

No.2003B

LC8910 Series

Remote Control LSI

Overview

The LC8910 series are LSIs designed for transmit/receive use in remote control system applications. The adoption of a statistical processing circuit entirely original with Sanyo enhances noise-resisting capability greatly.

Applications

- HA (home automation) use :
Air-conditioning equipment, lighting equipment, solar system, radio equipment, home appliances
- Crime preventing monitor system, disaster preventing monitor system :
Smoke detector, gas detector, fire detector, burglarproof system, electronic key
- Communication system :
Radio pager, remote data collecting system

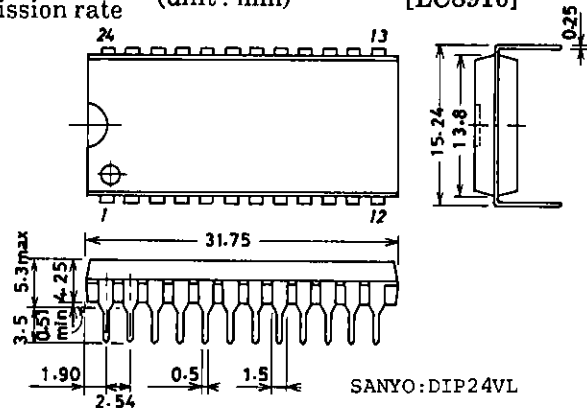
Type No.	Application	Unique Address Length (bits)*	Data Length (bits)	Package
LC8910	Controller	0	20 max	DIP24
LC8912	Terminal	8	4	DIP28
LC8913	Terminal	12	8	DIP40

* : Unique address designates individually assigned network addresses.

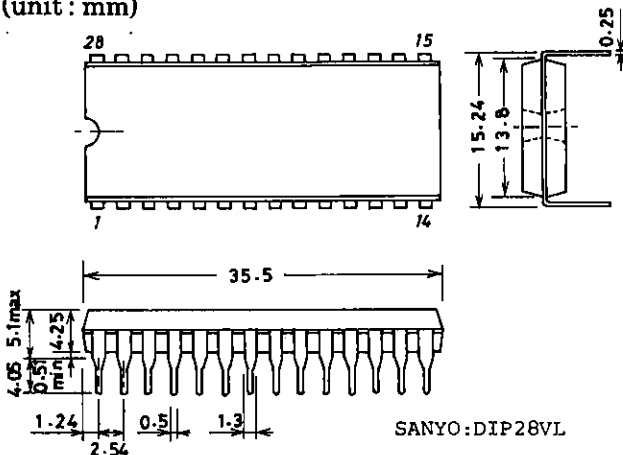
Features

- LSIs designed for transmit/receive use
- Transmission line access control : Master polling and CSMA/CD
- Biphase data transmission codes and variable transmission rate
- Modulation : Base band/AM (by on-chip modulation/demodulation circuit)
- Statistical processing circuit adopted to enhance noise-resisting capability greatly
- The LC8910 is capable of interfacing to any microcomputer.
- The LC8912, 8913 require a minimum number of external parts to make up a system.
- Answerback function and broadcast communication function
- CMOS process for low power dissipation

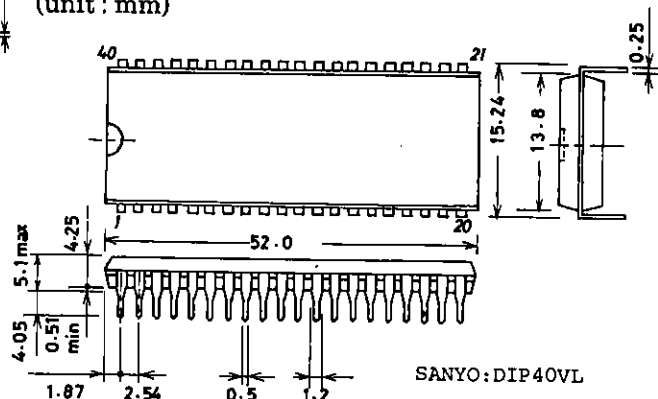
Package Dimensions 3068A [LC8910]
(unit : mm)



Package Dimensions 3069A [LC8912]
(unit : mm)



Package Dimensions 3077 [LC8913]
(unit : mm)



LC8910 Series

Specifications

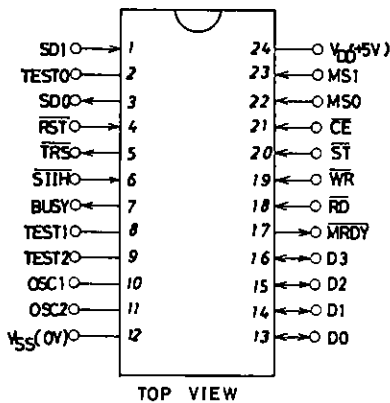
- Transmission mode : Half-duplex transmission
- Transmission line access control : CSMA/CD
- Modulation : Base band/AM
- Code : Biphase code
- Transmission rate : 15kb/s to 10b/s
- Error detection : Bit rule error
CKSM error
Overrun error
Underrun error
Transmission error by collision detection
- Answerback : Output data/input data
- Broadcast communication : General broadcast/group broadcast
- Supply voltage : Single 5V
- Power dissipation : 15mW typ

Signal Format

PR	ID	DC	ADRS	DATA	CKSM
PR : Preamble				12/32 bits	
ID : Control code				4 bits	
DC : Data count				4 bits	
ADRS : Address				0 to 12 bits	
DATA : Data				0 to 20 bits	
CKSM : Checksum				4 bits	

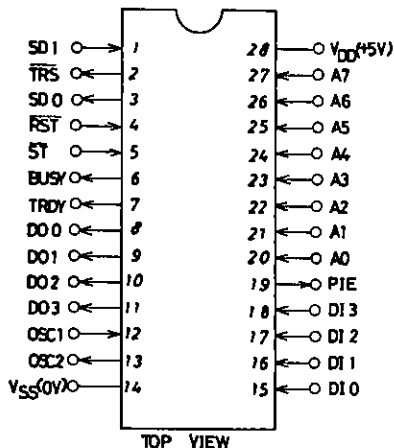
Pin Description

1) LC8910



- SDI : Receive signal input
- SDO : Transmit signal output
- RST : Reset input
- TRS : Transmit mode output
- ST : Receive disable signal input
- BUSY : Busy signal output
- TEST0 to 2 : Test input
- OSC1, 2 : Clock pins
- D0 to 3 : Data input/output
- MRDY : Reception completed signal output
- ST : Start input
- RD : Read input
- WR : Write input
- CE : Chip enable input
- MS0, 1 : Mode select signal input

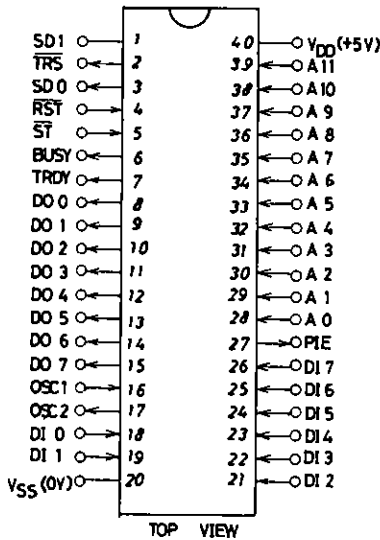
2) LC8912



- SDI : Receive signal input
- TRS : Transmit mode output
- SDO : Transmit signal output
- RST : Reset input
- ST : Start input
- BUSY : Busy signal output
- TRDY : Terminal ready
- DO0 to 3 : Data output
- OSC1, 2 : Clock pins
- DI0 to 3 : Data input
- PIE : Parameter/address select signal output
- A0 to 7 : Address/parameter input

LC8910 Series

3) LC8913



- SDI** : Receive signal input
- TR $\overline{\text{S}}$** : Transmit mode output
- SDO** : Transmit signal output
- R $\overline{\text{S}}$ T** : Reset input
- ST** : Start input
- BUSY** : Busy signal output
- TRDY** : Terminal ready
- DO0 to 7** : Data output
- OSC1, 2** : Clock pins
- DI0 to 7** : Data output
- PIE** : Parameter/address select signal output
- A0 to 11** : Address/parameter input

Absolute Maximum Ratings at $T_a = 25^\circ\text{C}, V_{SS} = 0\text{V}$

Parameter	Symbol	Value	unit
Maximum Supply Voltage	$V_{DD \text{ max}}$	-0.3 to +7.0	V
Input Voltage	V_I, V_O	-0.3 to $V_{DD} + 0.3$	V
Storage Temperature	T_{opr}	-55 to +125	$^\circ\text{C}$
Operating Temperature	T_{opg}	-30 to +70	$^\circ\text{C}$

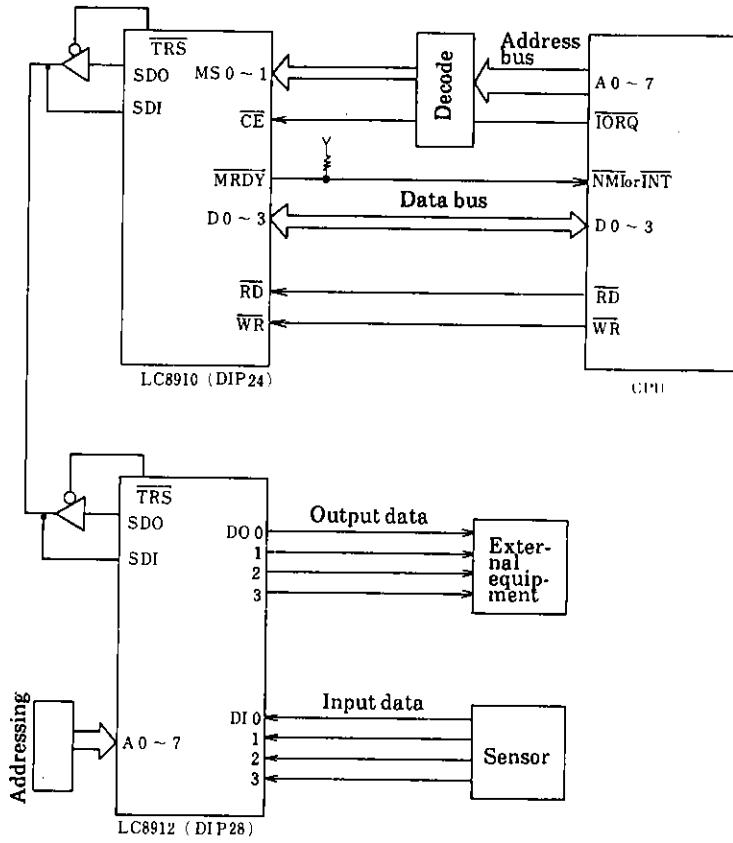
Allowable Operating Conditions at $T_a = -30$ to $+70^\circ\text{C}$

Parameter	Symbol	min	typ	max	unit
Supply Voltage	V_{DD}	4.5	5.0	5.5	V
Input Voltage Range	V_{IN}	0		V_{DD}	V

Electrical Characteristics at $V_{DD} = 4.5$ to $5.5\text{V}, T_a = -30$ to $+70^\circ\text{C}$

Parameter	Symbol	Condition	min	typ	max	unit
'H'-Level Input Voltage	V_{IH1}	Schmitt trigger	2.5			V
	V_{IH2}		2.2			V
	V_{IH3}	RST pin	$V_{DD} - 0.9$			V
'L'-Level Input Voltage	V_{IL1}	Schmitt trigger			0.6	V
	V_{IL2}				0.8	V
	V_{IL3}	RST pin			0.6	V
'H'-Level Output Voltage	V_{OH}	$I_{OH} = -0.4\text{mA}$	2.4			V
'L'-Level Output Voltage	V_{OL}	$I_{OL} = 2\text{mA}$			0.4	V
Input Leakage Current	I_L	$V_I = V_{SS}, V_{DD}$	-25		25	μA
Output Leakage Current	I_{OZ}	Output pin : 'H' impedance	-100		100	μA
OSC Amp 'H'-Level Input Voltage	V_{IHOSC}		$0.8V_{DD}$			V
OSC Amp 'L'-Level Input	V_{ILOSC}			$0.2V_{DD}$		V

Sample Application Circuit



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