

# 2SK1161, 2SK1162

Silicon N Channel MOS FET

REJ03G0912-0200  
(Previous: ADE-208-1250)

Rev.2.00

Sep 07, 2005

## Application

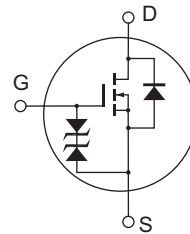
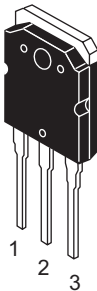
High speed power switching

## Features

- Low on-resistance
- High speed switching
- Low drive current
- No secondary breakdown
- Suitable for switching regulator and DC-DC converter

## Outline

RENESAS Package code: PRSS0004ZE-A  
(Package name: TO-3P)



1. Gate
2. Drain  
(Flange)
3. Source

## Absolute Maximum Ratings

(Ta = 25°C)

| Item                                      |         | Symbol              | Ratings     | Unit |
|-------------------------------------------|---------|---------------------|-------------|------|
| Drain to source voltage                   | 2SK1161 | $V_{DSS}$           | 450         | V    |
|                                           | 2SK1162 |                     | 500         |      |
| Gate to source voltage                    |         | $V_{GSS}$           | $\pm 30$    | V    |
| Drain current                             |         | $I_D$               | 10          | A    |
| Drain peak current                        |         | $I_{D(pulse)}^{*1}$ | 30          | A    |
| Body to drain diode reverse drain current |         | $I_{DR}$            | 10          | A    |
| Channel dissipation                       |         | $P_{ch}^{*2}$       | 100         | 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  $T_C = 25^\circ C$ 

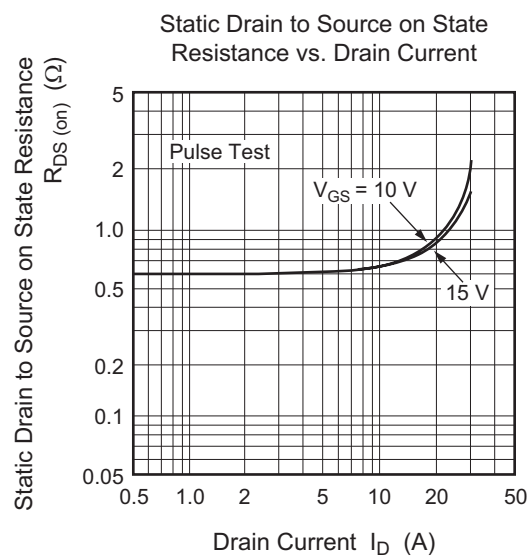
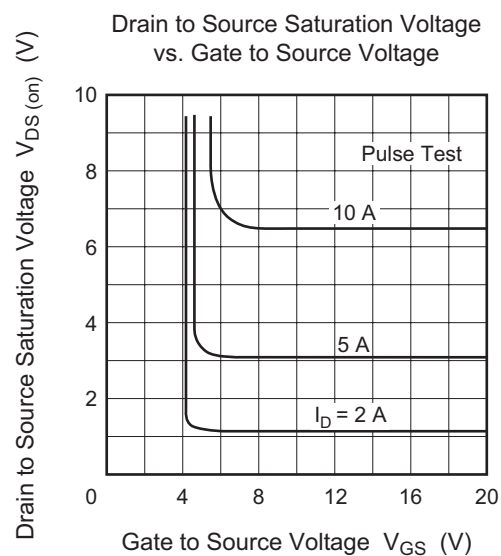
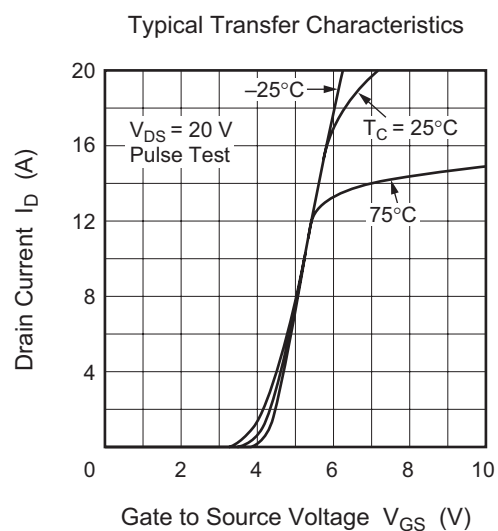
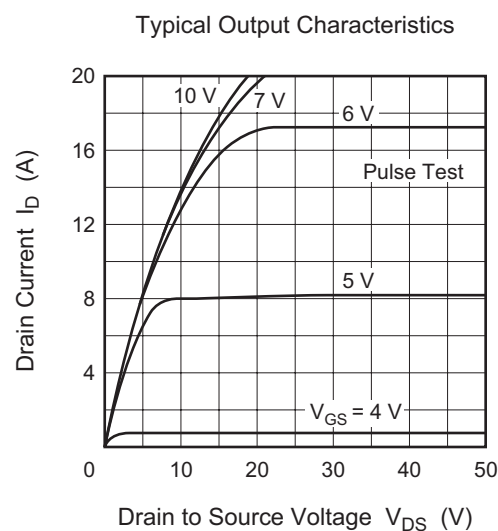
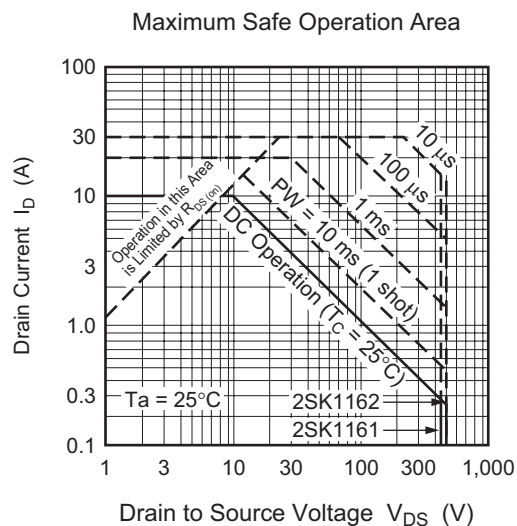
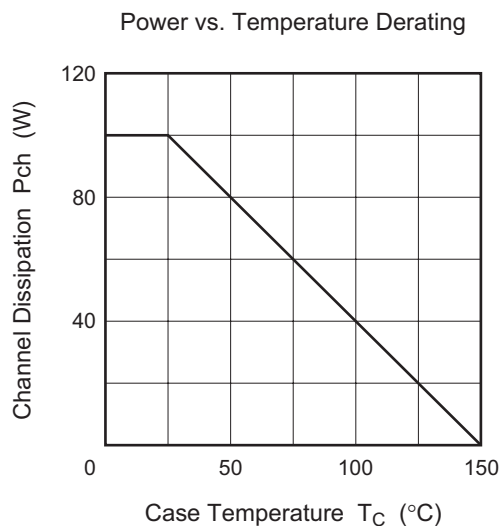
## Electrical Characteristics

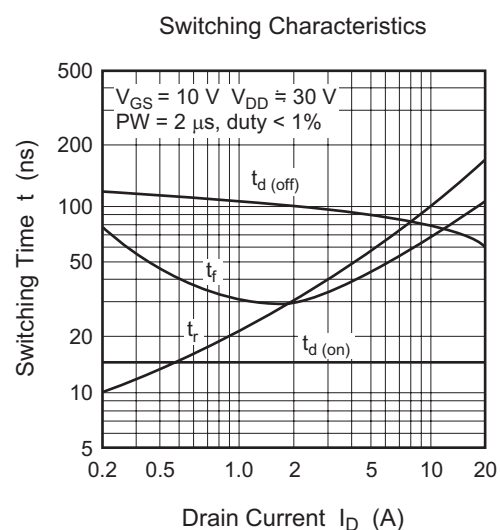
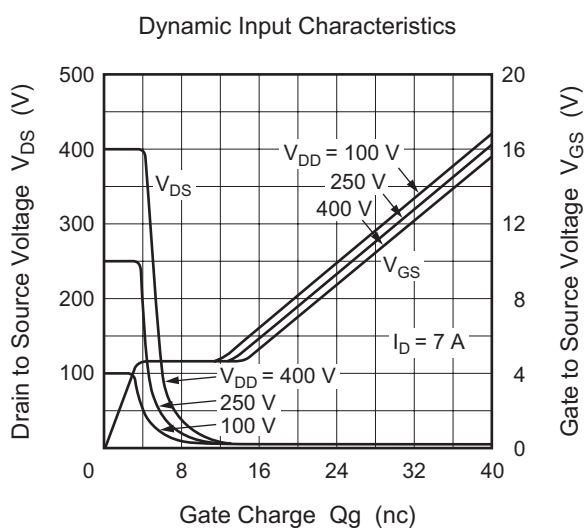
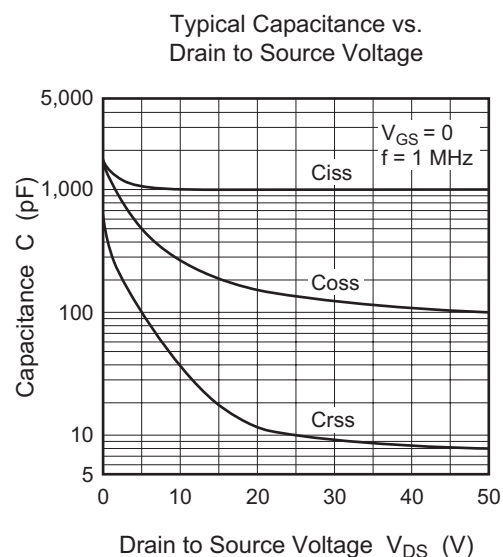
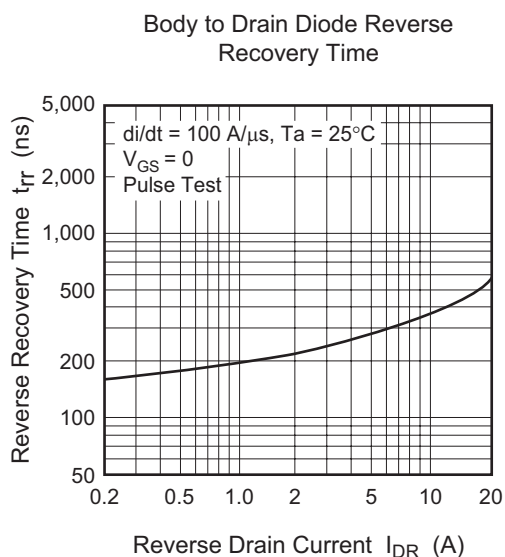
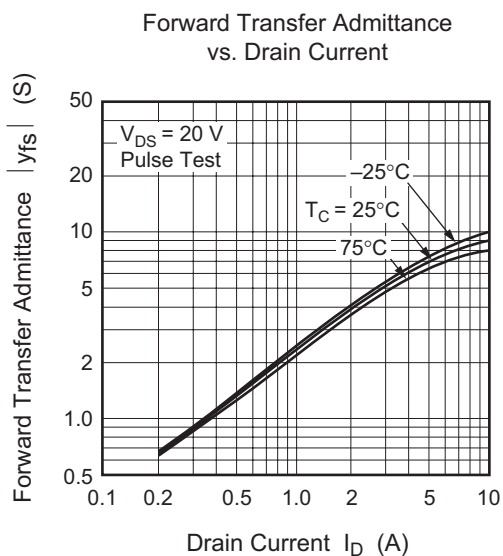
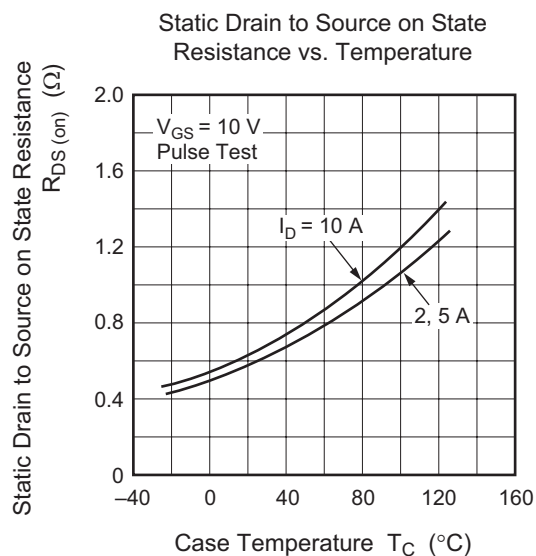
(Ta = 25°C)

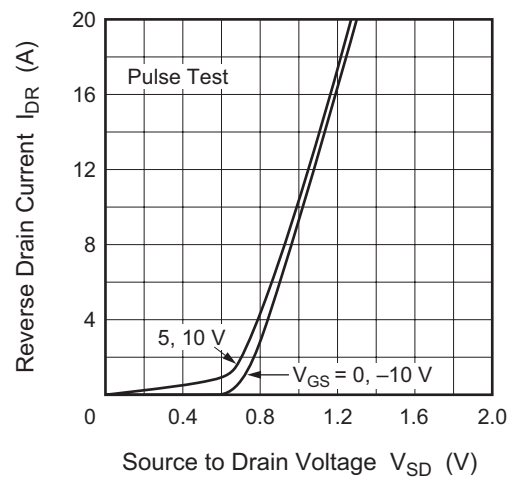
| Item                                       |         | Symbol        | Min      | Typ  | Max      | Unit     | Test conditions                                                          |
|--------------------------------------------|---------|---------------|----------|------|----------|----------|--------------------------------------------------------------------------|
| Drain to source breakdown voltage          | 2SK1161 | $V_{(BR)DSS}$ | 450      | —    | —        | V        | $I_D = 10 \text{ mA}$ , $V_{GS} = 0$                                     |
|                                            | 2SK1162 |               | 500      |      |          |          |                                                                          |
| Gate to source breakdown voltage           |         | $V_{(BR)GSS}$ | $\pm 30$ | —    | —        | V        | $I_G = \pm 100 \mu A$ , $V_{DS} = 0$                                     |
| Gate to source leak current                |         | $I_{GSS}$     | —        | —    | $\pm 10$ | $\mu A$  | $V_{GS} = \pm 25 \text{ V}$ , $V_{DS} = 0$                               |
| Zero gate voltage drain current            | 2SK1161 | $I_{DSS}$     | —        | —    | 250      | $\mu A$  | $V_{DS} = 360 \text{ V}$ , $V_{GS} = 0$                                  |
|                                            | 2SK1162 |               |          |      |          |          | $V_{DS} = 400 \text{ V}$ , $V_{GS} = 0$                                  |
| Gate to source cutoff voltage              |         | $V_{GS(off)}$ | 2.0      | —    | 3.0      | V        | $I_D = 1 \text{ mA}$ , $V_{DS} = 10 \text{ V}$                           |
| Static drain to source on state resistance | 2SK1161 | $R_{DS(on)}$  | —        | 0.6  | 0.8      | $\Omega$ | $I_D = 5 \text{ A}$ , $V_{GS} = 10 \text{ V}^{*3}$                       |
|                                            | 2SK1162 |               | —        | 0.7  | 0.9      |          |                                                                          |
| Forward transfer admittance                |         | $ y_{fs} $    | 4.0      | 7.0  | —        | S        | $I_D = 5 \text{ A}$ , $V_{DS} = 10 \text{ V}^{*3}$                       |
| Input capacitance                          |         | $C_{iss}$     | —        | 1050 | —        | pF       | $V_{DS} = 10 \text{ V}$ , $V_{GS} = 0$ ,<br>$f = 1 \text{ MHz}$          |
| Output capacitance                         |         | $C_{oss}$     | —        | 280  | —        | pF       |                                                                          |
| Reverse transfer capacitance               |         | $C_{rss}$     | —        | 40   | —        | pF       |                                                                          |
| Turn-on delay time                         |         | $t_{d(on)}$   | —        | 15   | —        | ns       | $I_D = 5 \text{ A}$ , $V_{GS} = 10 \text{ V}$ ,<br>$R_L = 6 \Omega$      |
| Rise time                                  |         | $t_r$         | —        | 60   | —        | ns       |                                                                          |
| Turn-off delay time                        |         | $t_{d(off)}$  | —        | 90   | —        | ns       |                                                                          |
| Fall time                                  |         | $t_f$         | —        | 45   | —        | ns       |                                                                          |
| Body to drain diode forward voltage        |         | $V_{DF}$      | —        | 1.0  | —        | V        | $I_F = 10 \text{ A}$ , $V_{GS} = 0$                                      |
| Body to drain diode reverse recovery time  |         | $t_{rr}$      | —        | 350  | —        | ns       | $I_F = 10 \text{ A}$ , $V_{GS} = 0$ ,<br>$di_F/dt = 100 \text{ A}/\mu s$ |

Note: 3. Pulse test

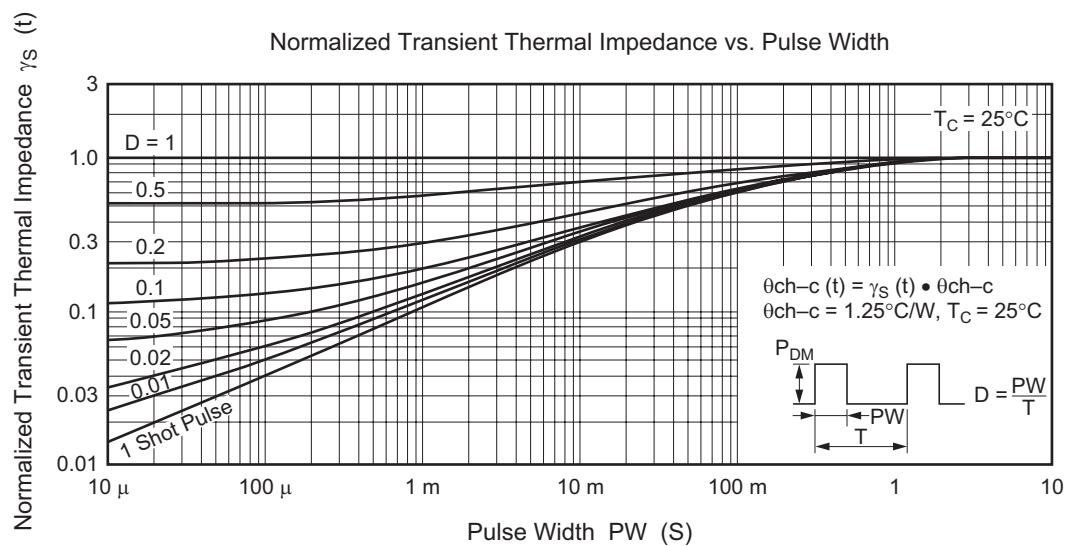
## Main Characteristics



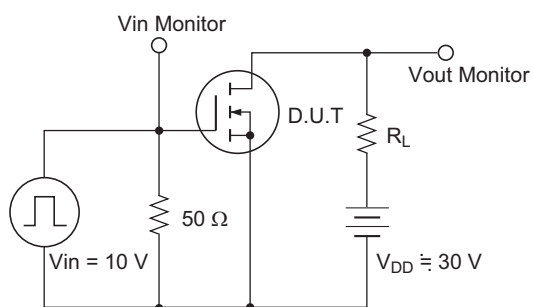


Reverse Drain Current vs.  
Source to Drain Voltage

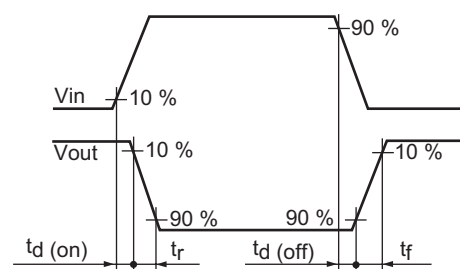
Normalized Transient Thermal Impedance vs. Pulse Width



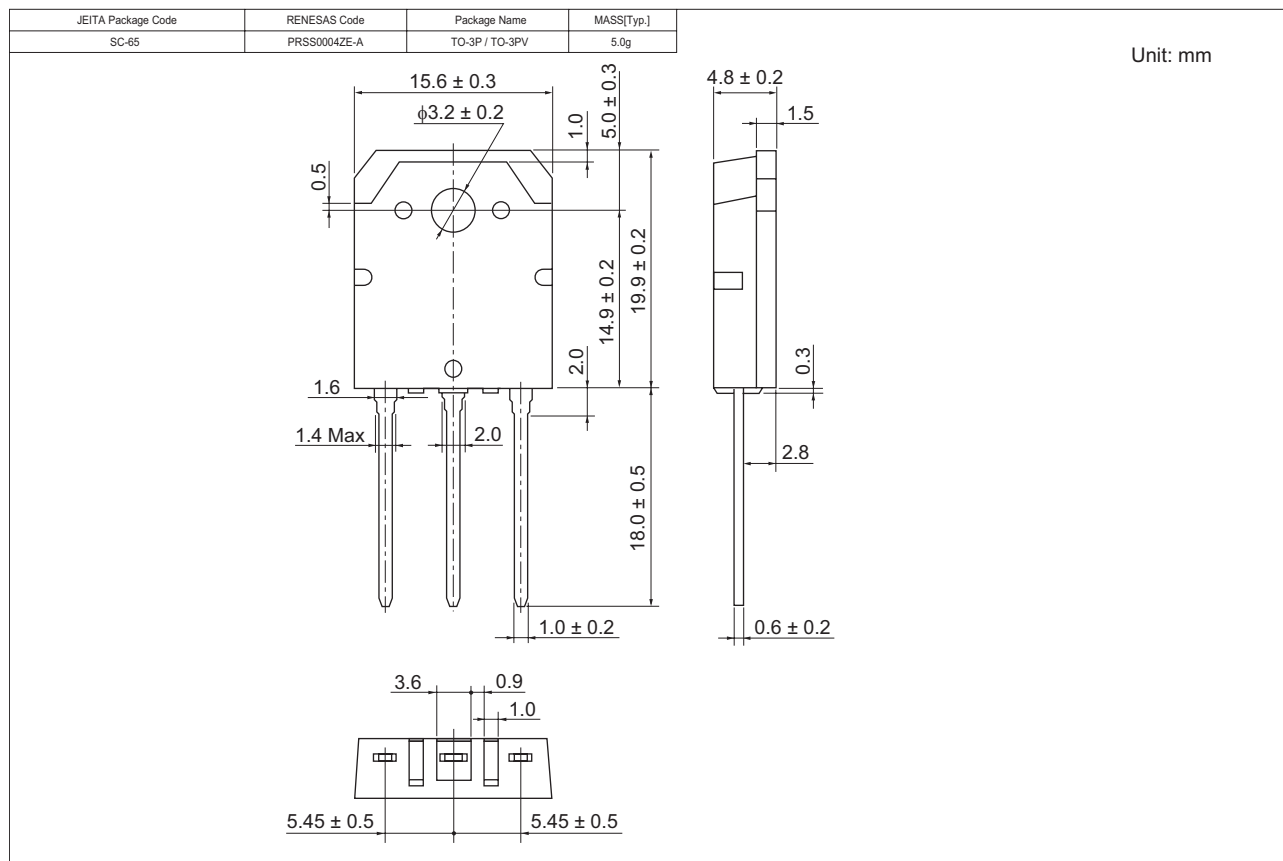
Switching Time Test Circuit



Waveforms



## Package Dimensions



## Ordering Information

| Part Name | Quantity | Shipping Container |
|-----------|----------|--------------------|
| 2SK1161-E | 360 pcs  | Box (Tube)         |
| 2SK1162-E | 360 pcs  | Box (Tube)         |

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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