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# 2SJ278

Silicon P-Channel MOS FET

# HITACHI

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## Application

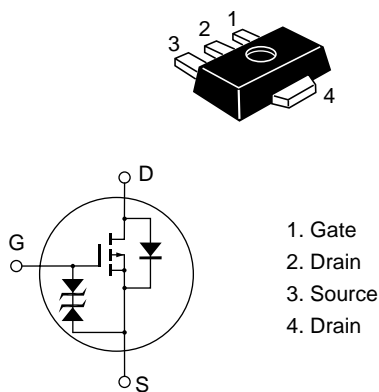
High speed power switching

## 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

UPAK



## 2SJ278

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

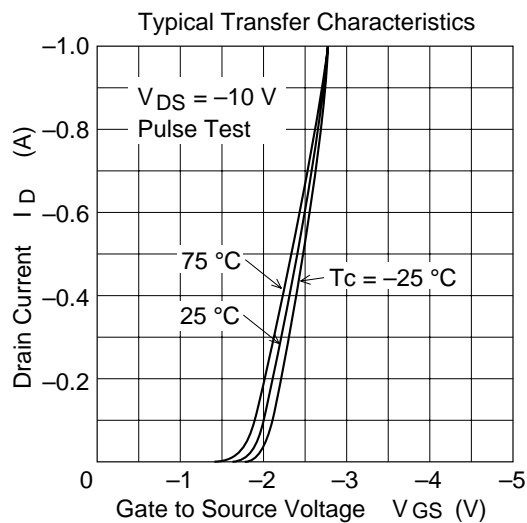
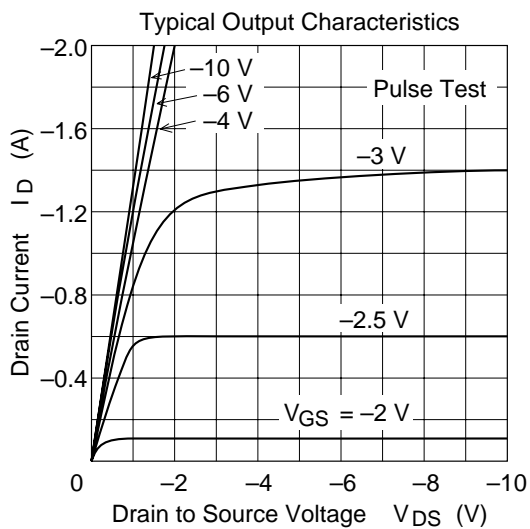
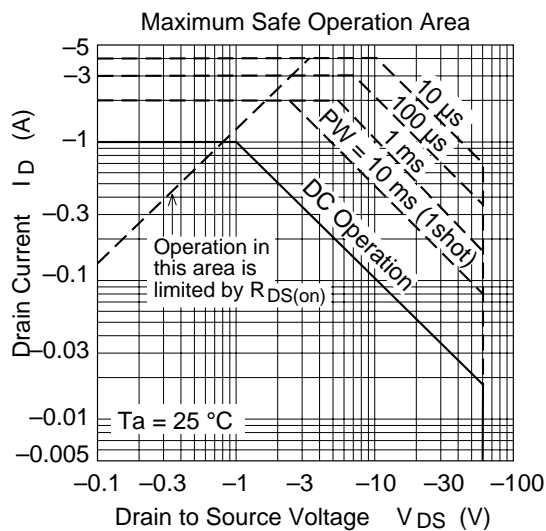
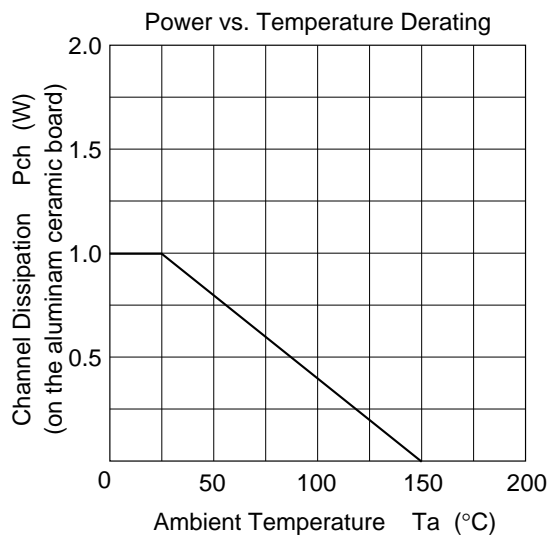
Item	Symbol	Ratings	Unit
Drain to source voltage	$V_{DS}$	-60	V
Gate to source voltage	$V_{GS}$	$\pm 20$	V
Drain current	$I_D$	-1	A
Drain peak current	$I_{D(pulse)}^{*1}$	-4	A
Body to drain diode reverse drain current	$I_{DR}$	-1	A
Channel dissipation	$P_{ch}^{*2}$	1	W
Channel temperature	$T_{ch}$	150	°C
Storage temperature	$T_{stg}$	-55 to +150	°C

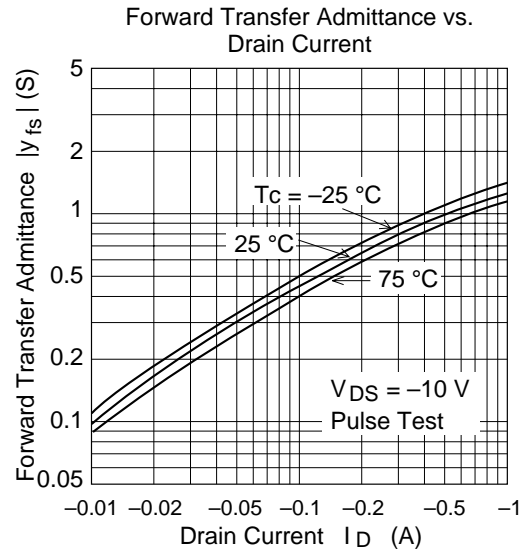
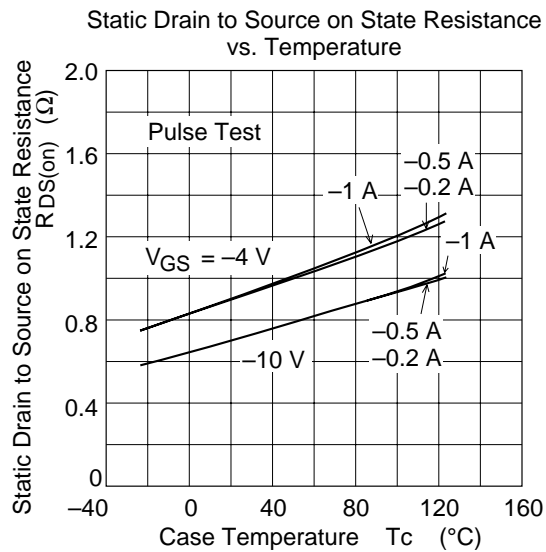
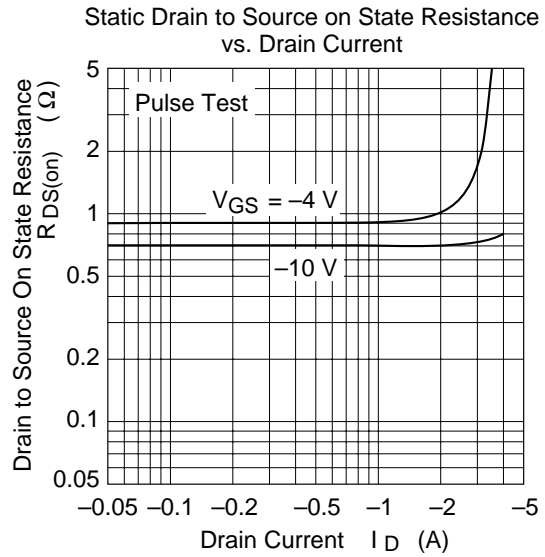
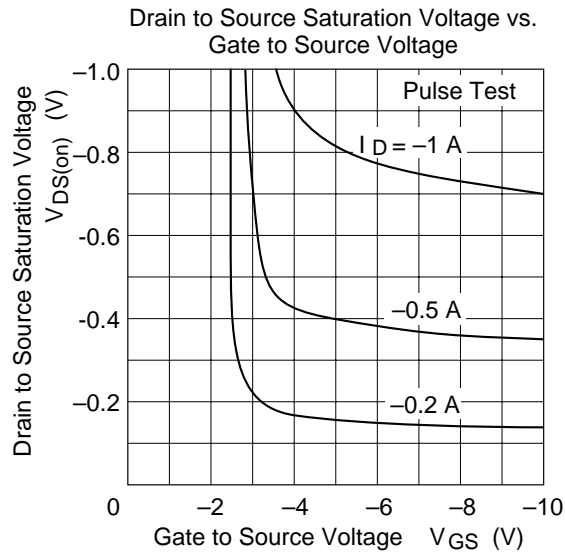
Notes: 1.  $PW \leq 10 \mu s$ , duty cycle  $\leq 1\%$   
 2. Value on the alumina ceramic board (12.5×20×0.7 mm)  
 3. Marking is "MY".

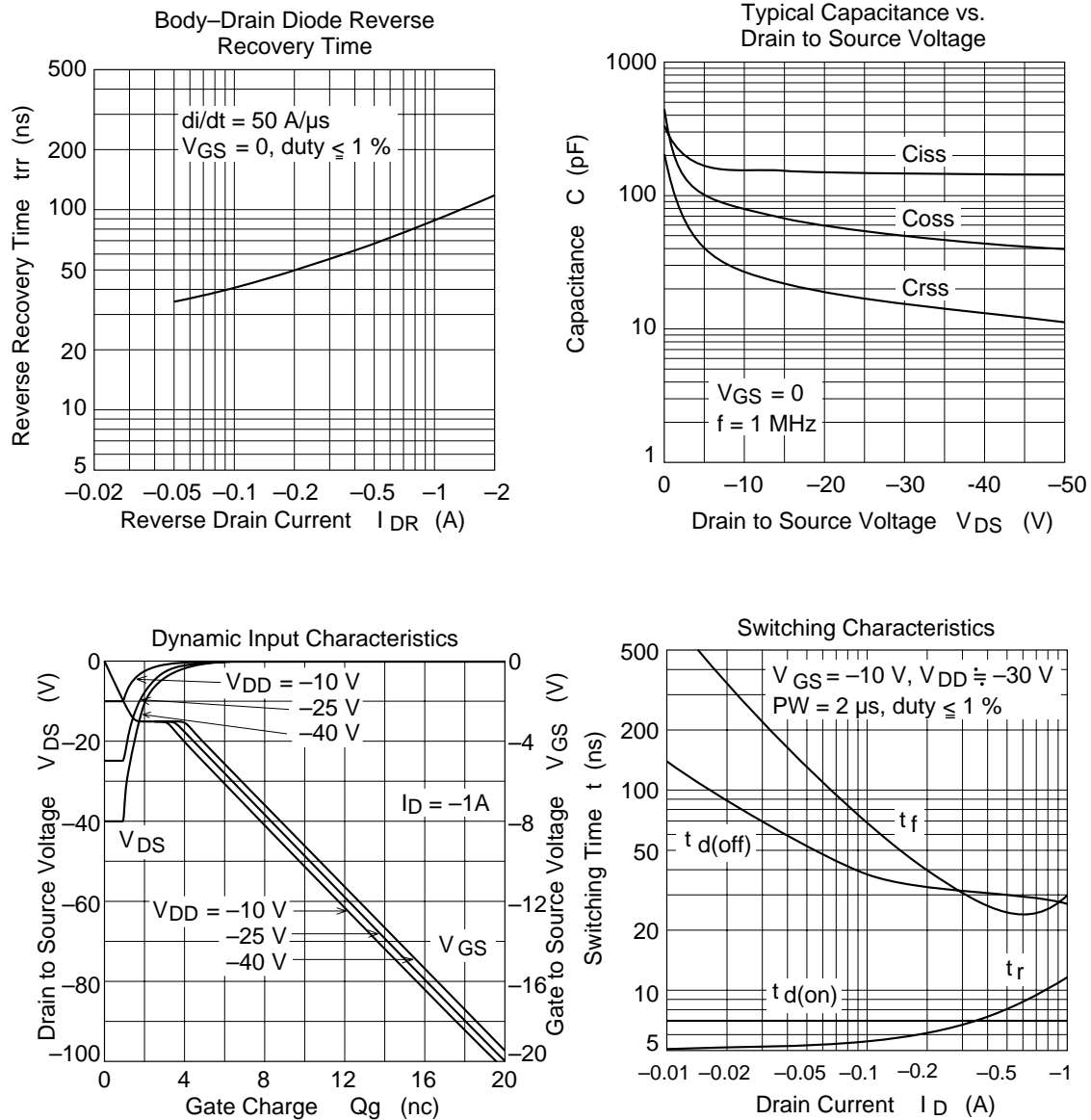
### Electrical Characteristics (Ta = 25°C)

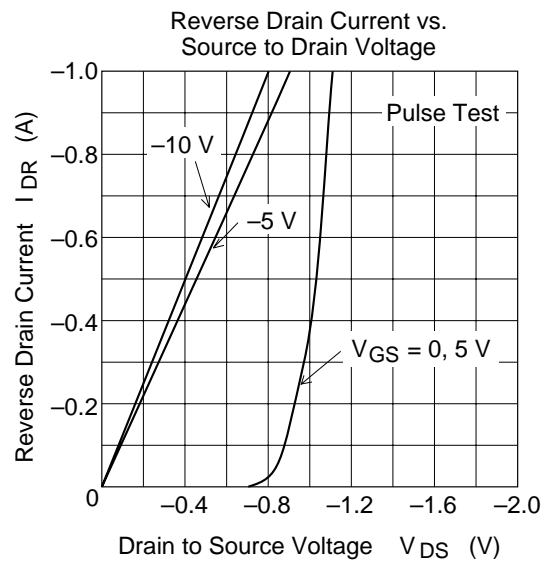
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DS}$	-60	—	—	V	$I_D = -10 \text{ mA}$ , $V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GS}$	$\pm 20$	—	—	V	$I_G = \pm 100 \mu A$ , $V_{DS} = 0$
Gate to source leak current	$I_{GSS}$	—	—	$\pm 5$	$\mu A$	$V_{GS} = \pm 16 \text{ V}$ , $V_{DS} = 0$
Zero gate voltage drain current	$I_{DSS}$	—	—	-10	$\mu A$	$V_{DS} = -50 \text{ V}$ , $V_{GS} = 0$
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	$R_{DS(on)}$	—	0.7	0.83	$\Omega$	$I_D = -0.5 \text{ A}$ , $V_{GS} = -10 \text{ V}^{*1}$
		—	0.9	1.2	$\Omega$	$I_D = -0.5 \text{ A}$ , $V_{GS} = -4 \text{ V}^{*1}$
Forward transfer admittance	$ y_{fs} $	0.6	1.0	—	S	$I_D = -0.5 \text{ A}$ , $V_{DS} = -10 \text{ V}^{*1}$
Input capacitance	$C_{iss}$	—	160	—	pF	$V_{DS} = -10 \text{ V}$ , $V_{GS} = 0$ , $f = 1 \text{ MHz}$
Output capacitance	$C_{oss}$	—	80	—	pF	
Reverse transfer capacitance	$C_{rss}$	—	28	—	pF	
Turn-on delay time	$t_{d(on)}$	—	7	—	ns	$I_D = -0.5 \text{ A}$ , $V_{GS} = -10 \text{ V}$ , $R_L = 60 \Omega$
Rise time	$t_r$	—	8	—	ns	
Turn-off delay time	$t_{d(off)}$	—	30	—	ns	
Fall time	$t_f$	—	25	—	ns	
Body to drain diode forward voltage	$V_{DF}$	—	-1.1	—	V	$I_F = -1 \text{ A}$ , $V_{GS} = 0$
Body to drain diode reverse recovery time	$t_{rr}$	—	90	—	ns	$I_F = -1 \text{ A}$ , $V_{GS} = 0$ , $di_F/dt = 50 \text{ A}/\mu s$

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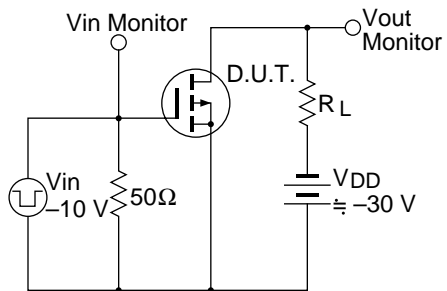




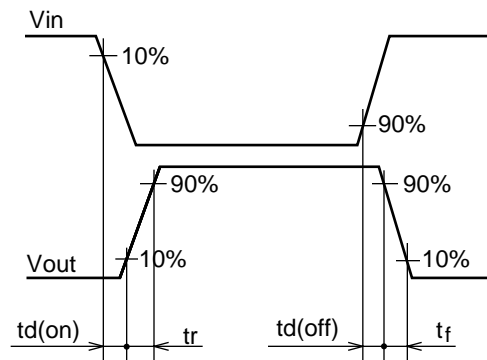




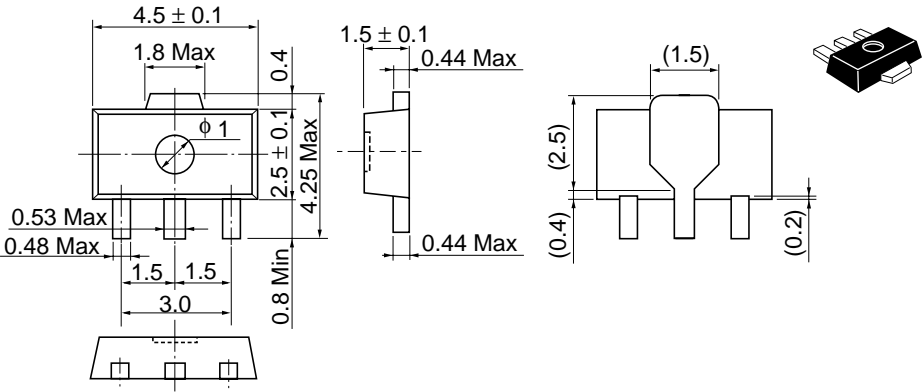
Switching Time Test Circuit



Waveforms



Unit: mm



Hitachi Code	UPAK
JEDEC	—
EIAJ	Conforms
Weight (reference value)	0.050 g

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## Hitachi, Ltd.

Semiconductor & Integrated Circuits.  
Nippon Bldg., 2-6-2, Ohte-machi, Chiyoda-ku, Tokyo 100-0004, Japan  
Tel: Tokyo (03) 3270-2111 Fax: (03) 3270-5109

URL      NorthAmerica      : <http://semiconductor.hitachi.com/>  
             Europe                : <http://www.hitachi-eu.com/hel/ecg>  
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## For further information write to:

Hitachi Semiconductor  
(America) Inc.  
179 East Tasman Drive,  
San Jose, CA 95134  
Tel: <1>(408) 433-1990  
Fax: <1>(408) 433-0223

Hitachi Europe GmbH  
Electronic components Group  
Domacher StraÙe 3  
D-85622 Feldkirchen, Munich  
Germany  
Tel: <49> (89) 9 9180-0  
Fax: <49> (89) 9 29 30 00  
  
Hitachi Europe Ltd.  
Electronic Components Group.  
Whitebrook Park  
Lower Cookham Road  
Maidenhead  
Berkshire SL6 8YA, United Kingdom  
Tel: <44> (1628) 585000  
Fax: <44> (1628) 778322

Hitachi Asia Pte. Ltd.  
16 Collyer Quay #20-00  
Hitachi Tower  
Singapore 049318  
Tel: 535-2100  
Fax: 535-1533  
  
Hitachi Asia Ltd.  
Taipei Branch Office  
3F, Hung Kuo Building, No.167,  
Tun-Hwa North Road, Taipei (105)  
Tel: <886> (2) 2718-3666  
Fax: <886> (2) 2718-8180

Hitachi Asia (Hong Kong) Ltd.  
Group III (Electronic Components)  
7/F., North Tower, World Finance Centre,  
Harbour City, Canton Road, Tsim Sha Tsui,  
Kowloon, Hong Kong  
Tel: <852> (2) 735 9218  
Fax: <852> (2) 730 0281  
Telex: 40815 HITEC HX

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