

# H5N2505DL, H5N2505DS

Silicon N Channel MOS FET  
High Speed Power Switching

REJ03G1107-0300

Rev.3.00

Oct 16, 2006

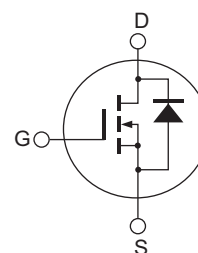
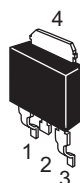
## Features

- Low on-resistance
- Low drive current
- High speed switching
- Low gate charge
- Avalanche ratings

## Outline

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

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



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

## Absolute Maximum Ratings

(Ta = 25°C)

| Item  | Symbol                            | Value       | Unit |
|---|-----------------------------------|-------------|------|
| Drain to source voltage                     | $V_{DSS}$                         | 250         | V    |
| Gate to source voltage                      | $V_{GSS}$                         | $\pm 30$    | V    |
| Drain current                               | $I_D$                             | 5           | A    |
| Drain peak current                          | $I_{D(pulse)}$ <sup>Note 1</sup>  | 20          | A    |
| Body-drain diode reverse drain current      | $I_{DR}$                          | 5           | A    |
| Body-drain diode reverse drain peak current | $I_{DR(pulse)}$ <sup>Note 1</sup> | 20          | A    |
| Avalanche current                           | $I_{AP}$ <sup>Note 3</sup>        | 5           | A    |
| Channel dissipation                         | $P_{ch}$ <sup>Note 2</sup>        | 25          | W    |
| Channel to case thermal Impedance           | $\theta_{ch-c}$                   | 5           | °C/W |
| Channel temperature                         | $T_{ch}$                          | 150         | °C   |
| Storage temperature                         | $T_{stg}$                         | -55 to +150 | °C   |

Notes: 1.  $PW \leq 10 \mu s$ , duty cycle  $\leq 1\%$

2. Value at  $T_c = 25^\circ C$

3.  $STch = 25^\circ C$ ,  $T_{ch} \leq 150^\circ C$

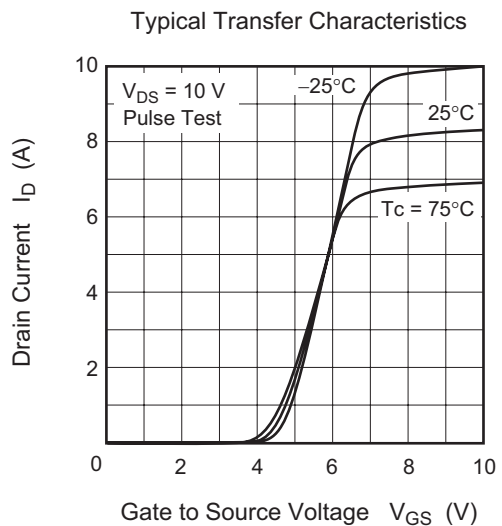
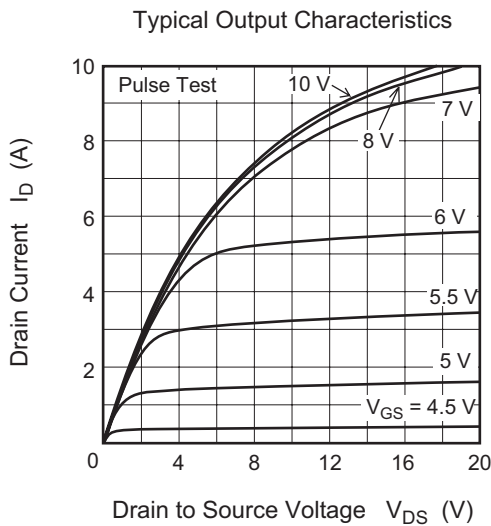
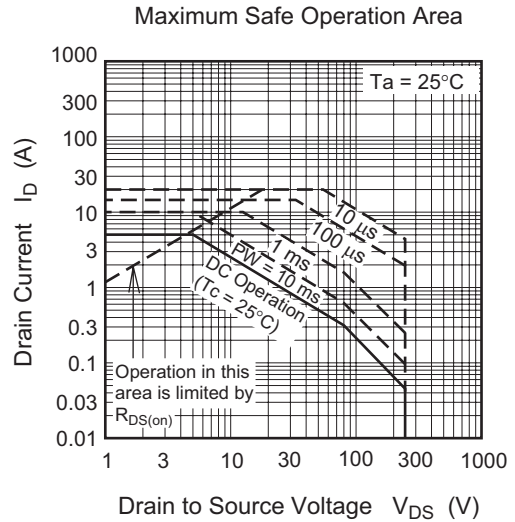
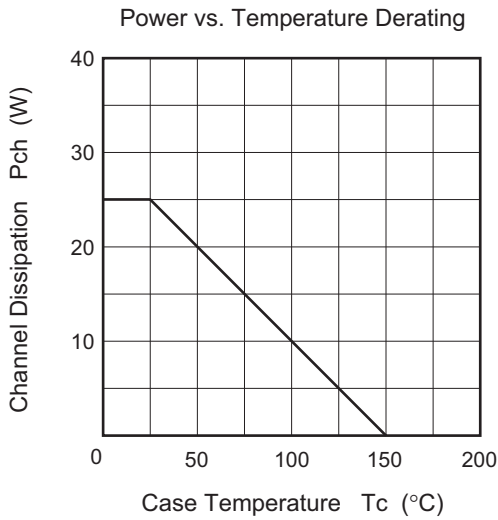
Electrical Characteristics

(Ta = 25°C)

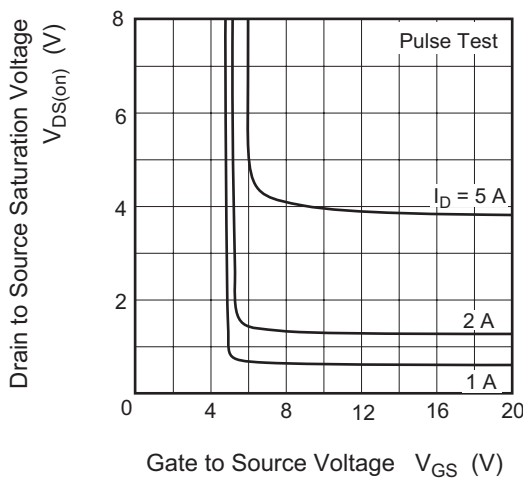
| Item                                       | Symbol        | Min | Typ  | Max       | Unit          | Test Conditions   |
|--|---------------|-----|------|-----------|---------------|---|
| Drain to source breakdown voltage          | $V_{(BR)DSS}$ | 250 | —    | —         | V             | $I_D = 10 \text{ mA}, V_{GS} = 0$   |
| 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} $    | 2.0 | 3.3  | —         | S             | $I_D = 2.5 \text{ A}, V_{DS} = 10 \text{ V}$ <sup>Note 4</sup>  |
| Static drain to source on state resistance | $R_{DS(on)}$  | —   | 0.68 | 0.89      | $\Omega$      | $I_D = 2.5 \text{ A}, V_{GS} = 10 \text{ V}$ <sup>Note 4</sup>  |
| Input capacitance                          | $C_{iss}$     | —   | 300  | —         | pF            | $V_{DS} = 25 \text{ V}, V_{GS} = 0,$<br>$f = 1 \text{ MHz}$   |
| Output capacitance                         | $C_{oss}$     | —   | 42   | —         | pF            |   |
| Reverse transfer capacitance               | $C_{rss}$     | —   | 11   | —         | pF            |   |
| Total gate charge                          | $Q_g$         | —   | 11   | —         | nC            | $V_{DD} = 200 \text{ V}, V_{GS} = 10 \text{ V},$<br>$I_D = 5 \text{ A}$   |
| Gate to source charge                      | $Q_{gs}$      | —   | 2    | —         | nC            |   |
| Gate to drain charge                       | $Q_{gd}$      | —   | 5    | —         | nC            |   |
| Turn-on delay time                         | $t_{d(on)}$   | —   | 18   | —         | ns            | $V_{DD} \cong 125 \text{ V}, I_D = 2.5 \text{ A},$<br>$V_{GS} = 10 \text{ V}$<br>$R_L = 50 \Omega, R_g = 10 \Omega$ |
| Rise time                                  | $t_r$         | —   | 18   | —         | ns            |   |
| Turn-off delay time                        | $t_{d(off)}$  | —   | 44   | —         | ns            |   |
| Fall time                                  | $t_f$         | —   | 11   | —         | ns            |   |
| Body-drain diode forward voltage           | $V_{DF}$      | —   | 1.0  | 1.5       | V             | $I_F = 5 \text{ A}, V_{GS} = 0$ <sup>Note 4</sup>   |
| Body-drain diode reverse recovery time     | $t_{rr}$      | —   | 100  | —         | ns            | $I_F = 5 \text{ A}, V_{GS} = 0$<br>$di_F/dt = 100 \text{ A}/\mu\text{s}$  |
| Body-drain diode reverse recovery charge   | $Q_{rr}$      | —   | 0.32 | —         | $\mu\text{C}$ |   |

Note: 4. Pulse test

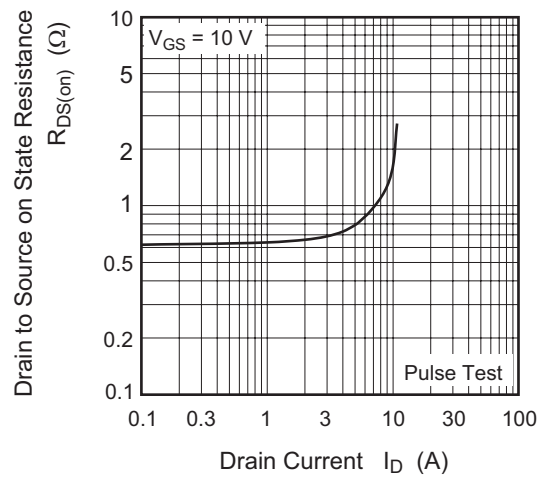
Main Characteristics

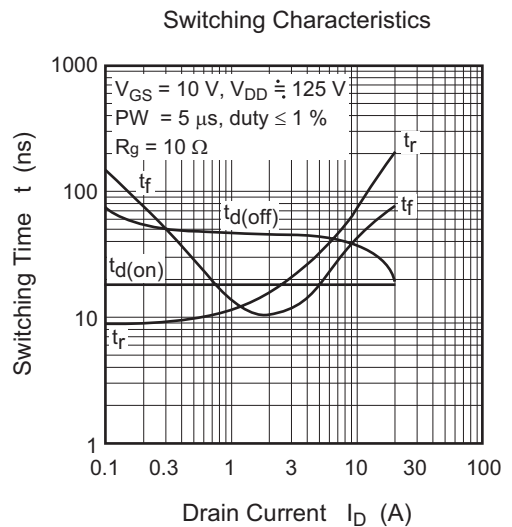
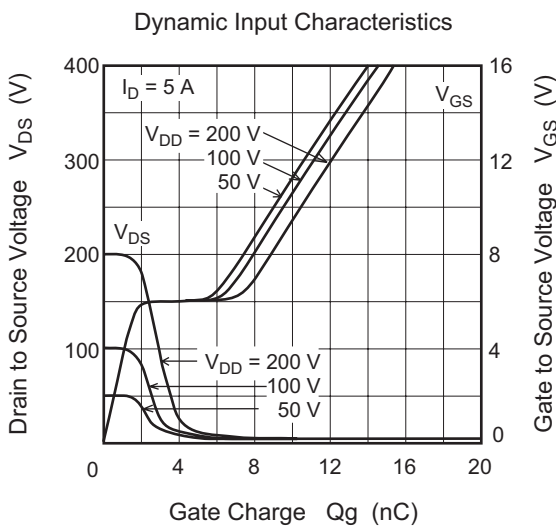
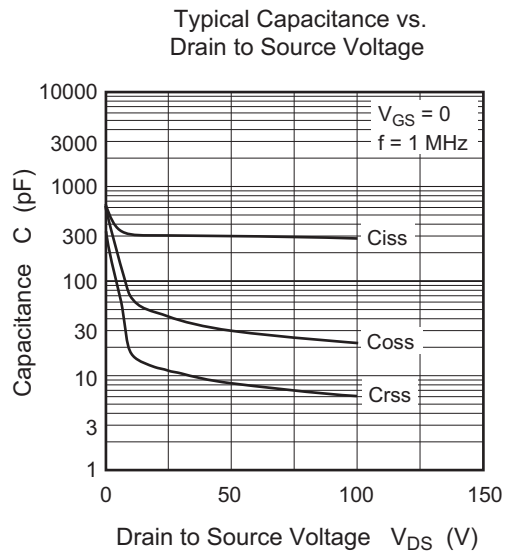
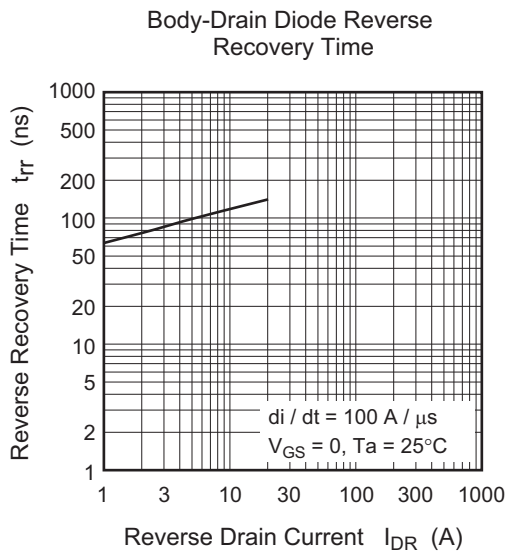
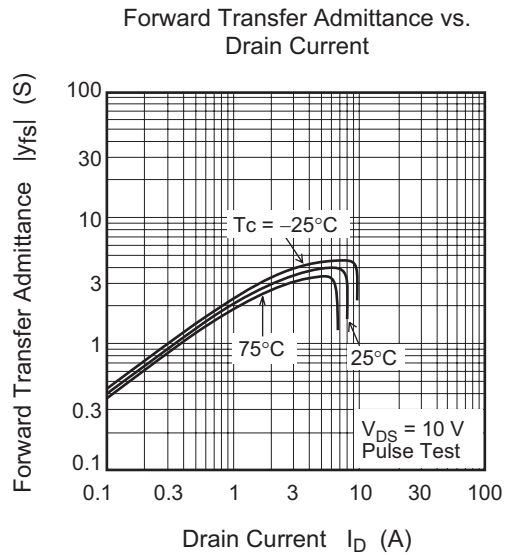
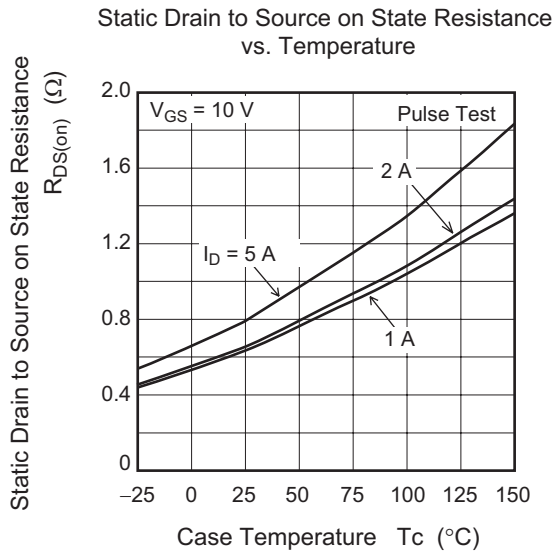


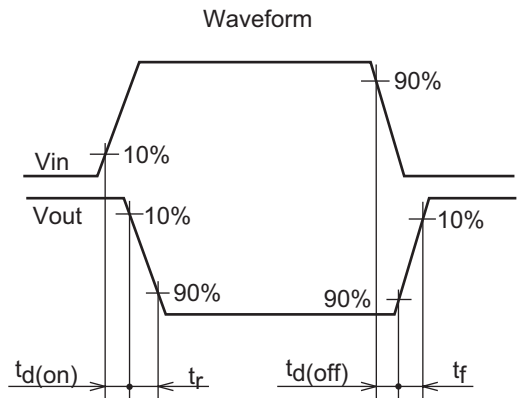
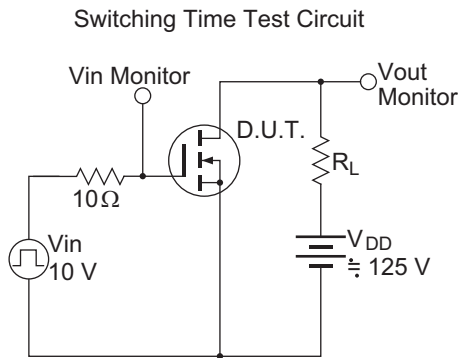
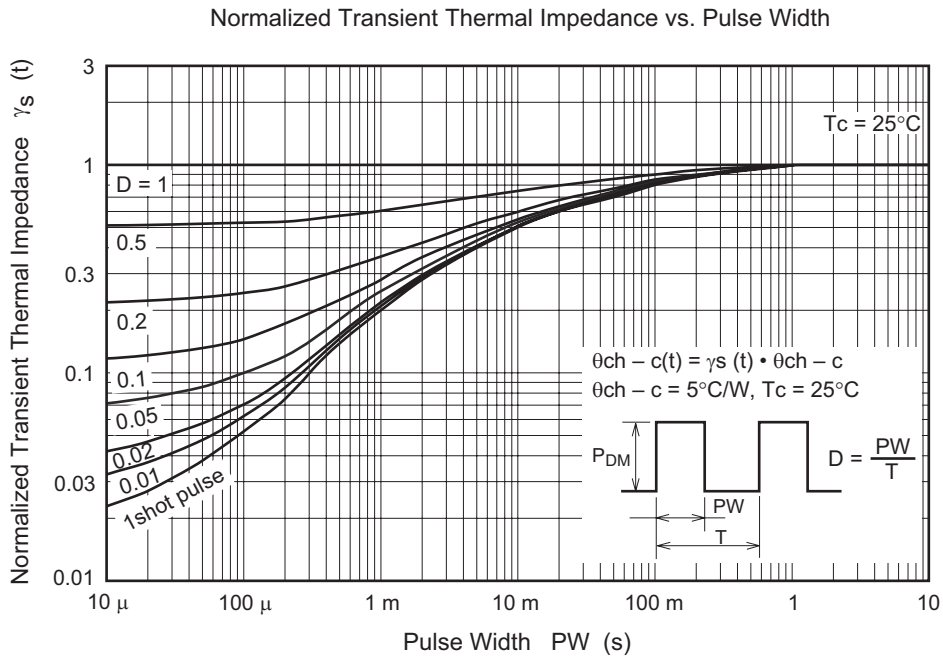
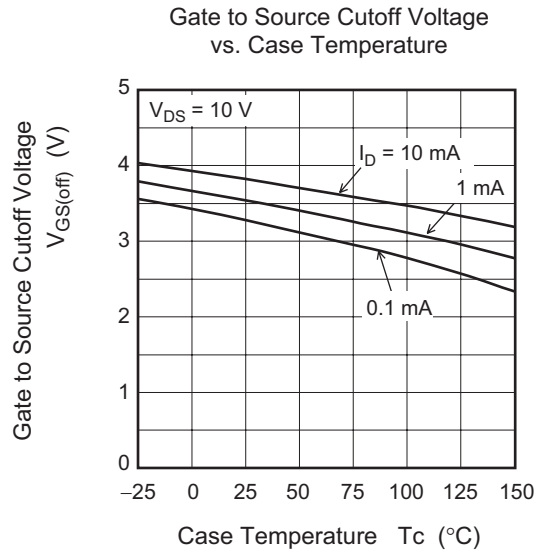
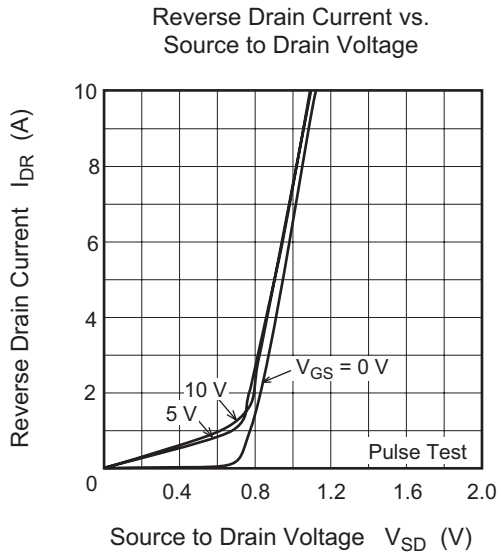
Drain to Source Saturation Voltage vs. Gate to Source Voltage



Static Drain to Source on State Resistance vs. Drain Current

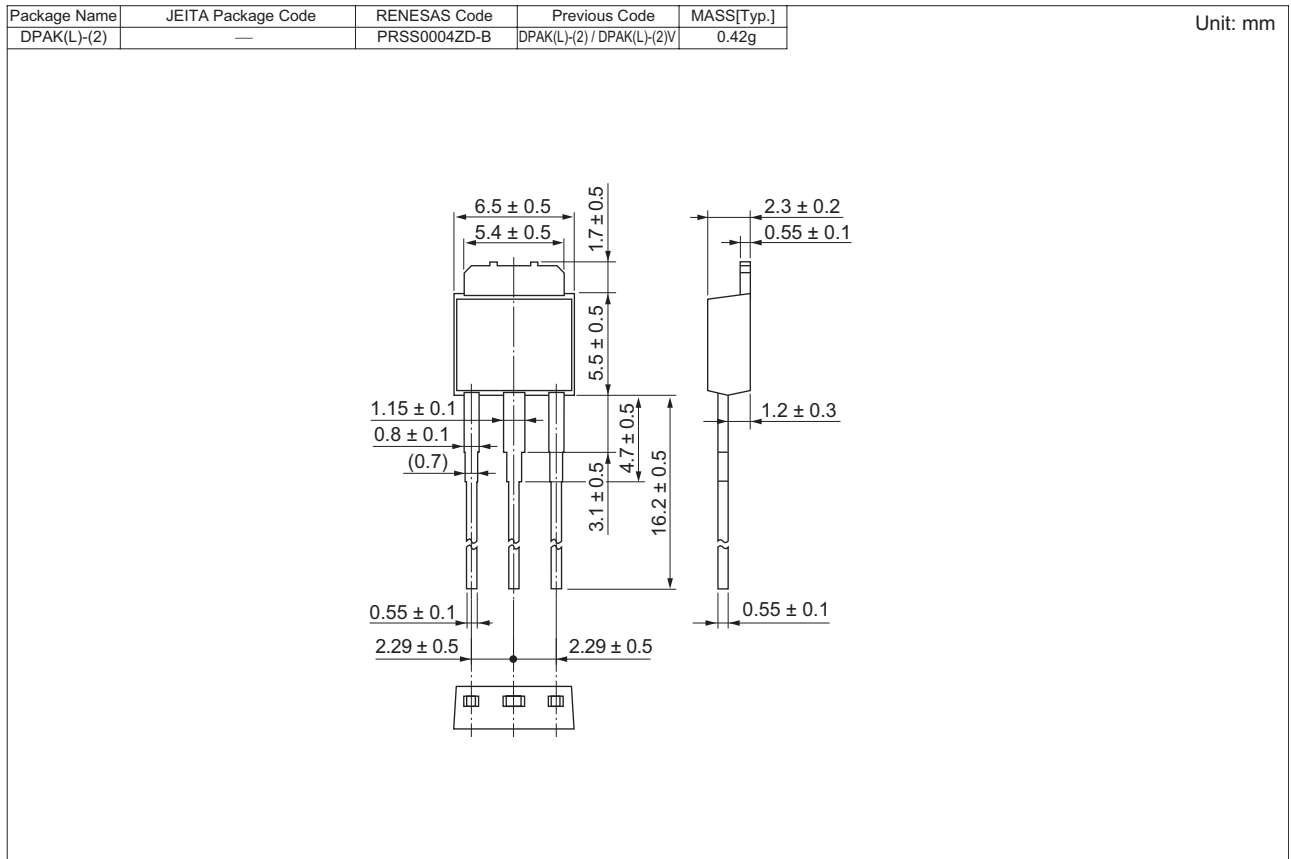




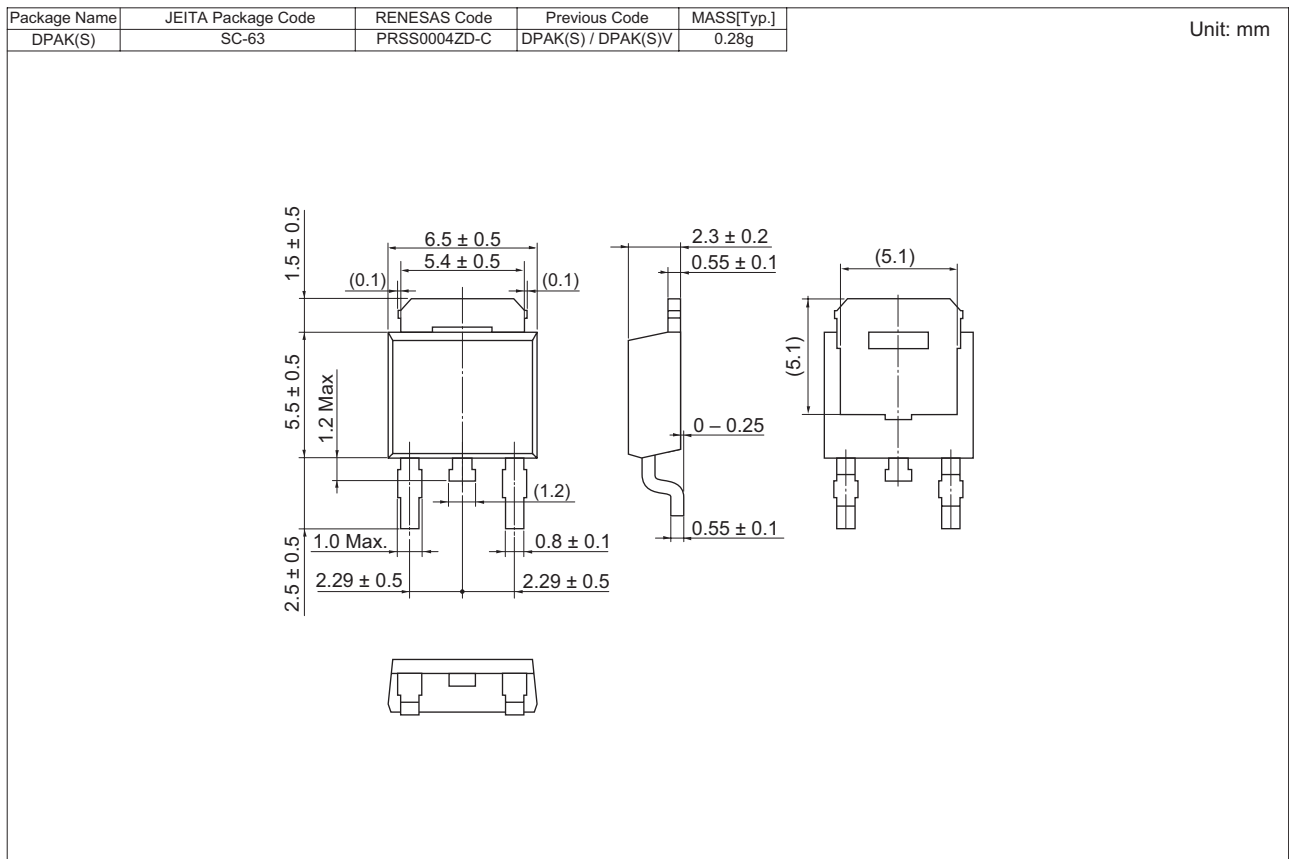


Package Dimensions

• H5N2505DL



• H5N2505DS



### Ordering Information

| Part Name     | Quantity | Shipping Container |
|---------------|----------|--------------------|
| H5N2505DL-E   | 3200 pcs | Box (Sack)         |
| H5N2505DSTL-E | 3000 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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