

# RJK4015DPK

400V - 30A - MOS FET  
High Speed Power Switching

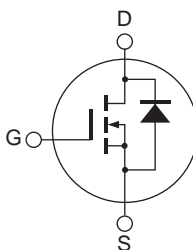
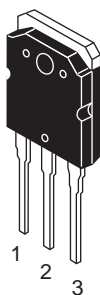
R07DS0446EJ0200  
(Previous: REJ03G1590-0100)  
Rev.2.00  
Jun 21, 2012

## Features

- Low on-resistance  
 $R_{DS(on)} = 0.14 \Omega$  typ. (at  $I_D = 15 \text{ A}$ ,  $V_{GS} = 10 \text{ V}$ ,  $T_a = 25^\circ\text{C}$ )
- 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

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

Item	Symbol	Ratings	Unit
Drain to source voltage	$V_{DSS}$	400	V
Gate to source voltage	$V_{GSS}$	$\pm 30$	V
Drain current	$I_D$	30	A
Drain peak current	$I_{D(pulse)}$ <sup>Note1</sup>	90	A
Body-drain diode reverse drain current	$I_{DR}$	30	A
Body-drain diode reverse drain peak current	$I_{DR(pulse)}$ <sup>Note1</sup>	90	A
Avalanche current	$I_{AP}$ <sup>Note3</sup>	10	A
Avalanche energy	$E_{AR}$ <sup>Note3</sup>	5.71	mJ
Channel dissipation	$P_{ch}$ <sup>Note2</sup>	150	W
Channel to case thermal impedance	$\theta_{ch-c}$	0.833	$^\circ\text{C}/\text{W}$
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.  $STch = 25^\circ\text{C}$ ,  $T_{ch} \leq 150^\circ\text{C}$

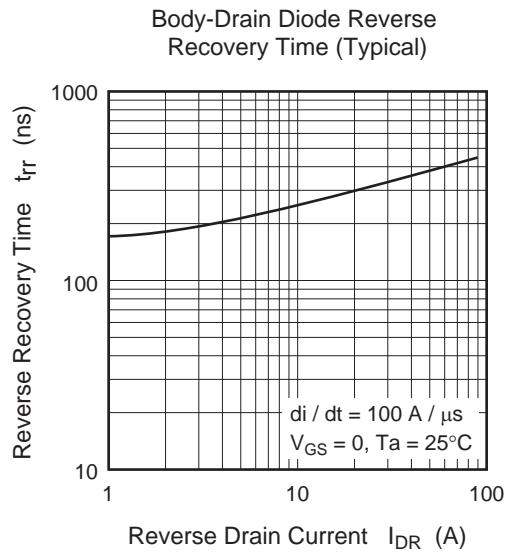
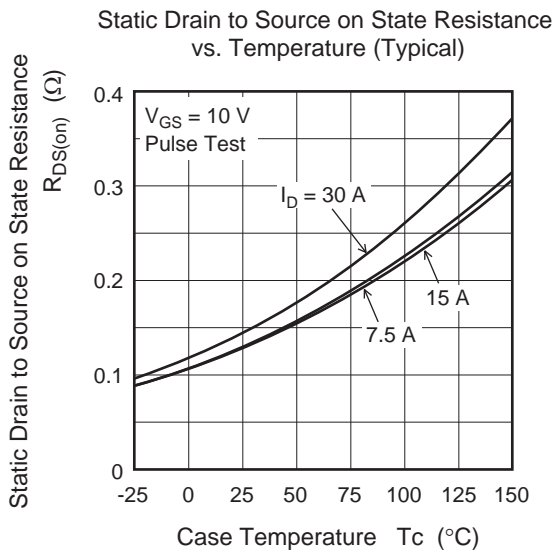
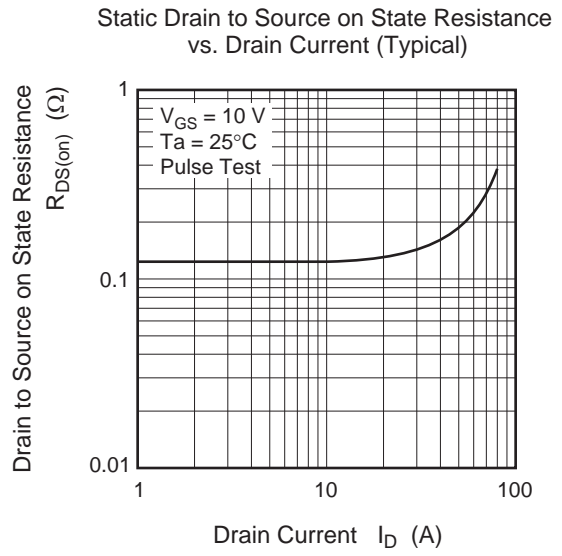
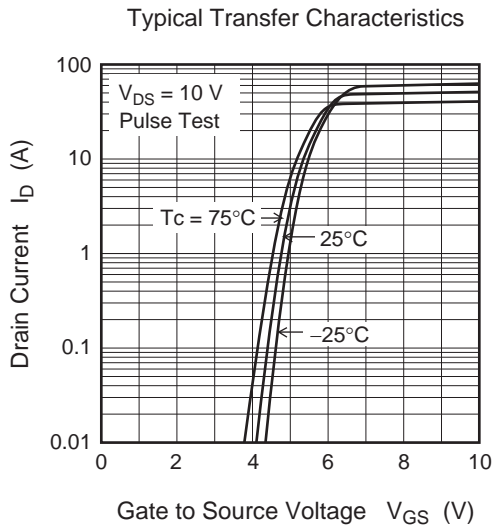
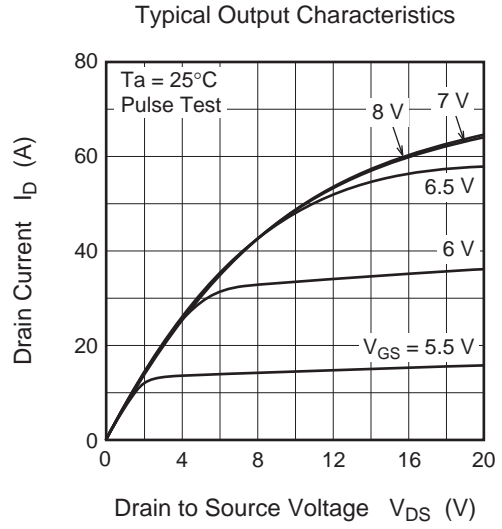
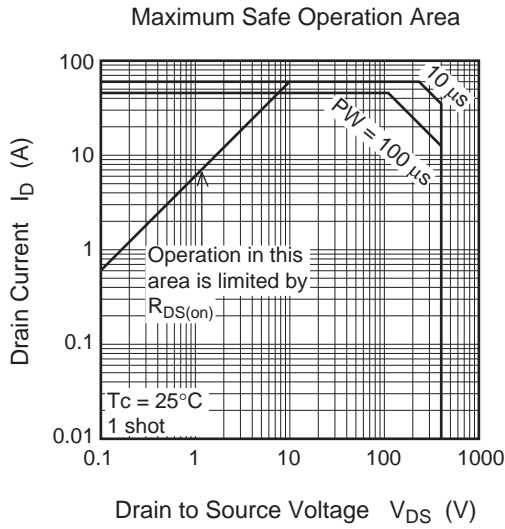
## Electrical Characteristics

(Ta = 25°C)

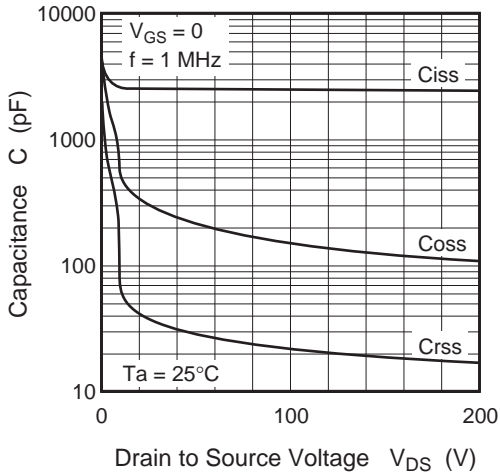
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	400	—	—	V	$I_D = 10 \text{ mA}$ , $V_{GS} = 0$
Zero gate voltage drain current	$I_{DSS}$	—	—	1	$\mu\text{A}$	$V_{DS} = 400 \text{ V}$ , $V_{GS} = 0$
Gate to source leak current	$I_{GSS}$	—	—	$\pm 0.1$	$\mu\text{A}$	$V_{GS} = \pm 30 \text{ V}$ , $V_{DS} = 0$
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	$R_{DS(on)}$	—	0.140	0.165	$\Omega$	$I_D = 15 \text{ A}$ , $V_{GS} = 10 \text{ V}$ <sup>Note4</sup>
Input capacitance	$C_{iss}$	—	2600	—	pF	$V_{DS} = 25 \text{ V}$
Output capacitance	$C_{oss}$	—	305	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	$C_{rss}$	—	38	—	pF	$f = 1 \text{ MHz}$
Turn-on delay time	$t_{d(on)}$	—	40	—	ns	$I_D = 15 \text{ A}$
Rise time	$t_r$	—	75	—	ns	$V_{GS} = 10 \text{ V}$
Turn-off delay time	$t_{d(off)}$	—	102	—	ns	$R_L = 13.3 \Omega$
Fall time	$t_f$	—	58	—	ns	$R_g = 10 \Omega$
Total gate charge	$Q_g$	—	62.6	—	nC	$V_{DD} = 320 \text{ V}$
Gate to source charge	$Q_{gs}$	—	13.1	—	nC	$V_{GS} = 10 \text{ V}$
Gate to drain charge	$Q_{gd}$	—	28.5	—	nC	$I_D = 30 \text{ A}$
Body-drain diode forward voltage	$V_{DF}$	—	0.9	1.5	V	$I_F = 30 \text{ A}$ , $V_{GS} = 0$ <sup>Note4</sup>
Body-drain diode reverse recovery time	$t_{rr}$	—	330	—	ns	$I_F = 30 \text{ A}$ , $V_{GS} = 0$ $di_F/dt = 100 \text{ A}/\mu\text{s}$

Notes: 4. Pulse test

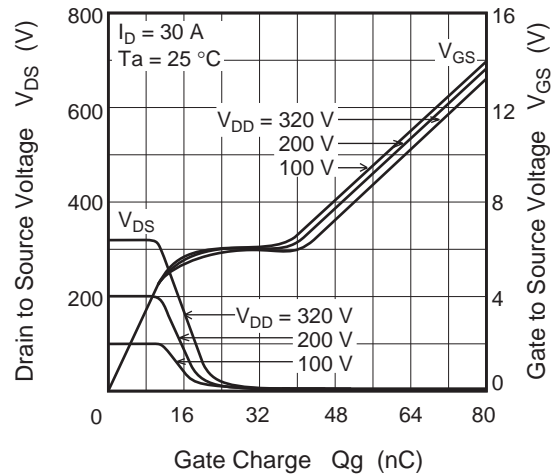
Main Characteristics



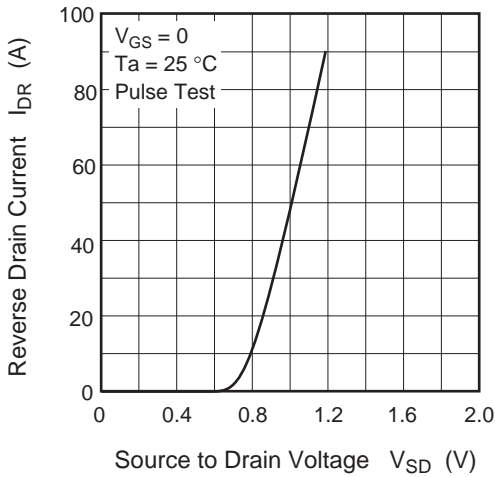
Typical Capacitance vs. Drain to Source Voltage



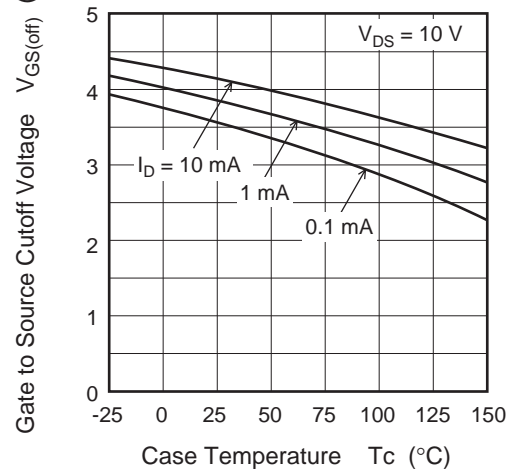
Dynamic Input Characteristics (Typical)



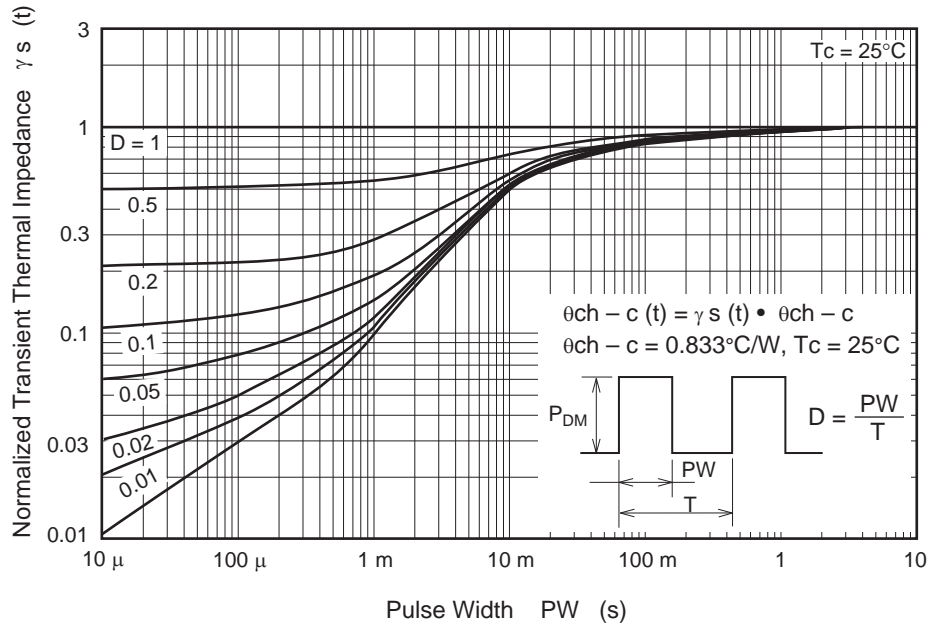
Reverse Drain Current vs. Source to Drain Voltage (Typical)



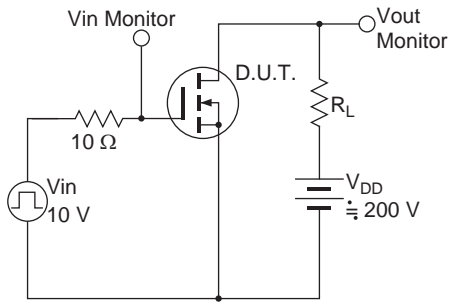
Gate to Source Cutoff Voltage vs. Case Temperature (Typical)



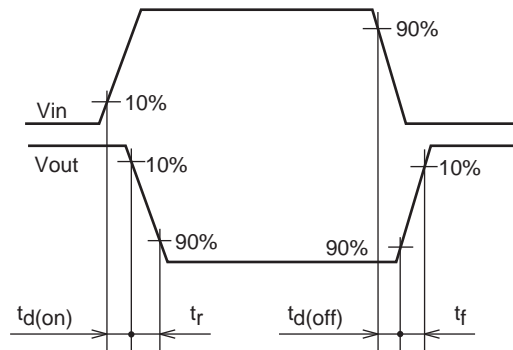
Normalized Transient Thermal Impedance vs. Pulse Width



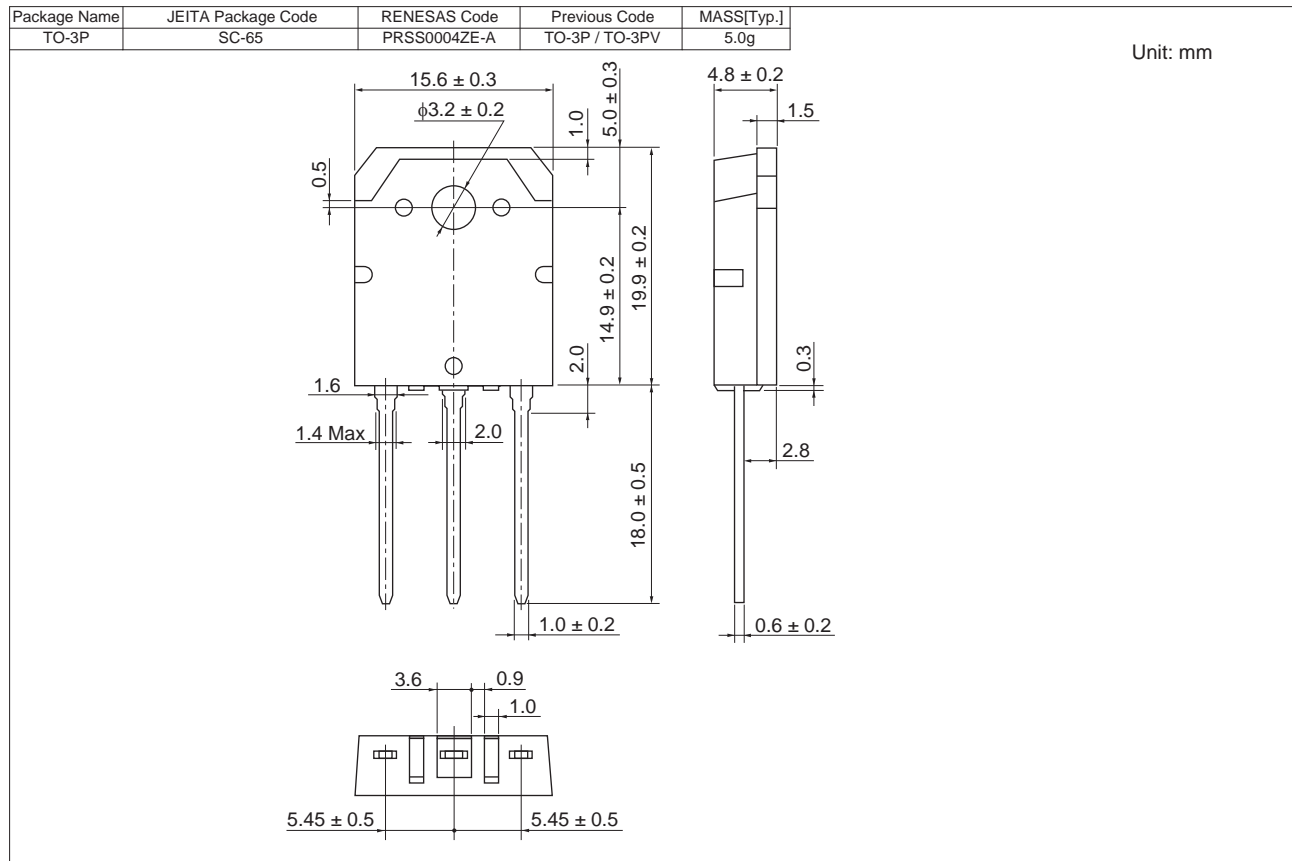
Switching Time Test Circuit



Waveform



### Package Dimensions



### Ordering Information

Orderable Part Number	Quantity	Shipping Container
RJK4015DPK-00#T0	360 pcs	Box (Tube)

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

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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

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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.**  
13F, No. 363, Fu Shing North Road, Taipei, Taiwan  
Tel: +886-2-8175-9600, Fax: +886 2-8175-9670

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Tel: +60-3-7955-3390, Fax: +60-3-7955-9510

**Renesas Electronics Korea Co., Ltd.**  
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Tel: +82-2-558-3737, Fax: +82-2-558-5141