

H5N3004P

Silicon N Channel MOS FET
High Speed Power Switching

RENESAS

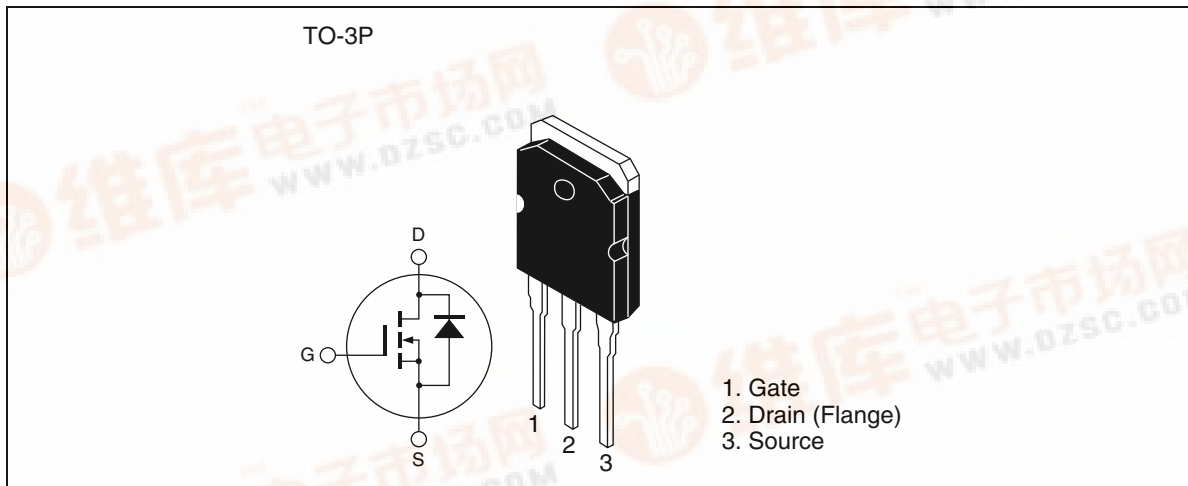
ADE-208-1523 (Z)

Rev.0
Apr. 2002

Features

- Low on-resistance
- Low leakage current
- High speed switching
- Low gate charge (Qg)
- Avalanche ratings

Outline



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Absolute Maximum Ratings

(Ta=25°C)

Item	Symbol	Ratings	Unit
Drain to source voltage	V_{DSS}	300	V
Gate to source voltage	V_{GSS}	±30	V
Drain current	I_D	25	A
Drain peak current	I_D (pulse) ^{Note1}	100	A
Body-drain diode reverse drain current	I_{DR}	25	A
Body-drain diode reverse drain peak current	I_{DR} (pulse) ^{Note1}	100	A
Avalanche current	I_{AP} ^{Note3}	25	A
Channel dissipation	Pch ^{Note2}	150	W
Channel to case Thermal impedance	θ_{ch-c}	0.833	°C/W
Channel temperature	Tch	150	°C
Storage temperature	Tstg	-55 to +150	°C

Notes: 1. PW ≤ 10 μs, duty cycle ≤ 1%
2. Value at Tc = 25°C
3. Tch ≤ 150°C

Electrical Characteristics

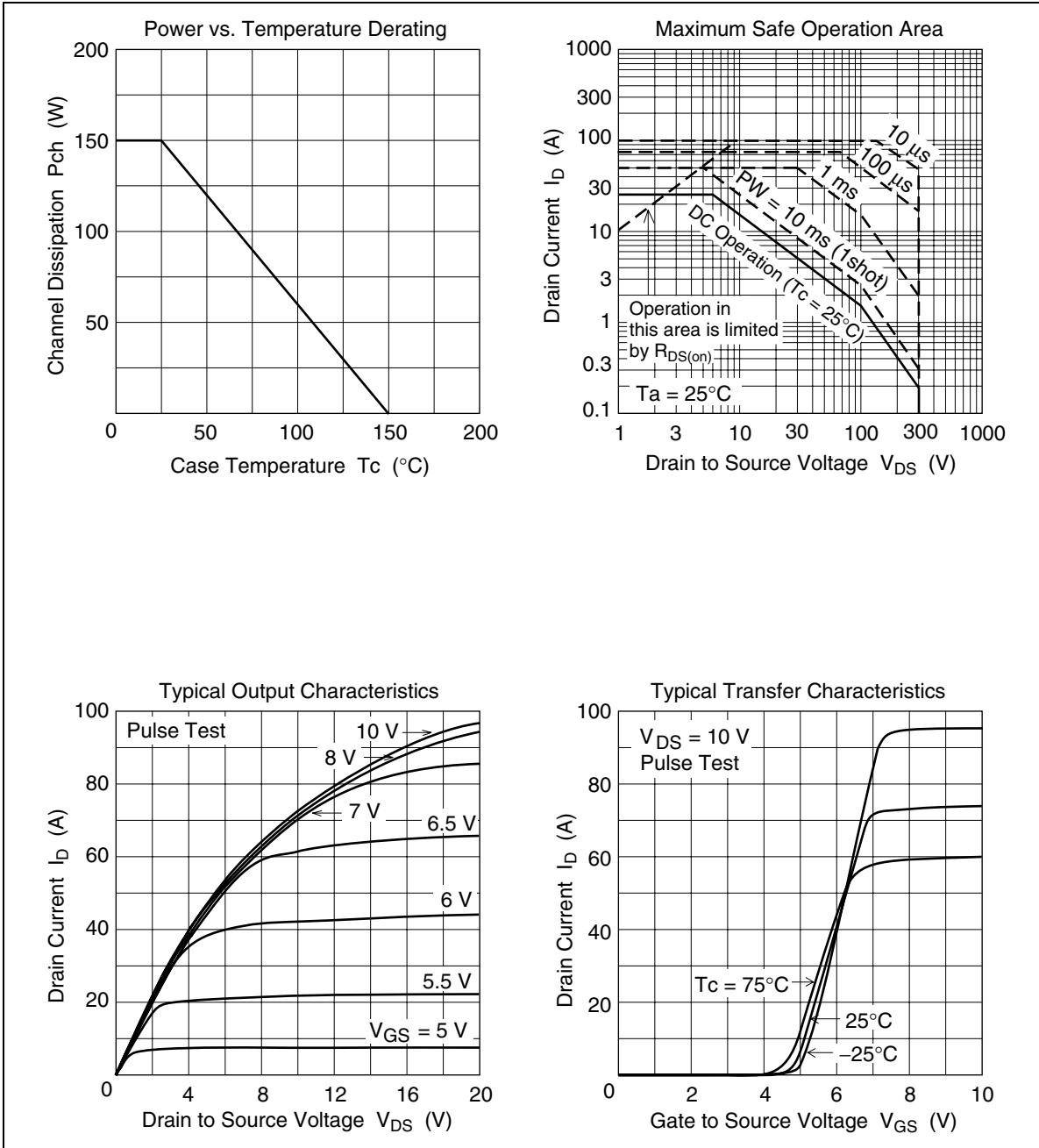
(Ta=25°C)

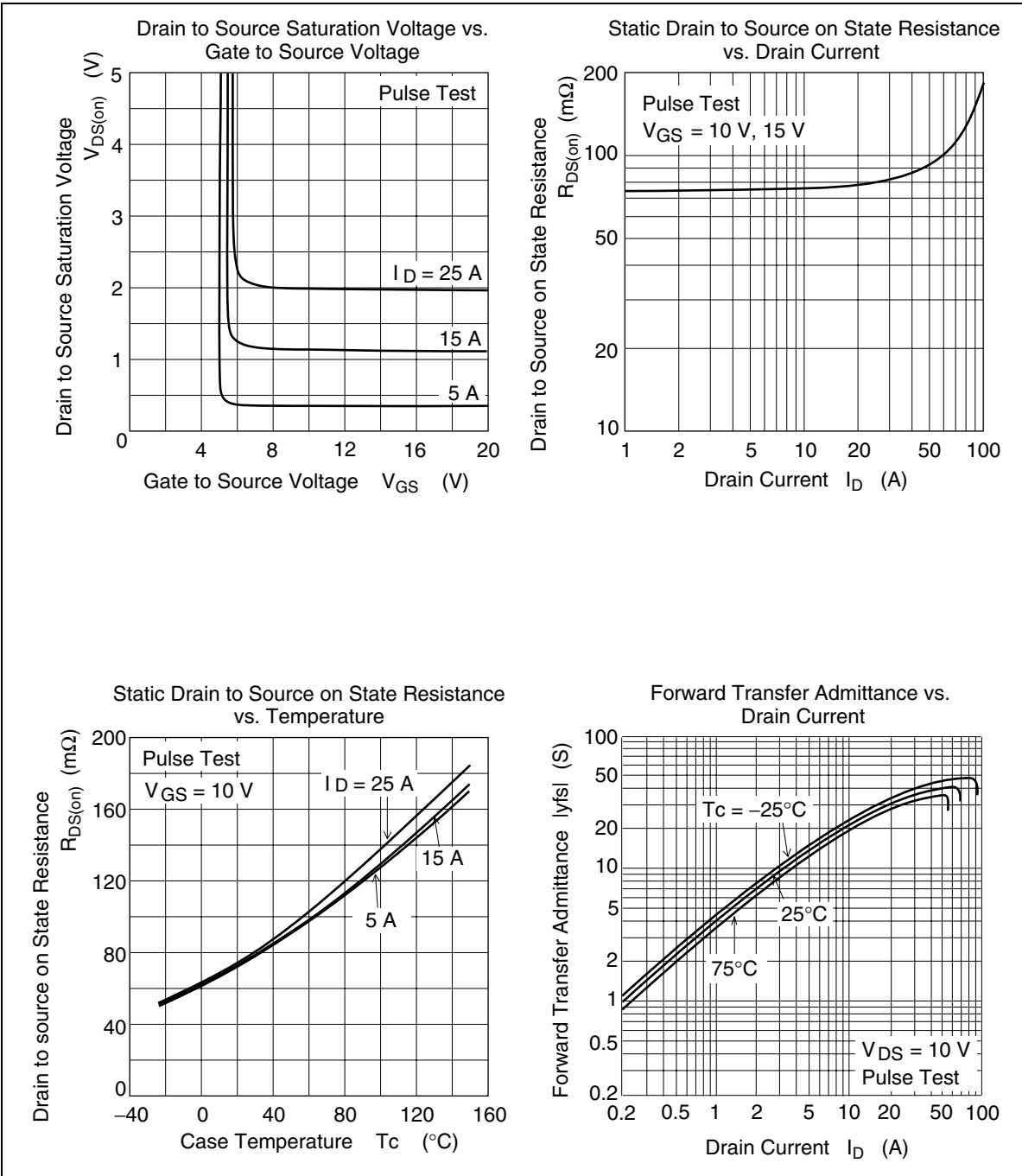
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	300	•	—	V	$I_D = 10 \text{ mA}$, $V_{GS} = 0$
Zero gate voltage drain current	I_{DSS}	—	•	1	μA	$V_{DS} = 300 \text{ V}$, $V_{GS} = 0$
Gate to source leak current	I_{GSS}	—	•	± 0.1	μA	$V_{GS} = \pm 30 \text{ V}$, $V_{DS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	3.0	•	4.0	V	$V_{DS} = 10 \text{ V}$, $I_D = 1 \text{ mA}$
Forward transfer admittance	$ y_{fs} $	15	25	—	S	$I_D = 12.5 \text{ A}$, $V_{DS} = 10 \text{ V}^{\text{Note4}}$
Static drain to source on state resistance	$R_{DS(on)}$	—	0.076	0.093	Ω	$I_D = 12.5 \text{ A}$, $V_{GS} = 10 \text{ V}^{\text{Note4}}$
Input capacitance	C_{iss}	—	3600	•	pF	$V_{DS} = 25 \text{ V}$
Output capacitance	C_{oss}	—	400	•	pF	$V_{GS} = 0$
Reverse transfer capacitance	C_{rss}	—	100	•	pF	$f = 1 \text{ MHz}$
Turn-on delay time	$td(on)$	—	50	•	ns	$I_D = 12.5 \text{ A}$
Rise time	tr	—	120	—	ns	$R_L = 12 \Omega$
Turn-off delay time	$td(off)$	—	180	•	ns	$V_{GS} = 10 \text{ V}$
Fall time	tf	—	90	—	ns	$R_g = 10 \Omega$
Total gate charge	Q_g	—	110	—	nC	$V_{DD} = 240 \text{ V}$
Gate to source charge	Q_{gs}	—	18	—	nC	$V_{GS} = 10 \text{ V}$
Gate to drain charge	Q_{gd}	—	55	—	nC	$I_D = 25 \text{ A}$
Body-drain diode forward voltage	V_{DF}	—	0.9	1.35	V	$I_F = 25 \text{ A}$, $V_{GS} = 0$
Body-drain diode reverse recovery time	trr	—	250	—	ns	$I_F = 25 \text{ A}$, $V_{GS} = 0$ $diF/dt = 100 \text{ A}/\mu\text{s}$
Body-drain diode reverse recovery charge	Q_{rr}	—	2.3	—	μC	

Notes: 4. Pulse test

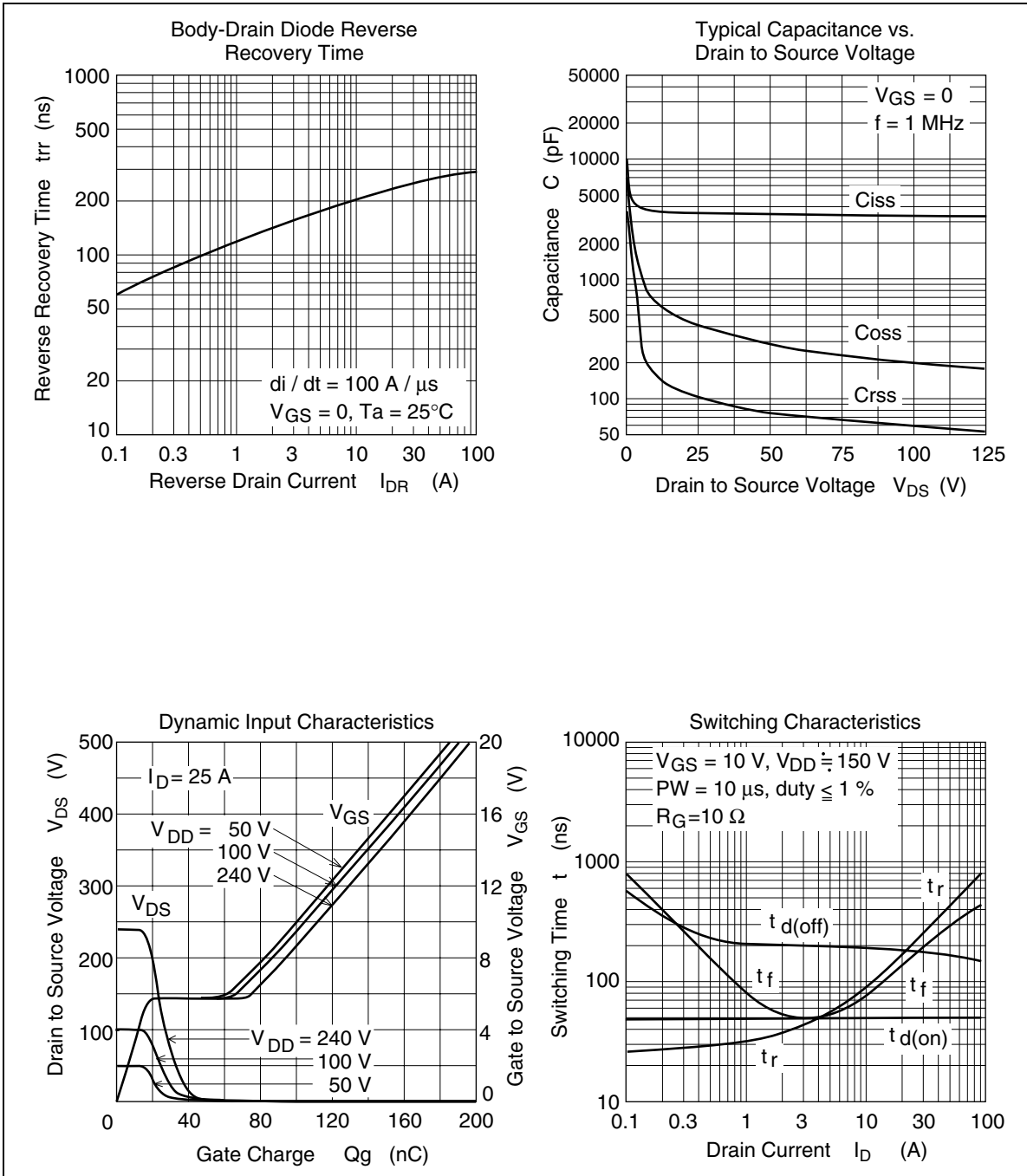
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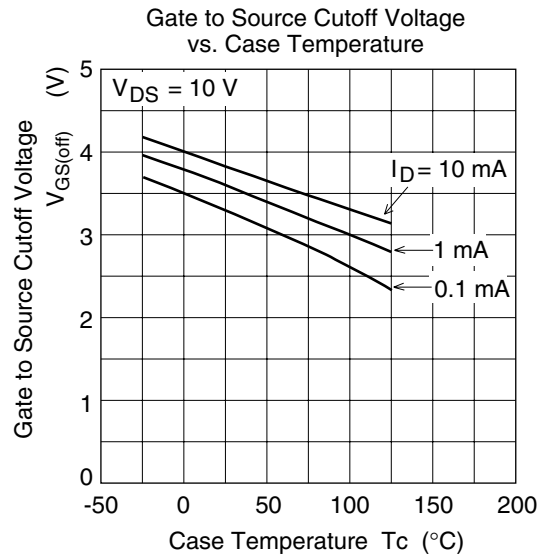
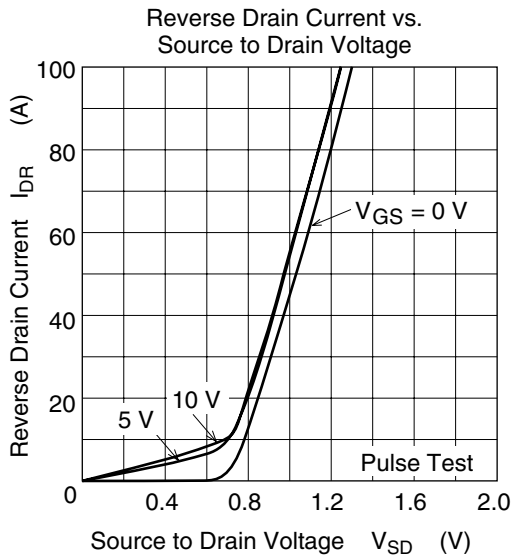
Main Characteristics



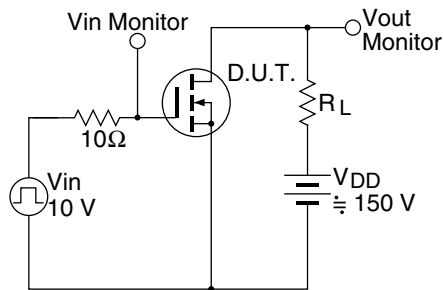


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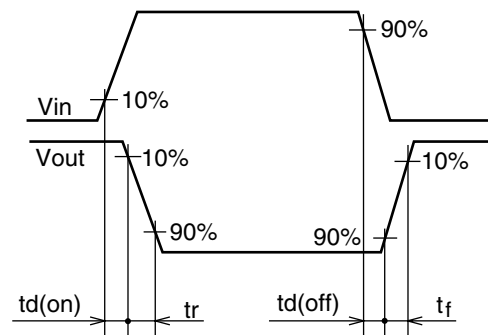




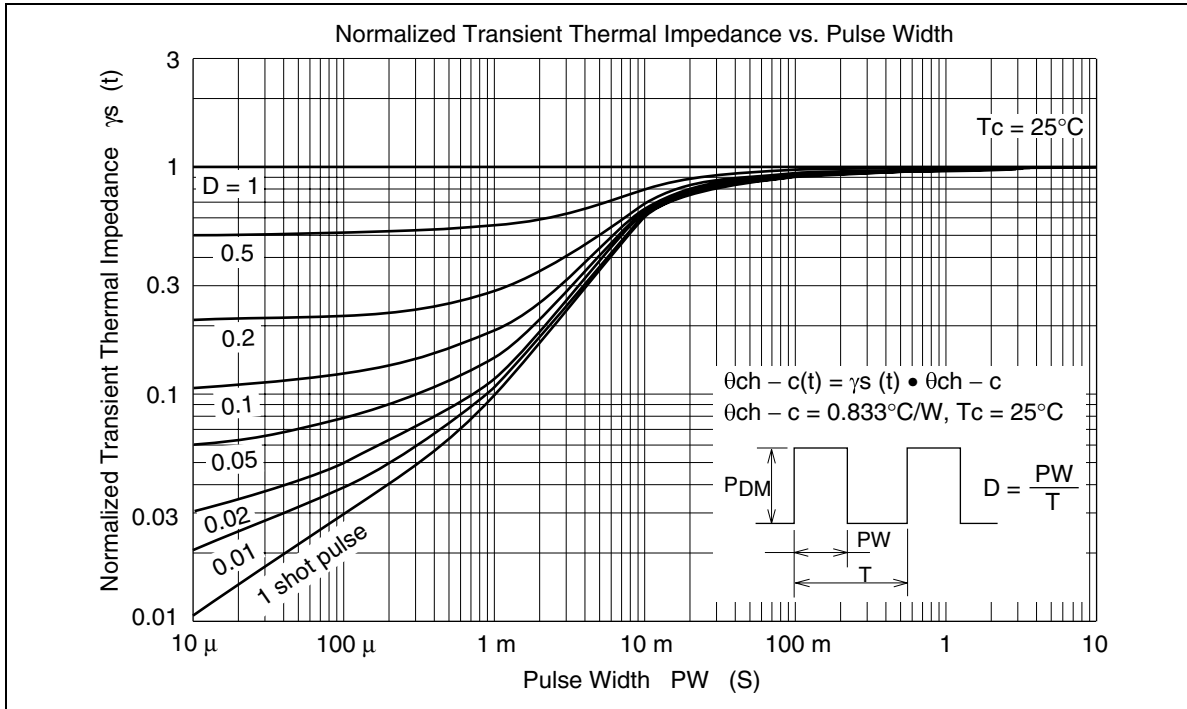
Switching Time Test Circuit



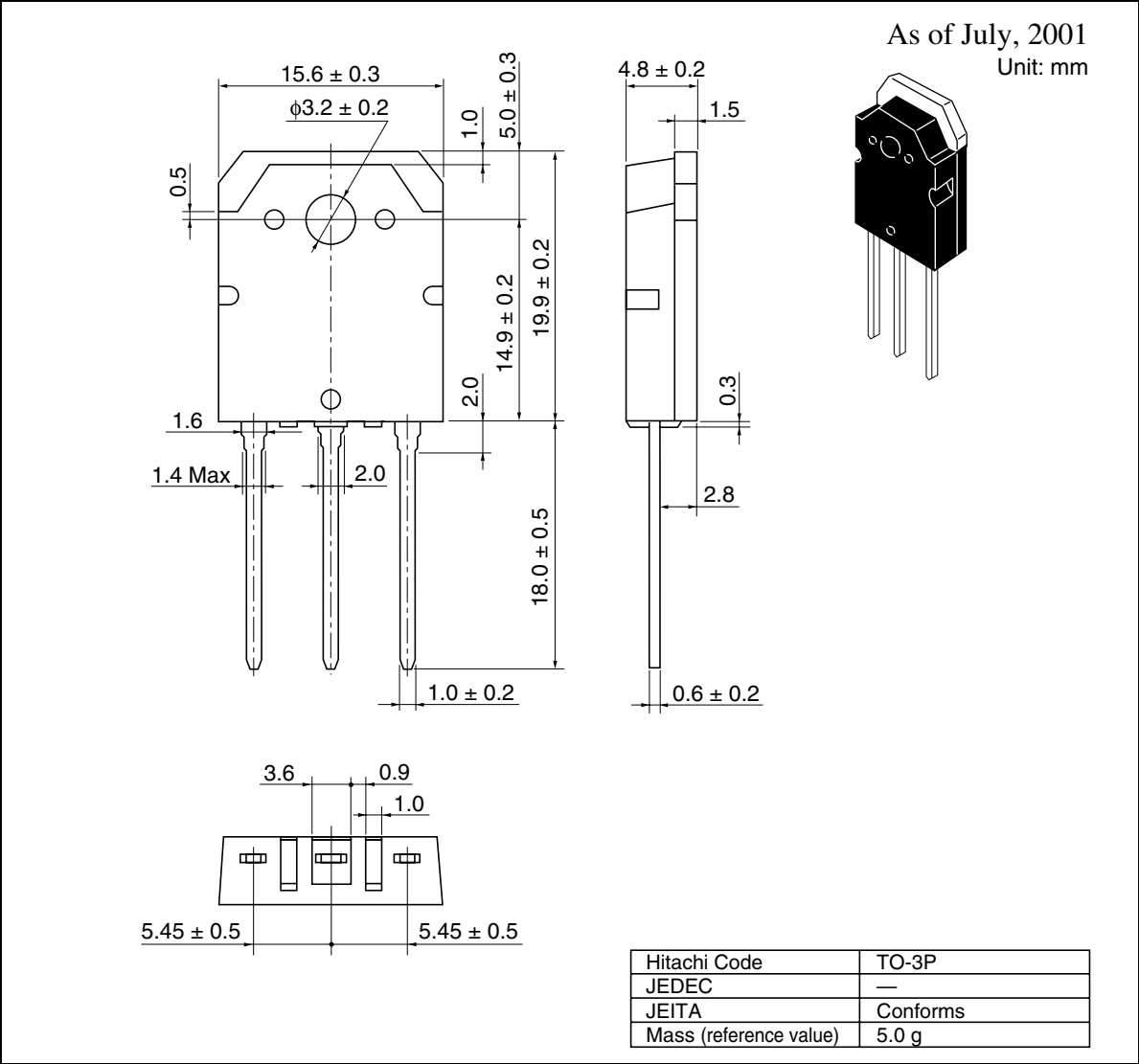
Waveform



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Package Dimensions



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