

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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## 2SK3212

Silicon N Channel MOS FET  
High Speed Power Switching

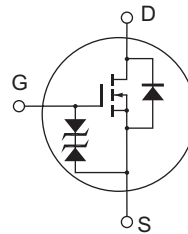
REJ03G1092-0300  
(Previous: ADE-208-752A)  
Rev.3.00  
Sep 07, 2005

### Features

- Low on-resistance  
 $R_{DS} = 0.1 \Omega$  typ.
- High speed switching
- 4 V gate drive device can be driven from 5 V source

### Outline

RENESAS Package code: PRSS0003AD-A  
(Package name: TO-220FM)



1. Gate
2. Drain
3. Source

## Absolute Maximum Ratings

(Ta = 25°C)

| Item                                   | Symbol                          | Ratings     | Unit |
|--|---------------------------------|-------------|------|
| Drain to source voltage                | $V_{DSS}$                       | 100         | V    |
| Gate to source voltage                 | $V_{GSS}$                       | ±20         | V    |
| Drain current                          | $I_D$                           | 10          | A    |
| Drain peak current                     | $I_{D(pulse)}$ <sup>Note1</sup> | 40          | A    |
| Body-drain diode reverse drain current | $I_{DR}$                        | 10          | A    |
| Avalanche current                      | $I_{AP}$ <sup>Note3</sup>       | 10          | A    |
| Avalanche energy                       | $E_{AR}$ <sup>Note3</sup>       | 10          | mJ   |
| Channel dissipation                    | $P_{ch}$ <sup>Note2</sup>       | 20          | 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. Value at  $T_{ch} = 25^\circ C$ ,  $R_g \geq 50\Omega$

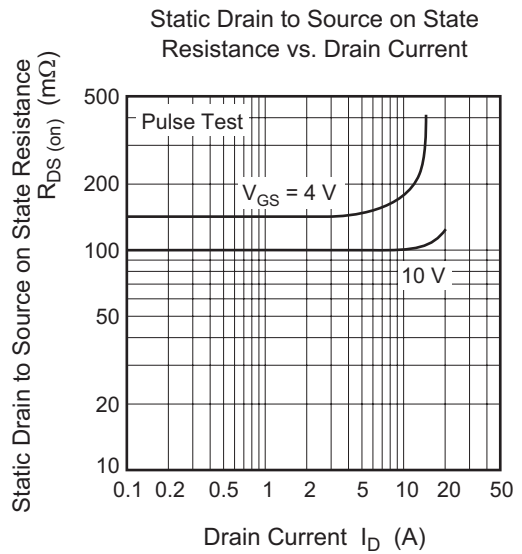
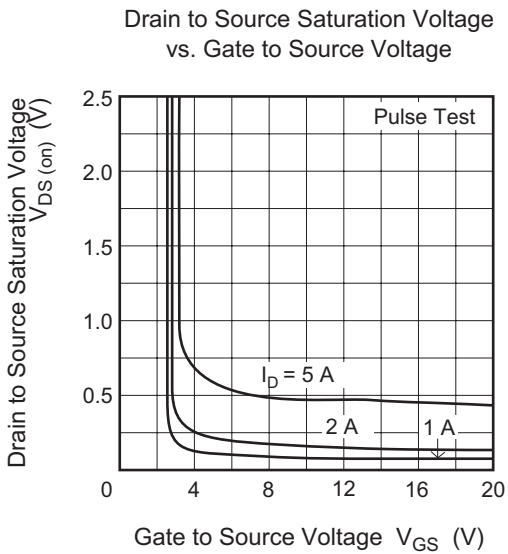
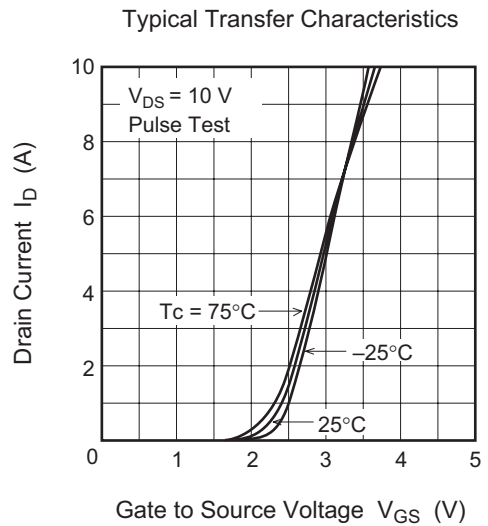
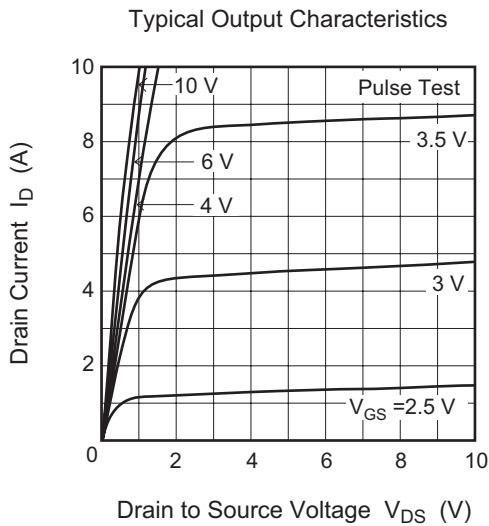
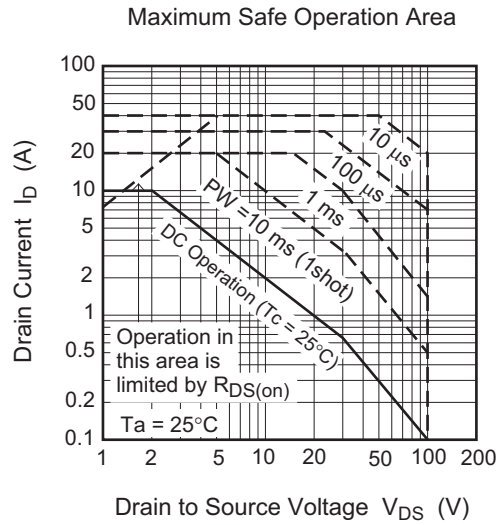
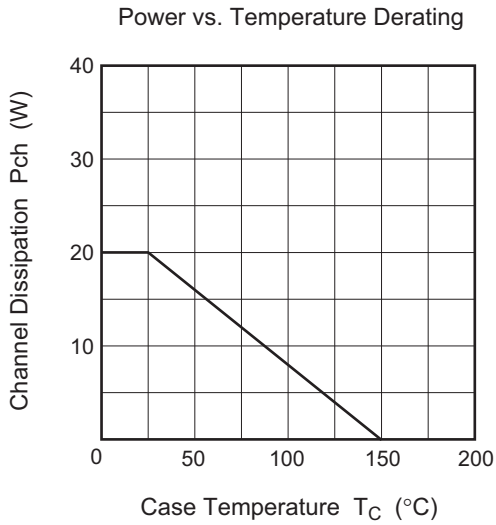
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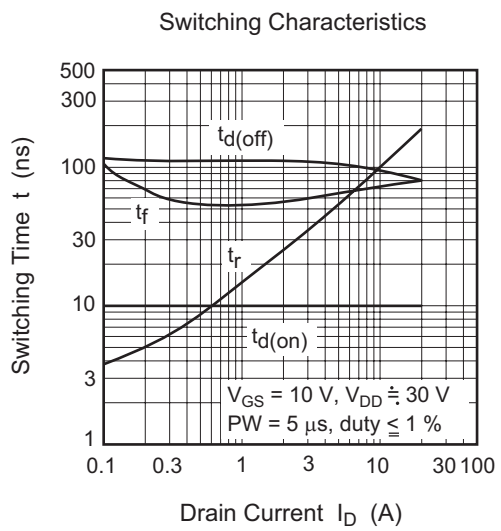
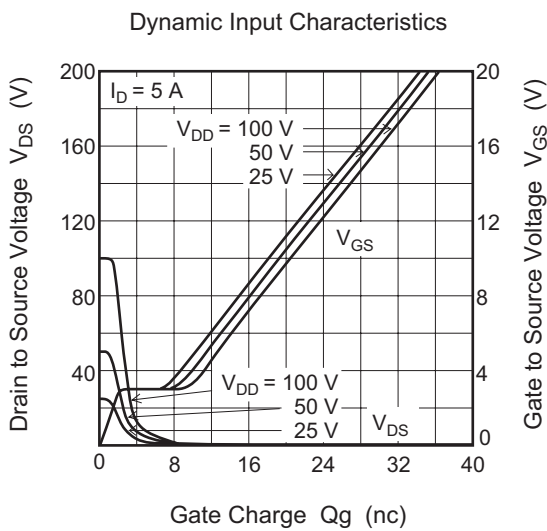
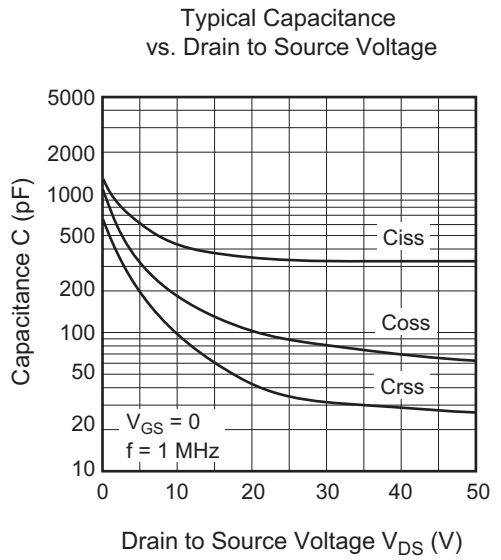
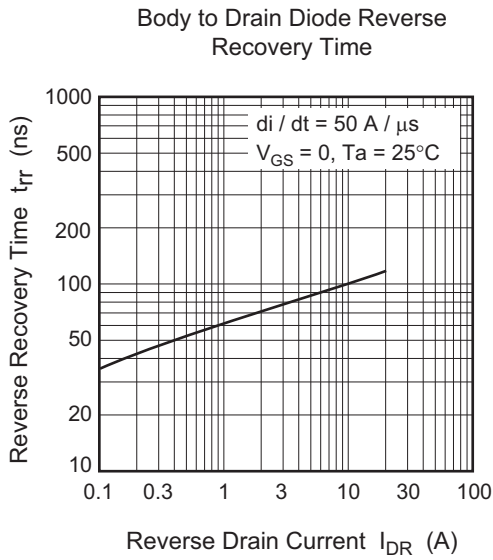
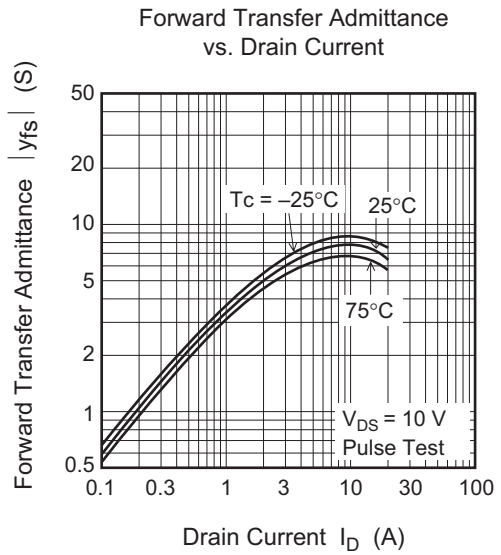
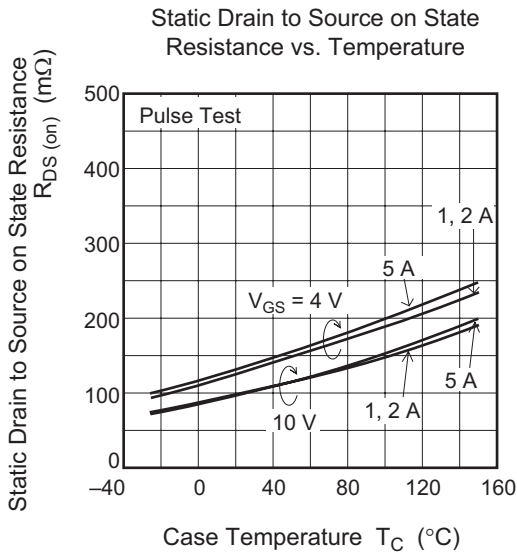
(Ta = 25°C)

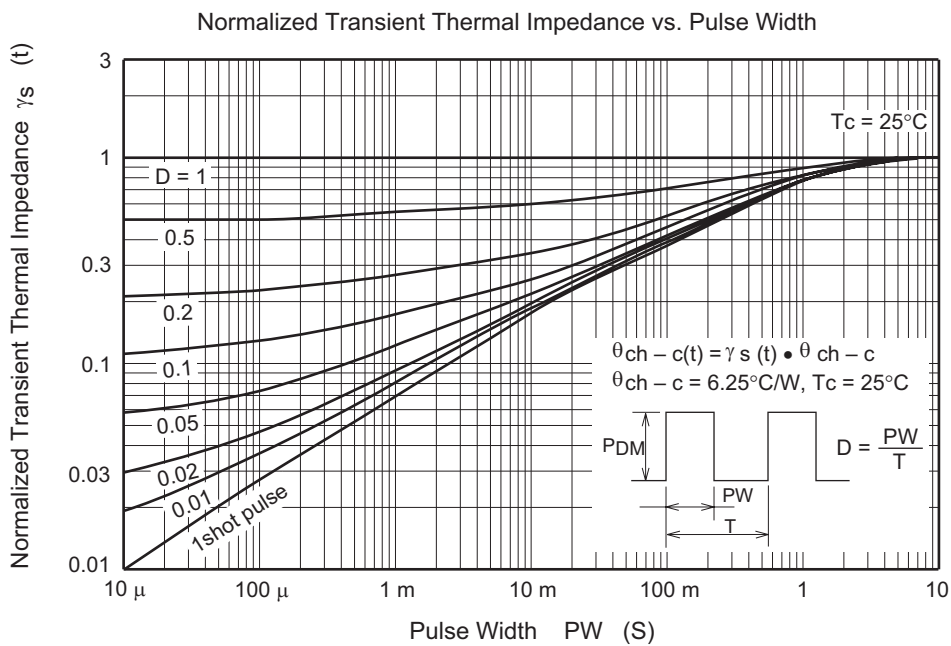
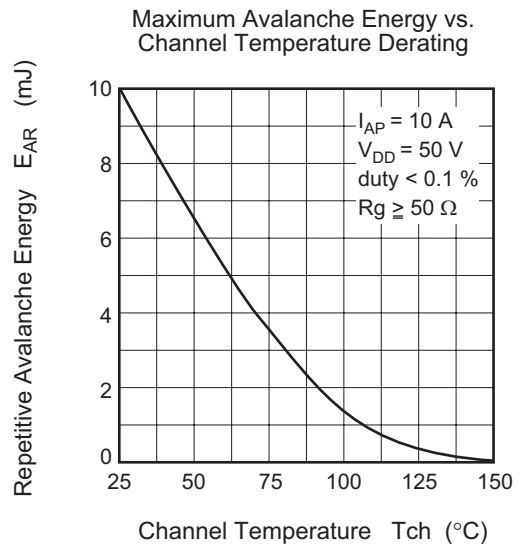
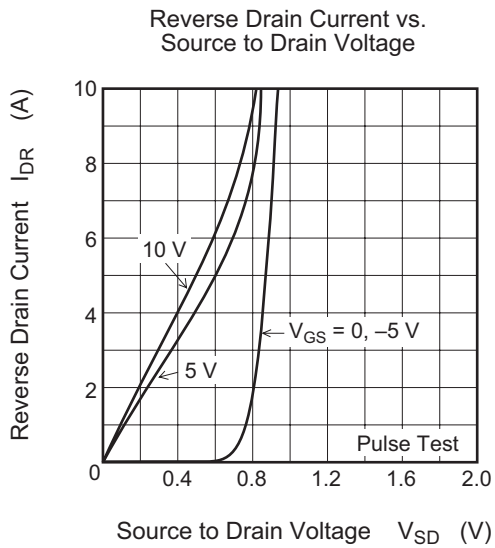
| Item                                       | Symbol        | Min | Typ | Max | Unit | Test Conditions   |
|--|---------------|-----|-----|-----|------|---|
| Drain to source breakdown voltage          | $V_{(BR)DSS}$ | 100 | —   | —   | V    | $I_D = 10\text{ mA}$ , $V_{GS} = 0$                                 |
| Gate to source breakdown voltage           | $V_{(BR)GSS}$ | ±20 | —   | —   | V    | $I_G = \pm 100\ \mu A$ , $V_{DS} = 0$                               |
| Gate to source leak current                | $I_{GSS}$     | —   | —   | ±10 | μA   | $V_{GS} = \pm 16\text{ V}$ , $V_{DS} = 0$                           |
| Zero gate voltage drain current            | $I_{DSS}$     | —   | —   | 10  | μA   | $V_{DS} = 100\text{ V}$ , $V_{GS} = 0$                              |
| Gate to source cutoff voltage              | $V_{GS(off)}$ | 1.0 | —   | 2.5 | V    | $I_D = 1\text{ mA}$ , $V_{DS} = 10\text{ V}$                        |
| Static drain to source on state resistance | $R_{DS(on)}$  | —   | 100 | 130 | mΩ   | $I_D = 5\text{ A}$ , $V_{GS} = 10\text{ V}$ <sup>Note4</sup>        |
|  | $R_{DS(on)}$  | —   | 130 | 170 | mΩ   | $I_D = 5\text{ A}$ , $V_{GS} = 4\text{ V}$ <sup>Note4</sup>         |
| Forward transfer admittance                | $ y_{fs} $    | 4.5 | 7.5 | —   | S    | $I_D = 5\text{ A}$ , $V_{DS} = 10\text{ V}$ <sup>Note4</sup>        |
| Input capacitance                          | $C_{iss}$     | —   | 420 | —   | pF   | $V_{DS} = 10\text{ V}$ , $V_{GS} = 0$ ,                             |
| Output capacitance                         | $C_{oss}$     | —   | 185 | —   | pF   | $f = 1\text{ MHz}$  |
| Reverse transfer capacitance               | $C_{rss}$     | —   | 100 | —   | pF   |   |
| Turn-on delay time                         | $t_{d(on)}$   | —   | 12  | —   | 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                        | $t_{d(off)}$  | —   | 105 | —   | ns   |   |
| Fall time                                  | $t_f$         | —   | 70  | —   | ns   |   |
| Body-drain diode forward voltage           | $V_{DF}$      | —   | 0.9 | —   | V    | $I_F = 10\text{ A}$ , $V_{GS} = 0$                                  |
| Body-drain diode reverse recovery time     | $t_{rr}$      | —   | 90  | —   | ns   | $I_F = 10\text{ A}$ , $V_{GS} = 0$<br>$di_F/dt = 50\text{ A}/\mu s$ |

Note: 4. Pulse test

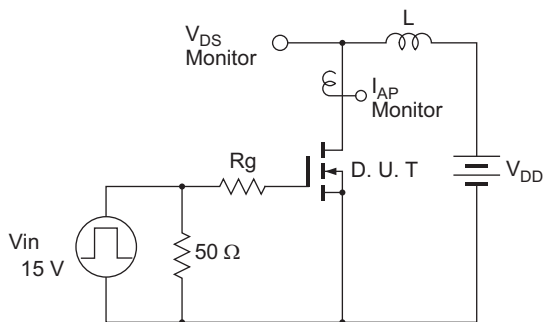
Main Characteristics



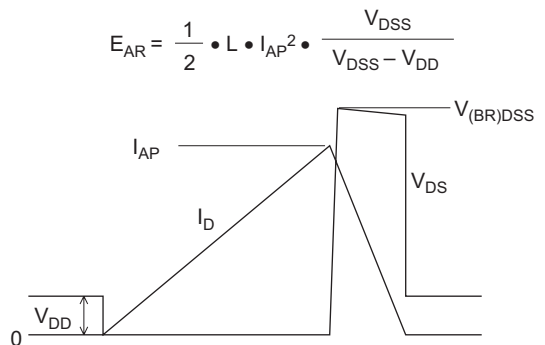


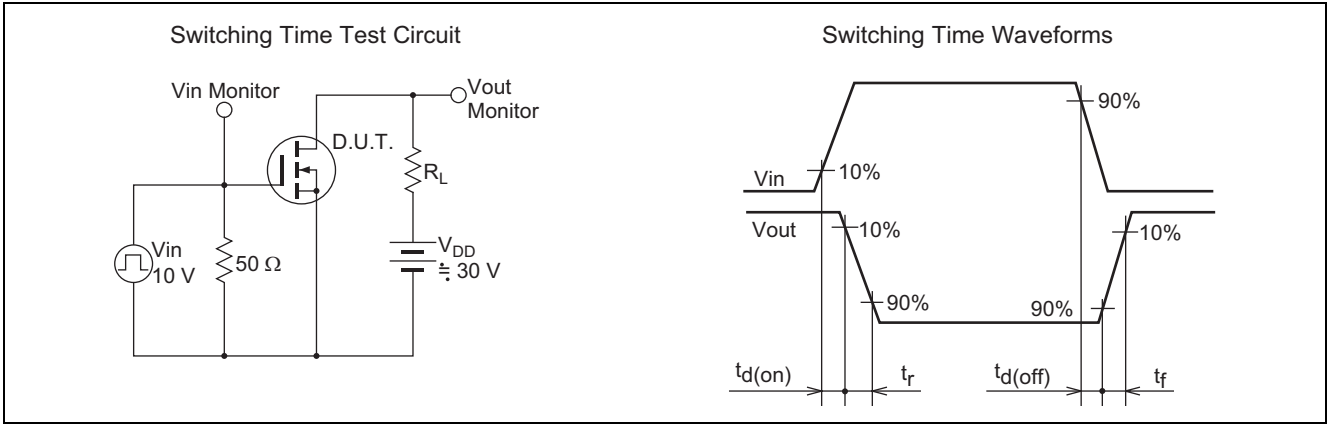


Avalanche Test Circuit



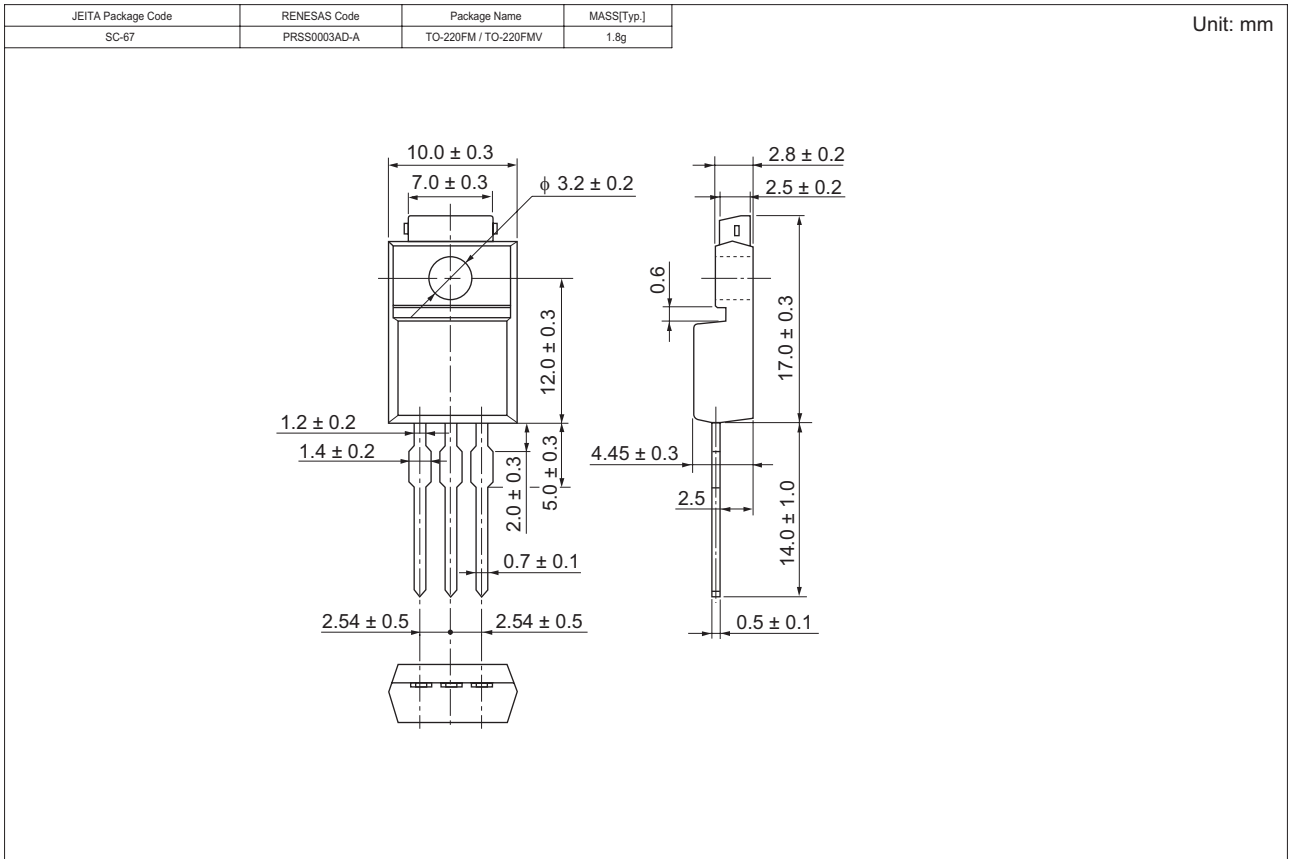
Avalanche Waveform







### Package Dimensions



### Ordering Information

| Part Name | Quantity | Shipping Container |
|-----------|----------|--------------------|
| 2SK3212-E | 500 pcs  | Box (Sack)         |

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