



**THE DATASHEET OF  
2SK2225-80-E#T2**



# 2SK2225-80-E

1500V - 2A - MOS FET  
High Speed Power Switching

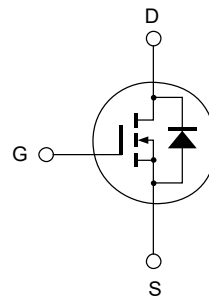
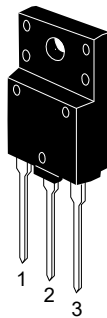
R07DS1275EJ0300  
Rev.3.00  
Dec.13.2021

## Features

- High breakdown voltage ( $V_{DSS} = 1500\text{ V}$ )
- High speed switching
- Low drive current
- Quality grade: Standard

## Outline

RENESAS Package code: PRSS0003ZP-A, PRSS0003ZD-A  
(Package name: TO-3PFP, TO-3PF)



1. Gate
2. Drain
3. Source

## Absolute Maximum Ratings

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

| Item                                      | Symbol                           | Value       | Unit             |
|---|----------------------------------|-------------|------------------|
| Drain to source voltage                   | $V_{DSS}$                        | 1500        | V                |
| Gate to source voltage                    | $V_{GSS}$                        | $\pm 20$    | V                |
| Drain current                             | $I_D$                            | 2           | A                |
| Drain peak current                        | $I_{D(pulse)}$ <sup>Notes1</sup> | 7           | A                |
| Body to drain diode reverse drain current | $I_{DR}$                         | 2           | A                |
| Channel dissipation                       | $P_{ch}$ <sup>Notes2</sup>       | 50          | W                |
| Channel temperature                       | $T_{ch}$                         | 150         | $^\circ\text{C}$ |
| Storage temperature                       | $T_{stg}$                        | -55 to +150 | $^\circ\text{C}$ |

Note: Continuous heavy condition (e.g. high temperature/voltage/current or high variation of temperature) may affect a reliability even if it is within the absolute maximum ratings. Please consider derating condition for appropriate reliability in reference Renesas Semiconductor Reliability Handbook (Recommendation for Handling and Usage of Semiconductor Devices) and individual reliability data.

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

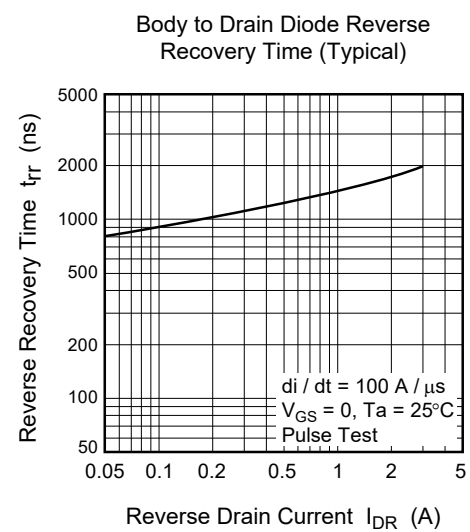
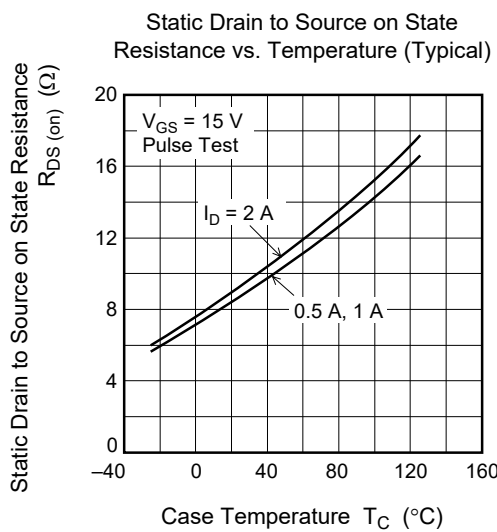
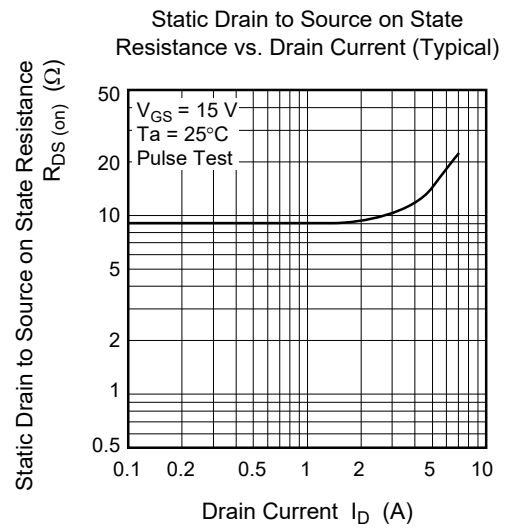
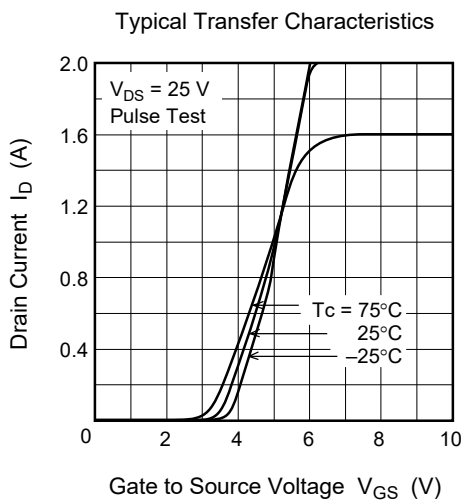
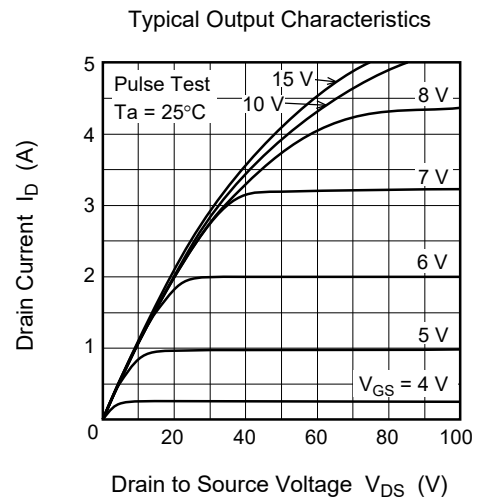
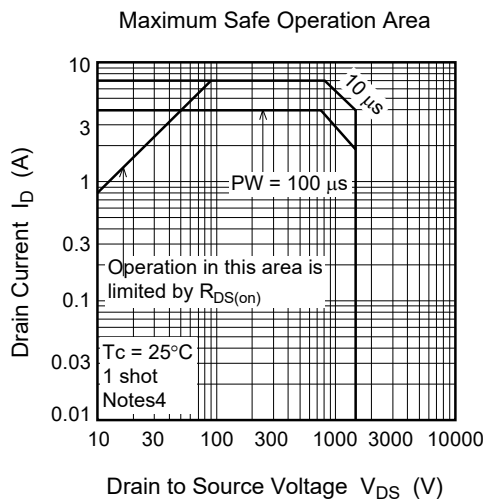
## Electrical Characteristics

(Ta = 25 °C)

| Item                                       | Symbol        | Min  | Typ  | Max     | Unit          | Test conditions   |
|--|---------------|------|------|---------|---------------|---|
| Drain to source breakdown voltage          | $V_{(BR)DSS}$ | 1500 | —    | —       | V             | $I_D = 10 \text{ mA}$ , $V_{GS} = 0$  |
| Gate to source leak current                | $I_{GSS}$     | —    | —    | $\pm 1$ | $\mu\text{A}$ | $V_{GS} = \pm 20 \text{ V}$ , $V_{DS} = 0$  |
| Zero gate voltage drain current            | $I_{DSS}$     | —    | —    | 500     | $\mu\text{A}$ | $V_{DS} = 1200 \text{ V}$ , $V_{GS} = 0$  |
| Gate to source cutoff voltage              | $V_{GS(off)}$ | 2.0  | —    | 4.0     | V             | $I_D = 1 \text{ mA}$ , $V_{DS} = 10 \text{ V}$                                    |
| Static drain to source on state resistance | $R_{DS(on)}$  | —    | 9    | 12      | $\Omega$      | $I_D = 1 \text{ A}$ , $V_{GS} = 15 \text{ V}$ <sup>Notes3</sup>                   |
| Forward transfer admittance                | $ y_{fs} $    | 0.45 | 0.75 | —       | S             | $I_D = 1 \text{ A}$ , $V_{DS} = 20 \text{ V}$ <sup>Notes3</sup>                   |
| Input capacitance                          | $C_{iss}$     | —    | 990  | —       | pF            | $V_{DS} = 10 \text{ V}$ , $V_{GS} = 0$ ,<br>$f = 1 \text{ MHz}$                   |
| Output capacitance                         | $C_{oss}$     | —    | 125  | —       | pF            |   |
| Reverse transfer capacitance               | $C_{rss}$     | —    | 60   | —       | pF            |   |
| Turn-on delay time                         | $t_{d(on)}$   | —    | 17   | —       | ns            | $I_D = 1 \text{ A}$ , $V_{GS} = 10 \text{ V}$ ,<br>$R_L = 30 \Omega$              |
| Rise time                                  | $t_r$         | —    | 50   | —       | ns            |   |
| Turn-off delay time                        | $t_{d(off)}$  | —    | 150  | —       | ns            |   |
| Fall time                                  | $t_f$         | —    | 50   | —       | ns            |   |
| Body-drain diode forward voltage           | $V_{DF}$      | —    | 0.9  | —       | V             | $I_F = 2 \text{ A}$ , $V_{GS} = 0$  |
| Body-drain diode reverse recovery time     | $t_{rr}$      | —    | 1750 | —       | ns            | $I_F = 2 \text{ A}$ , $V_{GS} = 0$ ,<br>$di_F / dt = 100 \text{ A} / \mu\text{s}$ |

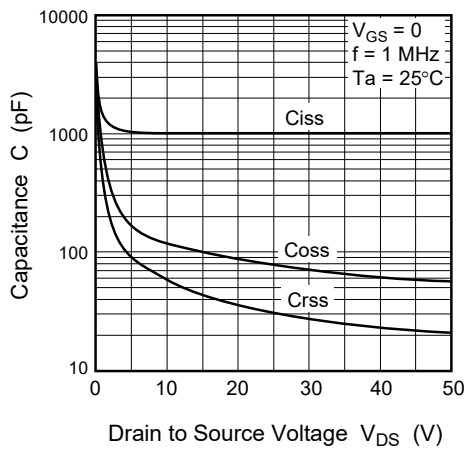
Notes: 3. Pulse Test

### Main Characteristics

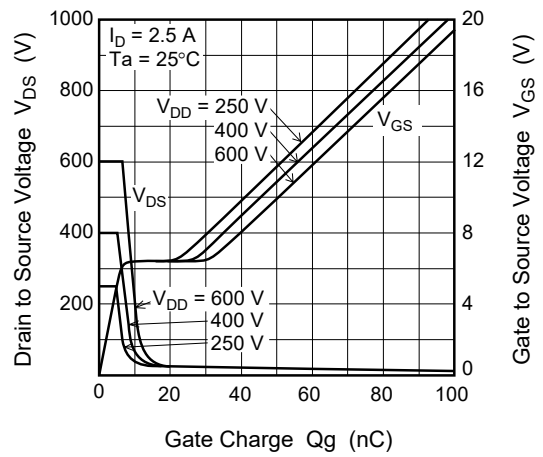


Notes: 4. Designed target value on Renesas measurement condition. (Not tested)  
 Renesas recommends that operating conditions are designed according to a document "Power MOS FET · IGBT Attention of Handling Semiconductor Devices".

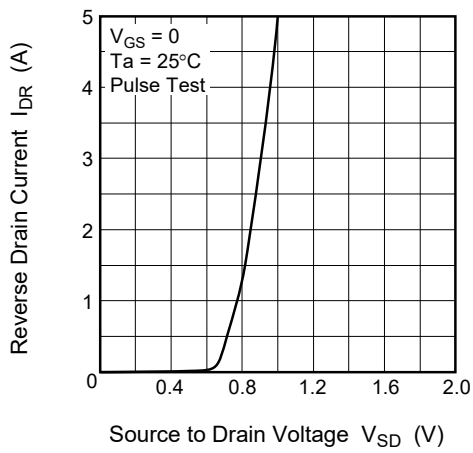
Typical Capacitance vs. Drain to Source Voltage

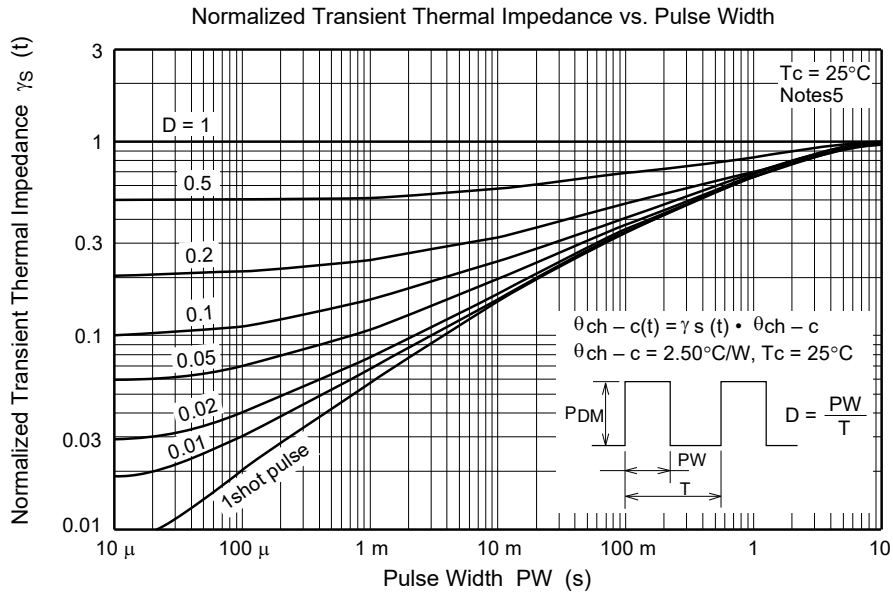


Dynamic Input Characteristics (Typical)

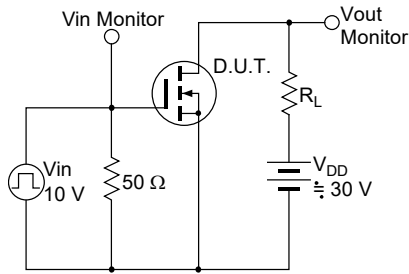


Reverse Drain Current vs. Source to Drain Voltage (Typical)

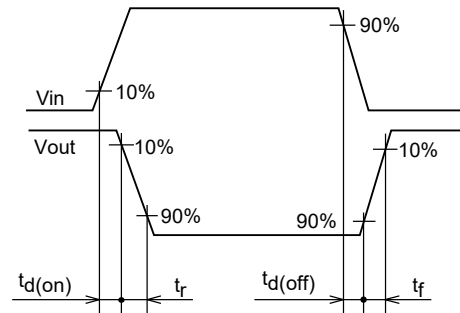




Switching Time Test Circuit



Waveforms



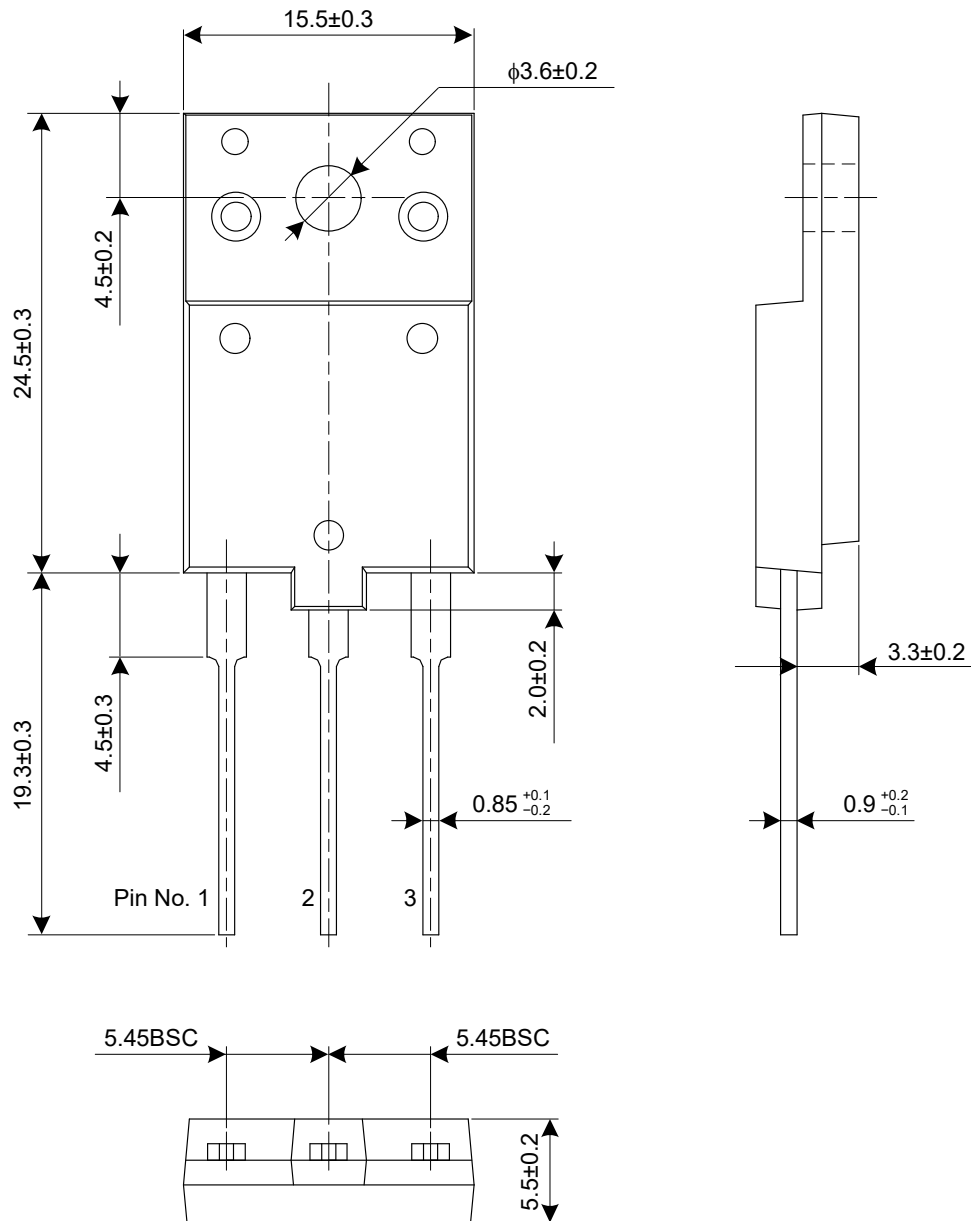
Notes: 5. Designed target value on Renesas measurement condition. (Not tested)

# Package Dimensions

ASSEMBLED IN CHINA

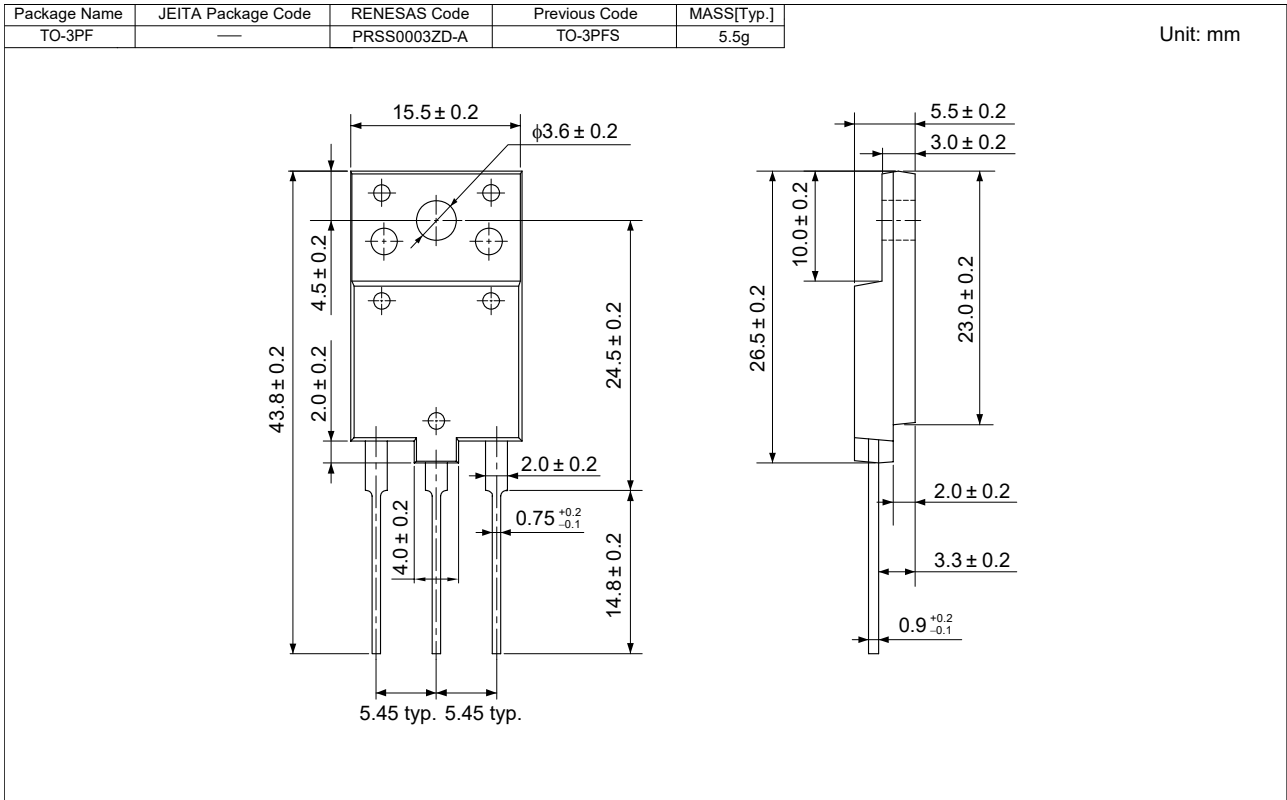
| Package Name | JEITA Package Code | RENESAS Code | Previous Code | MASS (Typ) [g] |
|--------------|--------------------|--------------|---------------|----------------|
| TO-3PFP      | —                  | PRSS0003ZP-A | TO-3PFP       | 6.2            |

Unit: mm



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**ASSEMBLED IN KOREA**



**Ordering Information**

| Orderable Part No.                   | Quantity | Shipping Container |
|--------------------------------------|----------|--------------------|
| 2SK2225-80-E#T2 (ASSEMBLED IN CHINA) | 25 pcs   | Tube               |
| 2SK2225-80-E#T2 (ASSEMBLED IN KOREA) | 30 pcs   | Tube               |

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