

# RJK4006DPP-M0

Silicon N Channel MOS FET  
High Speed Power Switching

R07DS0228EJ0100

Rev.1.00

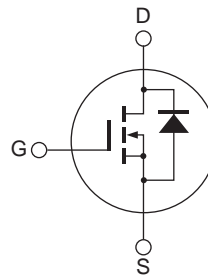
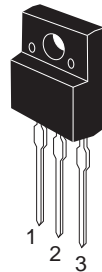
Dec 14, 2010

## Features

- Low on-resistance  
 $R_{DS(on)} = 0.69 \Omega$  typ. ( $I_D = 4 \text{ A}$ ,  $V_{GS} = 10 \text{ V}$ ,  $T_a = 25^\circ\text{C}$ )
- Low leakage current
- High speed switching

## Outline

RENESAS Package code: PRSS0003AF-A  
(Package name: TO-220FL)



1. Gate
2. Drain
3. Source

## Absolute Maximum Ratings

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

Item	Symbol	Ratings	Unit
Drain to source voltage	$V_{DSS}$	400	V
Gate to source voltage	$V_{GSS}$	$\pm 30$	V
Drain current	$I_D$ <sup>Note4</sup>	8	A
Drain peak current	$I_{D(pulse)}$ <sup>Note1</sup>	24	A
Body-drain diode reverse drain current	$I_{DR}$	8	A
Body-drain diode reverse drain peak current	$I_{DR(pulse)}$ <sup>Note1</sup>	24	A
Avalanche current	$I_{AP}$ <sup>Note3</sup>	8	A
Avalanche energy	$E_{AR}$ <sup>Note3</sup>	8.5	mJ
Channel dissipation	$P_{ch}$ <sup>Note2</sup>	29	W
Channel to case thermal impedance	$\theta_{ch-c}$	4.31	$^\circ\text{C}/\text{W}$
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. Value at  $T_c = 25^\circ\text{C}$   
 3.  $ST_{ch} = 25^\circ\text{C}$ ,  $T_{ch} \leq 150^\circ\text{C}$   
 4. Limited by maximum safe operation area

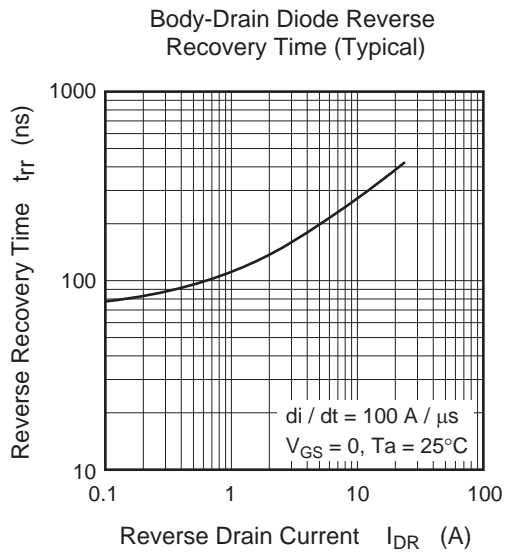
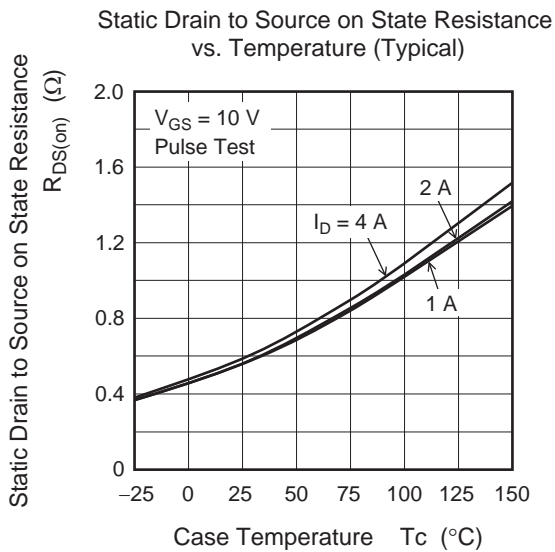
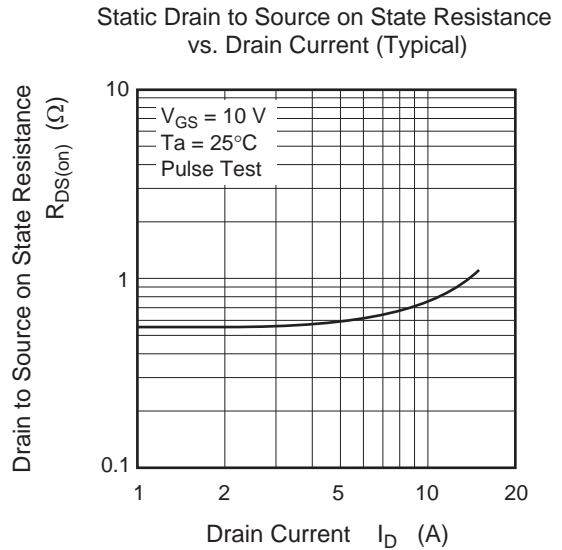
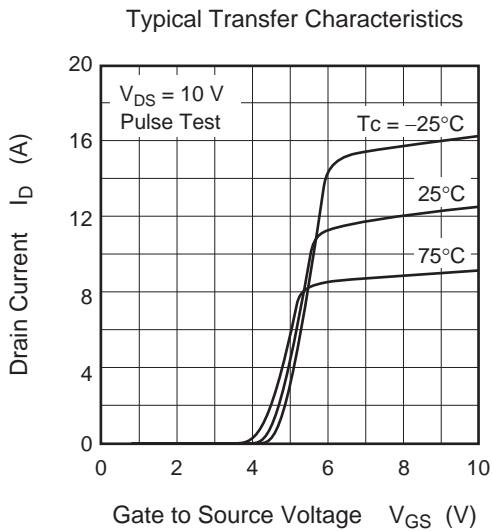
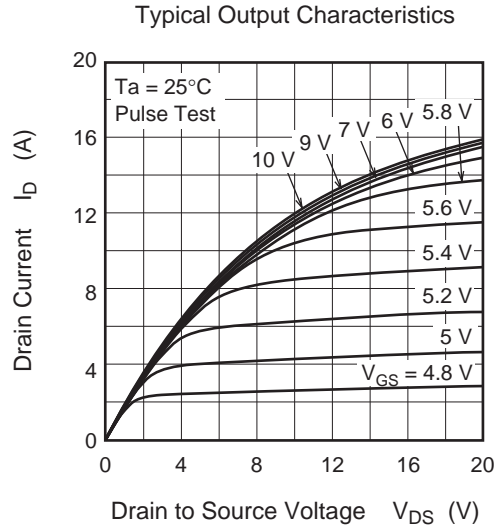
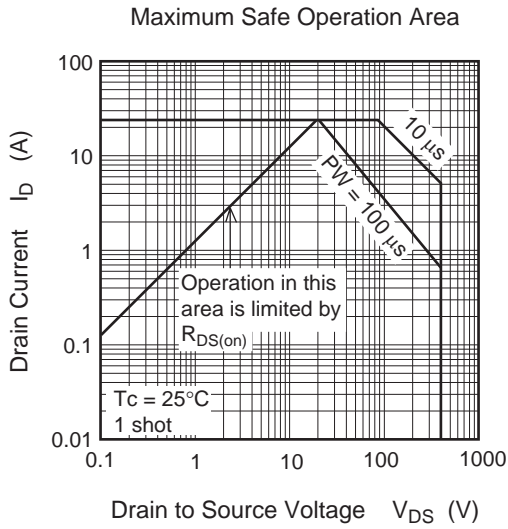
## Electrical Characteristics

(Ta = 25°C)

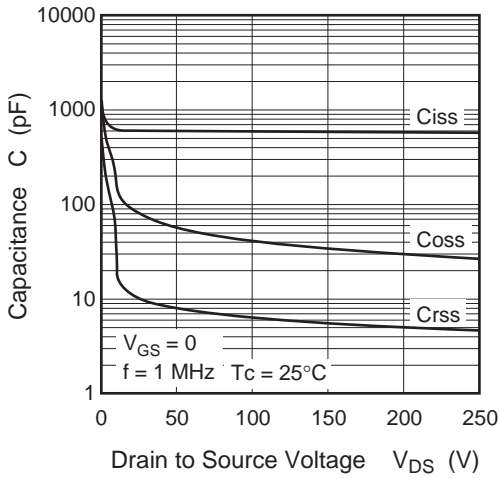
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	400	—	—	V	$I_D = 10 \text{ mA}$ , $V_{GS} = 0$
Zero gate voltage drain current	$I_{DSS}$	—	—	1	$\mu\text{A}$	$V_{DS} = 400 \text{ V}$ , $V_{GS} = 0$
Gate to source leak current	$I_{GSS}$	—	—	$\pm 0.1$	$\mu\text{A}$	$V_{GS} = \pm 30 \text{ V}$ , $V_{DS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	3.0	—	4.5	V	$V_{DS} = 10 \text{ V}$ , $I_D = 1 \text{ mA}$
Static drain to source on state resistance	$R_{DS(on)}$	—	0.69	0.80	$\Omega$	$I_D = 4 \text{ A}$ , $V_{GS} = 10 \text{ V}$ <sup>Note5</sup>
Input capacitance	$C_{iss}$	—	620	—	pF	$V_{DS} = 25 \text{ V}$
Output capacitance	$C_{oss}$	—	80	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	$C_{rss}$	—	11	—	pF	$f = 1 \text{ MHz}$
Turn-on delay time	$t_{d(on)}$	—	30	—	ns	$I_D = 4 \text{ A}$
Rise time	$t_r$	—	30	—	ns	$V_{GS} = 10 \text{ V}$
Turn-off delay time	$t_{d(off)}$	—	60	—	ns	$R_L = 50 \Omega$
Fall time	$t_f$	—	20	—	ns	$R_g = 10 \Omega$
Total gate charge	$Q_g$	—	20	—	nC	$V_{DD} = 320 \text{ V}$
Gate to source charge	$Q_{gs}$	—	4	—	nC	$V_{GS} = 10 \text{ V}$
Gate to drain charge	$Q_{gd}$	—	9	—	nC	$I_D = 8 \text{ A}$
Body-drain diode forward voltage	$V_{DF}$	—	0.9	1.5	V	$I_F = 8 \text{ A}$ , $V_{GS} = 0$ <sup>Note5</sup>
Body-drain diode reverse recovery time	$t_{rr}$	—	230	—	ns	$I_F = 8 \text{ A}$ , $V_{GS} = 0$ $di_F/dt = 100 \text{ A}/\mu\text{s}$

Notes: 5. Pulse test

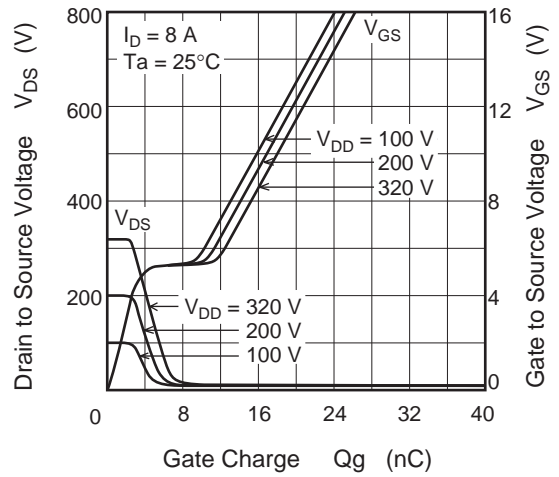
Main Characteristics



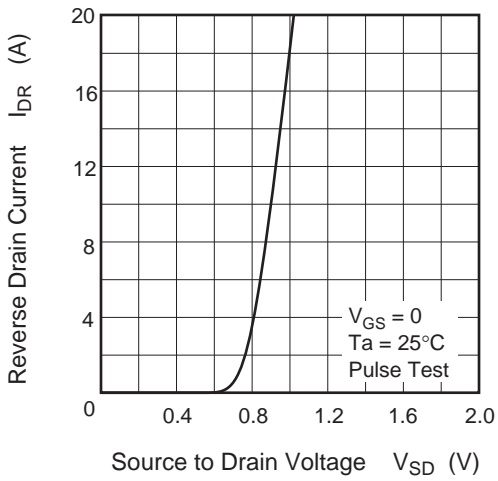
Typical Capacitance vs. Drain to Source Voltage



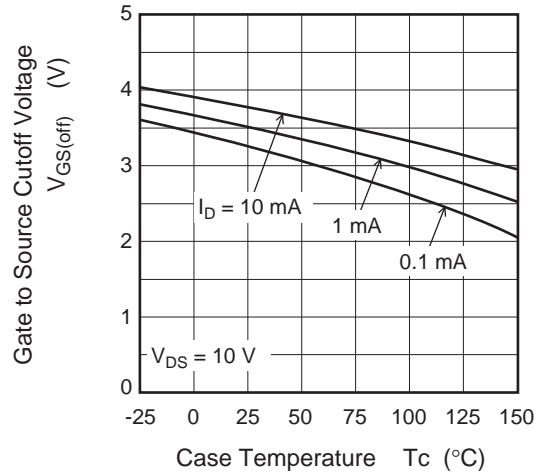
Dynamic Input Characteristics (Typical)



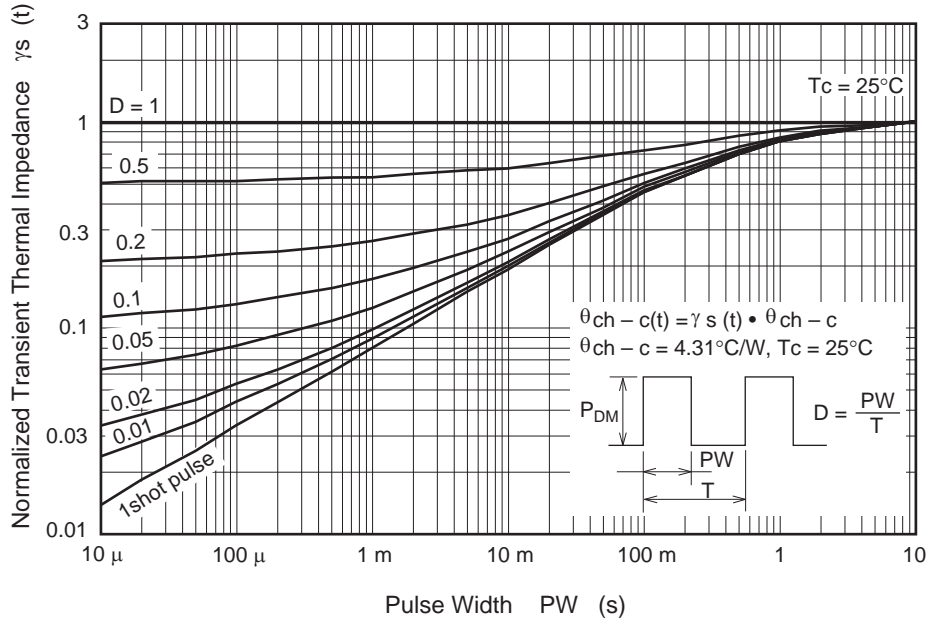
Reverse Drain Current vs. Source to Drain Voltage (Typical)



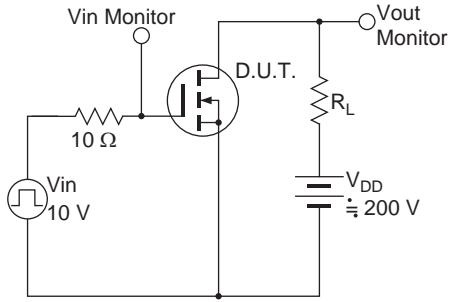
Gate to Source Cutoff Voltage vs. Case Temperature (Typical)



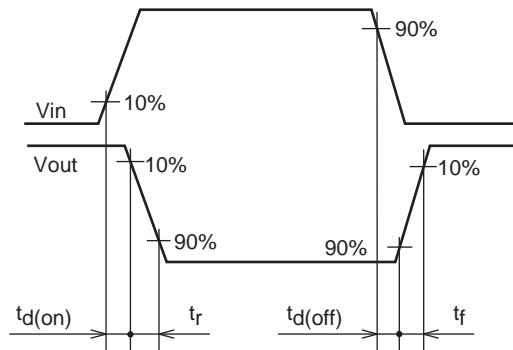
Normalized Transient Thermal Impedance vs. Pulse Width



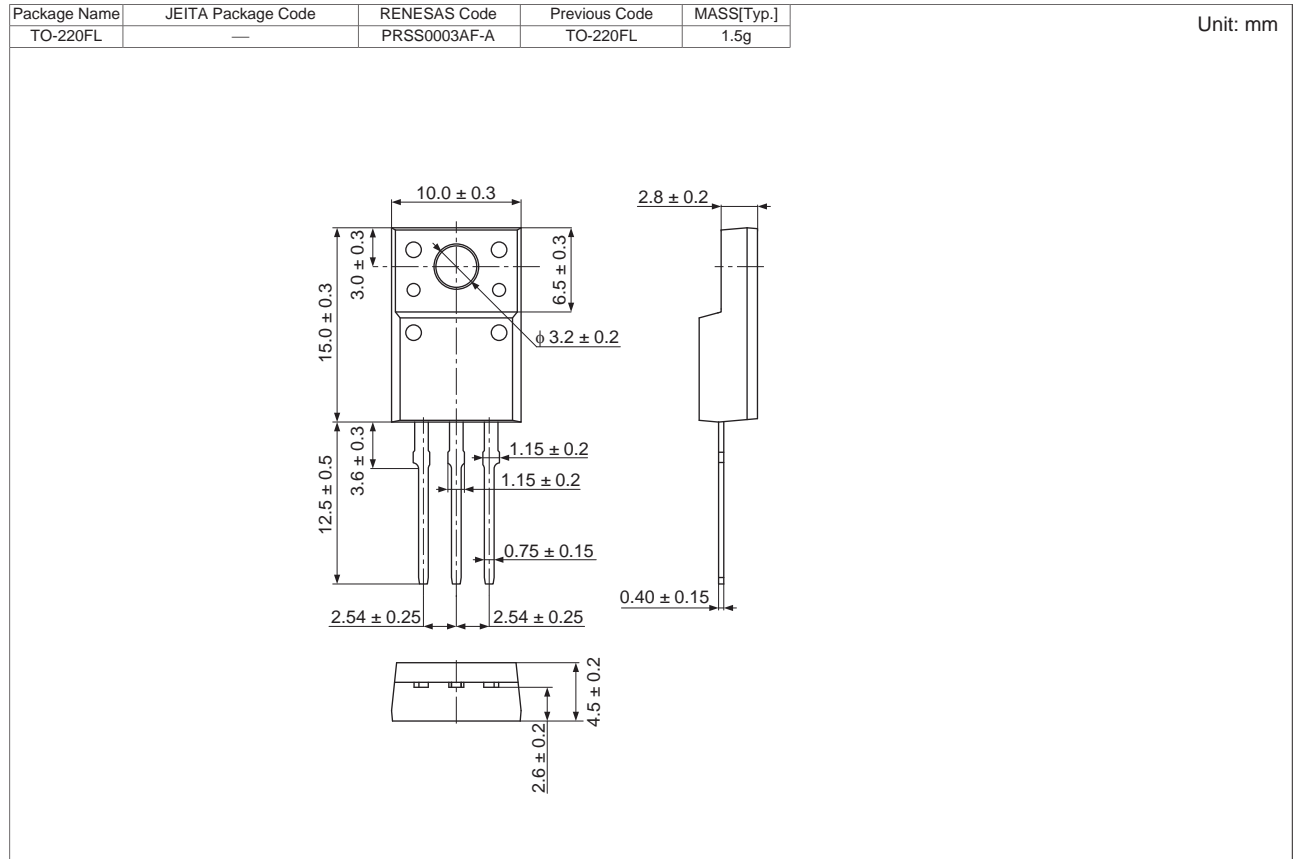
Switching Time Test Circuit



Waveform



### Package Dimension



### Ordering Information

Orderable Part Number	Quantity	Shipping Container
RJK4006DPP-M0-T2	1050 pcs	Box (Tube)

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2880 Scott Boulevard Santa Clara, CA 95050-2554, U.S.A.  
Tel: +1-408-588-6000, Fax: +1-408-588-6130

**Renesas Electronics Canada Limited**  
1101 Nicholson Road, Newmarket, Ontario L3Y 9C3, Canada  
Tel: +1-905-898-5441, Fax: +1-905-898-3220

**Renesas Electronics Europe Limited**  
Dukes Meadow, Millboard Road, Bourne End, Buckinghamshire, SL8 5FH, U.K  
Tel: +44-1628-585-100, Fax: +44-1628-585-900

**Renesas Electronics Europe GmbH**  
Arcadiastrasse 10, 40472 Düsseldorf, Germany  
Tel: +49-211-65030, Fax: +49-211-6503-1327

**Renesas Electronics (China) Co., Ltd.**  
7th Floor, Quantum Plaza, No.27 Zhichunlu Haidian District, Beijing 100083, P.R.China  
Tel: +86-10-8235-1155, Fax: +86-10-8235-7679

**Renesas Electronics (Shanghai) Co., Ltd.**  
Unit 204, 205, AZIA Center, No.1233 Lujiazui Ring Rd., Pudong District, Shanghai 200120, China  
Tel: +86-21-5877-1818, Fax: +86-21-6887-7858 / -7898

**Renesas Electronics Hong Kong Limited**  
Unit 1601-1613, 16/F., Tower 2, Grand Century Place, 193 Prince Edward Road West, Mongkok, Kowloon, Hong Kong  
Tel: +852-2886-9318, Fax: +852-2886-9022/9044

**Renesas Electronics Taiwan Co., Ltd.**  
7F, No. 363 Fu Shing North Road Taipei, Taiwan  
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Tel: +65-6213-0200, Fax: +65-6278-8001

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Tel: +60-3-7955-9390, Fax: +60-3-7955-9510

**Renesas Electronics Korea Co., Ltd.**  
11F., Samik Laviel'or Bldg., 720-2 Yeoksam-Dong, Kangnam-Ku, Seoul 135-080, Korea  
Tel: +82-2-558-3737, Fax: +82-2-558-5141