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# 2SK1670

Silicon N-Channel MOS FET

## HITACHI

November 1996

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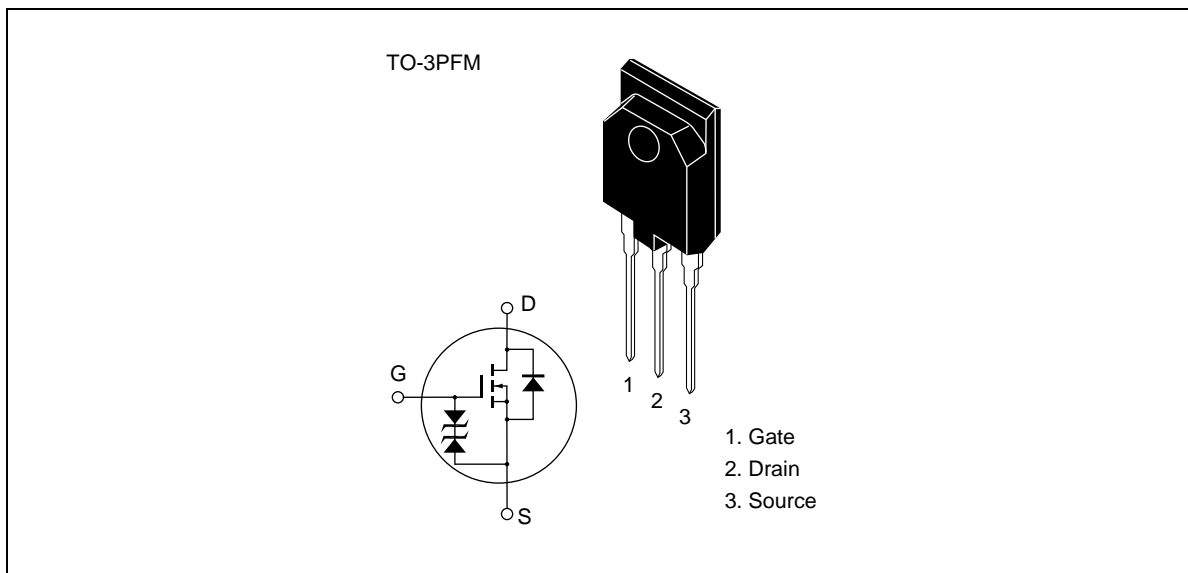
### Application

High speed power switching

### Features

- Low on-resistance
- High speed switching
- Low drive current
- Built-in fast recovery diode ( $t_r = 90 \text{ ns}$ )
- Suitable for motor control, switching regulator and DC – DC converter

### Outline



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

Item	Symbol	Ratings	Unit
Drain to source voltage	$V_{DS}$	250	V
Gate to source voltage	$V_{GS}$	±30	V
Drain current	$I_D$	30	A
Drain peak current	$I_{D(pulse)}^{*1}$	120	A
Body to drain diode reverse drain current	$I_{DR}$	30	A
Channel dissipation	$Pch^{*2}$	60	W
Channel temperature	Tch	150	°C
Storage temperature	Tstg	−55 to +150	°C

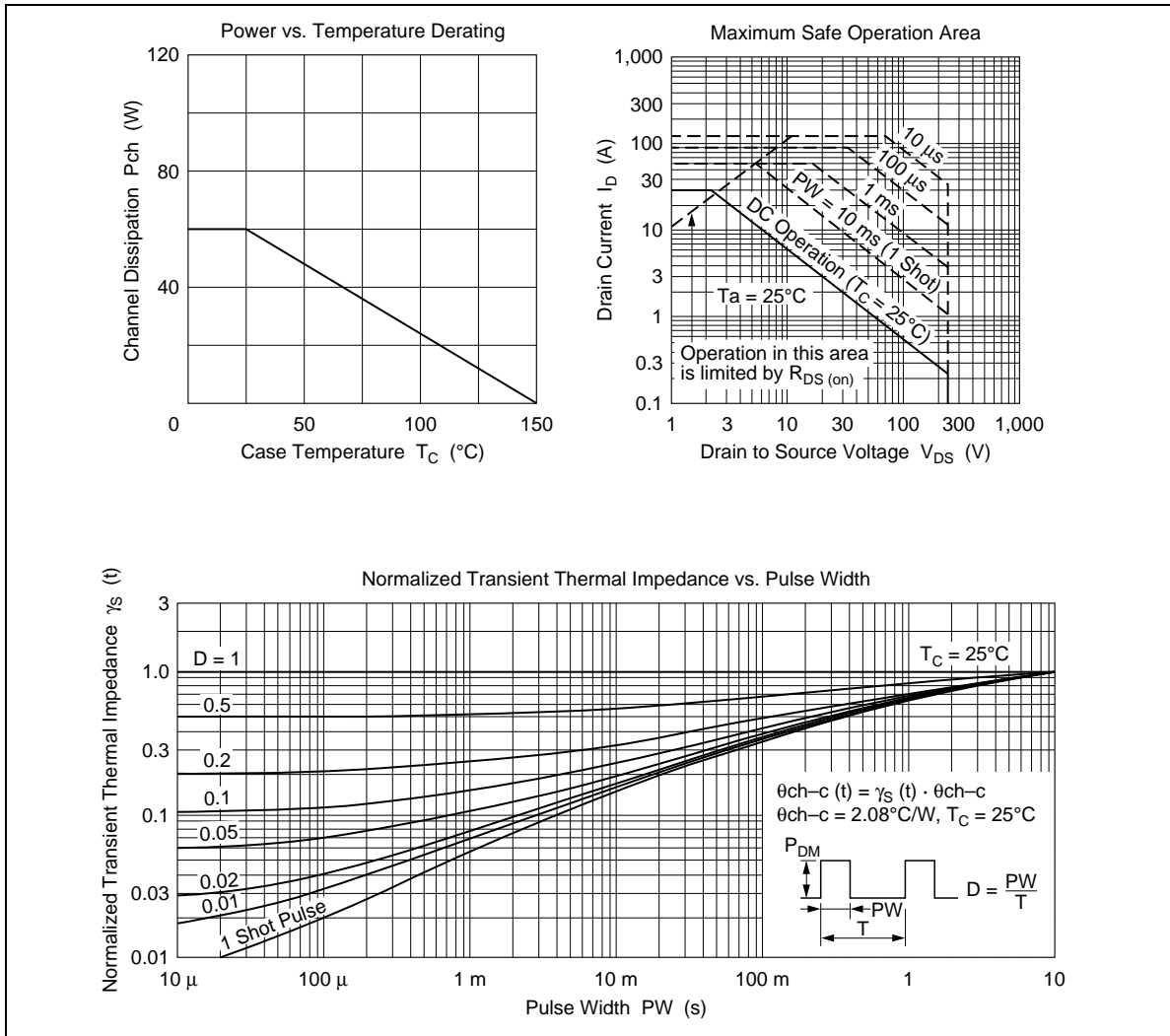
Notes 1.  $PW \leq 10 \mu s$ , duty cycle  $\leq 1\%$   
2. Value at  $T_c = 25^\circ C$

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

Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	250	—	—	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	$\mu\text{A}$	$V_{DS} = 200 \text{ V}$ , $V_{GS} = 0$
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	$R_{DS(on)}$	—	0.075	0.095	$\Omega$	$I_D = 15 \text{ A}$ , $V_{GS} = 10 \text{ V}^{*1}$
Forward transfer admittance	$ y_{fs} $	12	20	—	S	$I_D = 15 \text{ A}$ , $V_{DS} = 10 \text{ V}^{*1}$
Input capacitance	$C_{iss}$	—	3100	—	pF	$V_{DS} = 10 \text{ V}$ , $V_{GS} = 0$ , $f = 1 \text{ MHz}$
Output capacitance	$C_{oss}$	—	1330	—	pF	
Reverse transfer capacitance	$C_{rss}$	—	190	—	pF	
Turn-on delay time	$t_{d(on)}$	—	45	—	ns	$I_D = 15 \text{ A}$ , $V_{GS} = 10 \text{ V}$ , $R_L = 2 \text{ }\Omega$
Rise time	$t_r$	—	170	—	ns	
Turn-off delay time	$t_{d(off)}$	—	250	—	ns	
Fall time	$t_f$	—	150	—	ns	
Body to drain diode forward voltage	$V_{DF}$	—	1.0	—	V	$I_F = 30 \text{ A}$ , $V_{GS} = 0$
Body to drain diode reverse recovery time	$t_{rr}$	—	90	—	ns	$I_F = 30 \text{ A}$ , $V_{GS} = 0$ , $di_F/dt = 100 \text{ A}/\mu\text{s}$

Note 1. Pulse test

See characteristic curves of 2SK1669.



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