To our customers,

# Old Company Name in Catalogs and Other Documents

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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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# 2SK2408

## Silicon N Channel MOS FET

REJ03G1011-0300
(Previous: ADE-208-1358)
Rev.3.00
Apr 27, 2006

### Application

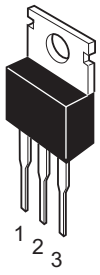
High speed power switching

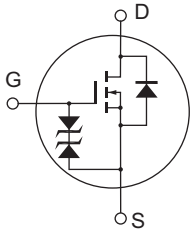
### Features

- Low on-resistance
- Built-in fast recovery diode (trr = 120 ns typ)
- High speed switching
- Low drive current
- Suitable for switching regulator, motor control

### 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 | $V_{DSS}$ | 500 | V |
| Gate to source voltage | $V_{GSS}$ | ±30 | V |
| Drain current | $I_D$ | 7 | A |
| Drain peak current | $I_{D(pulse)}$*[1] | 28 | A |
| Body to drain diode reverse drain current | $I_{DR}$ | 7 | A |
| Channel dissipation | Pch*[2] | 60 | 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

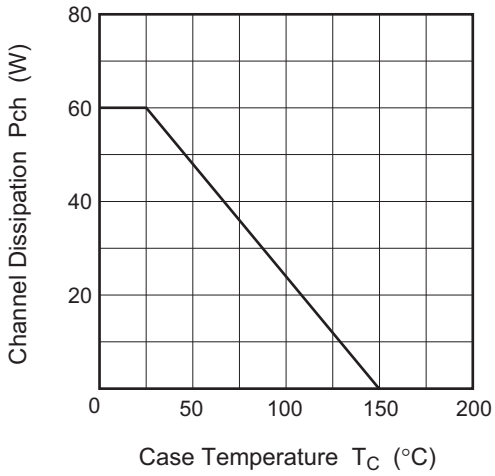
(Ta = 25°C)

| Item | Symbol | Min | Typ | Max | Unit | Test Conditions |
|---|---|---|---|---|---|---|
| Drain to source breakdown voltage | $V_{(BR)DSS}$ | 500 | — | — | V | $I_D$ = 10 mA, $V_{GS}$ = 0 |
| Gate to source breakdown voltage | $V_{(BR)GSS}$ | ±30 | — | — | V | $I_G$ = ±100 µA, $V_{DS}$ = 0 |
| Gate to source leak current | $I_{GSS}$ | — | — | ±10 | µA | $V_{GS}$ = ±25 V, $V_{DS}$ = 0 |
| Zero gate voltage drain current | $I_{DSS}$ | — | — | 250 | µA | $V_{DS}$ = 400 V, $V_{GS}$ = 0 |
| Gate to source cutoff voltage | $V_{GS(off)}$ | 2.0 | — | 3.0 | V | $I_D$ = 1 mA, $V_{DS}$ = 10 V |
| Static drain to source on state resistance | $R_{DS(on)}$ | — | 0.7 | 0.9 | Ω | $I_D$ = 4 A, $V_{GS}$ = 10 V*[3] |
| Forward transfer admittance | $\|y_{fs}\|$ | 3.5 | 6.0 | — | S | $I_D$ = 4 A, $V_{DS}$ = 10 V*[3] |
| Input capacitance | Ciss | — | 1100 | — | pF | $V_{DS}$ = 10 V, $V_{GS}$ = 0, f = 1 MHz |
| Output capacitance | Coss | — | 310 | — | pF | |
| Reverse transfer capacitance | Crss | — | 50 | — | pF | |
| Turn-on delay time | $t_{d(on)}$ | — | 15 | — | ns | $I_D$ = 4 A, $V_{GS}$ = 10 V, $R_L$ = 7.5 Ω |
| Rise time | $t_r$ | — | 55 | — | ns | |
| Turn-off delay time | $t_{d(off)}$ | — | 100 | — | ns | |
| Fall time | $t_f$ | — | 48 | — | ns | |
| Body to drain diode forward voltage | $V_{DF}$ | — | 0.9 | — | V | $I_F$ = 7 A, $V_{GS}$ = 0 |
| Body to drain diode reverse recovery time | $t_{rr}$ | — | 120 | — | ns | $I_F$ = 7 A, $V_{GS}$ = 0, $di_F$ / dt = 100 A / µs |

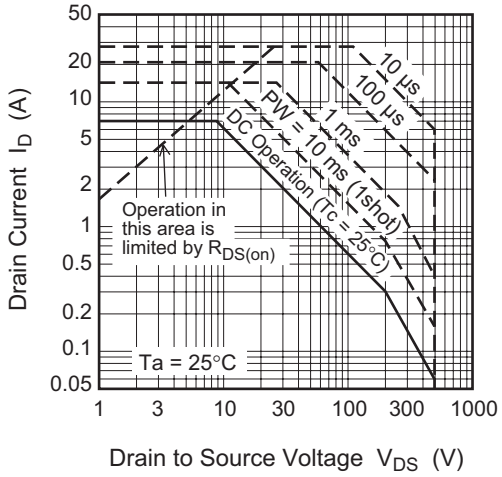
Note: 3. Pulse Test

## Main Characteristics

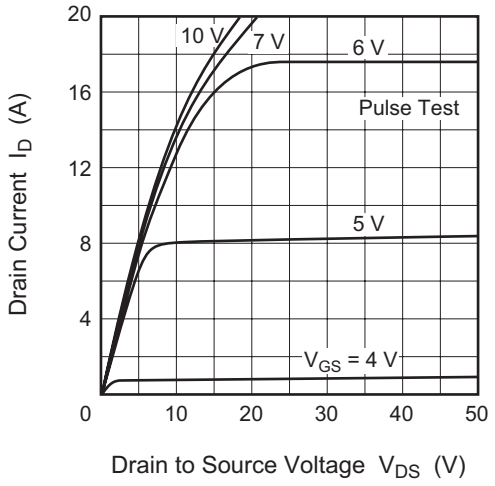
Power vs. Temperature Derating



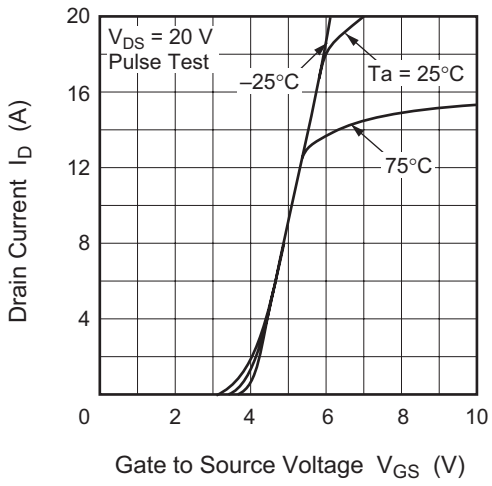

Maximum Safe Operation Area



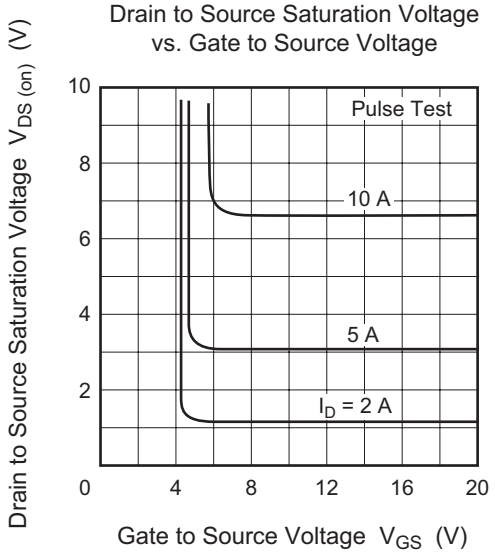

Typical Output Characteristics



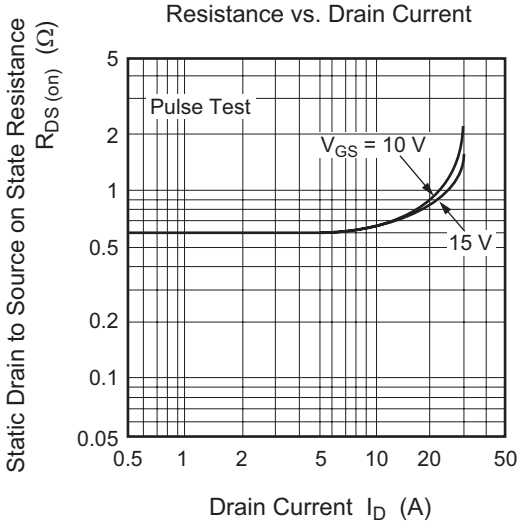

Typical Transfer Characteristics



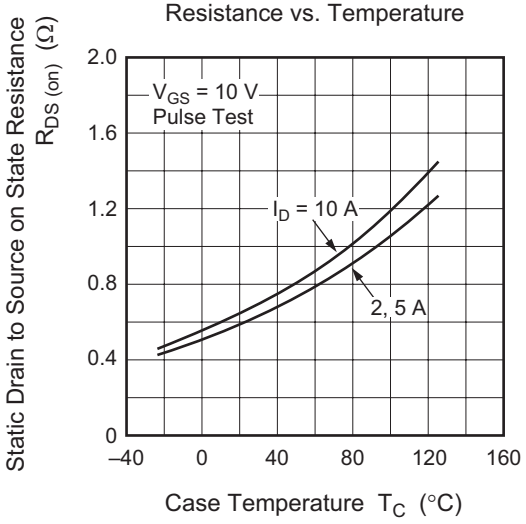

Drain to Source Saturation Voltage vs. Gate to Source Voltage



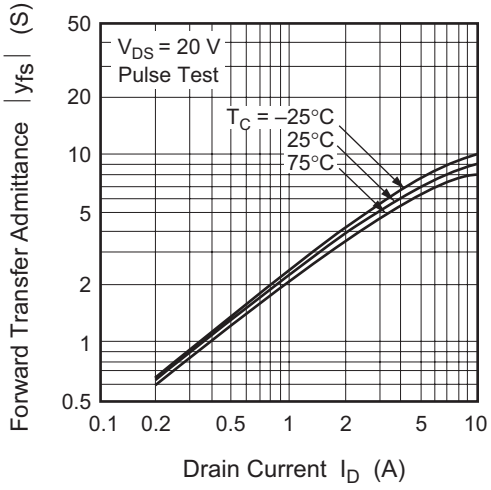

Static Drain to Source on State Resistance vs. Drain Current



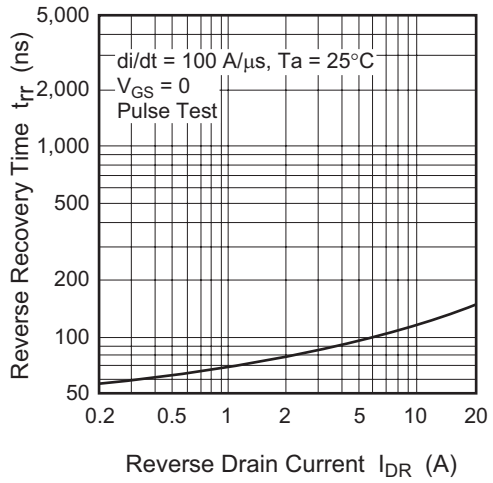
Static Drain to Source on State Resistance vs. Temperature



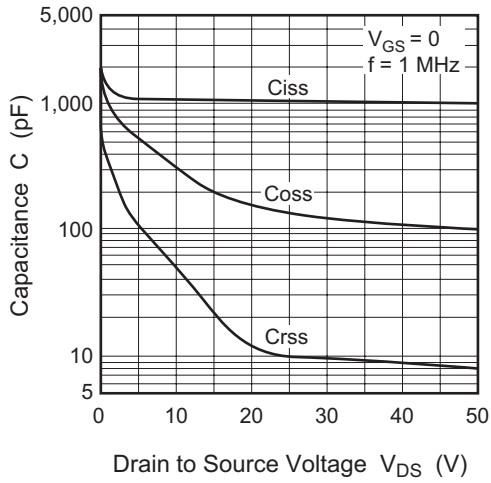

Forward Transfer Admittance vs. Drain Current



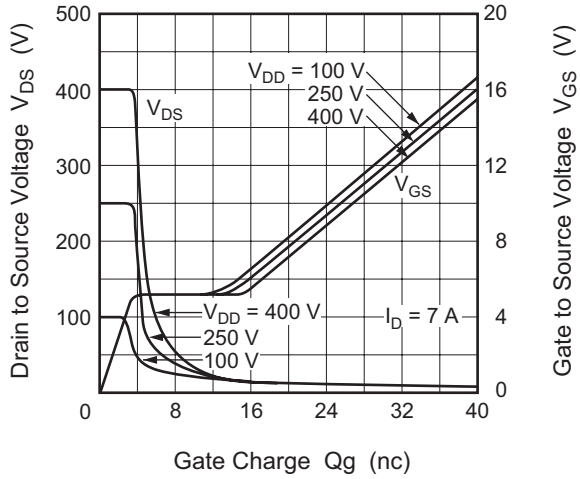

Body to Drain Diode Reverse Recovery Time



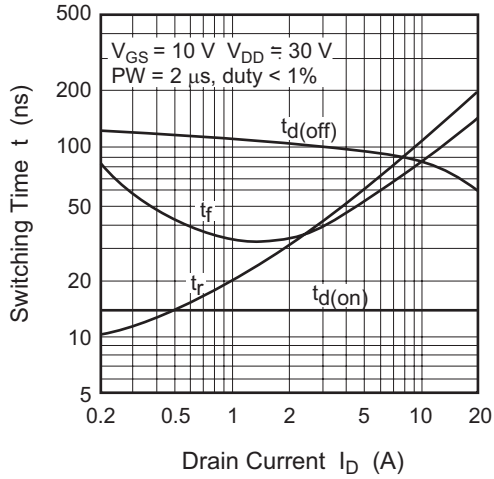

Typical Capacitance vs. Drain to Source Voltage



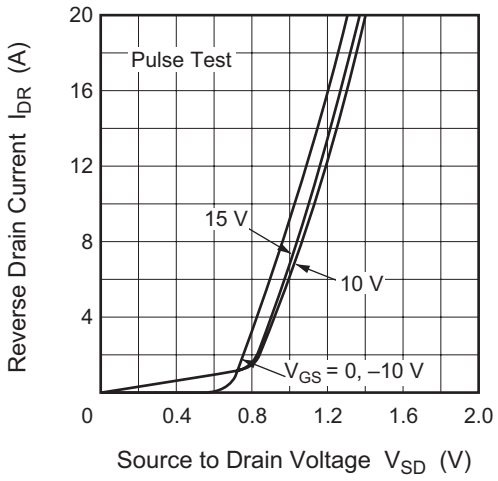

Dynamic Input Characteristics



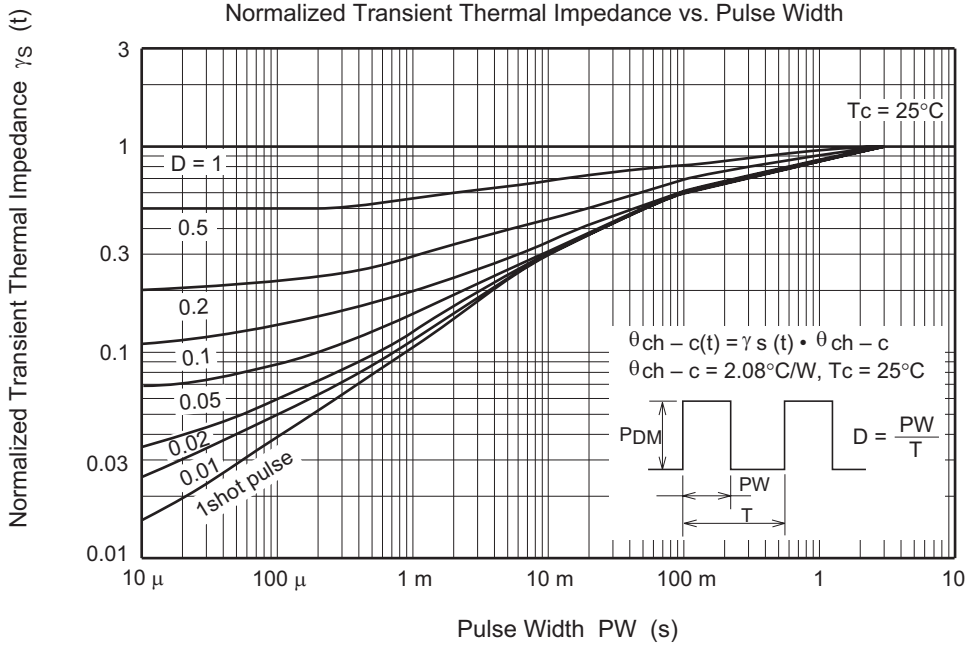

Switching Characteristics



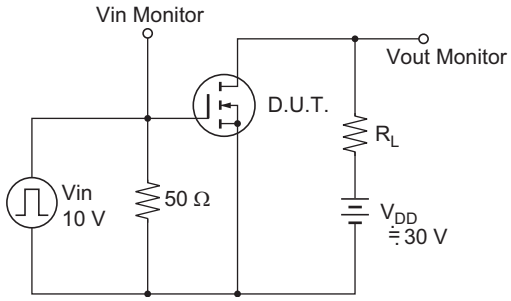
Reverse Drain Current vs.
Source to Drain Voltage



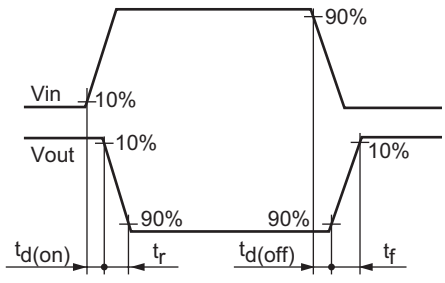

Normalized Transient Thermal Impedance vs. Pulse Width




Switching Time Test Circuit



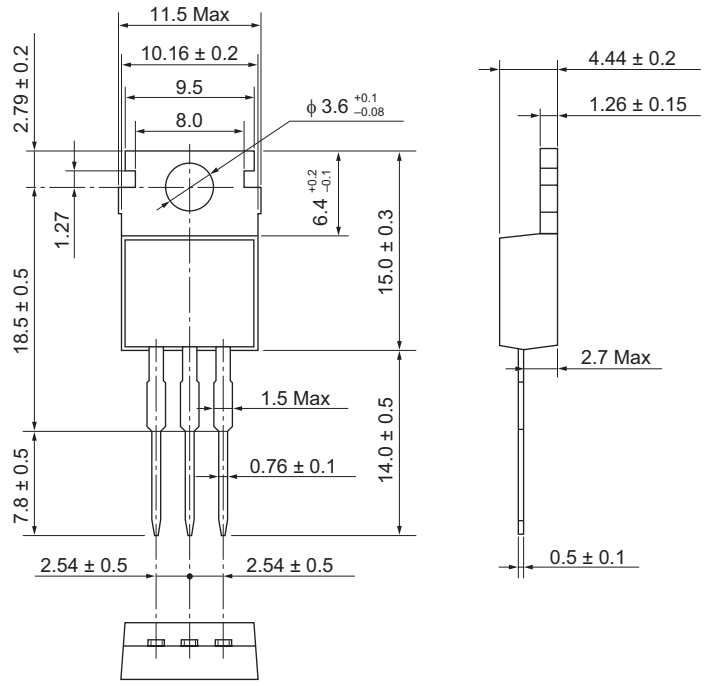

Waveforms



## Package Dimensions

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

Unit: mm




## Ordering Information

| Part Name | Quantity | Shipping Container |
|---|---|---|
| 2SK2408-E | 500 pcs | Box (Sack) |

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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, AZIACenter, No.1233 Lujiazui Ring Rd, Pudong District, Shanghai, China 200120
Tel: <86> (21) 5877-1818, Fax: <86> (21) 6887-7898

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7th Floor, North Tower, World Finance Centre, Harbour City, 1 Canton Road, Tsimshatsui, Kowloon, Hong Kong
Tel: <852> 2265-6688, Fax: <852> 2730-6071

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10th Floor, No.99, Fushing North Road, Taipei, Taiwan
Tel: <886> (2) 2715-2888, Fax: <886> (2) 2713-2999

**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, Jalan Persiaran Barat, 46050 Petaling Jaya, Selangor Darul Ehsan, Malaysia
Tel: <603> 7955-9390, Fax: <603> 7955-9510



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