2SJ295

Silicon P-Channel MOS FET

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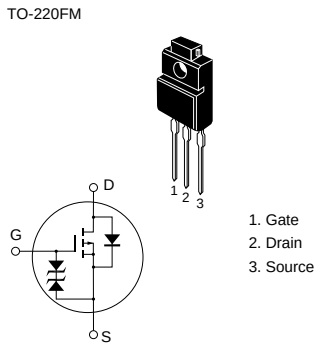
Application

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 switching regulator, DC-DC converter
- Avalanche ratings

Outline



Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Ratings	Unit
Drain to source voltage	V_{DSS}	–60	V
Gate to source voltage	V_{GSS}	±20	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
Avalanche current	I_{AP} *3	–30	A
Avalanche energy	E_{AR} *3	77	mJ
Channel dissipation	Pch*2	35	W
Channel temperature	Tch	150	°C
Storage temperature	Tstg	–55 to +150	°C

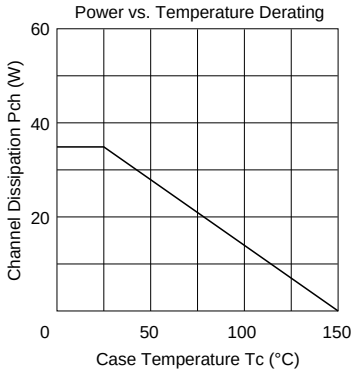
Notes
1. PW ≤ 10 µs, duty cycle ≤ 1%
2. Value at T_c = 25°C
3. Value at Tch = 25°C, Rg ≥ 50 Ω

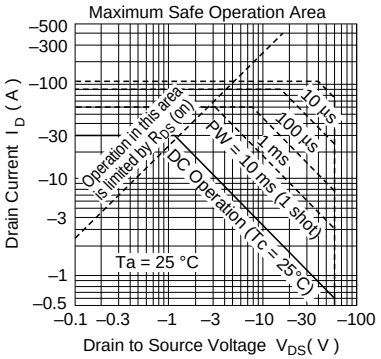
Electrical Characteristics (Ta = 25°C)

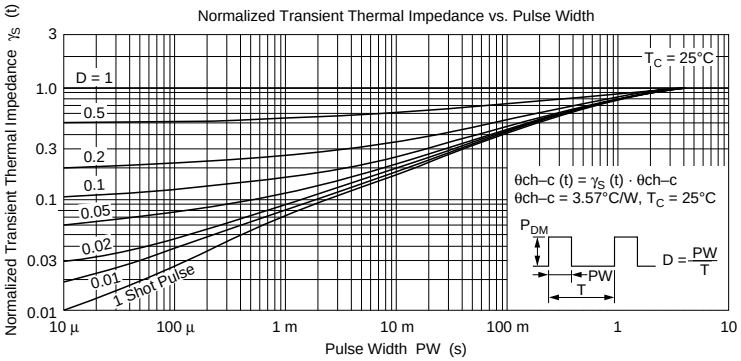
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	–60	—	—	V	I_D = –10 mA, V_{GS} = 0
Gate to source breakdown voltage	$V_{(BR)GSS}$	±20	—	—	V	I_G = ±200 µA, V_{DS} = 0
Gate to source leak current	I_{GSS}	—	—	±10	µA	V_{GS} = ±16 V, V_{DS} = 0
Zero gate voltage drain current	I_{DSS}	—	—	–250	µA	V_{DS} = –50 V, V_{GS} = 0
Gate to source cutoff voltage	$V_{GS(off)}$	–1.0	—	–2.25	V	I_D = –1 mA, V_{DS} = –10 V
Static drain to source on state resistance	$R_{DS(on)}$	—	0.033	0.043	Ω	I_D = –15 A, V_{GS} = –10 V*[1]
		—	0.045	0.06	Ω	I_D = –15 A, V_{GS} = –4 V*[1]
Forward transfer admittance	$\|y_{fs}\|$	17	25	—	S	I_D = –15 A, V_{DS} = –10 V*[1]
Input capacitance	Ciss	—	3300	—	pF	V_{DS} = –10 V, V_{GS} = 0, f = 1 MHz
Output capacitance	Coss	—	1500	—	pF	
Reverse transfer capacitance	Crss	—	480	—	pF	
Turn-on delay time	$t_{d(on)}$	—	30	—	ns	I_D = –15 A, V_{GS} = –10 V, R_L = 2 Ω
Rise time	t_r	—	170	—	ns	
Turn-off delay time	$t_{d(off)}$	—	500	—	ns	
Fall time	t_f	—	390	—	ns	
Body to drain diode forward voltage	V_{DF}	—	–1.5	—	V	I_F = –30 A, V_{GS} = 0
Body to drain diode reverse recovery time	t_{rr}	—	200	—	ns	I_F = –30 A, V_{GS} = 0, di_F/dt = 50 A/µs

Note 1. Pulse test

See characteristic curves of 2SJ280


Power vs. Temperature Derating
Channel Dissipation Pch (W)
60
40
20
0
50
100
150
Case Temperature Tc (°C)


Maximum Safe Operation Area
Drain Current I_D (A)
–500
–300
–100
–30
–10
–3
–1
–0.5
–0.1
–0.3
–1
–3
–10
–30
–100
Drain to Source Voltage V_DS(V)
Operation in this area is limited by R_DS (on)
10 µs
100 µs
1 ms
PW = 10 ms (1 shot)
DC Operation (Tc = 25°C)
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
T_C = 25°C
θch–c (t) = γS (t) · θch–c
θch–c = 3.57°C/W, T_C = 25°C
P_DM
PW
T
D = PW/T
10 µ
100 µ
1 m
10 m
100 m
1
10
Pulse Width PW (s)