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Renesas Electronics website: <http://www.renesas.com>

April 1st, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (<http://www.renesas.com>)

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2SJ542

Silicon P Channel MOS FET

REJ03G0889-0400
(Previous: ADE-208-591B)
Rev.4.00
Sep 07, 2005

Description

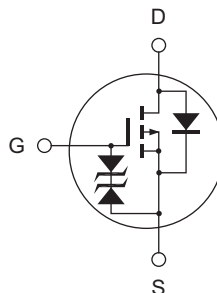
High speed power switching

Features

- Low on-resistance
 $R_{DS(on)} = 0.050 \Omega$ typ.
- Low drive current.
- 4 V gate drive devices.
- High speed switching.

Outline

RENESAS Package code: PRSS0004AC-A
(Package name: TO-220AB)



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

Absolute Maximum Ratings

(Ta = 25°C)

| Item | Symbol | Value | Unit |
|---|--|-------------|------|
| Drain to source voltage | V _{DSS} | -60 | V |
| Gate to source voltage | V _{GSS} | ±20 | V |
| Drain current | I _D | -18 | A |
| Drain peak current | I _{D (pulse)} ^{Note 1} | -72 | A |
| Body to drain diode reverse drain current | I _{DR} | -18 | A |
| Avalanche current | I _{AP} ^{Note 3} | -18 | A |
| Avalanche energy | E _{AR} ^{Note 3} | 27 | mJ |
| Channel dissipation | P _{ch} ^{Note 2} | 60 | W |
| Channel temperature | T _{ch} | 150 | °C |
| Storage temperature | T _{stg} | -55 to +150 | °C |

- Notes: 1. PW ≤ 10 μs, duty cycle ≤ 1%
 2. Value at T_c = 25°C
 3. Value at T_{ch} = 25°C, R_g ≥ 50 Ω

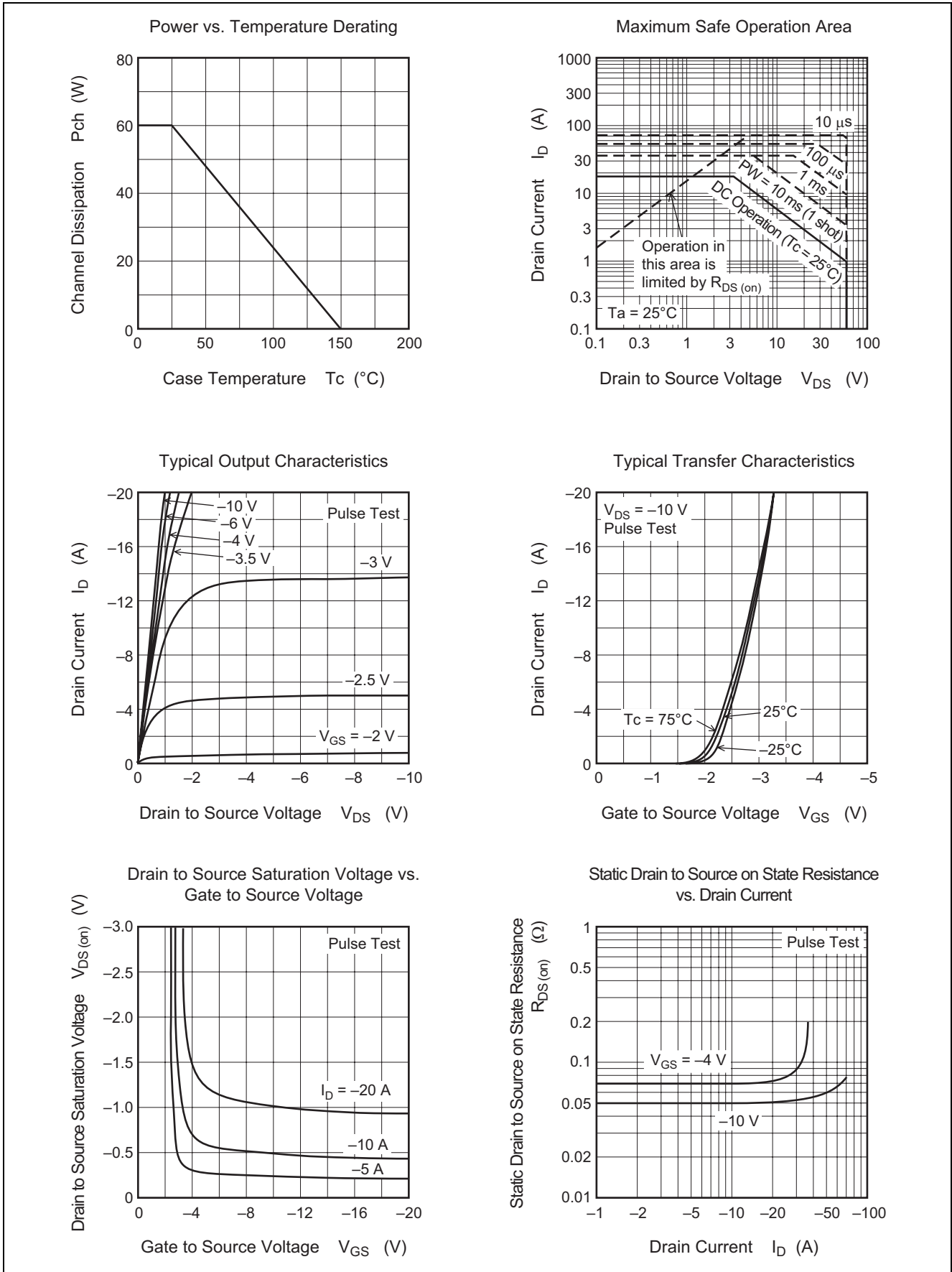
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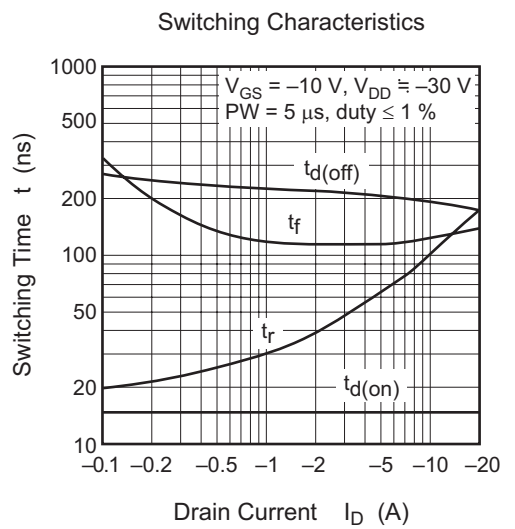
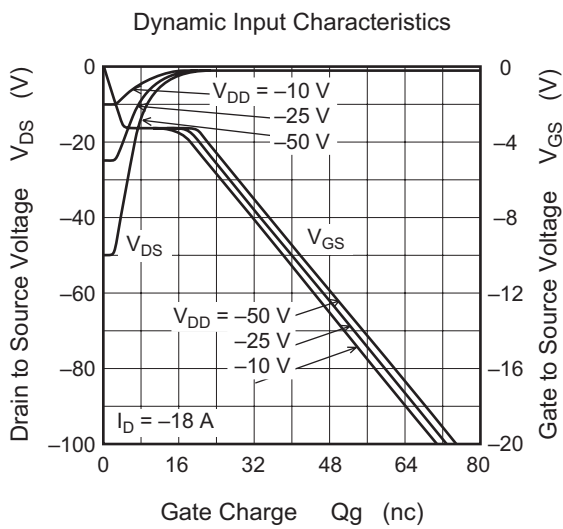
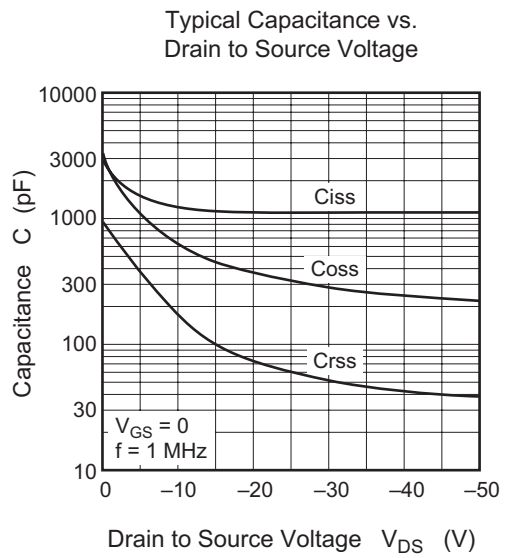
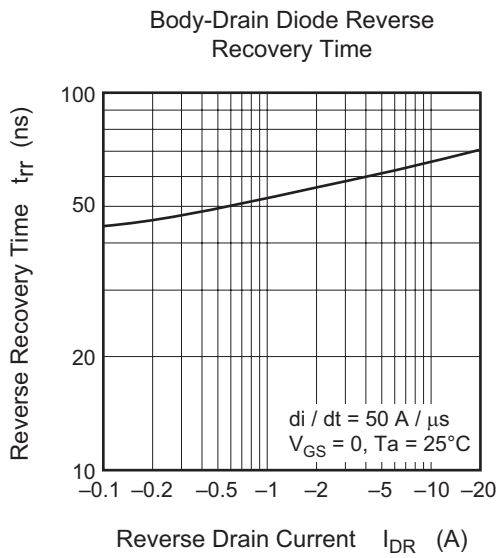
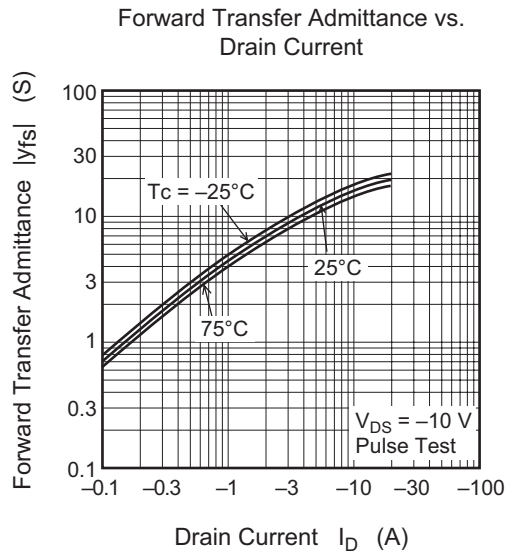
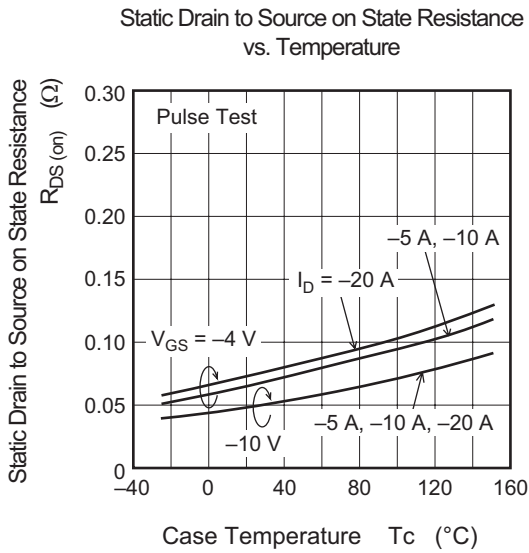
(Ta = 25°C)

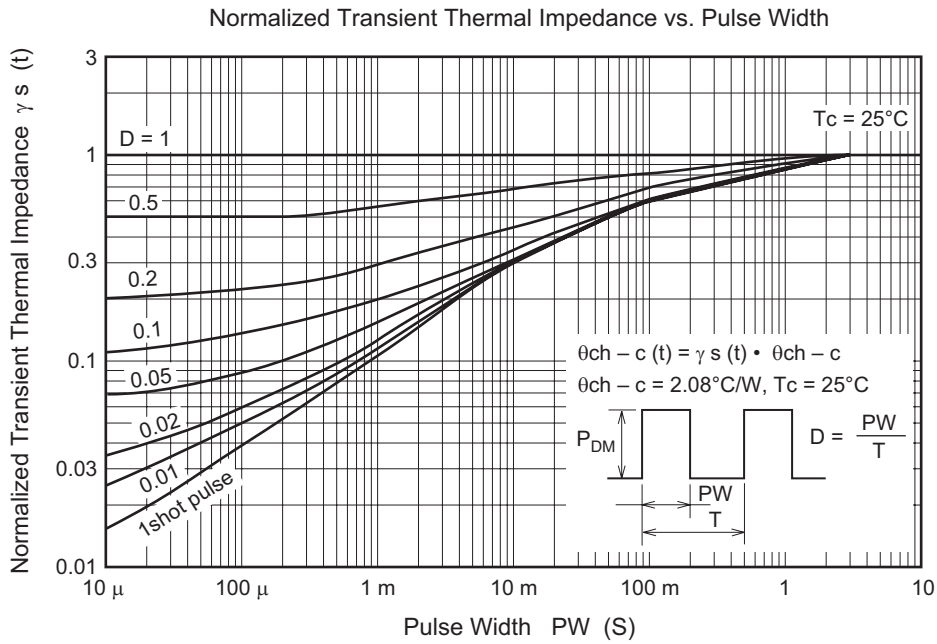
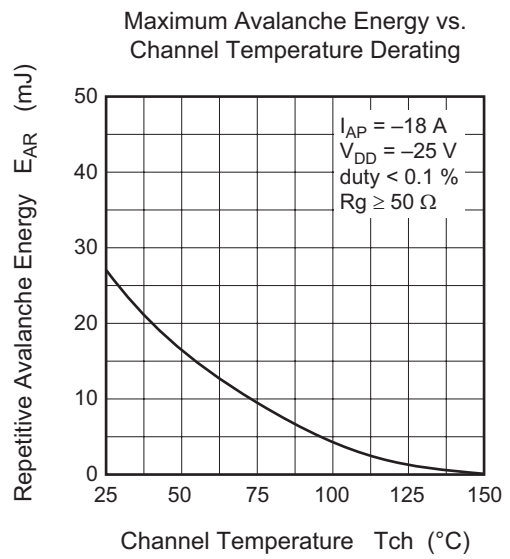
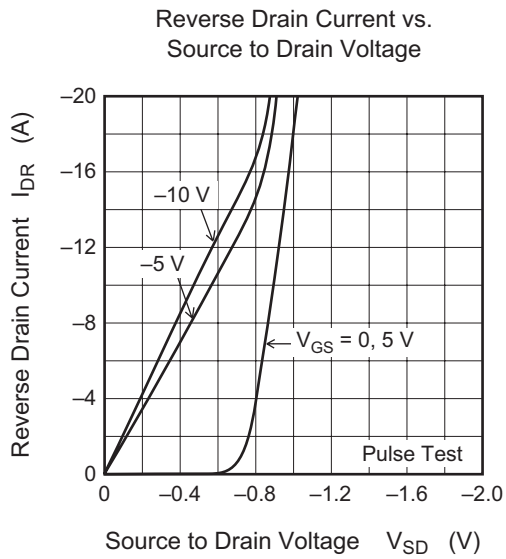
| Item | Symbol | Min | Typ | Max | Unit | Test Conditions |
|--|-----------------------|------|-------|-------|------|--|
| Drain to source breakdown voltage | V _{(BR) DSS} | -60 | — | — | V | I _D = -10 mA, V _{GS} = 0 |
| Gate to source breakdown voltage | V _{(BR) GSS} | ±20 | — | — | V | I _G = ±100 μA, V _{DS} = 0 |
| Zero gate voltage drain current | I _{DSS} | — | — | -10 | μA | V _{DS} = -60 V, V _{GS} = 0 |
| Gate to source leak current | I _{GSS} | — | — | ±10 | μA | V _{GS} = ±16 V, V _{DS} = 0 |
| Gate to source cutoff voltage | V _{GS (off)} | -1.0 | — | -2.0 | V | I _D = -1 mA, V _{DS} = -10 V |
| Static drain to source on state resistance | R _{DS (on)} | — | 0.050 | 0.065 | Ω | I _D = -9 A, V _{GS} = -10 V ^{Note 4} |
| | R _{DS (on)} | — | 0.070 | 0.110 | Ω | I _D = -9 A, V _{GS} = -4 V ^{Note 4} |
| Forward transfer admittance | y _{fs} | 10 | 16 | — | S | I _D = -9 A, V _{DS} = -10 V ^{Note 4} |
| Input capacitance | C _{iss} | — | 1300 | — | pF | V _{DS} = -10 V |
| Output capacitance | C _{oss} | — | 650 | — | pF | V _{GS} = 0 |
| Reverse transfer capacitance | C _{rss} | — | 180 | — | pF | f = 1 MHz |
| Turn-on delay time | t _{d (on)} | — | 14 | — | ns | V _{GS} = -10 V |
| Rise time | t _r | — | 95 | — | ns | I _D = -9 A |
| Turn-off delay time | t _{d (off)} | — | 190 | — | ns | R _L = 3.33 Ω |
| Fall time | t _f | — | 135 | — | ns | |
| Body to drain diode forward voltage | V _{DF} | — | -1.0 | — | V | I _F = -18 A, V _{GS} = 0 |
| Body to drain diode reverse recovery time | t _{rr} | — | 70 | — | ns | I _F = -18 A, V _{GS} = 0 di _F /dt = 50 A/μs |

- Note: 4. Pulse test

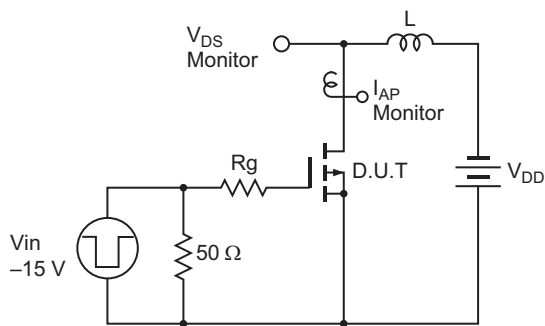
Main Characteristics





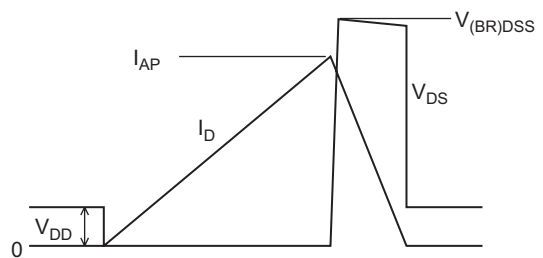


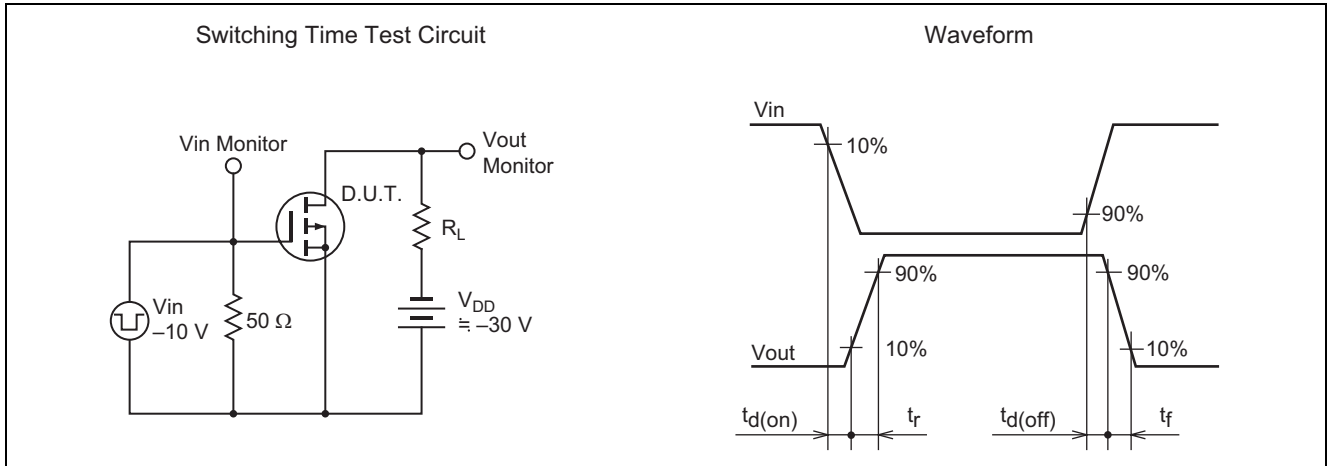
Avalanche Test Circuit



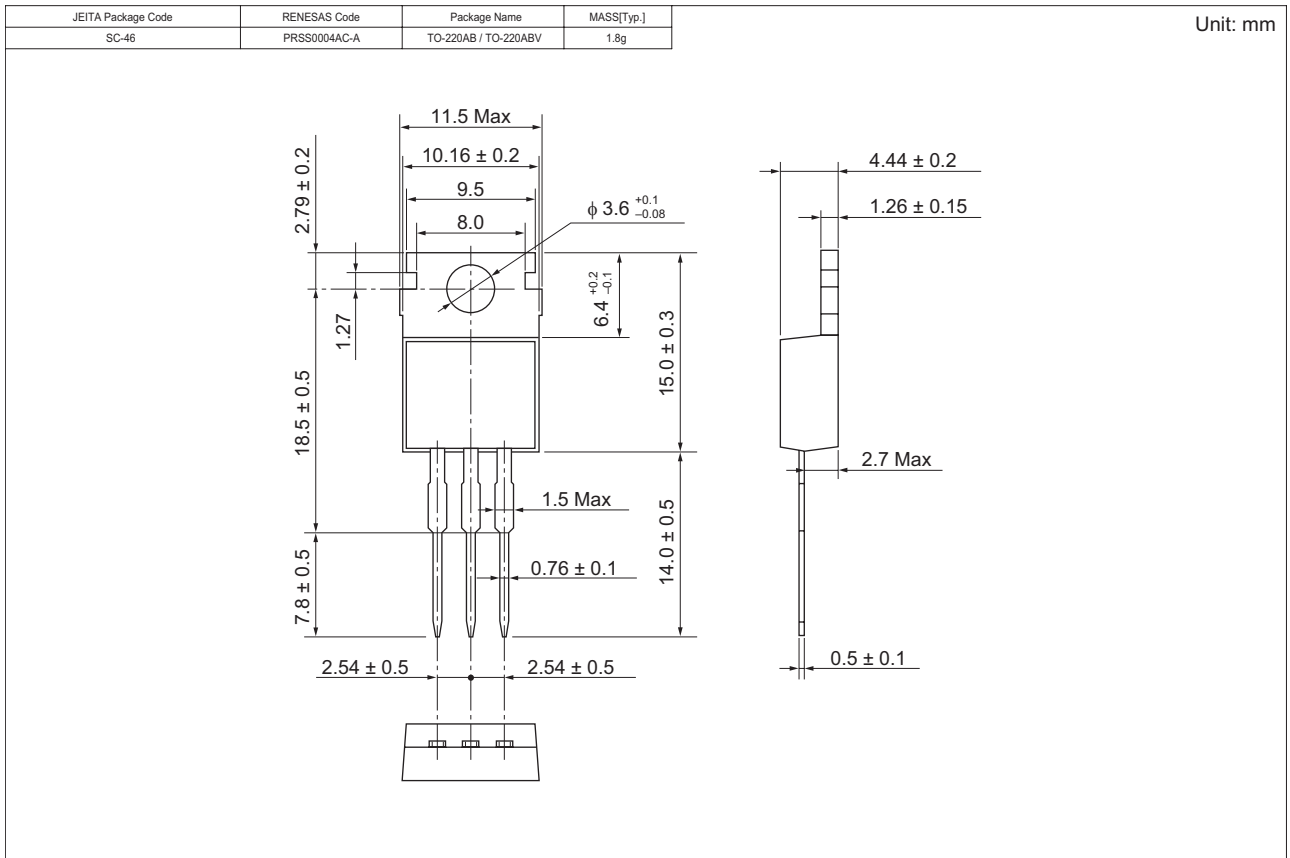
Avalanche Waveform

$$E_{AR} = \frac{1}{2} \cdot L \cdot I_{AP}^2 \cdot \frac{V_{DSS}}{V_{DSS} - V_{DD}}$$





Package Dimensions



Ordering Information

| Part Name | Quantity | Shipping Container |
|-----------|----------|--------------------|
| 2SJ542-E | 500 pcs | Box (Sack) |

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