# RJK0630JPE

## Silicon N Channel MOS FET
## High Speed Power Switching

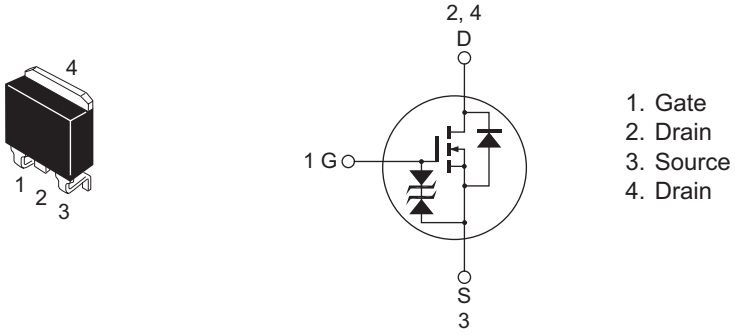
R07DS0340EJ0100
Rev.1.00
Apr 18, 2011

### Features

- For Automotive application
- AEC-Q101 compliant
- Low on-resistance : $R_{DS(on)}$ = 6.2 mΩ typ.
- Capable of 4.5 V gate drive
- Low input capacitance : Ciss = 2100 pF typ.

### Outline

RENESAS Package code: PRSS0004AE-B
(Package name: LDPAK(S)-(1) )




### 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 | $I_D$ | 75 | A |
| Drain peak current | $I_D$ (pulse) Note1 | 300 | A |
| Body-drain diode reverse drain current | $I_{DR}$ | 75 | A |
| Body-drain diode reverse drain peak current | $I_{DR}$ (pulse) Note1 | 300 | A |
| Avalanche current | $I_{AP}$ Note2 | 35 | A |
| Avalanche energy | $E_{AR}$ Note2 | 105 | mJ |
| Channel dissipation | Pch Note3 | 85 | W |
| Channel temperature | Tch Note4 | 175 | °C |
| Storage temperature | Tstg | –55 to +150 | °C |

Notes: 1. PW ≤ 10 μs, duty cycle ≤ 1%
2. Tch = 25°C, Rg ≥ 50 Ω
3. Tc = 25°C
4. AEC-Q101 compliant

### Thermal Impedance Characteristics

- Channel to case thermal impedance θch-c: 1.76°C/W

## Electrical Characteristics

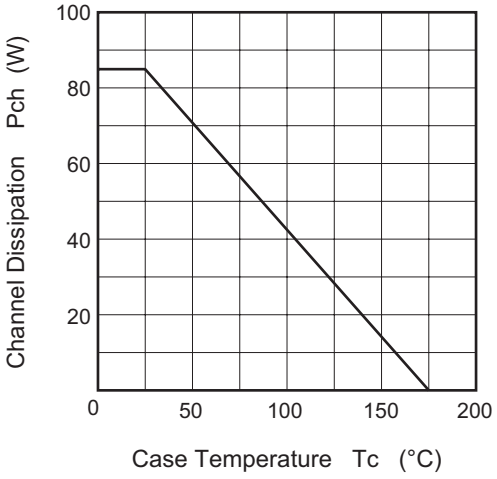
(Ta = 25°C)

| Item | Symbol | Min | Typ | Max | Unit | Test Conditions |
|---|---|---|---|---|---|---|
| Gate to source leak current | $I_{GSS}$ | — | — | ±10 | μA | $V_{GS}$ = ±20 V, $V_{DS}$ = 0 |
| Zero gate voltage drain current | $I_{DSS}$ | — | — | 1 | μA | $V_{DS}$ = 60 V, $V_{GS}$ = 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 | $R_{DS(on)}$ | — | 6.2 | 7.5 | mΩ | $I_D$ = 38 A, $V_{GS}$= 10 V Note5 |
| | | — | 8.5 | 11.5 | mΩ | $I_D$ = 38 A, $V_{GS}$= 4.5 V Note5 |
| Input capacitance | Ciss | — | 2100 | — | pF | $V_{DS}$ = 10 V, $V_{GS}$ = 0 f = 1 MHz |
| Output capacitance | Coss | — | 550 | — | pF | |
| Reverse transfer capacitance | Crss | — | 420 | — | pF | |
| Total gate charge | Qg | — | 49 | — | nC | $V_{DD}$ = 10 V, $V_{GS}$ = 10 V, $I_D$ = 75 A |
| Gate to source charge | Qgs | — | 7 | — | nC | |
| Gate to drain charge | Qgd | — | 15 | — | nC | |
| Turn-on delay time | $t_{d(on)}$ | — | 16 | — | ns | $I_D$= 38 A, $R_L$ = 2.0 Ω, $V_{GS}$ = 10 V, $R_G$ = 4.7 Ω |
| Rise time | $t_r$ | — | 17 | — | ns | |
| Turn-off delay time | $t_{d(off)}$ | — | 65 | — | ns | |
| Fall time | $t_f$ | — | 18 | — | ns | |
| Body-drain diode forward voltage | $V_{DF}$ | — | 0.94 | — | V | $I_F$ = 75 A, $V_{GS}$ = 0 Note5 |
| Body-drain diode reverse recovery time | $t_{rr}$ | — | 45 | — | ns | $I_F$ = 75 A, $V_{GS}$ = 0, $di_F/dt$ = 100 A/μs |

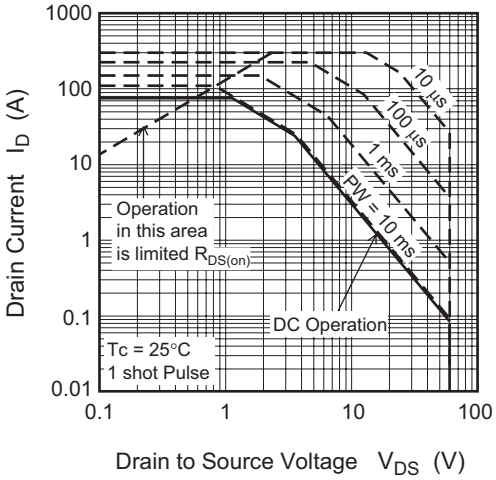
Note: 5. Pulse test

## Main Characteristics

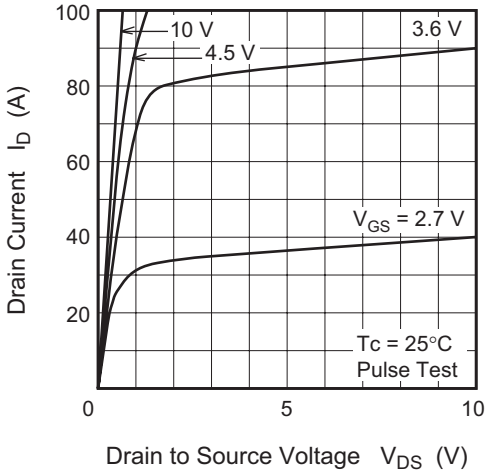
Power vs. Temperature Derating



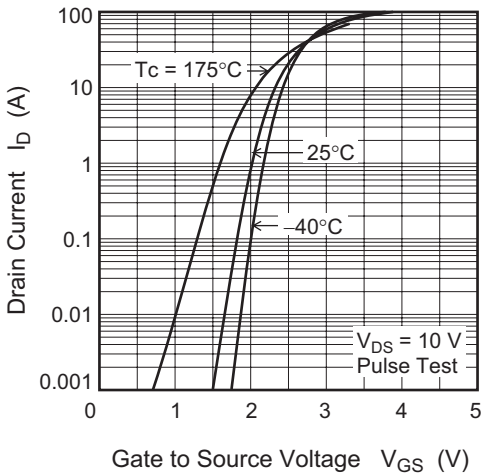

Maximum Safe Operation Area



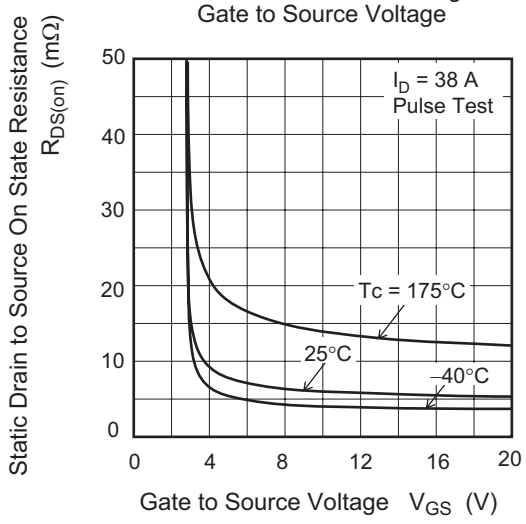

Typical Output Characteristics



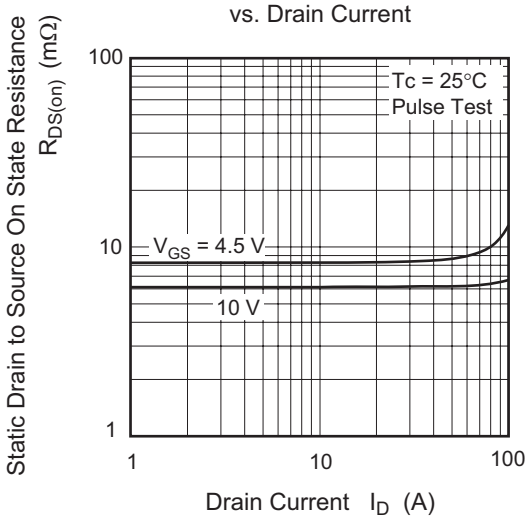

Typical Transfer Characteristics



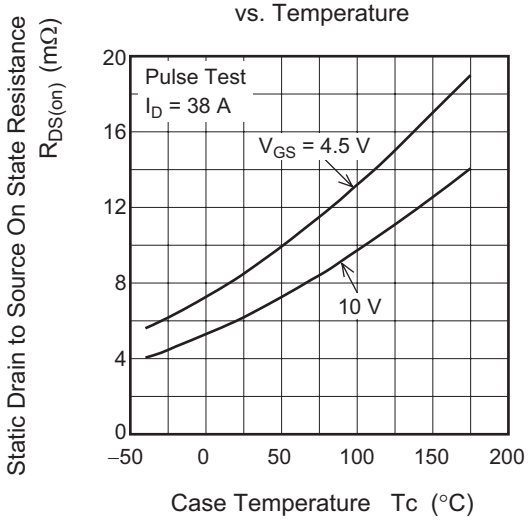

Drain Source Saturation Voltage vs. Gate to Source Voltage



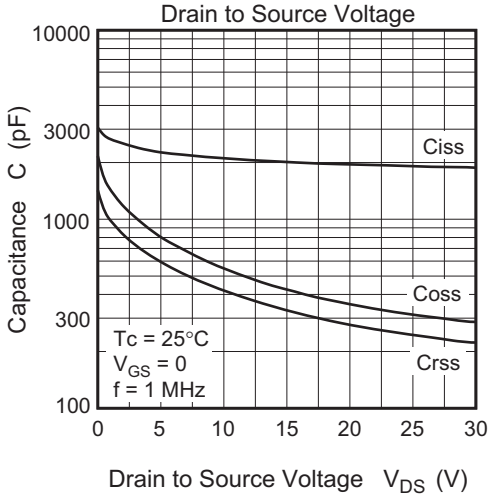

Static Drain to Source State Resistance vs. Drain Current



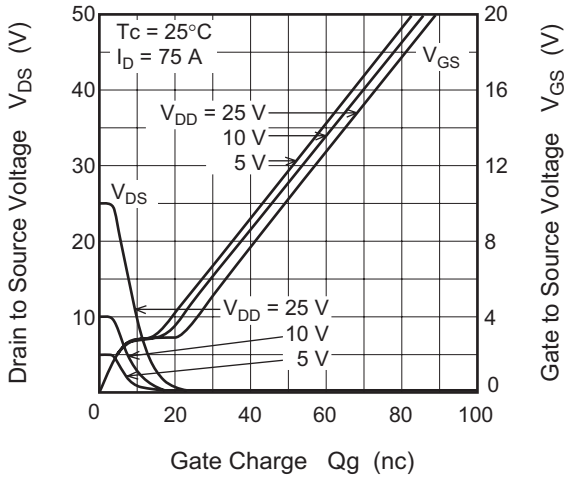
Static Drain to Source on State Resistance vs. Temperature



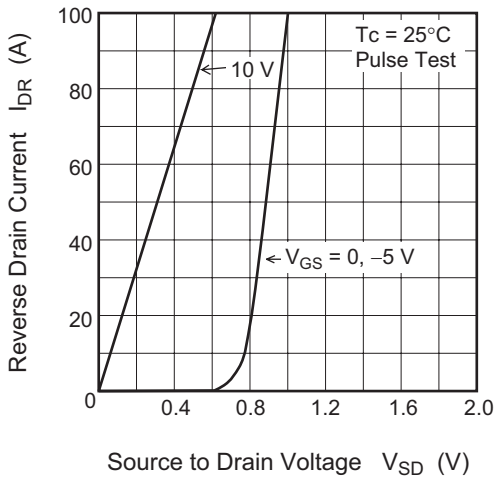

Typical Capacitance vs. Drain to Source Voltage



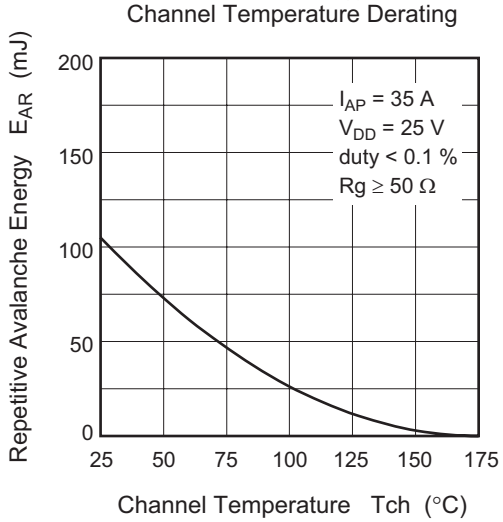

Dynamic Input Characteristics



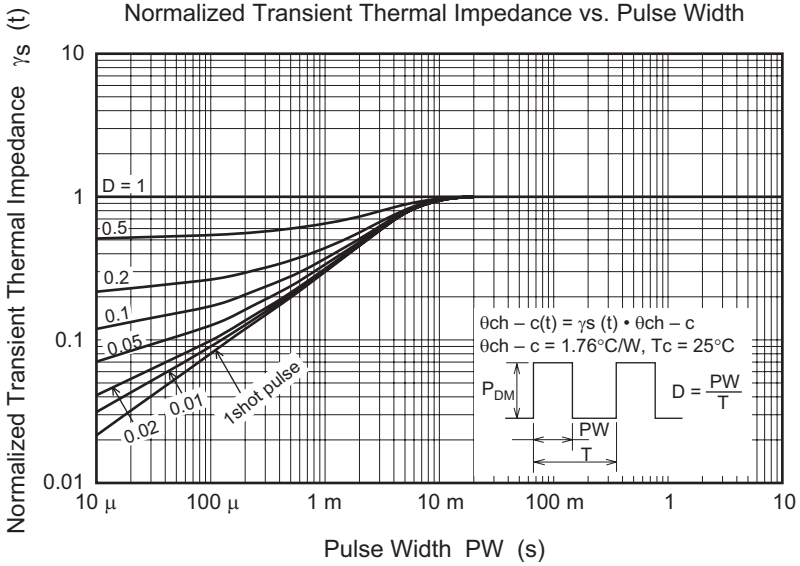

Reverse Drain Current vs. Source to Drain Voltage



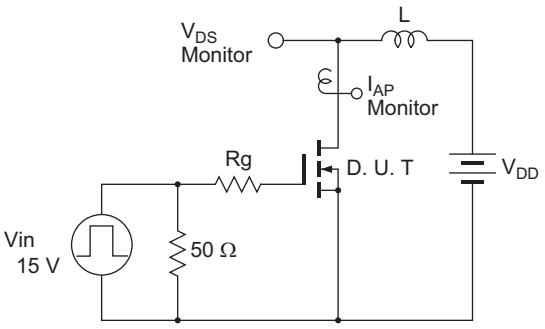

Avalanche Energy vs. Channel Temperature Derating



Normalized Transient Thermal Impedance vs. Pulse Width

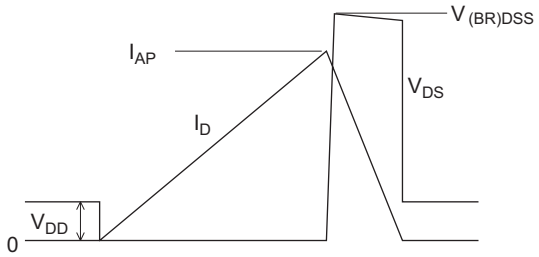



Avalanche Test Circuit

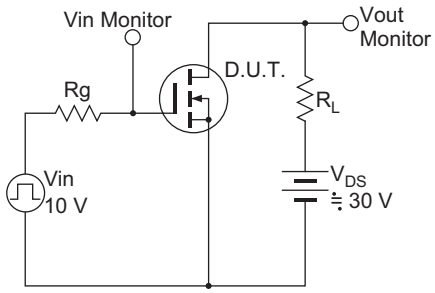



Avalanche Waveform

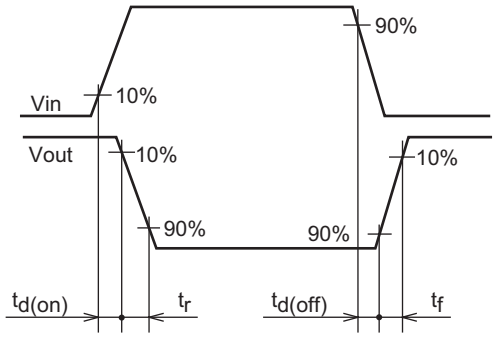
$$E_{AR} = \frac{1}{2} L \bullet I_{AP}^2 \bullet \frac{V_{DSS}}{V_{DSS} - V_{DD}}$$




Switching Time Test Circuit



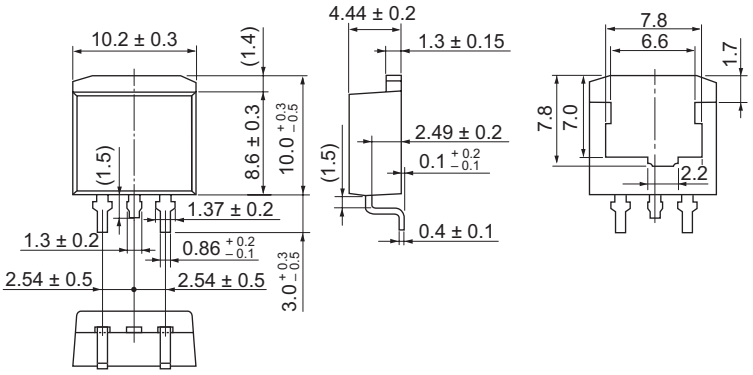

Switching Time Waveform



## Package Dimensions

| Package Name | JEITA Package Code | RENESAS Code | Previous Code | MASS[Typ.] |
|---|---|---|---|---|
| LDPAK(S)-(1) | SC-83 | PRSS0004AE-B | LDPAK(S)-(1) / LDPAK(S)-(1)V | 1.30g |

Unit: mm




## Ordering Information

| Orderable Part Number | Quantity | Shipping Container |
|---|---|---|
| RJK0630JPE-00-J3 | 1000 pcs | Taping (Sinistrorse) |

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