

# RJK6032DPH-E0

600V - 3A - MOS FET  
High Speed Power Switching

R07DS0993EJ0100

Rev.1.00

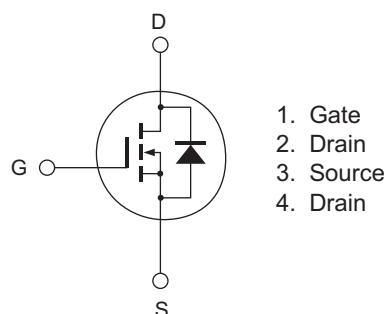
Jan 23, 2013

## Features

- Low on-resistance  
 $R_{DS(on)} = 3.3 \Omega$  typ. (at  $I_D = 1.0 \text{ A}$ ,  $V_{GS} = 10 \text{ V}$ ,  $T_a = 25^\circ\text{C}$ )
- Low drive current
- High density mounting

## Outline

RENESAS Package code: PRSS0004ZJ-B  
(Package name: TO-251)



## 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	$V_{GSS}$	$\pm 30$	V
Drain current	$I_D$	3	A
Drain peak current	$I_{D(pulse)}$ <sup>Note1</sup>	6	A
Body-drain diode reverse drain current	$I_{DR}$	3	A
Body-drain diode reverse drain peak current	$I_{DR(pulse)}$ <sup>Note1</sup>	6	A
Avalanche current	$I_{AP}$ <sup>Note2</sup>	3	A
Avalanche energy	$E_{AR}$ <sup>Note2</sup>	0.49	mJ
Channel dissipation	$P_{ch}$ <sup>Note3</sup>	40.3	W
Channel to case thermal impedance	$\theta_{ch-c}$	3.1	$^\circ\text{C/W}$
Channel temperature	$T_{ch}$	150	$^\circ\text{C}$
Storage temperature	$T_{stg}$	-55 to +150	$^\circ\text{C}$

Notes: 1.  $PW \leq 10 \mu\text{s}$ , duty cycle  $\leq 1\%$

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)

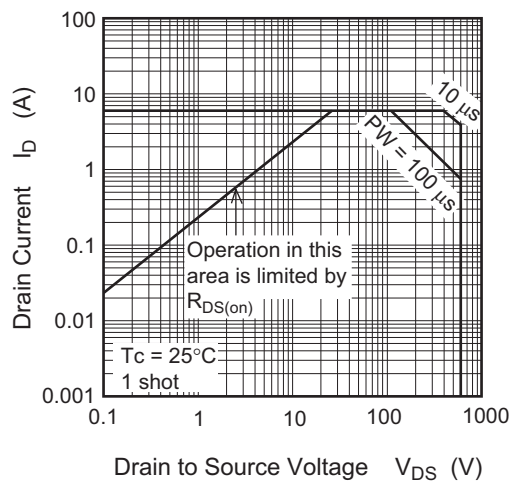
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	600	—	—	V	$I_D = 10 \text{ mA}$ , $V_{GS} = 0$
Zero gate voltage drain current	$I_{DSS}$	—	—	1	$\mu\text{A}$	$V_{DS} = 600 \text{ V}$ , $V_{GS} = 0$
Gate to source leak current	$I_{GSS}$	—	—	$\pm 0.1$	$\mu\text{A}$	$V_{GS} = \pm 30 \text{ V}$ , $V_{DS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	3.5	—	4.5	V	$V_{DS} = 10 \text{ V}$ , $I_D = 1 \text{ mA}$
Static drain to source on state resistance	$R_{DS(on)}$	—	3.3	4.3	$\Omega$	$I_D = 1.5 \text{ A}$ , $V_{GS} = 10 \text{ V}$ <sup>Note4</sup>
Input capacitance	$C_{iss}$	—	285	—	pF	$V_{DS} = 25 \text{ V}$ $V_{GS} = 0$ $f = 1 \text{ MHz}$
Output capacitance	$C_{oss}$	—	31	—	pF	
Reverse transfer capacitance	$C_{rss}$	—	3.5	—	pF	
Turn-on delay time	$t_{d(on)}$	—	13	—	ns	$I_D = 1.5 \text{ A}$ $V_{GS} = 10 \text{ V}$ $R_L = 200 \Omega$ $R_g = 10 \Omega$
Rise time	$t_r$	—	13	—	ns	
Turn-off delay time	$t_{d(off)}$	—	22	—	ns	
Fall time	$t_f$	—	22	—	ns	
Total gate charge	$Q_g$	—	9.0	—	nC	$V_{DD} = 480 \text{ V}$ $V_{GS} = 10 \text{ V}$ $I_D = 3 \text{ A}$
Gate to source charge	$Q_{gs}$	—	1.7	—	nC	
Gate to drain charge	$Q_{gd}$	—	4.9	—	nC	
Body-drain diode forward voltage	$V_{DF}$	—	0.9	1.5	V	$I_F = 3 \text{ A}$ , $V_{GS} = 0$ <sup>Note4</sup>
Body-drain diode reverse recovery time	$t_{rr}$	—	300	—	ns	$I_F = 3 \text{ A}$ , $V_{GS} = 0$ $di_F/dt = 100 \text{ A}/\mu\text{s}$

Notes: 4. Pulse test

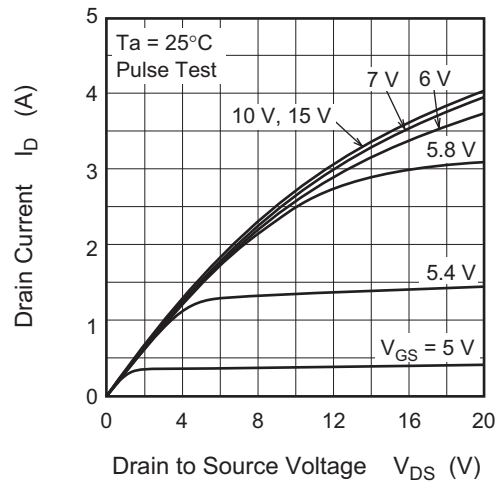
5. Since this device is equipped with high voltage FET chip ( $V_{DSS} \geq 600 \text{ V}$ ), high voltage may be supplied. Therefore, please be sure to confirm about Electric discharge between Drain terminal and other terminal.
6. This device is sensitive to electrostatic discharge.  
It is recommended to adopt appropriate cautions when handling this product.

## Main Characteristics

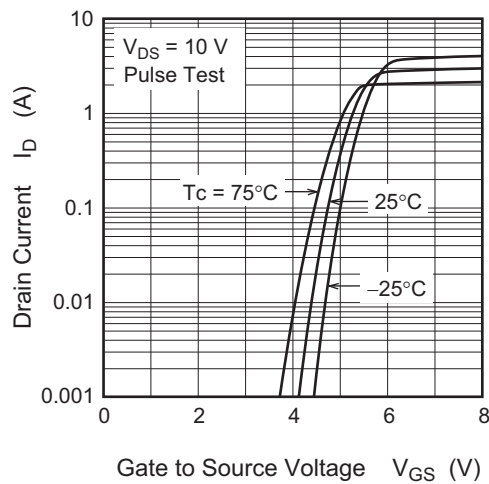
Maximum Safe Operation Area



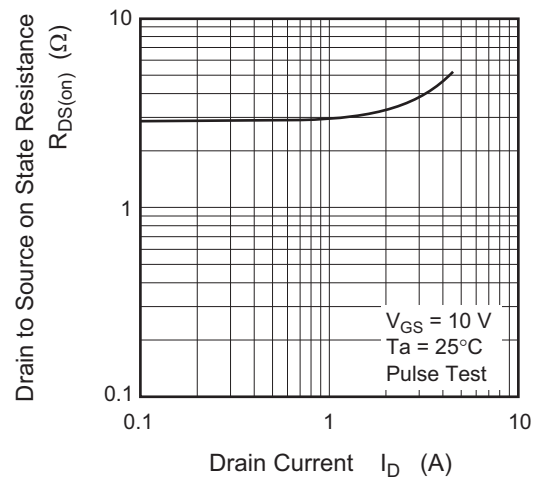
Typical Output Characteristics



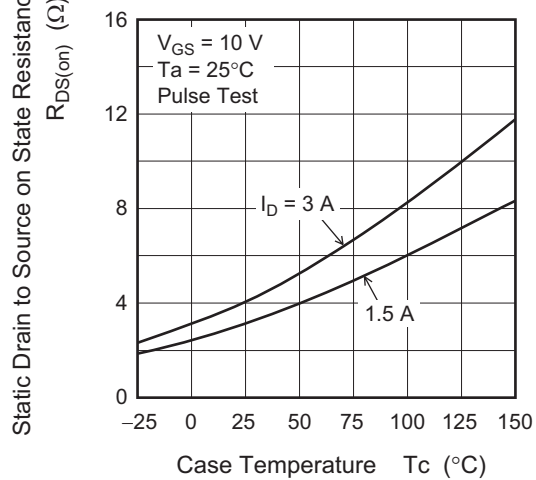
Typical Transfer Characteristics



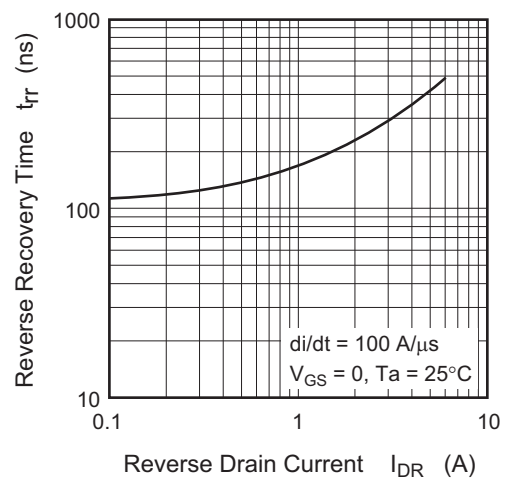
Static Drain to Source on State Resistance vs. Drain Current (Typical)

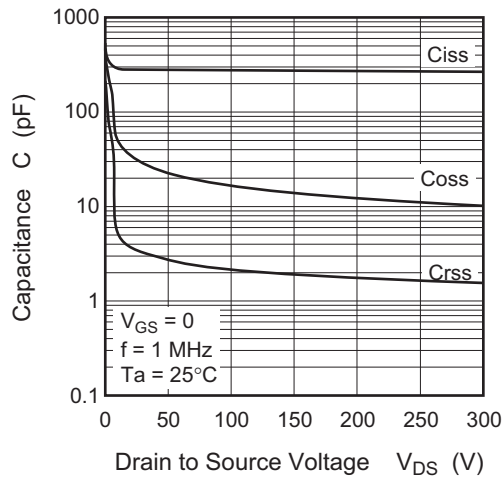


Static Drain to Source on State Resistance vs. Temperature (Typical)

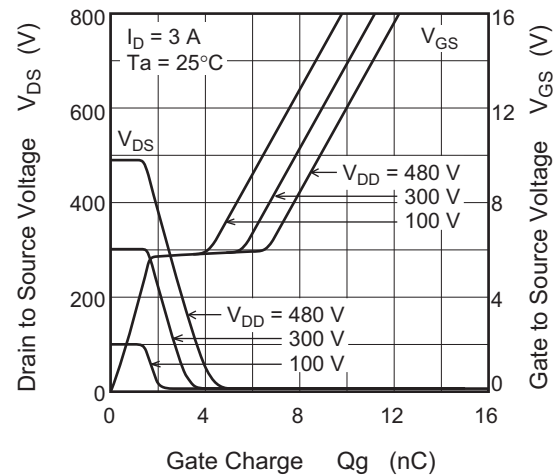
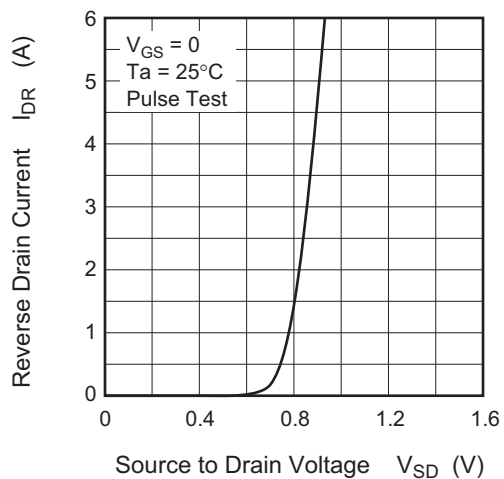
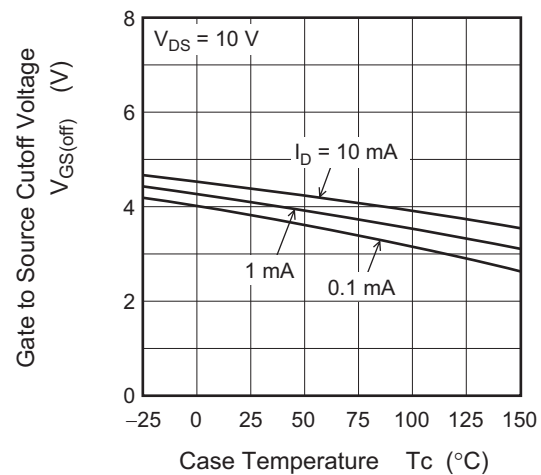


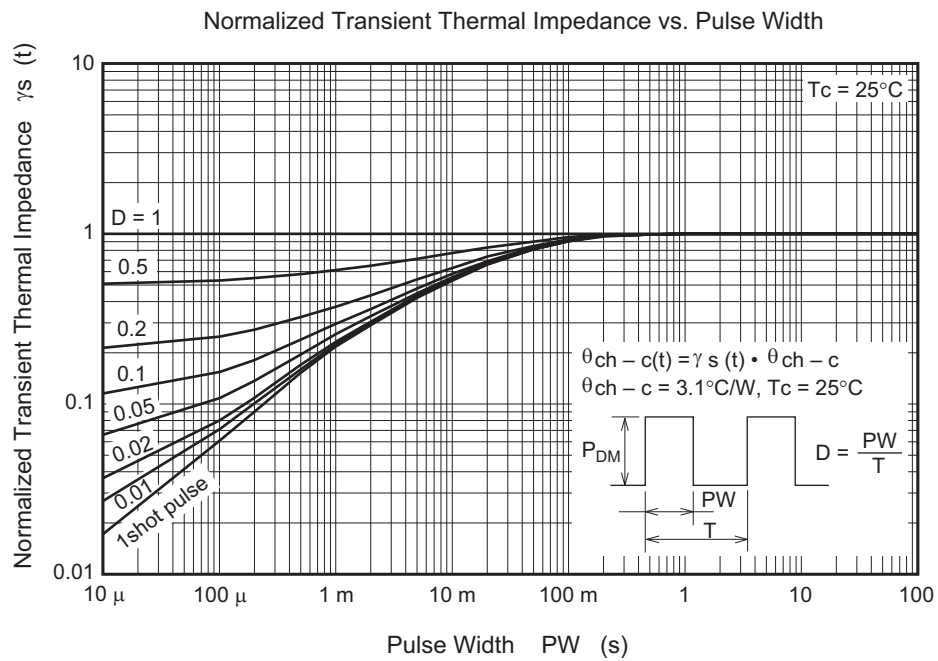
Body-Drain Diode Reverse Recovery Time (Typical)



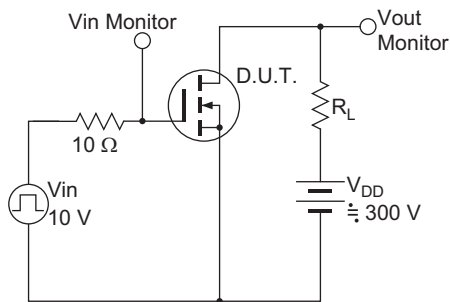
Typical Capacitance vs.  
Drain to Source Voltage

Dynamic Input Characteristics (Typical)

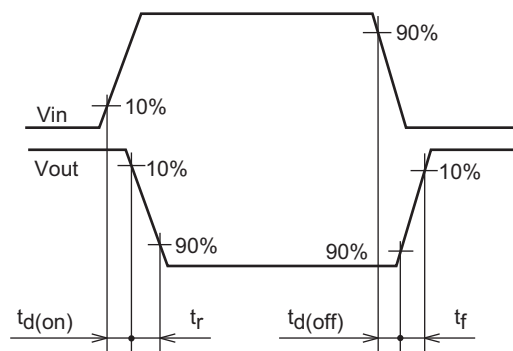
Reverse Drain Current vs.  
Source to Drain Voltage (Typical)Gate to Source Cutoff Voltage  
vs. Case Temperature (Typical)



Switching Time Test Circuit



Waveform



## Package Dimensions

Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]	Unit: mm
TO-251	—	PRSS0004ZJ-B	TO-251S	0.38g	

The drawing shows the mechanical dimensions of the RJK6032DPH-E0 package. The top view shows a square body with a width of  $6.6 \pm 0.5$  mm and a height of  $6.1 \pm 0.5$  mm. The body has a central circular feature with a diameter of  $5.34 \pm 0.5$  mm. The side view shows a total height of  $9.3 \pm 0.5$  mm, with a body height of  $6.1 \pm 0.5$  mm and a lead height of  $1.8 \pm 0.5$  mm. The bottom view shows a square base with a width of  $2.3$  mm and a height of  $0.50^{+0.10}_{-0.05}$  mm. The leads are spaced  $2.3$  mm apart. The lead thickness is  $0.76 \pm 0.10$  mm, and the lead width is  $0.96$  max. mm. The package is shown in a TO-251 configuration.

## Ordering Information

Orderable Part Number	Quantity	Shipping Container
RJK6032DPH-E0#T2	70 pcs	Tube

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