2SK2590

Silicon N-Channel MOS FET

HITACHI

Preliminary

Application

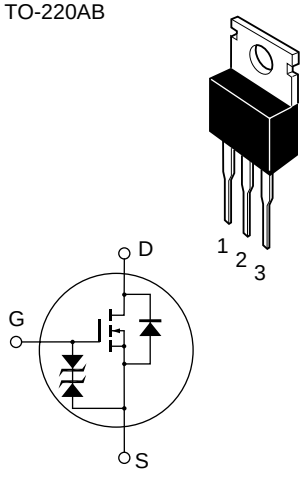
High speed power switching

Features

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

Outline

TO-220AB



1. Gate
2. Drain (Flange)
3. Source

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Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Ratings	Unit
Drain to source voltage	V_{DSS}	200	V
Gate to source voltage	V_{GSS}	±20	V
Drain current	I_D	7	A
Drain peak current	$I_{D(pulse)}$*[1]	28	A
Body to drain diode reverse drain current	I_{DR}	7	A
Channel dissipation	Pch*[2]	50	W
Channel temperature	Tch	150	°C
Storage temperature	Tstg	–55 to +150	°C

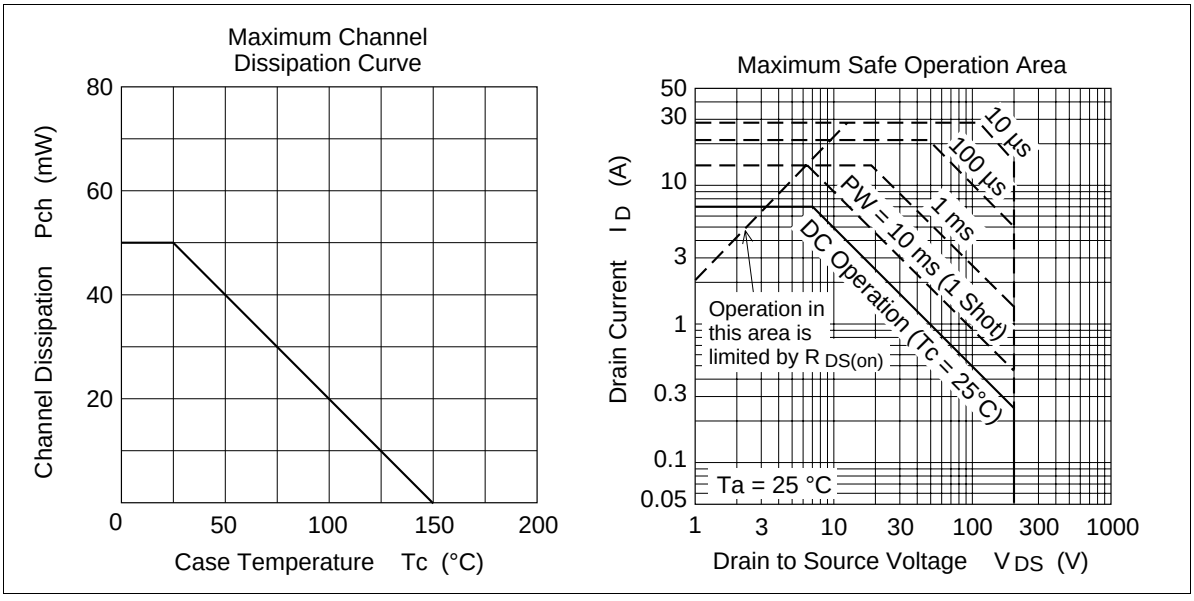
Notes 1. PW ≤ 10 µs, duty cycle ≤ 1 %
2. Value at Tc = 25 °C

Electrical Characteristics (Ta = 25°C)

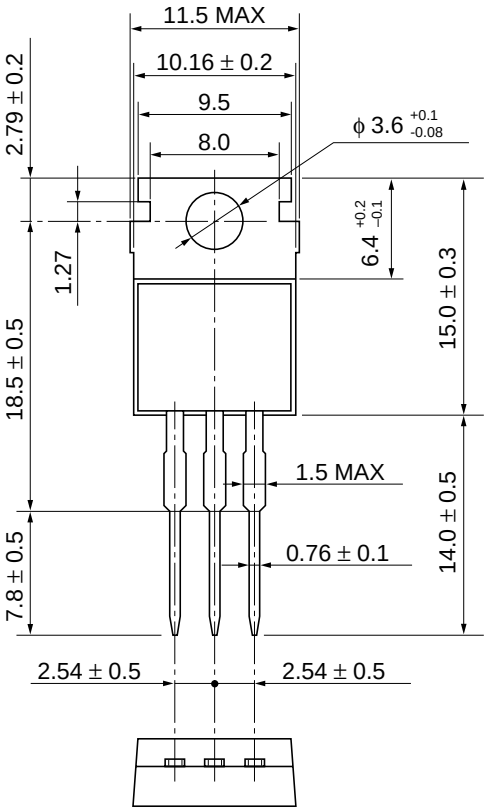
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	200	—	—	V	I_D = 10 mA, V_{GS} = 0
Gate to source breakdown voltage	$V_{(BR)GSS}$	±20	—	—	V	I_G = ±100 µA, V_{DS} = 0
Gate to source leak current	I_{GSS}	—	—	±10	µA	V_{GS} = ±16 V, V_{DS} = 0
Zero gate voltage drain current	I_{DSS}	—	—	250	µA	V_{DS} =160 V, V_{GS} = 0
Gate to source cutoff voltage	$V_{GS(off)}$	2.0	—	4.0	V	I_D = 1 mA, V_{DS} = 10 V
Static drain to source on state resistance	$R_{DS(on)}$	—	0.33	0.45	Ω	I_D = 4 A V_{GS} = 10 V*[1]
Forward transfer admittance	$\|y_{fs}\|$	3.0	4.5	—	S	I_D = 4 A V_{DS} = 10 V*[1]
Input capacitance	Ciss	—	700	—	pF	V_{DS} = 10 V
Output capacitance	Coss	—	260	—	pF	V_{GS} = 0
Reverse transfer capacitance	Crss	—	45	—	pF	f = 1 MHz
Turn-on delay time	$t_{d(on)}$	—	20	—	ns	I_D = 4 A
Rise time	t_r	—	45	—	ns	V_{GS} = 10 V
Turn-off delay time	$t_{d(off)}$	—	50	—	ns	R_L = 7.5Ω
Fall time	t_f	—	35	—	ns	
Body to drain diode forward voltage	V_{DF}	—	1.1	—	V	I_F = 7 A, V_{GS} = 0
Body to drain diode reverse recovery time	t_{rr}	—	150	—	ns	I_F = 7 A, V_{GS} = 0, di_F / dt = 100 A / µs

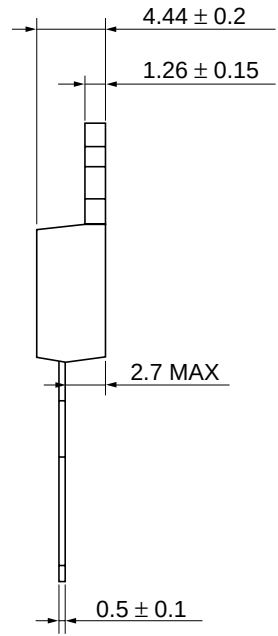
Note 1. Pulse Test

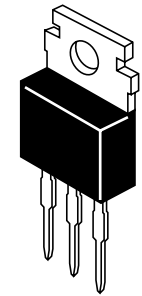
See characteristics curves of 2SK1957.


Maximum Channel Dissipation Curve
Channel Dissipation Pch (mW)
80
60
40
20
0
50
100
150
200
Case Temperature Tc (°C)
Maximum Safe Operation Area
Drain Current I D (A)
50
30
10
3
1
0.3
0.1
0.05
1
3
10
30
100
300
1000
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

Unit: mm







Hitachi Code	TO-220AB
JEDEC	Conforms
EIAJ	Conforms
Weight (reference value)	1.8 g

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