

2SJ535

Silicon P Channel MOS FET
High Speed Power Switching

HITACHI

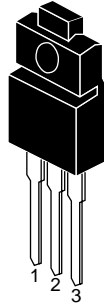
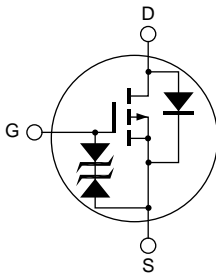
ADE-208-627B (Z)
3rd. Edition
Jun 1998

Features

- Low on-resistance
 $R_{DS(on)} = 0.028\Omega$ typ.
- Low drive current.
- 4V gate drive devices.
- High speed switching.

Outline

TO-220FM



1. Gate
2. Drain
3. Source

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	-30	A
Drain peak current	I _{D(pulse)} ^{Note1}	-120	A
Body-drain diode reverse drain current	I _{DR}	-30	A
Avalanche current	I _{AP} ^{Note3}	-30	A
Avalanche energy	E _{AR} ^{Note3}	77	mJ
Channel dissipation	Pch ^{Note2}	35	W
Channel temperature	Tch	150	°C
Storage temperature	Tstg	-55 to +150	°C

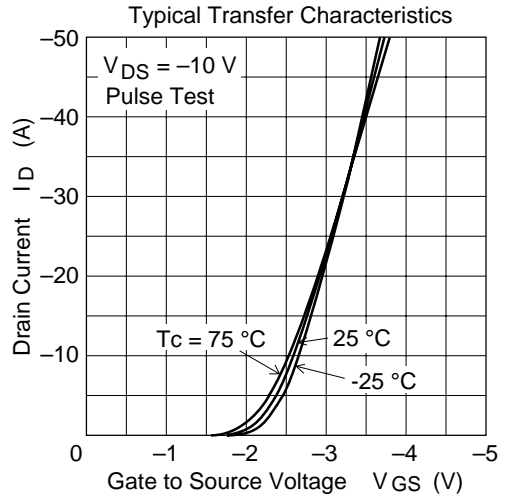
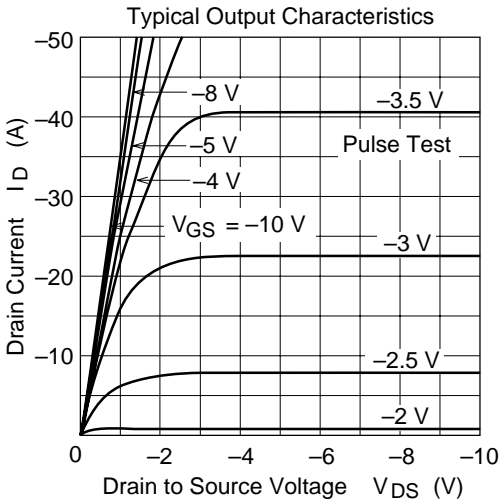
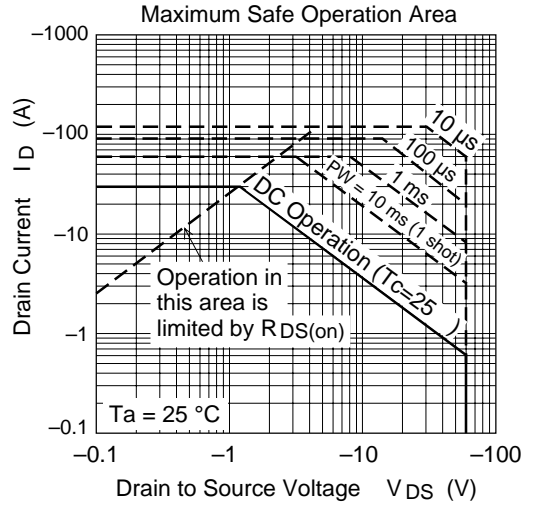
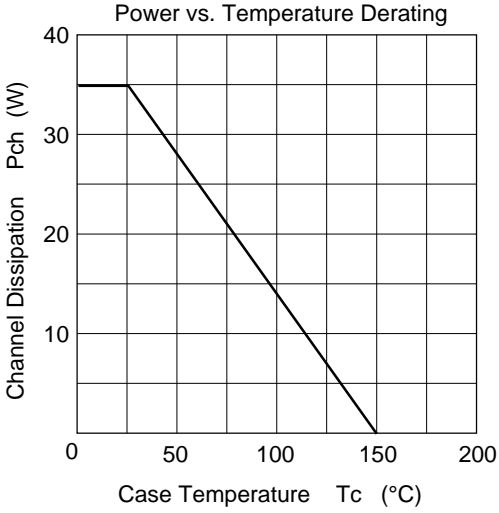
Note: 1. PW ≤ 10μs, duty cycle ≤ 1 %
 2. Value at Tc = 25°C
 3. Value at Tch = 25°C, Rg ≥ 50 Ω

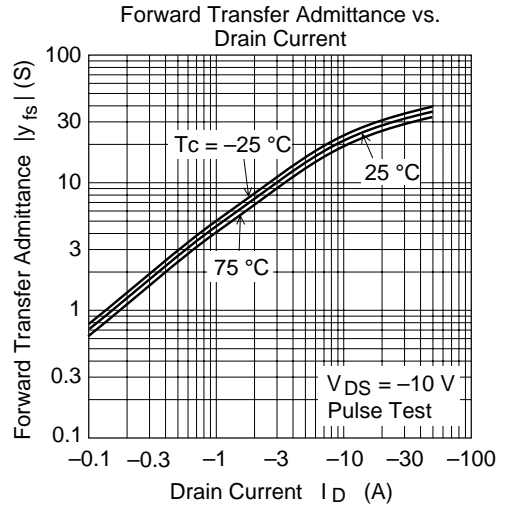
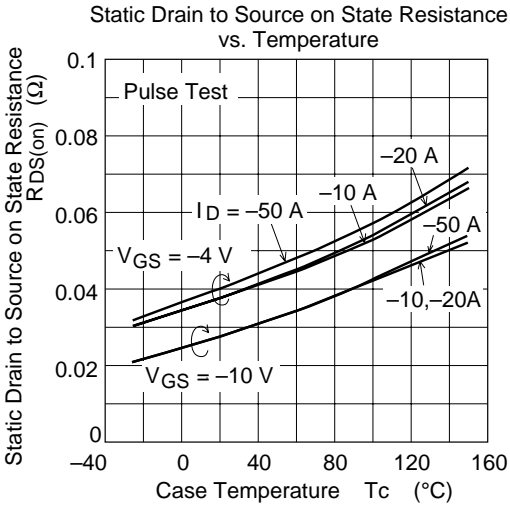
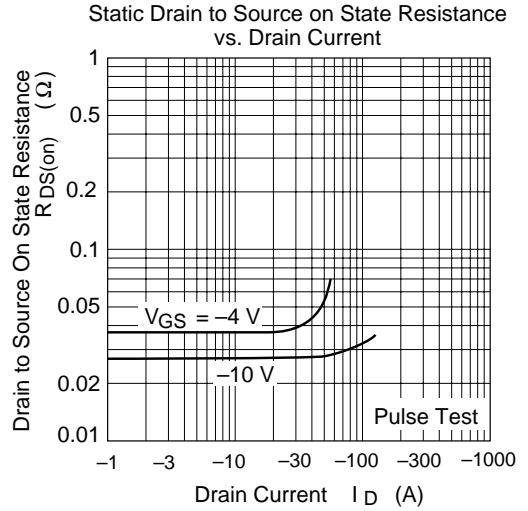
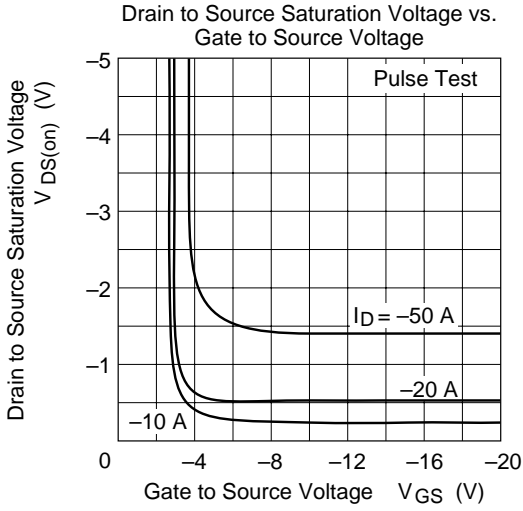
Electrical Characteristics (Ta = 25°C)

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)}	—	0.028	0.037	Ω	I _D = -15A, V _{GS} = -10V ^{Note4}
	R _{DS(on)}	—	0.038	0.055	Ω	I _D = -15A, V _{GS} = -4V ^{Note4}
Forward transfer admittance	y _{fs}	15	25	—	S	I _D = -15A, V _{DS} = -10V ^{Note4}
Input capacitance	Ciss	—	2500	—	pF	V _{DS} = -10V
Output capacitance	Coss	—	1300	—	pF	V _{GS} = 0
Reverse transfer capacitance	Crss	—	300	—	pF	f = 1MHz
Turn-on delay time	t _{d(on)}	—	25	—	ns	V _{GS} = -10V, I _D = -15A
Rise time	t _r	—	150	—	ns	R _L = 2Ω
Turn-off delay time	t _{d(off)}	—	350	—	ns	
Fall time	t _f	—	220	—	ns	
Body-drain diode forward voltage	V _{DF}	—	-0.95	—	V	I _F = -30A, V _{GS} = 0
Body-drain diode reverse recovery time	t _{rr}	—	100	—	ns	I _F = -30A, V _{GS} = 0 diF/ dt = 50A/μs

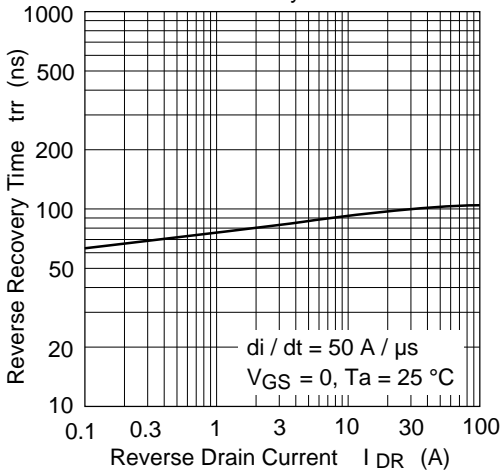
Note: 4. Pulse test

Main Characteristics

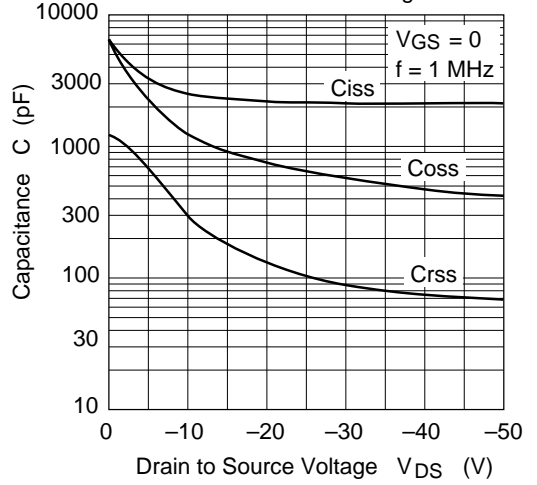




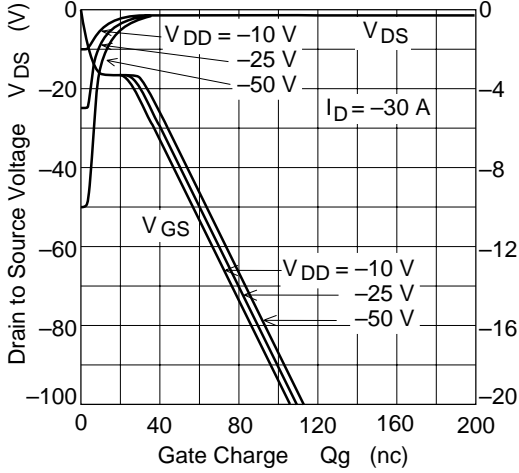
Body-Drain Diode Reverse Recovery Time



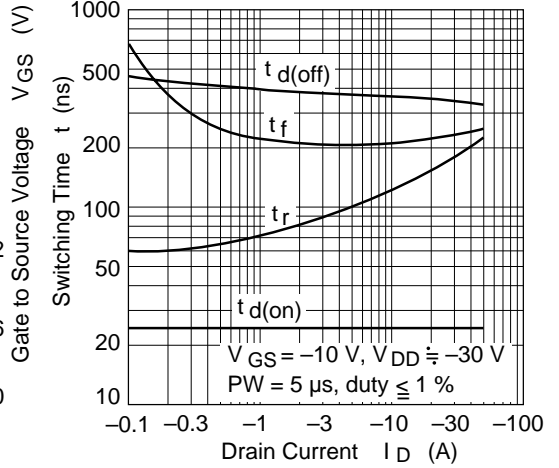
Typical Capacitance vs. Drain to Source Voltage

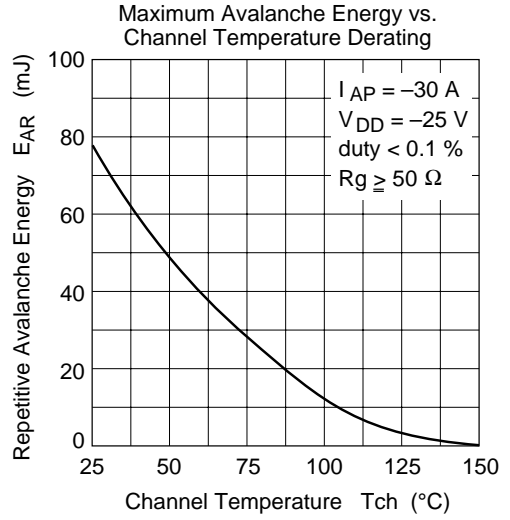
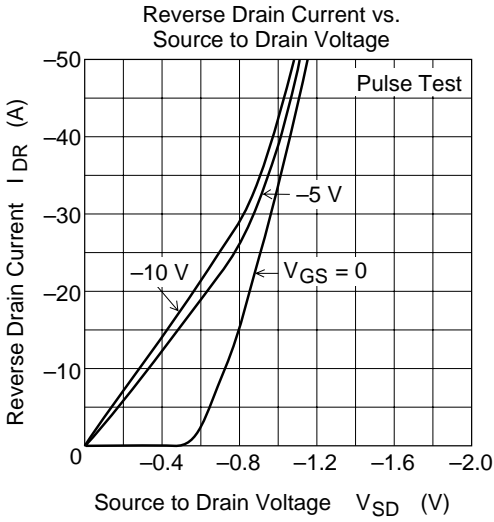


Dynamic Input Characteristics

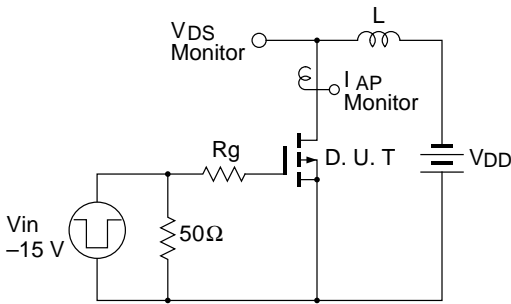


Switching Characteristics



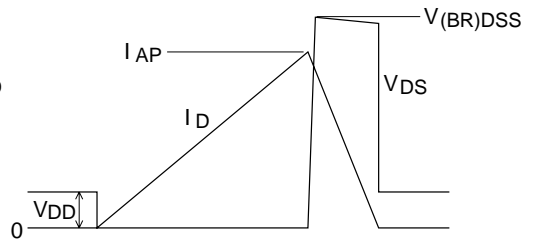


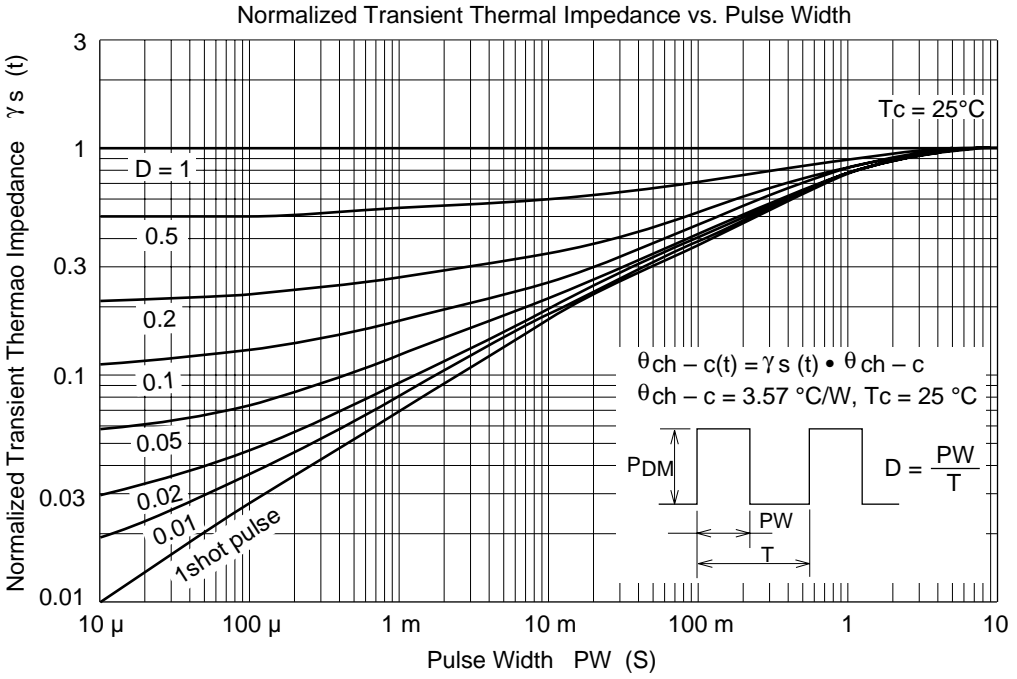
Avalanche Test Circuit



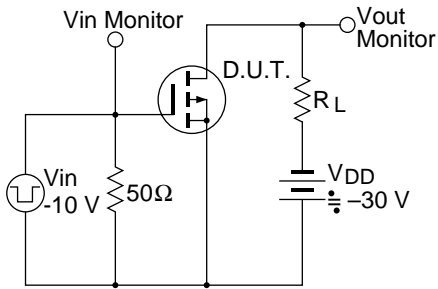
Avalanche Waveform

$$E_{AR} = \frac{1}{2} \cdot L \cdot I_{AP}^2 \cdot \frac{V_{DSS}}{V_{DSS} - V_{DD}}$$

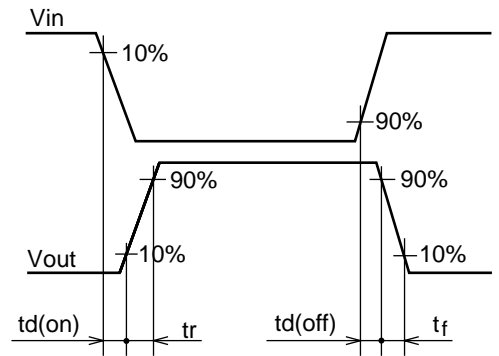




Switching Time Test Circuit

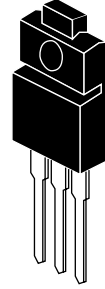
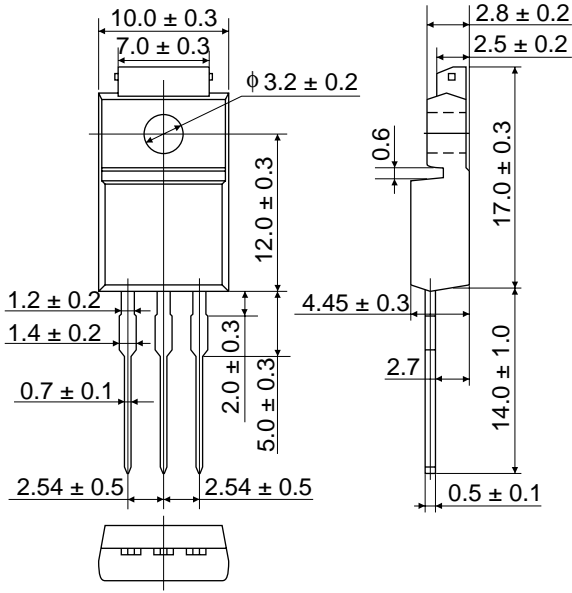


Waveform



Package Dimensions

Unit: mm



Hitachi Code	TO-220FM
EIAJ	SC-67
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

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

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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