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LA73076V

Monolithic Linear IC Video Driver for DVC/DSC, Cell Phone

Overview

The LA73076V is a low voltage drive (2.7V to 3.6V) video driver developed for portable appliances including digital video cameras, digital still cameras and cell phones. It incorporates a minus-voltage generator that allows the LA73076V to generate its output with the pedestal voltage set to 0V, so that no output coupling capacitor is required. This enables substantial reduction in mounting space without concerned about V-sag.

Features

- Output coupling capacity not required
- Low-voltage drive ($V_{CC} = 2.7V$ to $3.6V$)
- No V-sag
- Sextic LPF incorporated ($f_c = 10MHz$)
- 6dB amplifier
- Current drain of $0\mu A$ in the standby mode
- Output drive capable of covering maximum 75Ω output, one channel

Specifications

Maximum Ratings at $T_a = 25^\circ C$

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V_{CC} max		4.0	V
Allowable power dissipation	P_d max	$T_a \leq 80^\circ C$, *Mounted on a specified board	220	mW
Operating temperature	T_{opr}		-20 to +80	$^\circ C$
Storage temperature	T_{stg}		-55 to +150	$^\circ C$

*: Mounted on a specified board: 114.3mm×76.1mm×1.6mm, glass epoxy

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

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Recommended Operating Conditions at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Recommended Operating supply voltage	V_{CCSTD}		3.1	V
Operating supply voltage range	$V_{CCRANGE}$		2.7 to 3.6	V

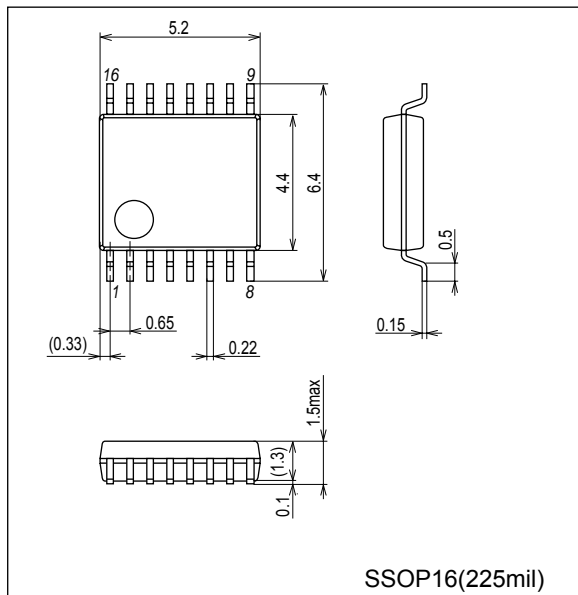
Electrical Characteristics at $T_a = 25^\circ\text{C}$, $V_{CC} = 3.1\text{V}$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Current dissipation part						
Current dissipation 1 (Non-signal active mode)	I_{CC}	2pin = Low, Input = White50%	25	37	44	mA
Current dissipation 2 (Non-signal active mode)	I_{CC2}	2pin = Low, Input = No signal	10.0	14	17.5	mA
Current dissipation 3 (Standby mode)	$I_{CC-STBY}$	2pin = High		0	5.0	μA
Control terminal part						
Stand-by control pin H voltage (SET = STANDBY MODE)	$V_{TH-STBY-H}$	2 pin voltage range at which $I_{CC} \leq 5\mu\text{A}$	$V_{CC}-0.5$		V_{CC}	V
Stand-by control pin L voltage (SET = ACTIVE MODE)	$V_{TH-STBY-L}$	2 pin voltage range at which $I_{CC} \geq 5\mu\text{A}$	GND		0.5	V
Output control pin H voltage range (SET=MIX_OUT)	V_{OUT_M}	Voltage in which only output of MIX is selected	2.2		V_{CC}	V
Output control pin M voltage range (SET=Y,C_OUT)	V_{OUT_YC}	Voltage in which output of Y and C is selected	1.5		1.7	V
Output control pin L voltage range (SET=ALL_OUT)	V_{OUT_ALL}	Voltage in which all outputs are selected	GND		0.5	V
SW, MUTE control pin voltage range (SET=MUTE MODE)	V_{SW_MUTE}	As for this voltage, SW selects MUTE	$V_{CC}-0.5$		V_{CC}	V
SW, through control pin voltage range (SET=through MODE)	V_{SW_THR}	As for this voltage, SW selects through	GND		0.5	V
Y-in						
Voltage gain	V_{GainY}	100% white $V_{YIN} = 1\text{Vp-p}$	5.7	6.2	6.7	dB
Freq. characteristics	$V_{f7.2Y}$	$f = 100\text{kHz}/7.2\text{MHz}$	-1.0	0	+1.0	dB
	V_{f20Y}	$f = 100\text{kHz}/20\text{MHz}$			-30	dB
Allowable sync input level	$V_{IN-Sync}$	$V_{YIN} = \text{Black burst}$, Output R conditions Mix_out: 150 Ω , Y_out: 150 Ω	200			mVp-p
C-in						
Voltage gain	V_{gainc}	$V_{CIN} = 350\text{mVp-p}$	5.7	6.2	6.7	dB
Freq. characteristics	V_{f20C}	$f = 4\text{MHz}/20\text{MHz}$			-25	dB

Package Dimensions

unit : mm (typ)

3178B



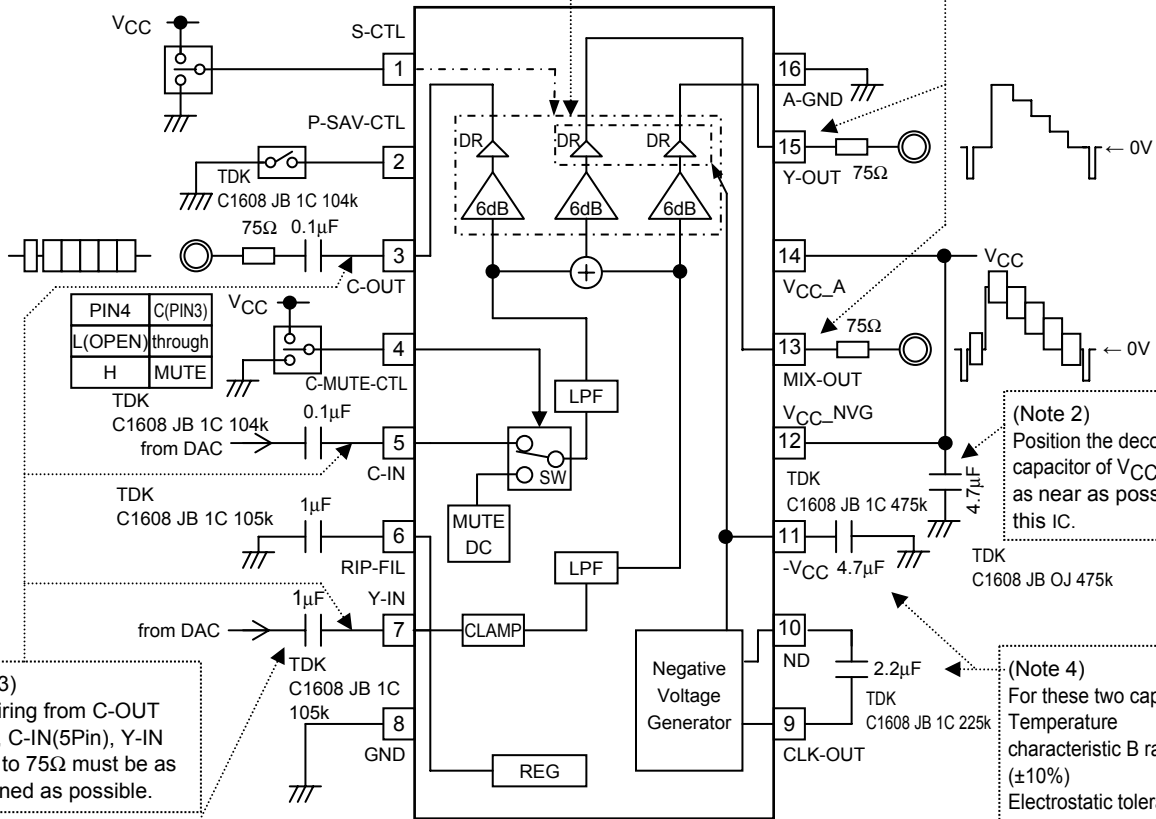
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Pin Assignment, Pin Function Diagram and Block Diagram

Control		OUT		
PIN2	PIN1	MIX	Y	C
L	L(GND)	○	○	○
	M(OPEN)	×	○	○
	H	○	×	×
H(OPEN)	*	×	×	×

☆ Active
(Input signal)
Signal → ON
No signal → OFF
☆ Standby → OFF

(Note 1)
The wiring from MIX-OUT(13Pin),
Y_OUT(Pin15) to 75Ω must be as
shortened as possible.



(Note 3)
The wiring from C-OUT
(3Pin), C-IN(5Pin), Y-IN
(7Pin) to 75Ω must be as
shortened as possible.

(Note 5)
Use the input capacity value within a range of
0.1µF to 1µF while checking the sag
condition of the output waveform.

(Note 2)
Position the decoupling
capacitor of VCC-GND
as near as possible to
this IC.

(Note 4)
For these two capacities;
Temperature
characteristic B rank
(±10%)
Electrostatic tolerance
K rank(±10%)
and Withstand voltage
of 6.3V or more are
recommended.

(Note 6)
As the minus power supply in this IC generates the clock for charge pump power supply by extracting the sink component of the input video signal (synchronous isolation) and by detecting its fall, the portion around the V-synchronization of this IC output may be reduced when the pseudo V signal without cut-in pulse is inserted as in the case of certain analog VCR special play (search). On the contrary, there is no problem when the pseudo V signal has the cut-in pulse. Pay due attention on this fact during use.

Pin Functions

Pin No	Symbol	Voltage	Description	Equivalent Circuit																														
1	S-CTL	V _{CC} or OPEN or 0V	Output select pin <table border="1"> <thead> <tr> <th colspan="2">Control of Pin1</th> <th></th> <th colspan="3">OUT</th> </tr> <tr> <th></th> <th></th> <th></th> <th>MIX</th> <th>Y</th> <th>C</th> </tr> </thead> <tbody> <tr> <td>L(GND)</td> <td>0V to 0.5V</td> <td>⇒</td> <td>○</td> <td>○</td> <td>○</td> </tr> <tr> <td>M(OPEN)</td> <td>OPEN or 1.6V±0.1V</td> <td>⇒</td> <td>×</td> <td>○</td> <td>○</td> </tr> <tr> <td>H(V_{CC})</td> <td>2.2V to V_{CC}</td> <td>⇒</td> <td>○</td> <td>×</td> <td>×</td> </tr> </tbody> </table>	Control of Pin1			OUT						MIX	Y	C	L(GND)	0V to 0.5V	⇒	○	○	○	M(OPEN)	OPEN or 1.6V±0.1V	⇒	×	○	○	H(V _{CC})	2.2V to V _{CC}	⇒	○	×	×	
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2	P-SAV-CTL	V _{CC} or 0V	Power save mode select pin <table border="1"> <thead> <tr> <th colspan="2">Control of Pin2</th> <th></th> <th>Mode</th> </tr> </thead> <tbody> <tr> <td>L(GND)</td> <td>0V to 0.5V</td> <td>⇒</td> <td>Active</td> </tr> <tr> <td>H(V_{CC})</td> <td>OPEN or V_{CC}±0.5V</td> <td>⇒</td> <td>Standby</td> </tr> </tbody> </table>	Control of Pin2			Mode	L(GND)	0V to 0.5V	⇒	Active	H(V _{CC})	OPEN or V _{CC} ±0.5V	⇒	Standby																			
Control of Pin2			Mode																															
L(GND)	0V to 0.5V	⇒	Active																															
H(V _{CC})	OPEN or V _{CC} ±0.5V	⇒	Standby																															
3	C-OUT	1.55V	Video output terminal (Push-pull output low-impedance) 																															
4	C-MUTE-CTL	V _{CC} or 0V	Mute select pin <table border="1"> <thead> <tr> <th colspan="2">Control of Pin</th> <th></th> <th>OUT</th> </tr> </thead> <tbody> <tr> <td>L(GND)</td> <td>0V to 0.5V or OPEN</td> <td>⇒</td> <td>through</td> </tr> <tr> <td>H(V_{CC})</td> <td>V_{CC}±0.5V</td> <td>⇒</td> <td>Pin4: H→MUTE</td> </tr> </tbody> </table>	Control of Pin			OUT	L(GND)	0V to 0.5V or OPEN	⇒	through	H(V _{CC})	V _{CC} ±0.5V	⇒	Pin4: H→MUTE																			
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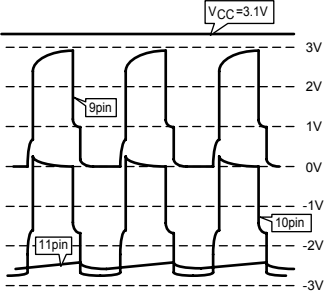
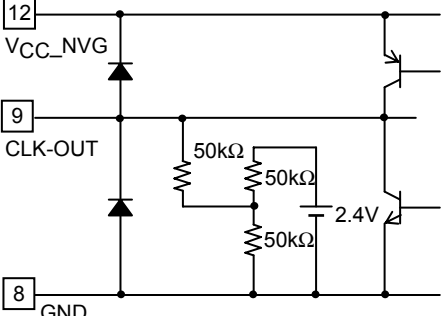
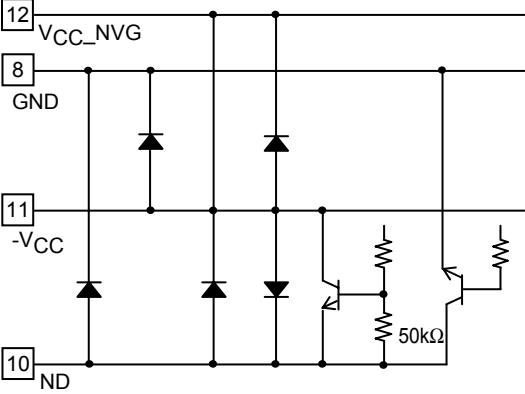
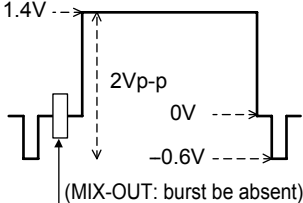
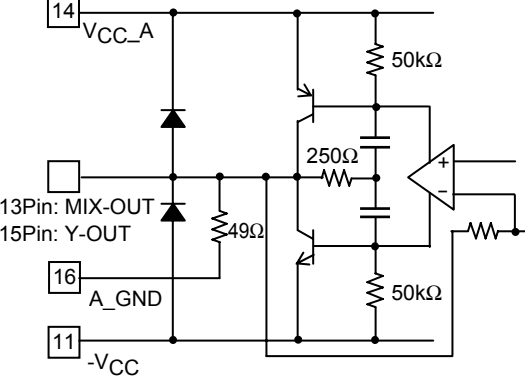
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Pin No	Symbol	Voltage	Description	Equivalent Circuit
5	C-IN	1.55V	Video input terminal (Input high-impedance)	
6	RIP-FIL	1.2V		
7	Y-IN	1.1V	Video input terminal (Sync-chip clamp (Input high-impedance))	
8	GND	0V		

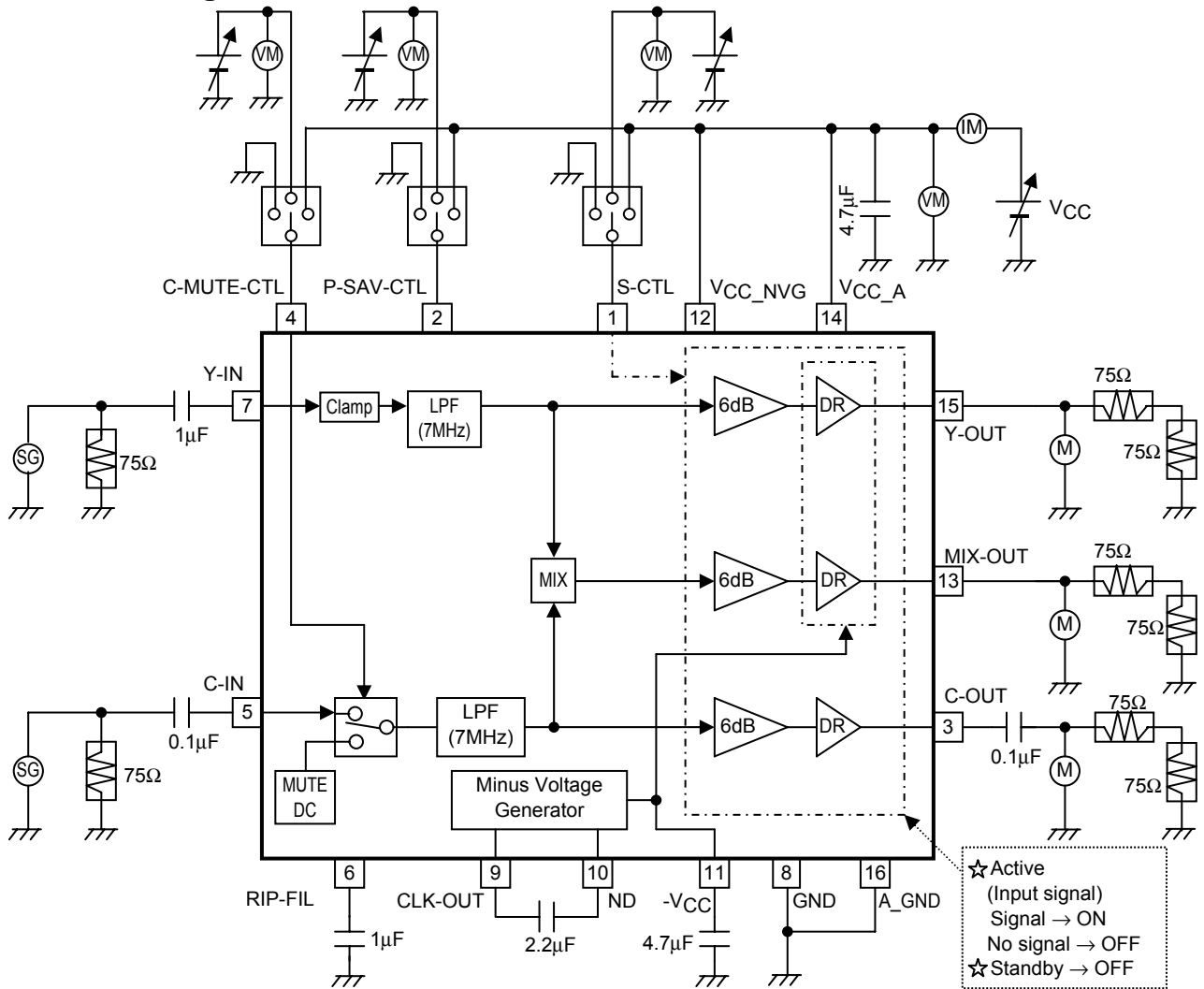
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Pin No	Symbol	Voltage	Description	Equivalent Circuit
9	CLK-OUT	V _{CC} ↑↓ 0V	Pin 9: Clock output terminal 	
10	ND	+0.5V ↑↓ -2.5V (-V _{CC})	Pin 10: The terminal which transmits an electric charge Pin 11: -V _{CC}	
11	-V _{CC}	0V ↑↓ -2.2V (-V _{CC})		
12	V _{CC_NVG}	2.7V to 3.6V		
13 15	MIX-OUT Y-OUT	0V	Video output terminal (Push-pull output low-impedance) 	
14	V _{CC_A}	2.7V to 3.6V	Analog V _{CC}	
16	A-GND	0V	Analog GND	

Test Circuit Diagram



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