

2SK2728

Silicon N Channel MOS FET
High Speed Power Switching

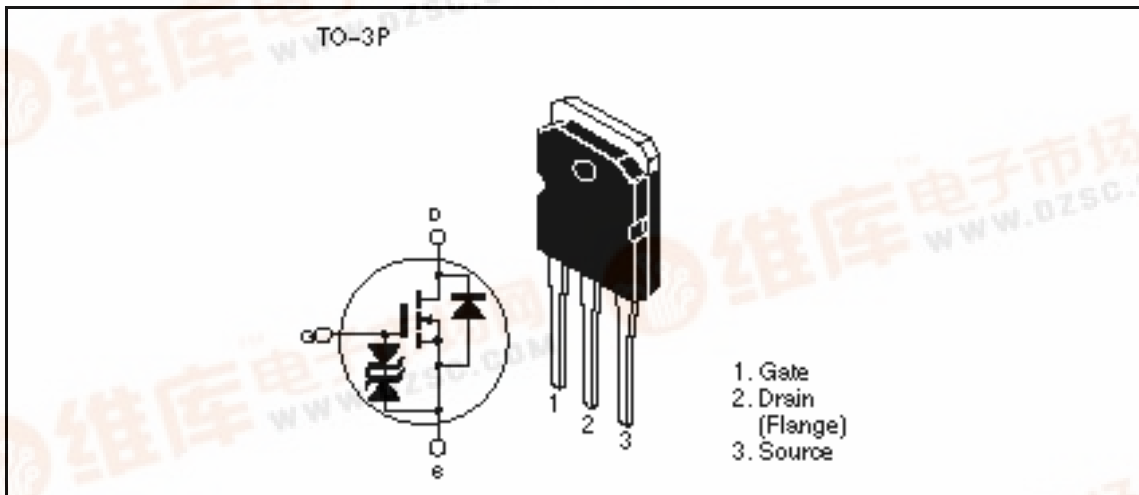
HITACHI

ADE-208-454 B
3rd. Edition

Features

- Low on-resistance
- High speed switching
- Low drive current
- Avalanche ratings

Outline



2SK2728

Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Ratings	Unit
Drain to source voltage	V_{DSS}	500	V
Gate to source voltage	V_{GSS}	±30	V
Drain current	I_D	18	A
Drain peak current	$I_{D(pulse)}^{*1}$	72	A
Body to drain diode reverse drain current	I_{DR}	18	A
Avalanche current	I_{AP}^{*3}	18	A
Avalanche energy	E_{AR}^{*3}	18	mJ
Channel dissipation	P_{ch}^{*2}	150	W
Channel temperature	Tch	150	°C
Storage temperature	Tstg	−55 to +150	°C

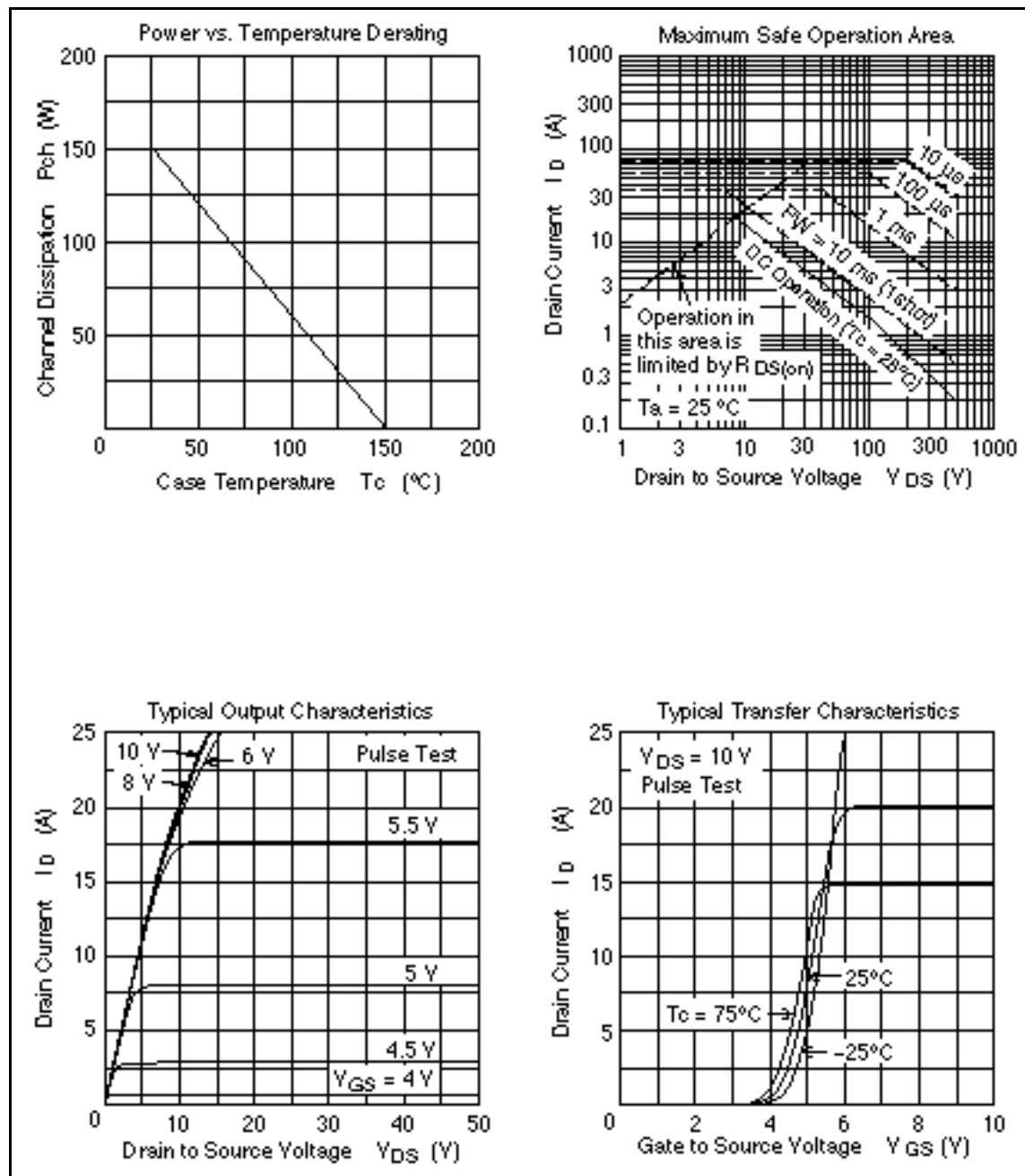
Notes: 1. PW 10μs, duty cycle 1 %
2. Value at Tc = 25°C
3. Value at Tch = 25°C, Rg 50 Ω, L = 100 μH

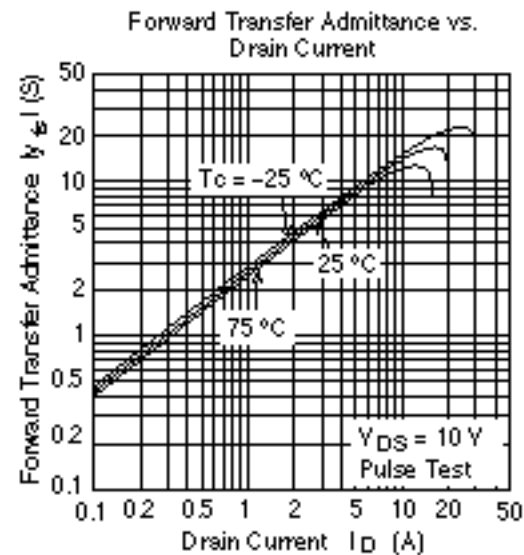
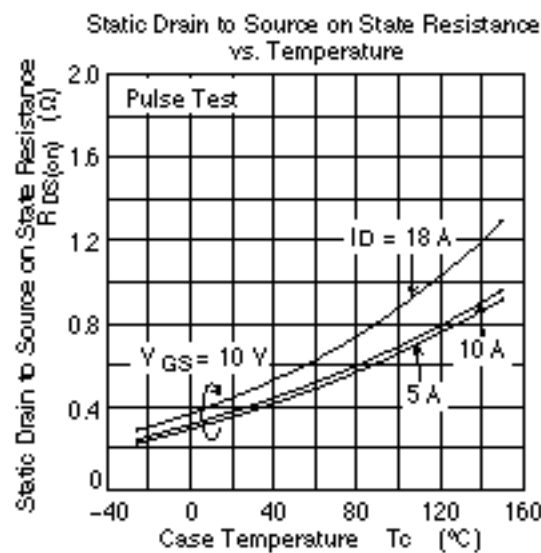
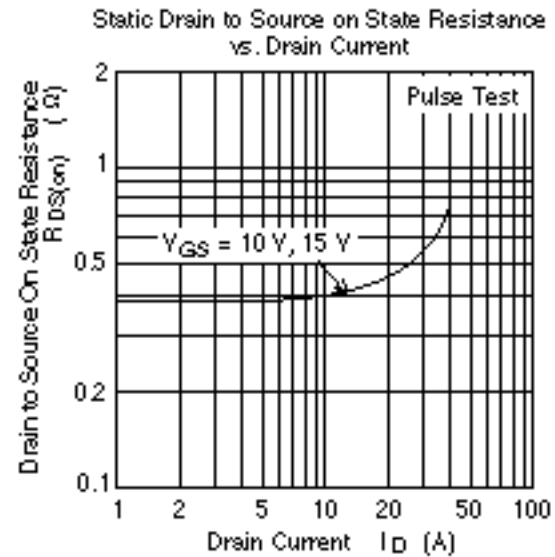
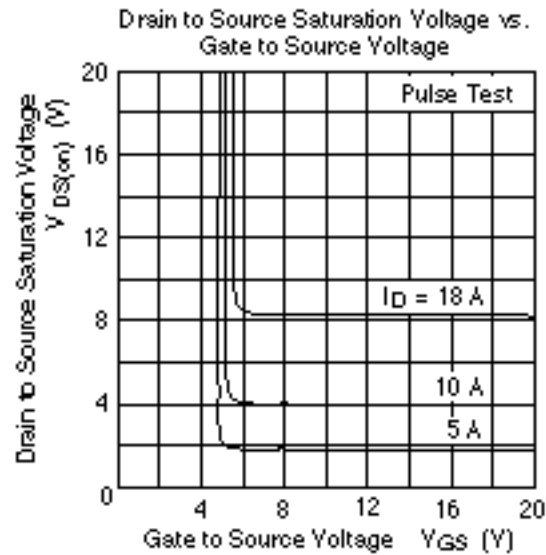
Electrical Characteristics (Ta = 25°C)

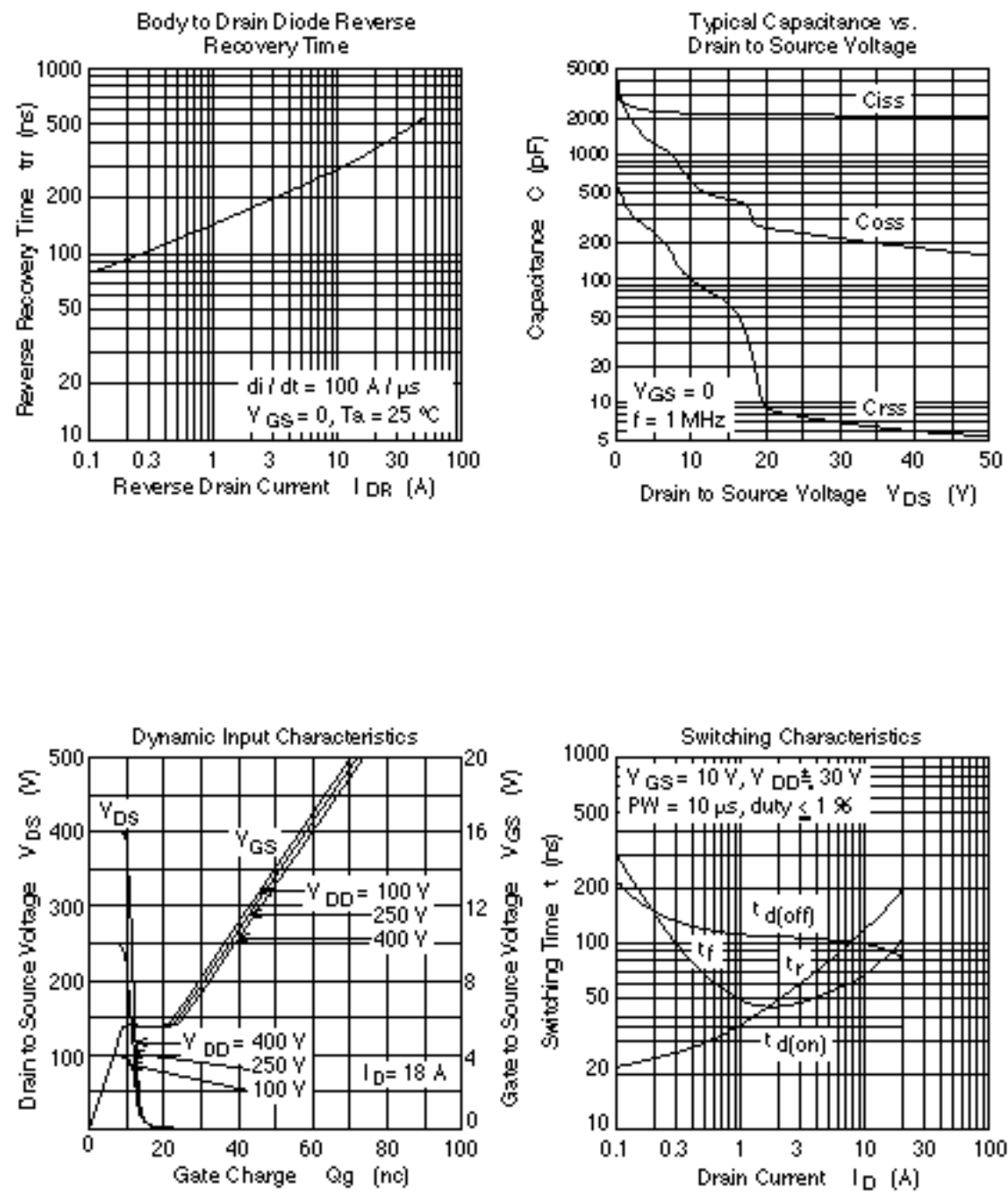
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	500	—	—	V	$I_D = 10\text{mA}$, $V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	±30	—	—	V	$I_G = \pm 100\mu\text{A}$, $V_{DS} = 0$
Gate to source leak current	I_{GSS}	—	—	±10	μA	$V_{GS} = \pm 25\text{V}$, $V_{DS} = 0$
Zero gate voltage drain current	I_{DSS}	—	—	10	μA	$V_{DS} = 500\text{V}$, $V_{GS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	2.5	—	3.5	V	$I_D = 1\text{mA}$, $V_{DS} = 10\text{V}^{*1}$
Static drain to source on state resistance	$R_{DS(on)}$	—	0.38	0.45		$I_D = 9\text{A}$, $V_{GS} = 10\text{V}^{*1}$
Forward transfer admittance	$ y_{fs} $	8	13	—	S	$I_D = 9\text{A}$, $V_{DS} = 10\text{V}^{*1}$
Input capacitance	C_{iss}	—	2150	—	pF	$V_{DS} = 10\text{V}$
Output capacitance	C_{oss}	—	630	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	C_{rss}	—	100	—	pF	$f = 1\text{MHz}$
Total gate charge	Q_g	—	38	—	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}	—	13	—	nc	$I_D = 18\text{A}$
Turn-on delay time	$t_{d(on)}$	—	35	—	ns	$V_{GS} = 10\text{V}$, $I_D = 9\text{A}$
Rise time	t_r	—	120	—	ns	$R_L = 3.3$
Turn-off delay time	$t_{d(off)}$	—	100	—	ns	
Fall time	t_f	—	65	—	ns	
Body to drain diode forward voltage	V_{DF}	—	1.0	—	V	$I_D = 18\text{A}$, $V_{GS} = 0$
Body to drain diode reverse recovery time	t_{rr}	—	380	—	ns	$I_F = 18\text{A}$, $V_{GS} = 0$ $diF/dt = 100\text{A}/\mu\text{s}$

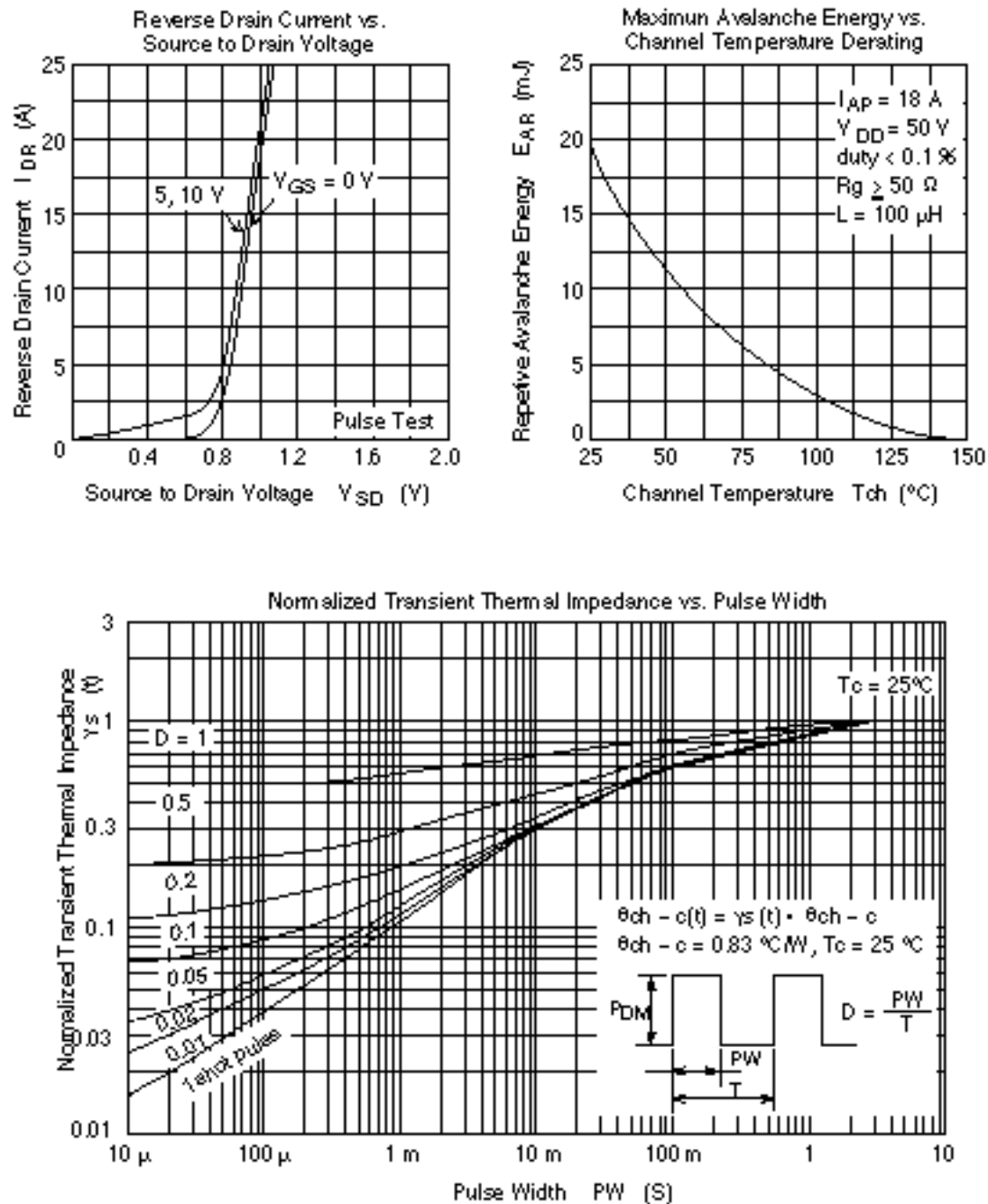
Note: 1. Pulse test

Main Characteristics

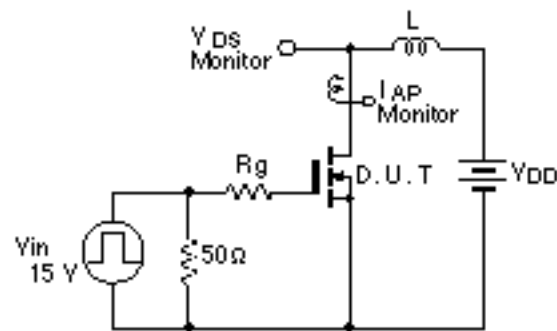






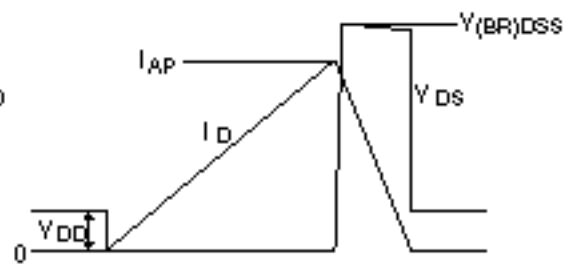


Avalanche Test Circuit

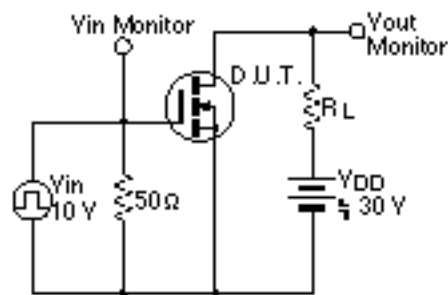


Avalanche Waveform

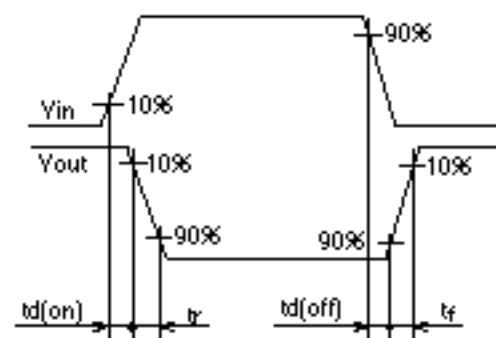
$$E_{AR} = \frac{1}{2} \cdot L \cdot I_{AP}^2 \cdot \frac{V_{DSS}}{V_{DSS} - V_{DD}}$$



Switching Time Test Circuit

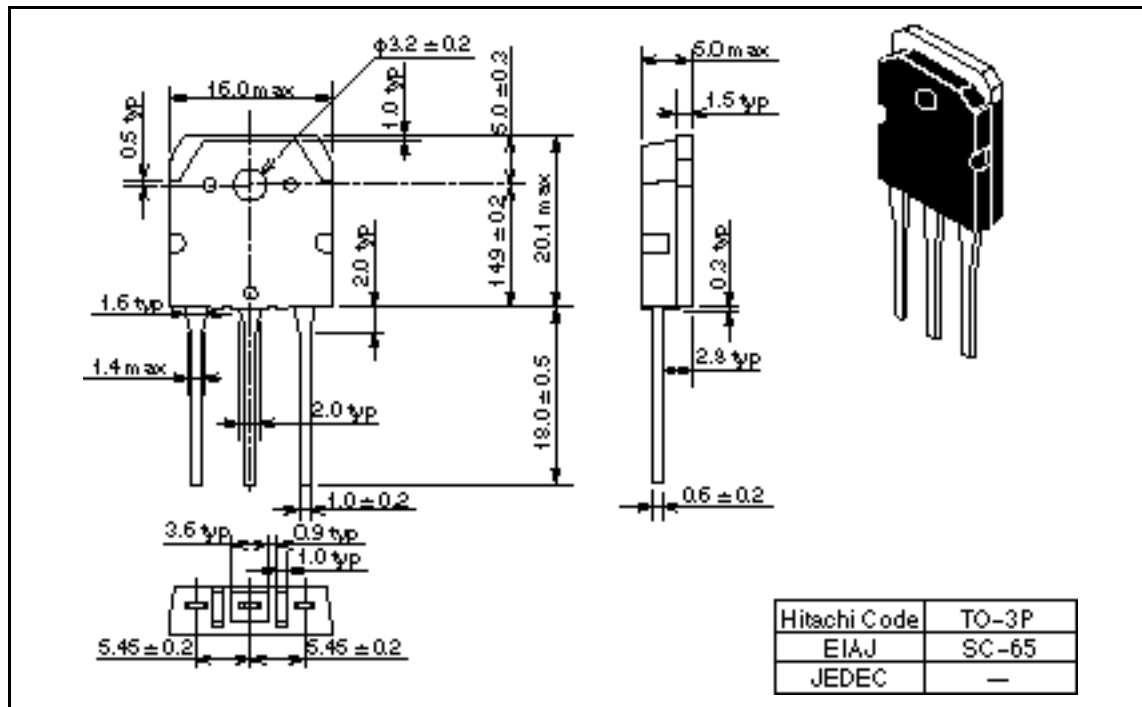


Switching Time Waveform



Package Dimensions

Unit: mm



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