

2SK2554

Silicon N Channel MOS FET

REJ03G1016-0600
(Previous: ADE-208-359D)
Rev.6.00
Sep 07, 2005

Application

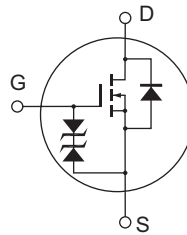
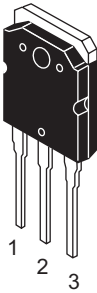
High speed power switching

Features

- Low on-resistance
- $R_{DS(on)} = 4.5 \text{ m}\Omega$ typ.
- High speed switching
- 4 V gate drive device can be driven from 5 V source

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 | V_{DSS} | 60 | V |
| Gate to source voltage | V_{GSS} | ± 20 | V |
| Drain current | I_D | 75 | A |
| Drain peak current | $I_{D(pulse)}^{*1}$ | 300 | A |
| Body to drain diode reverse drain current | I_{DR}^{*2} | 75 | A |
| Avalanche current | I_{AP}^{*3} | 50 | A |
| Avalanche energy | E_{AR}^{*3} | 214 | mJ |
| Channel dissipation | P_{ch}^{*2} | 150 | W |
| Channel temperature | Tch | 150 | °C |
| Storage temperature | Tstg | -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 $T_{ch} = 25^\circ C$, $R_g \geq 50 \Omega$

Electrical Characteristics

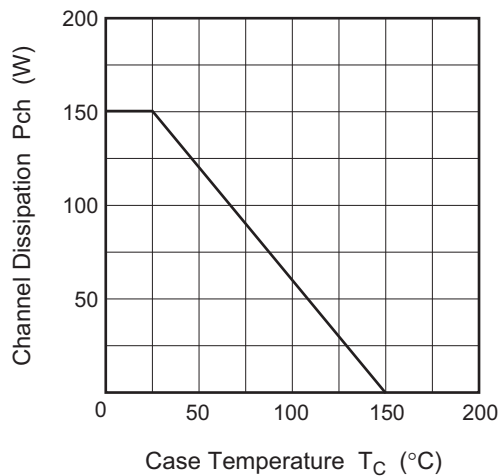
(Ta = 25°C)

| Item | Symbol | Min | Typ | Max | Unit | Test Conditions |
|--|---------------|----------|------|----------|-----------|---|
| Drain to source breakdown voltage | $V_{(BR)DSS}$ | 60 | — | — | 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} | — | — | 100 | μA | $V_{DS} = 60 \text{ V}$, $V_{GS} = 0$ |
| Gate to source cutoff voltage | $V_{GS(off)}$ | 1.0 | — | 2.0 | V | $I_D = 1 \text{ mA}$, $V_{DS} = 10 \text{ V}$ |
| Static drain to source on state resistance | $R_{DS(on)}$ | — | 4.5 | 6 | $m\Omega$ | $I_D = 40 \text{ A}$, $V_{GS} = 10 \text{ V}^{*4}$ |
| | | — | 5.8 | 10 | $m\Omega$ | $I_D = 40 \text{ A}$, $V_{GS} = 4 \text{ V}^{*4}$ |
| Forward transfer admittance | $ y_{fs} $ | 50 | 80 | — | S | $I_D = 40 \text{ A}$, $V_{DS} = 10 \text{ V}^{*4}$ |
| Input capacitance | C_{iss} | — | 7700 | — | pF | $V_{DS} = 10 \text{ V}$, $V_{GS} = 0$, $f = 1 \text{ MHz}$ |
| Output capacitance | C_{oss} | — | 4100 | — | pF | |
| Reverse transfer capacitance | C_{rss} | — | 760 | — | pF | |
| Turn-on delay time | $t_{d(on)}$ | — | 60 | — | ns | $I_D = 40 \text{ A}$, $V_{GS} = 10 \text{ V}$, $R_L = 0.75 \Omega$ |
| Rise time | t_r | — | 420 | — | ns | |
| Turn-off delay time | $t_{d(off)}$ | — | 1200 | — | ns | |
| Fall time | t_f | — | 900 | — | ns | |
| Body to drain diode forward voltage | V_{DF} | — | 0.95 | — | V | $I_F = 75 \text{ A}$, $V_{GS} = 0$ |
| Body to drain diode reverse recovery time | t_{rr} | — | 105 | — | ns | $I_F = 75 \text{ A}$, $V_{GS} = 0$ $di_F / dt = 50 \text{ A} / \mu s$ |

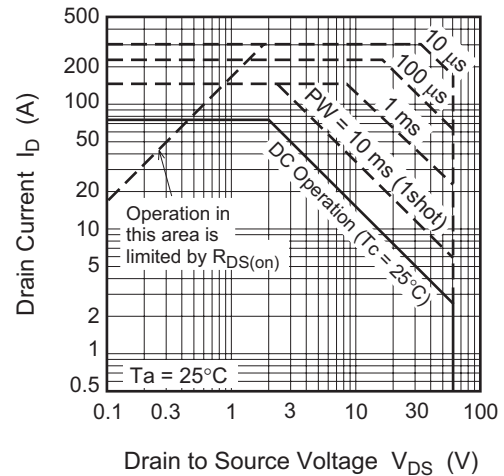
Note: 4. Pulse Test

Main Characteristics

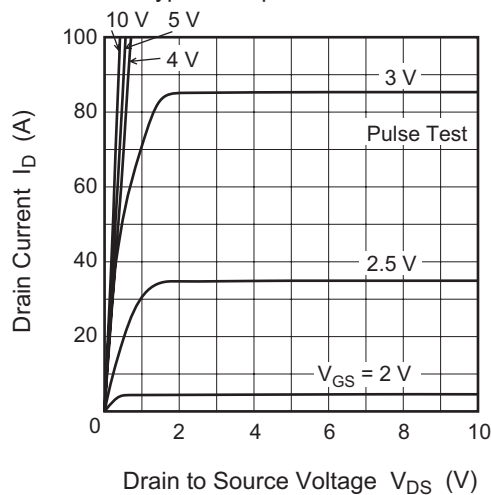
Power vs. Temperature Derating



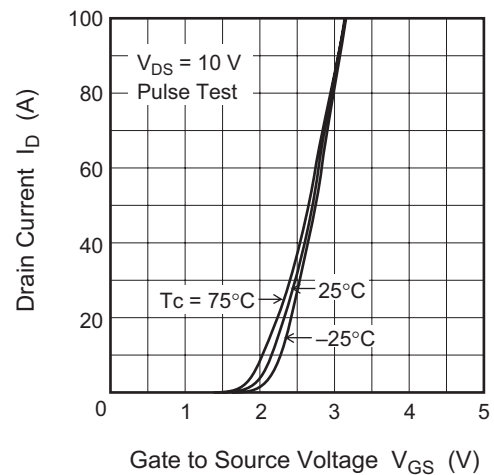
Maximum Safe Operation Area



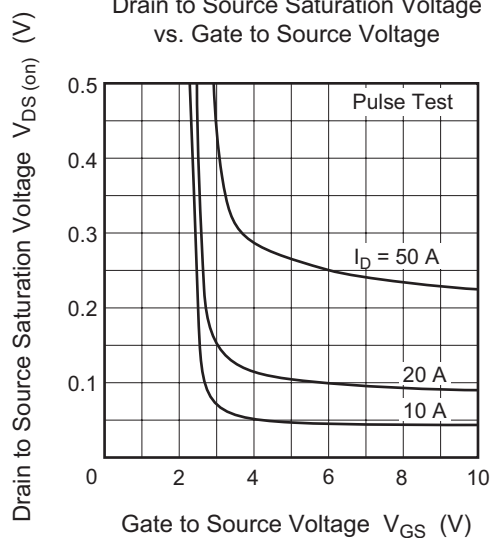
Typical Output Characteristics



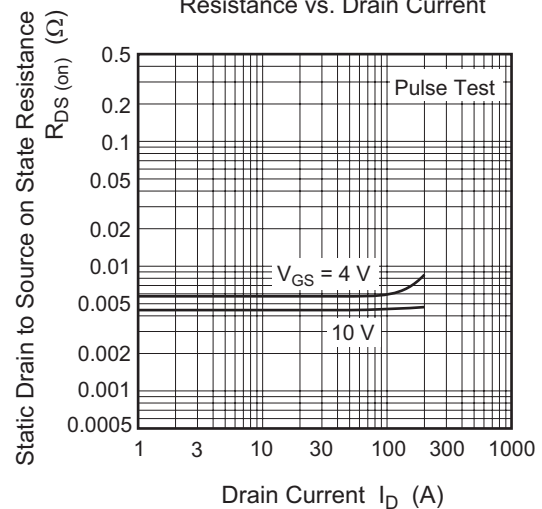
Typical Transfer Characteristics

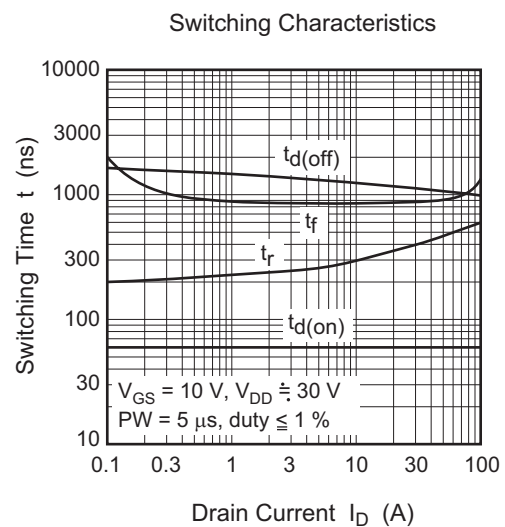
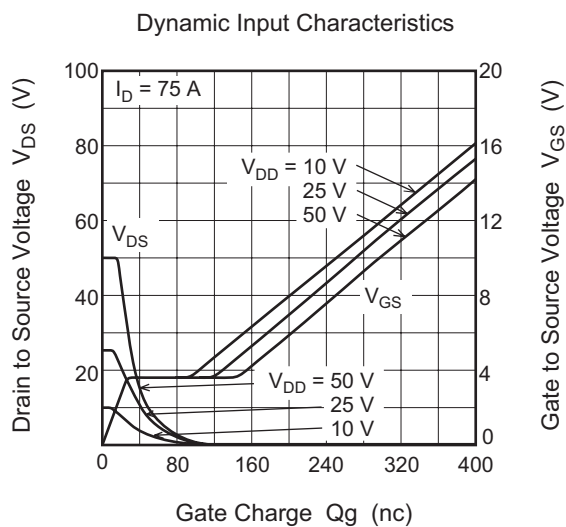
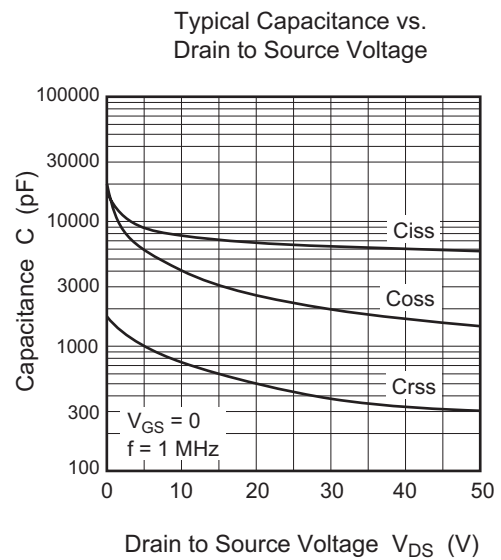
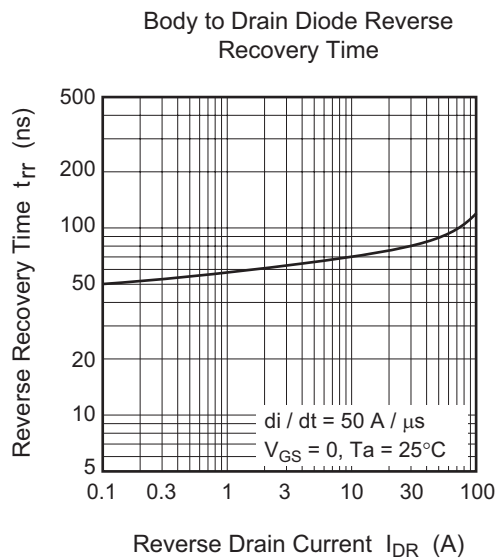
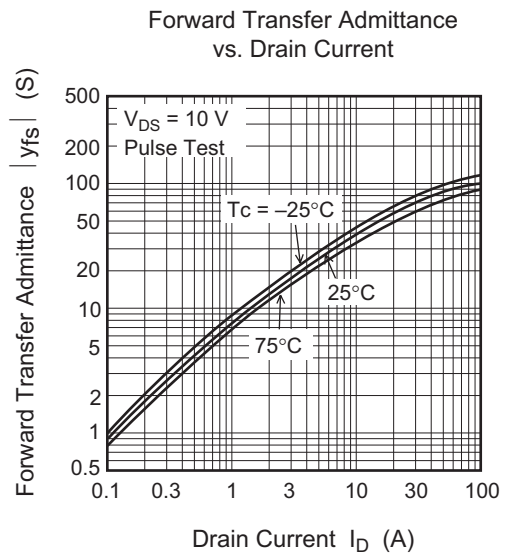
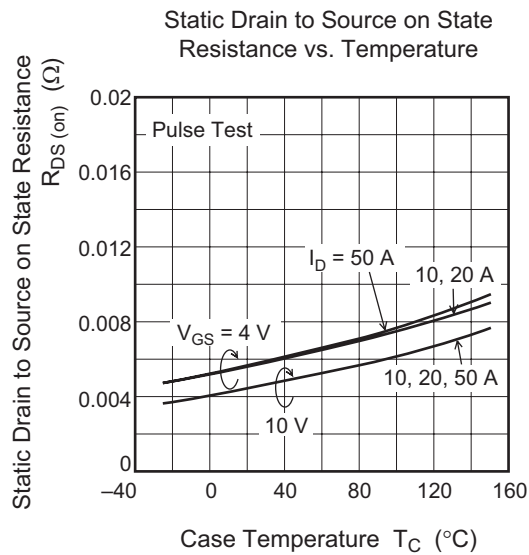


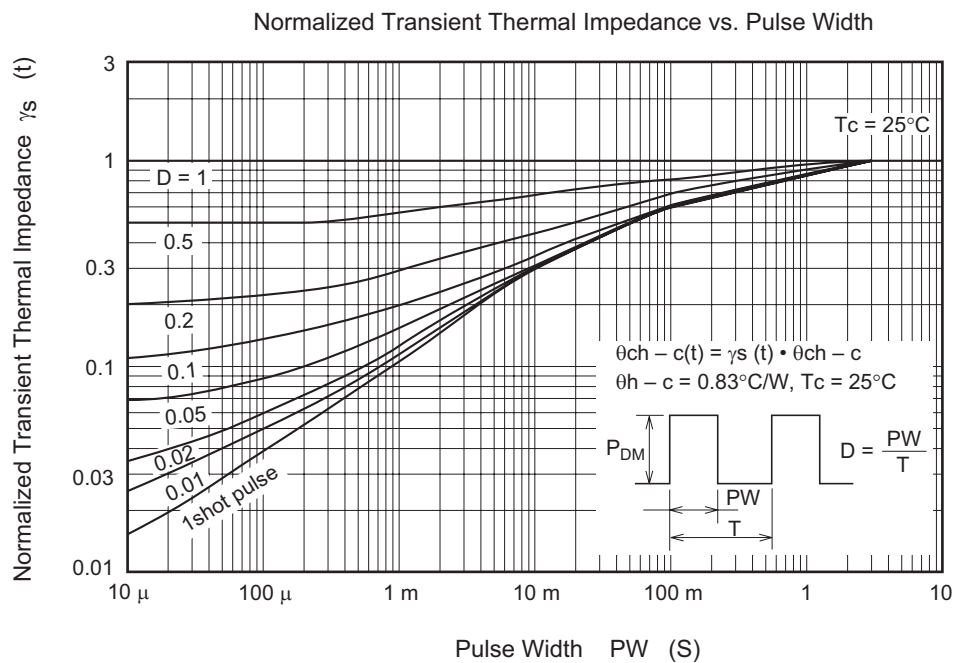
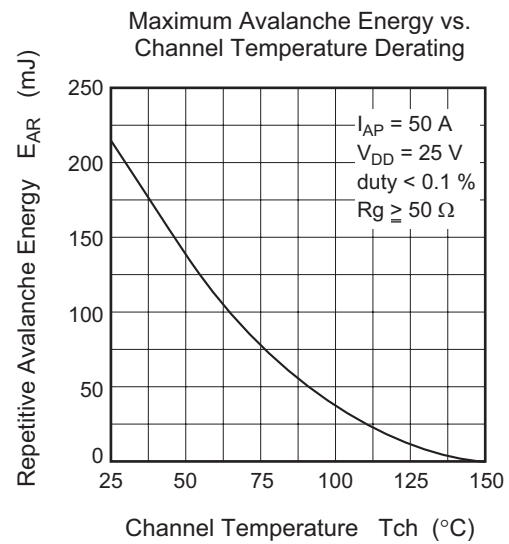
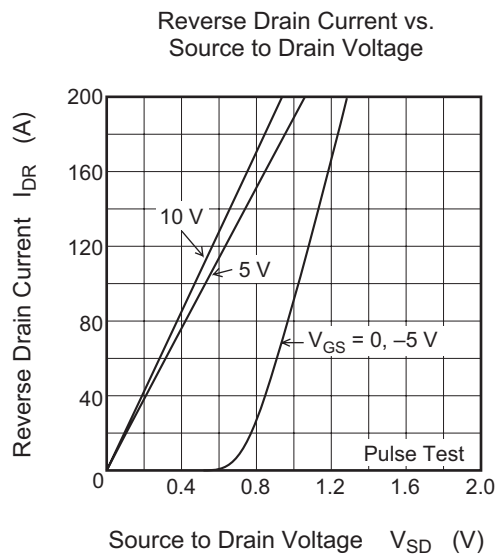
Drain to Source Saturation Voltage vs. Gate to Source Voltage



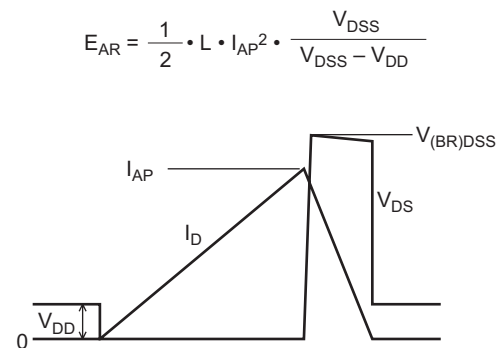
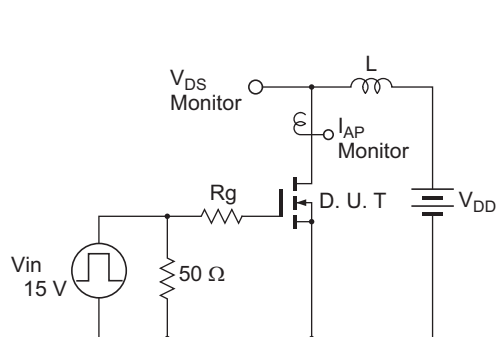
Static Drain to Source on State Resistance vs. Drain Current

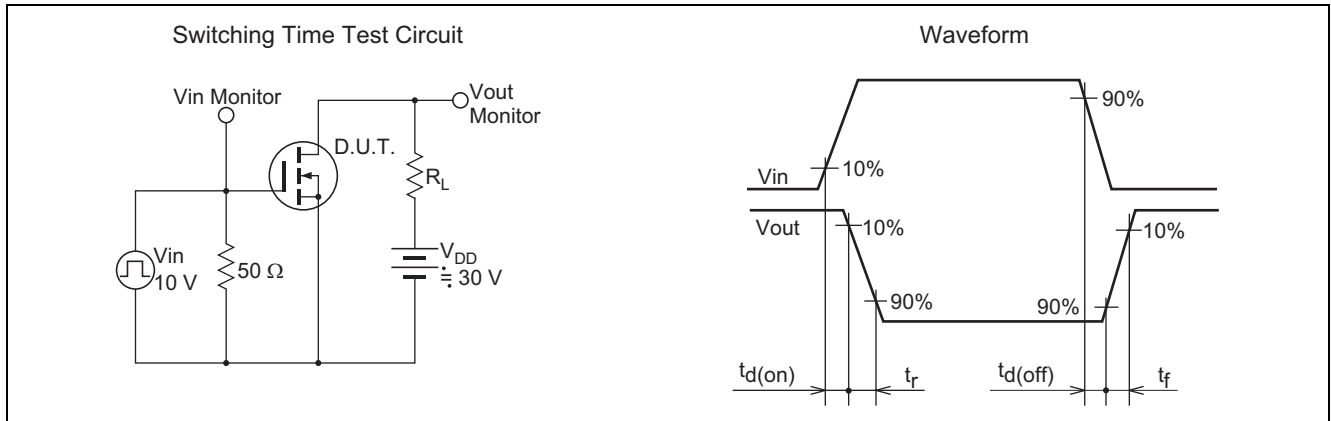




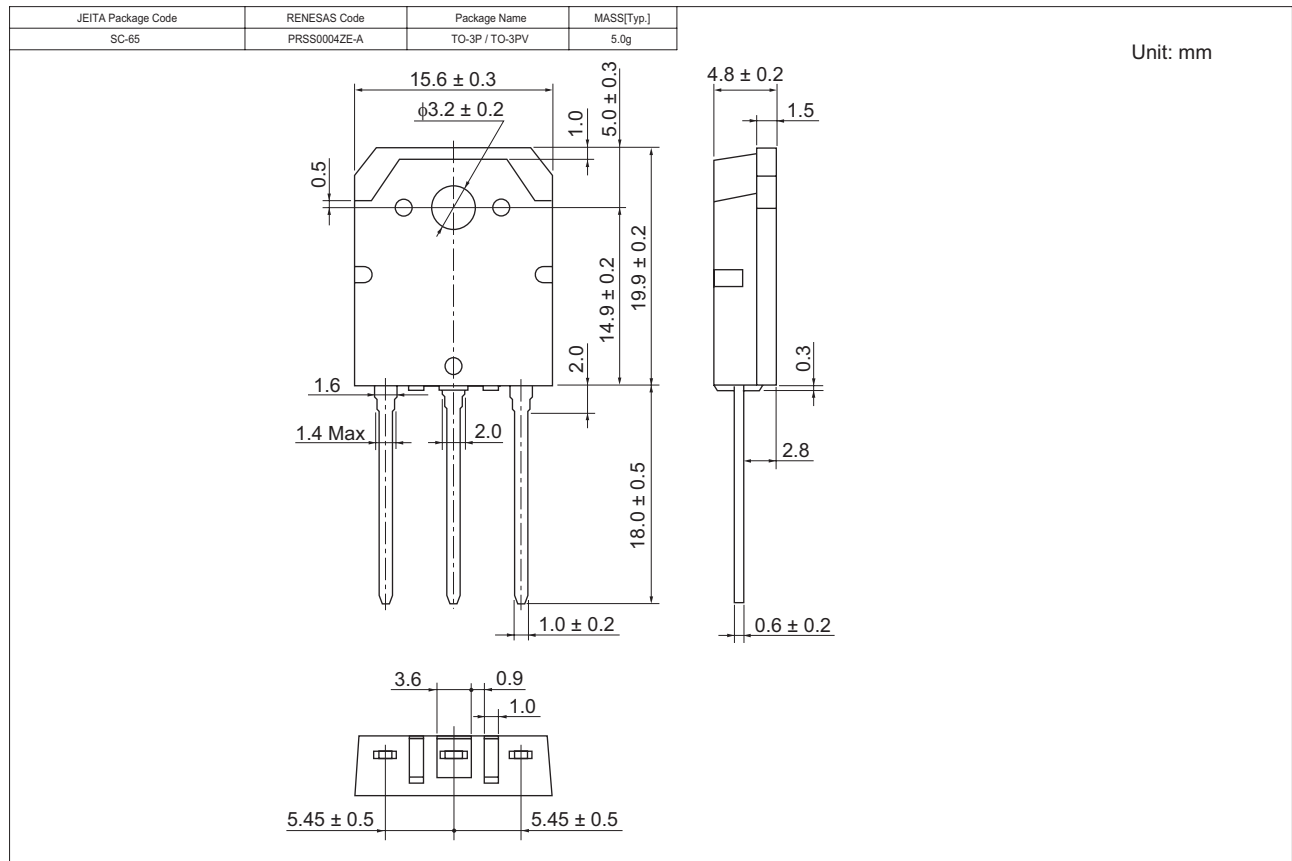


Avalanche Test Circuit and Waveform





Package Dimensions



Ordering Information

| Part Name | Quantity | Shipping Container |
|-----------|----------|--------------------|
| 2SK2554-E | 30 pcs | Plastic magazine |

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