

## H7N0311LD, H7N0311LS, H7N0311LM

Silicon N Channel MOS FET  
High Speed Power Switching

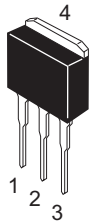
REJ03G1126-0500  
(Previous: ADE-208-1423C)  
Rev.5.00  
Apr 07, 2006

### Features

- Low on-resistance  
 $R_{DS(on)} = 7.0 \text{ m}\Omega$  typ.
- Low drive current

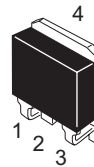
### Outline

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



H7N0311LD

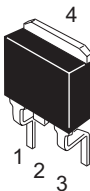
RENESAS Package code: PRSS0004AE-B  
(Package name: LDKPAK (S)-(1) )



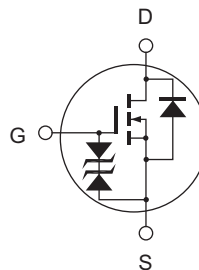
H7N0311LS

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

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



H7N0311LM



## 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>	45	A
Drain peak current	I <sub>D (pulse)</sub> <sup>Note 1</sup>	180	A
Body to drain diode reverse drain current	I <sub>DR</sub>	45	A
Channel dissipation	P <sub>ch</sub> <sup>Note 2</sup>	60	W
Channel to case thermal impedance	θ <sub>ch-c</sub>	2.08	°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

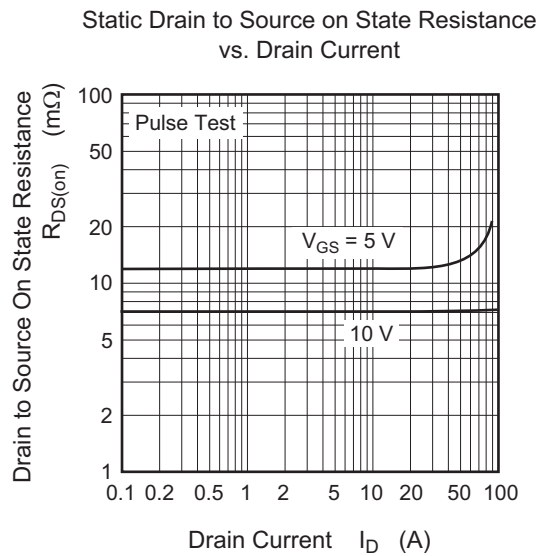
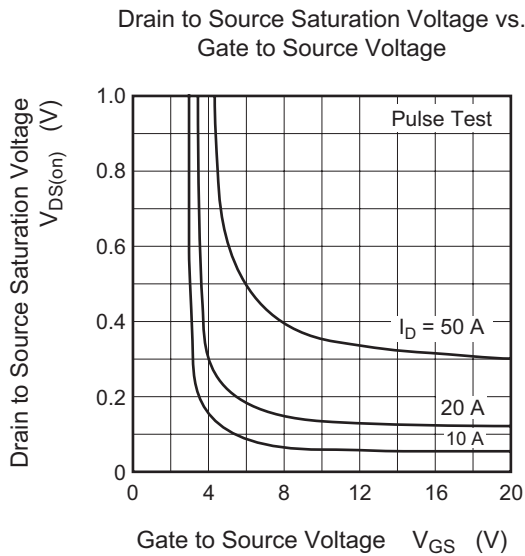
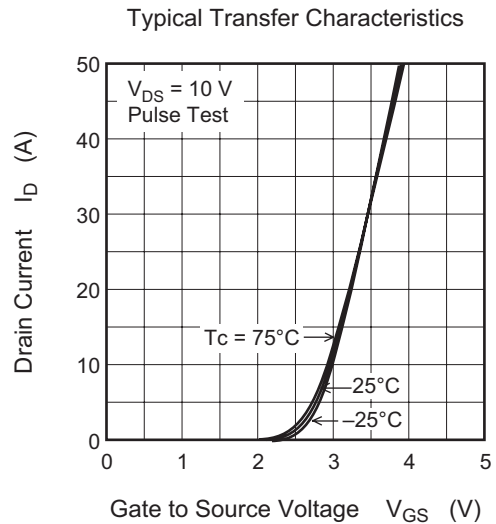
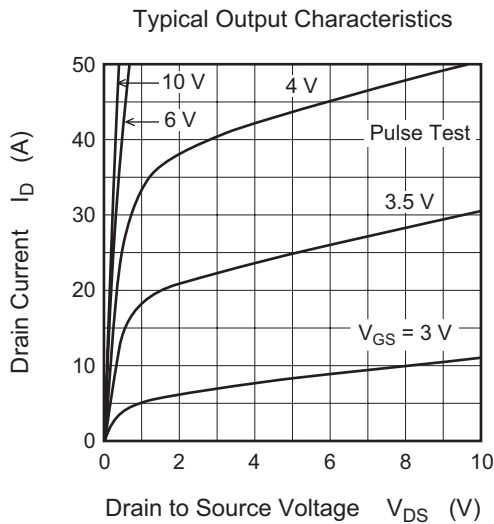
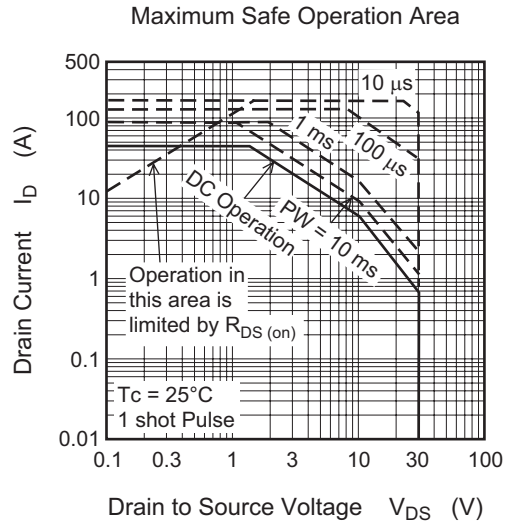
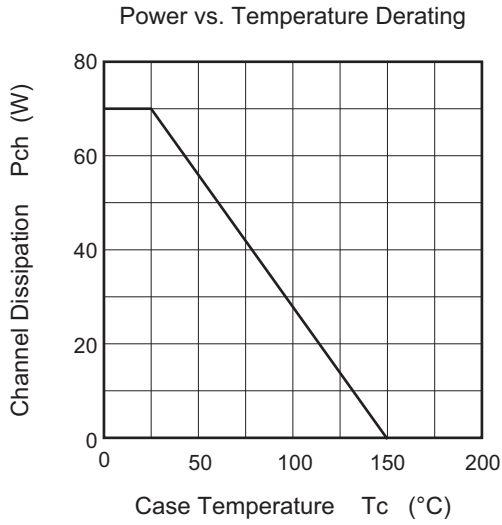
## Electrical Characteristics

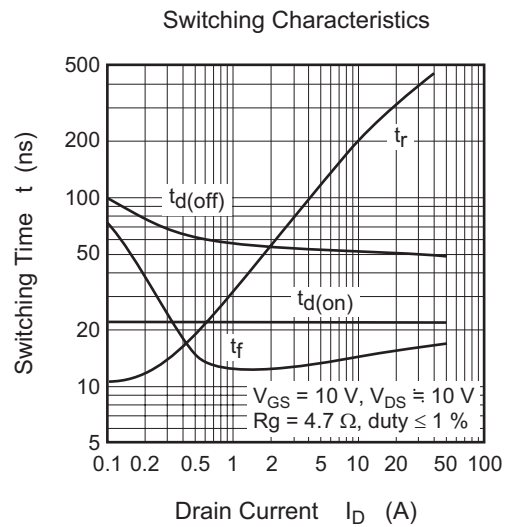
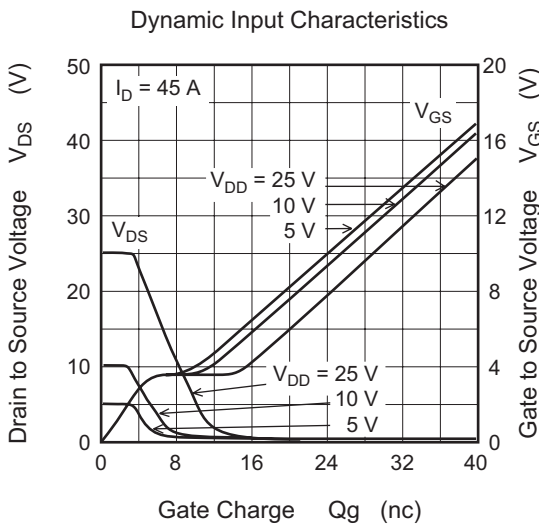
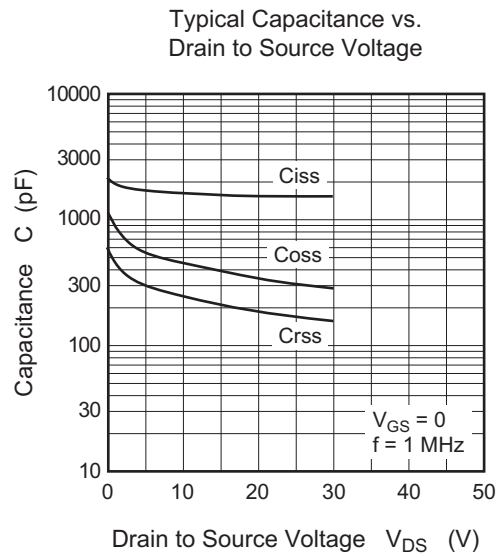
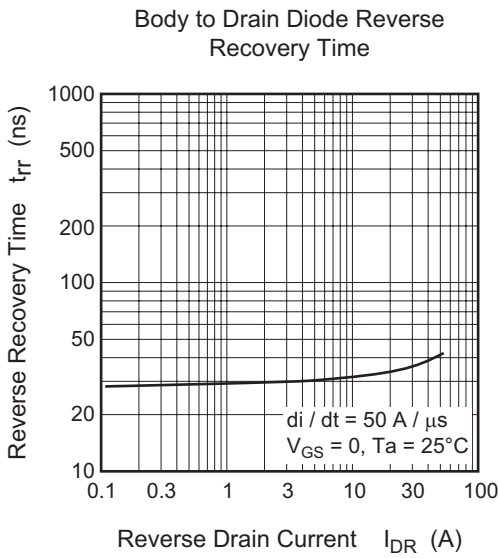
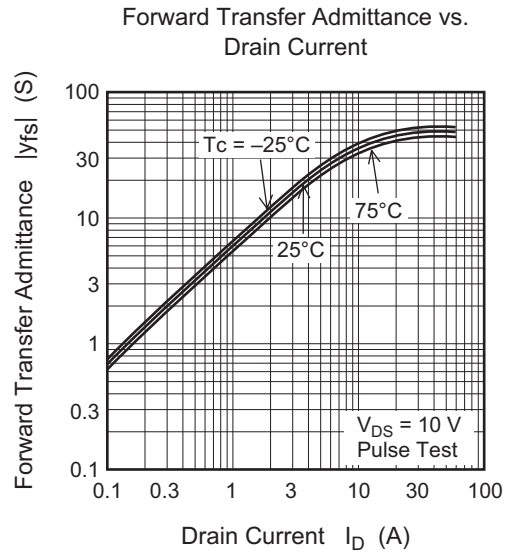
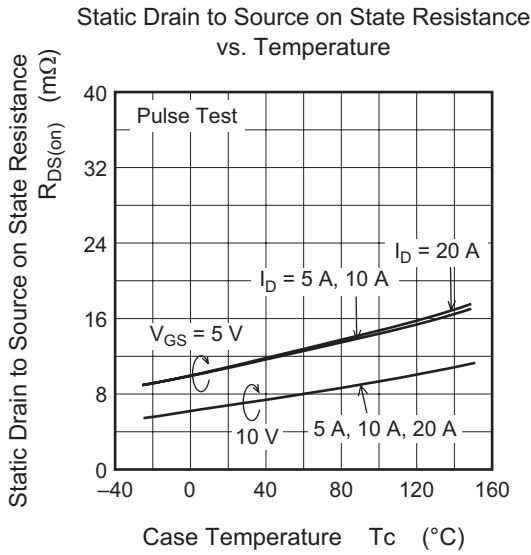
(Ta = 25°C)

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>	—	7.0	8.8	mΩ	I <sub>D</sub> = 22.5 A, V <sub>GS</sub> = 10 V <sup>Note 3</sup>
		—	11	16	mΩ	I <sub>D</sub> = 22.5 A, V <sub>GS</sub> = 5 V <sup>Note 3</sup>
Forward transfer admittance	y <sub>fs</sub>	27	45	—	S	I <sub>D</sub> = 22.5 A, V <sub>DS</sub> = 10 V <sup>Note 3</sup>
Input capacitance	C <sub>iss</sub>	—	1650	—	pF	V <sub>DS</sub> = 10 V V <sub>GS</sub> = 0 f = 1 MHz
Output capacitance	C <sub>oss</sub>	—	440	—	pF	
Reverse transfer capacitance	C <sub>rss</sub>	—	250	—	pF	
Total gate charge	Q <sub>g</sub>	—	28	—	nC	V <sub>DD</sub> = 10 V
Gate to source charge	Q <sub>gs</sub>	—	6.0	—	nC	V <sub>GS</sub> = 10 V
Gate to drain charge	Q <sub>gd</sub>	—	5.4	—	nC	I <sub>D</sub> = 45 A
Turn-on delay time	t <sub>d (on)</sub>	—	22	—	ns	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 22.5 A R <sub>L</sub> = 0.44 Ω R <sub>g</sub> = 4.7 Ω
Rise time	t <sub>r</sub>	—	310	—	ns	
Turn-off delay time	t <sub>d (off)</sub>	—	50	—	ns	
Fall time	t <sub>f</sub>	—	16	—	ns	
Body to drain diode forward voltage	V <sub>DF</sub>	—	0.93	—	V	I <sub>F</sub> = 45 A, V <sub>GS</sub> = 0
Body to drain diode reverse recovery time	t <sub>rr</sub>	—	40	—	ns	I <sub>F</sub> = 45 A, V <sub>GS</sub> = 0 di <sub>F</sub> /dt = 50 A/μs

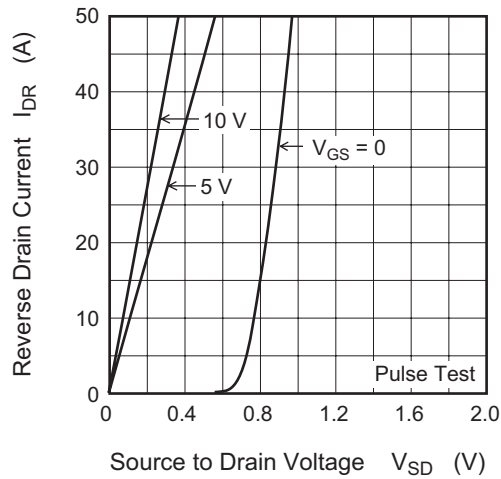
Note: 3. Pulse test

Main Characteristics

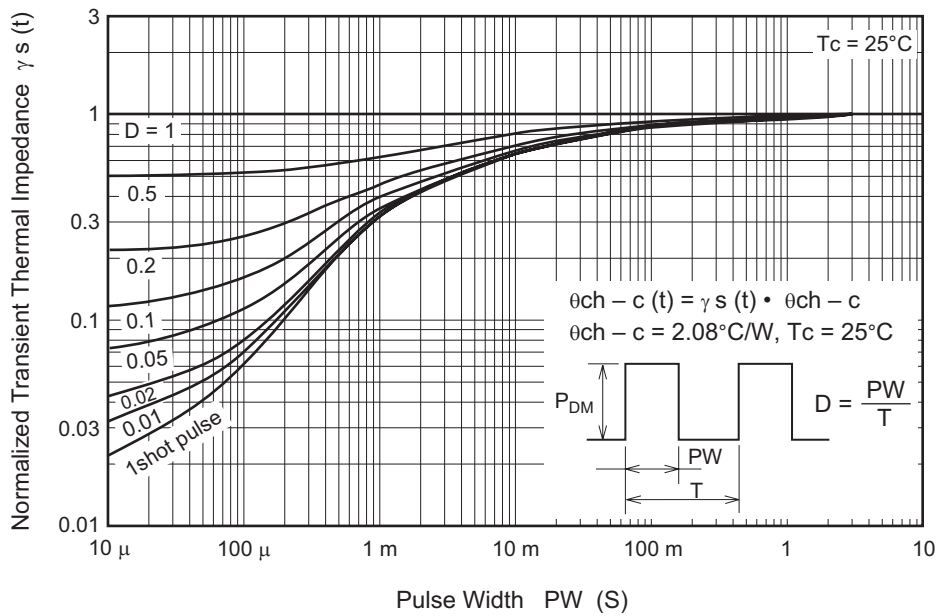




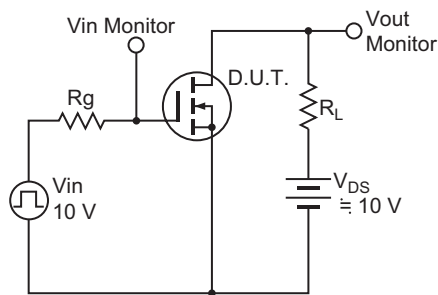
Reverse Drain Current vs. Source to Drain Voltage



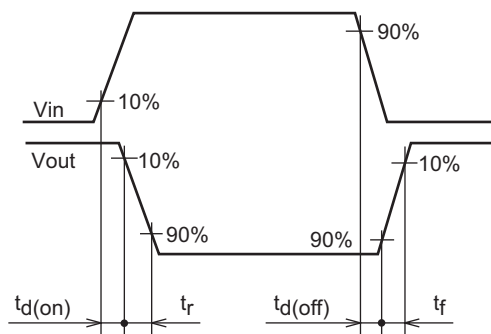
Normalized Transient Thermal Impedance vs. Pulse Width



Switching Time Test Circuit



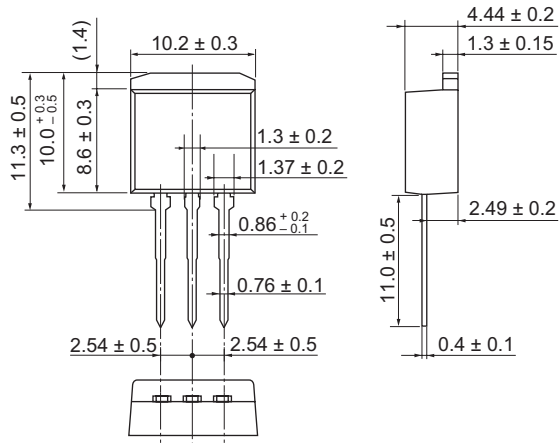
Switching Time Waveform



### Package Dimensions

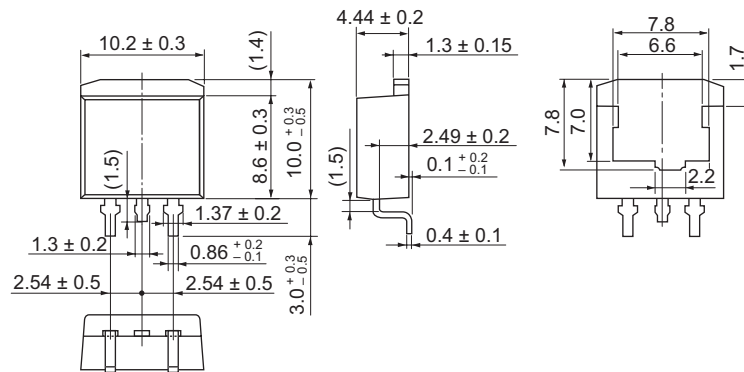
Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
LDBPAK(L)	—	PRSS0004AE-A	LDBPAK(L) / LDBPAK(L)V	1.40g

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

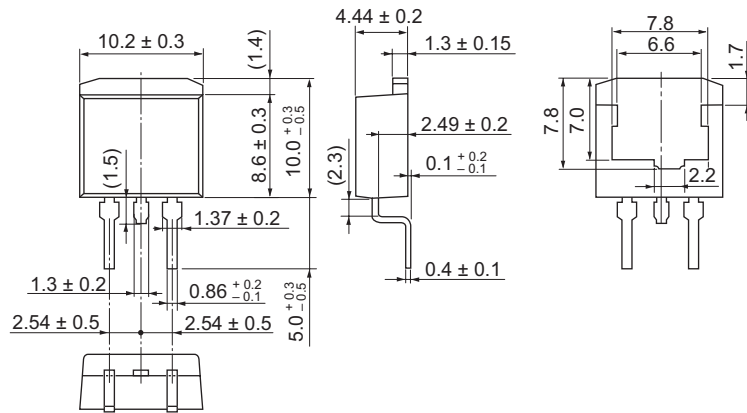
Unit: mm



## H7N0311LD, H7N0311LS, H7N0311LM

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
H7N0311LD-E	500 pcs	Box (Conductive Sack)
H7N0311LSTL-E	1000 pcs	Taping
H7N0311LMTL-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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