◈ Description

The S4308 is a single preamplifier IC with built-in ALC circuit, and has been designed for use in stereo radio-cassette recorders and tape recorders. The preamplifier has high gain and low distortion, and can be directly coupled to the tape head without coupling capacitors. This prevents tape head magnetization and pop noise generation. A built-in rectifier means that an ALC dynamic range can be constructed with addition of just an external time constant circuit. The IC also includes power-on mute circuits that suppress pop noise generation.

◈ Features

- Built-in ALC rectifier diode
- Wide operating power supply voltage range (VCC=5V to 14V)
- Low current dissipation (IQ=2.1mA)
- High gain (GVO=80dB)
- Low distortion (THD=0.1%)
- Low noise (VNIN=1μVrms)
- Input coupling capacitor unnecessary.
- Power-on mute circuit.
- ALC dynamic range can be varied by the addition of an external input resistor.

◈ Applications

- Stereo radio cassette recorders, cassette decks and home stereo systems and music centers.

◈ Ordering Information

Type NO.	Marking	Package Code
S4308	308 □ ① ②	SOT-26

①Device Code ②Year&Week Code

◈ Absolute Maximum Ratings

Characteristics	Symbol	Value	Unit
Power Dissipation	Pd	200	mW
Operating Ambient Temperature	Ta	−25 ~ 75	℃
Storage Temperature	Tstg	-55 ~ 125	℃
Maximum Supply Voltage	Vcc(max)	15	V

◈ Recommended Operating Conditions

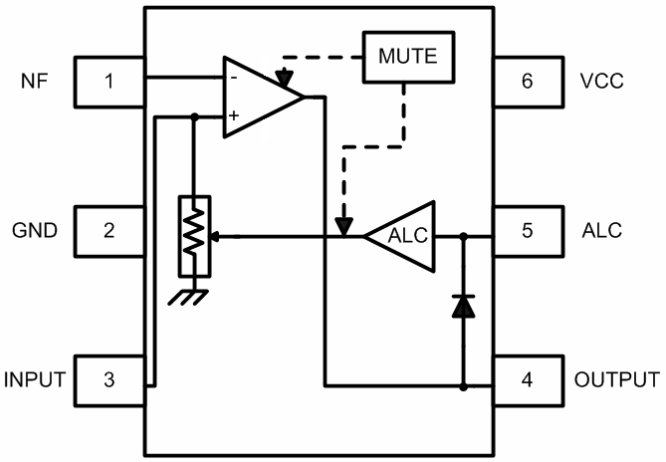
Parameter	Symbol	Min	Max	Unit
Power Supply Voltage	Vcc	5	14	V

◈ Electrical Characteristics

(Ta = 25℃, V_{CC}=7, f=1kHz and BPF : 20Hz to 20kHz)

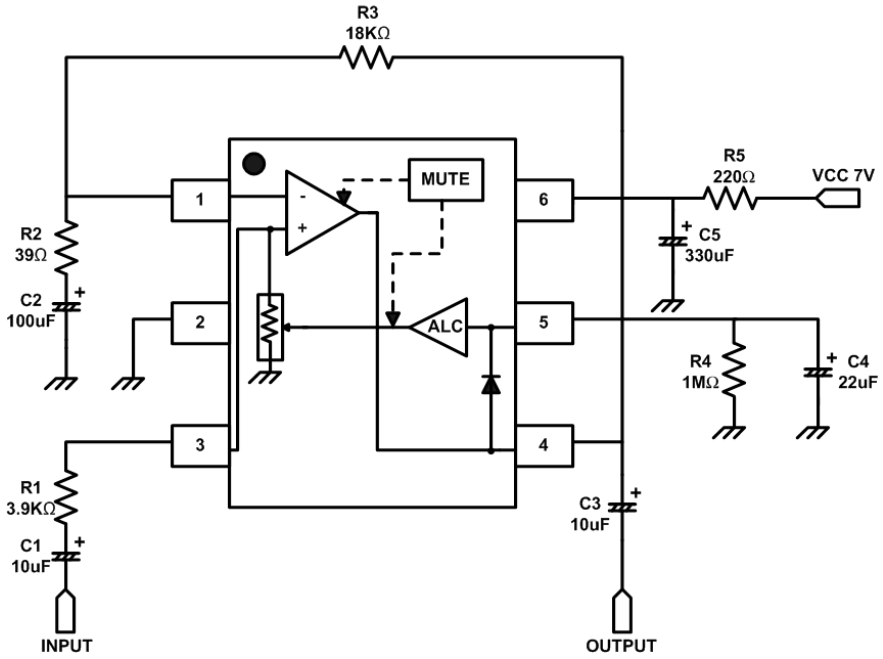
Characteristics	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Quiescent Current	IQ	VIN=0Vrms	1.2	2.1	3	mA
Open Loop Voltage Gain	GVO	VOUT=-10dBV(=0.316Vrms)	70	80		dB
Close Loop Voltage Gain	GVC	VOUT=-10dBV, f=1kHz	31	34	37	dB
Total Harmonic Distortion	THD	NAB 34dB, VOUT=40mVrms	-	0.1	0.3	%
Input Resistance	RIN	-	15	25	45	kΩ
Maximum Output Voltage	VOM	THD=1%	0.6	1.2	-	Vrms
Input Conversion Noise Voltage	VNIN	Conversion with Rg=2.2kΩ and NAB 34dB at 1kHz	-	1.0	2.0	uVrms
ALC Range	ALC	Rg=3.9kΩ, VIN=-70dBV Reference, THD=3%	40	45	-	dB

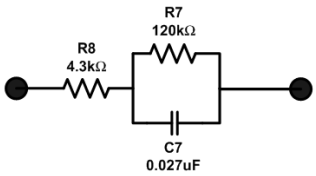
◈ Schematic Diagram



Pin	Symbol	Description
1	NF	Preamplifier -input
2	GND	Ground
3	INPUT	Preamplifier +input
4	OUTPUT	Preamplifier Output
5	ALC	Automatic Level Control
6	VCC	Supply Voltage

◈ Application Example





For NAB equalizer amplifier

1) Instead of R3.

2)Connect the circuit Between pin 4 and pin 1.

◈ Operation notes

1)Recording amplifier (Fig.1)

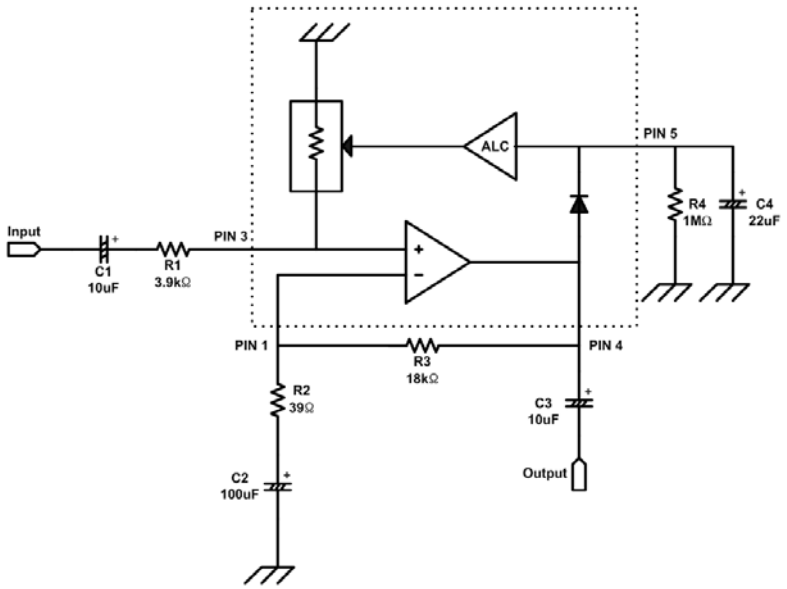
- Input coupling capacitor C1 is not required.
- Voltage gain : Gv = R3/R2
- “POP” noise is prevented by DC blocking capacitor C2 connected to pin1.

2) ALC (Automatic Level Control)

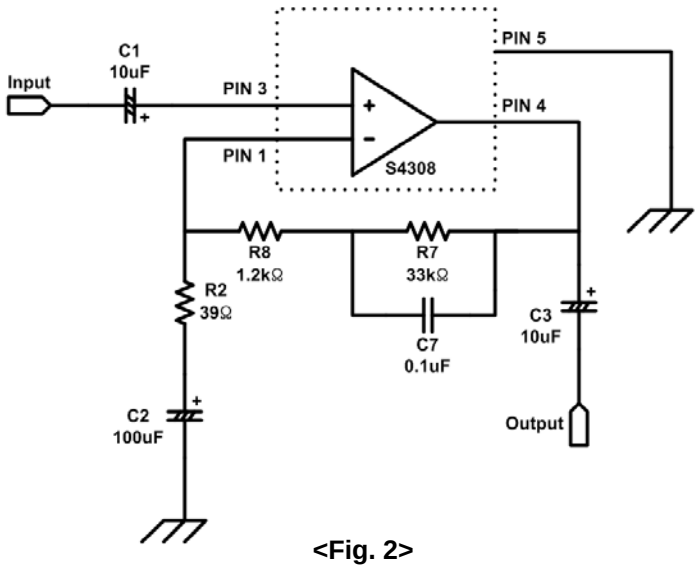
- The operating point of the S4308 output stage is fixed at 2.1V
- When the signal output voltage is 0.75Vrms, the ALC starts operating.
- Input signals is attenuated by the ratio of the electronic potentiometer resistance(RIN) and the external resistor R1.
- The range of the ALC can be varied by the value of R1.
- R1 is too large the S/N ratio will worsen. (Sufficient R1 value is several k ohms)
- R4 and C4 connected to pin 5 set the ALC attack and recovery times. the larger the value of time constant, the longer the recovery time, and the smaller the value of C4 the shorter the attack time.

3) NAB equalizer amplifier (Fig.2)

- During playback, the S4308 amplifier is used as NAB equalizer amplifiers.
- Voltage gain : GV = |R8 + R7 / (1 + jω C7 ∗ R7)| / R2
- The output stage (pin 4) operating point is fixed at 2.1V
- Max output voltage : 1.2Vrms(typ).
- ALC circuit is not required for playback.(pin 5 is grounded).

RECORDING AMPLIFIER	
OPERATION CIRCUIT	

<Fig. 1>

NAB EQUALIZER AMPLIFIER	
OPERATION CIRCUIT	

<Fig. 2>

◈ Electrical Characteristic Curves

Fig. 1 I_Q – V_{CC}

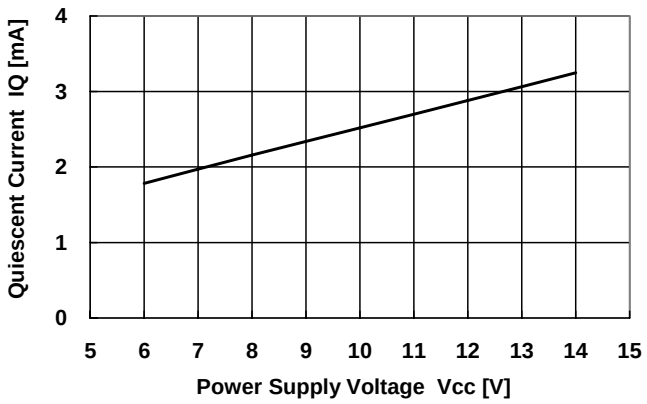


Fig. 2 I_Q – Ta

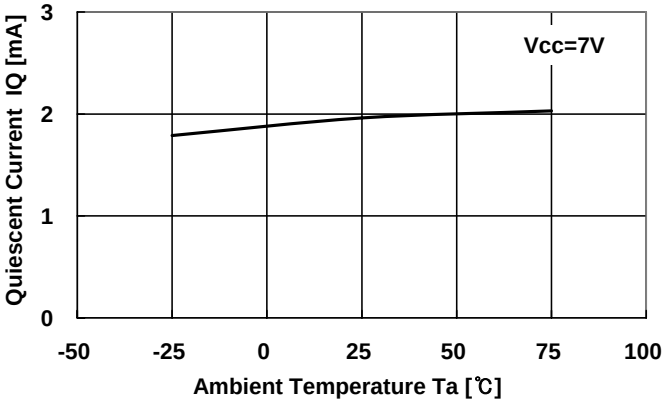


Fig. 3 Gv – f

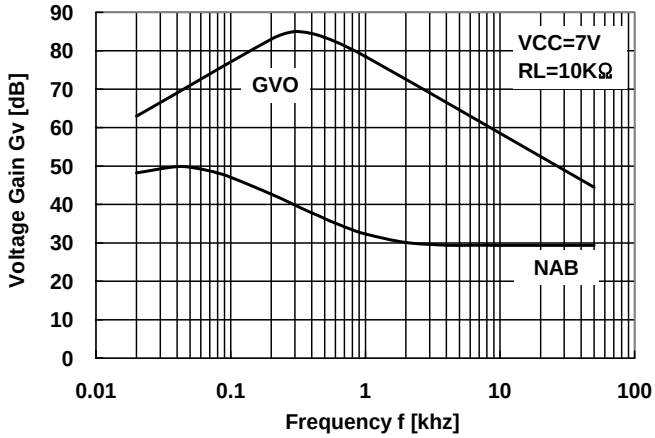


Fig. 4 V_{OUT} – V_{MUTE}

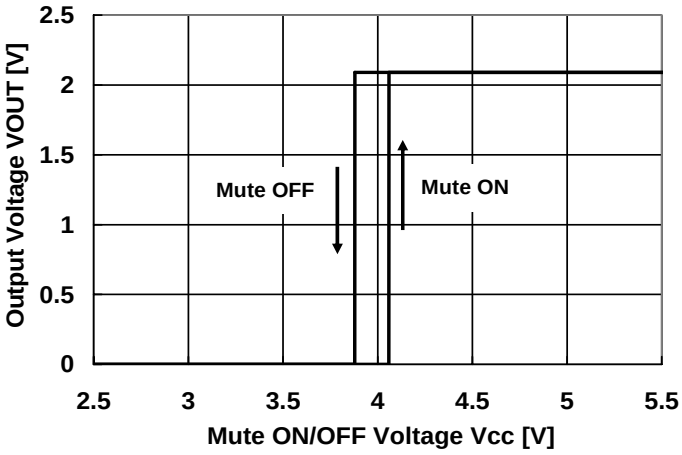


Fig. 5 ALC range – Ta

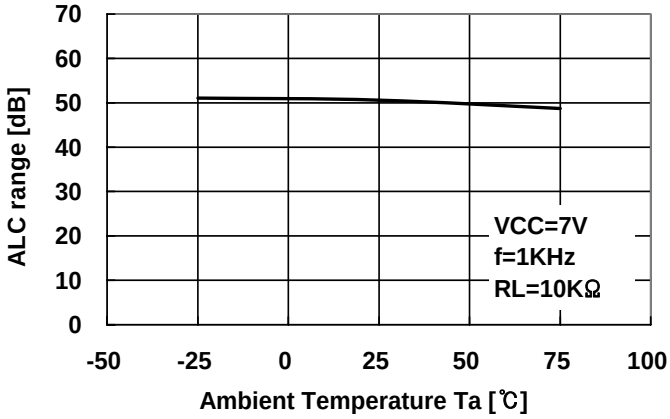
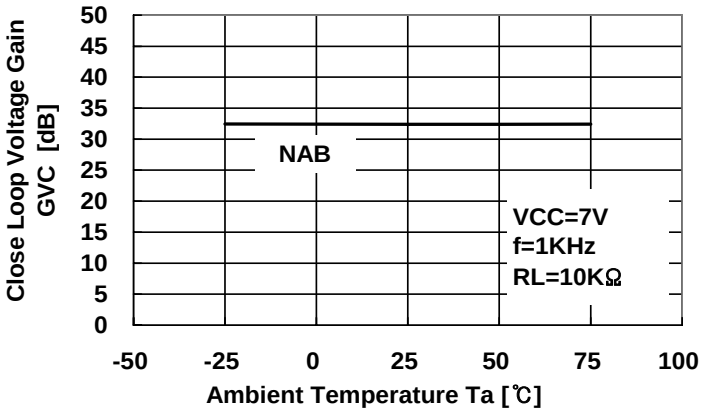


Fig. 6 G_{VC} – Ta



◈ Electrical Characteristic Curves

Fig. 7 V_{OM} – V_{CC}

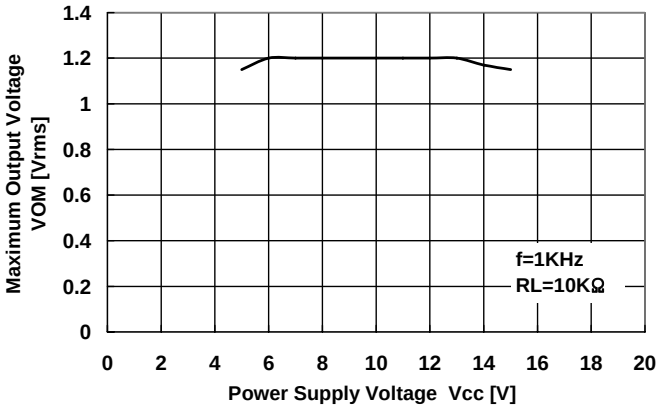
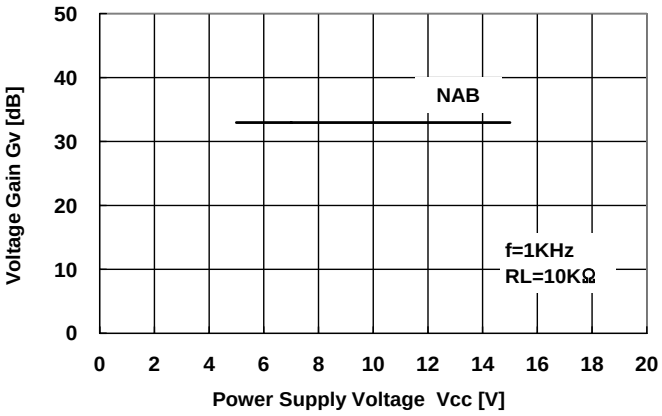
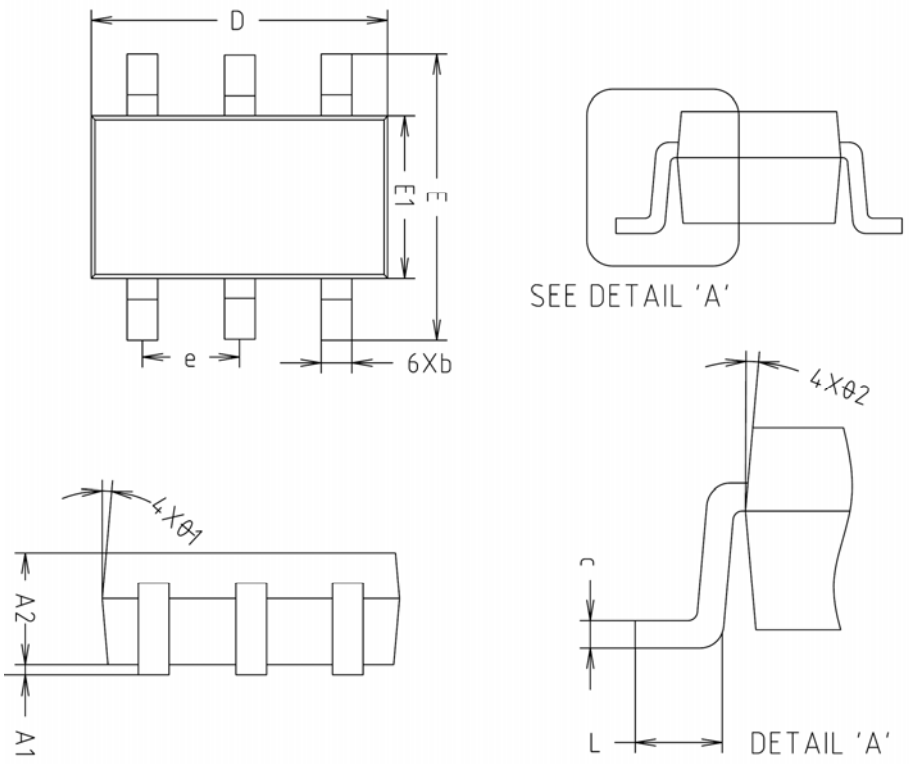


Fig. 8 G_V – V_{CC}



Outline Dimension(mm)



SYMBOL	MILLIMETERS(mm)			NOTE
	MINIMUM	NOMINAL	MAXIMUM	
A1	0.000	0.050	0.100	
A2	1.000	1.100	1.200	
b	-	0.400	0.450	
c	0.110	0.150	0.190	
D	2.800	2.900	3.000	
E	2.600	2.800	3.000	
E1	1.500	1.600	1.700	
e	0.930	0.950	0.970	
L	0.400	-	-	
θ1	5° REF			
θ2	5° REF			

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