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Renesas Technology Corp.
Customer Support Dept.
April 1, 2003

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H7N0310LD, H7N0310LS, H7N0310LM

Silicon N Channel MOS FET
High Speed Power Switching

RENESAS

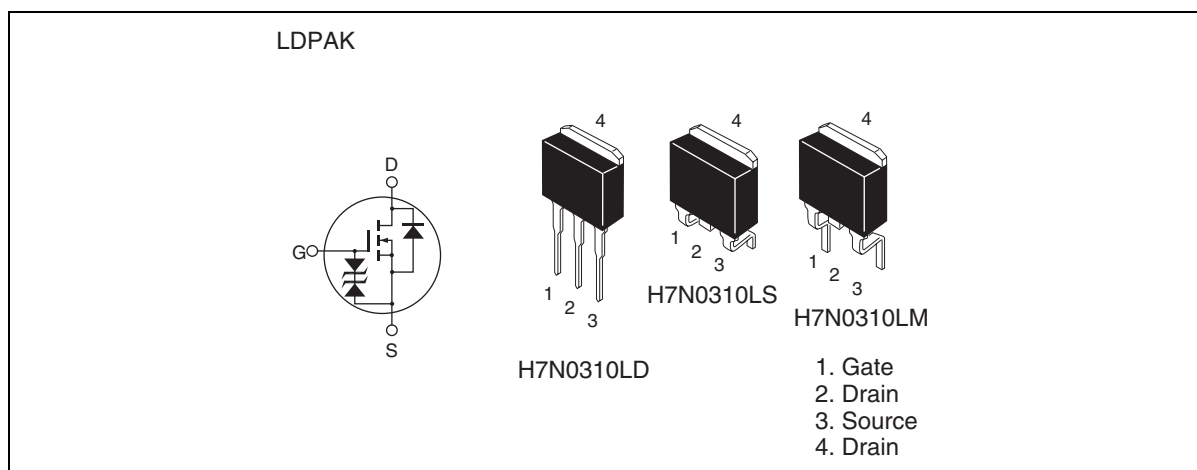
ADE-208-1422C(Z)

4th. Edition
Aug. 2002

Features

- Low on-resistance
- $R_{DS(on)} = 8 \text{ m}\Omega$ typ.
- Low drive current

Outline



H7N0310LD, H7N0310LS, H7N0310LM

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	30	A
Drain peak current	I _{D(pulse)} ^{Note 1}	120	A
Body-drain diode reverse drain current	I _{DR}	30	A
Channel dissipation	Pch ^{Note 2}	50	W
Channel to Case Thermal Impedance	θ _{ch-c}	2.5	°C/W
Channel temperature	T _{ch}	150	°C
Storage temperature	T _{stg}	-55 to +150	°C

Notes: 1. PW ≤ 10μs, duty cycle ≤ 1 %

2. Value at Tc = 25°C

H7N0310LD, H7N0310LS, H7N0310LM

Electrical Characteristics

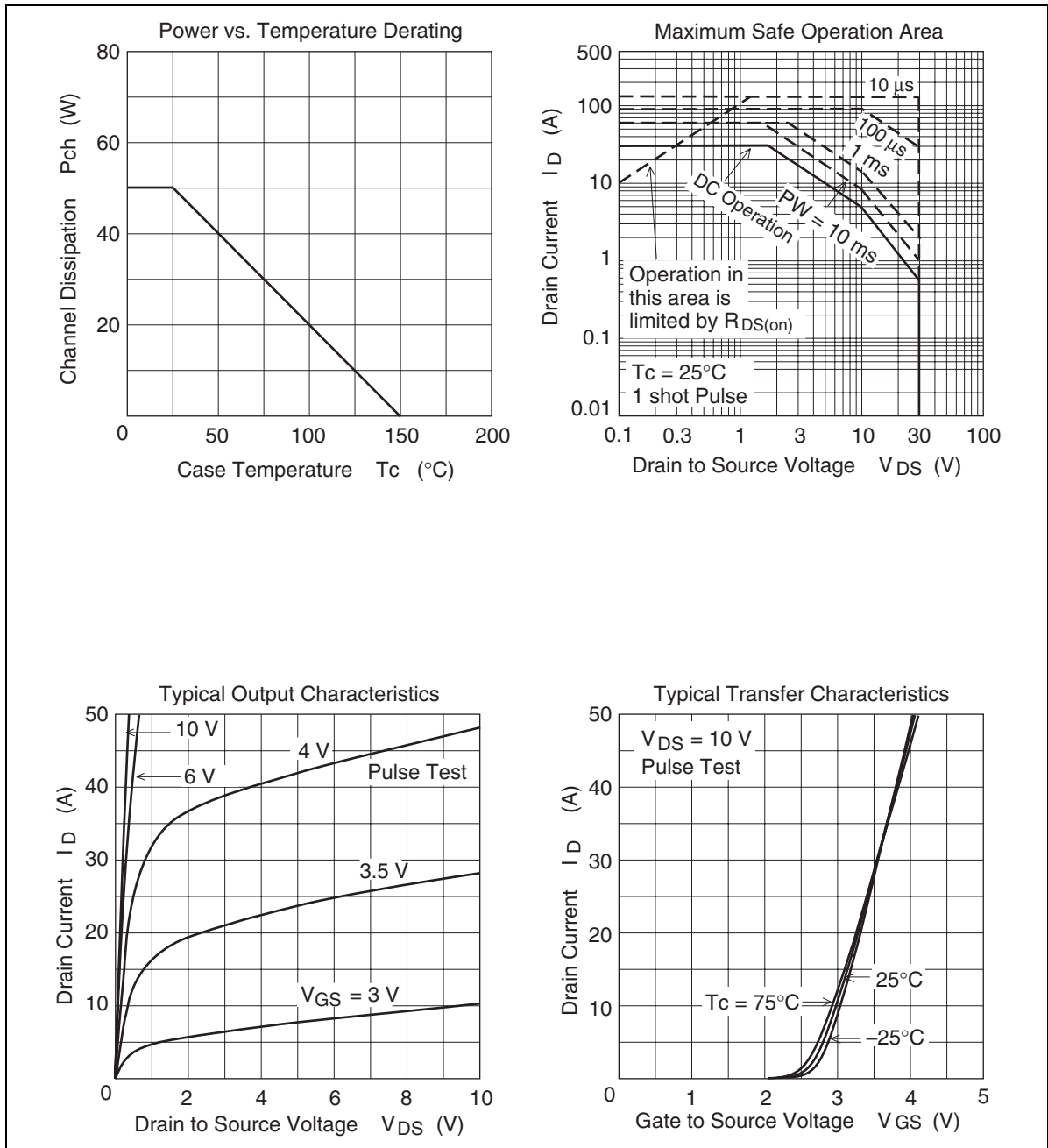
(Ta = 25°C)

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 breakdown voltage	$V_{(BR)GSS}$	± 20	—	—		$I_G = \pm 100 \text{ }\mu\text{A}, V_{DS} = 0$
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	$V_{DS} = 30 \text{ V}, V_{GS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	1.0	—	2.5	V	$I_D = 1 \text{ mA}, V_{DS} = 10 \text{ V}^{\text{Note1}}$
Static drain to source on state resistance	$R_{DS(on)}$	—	8.0	10	$\text{m}\Omega$	$I_D = 15 \text{ A}, V_{GS} = 10 \text{ V}^{\text{Note1}}$
		—	13	19	$\text{m}\Omega$	$I_D = 15 \text{ A}, V_{GS} = 5 \text{ V}^{\text{Note1}}$
Forward transfer admittance	$ y_{fs} $	21	35	—	S	$I_D = 15 \text{ A}, V_{DS} = 10 \text{ V}^{\text{Note1}}$
Input capacitance	C_{iss}	—	1400	—	pF	$V_{DS} = 10 \text{ V}$
Output capacitance	C_{oss}	—	380	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	C_{rss}	—	210	—	pF	$f = 1 \text{ MHz}$
Total gate charge	Q_g	—	24	—	nc	$V_{DD} = 10 \text{ V}$
Gate to source charge	Q_{gs}	—	4.8	—	nc	$V_{GS} = 10 \text{ V}$
Gate to drain charge	Q_{gd}	—	4.6	—	nc	$I_D = 30 \text{ A}$
Turn-on delay time	$t_{d(on)}$	—	21	—	ns	$V_{GS} = 10 \text{ V}, I_D = 15 \text{ A}$
Rise time	t_r	—	250	—	ns	$R_L = 0.67 \text{ }\Omega$
Turn-off delay time	$t_{d(off)}$	—	55	—	ns	$R_g = 4.7 \text{ }\Omega$
Fall time	t_f	—	16	—	ns	
Body-drain diode forward voltage	V_{DF}	—	0.90	—	V	$I_F = 30 \text{ A}, V_{GS} = 0$
Body-drain diode reverse recovery time	t_{rr}	—	35	—	ns	$I_F = 30 \text{ A}, V_{GS} = 0$ $diF/dt = 50 \text{ A}/\mu\text{s}$

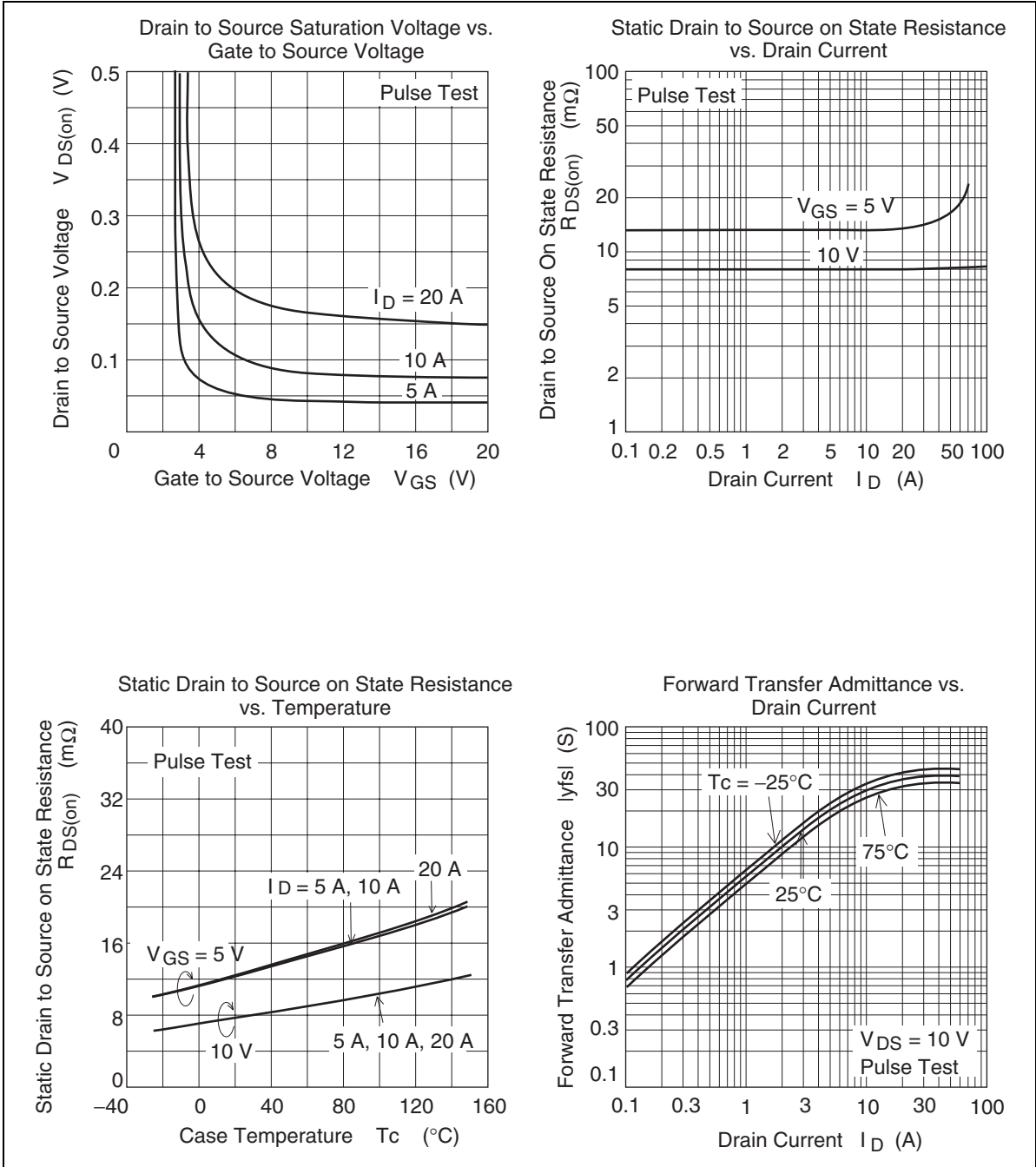
Notes: 1. Pulse test

H7N0310LD, H7N0310LS, H7N0310LM

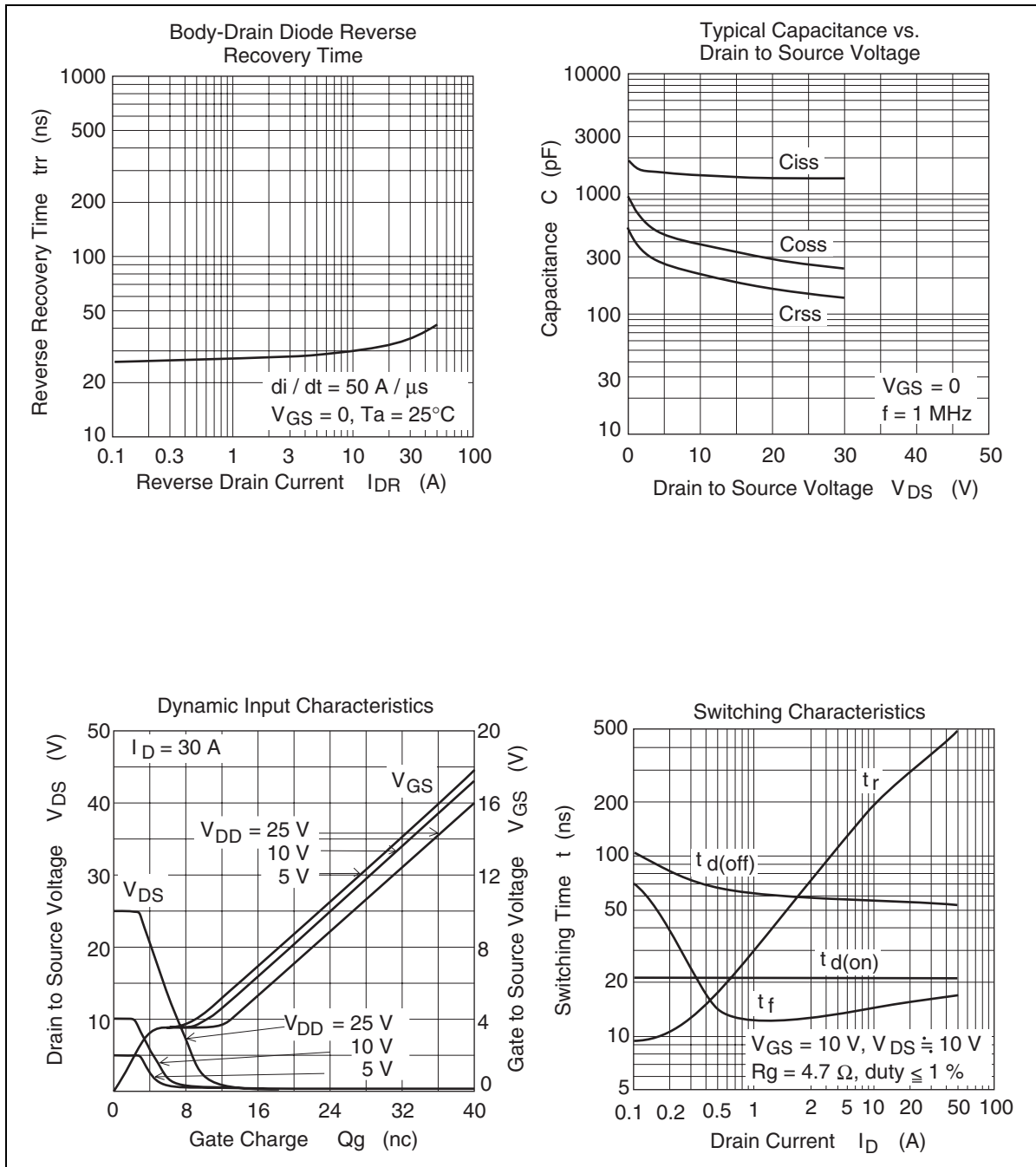
Main Characteristics



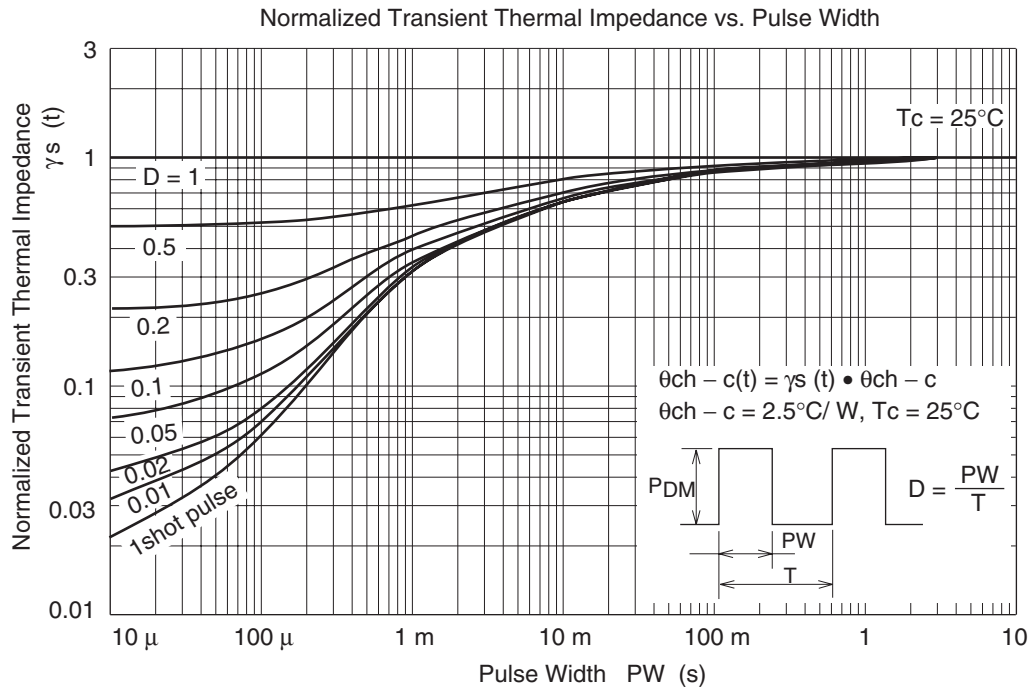
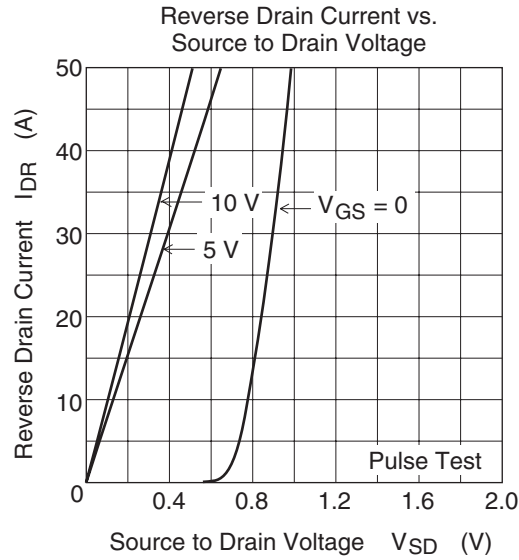
H7N0310LD, H7N0310LS, H7N0310LM



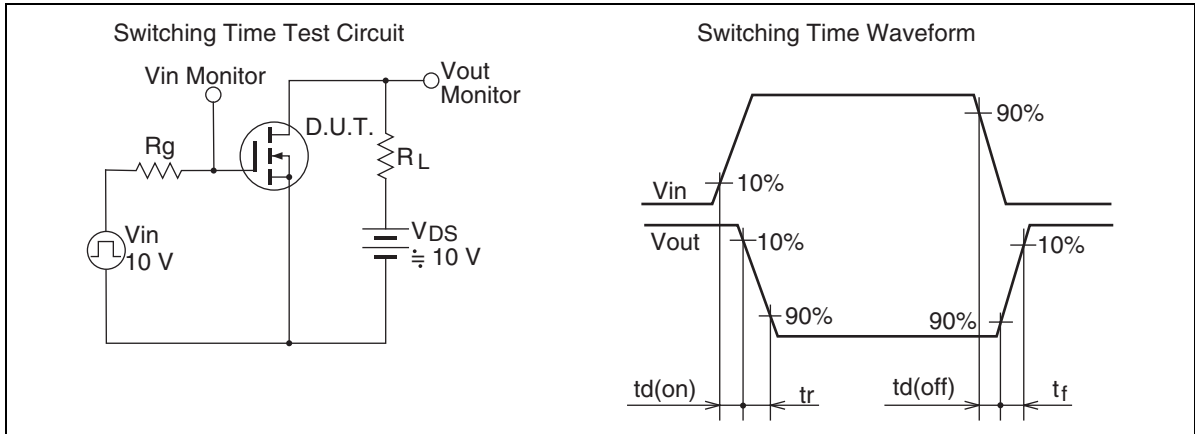
H7N0310LD, H7N0310LS, H7N0310LM



H7N0310LD, H7N0310LS, H7N0310LM



H7N0310LD, H7N0310LS, H7N0310LM

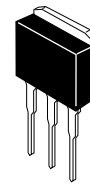
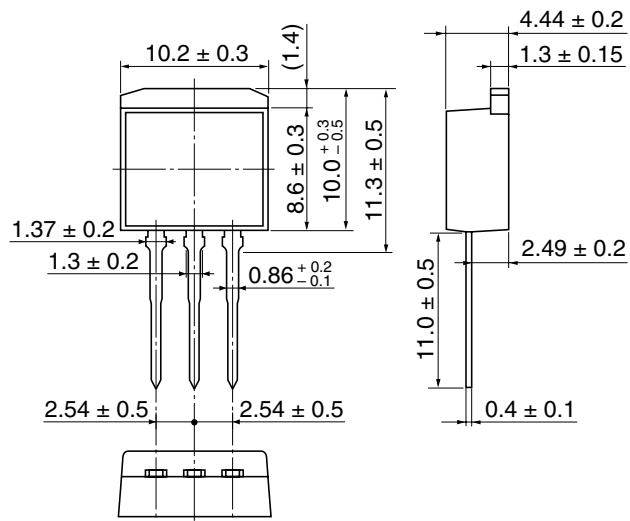


H7N0310LD, H7N0310LS, H7N0310LM

Package Dimensions

• H7N0310LD

Unit: mm

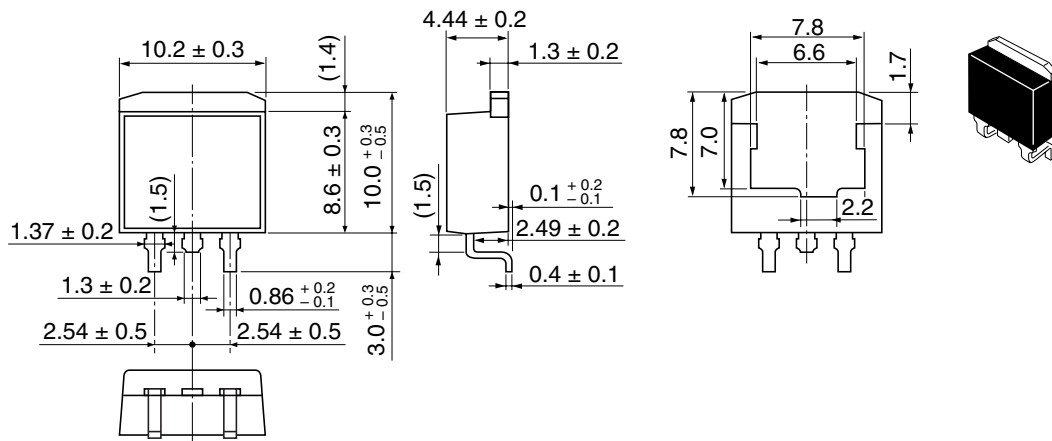


Hitachi Code	LDPAK (L)
JEDEC	—
JEITA	—
Mass (reference value)	1.4 g

H7N0310LD, H7N0310LS, H7N0310LM

• H7N0310LS

Unit: mm

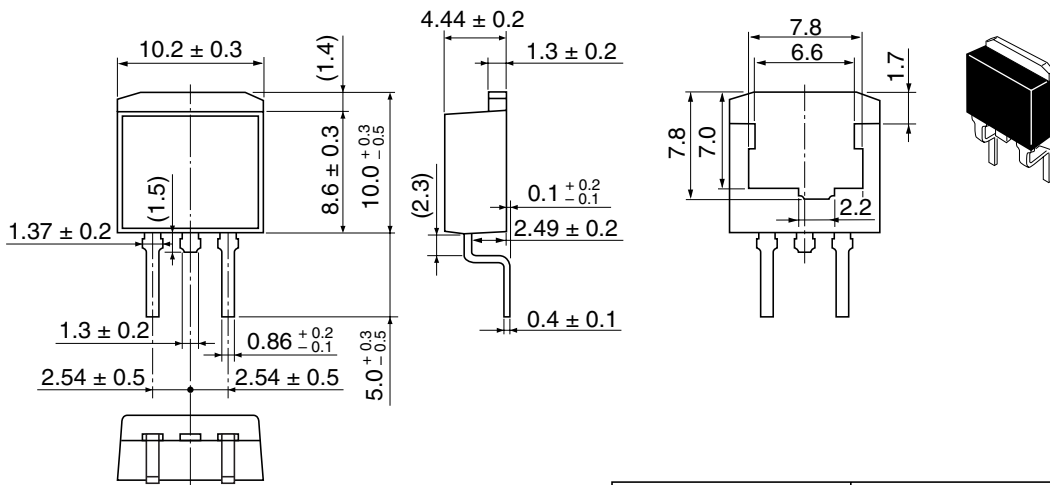


Hitachi Code	LDPAK (S)-(1)
JEDEC	—
JEITA	—
Mass (reference value)	1.3 g

H7N0310LD, H7N0310LS, H7N0310LM

• H7N0310LM

Unit: mm



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

H7N0310LD, H7N0310LS, H7N0310LM

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