

TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

# TA2025P, TA2025F

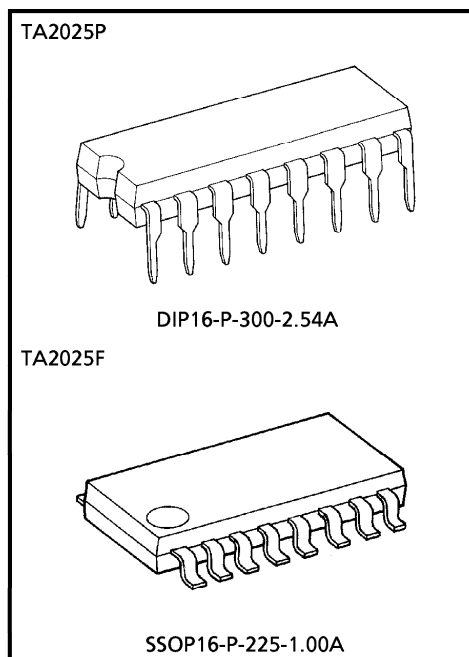
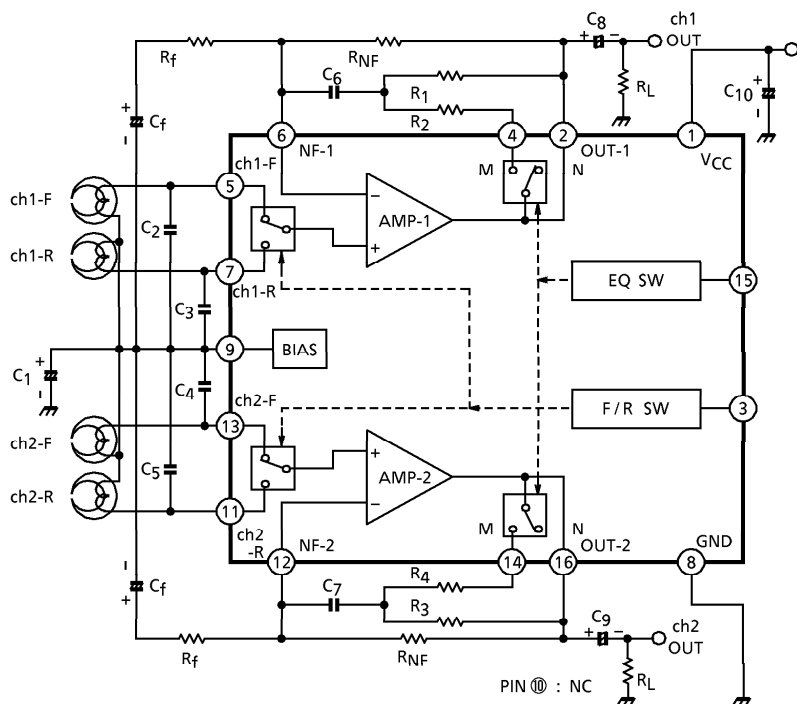
## LOW NOISE PREAMPLIFIER FOR AUTOREVERSE CAR STEREO

The TA2025P, TA2025F contains dual amplifier, forward, reverse control switches and metal, normal tape equalizer control switches.

### FEATURE

- High Voltage Gain  
:  $G_{VO} = 100 \text{ dB (Typ.)}$  ( $V_{CC} = 9V, f = 1\text{kHz}$ )
- No Input Coupling Capacitor
- Low Noise (Equivalent Noise Voltage)  
:  $V_{NI} = 0.6 \mu\text{Vrms (Typ.)}$  ( $V_{CC} = 9V, R_g = 620\Omega, BW = 20\text{Hz} \sim 20\text{kHz, NAB EQ}$ )
- Low Distortion :  $\text{THD} = 0.01\% \text{ (Typ.)}$
- Operating Supply Voltage Range :  $V_{CC} \text{ (opr.)} = 6 \sim 16V$

### BLOCK DIAGRAM



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

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**APPLICATION INFORMATION**

1. FORWARD, REVERSE SELECT SWITCH

(1) Threshold Voltage

Pin ③ is coupled to the base of Q<sub>1</sub> (PNP-Tr) as shown in Fig.1.  
Threshold voltage (pin ③) = 0.7 V

Reverse	0~0.5V
Forward	1.0~V <sub>CC</sub>

(2) The recommended Forward, Reverse

Select circuit is shown in Fig. 2.

(3) I<sub>3</sub> (In Fig.1)

I<sub>3</sub> = 12 μA (Max., Ta = 25° C)

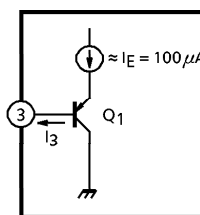


Fig.1

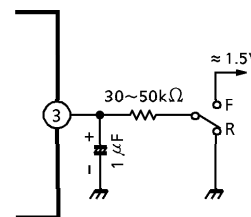


Fig.2

2. EQUALIZER CONTROL SWITCH

Pin ⑮ is coupled to the base of Q<sub>2</sub> (PNP-Tr) as shown in Fig.3.  
The emitter potential of Q<sub>2</sub> is 3.9V(DC).  
Threshold voltage (pin ⑮) = 2.8V

Metal	3.2~16V
Normal	0~2.4V

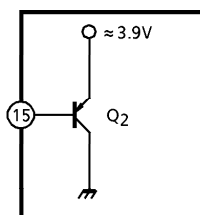


Fig.3

3. C<sub>2</sub>/C<sub>3</sub>/C<sub>4</sub>/C<sub>5</sub>

Capacitor C<sub>2</sub> ~ C<sub>5</sub> may be required for preventing a instability caused by the pattern layout or interference of external high frequency signal.

**MAXIMUM RATINGS (Ta = 25°C)**

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V <sub>CC</sub>	16	V
Power Dissipation (Note)	P <sub>D</sub>	350	mW
Operating Temperature	T <sub>opr</sub>	- 30~85	°C
Storage Temperature	T <sub>stg</sub>	- 55~150	°C

(Note) Derated above Ta = 25°C in the proportion of 6mW/°C for TA2025P and of 2.8mW/°C for TA2025F.

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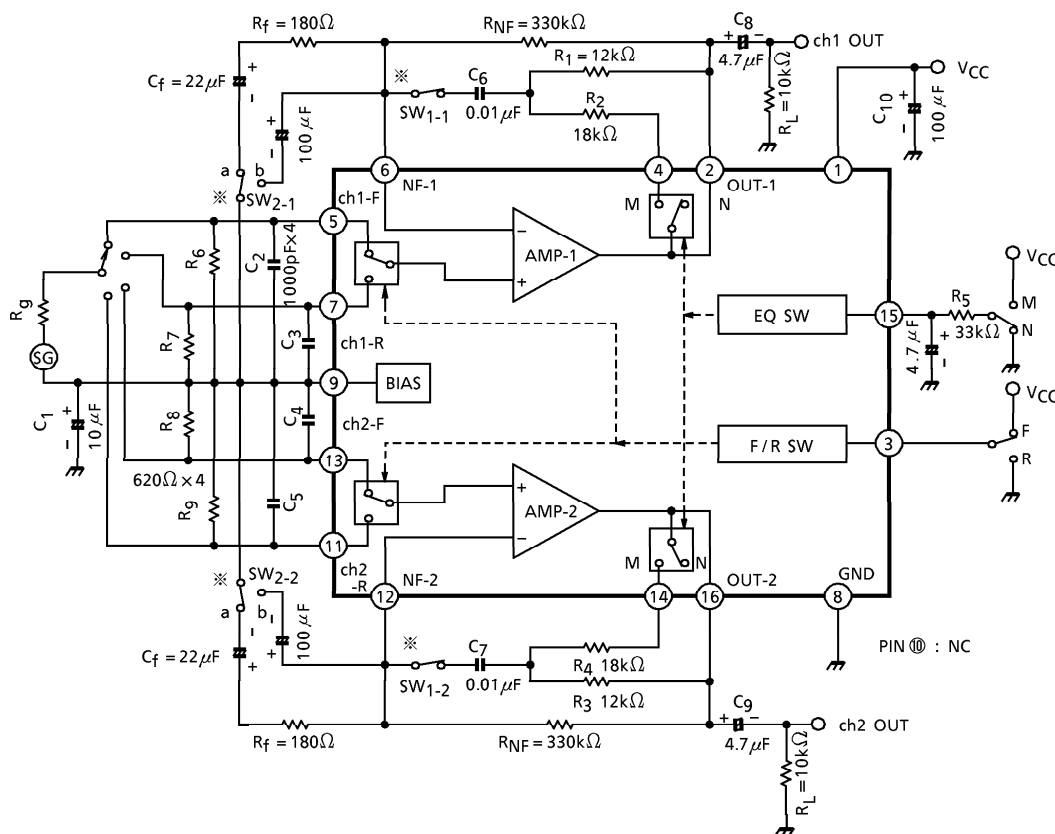
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**ELECTRICAL CHARACTERISTICS**

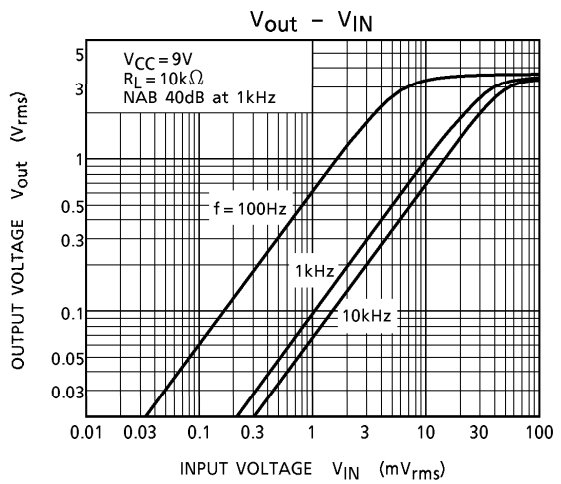
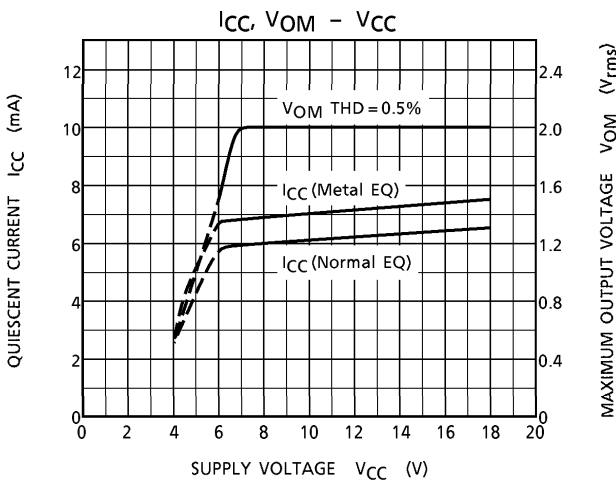
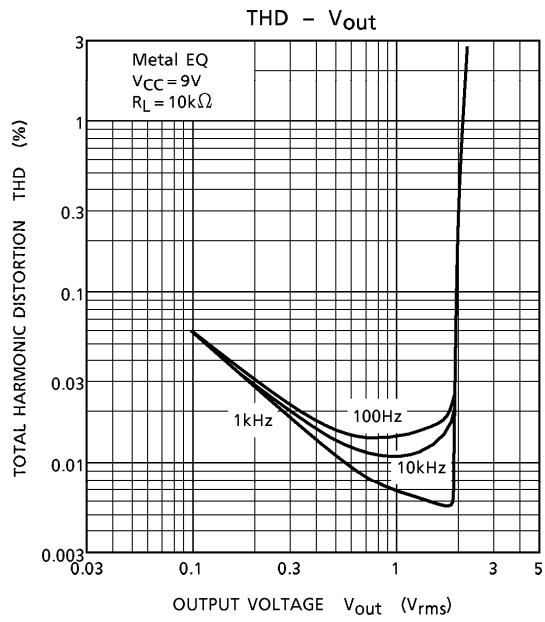
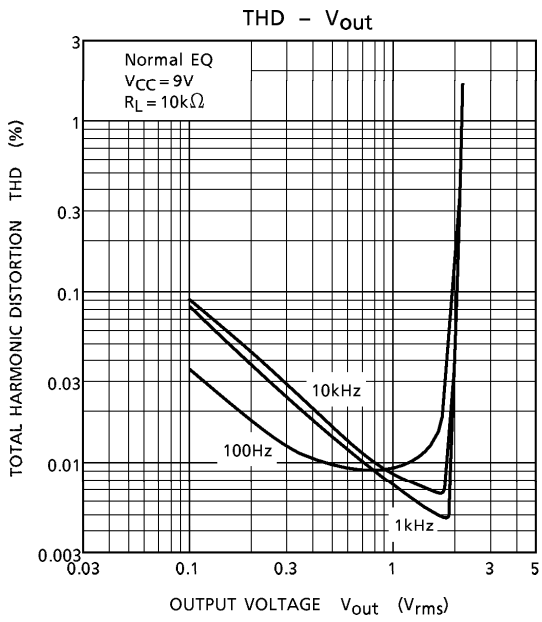
(Unless otherwise specified,  $V_{CC} = 9V$ ,  $f = 1kHz$ ,  $R_L = 10k\Omega$ ,  $R_g = 600\Omega$ ,  $T_a = 25^\circ C$ , Normal EQ)

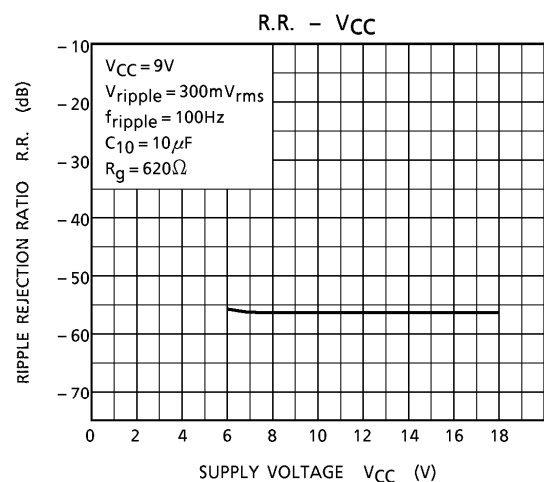
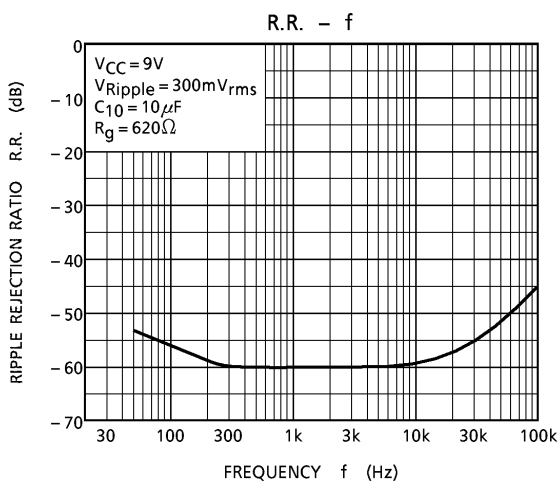
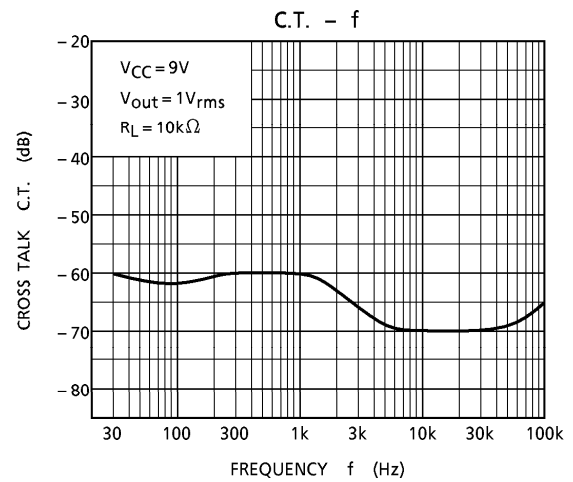
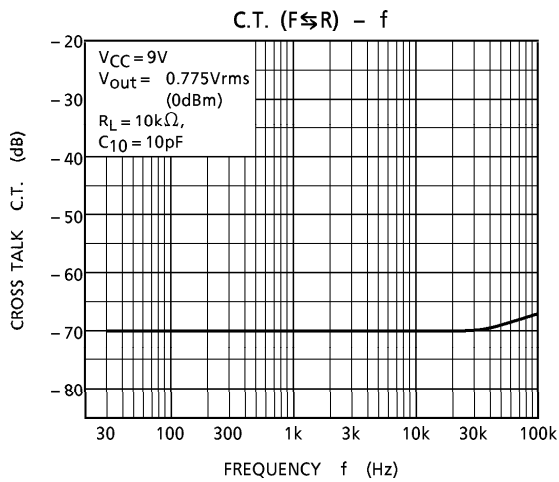
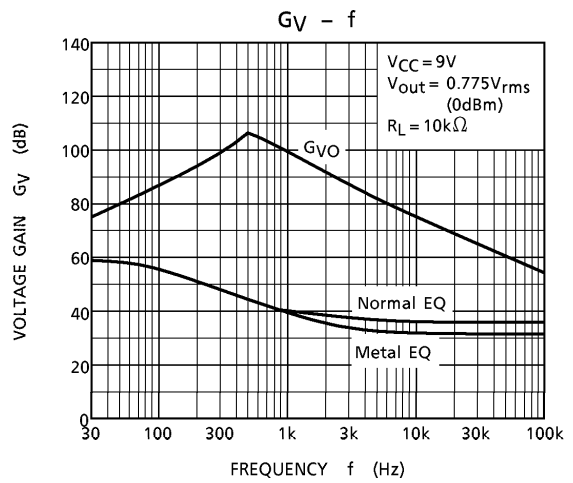
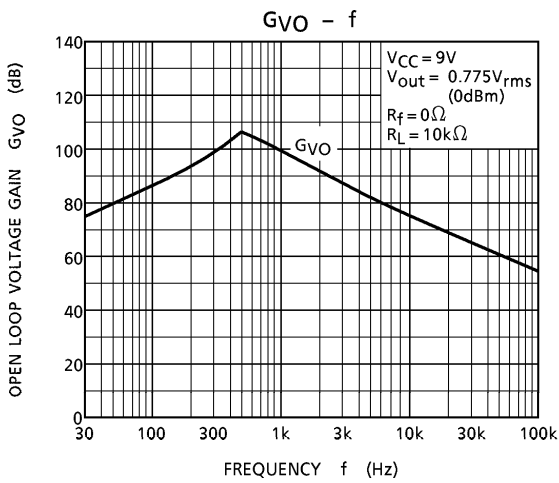
CHARACTERISTIC	SYMBOL	TEST CIRCUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Quiescent Current	$I_{CCQ(1)}$	—	$V_{IN} = 0$ , Normal EQ	—	6.0	—	mA
	$I_{CCQ(2)}$	—	$V_{IN} = 0$ , Metal EQ	—	7.0	10.0	
Open Loop Voltage Gain	$G_{VO}$	—	$C_f = 100\mu F$ , $R_f = 0$	—	100	—	dB
Maximum Output Voltage	$V_{OM}$	—	THD = 0.5%	1.5	2.1	—	$V_{rms}$
Total Harmonic Distortion	THD	—	$V_{OUT} = 0.5V_{rms}$	—	0.01	0.06	%
Equivalent Input Noise Voltage	$V_{NI}$	—	$R_g = 620\Omega$ , NAB BW = 20Hz~20kHz	—	0.6	1.2	$\mu V_{rms}$
Input Resistance	$R_{IN}$	—	—	—	330	—	$k\Omega$
Ripple Rejection	R.R.	—	$f = 100Hz$ , $V_{IN} = 1V_{rms}$	—	56	—	dB
Cross Talk	C.T.	—	$V_{OUT} = 0.775V_{rms}$ (0dBm)	50	60	—	dB
Forward / Reverse Cross Talk	C.T. (F/R)	—	$V_{OUT} = 0.775V_{rms}$ (0dBm)	60	70	—	dB

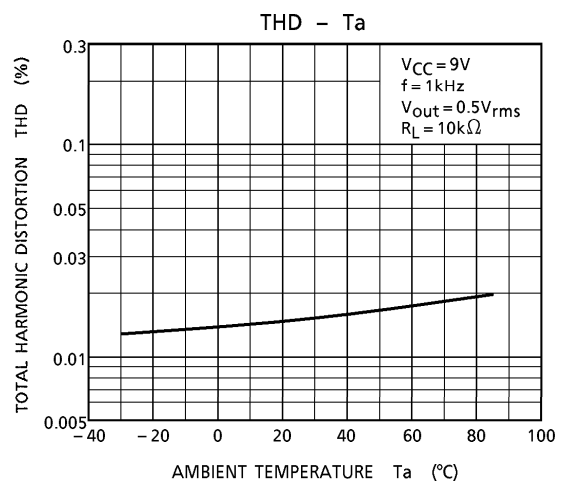
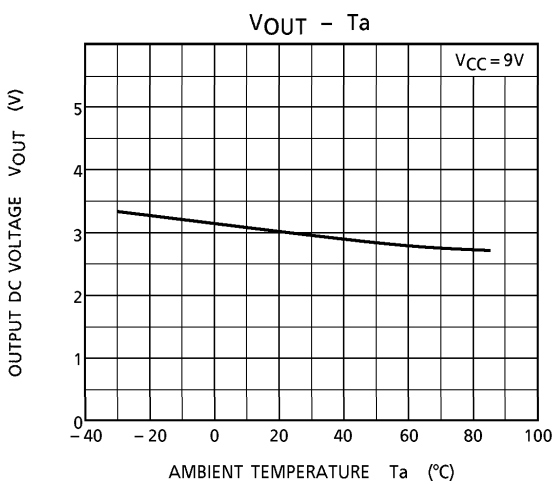
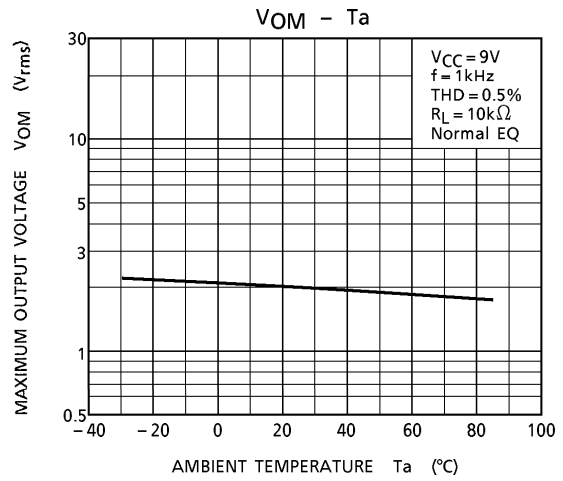
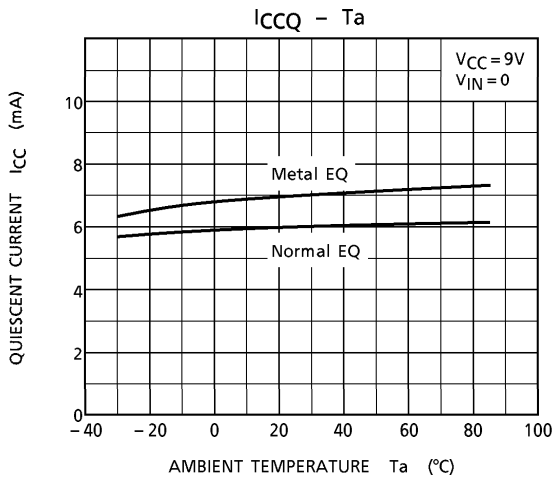
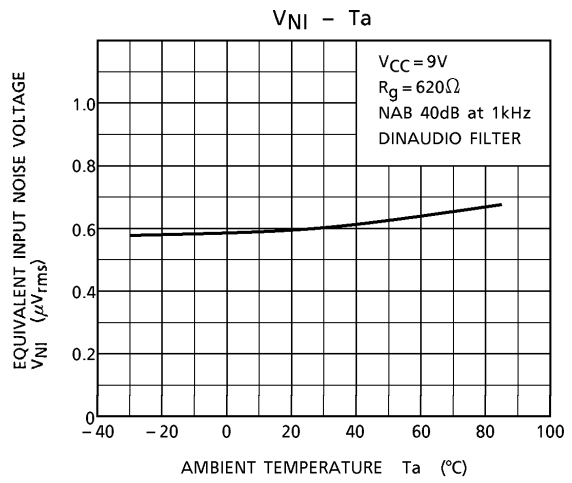
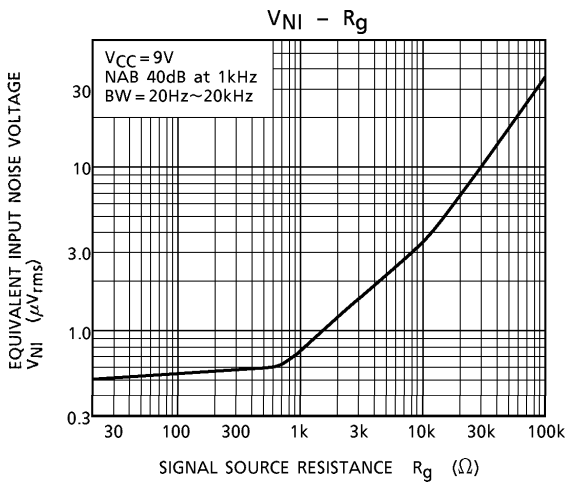
**TEST CIRCUIT**



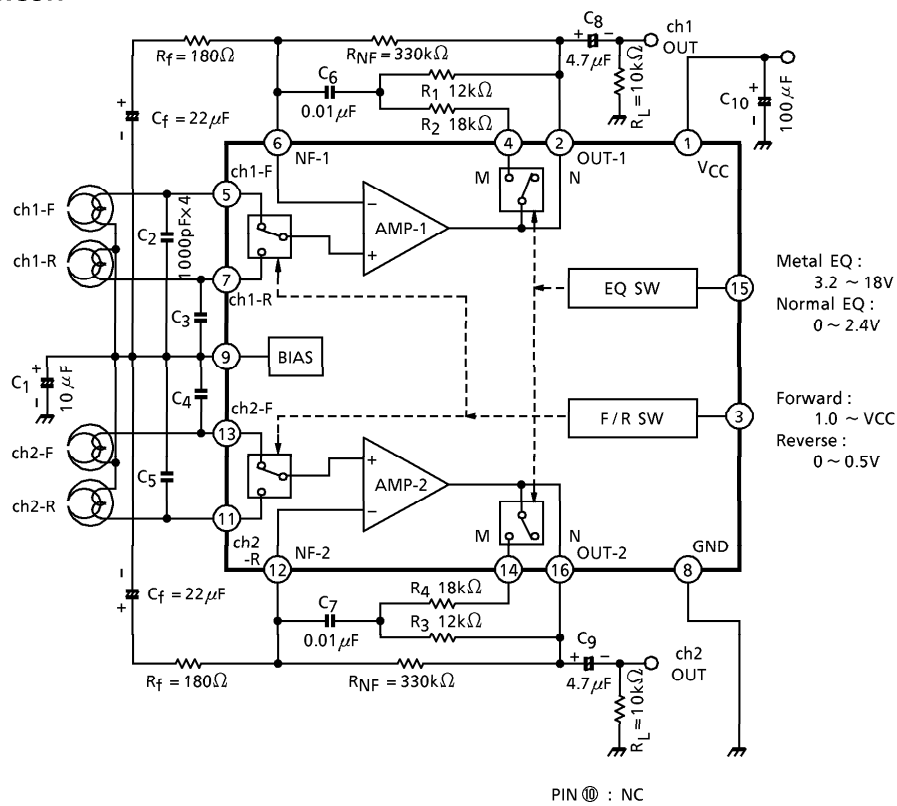
※  $G_{VO}$  Test : SW1-1,2 = OFF, SW2-1,2 = b





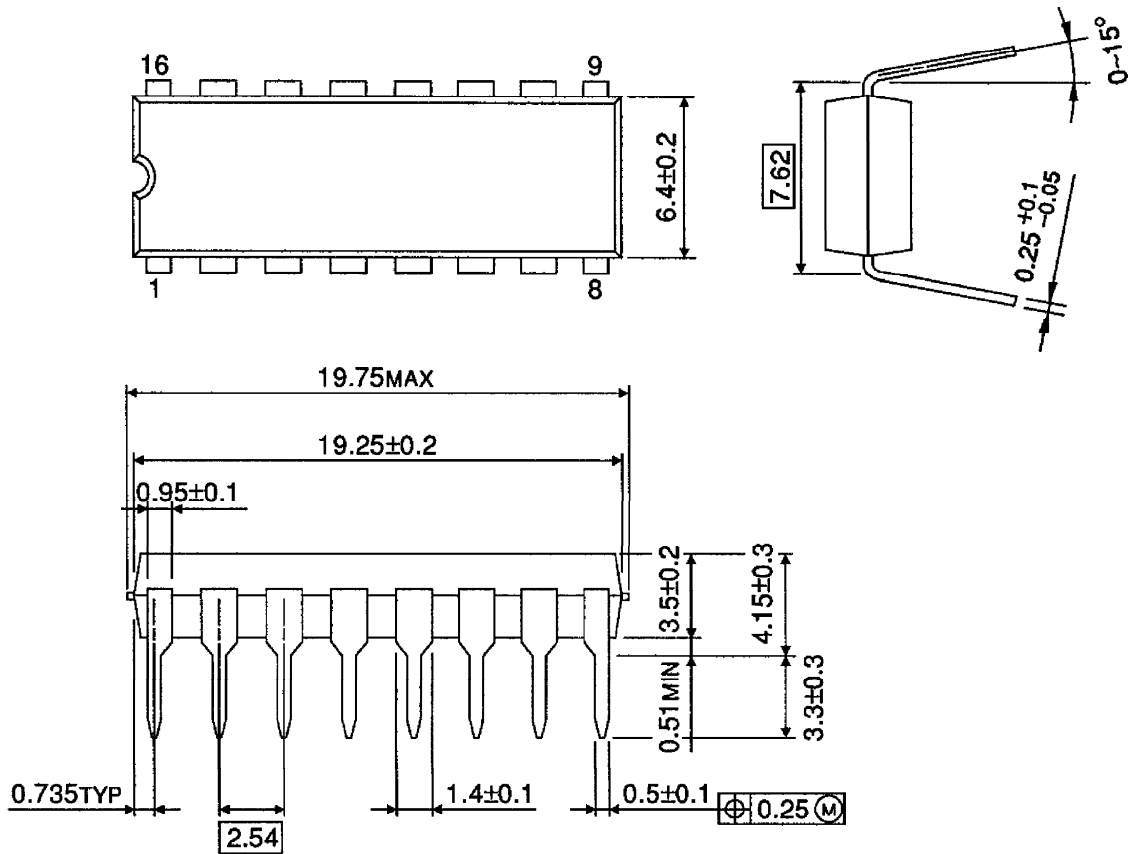


**APPLICATION CIRCUIT**



OUTLINE DRAWING  
DIP16-P-300-2.54A

Unit : mm

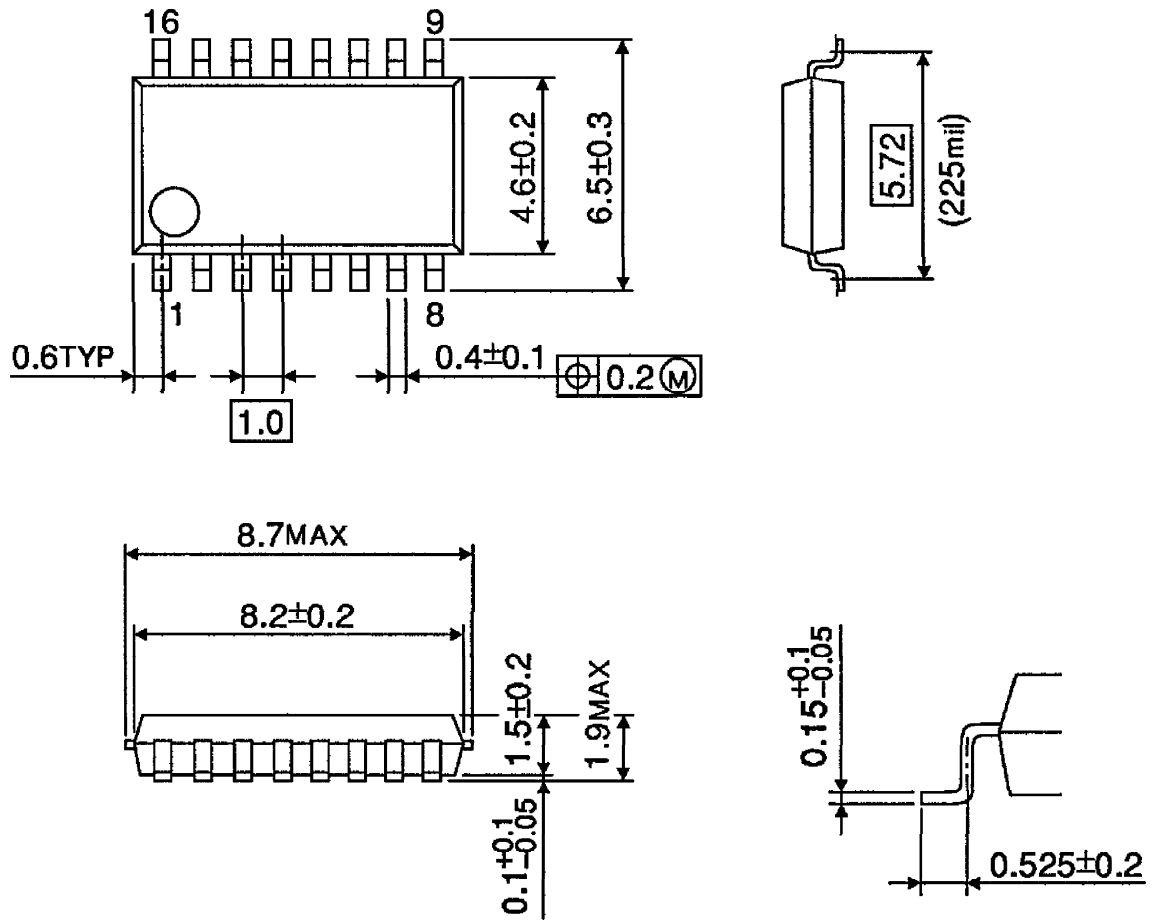


Weight : 1.00g (Typ.)



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

Unit : mm



Weight : 0.14g (Typ.)