



# SANYO Semiconductors

## DATA SHEET

# LV7150V — Bi-CMOS IC

## Switch for the Wideband Video Signal (with LPF)

### Overview

The LV7150V is switch for the wideband video signal. It has the two input switches by three channels.  
It built in the 6MHz/12MHz/30MHz-LPF. It is the best for the filter to remove the digital clock noise of the Y/Pb/Pr or RGB Analog video signal before the A/D converter.  
It can correspond to the full HD signal because it provides the flat frequency response to 60MHz.

### Functions

- Two input switches × three channels
- Y/Pb/Pr and RGB signal inputs
- Flat frequency response to 60MHz (Bypass filter)
- 6MHz/12MHz/30MHz-LPF

### Specifications

#### Maximum Ratings at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V <sub>CC max</sub>		6	V
Allowable power dissipation	P <sub>d max</sub>	Ta ≤ 75°C Mounted on a specified board *	300	mW
Operating temperature	T <sub>opr</sub>		-20 to +75	°C
Storage temperature	T <sub>stg</sub>		-40 to +125	°C

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

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**SANYO Semiconductor Co., Ltd.**

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# LV7150V

## Recommended Operating Conditions at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage	V <sub>CC</sub>		5	V
Operating supply voltage Range	V <sub>CC</sub> opg		4.75 to 5.25	V

## Electrical Characteristics at Ta = 25°C, V<sub>CC</sub> = 5.0V

Parameter	Input	Input signal				Out Point	Test Condition	Ratings			unit
		Point	Signal	Freq	Mag			min	typ	max	
<b>V<sub>CC</sub> supply current &amp; Internal reference regulator</b>											
V <sub>CC</sub> supply current		V3					At non-signal, The current flows to 3pin	26	34	42	mA
Internal reference regulator voltage						T16	The voltage of 16pin	2.8	3.0	3.2	V
<b>Voltage gain</b>											
Voltage gain	Py/Pb/Pr R/G/B	T1A T2A T4A T5A T7A T8A	SIG2	100k	300mVpp	T15 T13 T11	Output gain for input	-0.5	-0.2	0.0	dB
<b>Frequency response</b>											
Frequency response at LPF_Through	Py/Pb/Pr R/G/B	T1A T2A T4A T5A T7A T8A	SIG2	60M 100k	300mVpp	T15 T13 T11	LPF_Through is selected, Output gain difference between 100kHz and 60MHz	-3.0	-1.0	1.0	dB
Frequency response 1 at 6MHz_LPF	Py/Pb/Pr R/G/B	T1A T2A T4A T5A T7A T8A	SIG2	6M 100k	300mVpp	T15 T13 T11	6MHz_LPF is selected, Output gain difference between 100kHz and 6MHz	-3.0	0.0	1.0	dB
Frequency response 2 at 6MHz_LPF	Py/Pb/Pr R/G/B	T1A T2A T4A T5A T7A T8A	SIG2	13.5M 100k	300mVpp	T15 T13 T11	6MHz_LPF is selected, Output gain difference between 100kHz and 13.5MHz		-30.0	-20.0	dB
Frequency response 1 at 12MHz_LPF	Py/Pb/Pr R/G/B	T1A T2A T4A T5A T7A T8A	SIG2	12M 100k	300mVpp	T15 T13 T11	12MHz_LPF is selected, Output gain difference between 100kHz and 12MHz	-3.0	0.0	1.0	dB
Frequency response 2 at 12MHz_LPF	Py/Pb/Pr R/G/B	T1A T2A T4A T5A T7A T8A	SIG2	27M 100k	300mVpp	T15 T13 T11	12MHz_LPF is selected, Output gain difference between 100kHz and 27MHz		-30.0	-20.0	dB
Frequency response 1 at 30MHz_LPF	Py/Pb/Pr R/G/B	T1A T2A T4A T5A T7A T8A	SIG2	20M 100k	300mVpp	T15 T13 T11	30MHz_LPF is selected, Output gain difference between 100kHz and 20MHz	-1.0	0.0	1.0	dB
Frequency response 2 at 30MHz_LPF	Py/Pb/Pr R/G/B	T1A T2A T4A T5A T7A T8A	SIG2	30M 100k	300mVpp	T15 T13 T11	30MHz_LPF is selected, Output gain difference between 100kHz and 30MHz	-3.5	-1.0	1.5	dB
Frequency response 3 at 30MHz_LPF	Py/Pb/Pr R/G/B	T1A T2A T4A T5A T7A T8A	SIG2	74M 100k	300mVpp	T15 T13 T11	30MHz_LPF is selected, Output gain difference between 100kHz and 74MHz		-45.0	-33.0	dB
<b>S/N</b>											
S/N ratio at 30MHz_LPF	Py R G B	T1A T2A T4A T5A T7A T8A	SIG1	30M 100k	650mVpp	T15 T13 T11	30MHz_LPF is selected, The S/N ratio from 100kHz to 30MHz		-60.0	-50.0	dB
<b>Crosstalk</b>											
Crosstalk	Py/Pb/Pr R/G/B	T1A T2A T4A T5A T7A T8A	SIG2	5M	700mVpp	T15 T13 T11	The ratio of the output leak of the non-selection input		-60.0	-55.0	dB

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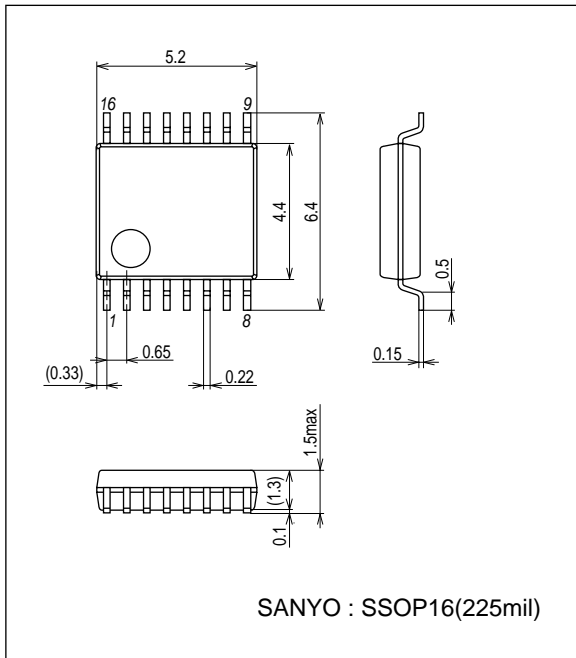
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Parameter	Input	Input signal				Out Point	Test Condition	Ratings			unit
		Point	Signal	Freq	Mag			min	typ	max	
<b>Group delay</b>											
Group delay at LPF_Through	Py/Pb/Pr R/G/B	T1A T2A T4A T5A T7A T8A	SIG2	60M 100k	300mVpp	T15 T13 T11	LPF_Through is selected, Delay difference between 100kHz and 60MHz		0.5	2.0	ns
Group delay at 6MHz_LPF	Py/Pb/Pr R/G/B	T1A T2A T4A T5A T7A T8A	SIG2	6M 100k	300mVpp	T15 T13 T11	6MHz_LPF is selected, Delay difference between 100kHz and 6MHz		40.0	70.0	ns
Group delay at 12MHz_LPF	Py/Pb/Pr R/G/B	T1A T2A T4A T5A T7A T8A	SIG2	12M 100k	300mVpp	T15 T13 T11	12MHz_LPF is selected, Delay difference between 100kHz and 12MHz		20.0	40.0	ns
Group delay at 30MHz_LPF	Py/Pb/Pr R/G/B	T1A T2A T4A T5A T7A T8A	SIG2	30M 100k	300mVpp	T15 T13 T11	30MHz_LPF is selected, Delay difference between 100kHz and 30MHz		10.0	20.0	ns

## Package Dimensions

unit : mm (typ)

3178B



## Pin Control Table

Pin Control Table

SW No.	Pin No.	SW function name
SW1	Pin12	CLAMP/BIAS_CTL
SW2	Pin10	Filter_CTL1
SW3	Pin9	Filter_CTL2
SW4	Pin14	Input_Select_CTL

Input Control Table

CLAMP/BIAS_CTL	Mode selected
Low (0 to 0.7V)	CLAMP (Y/Pb/Pr_Mode)
High (2.3V to V <sub>CC</sub> )	BIAS (RGB_Mode)

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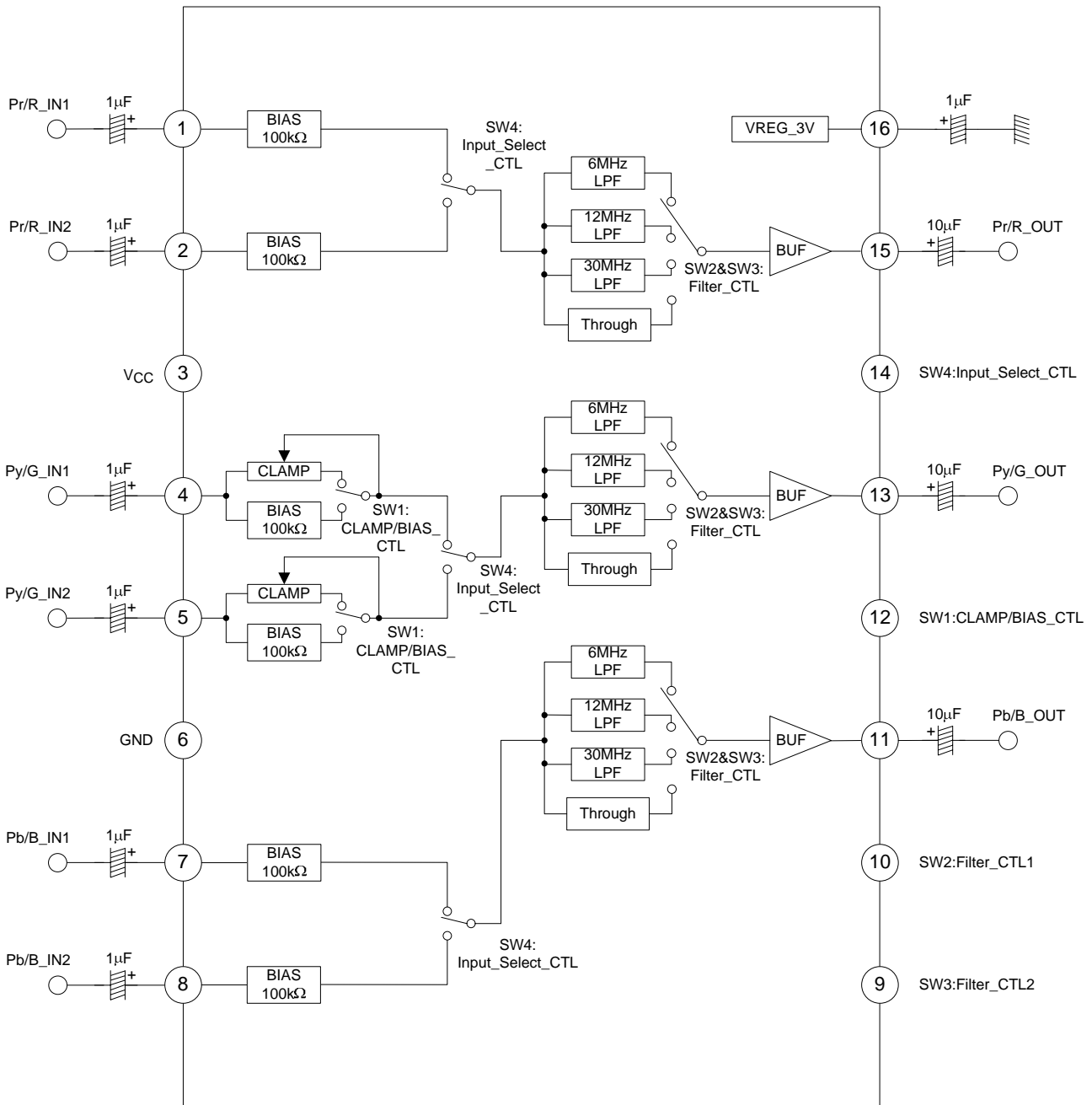
**Filter Control Table**

Filter_CTL1	Filter_CTL2	Mode selected
Low (0 to 0.7V)	Low (0 to 0.7V)	6Mz_LPF
Low (0 to 0.7V)	High (2.3V to V <sub>CC</sub> )	12Mz_LPF
High (2.3V to V <sub>CC</sub> )	Low (0 to 0.7V)	30Mz_LPF
High (2.3V to V <sub>CC</sub> )	High (2.3V to V <sub>CC</sub> )	LPF_Through

**Input Select Control Table**

Input_Select_CTL	Mode selected
Low (0 to 0.7V)	CH1_select
High (2.3V to V <sub>CC</sub> )	CH2_select

## Block Diagram



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## Pin Function

Pin No.	Pin name	DC voltage	Signal wave form	Input/Output form
P1	Pr/R_IN1	2.3V		
P2	Pr/R_IN2	2.3V		
P3	V <sub>CC</sub>			
P4	Py/G_IN1	Y/Pb/Pr: 1.8V (Clamp) RGB: 2.3V (Bias)		
P5	Py/G_IN2	Y/Pb/Pr: 1.8V (Clamp) RGB: 2.3V (Bias)		
P6	GND			
P7	Pb/B_IN1	2.3V		

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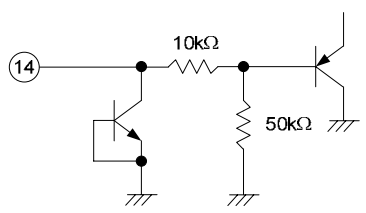
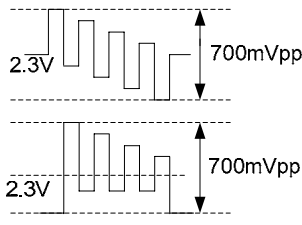
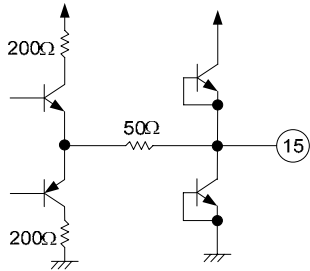
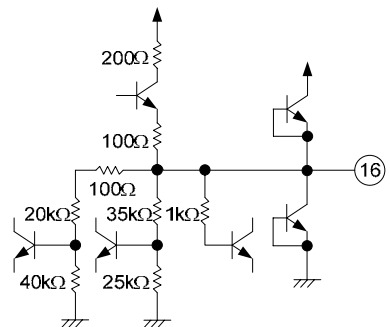
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Pin No.	Pin name	DC voltage	Signal wave form	Input/Output form
P8	Pb/RB_IN2	2.3V		
P9	Filter_CTL2	High: 2.3 to $V_{CC}$ Low: 0 to 0.7V		
P10	Filter_CTL1	High: 2.3 to $V_{CC}$ Low: 0 to 0.7V		
P11	Pb/B_OUT	2.3V		
P12	CLP/BIAS_CTL	High: 2.3 to $V_{CC}$ RGB (Bias) Low: 0 to 0.7V Y/Pb/Pr (Clamp)		
P13	Py/G_OUT	Y/Pb/Pr: 1.8V (Clamp) RGB: 2.3V (Bias)		

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Pin No.	Pin name	DC voltage	Signal wave form	Input/Output form
P14	Input_Select_CTL	High: 2.3 to $V_{CC}$ Ch2 Low: 0 to 0.7V Ch1		
P15	Pr/R_OUT	2.3V		
P16	REG3V	3.0V		

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