuit



Waveform

