Ordering number: EN 2003B

CMOS LSI

SANYO 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

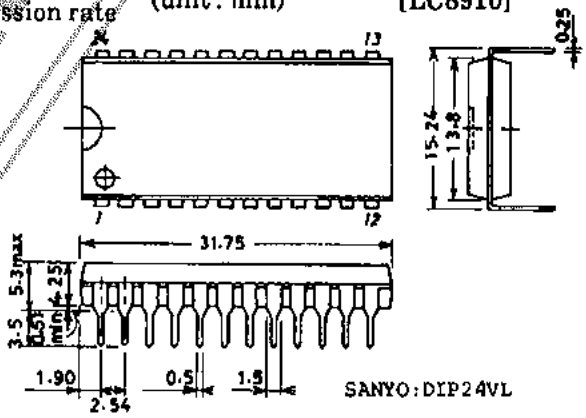
Type No.	Application	Unique Address Length (bits)*	Data Length (bits)	Package
LC8910	Controller	0	20 max	DIP24
LC8912	Terminal	8	4	DIP28
LC8913	Terminal	12	8	DIP40

*: Unique address designates individually assigned network addresses.

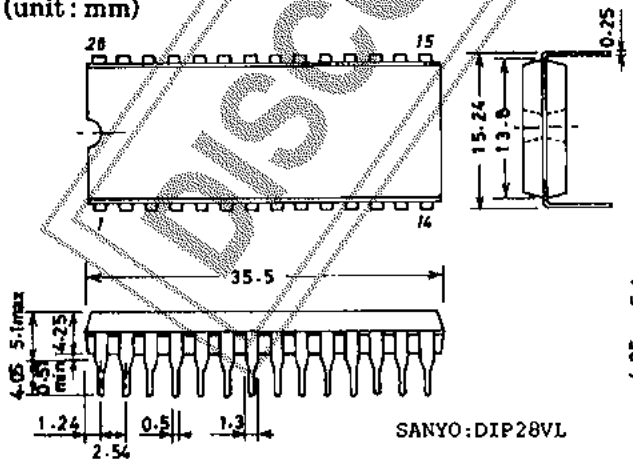
Features

- 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

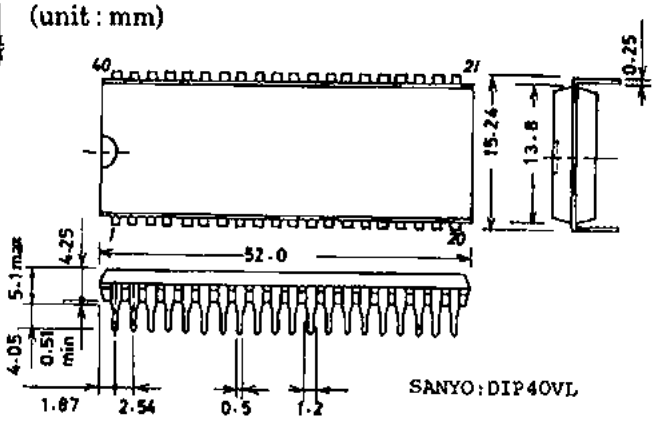
Package Dimensions 3068A [LC8910]
(unit : mm)



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



Package Dimensions 3077 [LC8913]
(unit : mm)



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

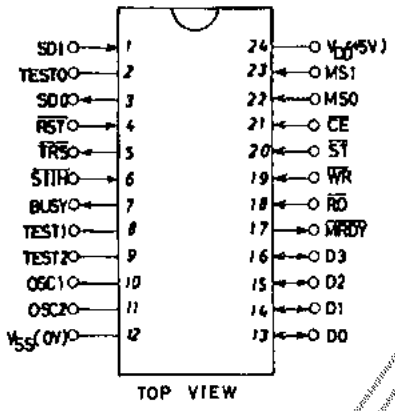
Signal Format

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

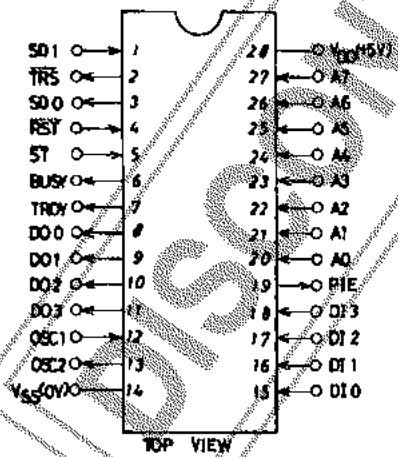
Pin Description

1) LC8910



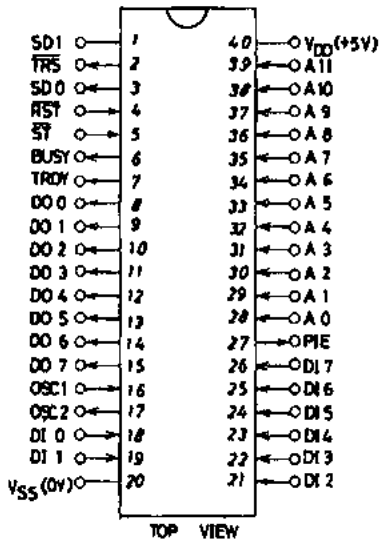
SDI : Receive signal input
SDO : Transmit signal output
$\overline{RST}$: Reset input
$\overline{TRS}$: Transmit mode output
SIH : Receive disable signal input
BUSY : Busy signal output
TEST0 to 2 : Test input
OSC1, 2 : Clock pins
D0 to 3 : Data input/output
$\overline{MRDY}$: Reception completed signal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

2) LC8912



SDI : Receive signal input
$\overline{TRS}$: Transmit mode output
SDO : Transmit signal output
$\overline{RST}$: Reset input
$\overline{ST}$: 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

3) LC8913



$\overline{SDI}$	: Receive signal input
$\overline{TRS}$	: Transmit mode output
SDO	: Transmit signal output
$\overline{RST}$	: Reset input
$\overline{ST}$	: 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 Ta = 25°C, V_{SS} = 0V

			unit
Maximum Supply Voltage	V_{DD} max	−0.3 to +7.0	V
Input Voltage	V_I, V_O	−0.3 to V_{DD}+0.3	V
Storage Temperature	Topr	−55 to +125	°C
Operating Temperature	Topg	−30 to +70	°C

Allowable Operating Conditions at Ta = −30 to +70°C

		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 5.5V, Ta = −30 to +70°C

			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} = −0.4mA	2.4			V
'L'-Level Output Voltage	V_{OL}	I_{OL} = 2mA			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