

# H5N2501LD, H5N2501LS, H5N2501LM

Silicon N Channel MOS FET  
High Speed Power Switching

R07DS0056EJ0300  
(Previous: REJ03G1250-0200)  
Rev.3.00  
Jul 23, 2010

## Features

- Low on-resistance  
 $R_{DS(on)} = 0.14 \Omega$  typ. (at  $I_D = 9 \text{ A}$ ,  $V_{GS} = 10 \text{ V}$ ,  $T_a = 25^\circ\text{C}$ )
- Low leakage current
- High speed switching

## Outline

RENESAS Package code: PRSS0004AE-A (Package name LDKPAK(L))      RENESAS Package code: PRSS0004AE-B (Package name LDKPAK(S)-(1))      RENESAS Package code: PRSS0004AE-C (Package name LDKPAK(S)-(2))

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

## Absolute Maximum Ratings

( $T_a = 25^\circ\text{C}$ )

Item	Symbol	Ratings	Unit
Drain to Source voltage	$V_{DSS}$	250	V
Gate to Source voltage	$V_{GSS}$	$\pm 30$	V
Drain current	$I_D$	18	A
Drain peak current	$I_{D(pulse)}$ <sup>Note1</sup>	72	A
Body-Drain diode reverse Drain current	$I_{DR}$	18	A
Avalanche current	$I_{AP}$ <sup>Note3</sup>	18	A
Avalanche energy	$E_{AR}$ <sup>Note3</sup>	20.25	mJ
Channel dissipation	$P_{ch}$ <sup>Note2</sup>	75	W
Channel to case thermal impedance	$\theta_{ch-c}$	1.67	$^\circ\text{C}/\text{W}$
Channel temperature	$T_{ch}$	150	$^\circ\text{C}$
Storage temperature	$T_{stg}$	-55 to +150	$^\circ\text{C}$

- Notes: 1.  $PW \leq 10 \mu\text{s}$ , duty cycle  $\leq 1\%$   
 2. Value at  $T_c = 25^\circ\text{C}$   
 3.  $STch = 25^\circ\text{C}$ ,  $T_{ch} \leq 150^\circ\text{C}$

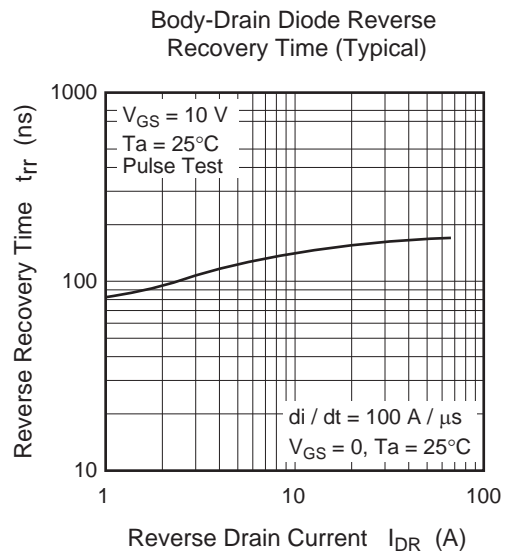
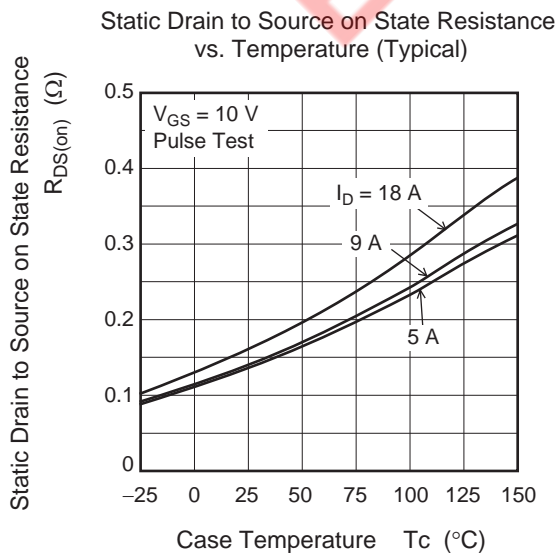
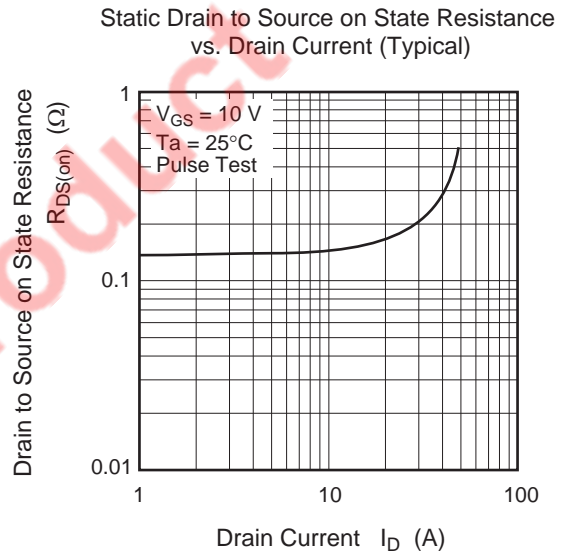
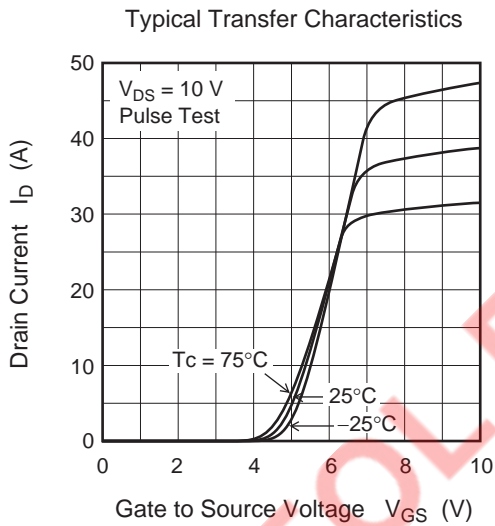
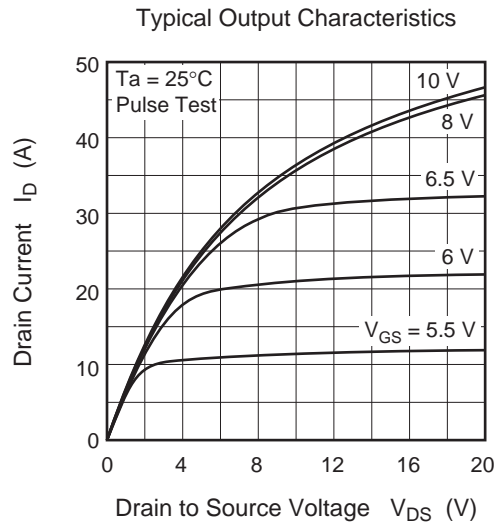
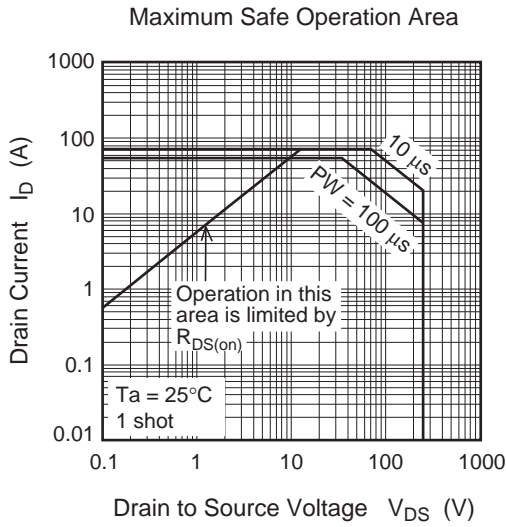
## Electrical Characteristics

(Ta = 25°C)

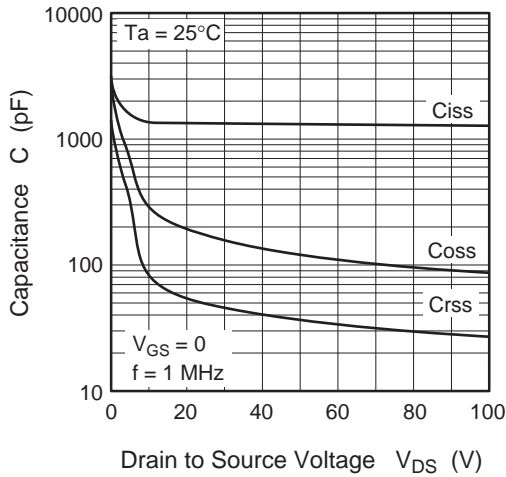
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to Source breakdown voltage	$V_{(BR)DSS}$	250	—	—	V	$I_D = 10 \text{ mA}$ , $V_{GS} = 0$
Zero Gate voltage drain current	$I_{DSS}$	—	—	1	$\mu\text{A}$	$V_{DS} = 250 \text{ V}$ , $V_{GS} = 0$
Gate to Source leak current	$I_{GSS}$	—	—	$\pm 0.1$	$\mu\text{A}$	$V_{GS} = \pm 30 \text{ V}$ , $V_{DS} = 0$
Gate to Source cutoff voltage	$V_{GS(off)}$	3.0	—	4.5	V	$V_{DS} = 10 \text{ V}$ , $I_D = 1 \text{ mA}$
Forward transfer admittance	$ y_{fs} $	8	14	—	S	$I_D = 9 \text{ A}$ , $V_{DS} = 10 \text{ V}$ <sup>Note4</sup>
Static Drain to Source on state resistance	$R_{DS(on)}$	—	0.14	0.18	$\Omega$	$I_D = 9 \text{ A}$ , $V_{GS} = 10 \text{ V}$ <sup>Note4</sup>
Input capacitance	$C_{iss}$	—	1350	—	pF	$V_{DS} = 25 \text{ V}$ $V_{GS} = 0$ $f = 1 \text{ MHz}$
Output capacitance	$C_{oss}$	—	170	—	pF	
Reverse transfer capacitance	$C_{rss}$	—	50	—	pF	
Turn-on delay time	$t_{d(on)}$	—	30	—	ns	$I_D = 9 \text{ A}$ $V_{GS} = 10 \text{ V}$ $R_L = 13.9 \Omega$ $R_g = 10 \Omega$
Rise time	$t_r$	—	65	—	ns	
Turn-off delay time	$t_{d(off)}$	—	95	—	ns	
Fall time	$t_f$	—	18	—	ns	
Total Gate charge	$Q_g$	—	45	—	nC	$V_{DD} = 200 \text{ V}$ $V_{GS} = 10 \text{ V}$ $I_D = 18 \text{ A}$
Gate to Source charge	$Q_{gs}$	—	8	—	nC	
Gate to Drain charge	$Q_{gd}$	—	22	—	nC	
Body-Drain diode forward voltage	$V_{DF}$	—	0.9	1.4	V	$I_F = 18 \text{ A}$ , $V_{GS} = 0$ <sup>Note4</sup>
Body-Drain diode reverse recovery time	$t_{rr}$	—	160	—	ns	$I_F = 18 \text{ A}$ , $V_{GS} = 0$ $di_F/dt = 100 \text{ A}/\mu\text{s}$
Body-Drain diode reverse recovery charge	$Q_{rr}$	—	1.0	—	$\mu\text{C}$	

Notes: 4. Pulse test

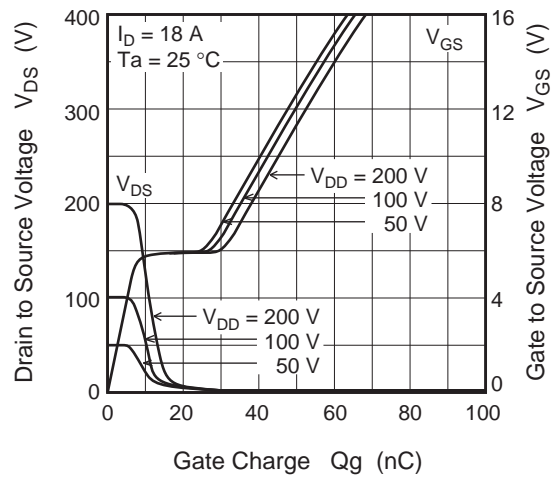
Main Characteristics



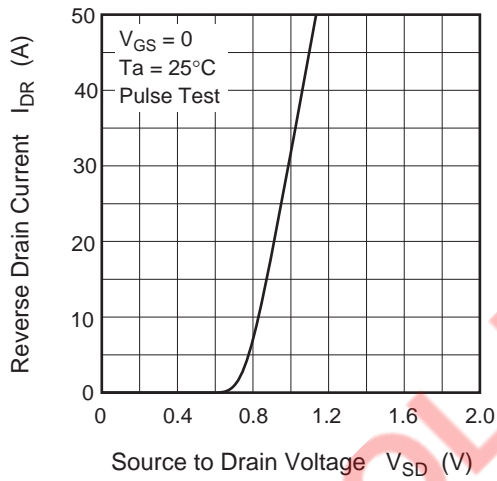
Typical Capacitance vs. Drain to Source Voltage



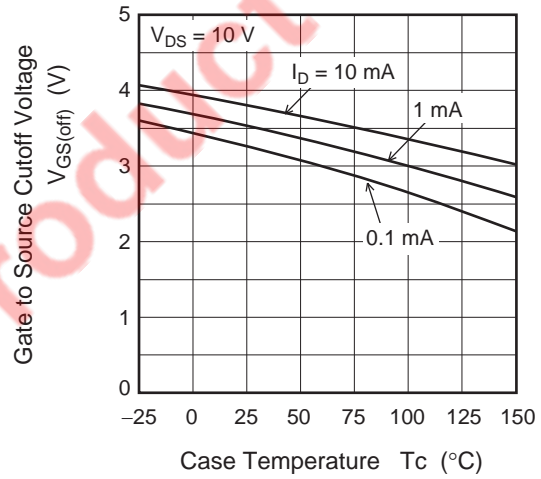
Dynamic Input Characteristics (Typical)



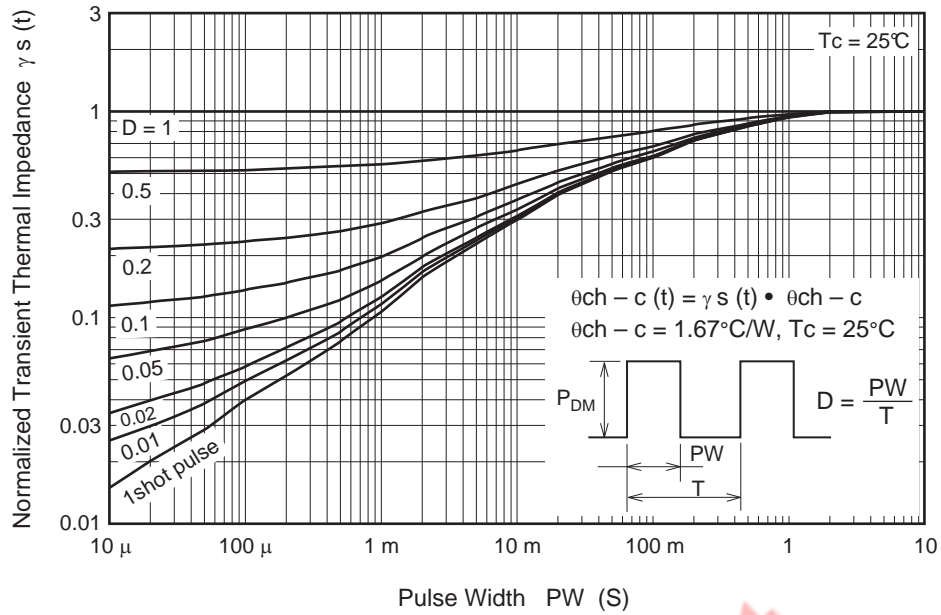
Reverse Drain Current vs. Source to Drain Voltage (Typical)



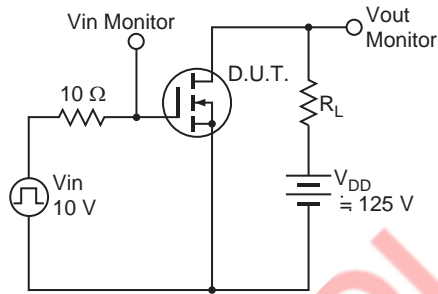
Gate to Source Cutoff Voltage vs. Case Temperature (Typical)



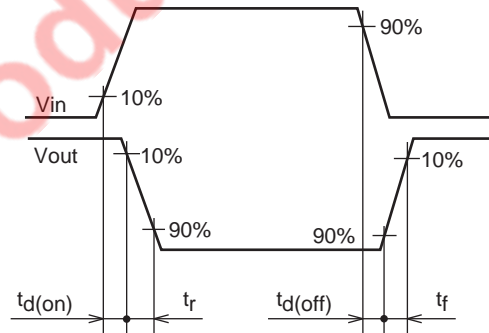
Normalized Transient Thermal Impedance vs. Pulse Width



Switching Time Test Circuit

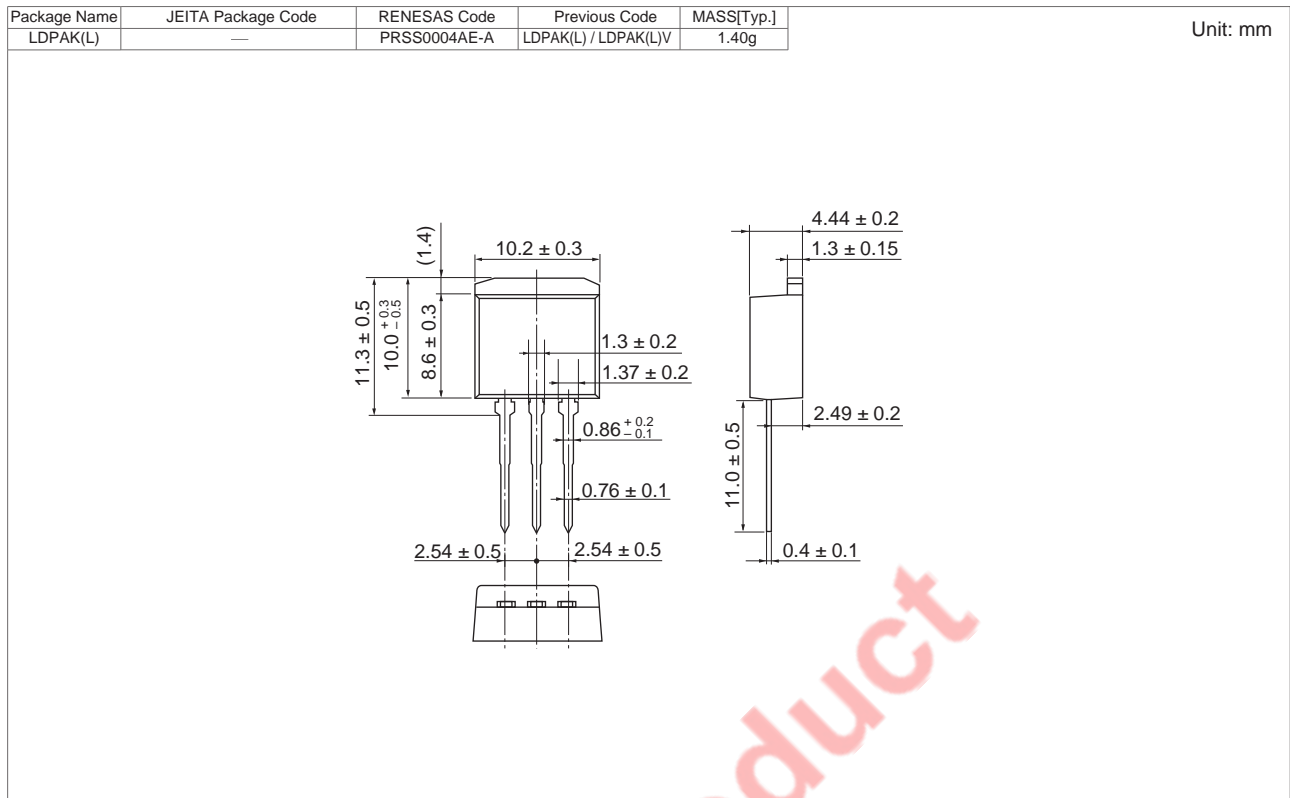


Switching Time Waveform

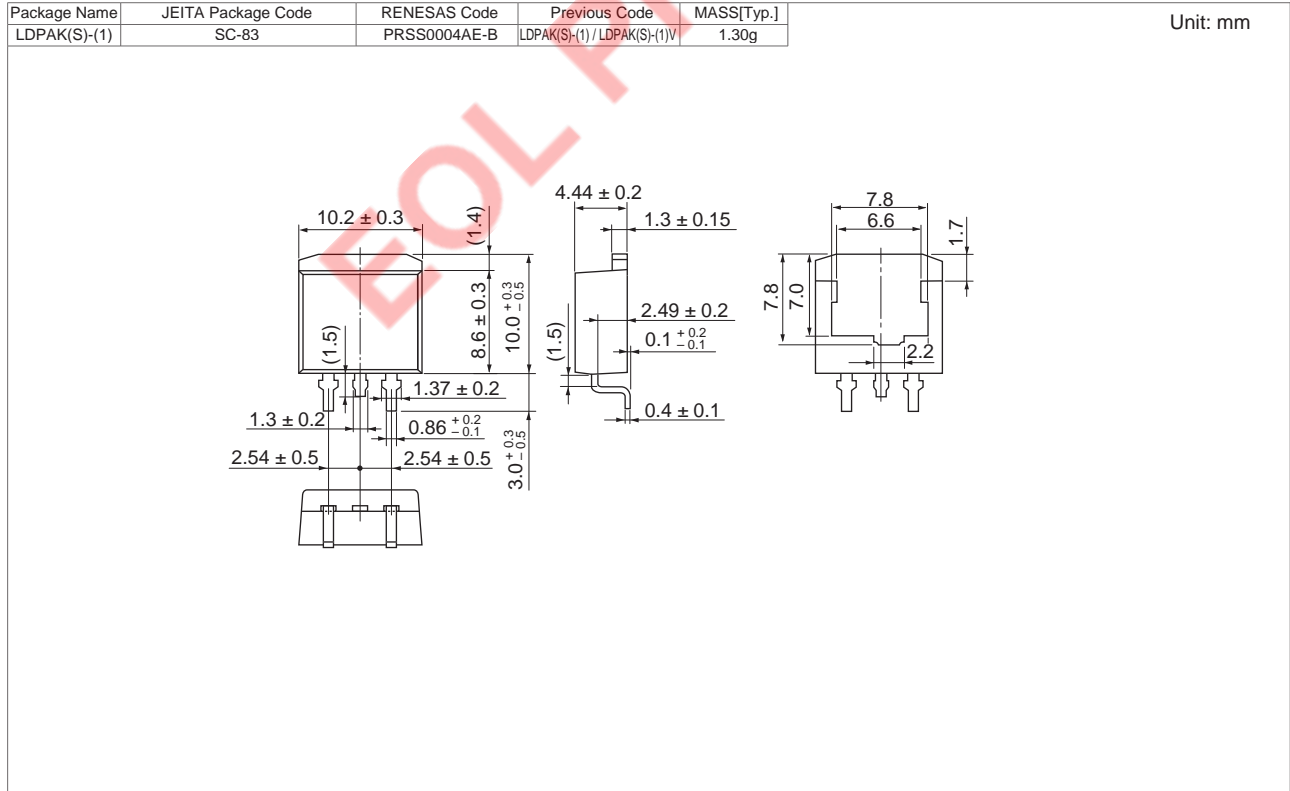


## Package Dimensions

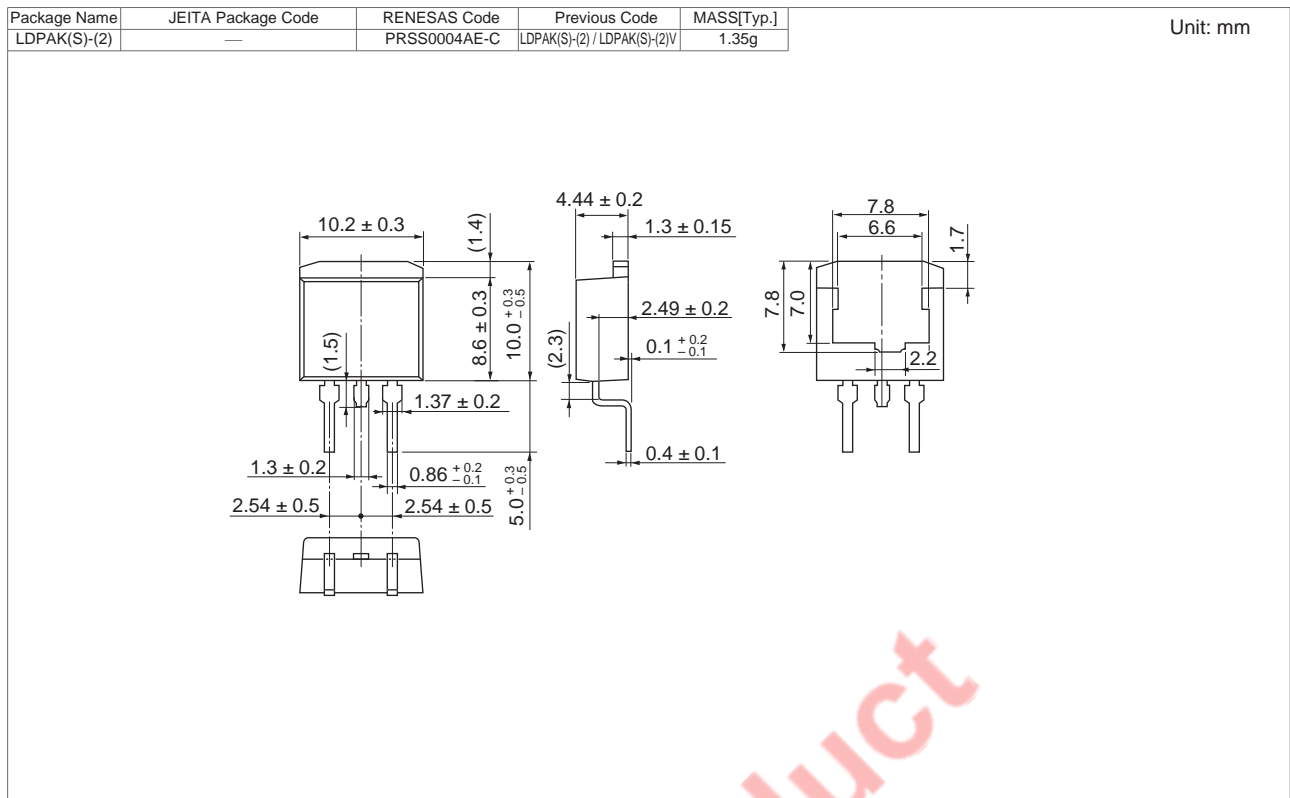
### • H5N2501LD



### • H5N2501LS



• H5N2501LM



Ordering Information

Part No.	Quantity	Shipping Container
H5N2501LD-E	300 pcs	Box (Tube)
H5N2501LSTL-E	1000 pcs	Taping
H5N2501LMTL-E	1000 pcs	Taping

EOL Product

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