Ordering number : ENA0260

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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Electrical Characteristics at Ta = 25°C, V_{CC} = 9V

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Current dissipation	I_{CC}	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 ≤ 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	CTa	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 ≤ 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	Ayc	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 : 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

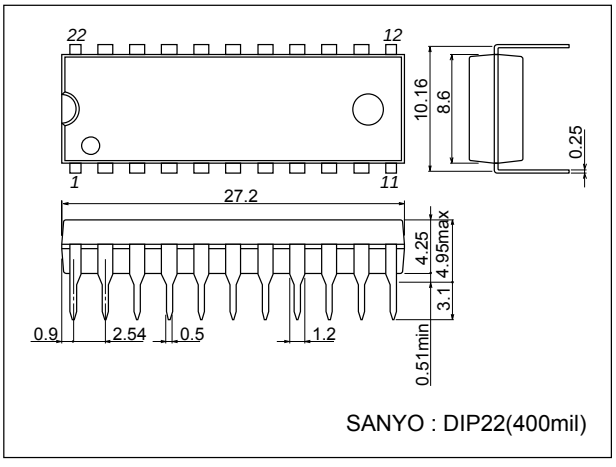
A : Pin 11	B : Pin 13	C : Pin 15		
		L	OPEN	H
L	L	LTV	LTV	LTV
H	L	L1	L1	L1
L	H	L2	L2	L2
H	H	L3	L3	L3

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

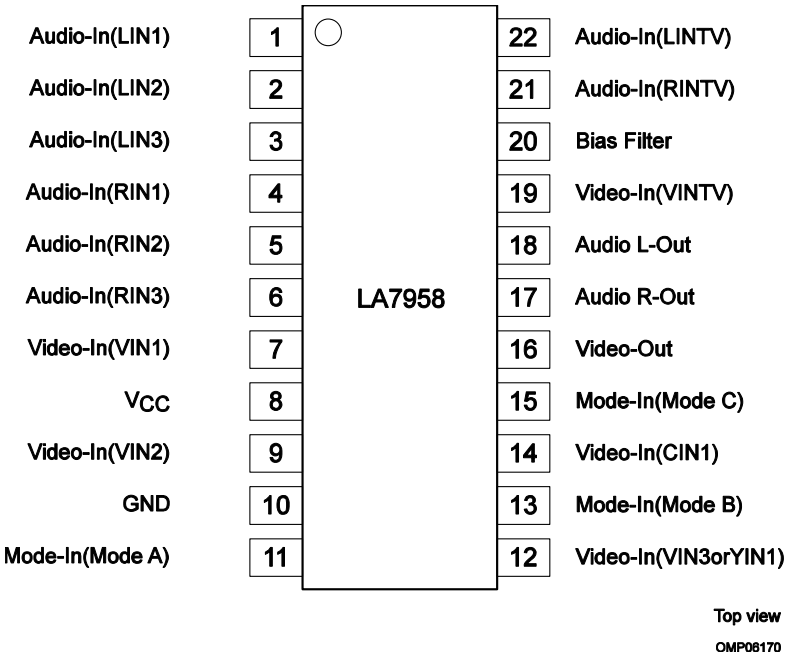
Package Dimensions

unit : mm

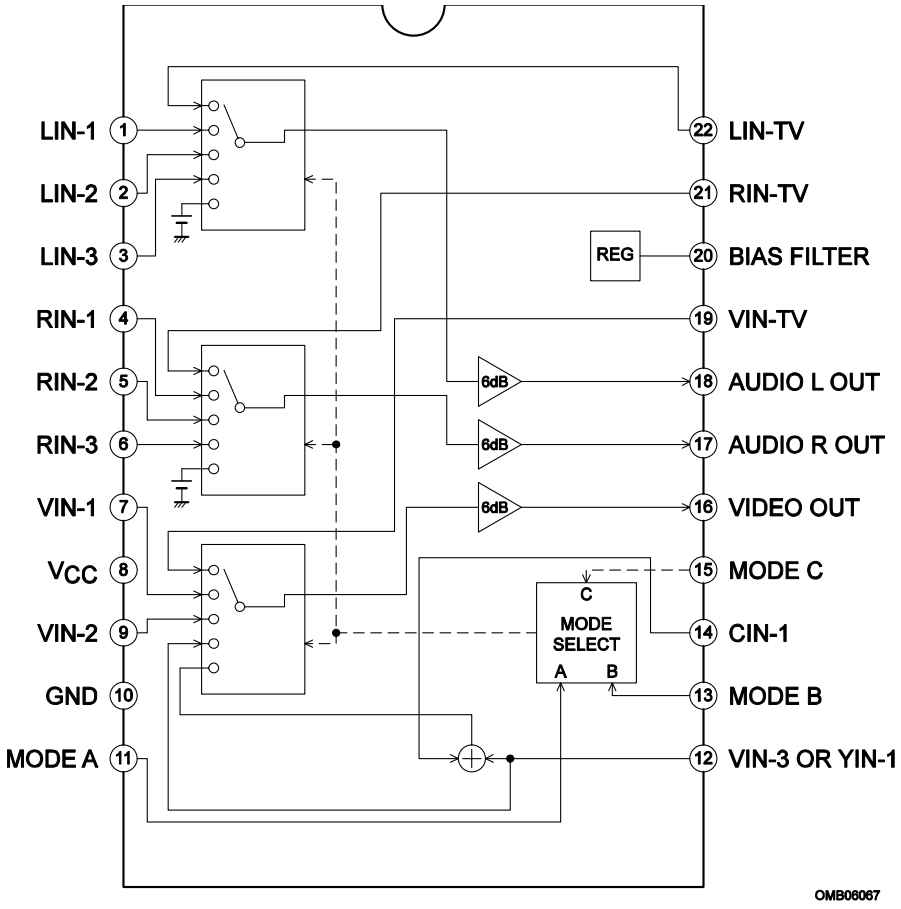
3010A

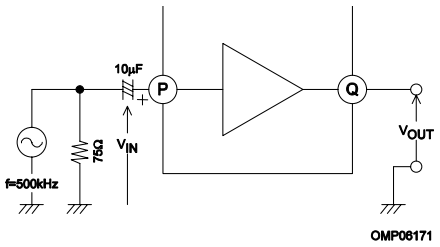
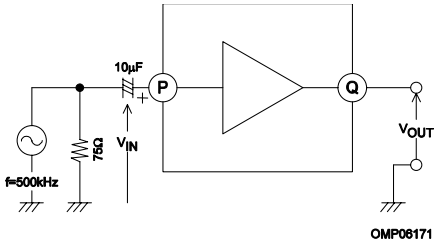
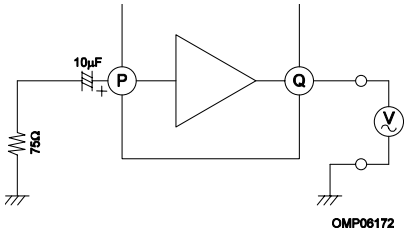
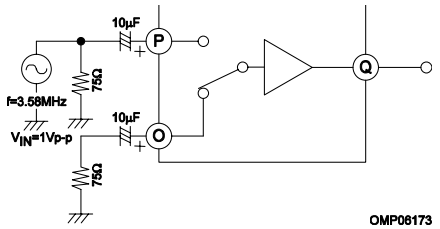
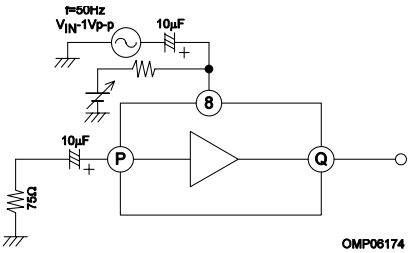
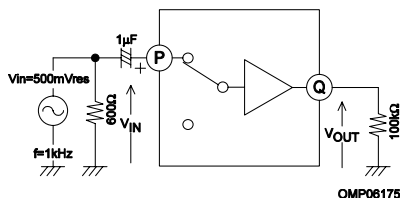


Pin Assignment



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 75kΩ Av = 20 log Vout/V_{IN} (dB)	
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	
5	Video channel PSRR (PSv)	Pin 8, f = 50Hz V_{IN} = 1Vp-p P : Pins 7, 9, 12, 19 Q : Pin 16	
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)	

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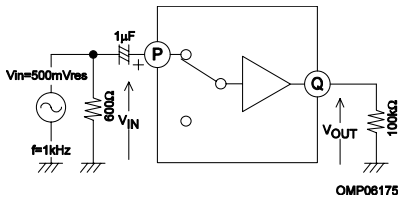
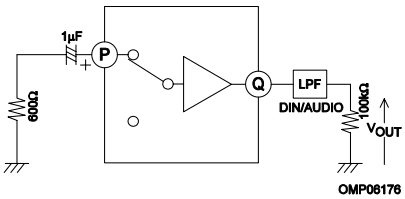
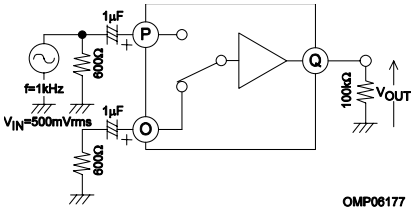
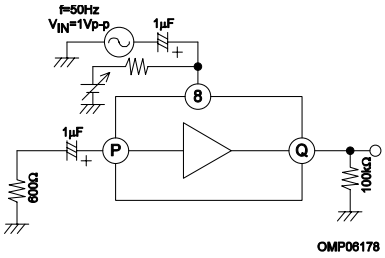
No.	Parameter	Explanations	Test circuit
7	Audio channel bandwidth (Fa)	P : Pins 1, 2, 3, 4, 5, 6, 21, 22 Q : Pins 17,18 V_{IN} = 500mVrms A frequency which becomes -3dB is measured.	
8	Audio channel THD (THDa)		It's the same Audio Signal Voltage Gain measurement circuit.
9	Audio channel S/N (SNa)	P : 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} = 1Vp-p P : Pins 1, 2, 3, 4,5, 6, 21, 22 Q : Pins 17, 18	

Test Circuit