

TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

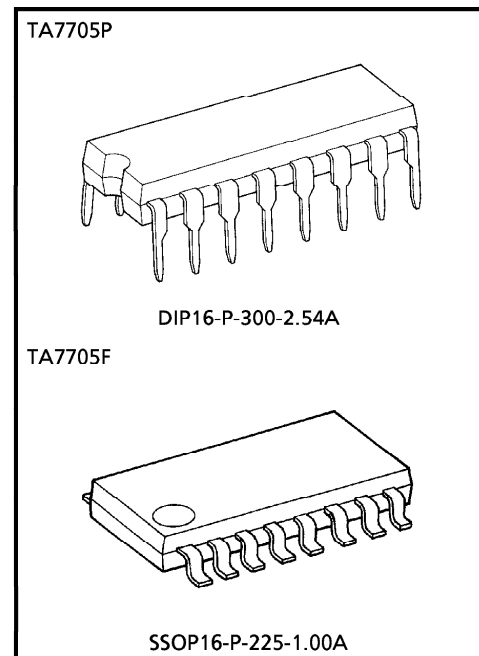
# TA7705P, TA7705F

## LOW NOISE DUAL AMPLIFIER FOR AUTOREVERSE CAR STEREO

TA7705P (DIP), TA7705F (SSOP) are dual preamplifier. These ICs contain dual amplifier, forward/reverse control switches and metal/normal tape equalizer control switches.

### FEATURES

- High Open Loop Voltage Gain  
:  $G_{VO} = 98\text{dB}$  (Typ.) ( $V_{CC} = 9\text{V}$ ,  $f = 1\text{kHz}$ )
- No Input Coupling Capacitor
- Low Distortion  
:  $\text{THD} = 0.035\%$  (Typ.) ( $G_V = 40\text{dB}$ ,  $V_{OUT} = 0.5V_{rms}$ )
- Low Noise (Equivalent Input Noise Voltage)  
:  $V_{NI} = 0.9\mu\text{V}_{rms}$  (Typ.)  
( $R_g = 620\Omega$ ,  $BW = 20\text{Hz} \sim 20\text{kHz}$ , NAB EQ)
- Operating Supply Voltage Range  
:  $V_{CC}(\text{opr.}) = 6 \sim 16\text{V}$



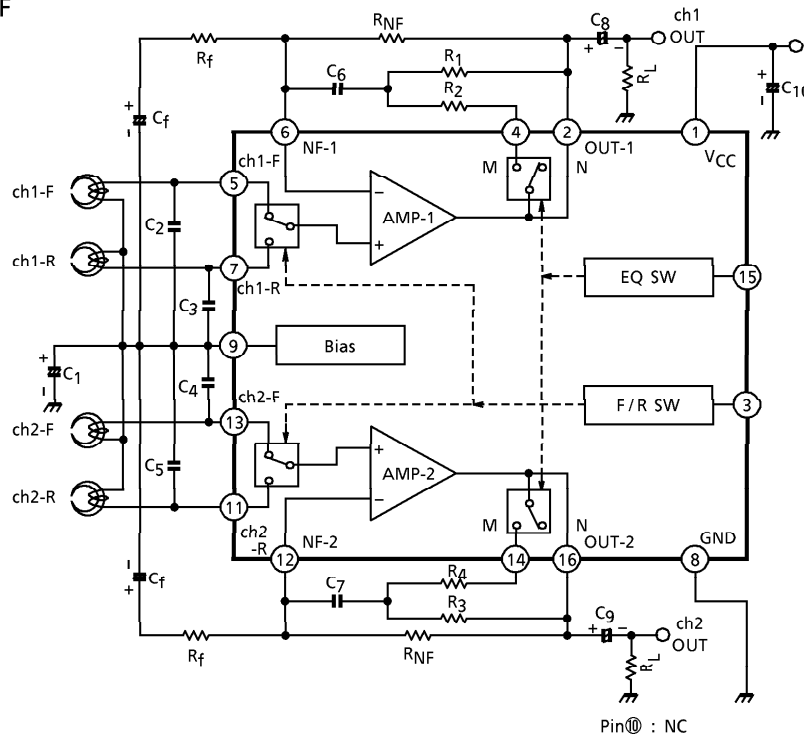
Weight  
 DIP16-P-300-2.54A : 1.0g (Typ.)  
 SSOP16-P-225-1.00A : 0.14g (Typ.)

961001EBA1

- TOSHIBA is continually working to improve the quality and the reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to observe standards of safety, and to avoid situations in which a malfunction or failure of a TOSHIBA product could cause loss of human life, bodily injury or damage to property. In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent products specifications. Also, please keep in mind the precautions and conditions set forth in the TOSHIBA Semiconductor Reliability Handbook.
- The products described in this document are subject to foreign exchange and foreign trade control laws.
- The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA CORPORATION for any infringements of intellectual property or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any intellectual property or other rights of TOSHIBA CORPORATION or others.
- The information contained herein is subject to change without notice.

**BLOCK DIAGRAM**

TA7705P, TA7705F



**APPLICATION INFORMATION**

1. Forward / Reverse select switch

(1) Threshold voltage

Pin③ is coupled to the base of Q<sub>1</sub> (PNP-Tr) as shown Fig.1.

Threshold voltage (③pin) = 0.7V

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

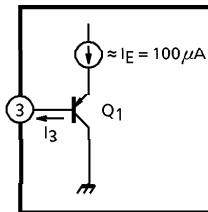


Fig.1

(2) The recommended Forward / Reverse select circuit is shown in Fig.2.

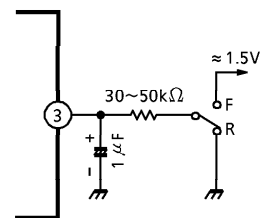


Fig.2



**MAXIMUM RATINGS (Ta = 25°C)**

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V <sub>CC</sub>	16	V
Power Dissipation	TA7705P	750	mW
	TA7705F	350	
Operating Temperature	T <sub>opr</sub>	- 30~75	°C
Storage Temperature	T <sub>stg</sub>	- 55~150	°C

(Note) Derated above Ta = 25°C in the proportion of 6mW/°C for TA7705P, and of 2.8mW/°C for TA7705F.

**ELECTRICAL CHARACTERISTICS**

(Unless otherwise specified, V<sub>CC</sub> = 9V, f = 1kHz, R<sub>L</sub> = 10kΩ, R<sub>g</sub> = 600Ω, Ta = 25°C, Normal EQ)

CHARACTERISTIC	SYMBOL	TEST CIRCUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Quiescent Current	I <sub>CCQ</sub> (1)	—	V <sub>IN</sub> = 0, Normal EQ	—	5.0	—	mA
	I <sub>CCQ</sub> (2)	—	V <sub>IN</sub> = 0, Metal EQ	—	6.0	9.0	
Open Loop Voltage Gain	G <sub>VO</sub>	—	C <sub>f</sub> = 100μF, R <sub>f</sub> = 0	—	98	—	dB
Maximum Output Voltage	V <sub>OM</sub>	—	THD = 0.5%	1.5	2.0	—	V <sub>rms</sub>
Total Harmonic Distortion	THD	—	V <sub>OUT</sub> = 0.5V <sub>rms</sub>	—	0.035	0.12	%
Equivalent Input Noise Voltage	V <sub>IN</sub>	—	R <sub>g</sub> = 620Ω, NAB BW = 20Hz~20kHz	—	0.9	1.7	μV <sub>rms</sub>
Input Resistance	R <sub>IN</sub>	—	—	—	500	—	kΩ
Ripple Rejection	R.R.	—	f <sub>ripple</sub> = 100Hz, V <sub>IN</sub> = 1V <sub>rms</sub>	—	55	—	dB
Cross Talk	C.T.	—	V <sub>OUT</sub> = 0.775V <sub>rms</sub> (0dBm)	50	60	—	dB
Forward / Reverse Cross Talk	C.T. (F / R)	—	V <sub>OUT</sub> = 0.775V <sub>rms</sub> (0dBm)	60	70	—	dB

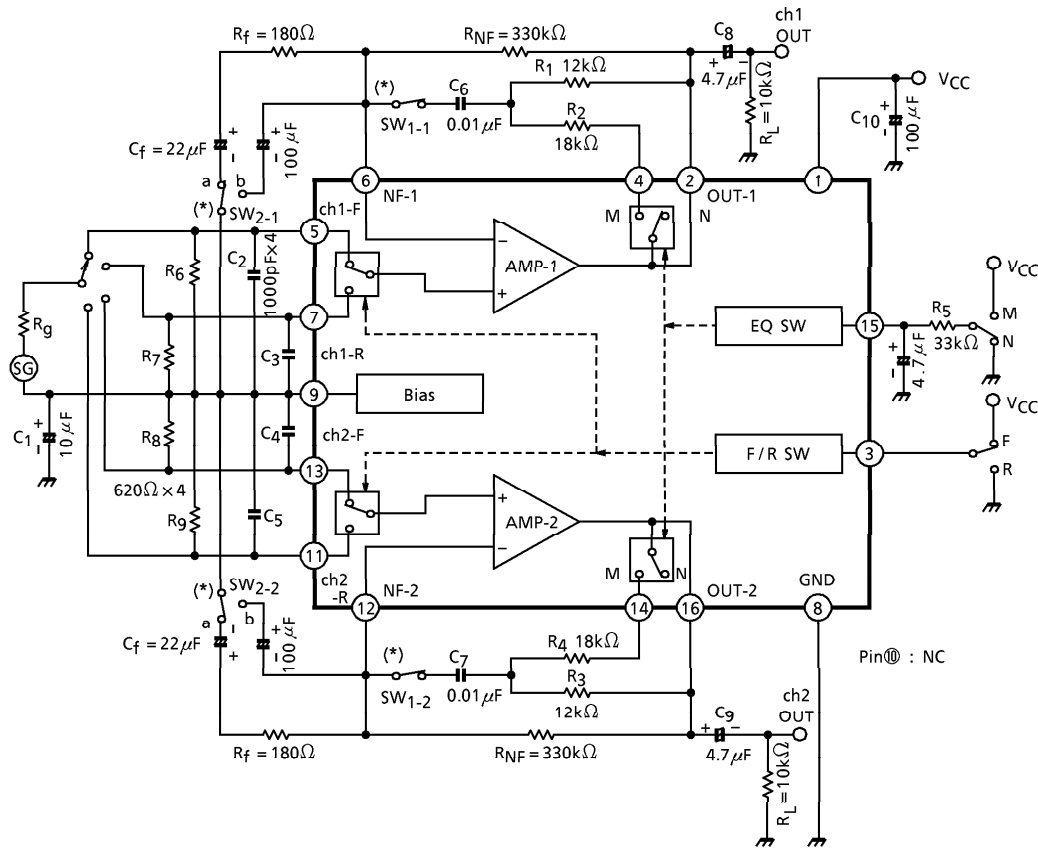
**TYP. DC VOLTAGE OF EACH TERMINAL**

(V<sub>CC</sub> = 9V, Ta = 25°C, Dual mode test circuit)

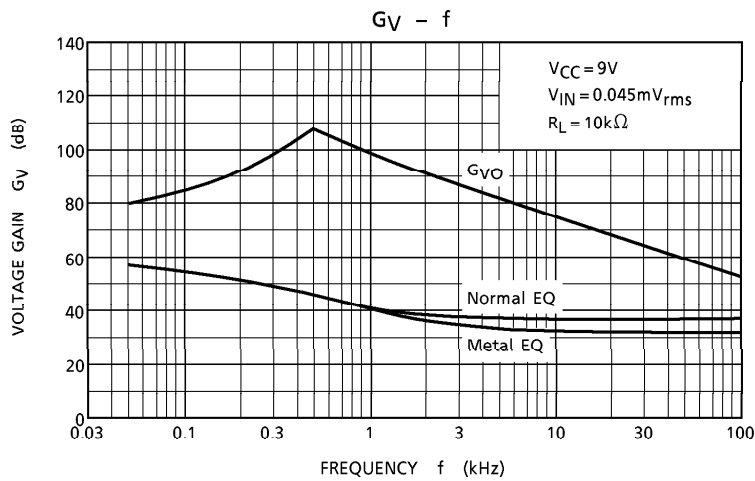
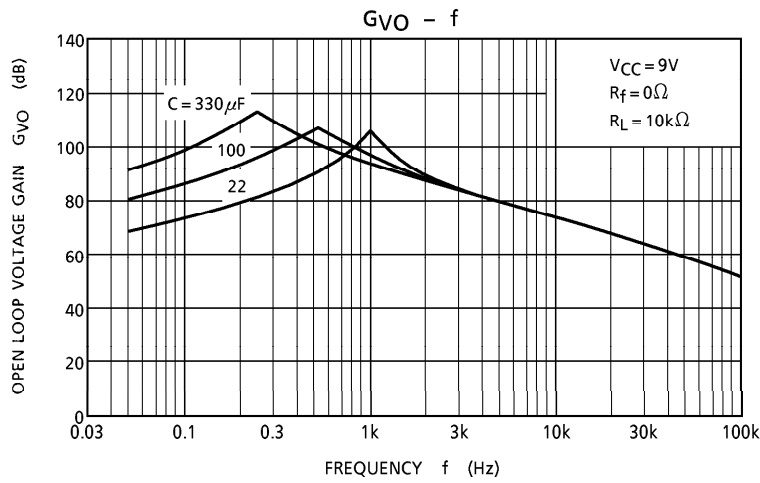
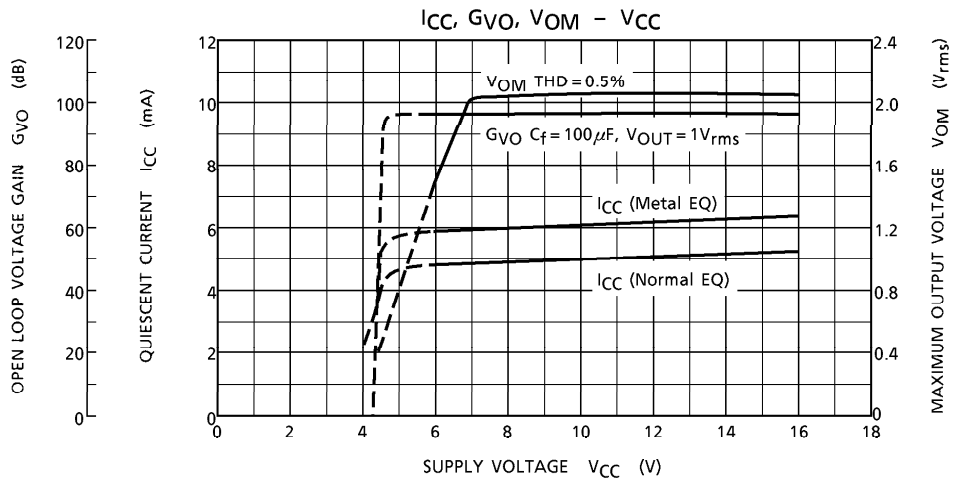
TERMINAL No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
DC-Voltage (V)	V <sub>CC</sub>	3.0	0.7	2.9	2.9	2.9	2.9	GND	2.9	NC	2.9	2.9	2.9	2.9	3.5	2.9

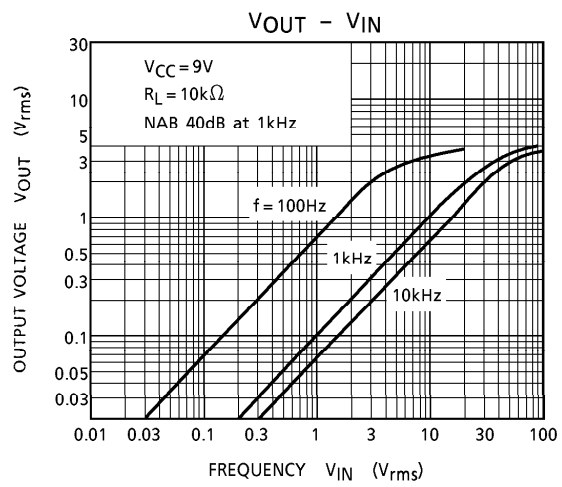
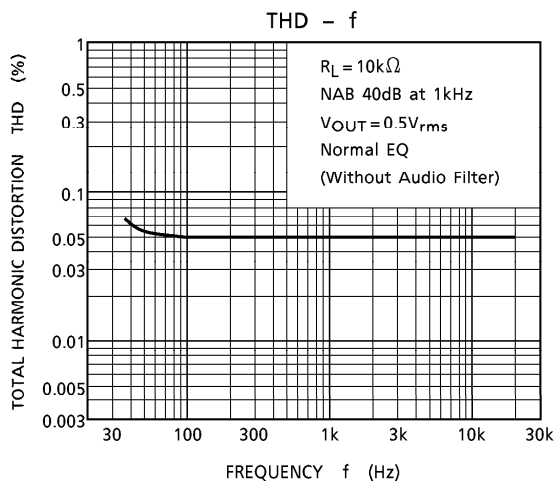
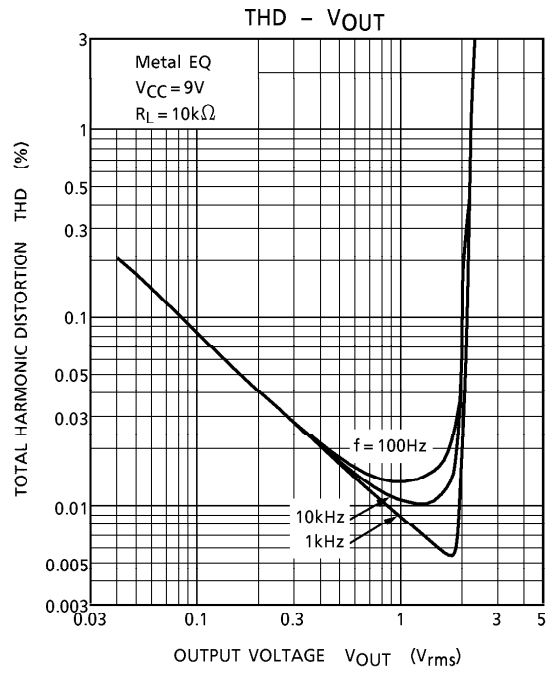
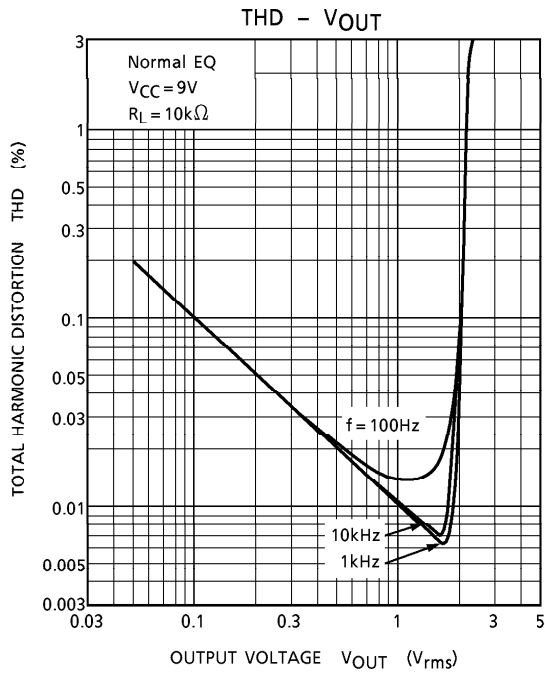
TEST CIRCUIT

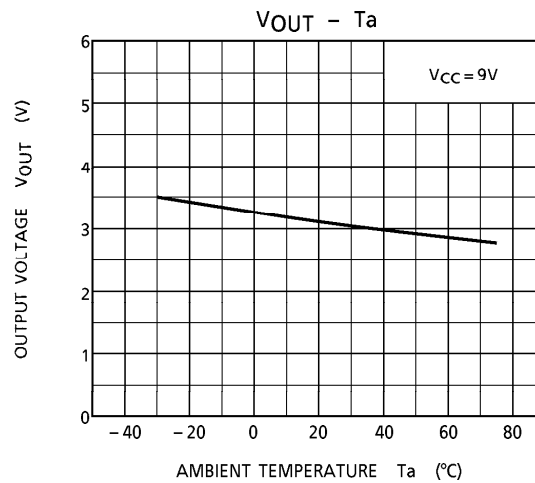
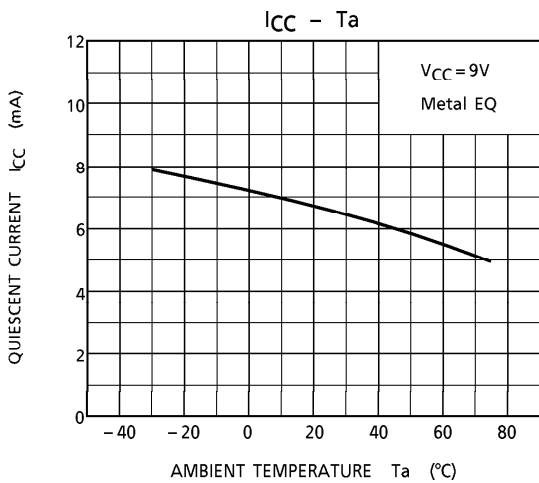
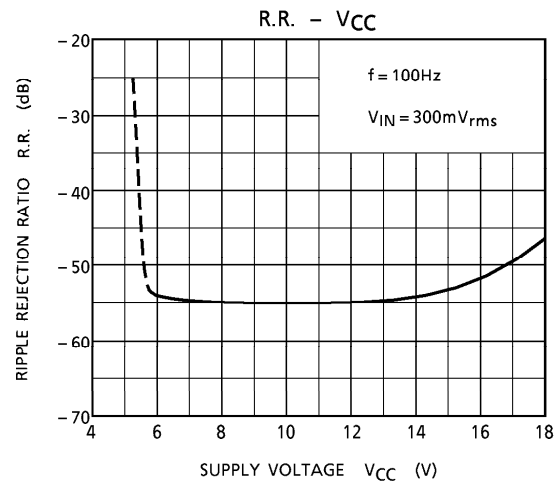
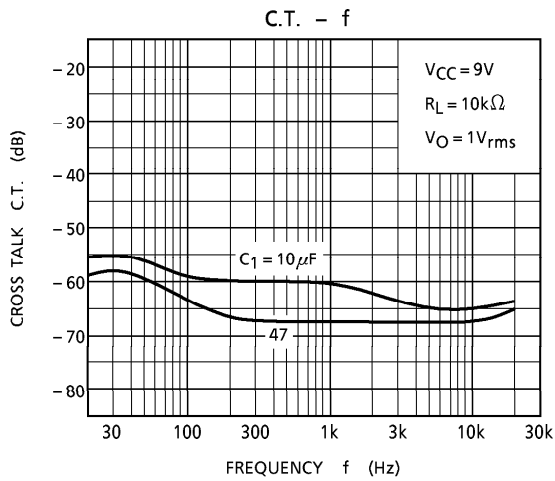
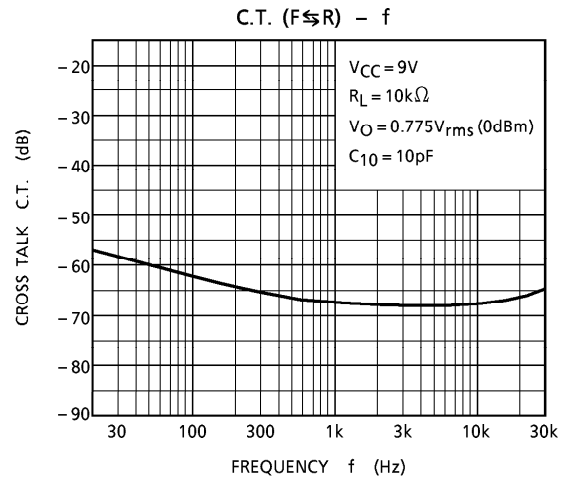
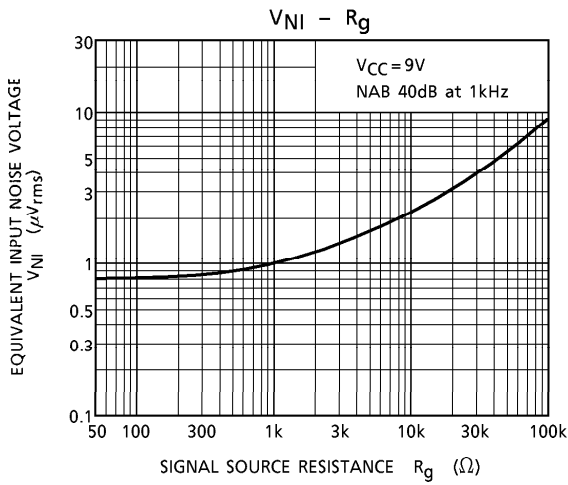
TA7705P, TA7705F



(\*) G<sub>VO</sub> Test : SW<sub>1-1</sub>, 2 = OFF, SW<sub>2-1</sub>, 2 = b



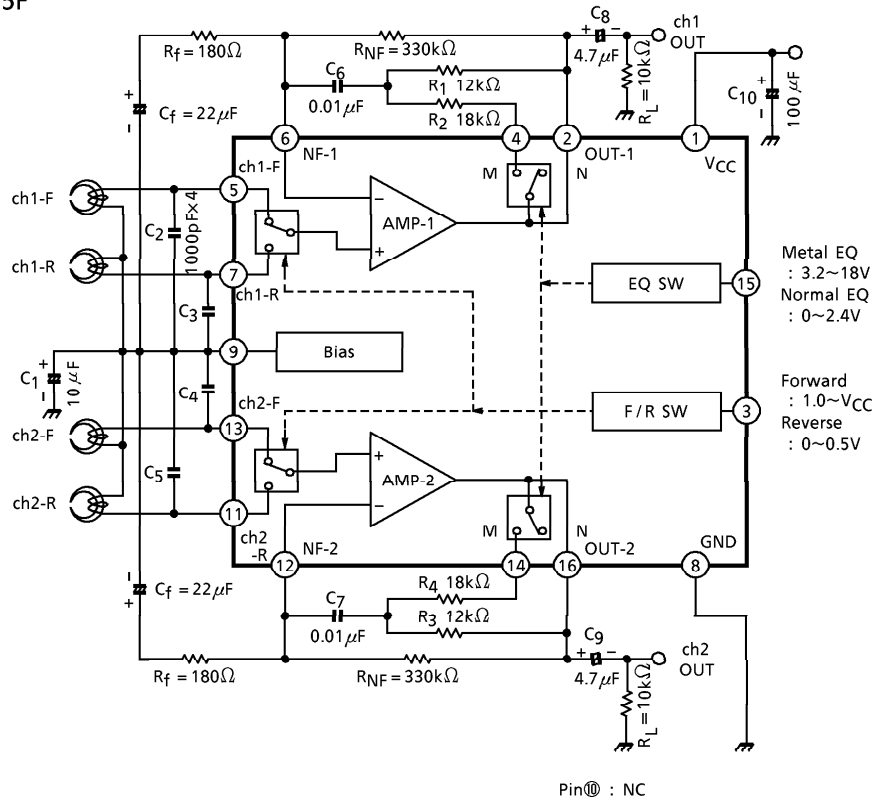






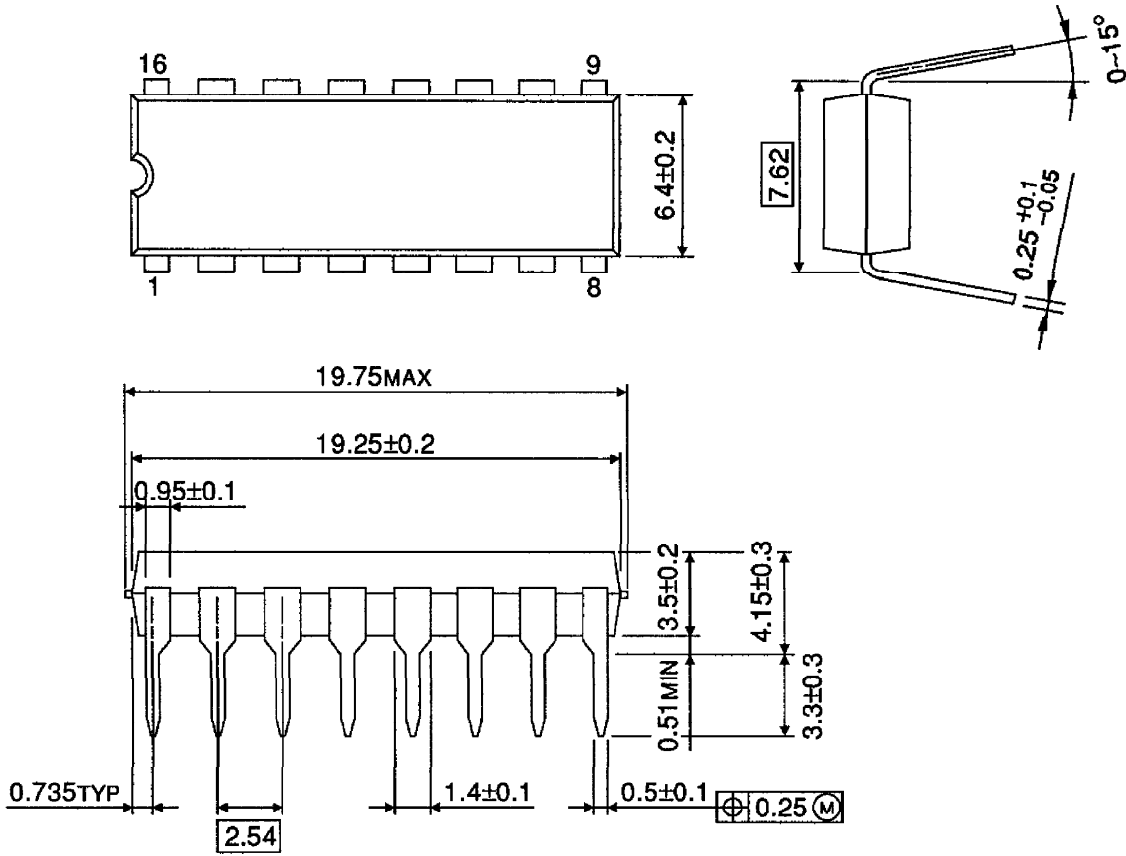
APPLICATION CIRCUIT

TA7705P, TA7705F



OUTLINE DRAWING  
DIP16-P-300-2.54A

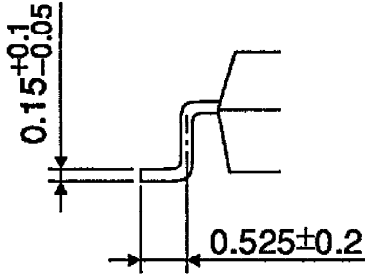
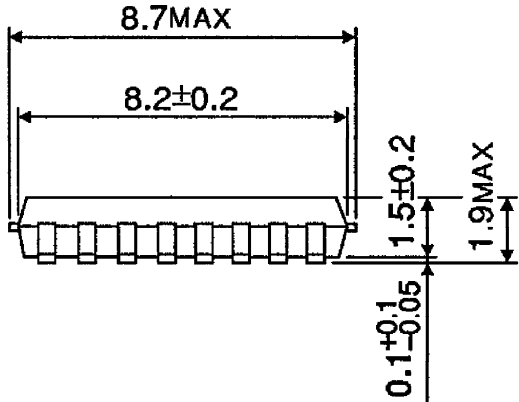
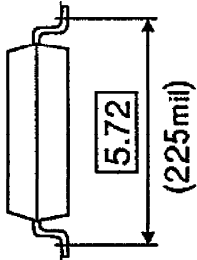
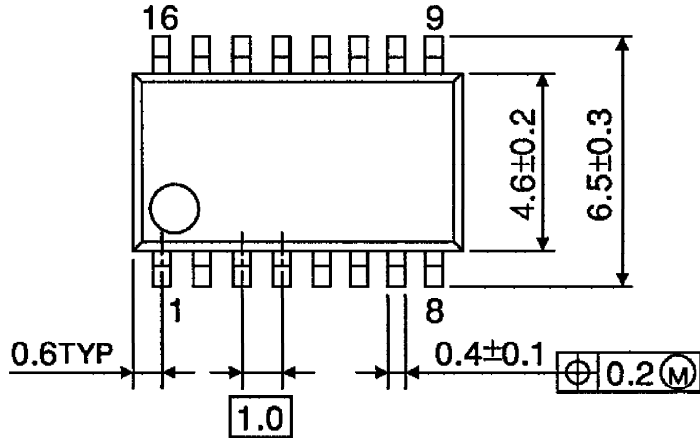
Unit : mm



Weight : 1.0g (Typ.)

OUTLINE DRAWING  
SSOP16-P-225-1.00A

Unit : mm



Weight : 0.14g (Typ.)