2SJ555

Silicon P Channel MOS FET
High Speed Power Switching

HITACHI

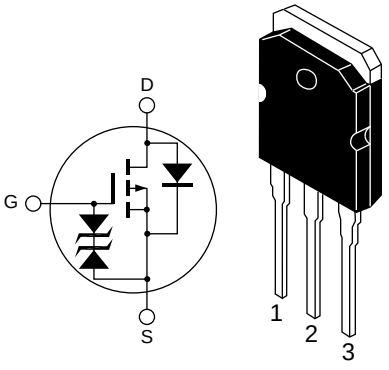
ADE-208-634A (Z)
2nd. Edition
Jun 1998

Features

- Low on-resistance
  $R_{DS(on)}$ = 0.017Ω typ.
- Low drive current.
- 4V gate drive devices.
- High speed switching.

Outline

TO–3P



1. Gate
2. Drain
   (Flange)
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	–60	A
Drain peak current	$I_{D(pulse)}$ Note1	–240	A
Body-drain diode reverse drain current	I_{DR}	–60	A
Avalanche current	I_{AP} Note3	–60	A
Avalanche energy	E_{AR} Note3	308	mJ
Channel dissipation	Pch Note2	125	W
Channel temperature	Tch	150	°C
Storage temperature	Tstg	–55 to +150	°C

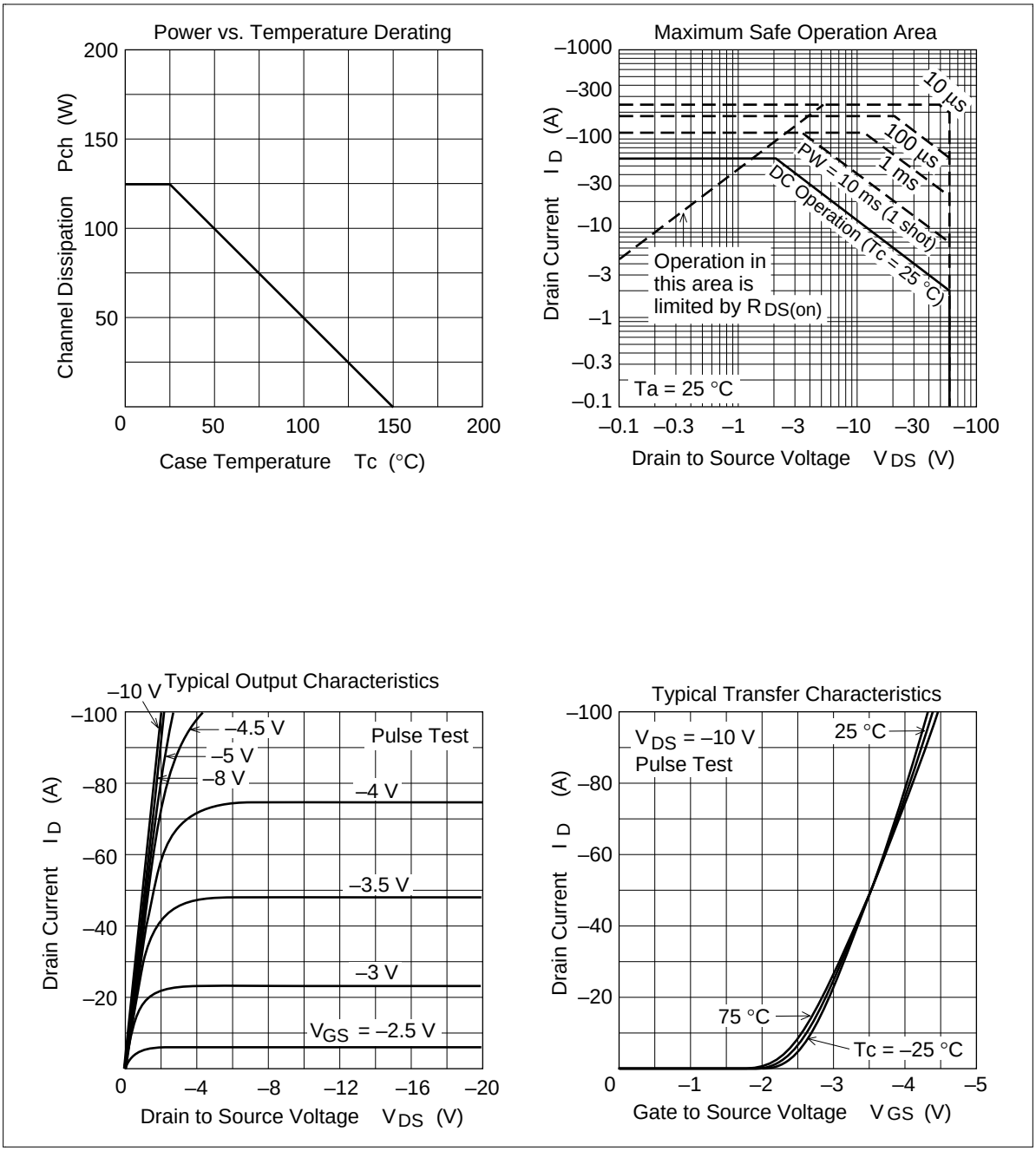
Note: 1. PW ≤ 10µs, duty cycle ≤ 1 %
2. Value at Tc = 25°C
3. Value at Tch = 25°C, Rg ≥ 50 Ω

Electrical Characteristics (Ta = 25°C)

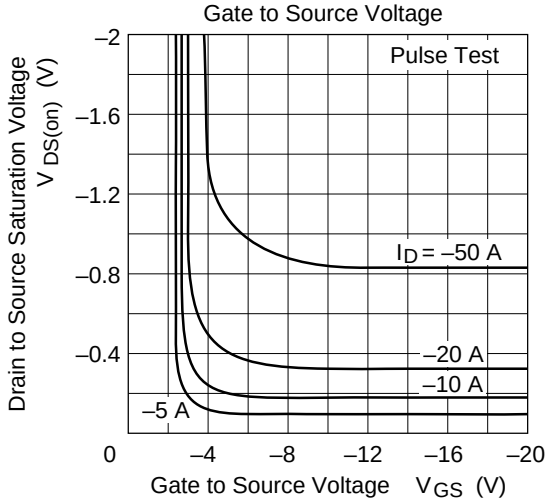
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	–60	—	—	V	I_D = –10mA, V_{GS} = 0
Gate to source breakdown voltage	$V_{(BR)GSS}$	±20	—	—	V	I_G = ±100µA, V_{DS} = 0
Zero gate voltege drain current	I_{DSS}	—	—	–10	µA	V_{DS} = –60 V, V_{GS} = 0
Gate to source 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	$R_{DS(on)}$	—	0.017	0.022	Ω	I_D = –30A, V_{GS} = –10V Note4
resistance	$R_{DS(on)}$	—	0.024	0.036	Ω	I_D = –30A, V_{GS} = –4V Note4
Forward transfer admittance	$\|y_{fs}\|$	27	45	—	S	I_D = –30A, V_{DS} = –10V Note4
Input capacitance	Ciss	—	4100	—	pF	V_{DS} = –10V
Output capacitance	Coss	—	2100	—	pF	V_{GS} = 0
Reverse transfer capacitance	Crss	—	450	—	pF	f = 1MHz
Turn-on delay time	$t_{d(on)}$	—	32	—	ns	V_{GS} = –10V, I_D = –30A
Rise time	t_r	—	270	—	ns	R_L = 1Ω
Turn-off delay time	$t_{d(off)}$	—	570	—	ns	
Fall time	t_f	—	360	—	ns	
Body–drain diode forward voltage	V_{DF}	—	–1.1	—	V	I_F = –60A, V_{GS} = 0
Body–drain diode reverse recovery time	t_{rr}	—	115	—	ns	I_F = –60A, V_{GS} = 0 diF/ dt =50A/µs

Note: 4. Pulse test

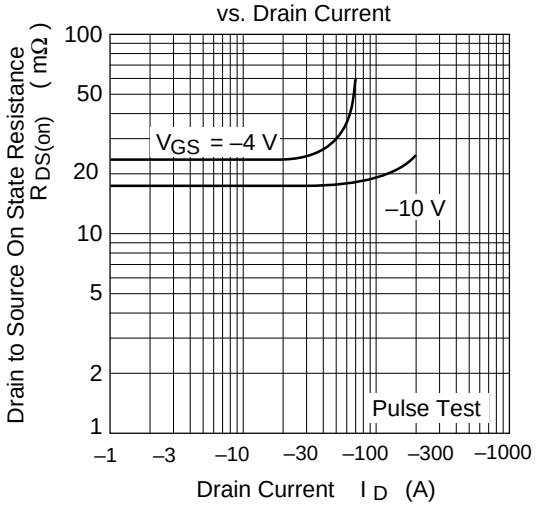
Main Characteristics



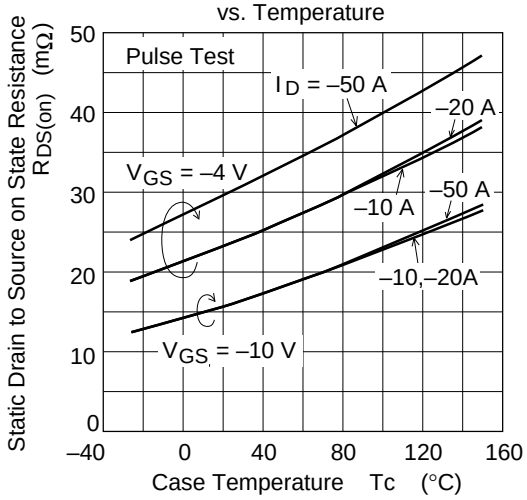
Drain to Source Saturation Voltage vs. Gate to Source Voltage



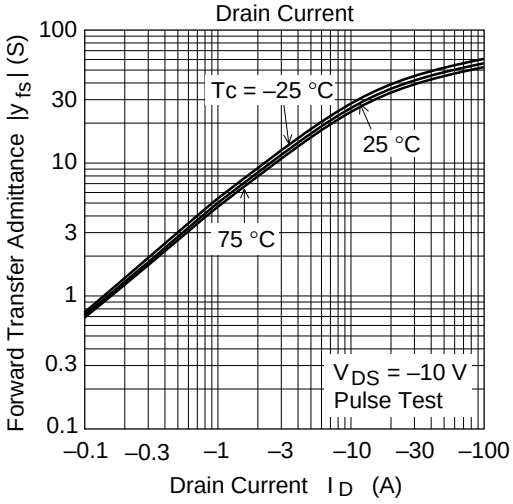
Static Drain to Source on State Resistance vs. Drain Current



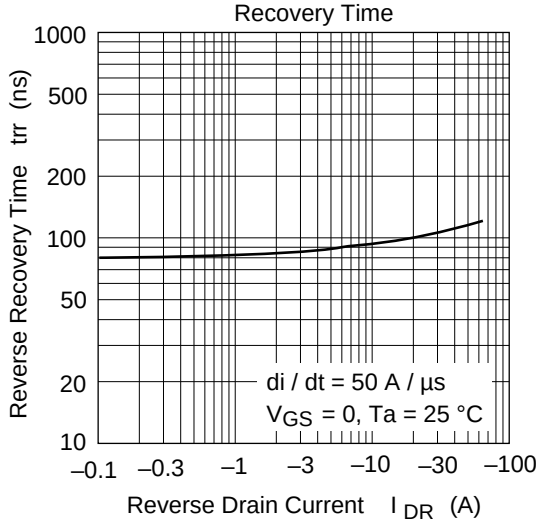
Static Drain to Source on State Resistance vs. Temperature



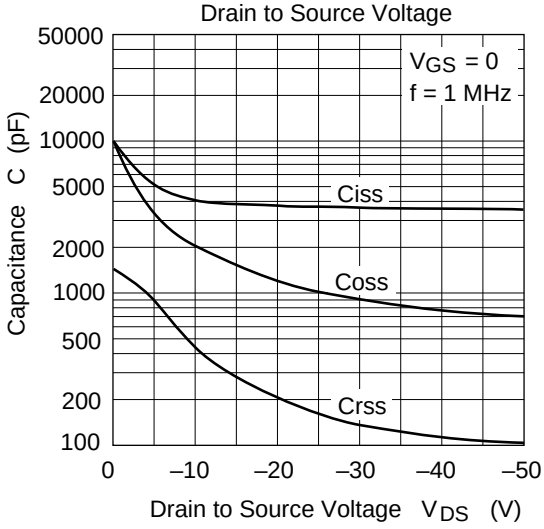
Forward Transfer Admittance vs. Drain Current



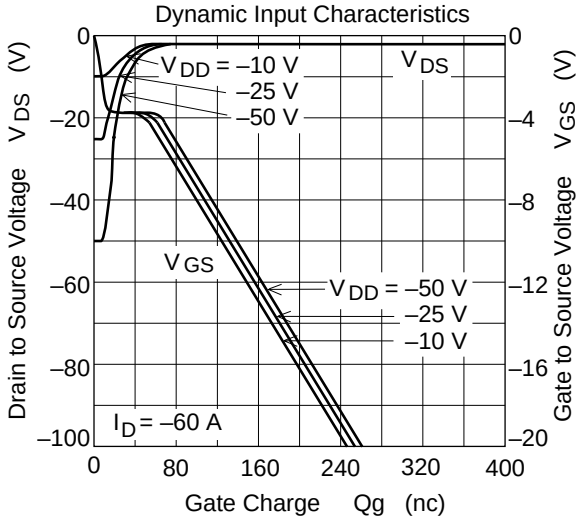
Body–Drain Diode Reverse Recovery Time



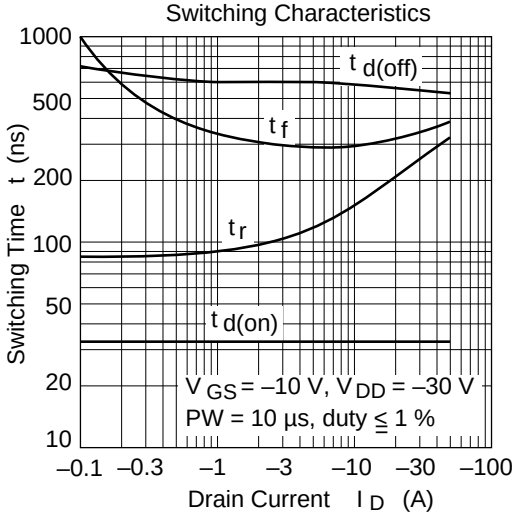
Typical Capacitance vs. Drain to Source Voltage



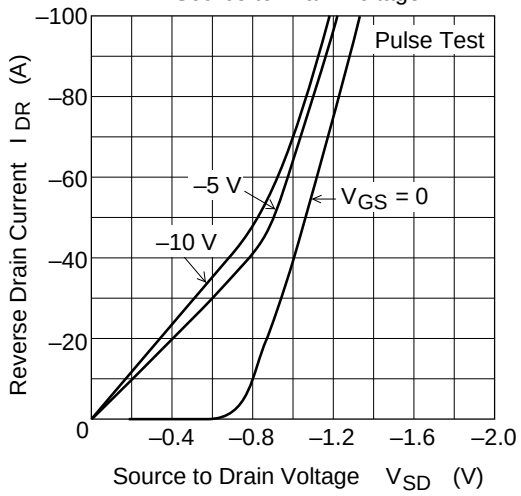
Dynamic Input Characteristics



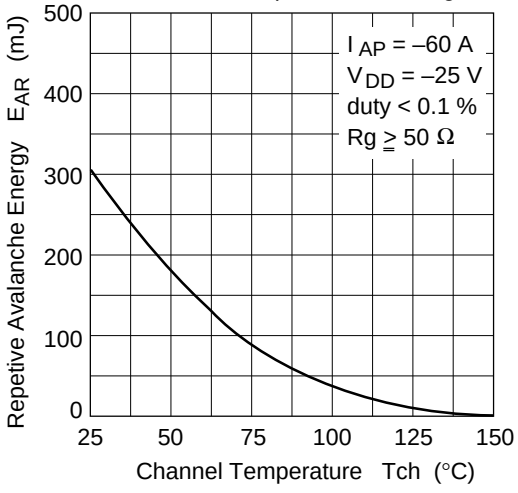
Switching Characteristics



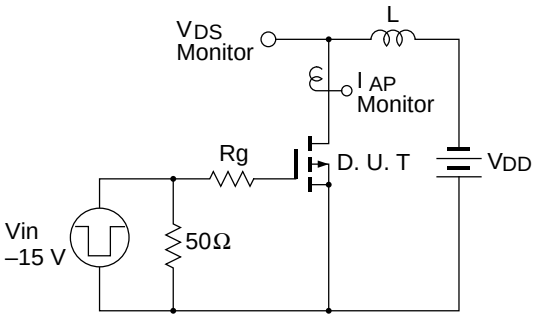
Reverse Drain Current vs.
Source to Drain Voltage



Maximum Avalanche Energy vs.
Channel Temperature Derating

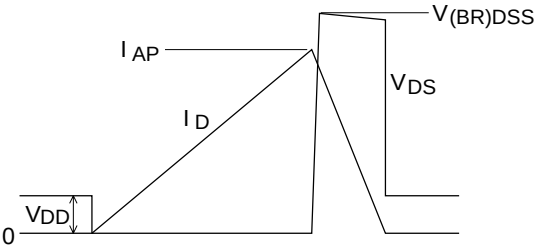


Avalanche Test Circuit

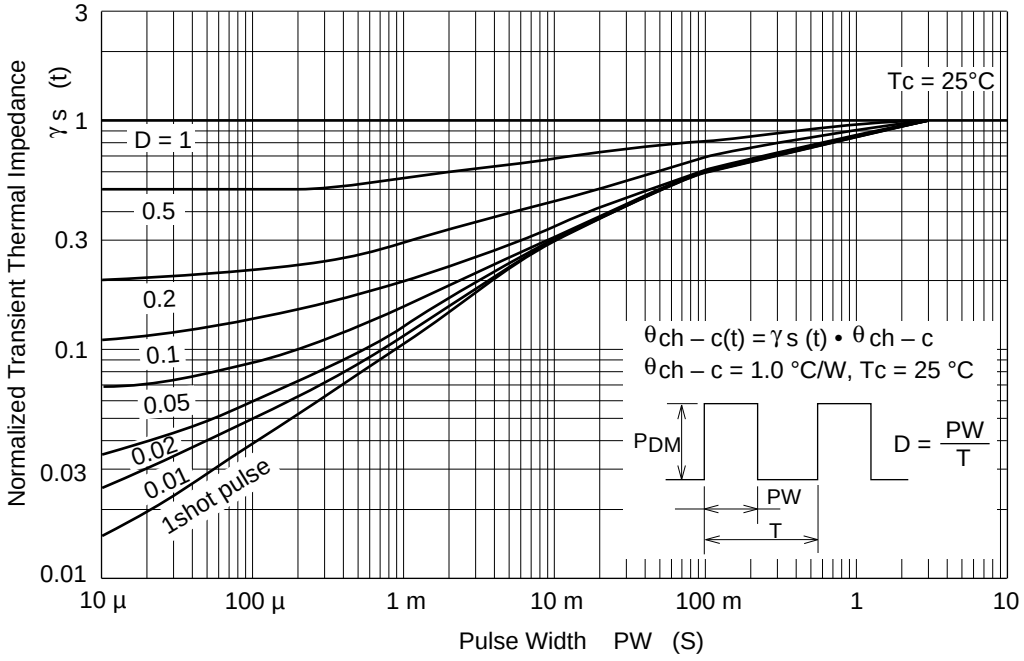


Avalanche Waveform

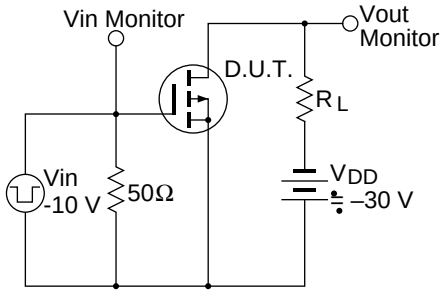
$$E_{AR} = \frac{1}{2} \bullet L \bullet I_{AP}^{2} \bullet \frac{V_{DSS}}{V_{DSS} - V_{DD}}$$



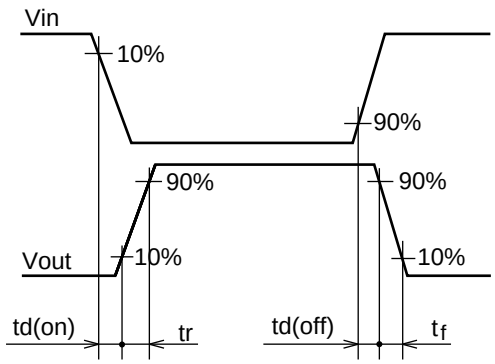
Normalized Transient Thermal Impedance vs. Pulse Width



Switching Time Test Circuit

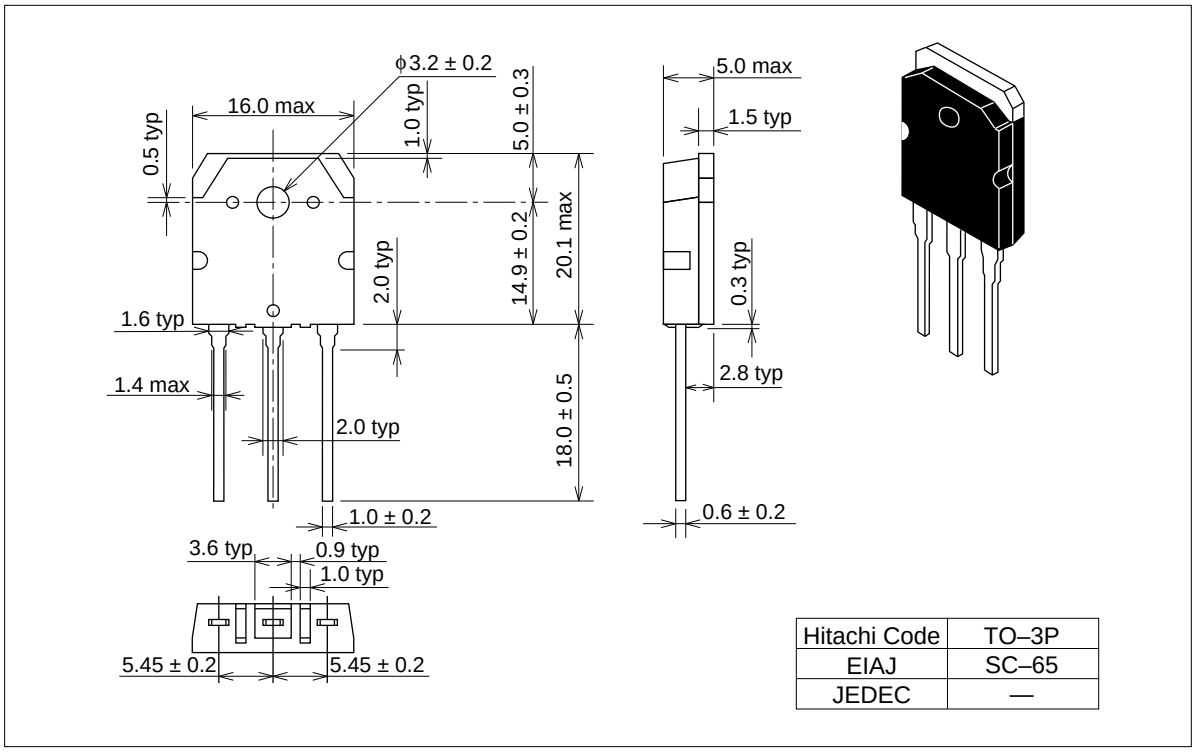


Waveform



Package Dimensions

Unit: mm



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HITACHI

Hitachi, Ltd.
Semiconductor & IC Div.
Nippon Bldg., 2-6-2, Ohte-machi, Chiyoda-ku, Tokyo 100, Japan
Tel: Tokyo (03) 3270-2111
Fax: (03) 3270-5109

For further information write to:

Hitachi America, Ltd.
Semiconductor & IC Div.
2000 Sierra Point Parkway
Brisbane, CA. 94005-1835
U S A
Tel: 415-589-8300
Fax: 415-583-4207

Hitachi Europe GmbH
Electronic Components Group
Continental Europe
Dornacher Straße 3
D-85622 Feldkirchen
München
Tel: 089-9 91 80-0
Fax: 089-9 29 30 00

Hitachi Europe Ltd.
Electronic Components Div.
Northern Europe Headquarters
Whitebrook Park
Lower Cookham Road
Maidenhead
Berkshire SL6 8YA
United Kingdom
Tel: 0628-585000
Fax: 0628-778322

Hitachi Asia Pte. Ltd.
16 Collyer Quay #20-00
Hitachi Tower
Singapore 0104
Tel: 535-2100
Fax: 535-1533

Hitachi Asia (Hong Kong) Ltd.
Unit 706, North Tower,
World Finance Centre,
Harbour City, Canton Road
Tsim Sha Tsui, Kowloon
Hong Kong
Tel: 27359218
Fax: 27306071