

# RQJ0303PGDQA

Silicon P Channel MOS FET  
Power Switching

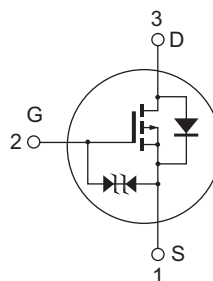
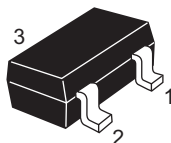
R07DS0295EJ0500  
(Previous: REJ03G1272-0400)  
Rev.5.00  
Mar 28, 2011

## Features

- Low on-resistance  
 $R_{DS(on)} = 54 \text{ m}\Omega \text{ typ}$  ( $V_{GS} = -10 \text{ V}$ ,  $I_D = -1.6 \text{ A}$ )
- Low drive current
- High speed switching
- 4.5 V gate drive

## Outline

RENESAS Package code: PLSP0003ZB-A  
(Package name: MPAK)



1. Source
2. Gate
3. Drain

Note: Marking is "PG".

## Absolute Maximum Ratings

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

| Item                                     | Symbol                          | Ratings     | Unit             |
|--|---------------------------------|-------------|------------------|
| Drain to source voltage                  | $V_{DSS}$                       | -30         | V                |
| Gate to source voltage                   | $V_{GSS}$                       | +10 / -20   | V                |
| Drain current                            | $I_D$                           | -3.3        | A                |
| Drain peak current                       | $I_{D(Pulse)}$ <sup>Note1</sup> | -5          | A                |
| Body - drain diode reverse drain current | $I_{DR}$                        | -3.3        | A                |
| Channel dissipation                      | $P_{ch}$ <sup>Note2</sup>       | 0.8         | 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. When using the glass epoxy board (FR-4: 40 × 40 × 1 mm)

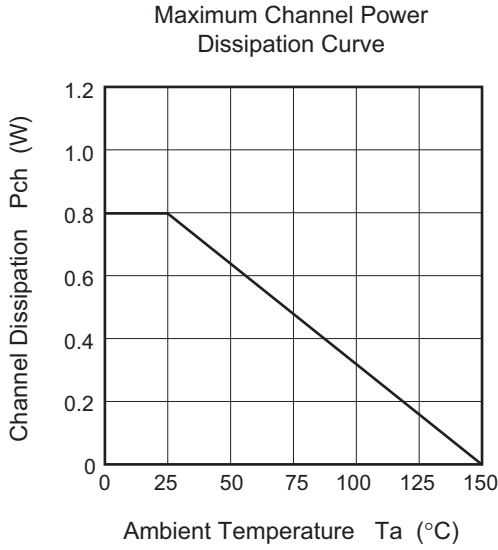
## Electrical Characteristics

(Ta = 25°C)

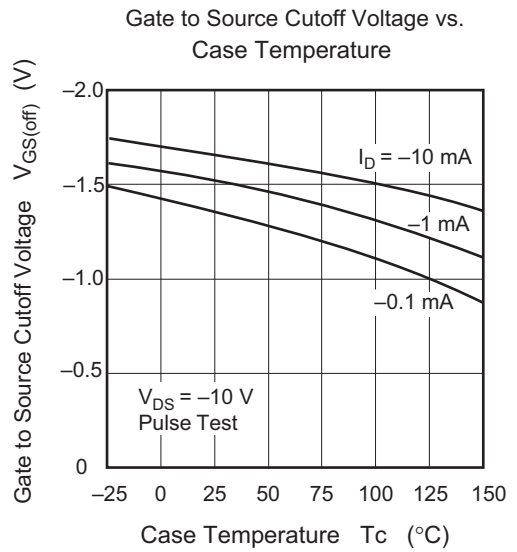
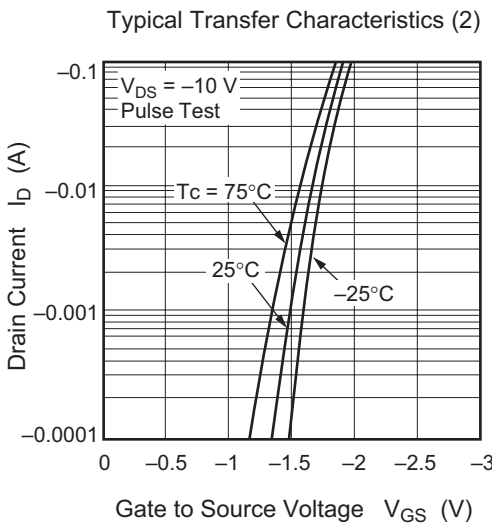
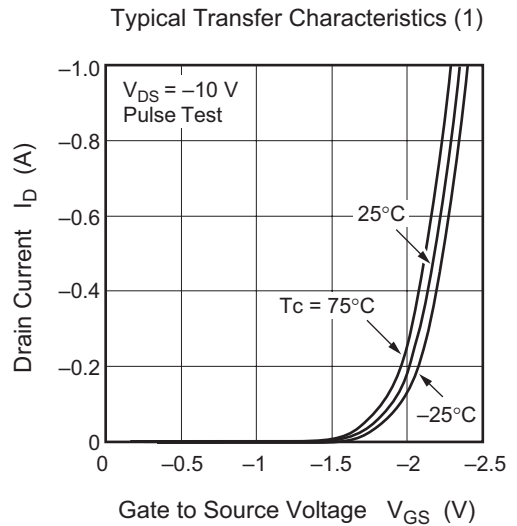
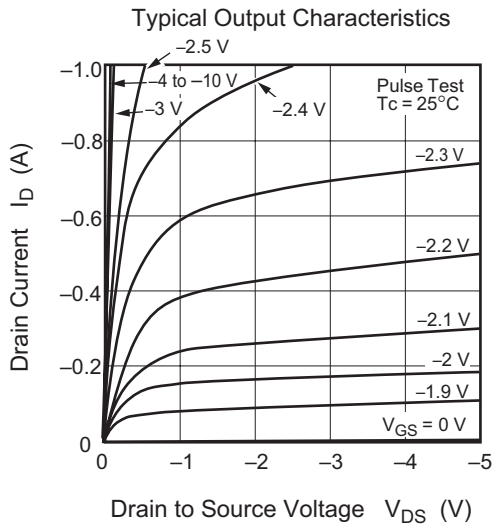
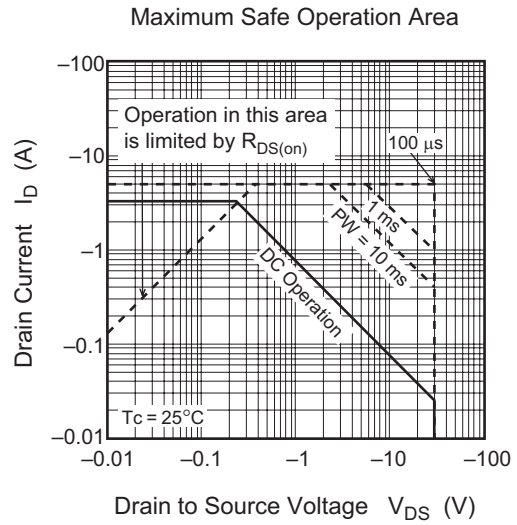
| Item                                | Symbol        | Min  | Typ  | Max  | Unit             | Test conditions  |
|-------------------------------------|---------------|------|------|------|------------------|--|
| Drain to source breakdown voltage   | $V_{(BR)DSS}$ | -30  | —    | —    | V                | $I_D = -10 \text{ mA}$ , $V_{GS} = 0$  |
| Gate to source breakdown voltage    | $V_{(BR)GSS}$ | +10  | —    | —    | V                | $I_G = +100 \text{ } \mu\text{A}$ , $V_{DS} = 0$   |
| Gate to source breakdown voltage    | $V_{(BR)GSS}$ | -20  | —    | —    | V                | $I_G = -100 \text{ } \mu\text{A}$ , $V_{DS} = 0$   |
| Gate to source leak current         | $I_{GSS}$     | —    | —    | +10  | $\mu\text{A}$    | $V_{GS} = +8 \text{ V}$ , $V_{DS} = 0$   |
| Gate to source leak current         | $I_{GSS}$     | —    | —    | -10  | $\mu\text{A}$    | $V_{GS} = -16 \text{ V}$ , $V_{DS} = 0$  |
| Drain to source leak current        | $I_{DSS}$     | —    | —    | -1   | $\mu\text{A}$    | $V_{DS} = -30 \text{ V}$ , $V_{GS} = 0$  |
| Gate to source cutoff voltage       | $V_{GS(off)}$ | -1.0 | —    | -2.0 | V                | $V_{DS} = -10 \text{ V}$ , $I_D = -1 \text{ mA}$   |
| Drain to source on state resistance | $R_{DS(on)}$  | —    | 54   | 68   | $\text{m}\Omega$ | $I_D = -1.6 \text{ A}$ , $V_{GS} = -10 \text{ V}$ <sup>Note3</sup>   |
|                                     | $R_{DS(on)}$  | —    | 76   | 107  | $\text{m}\Omega$ | $I_D = -1.6 \text{ A}$ , $V_{GS} = -4.5 \text{ V}$ <sup>Note3</sup>  |
| Forward transfer admittance         | $ y_{fs} $    | 2.5  | 4.2  | —    | S                | $I_D = -1.6 \text{ A}$ , $V_{DS} = -10 \text{ V}$ <sup>Note3</sup>   |
| Input capacitance                   | $C_{iss}$     | —    | 625  | —    | pF               | $V_{DS} = -10 \text{ V}$ , $V_{GS} = 0$ ,<br>$f = 1 \text{ MHz}$   |
| Output capacitance                  | $C_{oss}$     | —    | 111  | —    | pF               |  |
| Reverse transfer capacitance        | $C_{rss}$     | —    | 83   | —    | pF               |  |
| Turn - on delay time                | $t_{d(on)}$   | —    | 18   | —    | ns               | $I_D = -1 \text{ A}$ , $V_{GS} = -10 \text{ V}$ ,<br>$R_L = 6.6 \text{ } \Omega$ , $R_g = 4.7 \text{ } \Omega$ |
| Rise time                           | $t_r$         | —    | 29   | —    | ns               |  |
| Turn - off delay time               | $t_{d(off)}$  | —    | 47   | —    | ns               |  |
| Fall time                           | $t_f$         | —    | 5.7  | —    | ns               |  |
| Total gate charge                   | $Q_g$         | —    | 12   | —    | nC               | $V_{DD} = -10 \text{ V}$ , $V_{GS} = -10 \text{ V}$ ,<br>$I_D = -3.3 \text{ A}$                                |
| Gate to source charge               | $Q_{gs}$      | —    | 1.5  | —    | nC               |  |
| Gate to drain charge                | $Q_{gd}$      | —    | 2.9  | —    | nC               |  |
| Body - drain diode forward voltage  | $V_{DF}$      | —    | -0.9 | —    | V                | $I_F = -1.5 \text{ A}$ , $V_{GS} = 0$ <sup>Note3</sup>   |

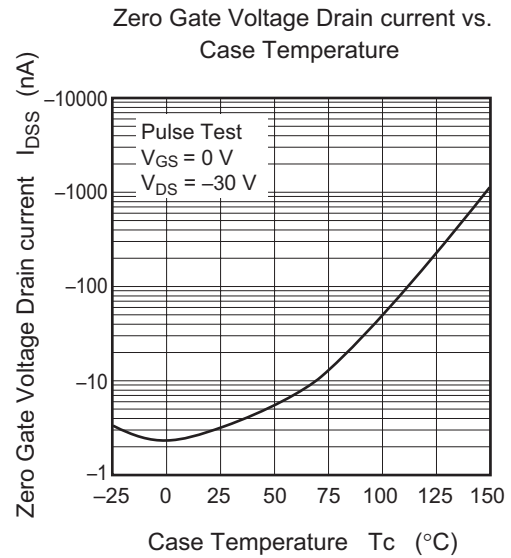
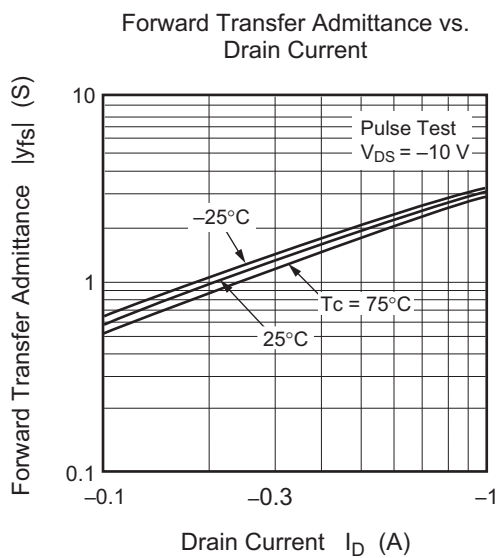
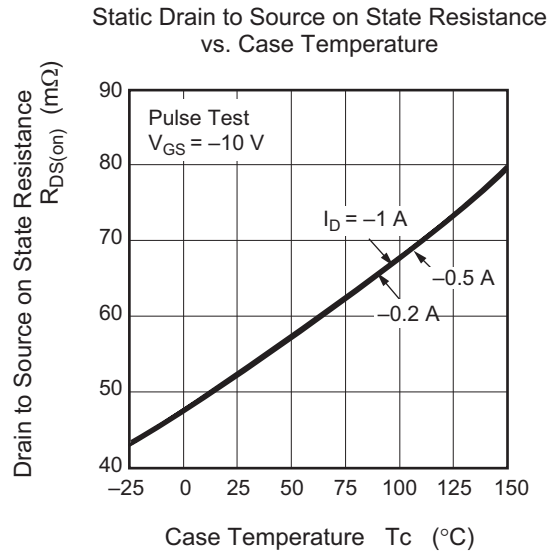
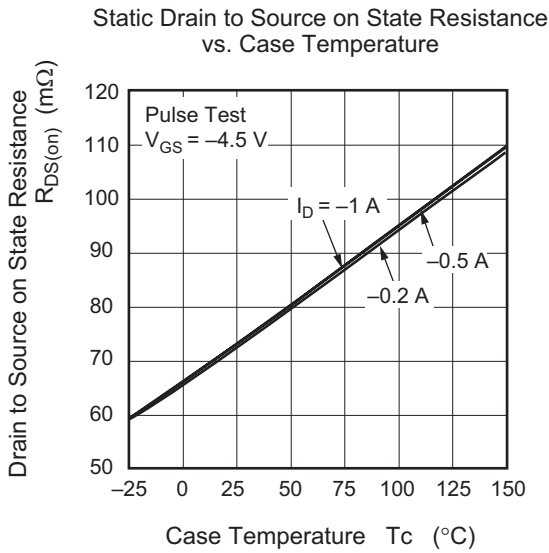
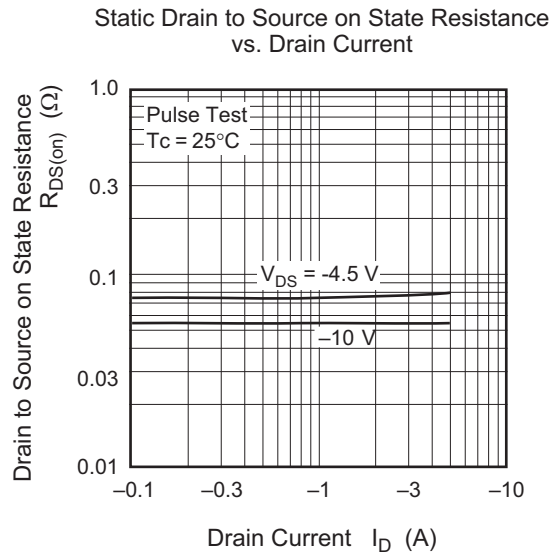
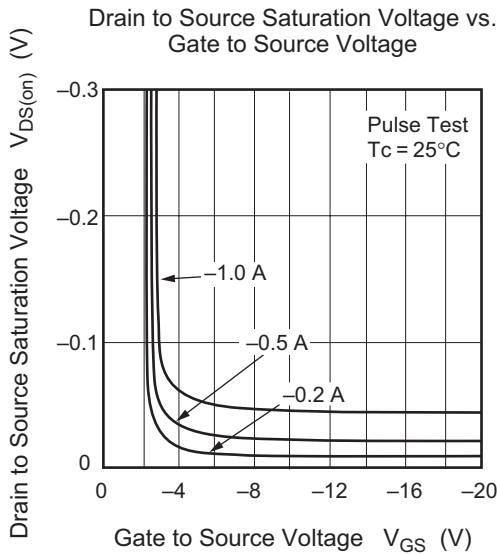
Notes: 3. Pulse test

Main Characteristics

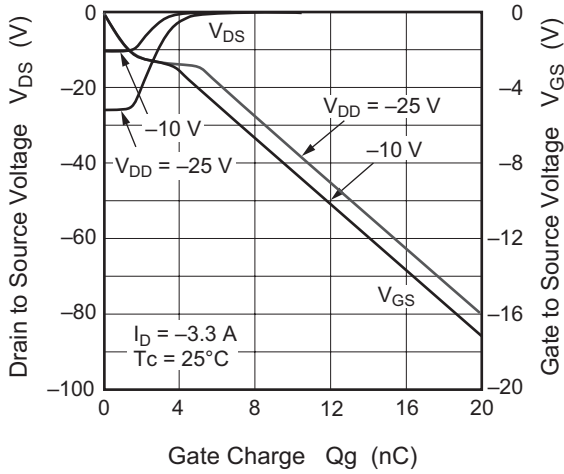


\*When using the glass epoxy board (FR-4: 40 × 40 × 1 mm)

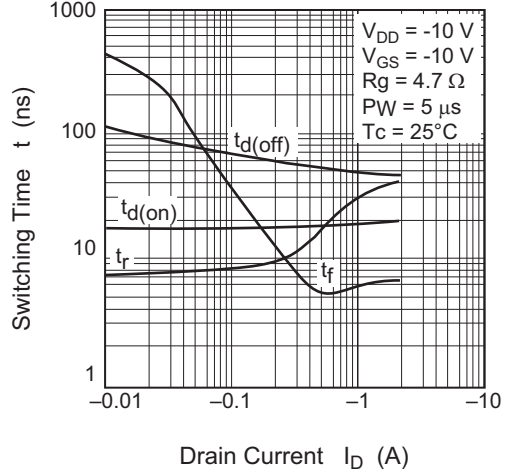




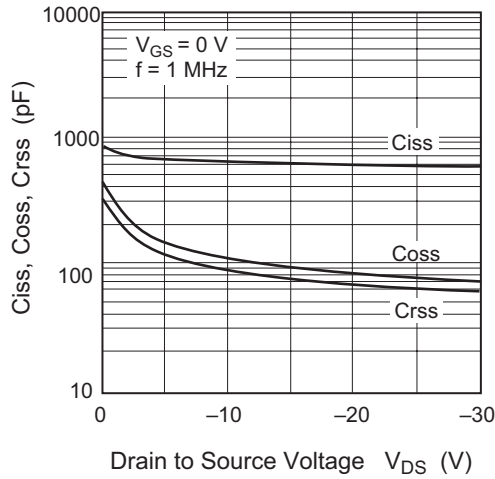
Dynamic Input Characteristics



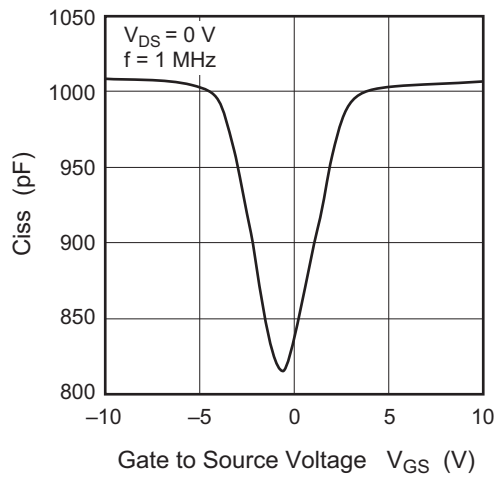
Switching Characteristics



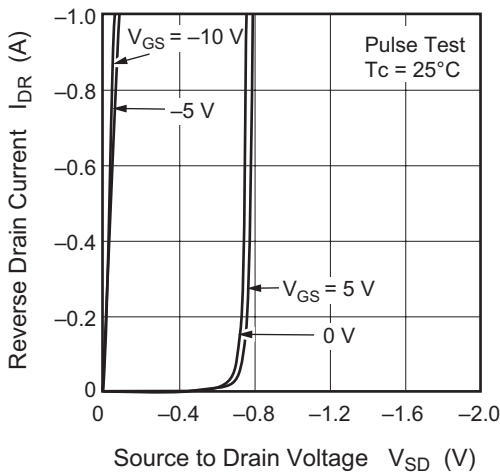
Typical Capacitance vs. Drain to Source Voltage



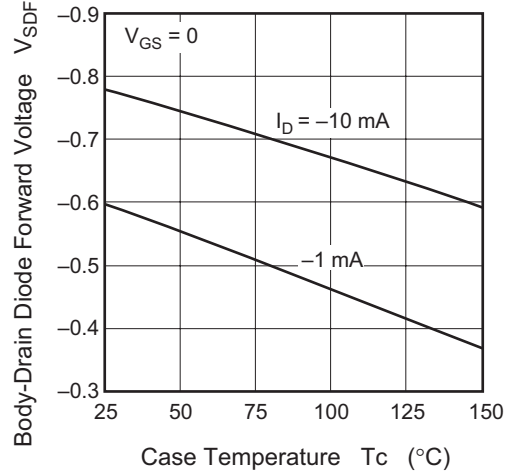
Input Capacitance vs. Gate to Source Voltage



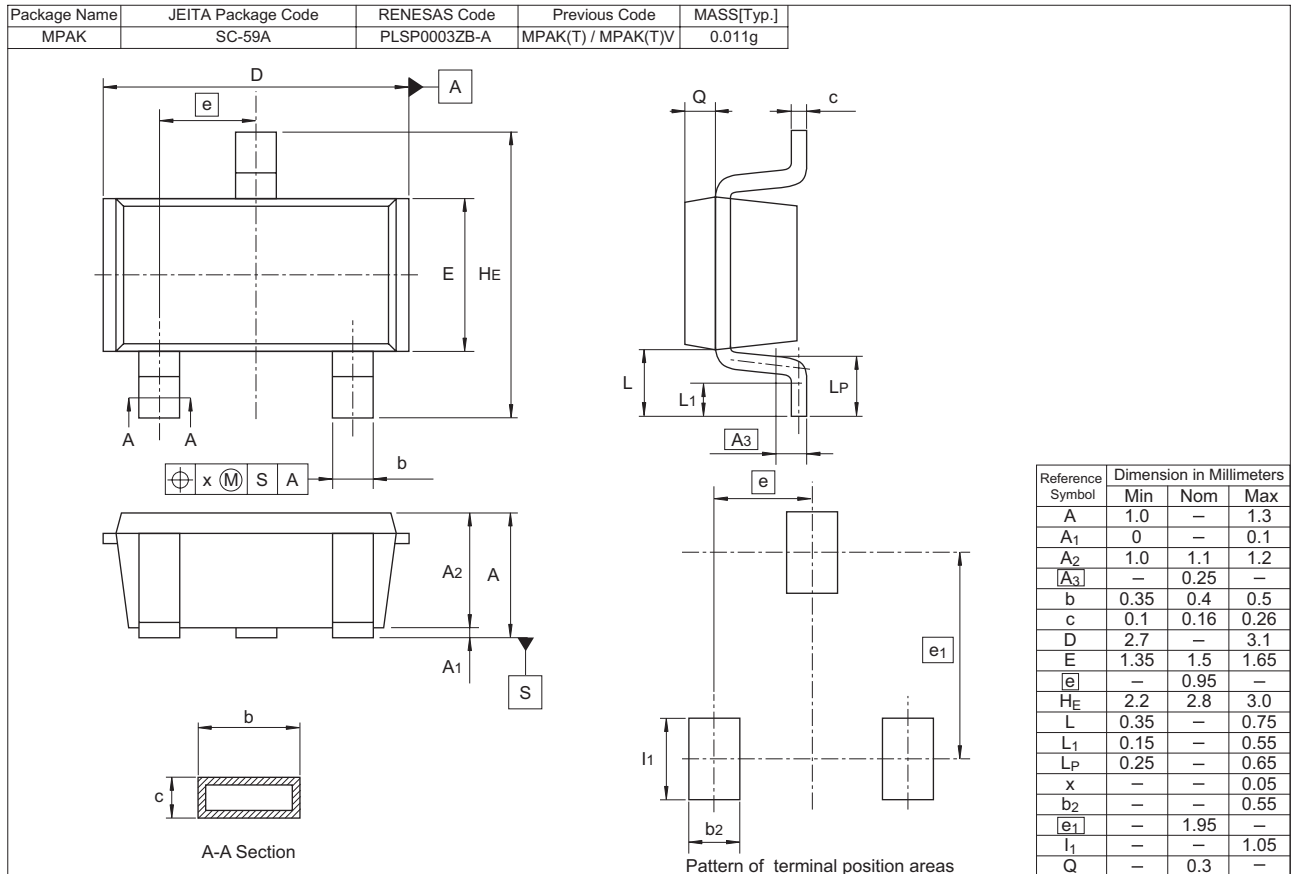
Reverse Drain Current vs. Source to Drain Voltage



Body-Drain Diode Forward Voltage vs. Case Temperature



### Package Dimensions



### Ordering Information

| Orderable Part Number | Quantity  | Shipping Container               |
|-----------------------|-----------|----------------------------------|
| RQJ0303PGDQATL-H      | 3000 pcs. | φ178 mm reel, 8 mm Emboss taping |

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