



# H7N0307LD, H7N0307LS, H7N0307LM

Silicon N Channel MOS FET  
High Speed Power Switching

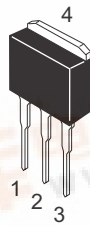
REJ03G1121-0700  
(Previous: ADE-208-1516E)  
Rev.7.00  
Apr 07, 2006

## Features

- Low on-resistance  
 $R_{DS(on)} = 4.6 \text{ m}\Omega$  typ.
- Low drive current
- 4.5 V gate drive device can be driven from 5 V source

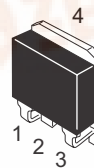
## Outline

RENESAS Package code: PRSS0004AE-A  
(Package name: LDKPAK (L) )



H7N0307LD

RENESAS Package code: PRSS0004AE-B  
(Package name: LDKPAK (S)-(1) )



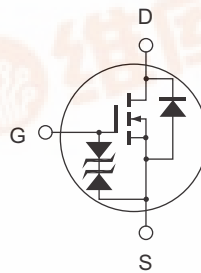
H7N0307LS

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

RENESAS Package code: PRSS0004AE-C  
(Package name: LDKPAK (S)-(2) )



H7N0307LM



## Absolute Maximum Ratings

(Ta = 25°C)

Item	Symbol	Value	Unit
Drain to source voltage	$V_{DS}$	30	V
Gate to source voltage	$V_{GS}$	±20	V
Drain current	$I_D$	60	A
Drain peak current	$I_{D(pulse)}$ <sup>Note 1</sup>	240	A
Body to drain diode reverse drain current	$I_{DR}$	60	A
Channel dissipation	$P_{ch}$ <sup>Note 2</sup>	90	W
Channel to case thermal impedance	$\theta_{ch-c}$	1.39	°C/W
Channel to ambient thermal impedance	$\theta_{ch-a}$	89	°C/W
Channel temperature	$T_{ch}$	150	°C
Storage temperature	$T_{stg}$	-55 to +150	°C

Notes: 1.  $PW \leq 10 \mu s$ , duty cycle  $\leq 1\%$ 2. Value at  $T_c = 25^\circ C$ 

## Electrical Characteristics

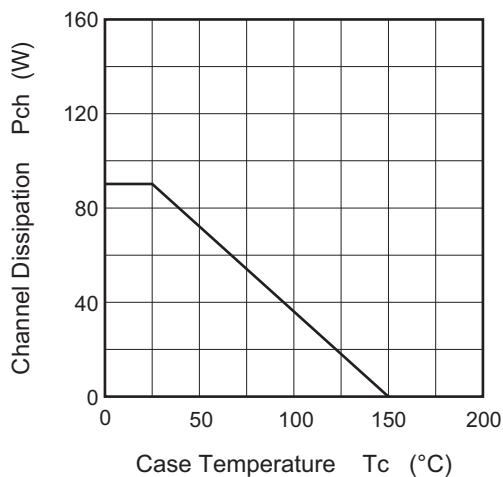
(Ta = 25°C)

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	—	—	V	$I_G = \pm 100 \mu A$ , $V_{DS} = 0$
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	$I_D = 1 \text{ mA}$ , $V_{DS} = 10 \text{ V}$ <sup>Note 3</sup>
Static drain to source on state resistance	$R_{DS(on)}$	—	4.6	5.8	mΩ	$I_D = 30 \text{ A}$ , $V_{GS} = 10 \text{ V}$ <sup>Note 3</sup>
		—	8.0	11.5	mΩ	$I_D = 30 \text{ A}$ , $V_{GS} = 4.5 \text{ V}$ <sup>Note 3</sup>
Forward transfer admittance	$ y_{fs} $	40	65	—	S	$I_D = 30 \text{ A}$ , $V_{DS} = 10 \text{ V}$ <sup>Note 3</sup>
Input capacitance	$C_{iss}$	—	2500	—	pF	$V_{DS} = 10 \text{ V}$ $V_{GS} = 0$ $f = 1 \text{ MHz}$
Output capacitance	$C_{oss}$	—	650	—	pF	
Reverse transfer capacitance	$C_{rss}$	—	350	—	pF	
Total gate charge	$Q_g$	—	40	—	nC	$V_{DD} = 10 \text{ V}$ $V_{GS} = 10 \text{ V}$ $I_D = 60 \text{ A}$
Gate to source charge	$Q_{gs}$	—	7	—	nC	
Gate to drain charge	$Q_{gd}$	—	8	—	nC	
Turn-on delay time	$t_{d(on)}$	—	20	—	ns	$V_{GS} = 10 \text{ V}$ , $I_D = 30 \text{ A}$ $R_L = 0.33 \Omega$ $R_g = 4.7 \Omega$
Rise time	$t_r$	—	300	—	ns	
Turn-off delay time	$t_{d(off)}$	—	70	—	ns	
Fall time	$t_f$	—	20	—	ns	
Body to drain diode forward voltage	$V_{DF}$	—	0.92	—	V	$I_F = 60 \text{ A}$ , $V_{GS} = 0$
Body to drain diode reverse recovery time	$t_{rr}$	—	60	—	ns	$I_F = 60 \text{ A}$ , $V_{GS} = 0$ $di_F/dt = 50 \text{ A}/\mu s$

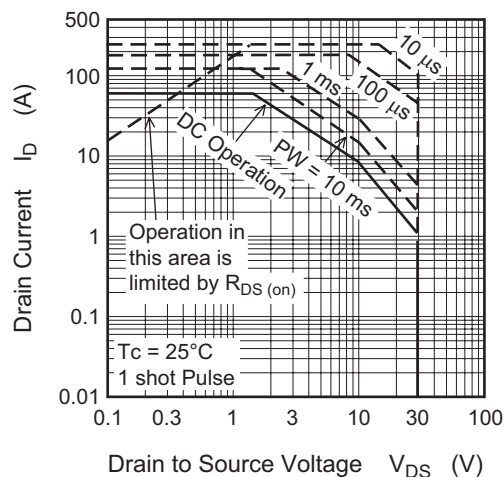
Note: 3. Pulse test

## Main Characteristics

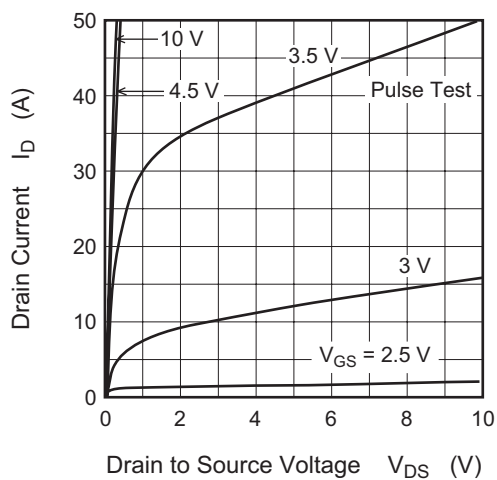
Power vs. Temperature Derating



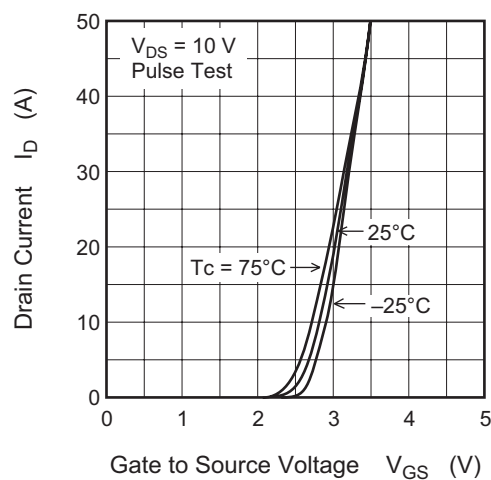
Maximum Safe Operation Area



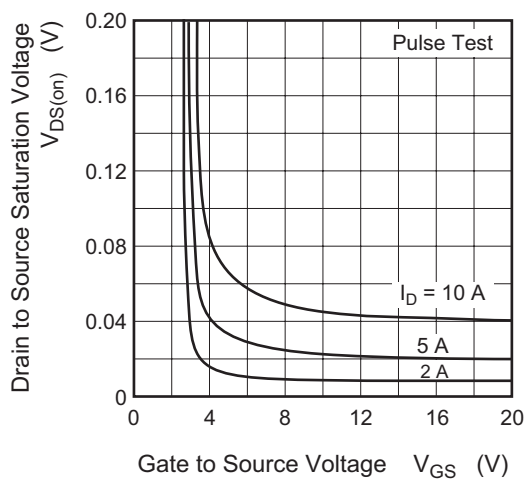
Typical Output Characteristics



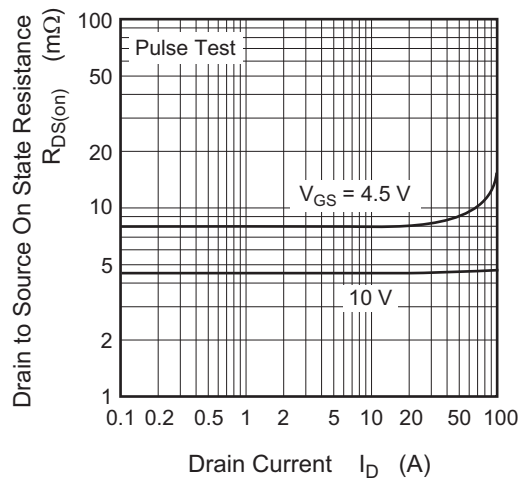
Typical Transfer Characteristics

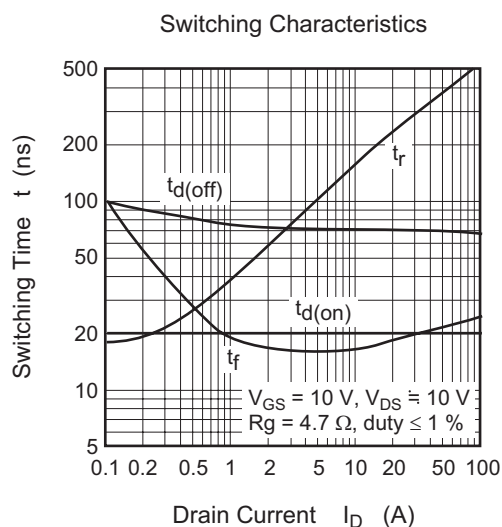
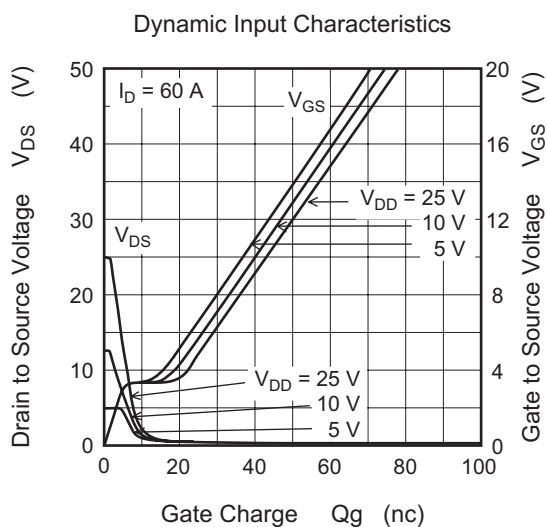
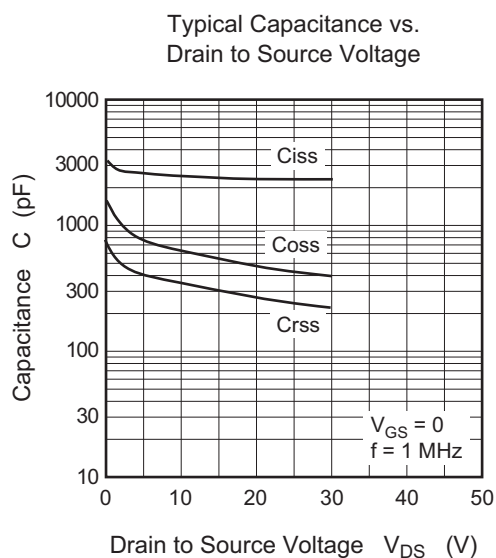
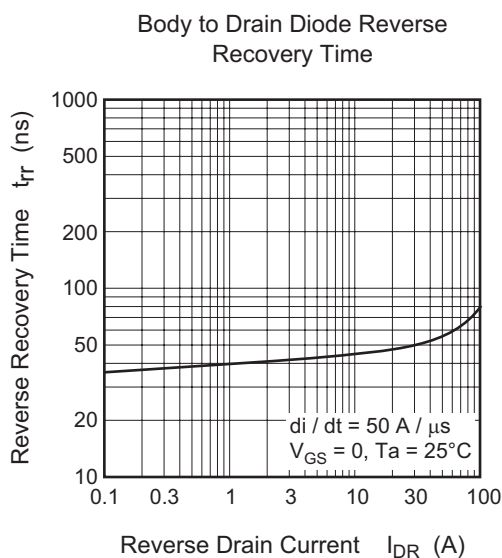
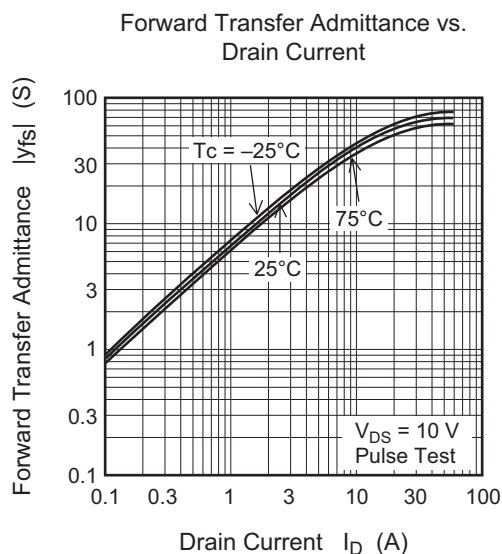
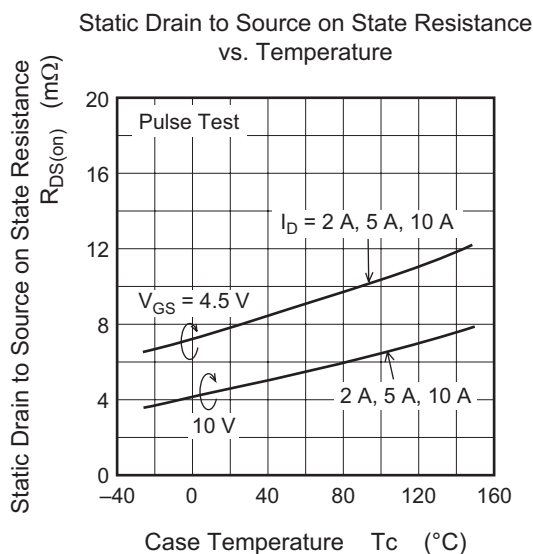


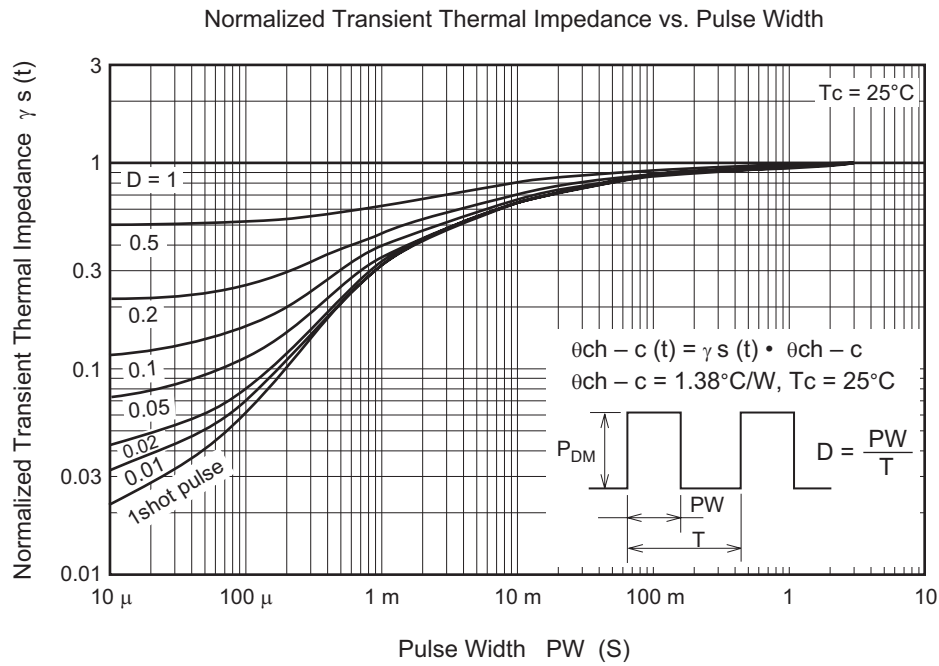
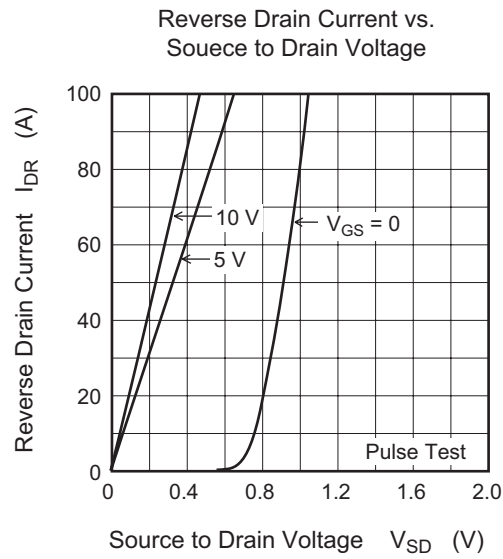
Drain to Source Saturation Voltage vs. Gate to Source Voltage



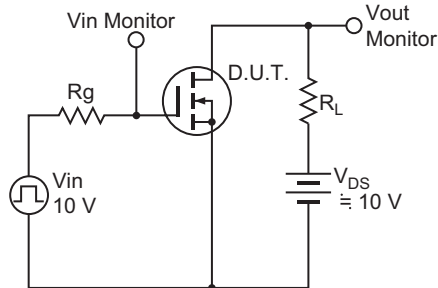
Static Drain to Source on State Resistance vs. Drain Current



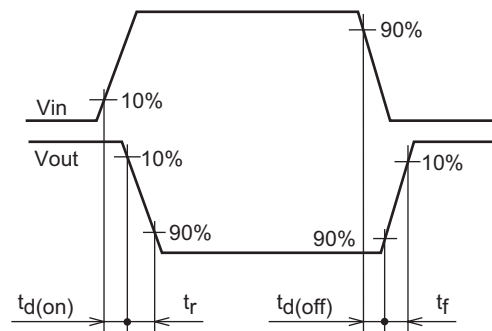




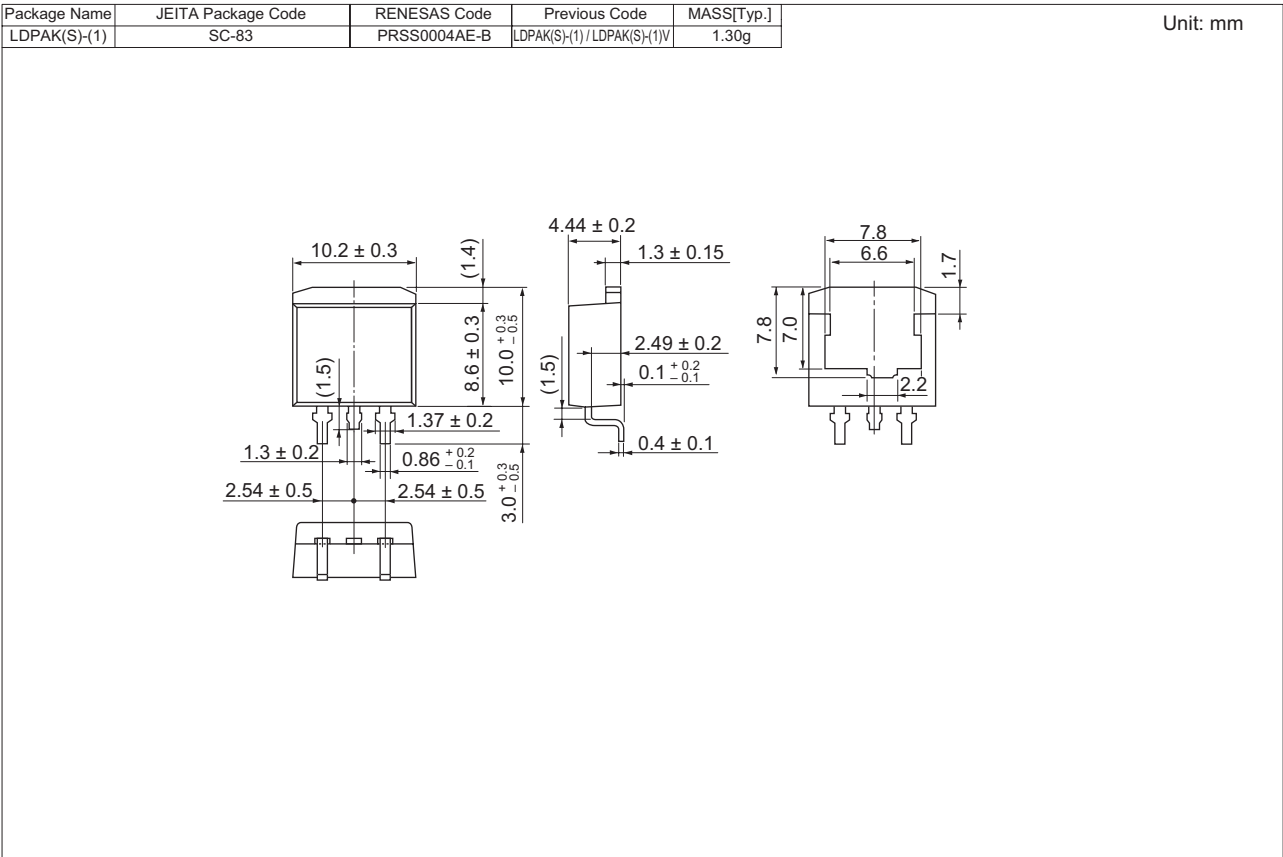
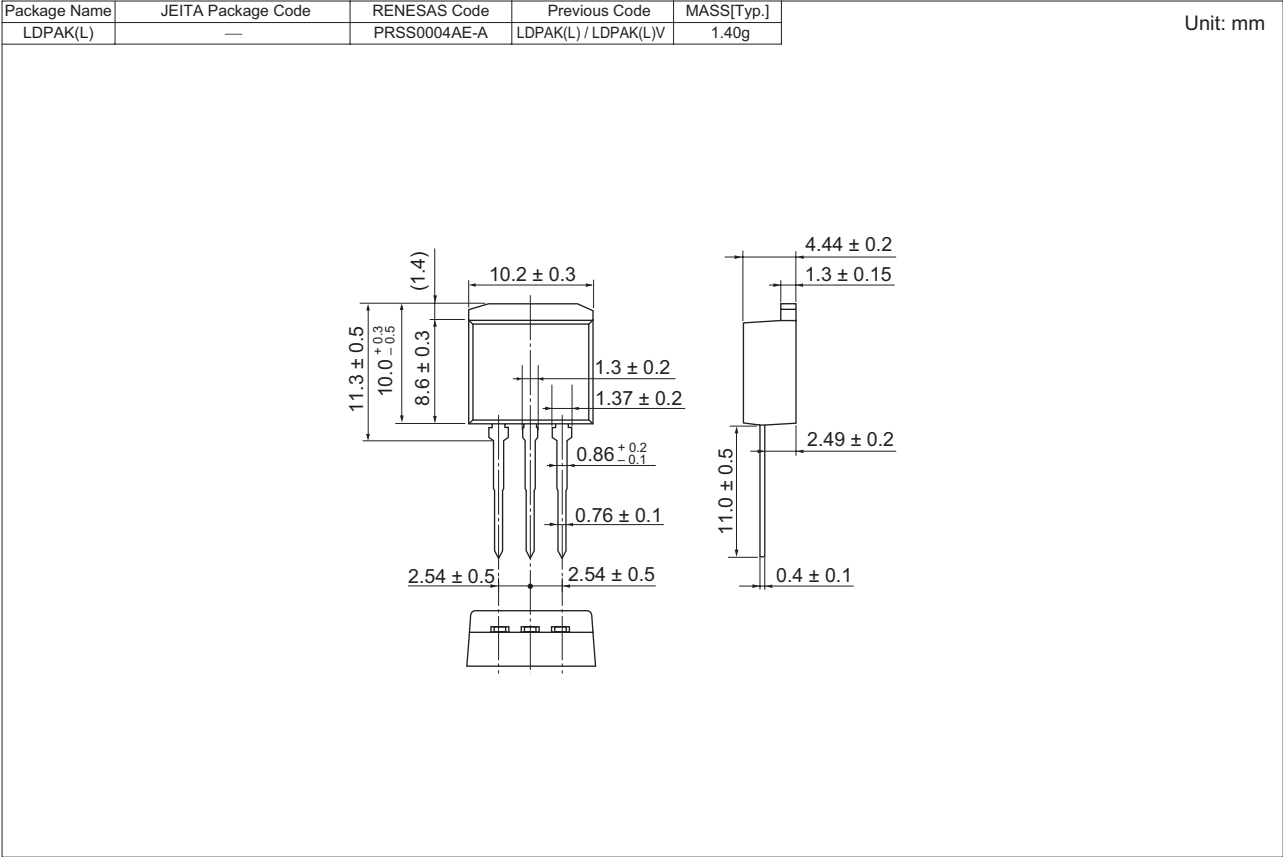
Switching Time Test Circuit



Switching Time Waveform



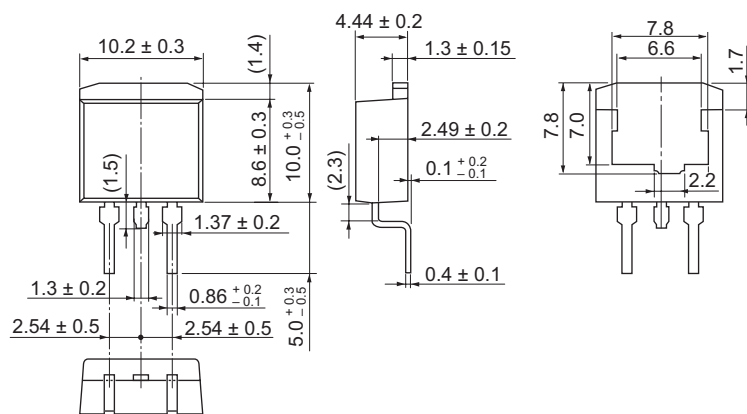
Package Dimensions



## H7N0307LD, H7N0307LS, H7N0307LM

Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
LDBAK(S)-(2)	—	PRSS0004AE-C	LDBAK(S)-(2) / LDBAK(S)-(2)V	1.35g

Unit: mm



## Ordering Information

Part Name	Quantity	Shipping Container
H7N0307LD-E	500 pcs	Box (Conductive Sack)
H7N0307LSTL-E	1000 pcs	Taping
H7N0307LMTL-E	1000 pcs	Taping

Note: For some grades, production may be terminated. Please contact the Renesas sales office to check the state of production before ordering the product.

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