2SK1338

Silicon N-Channel MOS FET

HITACHI

ADE-208-1275 (Z)
1st. Edition
Mar. 2001

Application

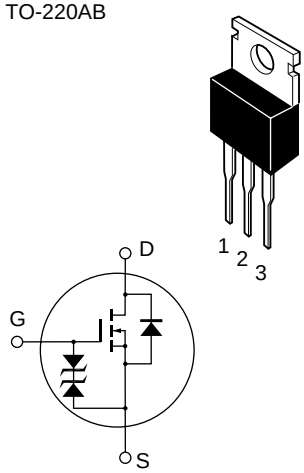
High speed power switching

Features

- Low on-resistance
- High speed switching
- Low drive current
- No secondary breakdown
- Suitable for switching regulator and DC-DC converter

Outline

TO-220AB



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

Hitachi semiconductor

Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Ratings	Unit
Drain to source voltage	V_{DSS}	900	V
Gate to source voltage	V_{GSS}	±30	V
Drain current	I_D	2	A
Drain peak current	$I_{D(pulse)}$*[1]	6	A
Body to drain diode reverse drain current	I_{DR}	2	A
Channel dissipation	Pch*[2]	50	W
Channel temperature	Tch	150	°C
Storage temperature	Tstg	–55 to +150	°C

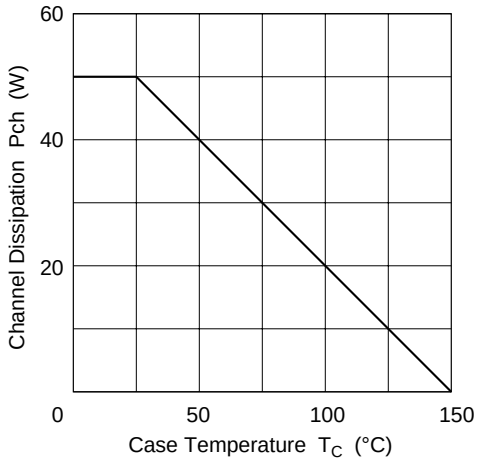
Notes: 1. PW 10 µs, duty cycle 1%
2. Value at T_C = 25°C

Electrical Characteristics (Ta = 25°C)

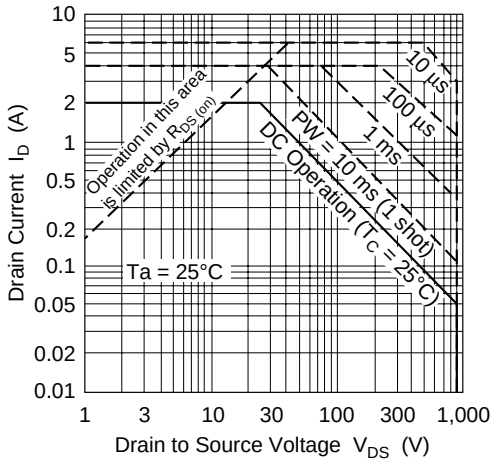
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	900	—	—	V	I_D = 10 mA, V_{GS} = 0
Gate to source breakdown voltage	$V_{(BR)GSS}$	±30	—	—	V	I_G = ±100 µA, V_{DS} = 0
Gate to source leak current	I_{GSS}	—	—	±10	µA	V_{GS} = ±25 V, V_{DS} = 0
Zero gate voltage drain current	I_{DSS}	—	—	250	µA	V_{DS} = 720 V, V_{GS} = 0
Gate to source cutoff voltage	$V_{GS(off)}$	2.0	—	3.0	V	I_D = 1 mA, V_{DS} = 10 V
Static drain to source on state resistance	$R_{DS(on)}$	—	5.0	7.0		I_D = 1 A, V_{GS} = 10 V *[1]
Forward transfer admittance	|yfs|	0.9	1.5	—	S	I_D = 1 A, V_{DS} = 20 V *[1]
Input capacitance	Ciss	—	425	—	pF	V_{DS} = 10 V, V_{GS} = 0,
Output capacitance	Coss	—	175	—	pF	f = 1 MHz
Reverse transfer capacitance	Crss	—	85	—	pF	
Turn-on delay time	$t_{d(on)}$	—	10	—	ns	I_D = 1 A, V_{GS} = 10 V,
Rise time	t_r	—	35	—	ns	R_L = 30
Turn-off delay time	$t_{d(off)}$	—	60	—	ns	
Fall time	t_f	—	50	—	ns	
Body to drain diode forward voltage	V_{DF}	—	0.9	—	V	I_F = 2 A, V_{GS} = 0
Body to drain diode reverse recovery time	t_{rr}	—	700	—	ns	I_F = 2 A, V_{GS} = 0, di_F/dt = 100 A/µs

Note: 1. Pulse test

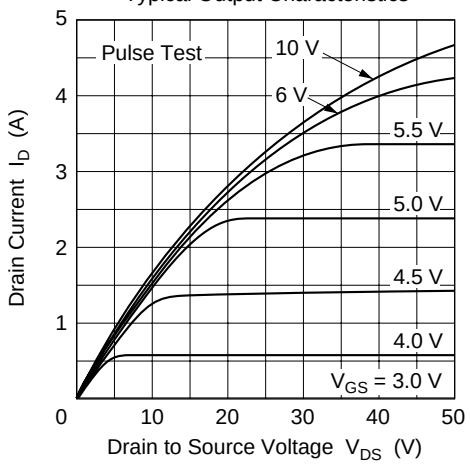
Power vs. Temperature Derating



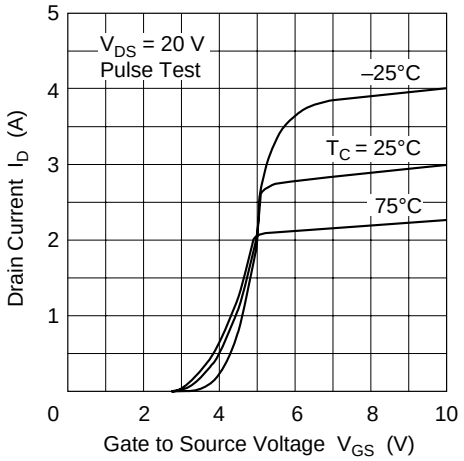
Maximum Safe Operation Area



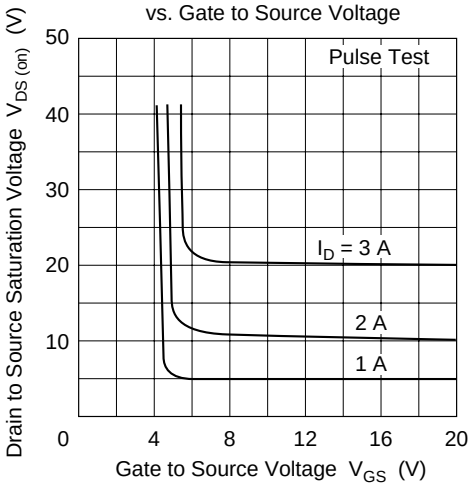
Typical Output Characteristics



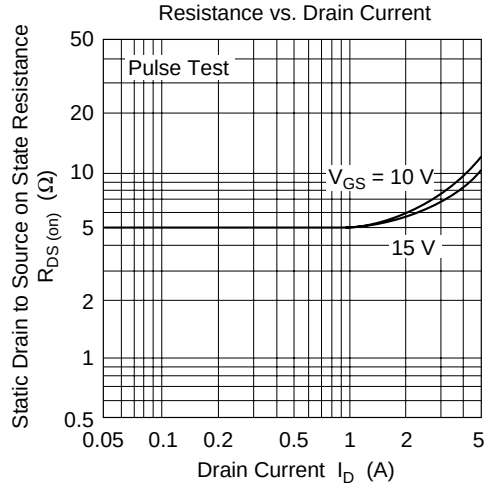
Typical Transfer Characteristics



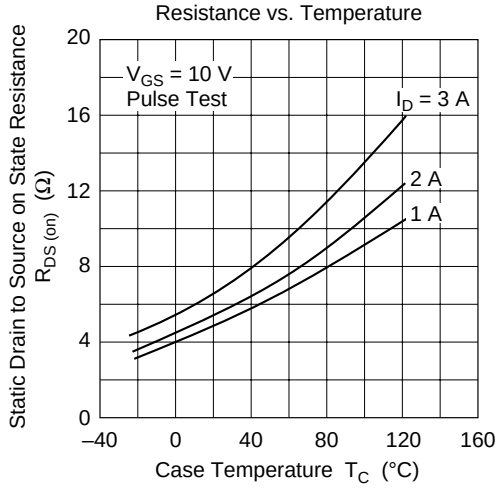
Drain to Source Saturation Voltage vs. Gate to Source Voltage



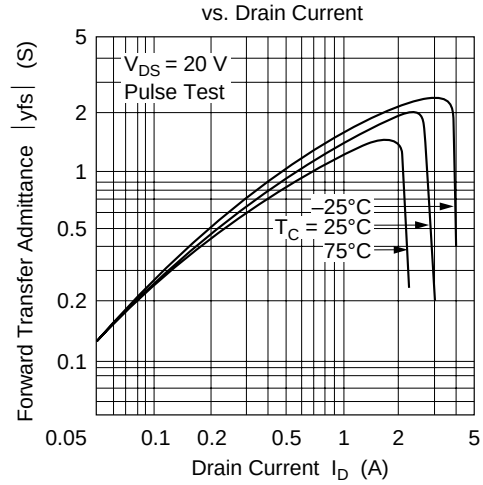
Static Drain to Source on State Resistance vs. Drain Current



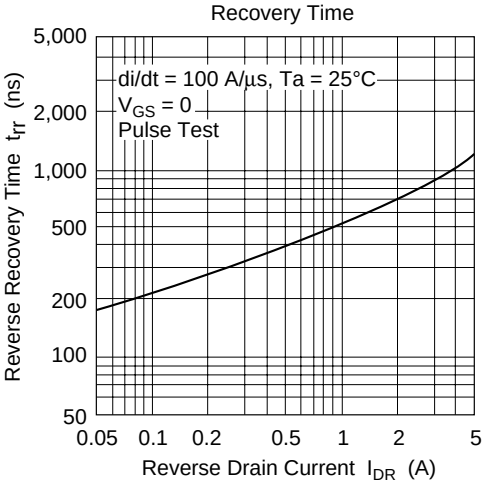
Static Drain to Source on State Resistance vs. Temperature



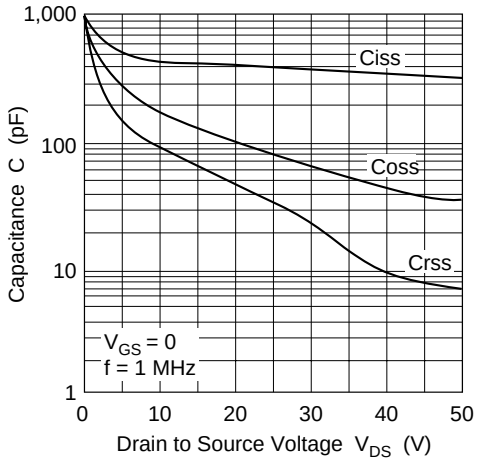
Forward Transfer Admittance vs. Drain Current



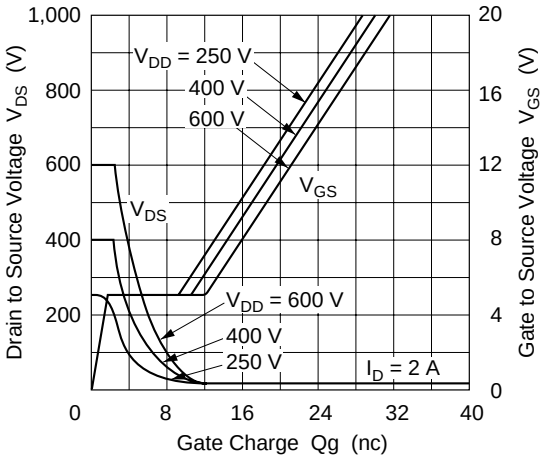
Body to Drain Diode Reverse Recovery Time



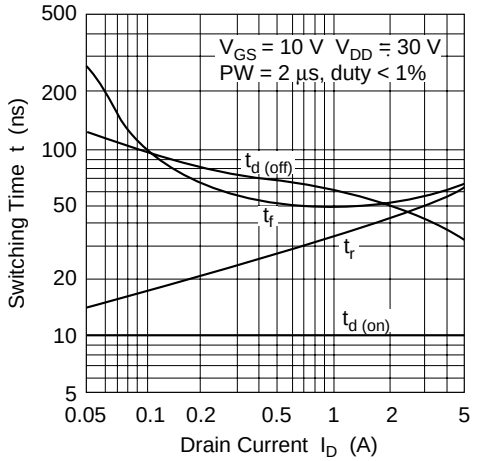
Typical Capacitance vs. Drain to Source Voltage



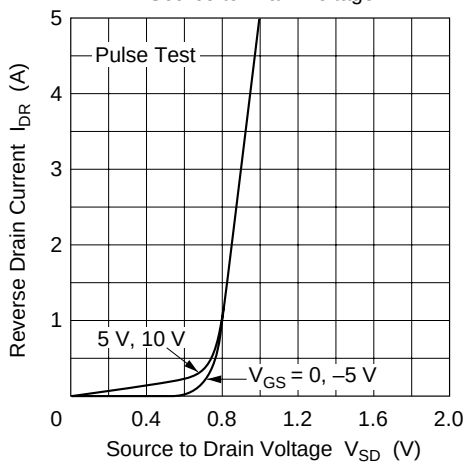
Dynamic Input Characteristics



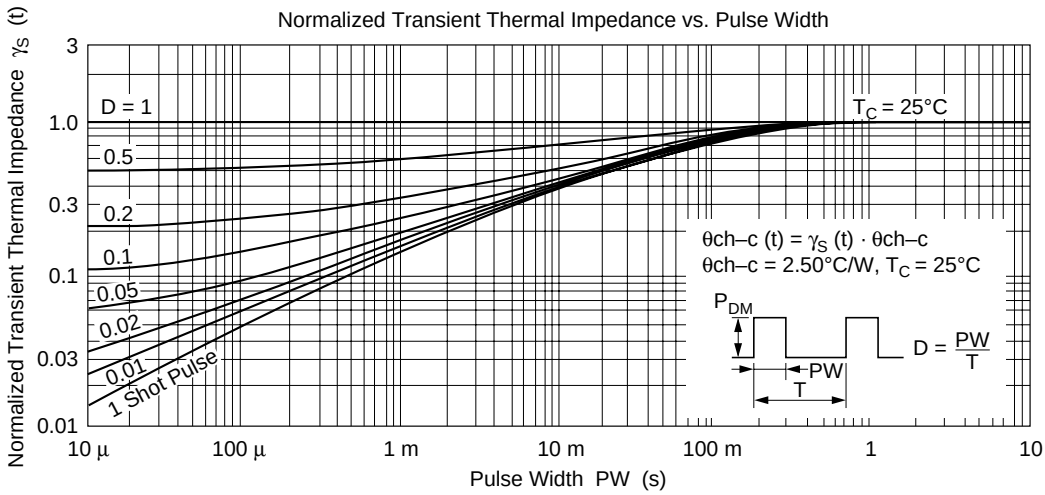
Switching Characteristics



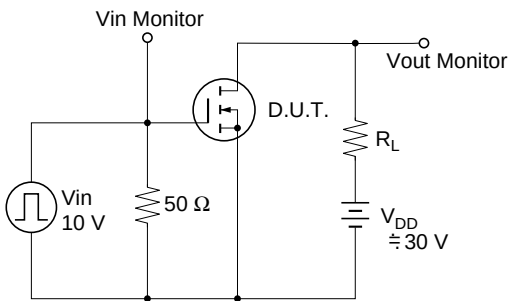
Reverse Drain Current vs.
Source to Drain Voltage



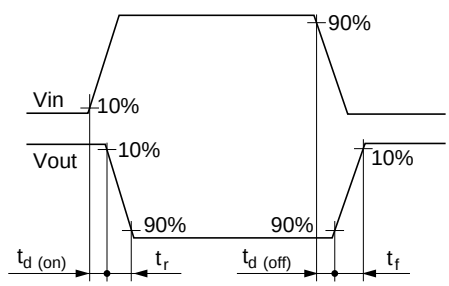
Normalized Transient Thermal Impedance vs. Pulse Width



Switching Time Test Circuit

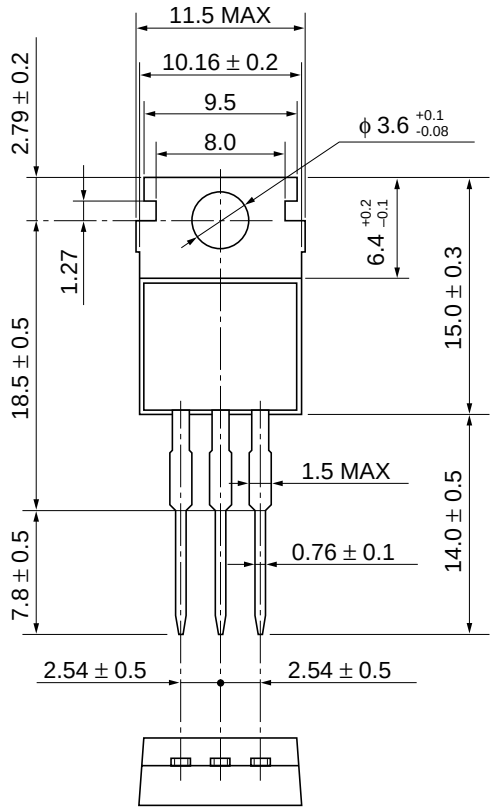


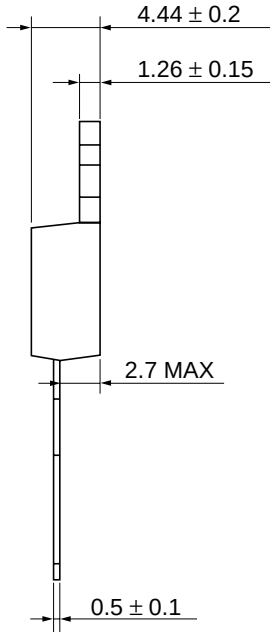
Waveforms

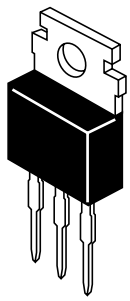


Package Dimensions

As of January, 2001
Unit: mm







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

Cautions

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