

## H7N1005LD, H7N1005LS, H7N1005LM

Silicon N Channel MOS FET  
High Speed Power Switching

REJ03G0391-0200

Rev.2.00

Oct 16, 2006

### Features

- Low on-resistance  
 $R_{DS(on)} = 85 \text{ m}\Omega$  typ.
- Low drive current
- Capable of 4.5 V gate drive

### Outline

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



H7N1005LD

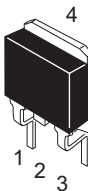
RENESAS Package code: PRSS0004AE-B  
(Package name: LDKPAK (S)-(1) )



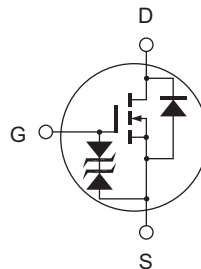
H7N1005LS

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

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



H7N1005LM



## Absolute Maximum Ratings

(Ta = 25°C)

Item	Symbol	Value	Unit
Drain to source voltage	V <sub>DSS</sub>	100	V
Gate to source voltage	V <sub>GSS</sub>	±20	V
Drain current	I <sub>D</sub>	15	A
Drain peak current	I <sub>D (pulse)</sub> <sup>Note 1</sup>	30	A
Body to drain diode reverse drain current	I <sub>DR</sub>	30	A
Avalanche current	I <sub>AP</sub> <sup>Note 3</sup>	8	A
Avalanche energy	E <sub>AR</sub> <sup>Note 3</sup>	6.4	mJ
Channel dissipation	P <sub>ch</sub> <sup>Note 2</sup>	30	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  
 3. Value at Tch = 25°C, Rg ≥ 50 Ω

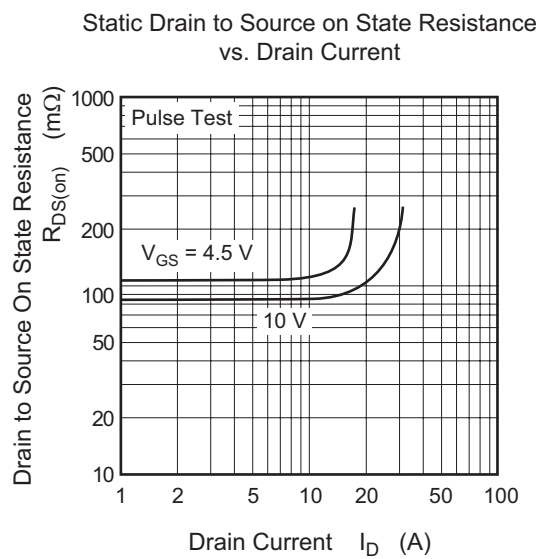
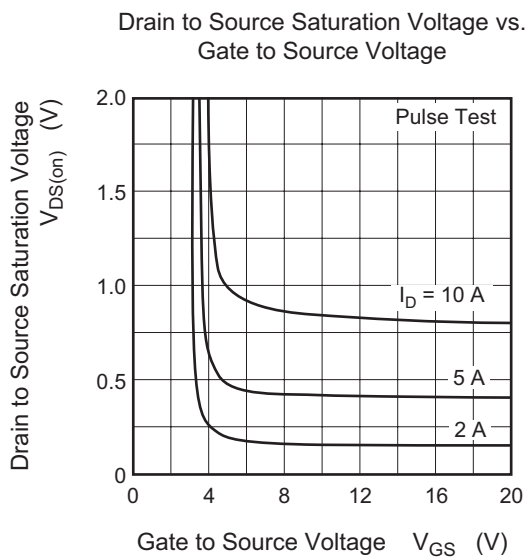
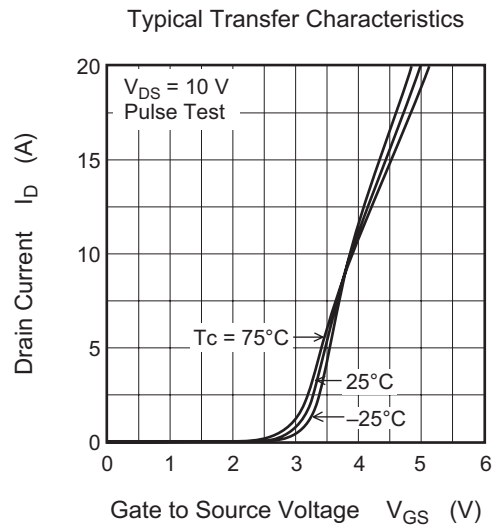
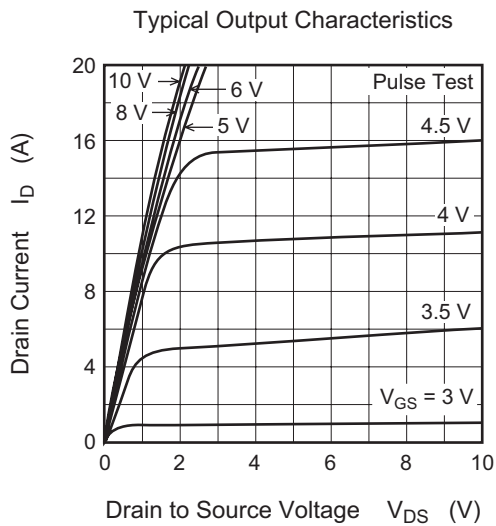
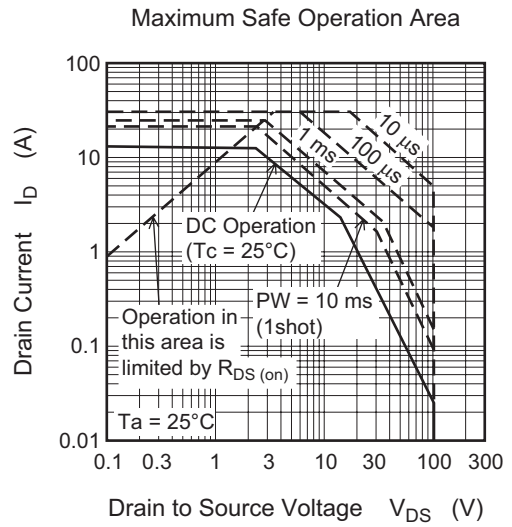
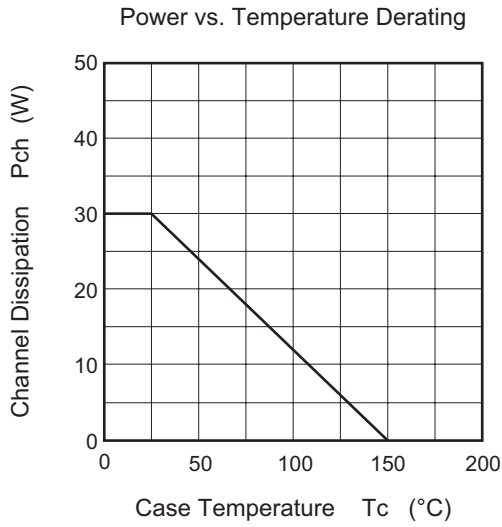
## Electrical Characteristics

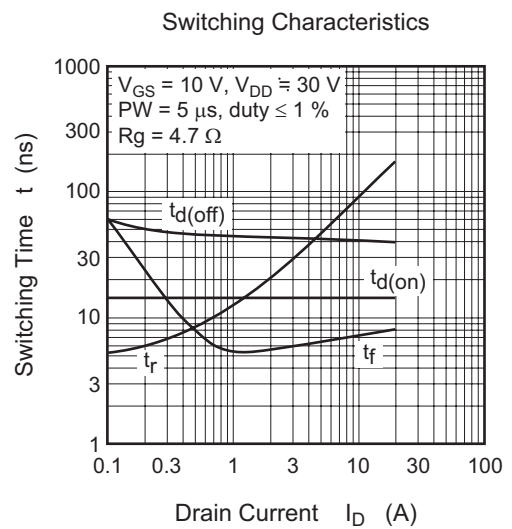
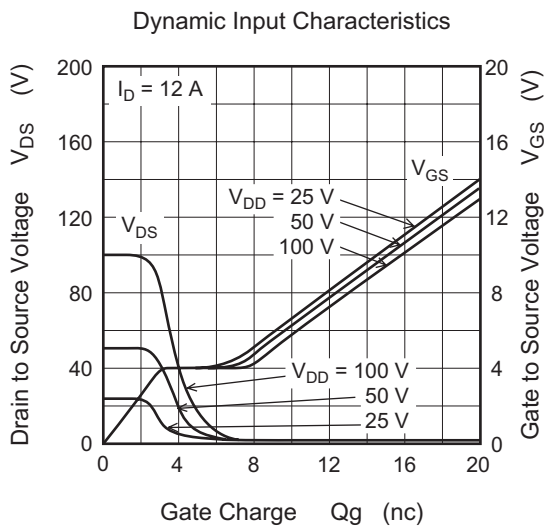
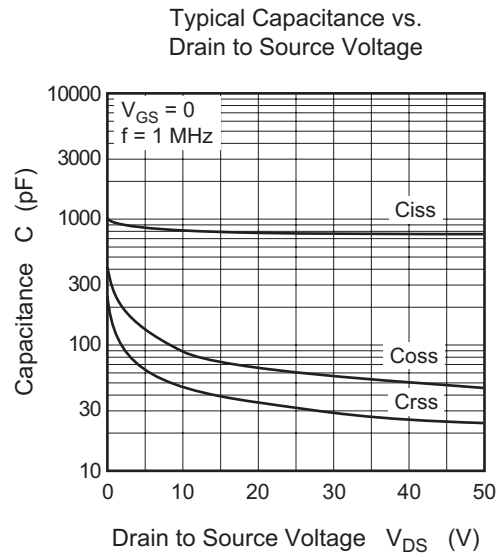
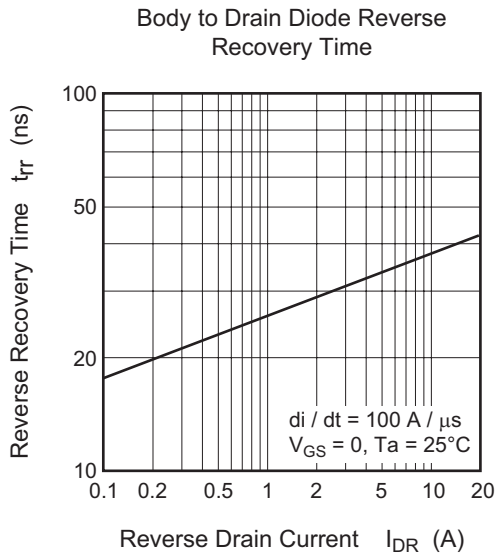
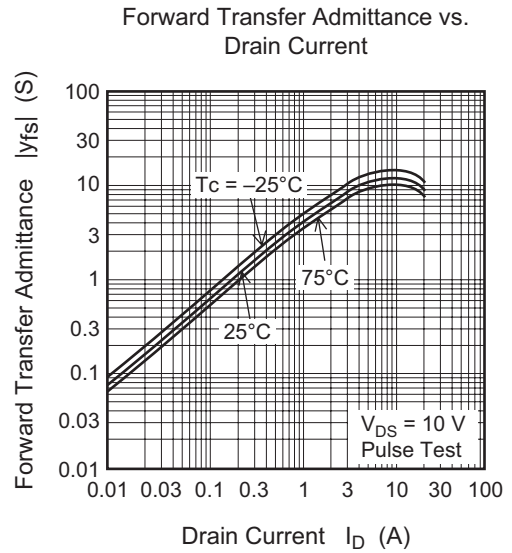
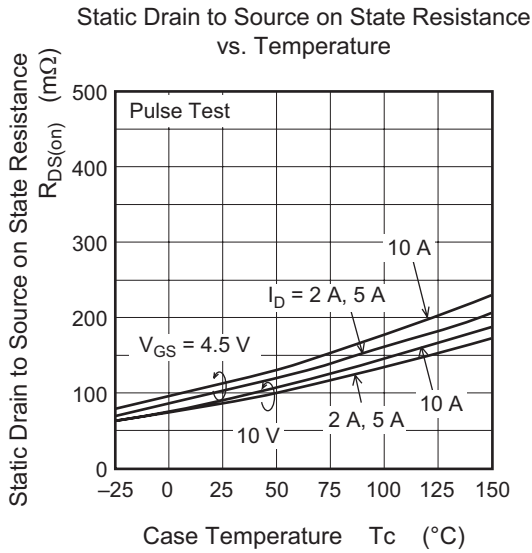
(Ta = 25°C)

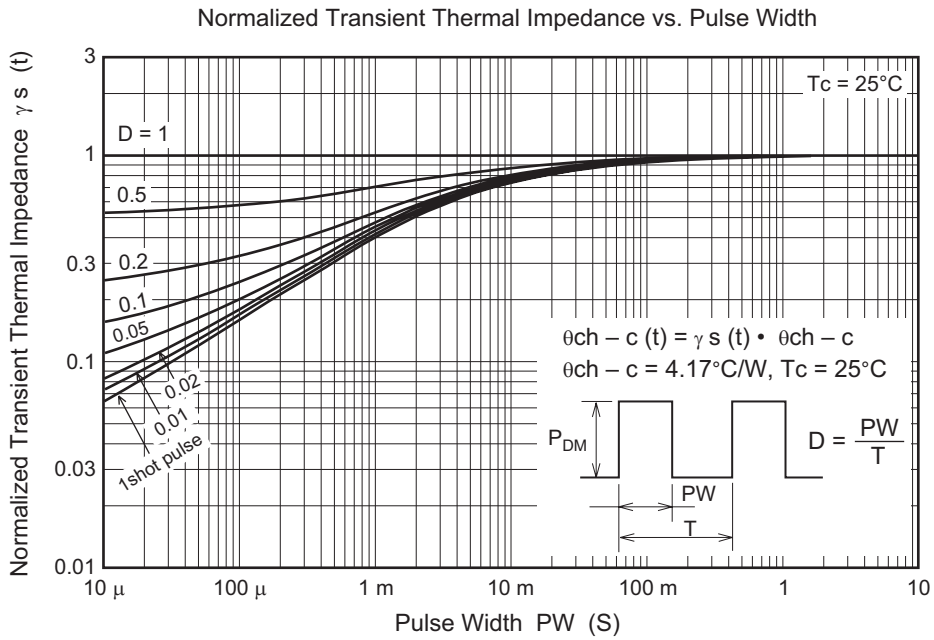
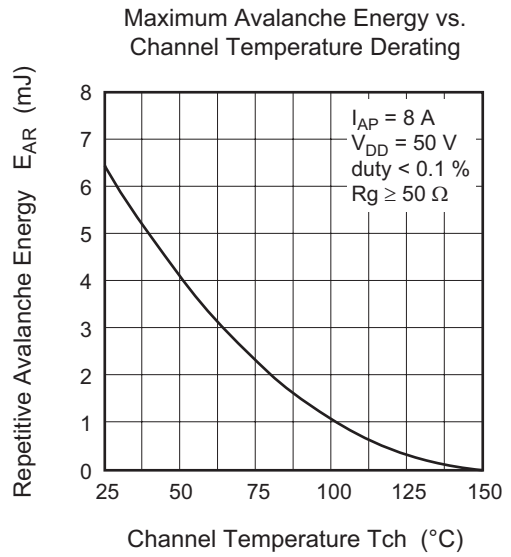
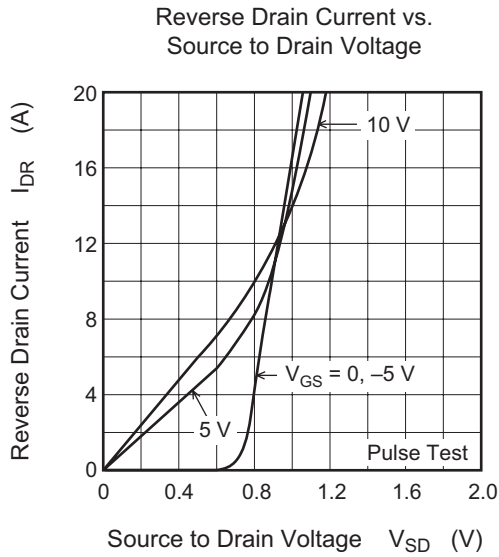
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	V <sub>(BR) DSS</sub>	100	—	—	V	I <sub>D</sub> = 10 mA, V <sub>GS</sub> = 0
Gate to source breakdown voltage	V <sub>(BR) GSS</sub>	±20	—	—	V	I <sub>G</sub> = ±100 μA, V <sub>DS</sub> = 0
Gate to source leak current	I <sub>GSS</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> = 100 V, V <sub>GS</sub> = 0
Gate to source cutoff voltage	V <sub>GS (off)</sub>	1.5	—	2.5	V	I <sub>D</sub> = 1 mA, V <sub>DS</sub> = 10 V <sup>Note 4</sup>
Static drain to source on state resistance	R <sub>DS (on)</sub>	—	85	110	mΩ	I <sub>D</sub> = 7.5 A, V <sub>GS</sub> = 10 V <sup>Note 4</sup>
		—	105	155	mΩ	I <sub>D</sub> = 7.5 A, V <sub>GS</sub> = 4.5 V <sup>Note 4</sup>
Forward transfer admittance	y <sub>fs</sub>	6.5	11	—	S	I <sub>D</sub> = 7.5 A, V <sub>GS</sub> = 10 V <sup>Note 4</sup>
Input capacitance	C <sub>iss</sub>	—	830	—	pF	V <sub>DS</sub> = 10 V
Output capacitance	C <sub>oss</sub>	—	90	—	pF	V <sub>GS</sub> = 0
Reverse transfer capacitance	C <sub>rss</sub>	—	55	—	pF	f = 1 MHz
Total gate charge	Q <sub>g</sub>	—	15	—	nC	V <sub>DD</sub> = 50 V
Gate to source charge	Q <sub>gs</sub>	—	3	—	nC	V <sub>GS</sub> = 10 V
Gate to drain charge	Q <sub>gd</sub>	—	4	—	nC	I <sub>D</sub> = 15 A
Turn-on delay time	t <sub>d (on)</sub>	—	15	—	ns	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 7.5 A
Rise time	t <sub>r</sub>	—	85	—	ns	R <sub>L</sub> = 4 Ω
Turn-off delay time	t <sub>d (off)</sub>	—	42	—	ns	R <sub>g</sub> = 4.7 Ω
Fall time	t <sub>f</sub>	—	6.8	—	ns	
Body to drain diode forward voltage	V <sub>DF</sub>	—	0.93	—	V	I <sub>F</sub> = 15 A, V <sub>GS</sub> = 0
Body to drain diode reverse recovery time	t <sub>rr</sub>	—	41	—	ns	I <sub>F</sub> = 15 A, V <sub>GS</sub> = 0 di <sub>F</sub> /dt = 100 A/μs

Note: 4. Pulse test

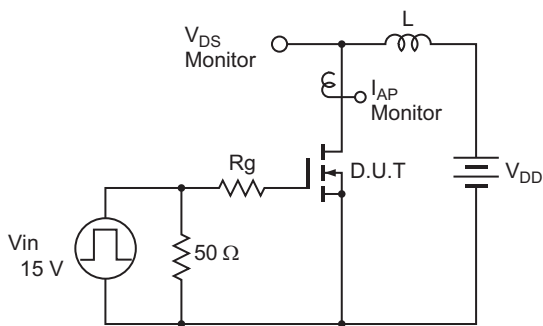
Main Characteristics





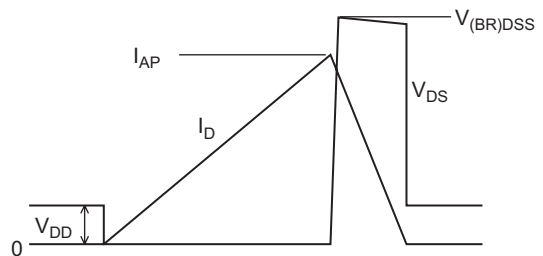


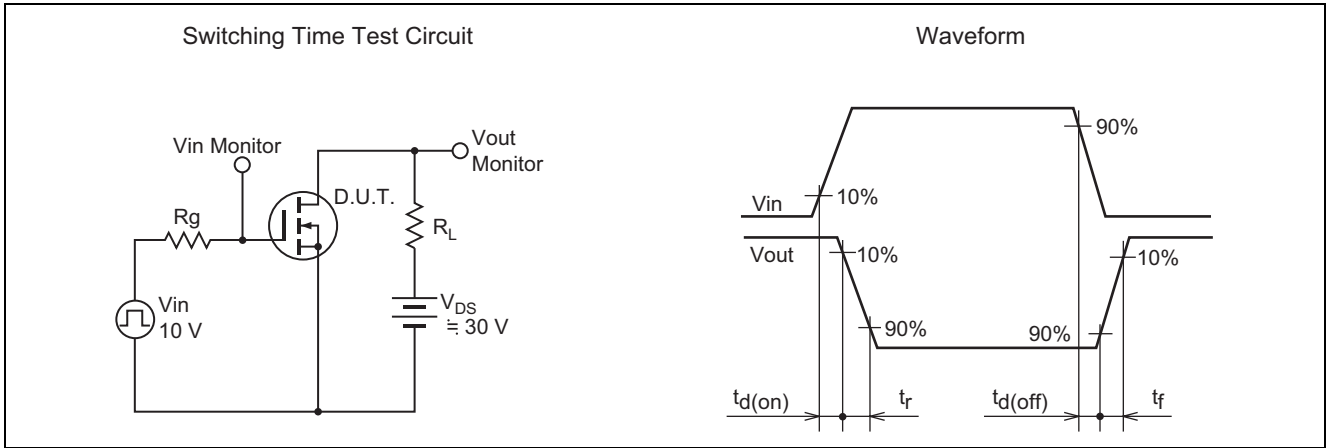
Avalanche Test Circuit



Avalanche Waveform

$$E_{AR} = \frac{1}{2} \cdot L \cdot I_{AP}^2 \cdot \frac{V_{DSS}}{V_{DSS} - V_{DD}}$$

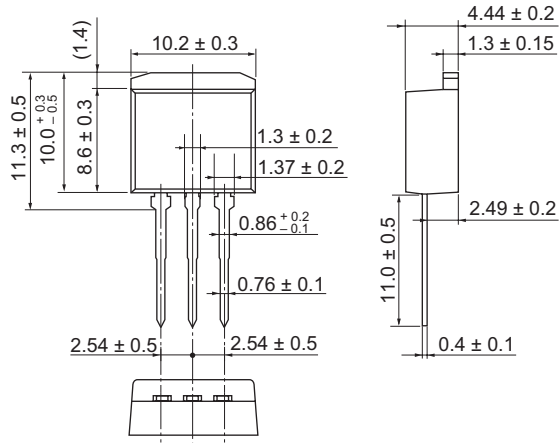




Package Dimensions

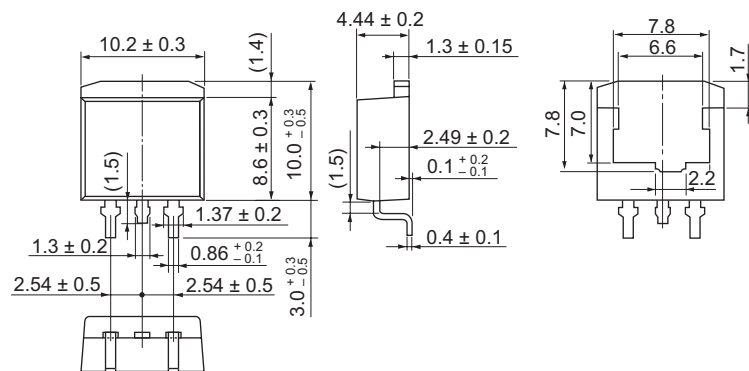
Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
LDBPAK(L)	—	PRSS0004AE-A	LDBPAK(L) / LDBPAK(L)V	1.40g

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

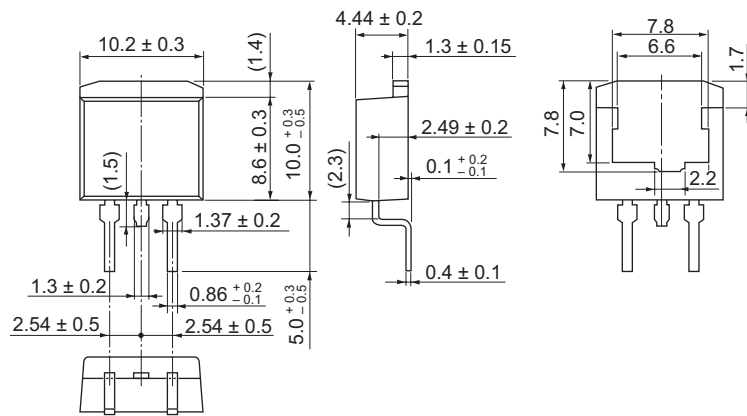
Unit: mm



## H7N1005LD, H7N1005LS, H7N1005LM

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
H7N1005LD-E	500 pcs	Box (Conductive Sack)
H7N1005LSTL-E	1000 pcs	Taping
H7N1005LMTL-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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