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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M62258FP

General Purpose Battery Charger Control IC

REJ03F0247-0200
Rev.2.00
Jun 16, 2008

Description

The M62258FP is designed as general purpose battery charger control. The M62258FP has function which require for the battery charge control on single chip. Not only the combination of M62258 and microcomputer capable of handing battery charge control, but also it is capable of monitoring battery temperature, prevent from over current or voltage, using minimal peripherals. It also has feedback function to the primary side of SW power supply, which can used to control feedback of charge current and output voltage.

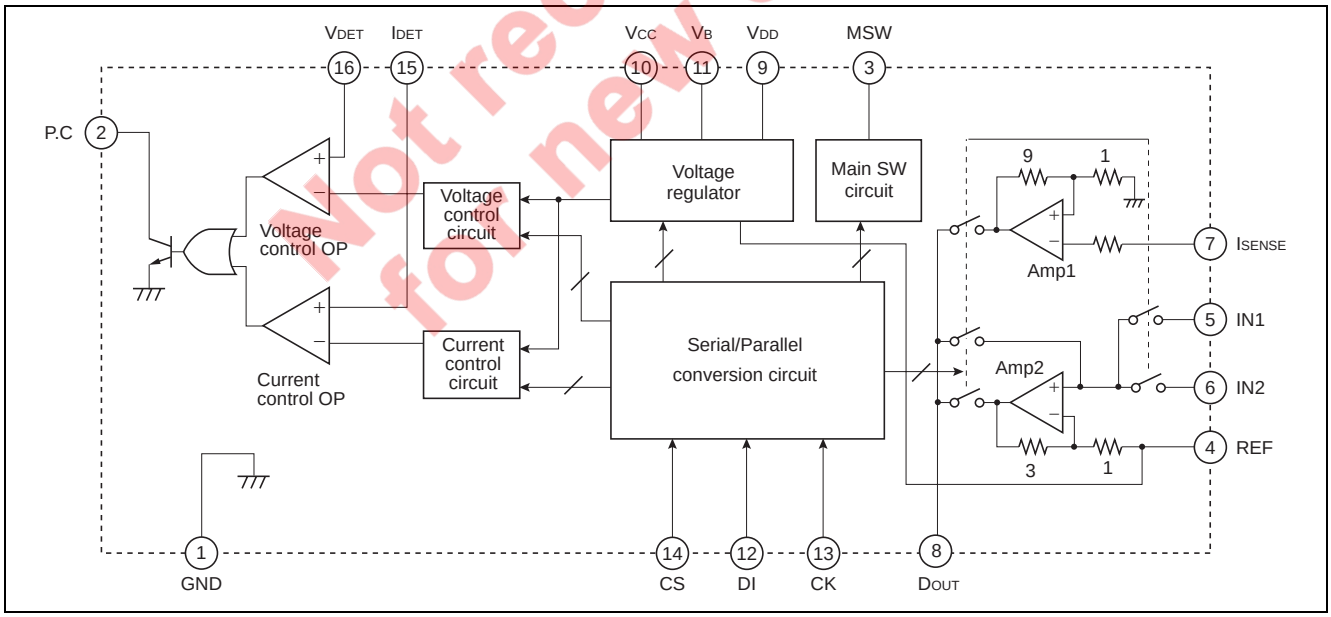
Features

- Built-in 3 wire serial data interface function for MCU.
- Built-in multiplexer and level magnification circuit with 2 input ports.
- Built-in low input/output operation 5 V voltage regulator function. (Pre drive type)
- Built-in charge current/output voltage control circuit.

Application

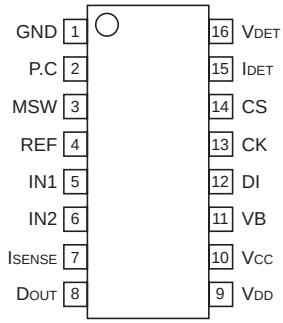
Video camera, mobile phone and general battery charger for other digital equipment

Block Diagram



Pin Arrangement

M62258FP



(Top view)

Outline: PRSP0016DE-A (16P2N-A)

Pin Description

Pin No.	Pin Name	Function
12	DI	The serial data input pin which used to receive 8-bit wide serial data
13	CK	The shift clock input pin which takes the input signal of DI pin to 8-bit shift register by the rising edge of clock signal
14	CS	When this pin is "Low", DI pin can receive the data into the 8-bit shift register. The each bit will be latched at rising edge of the clock signal
8	D_{OUT}	The output pin of the amplified A/D data
4	REF	The reference voltage output pin of the A/D converter
5, 6	IN1, IN2	The A/D converter input pin
7	I_{SENSE}	The current sense input pin
3	MSW1	The main switch driver output pin (Open collector)
9	V_{DD}	The stabilized +5 V output pin
11	V_B	The pre-drive pin which used to connect the external PNP Tr
10	V_{CC}	The power supply pin
15	I_{DET}	The current detection input pin
16	V_{DET}	The voltage detection input pin
2	P.C	The feedback pin for voltage and current control
1	GND	The ground pin

Absolute Maximum Ratings

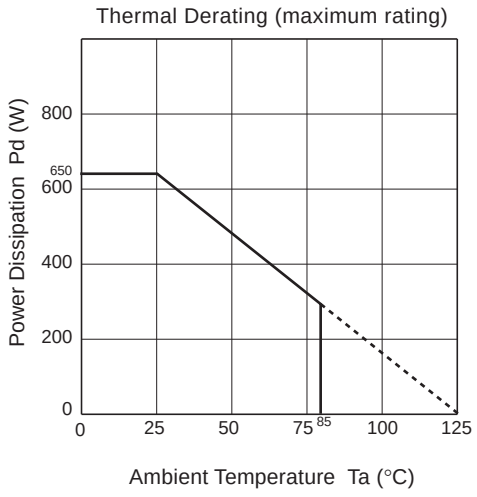
Item	Symbol	Ratings	Unit
Supply voltage	V_{CC}	16	V
Main switch drive current	I_{SW}	200	mA
Regulator output current	I_B	20	mA
P.C drive current	I_{PC}	10	mA
Main switch max. voltage	V_{SW}	V_{CC}	V
P.C max. voltage	V_{PC}	V_{CC}	V
Power dissipation	Pd	650	mW
Thermal derating	Kθ	6.5	mW/°C
Operating temperature	Topr	–20 to +85	°C
Storage temperature	Tstg	–40 to +125	°C

Electrical Characteristics

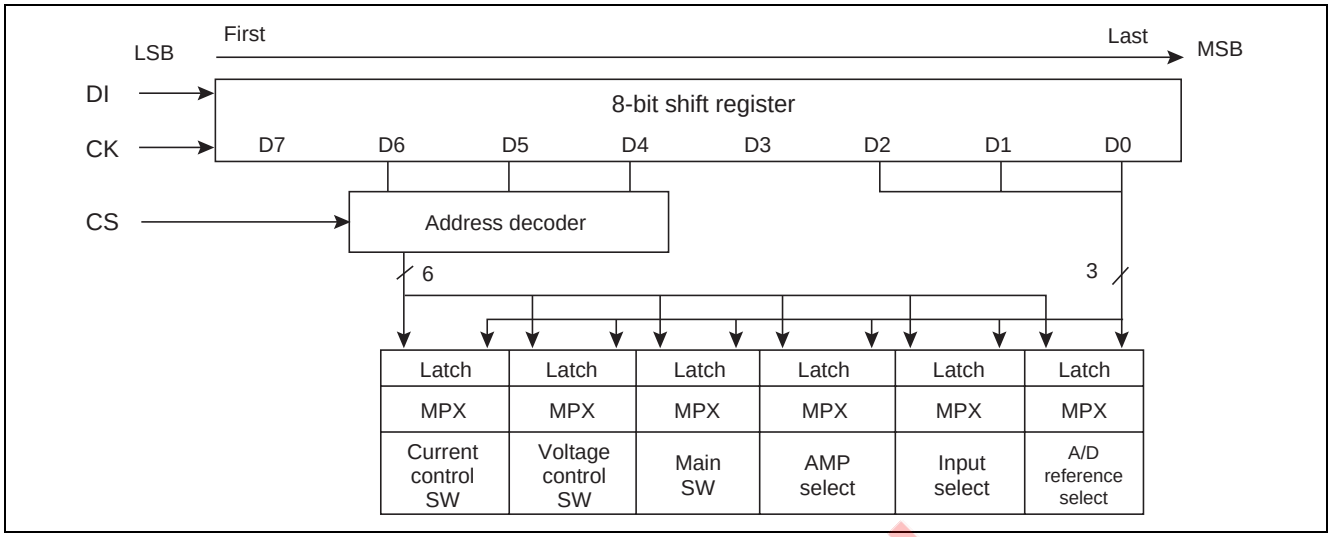
($Ta = 25°C$, $V_{CC} = 12$ V, $I_{SW} = 50$ mA, unless otherwise noted)

Block	Item	Symbol	Min	Typ	Max	Unit	Test Conditions
	Supply voltage	V_{CC}	V_{DD} + 0.2	—	15	V	
	Circuit current	I_{CC}	—	15	—	mA	
5 V power supply	Stabilized voltage output	V_{DD}	4.75	5.00	5.25	V	I_B = 10 mA
	Input regulation	Reg-in	—	50	200	mV	V_{DD} + 0.2 V
	Load regulation	Reg-L	—	10	100	mV	I_{DD} = 1 to 100 mA
	Ripple rejection ratio	R.R	—	60	—	dB	f = 120 Hz, Vin = 0 dBm
	Minimum input-output voltage difference	V_{DEF}	—	0.2	—	V	
SW	Main-SW output saturation voltage	VsatM	—	0.8	1.2	V	I_{SW} = 50 mA
Control Op.	Input voltage range	V_{IN}	0	—	V_{CC} – 2	V	
	Input bias current	I_{IB}	–1	—	—	µA	
	P.C output "L" voltage	V_{PCL}	—	0.2	0.4	V	I_{PC} = 5 mA
Level Mag.	I_{SENSE} input voltage range	VI_{SENSE}	—	—	0.5	V	
	IN input voltage range	V_{IN-IN}	0.2	—	5	V	$V_{CC} \geq 7$ V
			0.2	—	3.5	V	V_{CC} = 5.5 V
	IN input current	I_{IN}	–100	—	—	nA	

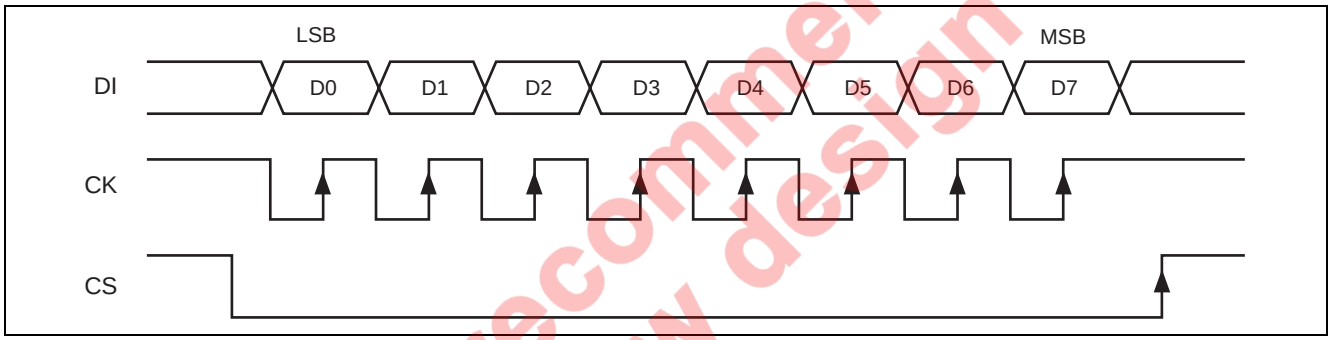
Typical Characteristics



Digital Data Format



Data Timing Chart (Model)



Data Settings

Control Function	Address				Data				Description
	D7	D6	D5	D4	D3	D2	D1	D0	
RESET	0	0	0	0	—	—	—	—	Main-SW is OFF, A/D reference voltage = 0.8 V Voltage setting reference voltage = 4.0 V Current setting reference voltage = 45 mV
Current control	0	0	0	1	—	—	—	—	See table 1
Voltage control	0	0	1	0	—	—	—	—	See table 2
Main SW	0	0	1	1	—	—	—	—	See table 3
Amp. select	0	1	0	0	—	—	—	—	See table 4
Input select	0	1	0	1	—	—	—	—	See table 5
A/D reference select	0	1	1	0	—	—	—	—	See table 6

Table 1 Current Control Data

D2	D1	D0	Current Control Input Voltage	Current Ratio
0	0	0	0 V	0
0	0	1	45 mV	1/8
0	1	0	80 mV	1/4
0	1	1	160 mV	1/2
1	0	0	240 mV	3/4
1	0	1	320 mV	1
1	1	0	—	Trickle

Note: During trickle charge mode, use constant voltage mode and charge directly to the battery using external resistor.
45 mV selected at RESET.

Table 2 Voltage Control Data

D2	D1	D0	Voltage Control Input Voltage	Voltage Ratio
0	0	0	0 V	0
0	0	1	0.8 V	1
0	1	0	1.6 V	2
0	1	1	2.4 V	3
1	0	0	3.2 V	4
1	0	1	4.0 V	5
1	1	0	4.8 V	6

Note: Output port of microcomputer can be used to control voltage and current setting.
4.0 V setting at RESET.

Table 3 Main SW Select

D0	SW1
0	OFF
1	ON

Note: Main SW is off at RESET.

Table 4 Amp. Select

D1	D0	State
0	0	Select Amp.1 output
0	1	Select Amp.2 input
1	0	Select Amp.2 output

Note: Amp.1 output is selected at RESET.

Table 5 Input Select

D0	State
0	Select IN1
1	Select IN2

Note: IN1 selected at RESET.

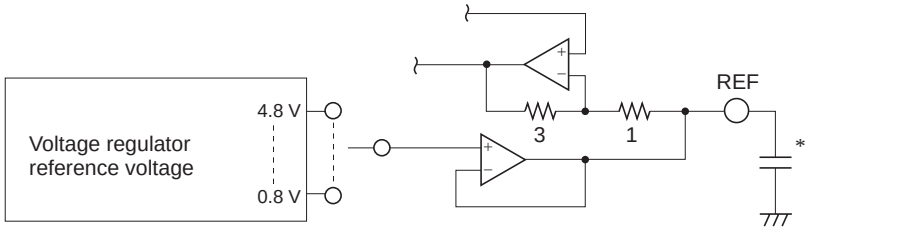
Table 6 A/D Reference Voltage Select

D2	D1	D0	State
0	0	0	Select 0 V
0	0	1	Select 0.8 V
0	1	0	Select 1.6 V
0	1	1	Select 2.4 V
1	0	0	Select 3.2 V
1	0	1	Select 4.0 V
1	1	0	Select 4.8 V

Note: 0.8 V is selected at RESET.

Function Block Description

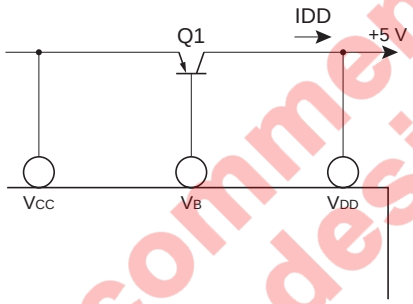
(1) A/D converter input



Note: Connect few 1000 pF capacitor to stabilize the reference voltage

Select the desire reference voltage to be detected by serial data from the microcomputer.
The input voltage level of IN1 and IN2 will be magnified 4 times using selected reference voltage as a center.
This magnified data will be return to the A/D input port of the microcomputer.
As result, accuracy of the A/D converter of the microcomputer will be increased by 2-bit.

(2) +5 V voltage regulator



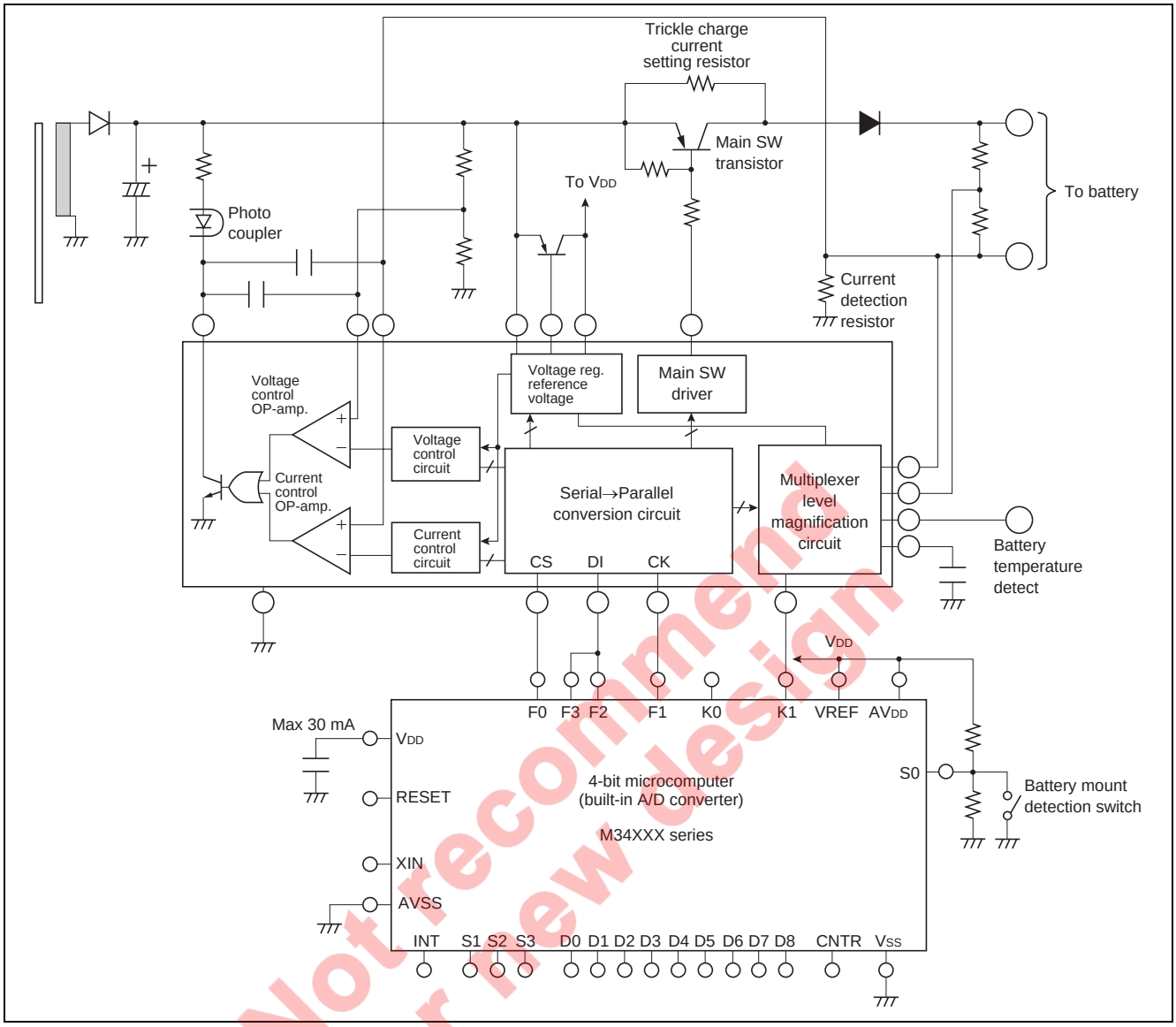
Since it capable of driving external PNP Tr. base up to 20 mA, it can supply current of

$IDD\ MAX = 20\ mA \times Q1h_{FE}$

Also, since this is low I/O type power source, it can be operate

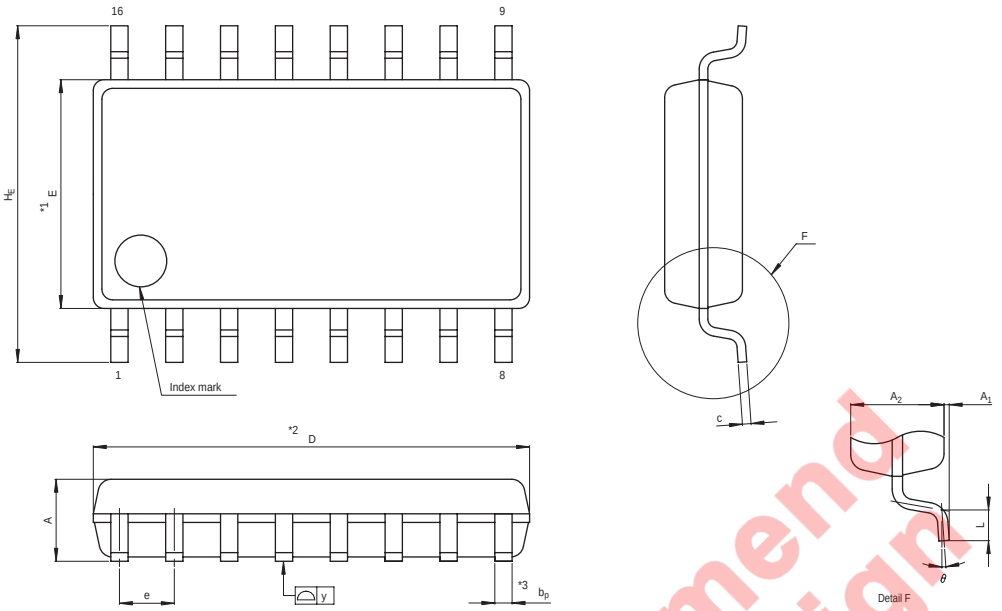
$V_{CC} - V_{DD} = 0.1\ V$

Application Example



Package Dimensions

JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
P-SOP16-5.3x10.1-1.27	PRSP0016DE-A	16P2N-A	0.2g



NOTE)
1. DIMENSIONS "*1" AND "*2" DO NOT INCLUDE MOLD FLASH.
2. DIMENSION "*3" DOES NOT INCLUDE TRIM OFFSET.

Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
D	10.0	10.1	10.2
E	5.2	5.3	5.4
A_2	—	1.8	—
A_1	0	0.1	0.2
A	—	—	2.1
b_p	0.35	0.4	0.5
c	0.18	0.2	0.25
θ	0°	—	8°
H_E	7.5	7.8	8.1
e	1.12	1.27	1.42
y	—	—	0.1
L	0.4	0.6	0.8

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) 6887-7858/7898

Renesas Technology Hong Kong Ltd.
7th Floor, North Tower, World Finance Centre, Harbour City, Canton Road, Tsimshatsui, Kowloon, Hong Kong
Tel: <852> 2265-6688, Fax: <852> 2377-3473

Renesas Technology Taiwan Co., Ltd.
10th Floor, No.99, Fushing North Road, Taipei, Taiwan
Tel: <886> (2) 2715-2888, Fax: <886> (2) 3518-3399

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

Colophon .7.2