

To our customers,

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## Old Company Name in Catalogs and Other Documents

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April 1<sup>st</sup>, 2010  
Renesas Electronics Corporation

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EOL product

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## 2SK1163, 2SK1164

Silicon N Channel MOS FET

REJ03G0913-0200  
(Previous: ADE-208-1251)  
Rev.2.00  
Sep 07, 2005

### Application

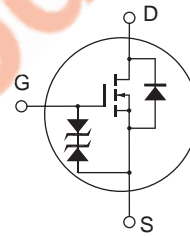
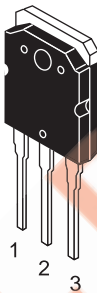
High speed power switching

### 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                   | 2SK1163                  | 450         | V    |
|   | 2SK1164                  | 500         |      |
| Gate to source voltage                    | V <sub>GSS</sub>         | ±30         | V    |
| Drain current                             | I <sub>D</sub>           | 11          | A    |
| Drain peak current                        | I <sub>D(pulse)</sub> *1 | 40          | A    |
| Body to drain diode reverse drain current | I <sub>DR</sub>          | 11          | A    |
| Channel dissipation                       | P <sub>ch</sub> *2       | 100         | W    |
| Channel temperature                       | T <sub>ch</sub>          | 150         | °C   |
| Storage temperature                       | T <sub>stg</sub>         | -55 to +150 | °C   |

Notes: 1. PW ≤ 10 μs, duty cycle ≤ 1%

2. Value at T<sub>C</sub> = 25°C

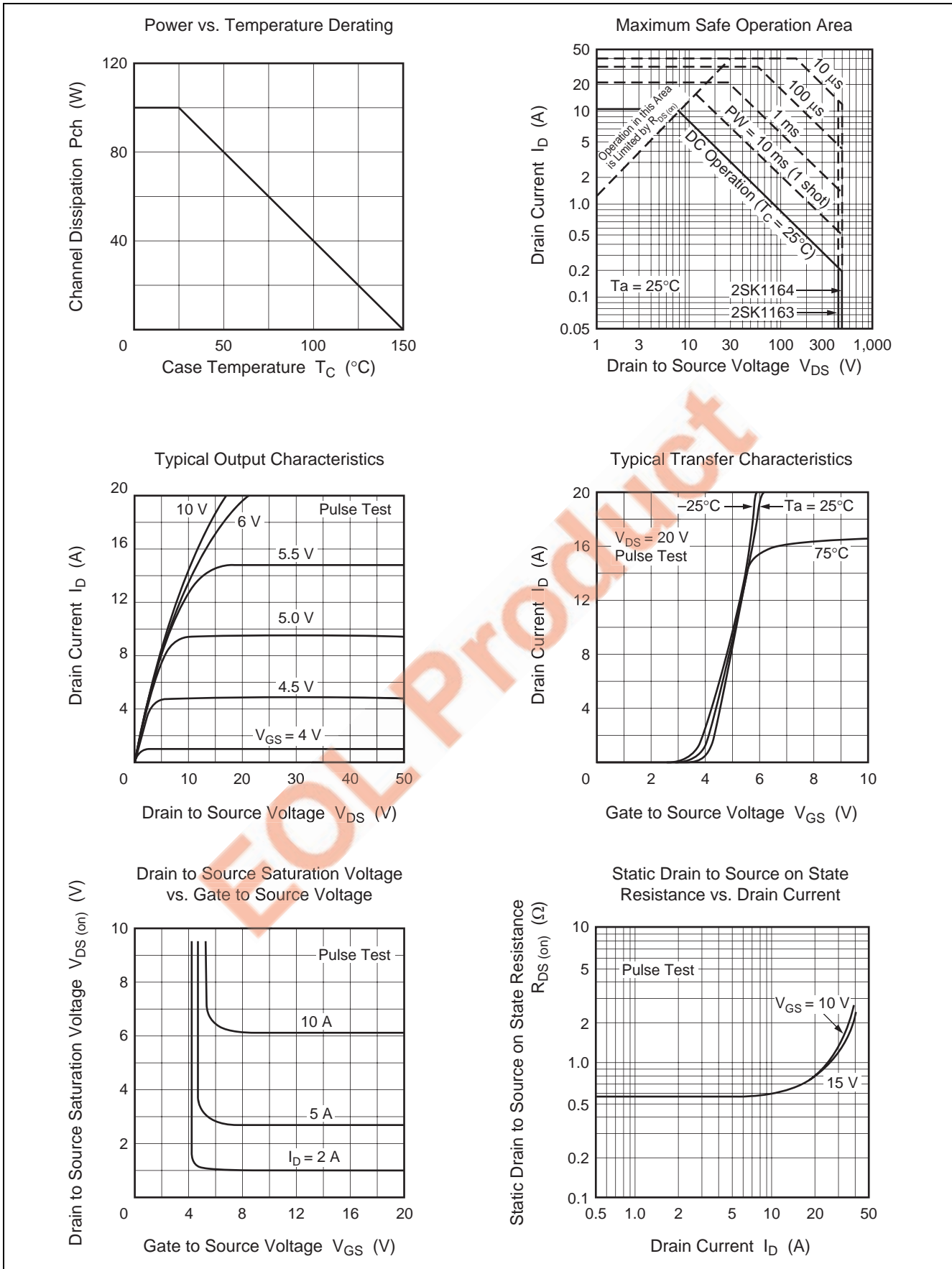
## Electrical Characteristics

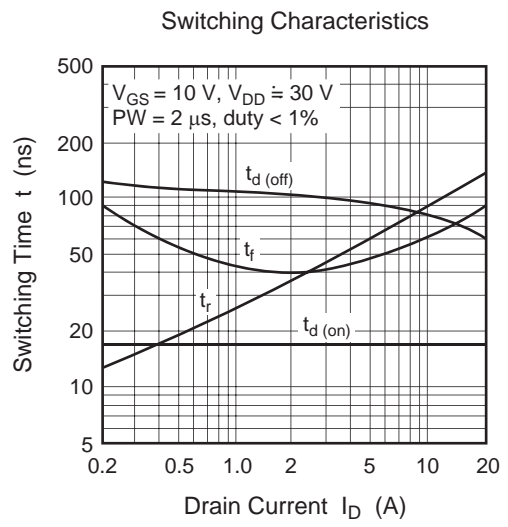
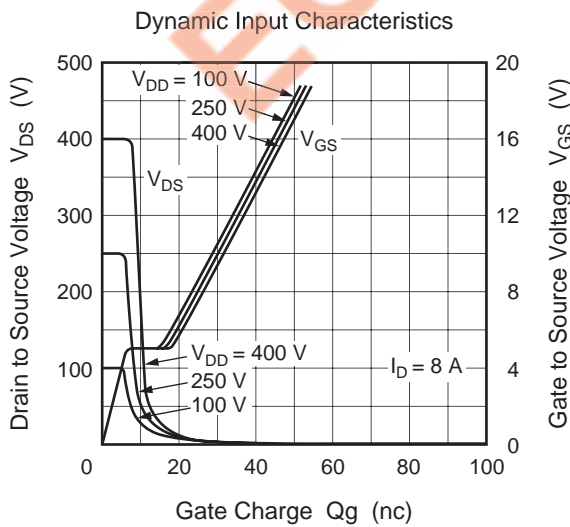
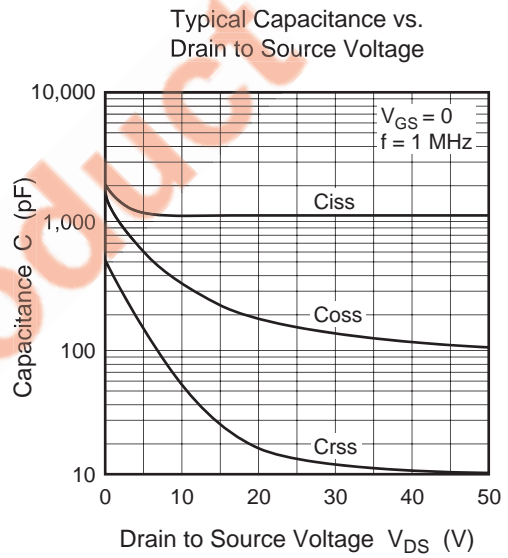
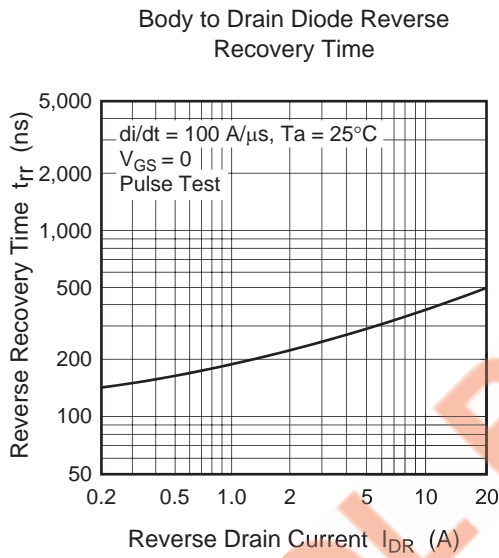
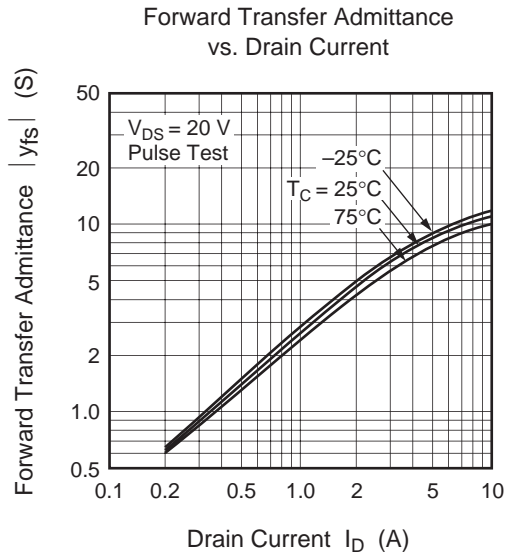
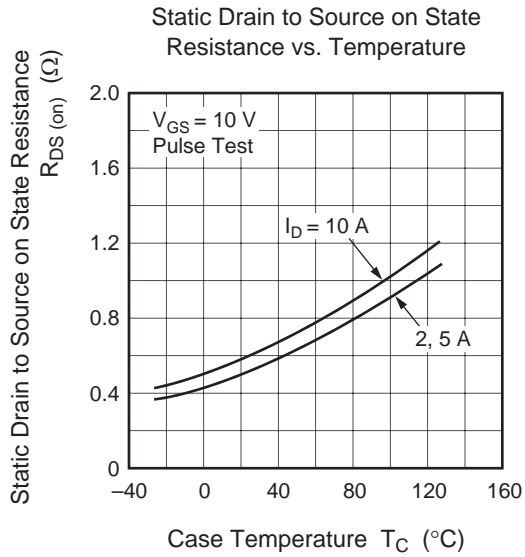
(Ta = 25°C)

| Item                                       | Symbol               | Min | Typ  | Max  | Unit | Test conditions   |
|--|----------------------|-----|------|------|------|---|
| Drain to source breakdown voltage          | 2SK1163              | 450 | —    | —    | V    | I <sub>D</sub> = 10 mA, V <sub>GS</sub> = 0                                   |
|  | 2SK1164              | 500 |      |      |      |   |
| Gate to source breakdown voltage           | V <sub>(BR)GSS</sub> | ±30 | —    | —    | V    | I <sub>G</sub> = ±100 μA, V <sub>DS</sub> = 0                                 |
| Gate to source leak current                | I <sub>GSS</sub>     | —   | —    | ±10  | μA   | V <sub>GS</sub> = ±25 V, V <sub>DS</sub> = 0                                  |
| Zero gate voltage drain current            | 2SK1163              | —   | —    | 250  | μA   | V <sub>DS</sub> = 360 V, V <sub>GS</sub> = 0                                  |
|  | 2SK1164              |     |      |      |      | V <sub>DS</sub> = 400 V, V <sub>GS</sub> = 0                                  |
| Gate to source cutoff voltage              | V <sub>GS(off)</sub> | 2.0 | —    | 3.0  | V    | I <sub>D</sub> = 1 mA, V <sub>DS</sub> = 10 V                                 |
| Static drain to source on state resistance | 2SK1163              | —   | 0.55 | 0.7  | Ω    | I <sub>D</sub> = 5 A, V <sub>GS</sub> = 10 V *3                               |
|  | 2SK1164              |     | —    | 0.60 |      |   |
| Forward transfer admittance                | y <sub>fs</sub>      | 5.0 | 8.0  | —    | S    | I <sub>D</sub> = 5 A, V <sub>DS</sub> = 10 V *3                               |
| Input capacitance                          | C <sub>iss</sub>     | —   | 1150 | —    | pF   | V <sub>DS</sub> = 10 V, V <sub>GS</sub> = 0,                                  |
| Output capacitance                         | C <sub>oss</sub>     | —   | 340  | —    | pF   | f = 1 MHz   |
| Reverse transfer capacitance               | C <sub>rss</sub>     | —   | 55   | —    | pF   |   |
| Turn-on delay time                         | t <sub>d(on)</sub>   | —   | 17   | —    | ns   | I <sub>D</sub> = 5 A, V <sub>GS</sub> = 10 V,<br>R <sub>L</sub> = 6 Ω         |
| Rise time                                  | t <sub>r</sub>       | —   | 60   | —    | ns   |   |
| Turn-off delay time                        | t <sub>d(off)</sub>  | —   | 95   | —    | ns   |   |
| Fall time                                  | t <sub>f</sub>       | —   | 50   | —    | ns   |   |
| Body to drain diode forward voltage        | V <sub>DF</sub>      | —   | 1.0  | —    | V    | I <sub>F</sub> = 11 A, V <sub>GS</sub> = 0                                    |
| Body to drain diode reverse recovery time  | t <sub>rr</sub>      | —   | 400  | —    | ns   | I <sub>F</sub> = 11 A, V <sub>GS</sub> = 0,<br>di <sub>F</sub> /dt = 100 A/μs |

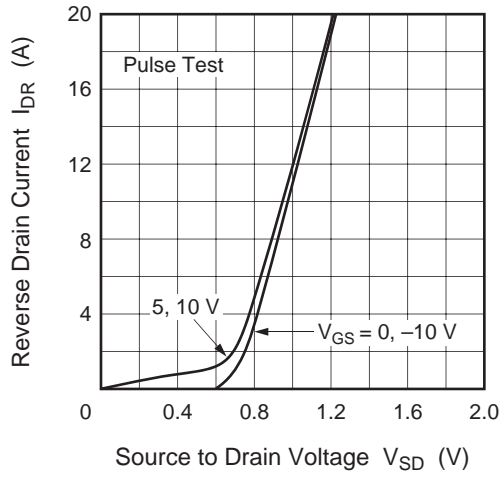
Note: 3. Pulse test

### Main Characteristics

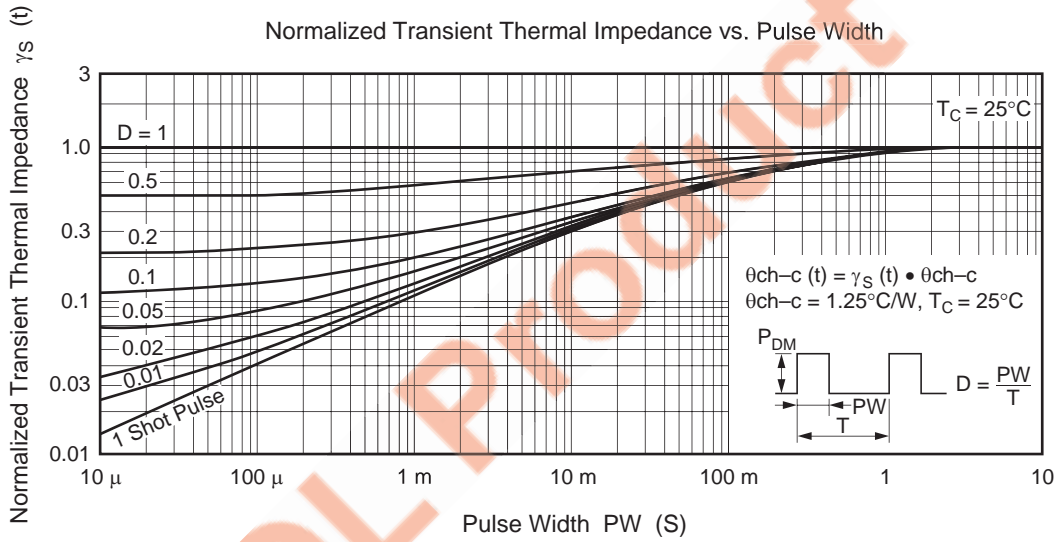




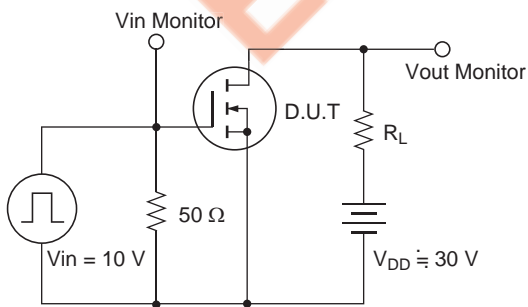
Reverse Drain Current vs. Source to Drain Voltage



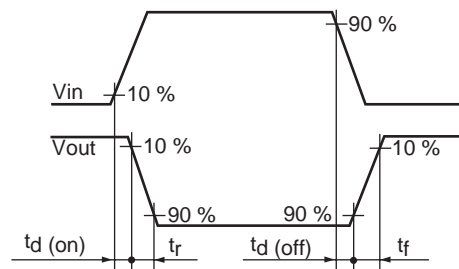
Normalized Transient Thermal Impedance vs. Pulse Width



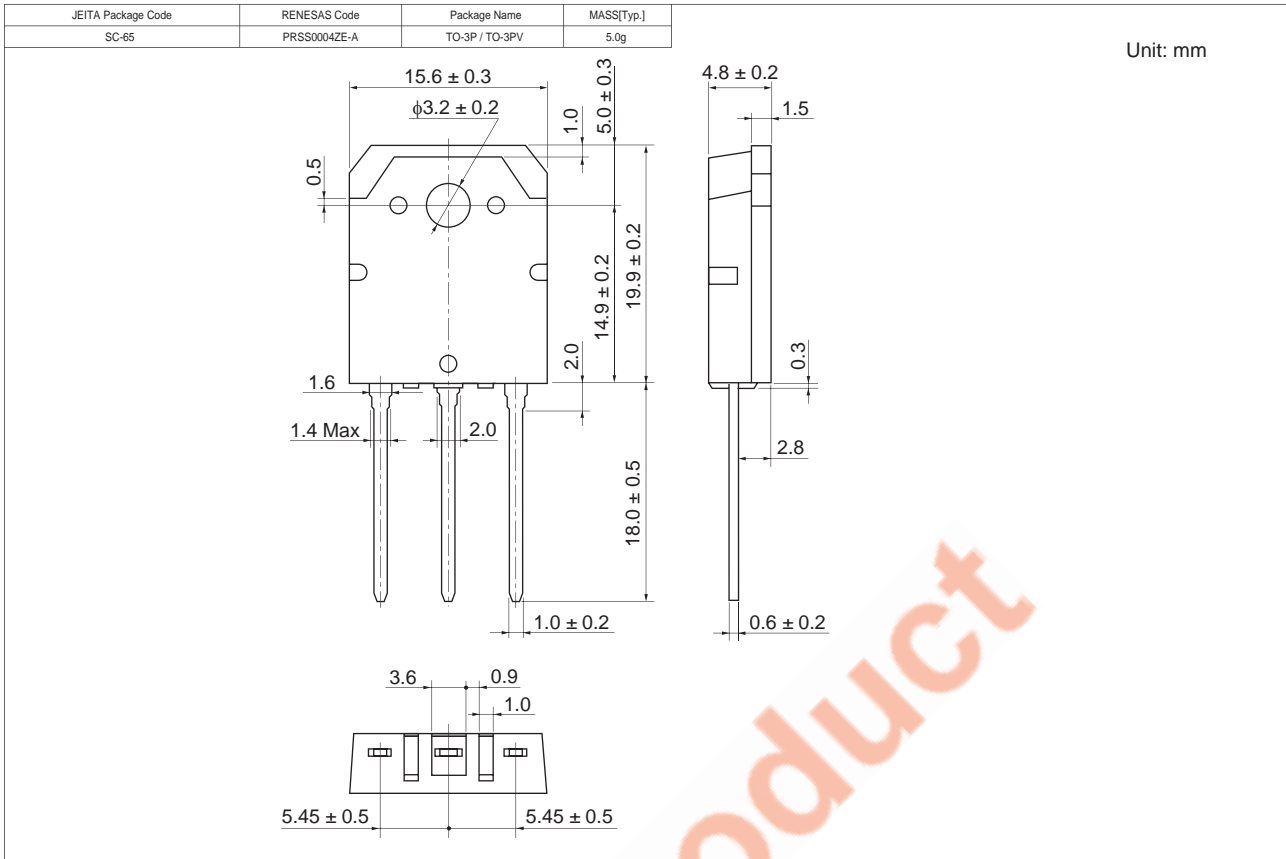
Switching Time Test Circuit



Waveforms



Package Dimensions



Ordering Information

| Part Name | Quantity | Shipping Container |
|-----------|----------|--------------------|
| 2SK1163-E | 360 pcs  | Box (Tube)         |
| 2SK1164-E | 360 pcs  | Box (Tube)         |

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