

RJK5014DPK

Silicon N Channel MOS FET
High Speed Power Switching

REJ03G1458-0200

Rev.2.00

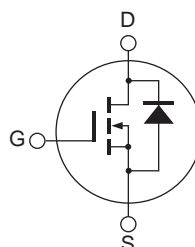
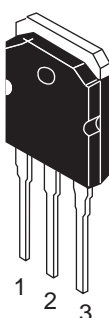
Oct 20, 2009

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}	± 30	V
Drain current	I_D	19	A
Drain peak current	$I_{D(pulse)}$ ^{Note1}	38	A
Body-drain diode reverse drain current	I_{DR}	19	A
Body-drain diode reverse drain peak current	$I_{DR(pulse)}$ ^{Note1}	38	A
Avalanche current	I_{AP} ^{Note3}	5	A
Avalanche energy	E_{AR} ^{Note3}	1.3	mJ
Channel dissipation	P_{ch} ^{Note2}	150	W
Channel to case thermal impedance	θ_{ch-c}	0.833	°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. $STch = 25^\circ C$, $T_{ch} \leq 150^\circ C$

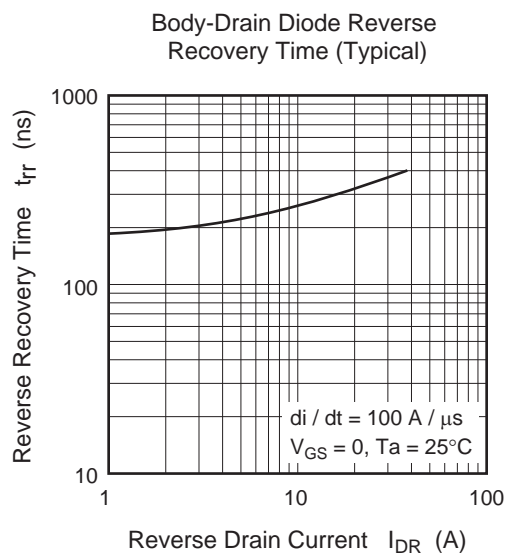
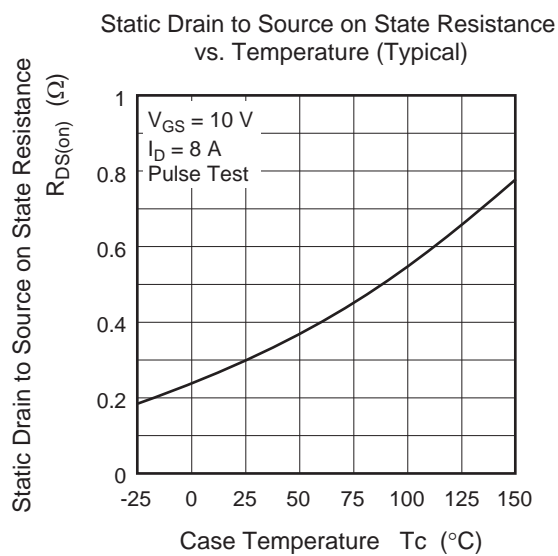
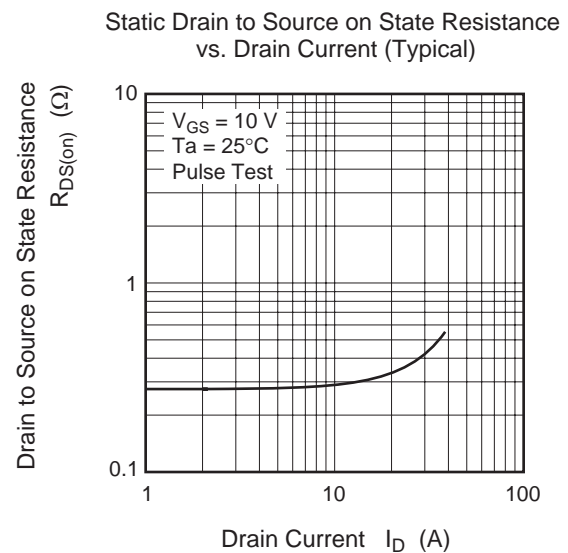
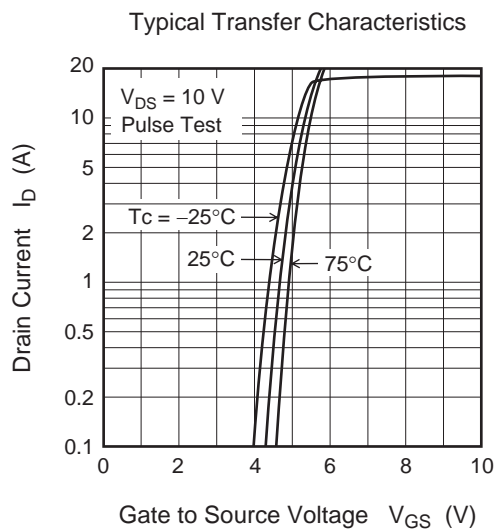
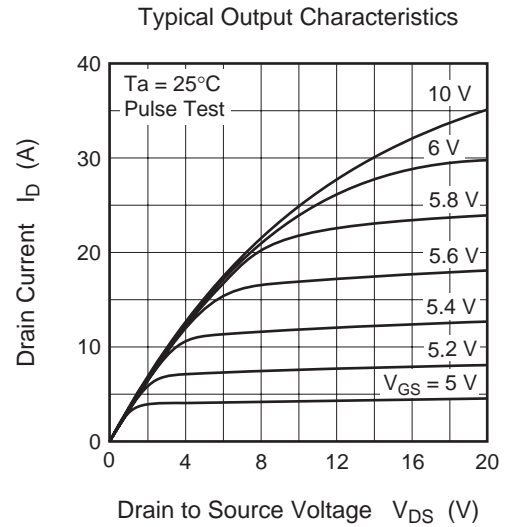
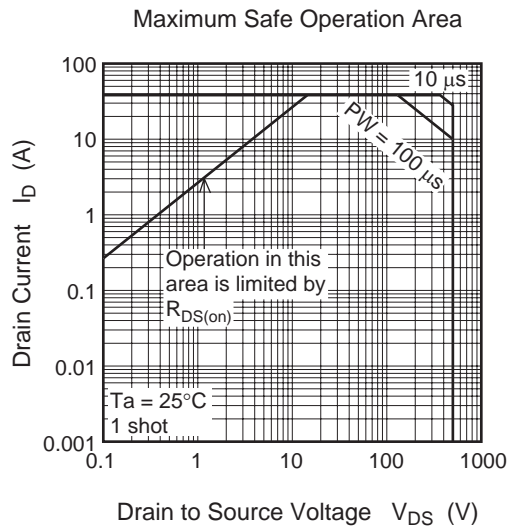
Electrical Characteristics

(Ta = 25°C)

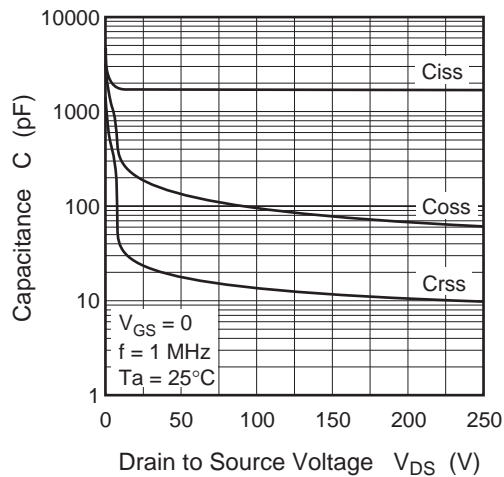
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	500	—	—	V	$I_D = 10 \text{ mA}$, $V_{GS} = 0$
Zero gate voltage drain current	I_{DSS}	—	—	1	μA	$V_{DS} = 500 \text{ V}$, $V_{GS} = 0$
Gate to source leak current	I_{GSS}	—	—	± 0.1	μA	$V_{GS} = \pm 30 \text{ V}$, $V_{DS} = 0$
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	$R_{DS(on)}$	—	0.315	0.380	Ω	$I_D = 9.5 \text{ A}$, $V_{GS} = 10 \text{ V}$ ^{Note4}
Input capacitance	C_{iss}	—	1800	—	pF	$V_{DS} = 25 \text{ V}$ $V_{GS} = 0$ $f = 1 \text{ MHz}$
Output capacitance	C_{oss}	—	190	—	pF	
Reverse transfer capacitance	C_{rss}	—	24	—	pF	
Turn-on delay time	$t_{d(on)}$	—	36	—	ns	$I_D = 9.5 \text{ A}$ $V_{GS} = 10 \text{ V}$ $R_L = 26.3 \Omega$ $R_g = 10 \Omega$
Rise time	t_r	—	41	—	ns	
Turn-off delay time	$t_{d(off)}$	—	93	—	ns	
Fall time	t_f	—	39	—	ns	
Total gate charge	Q_g	—	46	—	nC	$V_{DD} = 400 \text{ V}$ $V_{GS} = 10 \text{ V}$ $I_D = 19 \text{ A}$
Gate to source charge	Q_{gs}	—	9	—	nC	
Gate to drain charge	Q_{gd}	—	20	—	nC	
Body-drain diode forward voltage	V_{DF}	—	0.91	1.55	V	$I_F = 19 \text{ A}$, $V_{GS} = 0$ ^{Note4}
Body-drain diode reverse recovery time	t_{rr}	—	320	—	ns	$I_F = 19 \text{ A}$, $V_{GS} = 0$ $di_F/dt = 100 \text{ A}/\mu\text{s}$

Notes: 4. Pulse test

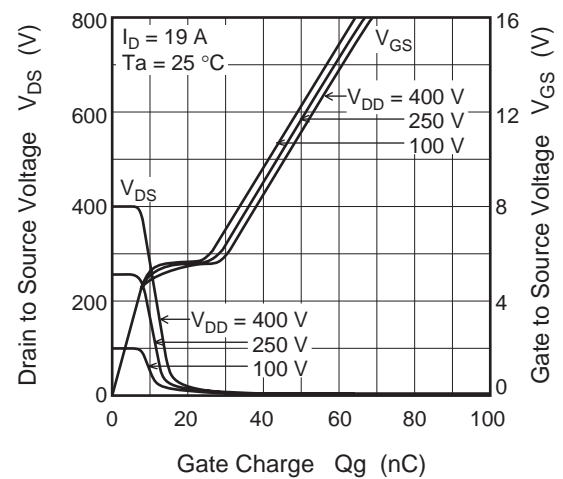
Main Characteristics



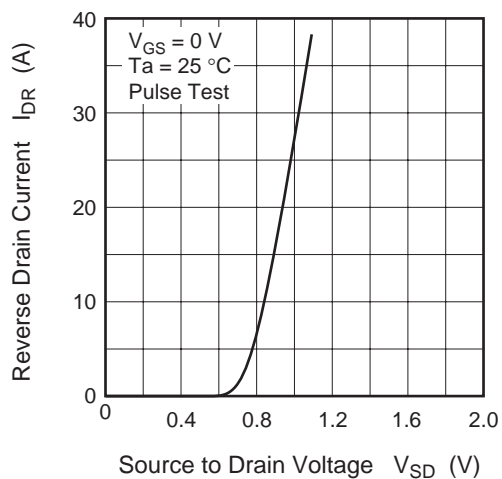
Typical Capacitance vs.
Drain to Source Voltage (Typical)



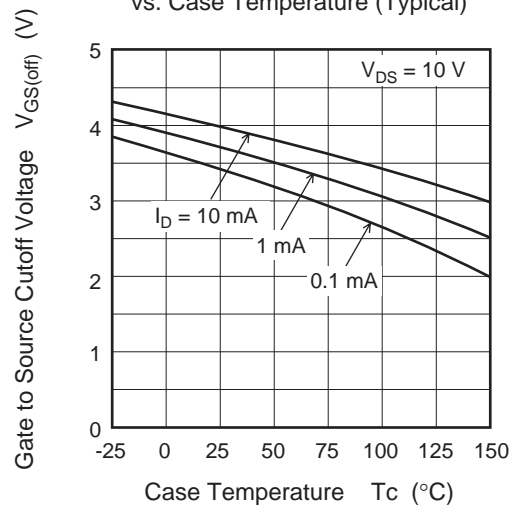
Dynamic Input Characteristics (Typical)

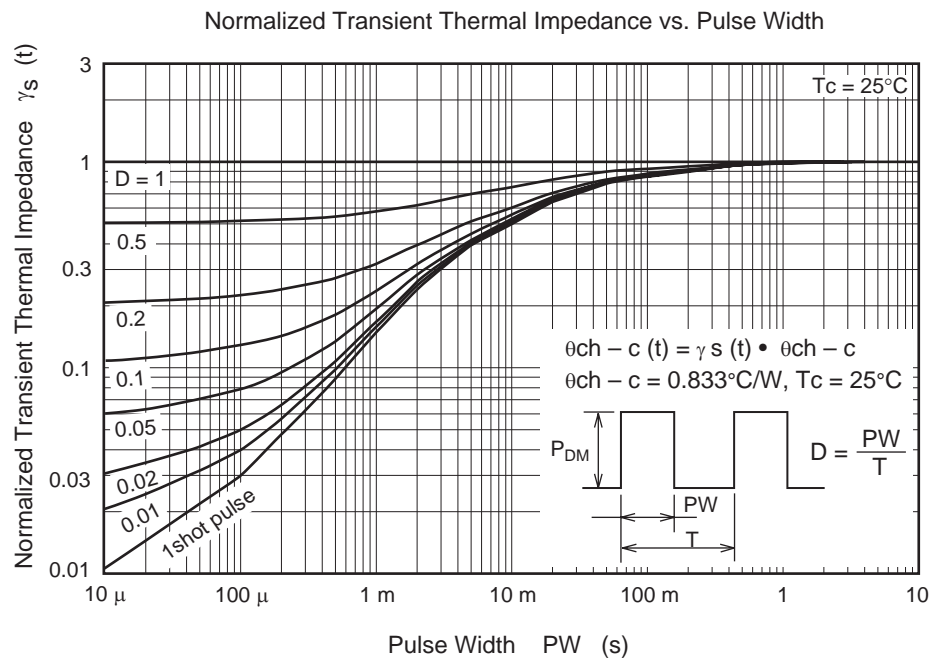


Reverse Drain Current vs.
Source to Drain Voltage (Typical)

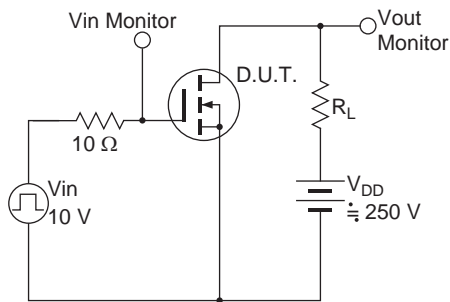


Gate to Source Cutoff Voltage
vs. Case Temperature (Typical)

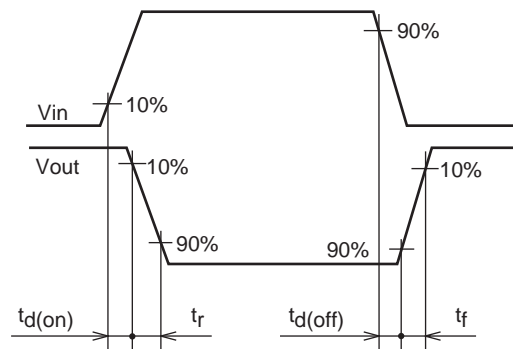




Switching Time Test Circuit



Waveform



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

Unit: mm

Technical drawing of the TO-3P package showing dimensions in millimeters. The drawing includes three views: a front view, a side view, and a bottom view.

Front View Dimensions:

- Overall width: 15.6 ± 0.3
- Top width: 15.6 ± 0.3
- Top hole diameter: $\phi 3.2 \pm 0.2$
- Top hole position from left edge: 0.5
- Top hole position from right edge: 1.0
- Top hole position from center: 5.0 ± 0.3
- Top hole position from bottom edge: 1.0
- Top hole position from right edge: 1.0
- Top hole position from center: 14.9 ± 0.2
- Top hole position from bottom edge: 19.9 ± 0.2
- Top hole position from right edge: 2.0
- Top hole position from center: 18.0 ± 0.5
- Top hole position from bottom edge: 1.0 ± 0.2
- Top hole position from right edge: 1.0
- Top hole position from center: 1.4 Max
- Top hole position from bottom edge: 2.0
- Top hole position from right edge: 1.6

Side View Dimensions:

- Overall height: 4.8 ± 0.2
- Top flange height: 1.5
- Top flange width: 0.3
- Top flange position from left edge: 2.8
- Top flange position from right edge: 0.6 ± 0.2

Bottom View Dimensions:

- Overall width: 5.45 ± 0.5
- Overall height: 5.45 ± 0.5
- Top flange width: 3.6
- Top flange height: 0.9
- Top flange position from left edge: 1.0
- Top flange position from right edge: 1.0

Part No.	Quantity	Shipping Container
RJK5014DPK-00-T0	360 pcs	Box (Tube)

Renesas Technology Corp. Sales Strategic Planning Div. Nippon Bldg., 2-6-2, Ohte-machi, Chiyoda-ku, Tokyo 100-0004, Japan

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Renesas Technology America, Inc.
450 Holger Way, San Jose, CA 95134-1368, U.S.A
Tel: <1> (408) 382-7500, Fax: <1> (408) 382-7501

Renesas Technology Europe Limited
Dukes Meadow, Millboard Road, Bourne End, Buckinghamshire, SL8 5FH, U.K.
Tel: <44> (1628) 585-100, Fax: <44> (1628) 585-900

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

Renesas Technology Hong Kong Ltd.
7th Floor, North Tower, World Finance Centre, Harbour City, Canton Road, Tsimshatsui, Kowloon, Hong Kong
Tel: <852> 2265-6688, Fax: <852> 2377-3473

Renesas Technology Taiwan Co., Ltd.
10th Floor, No.99, Fushing North Road, Taipei, Taiwan
Tel: <886> (2) 2715-2888, Fax: <886> (2) 3518-3399

Renesas Technology Singapore Pte. Ltd.
1 Harbour Front Avenue, #06-10, Keppel Bay Tower, Singapore 098632
Tel: <65> 6213-0200, Fax: <65> 6278-8001

Renesas Technology Korea Co., Ltd.
Kukje Center Bldg. 18th Fl., 191, 2-ka, Hangang-ro, Yongsan-ku, Seoul 140-702, Korea
Tel: <82> (2) 796-3115, Fax: <82> (2) 796-2145

Renesas Technology Malaysia Sdn. Bhd
Unit 906, Block B, Menara Amcorp, Amcorp Trade Centre, No.18, Jln Persiaran Barat, 46050 Petaling Jaya, Selangor Darul Ehsan, Malaysia
Tel: <603> 7955-9390, Fax: <603> 7955-9510