

RQM2201DNS

Silicon N Channel MOS FET
Power Switching

REJ03G1492-0200

Rev.2.00

Apr 16, 2007

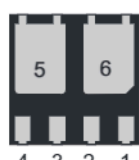
Features

- Small, thin and leadless type package (3 × 3 mm, t = 0.8 mm max.)
- Two FET chips are mounted in one package
- High density mounting
- High speed switching. (Ciss = 200 pF typ)
- $V_{DS} \geq 60$ V and capable of 2.5 V gate drive

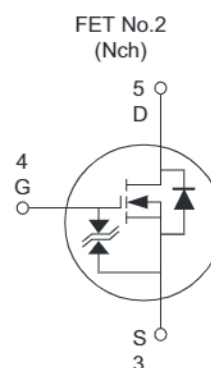
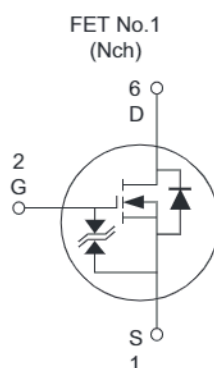
Outline

RENESAS Package code: PWSN0006ZA-A

(Package name: WSON0303-6 <HWSON-6>)



(Bottom view)



1, 3: Source
2, 4: Gate
5, 6: Drain

- Notes:
1. Marking is "M2201".
 2. The following maximum ratings and electric characteristics are applied to both FET1 and FET2.

Absolute Maximum Ratings

(Ta = 25°C)

Item	Symbol	Ratings	Unit
Drain to source voltage	V_{DS}	60	V
Gate to source voltage	V_{GS}	±12	V
Drain current	I_D	2	A
Drain peak current	$I_{D(pulse)}$ ^{Note1}	8	A
Body - drain diode reverse drain current	I_{DR}	2	A
Channel dissipation	P_{ch} ^{Note2}	1	W
Channel dissipation	P_{ch} ^{Note3}	1.5	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. 1 Drive operation: When using the glass epoxy board (FR-4 40 × 40 × 1 mm)

3. 2 Drive operation: When using the glass epoxy board (FR-4 40 × 40 × 1 mm)

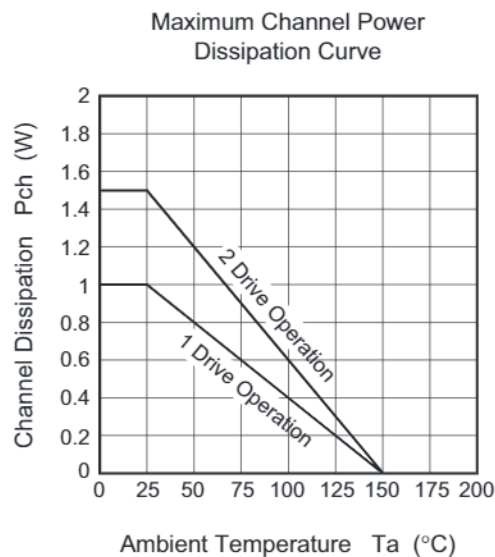
Electrical Characteristics

(Ta = 25°C)

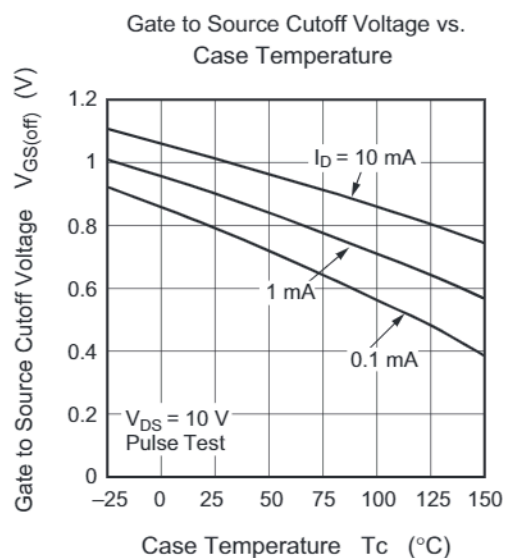
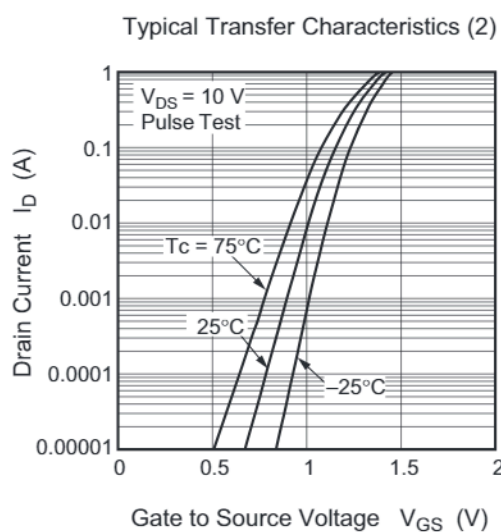
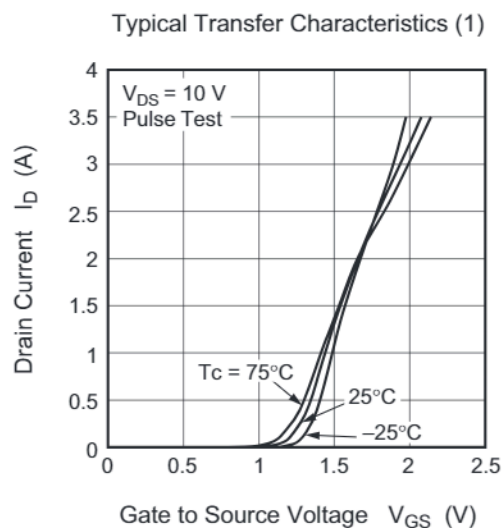
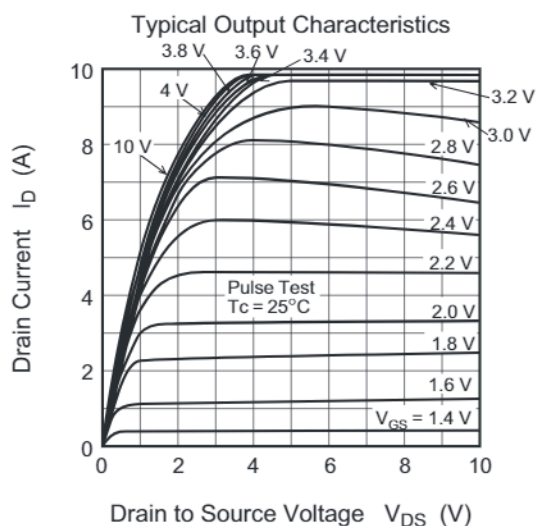
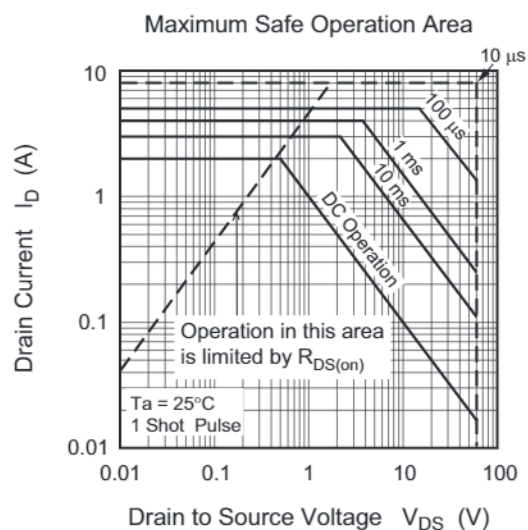
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	60	—	—	V	$I_D = 10 \text{ mA}$, $V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	+12	—	—	V	$I_G = +100 \text{ } \mu\text{A}$, $V_{DS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	-12	—	—	V	$I_G = -100 \text{ } \mu\text{A}$, $V_{DS} = 0$
Gate to source leak current	I_{GSS}	—	—	+10	μA	$V_{GS} = +10 \text{ V}$, $V_{DS} = 0$
Gate to source leak current	I_{GSS}	—	—	-10	μA	$V_{GS} = -10 \text{ V}$, $V_{DS} = 0$
Drain to source leak current	I_{DSS}	—	—	1	μA	$V_{DS} = 60 \text{ V}$, $V_{GS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	0.4	—	1.4	V	$V_{DS} = 10 \text{ V}$, $I_D = 1 \text{ mA}$
Drain to source on state resistance	$R_{DS(on)}$	—	173	225	m Ω	$I_D = 1 \text{ A}$, $V_{GS} = 4.5 \text{ V}$ ^{Note4}
Drain to source on state resistance	$R_{DS(on)}$	—	207	290	m Ω	$I_D = 1 \text{ A}$, $V_{GS} = 2.5 \text{ V}$ ^{Note4}
Forward transfer admittance	$ y_{fs} $	2.3	3.5	—	S	$I_D = 1 \text{ A}$, $V_{DS} = 10 \text{ V}$ ^{Note4}
Input capacitance	C_{iss}	—	200	—	pF	$V_{DS} = 10 \text{ V}$
Output capacitance	C_{oss}	—	25	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	C_{rss}	—	13	—	pF	$f = 1 \text{ MHz}$
Turn - on delay time	$t_{d(on)}$	—	7	—	ns	$I_D = 1 \text{ A}$ $V_{GS} = 10 \text{ V}$ $R_L = 10 \text{ } \Omega$ $R_g = 4.7 \text{ } \Omega$
Rise time	t_r	—	28	—	ns	
Turn - off delay time	$t_{d(off)}$	—	30	—	ns	
Fall time	t_f	—	4	—	ns	
Total gate charge	Q_g	—	2.4	—	nC	$V_{DD} = 10 \text{ V}$
Gate to Source charge	Q_{gs}	—	0.4	—	nC	$V_{GS} = 4.5 \text{ V}$
Gate to drain charge	Q_{gd}	—	0.4	—	nC	$I_D = 2 \text{ A}$
Body - drain diode forward voltage	V_{DF}	—	0.8	—	V	$I_F = 2 \text{ A}$, $V_{GS} = 0$ ^{Note4}

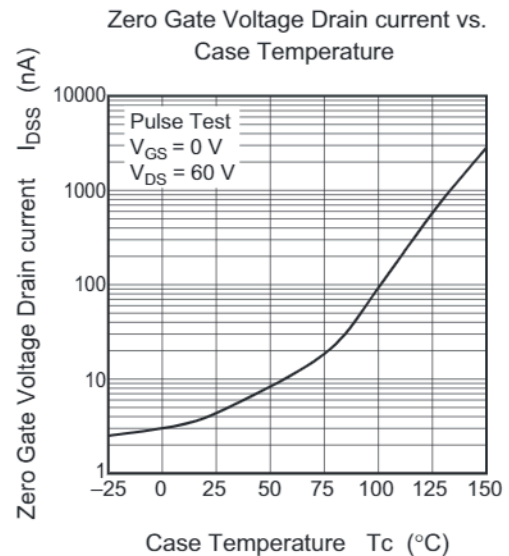
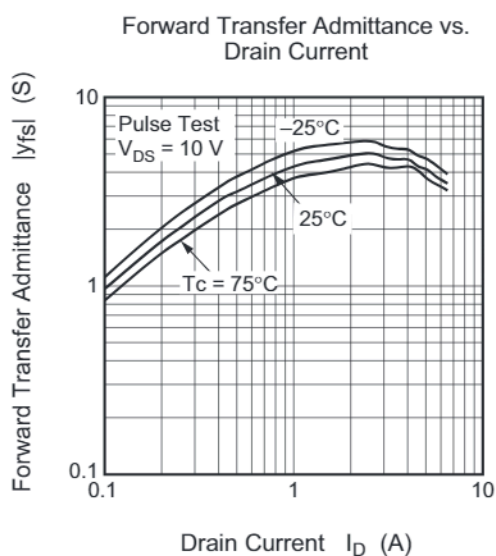
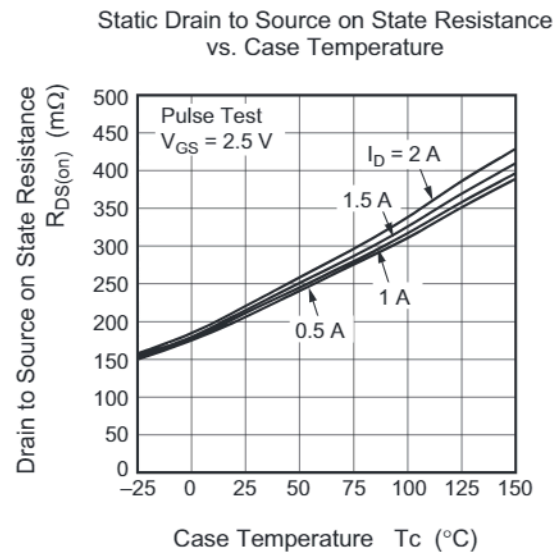
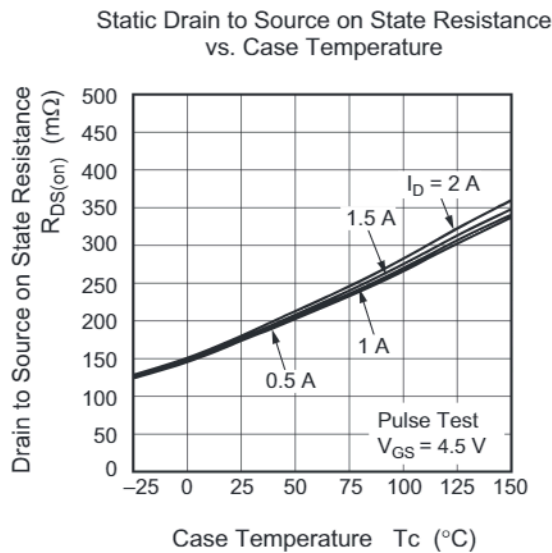
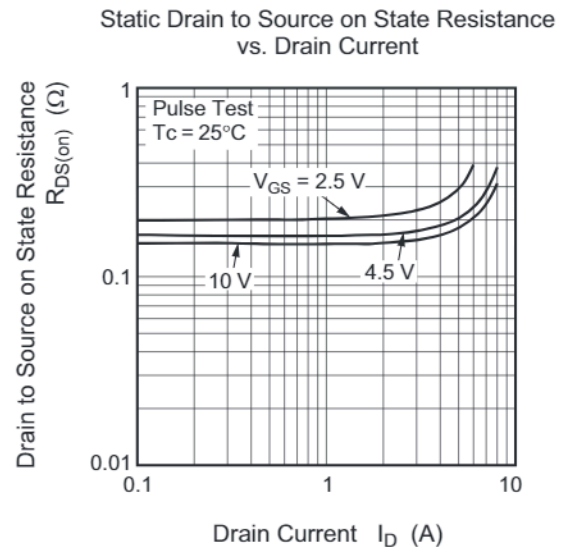
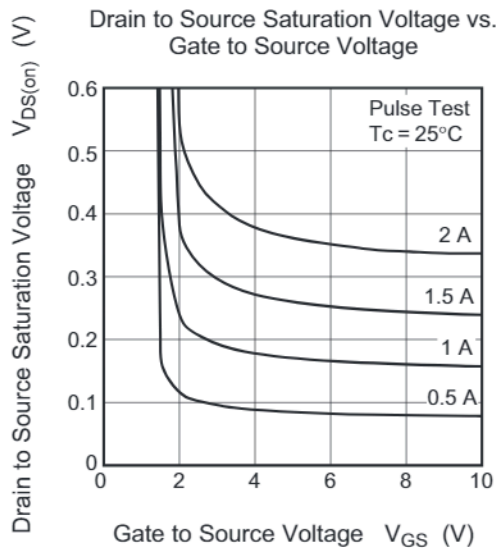
Notes: 4. Pulse test

Main Characteristics

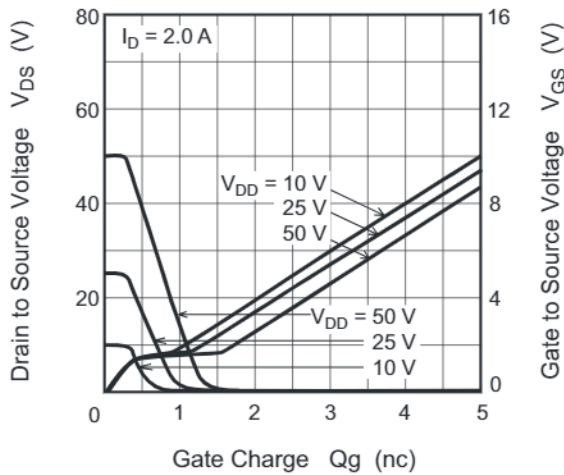


*When using the glass epoxy board (FR-4: 40 × 40 × 1 mm)

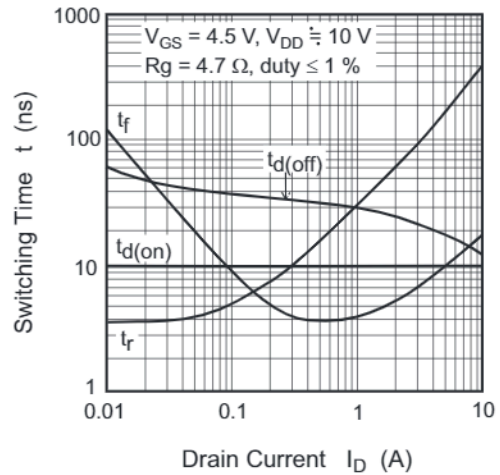




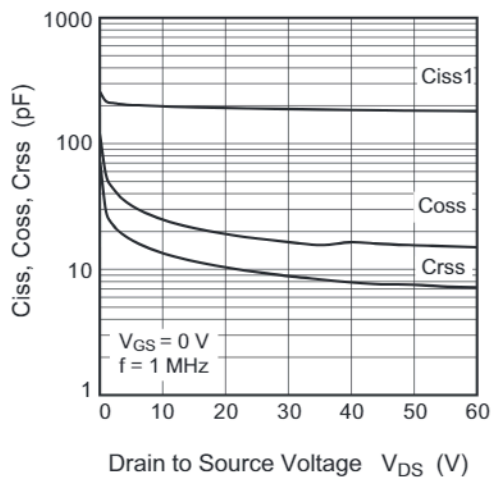
Dynamic Input Characteristics



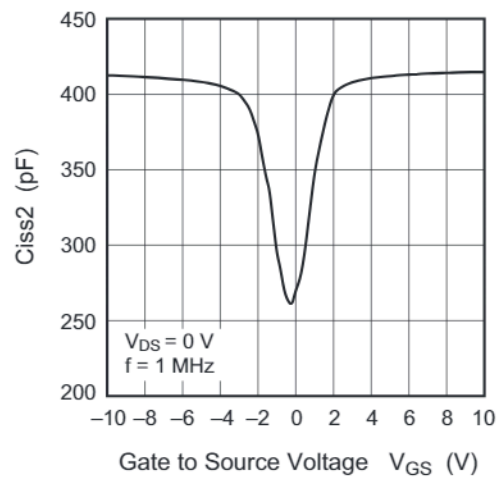
Switching Characteristics



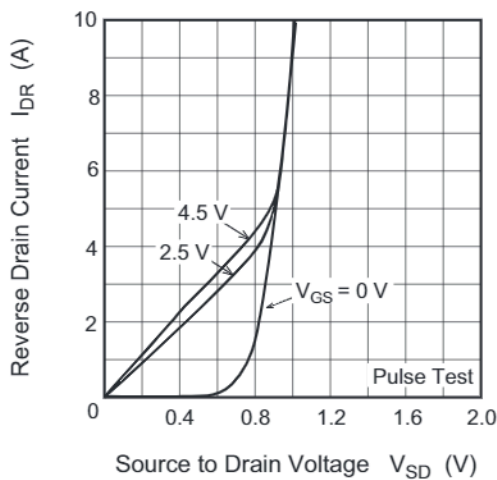
Typical Capacitance vs. Drain to Source Voltage



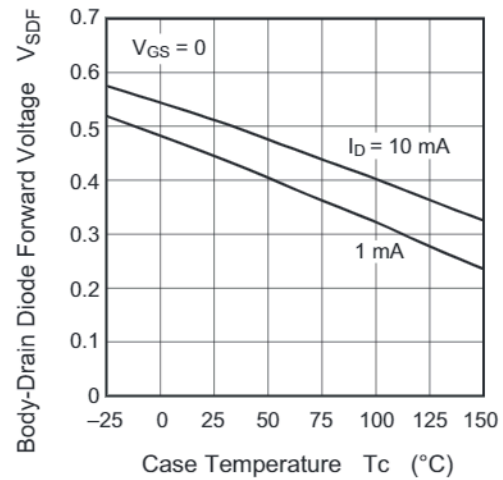
Input Capacitance vs. Gate to Source Voltage



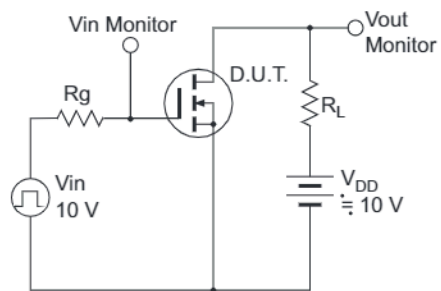
Reverse Drain Current vs. Source to Drain Voltage



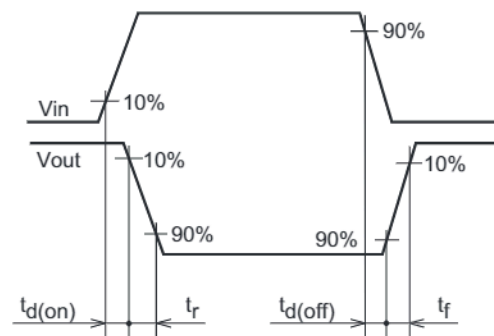
Body-Drain Diode Forward Voltage vs. Case Temperature



Switching Time Test Circuit

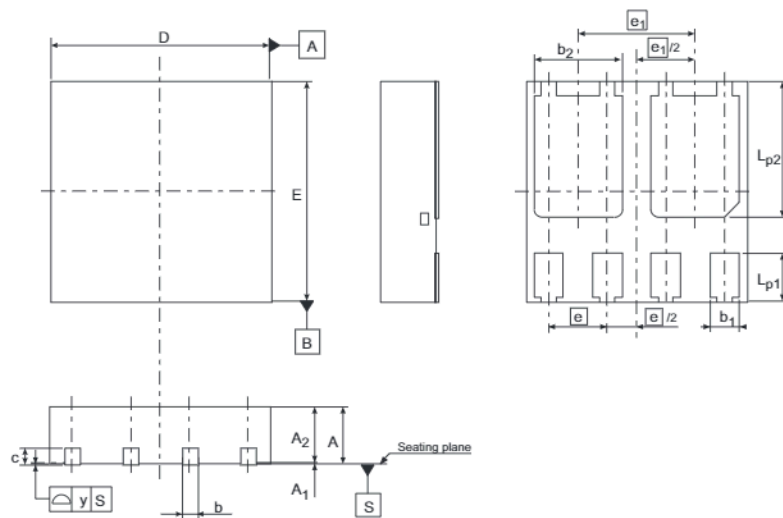


Switching Time Waveform



Package Dimensions

Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
HWSO6-6	P-HWSO6-3x3-0.80	PWSN0006ZA-A	—	0.022 g



Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
A	0.70	—	0.80
A ₁	0	—	0.05
A ₂	0.70	—	0.75
b	—	0.20	—
b ₁	0.35	0.40	0.45
b ₂	1.10	1.15	1.20
c	—	0.20	—
D	2.90	3.00	3.10
E	2.90	3.00	3.10
e	—	0.80	—
e ₁	—	1.60	—
L _{p1}	0.55	—	0.75
L _{p2}	1.75	—	1.95
y	—	—	0.05

Ordering Information

Part No.	Quantity	Shipping Container
RQM2201DNSTL-E	2000 pcs.	φ178 mm reel, 8 mm Emboss taping
RQM2201DNSTR-E	2000 pcs.	φ178 mm reel, 8 mm Emboss taping

Notes:

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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