

2SK3203(L), 2SK3203(S)

Silicon N Channel MOS FET
High Speed Power Switching

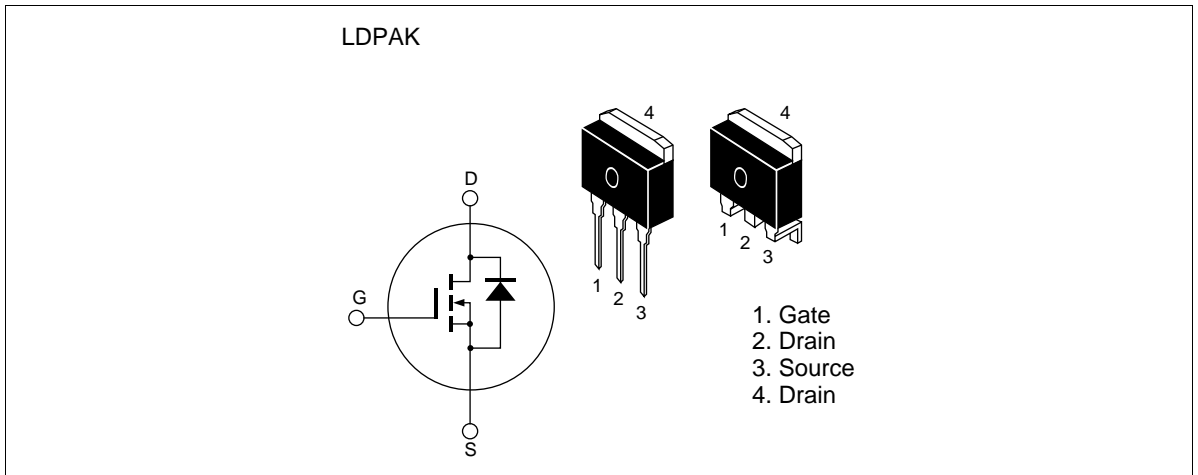
HITACHI

ADE-208-1384A (Z)
2nd. Edition
Jan. 2001

Features

- Low on-resistance
 $R_{DS(on)} = 11m$ typ.
- Low drive current
- 5V gate drive device can be driven from 5V source

Outline



2SK3203(L), 2SK3203(S)

Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Ratings	Unit
Drain to source voltage	V_{DSS}	30	V
Gate to source voltage	V_{GSS}	±20	V
Drain current	I_D	45	A
Drain peak current	$I_{D(pulse)}^{*1}$	180	A
Body-drain diode reverse drain current	I_{DR}	45	A
Channel dissipation	P_{ch}^{*2}	50	W
Channel temperature	T_{ch}	150	°C
Storage temperature	T_{stg}	-55 to +150	°C

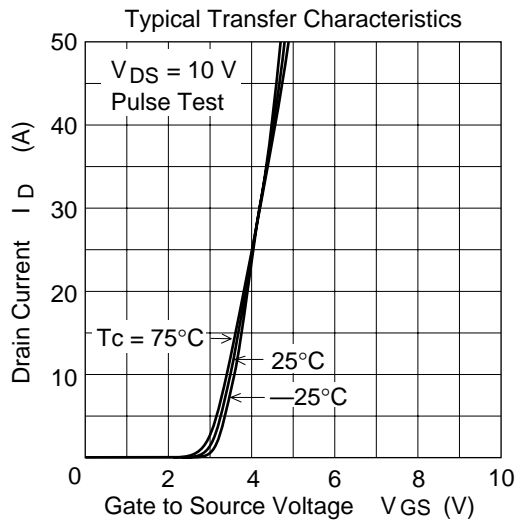
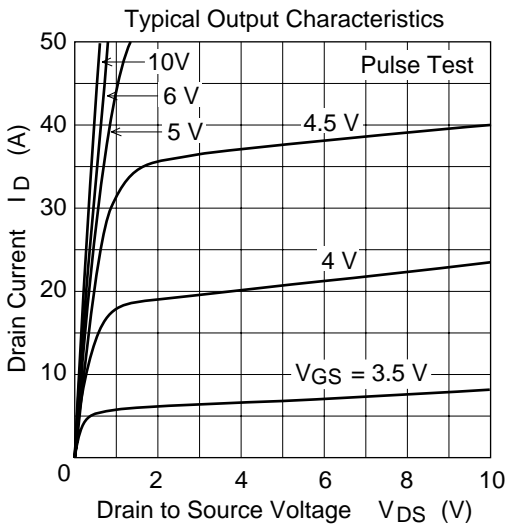
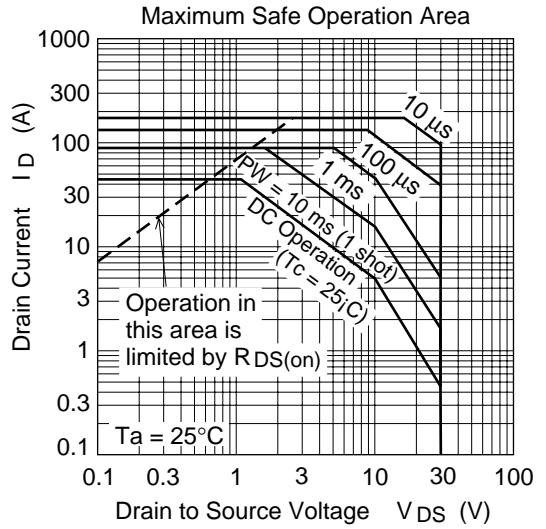
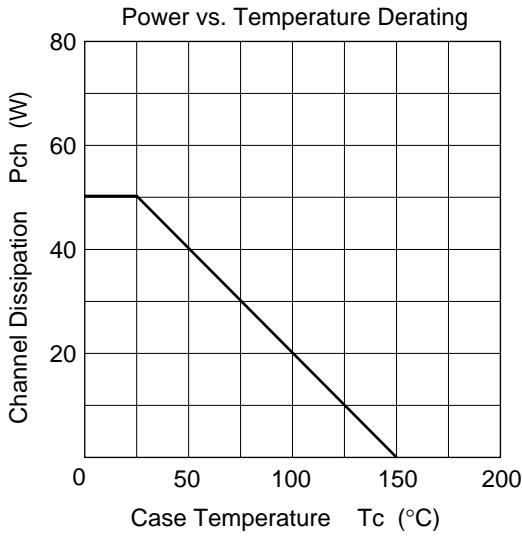
- Note:
1. $PW \leq 10\mu s$, duty cycle $\leq 1\%$
 2. Value at $T_c = 25^\circ C$
 3. Value at $T_{ch} = 25^\circ C$, $R_g \geq 50\Omega$

Electrical Characteristics (Ta = 25°C)

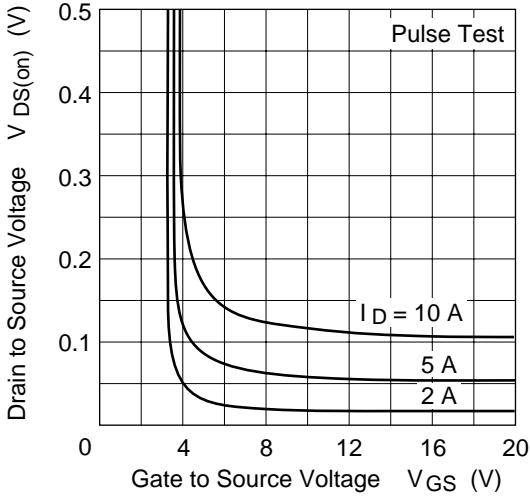
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	30	—	—	V	$I_D = 10\text{mA}, V_{GS} = 0$
Gate to source leak current	I_{GSS}	—	—	± 0.1	μA	$V_{GS} = \pm 20\text{V}, V_{DS} = 0$
Zero gate voltage drain current	I_{DSS}	—	—	10	μA	$V_{DS} = 30\text{V}, V_{GS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	1.5	—	3.0	V	$I_D = 1\text{mA}, V_{DS} = 10\text{V}^{*1}$
Static drain to source on state resistance	$R_{DS(on)}$	—	11	14	$\text{m}\Omega$	$I_D = 20\text{A}, V_{GS} = 10\text{V}^{*1}$
		—	18	28	$\text{m}\Omega$	$I_D = 20\text{A}, V_{GS} = 5\text{V}^{*1}$
Forward transfer admittance	$ y_{fs} $	13	22	—	S	$I_D = 20\text{A}, V_{DS} = 10\text{V}^{*1}$
Input capacitance	Ciss	—	1200	—	pF	$V_{DS} = 10\text{V}$
Output capacitance	Coss	—	380	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	Crss	—	200	—	pF	$f = 1\text{MHz}$
Total gate charge	Qg	—	23	—	nc	$V_{DD} = 10\text{V}$
Gate to source charge	Qgs	—	4.0	—	nc	$V_{GS} = 10\text{V}$
Gate to drain charge	Qgd	—	7.0	—	nc	$I_D = 45\text{A}$
Turn-on delay time	$t_{d(on)}$	—	17	—	ns	$V_{GS} = 10\text{V}, I_D = 20\text{A}$
Rise time	t_r	—	300	—	ns	$R_L = 0.5\Omega$
Turn-off delay time	$t_{d(off)}$	—	85	—	ns	
Fall time	t_f	—	65	—	ns	
Body-drain diode forward voltage	V_{DF}	—	1.15	—	V	$I_F = 45\text{A}, V_{GS} = 0$
Body-drain diode reverse recovery time	t_{rr}	—	60	—	ns	$I_F = 45\text{A}, V_{GS} = 0$ $di_F/dt = 20\text{A}/\mu\text{s}$

Note: 1. Pulse test

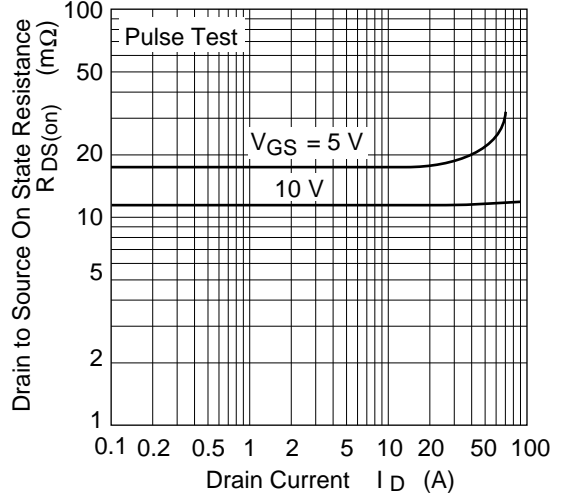
Main Characteristics



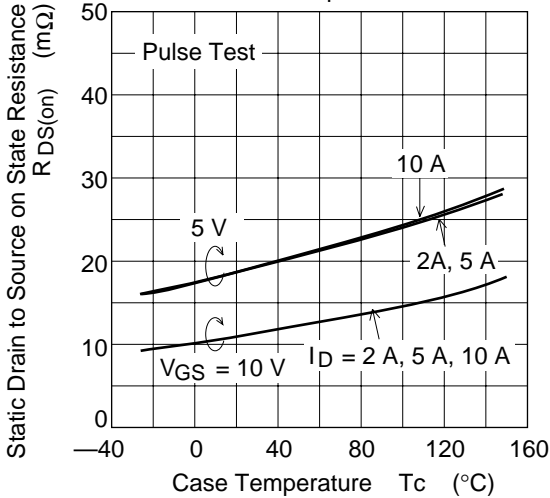
Drain to Source Saturation Voltage vs. Gate to Source Voltage



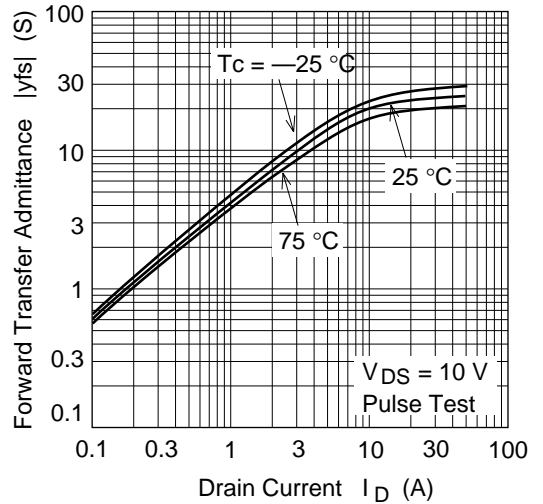
Static Drain to Source on State Resistance vs. Drain Current



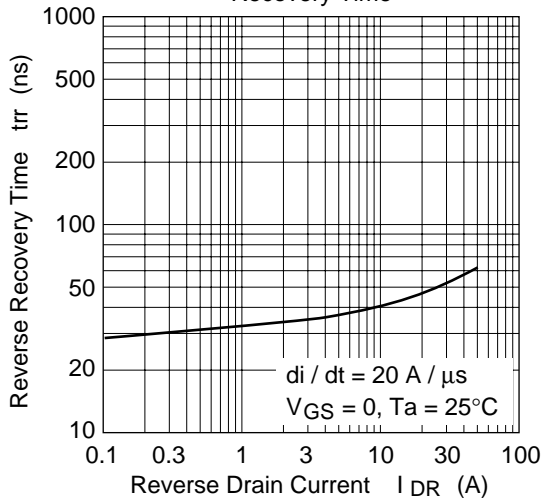
Static Drain to Source on State Resistance vs. Temperature



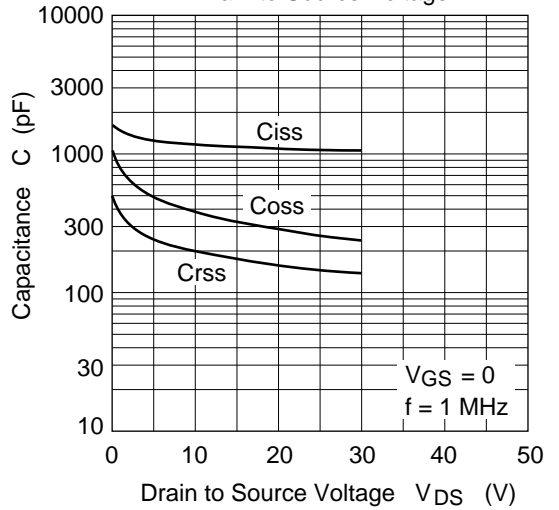
Forward Transfer Admittance vs. Drain Current



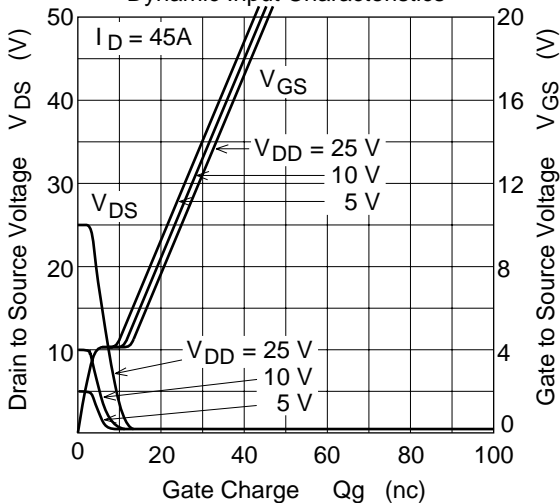
Body—Drain Diode Reverse Recovery Time



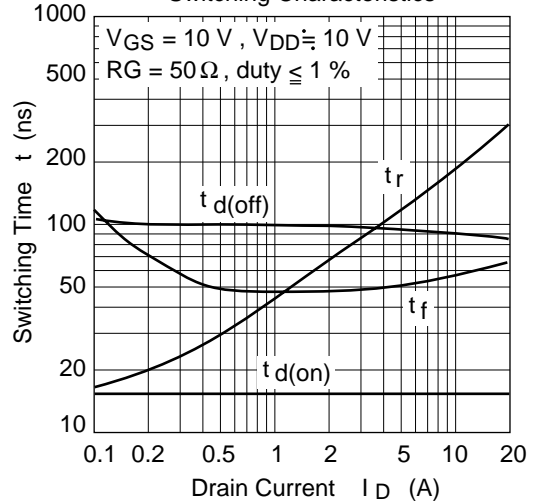
Typical Capacitance vs. Drain to Source Voltage

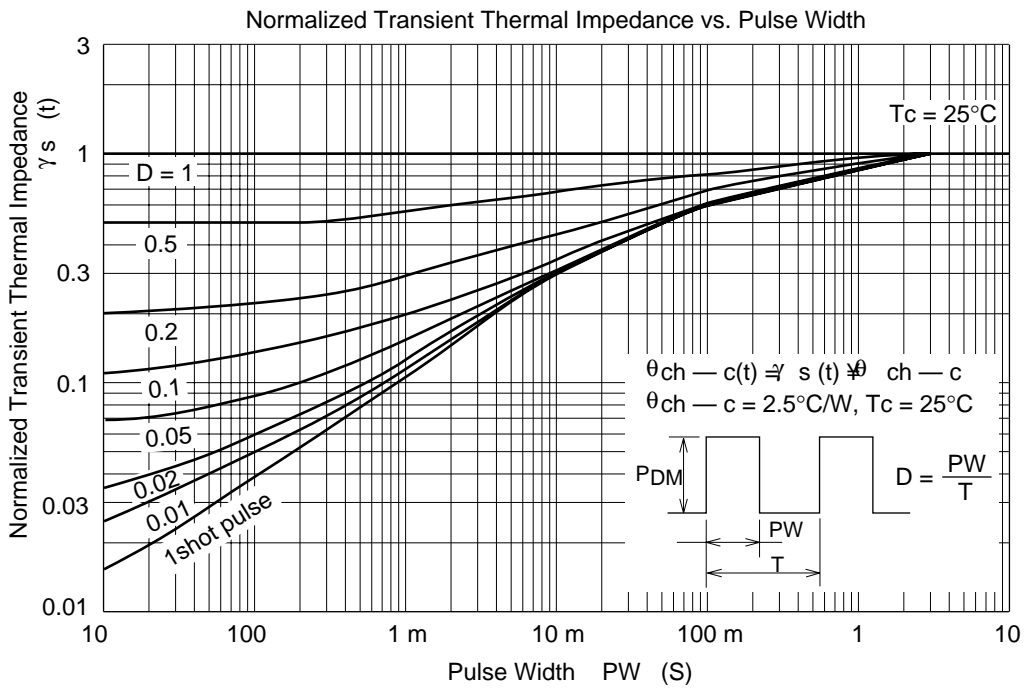
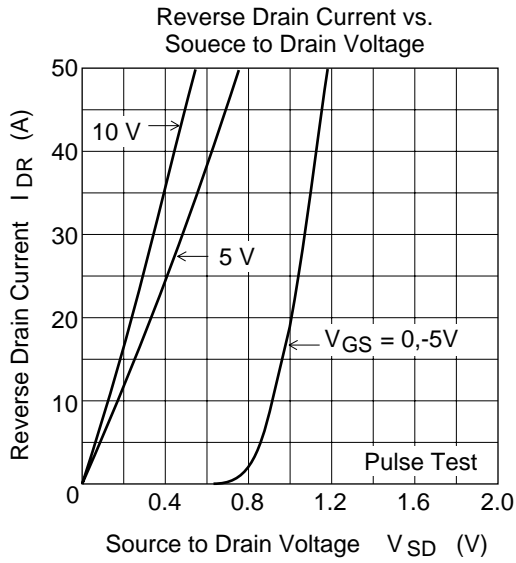


Dynamic Input Characteristics

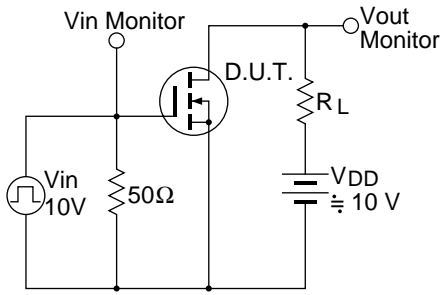


Switching Characteristics

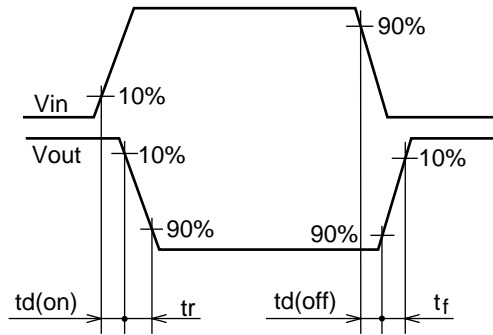




Switching Time Test Circuit

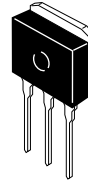
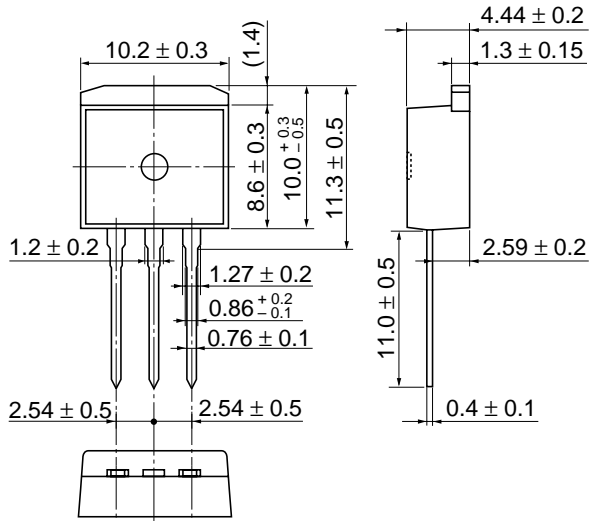


Switching Time Waveform



Package Dimensions

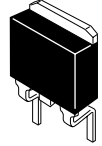
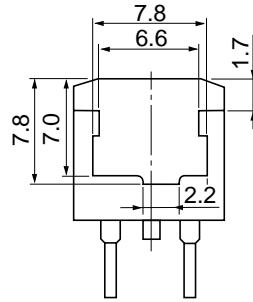
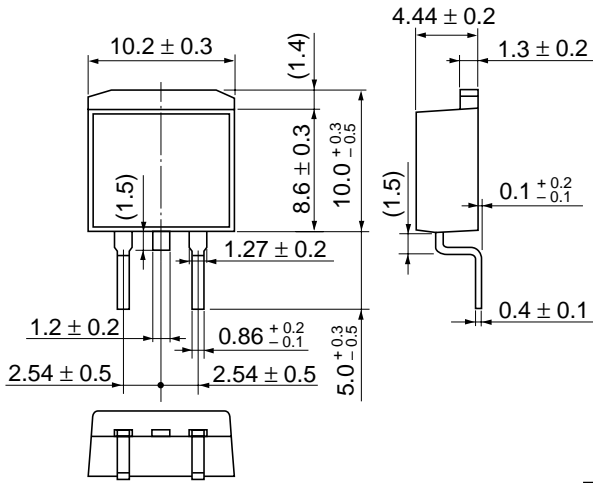
As of January, 2001
Unit: mm



Hitachi Code	LDPAK (L)
JEDEC	—
EIAJ	—
Mass (reference value)	1.4 g

2SK3203(L), 2SK3203(S)

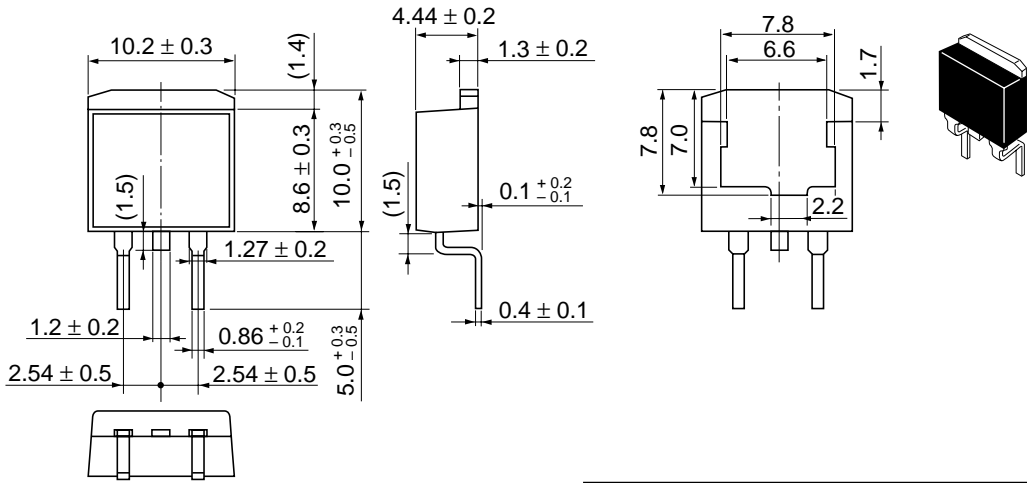
As of January, 2001
Unit: mm



Hitachi Code	LDBAK (S)-(2)
JEDEC	—
EIAJ	—
Mass (reference value)	1.35 g

2SK3203(L), 2SK3203(S)

As of January, 2001
Unit: mm



Hitachi Code	LDBAK (S)-(2)
JEDEC	—
EIAJ	—
Mass (reference value)	1.35 g

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