MOS LSI

No. 5115

SANYO

LC89915, 89915M

NTSC 1 H Delay Line

Overview

The LC89915 and LC89915M are delay lines that produce a 1 H delayed signal for NTSC format with an external low-pass filter. It can also provide 1 H delayed signal for PAL format by changing the number of its CCD shift register.

Functions

- 453.5 bits (switchable to 456.5 bits) CCD shift register
- Auto-bias circuit
- Sync tip clamping circuit
- Sample-and-hold circuit
- Delay time switching circuit

Features

- Single 5 V power supply
- Operates on a low-amplitude clock input.
- Built-in peripheral circuits allow applications to be constructed with a minimum number of external components.
- Positive-phase signal input/positive-phase signal output
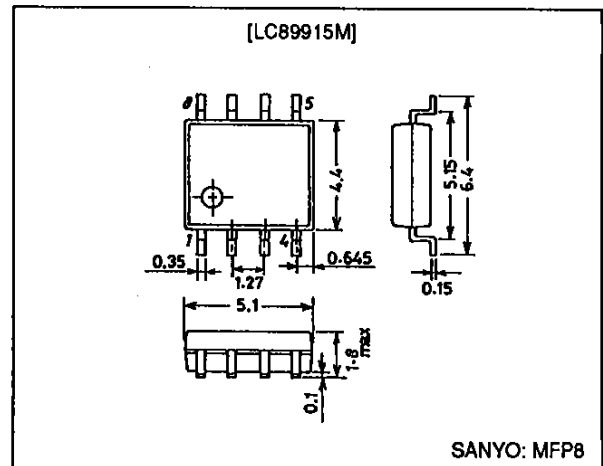- Control pin switchable to provide a PAL 1 H delayed signal.

Package Dimensions

unit: mm

3001B-DIP8

[LC89915]

SANYO: DIP8

unit: mm
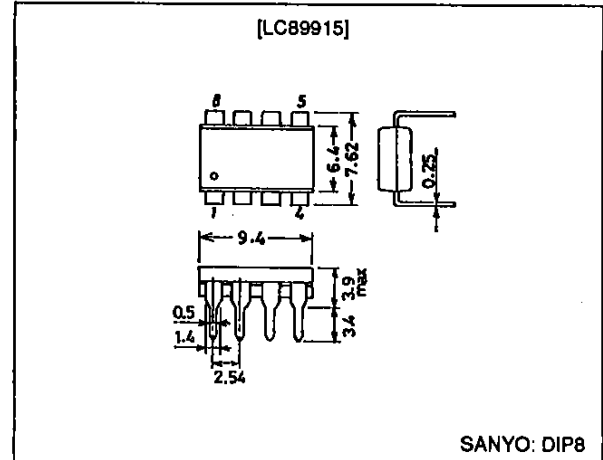
3032B-MFP8

[LC89915M]

SANYO: MFP8

Specifications

Absolute Maximum Ratings at Ta = 25°C

Parameter	Symbol	Conditions		Ratings	Unit
Maximum supply voltage	V_{DD} max			−0.3 to +6.0	V
Allowable power dissipation	Pd max	LC89915		400	mW
		LC89915M		140	mW
Operating temperature	Topr			−10 to +60	°C
Storage temperature	Tstg			−55 to +150	°C

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72595TH (OT) No. 5115-1/4
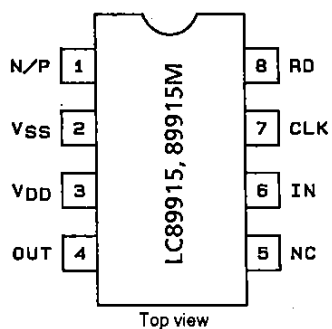
Allowable Operating Ranges at Ta = 25°C

Parameter	Symbol	Conditions	min	typ	max	Unit
Supply voltage	V_{DD}		4.75	5.00	5.25	V
Clock input amplitude	V_{CLK}	Sine wave	100	300	1000	mVp-p
Clock frequency	F_{CLK}		—	7.1590909	—	MHz
Signal input amplitude	V_{IN}	*	—	500		mVp-p

Note: * Connect the input signal with a low impedance to assure correct sync tip clamping.
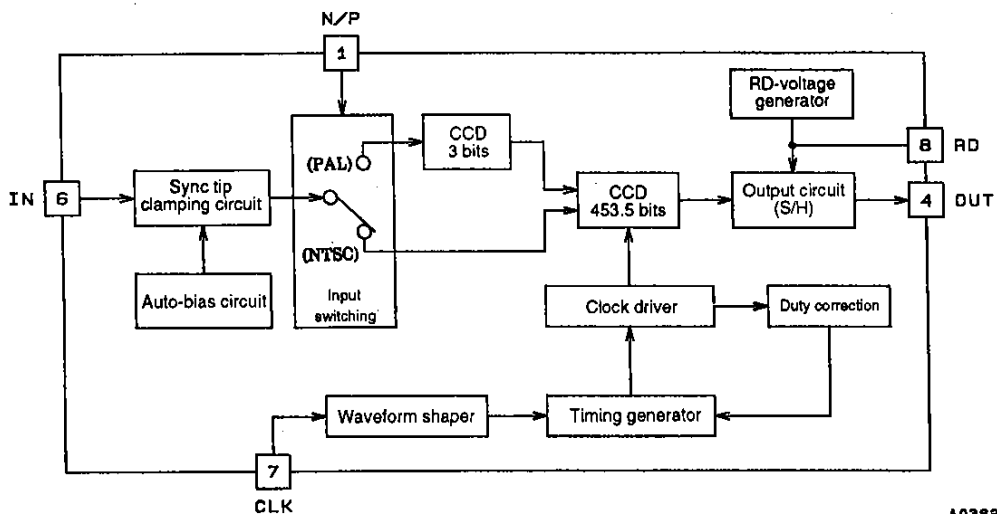
Pin Assignment

Top view   A03625

Pin Functions

Pin No.	Symbol	Function
1	N/P	Delay time switching
2	V_{SS}	GND
3	V_{DD}	Power supply
4	OUT	Delayed signal output
5	NC	
6	IN	Signal input
7	CLK	Clock input
8	RD	RD-voltage generator output

Block Diagram

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Functional Description

The delay time can be switched with the N/P control pin (pin 1).

0 V — NTSC mode
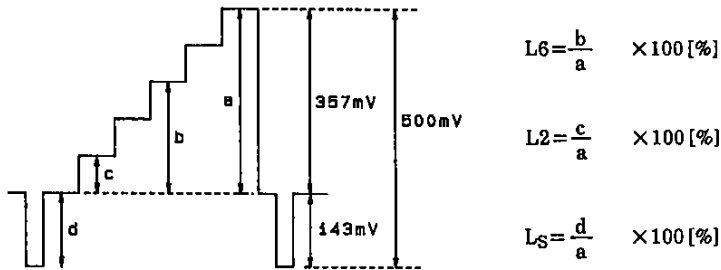   The CCD has a length of 453.5 bits and the delay time corresponds to 1 H (63.5 µs) in the NTSC format.

5 V — PAL mode
   The CCD has a length of 456.5 bits and the delay time corresponds to 1 H (64.0 µs) in the PAL format.

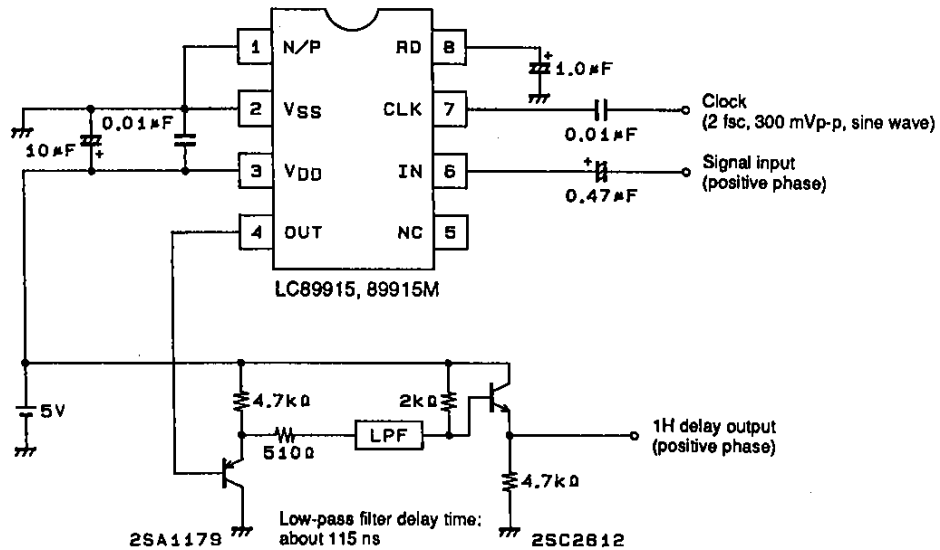## Electrical Characteristics at Ta = 25°C, V_{DD} = 5.0 V, CLK = 7.1590909 MHz; 300 mVp-p; sine wave

Parameter	Symbol	Conditions	min	typ	max	Unit
Current drain	I_{DD}	No signal input	4	8	12	mA
Voltage gain	G_V	With a 200 kHz 0.5 Vp-p input	2.5	4.5	6.5	dB
Frequency characteristics	G_f	2.0 MHz, 0.2 Vp-p/200 kHz, 0.2 Vp-p	−3.0	−1.5		dB
Linearity	L6	*	56	60	64	%
	L2	*	18	20	22	%
	L_S	*	37	40	43	%
Clock leakage	L_{CLK}	No signal input, the 2 fsc component		10	30	mVrms
Noise	N_O	No signal input, 4.2 MHz bandwidth		1.0	2.0	mVrms
Output impedance	Z_O		200	300	400	Ω
Delay time	T_{D-N}			63.44		μs
	T_{D-P}			63.86		μs

$$L6 = \frac{b}{a} \times 100 \, [\%]$$

$$L2 = \frac{c}{a} \times 100 \, [\%]$$

$$L_S = \frac{d}{a} \times 100 \, [\%]$$

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Note: * Input signal/output signal

Sample Application Circuit

LC89915, 89915M

Clock
(2 fsc, 300 mVp-p, sine wave)

Signal input
(positive phase)

1H delay output
(positive phase)

Low-pass filter delay time:
about 115 ns

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This catalog provides information as of July, 1995. Specifications and information herein are subject to change without notice.