
2SK3211(L), 2SK3211(S)

Silicon N Channel MOS FET
High Speed Power Switching

HITACHI

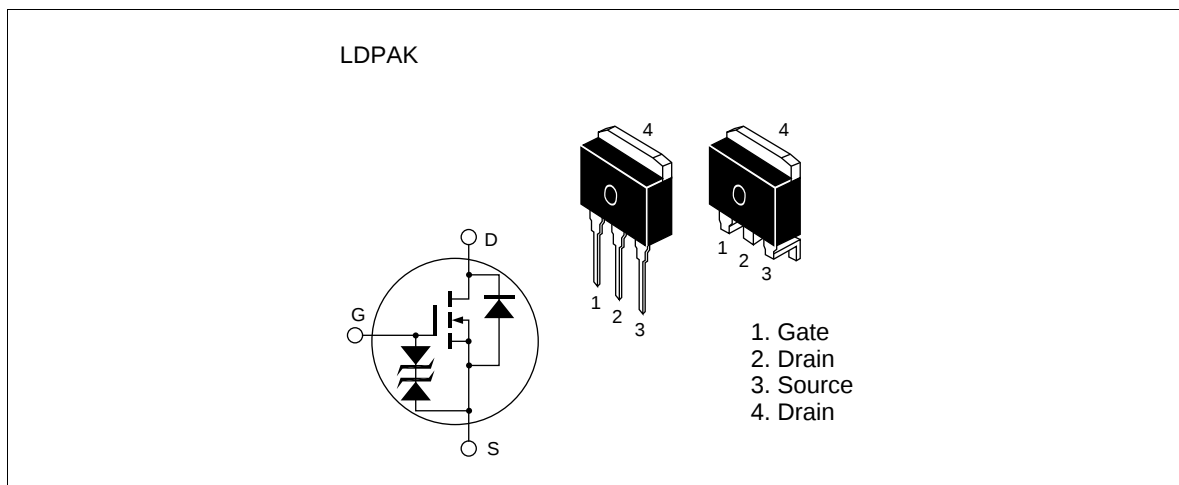
ADE-208-761A (Z)
2nd. Edition
February 1999

Features

- Low on-resistance
 $R_{DS} = 60 \text{ m}\Omega$ typ.
- High speed switching
- 4 V gate drive device can be driven from 5 V source

2SK3211

Outline



Absolute Maximum Ratings ($T_a = 25^\circ\text{C}$)

Item	Symbol	Ratings	Unit
Drain to source voltage	V_{DSS}	200	V
Gate to source voltage	V_{GSS}	± 20	V
Drain current	I_D	25	A
Drain peak current	$I_{D(pulse)}^{*1}$	100	A
Body-drain diode reverse drain current	I_{DR}	25	A
Avalanche current	I_{AP}^{*3}	25	A
Avalanche energy	E_{AR}^{*3}	41	mJ
Channel dissipation	P_{ch}^{*2}	100	W
Channel temperature	T_{ch}	150	$^\circ\text{C}$
Storage temperature	T_{stg}	-55 to $+150$	$^\circ\text{C}$

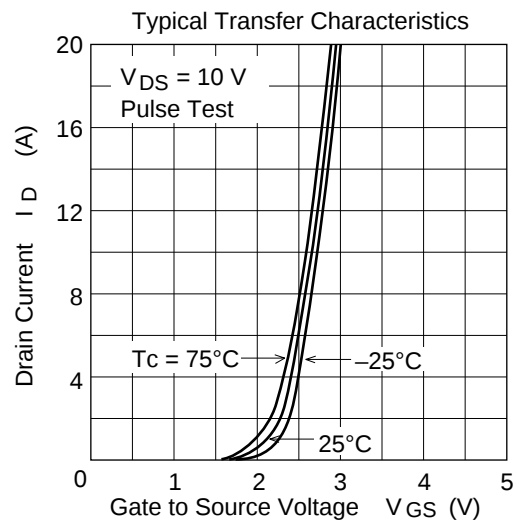
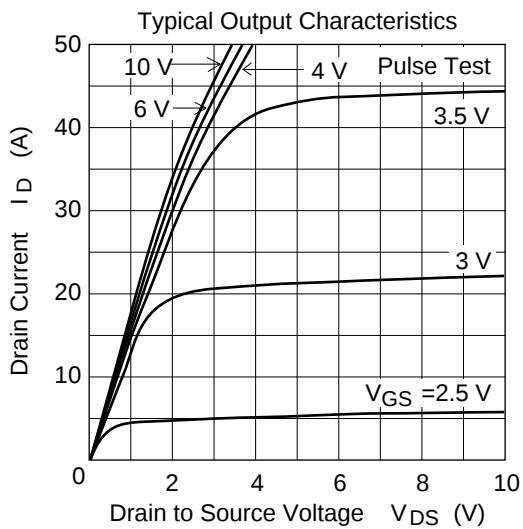
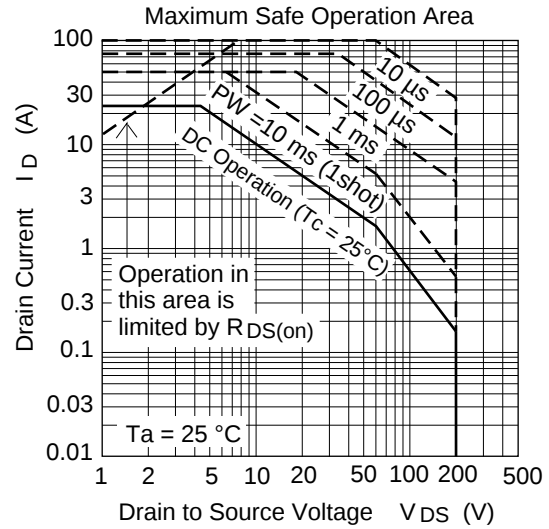
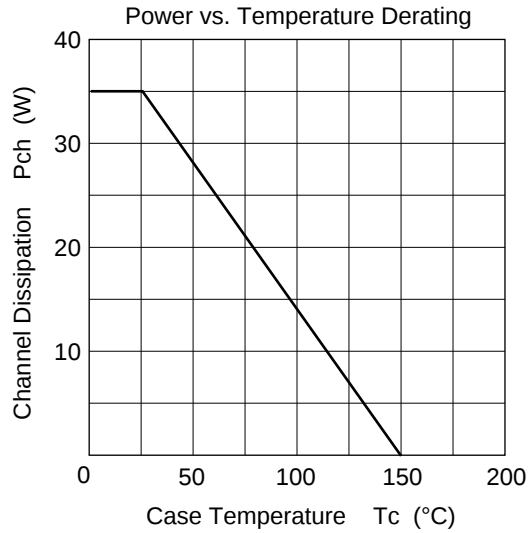
Note: 1. $PW \leq 10 \mu\text{s}$, duty cycle $\leq 1\%$
2. Value at $T_c = 25^\circ\text{C}$
3. Value at $T_{ch} = 25^\circ\text{C}$, $R_g \geq 50 \Omega$

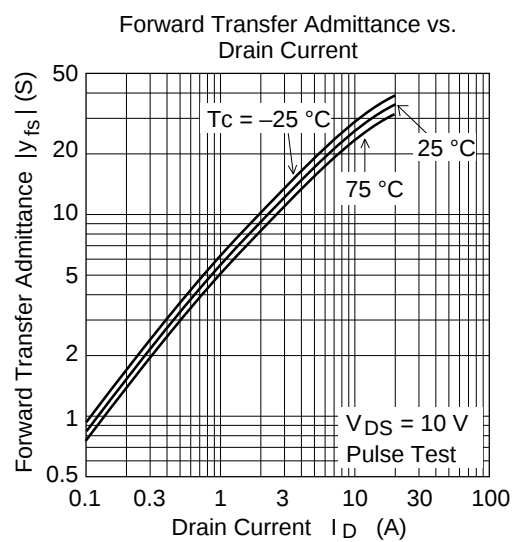
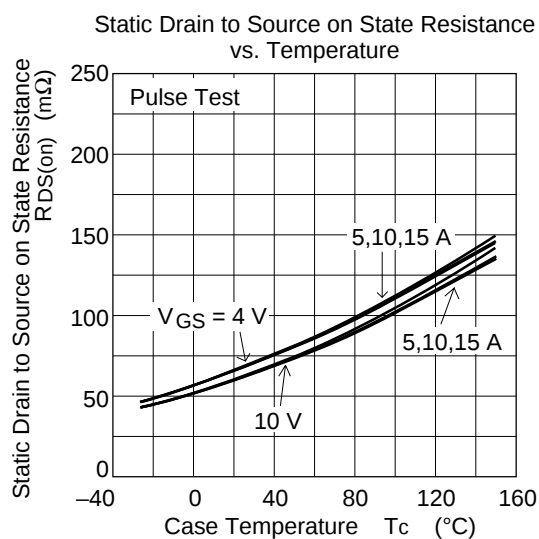
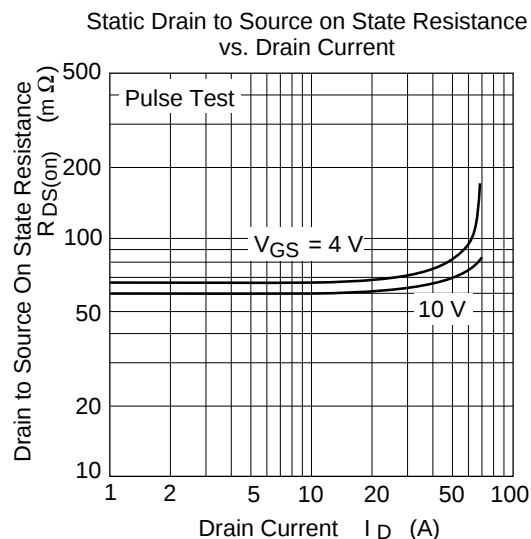
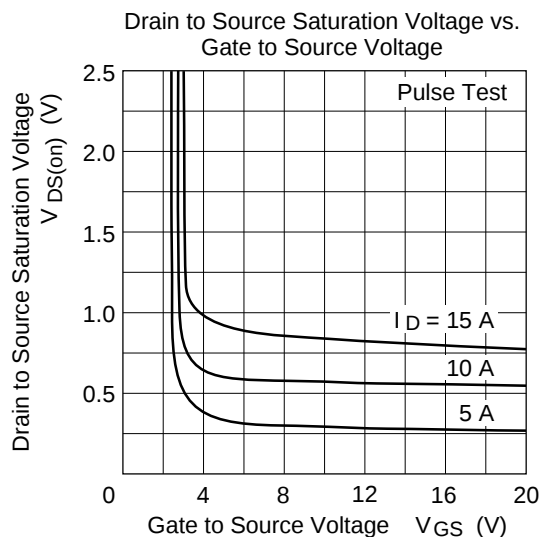
Electrical Characteristics (Ta = 25°C)

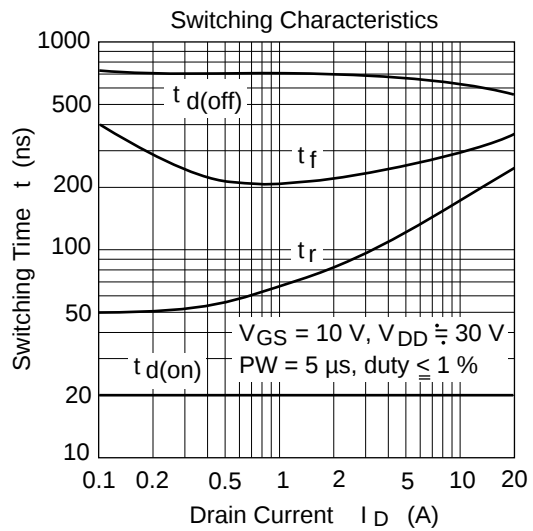
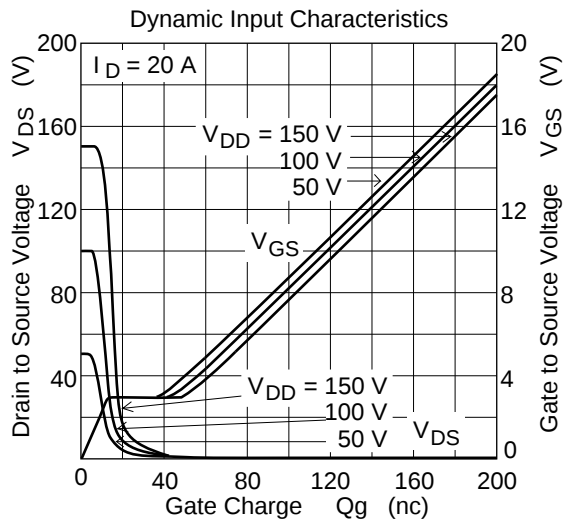
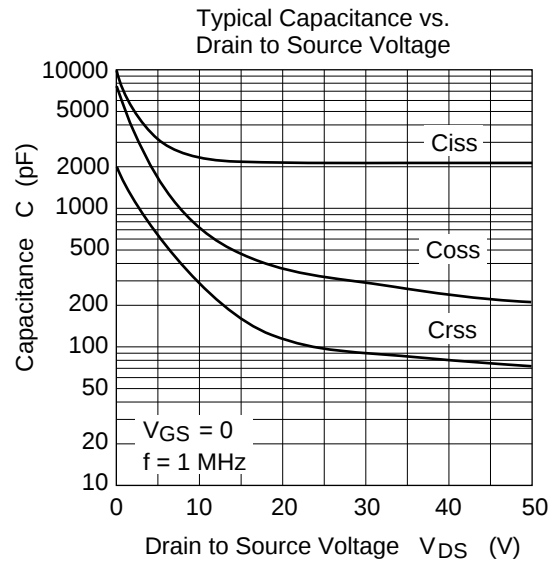
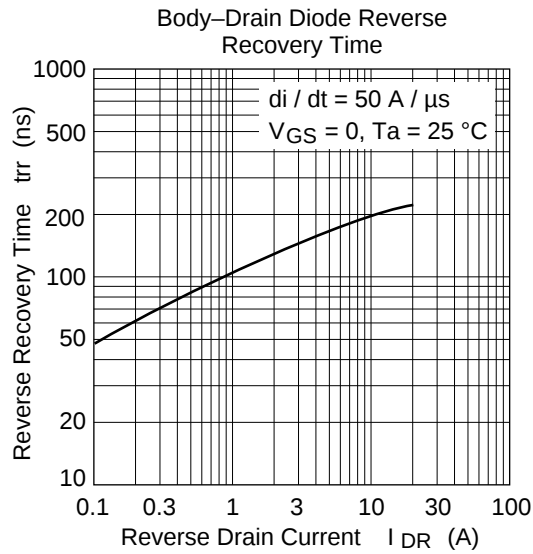
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	200	—	—	V	$I_D = 10 \text{ mA}$, $V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	± 20	—	—	V	$I_G = \pm 100 \text{ }\mu\text{A}$, $V_{DS} = 0$
Gate to source leak current	I_{GSS}	—	—	± 10	μA	$V_{GS} = \pm 16 \text{ V}$, $V_{DS} = 0$
Zero gate voltage drain current	I_{DSS}	—	—	10	μA	$V_{DS} = 200 \text{ V}$, $V_{GS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	1.0	—	2.5	V	$I_D = 1 \text{ mA}$, $V_{DS} = 10 \text{ V}$
Static drain to source on state resistance	$R_{DS(on)}$	—	60	75	$\text{m}\Omega$	$I_D = 15 \text{ A}$, $V_{GS} = 10 \text{ V}^{*4}$
	$R_{DS(on)}$	—	65	85	$\text{m}\Omega$	$I_D = 15 \text{ A}$, $V_{GS} = 4 \text{ V}^{*4}$
Forward transfer admittance	$ y_{fs} $	18	30	—	S	$I_D = 15 \text{ A}$, $V_{DS} = 10 \text{ V}^{*4}$
Input capacitance	C_{iss}	—	2420	—	pF	$V_{DS} = 10 \text{ V}$
Output capacitance	C_{oss}	—	790	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	C_{rss}	—	340	—	pF	$f = 1 \text{ MHz}$
Turn-on delay time	$t_{d(on)}$	—	20	—	ns	$I_D = 15 \text{ A}$, $V_{GS} = 10 \text{ V}$
Rise time	t_r	—	230	—	ns	$R_L = 2 \text{ }\Omega$
Turn-off delay time	$t_{d(off)}$	—	590	—	ns	
Fall time	t_f	—	330	—	ns	
Body-drain diode forward voltage	V_{DF}	—	0.95	—	V	$I_F = 25 \text{ A}$, $V_{GS} = 0$
Body-drain diode reverse recovery time	t_{rr}	—	230	—	ns	$I_F = 25 \text{ A}$, $V_{GS} = 0$ $di_F/dt = 50 \text{ A}/\mu\text{s}$

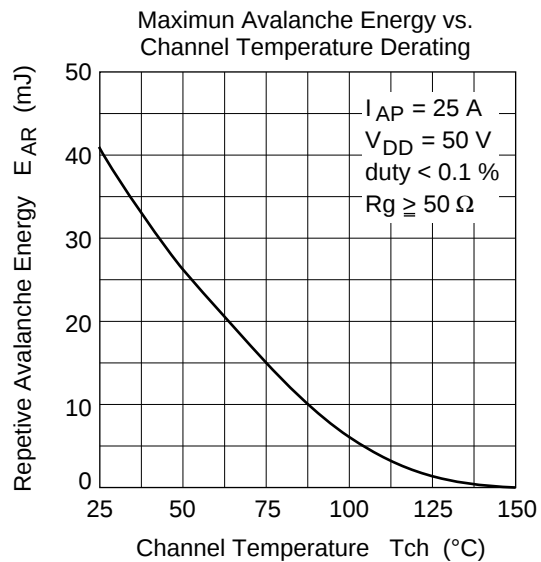
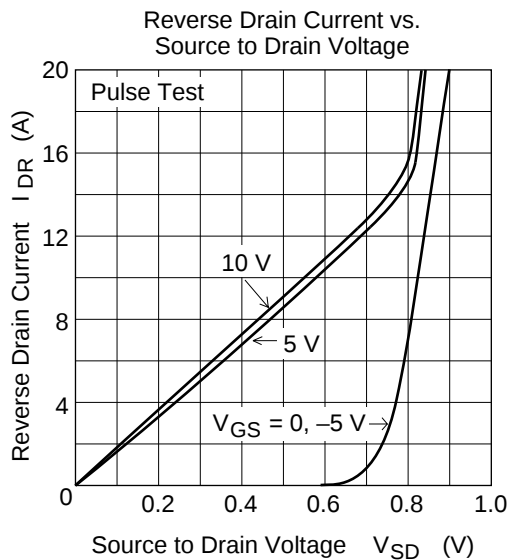
Note: 4. Pulse test

Main Characteristics

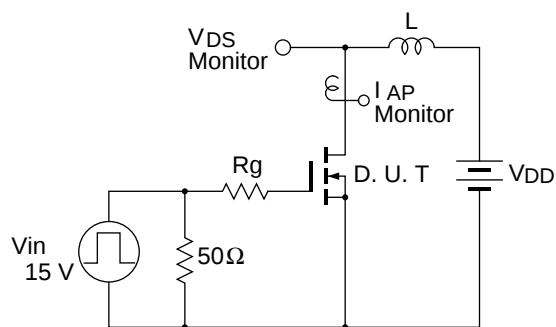






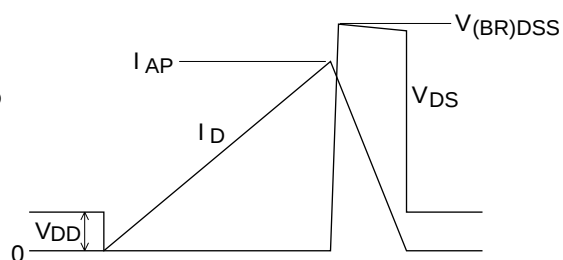


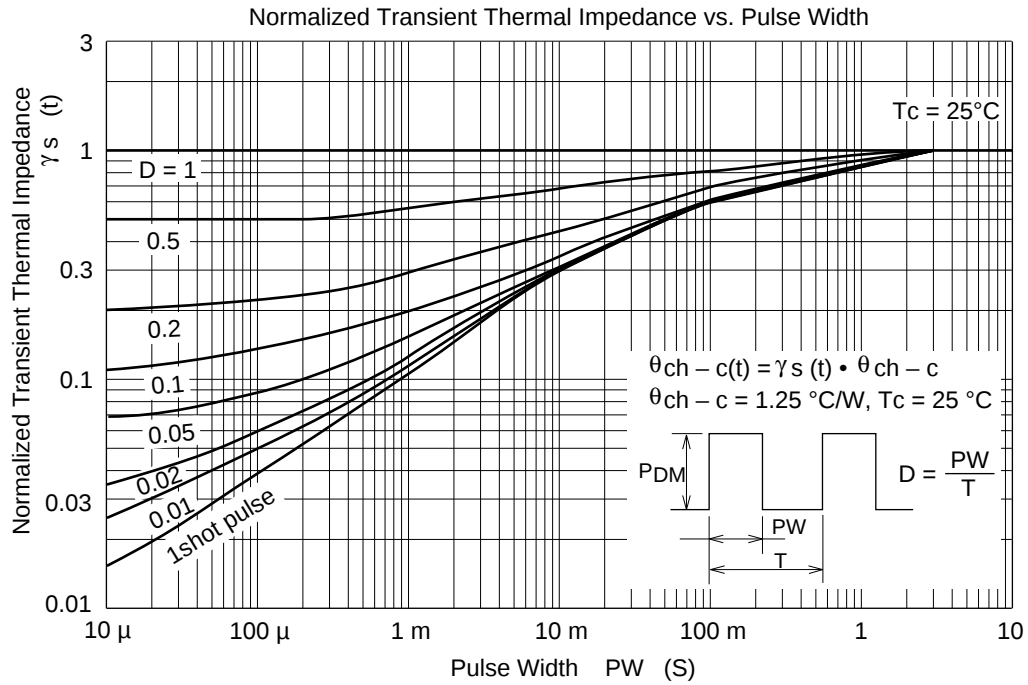
Avalanche Test Circuit



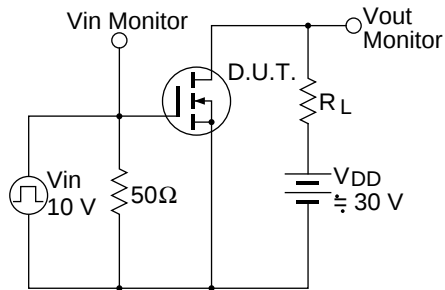
Avalanche Waveform

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

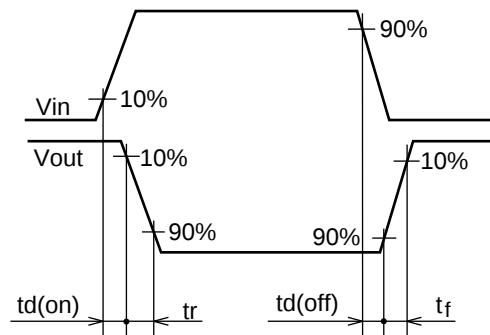




Switching Time Test Circuit

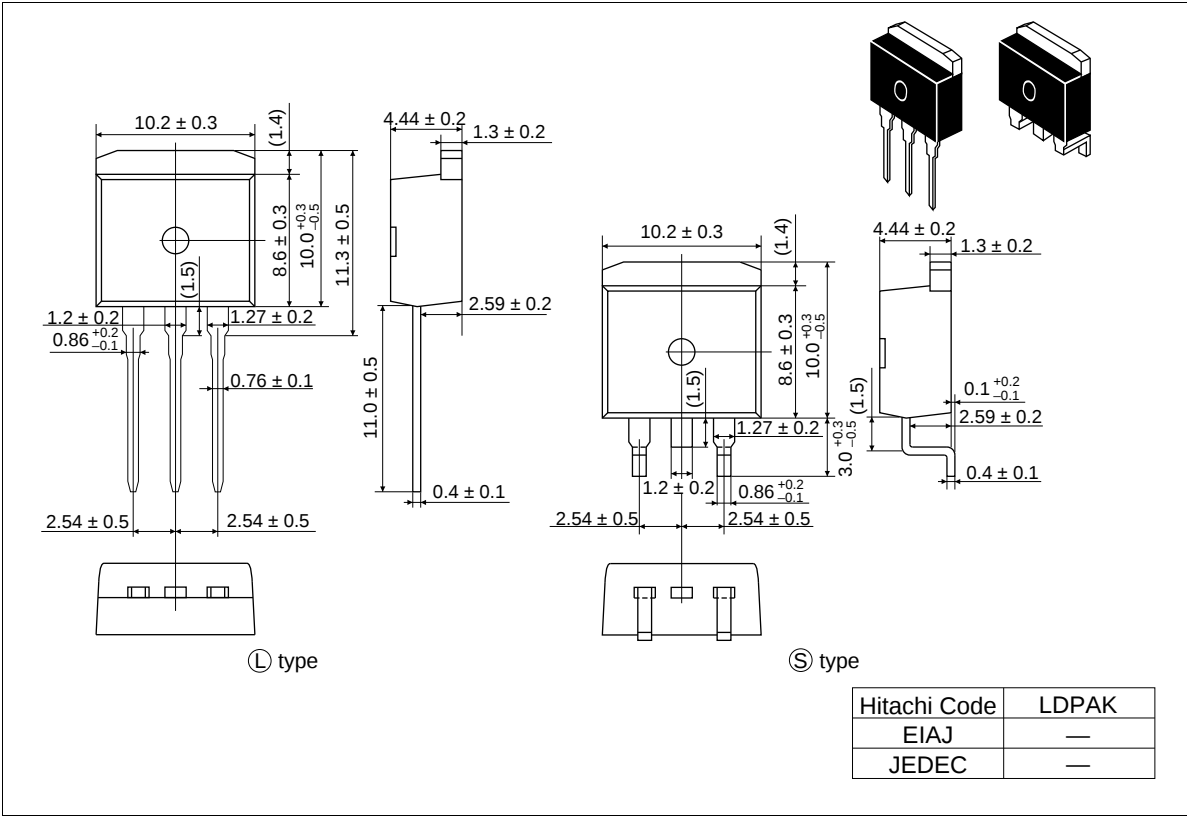


Waveform



Package Dimensions

Unit: mm



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