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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2SK3736

Silicon N Channel MOS FET
Power Switching

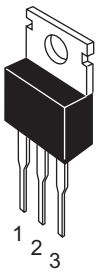
REJ03G0525-0200
Rev.2.00
Jul 27, 2006

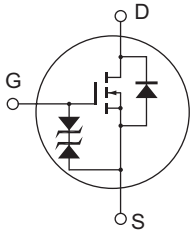
Features

- Capable of 2.5 V gate drive
- Low drive current
- Low on-resistance

Outline

RENESAS Package code: PRSS0004AC-A
(Package name: TO-220AB)





1. Gate
2. Drain
   (Flange)
3. Source

Absolute Maximum Ratings

(Ta = 25°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	6	A
Drain peak current	I_D (pulse) Note1	24	A
Body-drain diode reverse drain current	I_{DR}	6	A
Channel dissipation	Pch Note2	30	W
Channel temperature	Tch	150	°C
Storage temperature	Tstg	–55 to +150	°C

Notes: 1. PW ≤ 10 µs, duty cycle ≤ 1 %
2. Value at Tc = 25°C

Electrical Characteristics

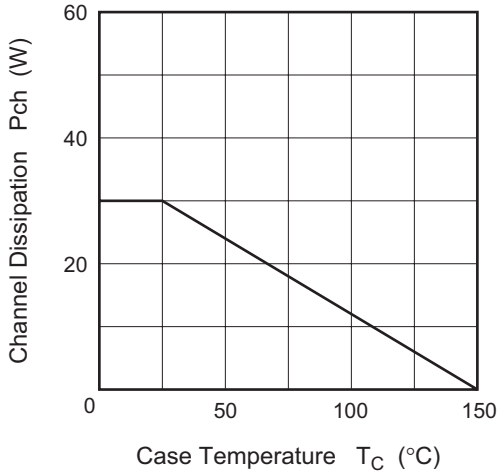
(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	250	—	—	V	I_D = 10 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}	—	—	5	µA	V_{DS} = 250 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	$R_{DS(on)}$	—	0.55	0.7	Ω	I_D = 3 A, V_{GS} = 4 V Note3
	$R_{DS(on)}$	—	0.57	0.8	Ω	I_D = 3 A, V_{GS} = 2.5V Note3
Forward transfer admittance	$\|y_{fs}\|$	5.5	9.2	—	S	I_D = 3 A, V_{DS} = 10 V Note3
Output capacitance	Ciss	—	450	—	pF	V_{DS} = 10 V, V_{GS} = 0, f = 1 MHz
Output capacitance	Coss	—	100	—	pF	
Reverse transfer capacitance	Crss	—	60	—	pF	
Total gate charge	Qg	—	17	—	nC	V_{DD} = 200 V, V_{GS} = 4 V, I_D = 6 A
Gate to source charge	Qgs	—	0.8	—	nC	
Gate to drain charge	Qgd	—	9.5	—	nC	
Turn-on delay time	$t_{d(on)}$	—	14	—	ns	V_{GS} = 4 V, I_D= 3 A, R_L = 10 Ω, Rg = 10 Ω
Rise time	t_r	—	48	—	ns	
Turn-off delay time	$t_{d(off)}$	—	88	—	ns	
Fall time	t_f	—	25	—	ns	
Body–drain diode forward voltage	V_{DF}	—	0.94	1.45	V	I_F = 6 A, V_{GS} = 0 Note3
Body–drain diode reverse recovery time	trr	—	125	—	ns	I_F = 6 A, V_{GS} = 0 di_F/dt = 100 A/µs

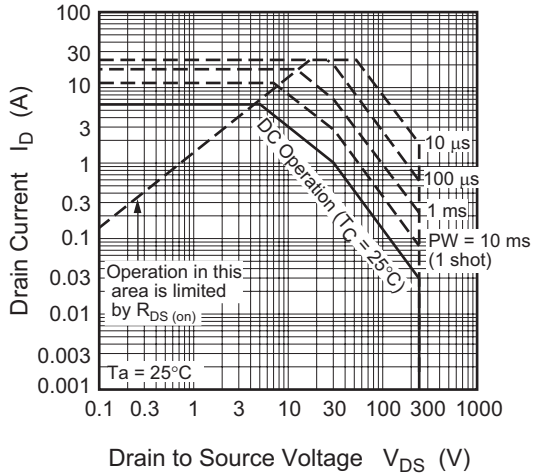
Notes: 3. Pulse test

Main Characteristics

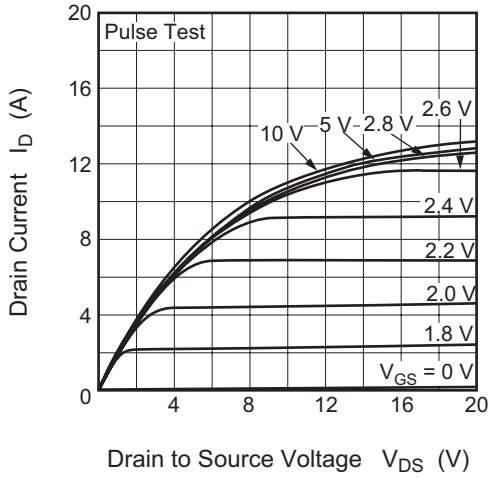
Power vs. Temperature Derating



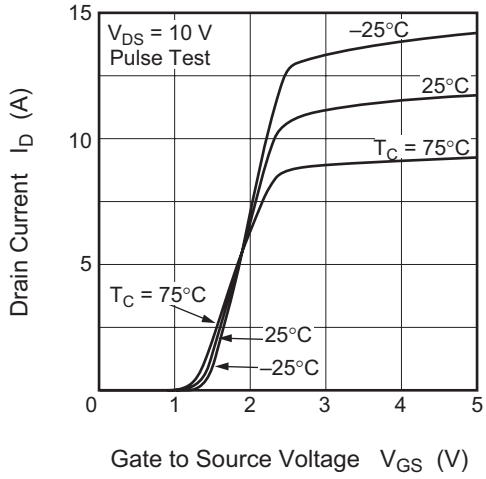
Maximum Safe Operation Area



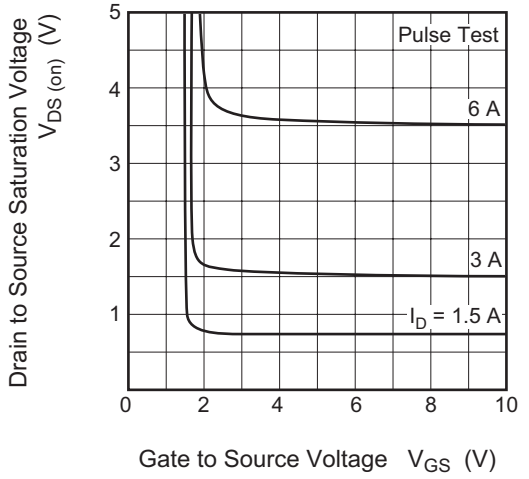
Typical Output Characteristics



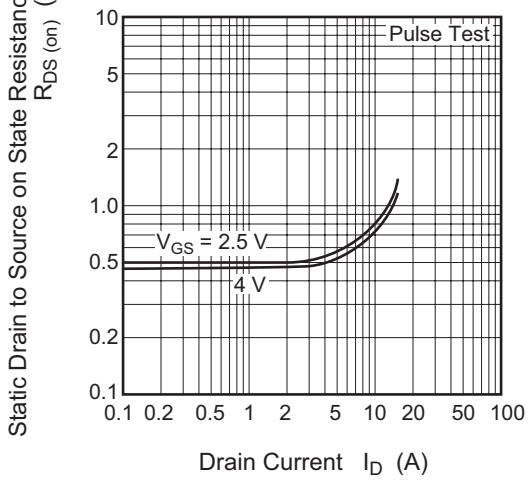
Typical Transfer Characteristics



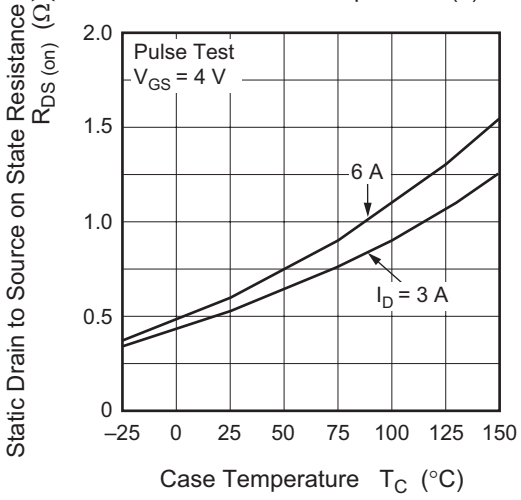
Drain to Source Saturation Voltage vs. Gate to Source Voltage



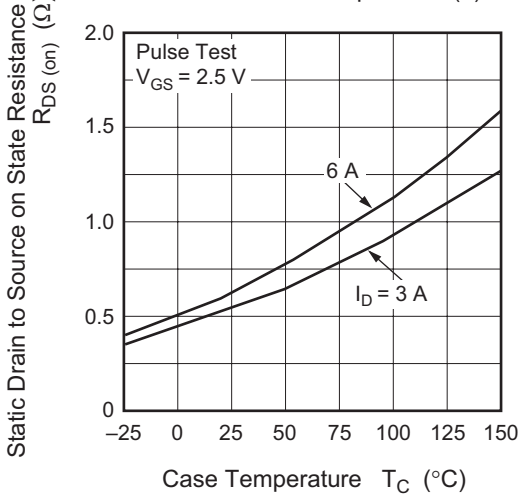
Static Drain to Source on State Resistance vs. Drain Current



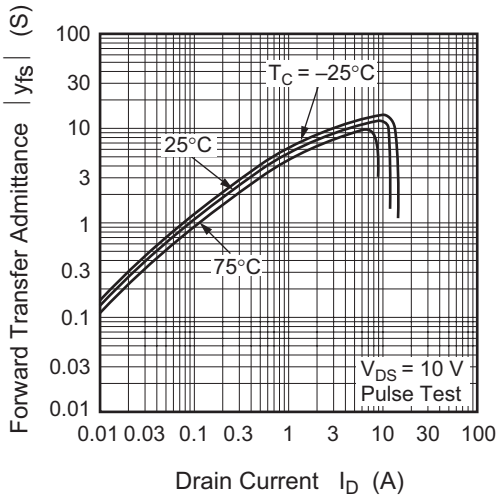
Static Drain to Source on State Resistance vs. Temperature (1)



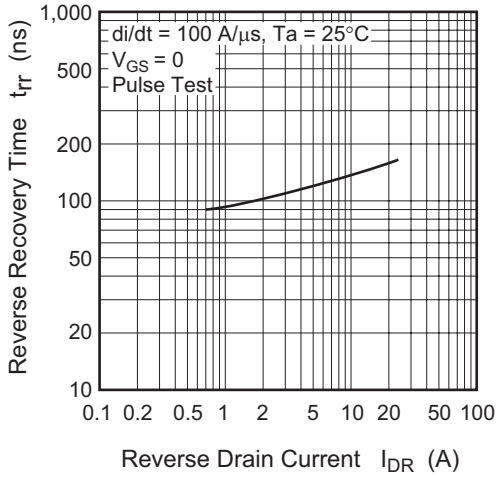
Static Drain to Source on State Resistance vs. Temperature (2)



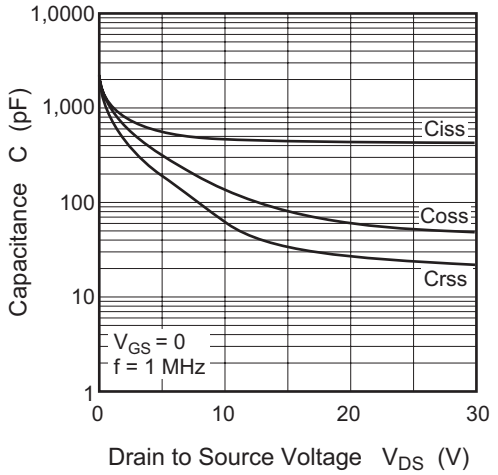
Forward Transfer Admittance vs. Drain Current



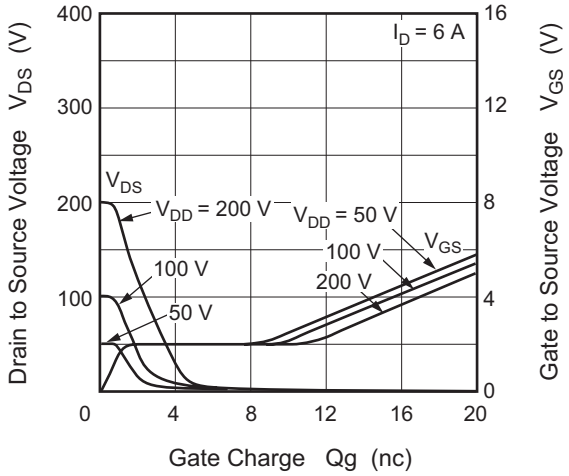
Body to Drain Diode Reverse Recovery Time



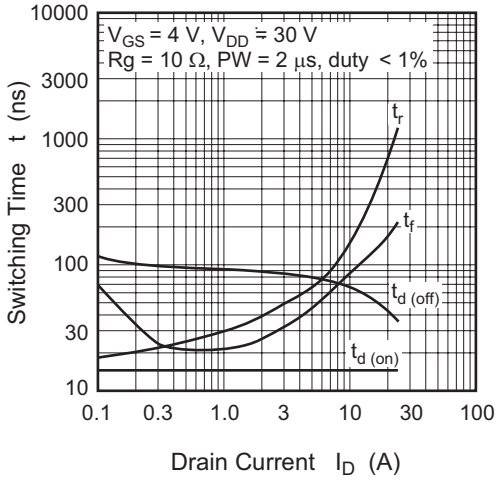
Typical Capacitance vs. Drain to Source Voltage



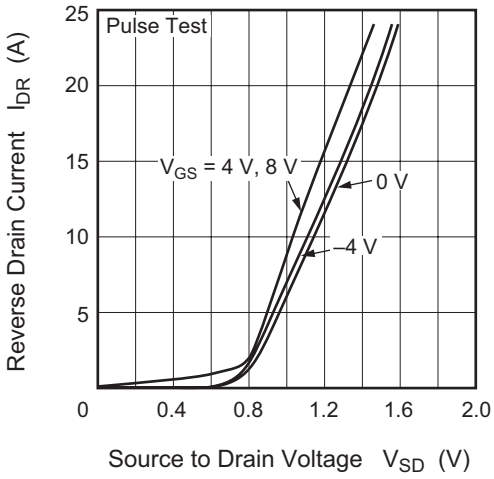
Dynamic Input Characteristics



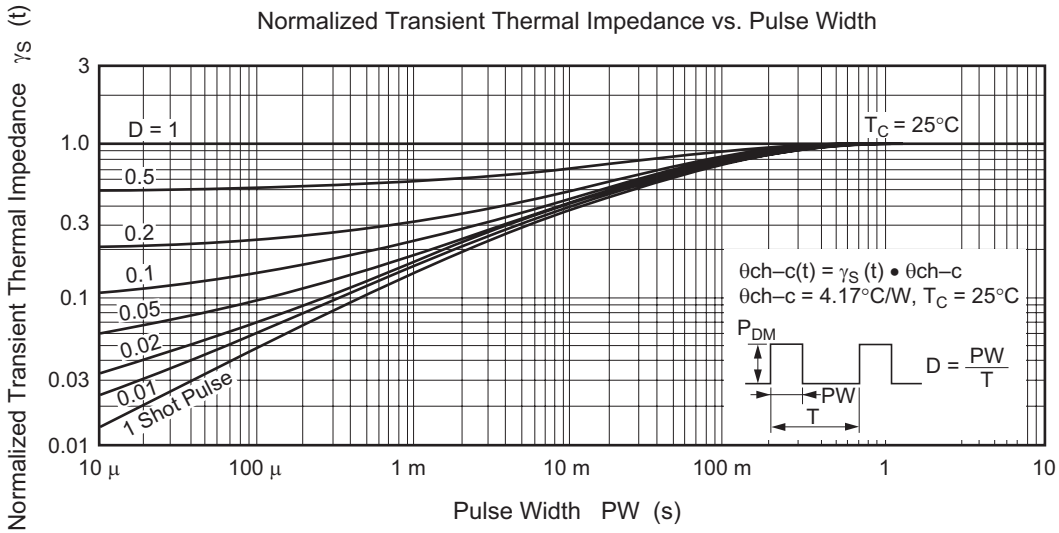
Switching Characteristics



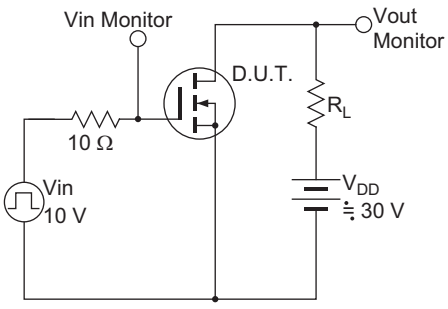
Reverse Drain Current vs. Source to Drain Voltage



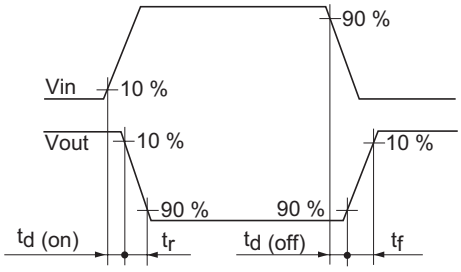
Normalized Transient Thermal Impedance vs. Pulse Width



Switching Time Test Circuit



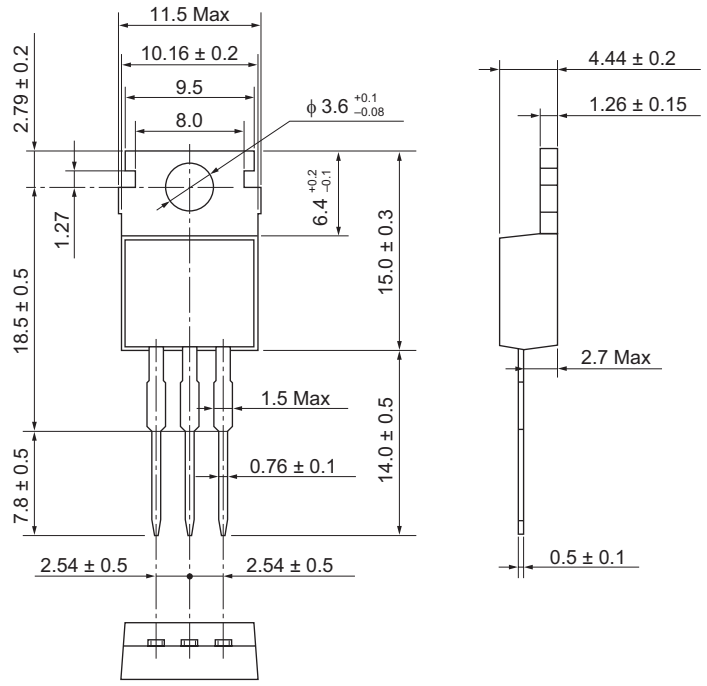
Waveforms



Package Dimensions

Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
TO-220AB	SC-46	PRSS0004AC-A	TO-220AB / TO-220ABV	1.8g

Unit: mm



Ordering Information

Part Name	Quantity	Shipping Container
2SK3736	50 pcs.	Sack

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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Colophon .6.0