2SK2008

Silicon N-Channel MOS FET

HITACHI

Application

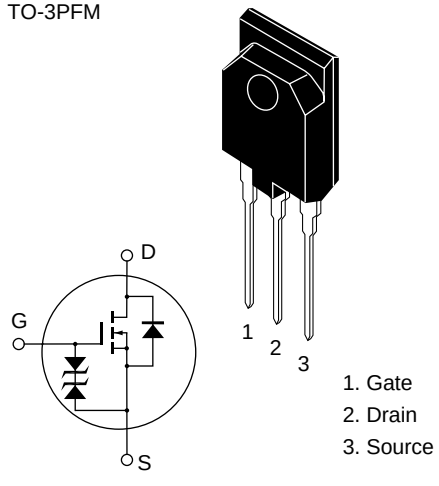
High speed power switching

Features

- Low on-resistance
- High speed switching
- Low drive current
- No Secondary Breakdown
- Suitable for Switching regulator, DC - DC converter, Motor Control

Outline

TO-3PFM



1. Gate
2. Drain
3. Source

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Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Ratings	Unit
Drain to source voltage	V_{DSS}	250	V
Gate to source voltage	V_{GSS}	±30	V
Drain current	I_D	20	A
Drain peak current	$I_{D(pulse)}$*[1]	80	A
Body to drain diode reverse drain current	I_{DR}	20	A
Channel dissipation	Pch*[2]	60	W
Channel temperature	Tch	150	°C
Storage temperature	Tstg	–55 to +150	°C

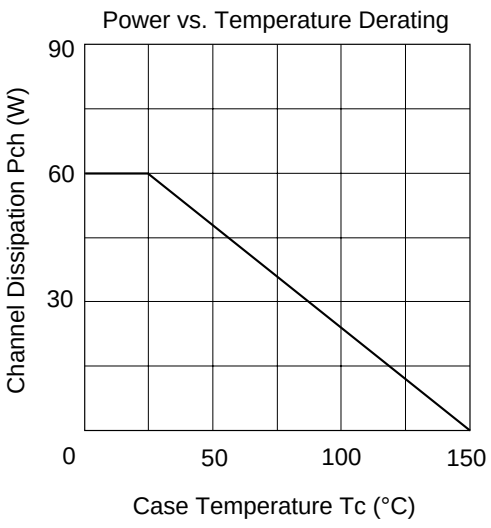
Notes 1. PW ≤ 10 µs, duty cycle ≤ 1 %
2. Value at Tc = 25°C

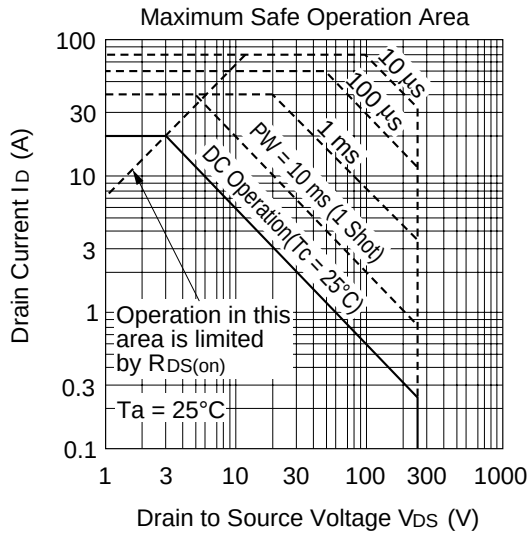
Electrical Characteristics (Ta = 25°C)

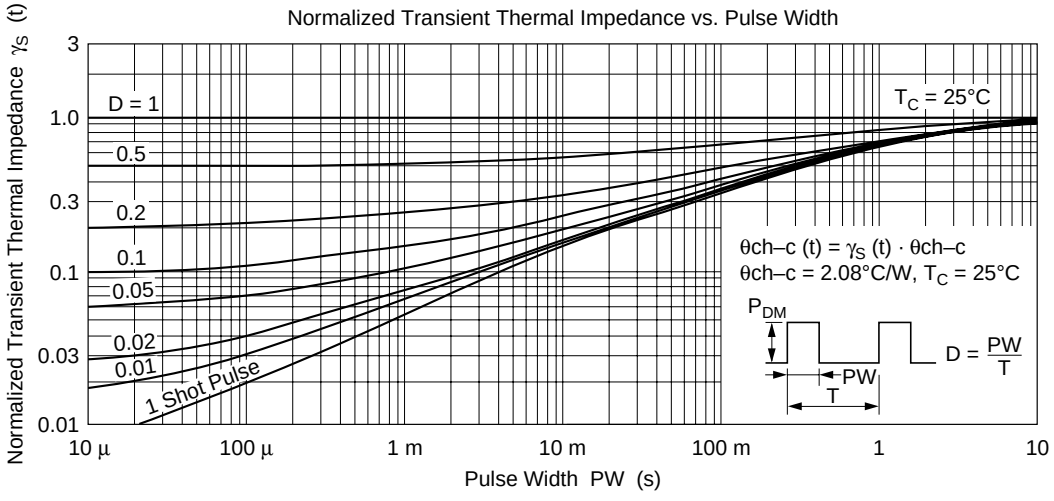
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	250	—	—	V	I_D = 10 mA, V_{GS} = 0
Gate to source breakdown voltage	$V_{(BR)GSS}$	±30	—	—	V	I_G = ±100 µA, V_{DS} = 0
Gate to source leak current	I_{GSS}	—	—	±10	µA	V_{GS} = ±25 V, V_{DS} = 0
Zero gate voltage drain current	I_{DSS}	—	—	250	µA	V_{DS} =200 V, V_{GS} = 0
Gate to source cutoff voltage	$V_{GS(off)}$	2.0	—	3.0	V	I_D = 1 mA, V_{DS} = 10 V
Static drain to source on state resistance	$R_{DS(on)}$	—	0.12	0.15	Ω	I_D = 10 A V_{GS} = 10 V*[1]
Forward transfer admittance	$\|y_{fs}\|$	9.0	14	—	S	I_D = 10 A V_{DS} = 10 V*[1]
Input capacitance	Ciss	—	2340	—	pF	V_{DS} = 10 V
Output capacitance	Coss	—	1000	—	pF	V_{GS} = 0
Reverse transfer capacitance	Crss	—	160	—	pF	f = 1 MHz
Turn-on delay time	$t_{d(on)}$	—	30	—	ns	I_D = 10 A
Rise time	t_r	—	125	—	ns	V_{GS} = 10 V
Turn-off delay time	$t_{d(off)}$	—	190	—	ns	R_L = 3 Ω
Fall time	t_f	—	100	—	ns	
Body to drain diode forward voltage	V_{DF}	—	1.2	—	V	I_F = 20 A, V_{GS} = 0
Body to drain diode reverse recovery time	t_{rr}	—	120	—	ns	I_F = 20 A, V_{GS} = 0, di_F / dt = 100 A / µs

Note 1. Pulse Test

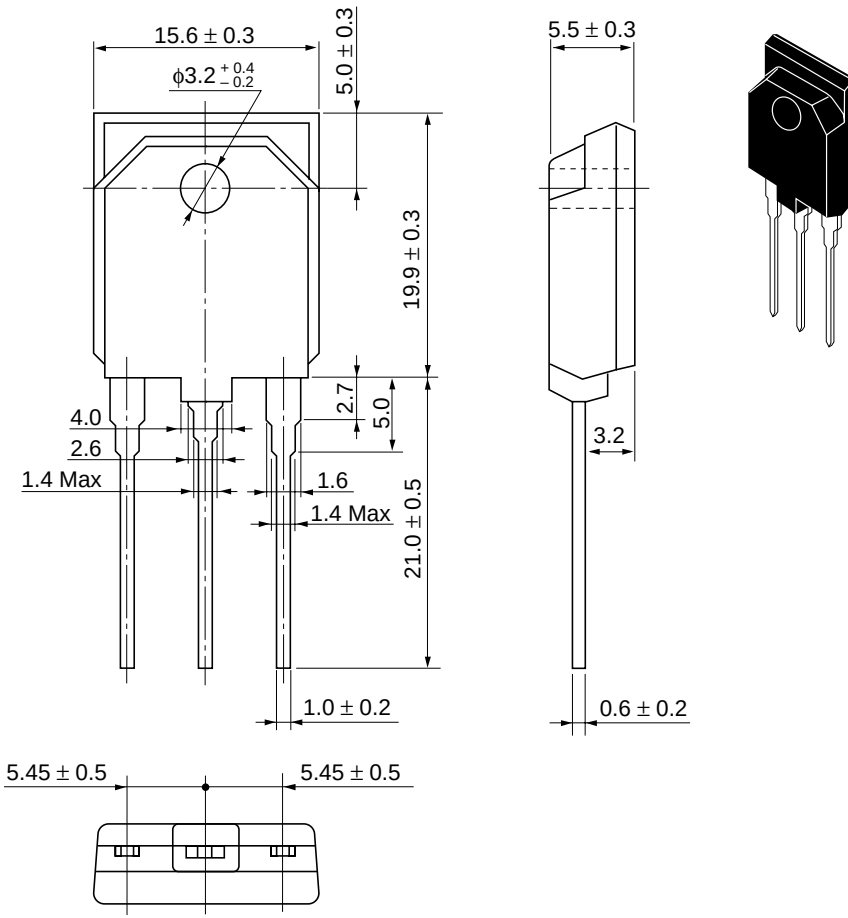
See chracteristic curves of 2SK2007


Power vs. Temperature Derating
Channel Dissipation Pch (W)
90
60
30
0
50
100
150
Case Temperature Tc (°C)


Maximum Safe Operation Area
Drain Current ID (A)
100
30
10
3
1
0.3
0.1
1
3
10
30
100
300
1000
Drain to Source Voltage VDS (V)
10 µs
100 µs
1 ms
PW = 10 ms (1 Shot)
DC Operation(Tc = 25°C)
Operation in this area is limited by RDS(on)
Ta = 25°C


Normalized Transient Thermal Impedance vs. Pulse Width
Normalized Transient Thermal Impedance γS (t)
3
1.0
0.3
0.1
0.03
0.01
D = 1
0.5
0.2
0.1
0.05
0.02
0.01
1 Shot Pulse
TC = 25°C
θch–c (t) = γS (t) · θch–c
θch–c = 2.08°C/W, TC = 25°C
PDM
D = PW/T
PW
T
10 µ
100 µ
1 m
10 m
100 m
1
10
Pulse Width PW (s)

Unit: mm



Hitachi Code	TO-3PFM
JEDEC	—
EIAJ	—
Weight (reference value)	5.6 g

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