



# TA7368P

## LINEAR INTEGRATED CIRCUIT

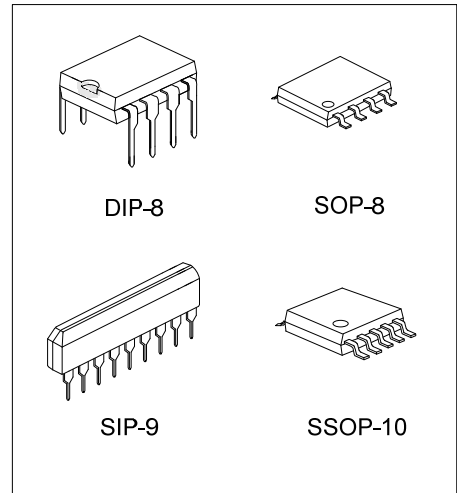
### 0.6W AUDIO POWER AMPLIFIER

■ DESCRIPTION

The UTC **TA7368P** is suitable for the audio power amplifier of portable cassette tape recorder and radio.

■ FEATURES

- \* Very Few External Components (Only Three Capacitors)
- \* Low Quiescent Current
- \* High Voltage Gain:  $G_v=40\text{dB}$



■ ORDERING INFORMATION

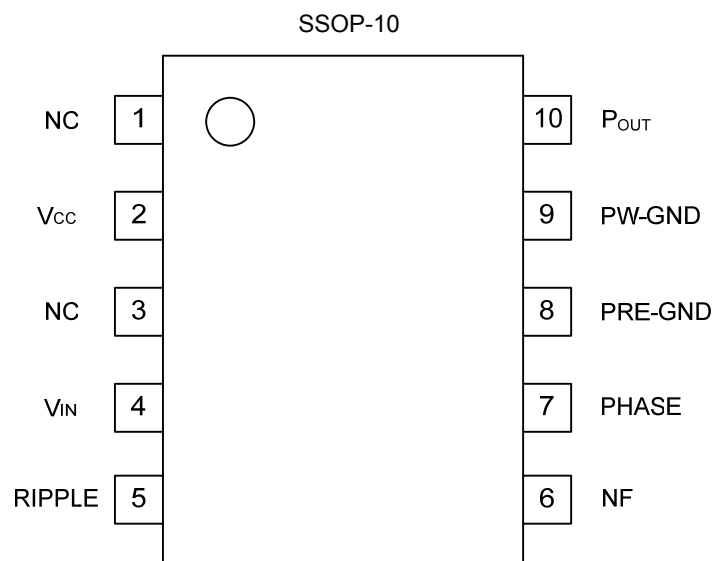
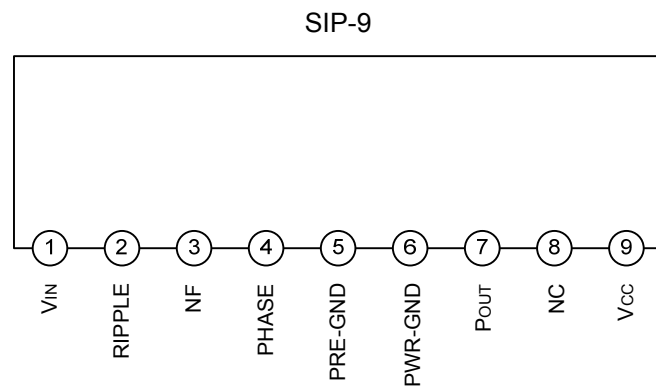
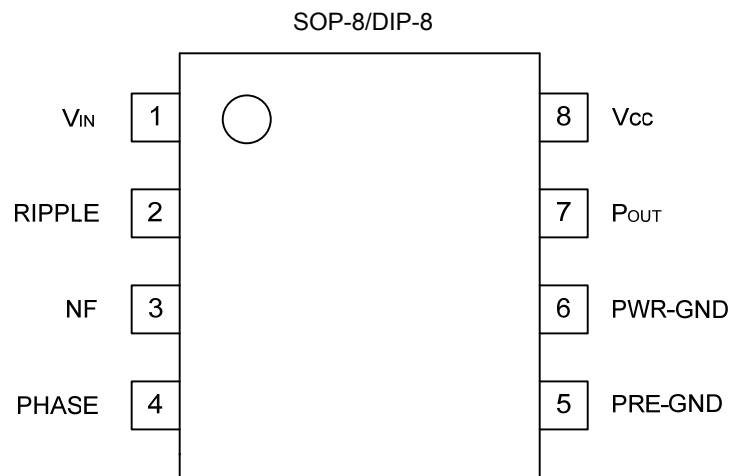
Ordering Number		Package	Packing
Lead Free	Halogen Free		
TA7368PL-D08-T	TA7368PG-D08-T	DIP-8	Tube
TA7368PL-S08-R	TA7368PG-S08-R	SOP-8	Tape Reel
TA7368PL-G09-T	TA7368PG-G09-T	SIP-9	Tube
TA7368PL-R10-R	TA7368PG-R10-R	SSOP-10	Tape Reel

<p>TA7368PG-D08-T</p> <p>(1)Packing Type (2)Package Type (3)Green Package</p>	<p>(1) T: Tube, R: Tape Reel (2) D08: DIP-8, S08: SOP-8, G09: SIP-9 R10: SSOP-10 (3) G: Halogen Free and Lead Free, L: Lead Free</p>
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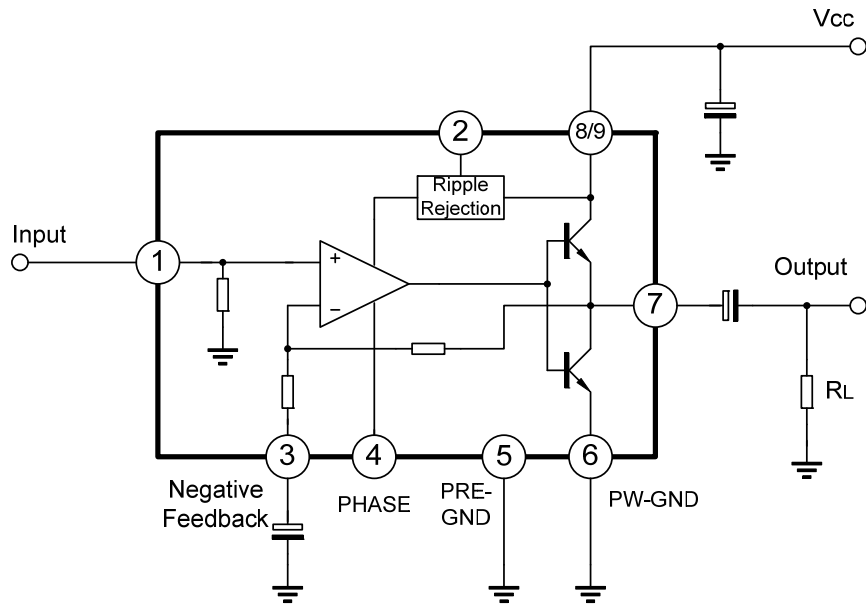
■ MARKING

DIP-8	SOP-8
<p>UTC □□□□ TA7368P □ □□</p> <p>8 7 6 5 → Date Code L: Lead Free G: Halogen Free □□ → Lot Code 1 2 3 4</p>	<p>UTC □□□□ TA7368P □ ● □□</p> <p>8 7 6 5 → Date Code L: Lead Free G: Halogen Free □□ → Lot Code 1 2 3 4</p>
SIP-9	SSOP-10
<p>UTC □□□□ TA7368P □ □□</p> <p>8 7 6 5 → Date Code L: Lead Free G: Halogen Free □□ → Lot Code 1 2 3 4 5 6 7 8 9</p>	<p>UTC □□□□ TA7368P □ ● □□</p> <p>10 9 8 7 6 → Date Code L: Lead Free G: Halogen Free □□ → Lot Code 1 2 3 4 5</p>

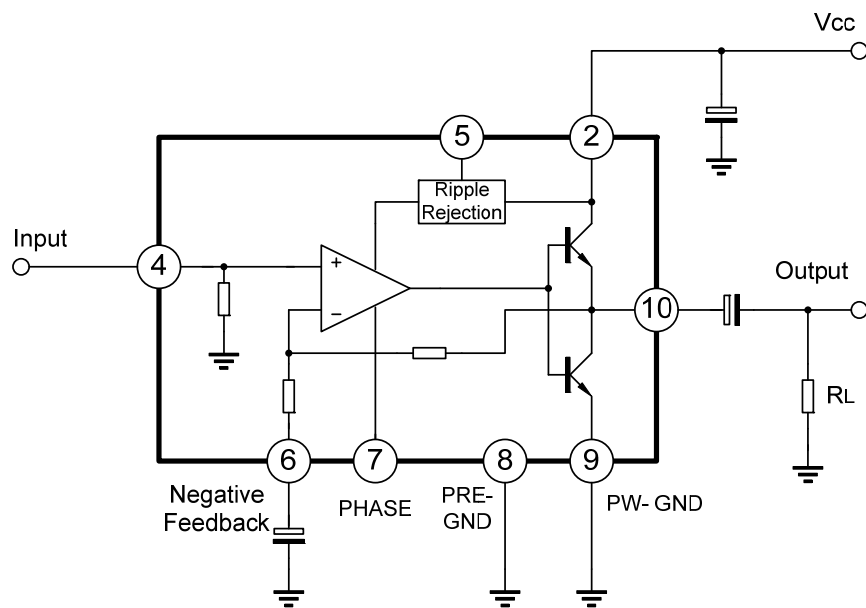
### ■ PIN CONFIGURATIONS



■ BLOCK DIAGRAMS



Note: Pin connection  
 DIP-8/SOP-8: PIN⑧:V<sub>CC</sub>  
 SIP-9: PIN⑧: NC, PIN⑨:V<sub>CC</sub>



Note: Pin connection for SSOP-10 package only.

■ ABSOLUTE MAXIMUM RATINGS ( $T_A=25^\circ\text{C}$ )

PARAMETER		SYMBOL	RATINGS	UNIT
Supply Voltage		$V_{CC}$	14	V
Power Dissipation	DIP-8	$P_D$	900	mW
	SIP-9		950	
	SOP-8/SSOP-10		400	
Operating Temperature		$T_{OPR}$	-30 ~ +75	$^\circ\text{C}$
Storage Temperature		$T_{STG}$	-55 ~ +150	$^\circ\text{C}$

Notes: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

2. Derated  $T_A > 25^\circ\text{C}$ , in the proportion of  $7.2\text{mW}/^\circ\text{C}$

■ ELECTRONIC CHARACTERISTICS

( $T_A=25^\circ\text{C}$ ,  $V_{CC}=6\text{V}$ ,  $f=1\text{kHz}$ ,  $R_g=600\Omega$ ,  $R_L=4\Omega$ , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Quiescent Circuit Current	$I_{CCQ}$	$V_{CC}=3\text{V}, V_{IN}=0$		5.5		mA
		$V_{CC}=9\text{V}, V_{IN}=0$		6.6	18	
		$V_{CC}=14\text{V}, V_{IN}=0$		7.5	21	
Voltage Gain	$G_V$	$V_{IN}=0.5\text{mVrms}$	37	40	43	dB
Output Power	$P_{OUT}$	$V_{CC}=3\text{V}, R_L=4\Omega, \text{THD}=10\%$		120		mW
		$V_{CC}=6\text{V}, R_L=4\Omega, \text{THD}=10\%$	500	720		
		$V_{CC}=9\text{V}, R_L=8\Omega, \text{THD}=10\%$	800	1100		
Total Harmonic Distortion	THD	$P_{OUT}=100\text{mW}$		0.3	1	%
Output Noise Voltage	eN	$R_G=10\text{k}\Omega, \text{BPF}=20\text{Hz}\sim 20\text{kHz}$		0.2	0.5	mVrms
Ripple Rejection	RR	$f_R=100\text{Hz}, V_R=0.3\text{Vrms}, \text{Crip}=0$		25		dB
Input Resistance	$R_{IN}$			27		k $\Omega$

■ TERMINAL DC VOLTAGE

Typical terminal DC Voltage at no signal with test circuit ( $V_{CC}=6\text{V}$ ,  $T_A=25^\circ\text{C}$ )

Pin No.	1	2	3	4	5	6	7	8	9	10
SOP-8/DIP-8	0	2.40	0.62	0.64	0	0	2.61	6.0	-	-
SIP-9	0	2.40	0.62	0.64	0	0	2.61	NC	6.0	-
SSOP-10	NC	6.0	NC	0	2.40	0.62	0.64	0	0	2.61

## ■ PRECAUTION FOR APPLICATION

### 1. Input stage (Figure 1)

The input stage of power amplifier is comprised of a PNP differential pair (Q2 and Q3) preceded by a PNP emitter follower (Q1) which allows DC referencing of the source signal to GND. This eliminates the need for an input coupling capacitor. However, in case the brush noise of volume becomes a problem, provide serially a coupling capacitor to the input side.

### 2. Adjustment of the voltage gain (Figure 2)

The voltage gain is fixed at  $G_V=40\text{dB}$  by the resistors (R4 and R5) in IC. Its reduction is possible through adding  $R_F$  as shown in Figure 2. In this case, the voltage gain is obtained by the following equation:  $G_V=20\log(R_5+R_4+R_F)/(R_4+R_F)$ . It is recommended to use this IC with the voltage gain of  $G_V=28\text{dB}$  or over.

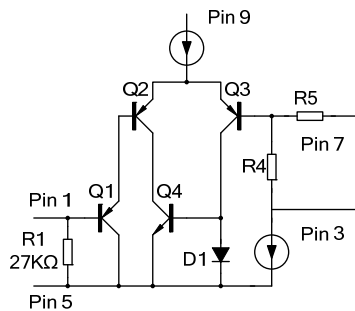


Figure 1

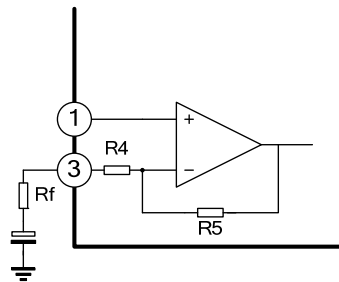


Figure 2

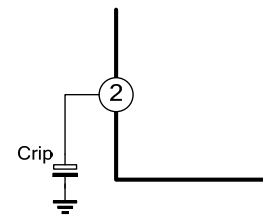


Figure 3

### 3. Ripple Rejection (Figure 3)

Adding Crip, to the ripple terminal 2 as shown in Figure 3, the ripple rejection ratio is improved from  $-25\text{dB}$  to  $-45\text{dB}$ .

### 4. Power dissipation

Casre should be taken to use IC below maximum power dissipation because it may be over maximum rating depending on operating condition.

$$P_D=900\text{mW} (T_A=25^\circ\text{C})$$

### 5. Phase-compensation

Small temperature coefficient and excellent frequency characteristics is needed by capacitor below:

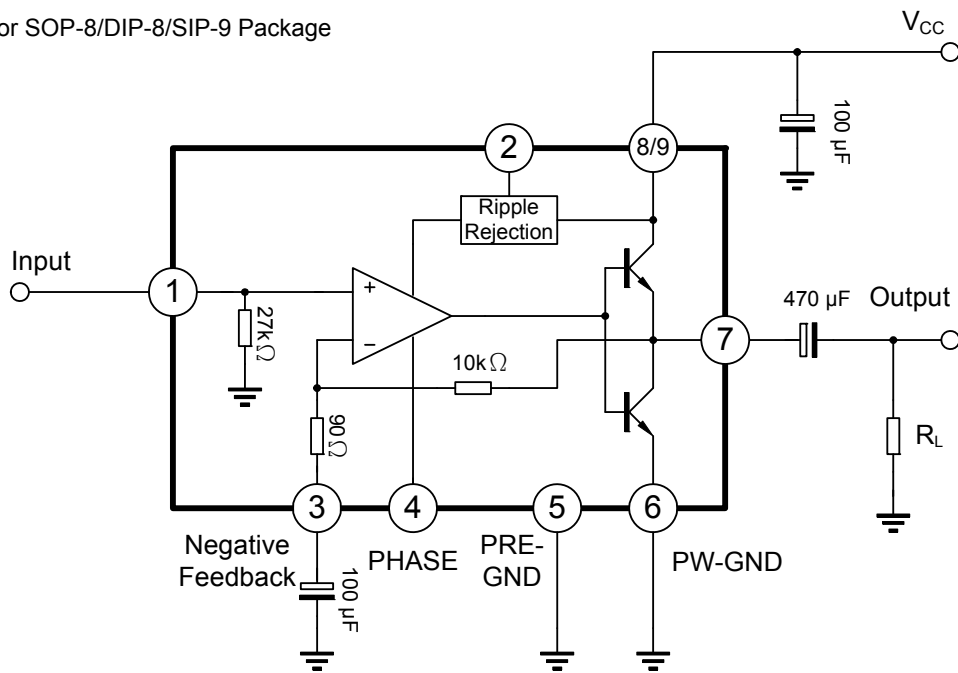
- \*Oscillation preventing capacitor for power amplifier output
- \*Bypass capacitor for ripple filter
- \*Capacitor between  $V_{CC}$  and GND

# TA7368P

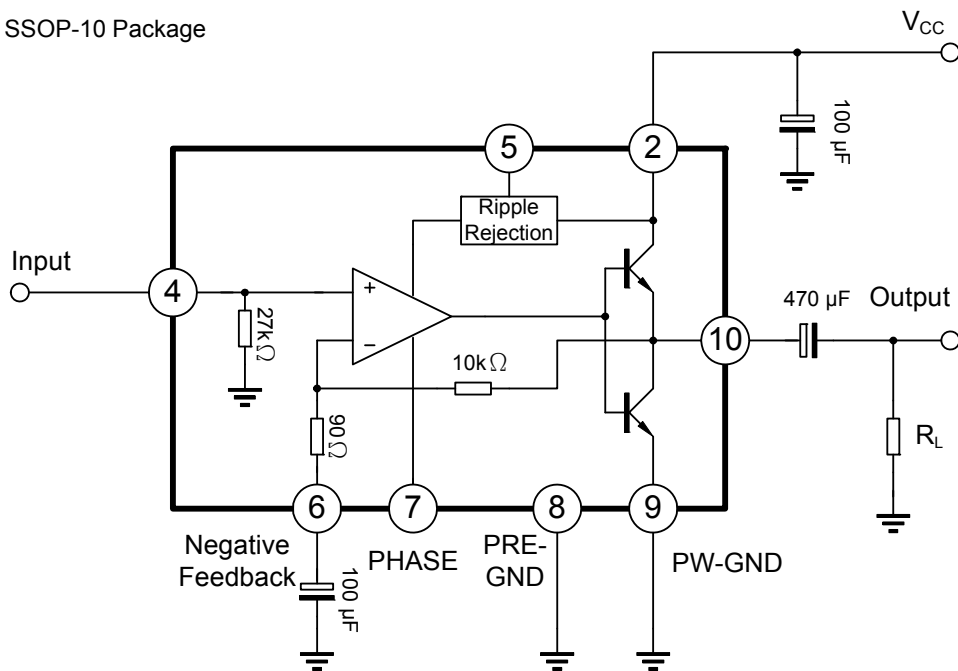
## LINEAR INTEGRATED CIRCUIT

### ■ TEST CIRCUITS

For SOP-8/DIP-8/SIP-9 Package



For SSOP-10 Package



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