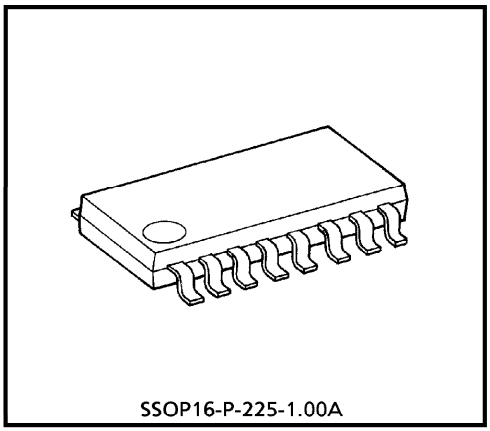
TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

TA8106F

STEREO HEADPHONE POWER AMPLIFIER (1.5V USE)

The TA8106F is a Dual headphone amplifier IC designed for low voltage operation (1.5V, 3.0V), which is suitable for stereo headphone radio and radio cassette recorder equipments. This item can realize the low power dissipation and have high power output capability.



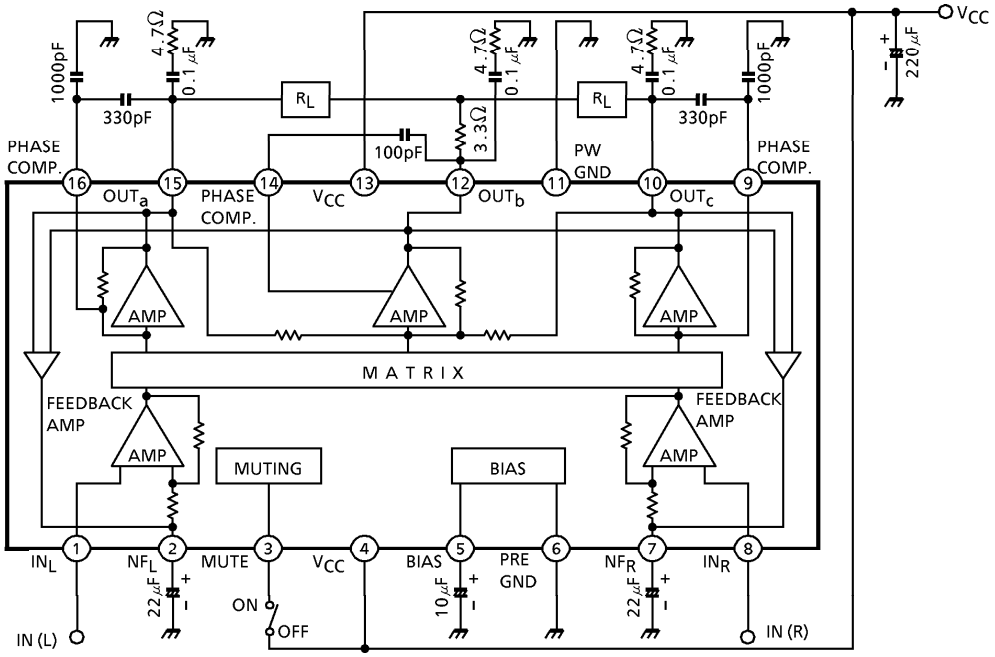
SSOP16-P-225-1.00A

Weight : 0.14g (Typ.)

FEATURES

- Condenser-less for input and output.
- Condenser-less for bootstrap.
- Built-in the muting function.
- High power output capability according to adopting the Matrix Drive Method.
  $P_{O\,(1)} = 14mW/ch$ (Typ.) at $V_{in\,(R)} = V_{in\,(L)}$ mode
  $P_{O\,(2)} = 5.5mW/ch$ (Typ.) at $V_{in\,(R)} = -V_{in\,(L)}$ mode
  $P_{O\,(3)} = 10.5mW/ch$ (Typ.) at $V_{in\,(R)} = 0$ or $V_{in\,(L)} = 0$
  ($V_{CC} = 1.5V$, $R_L = 32\Omega$, f = 1kHz, THD = 10%)
- Operating supply voltage range. : $V_{CC\,(opr)} = 0.9 \sim 5.0V$ (Ta = 25°C)

BLOCK DIAGRAM



(6) Total gain : G_V

In this system, the total gain G_V is given by

$$G_V = 20\ell og \frac{4 \times R_2}{R_1}$$

Typical values of this system is $R_1 = 1.6k\Omega$, $R_2 = 19k\Omega$, then this gain is ;

$G_V \fallingdotseq 34dB$ (Typ.)

(Note) The internal resistances are fixed, then the gain is fixed. In additional to the attenuator in front of this system, the gain is changeable.

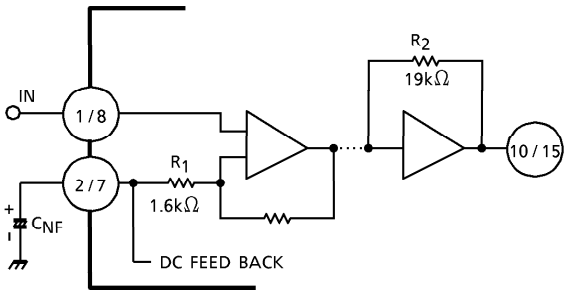


Fig.7

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V_{CC}	5	V
Output Current	$I_{O\ (peak)}$	160	mA
Power Dissipation	P_D (Note)	350	mW
Operating Temperature	T_{opr}	−25~75	°C
Storage Temperature	T_{stg}	−55~150	°C

(Note) Derated above Ta = 25°C in the proportion of 2.8mW / °C.

ELECTRICAL CHARACTERISTICS (AC)

(Unless otherwise specified, Ta = 25°C, V_{CC} = 1.5V, f = 1kHz, $R_g = 620\Omega$, $R_L = 32\Omega$)

CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Quiescent Supply Current	I_{CCQ}	—	$V_{in} = 0$	—	6	8.4	mA
Input Resistance	R_{IN}	—		—	50	—	kΩ
Voltage Gain	G_V	—	V_{in} = −50dBV	30	33	36	dB
Channel Balance	ΔG_V	—	$V_{in\ (R)} = V_{in\ (L)}$	—	0	1.3	dB
Output Power	P_o (1)	—	$V_{in\ (R)} = V_{in\ (L)}$ THD = 10%	11	14	—	mW
	P_o (2)	—	$V_{in\ (R)} = -V_{in\ (L)}$ THD = 10%	—	5.5	—	
	P_o (3)	—	$V_{in\ (R)} = 0$ or $V_{in\ (L)} = 0$ THD = 10%	—	10.5	—	
Total Harmonic Distortion	THD (1)	—	$P_{o\ (L)} = P_{o\ (R)} = 1mW$ $V_{in\ (R)} = V_{in\ (L)}$	—	0.4	1.0	%
	THD (2)	—	$P_{o\ (L)} = P_{o\ (R)} = 1mW$ $V_{in\ (R)} = -V_{in\ (L)}$	—	2.5	—	
	THD (3)	—	$V_{in\ (R)} = 0$ or $V_{in\ (L)} = 0$ $P_o = 1mW$	—	0.9	—	
Output Noise	V_{no}	—	$R_g = 620\Omega$, BPF = 20Hz~20kHz	—	0.15	0.3	mV_{rms}
Cross Talk	CT	—	V_o = −10dBV, $R_g = 620\Omega$	—	32	—	dB
Ripple Rejection Ratio	RR	—	V_r = −30dBV f_r = 100Hz, $R_g = 620\Omega$	—	35	—	dB
Muting Attenuation	ATT	—	V_{MUTE} = 1.5V	—	60	—	dB

DC CHARACTERISTICS (V_{CC} = 1.5V, Ta = 25°C, terminal voltage at no signal)

PIN No.	SYMBOL	TYP.	UNIT
PIN ① (INPUT L)	V_1	0.16	V
PIN ② (NF L)	V_2	0.73	V
PIN ③ (MUTE)	V_3	—	V
PIN ④ (V_{CC})	V_4	1.50	V
PIN ⑤ (BIAS)	V_5	0.74	V
PIN ⑥ (PRE GND)	V_6	0	V
PIN ⑦ (NF R)	V_7	0.73	V
PIN ⑧ (INPUT R)	V_8	0.16	V
PIN ⑨ (PHASE COMPENSATION)	V_9	0.80	V
PIN ⑩ (OUTPUT)	V_{10}	0.75	V
PIN ⑪ (PW GND)	V_{11}	0	V
PIN ⑫ (OUTPUT)	V_{12}	0.75	V
PIN ⑬ (V_{CC})	V_{13}	1.50	V
PIN ⑭ (PHASE COMPENSATION)	V_{14}	0.80	V
PIN ⑮ (OUTPUT)	V_{15}	0.75	V
PIN ⑯ (PHASE COMPENSATION)	V_{16}	0.80	V

TEST CIRCUIT