RENESAS

H7N1005LD, H7N1005LS, H7N1005LM

Silicon N Channel MOS FET
High Speed Power Switching

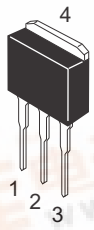
REJ03G0391-0200
Rev.2.00
Oct 16, 2006

Features

- Low on-resistance
  $R_{DS\ (on)}$ = 85 mΩ typ.
- Low drive current
- Capable of 4.5 V gate drive

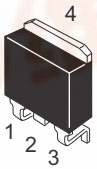
Outline

RENESAS Package code: PRSS0004AE-A
(Package name: LDPAK (L))



H7N1005LD

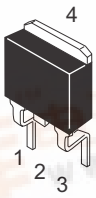
RENESAS Package code: PRSS0004AE-B
(Package name: LDPAK (S)-(1))



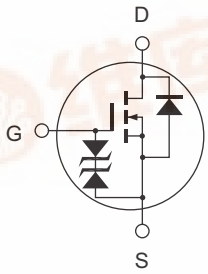
H7N1005LS

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

RENESAS Package code: PRSS0004AE-C
(Package name: LDPAK (S)-(2))



H7N1005LM



Absolute Maximum Ratings

(Ta = 25°C)

Item	Symbol	Value	Unit
Drain to source voltage	V_{DSS}	100	V
Gate to source voltage	V_{GSS}	±20	V
Drain current	I_D	15	A
Drain peak current	$I_{D\ (pulse)}$ Note 1	30	A
Body to drain diode reverse drain current	I_{DR}	30	A
Avalanche current	I_{AP} Note 3	8	A
Avalanche energy	E_{AR} Note 3	6.4	mJ
Channel dissipation	Pch Note 2	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
3. Value at Tch = 25°C, Rg ≥ 50 Ω

Electrical Characteristics

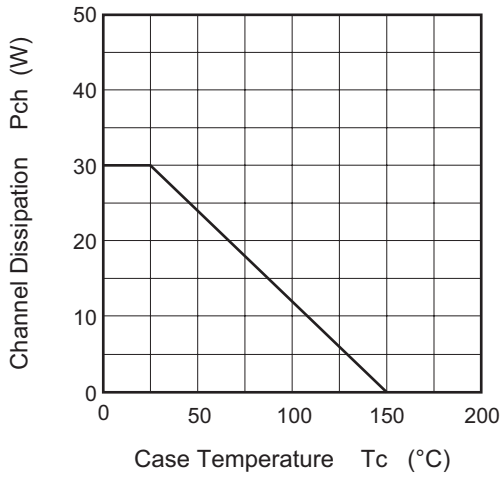
(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)\ DSS}$	100	—	—	V	I_D = 10 mA, V_{GS} = 0
Gate to source breakdown voltage	$V_{(BR)\ GSS}$	±20	—	—	V	I_G = ±100 µA, V_{DS} = 0
Gate to source leak current	I_{GSS}	—	—	±10	µA	V_{GS} = ±16 V, V_{DS} = 0
Zero gate voltage drain current	I_{DSS}	—	—	10	µA	V_{DS} = 100 V, V_{GS} = 0
Gate to source cutoff voltage	$V_{GS\ (off)}$	1.5	—	2.5	V	I_D = 1 mA, V_{DS} = 10 V Note 4
Static drain to source on state resistance	$R_{DS\ (on)}$	—	85	110	mΩ	I_D = 7.5 A, V_{GS} = 10 V Note 4
		—	105	155	mΩ	I_D = 7.5 A, V_{GS} = 4.5 V Note 4
Forward transfer admittance	$\|y_{fs}\|$	6.5	11	—	S	I_D = 7.5 A, V_{GS} = 10 V Note 4
Input capacitance	Ciss	—	830	—	pF	V_{DS} = 10 V V_{GS} = 0 f = 1 MHz
Output capacitance	Coss	—	90	—	pF	
Reverse transfer capacitance	Crss	—	55	—	pF	
Total gate charge	Qg	—	15	—	nC	V_{DD} = 50 V V_{GS} = 10 V I_D = 15 A
Gate to source charge	Qgs	—	3	—	nC	
Gate to drain charge	Qgd	—	4	—	nC	
Turn-on delay time	$t_{d\ (on)}$	—	15	—	ns	V_{GS} = 10 V, I_D = 7.5 A R_L = 4 Ω Rg = 4.7 Ω
Rise time	t_r	—	85	—	ns	
Turn-off delay time	$t_{d\ (off)}$	—	42	—	ns	
Fall time	t_f	—	6.8	—	ns	
Body to drain diode forward voltage	V_{DF}	—	0.93	—	V	I_F = 15 A, V_{GS} = 0
Body to drain diode reverse recovery time	t_{rr}	—	41	—	ns	I_F = 15 A, V_{GS} = 0 di_F/dt = 100 A/µs

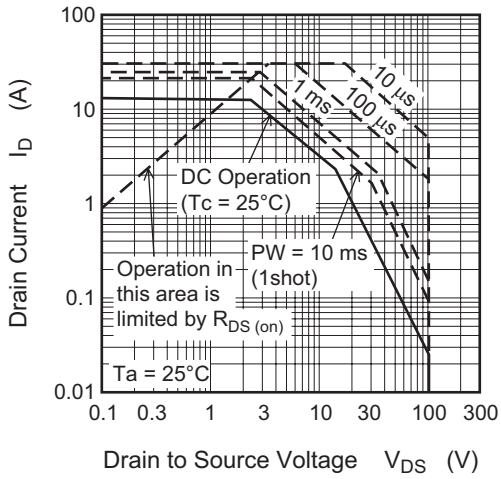
Note: 4. Pulse test

Main Characteristics

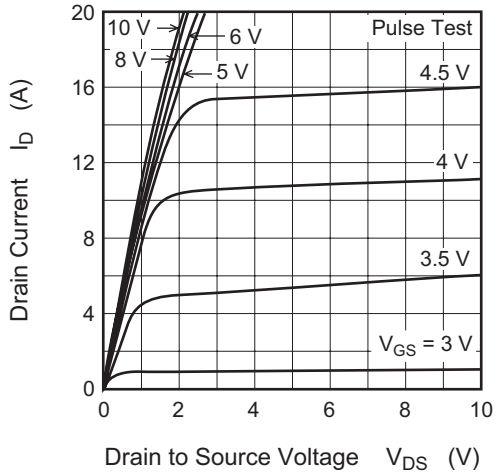
Power vs. Temperature Derating



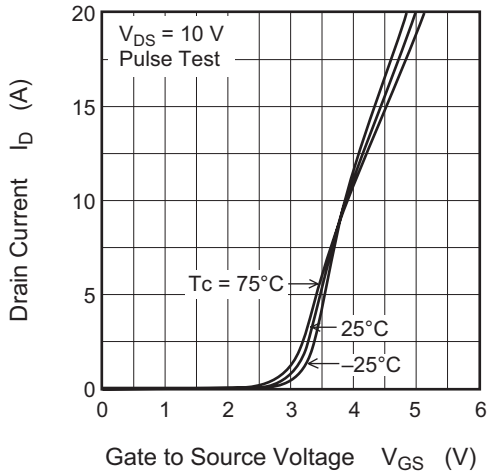
Maximum Safe Operation Area



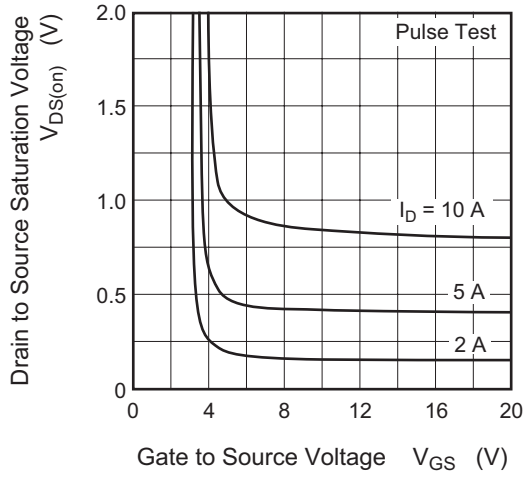
Typical Output Characteristics



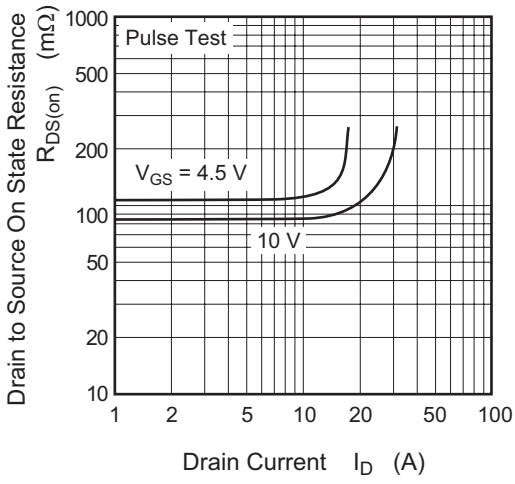
Typical Transfer Characteristics



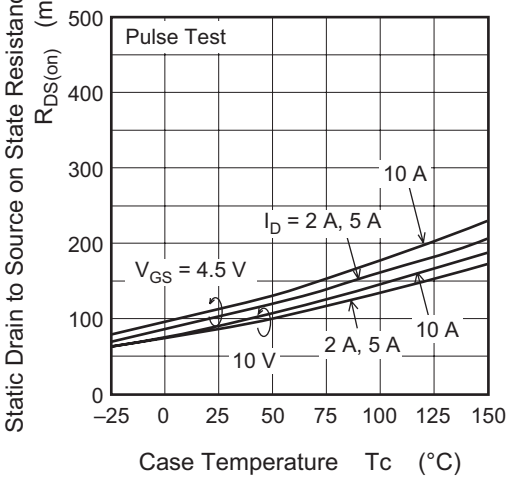
Drain to Source Saturation Voltage vs.
Gate to Source Voltage



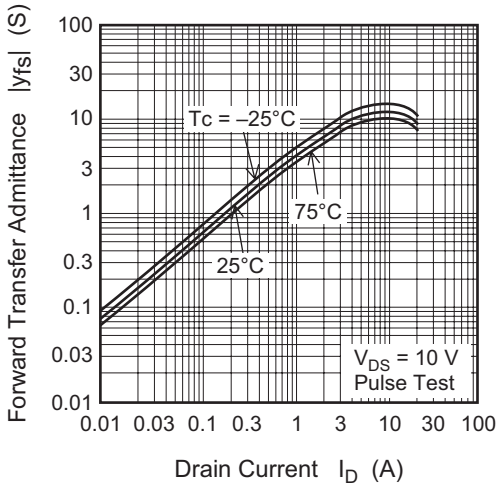
Static Drain to Source on State Resistance
vs. Drain Current



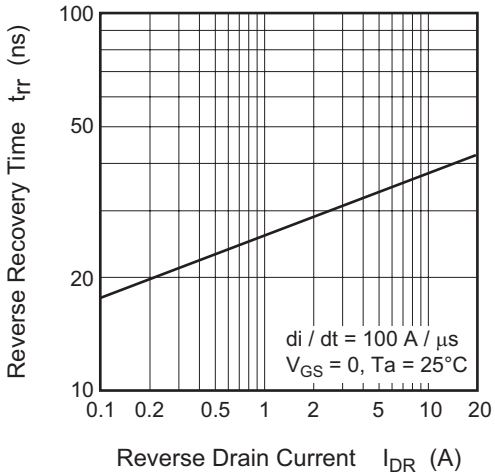
Static Drain to Source on State Resistance vs. Temperature



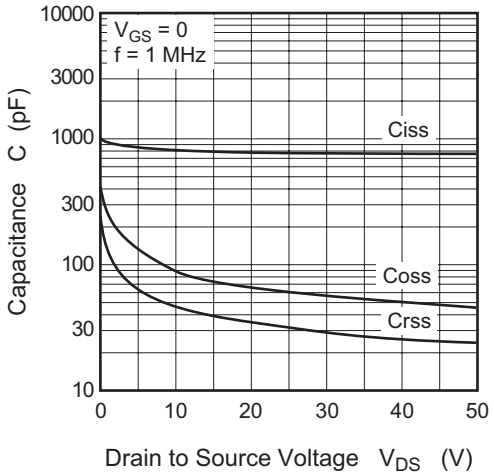
Forward Transfer Admittance vs. Drain Current



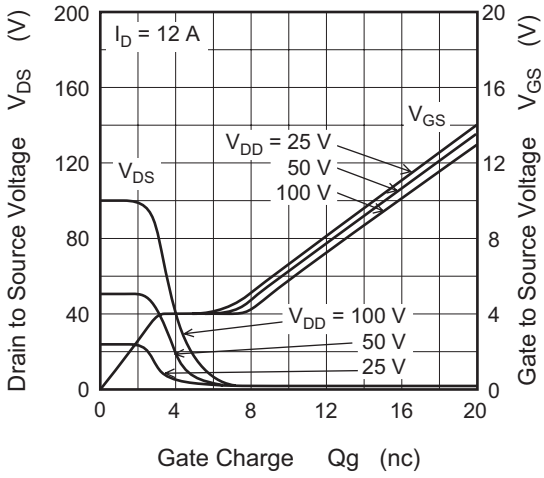
Body to Drain Diode Reverse Recovery Time



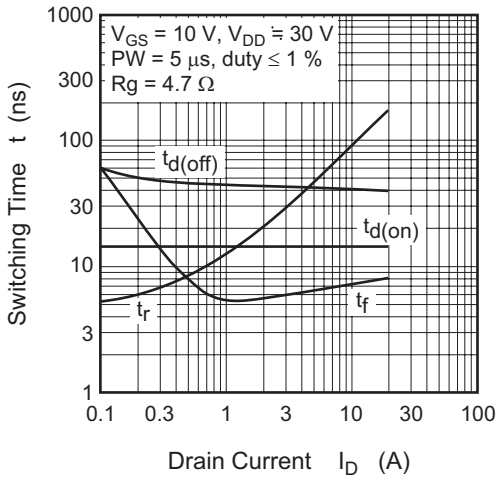
Typical Capacitance vs. Drain to Source Voltage



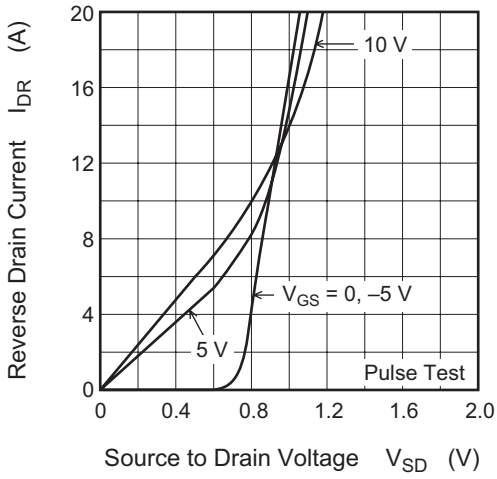
Dynamic Input Characteristics



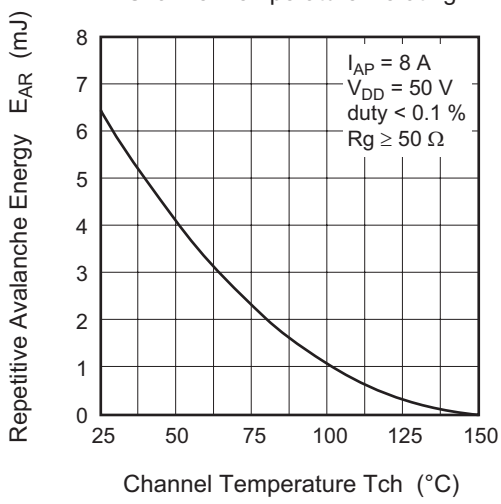
Switching Characteristics



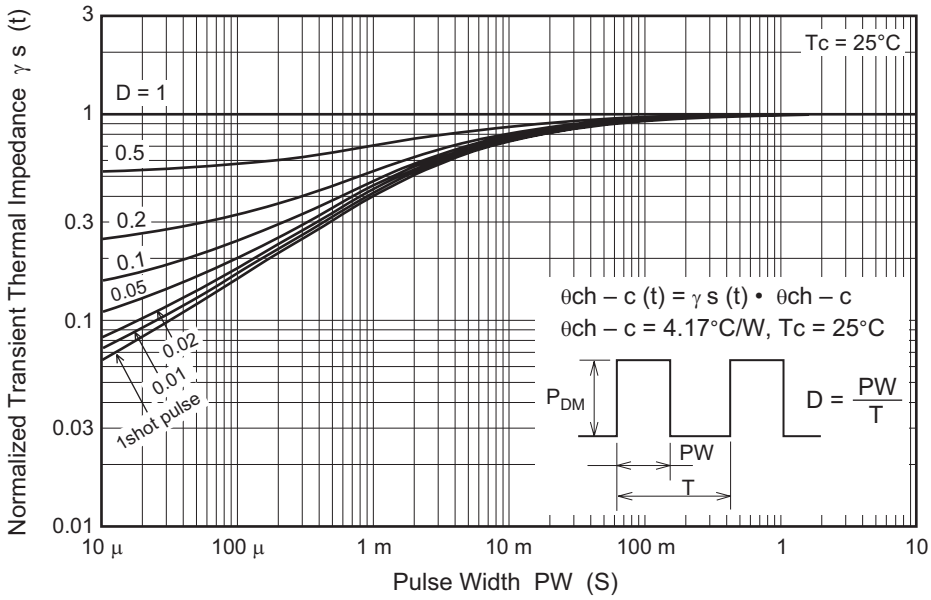
Reverse Drain Current vs. Source to Drain Voltage



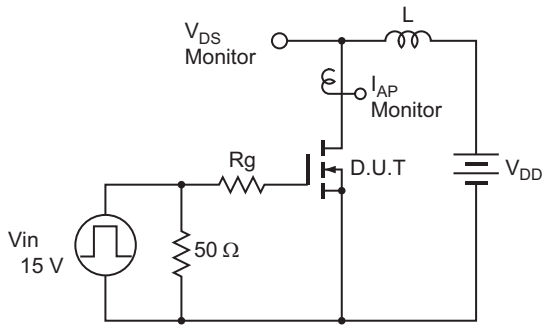
Maximum Avalanche Energy vs. Channel Temperature Derating



Normalized Transient Thermal Impedance vs. Pulse Width

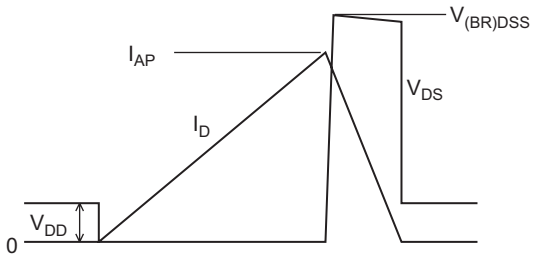


Avalanche Test Circuit

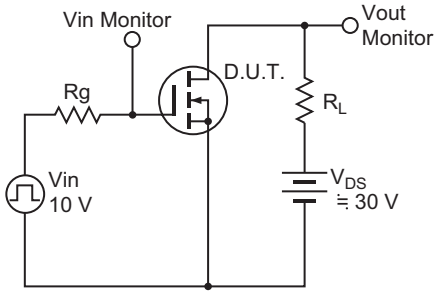


Avalanche Waveform

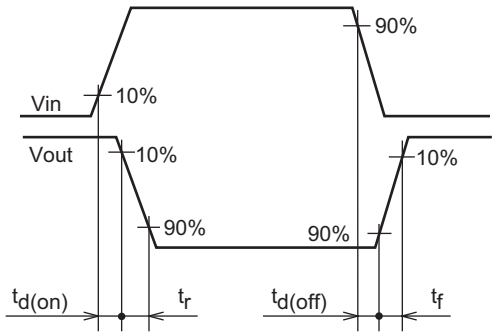
$$E_{AR} = \frac{1}{2} \cdot L \cdot I_{AP}^2 \cdot \frac{V_{DSS}}{V_{DSS} - V_{DD}}$$



Switching Time Test Circuit



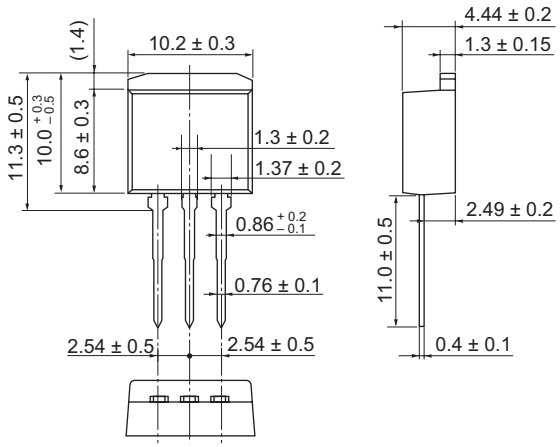
Waveform



Package Dimensions

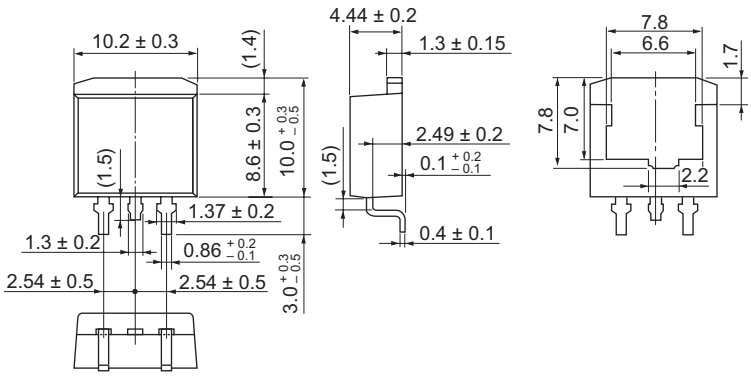
Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
LDPAK(L)	—	PRSS0004AE-A	LDPAK(L) / LDPAK(L)V	1.40g

Unit: mm



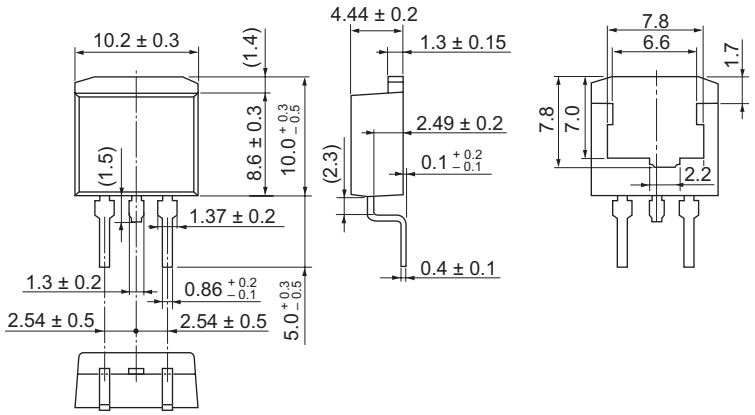
Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
LDPAK(S)-(1)	SC-83	PRSS0004AE-B	LDPAK(S)-(1) / LDPAK(S)-(1)V	1.30g

Unit: mm



Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
LDPAK(S)-(2)	—	PRSS0004AE-C	LDPAK(S)-(2) / LDPAK(S)-(2)V	1.35g

Unit: mm



Ordering Information

Part Name	Quantity	Shipping Container
H7N1005LD-E	500 pcs	Box (Conductive Sack)
H7N1005LSTL-E	1000 pcs	Taping
H7N1005LMTL-E	1000 pcs	Taping

Note: For some grades, production may be terminated. Please contact the Renesas sales office to check the state of production before ordering the product.

Renesas Technology Corp. Sales Strategic Planning Div. Nippon Bldg., 2-6-2, Ohte-machi, Chiyoda-ku, Tokyo 100-0004, Japan

RENESAS SALES OFFICES

http://www.renesas.com

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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