

To our customers,

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## Old Company Name in Catalogs and Other Documents

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April 1<sup>st</sup>, 2010  
Renesas Electronics Corporation

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# H7N0307LD, H7N0307LS, H7N0307LM

Silicon N Channel MOS FET  
High Speed Power Switching

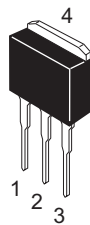
REJ03G1121-0700  
(Previous: ADE-208-1516E)  
Rev.7.00  
Apr 07, 2006

## 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

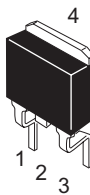
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(Package name: LDKPAK (S)-(1) )



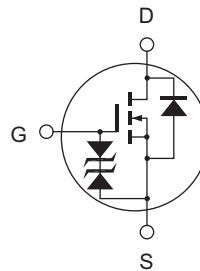
H7N0307LS

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 <sub>DSS</sub>	30	V
Gate to source voltage	V <sub>GSS</sub>	±20	V
Drain current	I <sub>D</sub>	60	A
Drain peak current	I <sub>D (pulse)</sub> <sup>Note 1</sup>	240	A
Body to drain diode reverse drain current	I <sub>DR</sub>	60	A
Channel dissipation	P <sub>ch</sub> <sup>Note 2</sup>	90	W
Channel to case thermal impedance	θ <sub>ch-c</sub>	1.39	°C/W
Channel to ambient thermal impedance	θ <sub>ch-a</sub>	89	°C/W
Channel temperature	T <sub>ch</sub>	150	°C
Storage temperature	T <sub>stg</sub>	-55 to +150	°C

Notes: 1. PW ≤ 10 μs, duty cycle ≤ 1%  
 2. Value at Tc = 25°C

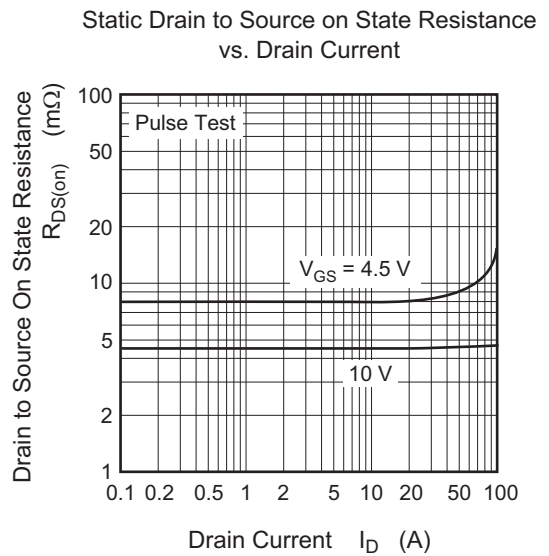
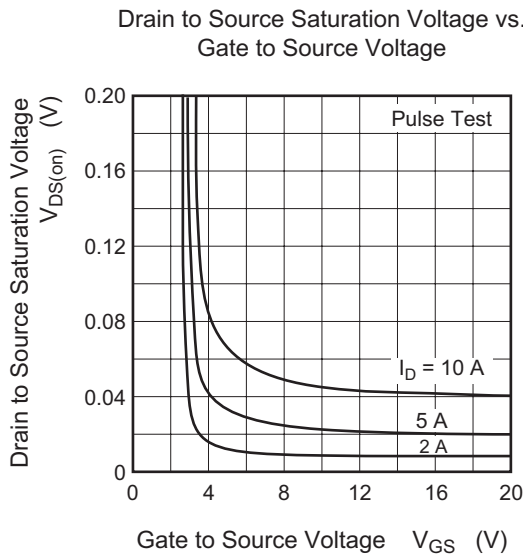
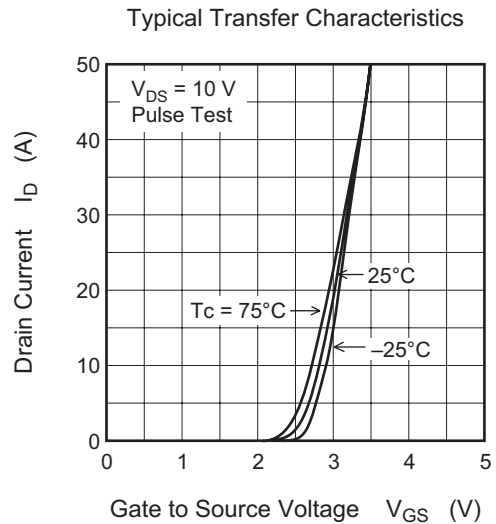
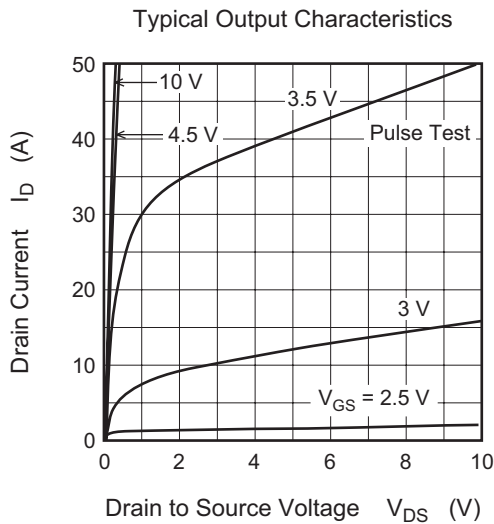
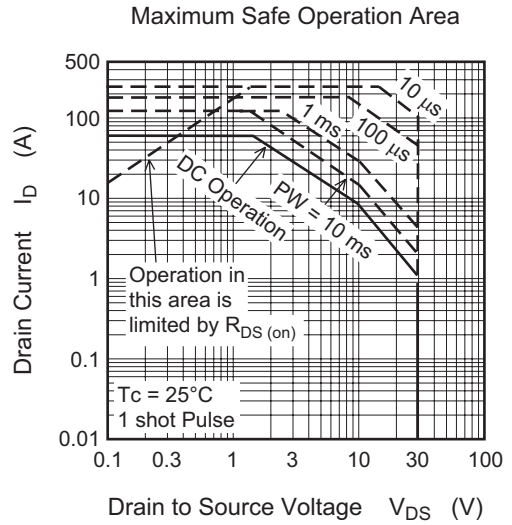
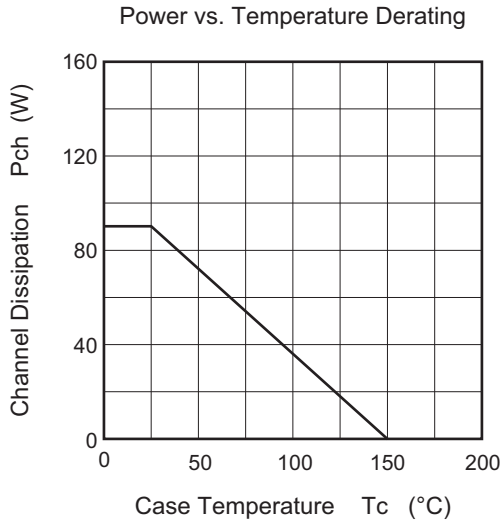
## Electrical Characteristics

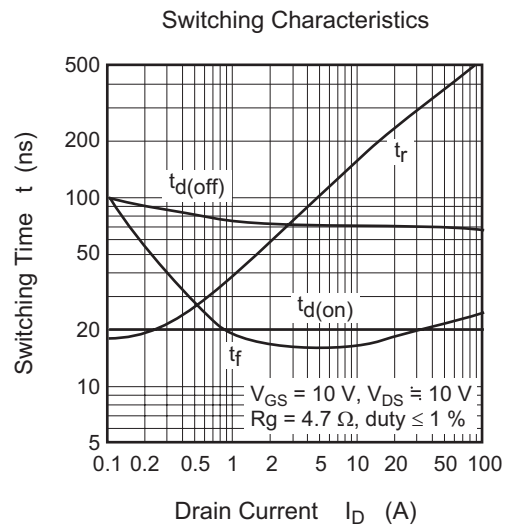
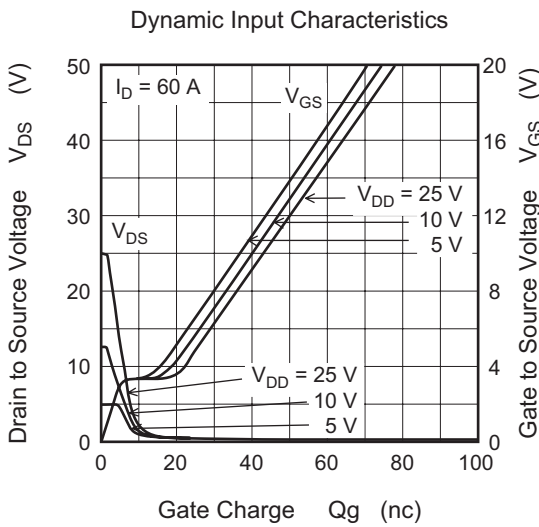
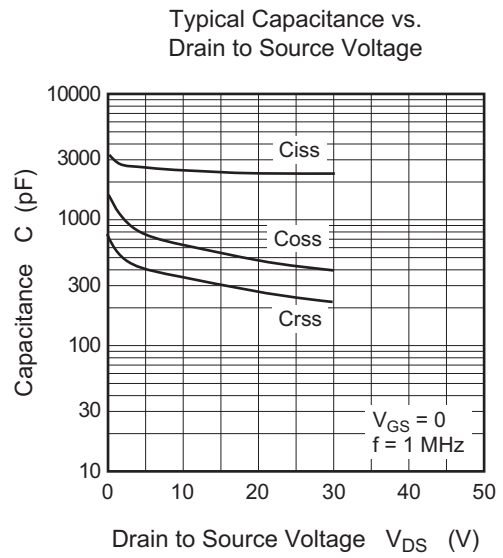
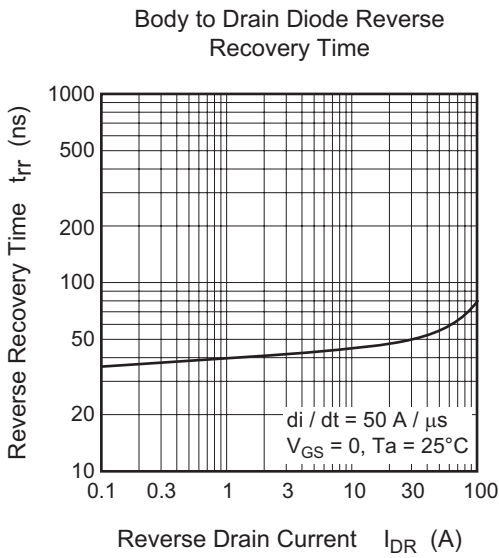
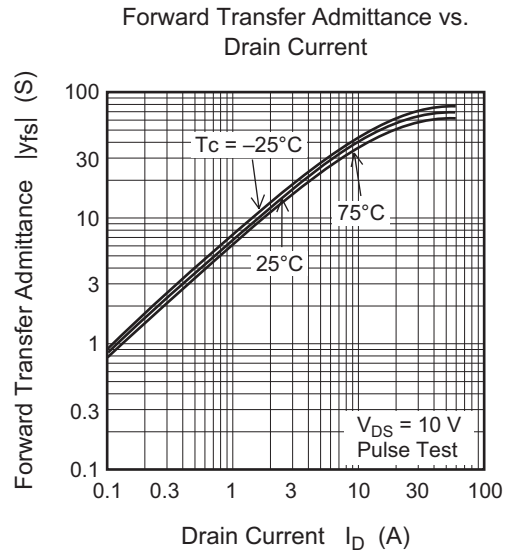
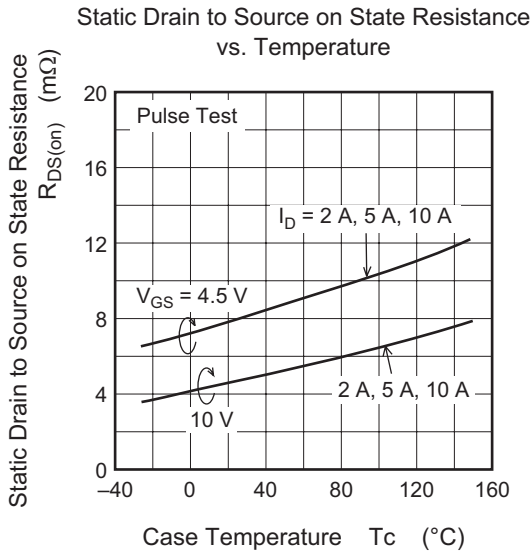
(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	V <sub>(BR) DSS</sub>	30	—	—	V	I <sub>D</sub> = 10 mA, V <sub>GS</sub> = 0
Gate to source breakdown voltage	V <sub>(BR) GSS</sub>	±20	—	—	V	I <sub>G</sub> = ±100 μA, V <sub>DS</sub> = 0
Gate to source leak current	I <sub>GSS</sub>	—	—	±10	μA	V <sub>GS</sub> = ±16 V, V <sub>DS</sub> = 0
Zero gate voltage drain current	I <sub>DSS</sub>	—	—	10	μA	V <sub>DS</sub> = 30 V, V <sub>GS</sub> = 0
Gate to source cutoff voltage	V <sub>GS (off)</sub>	1.0	—	2.5	V	I <sub>D</sub> = 1 mA, V <sub>DS</sub> = 10 V <sup>Note 3</sup>
Static drain to source on state resistance	R <sub>DS (on)</sub>	—	4.6	5.8	mΩ	I <sub>D</sub> = 30 A, V <sub>GS</sub> = 10 V <sup>Note 3</sup>
		—	8.0	11.5	mΩ	I <sub>D</sub> = 30 A, V <sub>GS</sub> = 4.5 V <sup>Note 3</sup>
Forward transfer admittance	y <sub>fs</sub>	40	65	—	S	I <sub>D</sub> = 30 A, V <sub>DS</sub> = 10 V <sup>Note 3</sup>
Input capacitance	C <sub>iss</sub>	—	2500	—	pF	V <sub>DS</sub> = 10 V
Output capacitance	C <sub>oss</sub>	—	650	—	pF	V <sub>GS</sub> = 0
Reverse transfer capacitance	C <sub>rss</sub>	—	350	—	pF	f = 1 MHz
Total gate charge	Q <sub>g</sub>	—	40	—	nC	V <sub>DD</sub> = 10 V
Gate to source charge	Q <sub>gs</sub>	—	7	—	nC	V <sub>GS</sub> = 10 V
Gate to drain charge	Q <sub>gd</sub>	—	8	—	nC	I <sub>D</sub> = 60 A
Turn-on delay time	t <sub>d (on)</sub>	—	20	—	ns	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 30 A
Rise time	t <sub>r</sub>	—	300	—	ns	R <sub>L</sub> = 0.33 Ω
Turn-off delay time	t <sub>d (off)</sub>	—	70	—	ns	R <sub>g</sub> = 4.7 Ω
Fall time	t <sub>f</sub>	—	20	—	ns	
Body to drain diode forward voltage	V <sub>DF</sub>	—	0.92	—	V	I <sub>F</sub> = 60 A, V <sub>GS</sub> = 0
Body to drain diode reverse recovery time	t <sub>rr</sub>	—	60	—	ns	I <sub>F</sub> = 60 A, V <sub>GS</sub> = 0 di <sub>F</sub> /dt = 50 A/μs

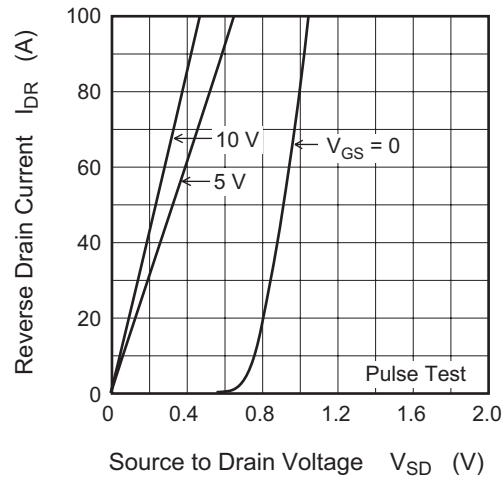
Note: 3. Pulse test

Main Characteristics

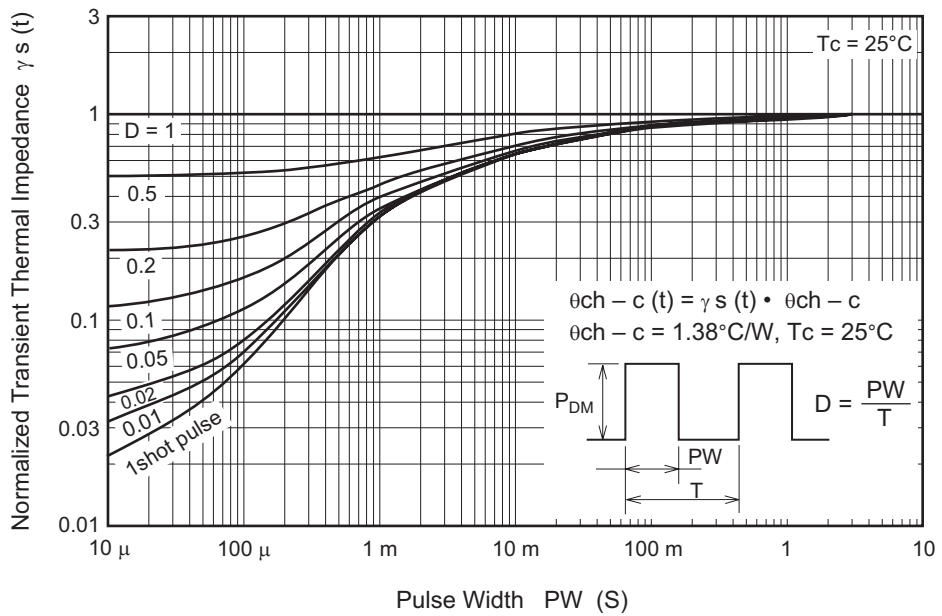




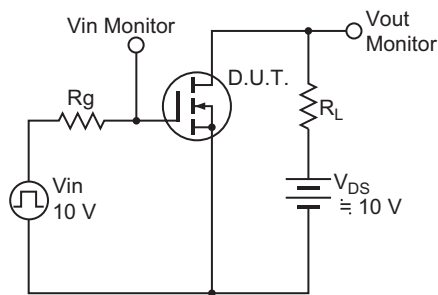
Reverse Drain Current vs. Source to Drain Voltage



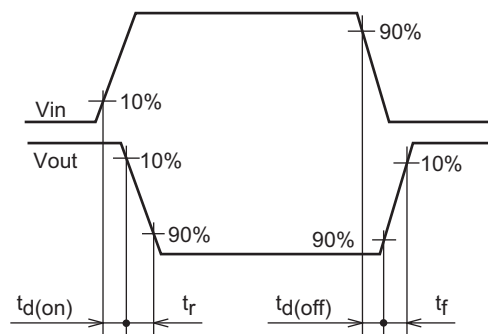
Normalized Transient Thermal Impedance vs. Pulse Width



Switching Time Test Circuit



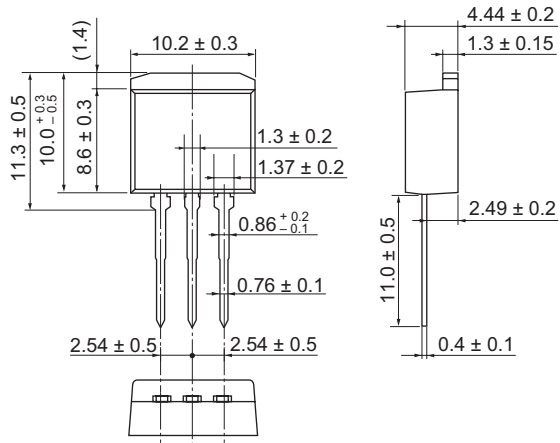
Switching Time Waveform



Package Dimensions

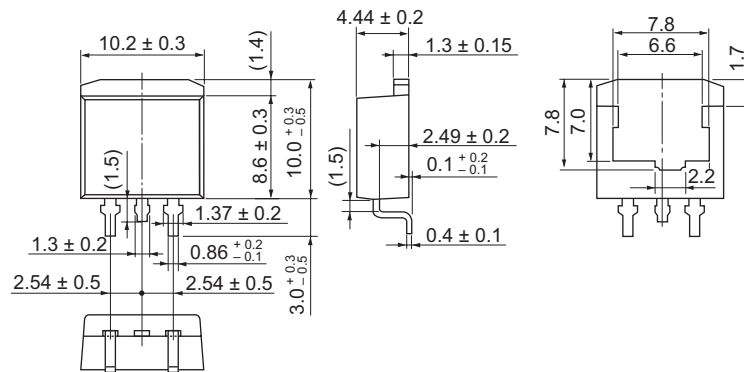
Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
LDBPAK(L)	—	PRSS0004AE-A	LDBPAK(L) / LDBPAK(L)V	1.40g

Unit: mm



Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
LDBPAK(S)-(1)	SC-83	PRSS0004AE-B	LDBPAK(S)-(1) / LDBPAK(S)-(1)V	1.30g

Unit: mm

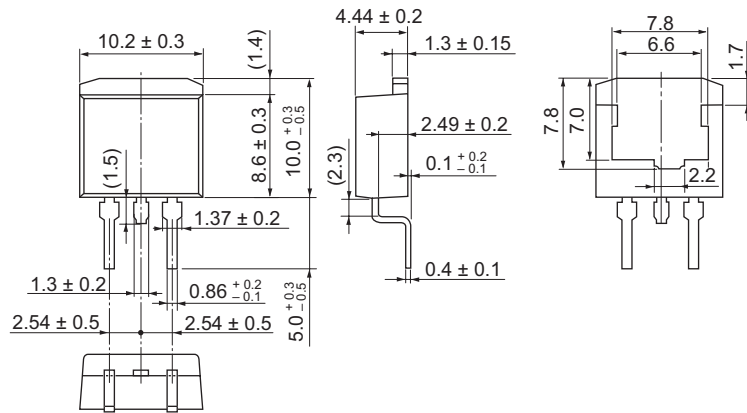




# H7N0307LD, H7N0307LS, H7N0307LM

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

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