

9097247 TOSHIBA. ELECTRONIC

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**TA7222AP**

T-74-05-01

**5.8W AUDIO POWER AMPLIFIER****CAR STEREO CAR RADIO AUDIO OUTPUT**

- Very Few External Parts (Require 4 PCS Capacitor)
- Adjustable Closed-Loop Gain
- High Sustaining Over Voltage  
(Surge voltage up to 40V for 0.2sec. pin 1 to 8)
- Excellent Ripple Rejection
- High Power and Low Distortion :  
 $P_{OUT}=5.8W(Typ.)$  at  $V_{CC}=13.2V$ ,  $R_L=4\Omega$ ,  $THD=10\%$ ,  
 $THD=0.2\%(Typ.)$
- Possible to Use for  $2\Omega$  Load :  
 $P_{OUT}=9.3W(Typ.)$  at  $V_{CC}=13.2V$ ,  $THD=10\%$
- Operating Supply Voltage Range :  $V_{CC}=8 \sim 18V$
- Audio Muting Circuit
- Protection Circuit (for Load Short, Excessive  
Supply Voltage and Thermal Shut-down)

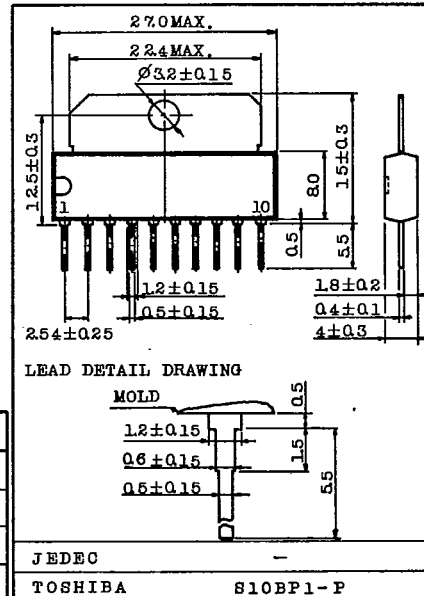
**MAXIMUM RATINGS** ( $T_a=25^\circ C$ )

CHARACTERISTIC	SYMBOL	RATING..	UNIT
Peak Supply Voltage (200ms)	$V_{CC}$ surge	40	V
D.C Supply Voltage	$V_{CC}(DC)$	25	V
Operating Supply Voltage	$V_{CC}(ope)$	18	V
Output Current (Peak)	$I_{O(peak)}$	4.5	A
Power Dissipation ( $T_c=25^\circ C$ )	$P_D$	12.5	W
Operating Temperature	$P_{opr}$	$-30 \sim 75$	$^\circ C$
Storage Temperature	$T_{stg}$	$-55 \sim 150$	$^\circ C$

**ELECTRICAL CHARACTERISTICS**(Unless otherwise specified,  $V_{CC}=12.5V$ ,  $R_L=4\Omega$ ,  $R_g=600\Omega$ ,  $f=1kHz$ ,  $T_a=25^\circ C$ )

CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Quiescent Current	$I_{CCQ}$	-	-	-	40	80	mA
			$V_{CC}=18V$	-	45	100	
Output Power	$P_{OUT}$	-	$THD=10\%$	-	5.2	-	W
			$V_{CC}=13.2V$ , $THD=10\%$	5.0	5.8	-	
			$V_{CC}=13.2V$ , $R_L=2\Omega$ , $THD=10\%$	-	9.3	-	
Maximum Output Power	$P_{OM}$	-	$V_{CC}=13.2V$ , $V_{IN}=100mV$	-	9.0	-	W
Total Harmonic Distortion	$THD$	-	$P_{OUT}=1W$	-	0.2	1.5	%
			$P_{OUT}=100mW$	-	0.36	1.0	
			$P_{OUT}=1W$ , $R_L=2\Omega$	-	0.5	-	
Voltage Gain	$G_v$	-	-	51.5	53	54.5	dB
Input Resistance	$R_{IN}$	-	-	-	34	-	k $\Omega$
Output Noise Voltage	$V_{NO}$	-	$R_g=10k\Omega$ , $BW=50 \sim 20kHz$	-	0.9	2.0	mV

Unit in mm



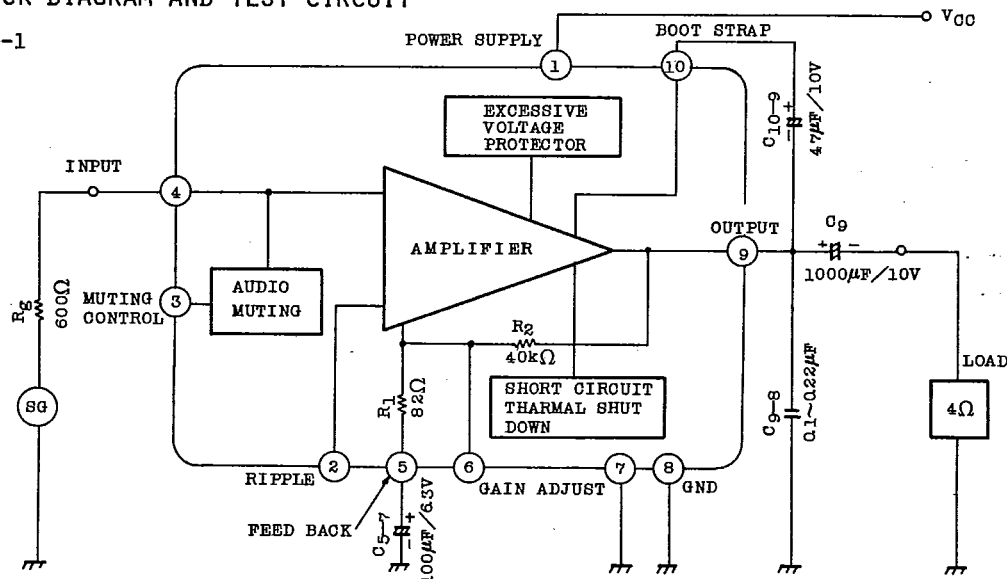
AUDIO LINEAR IC

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## BLOCK DIAGRAM AND TEST CIRCUIT

FIG-1



1. Terminal ⑦ is input stage GND, terminal ⑧ is output stage GND.
  2. Closed-loop voltage gain of the amplifier is determined by the ratio ;  $(R_1+R_2)/R_1$ . TA7222AP is fixed at typically 53.0 dB for designing minimum external components.
    - When higher closed loop gain is desired, the gain can be increased by connecting a resistor between pin ⑤ and pin ⑥ . Open loop gain is obtained by shortening pin ⑤ and pin ⑥ .
    - When lower closed loop gain is desired, the following two ways can be used.
      - A. Series connecting a resistor and a capacitor between pin ⑥ and pin ⑨ .
      - B. Series adding a resistor to pin ⑤.
- Both A and B, lower closed loop gain than 40 dB is not recommended. And also, ripple rejection ratio is decreased by using B configuration in such a case, connecting a capacitor from pin ② to ground is recommended. (Fig.2,3,4 show these ways.)
3. For applications requiring high ripple rejection ratio, an excellent supply voltage ripple rejection is obtained by connecting a capacitor (recommended value 4.7μF) between pin ② and ground. (R.R-f shows these characteristics)
  4. Terminal ③ is Audio Muting Control Input.
    - When control input is low state (; open or below 0.3V), muting circuit does not operate, OFF.
    - When control input is high state (; above 1.0V), muting circuit, then, operates, ON. (Refer to Fig.5)

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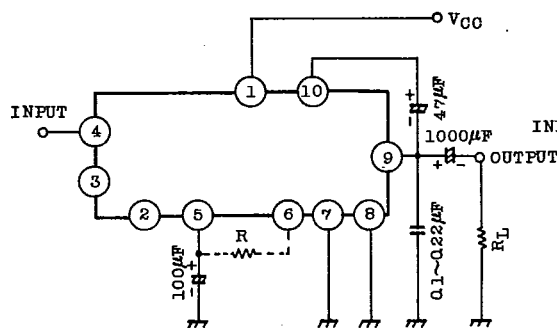
**APPLICATION CIRCUIT****HIGHER CLOSED LOOP GAIN CIRCUIT**

FIG-2

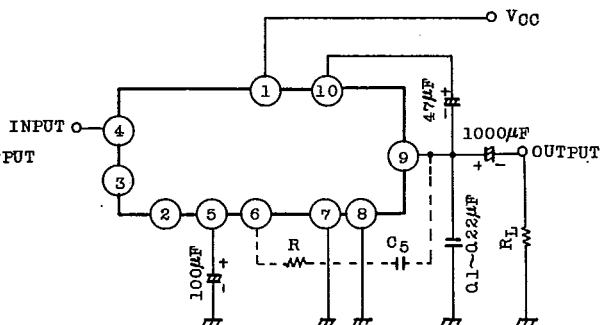
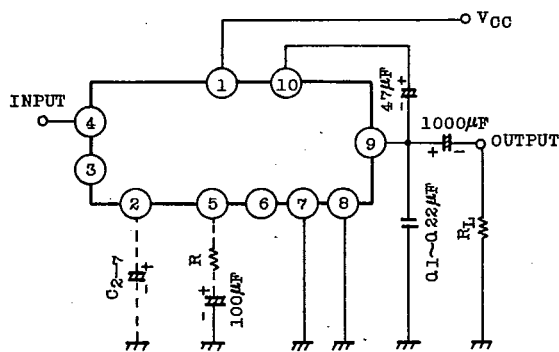
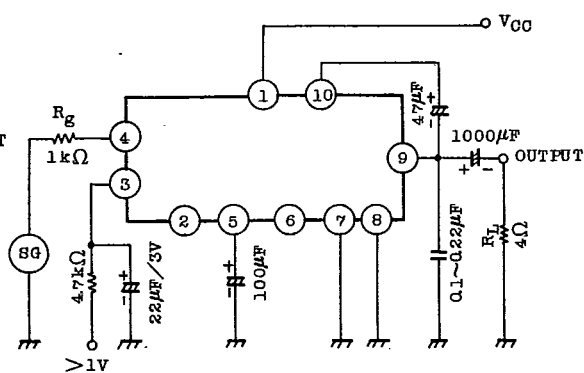
**LOWER CLOSED LOOP GAIN CIRCUIT (A)**

FIG-3

**LOWER CLOSED LOOP GAIN CIRCUIT (B)**

Note : Capacitor C2-7 must be used when high ripple rejection ratio is requested.

FIG-4

**AUDIO MUTING CIRCUIT**

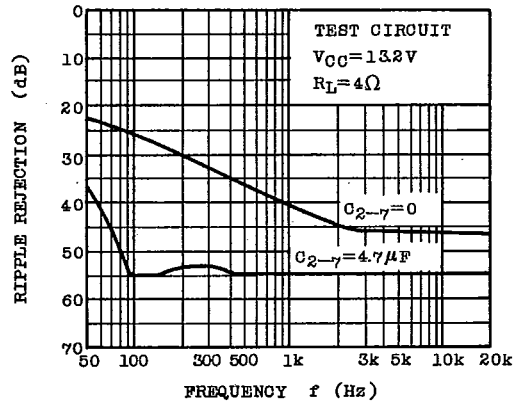
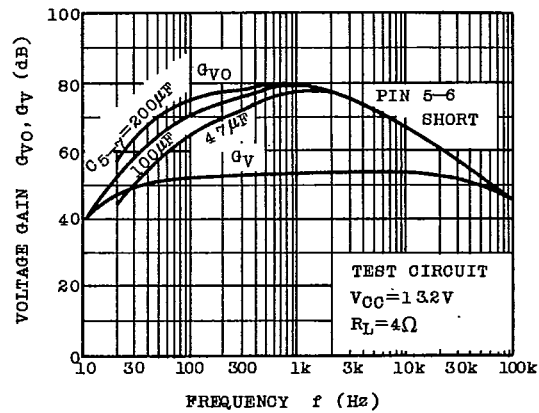
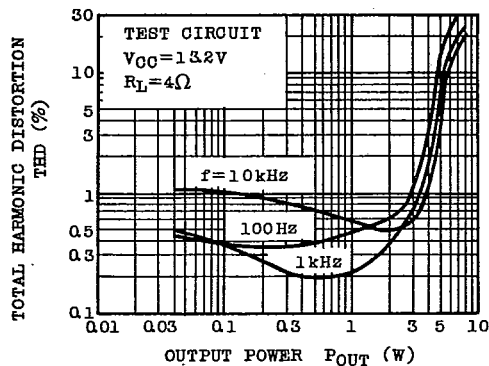
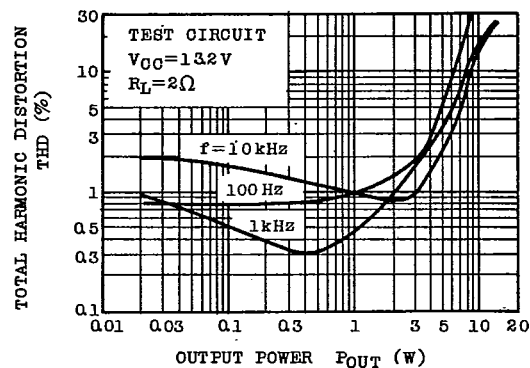
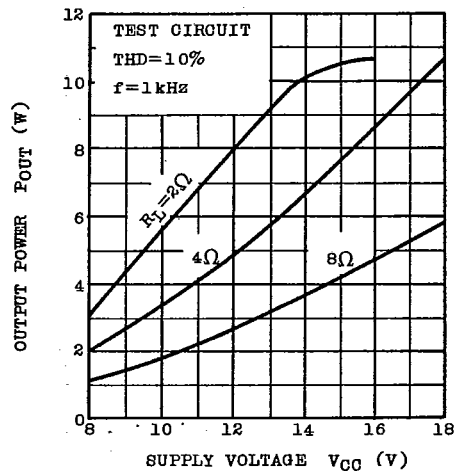
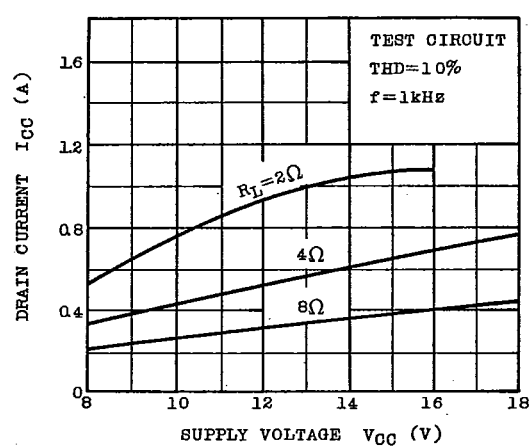
Note : Power output reduction level  
-40dB at  $R_g=1k\Omega$   
-35dB at  $R_g=0$

FIG-5

**AUDIO LINEAR IC**

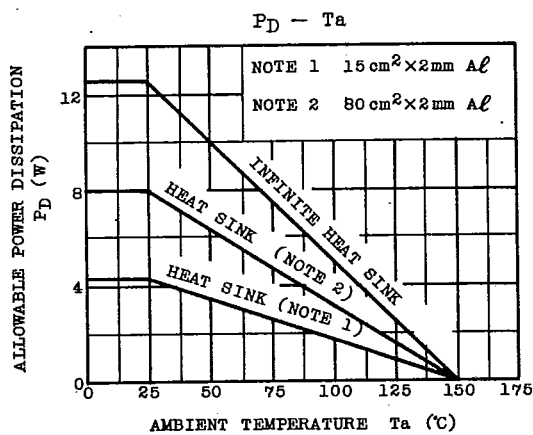
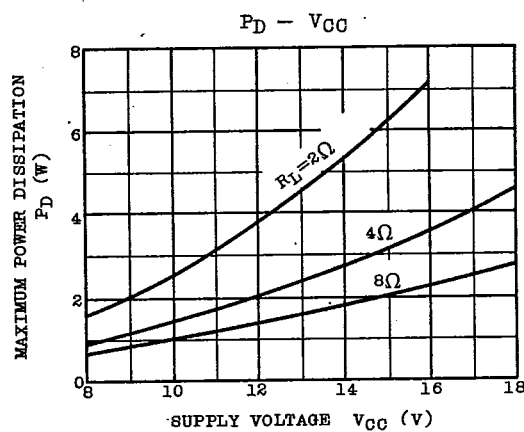
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RIPPLE REJECTION -  $f$  $G_{VO}, G_V - f$ THD -  $P_{OUT}$ THD -  $P_{OUT}$  $P_{OUT} - V_{CC}$  $I_{CC} - V_{CC}$ 

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