

2SK1517, 2SK1518

Silicon N Channel MOS FET

REJ03G0947-0200
(Previous: ADE-208-1287)
Rev.2.00
Sep 07, 2005

Application

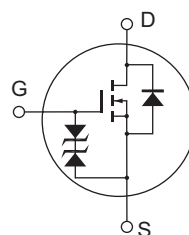
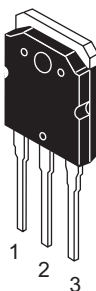
High speed power switching

Features

- Low on-resistance
- High speed switching
- Low drive current
- Built-in fast recovery diode ($t_{rr} = 120 \text{ ns}$)
- Suitable for motor control, switching regulator, 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 | 2SK1517 | V_{DSS} | 450 | V |
| | 2SK1518 | | 500 | |
| Gate to source voltage | | V_{GSS} | ±30 | V |
| Drain current | | I_D | 20 | A |
| Drain peak current | | $I_{D(pulse)}^{*1}$ | 80 | A |
| Body to drain diode reverse drain current | | I_{DR} | 20 | A |
| Channel dissipation | | P_{ch}^{*2} | 120 | 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 $T_C = 25^\circ C$

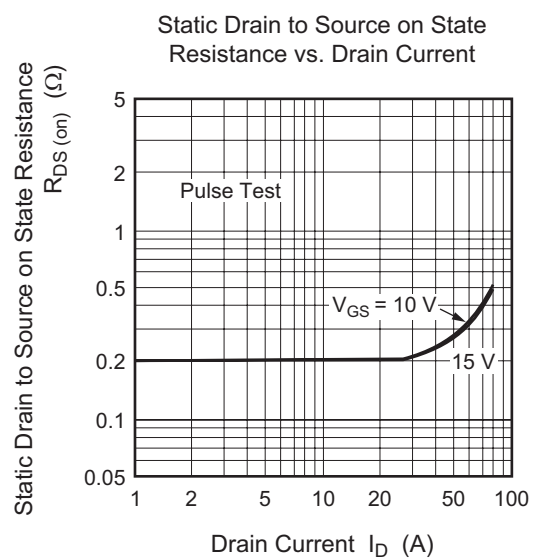
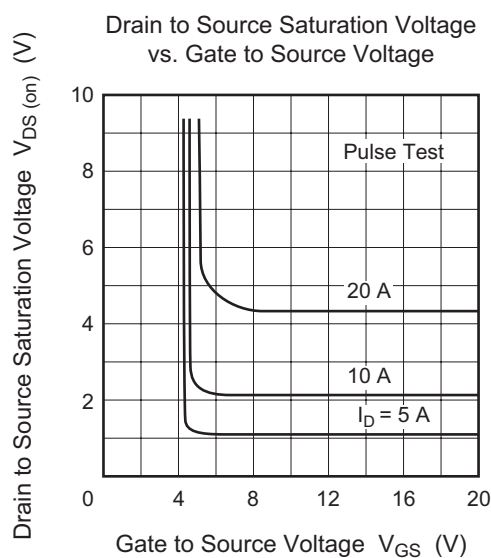
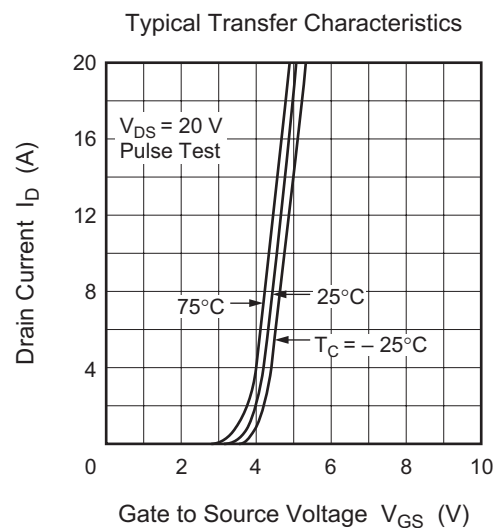
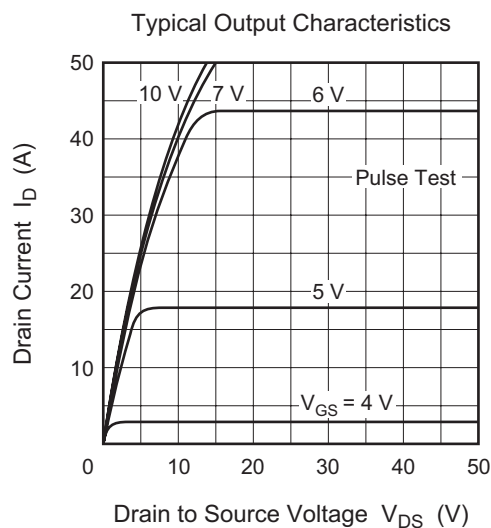
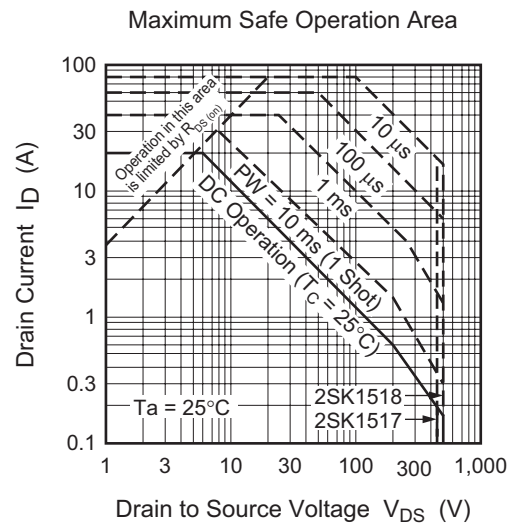
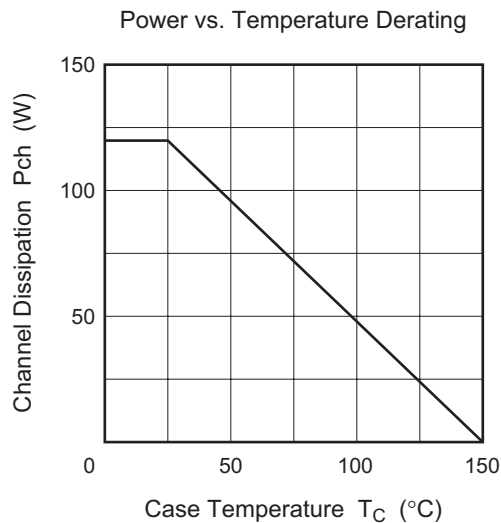
Electrical Characteristics

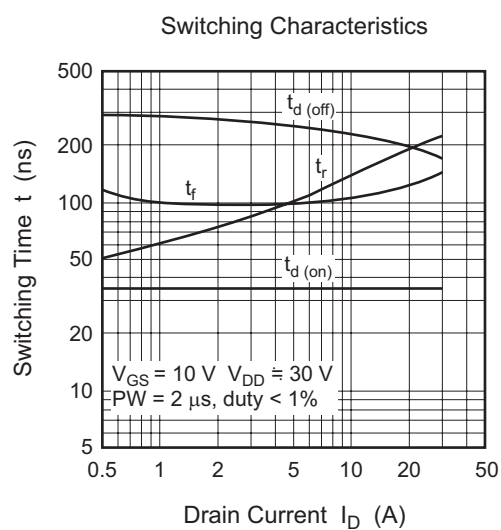
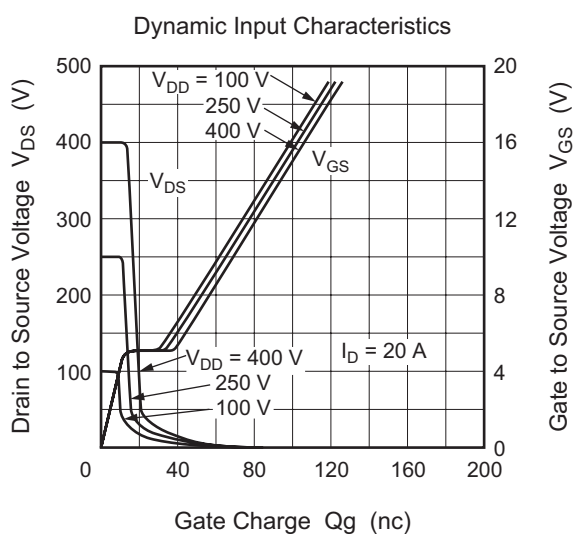
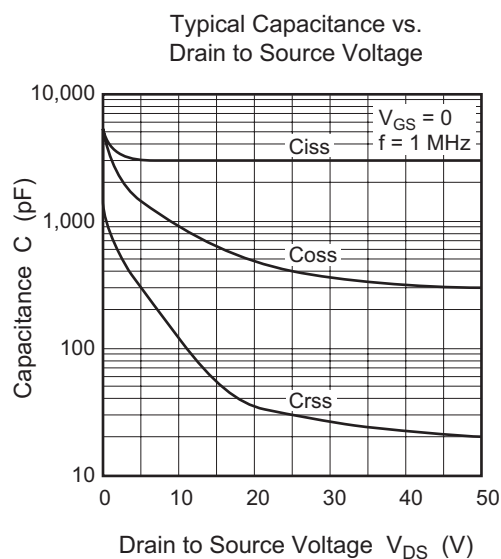
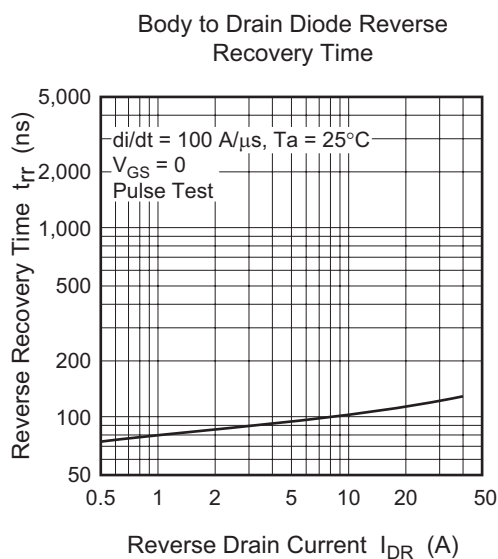
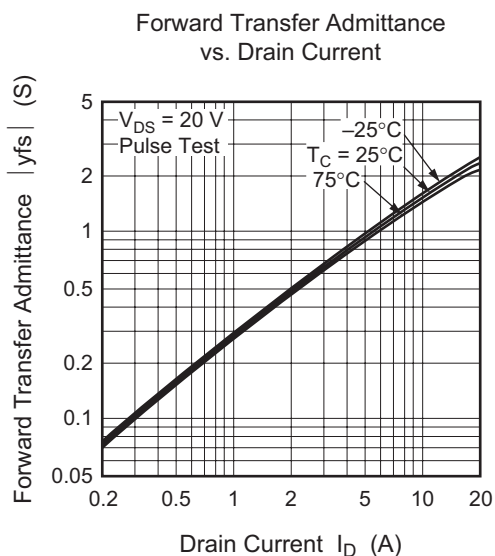
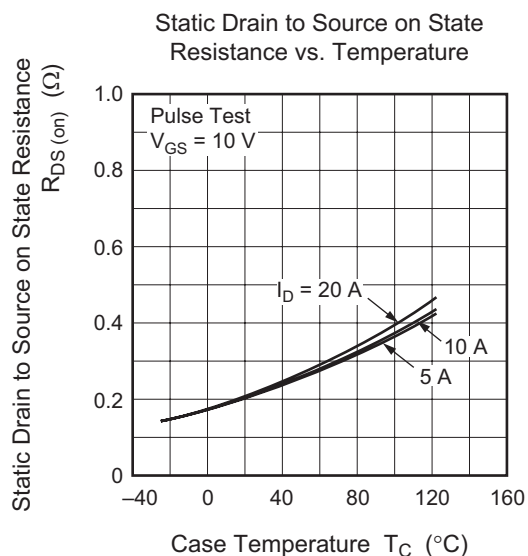
(Ta = 25°C)

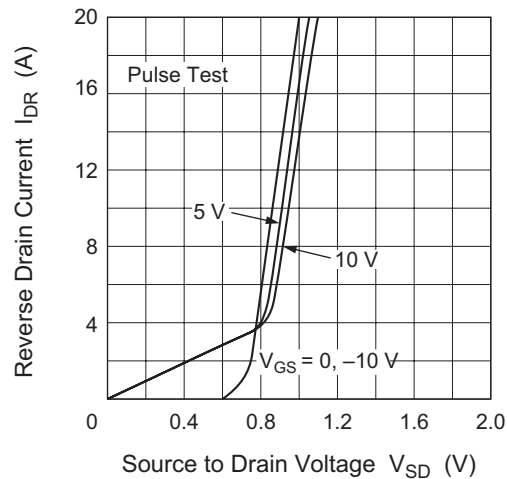
| Item | | Symbol | Min | Typ | Max | Unit | Test conditions |
|--|---------|---------------|-----|------|------|------|--|
| Drain to source breakdown voltage | 2SK1517 | $V_{(BR)DSS}$ | 450 | — | — | V | $I_D = 10 \text{ mA}$, $V_{GS} = 0$ |
| | 2SK1518 | | 500 | | | | |
| Gate to source breakdown voltage | | $V_{(BR)GSS}$ | ±30 | — | — | V | $I_G = \pm 100 \mu A$, $V_{DS} = 0$ |
| Gate to source leak current | | I_{GSS} | — | — | ±10 | μA | $V_{GS} = \pm 25 \text{ V}$, $V_{DS} = 0$ |
| Zero gate voltage drain current | 2SK1517 | I_{DSS} | — | — | 250 | μA | $V_{DS} = 360 \text{ V}$, $V_{GS} = 0$ |
| | 2SK1518 | | | | | | $V_{DS} = 400 \text{ V}$, $V_{GS} = 0$ |
| Gate to source cutoff voltage | | $V_{GS(off)}$ | 2.0 | — | 3.0 | V | $I_D = 1 \text{ mA}$, $V_{DS} = 10 \text{ V}$ |
| Static drain to source on state resistance | 2SK1517 | $R_{DS(on)}$ | — | 0.20 | 0.25 | Ω | $I_D = 10 \text{ A}$, $V_{GS} = 10 \text{ V}^{*3}$ |
| | 2SK1518 | | — | 0.22 | 0.27 | | |
| Forward transfer admittance | | $ y_{fs} $ | 10 | 16 | — | S | $I_D = 10 \text{ A}$, $V_{DS} = 10 \text{ V}^{*3}$ |
| Input capacitance | | C_{iss} | — | 3050 | — | pF | $V_{DS} = 10 \text{ V}$, $V_{GS} = 0$, $f = 1 \text{ MHz}$ |
| Output capacitance | | C_{oss} | — | 940 | — | pF | |
| Reverse transfer capacitance | | C_{rss} | — | 140 | — | pF | |
| Turn-on delay time | | $t_{d(on)}$ | — | 35 | — | ns | $I_D = 10 \text{ A}$, $V_{GS} = 10 \text{ V}$, $R_L = 3 \Omega$ |
| Rise time | | t_r | — | 130 | — | ns | |
| Turn-off delay time | | $t_{d(off)}$ | — | 240 | — | ns | |
| Fall time | | t_f | — | 105 | — | ns | |
| Body to drain diode forward voltage | | V_{DF} | — | 1.0 | — | V | $I_F = 20 \text{ A}$, $V_{GS} = 0$ |
| Body to drain diode reverse recovery time | | t_{rr} | — | 120 | — | ns | $I_F = 20 \text{ A}$, $V_{GS} = 0$, $di_F/dt = 100 \text{ A}/\mu s$ |

Note: 3. Pulse test

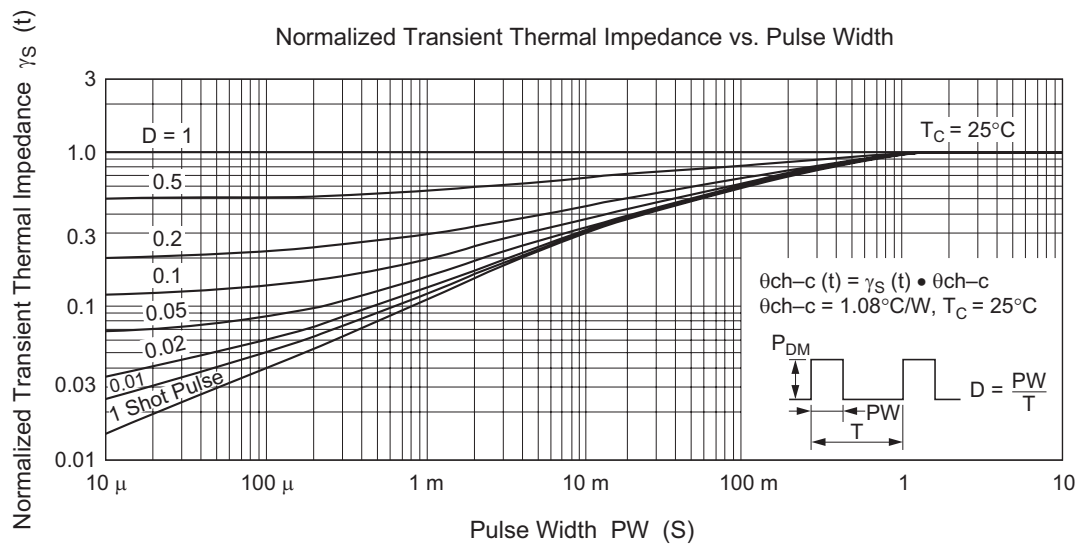
Main Characteristics



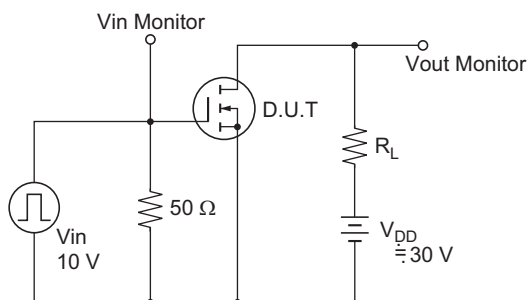


Reverse Drain Current vs.
Source to Drain Voltage

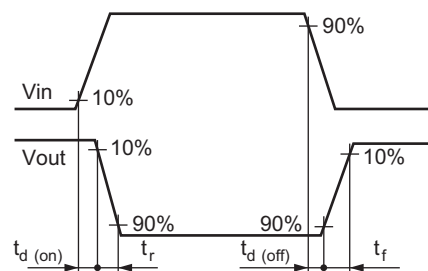
Normalized Transient Thermal Impedance vs. Pulse Width



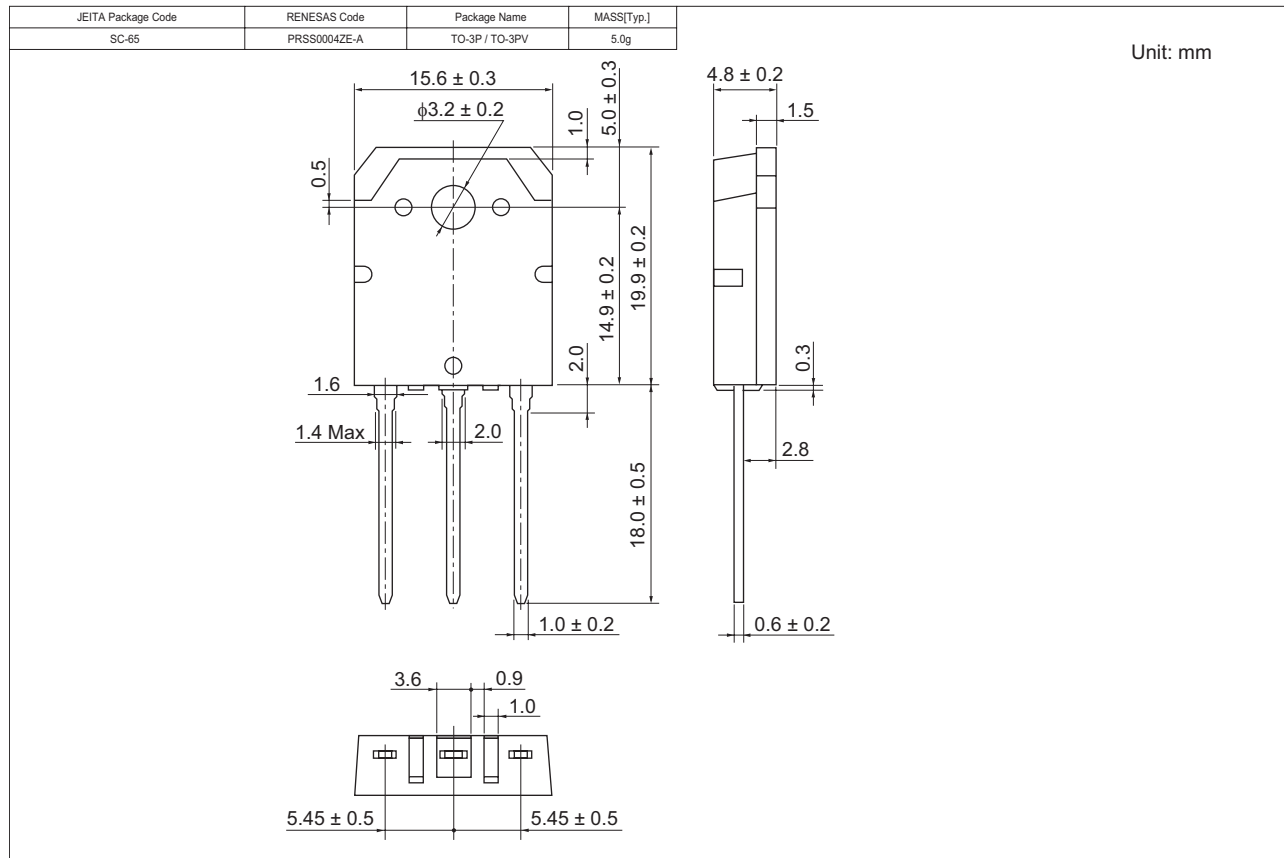
Switching Time Test Circuit



Waveforms



Package Dimensions



Ordering Information

| Part Name | Quantity | Shipping Container |
|-----------|----------|--------------------|
| 2SK1517-E | 360 pcs | Box (Tube) |
| 2SK1518-E | 360 pcs | Box (Tube) |

Note: For some grades, production may be terminated. Please contact the Renesas sales office to check the state of production before ordering the product.

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