

## 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.

## Specifications

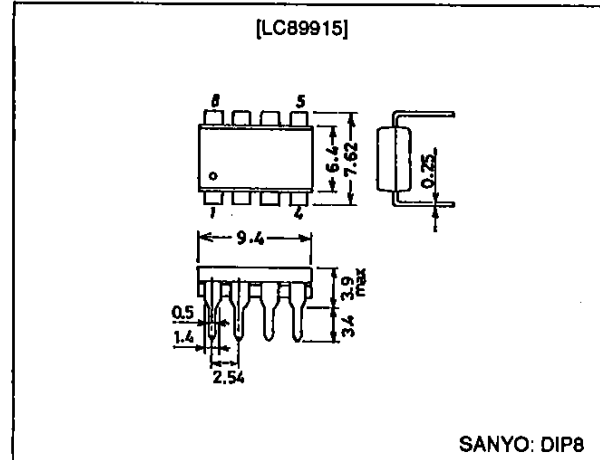
### Absolute Maximum Ratings at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	$V_{DD\text{ max}}$		-0.3 to +6.0	V
Allowable power dissipation	$P_{d\text{ max}}$	LC89915	400	mW
		LC89915M	140	mW
Operating temperature	$T_{opr}$		-10 to +60	$^\circ\text{C}$
Storage temperature	$T_{stg}$		-55 to +150	$^\circ\text{C}$

## Package Dimensions

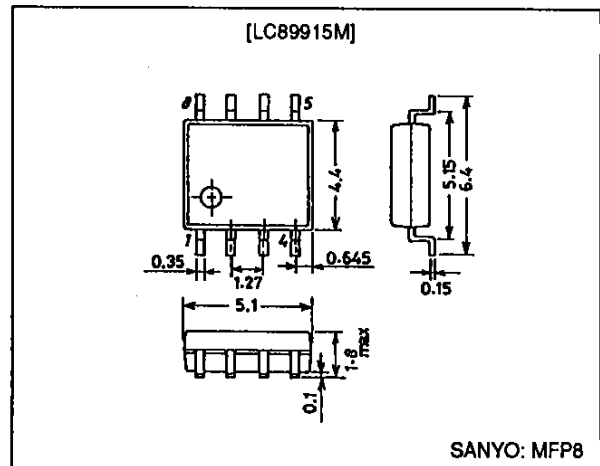
unit: mm

### 3001B-DIP8



unit: mm

### 3032B-MFP8

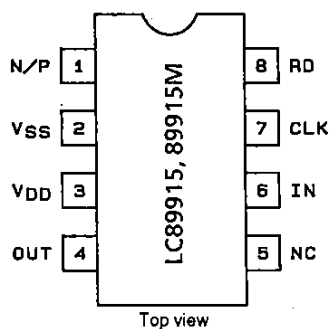


**Allowable Operating Ranges at Ta = 25°C**

Parameter	Symbol	Conditions	min	typ	max	Unit
Supply voltage	V <sub>DD</sub>		4.75	5.00	5.25	V
Clock input amplitude	V <sub>CLK</sub>	Sine wave	100	300	1000	mVp-p
Clock frequency	F <sub>CLK</sub>		—	7.1590909	—	MHz
Signal input amplitude	V <sub>IN</sub>	*	—	500	—	mVp-p

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

**Pin Assignment**

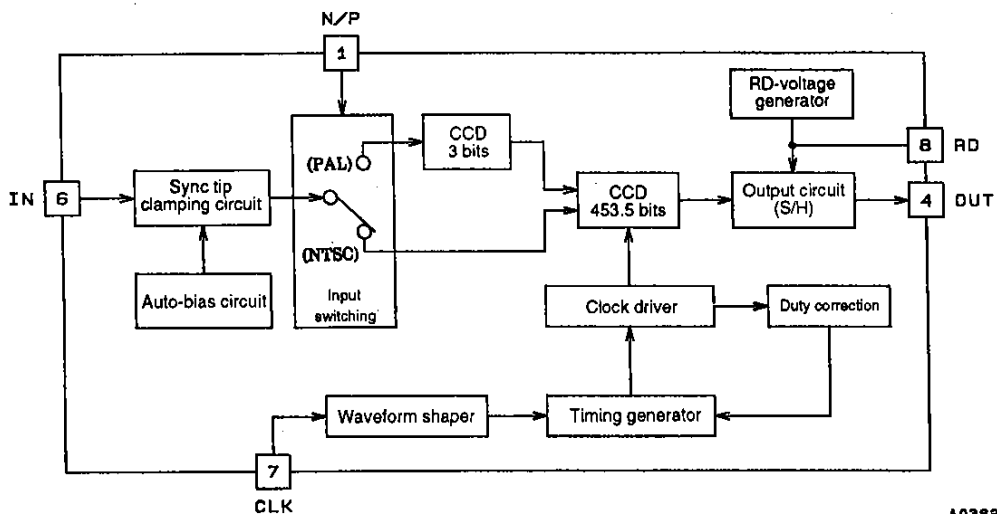


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**Pin Functions**

Pin No.	Symbol	Function
1	N/P	Delay time switching
2	V <sub>SS</sub>	GND
3	V <sub>DD</sub>	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.

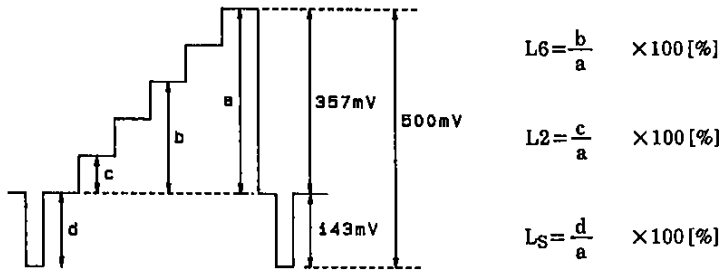
5 V — PAL mode

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

## LC89915, 89915M

**Electrical Characteristics at Ta = 25°C, V<sub>DD</sub> = 5.0 V, CLK = 7.1590909 MHz; 300 mVp-p; sine wave**

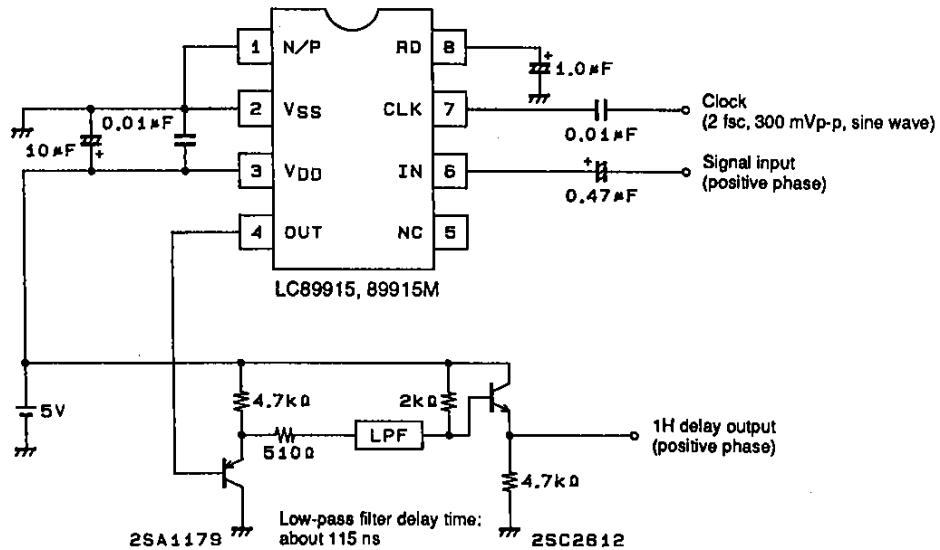
Parameter	Symbol	Conditions	min	typ	max	Unit
Current drain	I <sub>DD</sub>	No signal input	4	8	12	mA
Voltage gain	G <sub>V</sub>	With a 200 kHz 0.5 Vp-p input	2.5	4.5	6.5	dB
Frequency characteristics	G <sub>f</sub>	2.0 MHz, 0.2 Vp-p/200 kHz, 0.2 Vp-p	-3.0	-1.5		dB
Linearity	L <sub>6</sub>	*	56	60	64	%
	L <sub>2</sub>	*	18	20	22	%
	L <sub>S</sub>	*	37	40	43	%
Clock leakage	I <sub>CLK</sub>	No signal input, the 2 fsc component		10	30	mVrms
Noise	N <sub>O</sub>	No signal input, 4.2 MHz bandwidth		1.0	2.0	mVrms
Output impedance	Z <sub>O</sub>		200	300	400	Ω
Delay time	T <sub>D-N</sub>			63.44		μs
	T <sub>D-P</sub>			63.86		μs



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Note: \* Input signal/output signal

### Sample Application Circuit



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