

TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

# TA7709P, TA7709F

## DUAL PREAMPLIFIERS (3V USE)

The TA7709P and TA7709F are dual preamplifier designed for use in a playback amplifier of low voltage operating tape recorder.

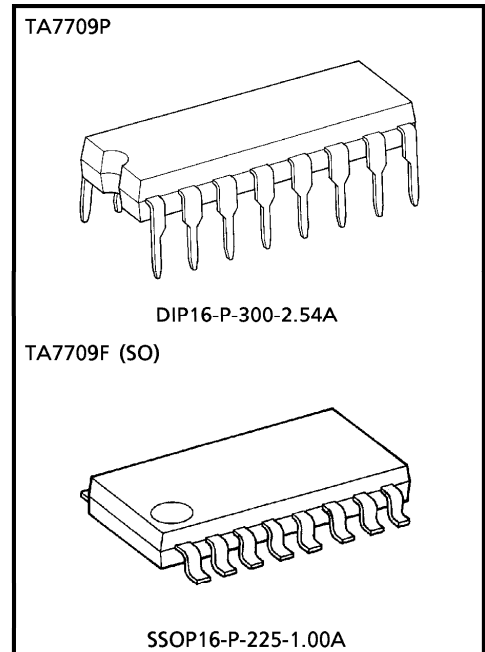
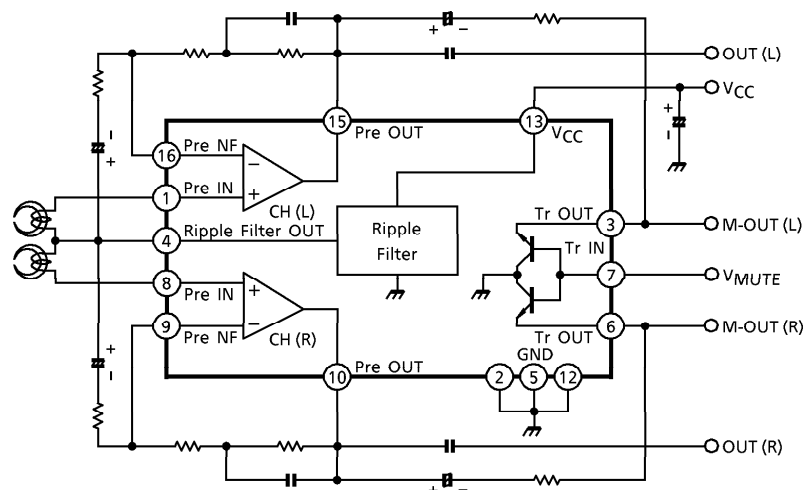
It consists of two channels preamplifier and two transistors of collector common grounded.

They are prepared two type package.  
(FLAT and Dual In-line package)

### FEATURES

- High voltage gain at open loop.  
:  $G_{VO} = 85\text{dB}$  (Typ.) ( $V_{CC} = 3\text{V}$ ,  $f = 1\text{kHz}$ )
- Non-necessary the input coupling condensers.
- Operating supply voltage range  
:  $V_{CC} = 1.6\sim 5\text{V}$  ( $T_a = 25^\circ\text{C}$ )
- TA7709F (SO) is standard model of flat package.

### BLOCK DIAGRAM



Weight  
 DIP16-P-300-2.54A : 1.00g (Typ.)  
 SSOP16-P-225-1.00A : 0.14g (Typ.)

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## APPLICATION NOTE

- Input signals can be applied between pin① or ⑧ and pin④ as common without input coupling capacitors.  
In case that input signals is applied between pin① or ⑧ and GND terminal, it is necessary that connecting input coupling capacitors, and starting time of amplifiers will increase.
- Test pin① and ④ should not be connected to avoid malfunctions.
- Ripple rejection characteristics are shown in the attached paper. To keep good rejection ratio, a combination of the TA7709P, TA7709F and the TA7688F is recommendable.  
In this case, the  $V_{CC}$  of the TA7709P, TA7709F is supplied by  $V_{RF}$  output of the TA7688F.

## MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	$V_{CC}$	7	V
Power Dissipation	TA7709P	$P_D$ (Note 1)	750
	TA7709F		350
Operating Temperature	$T_{opr}$ (Note 2)	-25~75	°C
Storage Temperature	$T_{stg}$	-55~150	°C

(Note 1) Derated above  $T_a = 25^\circ\text{C}$  in the proportion of  $6\text{mW}/^\circ\text{C}$  for TA7709P, and of  $2.8\text{mW}/^\circ\text{C}$  for TA7709F

(Note 2) At  $T_a = -25^\circ\text{C}$ ,  $V_{CC} \geq 1.7\text{V}$

ELECTRICAL CHARACTERISTICS (Unless otherwise specified,  $V_{CC} = 3\text{V}$ ,  $f = 1\text{kHz}$ ,  $T_a = 25^\circ\text{C}$ )

CHARACTERISTIC	SYMBOL	TEST CIRCUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Quiescent Current	$I_{CCQ}$	—	$V_{in} = 0$	—	2.0	3.4	mA
Open Loop Voltage Gain	$G_{VO}$	—	$V_{in} = -60\text{dBV}$	70	85	—	dB
Maximum Output Voltage	$V_{om}$	—	THD = 1%	0.5	0.9	—	$V_{rms}$
Total Harmonic Distortion	THD	—	$V_O = 0.1V_{rms}$	—	0.07	0.5	%
Output Noise Voltage	$V_{no}$	—	$R_g = 2.2\text{k}\Omega$ , $G_V = 40\text{dB}$ BPF = 50Hz~20kHz	—	0.14	0.22	$\text{mV}_{rms}$
Cross Talk	CT	—	$R_g = 600\Omega$ , $V_O = -10\text{dBV}$	—	60	—	dB
Muting Attenuation	ATT	—	$V_{MUTE} = 1\text{V}$	—	43	—	dB
Input Resistance	$R_{IN}$	—	—	20	30	—	$\text{k}\Omega$

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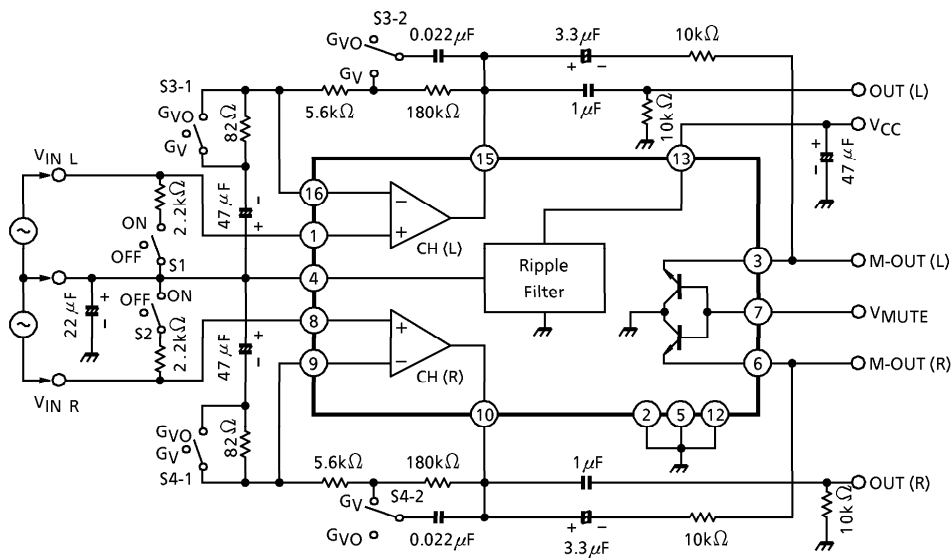
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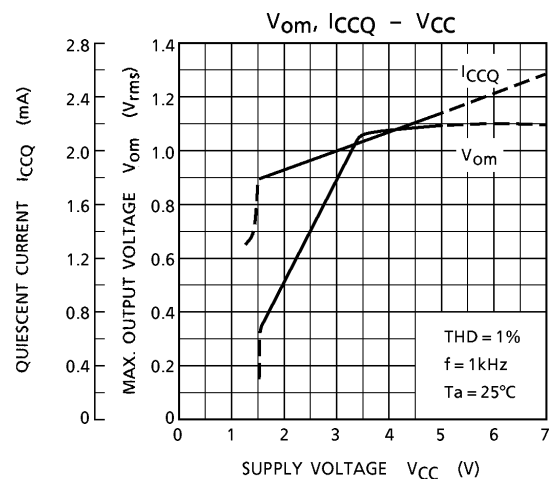
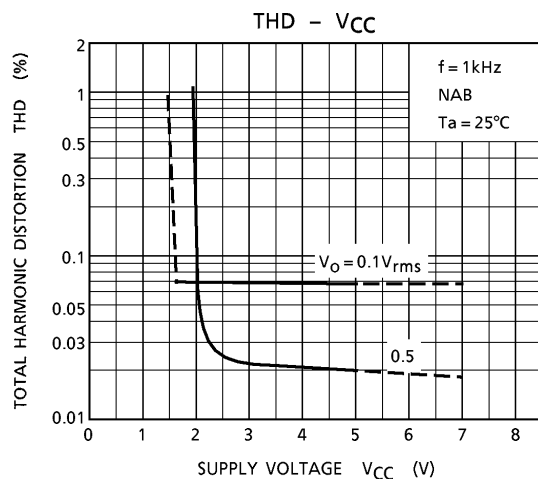
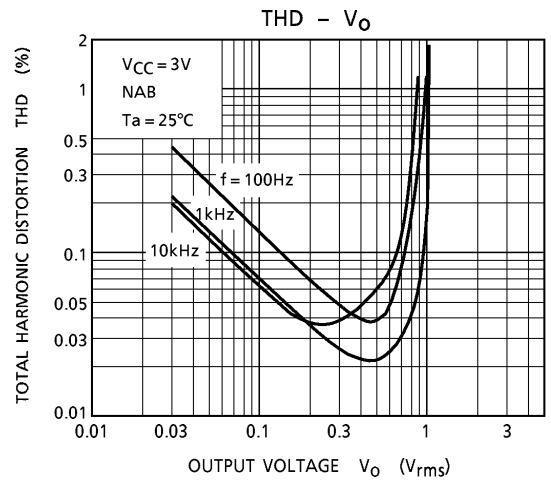
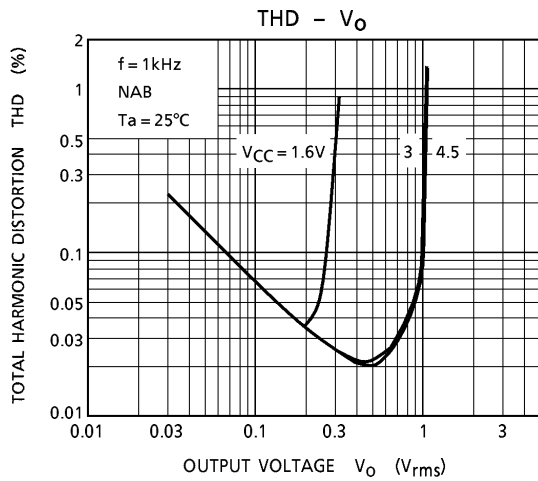
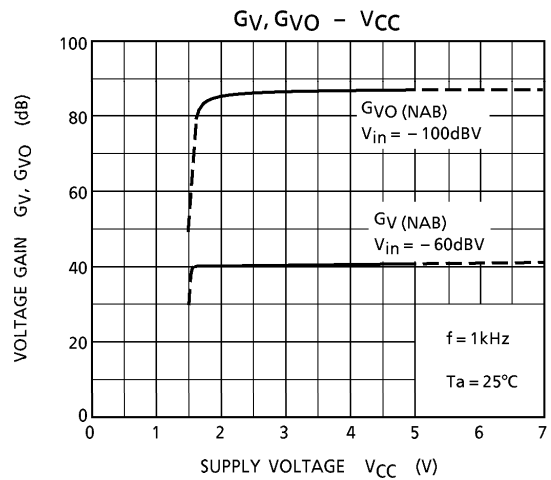
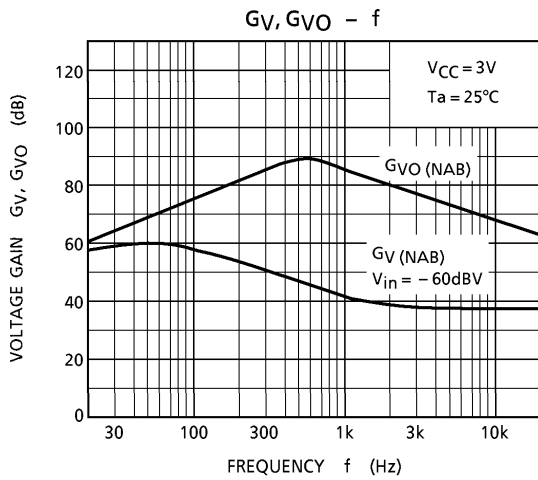
**DC CHARACTERISTICS**

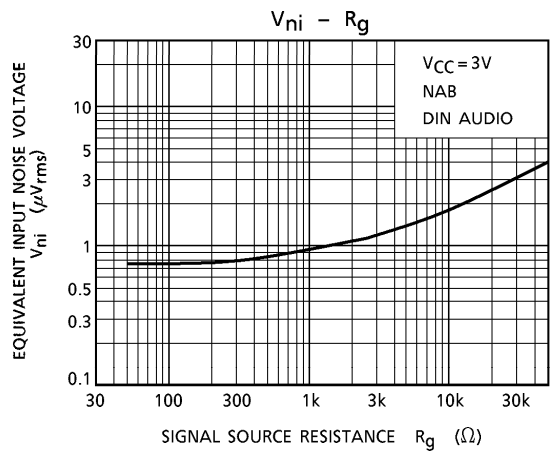
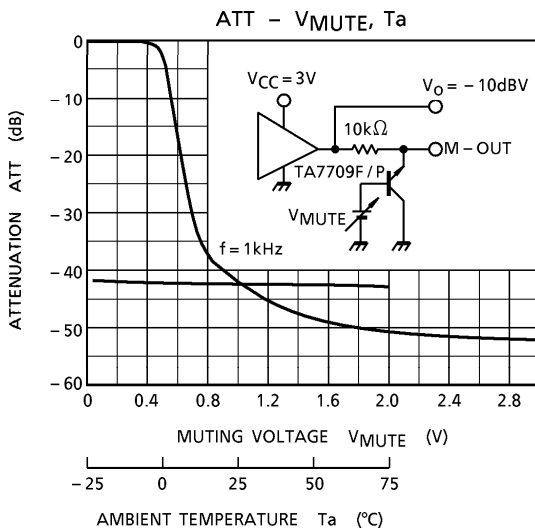
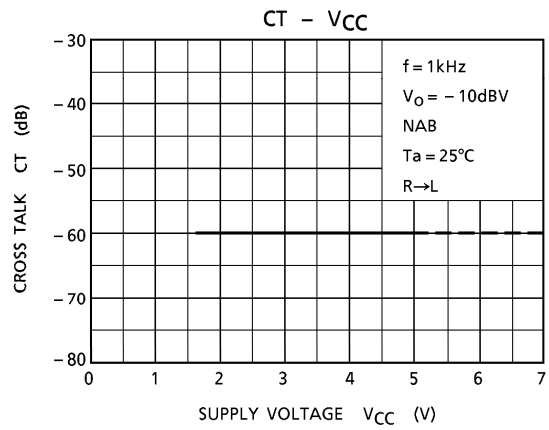
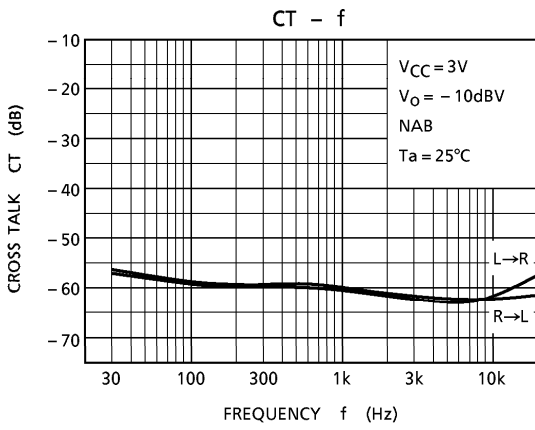
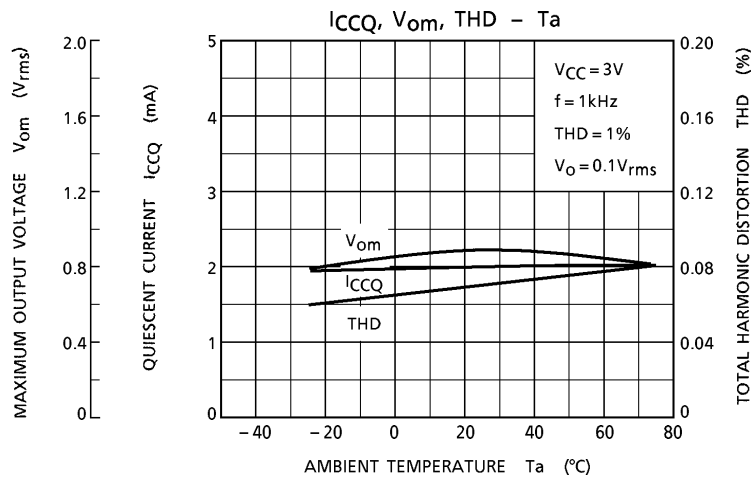
( $V_{CC} = 3V$ ,  $T_a = 25^\circ C$ , Terminal voltage at no signal)

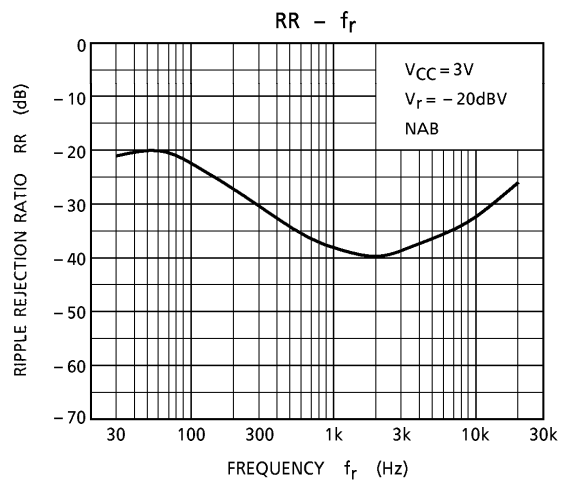
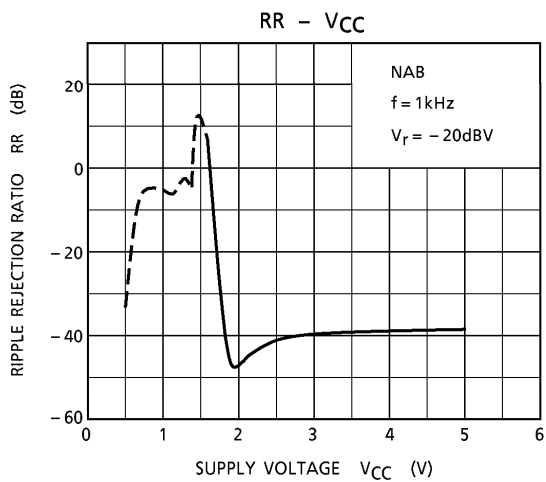
PIN No.	ITEM	SYMBOL	TYP.	UNIT
1	Pre IN	$V_1$	1.35	V
2	GND	$V_2$	0	V
3	Tr-OUT	$V_3$	—	V
4	Ripple Filter OUT	$V_4$	1.36	V
5	GND	$V_5$	0	V
6	Tr-OUT	$V_6$	—	V
7	Tr-IN	$V_7$	—	V
8	Pre IN	$V_8$	1.35	V
9	Pre NF	$V_9$	1.35	V
10	Pre OUT	$V_{10}$	1.44	V
11	TEST Pin	$V_{11}$	—	V
12	GND	$V_{12}$	0	V
13	$V_{CC}$	$V_{13}$	3.0	V
14	TEST Pin	$V_{14}$	—	V
15	Pre OUT	$V_{15}$	1.44	V
16	Pre NF	$V_{16}$	1.35	V

**TEST CIRCUIT**

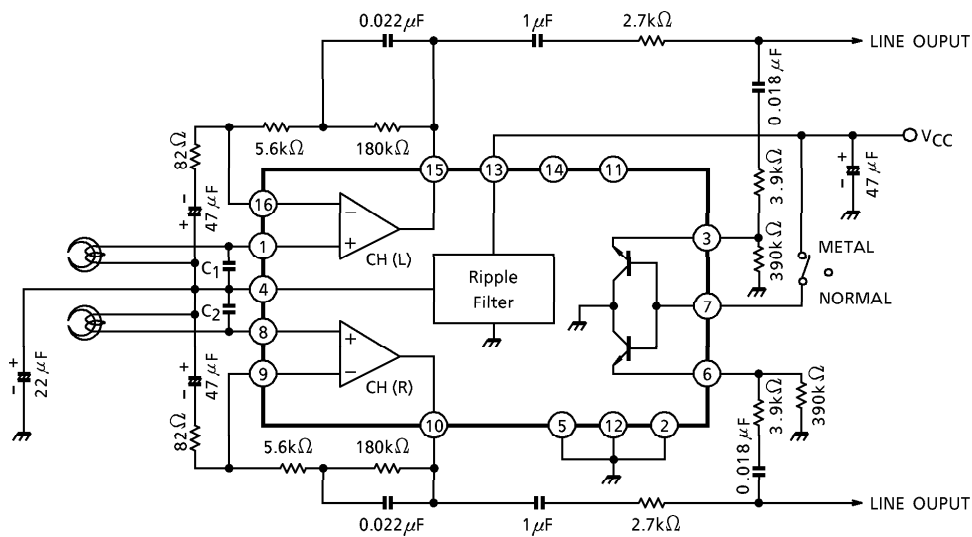








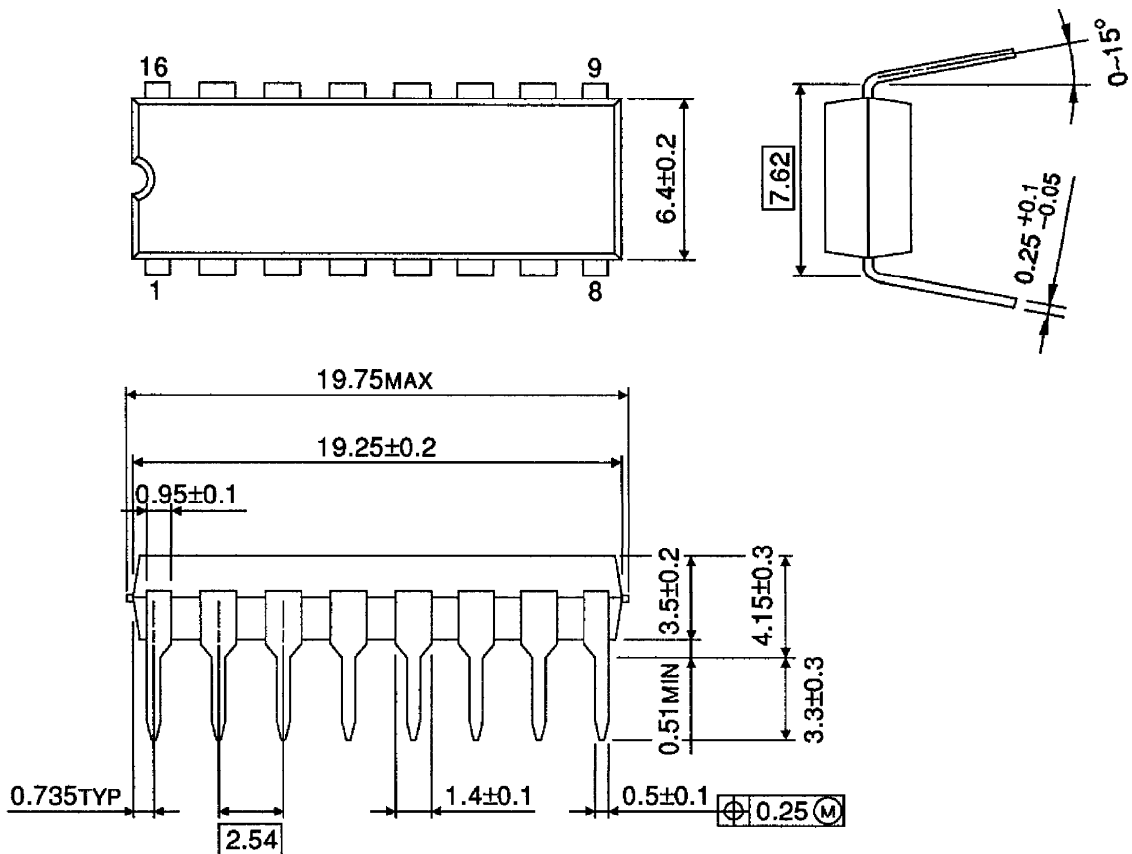
APPLICATION CIRCUIT



(Note) Capacitor C<sub>1</sub> and C<sub>2</sub> may be required for preventing a instability caused by the pattern layout or interference of external high frequency signal.

**OUTLINE DRAWING**  
DIP16-P-300-2.54A

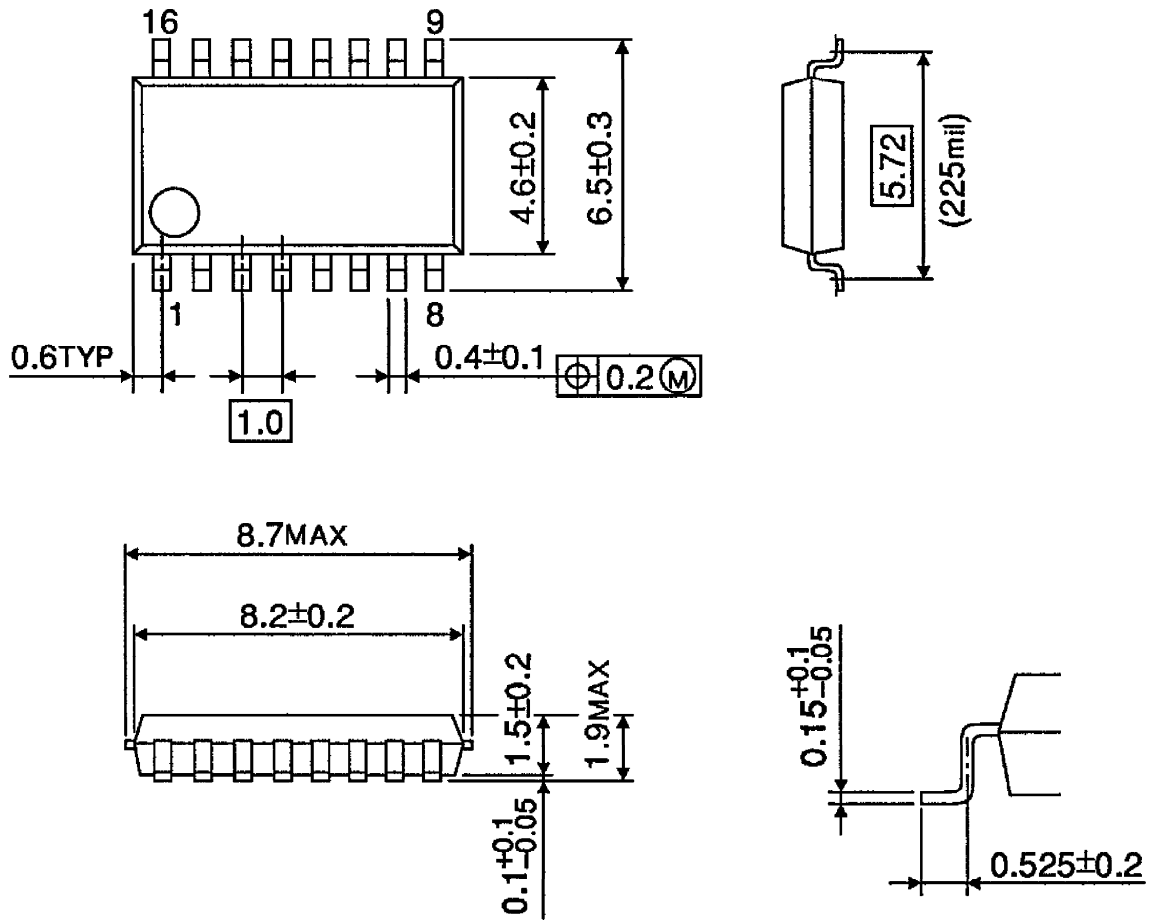
Unit : mm



Weight : 1.00g (Typ.)

**OUTLINE DRAWING**  
SSOP16-P-225-1.00A

Unit : mm



Weight : 0.14g (Typ.)