

**LC7456A**

## U.S. Closed Caption Signal Extraction IC

### Preliminary

#### Overview

The LC7456A receives the composite video signal from the V / C (Video Chroma) signal processor and extracts the closed caption data. This data and a clock signal, generated by an on-chip PLL, are then sent to the decoder IC. The LC7456A is a CMOS version of the LA7945 IC also currently in production. The differences between the LA7945 and the LC7456A are a change from Bipolar to CMOS technology, a smaller package size (22 pins to 16 pins), and a reduction in the external circuitry required.

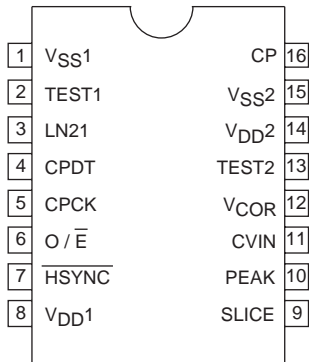
An LC8640XX series microcontroller is needed to perform the decoding after the LC7456A has extracted the caption data from the composite video signal.

#### Features

- Low power consumption due to CMOS process
- Accurate caption signal extraction using a built-in pead hold circuit and digital technology.
- Power Requirement :  $5V \pm 10\%$
- Package : DIP16

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## Pin Arrangement Diagram (DIP16)

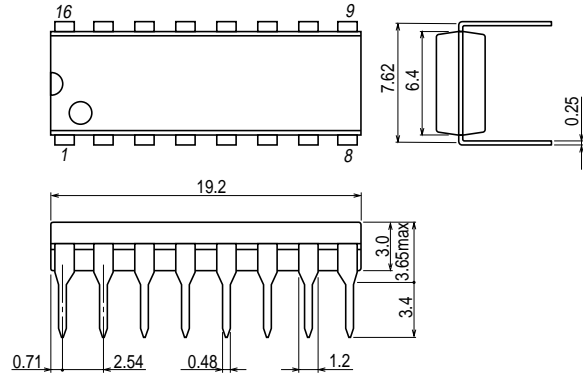


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## Package Dimensions

unit : mm

3006B

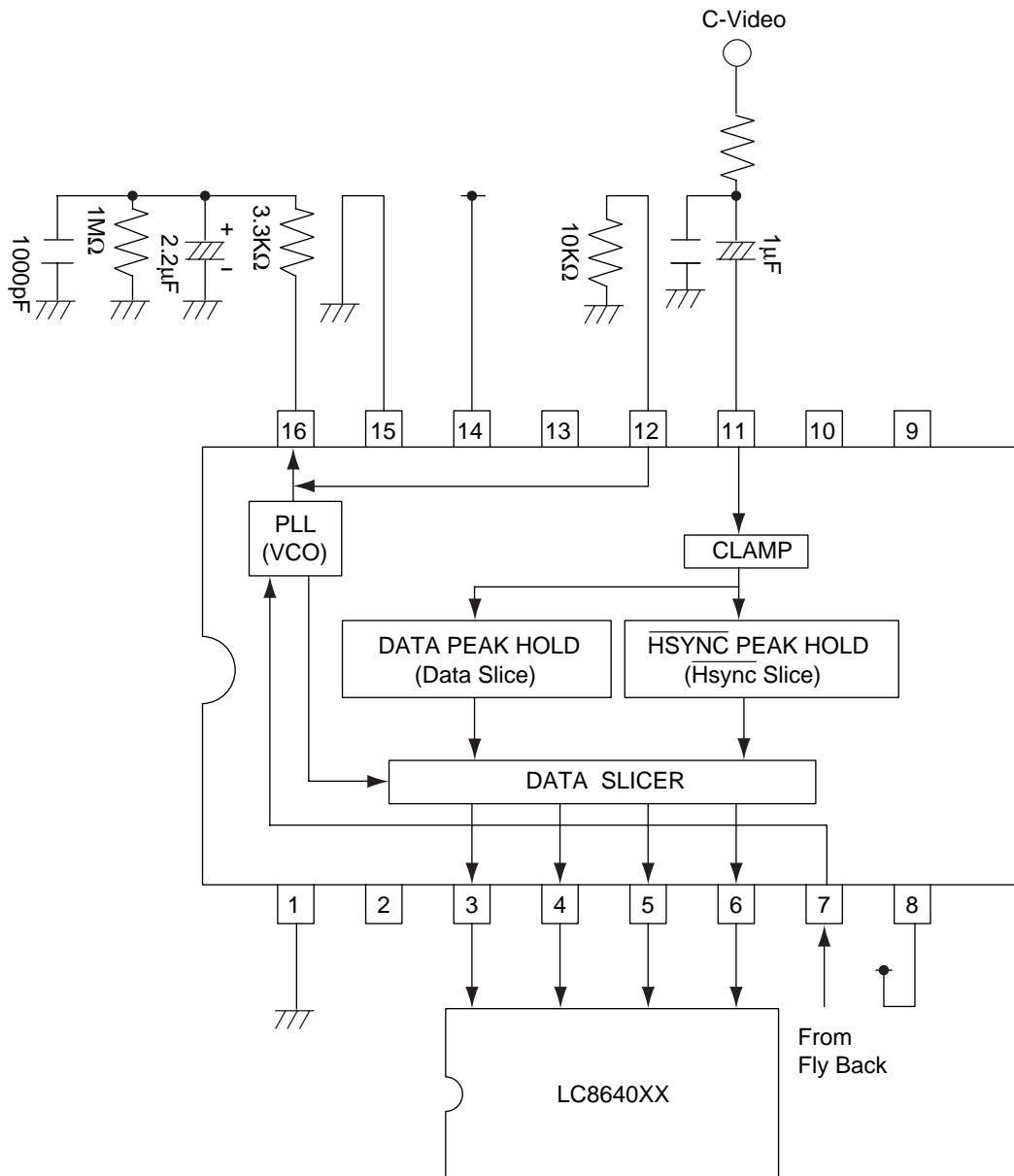


SANYO : DIP16(300mil)

## Pin Function

Pin		Function
No.	Name	
1	V <sub>SS</sub> 1	GND
2	TEST1	Test pin, usually open
3	LN21	Line 21H pulse output
4	CPDT	Caption data output
5	CPCCK	Caption data latch clock output
6	O/ $\bar{E}$	Field determination output
7	$\overline{\text{HSYNC}}$	$\overline{\text{HSYNC}}$ input
8	V <sub>DD</sub> 1	Power supply
9	SILCE	Caption data slice level output
10	PEAK	Caption data peak hold level output
11	CVIN	Composite video input
12	V <sub>COR</sub>	Built-in VCO frequency control pin
13	TEST2	Test pin, usually open
14	V <sub>DD</sub> 2	Power supply
15	V <sub>SS</sub> 2	GND
16	CP	Built-in PLL filter pin

## System Block Diagram and Application



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### 1. Absolute Maximum Ratings at $V_{SS}=0V$ and $T_a=25^{\circ}C$

Parameter	Symbol	Pins	Conditions	Ratings			unit
				min.	typ.	max.	
Supply voltage	VDDMAX	VDD1, VDD2	VDD1=VDD2	-0.3		+7.0	V
Input voltage	VI	HSYNC, CVIN		-0.3		VDD+0.3	
Output voltage	VO	LN21, CPDT CPCCK, O / $\bar{E}$		-0.3		VDD+0.3	
Maximum power dissipation	Pdmax	DIP16				300	mW
Operating temperature range	Topr			-30		+70	$^{\circ}C$
Storage temperature range	Tstg			-55		+150	

\*  $V_{SS1}$  and  $V_{SS2}$  are same level.

VDD1 and VDD2 are also same level.

### 2. Recommended Operating Range at $V_{SS}=0V$ and $T_a= -30^{\circ}C$ to $+70^{\circ}C$

Parameter	Symbol	Pins	Conditions	VDD[V]	Ratings			unit
					min.	typ.	max.	
Operating supply voltage	VDD	VDD1,VDD2	VDD1=VDD2		4.5		5.5	V
Input high voltage	VIH	HSYNC		4.5 to 5.5	0.85VDD		VDD	
Input low voltage	VIL	HSYNC		4.5 to 5.5	VSS		0.25VDD	
CVIN analog input range	CVSYNC	CVIN	SYNC-WHITE=1.0V	4.5 to 5.5	1Vp-p-3dB	1Vp-p	1Vp-p+3dB	
HSYNC input frequency range	fH	HSYNC		4.5 to 5.5	15.60	15.73	15.90	KHz

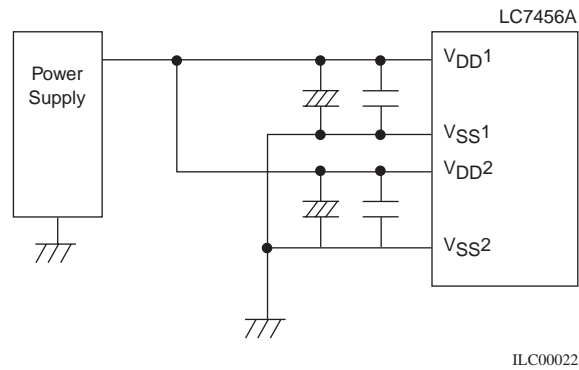
### 3. Electrical Characteristics at $V_{SS}=0V$ and $T_a= -30^{\circ}C$ to $+70^{\circ}C$

Parameter	Symbol	Pins	Conditions	VDD[V]	Ratings			unit
					min.	typ.	max.	
Input high current	IIH	HSYNC	VIN=VDD	4.5 to 5.5			1	$\mu A$
Input low current	IIL	HSYNC	VIN=VSS	4.5 to 5.5	-1			
Output high voltage	VOH	LN21, CPDT CPCCK, O / $\bar{E}$	IOH= -4mA	4.5 to 5.5	VDD-1.2			V
Output low voltage	VOL	LN21, CPDT CPCCK, O / $\bar{E}$	IOL=10mA	4.5 to 5.5			1	
Input clamp voltage	VCLMP	CVIN		5.0	2.3	2.5	2.7	

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Parameter	Symbol	Pins	Conditions	VDD[V]	Ratings			unit
					min.	typ.	max.	
Clamp input current	CII	CVIN	CVIN=3V	5.0	5	10	18	$\mu\text{A}$
Clamp output current	COI	CVIN	CVIN=2V	5.0	-120	-70	-30	
Current dissipation	IDD	VDD1,VDD2		4.5 to 5.5		6	15.0	mA

\* VDD1 and VSS1 are the power pins for the digital circuits of the LC7456A, and VDD2 and VSS2 for the analog circuits. Connect like the following figure to reduce into the both circuits.



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