

RJK60S7DPQ-E0

600V - 30A - SJ MOS FET
High Speed Power Switching

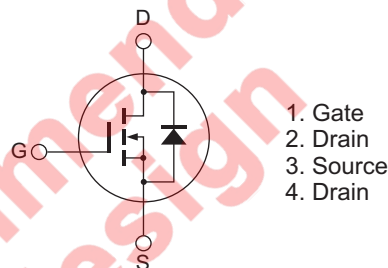
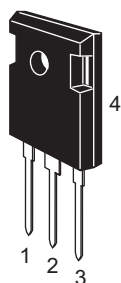
R07DS0736EJ0300
Rev.3.00
Dec 10, 2012

Features

- Superjunction MOSFET
- Low on-resistance
 $R_{DS(on)} = 0.1 \Omega$ typ. (at $I_D = 15 \text{ A}$, $V_{GS} = 10 \text{ V}$, $T_a = 25^\circ\text{C}$)
- High speed switching
 $t_f = 9 \text{ ns}$ typ. (at $I_D = 15 \text{ A}$, $V_{GS} = 10 \text{ V}$, $R_L = 20 \Omega$, $R_g = 10 \Omega$, $T_a = 25^\circ\text{C}$)

Outline

RENESAS Package code: PRSS0003ZE-A
(Package name: TO-247)



Absolute Maximum Ratings

($T_a = 25^\circ\text{C}$)

| Item | Symbol | Ratings | Unit |
|---|-----------------------------------|-------------|--------------------|
| Drain to source voltage | V_{DSS} | 600 | V |
| Gate to source voltage | V_{GSS} | +30, -20 | V |
| Drain current | I_D ^{Note1} | 30 | A |
| | I_D ^{Note1} | 19 | A |
| Drain peak current | I_D (pulse) ^{Note1} | 60 | A |
| Body-drain diode reverse drain current | I_{DR} ^{Note1} | 30 | A |
| Body-drain diode reverse drain peak current | I_{DR} (pulse) ^{Note1} | 60 | A |
| Avalanche current | I_{AP} ^{Note2} | 7.5 | A |
| Avalanche energy | E_{AR} ^{Note2} | 3.06 | mJ |
| Channel dissipation | P_{ch} ^{Note3} | 227.2 | W |
| Channel to case thermal impedance | θ_{ch-c} | 0.55 | $^\circ\text{C/W}$ |
| Channel temperature | T_{ch} | 150 | $^\circ\text{C}$ |
| Storage temperature | T_{stg} | -55 to +150 | $^\circ\text{C}$ |

Notes: 1. Limited by T_{ch} max.
2. $ST_{ch} = 25^\circ\text{C}$, $T_{ch} \leq 150^\circ\text{C}$
3. Value at $T_c = 25^\circ\text{C}$

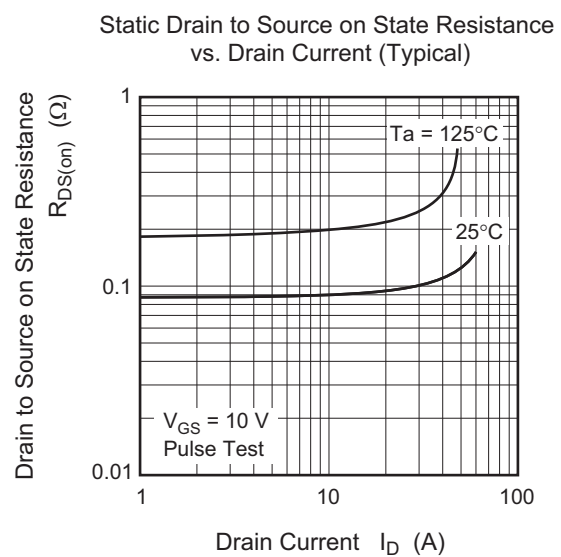
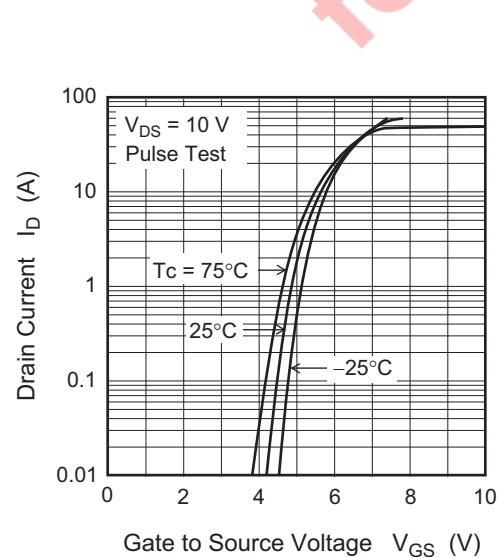
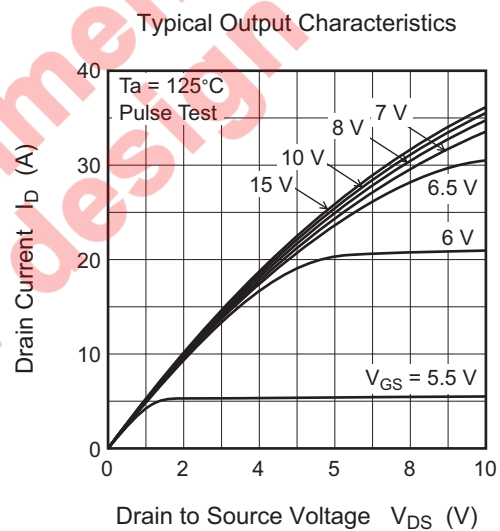
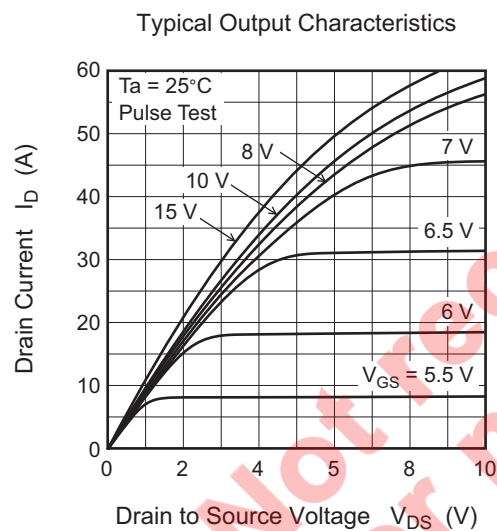
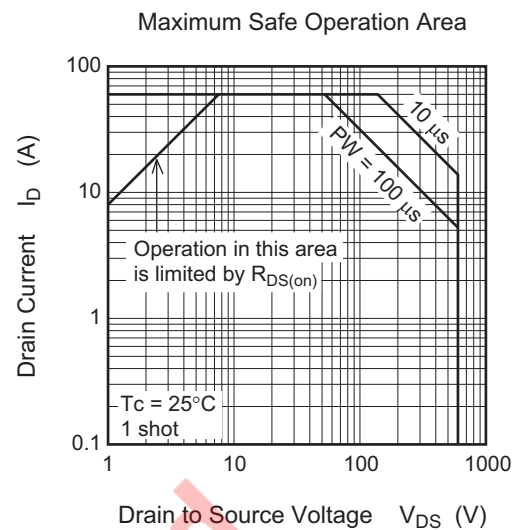
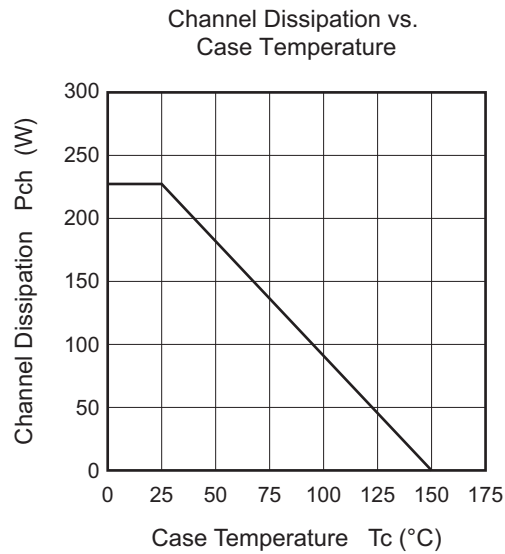
Electrical Characteristics

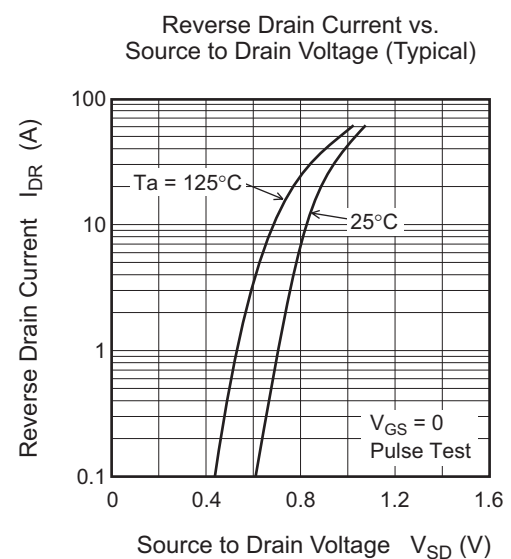
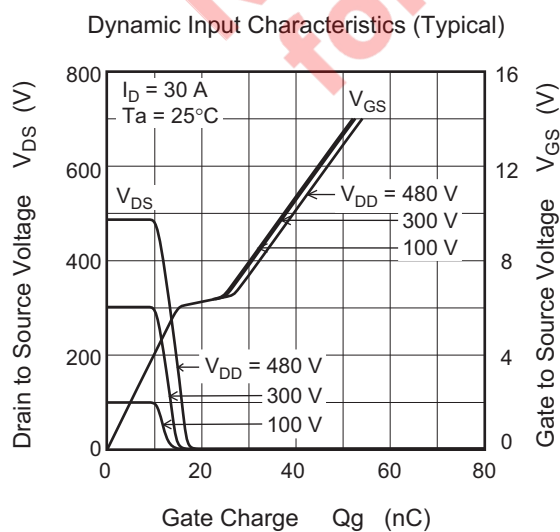
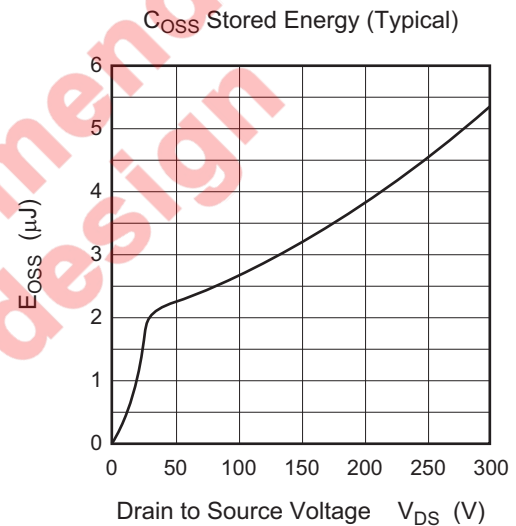
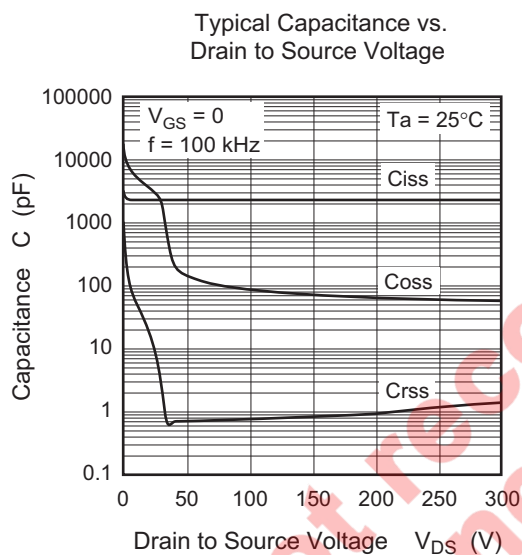
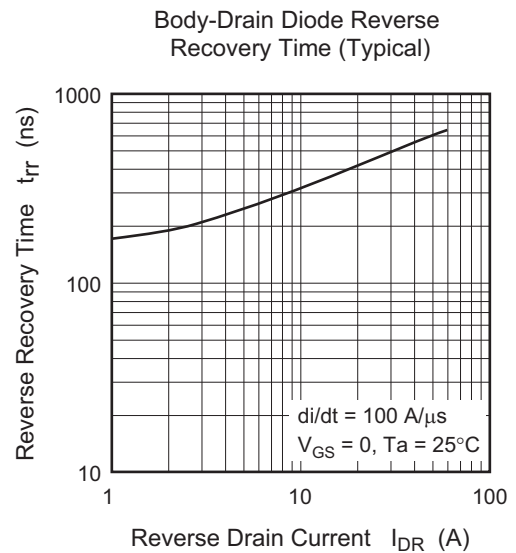
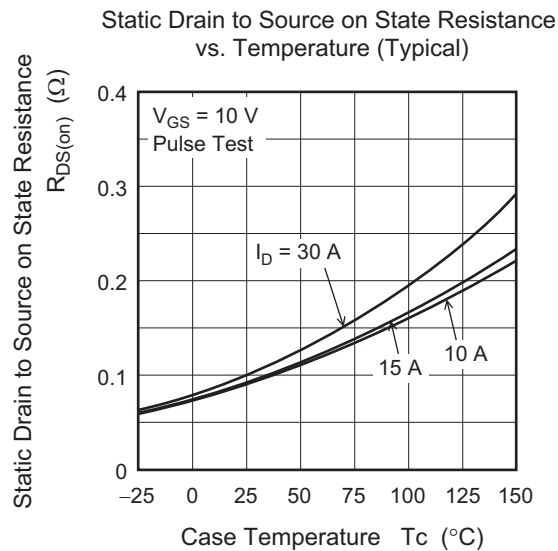
(Ta = 25°C)

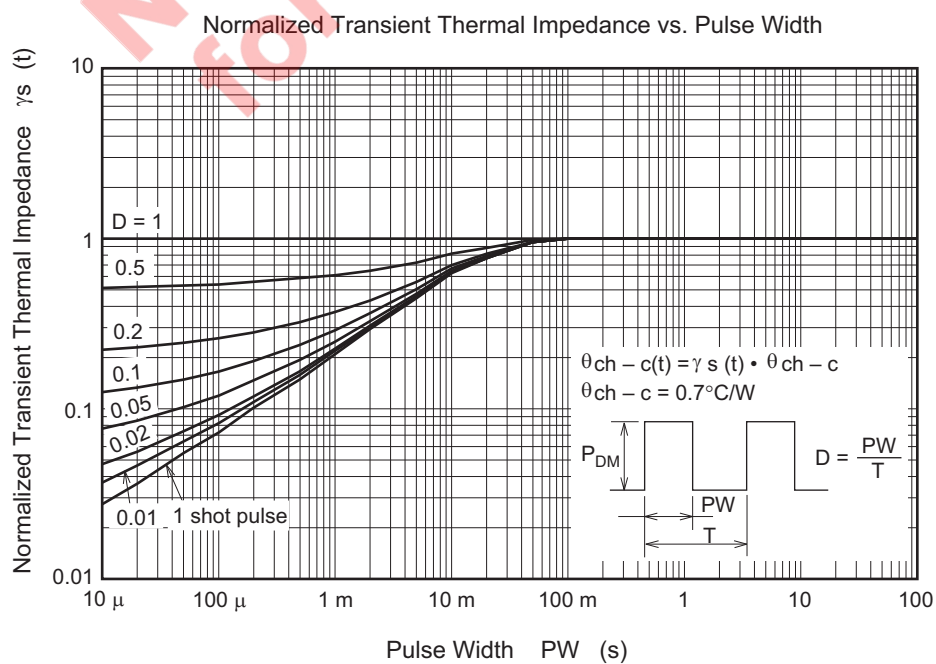
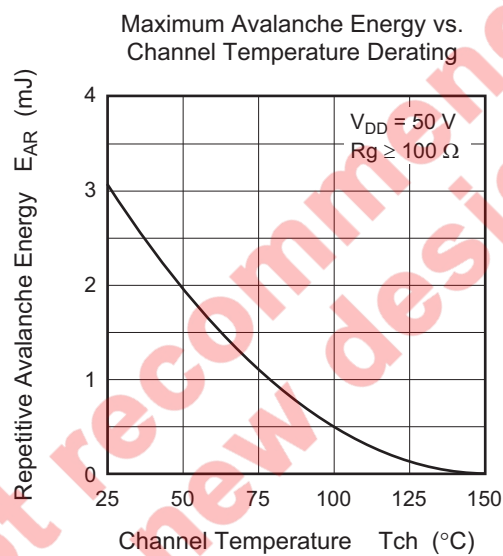
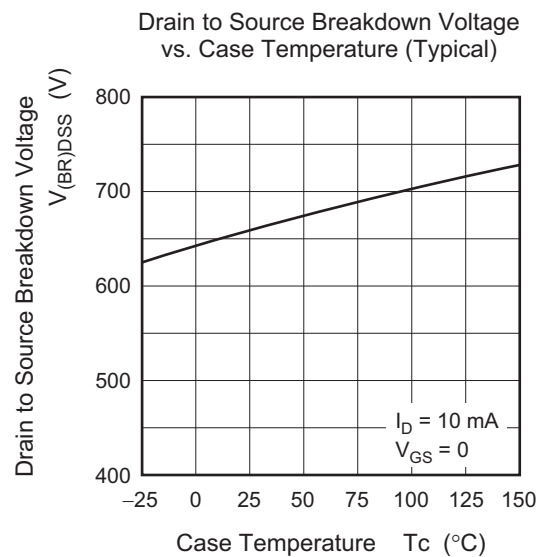
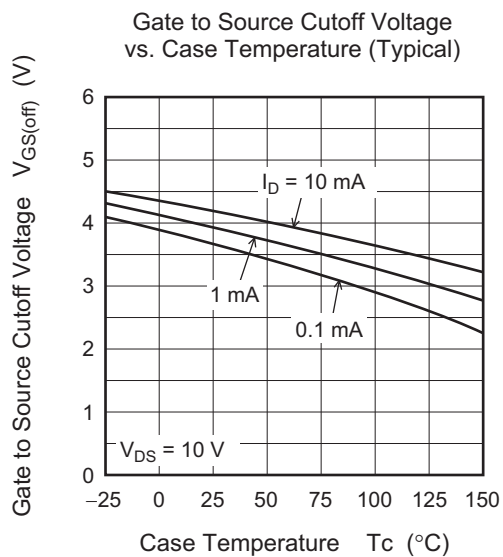
| Item | Symbol | Min | Typ | Max | Unit | Test conditions |
|--|---------------|-----|-------|-----------|---------------|---|
| Drain to source breakdown voltage | $V_{(BR)DSS}$ | 600 | — | — | V | $I_D = 10 \text{ mA}$, $V_{GS} = 0$ |
| Zero gate voltage drain current | I_{DSS} | — | — | 1 | mA | $V_{DS} = 600 \text{ V}$, $V_{GS} = 0$ |
| Gate to source leak current | I_{GSS} | — | — | ± 0.1 | μA | $V_{GS} = +30\text{V}$, -20 V , $V_{DS} = 0$ |
| Gate to source cutoff voltage | $V_{GS(off)}$ | 3 | — | 5 | V | $V_{DS} = 10 \text{ V}$, $I_D = 1 \text{ mA}$ |
| Static drain to source on state resistance | $R_{DS(on)}$ | — | 0.100 | 0.125 | Ω | $I_D = 15 \text{ A}$, $V_{GS} = 10 \text{ V}$ ^{Note4} |
| | $R_{DS(on)}$ | — | 0.25 | — | Ω | Ta = 150°C $I_D = 15 \text{ A}$, $V_{GS} = 10 \text{ V}$ ^{Note4} |
| Gate resistance | Rg | — | 2.0 | — | Ω | f = 1 MHz $V_{DS} = 25 \text{ V}$, $V_{GS} = 0$ |
| Input capacitance | Ciss | — | 2300 | — | pF | $V_{DS} = 25 \text{ V}$ $V_{GS} = 0$ f = 100 kHz |
| Output capacitance | Coss | — | 3000 | — | pF | |
| Reverse transfer capacitance | Crss | — | 10 | — | pF | |
| Turn-on delay time | $t_{d(on)}$ | — | 27 | — | ns | $I_D = 15 \text{ A}$ $V_{GS} = 10 \text{ V}$ $R_L = 20 \Omega$ Rg = 10 Ω ^{Note4} |
| Rise time | t_r | — | 28 | — | ns | |
| Turn-off delay time | $t_{d(off)}$ | — | 55 | — | ns | |
| Fall time | t_f | — | 9 | — | ns | |
| Total gate charge | Qg | — | 39 | — | nC | $V_{DD} = 480 \text{ V}$ $V_{GS} = 10 \text{ V}$ $I_D = 30 \text{ A}$ ^{Note4} |
| Gate to source charge | Qgs | — | 15 | — | nC | |
| Gate to drain charge | Qgd | — | 11 | — | nC | |
| Body-drain diode forward voltage | V_{DF} | — | 1.0 | 1.6 | V | $I_F = 30 \text{ A}$, $V_{GS} = 0$ ^{Note4} |
| Body-drain diode reverse recovery time | t_{rr} | — | 490 | — | ns | $I_F = 30 \text{ A}$ $V_{GS} = 0$ $di_F/dt = 100 \text{ A}/\mu\text{s}$ ^{Note4} |
| Body-drain diode reverse recovery current | I_{rr} | — | 26 | — | A | |
| Body-drain diode reverse recovery charge | Q_{rr} | — | 7.1 | — | μC | |

Notes: 4 Pulse test

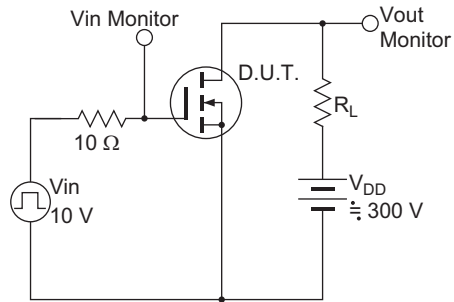
Main Characteristics



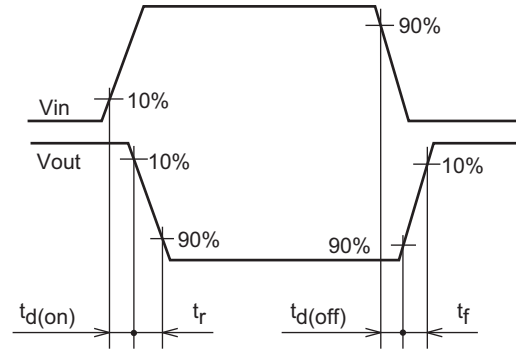




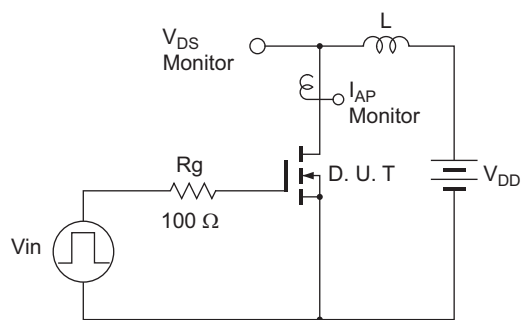
Switching Time Test Circuit



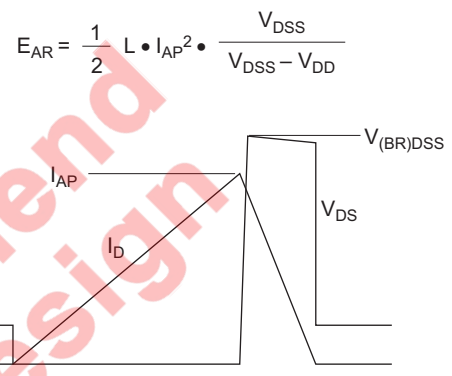
Waveform



Avalanche Test Circuit



Avalanche Waveform



Package Dimension

| Package Name | JEITA Package Code | RENESAS Code | Previous Code | MASS[Typ.] | Unit: mm |
|--------------|--------------------|--------------|---------------|------------|----------|
| TO-247 | — | PRSS0003ZE-A | — | 6.0g | |

Ordering Information

| Orderable Part Number | Quantity | Shipping Container |
|-----------------------|----------|--------------------|
| RJK60S7DPQ-E0#T2 | 240 pcs | Box (Tube) |

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