

RJK2009DPM

Silicon N Channel MOS FET
High Speed Power Switching

REJ03G0474-0200

Rev.2.00

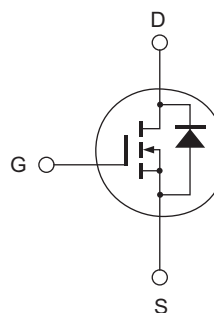
Aug.09.2005

Features

- Low on-resistance
- Low leakage current
- High speed switching

Outline

RENESAS Package code: PRSS0003ZA-A
(Package name: TO-3PFM)



1. Gate
2. Drain
3. Source

Absolute Maximum Ratings

(Ta = 25°C)

| Item | Symbol | Ratings | Unit |
|---|----------------------------------|-------------|------|
| Drain to source voltage | V_{DSS} | 200 | V |
| Gate to source voltage | V_{GSS} | ±30 | V |
| Drain current | I_D | 40 | A |
| Drain peak current | $I_{D(pulse)}$ ^{Note1} | 160 | A |
| Body-drain diode reverse drain current | I_{DR} | 40 | A |
| Body-drain diode reverse drain peak current | $I_{DR(pulse)}$ ^{Note1} | 160 | A |
| Avalanche current | I_{AP} ^{Note3} | 40 | A |
| Avalanche energy | E_{AR} ^{Note3} | 106 | mJ |
| Channel dissipation | P_{ch} ^{Note2} | 60 | W |
| Channel to case thermal impedance | θ_{ch-c} | 2.08 | °C/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. $STch = 25^\circ C$, $T_{ch} \leq 150^\circ C$

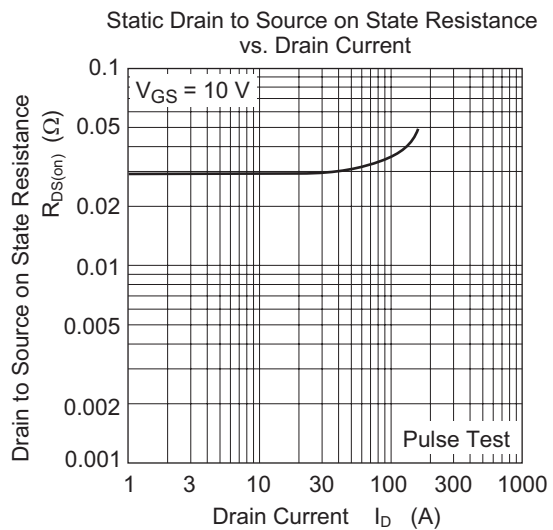
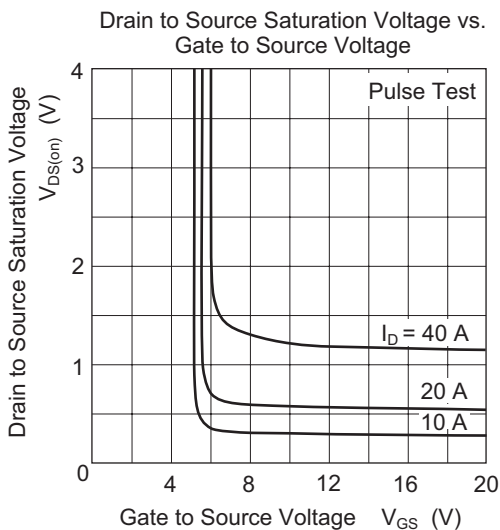
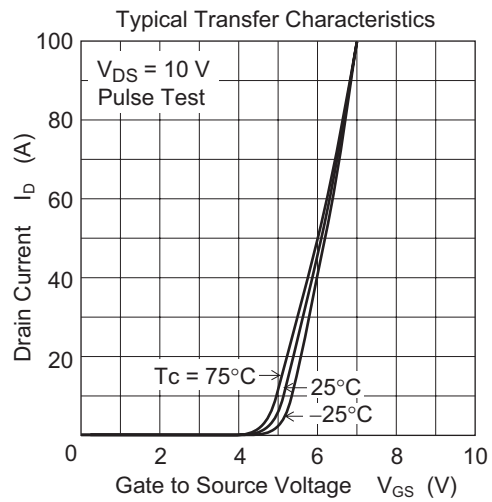
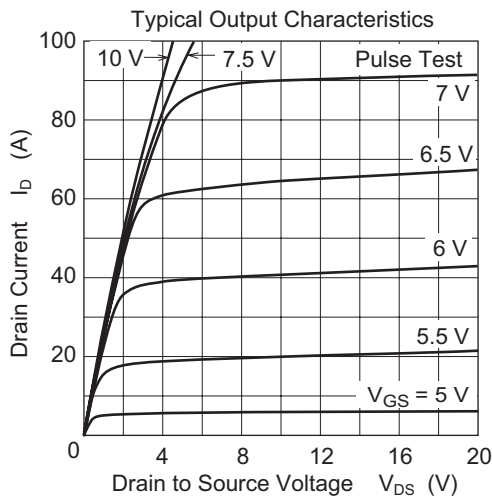
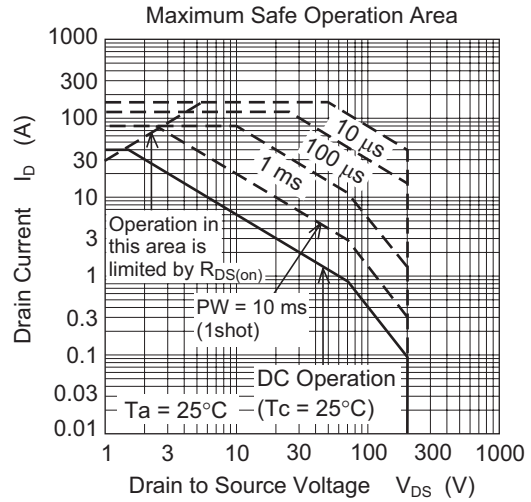
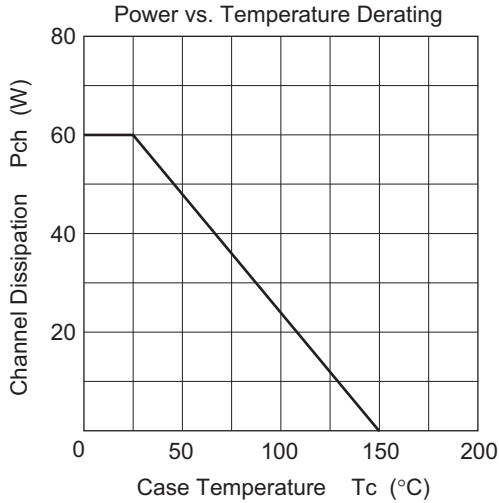
Electrical Characteristics

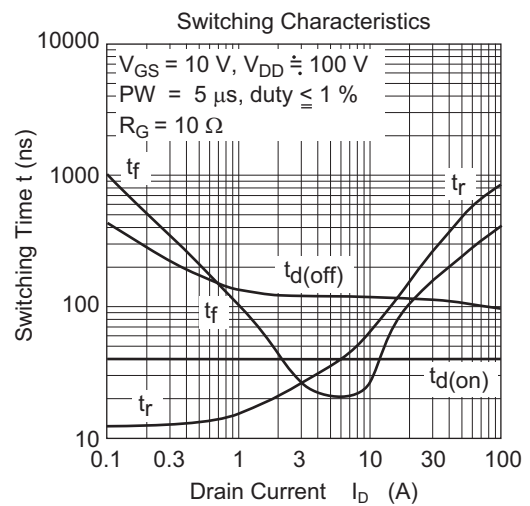
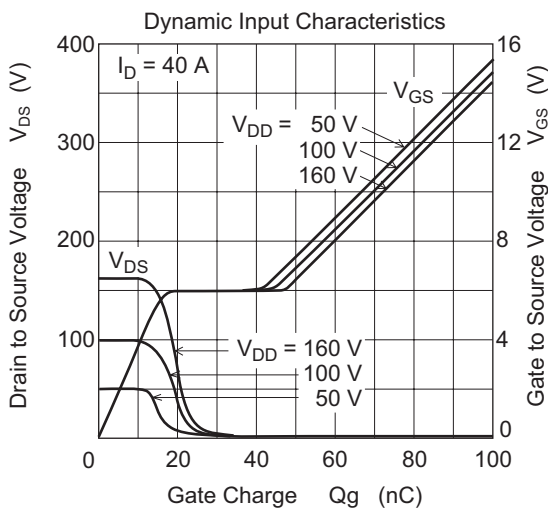
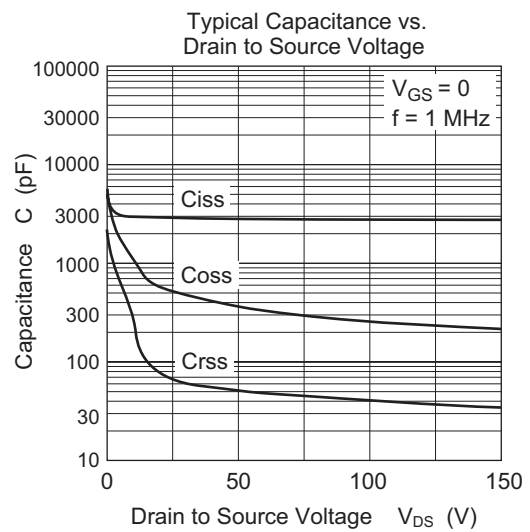
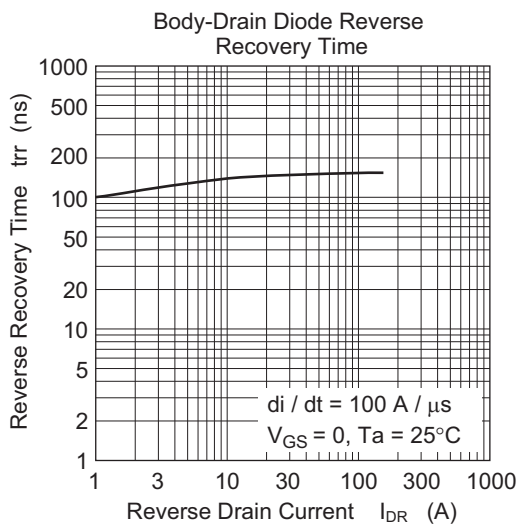
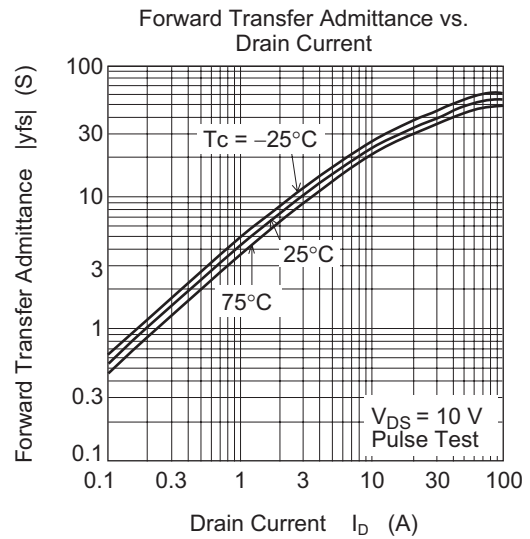
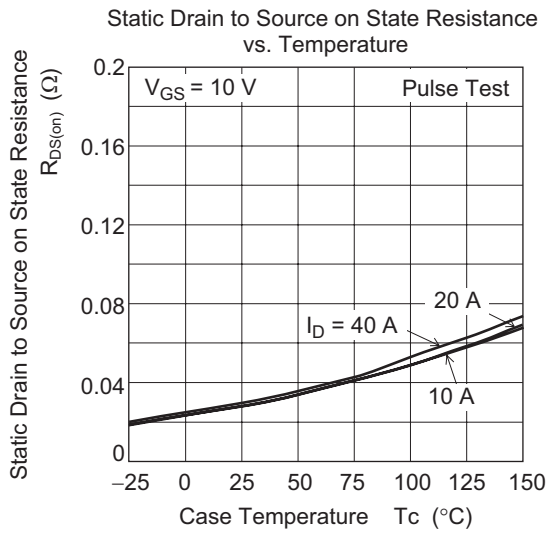
(Ta = 25°C)

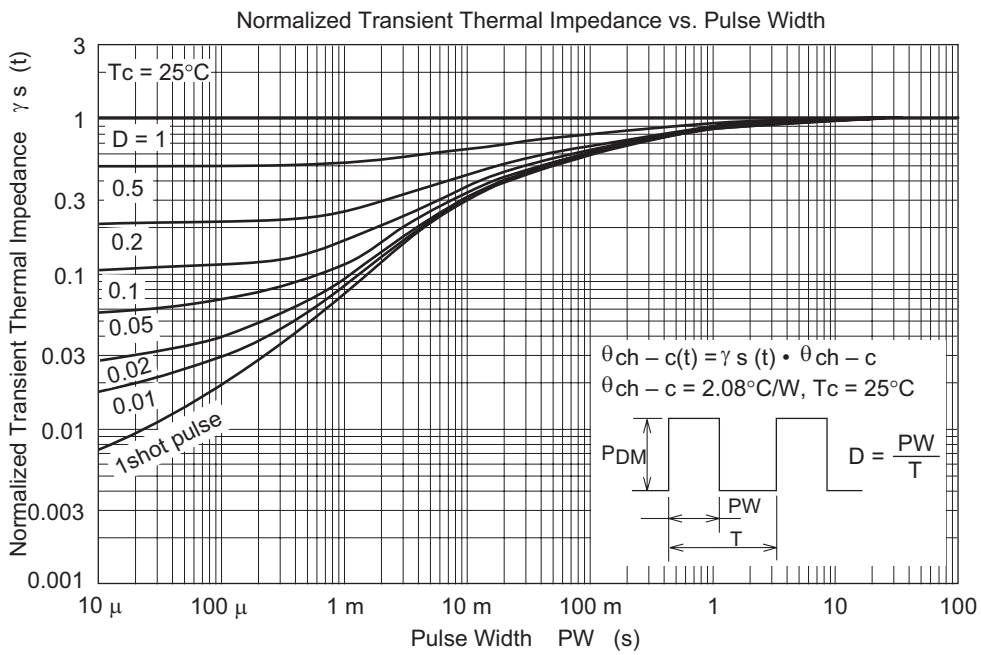
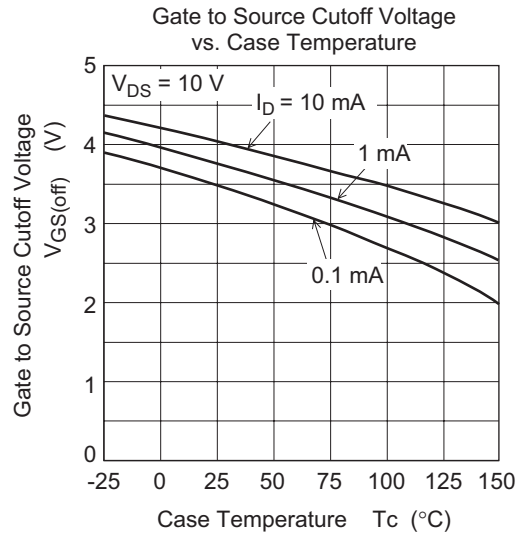
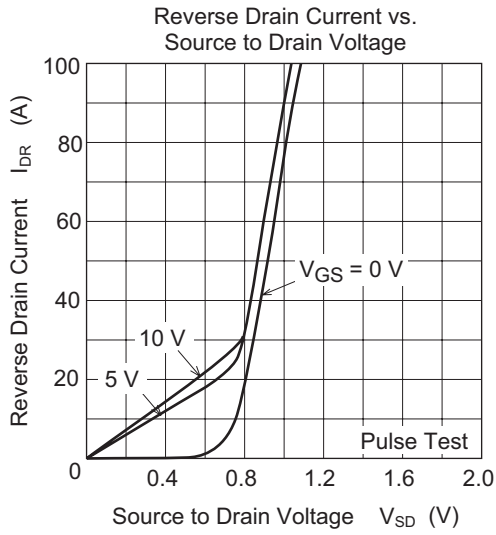
| Item | Symbol | Min | Typ | Max | Unit | Test conditions |
|--|---------------|-----|-------|-----------|---------------|--|
| Drain to source breakdown voltage | $V_{(BR)DSS}$ | 200 | — | — | V | $I_D = 10 \text{ mA}$, $V_{GS} = 0$ |
| Zero gate voltage drain current | I_{DSS} | — | — | 1 | μA | $V_{DS} = 200 \text{ V}$, $V_{GS} = 0$ |
| Gate to source leak current | I_{GSS} | — | — | ± 0.1 | μA | $V_{GS} = \pm 30 \text{ V}$, $V_{DS} = 0$ |
| Gate to source cutoff voltage | $V_{GS(off)}$ | 3.0 | — | 4.5 | V | $V_{DS} = 10 \text{ V}$, $I_D = 1 \text{ mA}$ |
| Forward transfer admittance | $ y_{fs} $ | 20 | 33 | — | S | $I_D = 20 \text{ A}$, $V_{DS} = 10 \text{ V}$ ^{Note4} |
| Static drain to source on state resistance | $R_{DS(on)}$ | — | 0.029 | 0.036 | Ω | $I_D = 20 \text{ A}$, $V_{GS} = 10 \text{ V}$ ^{Note4} |
| Input capacitance | C_{iss} | — | 2900 | — | pF | $V_{DS} = 25 \text{ V}$, $V_{GS} = 0$, $f = 1 \text{ MHz}$ |
| Output capacitance | C_{oss} | — | 520 | — | pF | |
| Reverse transfer capacitance | C_{rss} | — | 66 | — | pF | |
| Turn-on delay time | $t_{d(on)}$ | — | 40 | — | ns | $I_D = 20 \text{ A}$, $V_{GS} = 10 \text{ V}$, $R_L = 5 \Omega$, $R_g = 10 \Omega$ |
| Rise time | t_r | — | 160 | — | ns | |
| Turn-off delay time | $t_{d(off)}$ | — | 120 | — | ns | |
| Fall time | t_f | — | 110 | — | ns | |
| Total gate charge | Q_g | — | 72 | — | nC | $V_{DD} = 160 \text{ V}$, $V_{GS} = 10 \text{ V}$, $I_D = 40 \text{ A}$ |
| Gate to source charge | Q_{gs} | — | 16 | — | nC | |
| Gate to drain charge | Q_{gd} | — | 31 | — | nC | |
| Body-drain diode forward voltage | V_{DF} | — | 0.9 | 1.4 | V | $I_F = 40 \text{ A}$, $V_{GS} = 0$ ^{Note4} |
| Body-drain diode reverse recovery time | t_{rr} | — | 150 | — | ns | $I_F = 40 \text{ A}$, $V_{GS} = 0$, $diF/dt = 100 \text{ A}/\mu\text{s}$ |
| Body-drain diode reverse recovery charge | Q_{rr} | — | 0.8 | — | μC | |

Notes: 4. Pulse test

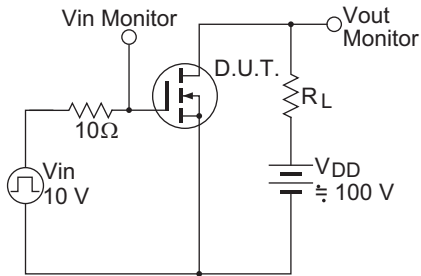
Main Characteristics



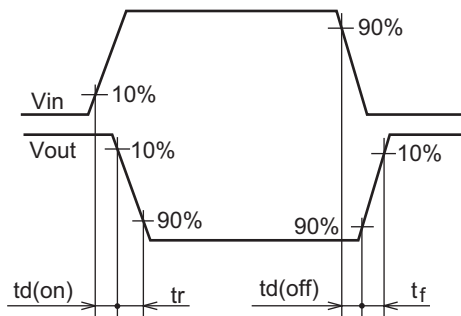




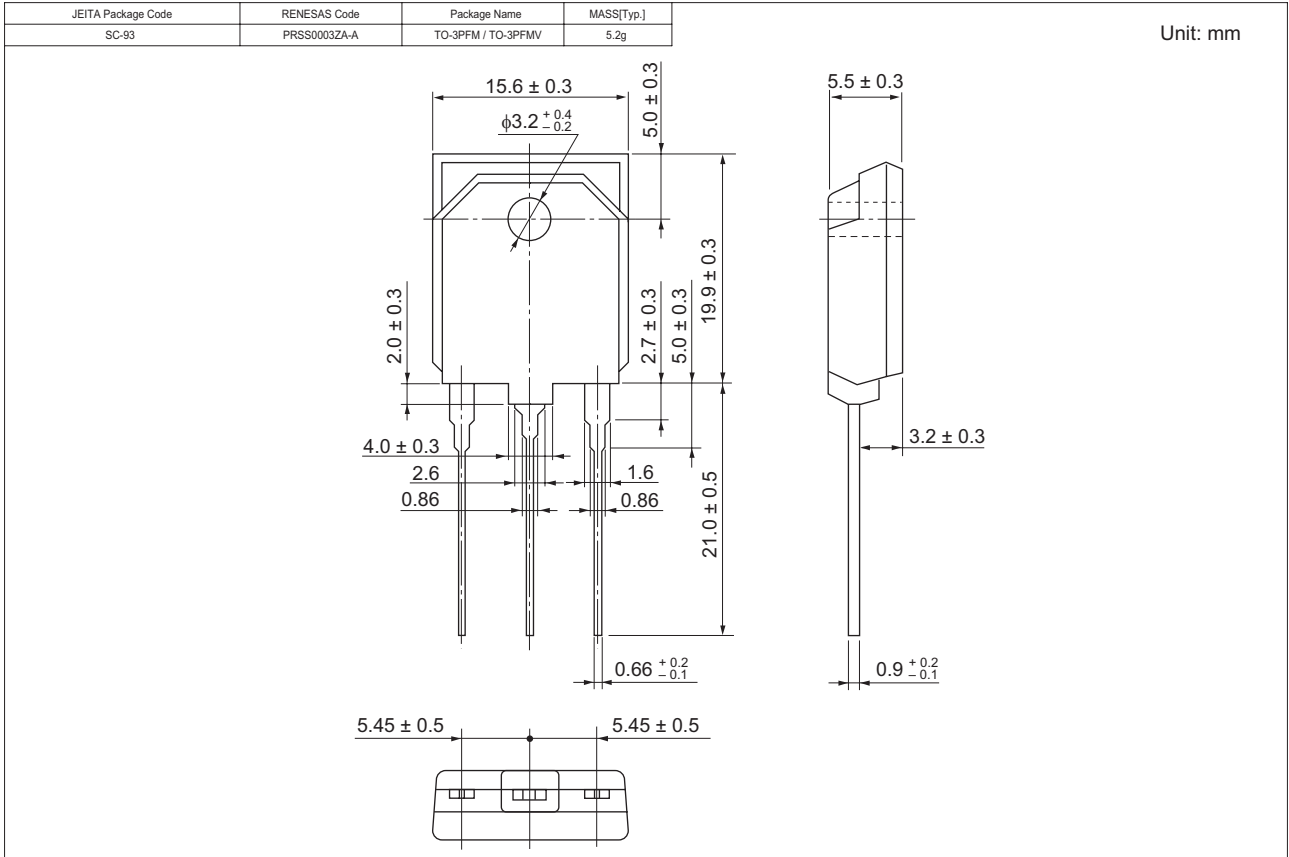
Switching Time Test Circuit



Waveform



Package Dimensions



Ordering Information

| Part Name | Quantity | Shipping Container |
|--------------|----------|--------------------|
| RJK2009DPM-E | 30 pcs | Plastic magazine |

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