To our customers,

Old Company Name in Catalogs and Other Documents

On April 1st, 2010, NEC Electronics Corporation merged with Renesas Technology Corporation, and Renesas Electronics Corporation took over all the business of both companies. Therefore, although the old company name remains in this document, it is a valid Renesas Electronics document. We appreciate your understanding.

Renesas Electronics website: http://www.renesas.com

April 1st, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (http://www.renesas.com)

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2SK4151

Silicon N Channel MOS FET
High Speed Power Switching

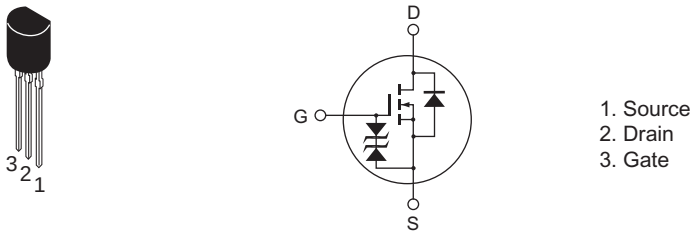
REJ03G1901-0100
Rev.1.00
Mar 15, 2010

Features

- Capable of 2.5 V gate drive
- Low drive current
- Low on-resistance
  $R_{DS(on)}$ = 1.5 Ω typ. (at I_D = 0.5 A, V_{GS} = 4 V, Ta = 25°C)

Outline

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



Absolute Maximum Ratings

(Ta = 25°C)

Item	Symbol	Ratings	Unit
Drain to source voltage	V_{DSS}	150	V
Gate to source voltage	V_{GSS}	±10	V
Drain current	I_D Note1	1	A
Drain peak current	$I_{D\ (pulse)}$ Note2	4	A
Body-drain diode reverse drain current	I_{DR} Note1	1	A
Body-drain diode reverse drain peak current	$I_{DR\ (pulse)}$ Note2	4	A
Channel dissipation	Pch Note2	0.75	W
Channel to ambient thermal impedance	θch-a	166.7	°C/W
Channel temperature	Tch	150	°C
Storage temperature	Tstg	–55 to +150	°C

Notes: 1. PW ≤ 10 μs, duty cycle ≤ 30%
2. PW ≤ 10 μs, duty cycle ≤ 1%

Electrical Characteristics

(Ta = 25°C)

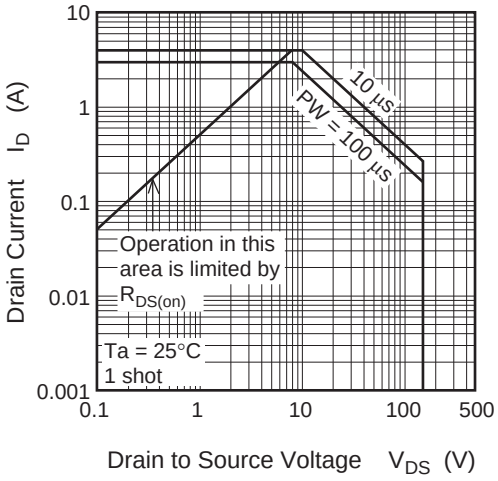
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	150	—	—	V	I_D = 10 mA, V_{GS} = 0
Gate to source breakdown voltage	$V_{(BR)GSS}$	±10	—	—	V	I_G = ±100 μA, V_{DS} = 0
Gate to source leak current	I_{GSS}	—	—	±10	μA	V_{GS} = ±8 V, V_{DS} = 0
Zero gate voltage drain current	I_{DSS}	—	—	1	μA	V_{DS} = 150 V, V_{GS} = 0
Gate to source cutoff voltage	$V_{GS(off)}$	0.5	—	1.5	V	V_{DS} = 10 V, I_D = 1 mA
Static drain to source on state resistance	$R_{DS(on)}$	—	1.5	1.95	Ω	I_D = 0.5 A, V_{GS} = 4 V Note3
	$R_{DS(on)}$	—	1.9	2.5	Ω	I_D = 0.5 A, V_{GS} = 2.5 V Note3
Input capacitance	Ciss	—	98	—	pF	V_{DS} = 10 V V_{GS} = 0 f = 1 MHz
Output capacitance	Coss	—	31	—	pF	
Reverse transfer capacitance	Crss	—	14	—	pF	
Total gate charge	Qg	—	3.5	—	nC	V_{DD} = 100 V V_{GS} = 4 V I_D = 1 A
Gate to source charge	Qgs	—	0.5	—	nC	
Gate to drain charge	Qgd	—	1.8	—	nC	
Turn-on delay time	$t_{d(on)}$	—	8	—	ns	V_{GS} = 4 V I_D = 0.5 A R_L = 60 Ω
Rise time	t_r	—	12	—	ns	
Turn-off delay time	$t_{d(off)}$	—	34	—	ns	
Fall time	t_f	—	19	—	ns	
Body–drain diode forward voltage	V_{DF}	—	1.0	1.5	V	I_F = 1 A, V_{GS} = 0 Note3
Body–drain diode reverse recovery time	t_{rr}	—	60	—	ns	I_F = 1 A, V_{GS} = 0 di_F/dt =100 A/μs

Notes: 3. Pulse test

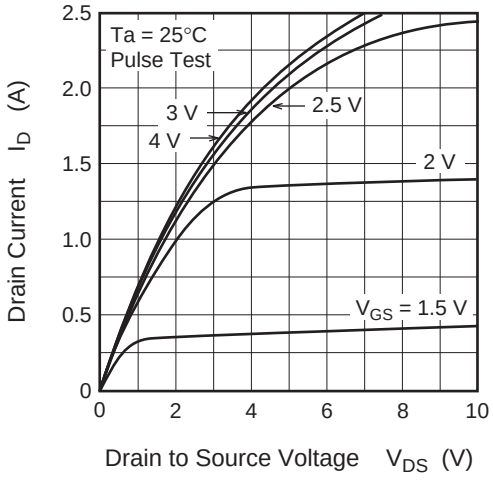
4. This device is sensitive to electrostatic discharge.
   It is recommended to adopt appropriate cautions when handling this product.

Main Characteristics

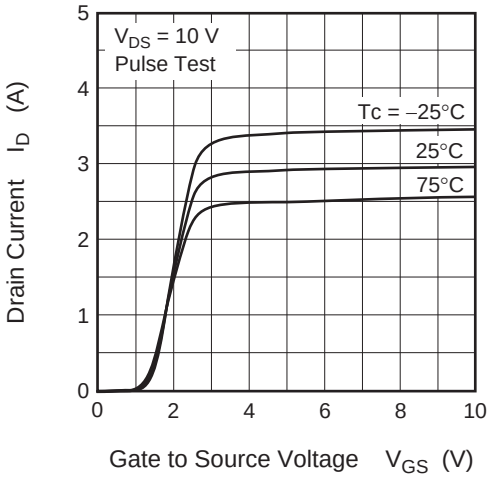
Maximum Safe Operation Area



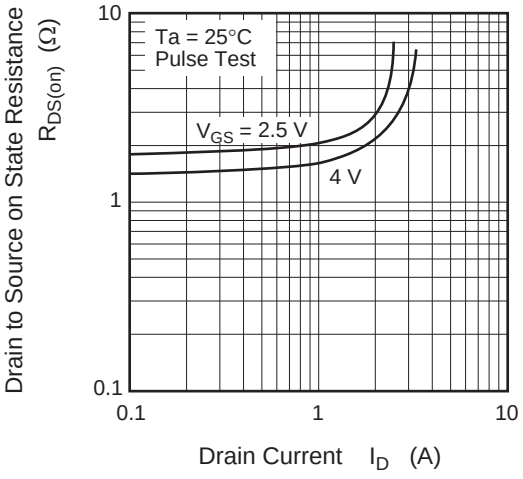
Typical Output Characteristics



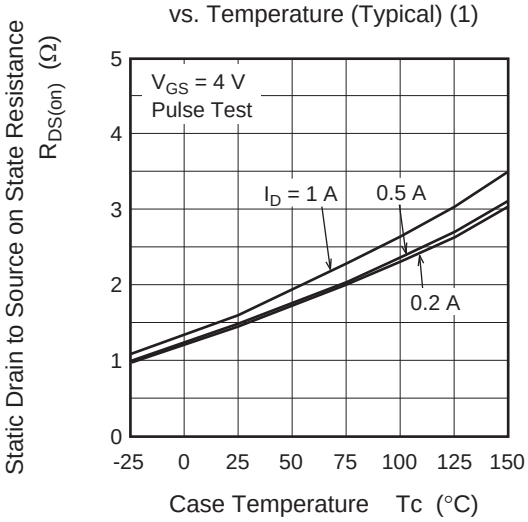
Typical Transfer Characteristics



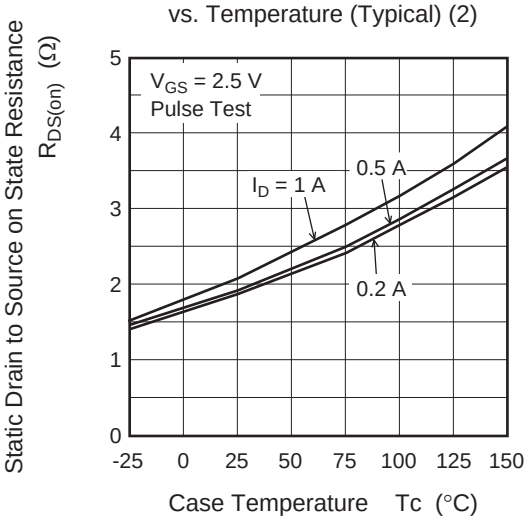
Static Drain to Source on State Resistance vs. Drain Current (Typical)



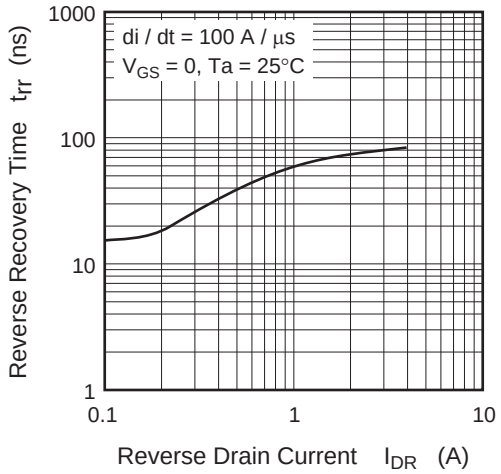
Static Drain to Source on State Resistance vs. Temperature (Typical) (1)



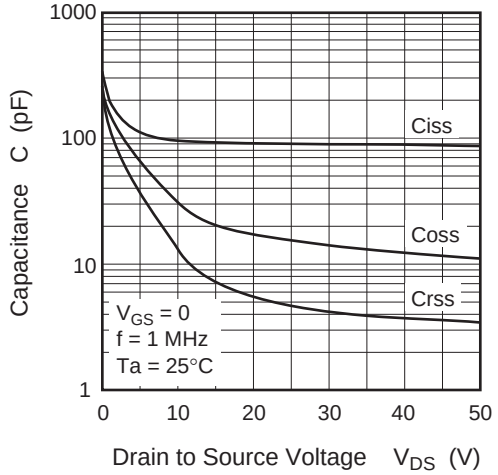
Static Drain to Source on State Resistance vs. Temperature (Typical) (2)



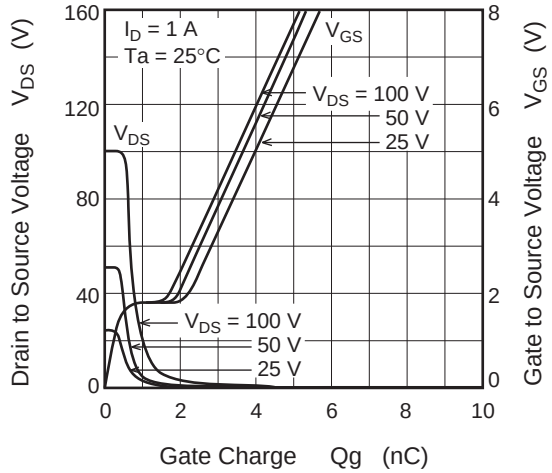
Body-Drain Diode Reverse Recovery Time (Typical)



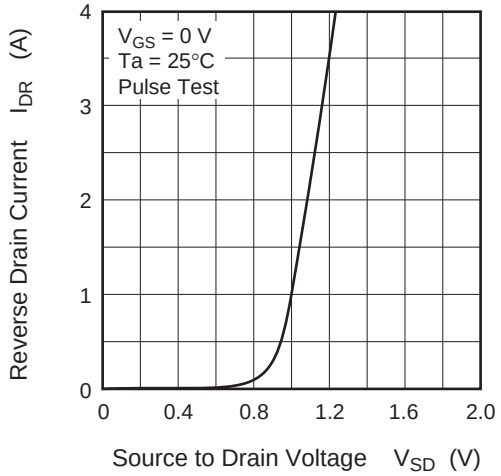
Typical Capacitance vs. Drain to Source Voltage



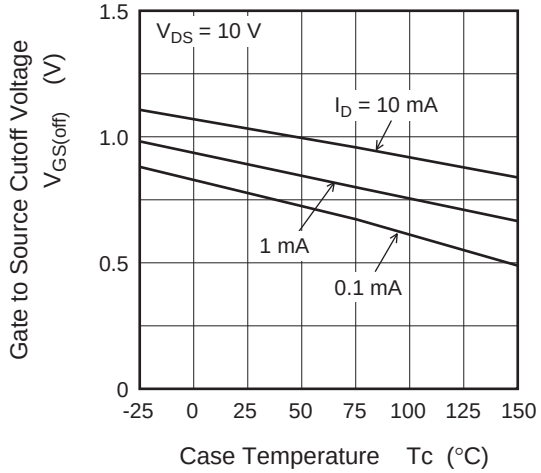
Dynamic Input Characteristics (Typical)



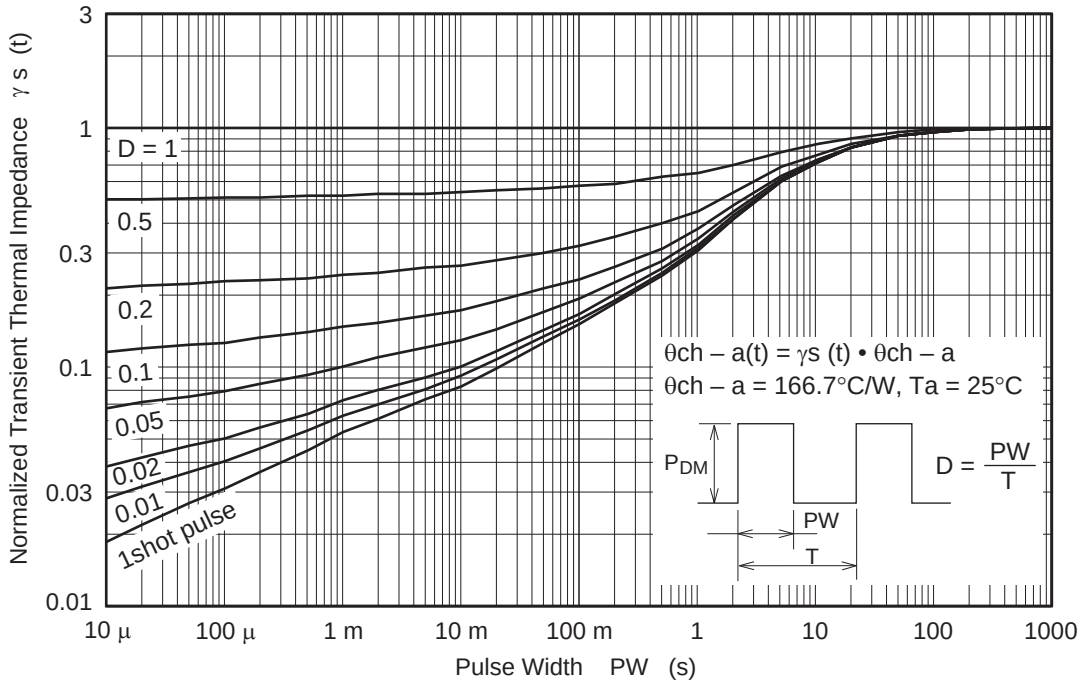
Reverse Drain Current vs. Source to Drain Voltage (Typical)



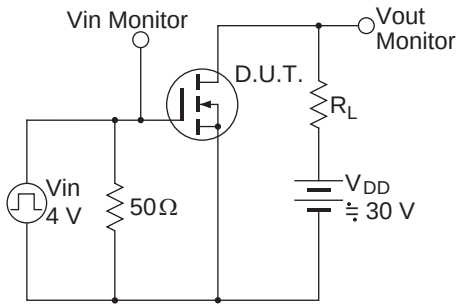
Gate to Source Cutoff Voltage vs. Case Temperature (Typical)



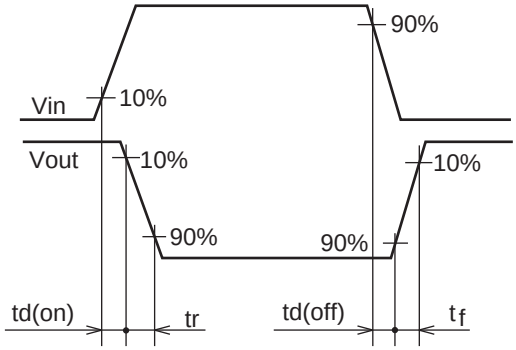
Normalized Transient Thermal Impedance vs. Pulse Width



Switching Time Test Circuit



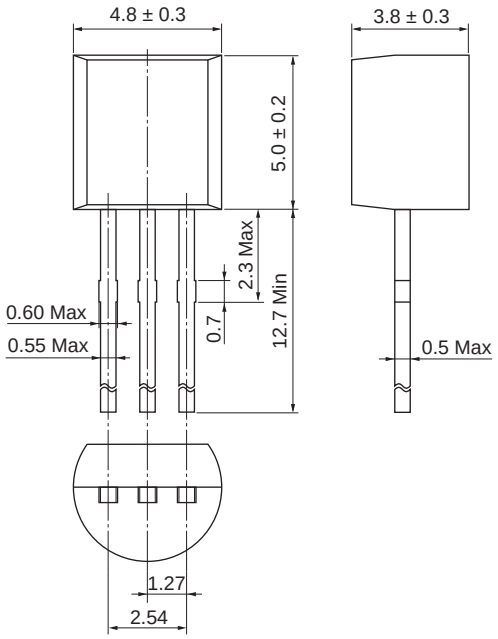
Waveform



Package Dimension

Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
TO-92(1)	SC-43A	PRSS0003DA-A	TO-92(1) / TO-92(1)V	0.25g

Unit: mm

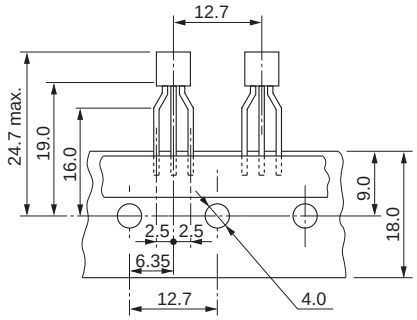


Ordering Information

Part No.	Quantity	Shipping Container
2SK4151TZ-E	2500 pcs	Hold box, Radial taping

Note: Leads is forming applied as following figure.

Unit: mm



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