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# 2SJ504

Silicon P Channel MOS FET  
High Speed Power Switching

# HITACHI

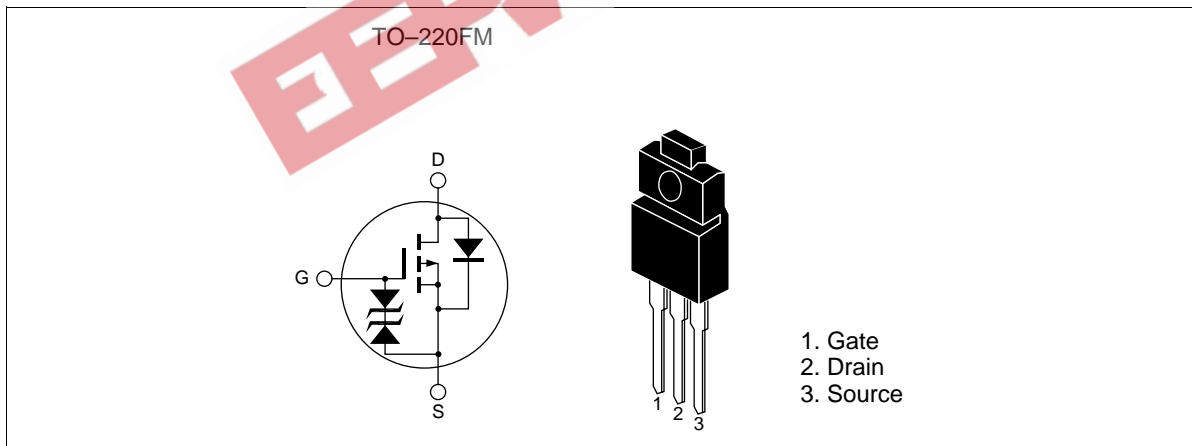
ADE-208-546  
Target specification 1st. Edition

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## Features

- Low on-resistance  
 $R_{DS(on)} = 0.042\Omega$  typ.
- Low drive current.
- 4V gate drive devices.
- High speed switching.

## Outline



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## 2SJ504

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### 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	$I_D$	-20	A
Drain peak current	$I_{D(pulse)}^{*1}$	-80	A
Body to drain diode reverse drain current	$I_{DR}$	-20	A
Avalanche current	$I_{AP}^{*3}$	-20	A
Avalanche energy	$E_{AR}^{*3}$	34	mJ
Channel dissipation	$Pch^{*2}$	30	W
Channel temperature	Tch	150	°C
Storage temperature	Tstg	-55 to +150	°C

- Notes: 1.  $PW \leq 10\mu s$ , duty cycle  $\leq 1\%$   
2. Value at  $T_c = 25^\circ C$   
3. Value at  $T_a = 25^\circ C$ ,  $R_g \geq 50 \Omega$ ,  $L = 100\mu H$

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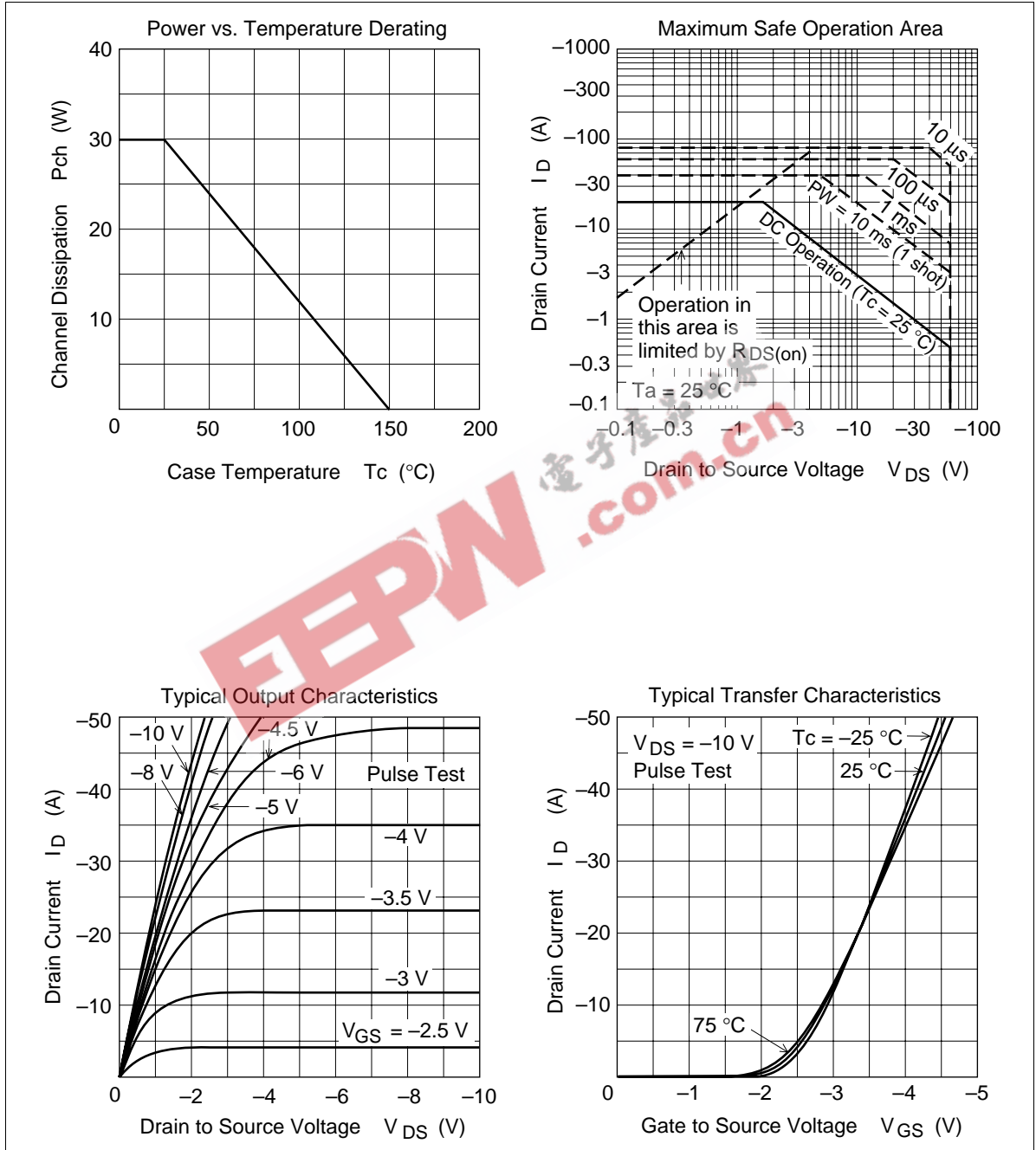
Electrical Characteristics (T<sub>a</sub> = 25°C)

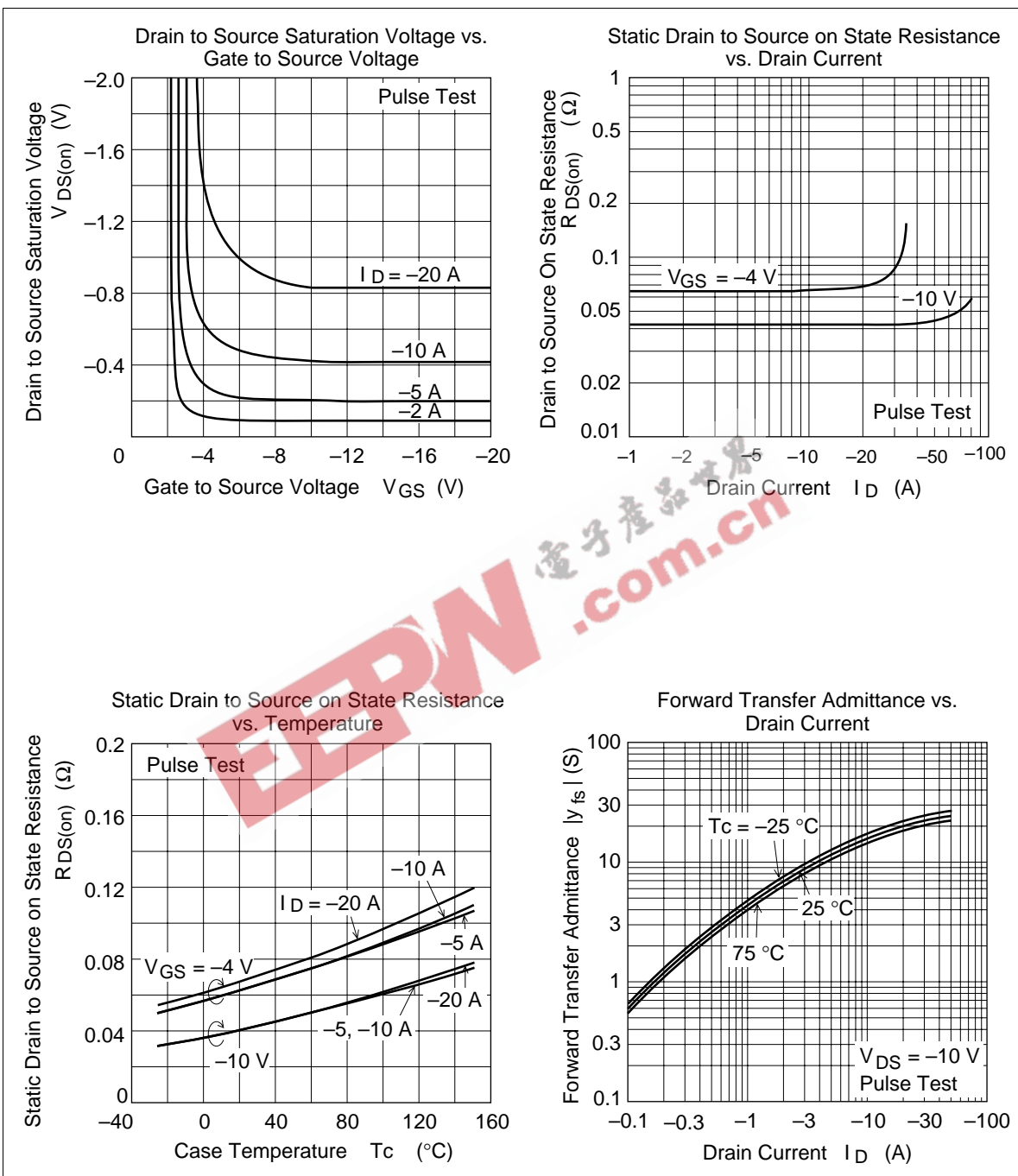
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	-60	—	—	V	$I_D = -10\text{mA}$ , $V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	±20	—	—	V	$I_G = \pm 100\mu\text{A}$ , $V_{DS} = 0$
Zero gate voltage drain current	$I_{DSS}$	—	—	-10	μA	$V_{DS} = -60\text{V}$ , $V_{GS} = 0$
Gate to source leak current	$I_{GSS}$	—	—	±10	μA	$V_{GS} = \pm 16\text{V}$ , $V_{DS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	-1.0	—	-2.0	V	$I_D = -1\text{mA}$ , $V_{DS} = -10\text{V}$
Static drain to source on state resistance	$R_{DS(on)}$	—	0.042	0.055	Ω	$I_D = -10\text{A}$ , $V_{GS} = -10\text{V}^{*1}$
	$R_{DS(on)}$	—	0.065	0.095	Ω	$I_D = -10\text{A}$ , $V_{GS} = -4\text{V}^{*1}$
Forward transfer admittance	$ y_{fs} $	10	16	—	S	$I_D = 10\text{A}$ , $V_{DS} = 10\text{V}^{*1}$
Input capacitance	$C_{iss}$	—	1750	—	pF	$V_{DS} = -10\text{V}$
Output capacitance	$C_{oss}$	—	800	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	$C_{rss}$	—	180	—	pF	$f = 1\text{MHz}$
Turn-on delay time	$t_{d(on)}$	—	16	—	ns	$V_{GS} = -10\text{V}$ , $I_D = -10\text{A}$
Rise time	$t_r$	—	100	—	ns	$R_L = 3\Omega$
Turn-off delay time	$t_{d(off)}$	—	230	—	ns	
Fall time	$t_f$	—	140	—	ns	
Body to drain diode forward voltage	$V_{DF}$	—	-1.0	—	V	$I_F = -20\text{A}$ , $V_{GS} = 0$
Body to drain diode reverse recovery time	$t_{rr}$	—	100	—	ns	$I_F = -20\text{A}$ , $V_{GS} = 0$ $di_F/dt = 50\text{A}/\mu\text{s}$

Note: 1. Pulse test

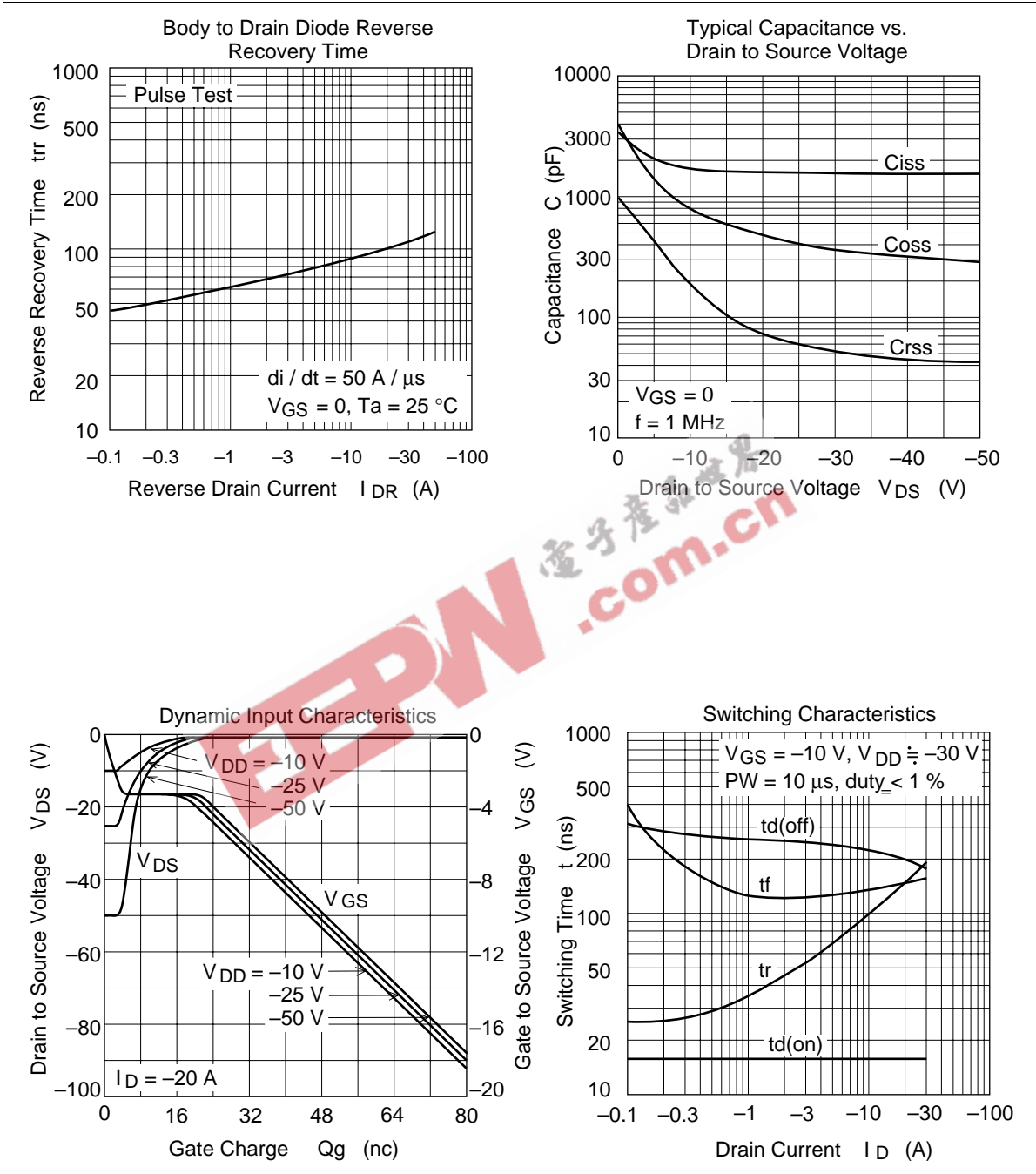
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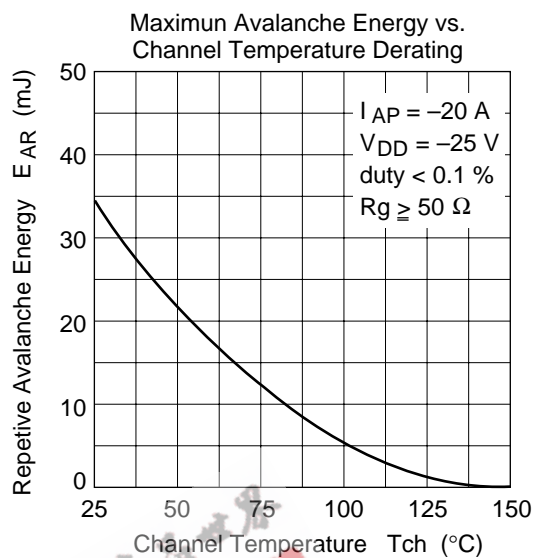
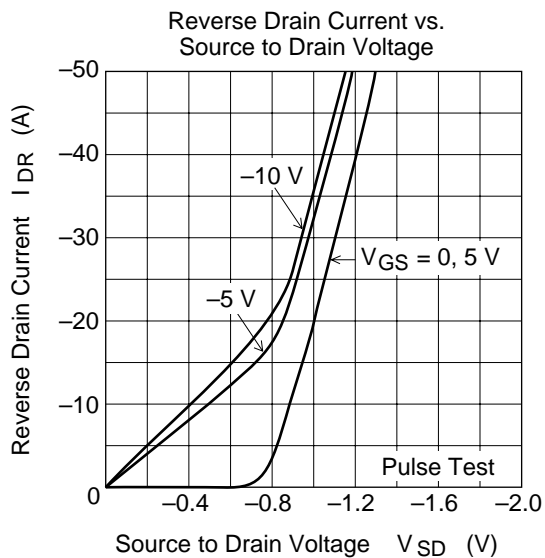
## Main Characteristics



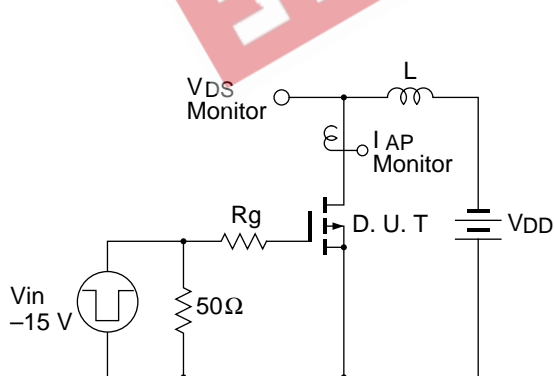


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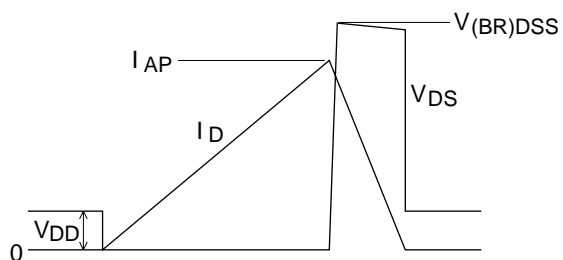


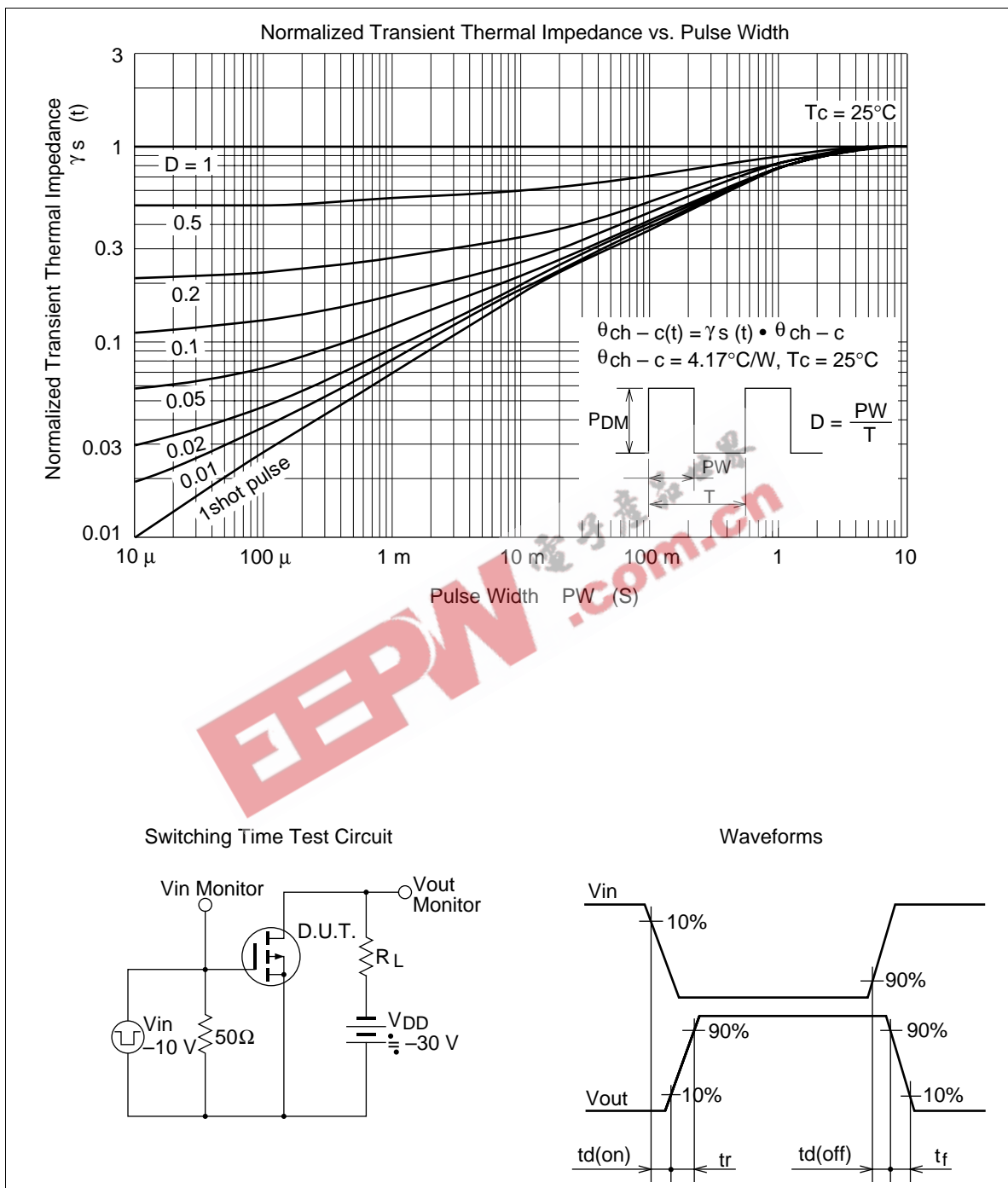


Avalanche Test Circuit and Waveform



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

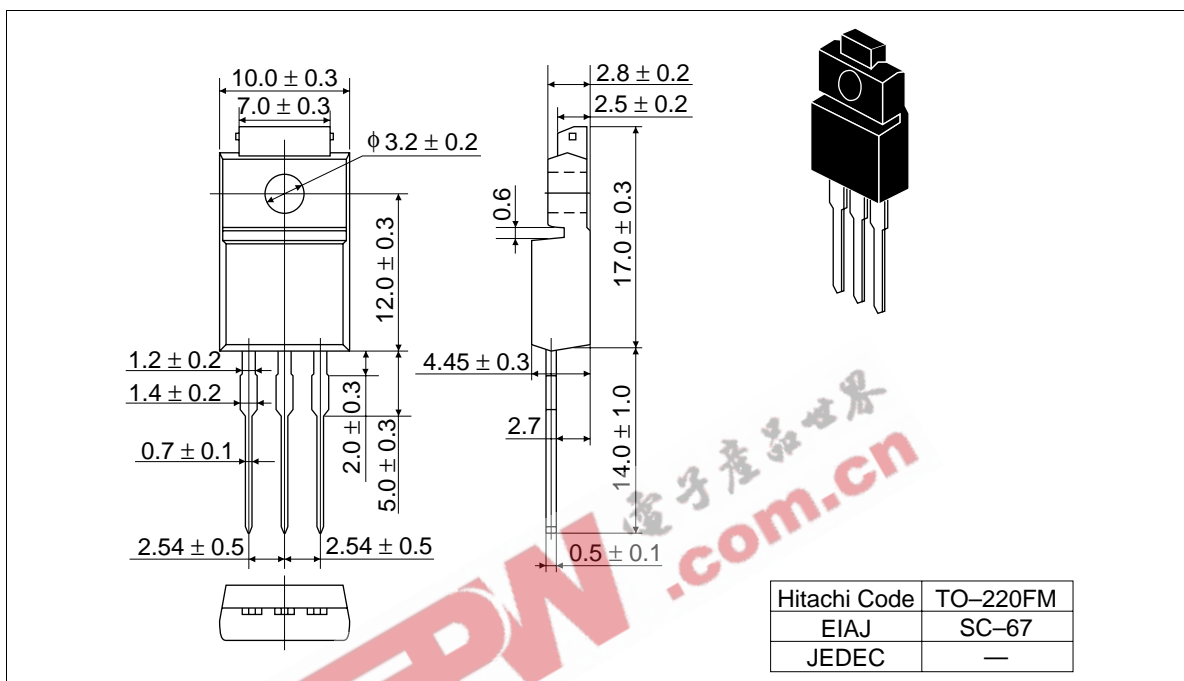






Package Dimensions

Unit: mm



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