

2SJ542

Silicon P Channel MOS FET
High Speed Power Switching

HITACHI

ADE-208-591B (Z)

3rd. Edition

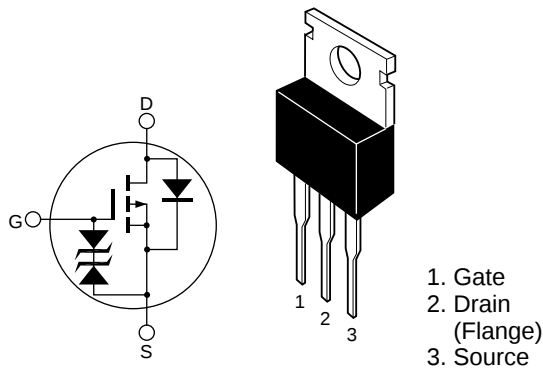
Jun 1998

Features

- Low on-resistance
 $R_{DS(on)} = 0.050\Omega$ typ.
- Low drive current.
- 4V gate drive devices.
- High speed switching.

Outline

TO-220AB



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	−18	A
Drain peak current	I _{D(pulse)} ^{Note1}	−72	A
Body-drain diode reverse drain current	I _{DR}	−18	A
Avalanche current	I _{AP} ^{Note3}	−18	A
Avalanche energy	E _{AR} ^{Note3}	27	mJ
Channel dissipation	P _{ch} ^{Note2}	60	W
Channel temperature	T _{ch}	150	°C
Storage temperature	T _{stg}	−55 to +150	°C

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

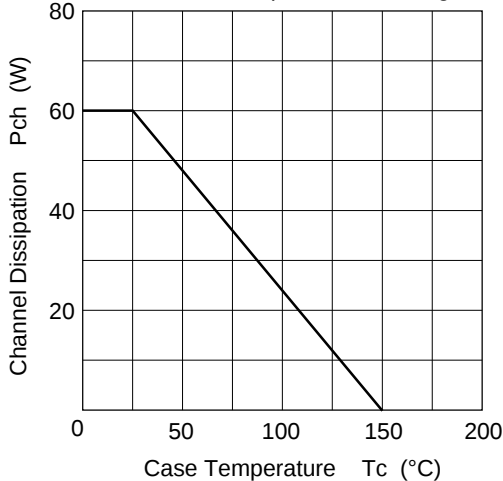
Electrical Characteristics (Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	V _{(BR)DSS}	−60	—	—	V	I _D = −10mA, V _{GS} = 0
Gate to source breakdown voltage	V _{(BR)GSS}	±20	—	—	V	I _G = ±100μA, V _{DS} = 0
Zero gate voltage drain current	I _{DSS}	—	—	−10	μA	V _{DS} = −60 V, V _{GS} = 0
Gate to source leak current	I _{GSS}	—	—	±10	μA	V _{GS} = ±16V, V _{DS} = 0
Gate to source cutoff voltage	V _{GS(off)}	−1.0	—	−2.0	V	I _D = −1mA, V _{DS} = −10V
Static drain to source on state resistance	R _{DS(on)}	—	0.050	0.065	Ω	I _D = −9A, V _{GS} = −10V ^{Note4}
	R _{DS(on)}	—	0.070	0.110	Ω	I _D = −9A, V _{GS} = −4V ^{Note4}
Forward transfer admittance	y _{fs}	10	16	—	S	I _D = −9A, V _{DS} = −10V ^{Note4}
Input capacitance	Ciss	—	1300	—	pF	V _{DS} = −10V
Output capacitance	Coss	—	650	—	pF	V _{GS} = 0
Reverse transfer capacitance	Crss	—	180	—	pF	f = 1MHz
Turn-on delay time	t _{d(on)}	—	14	—	ns	V _{GS} = −10V, I _D = −9A
Rise time	t _r	—	95	—	ns	R _L = 3.33Ω
Turn-off delay time	t _{d(off)}	—	190	—	ns	
Fall time	t _f	—	135	—	ns	
Body–drain diode forward voltage	V _{DF}	—	−1.0	—	V	I _F = −18A, V _{GS} = 0
Body–drain diode reverse recovery time	t _{rr}	—	70	—	ns	I _F = −18A, V _{GS} = 0 diF/ dt = 50A/μs

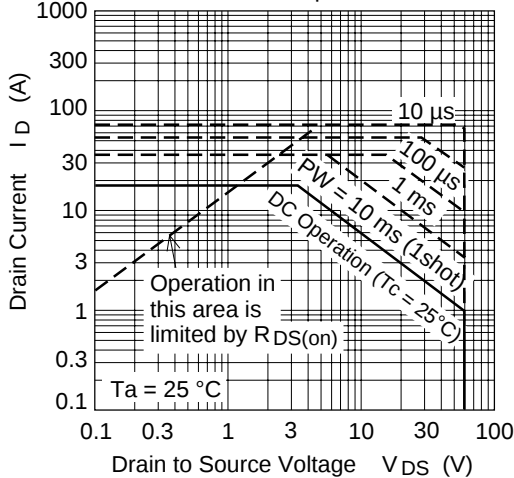
Note: 4. Pulse test

Main Characteristics

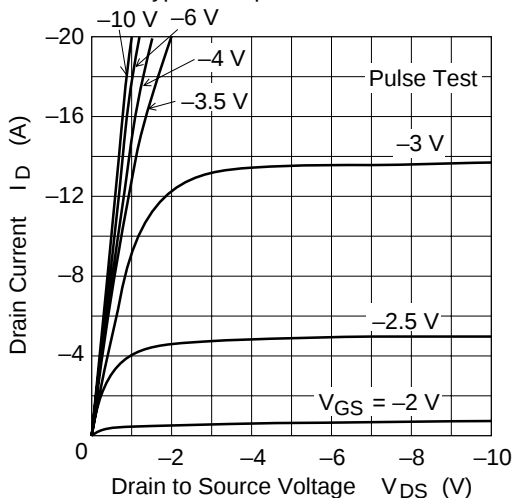
Power vs. Temperature Derating



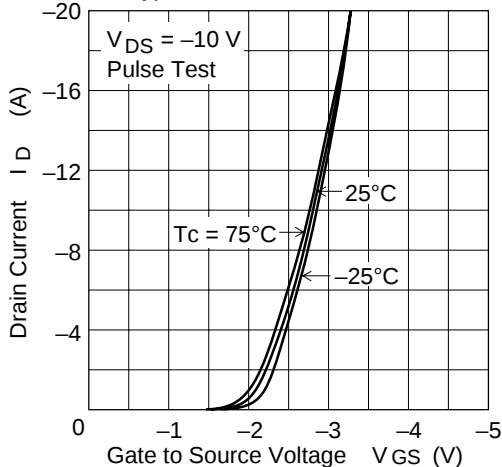
Maximum Safe Operation Area

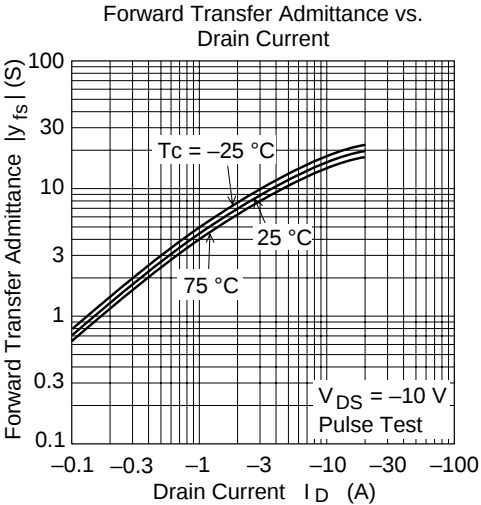
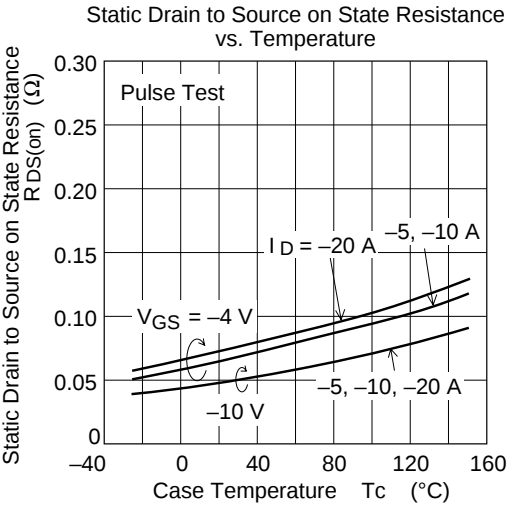
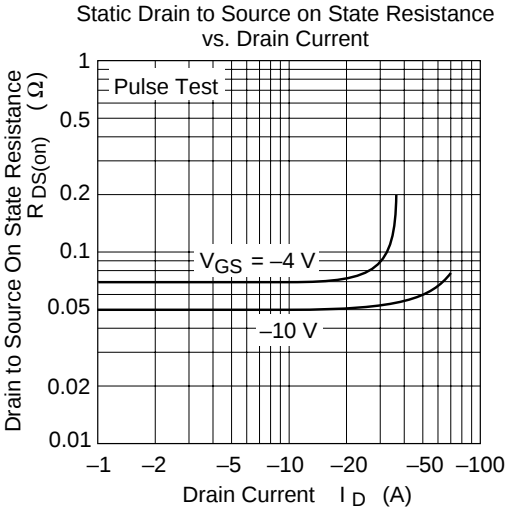
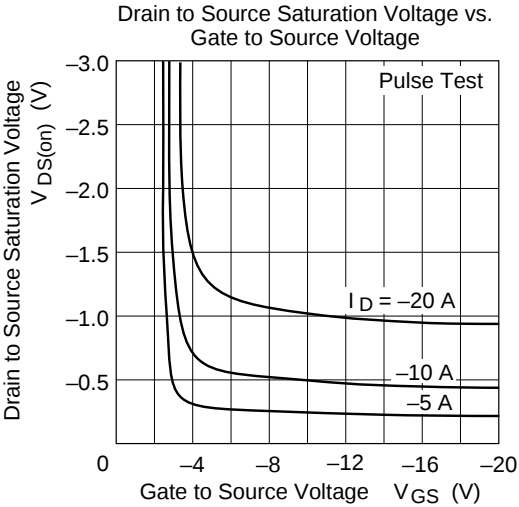


Typical Output Characteristics

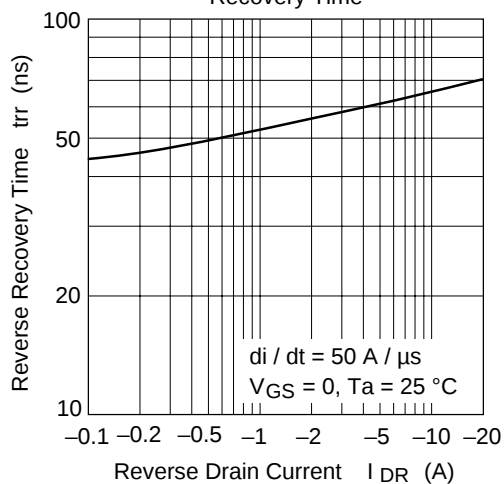


Typical Transfer Characteristics

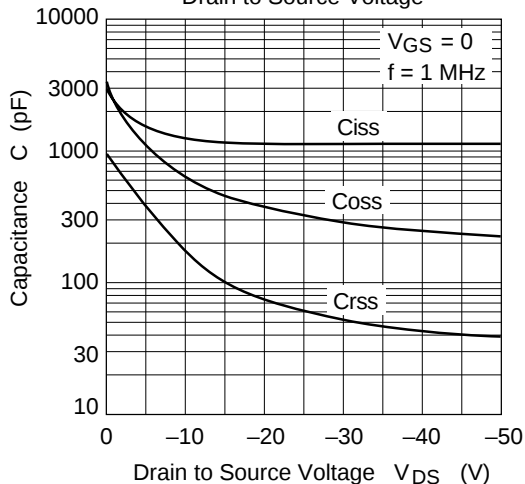




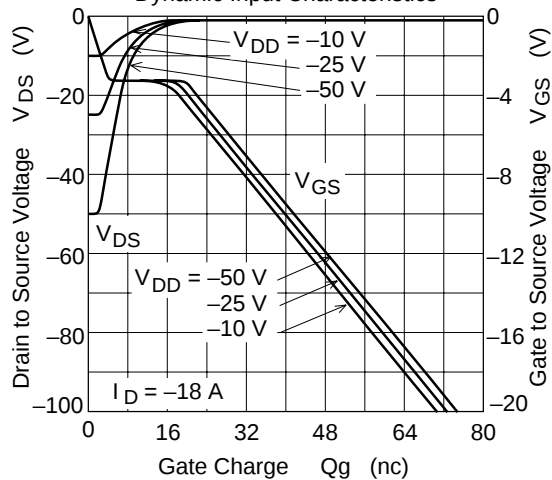
Body-Drain Diode Reverse Recovery Time



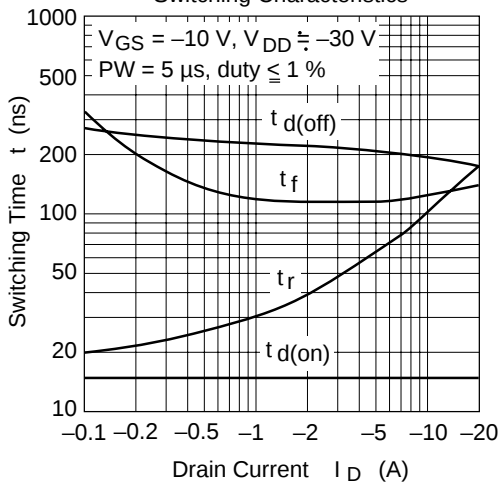
Typical Capacitance vs. Drain to Source Voltage

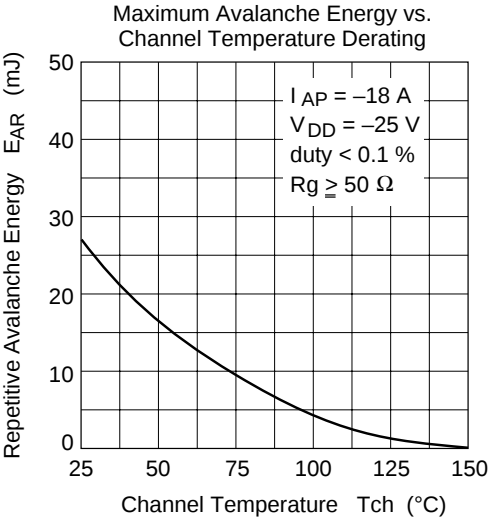
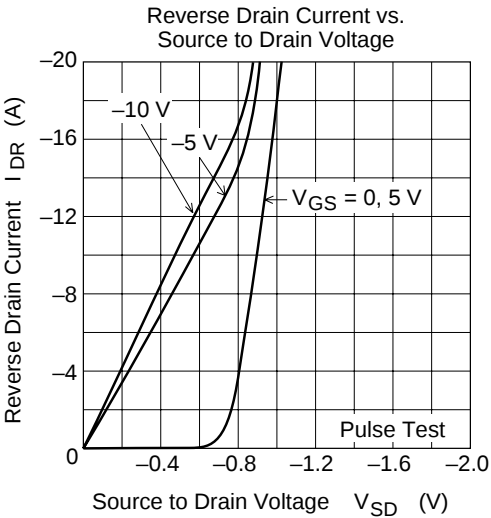


Dynamic Input Characteristics

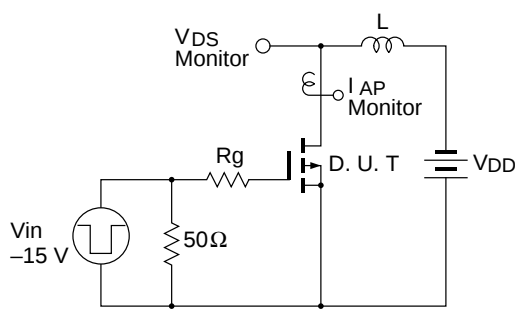


Switching Characteristics

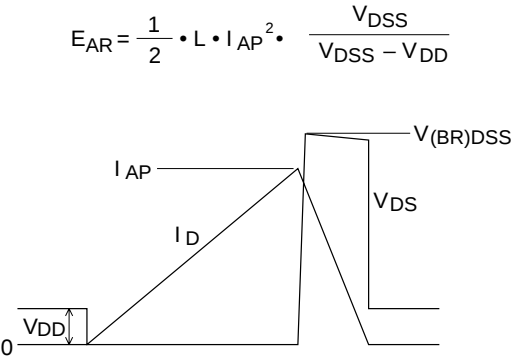




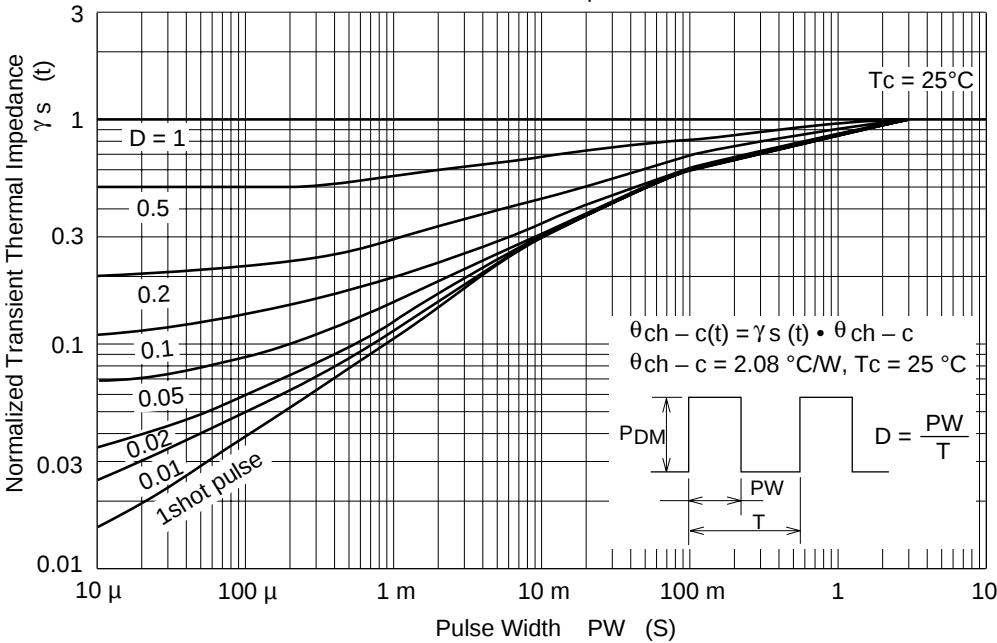
Avalanche Test Circuit



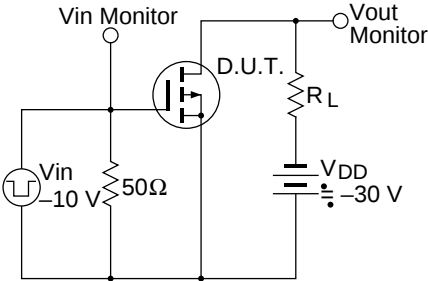
Avalanche Waveform



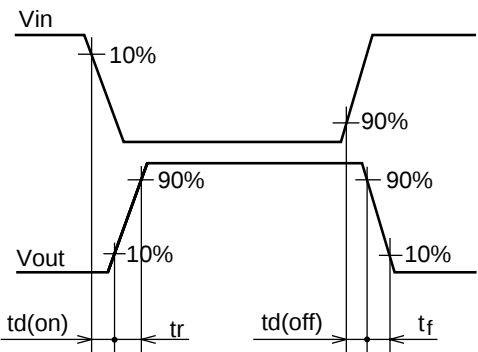
Normalized Transient Thermal Impedance vs. Pulse Width



Switching Time Test Circuit

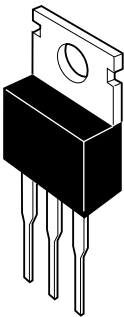
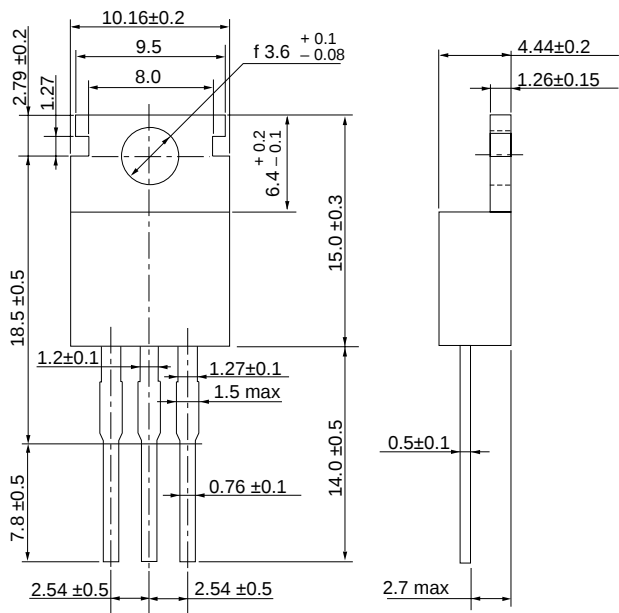


Waveform



Package Dimensions

Unit: mm



Hitachi Code	TO-220AB
EIAJ	SC-46
JEDEC	—

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HITACHI

Hitachi, Ltd.

Semiconductor & Integrated Circuits.
Nippon Bldg., 2-6-2, Ohte-machi, Chiyoda-ku, Tokyo 100-0004, Japan
Tel: Tokyo (03) 3270-2111 Fax: (03) 3270-5109

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For further information write to:

Hitachi Semiconductor (America) Inc. 179 East Tasman Drive, San Jose, CA 95134 Tel: <1> (408) 433-1990 Fax: <1> (408) 433-0223	Hitachi Europe GmbH Electronic components Group Dornacher Straße 3 D-85622 Feldkirchen, Munich Germany Tel: <49> (89) 9 9180-0 Fax: <49> (89) 9 29 30 00 Hitachi Europe Ltd. Electronic Components Group. Whitebrook Park Lower Cookham Road Maidenhead Berkshire SL6 8YA, United Kingdom Tel: <44> (1628) 585000 Fax: <44> (1628) 778322
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Hitachi Asia Pte. Ltd. 16 Collyer Quay #20-00 Hitachi Tower Singapore 049318 Tel: 535-2100 Fax: 535-1533 Hitachi Asia Ltd. Taipei Branch Office 3F, Hung Kuo Building, No.167, Tun-Hwa North Road, Taipei (105) Tel: <886> (2) 2718-3666 Fax: <886> (2) 2718-8180
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Hitachi Asia (Hong Kong) Ltd.
Group III (Electronic Components)
7/F., North Tower, World Finance Centre,
Harbour City, Canton Road, Tsim Sha Tsui,
Kowloon, Hong Kong
Tel: <852> (2) 735 9218
Fax: <852> (2) 730 0281
Telex: 40815 HITEC HX

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