

RJK1590DP3-A0

150 V - 1 A - MOS FET
High Speed Power Switching

R07DS1255EJ0100
Rev.1.00
Mar 30, 2015

Features

- Capable of 2.5 V gate drive
- Low drive current
- Low on-resistance
 $R_{DS(on)} = 1.5 \Omega$ typ. (at $V_{GS} = 4 V$)

Outline

RENESAS Package code: PRSP0004ZB-A
(Package name: SOT-223)

1. Gate
2. Drain
3. Source
4. Drain

Absolute Maximum Ratings

($T_a = 25^\circ C$)

Item	Symbol	Value	Unit
Drain to source voltage	V_{BSS}	150	V
Gate to source voltage	V_{GSS}	± 10	V
Drain current	I_D	1	A
Drain peak current	$I_{D(pulse)}$ <small>Note 1</small>	4	A
Body-drain diode reverse drain current	I_{DR}	1	A
Channel dissipation	P_{ch}	1.04	W
Channel to ambient thermal impedance	θ_{ch-a}	120	$^\circ C/W$
Channel temperature	T_{ch}	150	$^\circ C$
Storage temperature	T_{stg}	-55 to +150	$^\circ C$

Notes: 1. $PW \leq 10 \mu s$, duty cycle $\leq 1\%$

Electrical Characteristics

(Ta = 25°C)

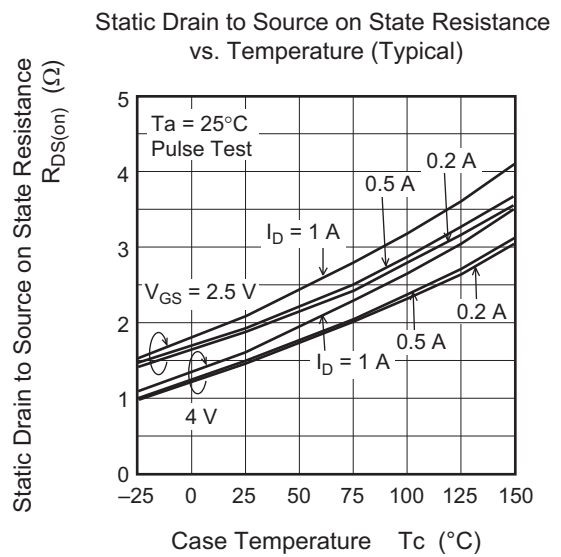
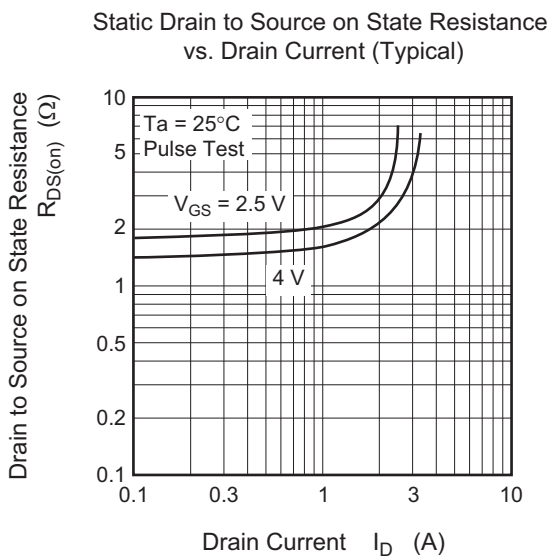
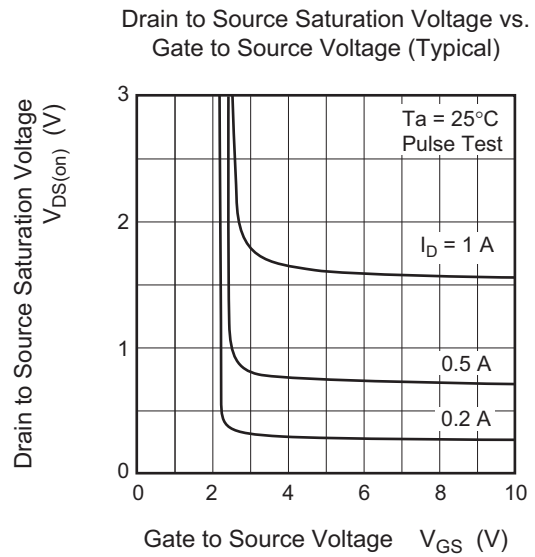
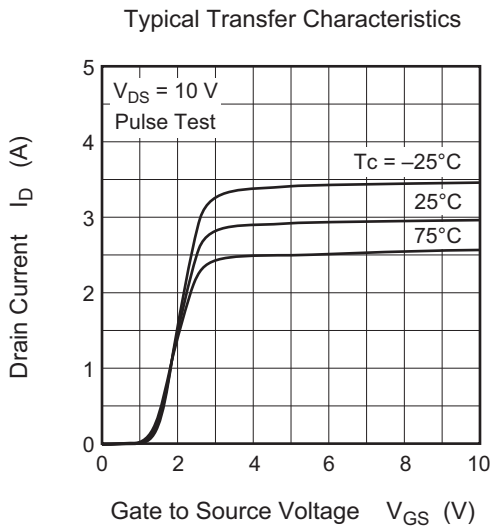
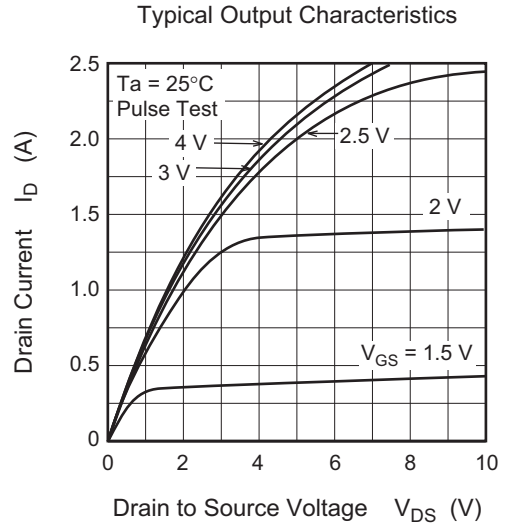
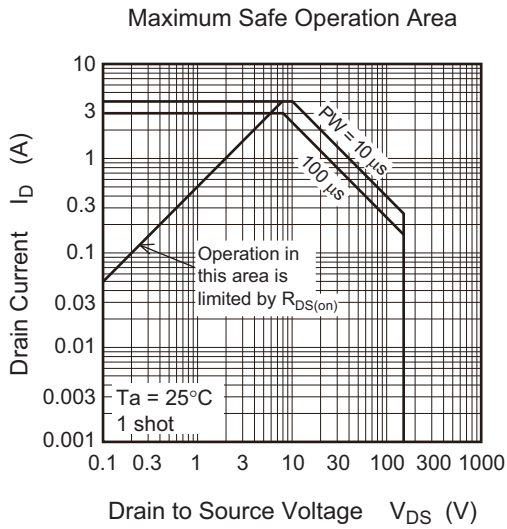
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	150	—	—	V	$I_D = 10 \text{ mA}$, $V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	± 10	—	—	V	$I_G = \pm 100 \text{ }\mu\text{A}$, $V_{DS} = 0$
Gate to source leak current	I_{GSS}	—	—	± 10	μA	$V_{GS} = \pm 8 \text{ V}$, $V_{DS} = 0$
Zero gate voltage drain current	I_{DSS}	—	—	1	μA	$V_{DS} = 150 \text{ V}$, $V_{GS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	0.5	—	1.5	V	$V_{DS} = 10 \text{ V}$, $I_D = 1 \text{ mA}$
Static drain to source on state resistance	$R_{DS(on)}$	—	1.5	1.95	Ω	$I_D = 0.5 \text{ A}$, $V_{GS} = 4 \text{ V}$ ^{Note 2}
	$R_{DS(on)}$	—	1.9	2.5	Ω	$I_D = 0.5 \text{ A}$, $V_{GS} = 2.5 \text{ V}$ ^{Note 2}
Input capacitance	C_{iss}	—	98	—	pF	$V_{DS} = 10 \text{ V}$ $V_{GS} = 0$ $f = 1 \text{ MHz}$
Output capacitance	C_{oss}	—	31	—	pF	
Reverse transfer capacitance	C_{rss}	—	14	—	pF	
Total gate charge	Q_g	—	3.5	—	nC	$V_{DD} = 100 \text{ V}$
Gate to source charge	Q_{gs}	—	0.5	—	nC	$V_{GS} = 4 \text{ V}$
Gate to drain charge	Q_{gd}	—	1.8	—	nC	$I_D = 1 \text{ A}$
Turn-on delay time	$t_{d(on)}$	—	8	—	ns	$V_{GS} = 4 \text{ V}$ $I_D = 0.5 \text{ A}$ $R_L = 60 \text{ }\Omega$
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	$I_F = 1 \text{ A}$, $V_{GS} = 0$ ^{Note 2}
Body-drain diode reverse recovery time	t_{rr}	—	60	—	ns	$I_F = 1 \text{ A}$, $V_{GS} = 0$ $di_F/dt = 100 \text{ A}/\mu\text{s}$

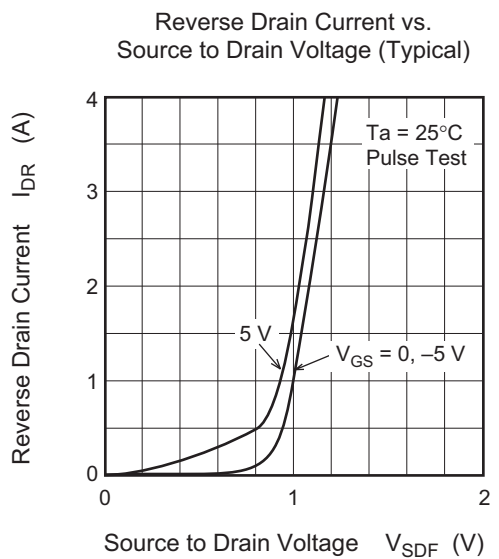
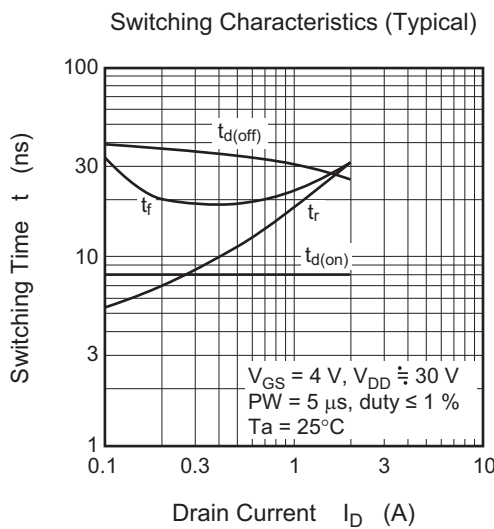
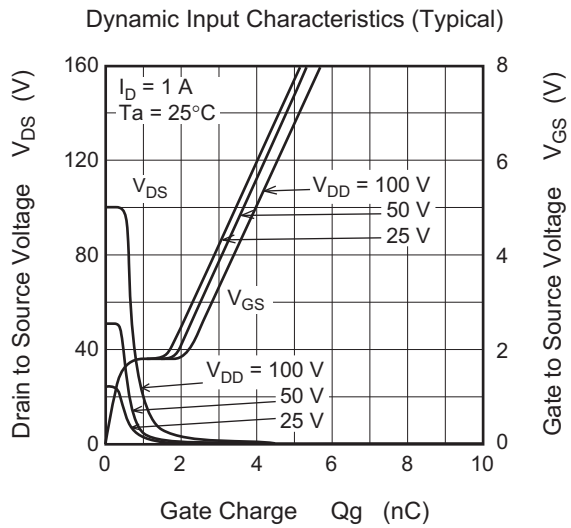
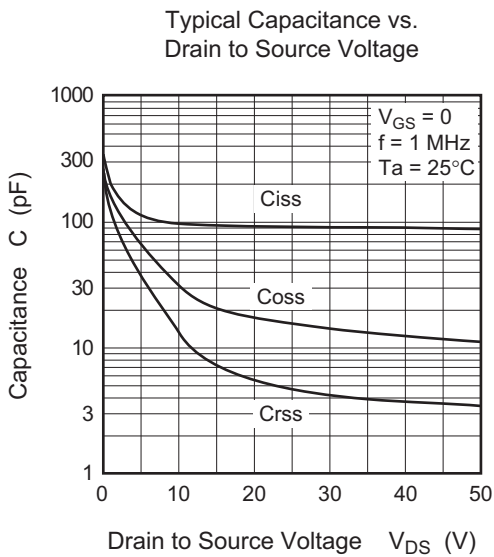
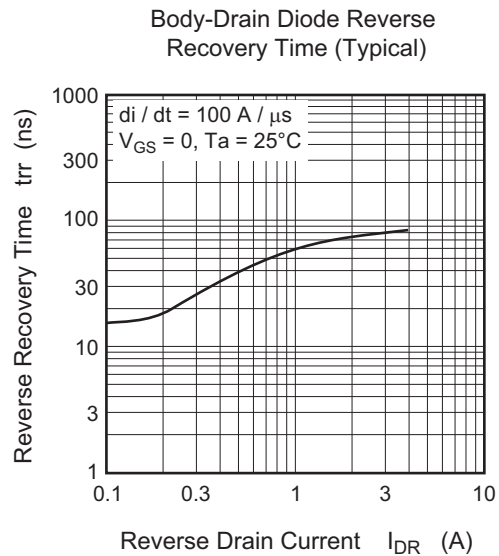
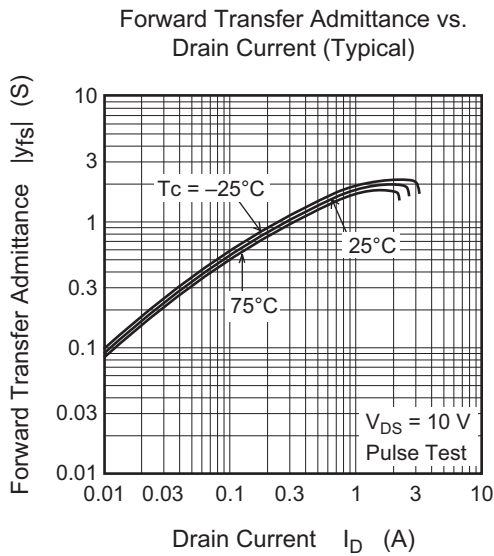
Notes: 2. Pulse test

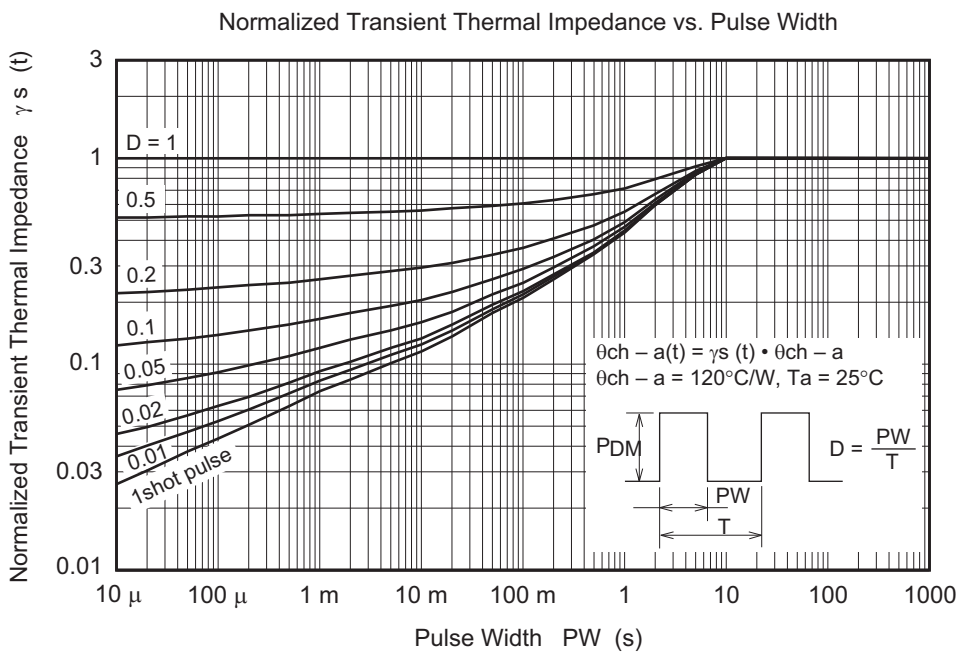
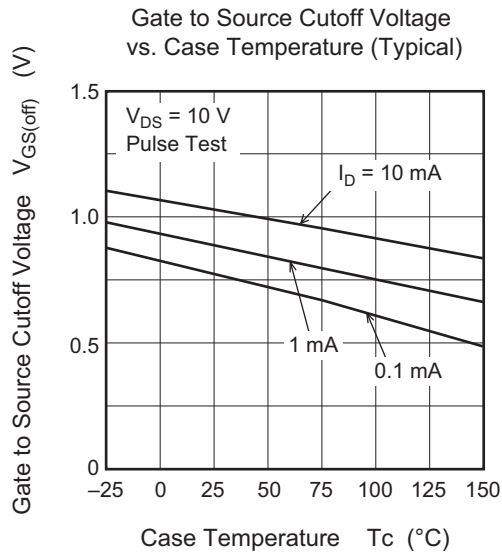
3. This device is sensitive to electrostatic discharge.

It is recommended to adopt appropriate cautions when handling this product.

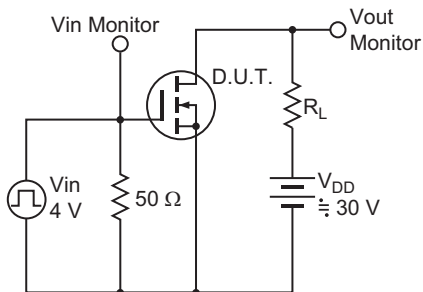
Main Characteristics



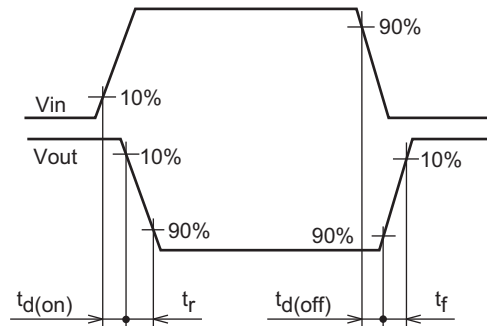




Switching Time Test Circuit



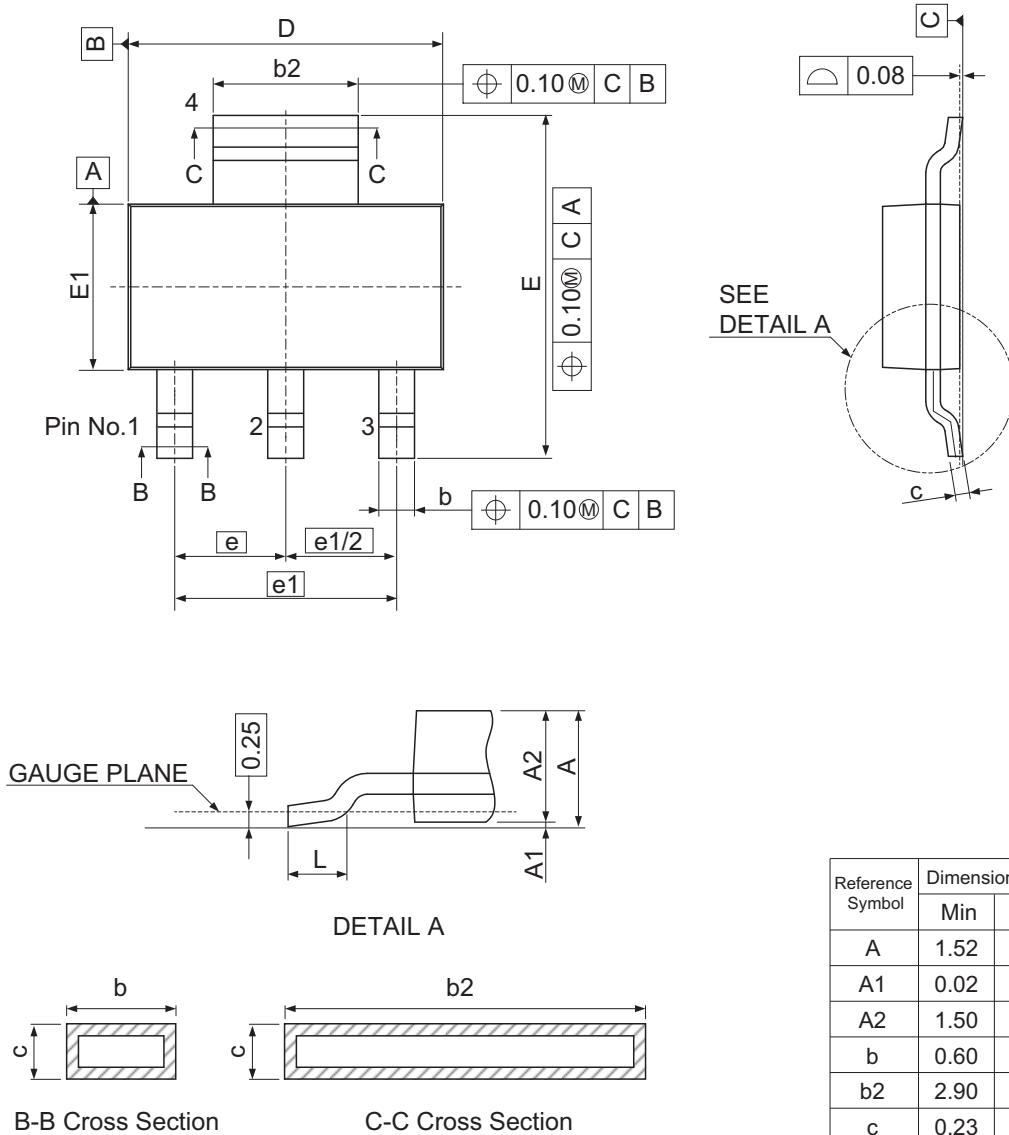
Waveform



Package Dimensions

Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS (Typ) [g]
SOT-223	—	PRSP0004ZB-A	SOT-223A	0.12

Unit: mm



Reference Symbol	Dimensions in millimeters		
	Min	Nom	Max
A	1.52	1.66	1.80
A1	0.02	—	0.10
A2	1.50	—	1.70
b	0.60	—	0.80
b2	2.90	—	3.10
c	0.23	—	0.33
D	6.30	—	6.70
E	6.70	—	7.30
E1	3.30	—	3.70
e	2.30 BASIC		
e1	4.60 BASIC		
L	0.90	—	1.10

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Ordering Information

Orderable Part No.	Quantity	Shipping Container
RJK1590DP3-A0#J2	3000 pcs	Taping

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Renesas Electronics America Inc.
2801 Scott Boulevard Santa Clara, CA 95050-2549, U.S.A.
Tel: +1-408-588-6000, Fax: +1-408-588-6130

Renesas Electronics Canada Limited
9251 Yonge Street, Suite 8309 Richmond Hill, Ontario Canada L4C 9T3
Tel: +1-905-237-2004

Renesas Electronics Europe Limited
Dukes Meadow, Millboard Road, Bourne End, Buckinghamshire, SL8 5FH, U.K
Tel: +44-1628-585-100, Fax: +44-1628-585-900

Renesas Electronics Europe GmbH
Arcadiastrasse 10, 40472 Düsseldorf, Germany
Tel: +49-211-6503-0, Fax: +49-211-6503-1327

Renesas Electronics (China) Co., Ltd.
Room 1709, Quantum Plaza, No.27 ZhichunLu Haidian District, Beijing 100191, P.R.China
Tel: +86-10-8235-1155, Fax: +86-10-8235-7679

Renesas Electronics (Shanghai) Co., Ltd.
Unit 301, Tower A, Central Towers, 555 Langao Road, Putuo District, Shanghai, P. R. China 200333
Tel: +86-21-2226-0888, Fax: +86-21-2226-0899

Renesas Electronics Hong Kong Limited
Unit 1601-1611, 16/F., Tower 2, Grand Century Place, 193 Prince Edward Road West, Mongkok, Kowloon, Hong Kong
Tel: +852-2265-8688, Fax: +852-2886-9022

Renesas Electronics Taiwan Co., Ltd.
13F, No. 363, Fu Shing North Road, Taipei 10543, Taiwan
Tel: +886-2-8175-9600, Fax: +886-2-8175-9670

Renesas Electronics Singapore Pte. Ltd.
80 Bendemeer Road, Unit #06-02 Hyflux Innovation Centre, Singapore 339949
Tel: +65-6213-0200, Fax: +65-6213-0300

Renesas Electronics Malaysia Sdn.Bhd.
Unit 1207, Block B, Menara Amcorp, Amcorp Trade Centre, No. 18, Jin Persiaran Barat, 46050 Petaling Jaya, Selangor Darul Ehsan, Malaysia
Tel: +60-3-7955-9390, Fax: +60-3-7955-9510

Renesas Electronics India Pvt. Ltd.
No.777C, 100 Feet Road, HAL II Stage, Indiranagar, Bangalore, India
Tel: +91-80-67208700, Fax: +91-80-67208777

Renesas Electronics Korea Co., Ltd.
12F., 234 Teheran-ro, Gangnam-Gu, Seoul, 135-080, Korea
Tel: +82-2-558-3737, Fax: +82-2-558-5141