

To all our customers

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Renesas Technology Corp.  
Customer Support Dept.  
April 1, 2003

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Keep safety first in your circuit designs!

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# 2SK1859

Silicon N-Channel MOS FET

**RENESAS**

ADE-208-1328 (Z)  
1st. Edition  
Mar. 2001

## Application

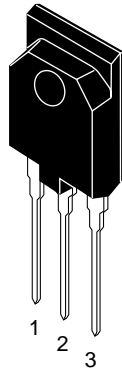
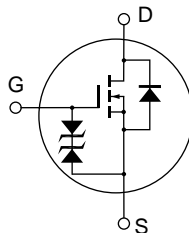
High speed power switching

## Features

- Low on-resistance
- High speed switching
- Low Drive Current
- No secondary breakdown
- Suitable for Switching regulator

## Outline

TO-3PFM



1. Gate
2. Drain
3. Source

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

Item	Symbol	Ratings	Unit
Drain to source voltage	V <sub>DSS</sub>	900	V
Gate to source voltage	V <sub>GSS</sub>	±30	V
Drain current	I <sub>D</sub>	6	A
Drain peak current	I <sub>D(pulse)</sub> <sup>*1</sup>	15	A
Body to drain diode reverse drain current	I <sub>DR</sub>	6	A
Channel dissipation	Pch <sup>*2</sup>	60	W
Channel temperature	Tch	150	°C
Storage temperature	Tstg	-55 to +150	°C

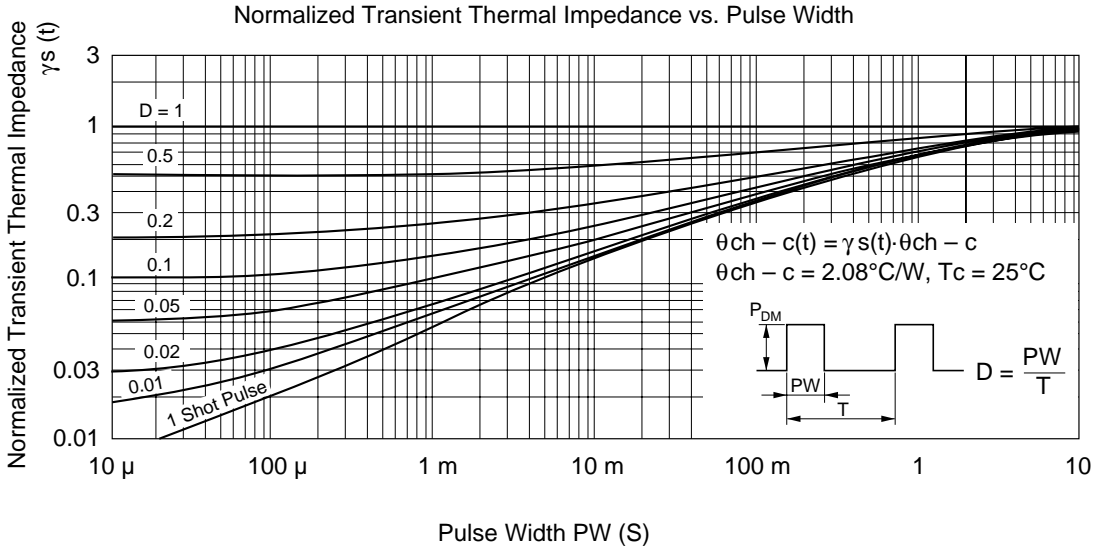
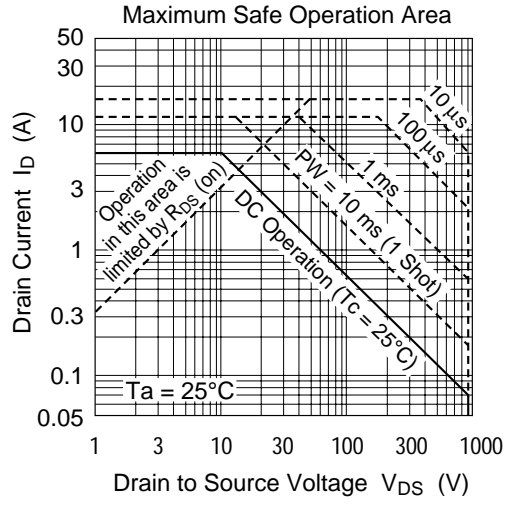
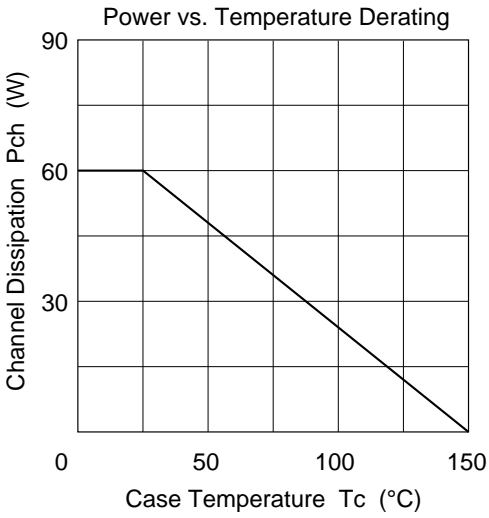
Notes 1. PW ≤ 10 μs, duty cycle ≤ 1 %  
2. Value at Tc = 25 °C

## Electrical Characteristics (Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	900	—	—	V	$I_D = 10 \text{ mA}$ , $V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	$\pm 30$	—	—	V	$I_G = \pm 100 \text{ }\mu\text{A}$ , $V_{DS} = 0$
Gate to source leak current	$I_{GSS}$	—	—	$\pm 10$	$\mu\text{A}$	$V_{GS} = \pm 25 \text{ V}$ , $V_{DS} = 0$
Zero gate voltage drain current	$I_{DSS}$	—	—	250	$\mu\text{A}$	$V_{DS} = 720 \text{ V}$ , $V_{GS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	2.0	—	3.0	V	$I_D = 1 \text{ mA}$ , $V_{DS} = 10 \text{ V}$
Static drain to source on state resistance	$R_{DS(on)}$	—	2.0	3.0	$\Omega$	$I_D = 3 \text{ A}$ $V_{GS} = 10 \text{ V}^{*1}$
Forward transfer admittance	$ y_{fs} $	2.3	3.7	—	S	$I_D = 3 \text{ A}$ $V_{DS} = 20 \text{ V}^{*1}$
Input capacitance	$C_{iss}$	—	980	—	pF	$V_{DS} = 10 \text{ V}$
Output capacitance	$C_{oss}$	—	400	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	$C_{rss}$	—	195	—	pF	$f = 1 \text{ MHz}$
Turn-on delay time	$t_{d(on)}$	—	20	—	ns	$I_D = 3 \text{ A}$
Rise time	$t_r$	—	80	—	ns	$V_{GS} = 10 \text{ V}$
Turn-off delay time	$t_{d(off)}$	—	125	—	ns	$R_L = 10 \text{ }\Omega$
Fall time	$t_f$	—	100	—	ns	
Body to drain diode forward voltage	$V_{DF}$	—	0.9	—	V	$I_F = 6 \text{ A}$ , $V_{GS} = 0$
Body to drain diode reverse recovery time	$t_{rr}$	—	1000	—	ns	$I_F = 6 \text{ A}$ , $V_{GS} = 0$ , $di_F / dt = 100 \text{ A} / \mu\text{s}$

Note 1. Pulse Test

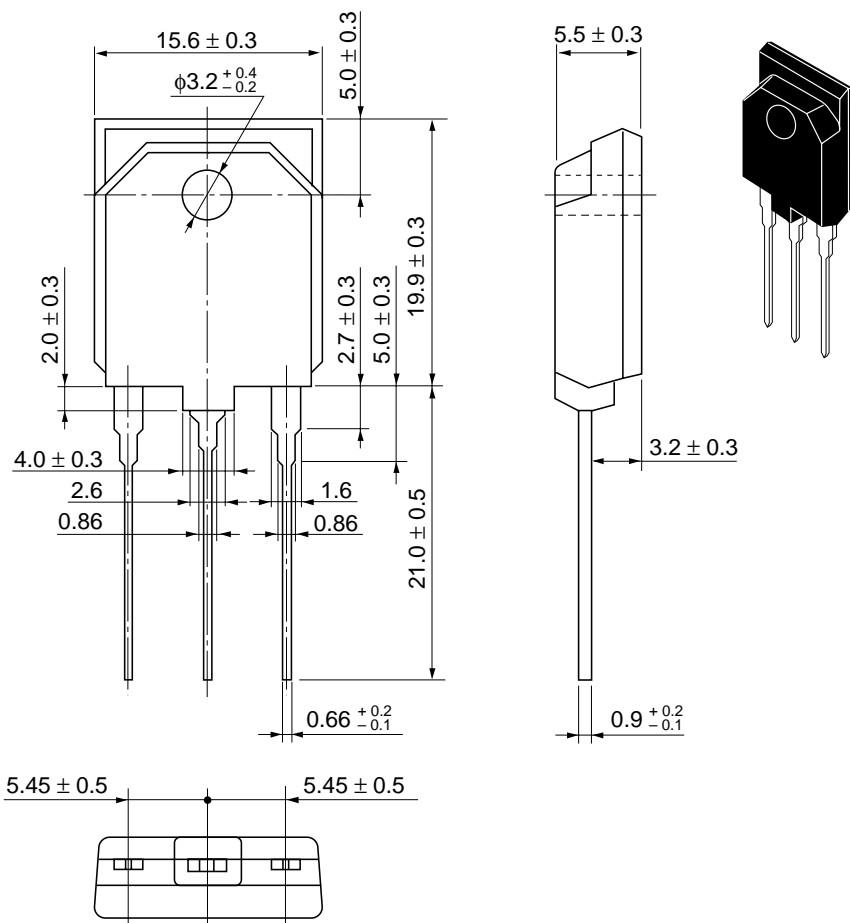
See characteristic curves of 2SK1341



Package Dimensions

As of January, 2001

Unit: mm



Hitachi Code	TO-3PFB
JEDEC	—
EIAJ	—
Mass (reference value)	5.2 g



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