

Silicon N Channel MOS FET

REJ03G1020-0500
(Previous: ADE-208-358C)
Rev.5.00
Sep 07, 2005

Application

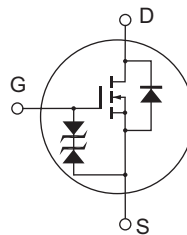
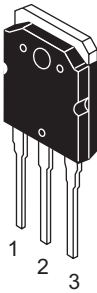
High speed power switching

Features

- Low on-resistance
 $R_{DS(on)} = 7\text{ m}\Omega$ typ.
- High speed switching
- 4 V gate drive device can be driven from 5 V source

Outline

RENESAS Package code: PRSS0004ZE-A
(Package name: TO-3P)



1. Gate
2. Drain
(Flange)
3. Source

Absolute Maximum Ratings

(Ta = 25°C)

Item	Symbol	Ratings	Unit
Drain to source voltage	V_{DSS}	60	V
Gate to source voltage	V_{GSS}	±20	V
Drain current	I_D^{*2}	60	A
Drain peak current	$I_{D(pulse)}^{*1}$	240	A
Body to drain diode reverse drain current	I_{DR}^{*2}	60	A
Avalanche current	I_{AP}^{*3}	45	A
Avalanche energy	E_{AR}^{*3}	174	mJ
Channel dissipation	P_{ch}^{*2}	125	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

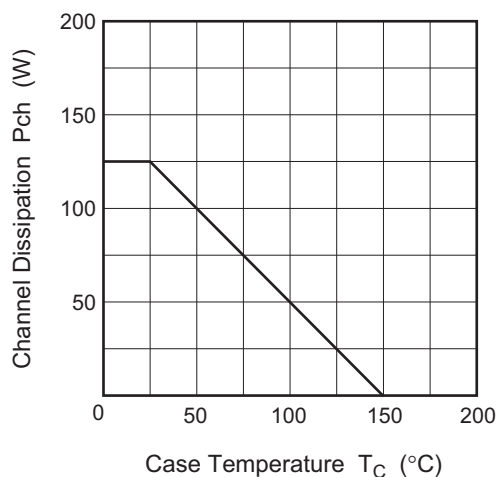
(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	60	—	—	V	$I_D = 10 \text{ mA}$, $V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	±20	—	—	V	$I_G = \pm 100 \text{ } \mu\text{A}$, $V_{DS} = 0$
Gate to source leak current	I_{GSS}	—	—	±10	μA	$V_{GS} = \pm 16 \text{ V}$, $V_{DS} = 0$
Zero gate voltage drain current	I_{DSS}	—	—	100	μA	$V_{DS} = 60 \text{ V}$, $V_{GS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	1.0	—	2.0	V	$I_D = 1 \text{ mA}$, $V_{DS} = 10 \text{ V}$
Static drain to source on state resistance	$R_{DS(on)}$	—	7	10	mΩ	$I_D = 30 \text{ A}$, $V_{GS} = 10 \text{ V}^{*4}$
		—	10	16	mΩ	$I_D = 30 \text{ A}$, $V_{GS} = 4 \text{ V}^{*4}$
Forward transfer admittance	$ y_{fs} $	35	60	—	S	$I_D = 30 \text{ A}$, $V_{DS} = 10 \text{ V}^{*4}$
Input capacitance	C_{iss}	—	3550	—	pF	$V_{DS} = 10 \text{ V}$, $V_{GS} = 0$, $f = 1 \text{ MHz}$
Output capacitance	C_{oss}	—	1760	—	pF	
Reverse transfer capacitance	C_{rss}	—	500	—	pF	
Turn-on delay time	$t_{d(on)}$	—	35	—	ns	$I_D = 30 \text{ A}$, $V_{GS} = 10 \text{ V}$, $R_L = 1.0 \text{ } \Omega$
Rise time	t_r	—	260	—	ns	
Turn-off delay time	$t_{d(off)}$	—	480	—	ns	
Fall time	t_f	—	370	—	ns	
Body to drain diode forward voltage	V_{DF}	—	0.94	—	V	$I_F = 60 \text{ A}$, $V_{GS} = 0$
Body to drain diode reverse recovery time	t_{rr}	—	140	—	ns	$I_F = 60 \text{ A}$, $V_{GS} = 0$ $di_F / dt = 50 \text{ A} / \mu\text{s}$

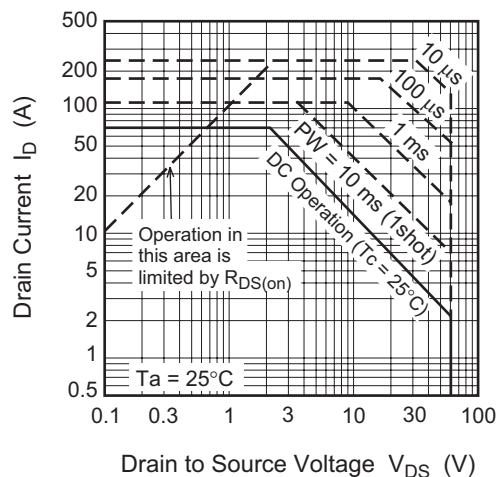
Note: 4. Pulse Test

Main Characteristics

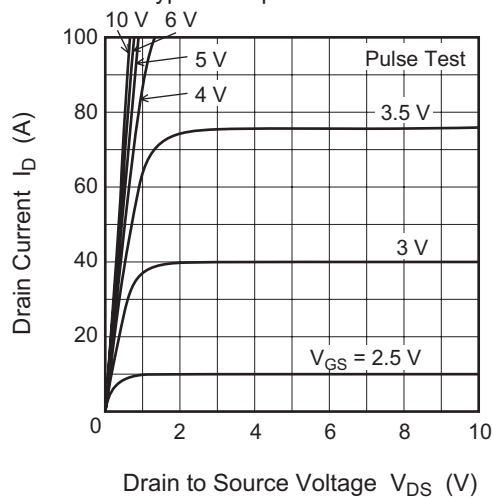
Power vs. Temperature Derating



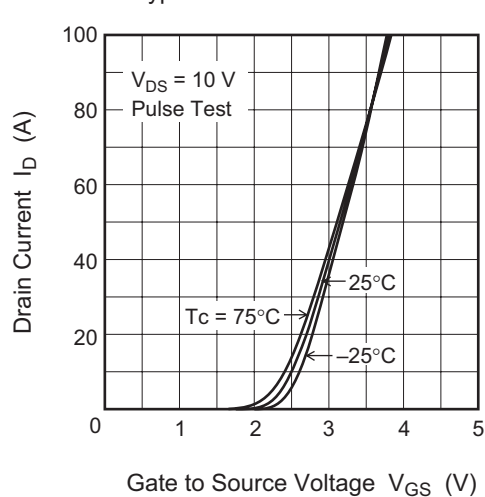
Maximum Safe Operation Area



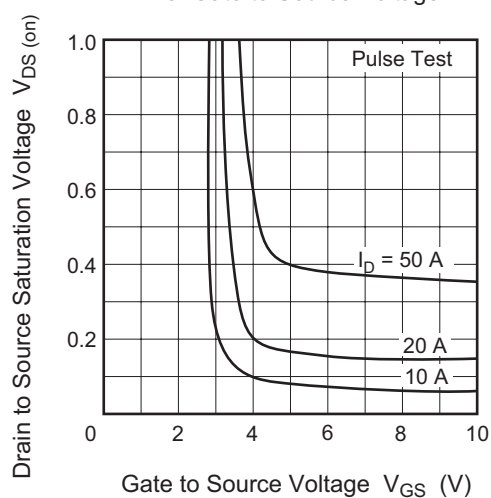
Typical Output Characteristics



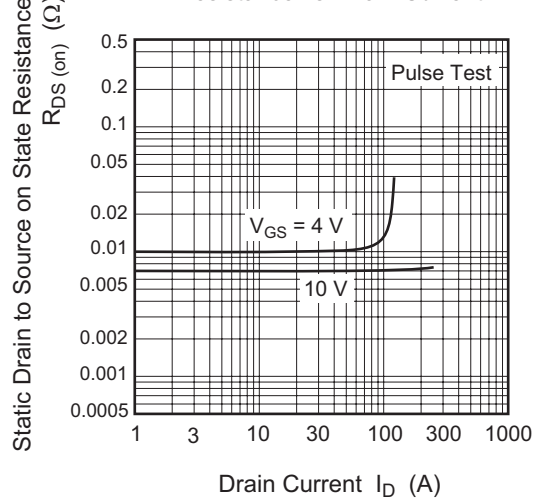
Typical Transfer Characteristics

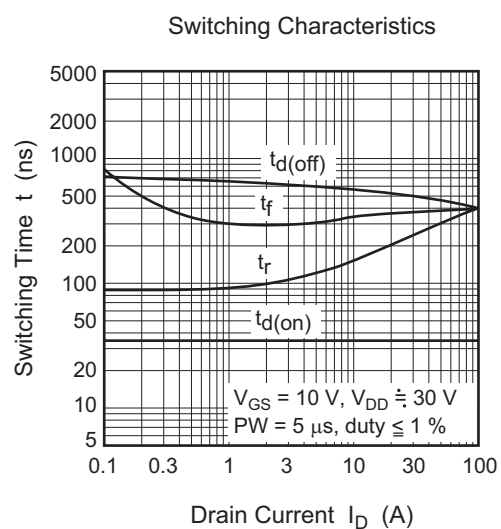
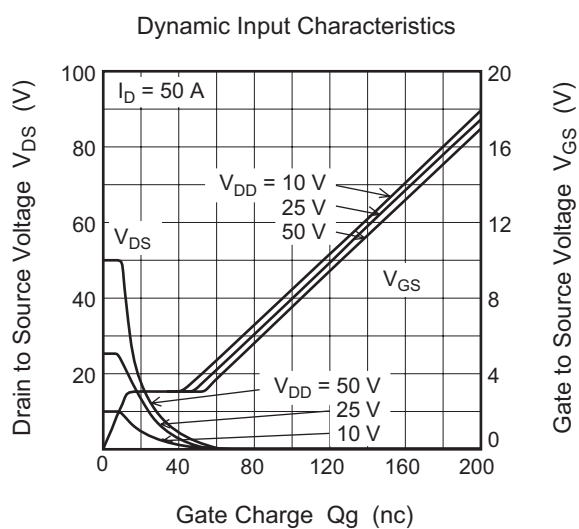
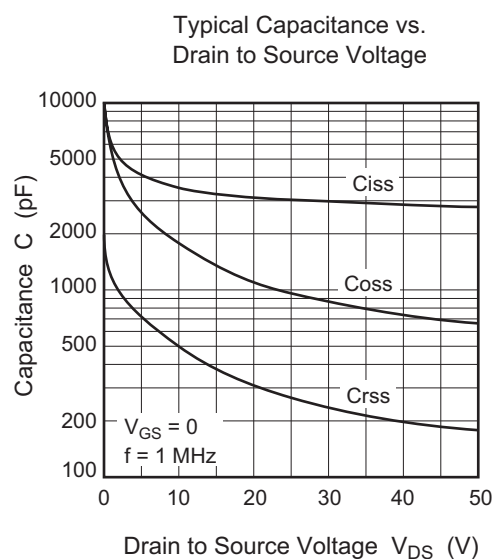
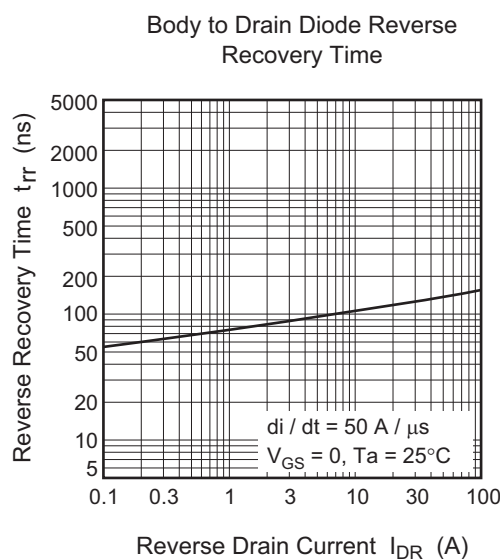
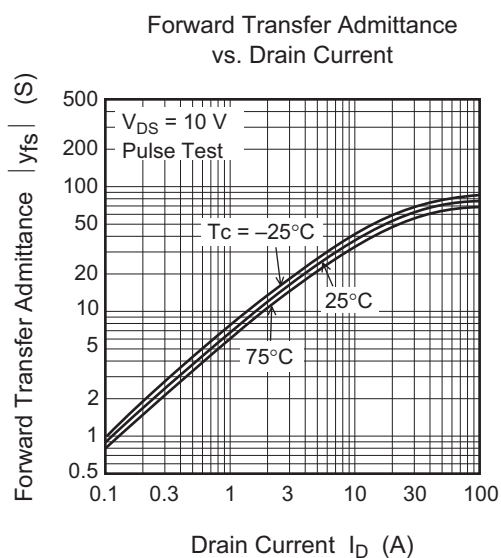
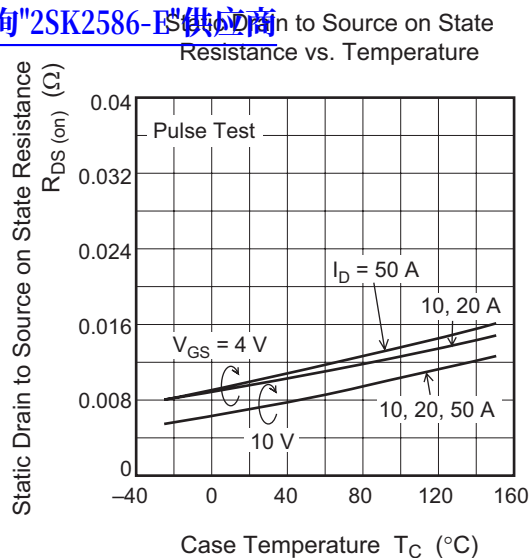


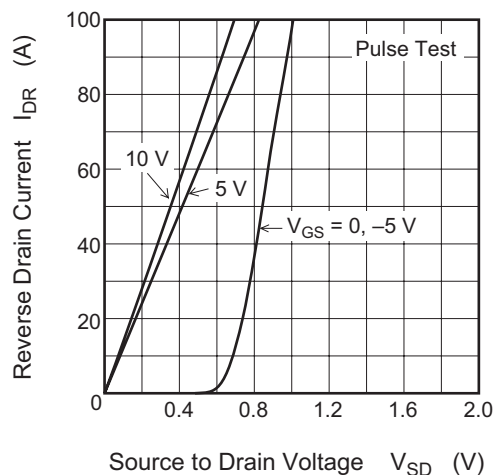
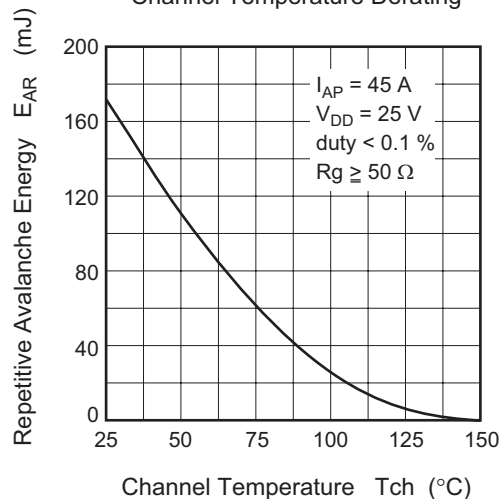
Drain to Source Saturation Voltage vs. Gate to Source Voltage



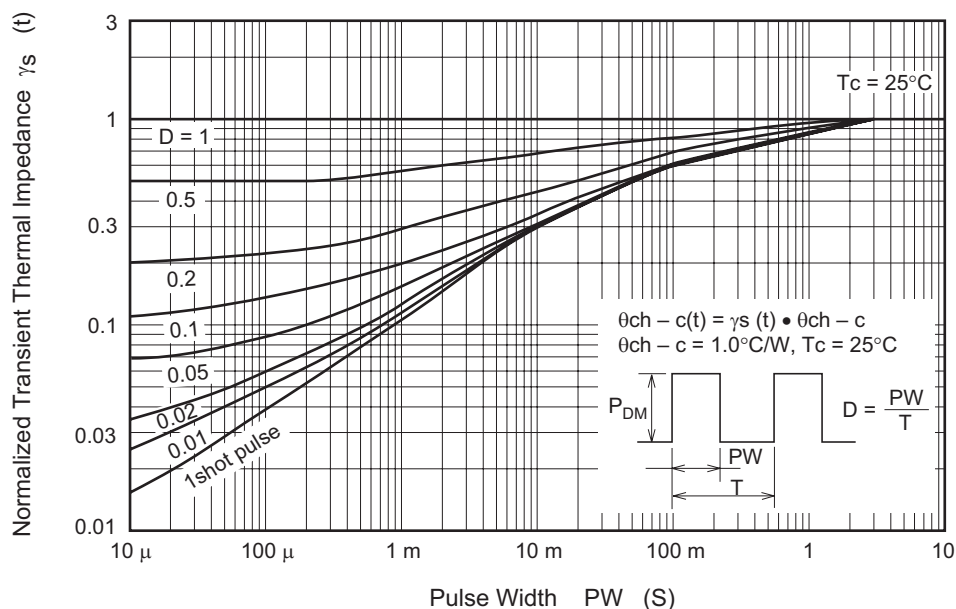
Static Drain to Source on State Resistance vs. Drain Current



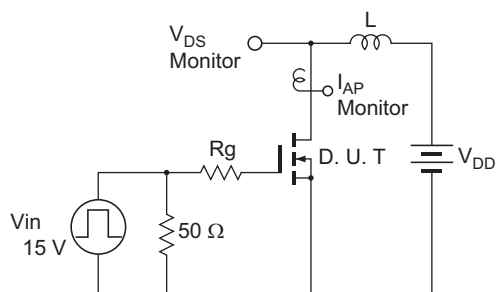
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Reverse Drain Current vs.
Source to Drain VoltageMaximum Avalanche Energy vs.
Channel Temperature Derating

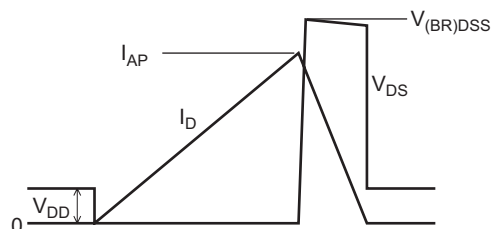
Normalized Transient Thermal Impedance vs. Pulse Width



Avalanche Test Circuit and Waveform

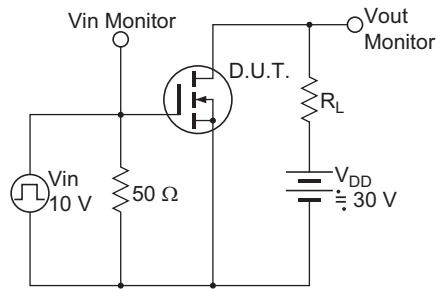


$$E_{AR} = \frac{1}{2} \cdot L \cdot I_{AP}^2 \cdot \frac{V_{DSS}}{V_{DSS} - V_{DD}}$$

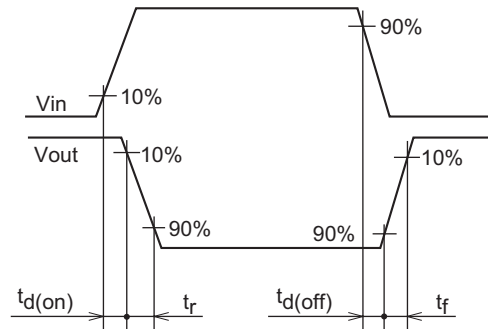


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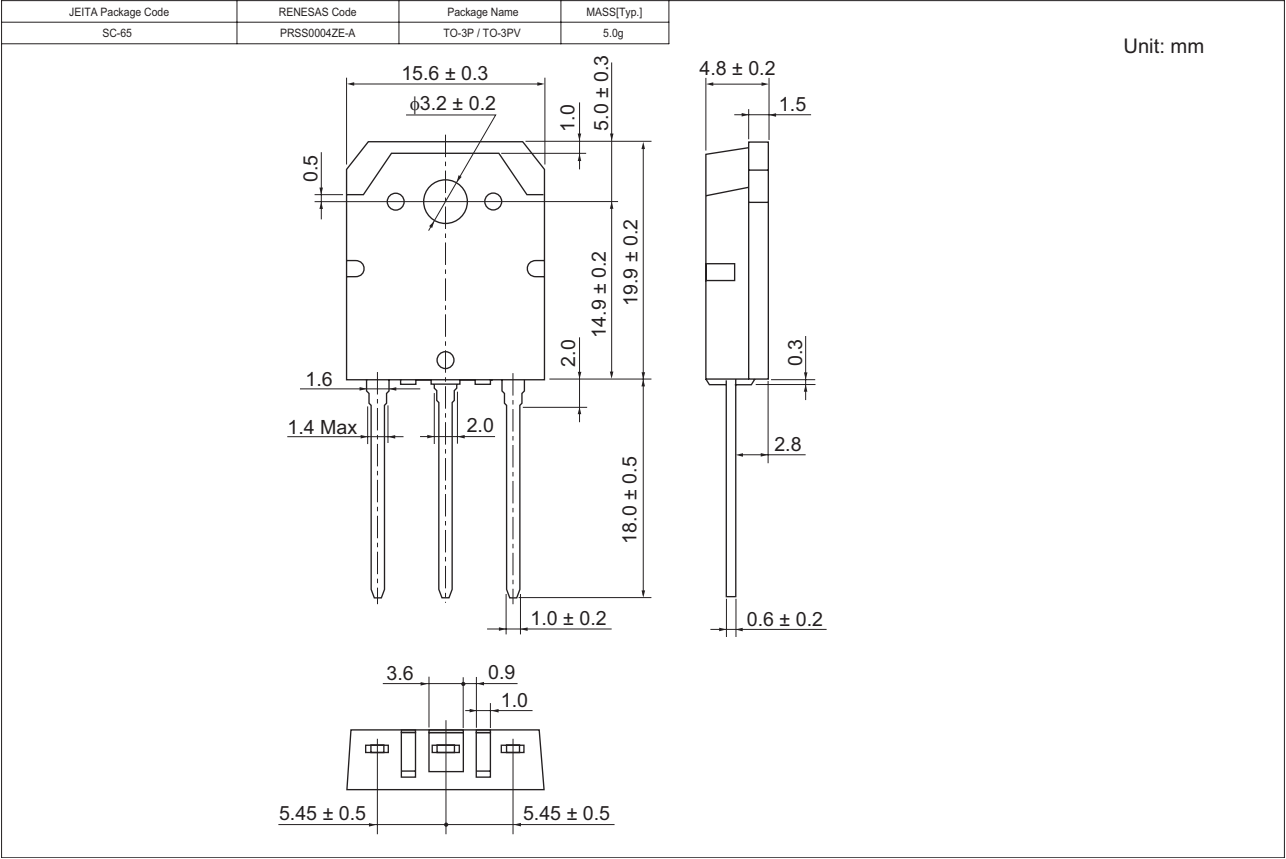
Switching Time Test Circuit



Waveform



2SK2586-E 封装尺寸



Ordering Information

Part Name	Quantity	Shipping Container
2SK2586-E	30 pcs	Plastic magazine

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Renesas Technology Europe Limited

Dukes Meadow, Millboard Road, Bourne End, Buckinghamshire, SL8 5FH, U.K.
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Renesas Technology Hong Kong Ltd.

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Tel: <852> 2265-6688, Fax: <852> 2730-6071

Renesas Technology Taiwan Co., Ltd.

10th Floor, No.99, Fushing North Road, Taipei, Taiwan
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Renesas Technology (Shanghai) Co., Ltd.

Unit2607 Ruijing Building, No.205 Maoming Road (S), Shanghai 200020, China
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Renesas Technology Singapore Pte. Ltd.

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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