

# H7P1002DL, H7P1002DS

Silicon P Channel MOS FET  
High Speed Power Switching

REJ03G1601-0100

Rev.1.00

Nov 16, 2007

## Features

- Low on-resistance  
 $R_{DS(on)} = 85 \text{ m}\Omega$  typ.
- Low drive current
- 4.5 V gate drive device can driven from 5 V source

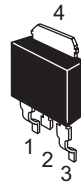
## Outline

RENESAS Package code: PRSS0004ZD-B  
(Package name: DPAK (L)-(2) )

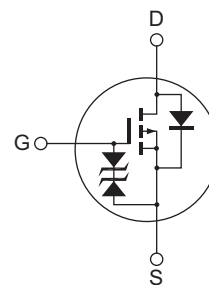


H7P0601DL

RENESAS Package code: PRSS0004ZD-C  
(Package name: DPAK (S) )



H7P0601DS



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

## Absolute Maximum Ratings

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

Item	Symbol	Rating	Unit
Drain to source voltage	$V_{DSS}$	-100	V
Gate to source voltage	$V_{GSS}$	$\pm 20$	V
Drain current	$I_D$	-15	A
Drain peak current	$I_{D(pulse)}$ <sup>Note1</sup>	-60	A
Body-drain diode reverse drain current	$I_{DR}$	-15	A
Avalanche current	$I_{AP}$ <sup>Note3</sup>	-12	A
Avalanche energy	$E_{AR}$ <sup>Note3</sup>	14.4	mJ
Channel dissipation	$P_{ch}$ <sup>Note2</sup>	30	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. Value at  $T_{ch} = 25^\circ\text{C}$ ,  $R_g \geq 50 \Omega$

## Electrical Characteristics

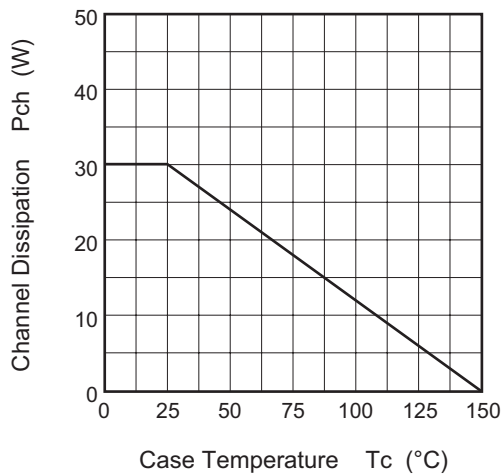
(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	-100	—	—	V	$I_D = -10 \text{ mA}$ , $V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	$\pm 20$	—	—	V	$I_G = \pm 100 \text{ }\mu\text{A}$ , $V_{DS} = 0$
Gate to source leak current	$I_{GSS}$	—	—	$\pm 10$	$\mu\text{A}$	$V_{GS} = \pm 16 \text{ V}$ , $V_{DS} = 0$
Zero gate voltage drain current	$I_{DSS}$	—	—	-10	$\mu\text{A}$	$V_{DS} = -100 \text{ V}$ , $V_{GS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	-1.0	—	-2.5	V	$I_D = -1 \text{ mA}$ , $V_{DS} = -10 \text{ V}$ <sup>Note4</sup>
Static drain to source on state resistance	$R_{DS(on)}$	—	85	105	m $\Omega$	$I_D = -7.5 \text{ A}$ , $V_{GS} = -10 \text{ V}$ <sup>Note4</sup>
		—	105	150	m $\Omega$	$I_D = -7.5 \text{ A}$ , $V_{GS} = -4.5 \text{ V}$ <sup>Note4</sup>
Forward transfer admittance	$ y_{fs} $	7.2	12	—	S	$I_D = -7.5 \text{ A}$ , $V_{DS} = -10 \text{ V}$ <sup>Note4</sup>
Input capacitance	$C_{iss}$	—	2600	—	pF	$V_{DS} = -10 \text{ V}$ $V_{GS} = 0$ $f = 1 \text{ MHz}$
Output capacitance	$C_{oss}$	—	190	—	pF	
Reverse transfer capacitance	$C_{rss}$	—	120	—	pF	
Total gate charge	$Q_g$	—	45	—	nC	$V_{DD} = -50 \text{ V}$ $V_{GS} = -10 \text{ V}$ $I_D = -15 \text{ A}$
Gate to source charge	$Q_{gs}$	—	6.5	—	nC	
Gate to drain charge	$Q_{gd}$	—	9.0	—	nC	
Turn-on delay time	$t_{d(on)}$	—	23	—	ns	$V_{GS} = -10 \text{ V}$ , $I_D = -7.5 \text{ A}$ $R_L = 4.0 \text{ }\Omega$ $R_g = 4.7 \text{ }\Omega$
Rise time	$t_r$	—	45	—	ns	
Turn-off delay time	$t_{d(off)}$	—	80	—	ns	
Fall time	$t_f$	—	13	—	ns	
Body-drain diode forward voltage	$V_{DF}$	—	-0.91	—	V	$I_F = -15 \text{ A}$ , $V_{GS} = 0$
Body-drain diode reverse recovery time	$t_{rr}$	—	50	—	ns	$I_F = -15 \text{ A}$ , $V_{GS} = 0$ $di_F/dt = 100 \text{ A}/\mu\text{s}$

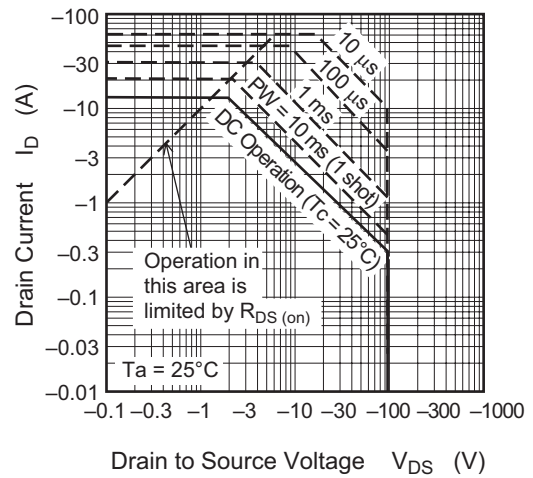
Note: 4. Pulse test

## Main Characteristics

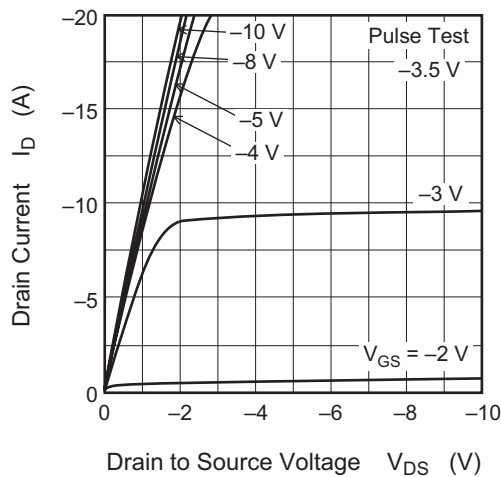
Power vs. Temperature Derating



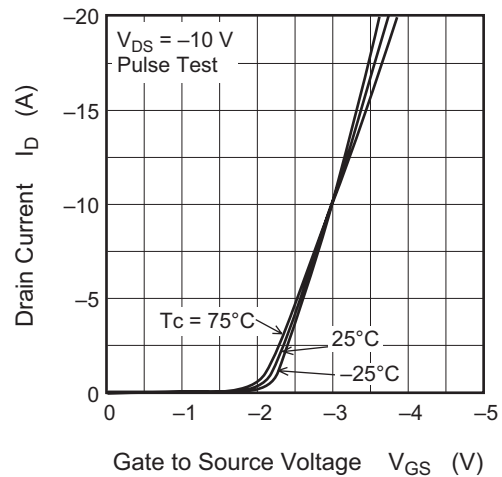
Maximum Safe Operation Area



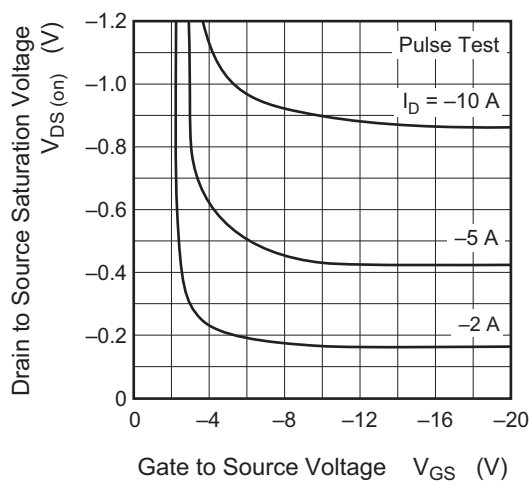
Typical Output Characteristics



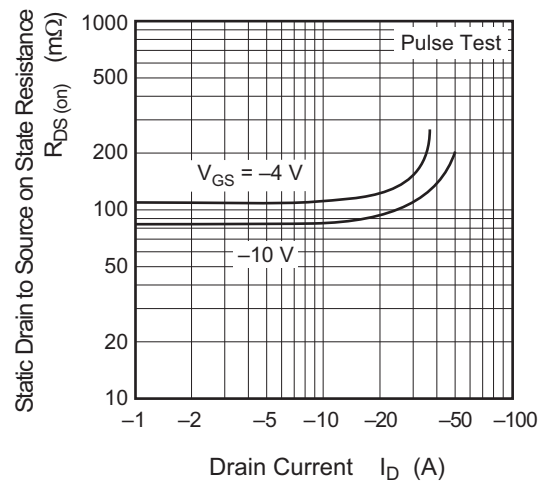
Typical Transfer Characteristics

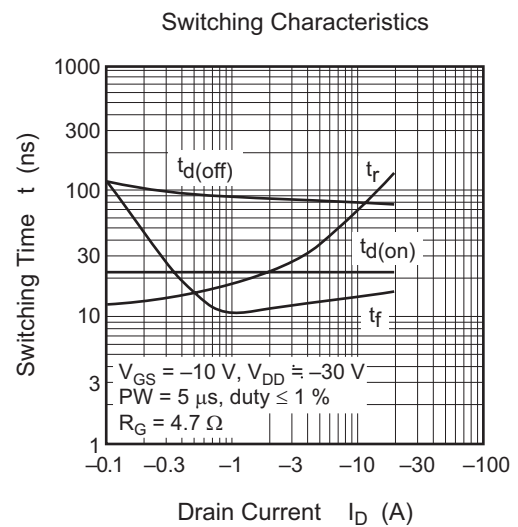
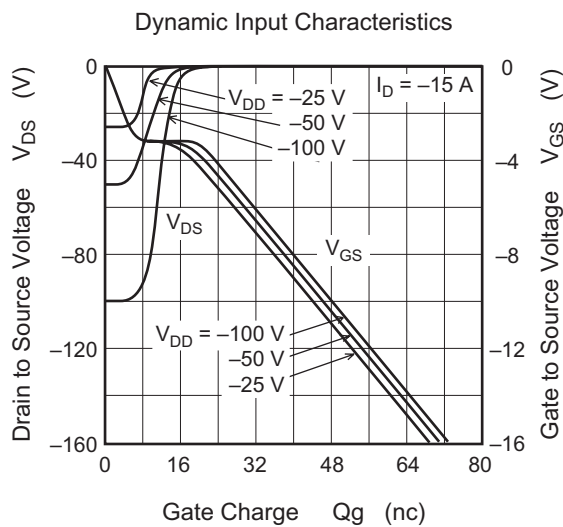
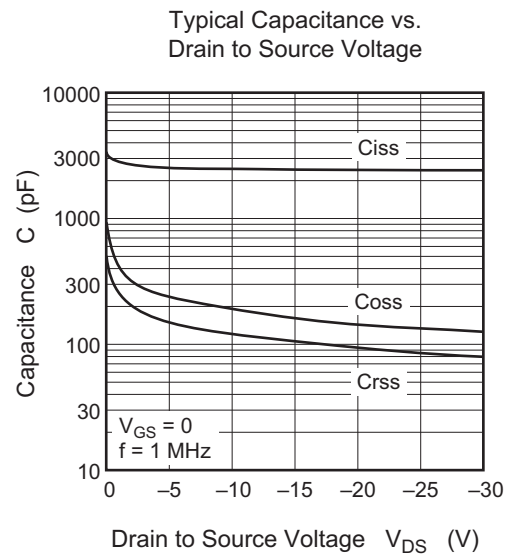
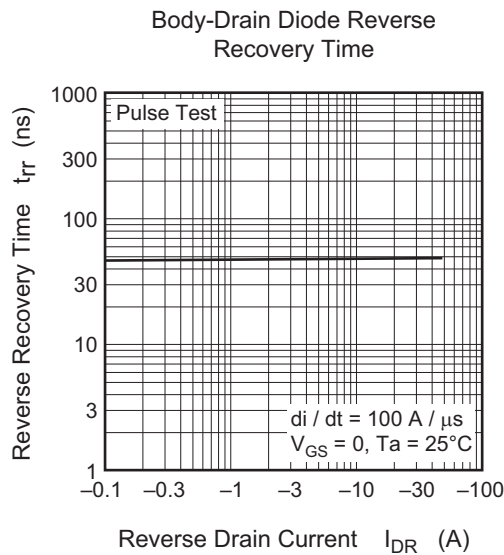
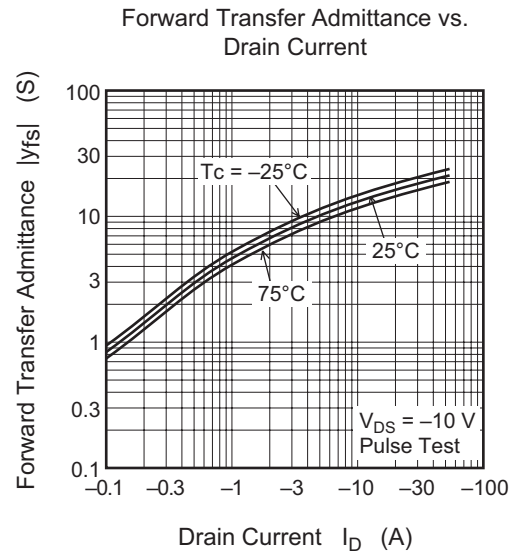
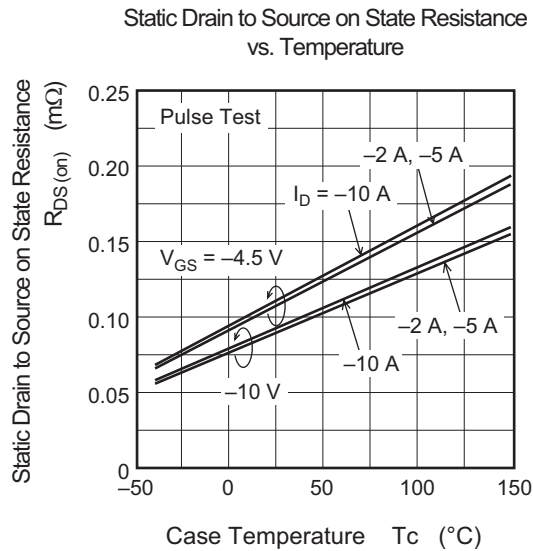


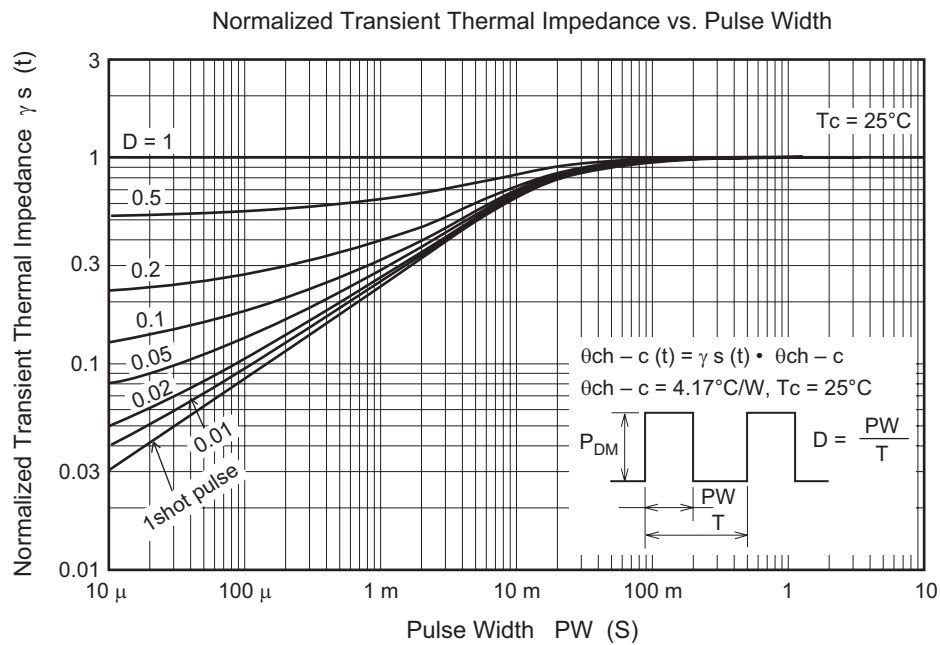
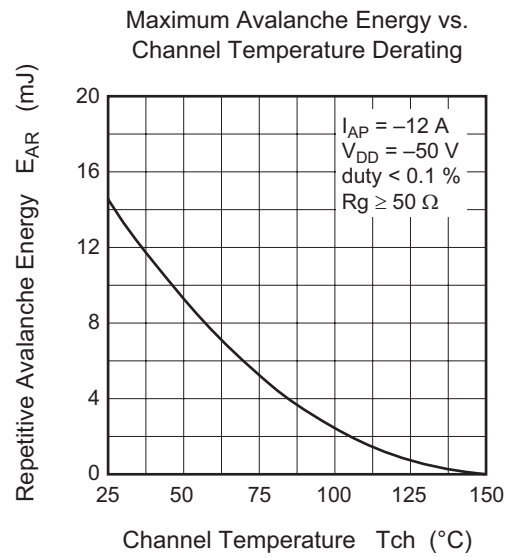
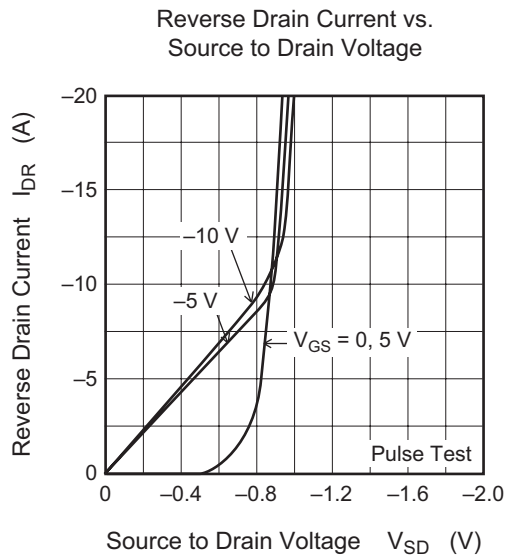
Drain to Source Saturation Voltage vs. Gate to Source Voltage



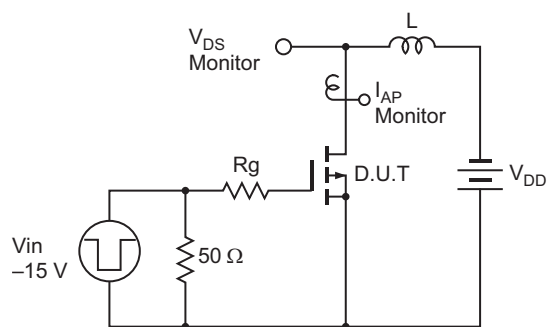
Static Drain to Source on State Resistance vs. Drain Current





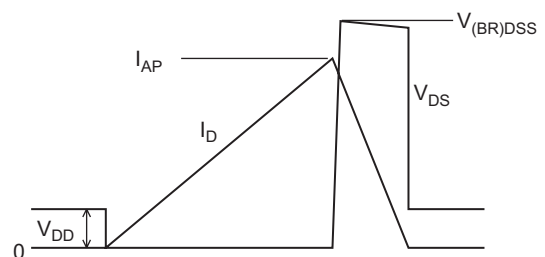


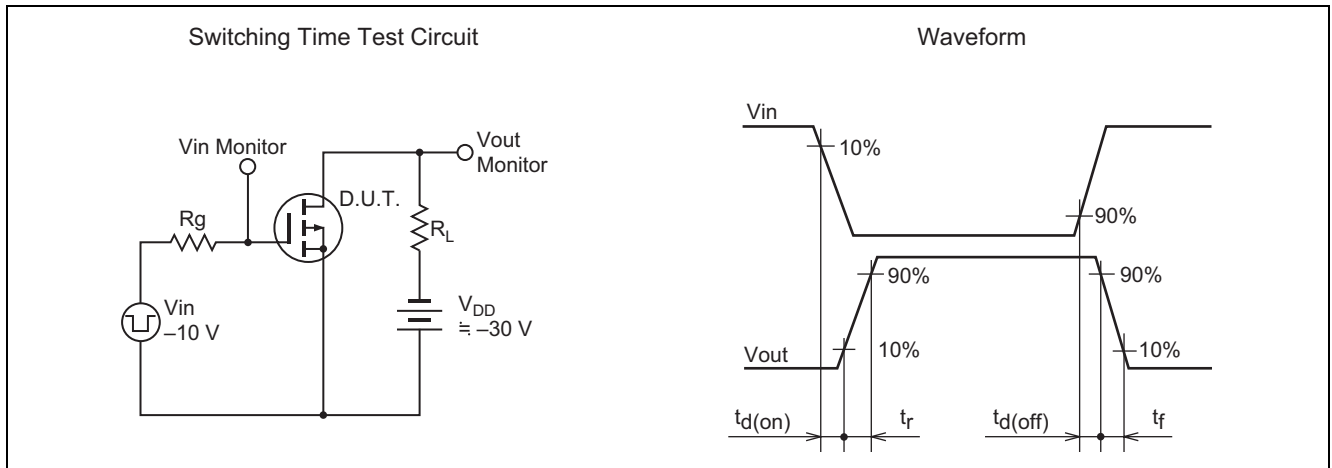
Avalanche Test Circuit



Avalanche Waveform

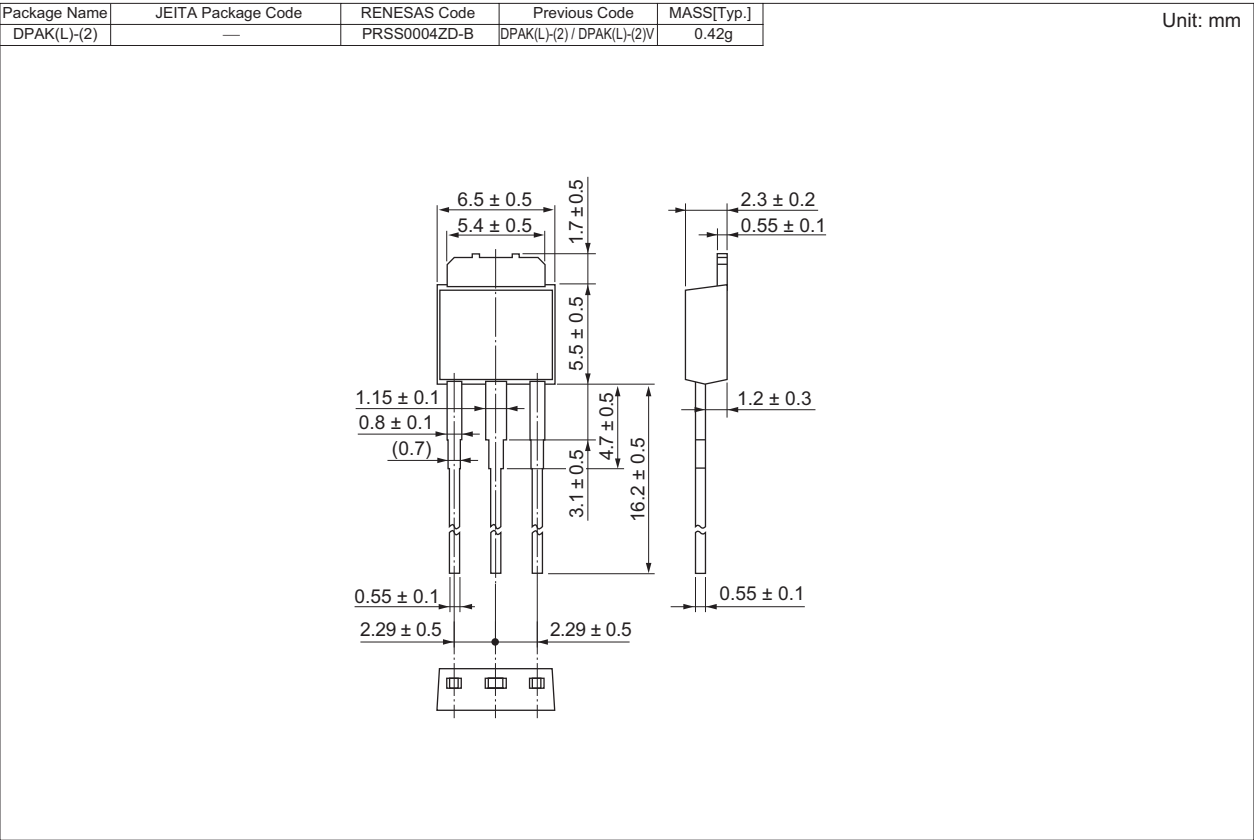
$$E_{AR} = \frac{1}{2} \cdot L \cdot I_{AP}^2 \cdot \frac{V_{DSS}}{V_{DSS} - V_{DD}}$$



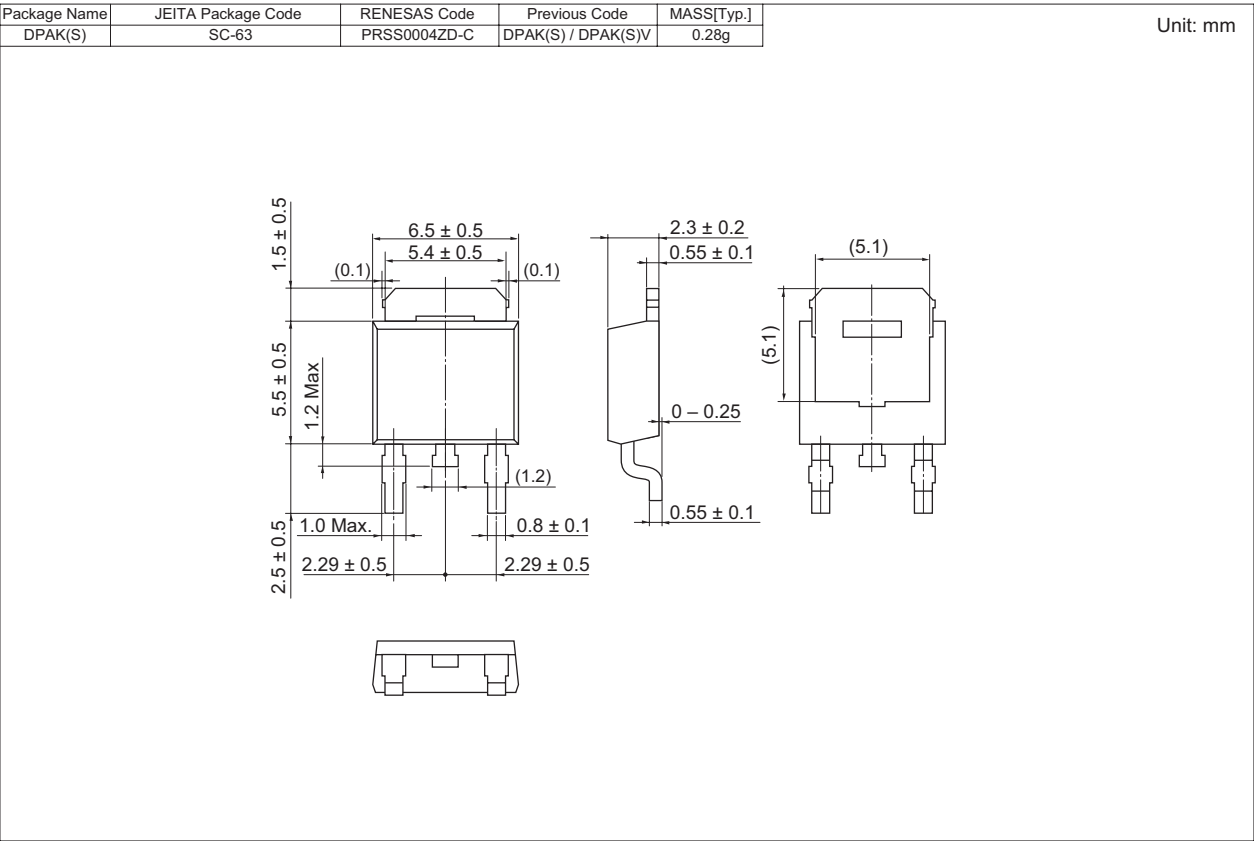


Package Dimensions

• H7P1002DL



• H7P1002DS



## Ordering Information

Part No.	Quantity	Shipping Container
H7P1002DL-E	3200 pcs	Hold Box, Radial Taping
H7P1002DSTL-E	3000 pcs	Taping



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