2SK1698

Silicon N-Channel MOS FET

HITACHI

Application

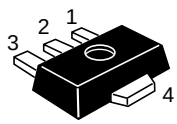
High speed power switching

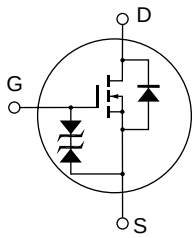
Features

- Low on-resistance
- High speed switching
- Low drive current
- 4 V gate drive device - - - can be driven from 5 V source.
- Suitable for DC – DC converter, motor drive, power switch, solenoid drive

Outline

UPAK





1. Gate
2. Drain
3. Source
4. Drain

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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	0.3	A
Drain peak current	$I_{D(pulse)}$*[1]	1.2	A
Body to drain diode reverse drain current	I_{DR}	0.3	A
Channel dissipation	Pch*[2]	1	W
Channel temperature	Tch	150	°C
Storage temperature	Tstg	–55 to +150	°C

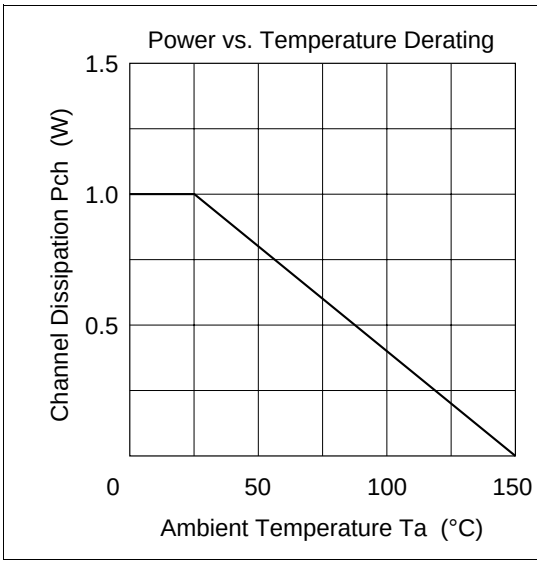
Notes 1. PW 10 µs, duty cycle 1%
2. When using the alumina ceramic board (12.5 × 20 × 0.7 mm)
3. Marking is “FY”.

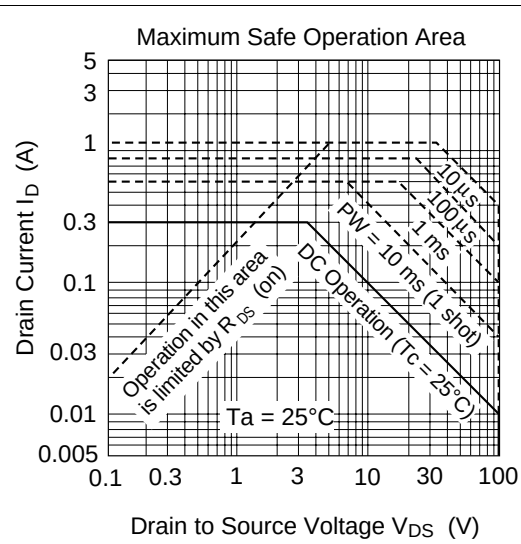
Electrical Characteristics (Ta = 25°C)

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}	—	—	50	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	$R_{DS(on)}$	—	3.5	4.5		I_D = 0.2 A, V_{GS} = 10 V *[1]
		—	4.5	6.5		I_D = 0.2 A, V_{GS} = 4 V *[1]
Forward transfer admittance	$\|y_{fs}\|$	0.22	0.35	—	S	I_D = 0.2 A, V_{DS} = 10 V *[1]
Input capacitance	Ciss	—	35	—	pF	V_{DS} = 10 V, V_{GS} = 0, f = 1 MHz
Output capacitance	Coss	—	14	—	pF	
Reverse transfer capacitance	Crss	—	3.5	—	pF	
Turn-on delay time	$t_{d(on)}$	—	2	—	ns	I_D = 0.2 A, V_{GS} = 10 V, R_L = 150
Rise time	t_r	—	4	—	ns	
Turn-off delay time	$t_{d(off)}$	—	17	—	ns	
Fall time	t_f	—	15	—	ns	
Body to drain diode forward voltage	V_{DF}	—	0.9	—	V	I_F = 0.3 A, V_{GS} = 0
Body to drain diode reverse recovery time	t_{rr}	—	80	—	ns	I_F = 0.3 A, V_{GS} = 0, di_F/dt = 50 A/µs

Note 1. Pulse test

See characteristic curve of 2SK1337.


Power vs. Temperature Derating
Channel Dissipation Pch (W)
1.5
1.0
0.5
0
50
100
150
Ambient Temperature Ta (°C)


Maximum Safe Operation Area
Drain Current I_D (A)
5
3
1
0.3
0.1
0.03
0.01
0.005
0.1
0.3
1
3
10
30
100
Drain to Source Voltage V_{DS} (V)
10 µs
100 µs
1 ms
PW = 10 ms (1 shot)
DC Operation (Tc = 25°C)
Operation in this area is limited by R_{DS} (on)
Ta = 25°C

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