LVDS Interface ICs

4bit LVDS Receiver

BU90LV048

No.12057EAT03

●Description

LVDS Interface IC of ROHM "Serializer" "Deserializer" operate from 8MHz to 150MHz wide clock range, and number of bits range is from 35 to 70. Data is transmitted seven times (7X) stream and reduce cable number by 3(1/3) or less. The ROHM's LVDS has low swing mode to be able to expect further low EMI.
Driver and Receiver of 4 bits operate to 250MHz. It can be used for a variety of purposes, home appliances such as LCD-TV, business machines such as decoders, instruments, and medical equipment.

●Features

1) >500 Mbps (250 MHz) switching rates
2) Flow-through pinout simplifies PCB layout
3) 150 ps channel-to-channel skew (typical)
4) 100 ps differential skew (typical)
5) 3.7 ns maximum propagation delay
6) 3.3V power supply design
7) 6mA and 8mA selectable output drive strength
8) Accepts small swing (200 mV typical) differential signal levels
9) Supports open, short and terminated input fail-safe
10) Conforms to ANSI/TIA/EIA-644 Standard
11) Industrial temperature operating range (-40℃ to +85℃)

●Applications

Car Navigation System
Copier
Digital TV (Signal System)
FA equipment
Medical equipment
Vending machine, Ticket vending machine

●Precaution

■This chip is not designed to protect from radioactivity.
■This document may be used as strategic technical data which subjects to COCOM regulations.

●Block Diagram

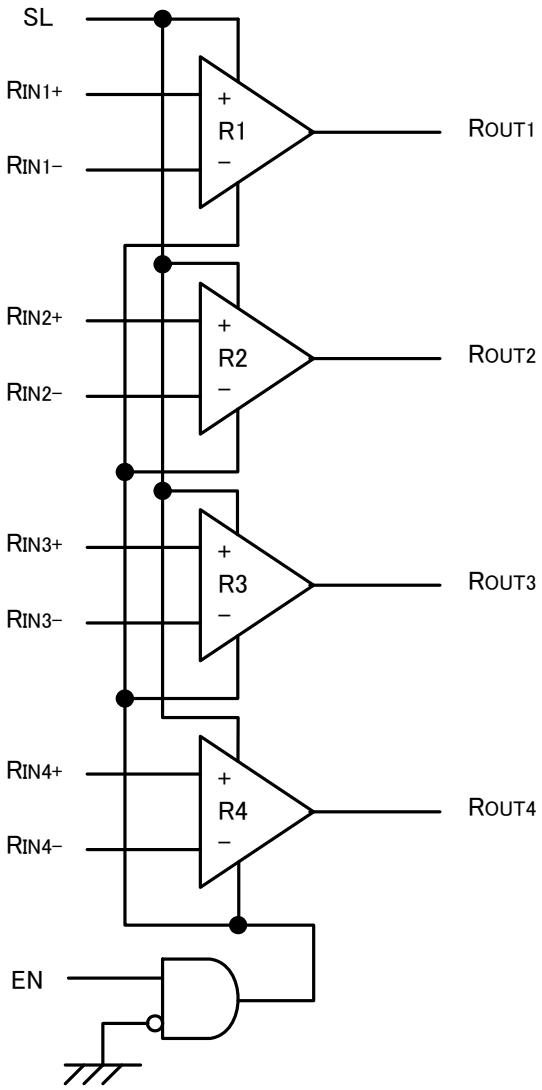


Fig.1. Block Diagram

●SSOP-B16 Package Outline and Specification

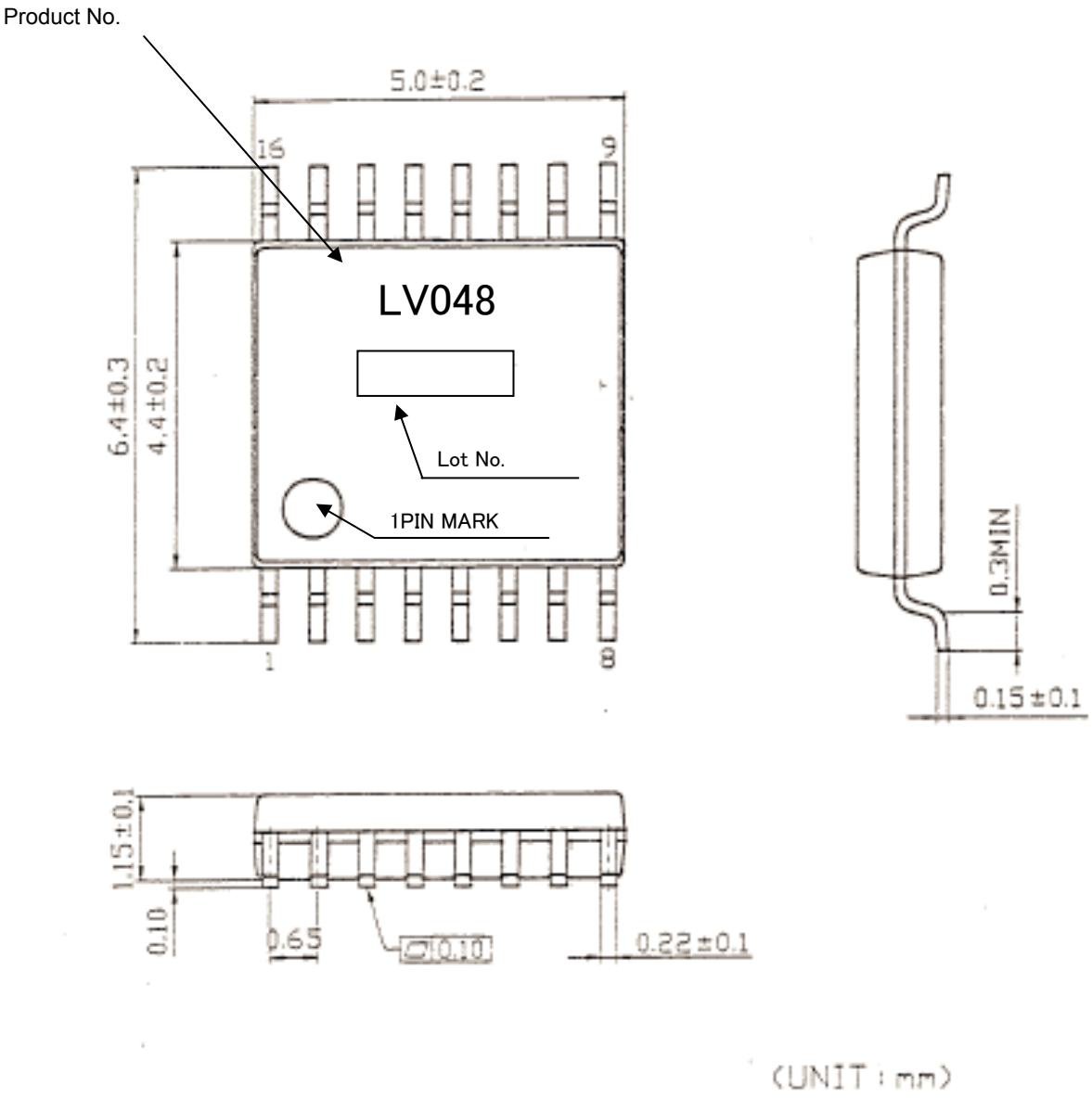


Fig.2. SSOP-B16 Package Outline and Specification

●Pin Configuration

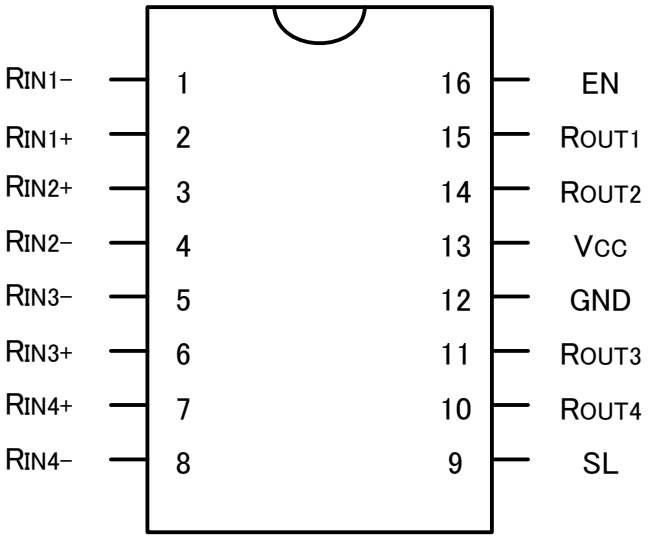


Fig.3. Pin Diagram (Top View)

●Pin Description

Table 1 : Pin Description

Pin Name	Pin No.	Type	Descriptions
RIN+	2, 3, 6, 7	LVDS In	Non-inverting receiver input pin
RIN-	1, 4, 5, 8	LVDS In	Inverting receiver input pin
ROUT	10, 11, 14, 15	LVCMOS Out	Receiver output pin
SL	9	LVCMOS In	Drive strength select pin : When SL is low or open, Rout set 8mA mode. When SL is high, Rout set 6mA mode.
EN	16	LVCMOS In	Receiver enable pin: When EN is Low or open, the receiver is disabled. When EN is high, the receiver is enabled.
VCC	13	Power	Power supply pin, +3.3V±0.3V
GND	12	GND	Ground pin

●Function Description

		INPUT	OUTPUTS	Drive Strength
EN	SL	$R_{IN+} - R_{IN-}$	R_{OUT}	
H	L or Open	VID ≧0V	H	8mA
		VID ≦−0.1V	L	
		Full Fail-safe OPEN/SHORT or Terminated	H	
H	H	VID ≧0V	H	6mA
		VID ≦−0.1V	L	
		Full Fail-safe OPEN/SHORT or Terminated	H	
All other combinations of EN, SL inputs		X	Z	

●Absolute Maximum Ratings

Item	Symbol	Value		Unit
		Min.	Max.	
Supply voltage	VCC	-0.3	4.0	V
Input voltage	VIN	-0.3	VCC+0.3	V
Output voltage	VOUT	-0.3	VCC+0.3	V
Storage temperature range	Tstg	-55	125	℃

●Package Power

Package	PD(mW)	DERATING(mW/℃) ※1
SSOP-B16	400	4.0
	450*2	4.5※2

※1 At temperature Ta > 25℃
※2 Package power when mounting on the PCB board.
The size of PCB board :70×70×1.6（mm^3）
The material of PCB board :The FR4 glass epoxy board.(3% or less copper foil area)

●Recommended Operating Conditions

Item	Symbol	Value			Unit	Condition
		Min.	Typ.	Max.		
Supply voltage	Vcc	3.0	3.3	3.6	V	
Operating temperature range	Topr	-40	-	85	℃	

●DC Characteristics

Parameter	Symbol	Conditions	Pin	Min	Typ	Max	Units
Differential Input High Threshold	V_{TH}	V_{CM} = +1.2V, 0.05V, 2.95V	R_{IN+}, R_{IN-}	-	-	100	mV
Differential Input Low Threshold	V_{TL}			-100	-	-	mV
Common-Mode Voltage Range	VCMR	VID = 200mV pk to pk		0.1	-	2.3	V
Input Current	I_{IN}	V_{IN} = 0 or Vcc		-20	-	+20	μA
Output High Voltage	V_{OH1}	I_{OH} = −8 mA, V_{ID} = +200 mV, SL=low	R_{OUT}	V_{CC}-0.4	-	-	V
Output High Voltage	V_{OH2}	I_{OH} = −6 mA, V_{ID} = +200 mV, SL= high		V_{CC}-0.4	-	-	V
Output Low Voltage	V_{OL1}	I_{OL} = 8 mA, V_{ID} = −200 mV, SL=low		-	-	0.4	V
Output Low Voltage	V_{OL2}	I_{OL} = 6 mA, V_{ID} = −200 mV, SL= high		-	-	0.4	V
Output Short Circuit Current	I_{OS}	Enabled, V_{OUT} = 0V		-15	-80	-	mA
Output 3-STATE Current	I_{OZ}	Disabled, V_{OUT} = 0V or V_{CC}		-10	±1	+10	uA
Input High Voltage	V_{IH}		SL EN	V_{CC} × 0.8	-	V_{CC}	V
Input Low Voltage	V_{IL}			GND	-	V_{CC} × 0.2	V
Input Current	I_I	V_{IN} = 0V or V_{CC}, Other Input = V_{CC} or GND		-10	-	+10	μA
Input Clamp Voltage	V_{CL}	I_{CL} = −18 mA		-1.5	-0.8	-	V
No Load Supply Current Receivers Enabled	I_{CC}	EN = V_{CC}, Inputs Open	V_{CC}	-	1	-	mA
No Load Supply Current Receivers Disabled	I_{CCZ}	EN= GND, SL = GND, Inputs Open		-	0.5	-	mA

●Switching Characteristics

V_{CC} = +3.3V ±0.3V, T_{opr} = -40℃ to +85℃.

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Differential Propagation Delay High to Low	t_{PHLD}	C_L = 15pF V_{ID} = 200mV (Fig.4 and Fig.5)	1.2	2.0	3.7	ns
Differential Propagation Delay Low to High	t_{PLHD}		1.2	1.9	3.7	ns
Differential Pulse Skew $\|t_{PHLD} - t_{PLHD}\|$	t_{SKD1}		0	0.1	0.4	ns
Differential Channel-to-Channel Skew; same device	t_{SKD2}		0	0.15	0.5	ns
Differential Part to Part Skew	t_{SKD3}		-	-	1.0	ns
Differential Part to Part Skew	t_{SKD4}		-	-	1.5	ns
Rise Time	t_{TLH}		-	0.5	1.5	ns
Fall Time	t_{THL}		-	0.5	1.5	ns
Disable Time High to Z	t_{PHZ}	R_L = 2kΩ C_L = 15pF (Fig.6 and Fig.7)	-	8	14	ns
Disable Time Low to Z	t_{PLZ}		-	8	14	ns
Enable Time Z to High	t_{PZH}		-	3	14	ns
Enable Time Z to Low	t_{PZL}		-	9	14	ns
Maximum Operating Frequency	f_{Max}	All Channels Switching	250	-	-	MHz

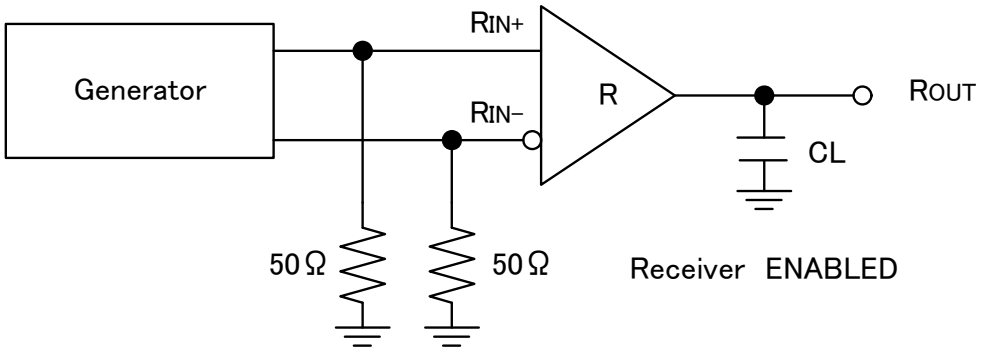


Fig.4. Receiver Propagation Delay and Transition Time Test Circuit

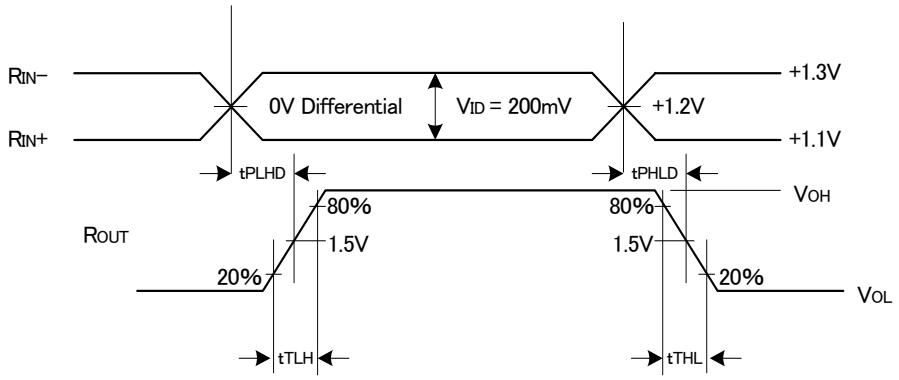


Fig.5. Receiver Propagation Delay and Transition Time Waveforms

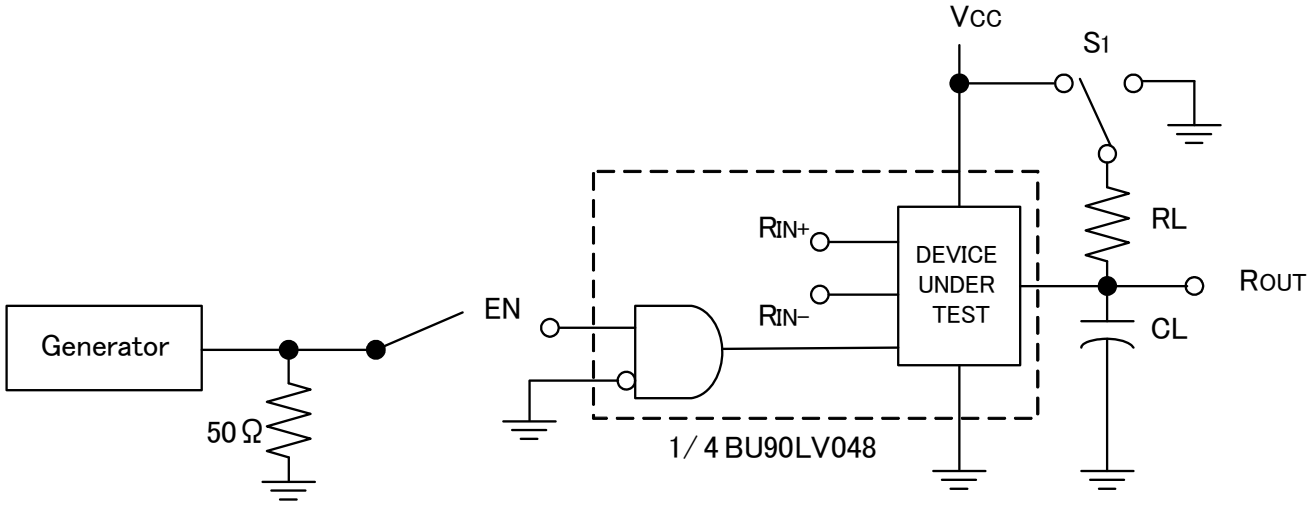


Fig.6. Receiver 3-STATE Delay Test Circuit

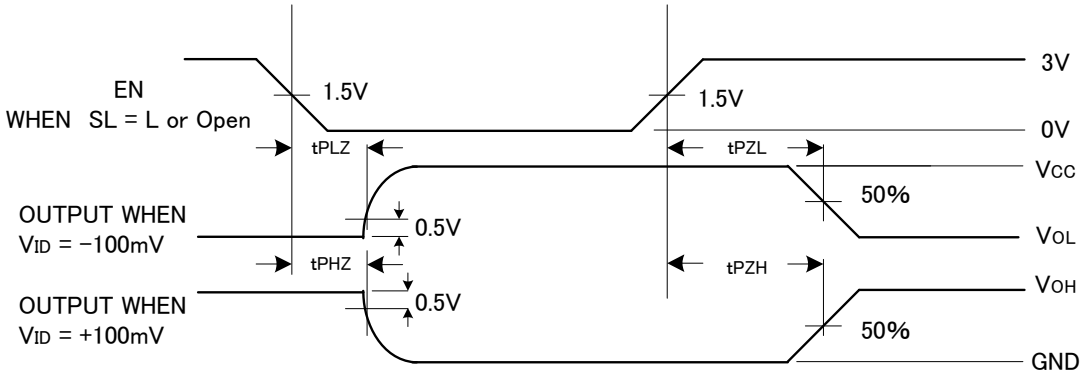


Figure7. Receiver 3-STATE Delay Waveforms

Typical Application

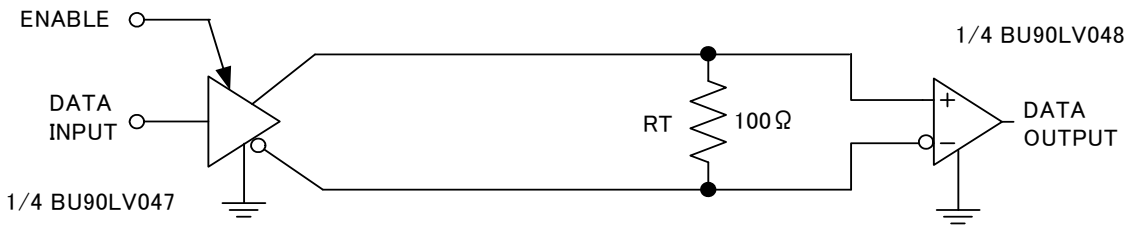


Fig.8. Point-to-Point Application

●Ordering part number

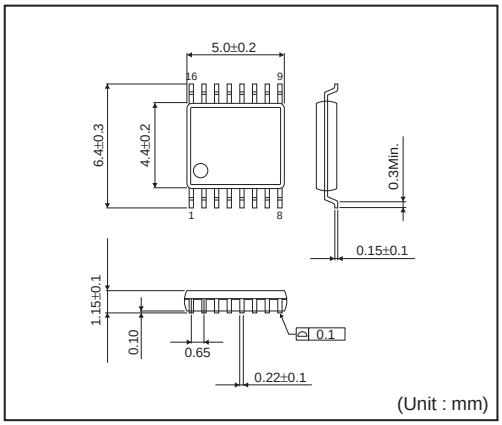
B	U	9	0	L	V	0	4	8	-	E	2

Part No.

Part No.
90LV048 (Package: SSOP-B16)

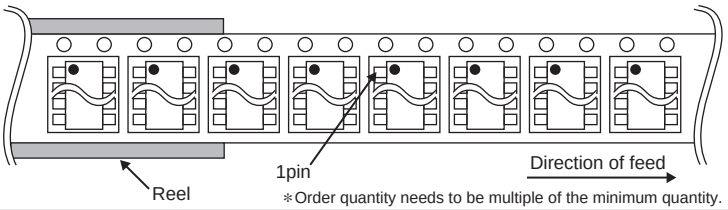
Packaging and forming specification
E2: Embossed tape and reel

SSOP-B16



<Tape and Reel information>

Tape	Embossed carrier tape
Quantity	2500pcs
Direction of feed	E2 (The direction is the 1pin of product is at the upper left when you hold reel on the left hand and you pull out the tape on the right hand)



∗Order quantity needs to be multiple of the minimum quantity.

Notes

No copying or reproduction of this document, in part or in whole, is permitted without the consent of ROHM Co.,Ltd.

The content specified herein is subject to change for improvement without notice.

The content specified herein is for the purpose of introducing ROHM's products (hereinafter "Products"). If you wish to use any such Product, please be sure to refer to the specifications, which can be obtained from ROHM upon request.

Examples of application circuits, circuit constants and any other information contained herein illustrate the standard usage and operations of the Products. The peripheral conditions must be taken into account when designing circuits for mass production.

Great care was taken in ensuring the accuracy of the information specified in this document. However, should you incur any damage arising from any inaccuracy or misprint of such information, ROHM shall bear no responsibility for such damage.

The technical information specified herein is intended only to show the typical functions of and examples of application circuits for the Products. ROHM does not grant you, explicitly or implicitly, any license to use or exercise intellectual property or other rights held by ROHM and other parties. ROHM shall bear no responsibility whatsoever for any dispute arising from the use of such technical information.

The Products specified in this document are intended to be used with general-use electronic equipment or devices (such as audio visual equipment, office-automation equipment, communication devices, electronic appliances and amusement devices).

The Products specified in this document are not designed to be radiation tolerant.

While ROHM always makes efforts to enhance the quality and reliability of its Products, a Product may fail or malfunction for a variety of reasons.

Please be sure to implement in your equipment using the Products safety measures to guard against the possibility of physical injury, fire or any other damage caused in the event of the failure of any Product, such as derating, redundancy, fire control and fail-safe designs. ROHM shall bear no responsibility whatsoever for your use of any Product outside of the prescribed scope or not in accordance with the instruction manual.

The Products are not designed or manufactured to be used with any equipment, device or system which requires an extremely high level of reliability the failure or malfunction of which may result in a direct threat to human life or create a risk of human injury (such as a medical instrument, transportation equipment, aerospace machinery, nuclear-reactor controller, fuel-controller or other safety device). ROHM shall bear no responsibility in any way for use of any of the Products for the above special purposes. If a Product is intended to be used for any such special purpose, please contact a ROHM sales representative before purchasing.

If you intend to export or ship overseas any Product or technology specified herein that may be controlled under the Foreign Exchange and the Foreign Trade Law, you will be required to obtain a license or permit under the Law.

ROHM SEMICONDUCTOR

Thank you for your accessing to ROHM product informations.
More detail product informations and catalogs are available, please contact us.

ROHM Customer Support System

http://www.rohm.com/contact/