

NE5550279A

Data Sheet
 R09DS0033EJ0200
 Rev.2.00
 Jul 04, 2012

Silicon Power LDMOS FET

FEATURES

- High Output Power : $P_{out} = 33.0$ dBm TYP. ($V_{DS} = 7.5$ V, $I_{Dset} = 40$ mA, $f = 460$ MHz, $P_{in} = 15$ dBm)
- High power added efficiency : $\eta_{add} = 68\%$ TYP. ($V_{DS} = 7.5$ V, $I_{Dset} = 40$ mA, $f = 460$ MHz, $P_{in} = 15$ dBm)
- High Linear gain : $G_L = 22.5$ dB TYP. ($V_{DS} = 7.5$ V, $I_{Dset} = 40$ mA, $f = 460$ MHz, $P_{in} = 0$ dBm)
- High ESD tolerance
- Suitable for VHF to UHF-BAND Class-AB power amplifier.

APPLICATIONS

- 150 MHz Band Radio System
- 460 MHz Band Radio System
- 900 MHz Band Radio System

ORDERING INFORMATION

Part Number	Order Number	Package	Marking	Supplying Form
NE5550279A	NE5550279A-A	79A (Pb Free)	W7	<ul style="list-style-type: none"> • 12 mm wide embossed taping • Gate pin faces the perforation side of the tape
NE5550279A-T1	NE5550279A-T1-A			<ul style="list-style-type: none"> • 12 mm wide embossed taping • Gate pin faces the perforation side of the tape • Qty 1 kpcs/reel
NE5550279A-T1A	NE5550279A-T1A-A			<ul style="list-style-type: none"> • 12 mm wide embossed taping • Gate pin faces the perforation side of the tape • Qty 5 kpcs/reel

Remark To order evaluation samples, please contact your nearby sales office.
 Part number for sample order: NE5550279A-A

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$, unless otherwise specified)

Operation in excess of any one of these parameters may result in permanent damage.

Parameter	Symbol	Ratings	Unit
Drain to Source Voltage	V_{DS}	30	V
Gate to Source Voltage	V_{GS}	6.0	V
Drain Current	I_{DS}	0.6	A
Drain Current (50% Duty Pulsed)	$I_{DS-pulse}$	1.2	A
Total Power Dissipation ^{Note}	P_{tot}	6.25	W
Channel Temperature	T_{ch}	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-55 to +150	$^\circ\text{C}$

Note: Value at $T_C = 25^\circ\text{C}$

CAUTION

Observe precautions when handling because these devices are sensitive to electrostatic discharge.

The mark <R> shows major revised points.

The revised points can be easily searched by copying an "<R>" in the PDF file and specifying it in the "Find what:" field.

NE5550279A

RECOMMENDED OPERATING RANGE ($T_A = 25^\circ\text{C}$)

Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
Drain to Source Voltage	V_{DS}		–	7.5	9.0	V
Gate to Source Voltage	V_{GS}		1.65	2.20	2.85	V
Drain Current	I_{DS}		–	0.4	–	A
Input Power	P_{in}	$f = 460 \text{ MHz}, V_{DS} = 7.5 \text{ V}$	–	15	20	dBm

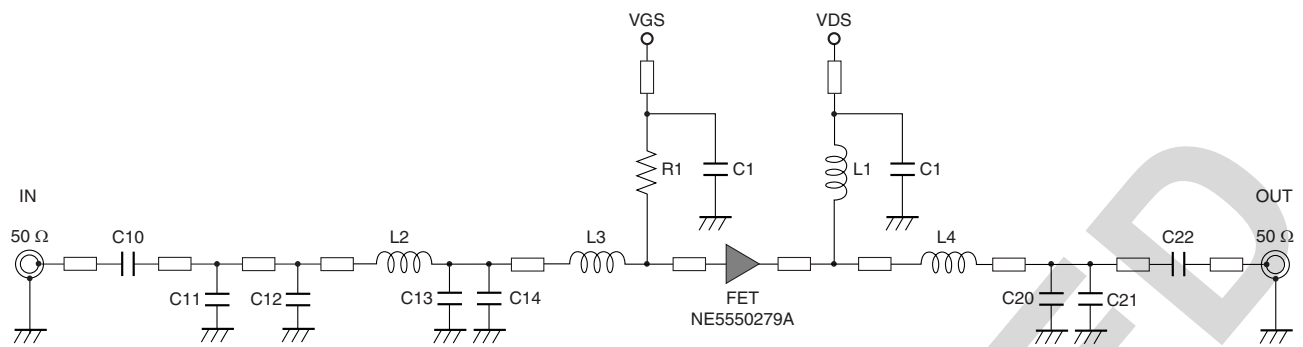
ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$, unless otherwise specified)

Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
DC Characteristics						
Gate to Source Leakage Current	I_{GSS}	$V_{GS} = 6.0 \text{ V}$	–	–	100	nA
Drain to Source Leakage Current (Zero Gate Voltage Drain Current)	I_{DSS}	$V_{DS} = 25 \text{ V}$	–	–	10	μA
Gate Threshold Voltage	V_{th}	$V_{DS} = 7.5 \text{ V}, I_{DS} = 1.0 \text{ mA}$	1.15	1.65	2.25	V
Drain to Source Breakdown Voltage	BV_{DSS}	$I_{DS} = 10 \mu\text{A}$	25	38	–	V
Transconductance	G_m	$V_{DS} = 7.5 \text{ V}, I_{DS} = 140 \pm 20 \text{ mA}$	0.36	0.44	0.58	S
Thermal Resistance	R_{th}	Channel to Case	–	20.0	–	$^\circ\text{C/W}$
RF Characteristics						
Output Power	P_{out}	$f = 460 \text{ MHz}, V_{DS} = 7.5 \text{ V},$	31.5	33.0	–	dBm
Drain Current	I_{DS}	$P_{in} = 15 \text{ dBm},$	–	0.38	–	A
Power Drain Efficiency	η_d	$I_{Dset} = 40 \text{ mA (RF OFF)}$	–	70	–	%
Power Added Efficiency	η_{add}		–	68	–	%
Linear Gain	G_L ^{Note}		–	22.5	–	dB

Note: $P_{in} = 0 \text{ dBm}$

Remark DC performance is 100% testing. RF performance is testing several samples per wafer.
Wafer rejection criteria for standard devices is 1 reject for several samples.

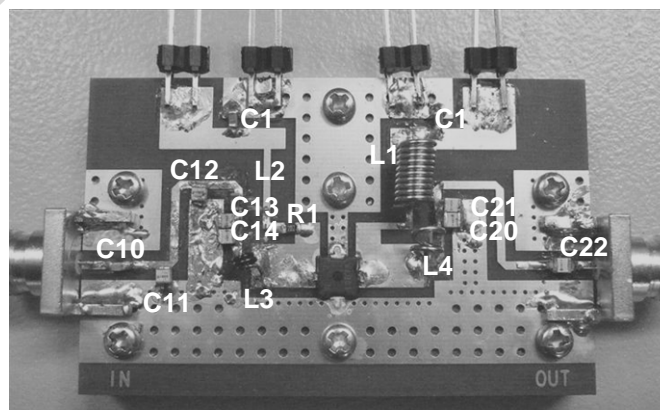
TEST CIRCUIT SCHEMATIC FOR 460 MHz



COMPONENTS OF TEST CIRCUIT FOR MEASURING ELECTRICAL CHARACTERISTICS

Symbol	Value	Type	Maker
C1	1 μ F	GRM188B31C105KA92	Murata
C10	22 pF	GRM1882C1H220JA01	Murata
C11	1.2 pF	ATC100A1R2JW	American Technical Ceramics
C12	4.7 pF	ATC100A4R7BW	American Technical Ceramics
C13	15 pF	ATC100A150BW	American Technical Ceramics
C14	12 pF	ATC100A120BW	American Technical Ceramics
C20	10 pF	ATC100A100JW	American Technical Ceramics
C21	3.9 pF	ATC100A3R9BW	American Technical Ceramics
C22	100 pF	ATC100A101JW	American Technical Ceramics
R1	2 k Ω	1/10 W Chip Resistor RK73B1JTTD202J	KOA
L1	123 nH	ϕ 0.5 mm, ϕ D = 3 mm, 10 Turns	Ohesangyou
L2	10 nH	LQW18AN10NG00	Murata
L3	9.8 nH	ϕ 0.4 mm, ϕ D = 1.6 mm, 3 Turns	Ohesangyou
L4	20 nH	ϕ 0.5 mm, ϕ D = 3 mm, 2 Turns	Ohesangyou
PCB	-	R4775, t = 0.4 mm, ϵ r = 4.5, size = 30 \times 48 mm	Panasonic
SMA Connector	-	WAKA 01K0790-20	WAKA

COMPONENT LAYOUT OF TEST CIRCUIT FOR 460 MHz

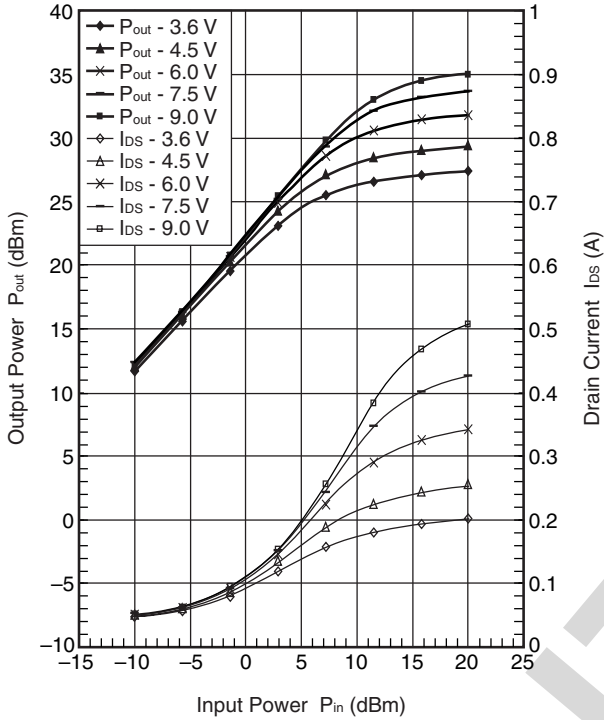


TYPICAL CHARACTERISTICS 1 (T_A = 25°C)

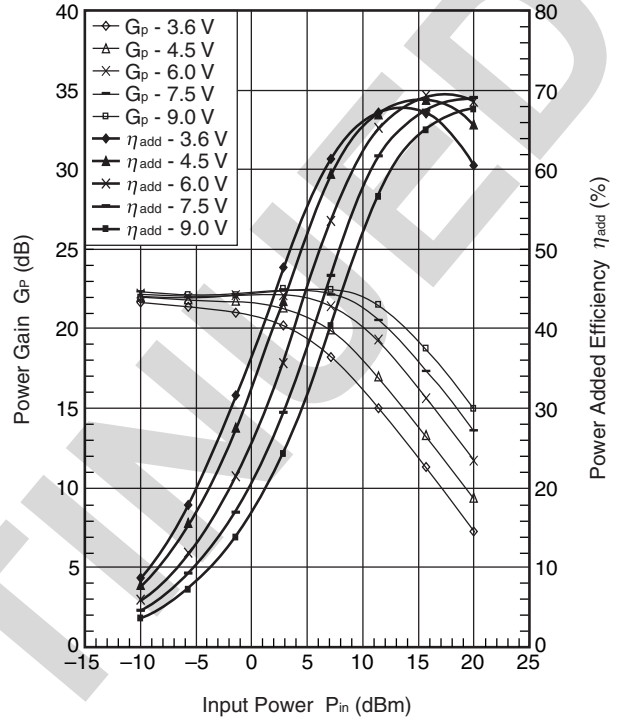
R: f = 460 MHz, V_{DS} = 3.6/4.5/6/7.5/9 V, I_{Dset} = 40 mA, P_{in} = -10 to 20 dBm

IM: f1 = 460 MHz, f2 = 461 MHz, V_{DS} = 3.6/4.5/6/7.5/9 V, I_{Dset} = 40 mA, P_{out} (2 tone) = 8 to 32 dBm

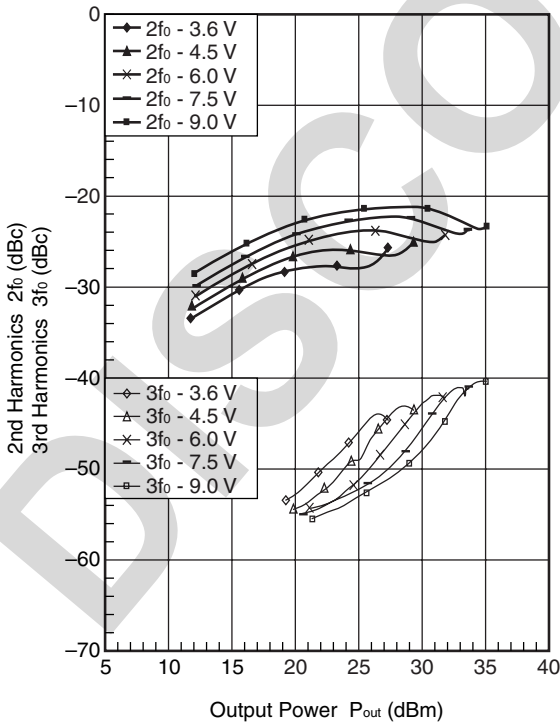
OUTPUT POWER, DRAIN CURRENT vs. INPUT POWER



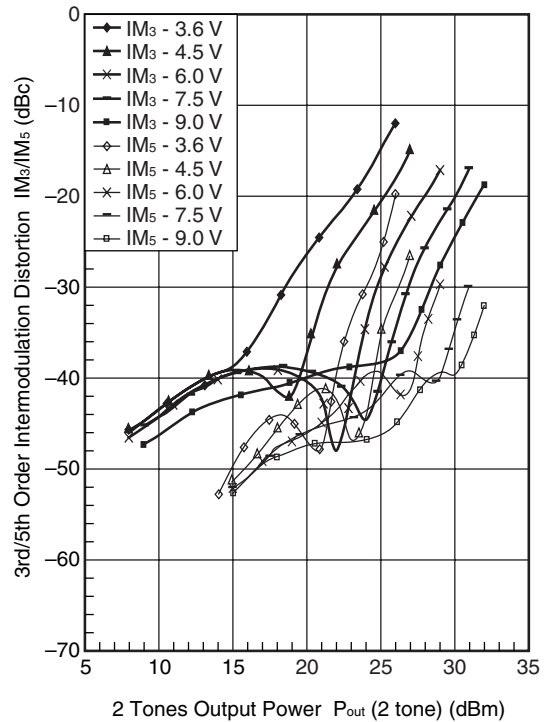
POWER GAIN, POWER ADDED EFFICIENCY vs. INPUT POWER



2f₀, 3f₀ vs. OUTPUT POWER



IM₃/IM₅ vs. 2 TONES OUTPUT POWER



Remark The graphs indicate nominal characteristics.

S-PARAMETERS

S-parameters and noise parameters are provided on our web site in a form (S2P) that enables direct import of the parameters to microwave circuit simulators without the need for keyboard inputs.

Click here to download S-parameters.

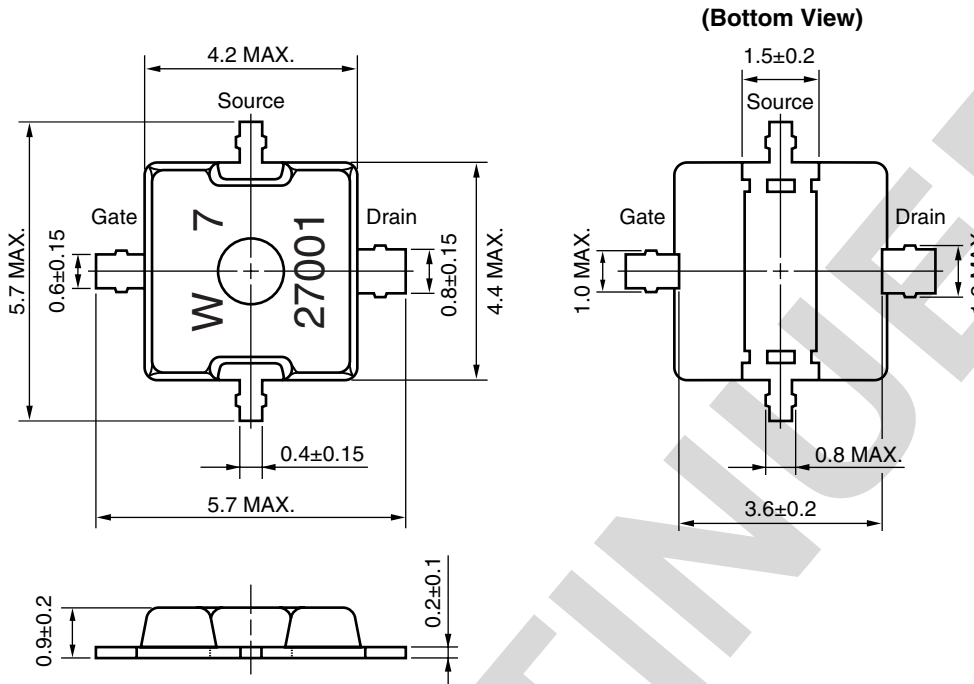
[Products] → [RF Devices] → [Device Parameters]

URL <http://www.renesas.com/products/microwave/>

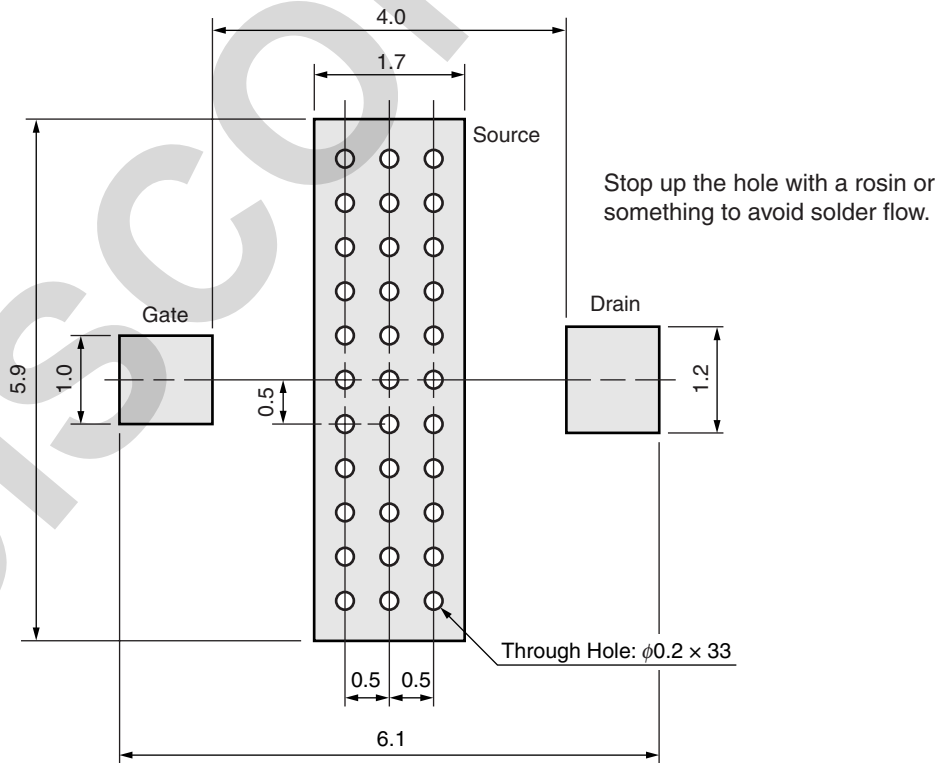
DISCONTINUED

PACKAGE DIMENSIONS

79A (UNIT: mm)



79A PACKAGE RECOMMENDED P.C.B. LAYOUT (UNIT: mm)



Revision History	NE5550279A Data Sheet
-------------------------	------------------------------

Rev.	Date	Description	
		Page	Summary
1.00	Mar 28, 2012	-	First edition issued
2.00	Jul 04, 2012	p.2	Modification of ELECTRICAL CHARACTERISTICS

DISCONTINUED

All trademarks and registered trademarks are the property of their respective owners.

NOTICE

1. 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. California Eastern Laboratories and Renesas Electronics assumes no responsibility for any losses incurred by you or third parties arising from the use of these circuits, software, or information.
2. California Eastern Laboratories has used reasonable care in preparing the information included in this document, but California Eastern Laboratories does not warrant that such information is error free. California Eastern Laboratories and Renesas Electronics assumes no liability whatsoever for any damages incurred by you resulting from errors in or omissions from the information included herein.
3. California Eastern Laboratories and Renesas Electronics do 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 California Eastern Laboratories or Renesas Electronics or others.
4. You should not alter, modify, copy, or otherwise misappropriate any Renesas Electronics product, whether in whole or in part. California Eastern Laboratories and Renesas Electronics assume no responsibility for any losses incurred by you or third parties arising from such alteration, modification, copy or otherwise misappropriation of Renesas Electronics product.
5. Renesas Electronics products are classified according to the following two quality grades: "Standard" and "High Quality". The recommended applications for each Renesas Electronics product depends on the product's quality grade, as indicated below. "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 etc. "High Quality": Transportation equipment (automobiles, trains, ships, etc.); traffic control systems; anti-disaster systems; anti-crime systems; and safety equipment etc. Renesas Electronics products are neither intended nor authorized for use in products or systems that may pose a direct threat to human life or bodily injury (artificial life support devices or systems, surgical implantations etc.), or may cause serious property damages (nuclear reactor control systems, military equipment etc.). 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 for which it is not intended. California Eastern Laboratories and 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 which the product is not intended by California Eastern Laboratories or Renesas Electronics.
6. You should use the Renesas Electronics products described in this document within the range specified by California Eastern Laboratories, especially with respect to the maximum rating, operating supply voltage range, movement power voltage range, heat radiation characteristics, installation and other product characteristics. California Eastern Laboratories shall have no liability for malfunctions or damages arising out of the use of Renesas Electronics products beyond such specified ranges.
7. 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 systems manufactured by you.
8. Please contact a California Eastern Laboratories 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. California Eastern Laboratories and Renesas Electronics assume no liability for damages or losses occurring as a result of your noncompliance with applicable laws and regulations.
9. 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. You should not use Renesas Electronics products or 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. When exporting the Renesas Electronics 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.
10. It is the responsibility of the buyer or distributor of California Eastern Laboratories, who distributes, disposes of, or otherwise places the Renesas Electronics product with a third party, to notify such third party in advance of the contents and conditions set forth in this document, California Eastern Laboratories and Renesas Electronics assume no responsibility for any losses incurred by you or third parties as a result of unauthorized use of Renesas Electronics products.
11. This document may not be reproduced or duplicated in any form, in whole or in part, without prior written consent of California Eastern Laboratories.
12. Please contact a California Eastern Laboratories 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.

NOTE 3: Products and product information are subject to change without notice.

CEL Headquarters • 4590 Patrick Henry Drive, Santa Clara, CA 95054 • Phone (408) 919-2500 • www.cel.com

For a complete list of sales offices, representatives and distributors,
Please visit our website: www.cel.com/contactus