

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°C to +85°C)

●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

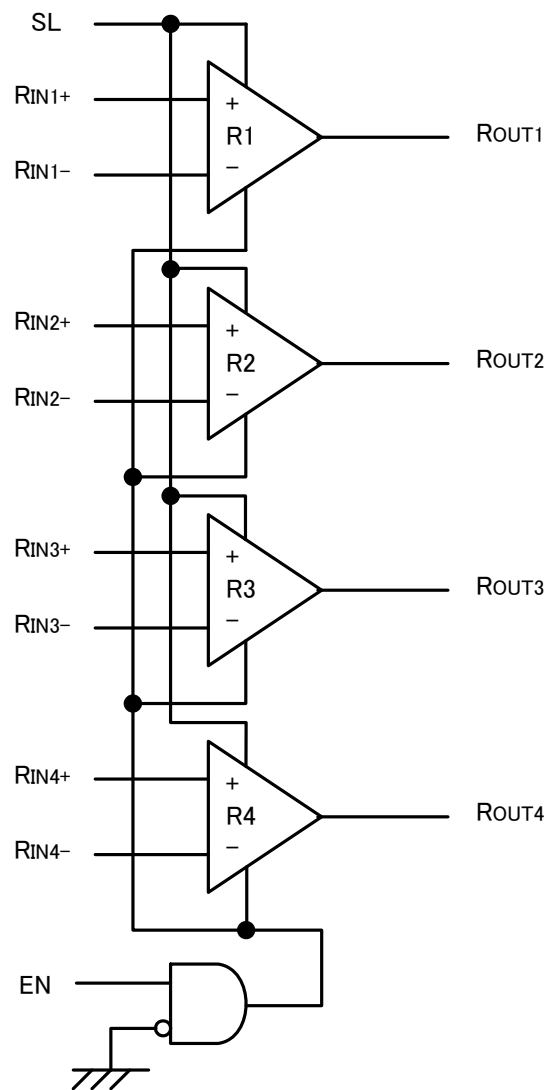


Fig.1. Block Diagram

●SSOP-B16 Package Outline and Specification

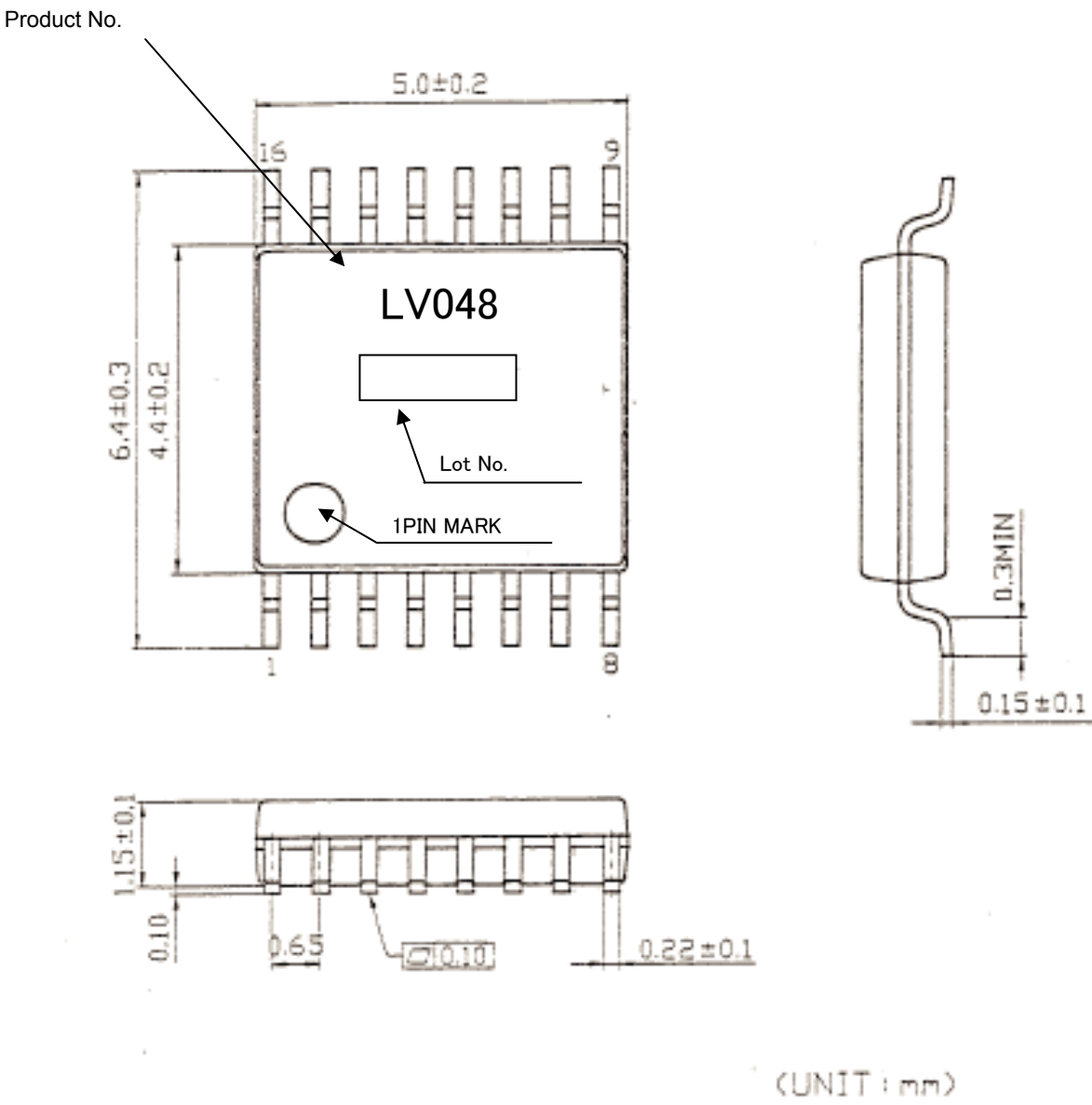


Fig.2. SSOP-B16 Package Outline and Specification

●Pin Configuration

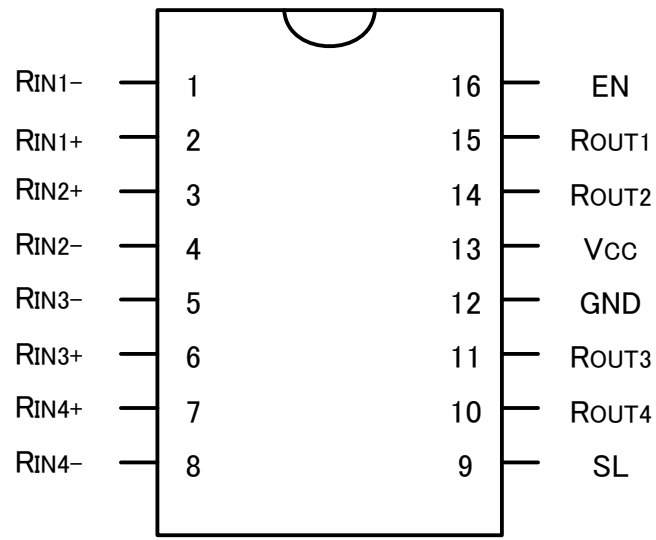


Fig.3. Pin Diagram (Top View)

●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	LVC MOS Out	Receiver output pin
SL	9	LVC MOS 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	LVC MOS 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	VOOUT	-0.3	VCC+0.3	V
Storage temperature range	Tstg	-55	125	°C

●Package Power

Package	PD(mW)	DERATING(mW/°C) ※1
SSOP-B16	400	4.0
	450 ^{*2}	4.5※2

※1 At temperature Ta > 25°C

※2 Package power when mounting on the PCB board.

The size of PCB board : 70 × 70 × 1.6 (mm³)

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	°C	

●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+}	-	-	100	mV
Differential Input Low Threshold	V_{TL}		R_{IN-}	-100	-	-	mV
Common-Mode Voltage Range	V_{CMR}	$V_{ID} = 200mV$ pk to pk		0.1	-	2.3	V
Input Current	I_{IN}	$V_{IN} = 0$ or V_{CC}		-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	μA
Input High Voltage	V_{IH}		SL	$V_{CC} \times 0.8$	-	V_{CC}	V
Input Low Voltage	V_{IL}		EN	GND	-	$V_{CC} \times 0.2$	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

$V_{CC} = +3.3V \pm 0.3V$, $T_{opr} = -40^{\circ}C$ to $+85^{\circ}C$.

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}	$R_L = 2k\Omega$ $C_L = 15pF$ (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

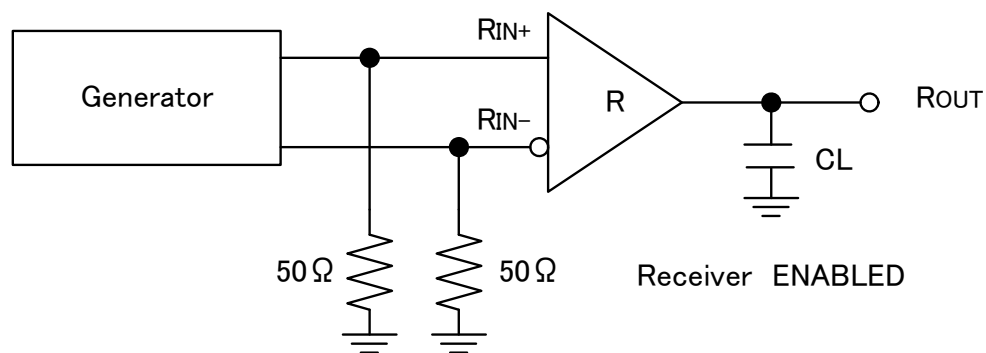


Fig.4. Receiver Propagation Delay and Transition Time Test Circuit

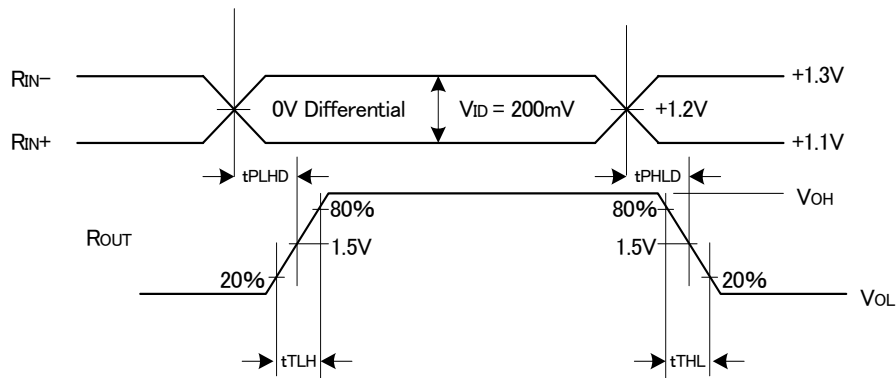


Fig.5. Receiver Propagation Delay and Transition Time Waveforms

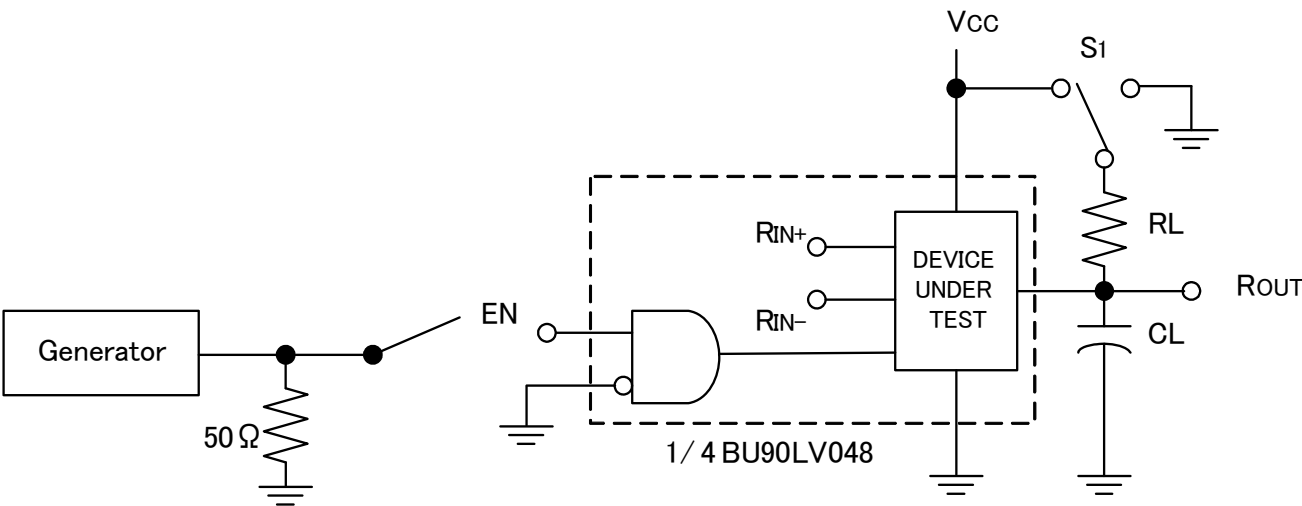


Fig.6. Receiver 3-STATE Delay Test Circuit

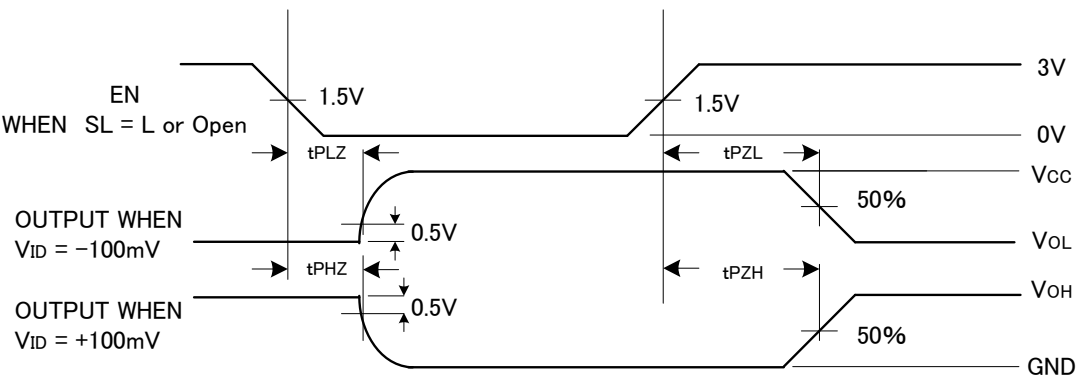


Figure7. Receiver 3-STATE Delay Waveforms

Typical Application

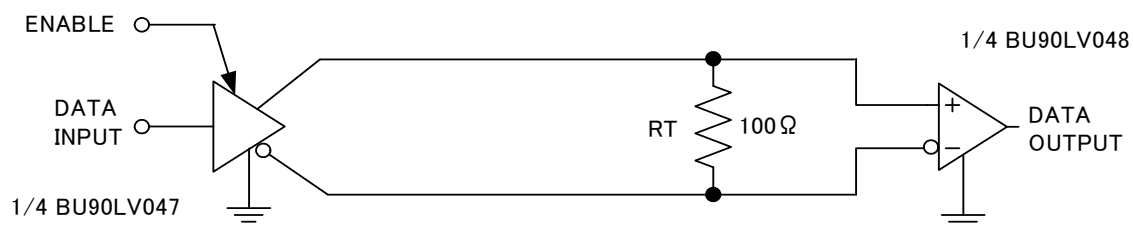


Fig.8. Point-to-Point Application

●Ordering part number

B	U
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Part No.

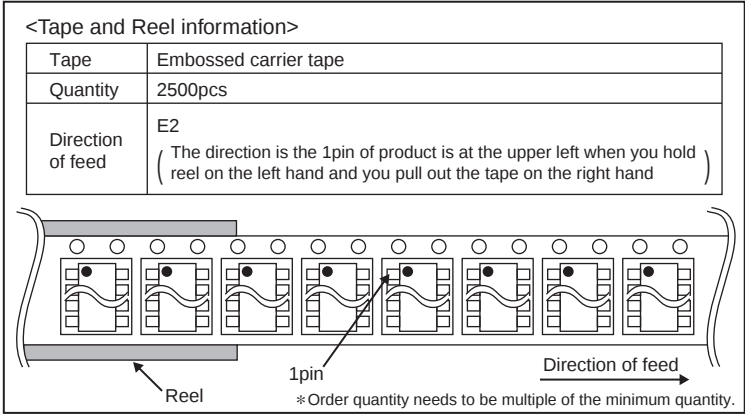
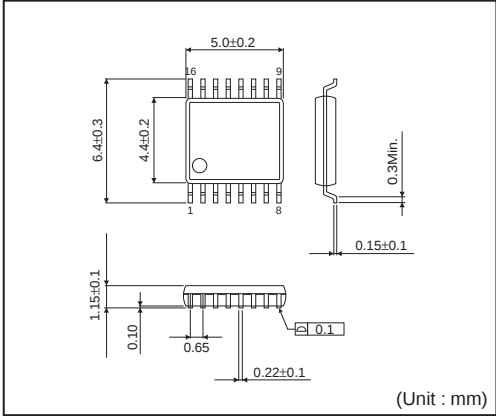
9	0	L	V	0	4	8
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Part No.
90LV048 (Package: SSOP-B16)

E	2
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Packaging and forming specification
E2: Embossed tape and reel

SSOP-B16



Notes

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