Ordering number : ENA0896A

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_{CC} max		6	V
Allowable power dissipation	Pd max	Ta≤75°C Mounted on a specified board *	300	mW
Operating temperature	Topr		-20 to +75	°C
Storage temperature	Tstg		-40 to +125	°C

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

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Recommended Operating Conditions at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage	V_{CC}		5	V
Operating supply voltage Range	V_{CC} opg		4.75 to 5.25	V

Electrical Characteristics at Ta = 25°C, V_{CC} = 5.0V

Parameter	Input	Input signal				Out	Test Condition	Ratings			unit
		Point	Signal	Freq	Mag	Point		min	typ	max	
V_{CC} supply current & Internal reference regulator											
V_{CC} 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
Voltage gain											
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
Frequency response											
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
S/N											
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
Crosstalk											
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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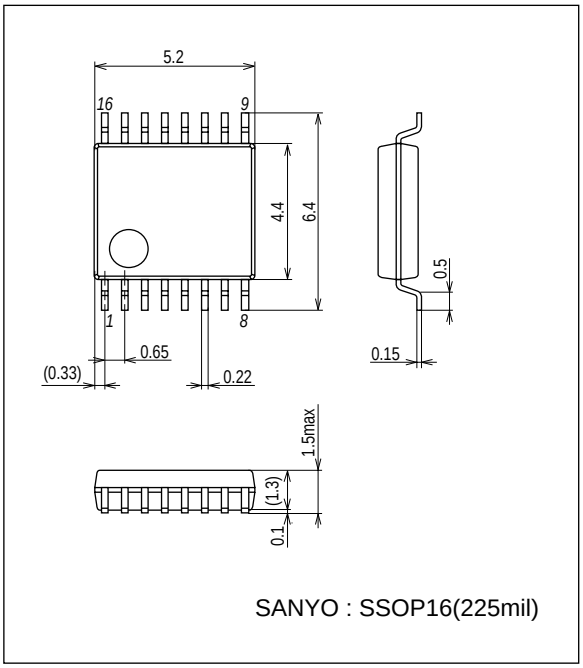
Parameter	Input	Input signal				Out	Test Condition	Ratings			unit
		Point	Signal	Freq	Mag	Point		min	typ	max	
Group delay											
Group delay at LPF_Through	Py/Pb/Pr R/G/B	T1A T2A T4A T5A T7A T8A	SIG2	60M 100k	300mVpp	T15 T13 T11	LPF_Through is selected, Delay difference between 100kHz and 60MHz		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



SANYO : SSOP16(225mil)

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_{CC})	BIAS (RGB_Mode)

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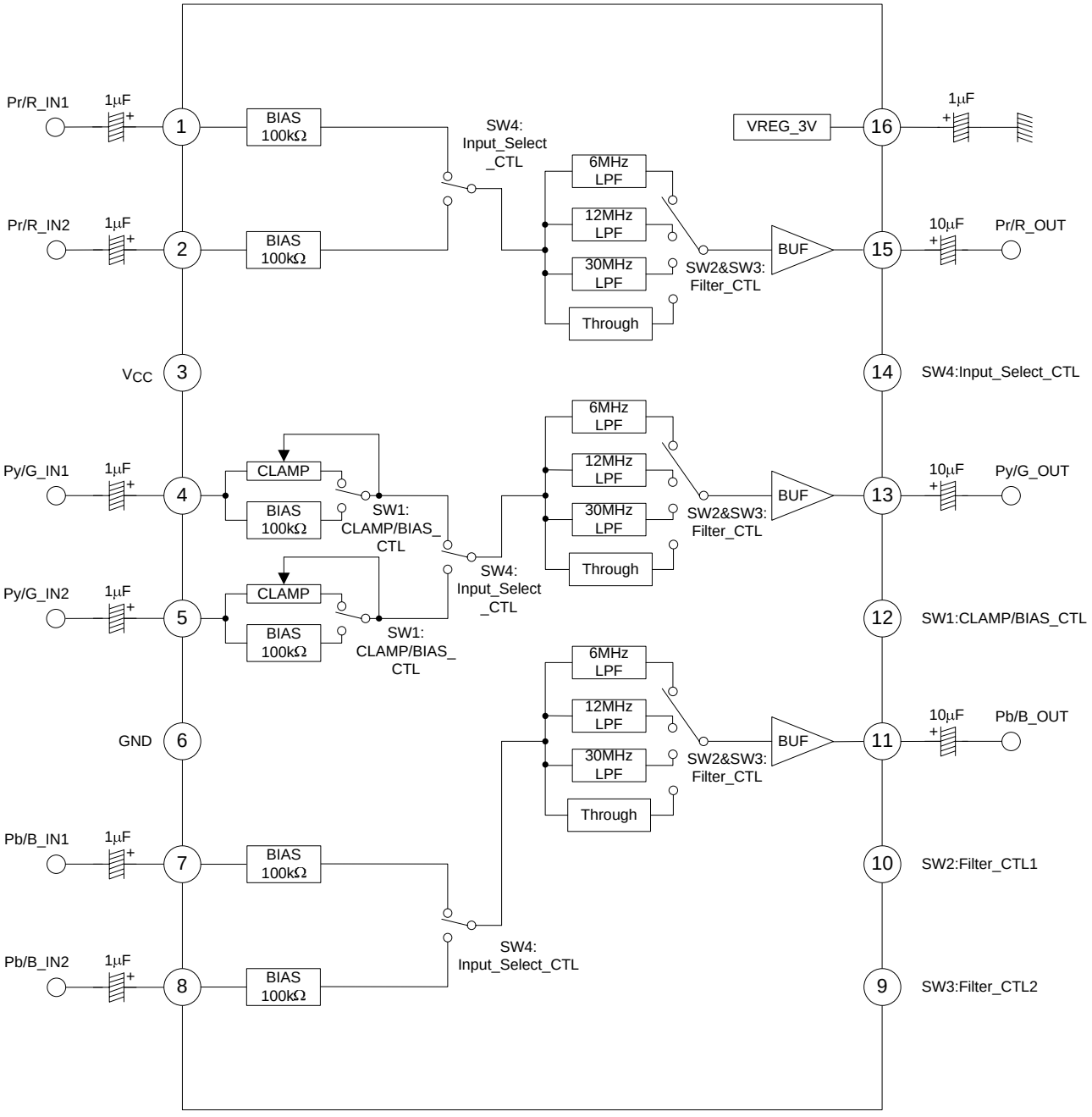
Filter Control Table

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_{CC})	12Mz_LPF
High (2.3V to V_{CC})	Low (0 to 0.7V)	30Mz_LPF
High (2.3V to V_{CC})	High (2.3V to V_{CC})	LPF_Through

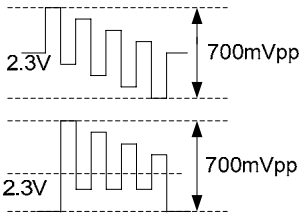
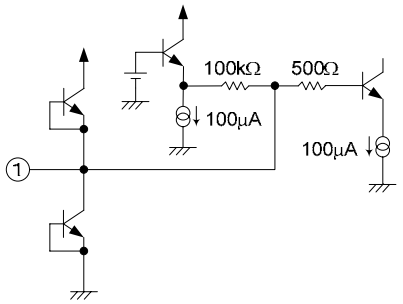
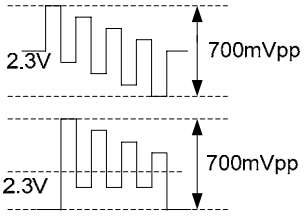
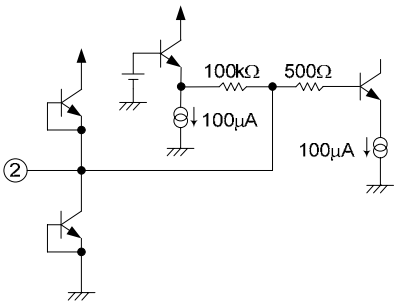
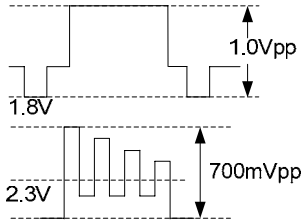
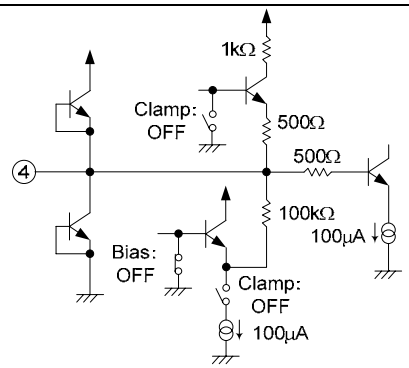
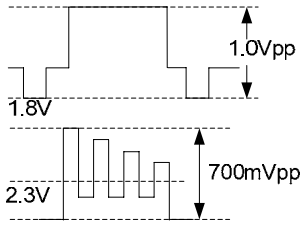
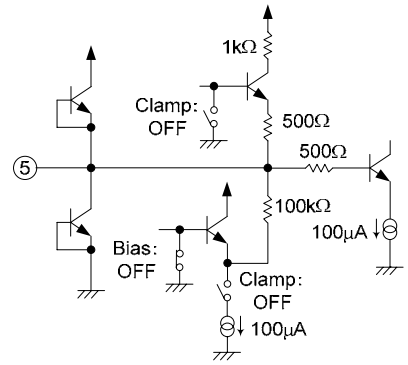
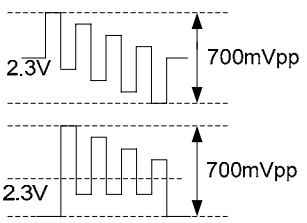
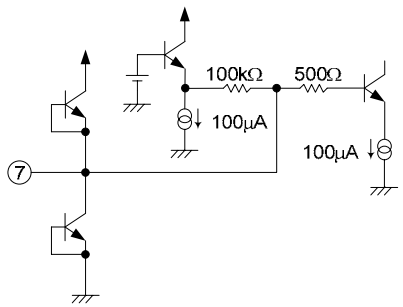
Input Select Control Table

Input_Select_CTL	Mode selected
Low (0 to 0.7V)	CH1_select
High (2.3V to V_{CC})	CH2_select

Block Diagram



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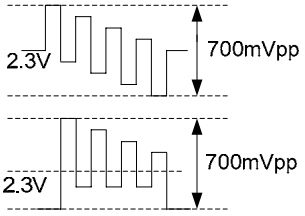
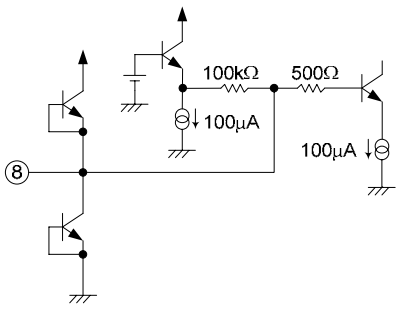
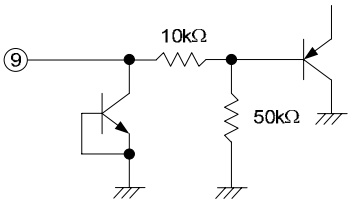
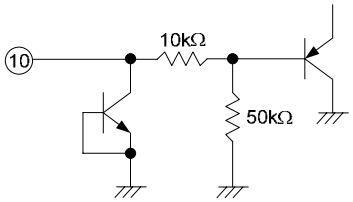
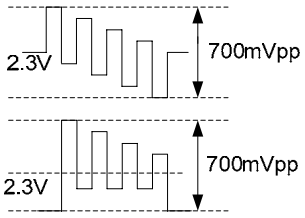
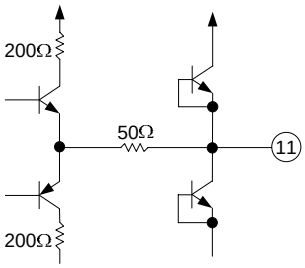
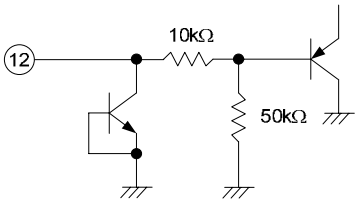
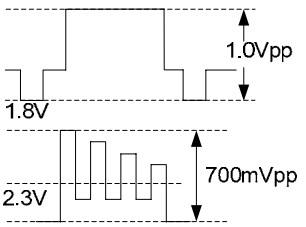
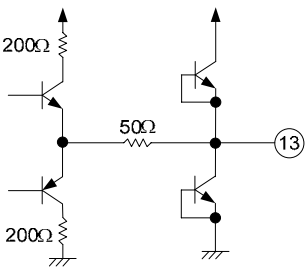
Pin No.	Pin name	DC voltage	Signal wave form	Input/Output form
P8	Pb/RB_IN2	2.3V		
P9	Filter_CTL2	High: 2.3 to V_{CC} Low: 0 to 0.7V		
P10	Filter_CTL1	High: 2.3 to V_{CC} Low: 0 to 0.7V		
P11	Pb/B_OUT	2.3V		
P12	CLP/BIAS_CTL	High: 2.3 to V_{CC} RGB (Bias) Low: 0 to 0.7V Y/Pb/Pr (Clamp)		
P13	Py/G_OUT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

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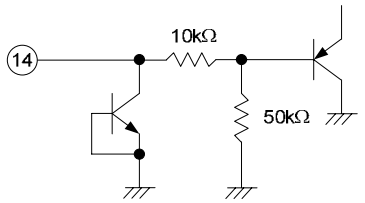
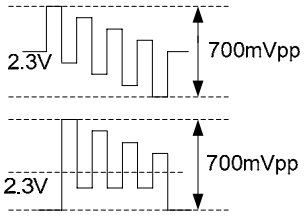
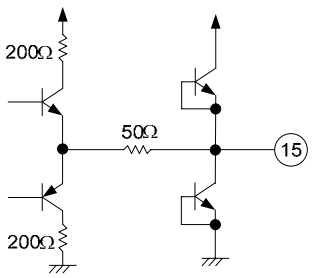
Pin No.	Pin name	DC voltage	Signal wave form	Input/Output form
P14	Input_Select_CTL	High: 2.3 to V_{CC} Ch2 Low: 0 to 0.7V Ch1		
P15	Pr/R_OUT	2.3V		
P16	REG3V	3.0V