

2SK2939(L),2SK2939(S)

Silicon N Channel MOS FET
High Speed Power Switching

HITACHI

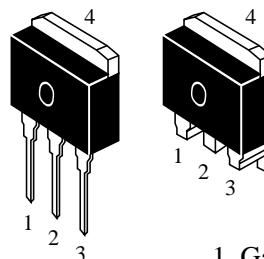
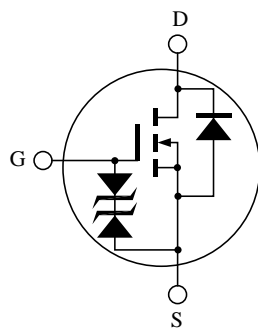
ADE-208-562D (Z)
5th. Edition
Jun 1998

Features

- Low on-resistance
 $R_{DS} = 0.020 \Omega$ typ.
- High speed switching
- 4V gate drive device can be driven from 5V source

Outline

LDBPAK



1. Gate
2. Drain
3. Source
4. Drain

2SK2939(L),2SK2939(S)

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	35	A
Drain peak current	$I_{D(pulse)}^{Note1}$	140	A
Body-drain diode reverse drain current	I_{DR}	35	A
Avalanche current	I_{AP}^{Note3}	35	A
Avalanche energy	E_{AR}^{Note3}	105	mJ
Channel dissipation	P_{ch}^{Note2}	50	W
Channel temperature	Tch	150	°C
Storage temperature	Tstg	-55 to +150	°C

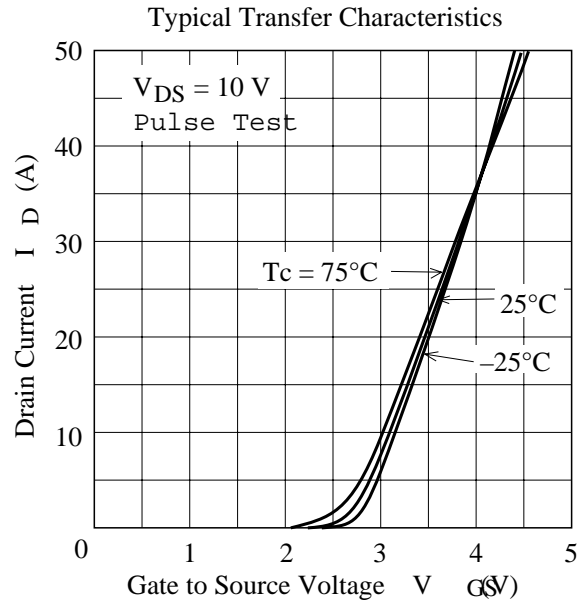
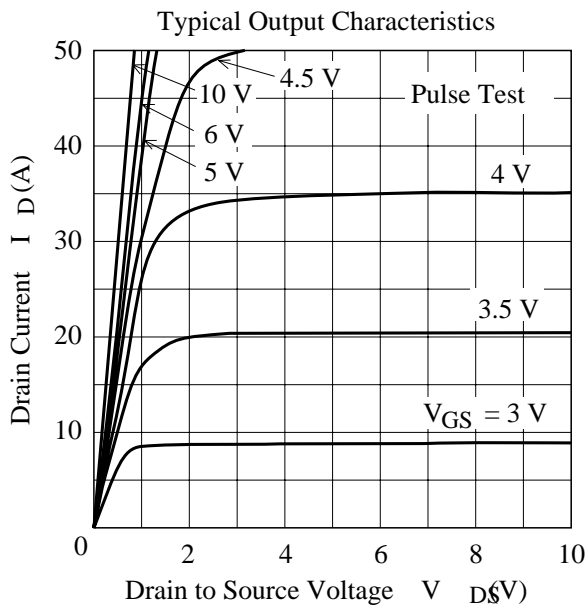
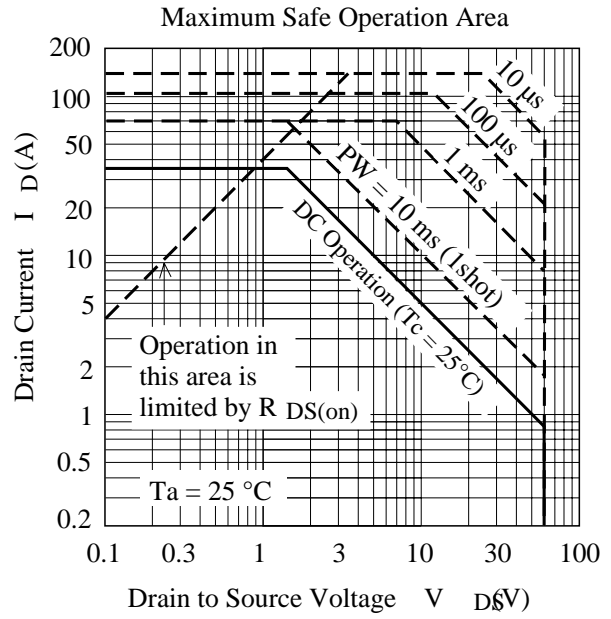
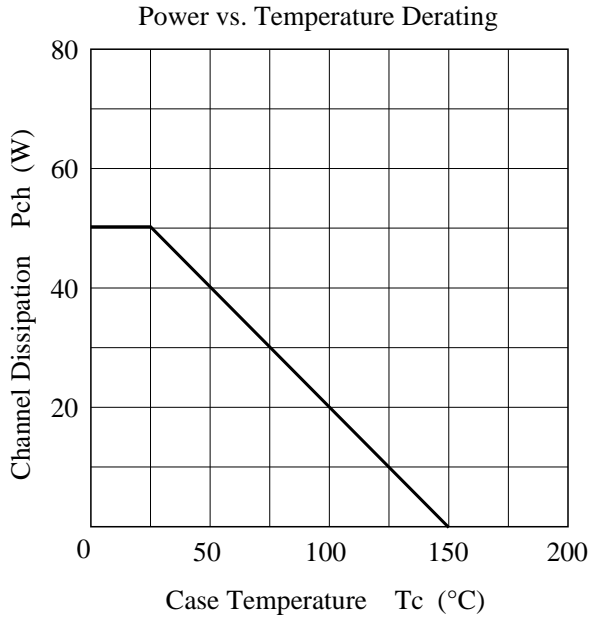
Note: 1. $PW \leq 10\mu s$, duty cycle $\leq 1\%$
2. Value at $T_c = 25^\circ C$
3. Value at $T_{ch} = 25^\circ C$, $R_g \geq 50\Omega$

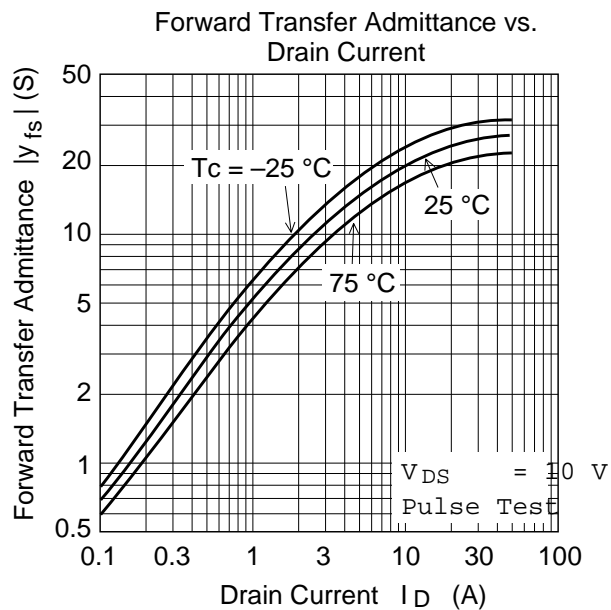
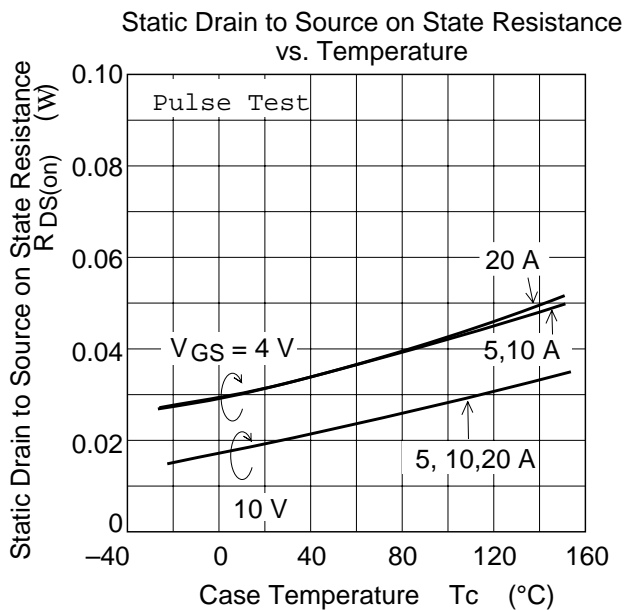
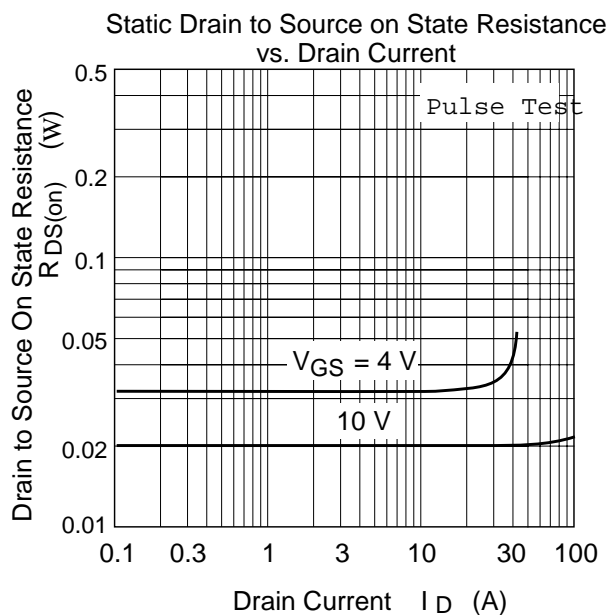
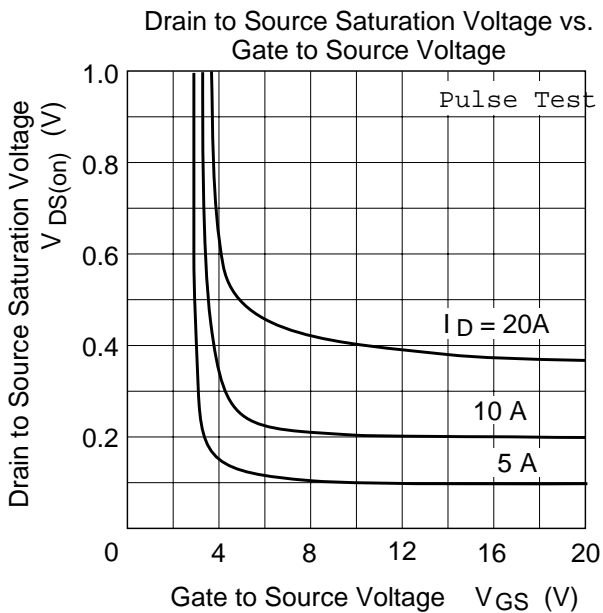
Electrical Characteristics (Ta = 25°C)

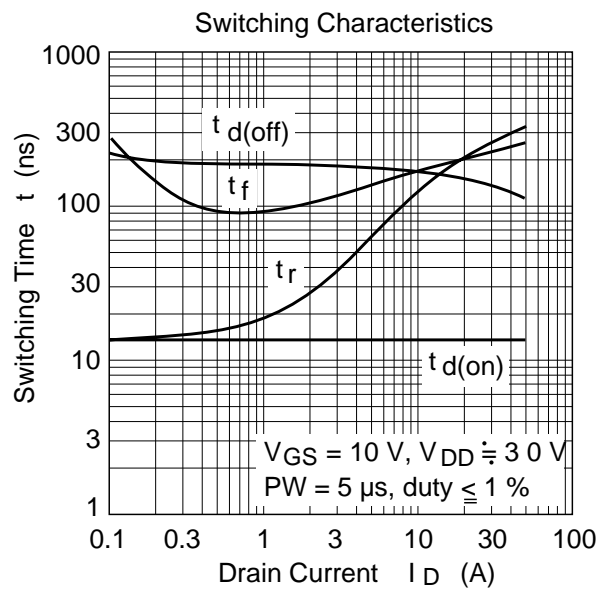
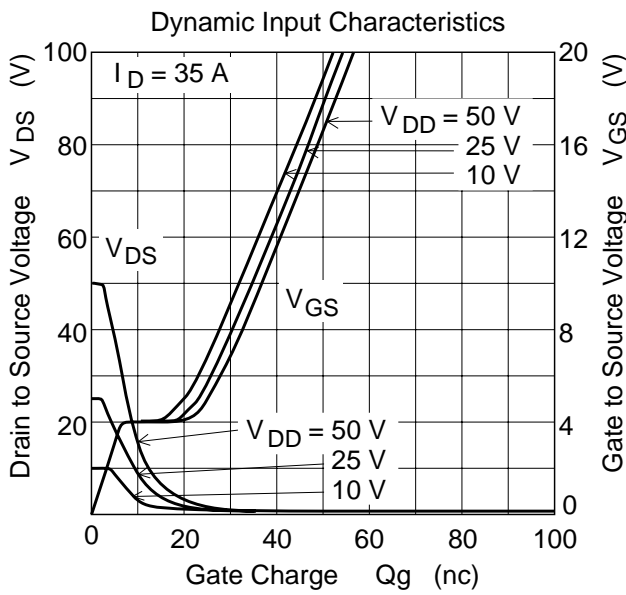
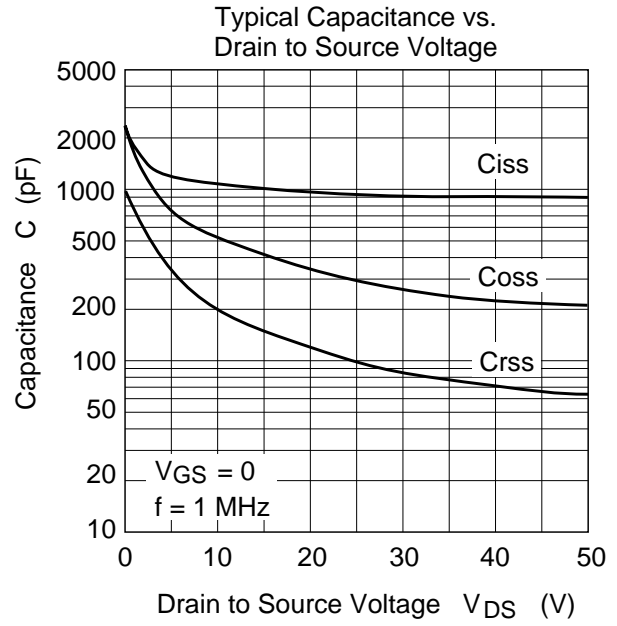
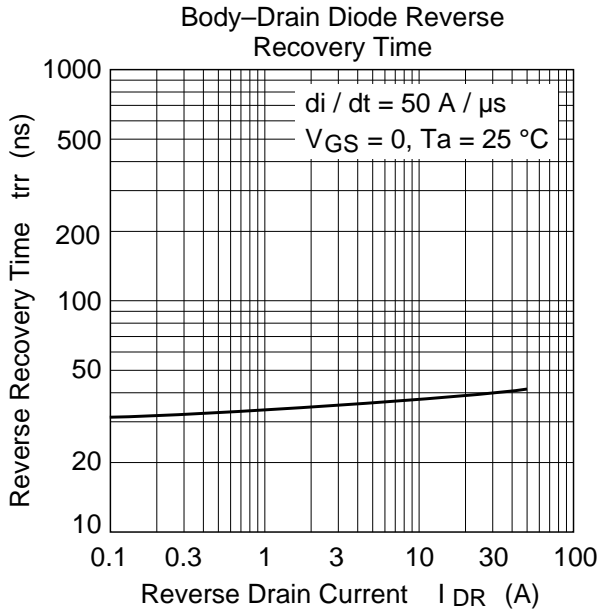
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	60	—	—	V	$I_D = 10mA, V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	±20	—	—	V	$I_G = ±100μA, V_{DS} = 0$
Gate to source leak current	I_{GSS}	—	—	±10	μA	$V_{GS} = ±16V, V_{DS} = 0$
Zero gate voltage drain current	I_{DSS}	—	—	10	μA	$V_{DS} = 60V, V_{GS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	1.5	—	2.5	V	$I_D = 1mA, V_{DS} = 10V$
Static drain to source on state resistance	$R_{DS(on)}$	—	0.020	0.026	Ω	$I_D = 15A, V_{GS} = 10V$ ^{Note4}
	$R_{DS(on)}$	—	0.032	0.050	Ω	$I_D = 15A, V_{GS} = 4V$ ^{Note4}
Forward transfer admittance	$ y_{fs} $	14	23	—	S	$I_D = 15A, V_{DS} = 10V$ ^{Note4}
Input capacitance	C_{iss}	—	1100	—	pF	$V_{DS} = 10V$
Output capacitance	C_{oss}	—	540	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	C_{rss}	—	200	—	pF	$f = 1MHz$
Turn-on delay time	$t_{d(on)}$	—	15	—	ns	$I_D = 15A, V_{GS} = 10V$
Rise time	t_r	—	180	—	ns	$R_L = 2Ω$
Turn-off delay time	$t_{d(off)}$	—	175	—	ns	
Fall time	t_f	—	195	—	ns	
Body–drain diode forward voltage	V_{DF}	—	0.95	—	V	$I_F = 35A, V_{GS} = 0$
Body–drain diode reverse recovery time	t_{rr}	—	40	—	ns	$I_F = 35A, V_{GS} = 0$ $diF/dt = 50A/μs$

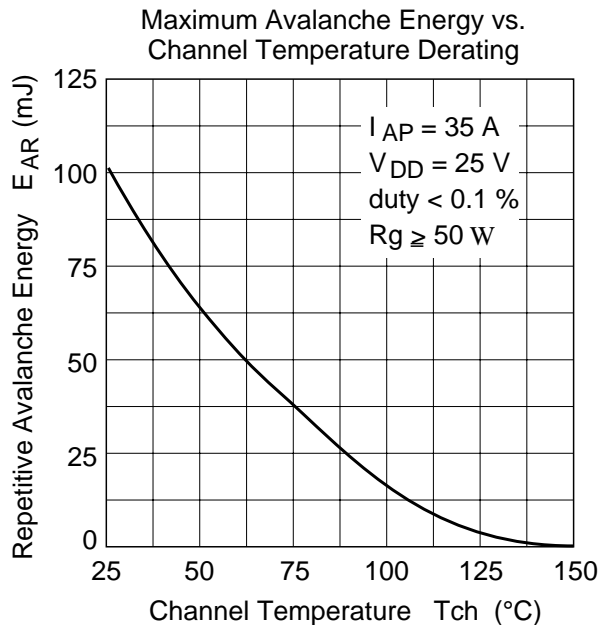
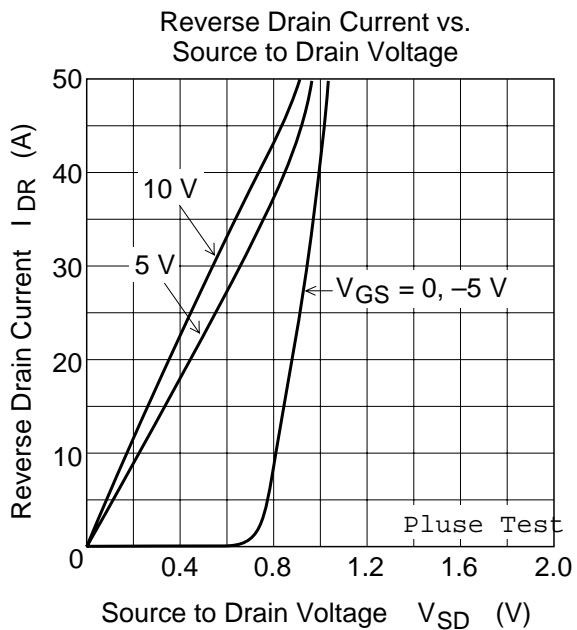
Note: 4. Pulse test

Main Characteristics

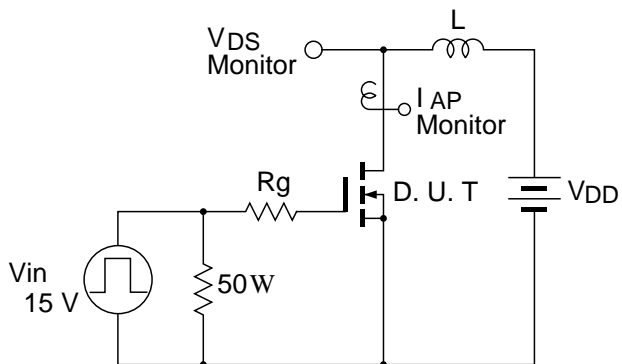






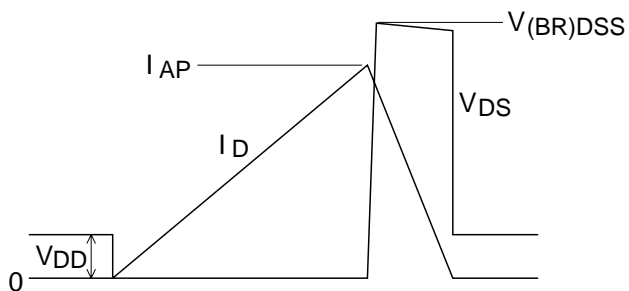


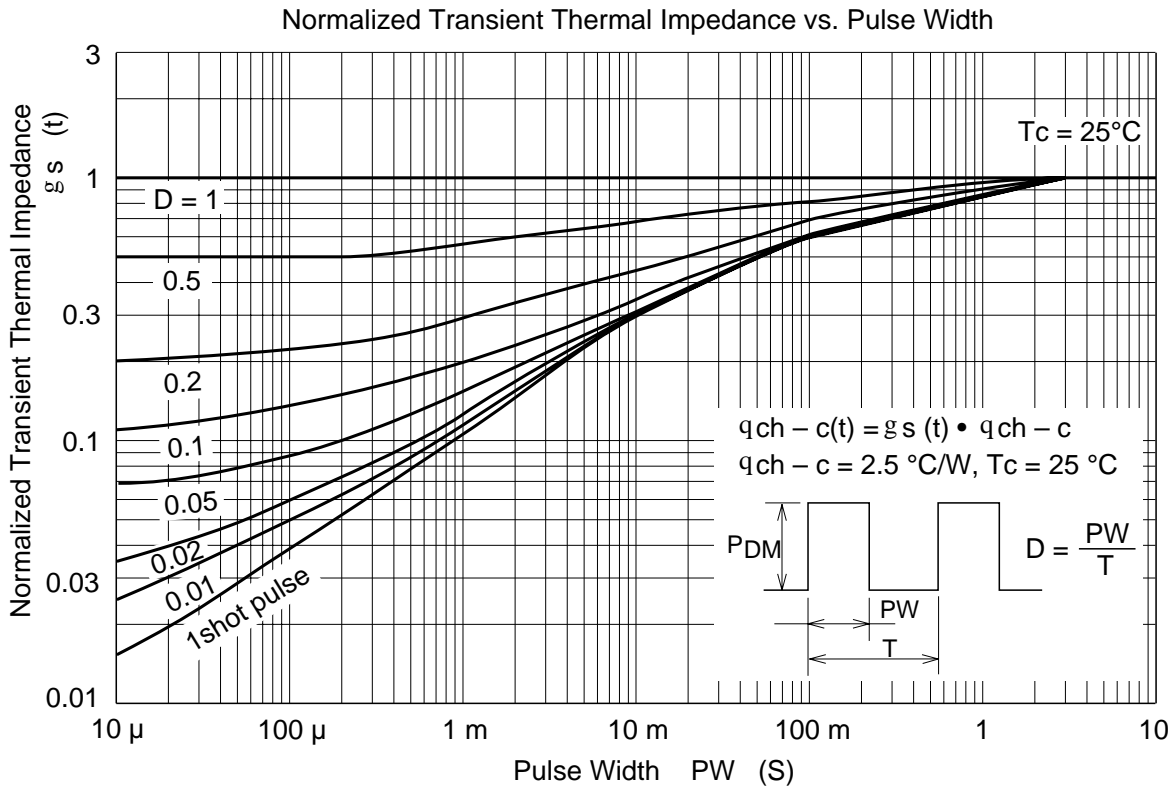
Avalanche Test Circuit



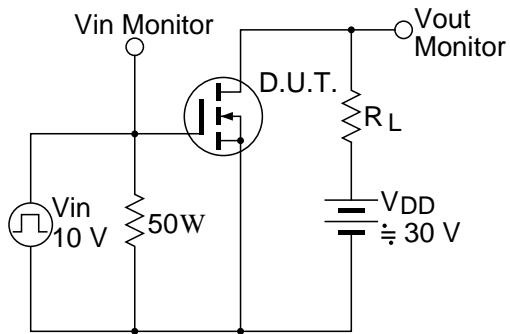
Avalanche Waveform

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

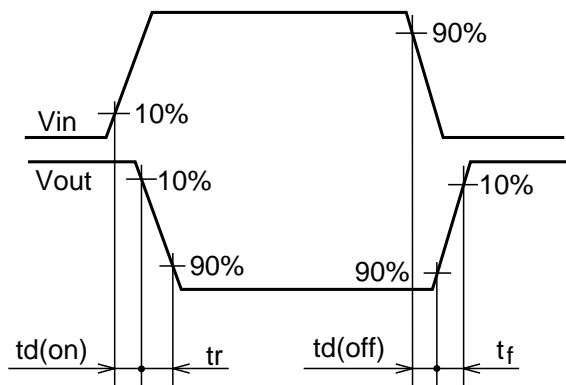




Switching Time Test Circuit

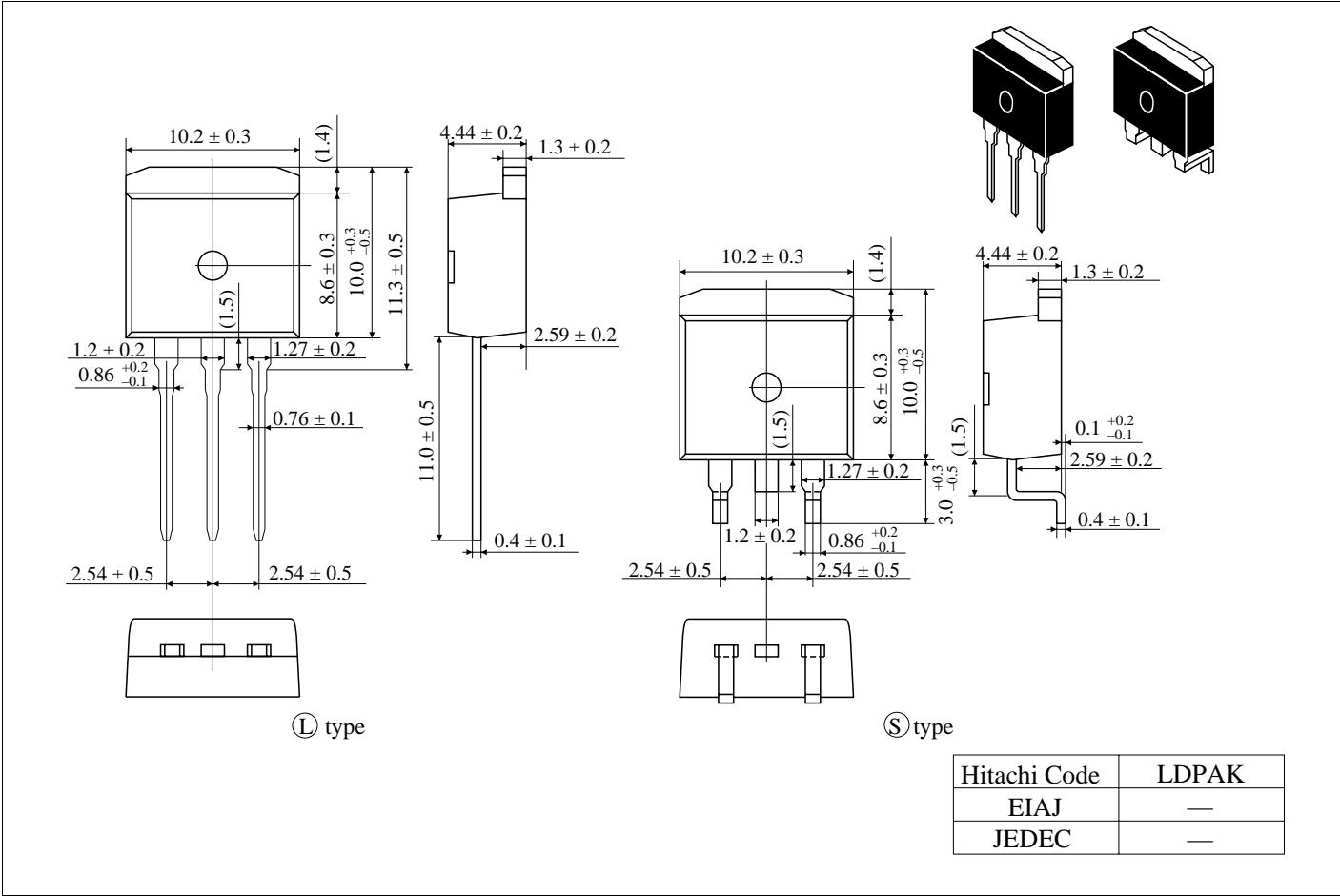


Waveform



Package Dimentions

Unit: mm



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