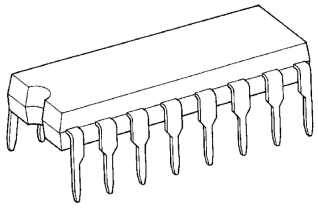
TOSHIBA Bipolar Linear Integrated Circuit Silicon Monolithic

TA2025P,TA2025F

Low Noise Preamplifier For Autoreverse Car Stereo

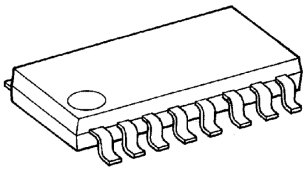
The TA2025P, TA2025F contains dual amplifier, forward, reverse control switches and metal, normal tape equalizer control switches.

TA2025P



DIP16-P-300-2.54A

TA2025F



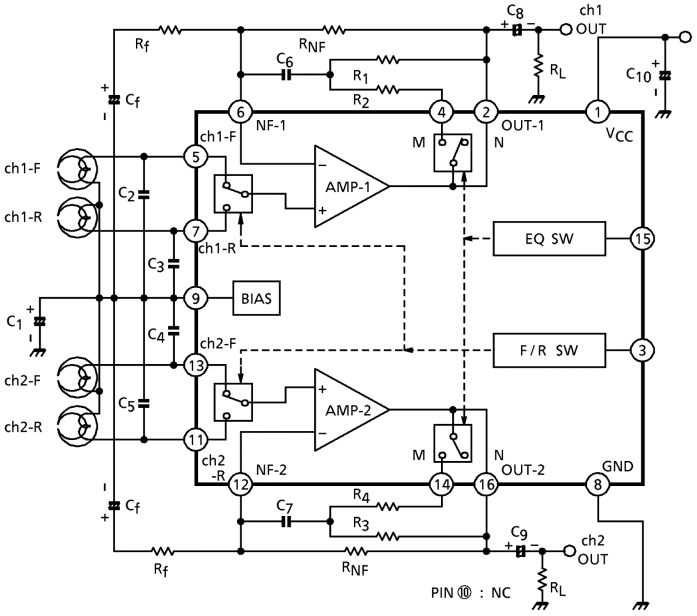
SSOP16-P-225-1.00A

Weight
DIP16−P−300−2.54A: 1.00g (typ.)
SSOP16−P−225−1.00A: 0.14g (typ.)

Feature

- High voltage gain
  : G_{VO} = 100dB (typ.) (V_{CC} = 9V, f = 1kHz)
- No input coupling capacitor
- Low noise (equivalent noise voltage)
  : V_{NI} = 0.6μVrms (typ.) (V_{CC} = 9V, Rg = 620Ω、
  BW = 20Hz~20kHz, NAB EQ)
- Low distortion: THD = 0.01% (typ.)
- Operating supply voltage range: V_{CC} (opr.) = 6~16V

Block Diagram



Application Information

1. Forward, reverse select switch
   (1) Threshold voltage
   Pin(3) is coupled to the base of Q_1 (PNP–Tr) as shown in Fig.1.
   Threshold voltage (pin(3)) = 0.7V

Reverse	0~0.5V
Forward	1.0~V_{CC}

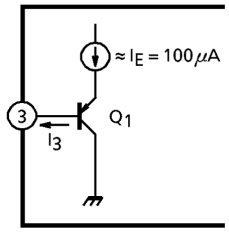


Fig.1

   (2) The recommended forward, reverse select circuit is shown in Fig.2.

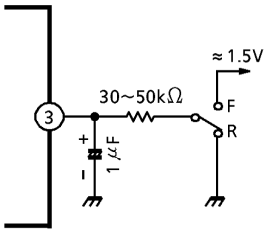


Fig.2

   (3) I_3 (in Fig.1)
   I_3 = 12μA (max., Ta = 25°C)

2. Equalizer control switch
   Pin(15) is coupled to the base of Q_2 (PNP–Tr) as shown in Fig.3.
   The emitter potential of Q_2 is 3.9V (DC).
   Threshold voltage (pin(15)) = 2.8V

Metal	3.2~16V
Normal	0~2.4V

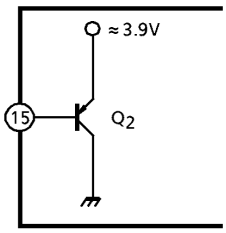


Fig.3

3. C_2 / C_3 / C_4 / C_5
   Capacitor C_2~C_5 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_{CC}	16	V
Power dissipation	(Note)	P_D	350	mW
Operating temperature		T_{opr}	−30~85	°C
Storage temperature		T_{stg}	−55~150	°C

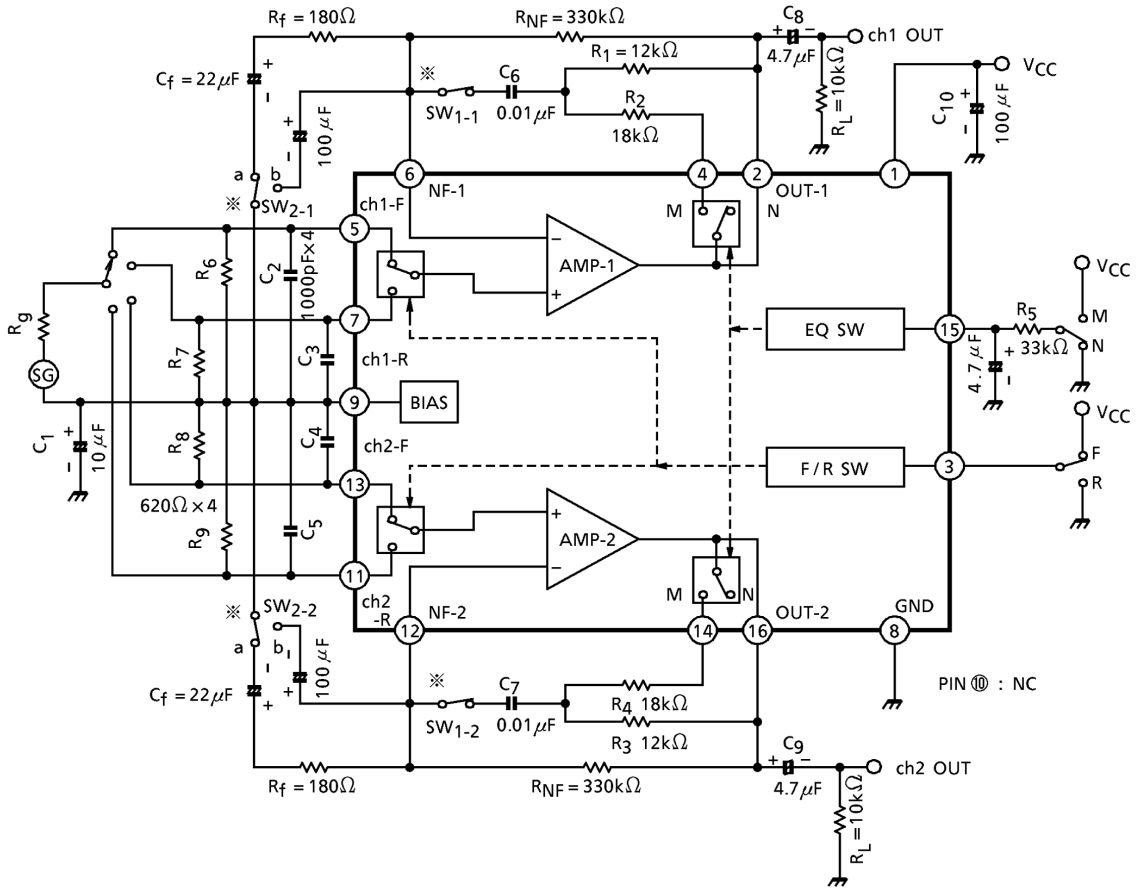
(Note) Derated above Ta = 25°C in the proportion of 6mW / °C for TA2025P and of 2.8mW / °C for TA2025F.

Electrical Characteristics

(unless otherwise specified, V_{CC} = 9V、 f = 1kHz、R_L = 10kΩ、 R_g = 600Ω、 Ta = 25°C、 normal EQ)

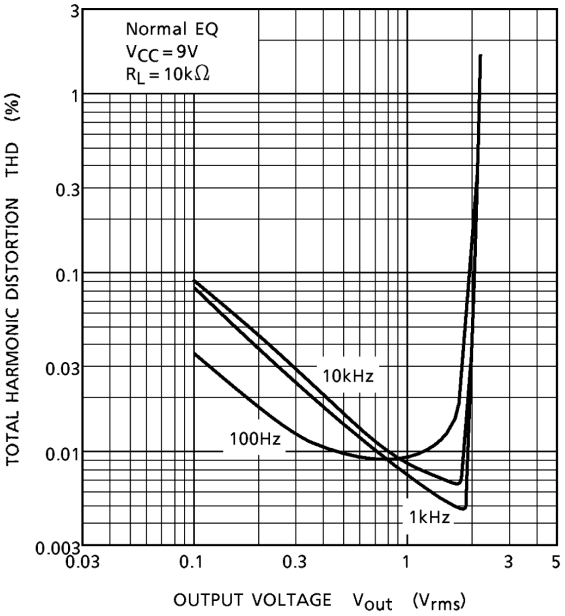
Characteristic	Symbol	Test Cir−cuit	Test Condition	Min.	Typ.	Max.	Unit
Quiescent current	$I_{CCQ\ (1)}$	—	V_{IN} = 0, normal EQ	—	6.0	—	mA
	$I_{CCQ\ (2)}$	—	V_{IN} = 0, metal EQ	—	7.0	10.0	
Open loop voltage gain	G_{VO}	—	C_f = 100μF, R_f = 0	—	100	—	dB
Maximum output voltage	V_{OM}	—	THD = 0.5%	1.5	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 = 620Ω, NAB BW = 20Hz~20kHz	—	0.6	1.2	μV_{rms}
Input resistance	R_{IN}	—	—	—	330	—	kΩ
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

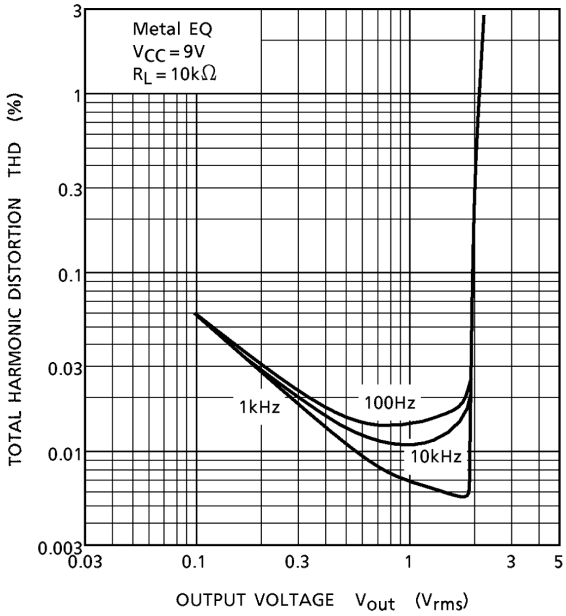


※ G_{VO} test: SW1−1, 2 = off, SW2−1, 2 = b

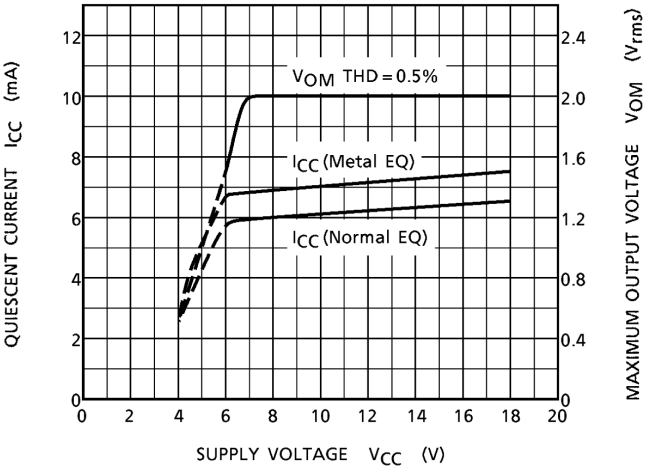
THD – V_{out}



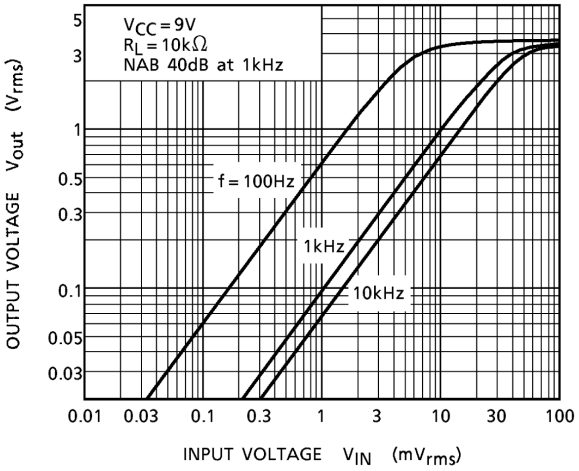
THD – V_{out}



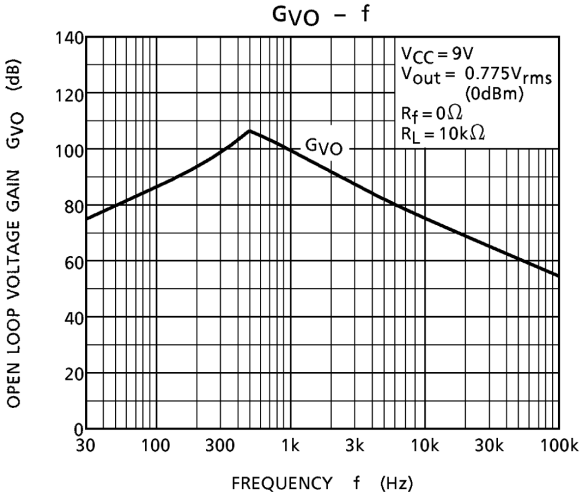
I_{CC}, V_{OM} – V_{CC}



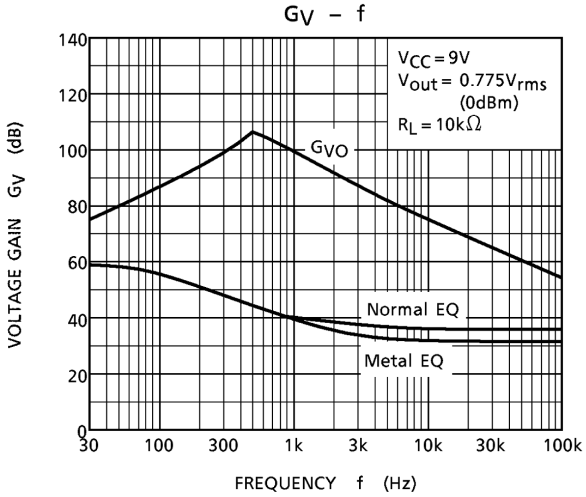
V_{out} – V_{IN}



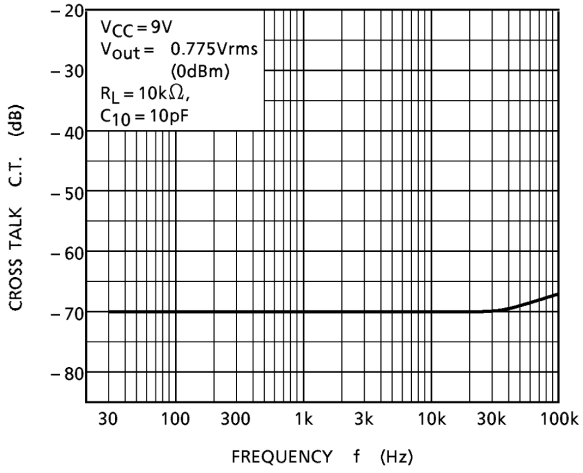
G_{VO} – f



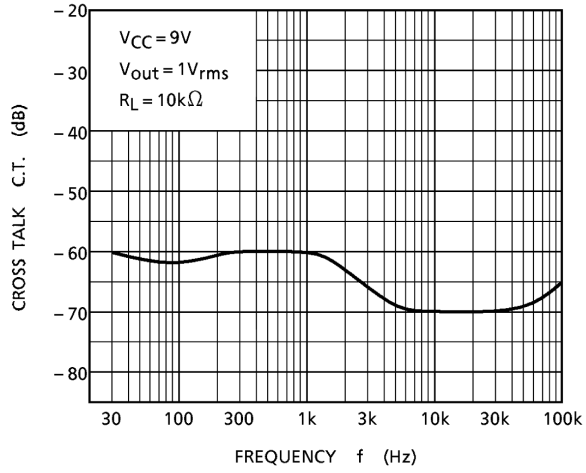
G_V – f



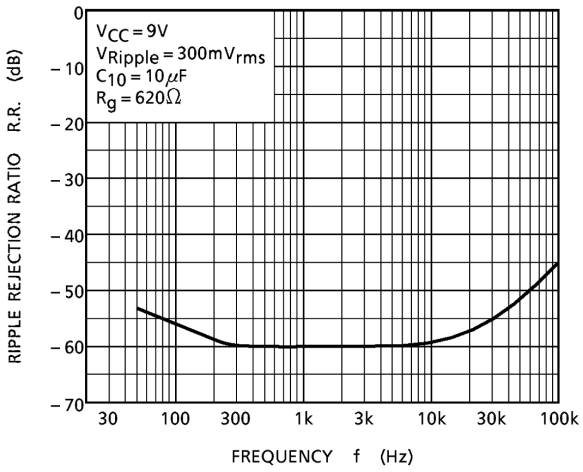
C.T. (F⇆R) – f



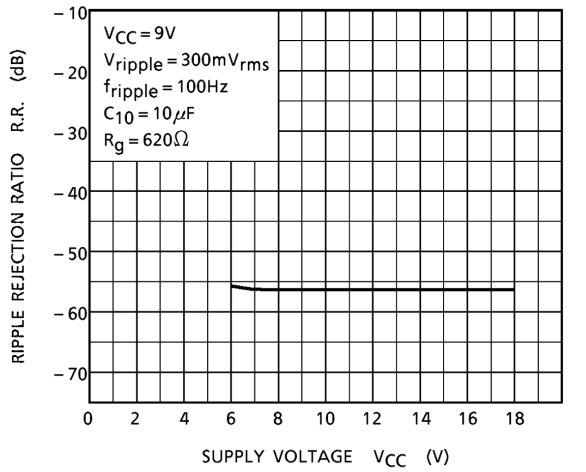
C.T. – f



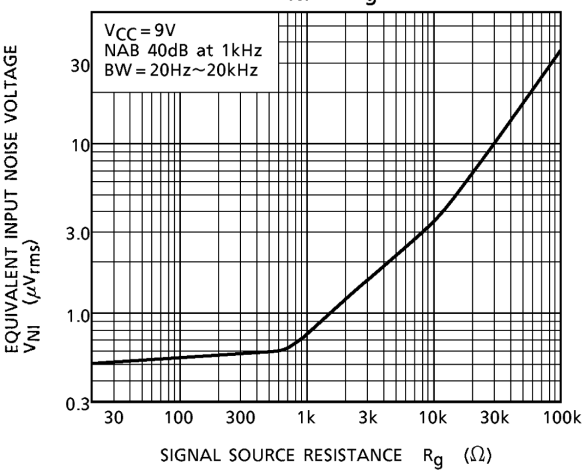
R.R. – f



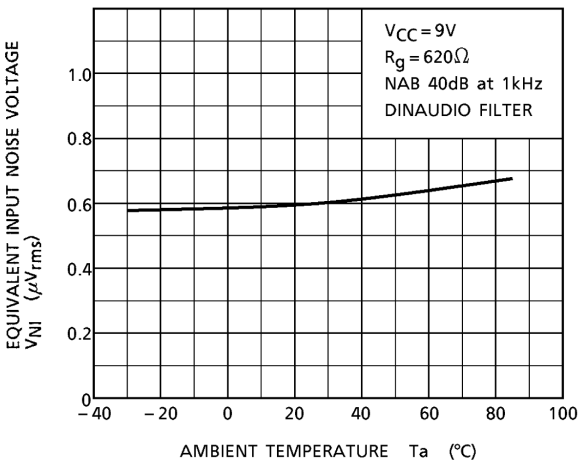
R.R. – V_{CC}



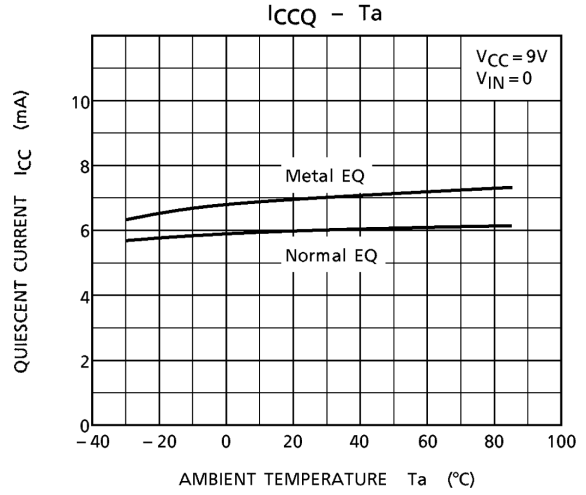
V_{NI} – R_g



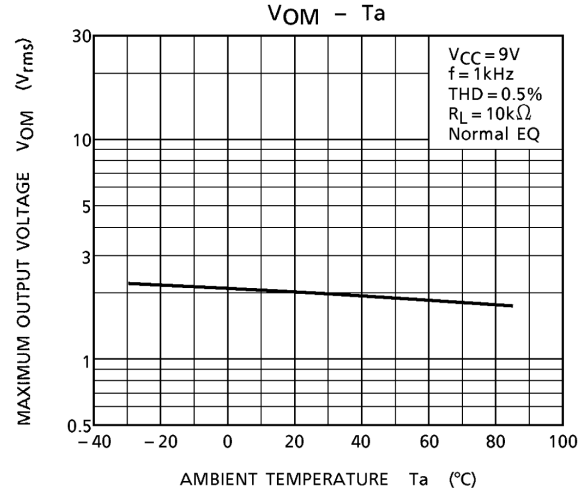
V_{NI} – Ta



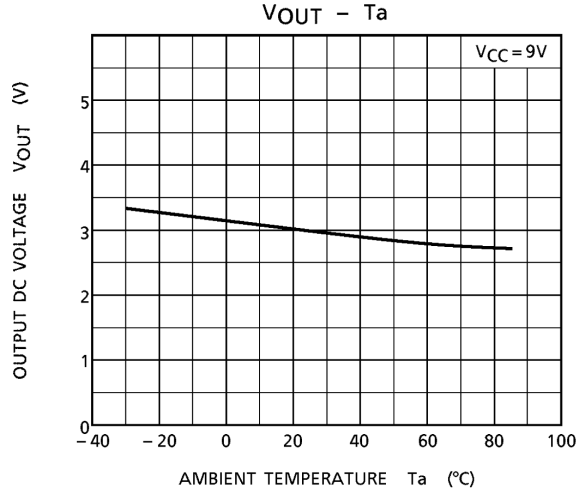
I_{CCQ} – Ta



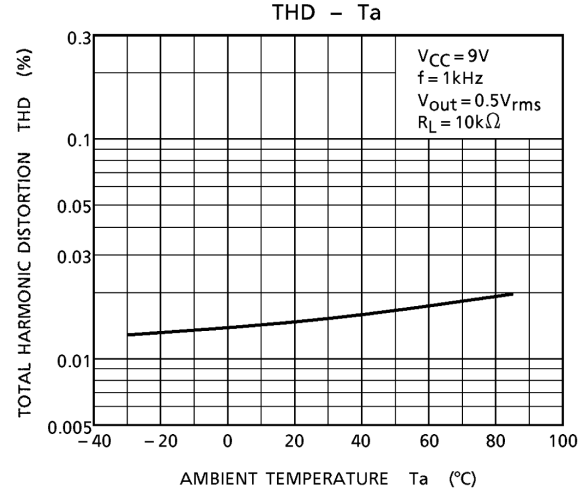
V_{OM} – Ta



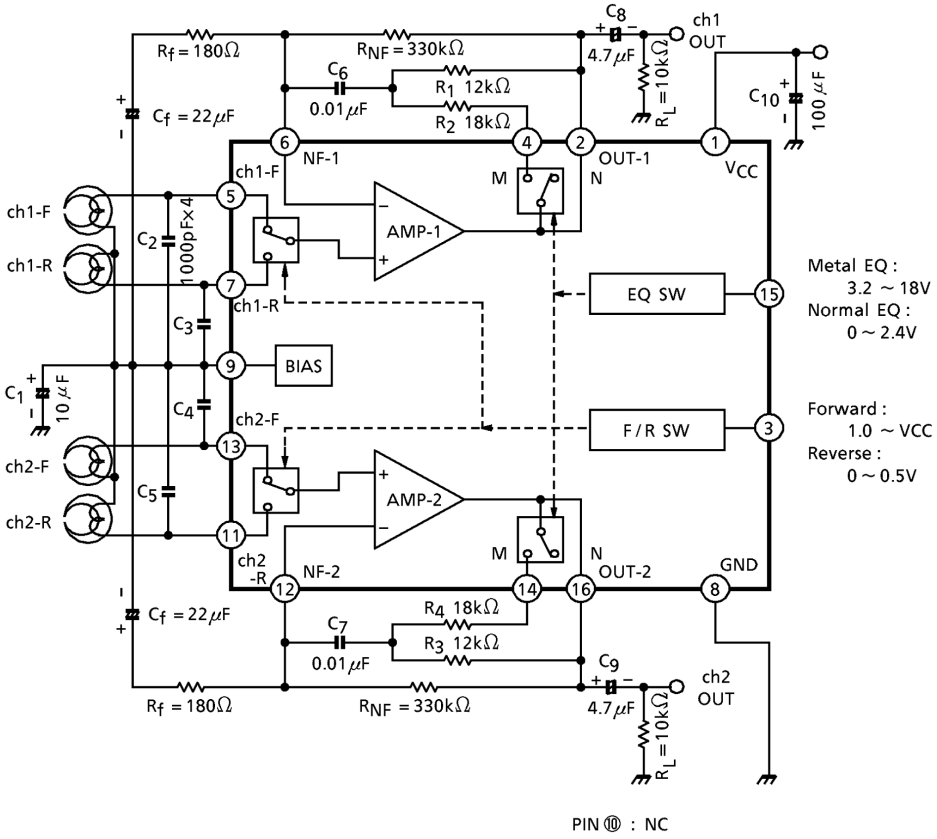
V_{OUT} – Ta



THD – Ta

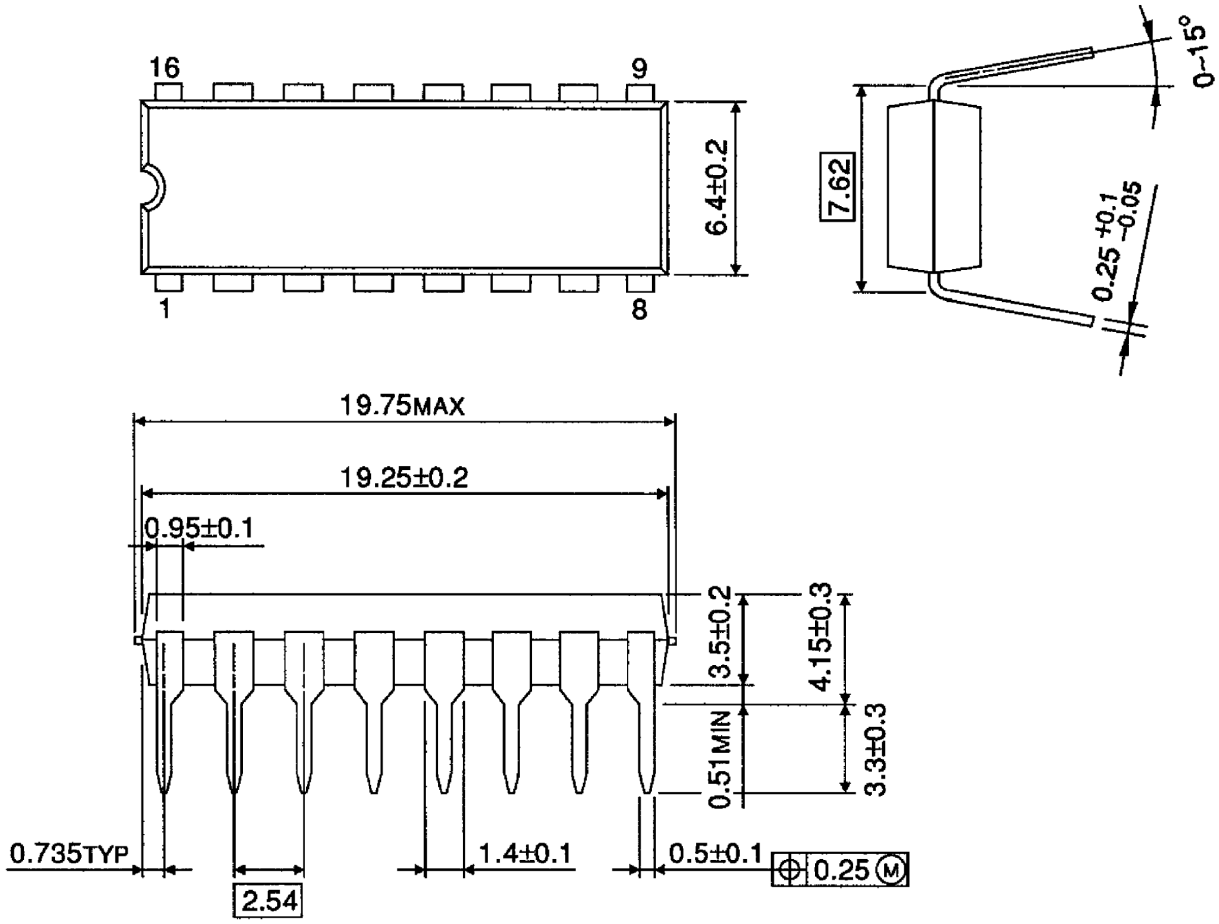


Application Circuit



Package Dimensions

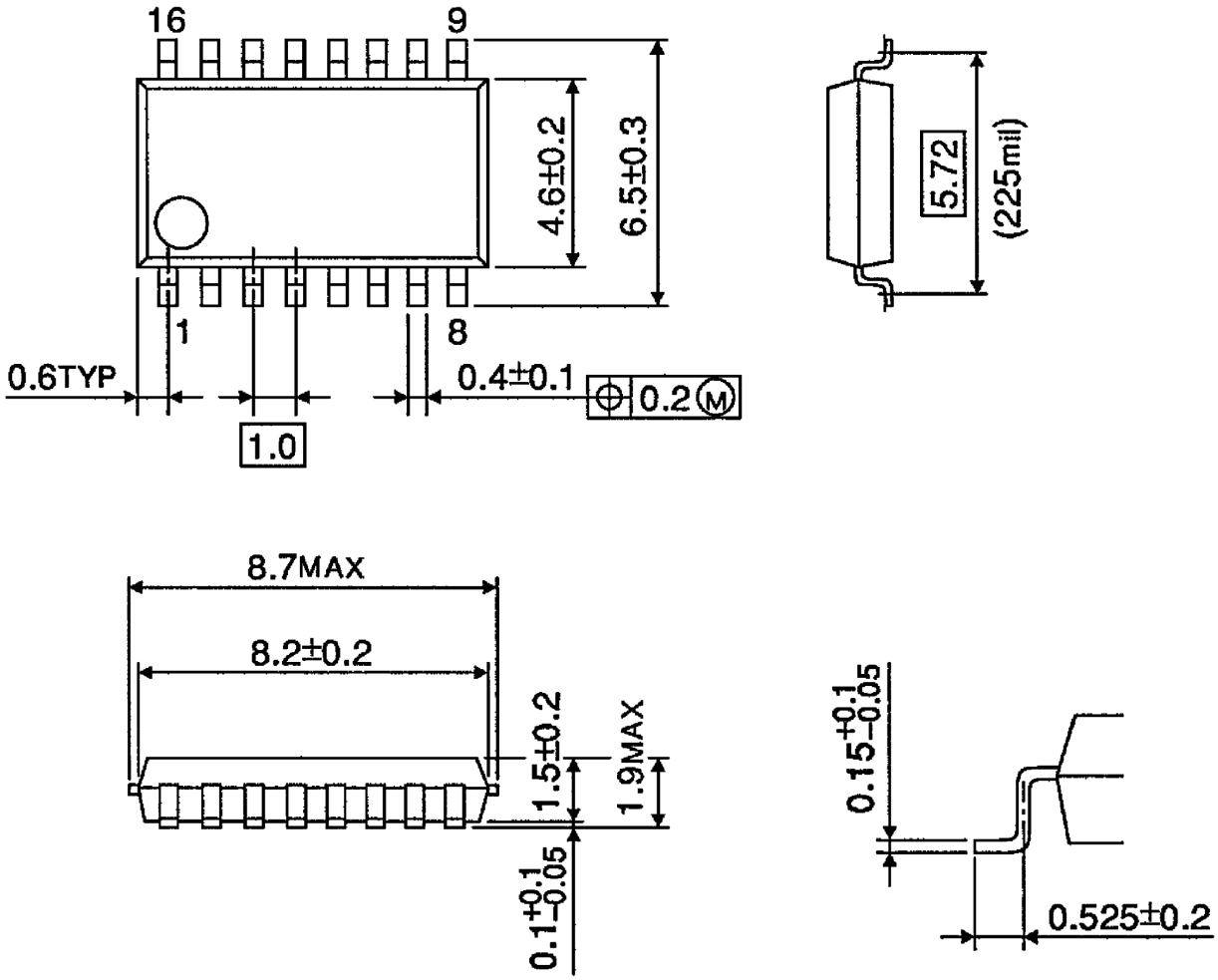
DIP16-P-300-2.54A Unit : mm



Weight: 1.00g (typ.)

Package Dimensions

SSOP16-P-225-1.00A Unit : mm



Weight: 0.14g (typ.)

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