

SANYO Semiconductors DATA SHEET

LA7958

Monolithic Linear IC For TV, VTR Audio/Video Switch

Overview

This LA7958 is a Audio/Video Switch for TV, VTR.

Functions

- Audio: Possible to Change 4 Channel×2
- Video: Possible to Change 4 Channel, 6dB Amplifier, Y+C Amplifier

Specifications

Maximum Ratings at $Ta = 25^{\circ}C$

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	$V_{CC} V \max$	Pin 8	13.2	V
Allowable power dissipation	Pd max	Ta ≤ 70°C	300	mW
Operating temperature	Topr		-20 to +70	°C
Storage temperature	Tstg		-55 to +150	°C

Operating Conditions at $Ta = 25^{\circ}C$

Parameter	Symbol	Conditions	Ratings	Unit
Recommending operation voltage	V _{CC}	Pin 8	9.0	V
Operating voltage range	V _{CC} op	Pin 8	8.0 to 12.0	V

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Electrical Characteristics at $Ta = 25^{\circ}C$, $V_{CC} = 9V$

Parameter	Symbol	Conditions	Ratings			Linit
			min	typ	max	Unit
Current dissipation	ICC	V _{CC} = 9V, No signal	11.2	14.0	16.8	mA
Audio Block						
Audio input DC voltage	INa		4.0	4.3	4.6	V
Audio output DC voltage	Oa		3.2	3.6	4.0	V
Audio channel bandwidth	Fa	-3dB frequency	100			kHz
Audio signal voltage gain	Aa	f = 1kHz, V _{IN} = 500mVrms	5.0	6.0	7.0	dB
Audio input dynamic range	Da	f = 1kHz, THD \leq 1%	2.0	2.5		Vp-p
Audio channel PSRR	PSa	V _{CC} = 9V+1Vp-p, SINE WAVE (50Hz)	35	50		dB
Audio channel input impedance	Ria		80	100	120	kΩ
Audio channel output impedance	Roa		40	50	65	Ω
Audio channel crosstalk	СТа	f = 1kHz	65	80		dB
Audio channel S/N	SNa	Filter = DIN/AUDIO	70	85		dB
Audio channel THD	THDa	f = 1kHz, V _{IN} = 500mVrms		0.15	0.3	%
Video Block						
Video input DC voltage	INv		4.0	4.3	4.6	V
Video output DC voltage	Ov		3.2	3.6	4.0	V
Video channel bandwidth	Fv	-3dB frequency	10			MHz
Video signal voltage gain	Av	f = 500kHz, V _{IN} = 1Vp-p	5.0	6.0	7.0	dB
Video input dynamic range	Dv	f = 100kHz, THD \leq 1%	2.0	2.5		Vp-p
Video channel PSRR	PSv	SINE WAVE (50Hz)	35	50		dB
Video channel input impedance	Riv		8.0	10	12.0	kΩ
Video channel output impedance	Rov		29	37	48	Ω
Video channel crosstalk	CTv	f = 3.58MHz, V _{IN} = 1Vp-p	45	60		dB
Video channel noise	SNv	Bandwidth 10MHz	57	62		dB
Y, C Mixer						
Y input DC voltage	INy		4.0	4.3	4.6	V
C input DC voltage	INc		4.0	4.3	4.6	V
Y+C signal voltage gain	Аус	Yin = 1Vp-p, Cin = 0.3Vp-p	5.0	6	7.0	dB
Differential gain	DG			2.0	3.5	%
Differential phase	DP			1.0	2.0	deg
Mode Selection Block						
Mode selection threshold voltage	Vmth		2.2	2.6	3.0	V

Logic True Table Video-Output

A D' 14	D D: 10	C : Pin 15			
A.PINTI	B. PIII 13	L	OPEN	Н	
L	L	VTV	VTV	VTV	
Н	L	V1	V1	V1	
L	Н	V2	V2	V2	
н	Н	Y+C	V3/Y	V3/Y	

VTV = (-A)*(-B) V2 = (-A)*(B)

 $\begin{array}{l} \mathsf{V1}=(\mathsf{A})^*(\mathsf{-B}) \\ \mathsf{V3}=(\mathsf{A})^*(\mathsf{B})^*(\mathsf{-}(\mathsf{C}\!=\!\mathsf{L}))/\mathsf{Y}\!=\!(\mathsf{A})^*(\mathsf{B})^*(\mathsf{-}(\mathsf{C}\!=\!\mathsf{L})) \end{array}$

Y+C = (A)*(B)*(C=L) Audio-R-Output

	•				
A : Pin 11	B : Pin 13	C : Pin 15			
		L	OPEN	Н	
L	L	RTV	RTV	RTV	
Н	L	R1	R1	R1	
L	Н	R2	R2	R2	
Н	Н	R3	R3	R3	
RTV = (-A)*(-B)		R1 = (A)*(-B)			

 $RTV = (-A)^{*}(-E)$ $R2 = (-A)^{*}(B)$ $R^{T} = (A) (-B)$ $R^{T} = (A)^{*}(B)$

Audio-L-Output

A : Pin 11	B : Pin 13	C : Pin 15			
		L	OPEN	Н	
L	L	LTV	LTV	LTV	
Н	L	L1	L1	L1	
L	Н	L2	L2	L2	
Н	Н	L3	L3	L3	

LTV = (-A)*(-B) L2 = (-A)*(B) $L1 = (A)^{*}(-B)$ $L3 = (A)^{*}(B)$

Package Dimensions

unit : mm

3010A



Pin Assignment



Block Diagram



No.	Parameter	Explanations	Test circuit
1	Video signal voltage gain (Av)	P : Pins 7, 9, 12, 19 Q : Pin 16 $V_{IN} = 1Vp-p$ Input inpedance 75k Ω Av = 20 log Vout/V _{IN} (dB)	10µF P Q Vour f=500kHz m OMP06171
2	Video channel bandwidth (Fv)	P : Pins 7, 9, 12, 19 Q : Pin 16 V _{IN} = 1Vp-p A frequency which becomes -3dB is measured.	
3	Video channel noise (SNv)	P : Pins 7, 9, 12, 19 Q : Pin 16	
4	Video channel crosstalk (CTv)	P : Pin 7 (Pins 9, 12, 19) O : Pins 9, 12, 19 (Pin 7) Q : Pin 16	10µF P C F=3.58MHz VIN=1Vp-P VIN=1Vp-P C C C C C C C C C C C C C
5	Video channel PSRR (PSv)	Pin 8, f = 50Hz V _{IN} = 1Vp-p P : Pins 7, 9, 12, 19 Q : Pin 16	^{№50H/z} VIN ^{-1VP-p} 10µ ^F 10µ ^F + + Р (0) (0) (0) (0) (0) (0) (0) (0) (0) (0)
6	Audio signal voltage gain (Aa)	P : Pins 1, 2, 3, 4, 5, 6, 21, 22 Q : Pins 17, 18 V _{IN} = 500mVrms Aa = 20 log Vout/V _{IN} (dB)	Vin=500mVres Vin=500mVres G f=1kHz /// // // // // // // // //

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No.	Parameter	Explanations	Test circuit
7	Audio channel bandwidth (Fa)	P : Pins 1, 2, 3, 4, 5, 6, 21, 22 Q : Pins 17,18 V _{IN} = 500mVrms A frequency which becomes -3dB is measured.	VIN=500mVres VIN S S VIN F=1kHz TT TT OMPD6175
8	Audio channel THD (THDa)		It's the same Audio Signal Voltage Gain measurement circuit.
9	Audio channel S/N (SNa)	P : Pins 1, 2, 3, 4, 5, 6, 21, 22 Q : Pins 17, 18	
10	Audio channel crosstalk (CTa)	P : Pins 2, 3, 4, 5, 6, 21, 22 Q : Pins 17,18	t=1kHz v _{IN} =500mVms ↓µF v _{IN} =500mVms ↓µF ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓
11	Audio channel PSSR (PSa)	Pin 8, f = 50Hz V _{IN} = 1Vp-p P : Pins 1, 2, 3, 4,5, 6, 21, 22 Q : Pins 17, 18	P=50Hz VIN=TVP-P ↓↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓

Test Circuit



OMB06068

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