

To our customers,

Old Company Name in Catalogs and Other Documents

On April 1st, 2010, NEC Electronics Corporation merged with Renesas Technology Corporation, and Renesas Electronics Corporation took over all the business of both companies. Therefore, although the old company name remains in this document, it is a valid Renesas Electronics document. We appreciate your understanding.

Renesas Electronics website: <http://www.renesas.com>

April 1st, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (<http://www.renesas.com>)

Send any inquiries to <http://www.renesas.com/inquiry>.

Not recommended
for new design

Notice

1. All information included in this document is current as of the date this document is issued. Such information, however, is subject to change without any prior notice. Before purchasing or using any Renesas Electronics products listed herein, please confirm the latest product information with a Renesas Electronics sales office. Also, please pay regular and careful attention to additional and different information to be disclosed by Renesas Electronics such as that disclosed through our website.
2. Renesas Electronics does not assume any liability for infringement of patents, copyrights, or other intellectual property rights of third parties by or arising from the use of Renesas Electronics products or technical information described in this document. No license, express, implied or otherwise, is granted hereby under any patents, copyrights or other intellectual property rights of Renesas Electronics or others.
3. You should not alter, modify, copy, or otherwise misappropriate any Renesas Electronics product, whether in whole or in part.
4. Descriptions of circuits, software and other related information in this document are provided only to illustrate the operation of semiconductor products and application examples. You are fully responsible for the incorporation of these circuits, software, and information in the design of your equipment. Renesas Electronics assumes no responsibility for any losses incurred by you or third parties arising from the use of these circuits, software, or information.
5. When exporting the products or technology described in this document, you should comply with the applicable export control laws and regulations and follow the procedures required by such laws and regulations. You should not use Renesas Electronics products or the technology described in this document for any purpose relating to military applications or use by the military, including but not limited to the development of weapons of mass destruction. Renesas Electronics products and technology may not be used for or incorporated into any products or systems whose manufacture, use, or sale is prohibited under any applicable domestic or foreign laws or regulations.
6. Renesas Electronics has used reasonable care in preparing the information included in this document, but Renesas Electronics does not warrant that such information is error free. Renesas Electronics assumes no liability whatsoever for any damages incurred by you resulting from errors in or omissions from the information included herein.
7. Renesas Electronics products are classified according to the following three quality grades: “Standard”, “High Quality”, and “Specific”. The recommended applications for each Renesas Electronics product depends on the product’s quality grade, as indicated below. You must check the quality grade of each Renesas Electronics product before using it in a particular application. You may not use any Renesas Electronics product for any application categorized as “Specific” without the prior written consent of Renesas Electronics. Further, you may not use any Renesas Electronics product for any application for which it is not intended without the prior written consent of Renesas Electronics. Renesas Electronics shall not be in any way liable for any damages or losses incurred by you or third parties arising from the use of any Renesas Electronics product for an application categorized as “Specific” or for which the product is not intended where you have failed to obtain the prior written consent of Renesas Electronics. The quality grade of each Renesas Electronics product is “Standard” unless otherwise expressly specified in a Renesas Electronics data sheets or data books, etc.
 - “Standard”: Computers; office equipment; communications equipment; test and measurement equipment; audio and visual equipment; home electronic appliances; machine tools; personal electronic equipment; and industrial robots.
 - “High Quality”: Transportation equipment (automobiles, trains, ships, etc.); traffic control systems; anti-disaster systems; anti-crime systems; safety equipment; and medical equipment not specifically designed for life support.
 - “Specific”: Aircraft; aerospace equipment; submersible repeaters; nuclear reactor control systems; medical equipment or systems for life support (e.g. artificial life support devices or systems), surgical implantations, or healthcare intervention (e.g. excision, etc.), and any other applications or purposes that pose a direct threat to human life.
8. You should use the Renesas Electronics products described in this document within the range specified by Renesas Electronics, especially with respect to the maximum rating, operating supply voltage range, movement power voltage range, heat radiation characteristics, installation and other product characteristics. Renesas Electronics shall have no liability for malfunctions or damages arising out of the use of Renesas Electronics products beyond such specified ranges.
9. Although Renesas Electronics endeavors to improve the quality and reliability of its products, semiconductor products have specific characteristics such as the occurrence of failure at a certain rate and malfunctions under certain use conditions. Further, Renesas Electronics products are not subject to radiation resistance design. Please be sure to implement safety measures to guard them against the possibility of physical injury, and injury or damage caused by fire in the event of the failure of a Renesas Electronics product, such as safety design for hardware and software including but not limited to redundancy, fire control and malfunction prevention, appropriate treatment for aging degradation or any other appropriate measures. Because the evaluation of microcomputer software alone is very difficult, please evaluate the safety of the final products or system manufactured by you.
10. Please contact a Renesas Electronics sales office for details as to environmental matters such as the environmental compatibility of each Renesas Electronics product. Please use Renesas Electronics products in compliance with all applicable laws and regulations that regulate the inclusion or use of controlled substances, including without limitation, the EU RoHS Directive. Renesas Electronics assumes no liability for damages or losses occurring as a result of your noncompliance with applicable laws and regulations.
11. This document may not be reproduced or duplicated, in any form, in whole or in part, without prior written consent of Renesas Electronics.
12. Please contact a Renesas Electronics sales office if you have any questions regarding the information contained in this document or Renesas Electronics products, or if you have any other inquiries.

(Note 1) “Renesas Electronics” as used in this document means Renesas Electronics Corporation and also includes its majority-owned subsidiaries.

(Note 2) “Renesas Electronics product(s)” means any product developed or manufactured by or for Renesas Electronics.

RKZ-KD Series

Silicon Planar Zener Diode for Stabilized Power Supply

REJ03G1264-0200
Rev.2.00
May 09, 2008

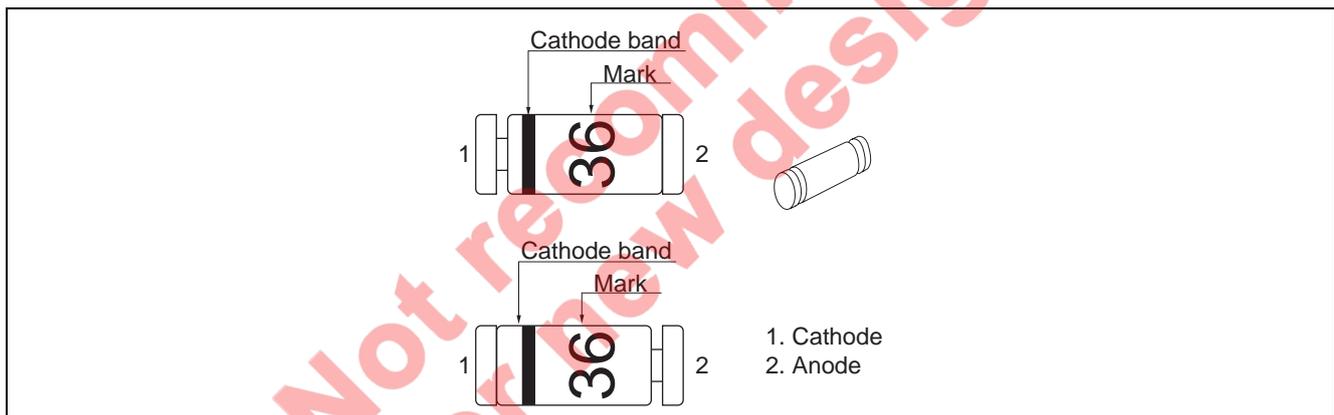
Features

- Low leakage, low zener impedance and maximum power dissipation of 500 mW.
- Wide spectrum from 1.9 V through 38 V of zener voltage provide flexible application.
- LLD Package is suitable for high density surface mounting and high speed assembly.

Ordering Information

Part No.	Cathode band	Character Mark	Package Name	Package Code
RKZ-KD Series	Same Color as Character Mark	Refer to Mark Code	LLD	GLZZ0002ZA-A

Pin Arrangement



Absolute Maximum Ratings

(Ta = 25°C)

Item	Symbol	Value	Unit
Power dissipation	Pd	500	mW
Junction temperature	Tj	175	°C
Storage temperature	Tstg	-55 to +175	°C

Electrical Characteristics

(Ta = 25°C)

Part No.	Zener Voltage		Reverse Current		Dynamic Resistance		
	V _Z (V) ^{*1}		Test Condition	I _R (μA)	Test Condition	r _d (Ω)	Test Condition
	Min	Max	I _Z (mA)	Max	V _R (V)	Max	I _Z (mA)
RKZ2B1KD	1.9	2.1	5	5	0.5	100	5
RKZ2B2KD	2.0	2.2					
RKZ2B3KD	2.1	2.3					
RKZ2C1KD	2.2	2.4					
RKZ2C2KD	2.3	2.5					
RKZ2C3KD	2.4	2.6					
RKZ3A1KD	2.5	2.7	5	5	0.5	100	5
RKZ3A2KD	2.6	2.8					
RKZ3A3KD	2.7	2.9					
RKZ3B1KD	2.8	3.0					
RKZ3B2KD	2.9	3.1					
RKZ3B3KD	3.0	3.2					
RKZ3C1KD	3.1	3.3	5	5	1.0	100	5
RKZ3C2KD	3.2	3.4					
RKZ3C3KD	3.3	3.5					
RKZ4A1KD	3.4	3.6					
RKZ4A2KD	3.5	3.7					
RKZ4A3KD	3.6	3.8					
RKZ4B1KD	3.7	3.9	5	5	1.5	100	5
RKZ4B2KD	3.8	4.0					
RKZ4B3KD	3.9	4.1					
RKZ4C1KD	4.0	4.2					
RKZ4C2KD	4.1	4.3					
RKZ4C3KD	4.2	4.4					
RKZ5A1KD	4.3	4.5	5	5	1.5	100	5
RKZ5A2KD	4.4	4.6					
RKZ5A3KD	4.5	4.7					
RKZ5B1KD	4.6	4.8					
RKZ5B2KD	4.7	4.9					
RKZ5B3KD	4.8	5.0					
RKZ5C1KD	4.9	5.1	5	5	1.5	100	5
RKZ5C2KD	5.0	5.2					
RKZ5C3KD	5.1	5.3					

Note: 1. Tested with DC.

Part No.	Zener Voltage		Reverse Current		Dynamic Resistance		
	V _Z (V)*1		Test Condition	I _R (μA)	Test Condition	r _d (Ω)	Test Condition
	Min	Max	I _Z (mA)	Max	V _R (V)	Max	I _Z (mA)
RKZ6A1KD	5.2	5.5	5	5	2.0	40	5
RKZ6A2KD	5.3	5.6					
RKZ6A3KD	5.4	5.7					
RKZ6B1KD	5.5	5.8					
RKZ6B2KD	5.6	5.9					
RKZ6B3KD	5.7	6.0					
RKZ6C1KD	5.8	6.1					
RKZ6C2KD	6.0	6.3					
RKZ6C3KD	6.1	6.4					
RKZ7A1KD	6.3	6.6	5	1	3.5	15	5
RKZ7A2KD	6.4	6.7					
RKZ7A3KD	6.6	6.9					
RKZ7B1KD	6.7	7.0					
RKZ7B2KD	6.9	7.2					
RKZ7B3KD	7.0	7.3					
RKZ7C1KD	7.2	7.6					
RKZ7C2KD	7.3	7.7					
RKZ7C3KD	7.5	7.9					
RKZ9A1KD	7.7	8.1	5	1	5.0	20	5
RKZ9A2KD	7.9	8.3					
RKZ9A3KD	8.1	8.5					
RKZ9B1KD	8.3	8.7					
RKZ9B2KD	8.5	8.9					
RKZ9B3KD	8.7	9.1					
RKZ9C1KD	8.9	9.3					
RKZ9C2KD	9.1	9.5					
RKZ9C3KD	9.3	9.7					
RKZ11A1KD	9.5	9.9	5	1	7.5	25	5
RKZ11A2KD	9.7	10.1					
RKZ11A3KD	9.9	10.3					
RKZ11B1KD	10.2	10.6					
RKZ11B2KD	10.4	10.8					
RKZ11B3KD	10.7	11.1					
RKZ11C1KD	10.9	11.3					
RKZ11C2KD	11.1	11.6					
RKZ11C3KD	11.4	11.9					

Note: 1. Tested with DC.

Part No.	Zener Voltage		Reverse Current			Dynamic Resistance	
	V _Z (V) ^{*1}		Test Condition	I _R (μA)	Test Condition	r _d (Ω)	Test Condition
	Min	Max	I _Z (mA)	Max	V _R (V)	Max	I _Z (mA)
RKZ12A1KD	11.6	12.1	5	1	9.5	35	5
RKZ12A2KD	11.9	12.4					
RKZ12A3KD	12.2	12.7					
RKZ12B1KD	12.4	12.9					
RKZ12B2KD	12.6	13.1					
RKZ12B3KD	12.9	13.4					
RKZ12C1KD	13.2	13.7					
RKZ12C2KD	13.5	14.0					
RKZ12C3KD	13.8	14.3					
RKZ15-1KD	14.1	14.7	5	1	11.0	40	5
RKZ15-2KD	14.5	15.1					
RKZ15-3KD	14.9	15.5					
RKZ16-1KD	15.3	15.9	5	1	12.0	45	5
RKZ16-2KD	15.7	16.5					
RKZ16-3KD	16.3	17.1					
RKZ18-1KD	16.9	17.7	5	1	13.0	55	5
RKZ18-2KD	17.5	18.3					
RKZ18-3KD	18.1	19.0					
RKZ20-1KD	18.8	19.7	2	1	15.0	60	2
RKZ20-2KD	19.5	20.4					
RKZ20-3KD	20.2	21.1					
RKZ22-1KD	20.9	21.9	2	1	17.0	65	2
RKZ22-2KD	21.6	22.6					
RKZ22-3KD	22.3	23.3					
RKZ24-1KD	22.9	24.0	2	1	19.0	70	2
RKZ24-2KD	23.6	24.7					
RKZ24-3KD	24.3	25.5					
RKZ27-1KD	25.2	26.6	2	1	21.0	80	2
RKZ27-2KD	26.2	27.6					
RKZ27-3KD	27.2	28.6					
RKZ30-1KD	28.2	29.6	2	1	23.0	100	2
RKZ30-2KD	29.2	30.6					
RKZ30-3KD	30.2	31.6					
RKZ33-1KD	31.2	32.6	2	1	25.0	120	2
RKZ33-2KD	32.2	33.6					
RKZ33-3KD	33.2	34.6					
RKZ36-1KD	34.2	35.7	2	1	27.0	140	2
RKZ36-2KD	35.3	36.8					
RKZ36-3KD	36.4	38.0					

Note: 1. Tested with DC.

Mark Code

Part No.	Character Mark	Color	Part No.	Character Mark	Color	Part No.	Character Mark	Color
RKZ2B1KD	2B	Pink	RKZ6B1KD	6B	Pink	RKZ12B1KD	BB	Pink
RKZ2B2KD	2B	Blue	RKZ6B2KD	6B	Blue	RKZ12B2KD	BB	Blue
RKZ2B3KD	2B	White	RKZ6B3KD	6B	White	RKZ12B3KD	BB	White
RKZ2C1KD	2C	Pink	RKZ6C1KD	6C	Pink	RKZ12C1KD	BC	Pink
RKZ2C2KD	2C	Blue	RKZ6C2KD	6C	Blue	RKZ12C2KD	BC	Blue
RKZ2C3KD	2C	White	RKZ6C3KD	6C	White	RKZ12C3KD	BC	White
RKZ3A1KD	3A	Pink	RKZ7A1KD	7A	Pink	RKZ15-1KD	15	Pink
RKZ3A2KD	3A	Blue	RKZ7A2KD	7A	Blue	RKZ15-2KD	15	Blue
RKZ3A3KD	3A	White	RKZ7A3KD	7A	White	RKZ15-3KD	15	White
RKZ3B1KD	3B	Pink	RKZ7B1KD	7B	Pink	RKZ16-1KD	16	Pink
RKZ3B2KD	3B	Blue	RKZ7B2KD	7B	Blue	RKZ16-2KD	16	Blue
RKZ3B3KD	3B	White	RKZ7B3KD	7B	White	RKZ16-3KD	16	White
RKZ3C1KD	3C	Pink	RKZ7C1KD	7C	Pink	RKZ18-1KD	18	Pink
RKZ3C2KD	3C	Blue	RKZ7C2KD	7C	Blue	RKZ18-2KD	18	Blue
RKZ3C3KD	3C	White	RKZ7C3KD	7C	White	RKZ18-3KD	18	White
RKZ4A1KD	4A	Pink	RKZ9A1KD	9A	Pink	RKZ20-1KD	20	Pink
RKZ4A2KD	4A	Blue	RKZ9A2KD	9A	Blue	RKZ20-2KD	20	Blue
RKZ4A3KD	4A	White	RKZ9A3KD	9A	White	RKZ20-3KD	20	White
RKZ4B1KD	4B	Pink	RKZ9B1KD	9B	Pink	RKZ22-1KD	22	Pink
RKZ4B2KD	4B	Blue	RKZ9B2KD	9B	Blue	RKZ22-2KD	22	Blue
RKZ4B3KD	4B	White	RKZ9B3KD	9B	White	RKZ22-3KD	22	White
RKZ4C1KD	4C	Pink	RKZ9C1KD	9C	Pink	RKZ24-1KD	24	Pink
RKZ4C2KD	4C	Blue	RKZ9C2KD	9C	Blue	RKZ24-2KD	24	Blue
RKZ4C3KD	4C	White	RKZ9C3KD	9C	White	RKZ24-3KD	24	White
RKZ5A1KD	5A	Pink	RKZ11A1KD	AA	Pink	RKZ27-1KD	27	Pink
RKZ5A2KD	5A	Blue	RKZ11A2KD	AA	Blue	RKZ27-2KD	27	Blue
RKZ5A3KD	5A	White	RKZ11A3KD	AA	White	RKZ27-3KD	27	White
RKZ5B1KD	5B	Pink	RKZ11B1KD	AB	Pink	RKZ30-1KD	30	Pink
RKZ5B2KD	5B	Blue	RKZ11B2KD	AB	Blue	RKZ30-2KD	30	Blue
RKZ5B3KD	5B	White	RKZ11B3KD	AB	White	RKZ30-3KD	30	White
RKZ5C1KD	5C	Pink	RKZ11C1KD	AC	Pink	RKZ33-1KD	33	Pink
RKZ5C2KD	5C	Blue	RKZ11C2KD	AC	Blue	RKZ33-2KD	33	Blue
RKZ5C3KD	5C	White	RKZ11C3KD	AC	White	RKZ33-3KD	33	White
RKZ6A1KD	6A	Pink	RKZ12A1KD	BA	Pink	RKZ36-1KD	36	Pink
RKZ6A2KD	6A	Blue	RKZ12A2KD	BA	Blue	RKZ36-2KD	36	Blue
RKZ6A3KD	6A	White	RKZ12A3KD	BA	White	RKZ36-3KD	36	White

Main Characteristic

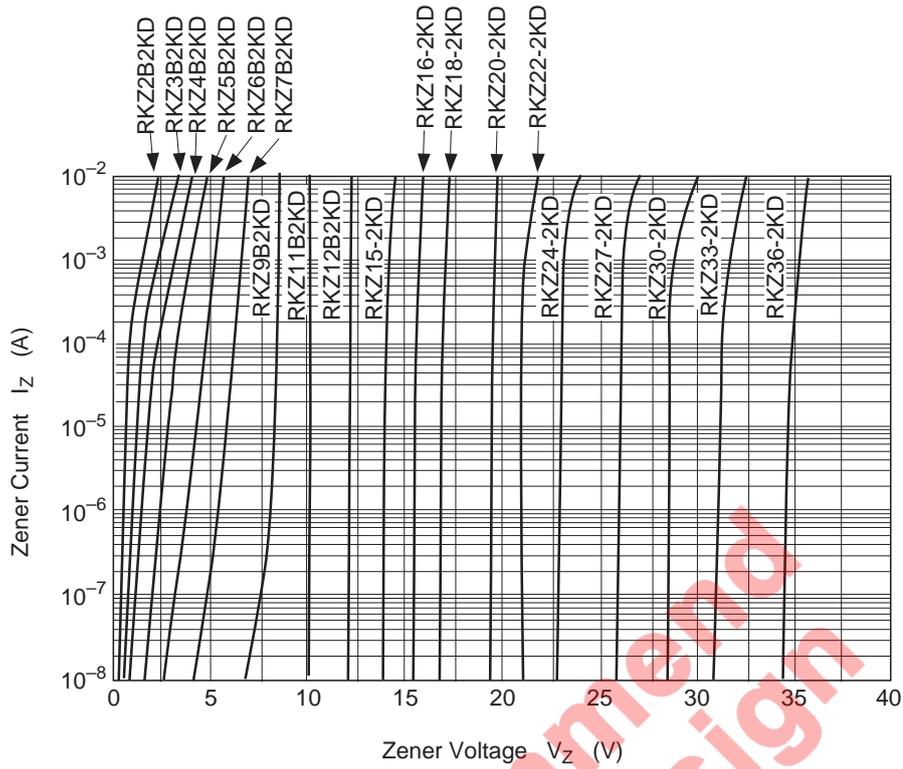


Fig.1 Zener current vs. Zener voltage

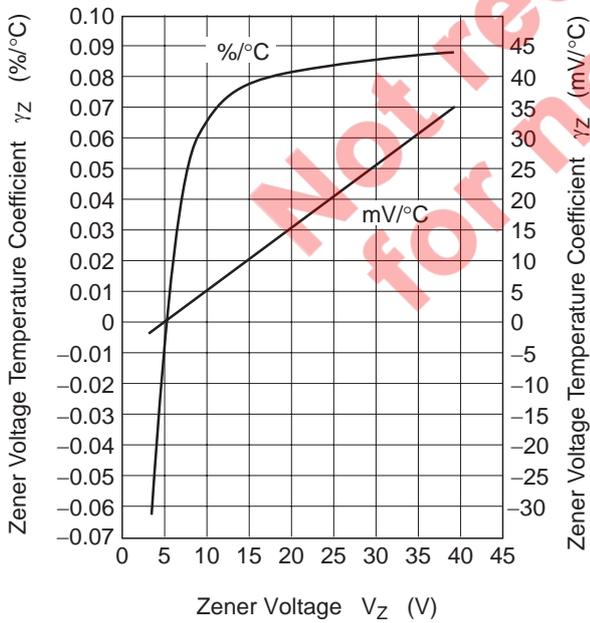


Fig.2 Temperature Coefficient vs. Zener voltage

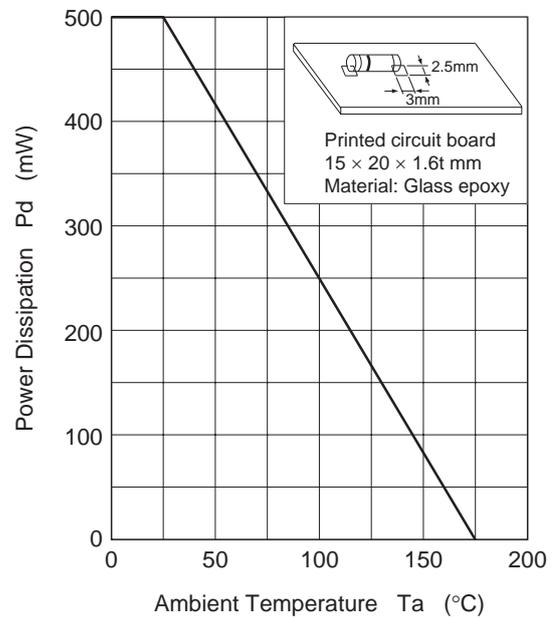
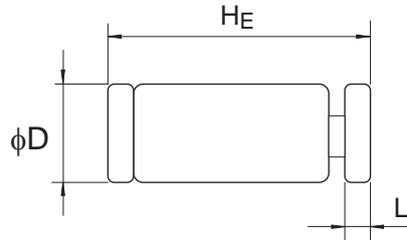


Fig.3 Power Dissipation vs. Ambient Temperature

Package Dimensions

Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
LLD	—	GLZZ0002ZA-A	LLD / LLDV	0.027g



Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
ϕD	1.25	1.35	1.45
H_E	3.30	3.50	3.60
L	-	0.35	-

Not recommend
for new design

Notes:

1. This document is provided for reference purposes only so that Renesas customers may select the appropriate Renesas products for their use. Renesas neither makes warranties or representations with respect to the accuracy or completeness of the information contained in this document nor grants any license to any intellectual property rights or any other rights of Renesas or any third party with respect to the information in this document.
2. Renesas shall have no liability for damages or infringement of any intellectual property or other rights arising out of the use of any information in this document, including, but not limited to, product data, diagrams, charts, programs, algorithms, and application circuit examples.
3. You should not use the products or the technology described in this document for the purpose of military applications such as the development of weapons of mass destruction or for the purpose of any other military use. When exporting the products or technology described herein, you should follow the applicable export control laws and regulations, and procedures required by such laws and regulations.
4. All information included in this document such as product data, diagrams, charts, programs, algorithms, and application circuit examples, is current as of the date this document is issued. Such information, however, is subject to change without any prior notice. Before purchasing or using any Renesas products listed in this document, please confirm the latest product information with a Renesas sales office. Also, please pay regular and careful attention to additional and different information to be disclosed by Renesas such as that disclosed through our website. (<http://www.renesas.com>)
5. Renesas has used reasonable care in compiling the information included in this document, but Renesas assumes no liability whatsoever for any damages incurred as a result of errors or omissions in the information included in this document.
6. When using or otherwise relying on the information in this document, you should evaluate the information in light of the total system before deciding about the applicability of such information to the intended application. Renesas makes no representations, warranties or guarantees regarding the suitability of its products for any particular application and specifically disclaims any liability arising out of the application and use of the information in this document or Renesas products.
7. With the exception of products specified by Renesas as suitable for automobile applications, Renesas products are not designed, manufactured or tested for applications or otherwise in systems the failure or malfunction of which may cause a direct threat to human life or create a risk of human injury or which require especially high quality and reliability such as safety systems, or equipment or systems for transportation and traffic, healthcare, combustion control, aerospace and aeronautics, nuclear power, or undersea communication transmission. If you are considering the use of our products for such purposes, please contact a Renesas sales office beforehand. Renesas shall have no liability for damages arising out of the uses set forth above.
8. Notwithstanding the preceding paragraph, you should not use Renesas products for the purposes listed below:
 - (1) artificial life support devices or systems
 - (2) surgical implantations
 - (3) healthcare intervention (e.g., excision, administration of medication, etc.)
 - (4) any other purposes that pose a direct threat to human lifeRenesas shall have no liability for damages arising out of the uses set forth in the above and purchasers who elect to use Renesas products in any of the foregoing applications shall indemnify and hold harmless Renesas Technology Corp., its affiliated companies and their officers, directors, and employees against any and all damages arising out of such applications.
9. You should use the products described herein within the range specified by Renesas, especially with respect to the maximum rating, operating supply voltage range, movement power voltage range, heat radiation characteristics, installation and other product characteristics. Renesas shall have no liability for malfunctions or damages arising out of the use of Renesas products beyond such specified ranges.
10. Although Renesas endeavors to improve the quality and reliability of its products, IC products have specific characteristics such as the occurrence of failure at a certain rate and malfunctions under certain use conditions. Please be sure to implement safety measures to guard against the possibility of physical injury, and injury or damage caused by fire in the event of the failure of a Renesas product, such as safety design for hardware and software including but not limited to redundancy, fire control and malfunction prevention, appropriate treatment for aging degradation or any other applicable measures. Among others, since the evaluation of microcomputer software alone is very difficult, please evaluate the safety of the final products or system manufactured by you.
11. In case Renesas products listed in this document are detached from the products to which the Renesas products are attached or affixed, the risk of accident such as swallowing by infants and small children is very high. You should implement safety measures so that Renesas products may not be easily detached from your products. Renesas shall have no liability for damages arising out of such detachment.
12. This document may not be reproduced or duplicated, in any form, in whole or in part, without prior written approval from Renesas.
13. Please contact a Renesas sales office if you have any questions regarding the information contained in this document, Renesas semiconductor products, or if you have any other inquiries.



RENESAS SALES OFFICES

<http://www.renesas.com>

Refer to "<http://www.renesas.com/en/network>" for the latest and detailed information.

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