

2SK4150

Silicon N Channel MOS FET High Speed Power Switching

REJ03G1909-0300

Rev.3.00

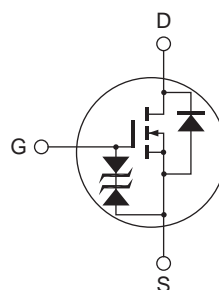
May 27, 2010

Features

- Capable of 2.5 V gate drive
- Low drive current
- Low on-resistance
 $R_{DS(on)} = 4.0 \Omega$ typ. (at $I_D = 0.2 \text{ A}$, $V_{GS} = 4 \text{ V}$, $T_a = 25^\circ\text{C}$)

Outline

RENESAS Package code: PRSS0003DA-A
(Package name: TO-92(1))



1. Source
2. Drain
3. Gate

Absolute Maximum Ratings

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

Item	Symbol	Ratings	Unit
Drain to source voltage	V_{DSS}	250	V
Gate to source voltage	V_{GSS}	± 10	V
Drain current	I_D	0.4	A
Drain peak current	$I_{D(pulse)}$ ^{Note1}	1.6	A
Body-drain diode reverse drain current	I_{DR}	0.4	A
Body-drain diode reverse drain peak current	$I_{DR(pulse)}$ ^{Note1}	1.6	A
Channel dissipation	Pch	0.75	W
Channel to ambient thermal impedance	θ_{ch-a}	166.7	$^\circ\text{C/W}$
Channel temperature	Tch	150	$^\circ\text{C}$
Storage temperature	Tstg	-55 to +150	$^\circ\text{C}$

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

Electrical Characteristics

(Ta = 25°C)

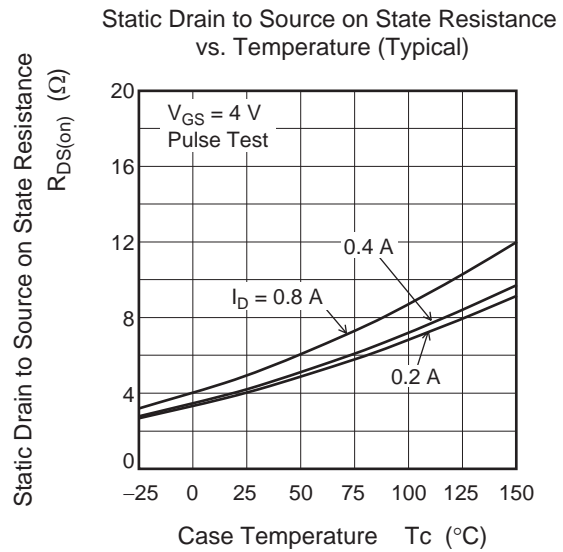
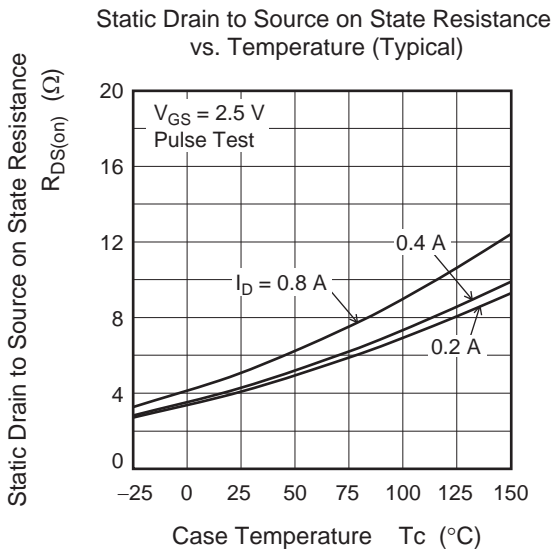
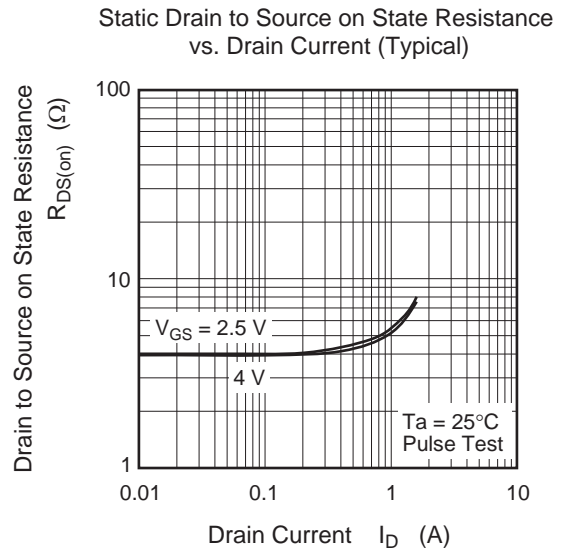
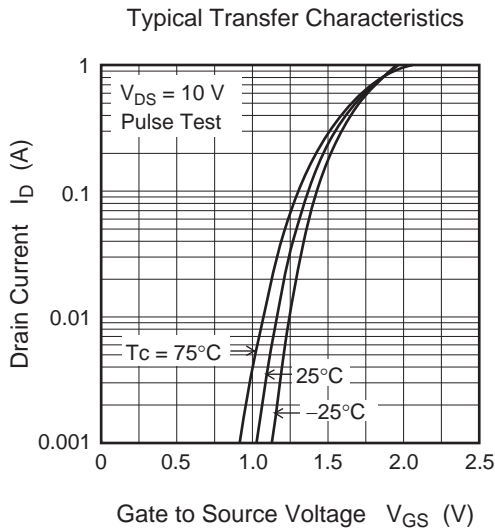
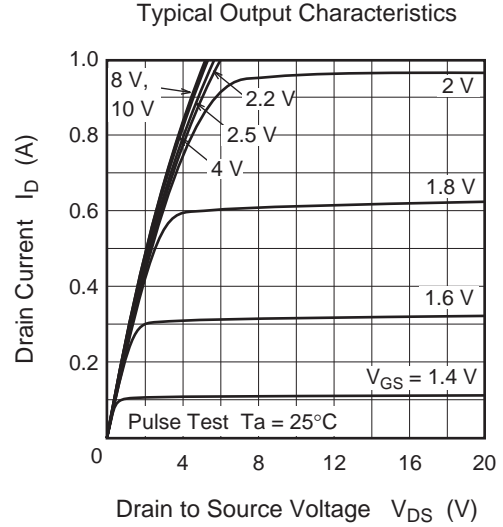
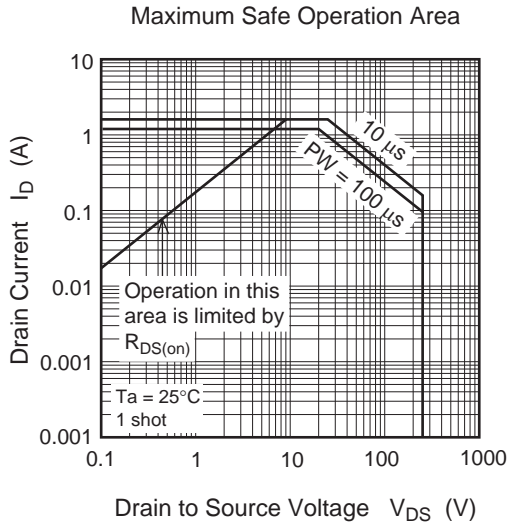
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	250	—	—	V	$I_D = 10 \text{ mA}$, $V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	± 10	—	—	V	$I_G = \pm 100 \text{ }\mu\text{A}$, $V_{DS} = 0$
Zero gate voltage drain current	I_{DSS}	—	—	1	μA	$V_{DS} = 250 \text{ V}$, $V_{GS} = 0$
Gate to source leak current	I_{GSS}	—	—	± 10	μA	$V_{GS} = \pm 8 \text{ V}$, $V_{DS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	0.5	—	1.5	V	$V_{DS} = 10 \text{ V}$, $I_D = 1 \text{ mA}$
Static drain to source on state resistance	$R_{DS(on)}$	—	4.0	5.7	Ω	$I_D = 0.2 \text{ A}$, $V_{GS} = 4 \text{ V}$ ^{Note2}
Static drain to source on state resistance	$R_{DS(on)}$	—	4.1	5.9	Ω	$I_D = 0.2 \text{ A}$, $V_{GS} = 2.5 \text{ V}$ ^{Note2}
Input capacitance	C_{iss}	—	80	—	pF	$V_{DS} = 25 \text{ V}$
Output capacitance	C_{oss}	—	11.4	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	C_{rss}	—	3.4	—	pF	$f = 1 \text{ MHz}$
Turn-on delay time	$t_{d(on)}$	—	17	—	ns	$I_D = 0.2 \text{ A}$
Rise time	t_r	—	14	—	ns	$V_{GS} = 4 \text{ V}$
Turn-off delay time	$t_{d(off)}$	—	38	—	ns	$R_L = 625 \text{ }\Omega$
Fall time	t_f	—	36	—	ns	$R_g = 10 \text{ }\Omega$
Total gate charge	Q_g	—	3.7	—	nC	$V_{DD} = 200 \text{ V}$
Gate to source charge	Q_{gs}	—	0.3	—	nC	$V_{GS} = 4 \text{ V}$
Gate to drain charge	Q_{gd}	—	2.3	—	nC	$I_D = 0.4 \text{ A}$
Body-drain diode forward voltage	V_{DF}	—	0.8	1.2	V	$I_F = 0.4 \text{ A}$, $V_{GS} = 0$ ^{Note2}
Body-drain diode reverse recovery time	t_{rr}	—	70	—	ns	$I_F = 0.4 \text{ A}$, $V_{GS} = 0$ $di_F/dt = 100 \text{ A}/\mu\text{s}$

Notes: 2. Pulse test

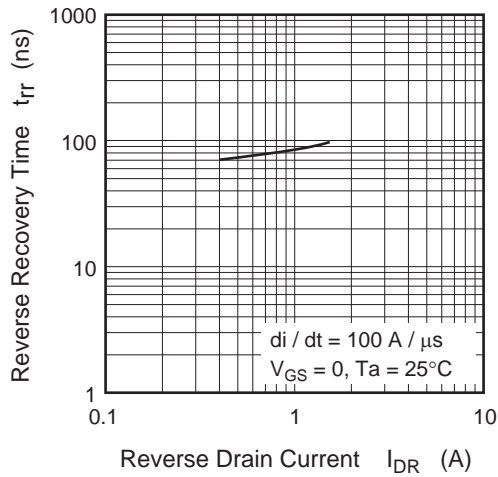
3. This device is sensitive to electrostatic discharge.

It is recommended to adopt appropriate cautions when handling this product.

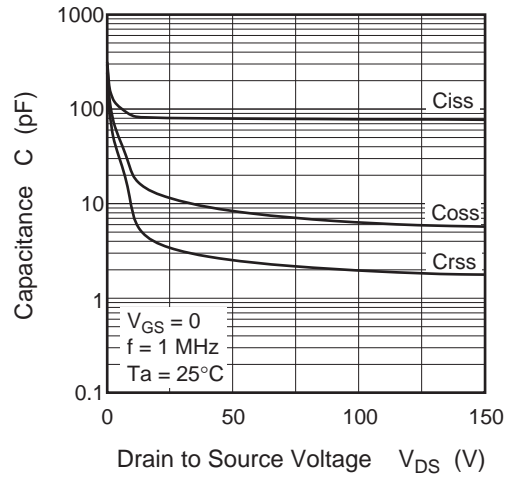
Main Characteristics



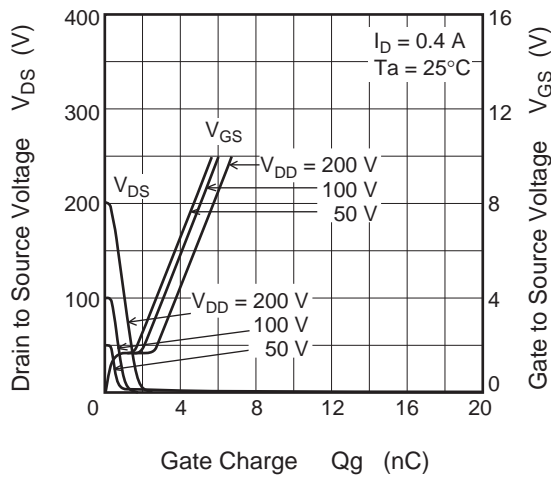
Body-Drain Diode Reverse Recovery Time (Typical)



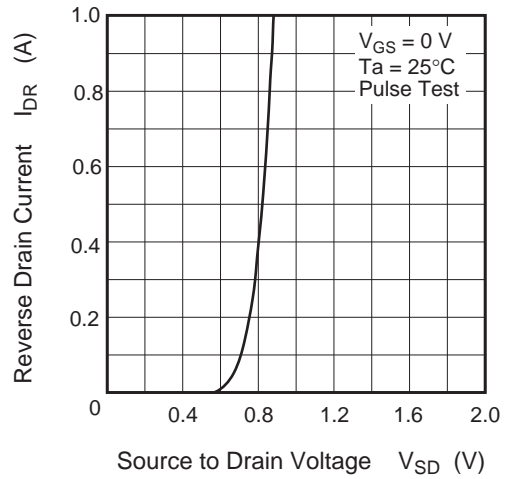
Typical Capacitance vs. Drain to Source Voltage



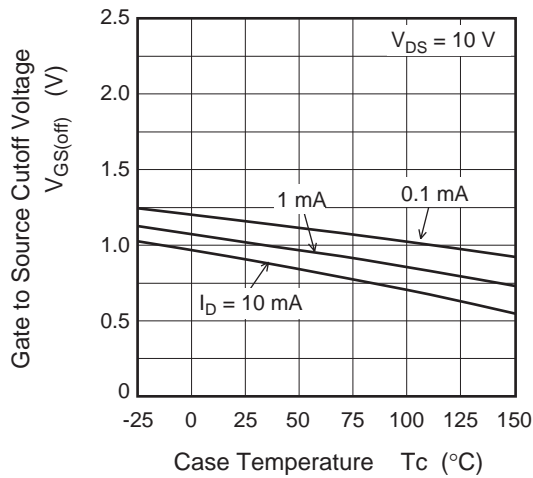
Dynamic Input Characteristics (Typical)

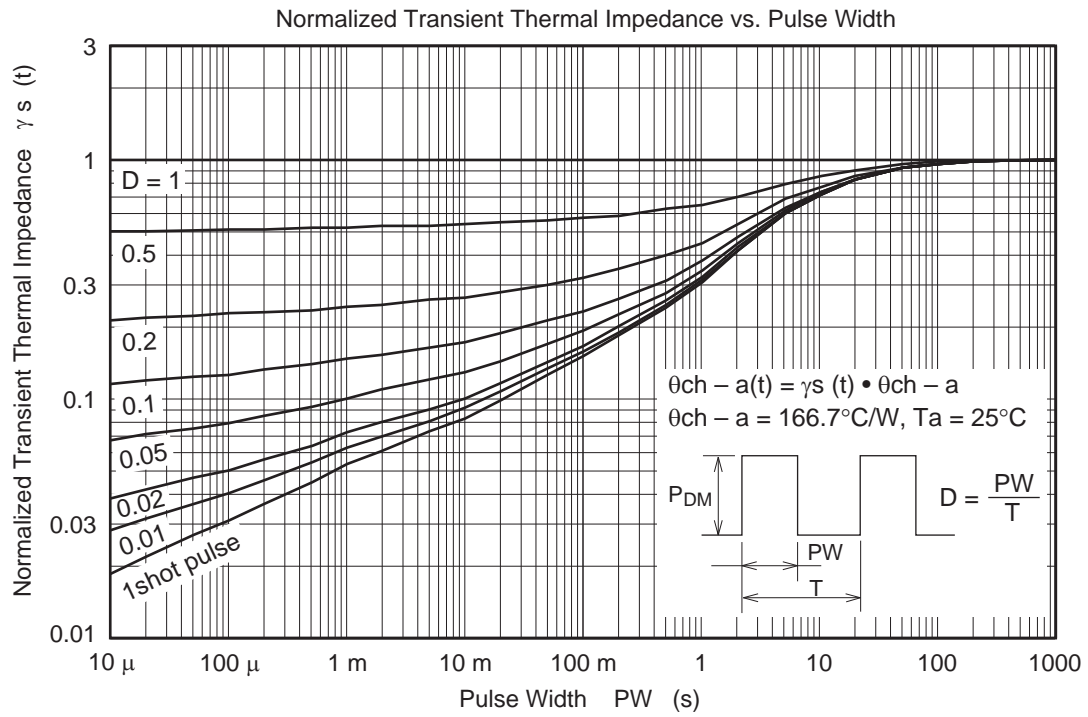


Reverse Drain Current vs. Source to Drain Voltage (Typical)

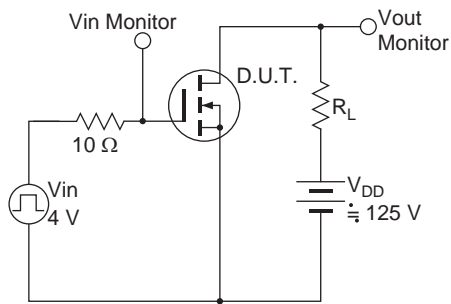


Gate to Source Cutoff Voltage vs. Case Temperature (Typical)

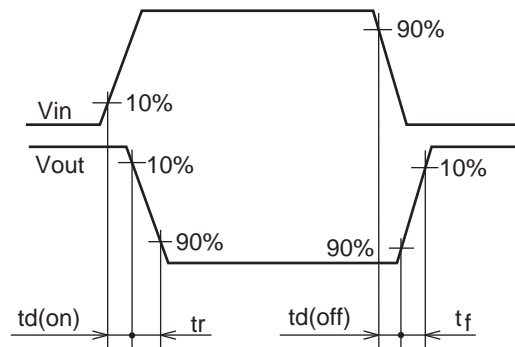




Switching Time Test Circuit



Waveform



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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.
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Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: info@moschip.ru

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