

# RJK5013DPK

## Silicon N Channel MOS FET High Speed Power Switching

REJ03G1491-0100

Rev.1.00

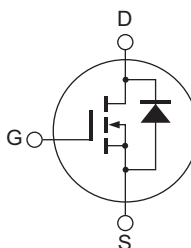
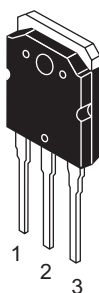
Nov 30, 2006

### Features

- Low on-resistance
- Low leakage current
- High speed switching

### 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	$V_{DSS}$	500	V
Gate to source voltage	$V_{GSS}$	$\pm 30$	V
Drain current	$I_D$	14	A
Drain peak current	$I_{D(pulse)}$ <sup>Note1</sup>	42	A
Body-drain diode reverse drain current	$I_{DR}$	14	A
Body-drain diode reverse drain peak current	$I_{DR(pulse)}$ <sup>Note1</sup>	42	A
Avalanche current	$I_{AP}$ <sup>Note3</sup>	4	A
Avalanche energy	$E_{AR}$ <sup>Note3</sup>	0.88	mJ
Channel dissipation	$P_{ch}$ <sup>Note2</sup>	100	W
Channel to case thermal impedance	$\theta_{ch-c}$	1.25	°C/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  $T_c = 25^\circ C$   
 3.  $STch = 25^\circ C$ ,  $T_{ch} \leq 150^\circ C$

## Electrical Characteristics

(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	500	—	—	V	$I_D = 10 \text{ mA}$ , $V_{GS} = 0$
Zero gate voltage drain current	$I_{DSS}$	—	—	1	$\mu\text{A}$	$V_{DS} = 500 \text{ V}$ , $V_{GS} = 0$
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	$R_{DS(on)}$	—	0.385	0.465	$\Omega$	$I_D = 7 \text{ A}$ , $V_{GS} = 10 \text{ V}$ <sup>Note4</sup>
Input capacitance	$C_{iss}$	—	1450	—	pF	$V_{DS} = 25 \text{ V}$ $V_{GS} = 0$ $f = 1 \text{ MHz}$
Output capacitance	$C_{oss}$	—	155	—	pF	
Reverse transfer capacitance	$C_{rss}$	—	19	—	pF	
Turn-on delay time	$t_{d(on)}$	—	34	—	ns	$I_D = 7 \text{ A}$ $V_{GS} = 10 \text{ V}$ $R_L = 35.7 \Omega$ $R_g = 10 \Omega$
Rise time	$t_r$	—	24	—	ns	
Turn-off delay time	$t_{d(off)}$	—	86	—	ns	
Fall time	$t_f$	—	16	—	ns	
Total gate charge	$Q_g$	—	38	—	nC	$V_{DD} = 400 \text{ V}$ $V_{GS} = 10 \text{ V}$ $I_D = 14 \text{ A}$
Gate to source charge	$Q_{gs}$	—	8	—	nC	
Gate to drain charge	$Q_{gd}$	—	17	—	nC	
Body-drain diode forward voltage	$V_{DF}$	—	0.9	1.5	V	$I_F = 14 \text{ A}$ , $V_{GS} = 0$ <sup>Note4</sup>
Body-drain diode reverse recovery time	$t_{rr}$	—	310	—	ns	$I_F = 14 \text{ A}$ , $V_{GS} = 0$ $di_F/dt = 100 \text{ A}/\mu\text{s}$

Notes: 4. Pulse test

Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
TO-3P	SC-65	PRSS0004ZE-A	TO-3P / TO-3PV	5.0g

Unit: mm

The technical drawing illustrates the TO-3P package in three views:

- Front View:** Shows a central circular feature with a diameter of  $\phi 3.2 \pm 0.2$ . The overall width is  $15.6 \pm 0.3$  mm. The height from the base to the top of the central feature is  $14.9 \pm 0.2$  mm. The total height, including the base, is  $18.0 \pm 0.5$  mm. The base has a width of  $1.0 \pm 0.2$  mm. The distance from the base to the top of the central feature is  $19.9 \pm 0.2$  mm. The distance from the base to the top of the side features is  $5.0 \pm 0.3$  mm. The distance from the base to the top of the central feature is  $1.0$  mm. The distance from the base to the top of the side features is  $0.5$  mm. The distance from the base to the top of the central feature is  $2.0$  mm. The distance from the base to the top of the side features is  $1.6$  mm. The distance from the base to the top of the central feature is  $1.4$  Max.
- Side View:** Shows the profile of the package. The overall height is  $4.8 \pm 0.2$  mm. The distance from the base to the top of the central feature is  $1.5$  mm. The distance from the base to the top of the side features is  $0.3$  mm. The distance from the base to the top of the central feature is  $2.8$  mm. The distance from the base to the top of the side features is  $0.6 \pm 0.2$  mm.
- Bottom View:** Shows the base of the package. The overall width is  $5.45 \pm 0.5$  mm. The distance from the base to the top of the central feature is  $3.6$  mm. The distance from the base to the top of the side features is  $0.9$  mm. The distance from the base to the top of the central feature is  $1.0$  mm.

Part Name	Quantity	Shipping Container
RJK5013DPK-00-T0	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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