



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°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°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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LA7958

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

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Current dissipation	I_{CC}	$V_{CC} = 9\text{V}$, No signal	11.2	14.0	16.8	mA
Audio Block						
Audio input DC voltage	I_{Na}		4.0	4.3	4.6	V
Audio output DC voltage	O_a		3.2	3.6	4.0	V
Audio channel bandwidth	F_a	-3dB frequency	100			kHz
Audio signal voltage gain	A_a	$f = 1\text{kHz}$, $V_{IN} = 500\text{mVrms}$	5.0	6.0	7.0	dB
Audio input dynamic range	D_a	$f = 1\text{kHz}$, $\text{THD} \leq 1\%$	2.0	2.5		Vp-p
Audio channel PSRR	PS_a	$V_{CC} = 9\text{V} + 1\text{Vp-p}$, SINE WAVE (50Hz)	35	50		dB
Audio channel input impedance	R_{i_a}		80	100	120	$k\Omega$
Audio channel output impedance	R_{o_a}		40	50	65	Ω
Audio channel crosstalk	CT_a	$f = 1\text{kHz}$	65	80		dB
Audio channel S/N	SN_a	Filter = DIN/AUDIO	70	85		dB
Audio channel THD	THD_a	$f = 1\text{kHz}$, $V_{IN} = 500\text{mVrms}$		0.15	0.3	%
Video Block						
Video input DC voltage	I_{Nv}		4.0	4.3	4.6	V
Video output DC voltage	O_v		3.2	3.6	4.0	V
Video channel bandwidth	F_v	-3dB frequency	10			MHz
Video signal voltage gain	A_v	$f = 500\text{kHz}$, $V_{IN} = 1\text{Vp-p}$	5.0	6.0	7.0	dB
Video input dynamic range	D_v	$f = 100\text{kHz}$, $\text{THD} \leq 1\%$	2.0	2.5		Vp-p
Video channel PSRR	PS_v	SINE WAVE (50Hz)	35	50		dB
Video channel input impedance	R_{i_v}		8.0	10	12.0	$k\Omega$
Video channel output impedance	R_{o_v}		29	37	48	Ω
Video channel crosstalk	CT_v	$f = 3.58\text{MHz}$, $V_{IN} = 1\text{Vp-p}$	45	60		dB
Video channel noise	SN_v	Bandwidth 10MHz	57	62		dB
Y, C Mixer						
Y input DC voltage	I_{Ny}		4.0	4.3	4.6	V
C input DC voltage	I_{Nc}		4.0	4.3	4.6	V
Y+C signal voltage gain	A_{yc}	$Y_{in} = 1\text{Vp-p}$, $C_{in} = 0.3\text{Vp-p}$	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	V_{mth}		2.2	2.6	3.0	V

Logic True Table

Video-Output

A : Pin 11	B : Pin 13	C : Pin 15		
		L	OPEN	H
L	L	VTV	VTV	VTV
H	L	V1	V1	V1
L	H	V2	V2	V2
H	H	Y+C	V3/Y	V3/Y

$VTV = (-A)*(-B)$ $V1 = (A)*(-B)$
 $V2 = (-A)*(B)$ $V3 = (A)*(B)*(-(C=L))/Y=(A)*(B)*(-(C=L))$
 $Y+C = (A)*(B)*(C=L)$

Audio-R-Output

A : Pin 11	B : Pin 13	C : Pin 15		
		L	OPEN	H
L	L	RTV	RTV	RTV
H	L	R1	R1	R1
L	H	R2	R2	R2
H	H	R3	R3	R3

$RTV = (-A)*(-B)$ $R1 = (A)*(-B)$
 $R2 = (-A)*(B)$ $R3 = (A)*(B)$

Audio-L-Output

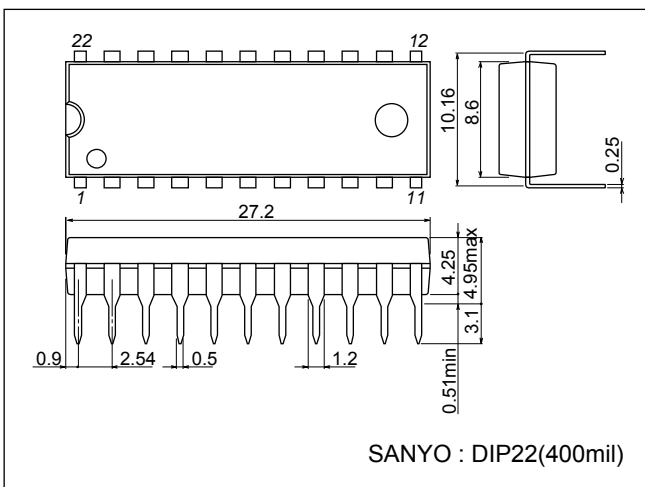
A : Pin 11	B : Pin 13	C : Pin 15		
		L	OPEN	H
L	L	LTV	LTV	LTV
H	L	L1	L1	L1
L	H	L2	L2	L2
H	H	L3	L3	L3

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

Package Dimensions

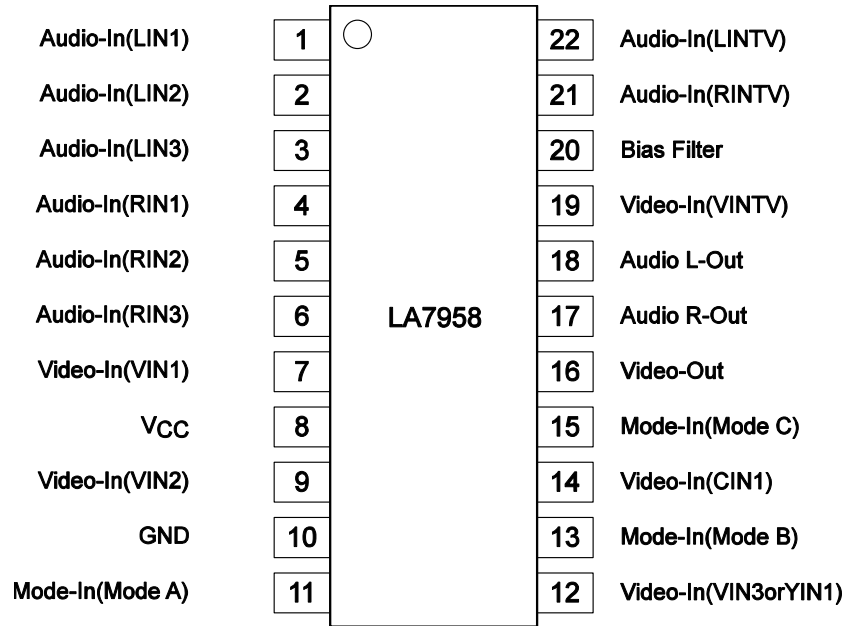
unit : mm

3010A



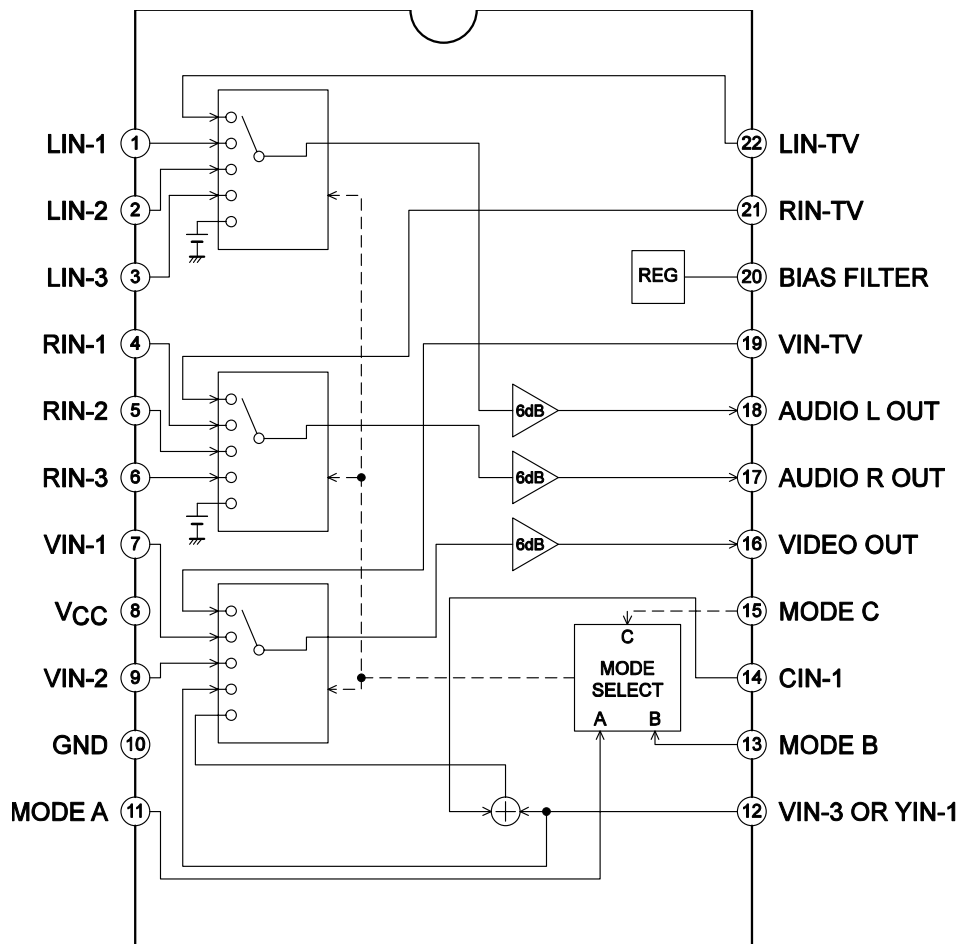
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Pin Assignment



Top view
OMP08170

Block Diagram



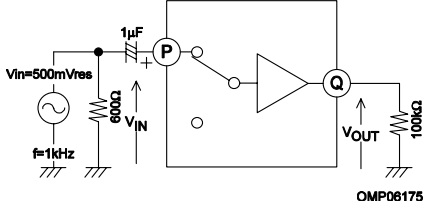
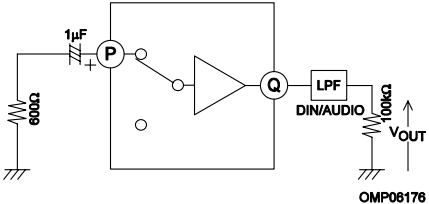
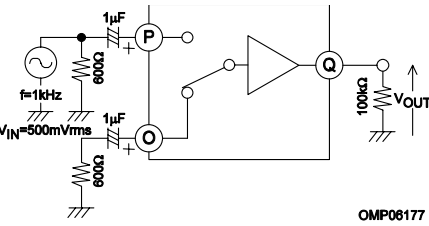
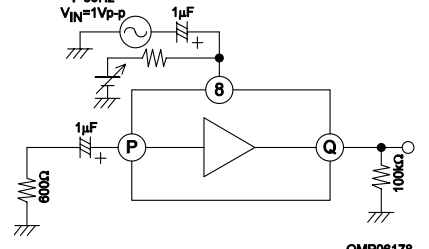
OMB06067

No.	Parameter	Explanations	Test circuit
1	Video signal voltage gain (A_v)	P : Pins 7, 9, 12, 19 Q : Pin 16 $V_{IN} = 1V_{p-p}$ Input impedance $75k\Omega$ $A_v = 20 \log V_{out}/V_{IN}$ (dB)	<p style="text-align: right;">OMP06171</p>
2	Video channel bandwidth (F_v)	P : Pins 7, 9, 12, 19 Q : Pin 16 $V_{IN} = 1V_{p-p}$ A frequency which becomes -3dB is measured.	<p style="text-align: right;">OMP06171</p>
3	Video channel noise (SN_v)	P : Pins 7, 9, 12, 19 Q : Pin 16	<p style="text-align: right;">OMP06172</p>
4	Video channel crosstalk (CT_v)	P : Pin 7 (Pins 9, 12, 19) O : Pins 9, 12, 19 (Pin 7) Q : Pin 16	<p style="text-align: right;">OMP06173</p>
5	Video channel PSRR (PS_v)	Pin 8, $f = 50Hz$ $V_{IN} = 1V_{p-p}$ P : Pins 7, 9, 12, 19 Q : Pin 16	<p style="text-align: right;">OMP06174</p>
6	Audio signal voltage gain (A_a)	P : Pins 1, 2, 3, 4, 5, 6, 21, 22 Q : Pins 17, 18 $V_{IN} = 500mV_{rms}$ $A_a = 20 \log V_{out}/V_{IN}$ (dB)	<p style="text-align: right;">OMP06175</p>

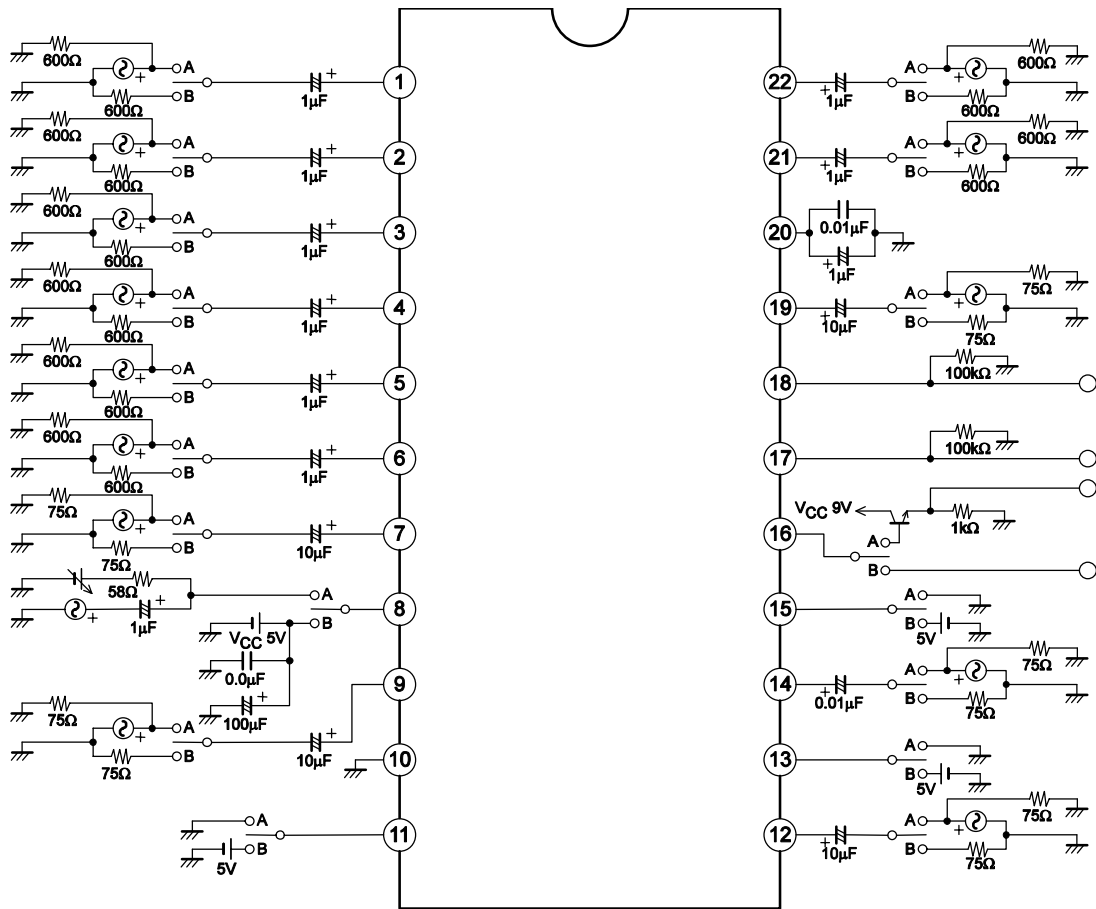
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No.	Parameter	Explanations	Test circuit
7	Audio channel bandwidth (Fa)	P : Pins 1, 2, 3, 4, 5, 6, 21, 22 Q : Pins 17,18 $V_{IN} = 500mV_{rms}$ A frequency which becomes -3dB is measured.	
8	Audio channel THD (THDa)		It's the same Audio Signal Voltage 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	
11	Audio channel PSSR (PSa)	Pin 8, $f = 50Hz$ $V_{IN} = 1V_{p-p}$ P : Pins 1, 2, 3, 4,5, 6, 21, 22 Q : Pins 17, 18	

Test Circuit



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