Ordering number : ENN*6733

CMOS IC

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 requierd.

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 ± 10 %
- Package : DIP16

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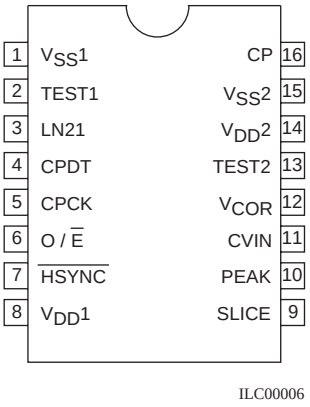
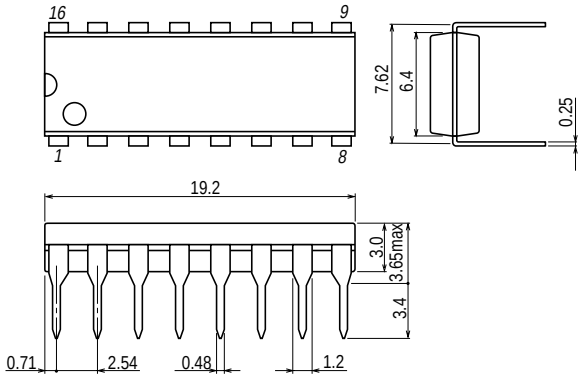
Pin Arrangement Diagram (DIP16)



Package Dimensions

unit : mm

3006B

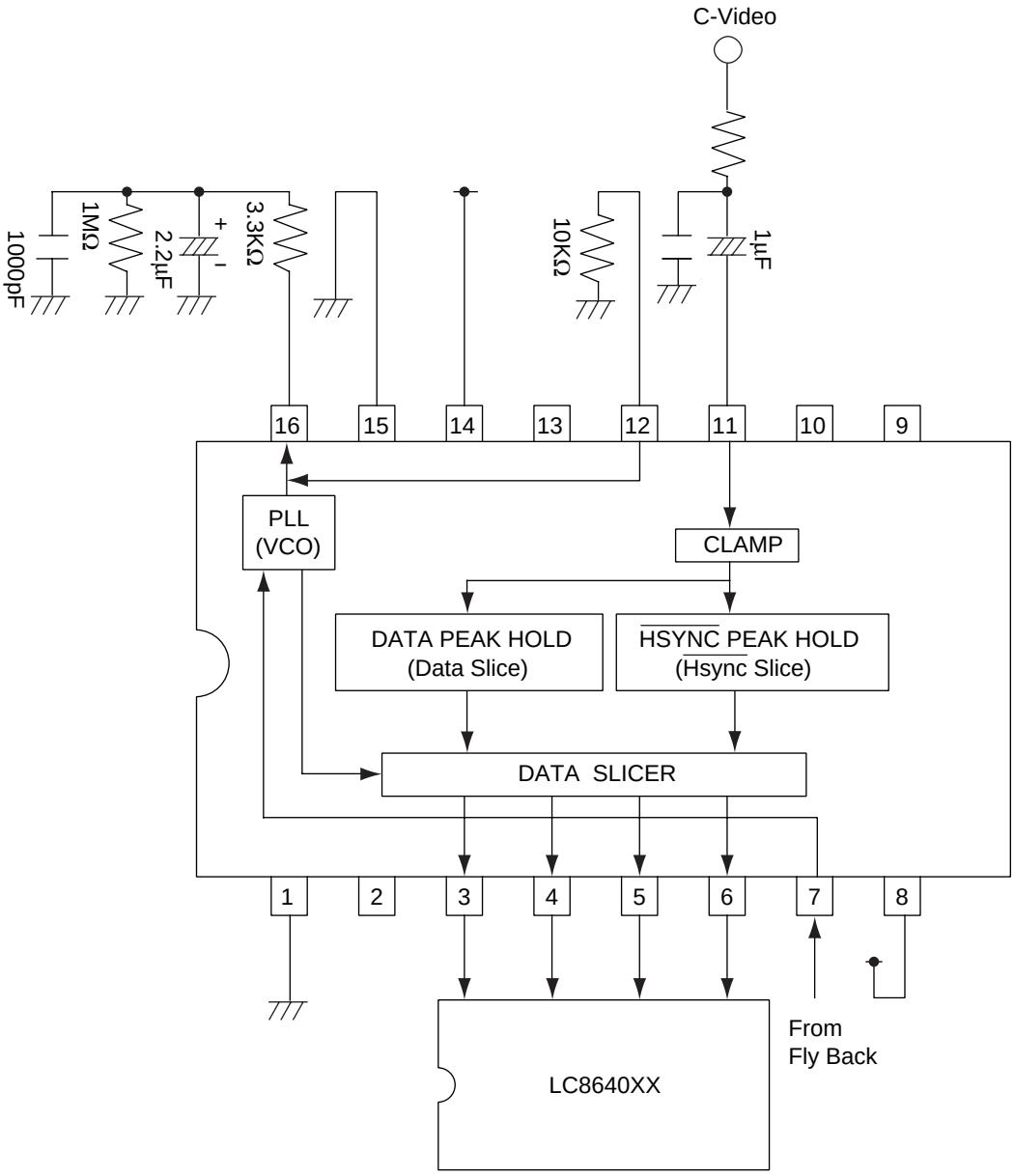


SANYO : DIP16(300mil)

Pin Function

Pin		Function
No.	Name	
1	$V_{SS}1$	GND
2	TEST1	Test pin, usually open
3	LN21	Line 21H pulse output
4	CPDT	Caption data output
5	CPCK	Caption data latch clock output
6	O/$\overline{E}$	Field determination output
7	$\overline{HSYNC}$	$\overline{HSYNC}$ input
8	$V_{DD}1$	Power supply
9	SILCE	Caption data slice level output
10	PEAK	Caption data peak hold level output
11	CVIN	Composite video input
12	VCOR	Built-in VCO frequency control pin
13	TEST2	Test pin, usually open
14	$V_{DD}2$	Power supply
15	$V_{SS}2$	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 Ta=25°C

Parameter	Symbol	Pins	Conditions	Ratings			unit
				min.	typ.	max.	
Supply voltage	$V_{DD}MAX$	$V_{DD}1$, $V_{DD}2$	$V_{DD}1=V_{DD}2$	−0.3		+7.0	V
Input voltage	V_I	$\overline{HSYNC}$, CVIN		−0.3		V_{DD}+0.3	
Output voltage	V_O	LN21, CPDT CPCK, O / $\overline{E}$		−0.3		V_{DD}+0.3	
Maximum power dissipation	Pdmax	DIP16				300	mW
Operating temperature range	Topr			−30		+70	°C
Storage temperature range	Tstg			−55		+150	

* $V_{SS}1$ and $V_{SS}2$ are same level.
$V_{DD}1$ and $V_{DD}2$ are also same level.

2. Recommended Operating Range at V_{SS}=0V and Ta= −30°C to +70°C

Parameter	Symbol	Pins	Conditions		Ratings			unit
				V_{DD}[V]	min.	typ.	max.	
Operating supply voltage	V_{DD}	$V_{DD}1$,$V_{DD}2$	$V_{DD}1=V_{DD}2$		4.5		5.5	V
Input high voltage	V_{IH}	$\overline{HSYNC}$		4.5 to 5.5	0.85V_{DD}		V_{DD}	
Input low voltage	V_{IL}	$\overline{HSYNC}$		4.5 to 5.5	V_{SS}		0.25V_{DD}	
CVIN analog input range	CVSYNC	C_{VIN}	SYNC-WHITE=1.0V	4.5 to 5.5	1Vp-p-3dB	1Vp-p	1Vp-p+3dB	
$\overline{HSYNC}$ input frequency range	fH	$\overline{HSYNC}$		4.5 to 5.5	15.60	15.73	15.90	KHz

3. Electrical Characteristics at V_{SS}=0V and Ta= −30°C to +70°C

Parameter	Symbol	Pins	Conditions		Ratings			unit
				V_{DD}[V]	min.	typ.	max.	
Input high current	I_{IH}	$\overline{HSYNC}$	$V_{IN}=V_{DD}$	4.5 to 5.5			1	μA
Input low current	I_{IL}	$\overline{HSYNC}$	$V_{IN}=V_{SS}$	4.5 to 5.5	−1			
Output high voltage	V_{OH}	LN21, CPDT CPCK, O / $\overline{E}$	I_{OH}= −4mA	4.5 to 5.5	V_{DD}-1.2			V
Output low voltage	V_{OL}	LN21, CPDT CPCK, O / $\overline{E}$	I_{OL}=10mA	4.5 to 5.5			1	
Input clamp voltage	VCLMP	C_{VIN}		5.0	2.3	2.5	2.7	

Parameter	Symbol	Pins	Conditions		Ratings			unit
				V_{DD}[V]	min.	typ.	max.	
Clamp input current	CII	C_{VIN}	C_{VIN}=3V	5.0	5	10	18	μA
Clamp output current	COI	C_{VIN}	C_{VIN}=2V	5.0	−120	−70	−30	
Current dissipation	I_{DD}	$V_{DD}1$,$V_{DD}2$		4.5 to 5.5		6	15.0	mA

* $V_{DD}1$ and $V_{SS}1$ are the power pins for the digital circuits of the LC7456A, and $V_{DD}2$ and $V_{SS}2$ for the analog circuits. Connect like the following figure to reduce into the both circuits.