

# 2SK3158

Silicon N Channel MOS FET  
High Speed Power Switching

# HITACHI

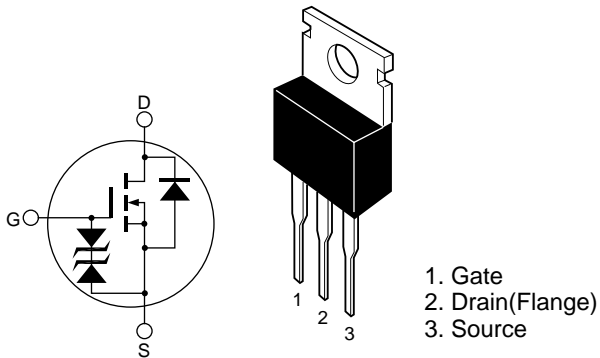
ADE-208-757B (Z)  
Target Specification 3rd. Edition  
Mar. 2001

## Features

- Low on-resistance  
 $R_{DS} = 40\text{m}\Omega$  typ.
- High speed switching
- 4V gate drive device can be driven from 5V source

## Outline

TO-220AB



Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Ratings	Unit
Drain to source voltage	$V_{DSS}$	150	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-drain diode reverse drain current	$I_{DR}$	30	A
Avalanche current	$I_{AP}^{*3}$	30	A
Avalanche energy	$E_{AR}^{*3}$	67	mJ
Channel dissipation	$Pch^{*2}$	100	W
Channel temperature	Tch	150	°C
Storage temperature	Tstg	−55 to +150	°C

Note: 1.  $PW \leq 10\mu s$ , duty cycle  $\leq 1\%$   
2. Value at  $T_c = 25^\circ C$   
3. Value at  $Tch = 25^\circ C$ ,  $R_g \geq 50\Omega$

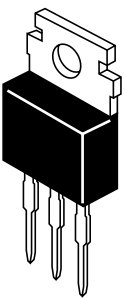
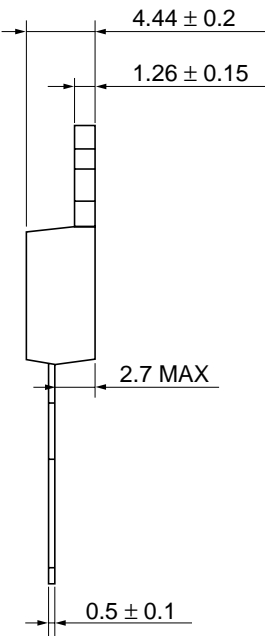
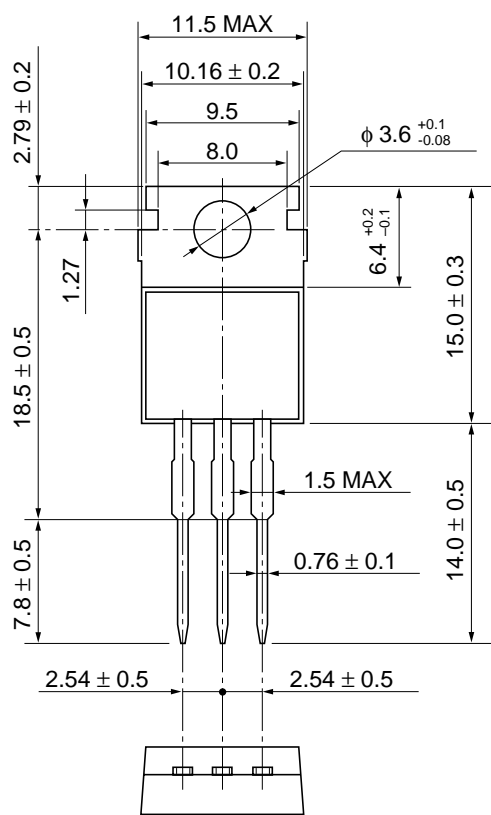
**Electrical Characteristics** ( $T_a = 25^\circ\text{C}$ )

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	150	—	—	V	$I_D = 10\text{mA}$ , $V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	$\pm 20$	—	—	V	$I_G = \pm 100\mu\text{A}$ , $V_{DS} = 0$
Gate to source leak current	$I_{GSS}$	—	—	$\pm 10$	$\mu\text{A}$	$V_{GS} = \pm 16\text{V}$ , $V_{DS} = 0$
Zero gate voltage drain current	$I_{DSS}$	—	—	10	$\mu\text{A}$	$V_{DS} = 150\text{V}$ , $V_{GS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	1.0	—	2.5	V	$I_D = 1\text{mA}$ , $V_{DS} = 10\text{V}$
Static drain to source on state resistance	$R_{DS(on)}$	—	40	45	$\text{m}\Omega$	$I_D = 15\text{A}$ , $V_{GS} = 10\text{V}^{*4}$
	$R_{DS(on)}$	—	45	63	$\text{m}\Omega$	$I_D = 15\text{A}$ , $V_{GS} = 4\text{V}^{*4}$
Forward transfer admittance	$ y_{fs} $	18	30	—	S	$I_D = 15\text{A}$ , $V_{DS} = 10\text{V}^{*4}$
Input capacitance	$C_{iss}$	—	2600	—	pF	$V_{DS} = 10\text{V}$
Output capacitance	$C_{oss}$	—	820	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	$C_{rss}$	—	350	—	pF	$f = 1\text{MHz}$
Turn-on delay time	$t_{d(on)}$	—	25	—	ns	$I_D = 15\text{A}$ , $V_{GS} = 10\text{V}$
Rise time	$t_r$	—	180	—	ns	$R_L = 2\Omega$
Turn-off delay time	$t_{d(off)}$	—	600	—	ns	
Fall time	$t_f$	—	280	—	ns	
Body-drain diode forward voltage	$V_{DF}$	—	0.91	—	V	$I_F = 30\text{A}$ , $V_{GS} = 0$
Body-drain diode reverse recovery time	$t_{rr}$	—	110	—	ns	$I_F = 30\text{A}$ , $V_{GS} = 0$ $di_F/dt = 50\text{A}/\mu\text{s}$

Note: 4. Pulse test

Package Dimensions

As of January, 2001  
Unit: mm



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

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