2SK1808

Silicon N Channel MOS FET

Application

High speed power switching

Features

- Low on–resistance
- High speed switching
- Low drive current
- No secondary breakdown
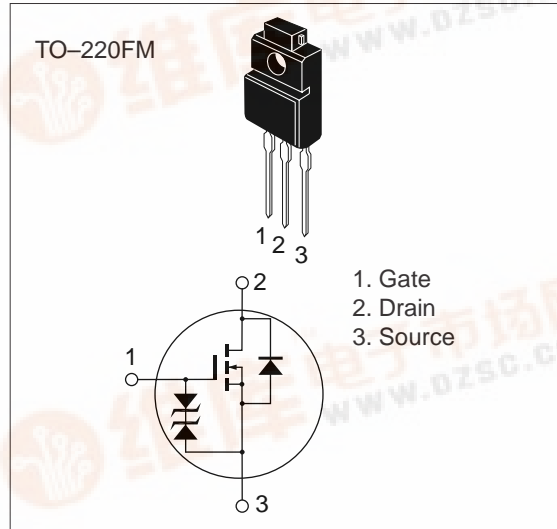- Suitable for switchingregulator, DC–DC converter

TO–220FM

1. Gate
2. Drain
3. Source

Table 1   Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Ratings	Unit
Drain to source voltage	V_{DSS}	900	V
Gate to source voltage	V_{GSS}	±30	V
Drain current	I_D	4	A
Drain peak current	$I_{D(pulse)}$*	10	A
Body–drain diode reverse drain current	I_{DR}	4	A
Channel dissipation	Pch**	35	W
Channel temperature	Tch	150	°C
Storage temperature	Tstg	–55 to +150	°C

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

Table 2 Electrical Characteristics (Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	900	—	—	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	$V_{DS} = 720$ 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	$R_{DS(on)}$	—	3.0	4.0	Ω	$I_D = 2$ A $V_{GS} = 10$ V *
Forward transfer admittance	$|y_{fs}|$	1.7	2.7	—	S	$I_D = 2$ A $V_{DS} = 10$ V *
Input capacitance	Ciss	—	740	—	pF	$V_{DS} = 10$ V
Output capacitance	Coss	—	305	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	Crss	—	150	—	pF	f = 1 MHz
Turn–on delay time	$t_{d(on)}$	—	15	—	ns	$I_D = 2$ A
Rise time	t_r	—	60	—	ns	$V_{GS} = 10$ V
Turn–off delay time	$t_{d(off)}$	—	100	—	ns	$R_L = 15$ Ω
Fall time	t_f	—	80	—	ns	
Body–drain diode forward voltage	V_{DF}	—	0.9	—	V	$I_F = 4$ A, $V_{GS} = 0$
Body–drain diode reverse recovery time	t_{rr}	—	800	—	ns	$I_F = 4$ A, $V_{GS} = 0$, $di_F / dt = 100$ A / µs

*   Pulse Test

See characteristic curves of 2SK1340

Power vs. Temperature Derating

Channel Dissipation Pch (W) vs. Case Temperature Tc (°C)

Maximum Safe Operation Area

Drain Current I_D (A) vs. 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) vs. Pulse Width PW (S)

D = 1
Tc = 25°C
0.5
0.2
0.1
0.05
0.02
0.01
1 shot Pulse

$\theta ch - c(t) = \gamma s(t) \cdot \theta ch - c$
$\theta ch - c = 3.57°C$ / W. Tc = 25°C

P_{DM}

$D = \dfrac{PW}{T}$