

RJK5012DPP

Silicon N Channel MOS FET
High Speed Power Switching

REJ03G1545-0100

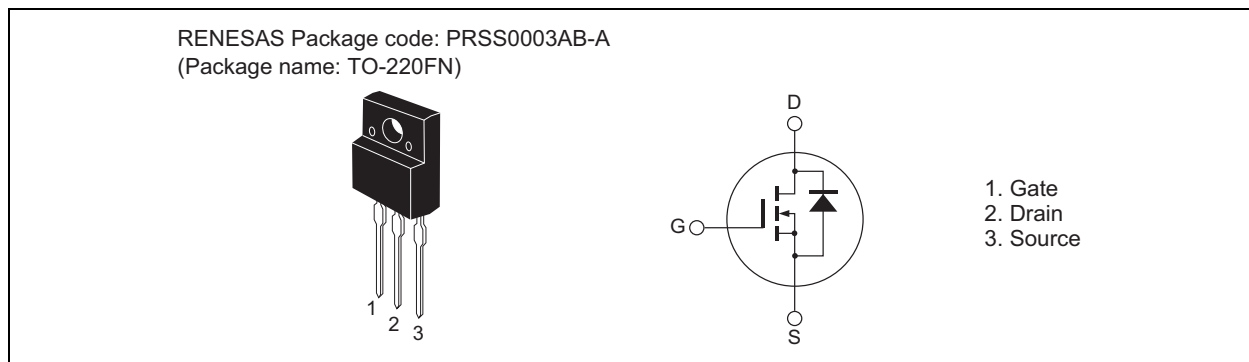
Rev.1.00

May 10, 2007

Features

- Low on-resistance
- Low leakage current
- High speed switching

Outline



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 ^{Note4} | 12 | A |
| Drain peak current | $I_{D(pulse)}$ ^{Note1} | 24 | A |
| Body-drain diode reverse drain current | I_{DR} | 12 | A |
| Body-drain diode reverse drain peak current | $I_{DR(pulse)}$ ^{Note1} | 24 | A |
| Avalanche current | I_{AP} ^{Note3} | 4 | A |
| Avalanche energy | E_{AR} ^{Note3} | 0.88 | mJ |
| Channel dissipation | P_{ch} ^{Note2} | 30 | W |
| Channel to case thermal impedance | θ_{ch-c} | 4.17 | °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. $ST_{ch} = 25^\circ C$, $T_{ch} \leq 150^\circ C$
 4. Limited by maximum safe operation area

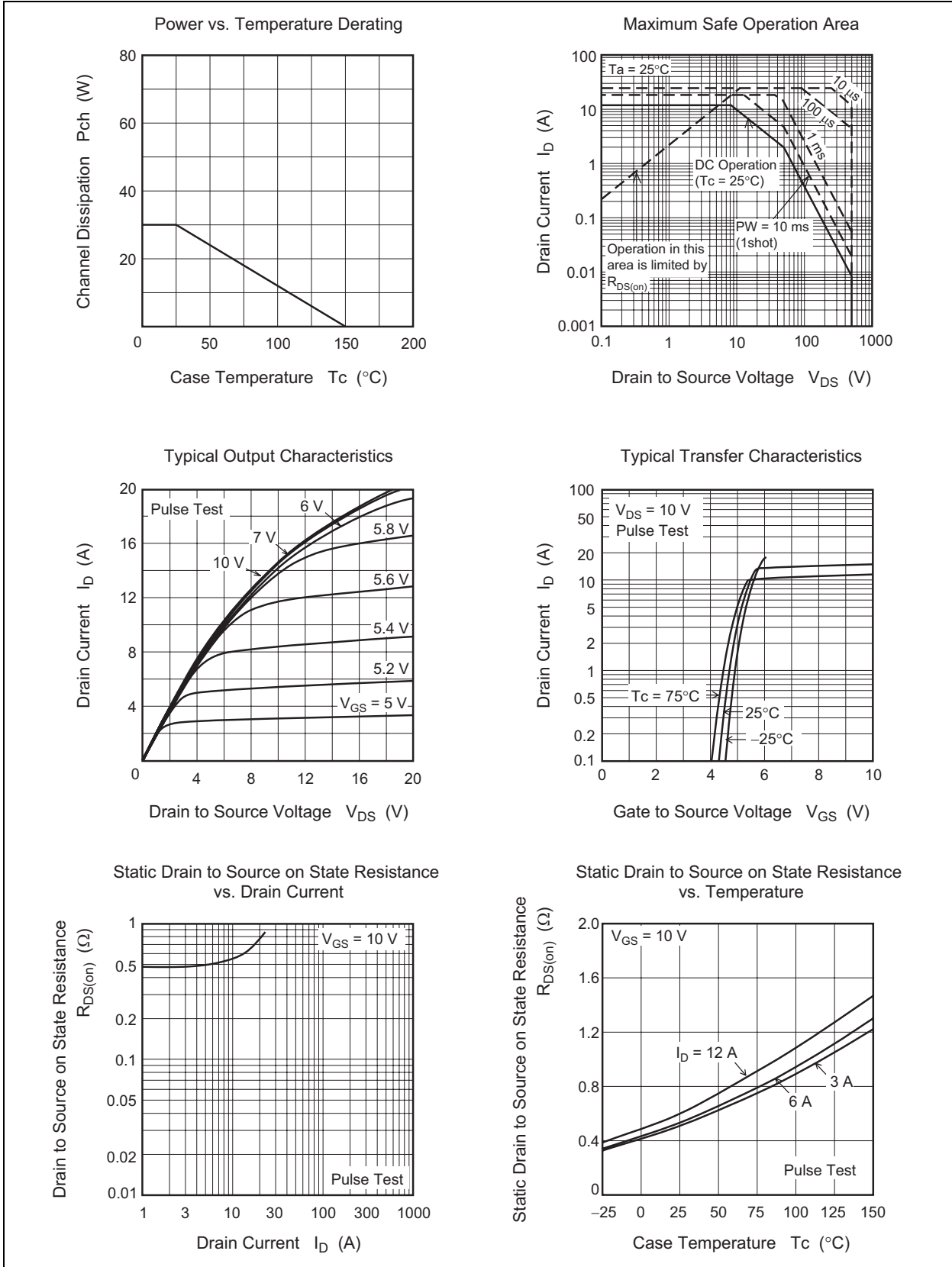
Electrical Characteristics

(Ta = 25°C)

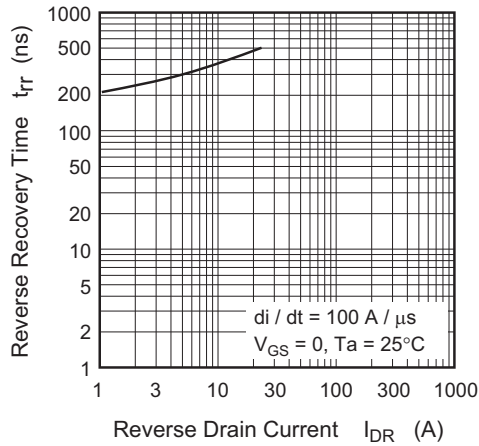
| Item | Symbol | Min | Typ | Max | Unit | Test conditions |
|--|---------------|-----|-------|-----------|---------------|--|
| Drain to source breakdown voltage | $V_{(BR)DSS}$ | 500 | — | — | V | $I_D = 10 \text{ mA}$, $V_{GS} = 0$ |
| Zero gate voltage drain current | I_{DSS} | — | — | 1 | μA | $V_{DS} = 500 \text{ V}$, $V_{GS} = 0$ |
| 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 | $R_{DS(on)}$ | — | 0.515 | 0.620 | Ω | $I_D = 6 \text{ A}$, $V_{GS} = 10 \text{ V}$ ^{Note5} |
| Input capacitance | C_{iss} | — | 1100 | — | pF | $V_{DS} = 25 \text{ V}$ $V_{GS} = 0$ $f = 1 \text{ MHz}$ |
| Output capacitance | C_{oss} | — | 120 | — | pF | |
| Reverse transfer capacitance | C_{rss} | — | 15 | — | pF | |
| Turn-on delay time | $t_{d(on)}$ | — | 30 | — | ns | $I_D = 6 \text{ A}$ $V_{GS} = 10 \text{ V}$ $R_L = 41.6 \Omega$ $R_g = 10 \Omega$ |
| Rise time | t_r | — | 23 | — | ns | |
| Turn-off delay time | $t_{d(off)}$ | — | 77 | — | ns | |
| Fall time | t_f | — | 16 | — | ns | |
| Total gate charge | Q_g | — | 29 | — | nC | $V_{DD} = 400 \text{ V}$ |
| Gate to source charge | Q_{gs} | — | 5.5 | — | nC | $V_{GS} = 10 \text{ V}$ |
| Gate to drain charge | Q_{gd} | — | 13 | — | nC | $I_D = 12 \text{ A}$ |
| Body-drain diode forward voltage | V_{DF} | — | 0.89 | 1.50 | V | $I_F = 12 \text{ A}$, $V_{GS} = 0$ ^{Note5} |
| Body-drain diode reverse recovery time | t_{rr} | — | 280 | — | ns | $I_F = 12 \text{ A}$, $V_{GS} = 0$ $di_F/dt = 100 \text{ A}/\mu\text{s}$ |

Notes: 5. Pulse test

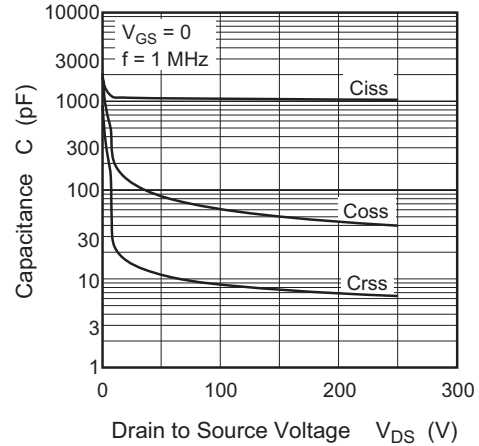
Main Characteristics



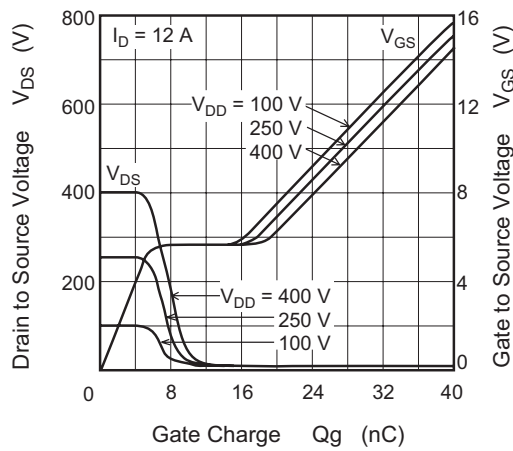
Body-Drain Diode Reverse Recovery Time



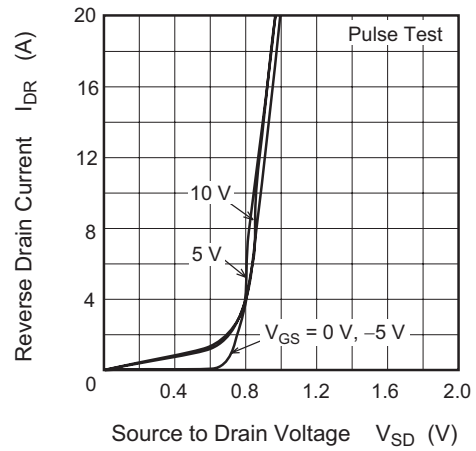
Typical Capacitance vs. Drain to Source Voltage



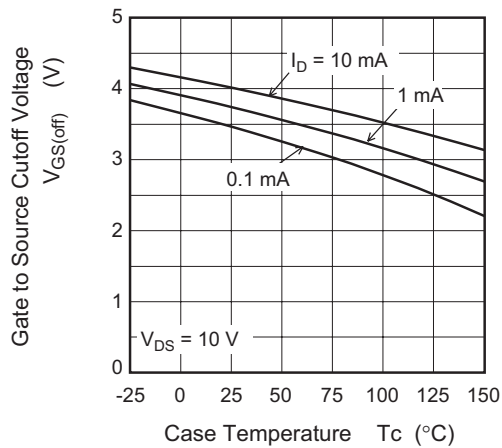
Dynamic Input Characteristics

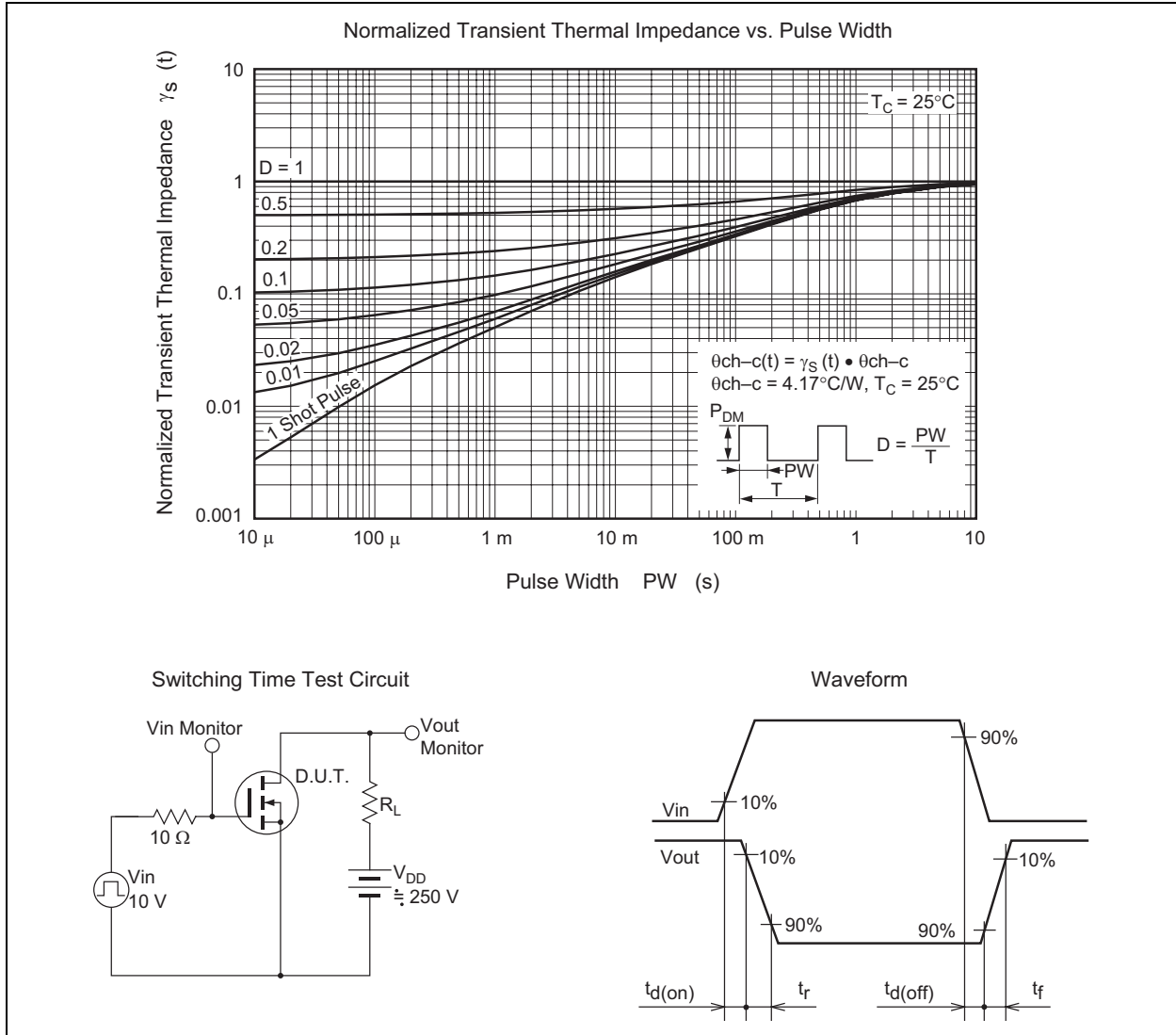


Reverse Drain Current vs. Source to Drain Voltage

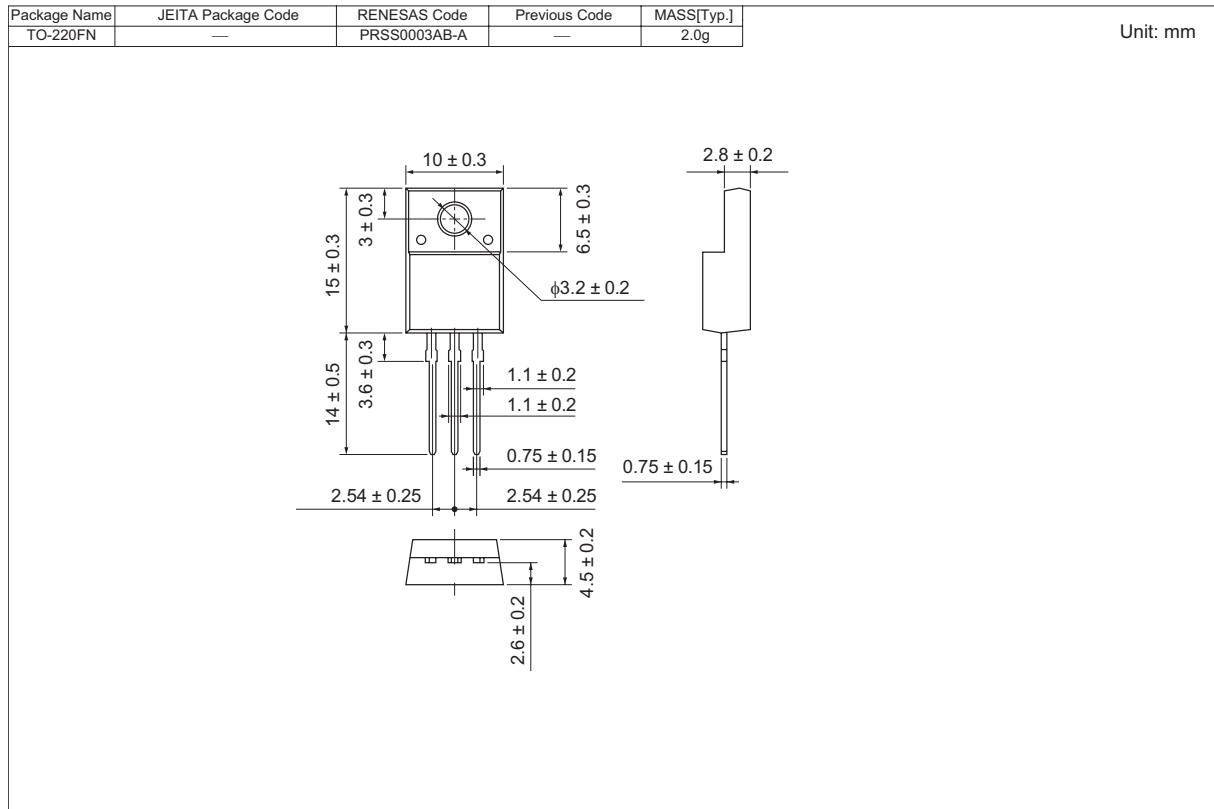


Gate to Source Cutoff Voltage vs. Case Temperature





Package Dimensions



Ordering Information

| Part No. | Quantity | Shipping Container |
|------------------|----------|--------------------|
| RJK5012DPP-00-T2 | 1050 pcs | Box (Tube) |

Notes:

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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

Renesas Technology Hong Kong Ltd.

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

Renesas Technology Taiwan Co., Ltd.

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