

# 2SK3235

Silicon N Channel MOS FET  
High Speed Power Switching

# HITACHI

ADE-208-1371 (Z)

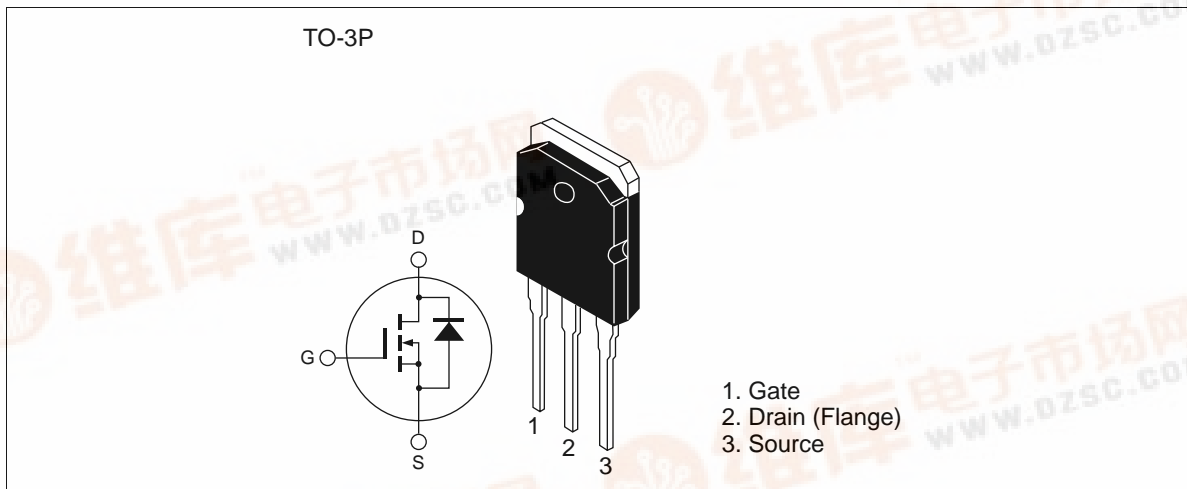
1st. Edition

Mar. 2001

## Features

- Low on-resistance:  $R_{DS(on)} = 0.3 \Omega$  typ.
- Low leakage current:  $IDSS = 1 \mu A$  max (at  $V_{DS} = 500 V$ )
- High speed switching:  $t_f = 50 ns$  typ (at  $V_{GS} = 10 V$ ,  $V_{DD} = 250 V$ ,  $I_D = 7.5 A$ )
- Low gate charge:  $Q_g = 48 nC$  typ (at  $V_{DD} = 400 V$ ,  $V_{GS} = 10 V$ ,  $I_D = 15 A$ )
- Avalanche ratings

## Outline



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## 2SK3235

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### Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Value	Unit
Drain to source voltage	$V_{DSS}$	500	V
Gate to source voltage	$V_{GSS}$	±30	V
Drain current	$I_D$	15	A
Drain peak current	$I_{D (pulse)}$ <sup>Note1</sup>	60	A
Body-drain diode reverse drain current	$I_{DR}$	15	A
Body-drain diode reverse drain peak current	$I_{DR (pulse)}$ <sup>Note1</sup>	60	A
Avalanche current	$I_{AP}$ <sup>Note3</sup>	15	A
Channel dissipation	$P_{ch}$ <sup>Note2</sup>	150	W
Channel to case Thermal Impedance	$\theta_{ch-c}$	0.833	°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  $T_c = 25^\circ C$   
3.  $T_{ch} \leq 150^\circ C$



## Electrical Characteristics (Ta = 25°C)

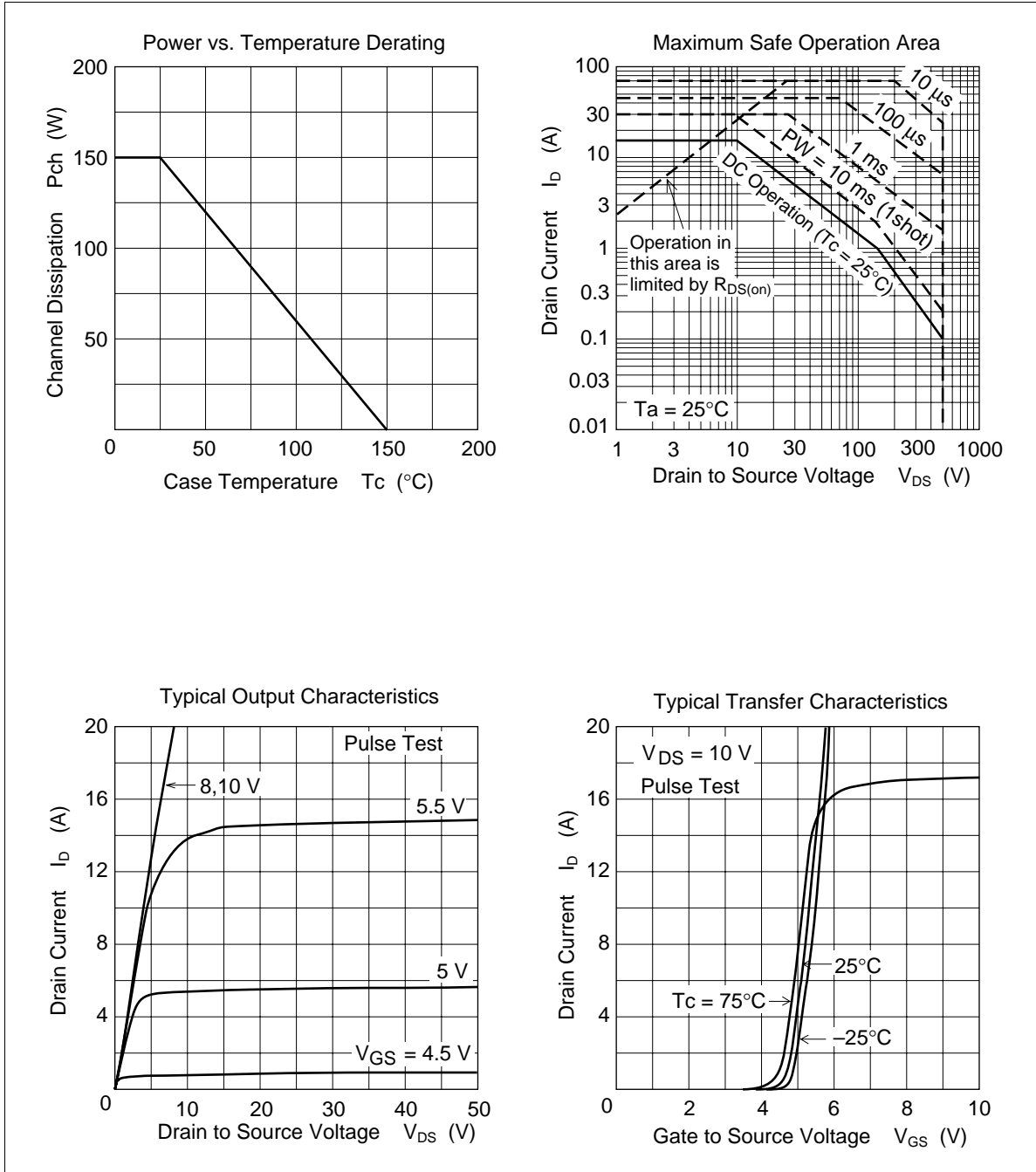
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	500	—	—	V	$I_D = 10 \text{ mA}$ , $V_{GS} = 0$
Gate to source leak current	$I_{GSS}$	—	—	$\pm 0.1$	$\mu\text{A}$	$V_{GS} = \pm 30 \text{ V}$ , $V_{DS} = 0$
Zero gate voltage drain current	$I_{DSS}$	—	—	1	$\mu\text{A}$	$V_{DS} = 500 \text{ V}$ , $V_{GS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	3.0	—	4.0	V	$V_{DS} = 10 \text{ V}$ , $I_D = 1 \text{ mA}$
Static drain to source on state resistance	$R_{DS(on)}$	—	0.3	0.4	$\Omega$	$I_D = 7.5 \text{ A}$ , $V_{GS} = 10 \text{ V}$ <sup>Note4</sup>
Forward transfer admittance	$ y_{fs} $	8.5	14	—	S	$I_D = 7.5 \text{ A}$ , $V_{DS} = 10 \text{ V}$ <sup>Note4</sup>
Input capacitance	$C_{iss}$	—	1920	—	pF	$V_{DS} = 25 \text{ V}$
Output capacitance	$C_{oss}$	—	220	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	$C_{rss}$	—	30	—	pF	$f = 1 \text{ MHz}$
Turn-on delay time	$t_{d(on)}$	—	35	—	ns	$I_D = 7.5 \text{ A}$
Rise time	$t_r$	—	30	—	ns	$V_{GS} = 10 \text{ V}$
Turn-off delay time	$t_{d(off)}$	—	120	—	ns	$R_L = 33.3 \Omega$
Fall time	$t_f$	—	50	—	ns	$R_g = 10 \Omega$
Total gate charge	$Q_g$	—	48	—	nC	$V_{DD} = 400 \text{ V}$
Gate to source charge	$Q_{gs}$	—	10	—	nC	$V_{GS} = 10 \text{ V}$
Gate to drain charge	$Q_{gd}$	—	24	—	nC	$I_D = 15 \text{ A}$
Body-drain diode forward voltage	$V_{DF}$	—	0.85	1.3	V	$I_F = 15 \text{ A}$ , $V_{GS} = 0$
Body-drain diode reverse recovery time	$t_{rr}$	—	500	—	ns	$I_F = 15 \text{ A}$ , $V_{GS} = 0$
Body-drain diode reverse recovery charge	$Q_{rr}$	—	20	—	$\mu\text{C}$	$diF/dt = 100 \text{ A}/\mu\text{s}$

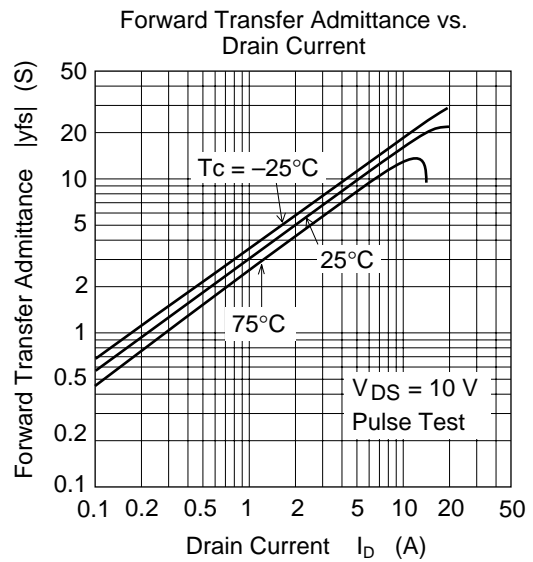
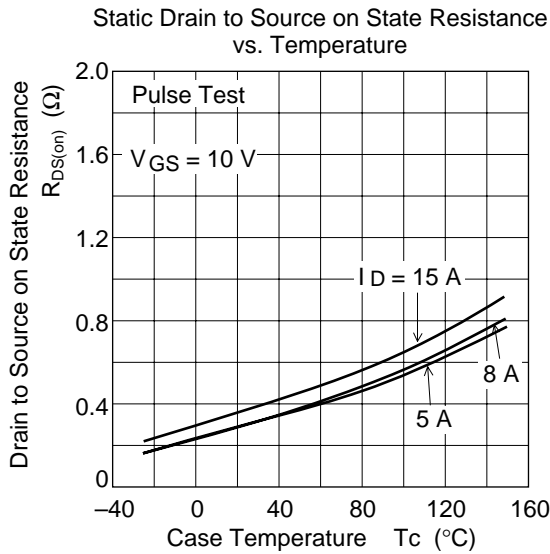
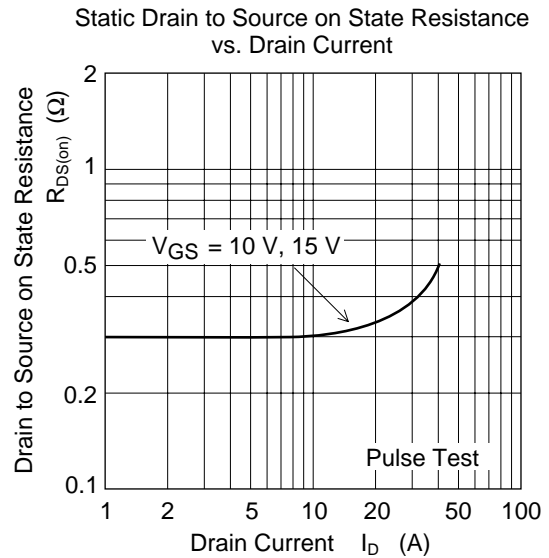
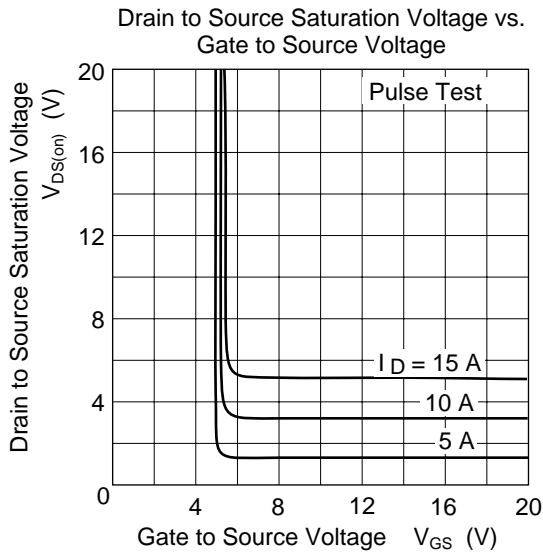
Note: 4. Pulse test



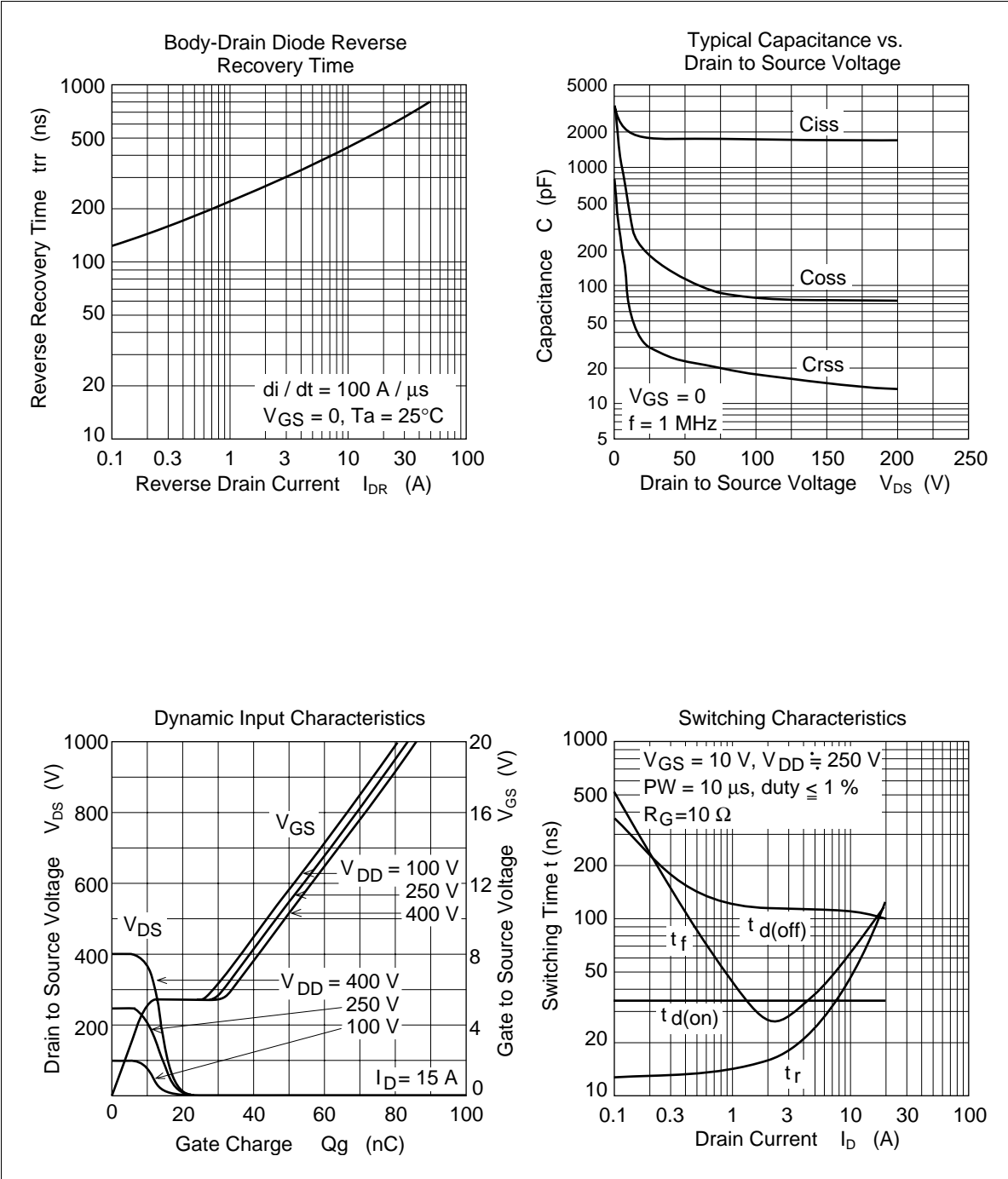
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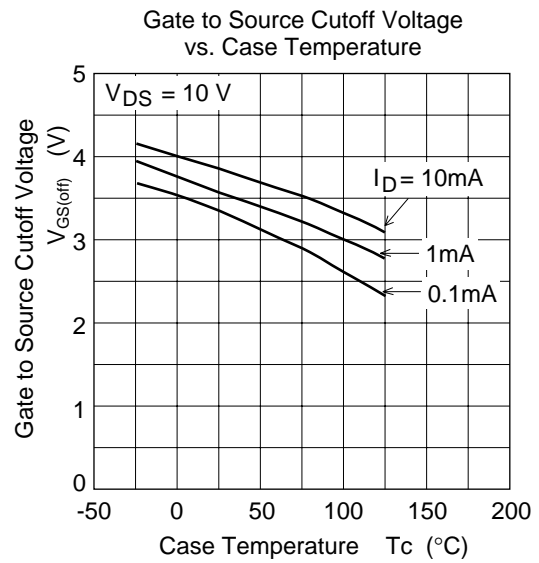
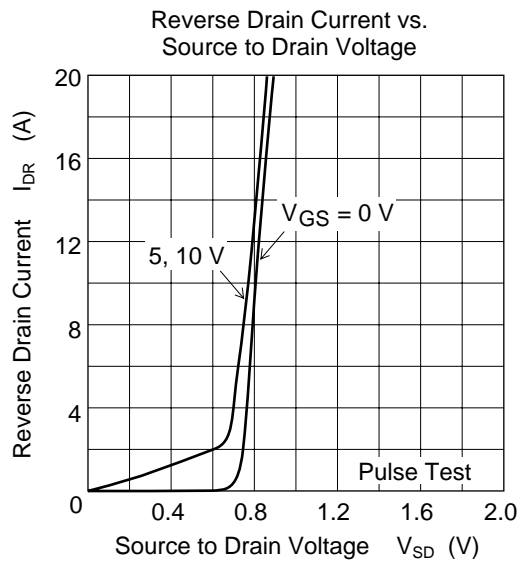
## Main Characteristics



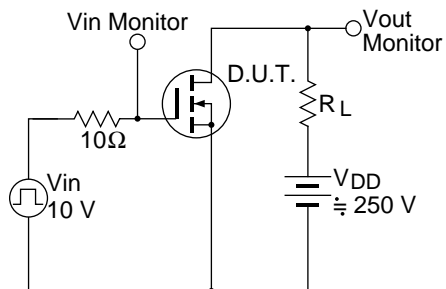


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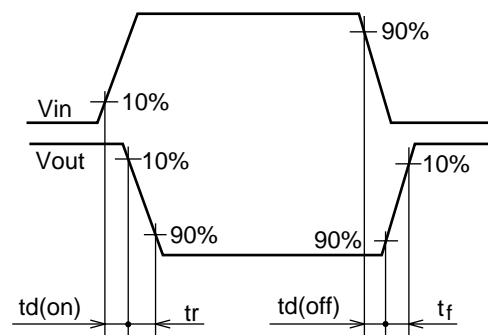




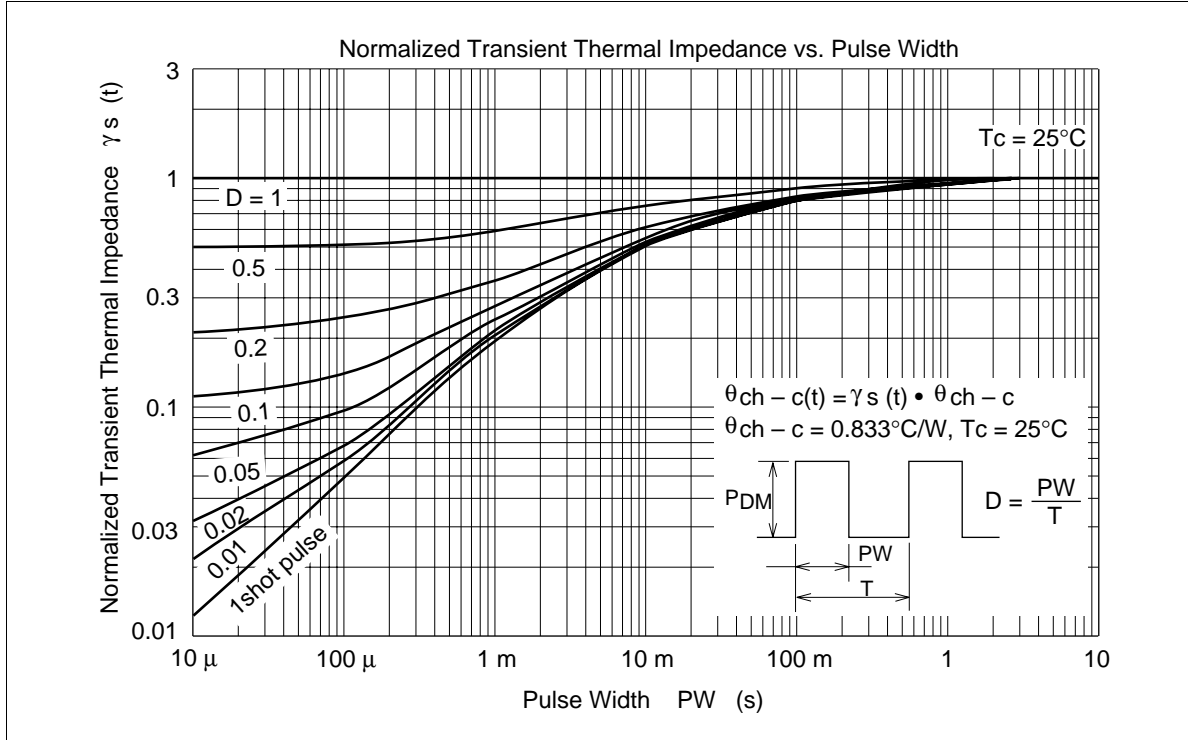
Switching Time Test Circuit



Waveform

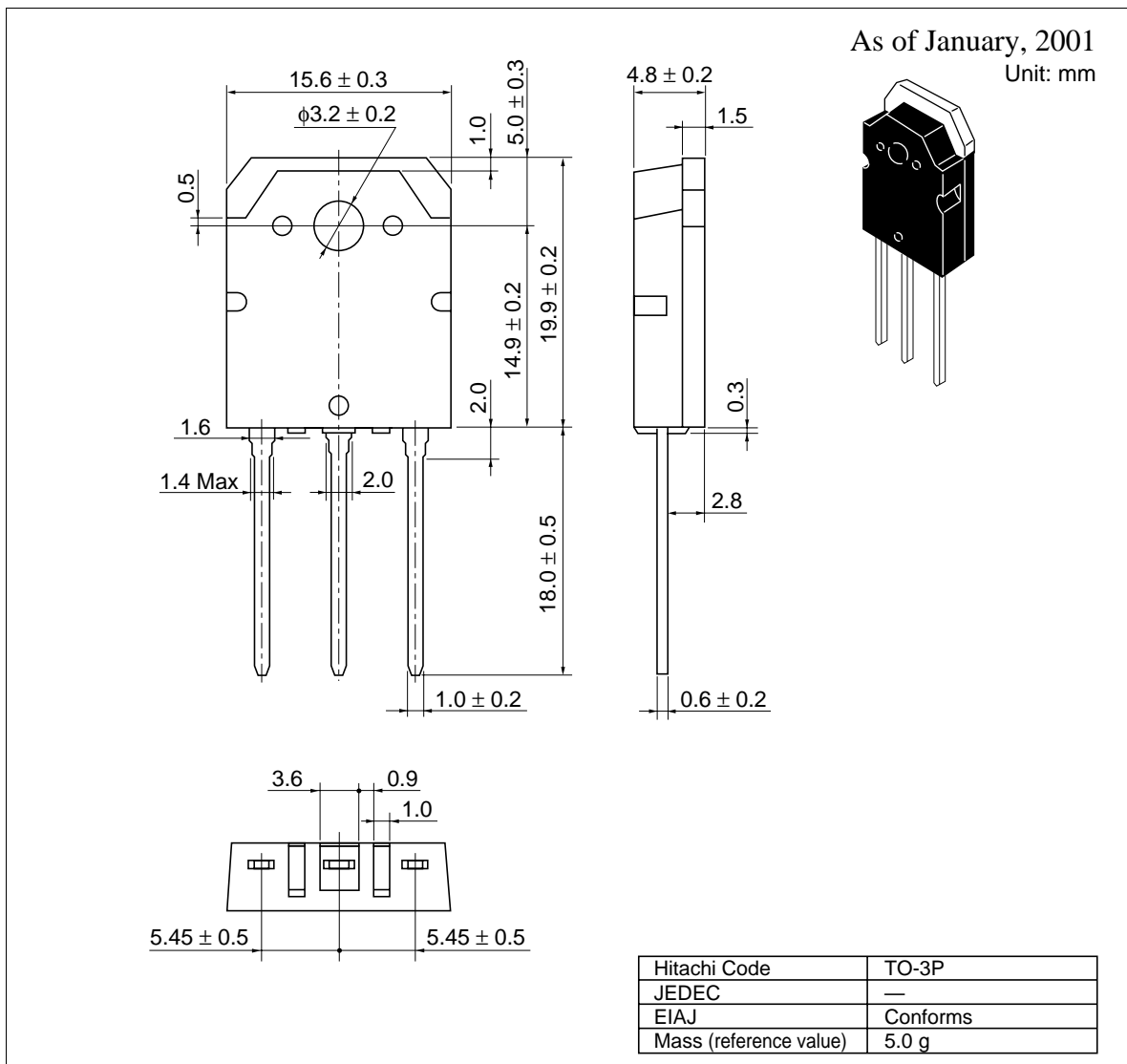


## 2SK3235





Package Dimensions



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