

H7N0308AB

Silicon N Channel MOS FET
High Speed Power Switching

RENESAS

ADE-208-1569B(Z)

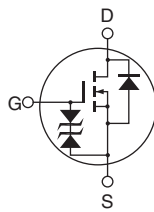
3rd. Edition
Aug. 2002

Features

- Low on-resistance
- $R_{DS(on)} = 3.8 \text{ m}\Omega$ typ.
- Low drive current
- 4.5 V gate drive device can be driven from 5 V source

Outline

TO-220AB



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

Absolute Maximum Ratings

(Ta = 25°C)

Item	Symbol	Ratings	Unit
Drain to source voltage	V_{DSS}	30	V
Gate to source voltage	V_{GSS}	±20	V
Drain current	I_D	70	A
Drain peak current	$I_{D(pulse)}$ ^{Note 1}	280	A
Body-drain diode reverse drain current	I_{DR}	70	A
Channel dissipation	P_{ch} ^{Note 2}	100	W
Channel to Case Thermal Impedance	θ_{ch-c}	1.25	°C/W
Channel temperature	T_{ch}	150	°C
Storage temperature	T_{stg}	-55 to +150	°C

Notes: 1. $PW \leq 10 \mu s$, duty cycle $\leq 1\%$

2. Value at $T_c = 25^\circ C$

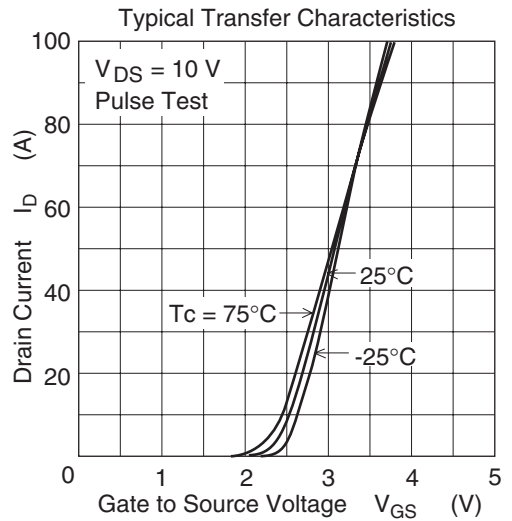
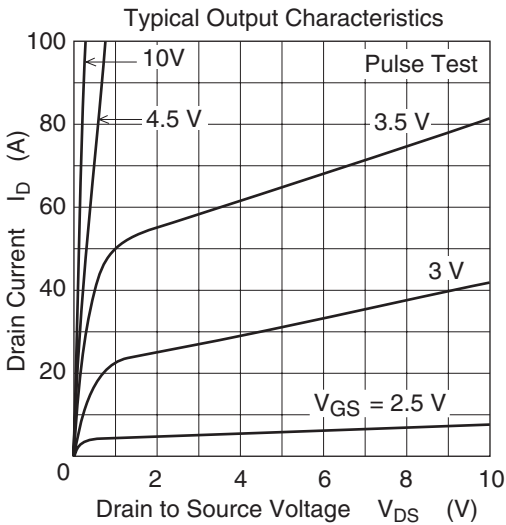
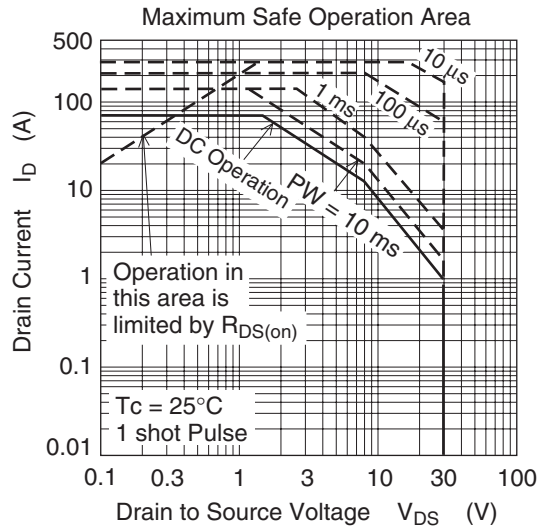
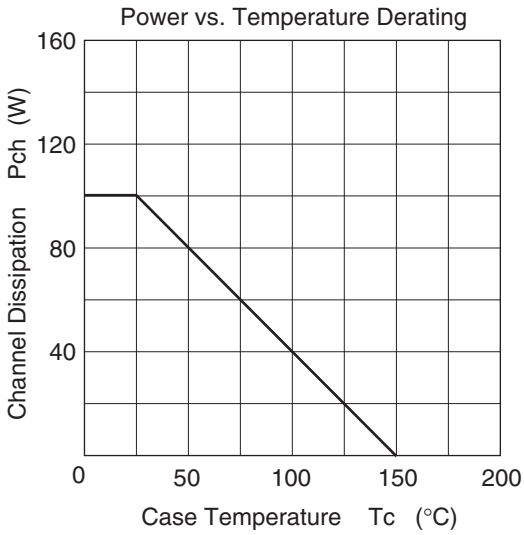
Electrical Characteristics

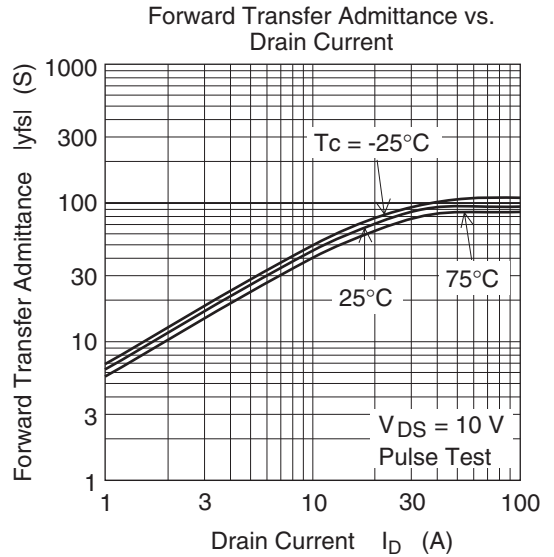
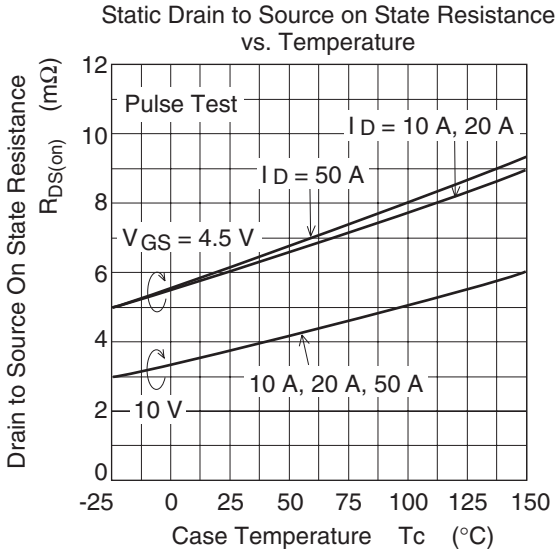
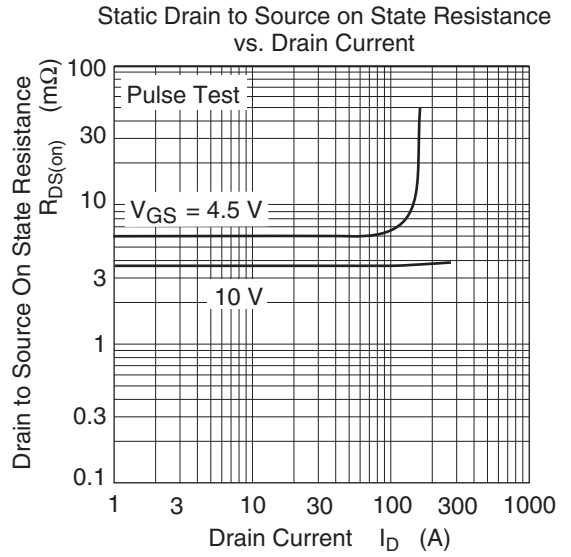
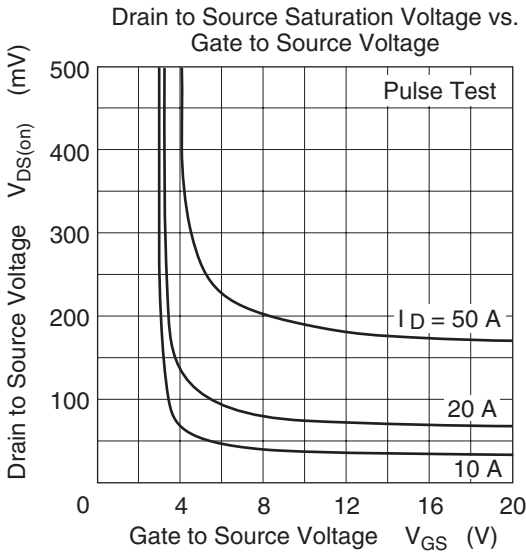
(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	30	—	—	V	$I_D = 10 \text{ mA}$, $V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	±20	—	—		$I_G = \pm 100 \text{ } \mu\text{A}$, $V_{DS} = 0$
Gate to source leak current	I_{GSS}	—	—	±10	μA	$V_{GS} = \pm 16 \text{ V}$, $V_{DS} = 0$
Zero gate voltage drain current	I_{DSS}	—	—	10	μA	$V_{DS} = 30 \text{ V}$, $V_{GS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	1.0	—	2.5	V	$I_D = 1 \text{ mA}$, $V_{DS} = 10 \text{ V}$ ^{Note 1}
Static drain to source on state resistance	$R_{DS(on)}$	—	3.8	4.8	mΩ	$I_D = 35 \text{ A}$, $V_{GS} = 10 \text{ V}$ ^{Note 1}
		—	6.0	8.5	mΩ	$I_D = 35 \text{ A}$, $V_{GS} = 4.5 \text{ V}$ ^{Note 1}
Forward transfer admittance	$ y_{fs} $	54	90	—	S	$I_D = 35 \text{ A}$, $V_{DS} = 10 \text{ V}$ ^{Note 1}
Input capacitance	Ciss	—	3350	—	pF	$V_{DS} = 10 \text{ V}$
Output capacitance	Coss	—	840	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	Crss	—	480	—	pF	f = 1MHz
Total gate charge	Qg	—	52	—	nc	$V_{DD} = 10 \text{ V}$
Gate to source charge	Qgs	—	11	—	nc	$V_{GS} = 10 \text{ V}$
Gate to drain charge	Qgd	—	10	—	nc	$I_D = 70 \text{ A}$
Turn-on delay time	$t_{d(on)}$	—	30	—	ns	$V_{GS} = 10 \text{ V}$, $I_D = 35 \text{ A}$
Rise time	t_r	—	370	—	ns	$R_L = 0.29 \text{ } \Omega$
Turn-off delay time	$t_{d(off)}$	—	80	—	ns	$R_g = 4.7 \text{ } \Omega$
Fall time	t_f	—	27	—	ns	
Body-drain diode forward voltage	V_{DF}	—	0.93	—	V	$I_F = 70 \text{ A}$, $V_{GS} = 0$
Body-drain diode reverse recovery time	t_{rr}	—	60	—	ns	$I_F = 70 \text{ A}$, $V_{GS} = 0$ diF/ dt = 50 A/μs

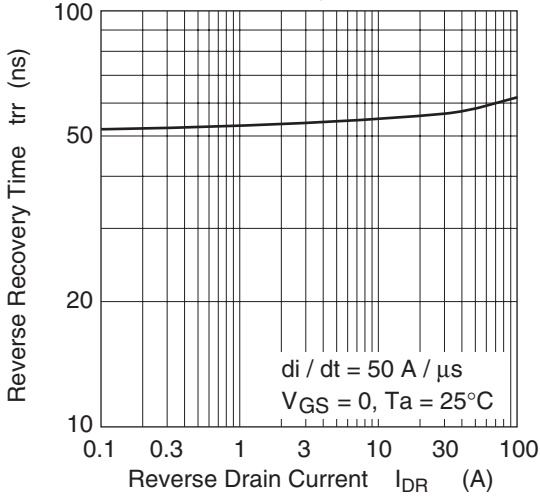
Notes: 1. Pulse test

Main Characteristics

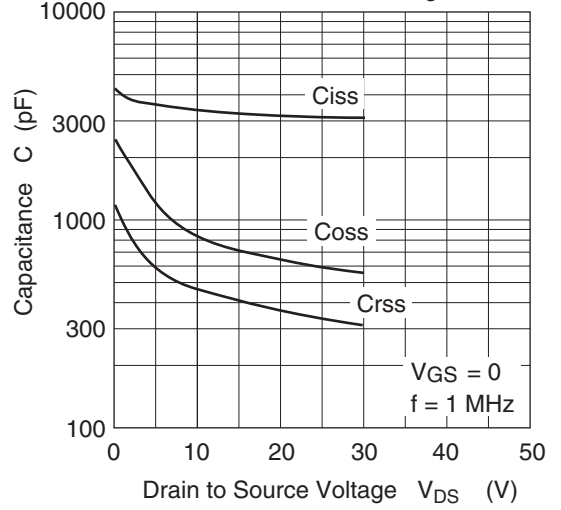




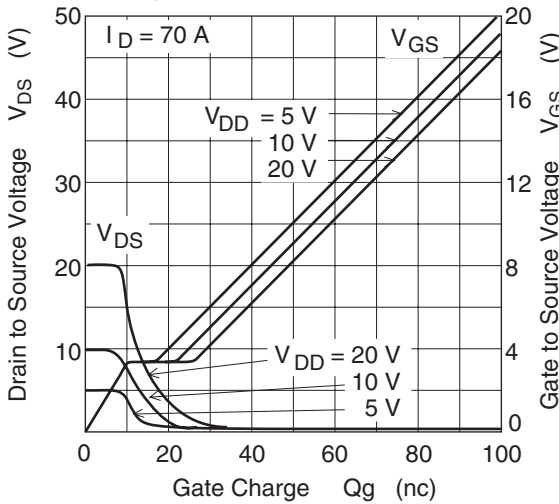
Body-Drain Diode Reverse Recovery Time



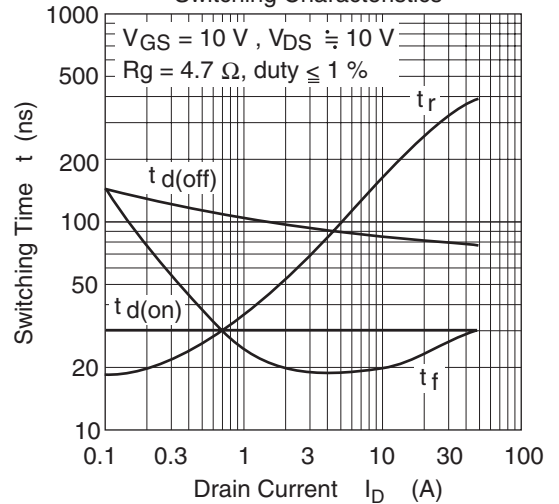
Typical Capacitance vs. Drain to Source Voltage

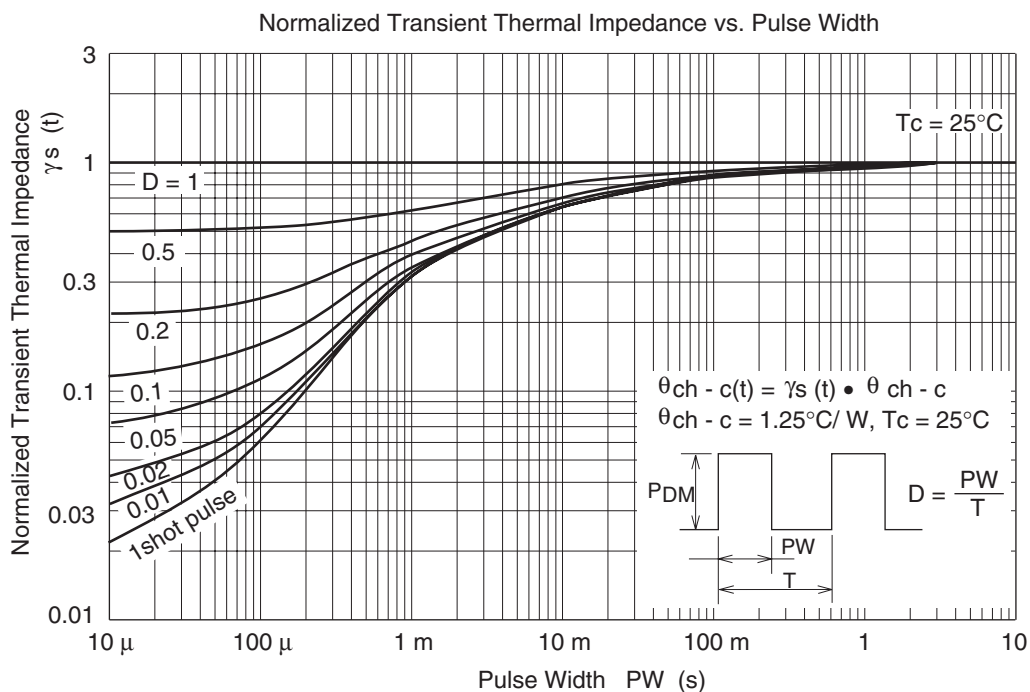
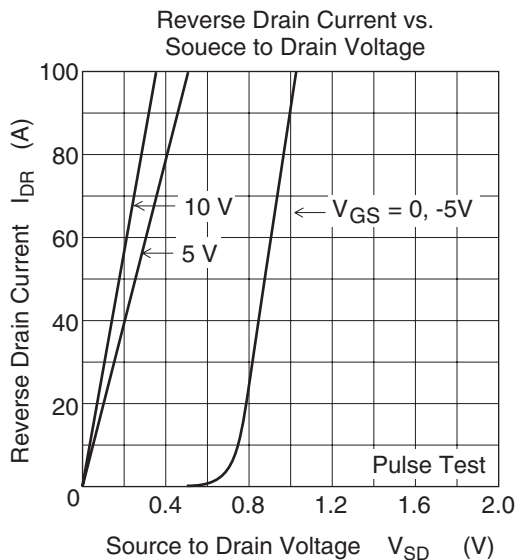


Dynamic Input Characteristics



Switching Characteristics

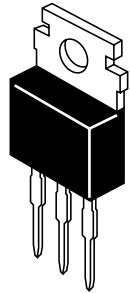
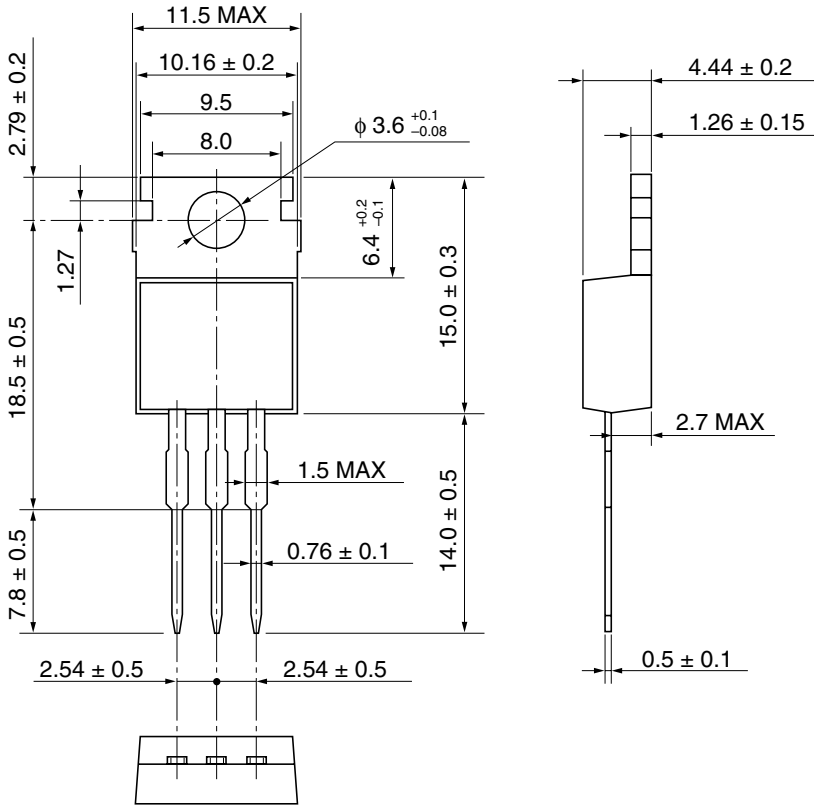




Package Dimensions

As of January, 2002

Unit: mm



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

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