2SK1307

Silicon N-Channel MOS FET

HITACHI

Application

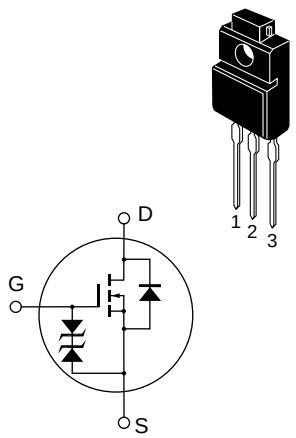
High speed power switching

Features

- Low on-resistance
- High speed switching
- 4 V gate drive device
  — Can be driven from 5 V source
- Suitable for motor drive, DC-DC converter, power switch and solenoid drive

Outline

TO-220FM



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}	100	V
Gate to source voltage	V_{GSS}	±20	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]	35	W
Channel temperature	Tch	150	°C
Storage temperature	Tstg	–55 to +150	°C

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

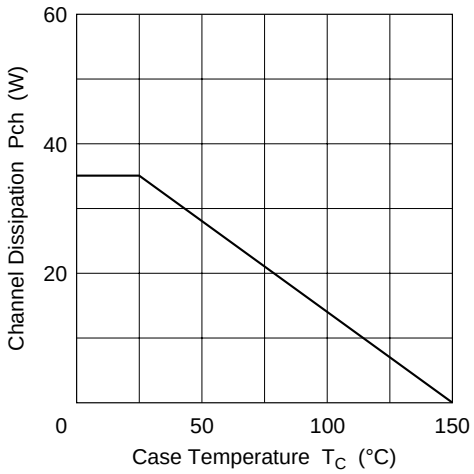
Electrical Characteristics (Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	100	—	—	V	I_D = 10 mA, V_{GS} = 0
Gate to source breakdown voltage	$V_{(BR)GSS}$	±20	—	—	V	I_G = ±100 µA, V_{DS} = 0
Gate to source leak current	I_{GSS}	—	—	±10	µA	V_{GS} = ±16 V, V_{DS} = 0
Zero gate voltage drain current	I_{DSS}	—	—	250	µA	V_{DS} = 80 V, V_{GS} = 0
Gate to source cutoff voltage	$V_{GS(off)}$	1.0	—	2.0	V	I_D = 1 mA, V_{DS} = 10 V
Static drain to source on state resistance	$R_{DS(on)}$	—	0.065	0.085		I_D = 10 A, V_{GS} = 10 V *[1]
		—	0.085	0.12		I_D = 10 A, V_{GS} = 4 V *[1]
Forward transfer admittance	|yfs|	10	16	—	S	I_D = 10 A, V_{DS} = 10 V *[1]
Input capacitance	Ciss	—	1300	—	pF	V_{DS} = 10 V, V_{GS} = 0, f = 1 MHz
Output capacitance	Coss	—	540	—	pF	
Reverse transfer capacitance	Crss	—	160	—	pF	
Turn-on delay time	$t_{d(on)}$	—	12	—	ns	I_D = 10 A, V_{GS} = 10 V, R_L = 3
Rise time	t_r	—	100	—	ns	
Turn-off delay time	$t_{d(off)}$	—	300	—	ns	
Fall time	t_f	—	150	—	ns	
Body to drain diode forward voltage	V_{DF}	—	1.3	—	V	I_F = 20 A, V_{GS} = 0
Body to drain diode reverse recovery time	t_{rr}	—	300	—	ns	I_F = 20 A, V_{GS} = 0, di_F/dt = 50 A/µs

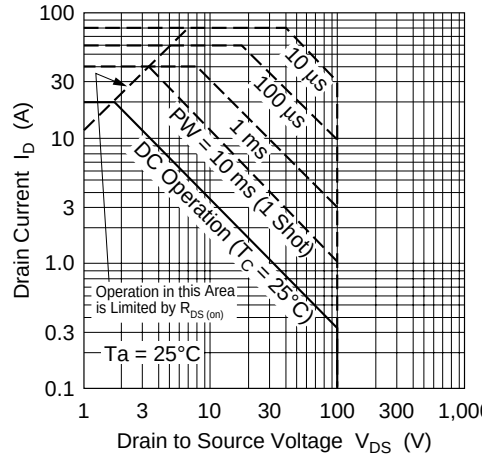
Note: 1. Pulse test

See characteristic curves of 2SK1302.

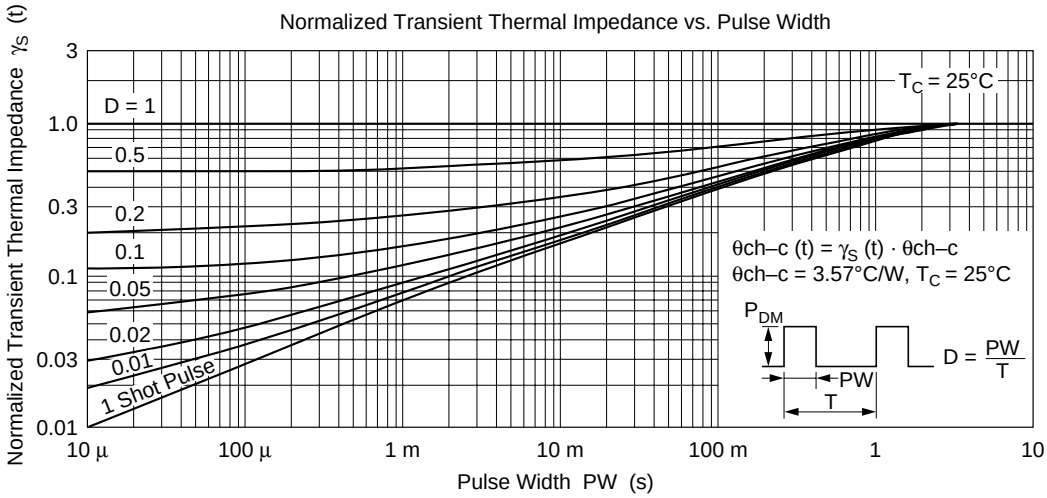
Power vs. Temperature Derating



Maximum Safe Operation Area



Normalized Transient Thermal Impedance vs. Pulse Width



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