

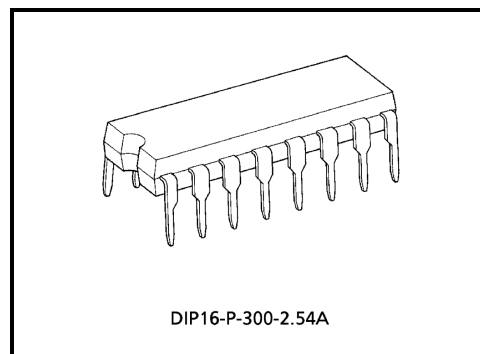
TA8119P

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.

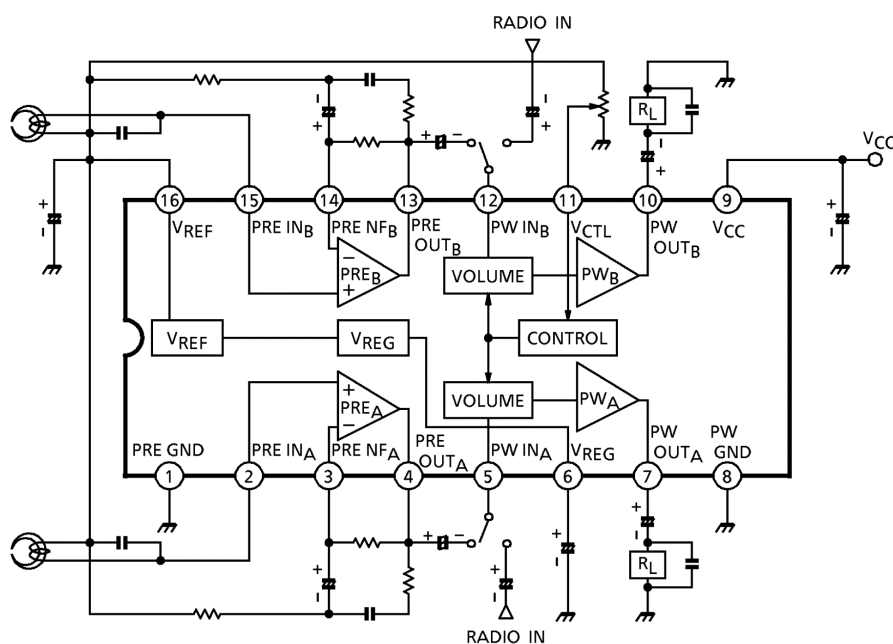
Features

- 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 ($V_{CC} = 3V$, $T_a = 25^\circ C$)
 $ICCQ = 9mA$ (typ.)
- Operating supply voltage range ($T_a = 25^\circ C$)
 $V_{CC} (opr) = 1.8 \sim 6V$



Weight: 1.00g (typ.)

Block Diagram



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 _A	Input of preamplifier		1.3
15	PRE IN _B			1.3
3	PRE NF _A	NF of preamplifier		1.3
14	PRE NF _B			1.3
4	PRE OUT _A	Output of preamplifier		1.3
13	PRE OUT _B			1.3
5	PW IN _A	Input of power amplifier for headphone (through DC volume stage)		2.6
12	PW IN _B			1.3
6	V _{REG}	Ripple filter of power supply		1.3
16	V _{REF}	Reference voltage		1.3
7	PW OUT _A	Output of power amplifier		1.3
10	PW OUT _B			1.3
8	PW GND	—	—	0
9	V _{CC}	—	—	3
11	V _{CTL}	Input of control voltage for volume control		—

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 VREF and GND.
- Capacitor between VCC and GND.
- Capacitor between VREG and GND.

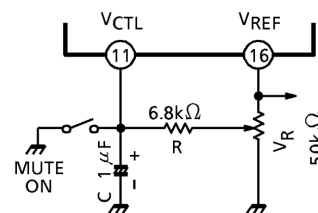


Fig.1 Function of mute

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 Ta = 25°C in the proportion of 6mW / °C.

Electrical Characteristics

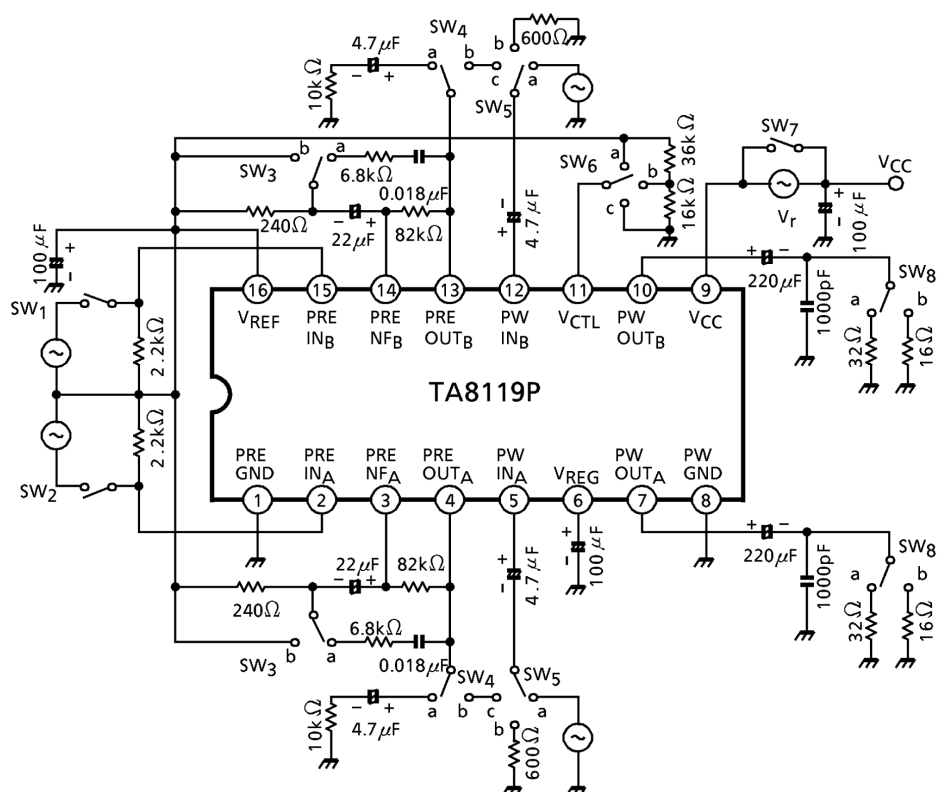
Unless Otherwise Specified, $V_{CC} = 3V$, $T_a = 25^\circ C$, $f = 1kHz$

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_{CCQ1}	—	$V_{in} = 0$, Vol = min	—	9.0	13.0	mA
		I_{CCQ2}	—	$V_{in} = 0$, Vol = max	—	11.0	—	
Preamplifier section	Open loop voltage gain	G_{VO}	—	$V_O = -12dBV$	55	62	—	dB
	Closed loop voltage gain	G_{VC}	—	NAB = 1kHz, $V_O = -12dBV$	—	33	—	dB
	Maximum output voltage	V_{om}	—	THD = 1%	600	720	—	mV _{rms}
	Total harmonic distortion	THD1	—	$V_O = -12dBV$	—	0.04	0.1	%
	Equivalent input noise voltage	V_{ni}	—	$R_g = 2.2k\Omega$ BPF = 30Hz~20kHz NAB ($G_V = 33dB$, $f = 1kHz$)	—	1.2	2.0	μV_{rms}
	Ripple rejection ratio	RR1	—	$R_g = 2.2k\Omega$ $V_r = -22dBV$, $f_r = 100Hz$	—	46	—	dB
Power amplifier section	Output power	(1) P_{o1}	—	THD = 10%	20	27	—	mW
		(2) P_{o2}	—	$R_L = 16\Omega$, THD = 10%	—	39	—	
	Voltage gain (1)	G_{V1}	—	$V_O = -12dBV$	28	30	32	dB
	Channel balance	CB	—		—	0	1.5	dB
	Voltage gain (2)	G_{V2}	—	$V_O = -12dBV$, Vol = mid	—	15	—	dB
	Total harmonic distortion	THD2	—	$P_O = 10mW$	—	0.5	1.2	%
		THD3	—	$P_O = 10mW$, Vol = mid	—	0.3	—	
	Output noise voltage	V_{no}	—	$R_g = 600\Omega$ BPF = 30Hz~20kHz	—	250	320	μV_{rms}
	Maximum attenuation	ATT	—	$V_O = -12dBV$ Vol = max→min	66	72	—	dB
Total	Ripple rejection ratio	RR2	—	$R_g = 600\Omega$ $V_r = -22dBV$, $f_r = 100Hz$	—	46	—	dB
	Cross talk (ch-A / ch-B)	CT	—	$R_g = 2.2k\Omega$ $V_O = -12dBV$, Vol = max	34	40	—	dB

Test Circuit



Switch State For Electrical Characteristics

Characteristic	SW ₁	SW ₂	SW ₃	SW ₄	SW ₅	SW ₆	SW ₇	SW ₈
I _{CCQ1}	×	×	a	a	b	c	○	a
I _{CCQ2}	×	×	a	a	b	a	○	a
G _{VO}	○	○	b	a	b	c	○	a
G _{VC}	○	○	a	a	b	c	○	a
V _{om}	○	○	a	a	b	c	○	a
THD1	○	○	a	a	b	c	○	a
V _{ni}	×	×	a	a	b	c	○	a
RR1	×	×	a	a	b	c	×	a
P _{o1}	×	×	a	a	a	a	○	a
P _{o2}	×	×	a	a	a	a	○	b
G _{V1}	×	×	a	a	a	a	○	a
CB	×	×	a	a	a	a	○	a
G _{V2}	×	×	a	a	a	b	○	a
THD2	×	×	a	a	a	a	○	a
THD3	×	×	a	a	a	b	○	a
V _{no}	×	×	a	a	b	a	○	a
ATT	×	×	a	a	a	a→c	○	a
RR2	×	×	a	a	b	c	×	a
CT	○ / ×	× / ○	a	b	c	a	○	a

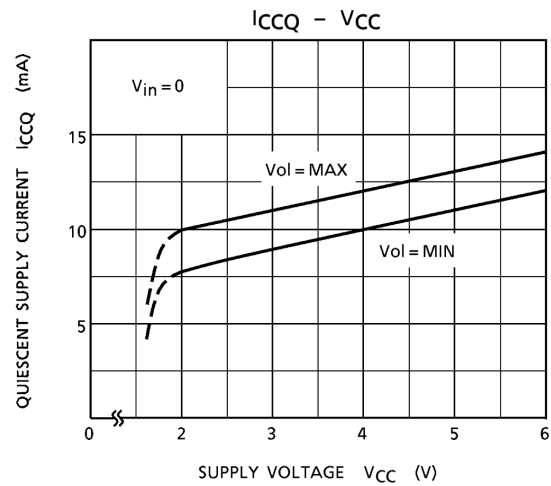
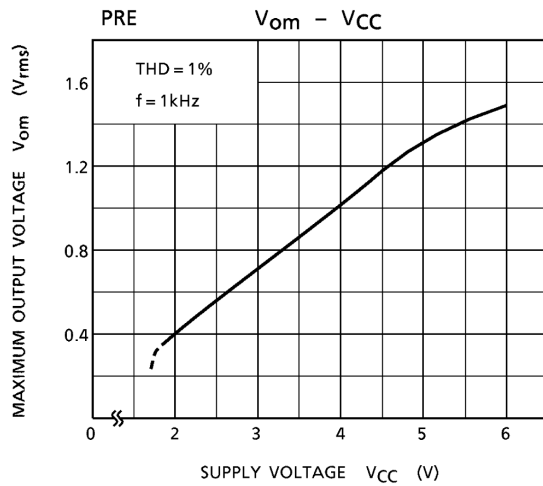
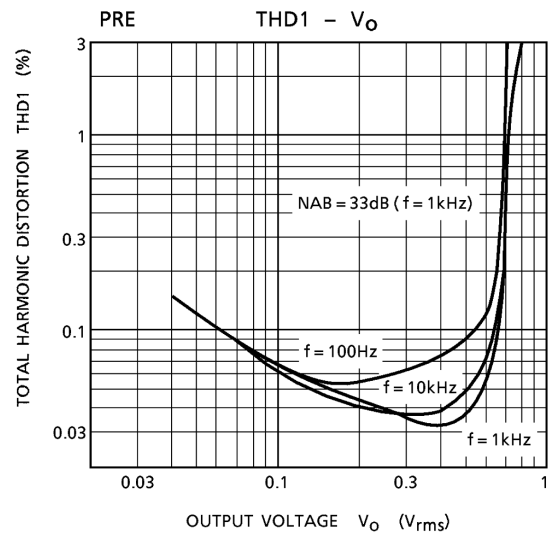
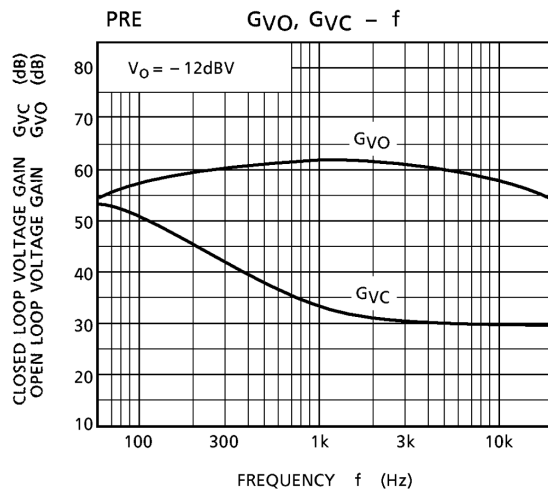
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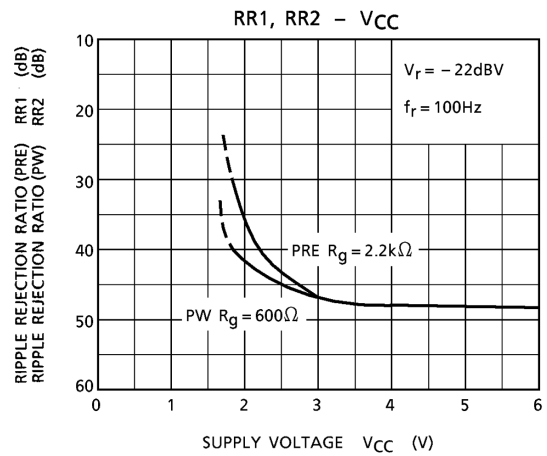
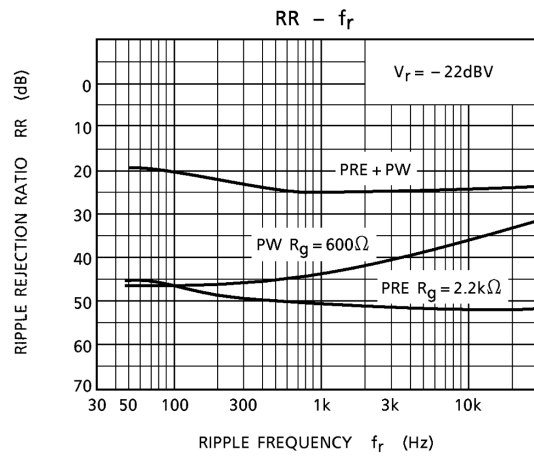
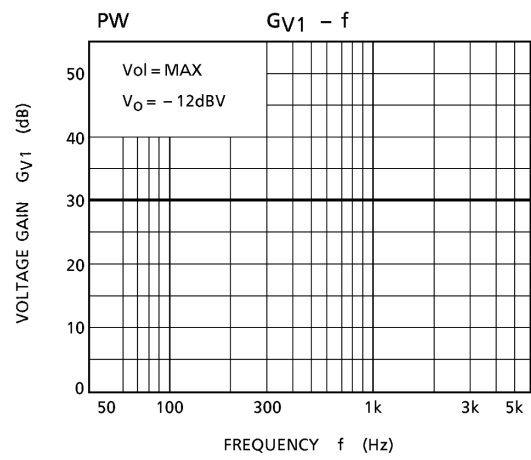
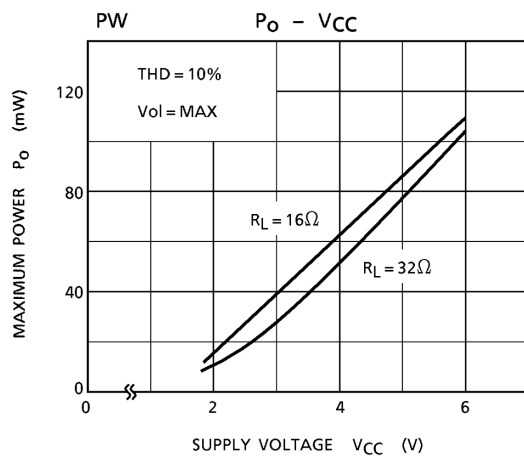
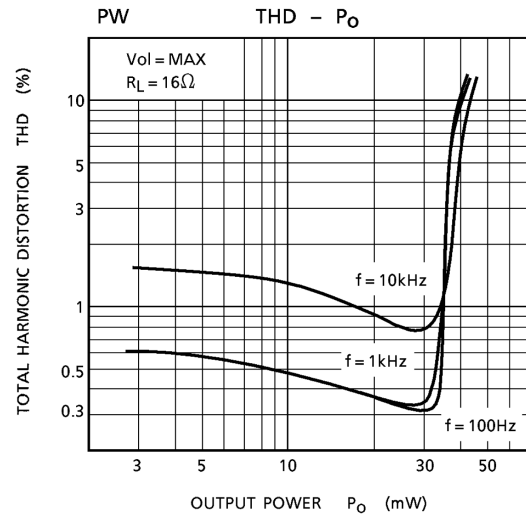
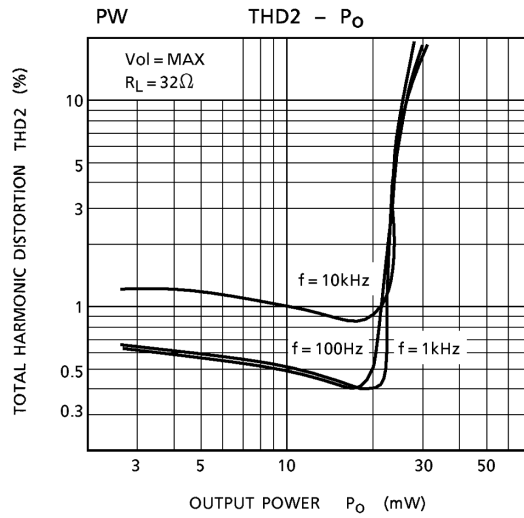
Characteristic Curves

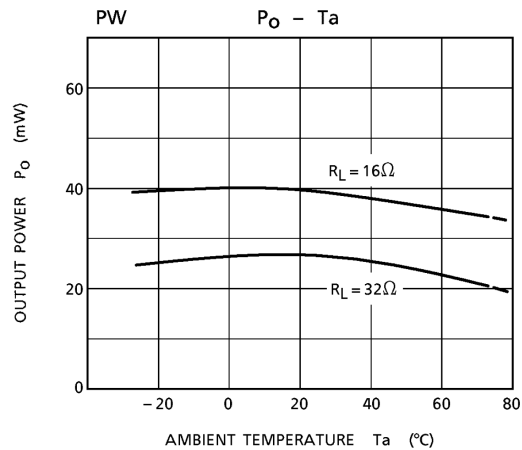
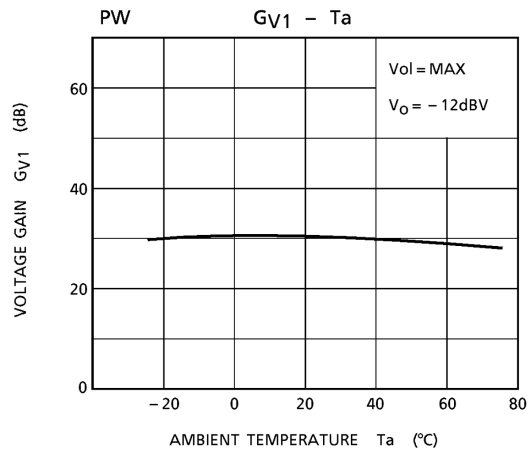
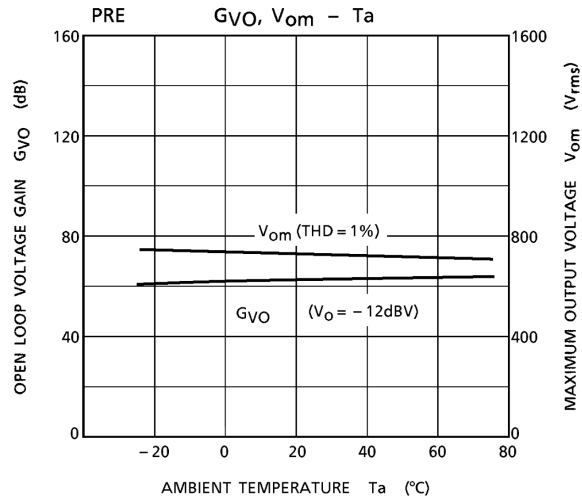
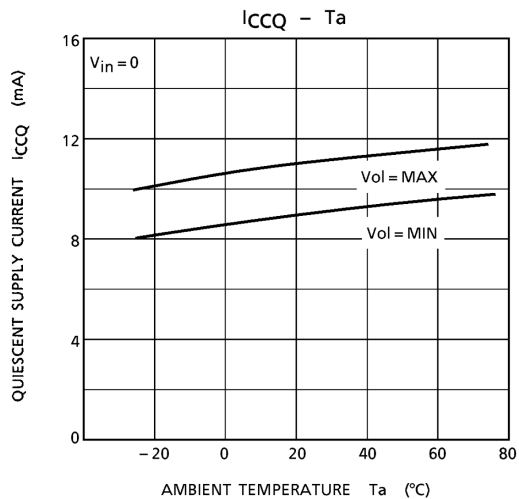
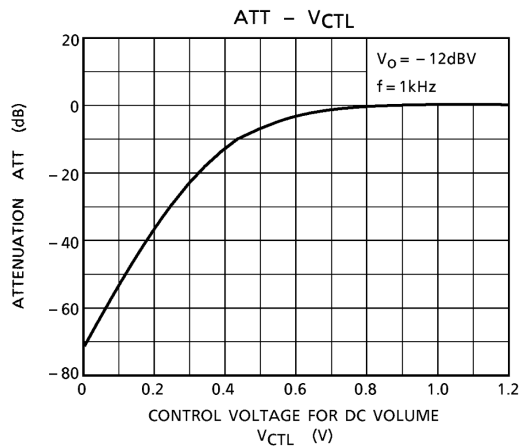
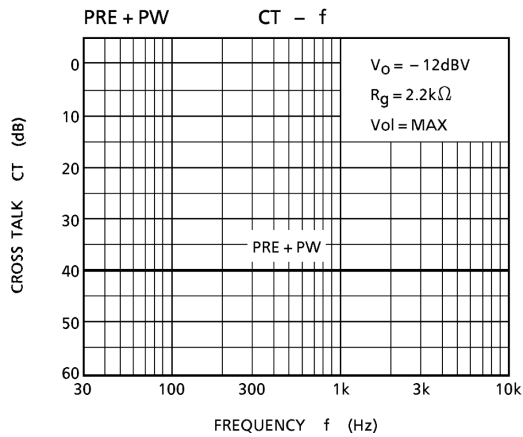
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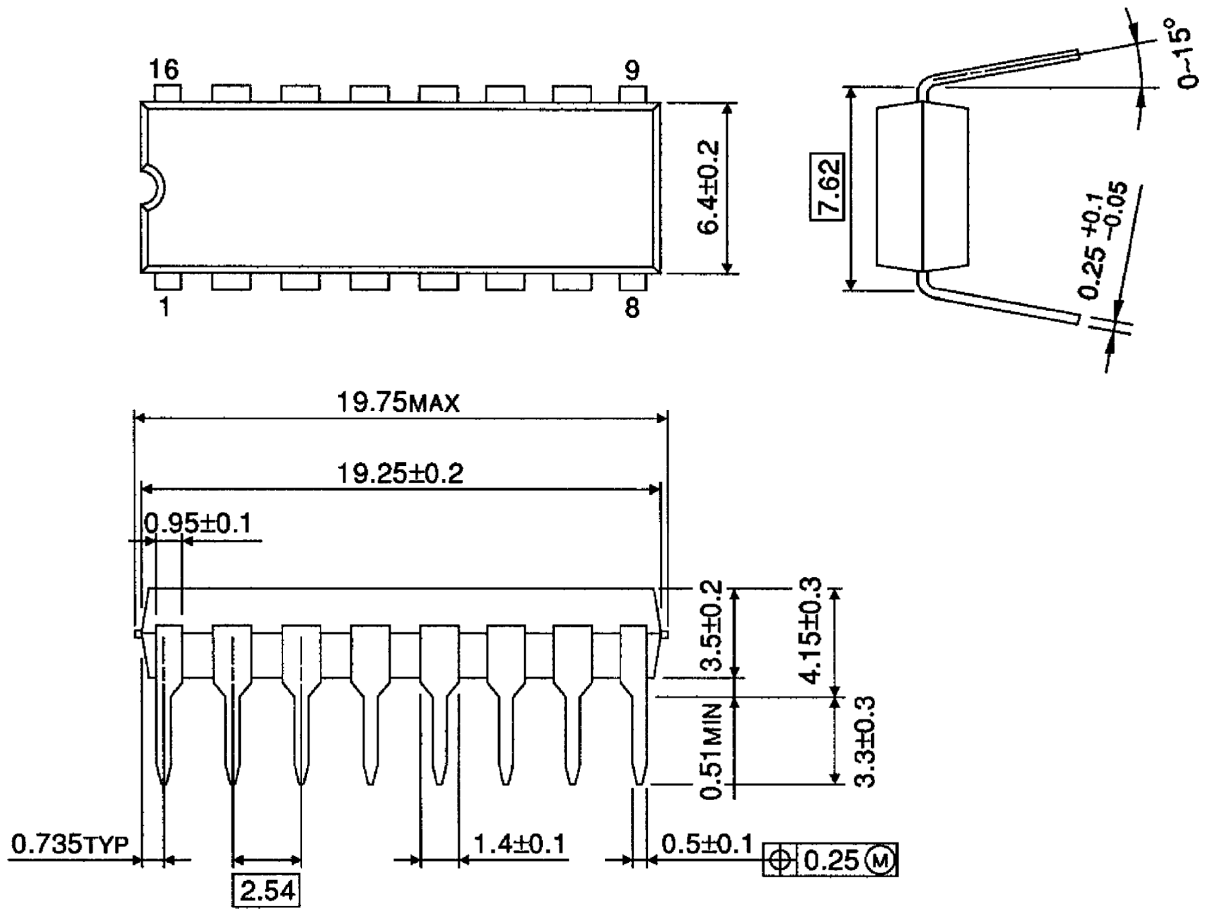




Package Dimensions

DIP16-P-300-2.54A

Unit : mm



Weight: 1.00g (typ.)

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