

# RJK0632JPD

60 V, 20 A Silicon N Channel MOS FET  
High Speed Power Switching

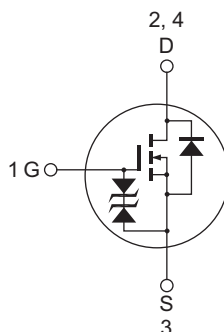
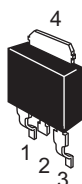
R07DS0342EJ0200  
Rev.2.00  
Oct 16, 2014

## Features

- For Automotive application
- AEC-Q101 compliant
- Low on-resistance :  $R_{DS(on)} = 29 \text{ m}\Omega$  typ.
- Capable of 4.5 V gate drive
- Low input capacitance :  $C_{iss} = 440 \text{ pF}$  typ.

## Outline

RENESAS Package code: PRSS0004ZD-C  
(Package name: DPAK (S))



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

## Absolute Maximum Ratings

( $T_a = 25^\circ\text{C}$ )

Item	Symbol	Value	Unit
Drain to source voltage	$V_{DSS}$	60	V
Gate to source voltage	$V_{GSS}$	$\pm 20$	V
Drain current	$I_D$	20	A
Drain peak current	$I_{D(\text{pulse})}$ <sup>Note1</sup>	80	A
Body-drain diode reverse drain current	$I_{DR}$	20	A
Body-drain diode reverse drain peak current	$I_{DR(\text{pulse})}$ <sup>Note1</sup>	80	A
Avalanche current	$I_{AP}$ <sup>Note2</sup>	14	A
Avalanche energy	$E_{AR}$ <sup>Note2</sup>	16.8	mJ
Channel dissipation	$P_{ch}$ <sup>Note3</sup>	25	W
Channel temperature	$T_{ch}$ <sup>Note4</sup>	175	$^\circ\text{C}$
Storage temperature	$T_{stg}$	-55 to +150	$^\circ\text{C}$

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

2.  $T_{ch} = 25^\circ\text{C}$ ,  $R_g \geq 50 \Omega$

3.  $T_c = 25^\circ\text{C}$

4. AEC-Q101 compliant

## Thermal Impedance Characteristics

- Channel to case thermal impedance  $\theta_{ch-c}$ :  $6.00^\circ\text{C/W}$

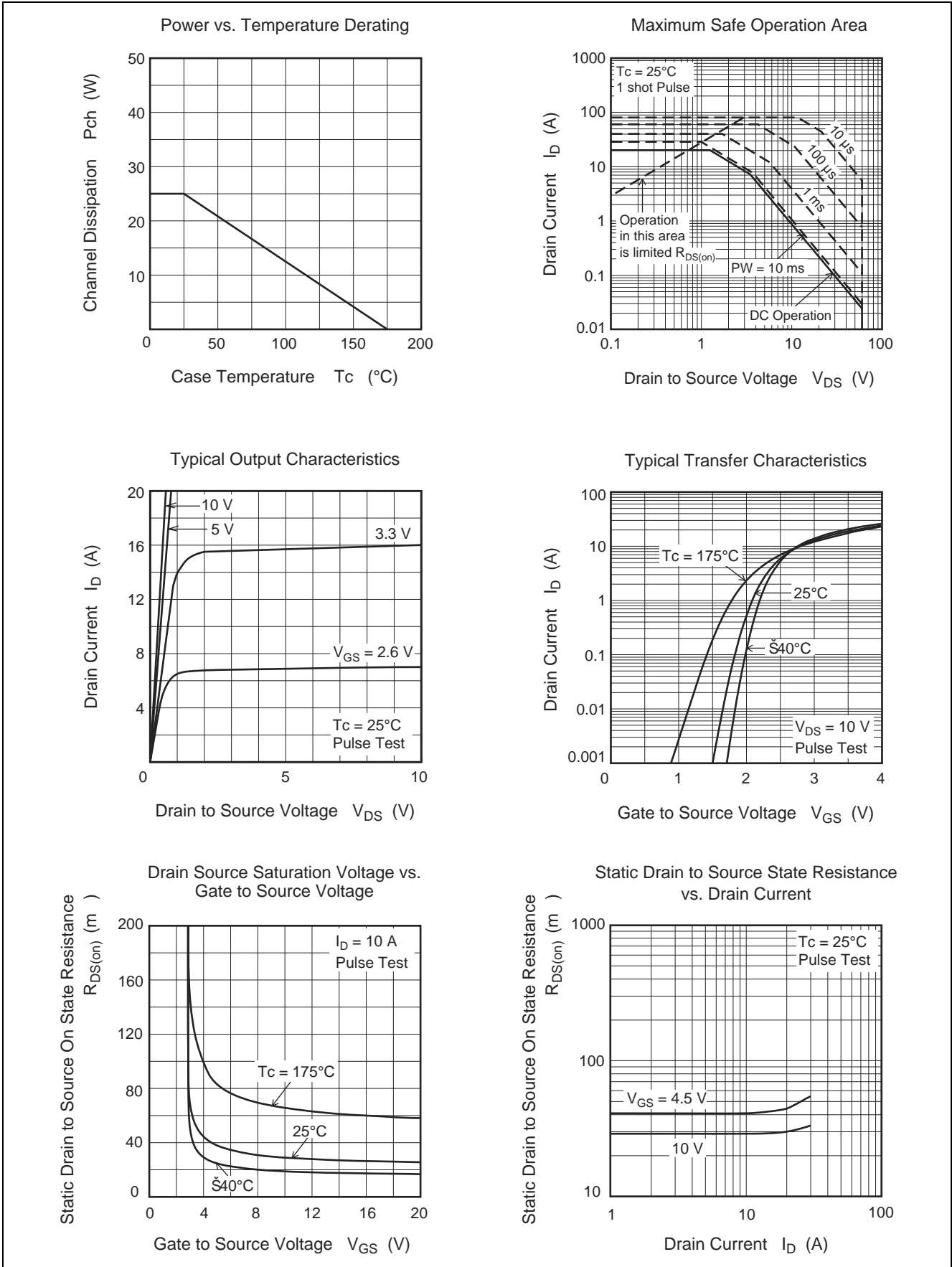
## Electrical Characteristics

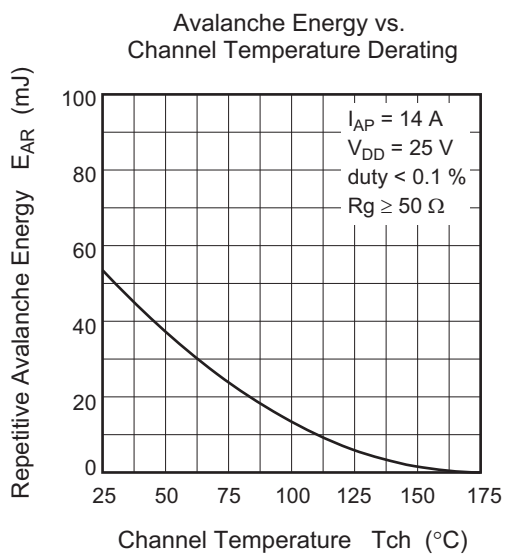
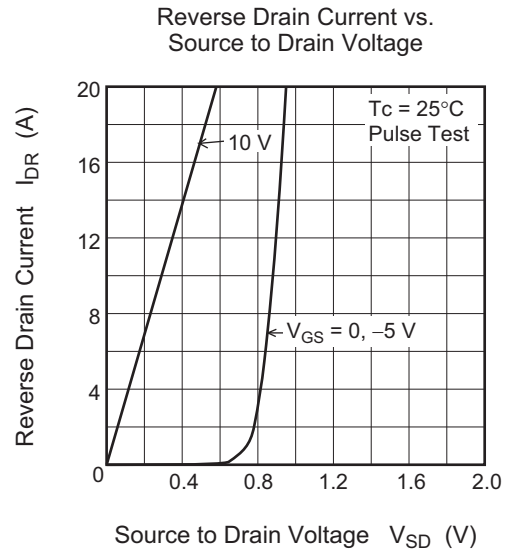
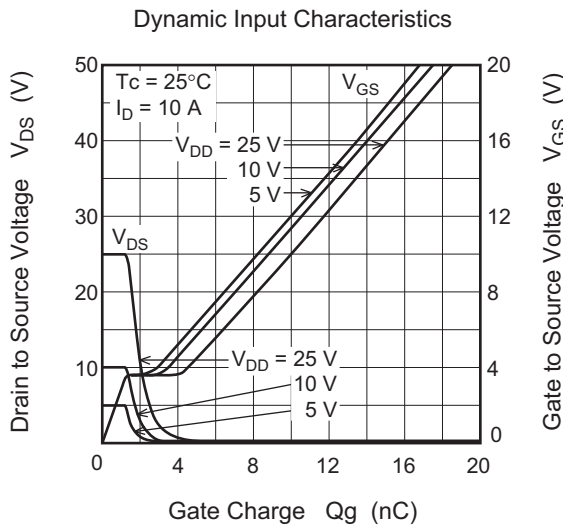
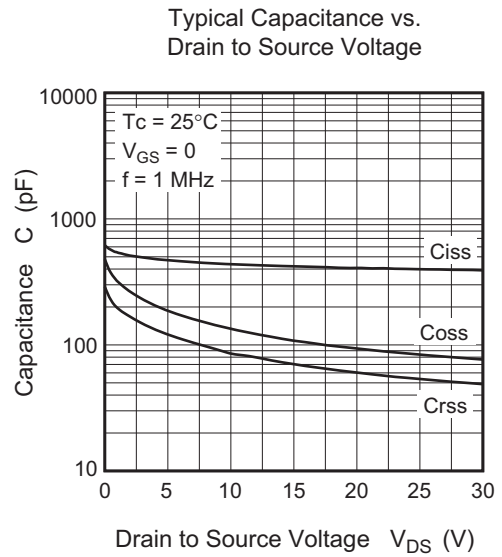
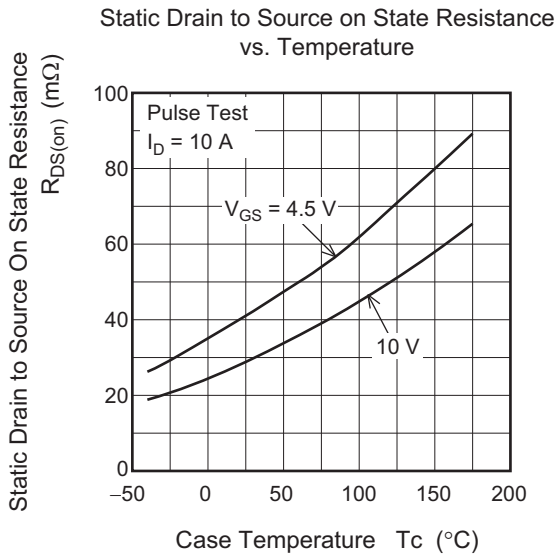
(Ta = 25°C)

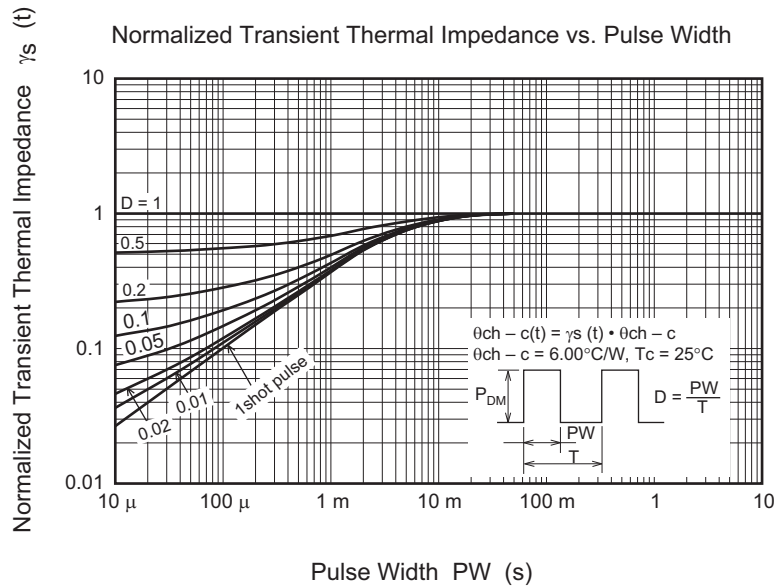
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Gate to source leak current	$I_{GSS}$	—	—	±10	μA	$V_{GS} = \pm 20\text{ V}$ , $V_{DS} = 0$
Zero gate voltage drain current	$I_{DSS}$	—	—	1	μA	$V_{DS} = 60\text{ V}$ , $V_{GS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	1.0	—	2.0	V	$I_D = 1\text{ mA}$ , $V_{DS} = 10\text{ V}$
Static drain to source on state resistance	$R_{DS(on)}$	—	29	35	mΩ	$I_D = 10\text{ A}$ , $V_{GS} = 10\text{ V}$ <sup>Note5</sup>
Static drain to source on state resistance	$R_{DS(on)}$	—	41	55	mΩ	$I_D = 10\text{ A}$ , $V_{GS} = 4.5\text{ V}$ <sup>Note5</sup>
Input capacitance	$C_{iss}$	—	440	—	pF	$V_{DS} = 10\text{ V}$ , $V_{GS} = 0$ $f = 1\text{ MHz}$
Output capacitance	$C_{oss}$	—	135	—	pF	
Reverse transfer capacitance	$C_{rss}$	—	85	—	pF	
Total gate charge	$Q_g$	—	10	—	nC	$V_{DD} = 25\text{ V}$ , $V_{GS} = 10\text{ V}$ , $I_D = 20\text{ A}$
Gate to source charge	$Q_{gs}$	—	1.4	—	nC	
Gate to drain charge	$Q_{gd}$	—	3.0	—	nC	
Turn-on delay time	$t_{d(on)}$	—	8.5	—	ns	$I_D = 10\text{ A}$ , $R_L = 3\ \Omega$ $V_{GS} = 10\text{ V}$ , $R_G = 4.7\ \Omega$
Rise time	$t_r$	—	12	—	ns	
Turn-off delay time	$t_{d(off)}$	—	40	—	ns	
Fall time	$t_f$	—	11	—	ns	
Body-drain diode forward voltage	$V_{DF}$	—	0.95	1.24	V	$I_F = 20\text{ A}$ , $V_{GS} = 0$ <sup>Note5</sup>
Body-drain diode reverse recovery time	$t_{rr}$	—	30	—	ns	$I_F = 20\text{ A}$ , $V_{GS} = 0$ , $di_F/dt = 100\text{ A}/\mu\text{s}$

Note: 5. Pulse test

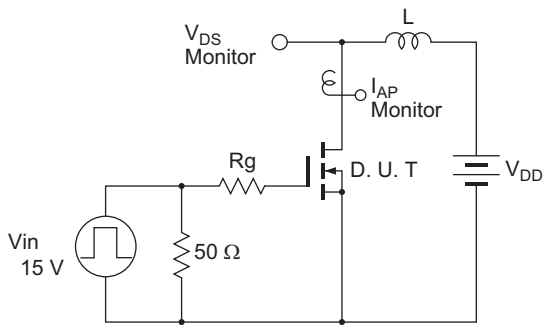
Main Characteristics





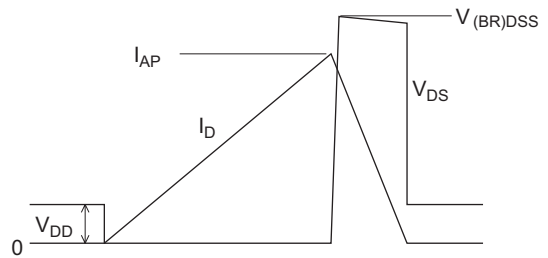


Avalanche Test Circuit

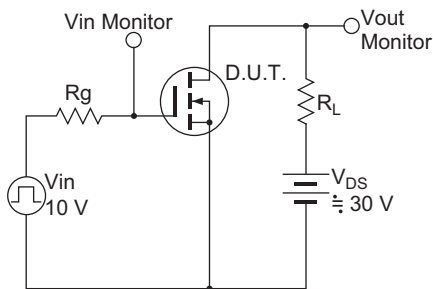


Avalanche Waveform

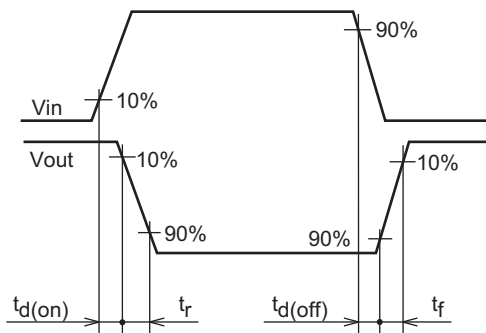
$$E_{AR} = \frac{1}{2} L \cdot I_{AP}^2 \cdot \frac{V_{DSS}}{V_{DSS} - V_{DD}}$$



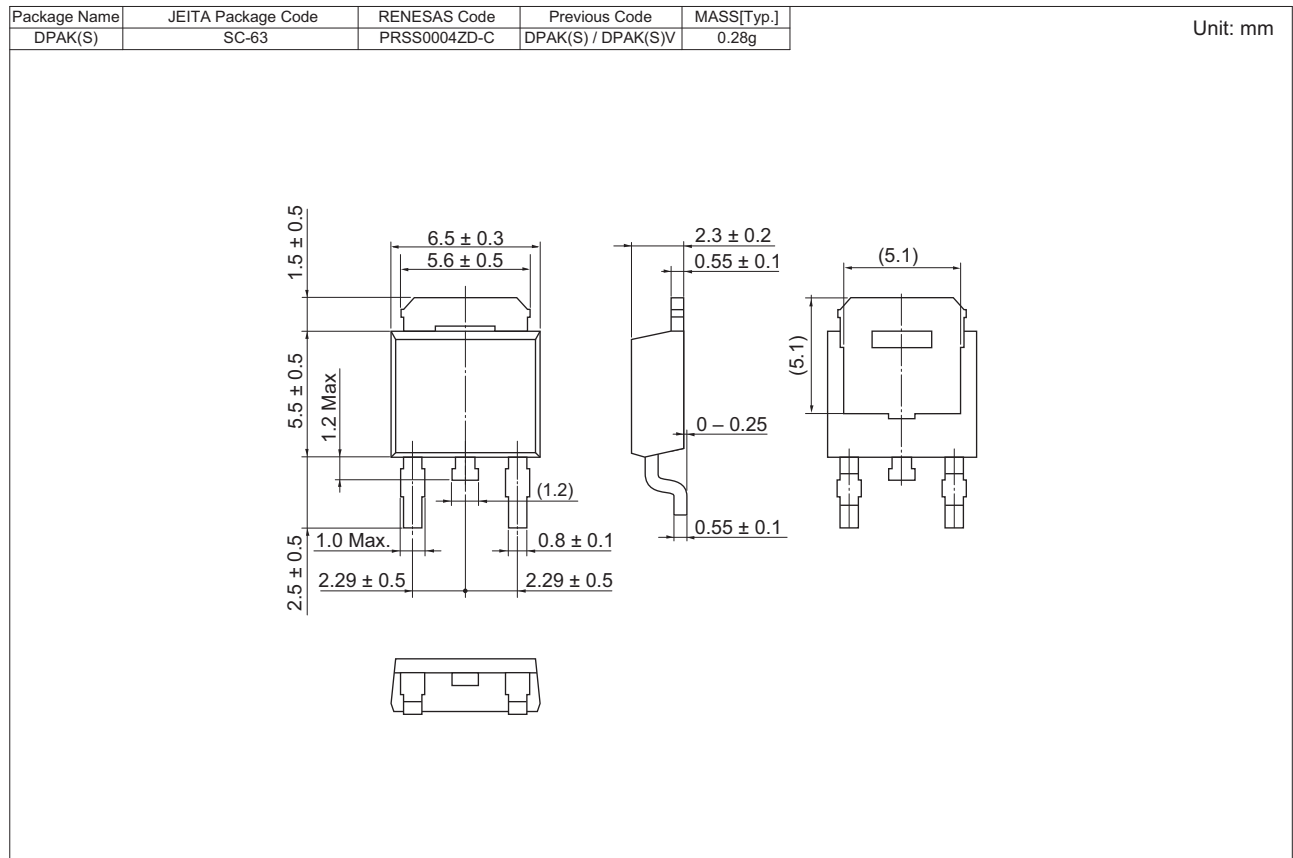
Switching Time Test Circuit



Switching Time Waveform



## Package Dimensions



## Ordering Information

Orderable Part Number	Quantity	Shipping Container
RJK0632JPD-00-J3	3000 pcs	Taping (Sinistrorse)

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Tel: +1-408-586-6000, Fax: +1-408-588-6130

**Renesas Electronics Canada Limited**  
1101 Nicholson Road, Newmarket, Ontario L3Y 9C3, Canada  
Tel: +1-905-898-5441, Fax: +1-905-898-3220

**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: +86-21-2226-0999

**Renesas Electronics Hong Kong Limited**  
Unit 1601-1613, 16/F., Tower 2, Grand Century Place, 193 Prince Edward Road West, Mongkok, Kowloon, Hong Kong  
Tel: +852-2265-6688, Fax: +852 2886-9022/9044

**Renesas Electronics Taiwan Co., Ltd.**  
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Tel: +886-2-8175-9600, Fax: +886 2-8175-9670

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Tel: +65-6213-0200, Fax: +65-6213-0300

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Unit 906, Block B, Menara Amcorp, Amcorp Trade Centre, No. 18, Jln Persiaran Barat, 46050 Petaling Jaya, Selangor Darul Ehsan, Malaysia  
Tel: +60-3-7955-9390, Fax: +60-3-7955-9510

**Renesas Electronics Korea Co., Ltd.**  
12F., 234 Teheran-ro, Gangnam-Ku, Seoul, 135-920, Korea  
Tel: +82-2-558-3737, Fax: +82-2-558-5141