

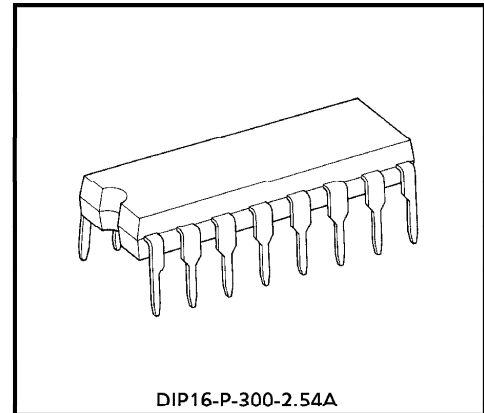
# TA8119P

## STEREO HEADPHONE AMPLIFIER (3V USE)

The TA8119P is developed for play-back stereo headphone player (3V use), which is built-in preamplifiers, power amplifiers (for headphone) and DC volume controls.

### FEATURES

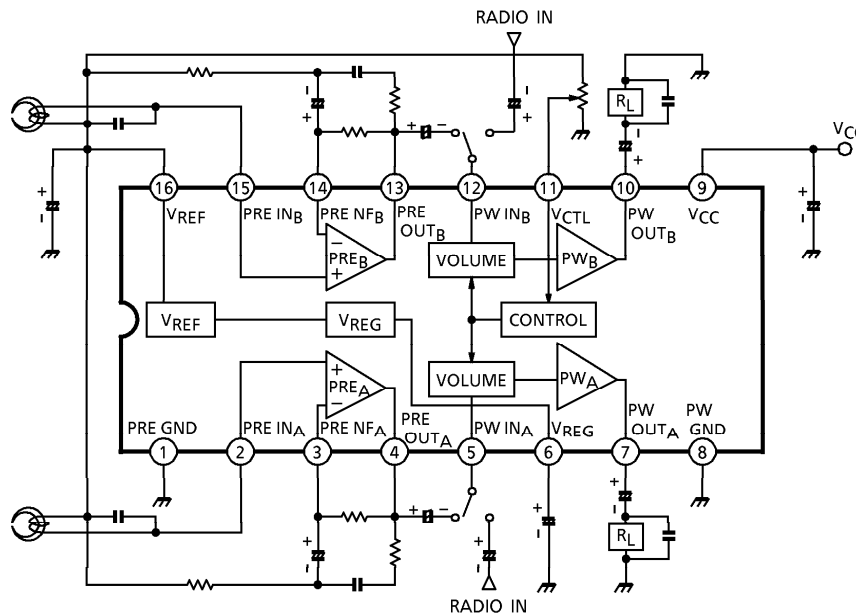
- Built-in DC volume controls
- Coupling condenser-less for input of preamplifier
- The loop gain of power amplifier is 30dB (Typ.), in case that DC volume is at maximum
- Available of external input signal from DC volume stage
- Low quiescent current ( $V_{CC} = 3V, T_a = 25^\circ C$ )  
 $I_{CCQ} = 9mA$  (Typ.)
- Operating supply voltage range ( $T_a = 25^\circ C$ )  
 $V_{CC} (opr) = 1.8 \sim 6V$



DIP16-P-300-2.54A

Weight : 1.00g (Typ.)

### BLOCK DIAGRAM



961001EBA2

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**PIN FUNCTION**

Terminal voltage : Typical terminal voltage at no signal with test circuit ( $V_{CC} = 3V, T_a = 25^\circ C$ )

PIN No.	PIN NAME	CONTENTS	EQUIVALENT	TERMINAL VOLTAGE (V)
1	PRE GND	—	—	0
2	PRE IN <sub>A</sub>	Input of preamplifier		1.3
15	PRE IN <sub>B</sub>			1.3
3	PRE NF <sub>A</sub>	NF of preamplifier		1.3
14	PRE NF <sub>B</sub>			1.3
4	PRE OUT <sub>A</sub>	Output of preamplifier		1.3
13	PRE OUT <sub>B</sub>			1.3
5	PW IN <sub>A</sub>	Input of power amplifier for headphone (through DC volume stage)		1.3
12	PW IN <sub>B</sub>			1.3
6	V <sub>REG</sub>	Ripple filter of power supply		2.6
16	V <sub>REF</sub>	Reference voltage		1.3
7	PW OUT <sub>A</sub>	Output of power amplifier		1.3
10	PW OUT <sub>B</sub>			1.3
8	PW GND	—	—	0
9	V <sub>CC</sub>	—	—	3
11	V <sub>CTL</sub>	Input of control voltage for volume control		—

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**APPLICATION NOTE**

- (1) A volume which has the characteristic "curve A" is available for the DC volume control.
- (2) The capacitor C is used for absorbing volume sliding noise.
- (3) The DC volume control circuit is applicable to "Function of Mute", connecting as Fig.1.  
In case of tuning mute-on, the load of "Reference voltage circuit" is R, at maximum volume.
- (4) Small temperature coefficient and excellent frequency characteristic is needed by capacitors below.
  - Oscillation preventing capacitors for power amplifier output.
  - Capacitor between  $V_{REF}$  and GND.
  - Capacitor between  $V_{CC}$  and GND.
  - Capacitor between  $V_{REG}$  and GND.

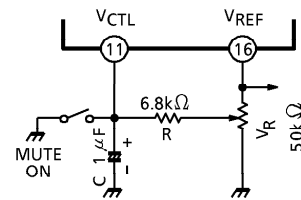


Fig.1 Function of mute

**MAXIMUM RATINGS (Ta = 25°C)**

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	$V_{CC}$	7	V
Output Current	$I_{O(peak)}$	120	mA
Power Dissipation	$P_D$ (Note)	750	mW
Operating Temperature	$T_{opr}$	- 25~75	°C
Storage Temperature	$T_{stg}$	- 55~150	°C

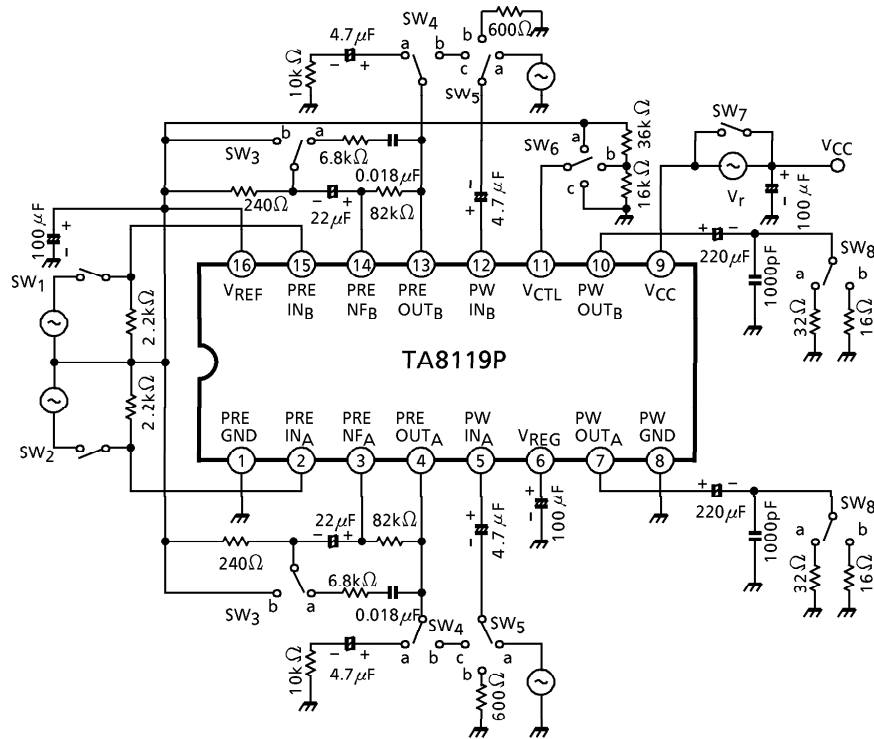
(Note) Derated above  $T_a = 25^\circ\text{C}$  in the proportion of  $6\text{mW}/^\circ\text{C}$ .

**ELECTRICAL CHARACTERISTICS**

Unless otherwise specified,  $V_{CC} = 3V$ ,  $T_a = 25^\circ C$ ,  $f = 1kHz$   
 Preamplifier :  $R_L = 10k\Omega$ , Vol = MIN  
 Power amplifier :  $R_L = 32\Omega$ , Vol = MAX

CHARACTERISTIC		SYMBOL	TEST CIRCUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Quiescent Supply Current		I <sub>CCQ1</sub>	—	V <sub>in</sub> = 0, Vol = MIN	—	9.0	13.0	mA
		I <sub>CCQ2</sub>	—	V <sub>in</sub> = 0, Vol = MAX	—	11.0	—	
Preamplifier Section	Open Loop Voltage Gain	G <sub>VO</sub>	—	V <sub>O</sub> = -12dBV	55	62	—	dB
	Closed Loop Voltage Gain	G <sub>VC</sub>	—	NAB = 1kHz, V <sub>O</sub> = -12dBV	—	33	—	dB
	Maximum Output Voltage	V <sub>Om</sub>	—	THD = 1%	600	720	—	mV <sub>rms</sub>
	Total Harmonic Distortion	THD1	—	V <sub>O</sub> = -12dBV	—	0.04	0.1	%
	Equivalent Input Noise Voltage	V <sub>ni</sub>	—	R <sub>g</sub> = 2.2kΩ BPF = 30Hz~20kHz NAB (G <sub>V</sub> = 33dB, f = 1kHz)	—	1.2	2.0	μV <sub>rms</sub>
	Ripple Rejection Ratio	RR1	—	R <sub>g</sub> = 2.2kΩ V <sub>r</sub> = -22dBV, f <sub>r</sub> = 100Hz	—	46	—	dB
Power Amplifier Section	Output Power	(1)	P <sub>O1</sub>	—	THD = 10%	20	27	mW
		(2)	P <sub>O2</sub>	—	R <sub>L</sub> = 16Ω, THD = 10%	—	39	
	Voltage Gain (1)	G <sub>V1</sub>	—	V <sub>O</sub> = -12dBV	28	30	32	dB
	Channel Balance	CB			—	0	1.5	dB
	Voltage Gain (2)	G <sub>V2</sub>	—	V <sub>O</sub> = -12dBV, Vol = MID	—	15	—	dB
	Total Harmonic Distortion	THD2	—	P <sub>O</sub> = 10mW	—	0.5	1.2	%
		THD3			P <sub>O</sub> = 10mW, Vol = MID	—	0.3	
	Output Noise Voltage	V <sub>no</sub>	—	R <sub>g</sub> = 600Ω BPF = 30Hz~20kHz	—	250	320	μV <sub>rms</sub>
	Maximum Attenuation	ATT	—	V <sub>O</sub> = -12dBV Vol = MAX→MIN	66	72	—	dB
Ripple Rejection Ratio	RR2	—	R <sub>g</sub> = 600Ω V <sub>r</sub> = -22dBV, f <sub>r</sub> = 100Hz	—	46	—	dB	
Total	Cross Talk (CH-A / CH-B)	CT	—	R <sub>g</sub> = 2.2kΩ V <sub>O</sub> = -12dBV, Vol = MAX	34	40	—	dB

TEST CIRCUIT



**SWITCH STATE FOR ELECTRICAL CHARACTERISTICS**

CHARACTERISTIC	SW <sub>1</sub>	SW <sub>2</sub>	SW <sub>3</sub>	SW <sub>4</sub>	SW <sub>5</sub>	SW <sub>6</sub>	SW <sub>7</sub>	SW <sub>8</sub>
I <sub>CCQ1</sub>	x	x	a	a	b	c	○	a
I <sub>CCQ2</sub>	x	x	a	a	b	a	○	a
GVO	○	○	b	a	b	c	○	a
GVC	○	○	a	a	b	c	○	a
V <sub>om</sub>	○	○	a	a	b	c	○	a
THD1	○	○	a	a	b	c	○	a
V <sub>ni</sub>	x	x	a	a	b	c	○	a
RR1	x	x	a	a	b	c	x	a
P <sub>o1</sub>	x	x	a	a	a	a	○	a
P <sub>o2</sub>	x	x	a	a	a	a	○	b
GV1	x	x	a	a	a	a	○	a
CB	x	x	a	a	a	a	○	a
GV2	x	x	a	a	a	b	○	a
THD2	x	x	a	a	a	a	○	a
THD3	x	x	a	a	a	b	○	a
V <sub>no</sub>	x	x	a	a	b	a	○	a
ATT	x	x	a	a	a	a→c	○	a
RR2	x	x	a	a	b	c	x	a
CT	○ / x	x / ○	a	b	c	a	○	a

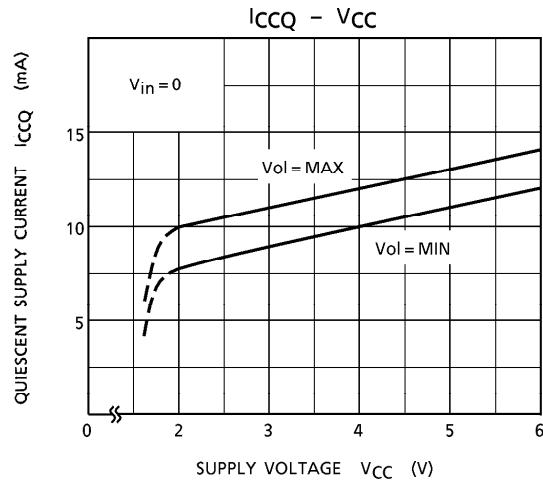
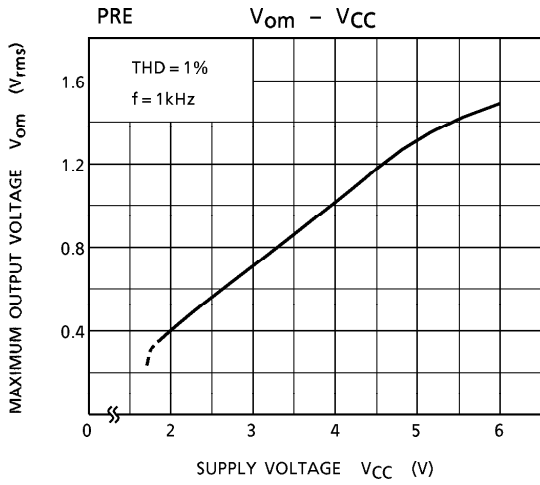
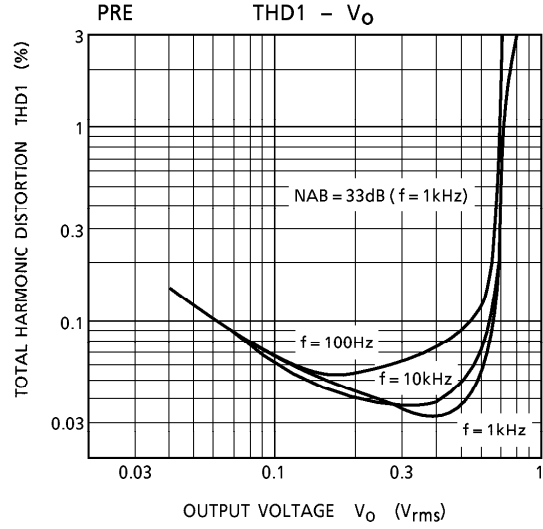
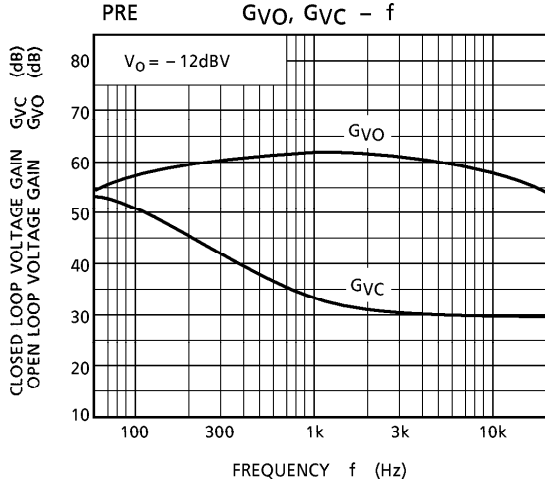
○ : short    x : open

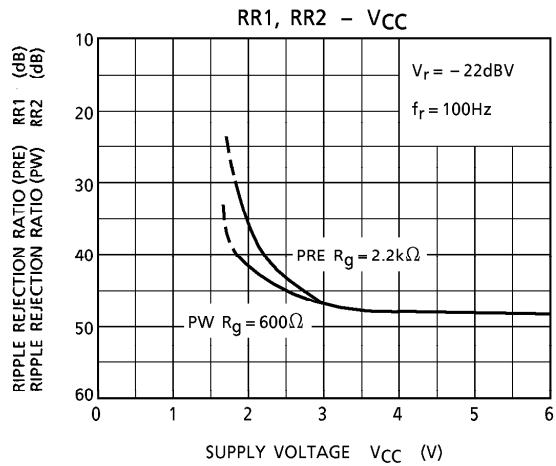
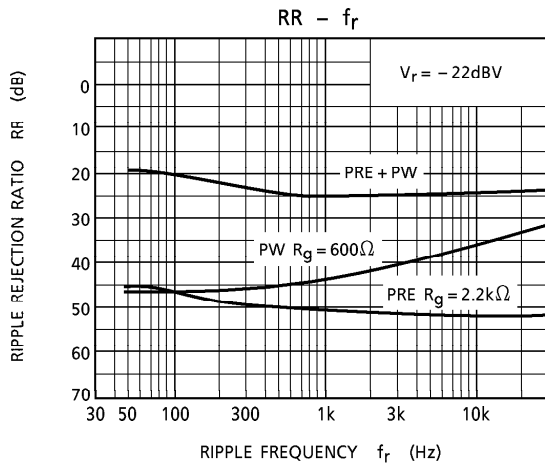
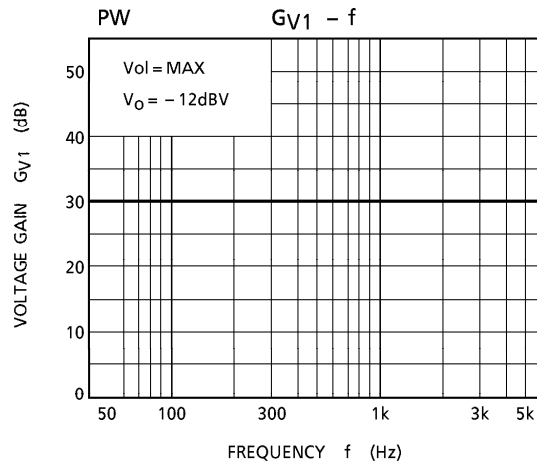
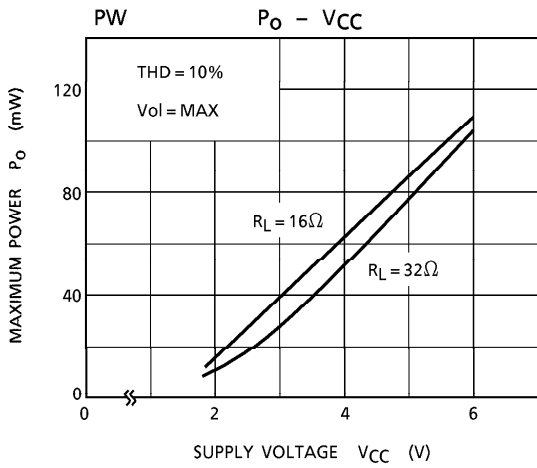
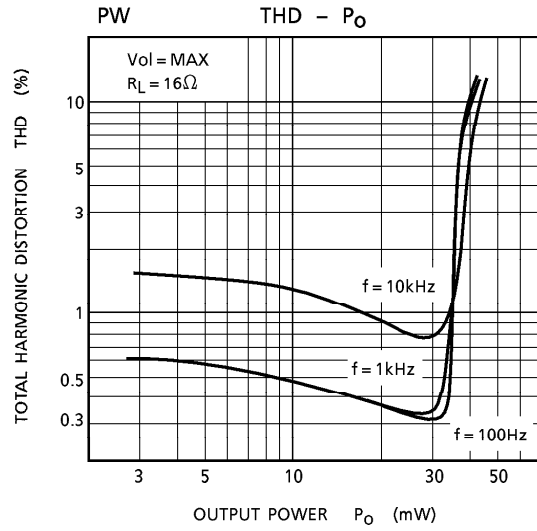
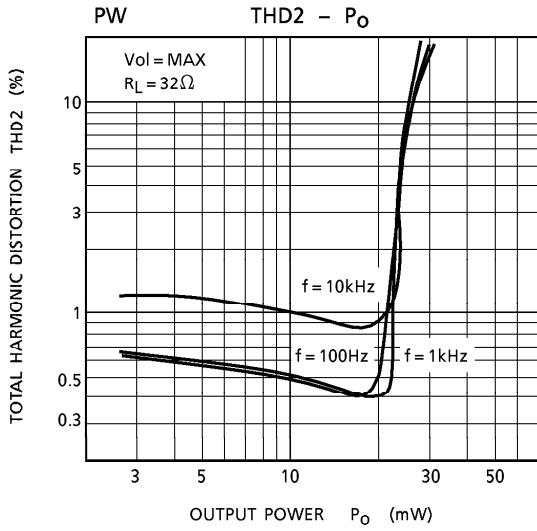
**CHARACTERISTIC CURVES**

Unless otherwise specified :  $V_{CC} = 3V$ ,  $f = 1kHz$ ,  $T_a = 25^\circ C$

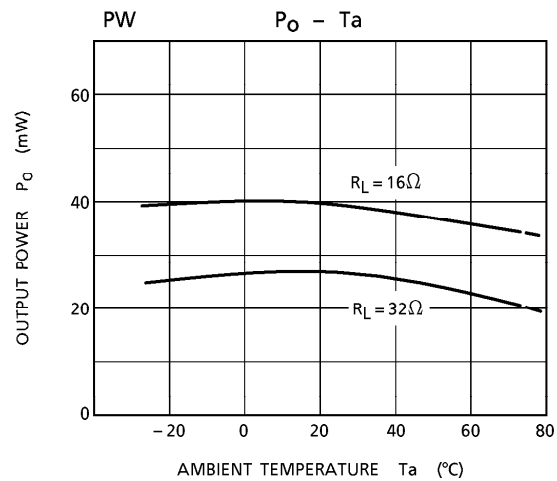
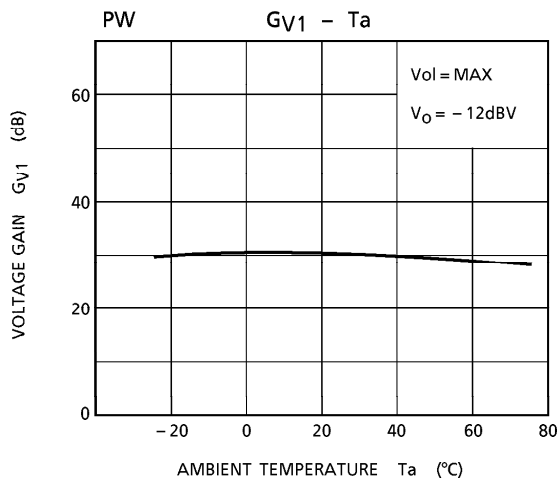
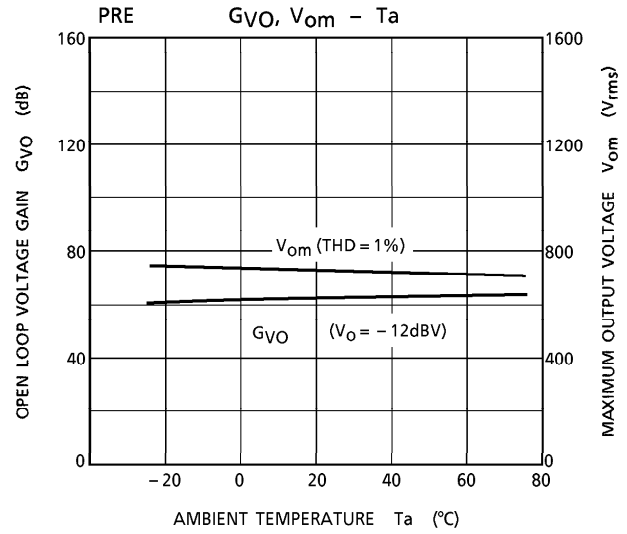
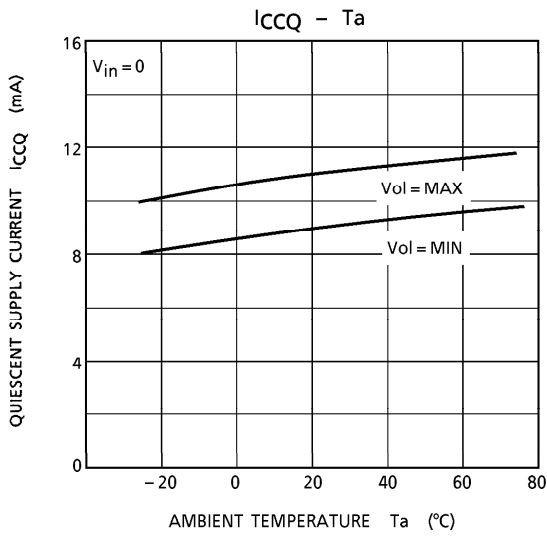
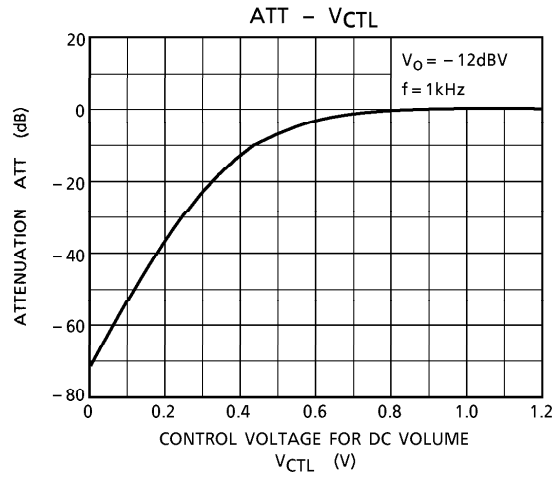
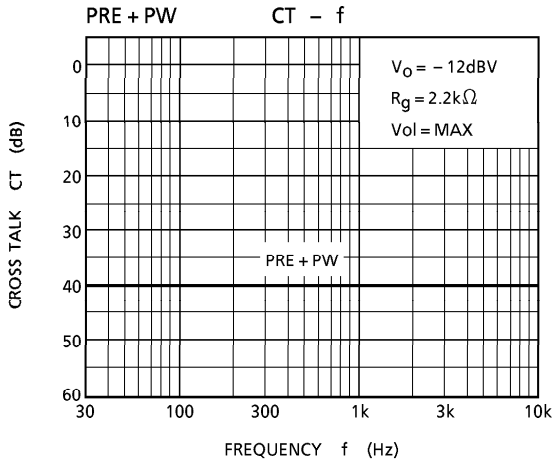
Preamplifier :  $R_L = 10k\Omega$ , Vol = MIN

Power Amplifier :  $R_L = 32\Omega$ , Vol = MAX



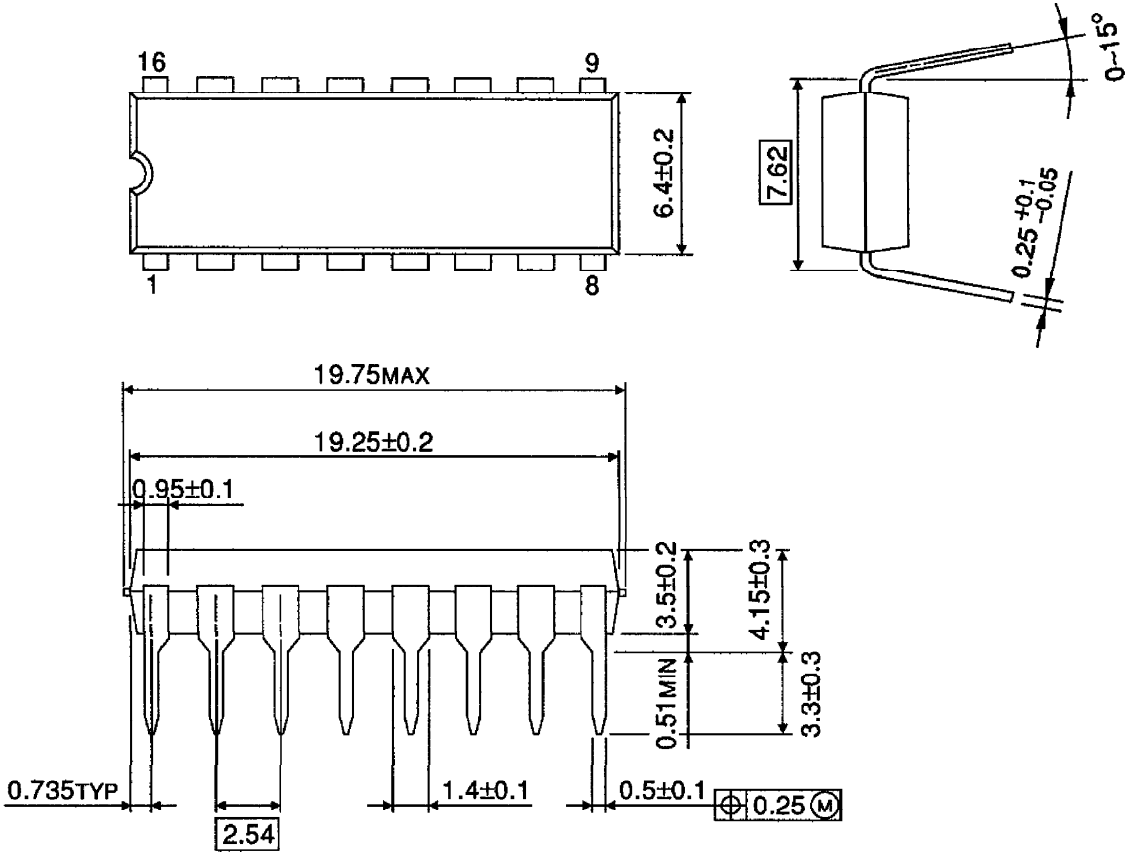






OUTLINE DRAWING  
DIP16-P-300-2.54A

Unit : mm



Weight : 1.00g (Typ.)