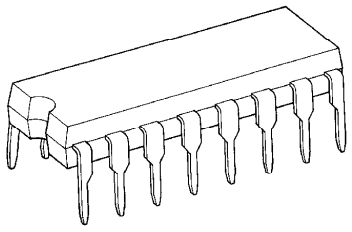
TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

TA7796P, TA7796Z

5 BAND GRAPHIC EQUALIZER

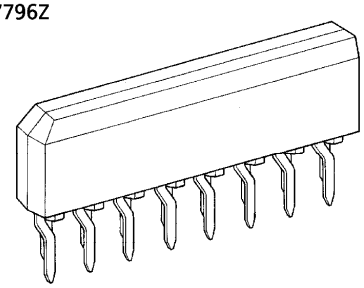
TA7796P, TA7796Z are 5-Band graphic equalizer IC, which have 5 resonance circuit and an output buffer amplifier. 5 band graphic equalizer for one channel can be formed easily by externally connecting capacitors and variable resistors which fix fo (resonance frequency).
Dual inline package 16pin TA7796P
Zig-Zag inline package 16pin TA7796Z

TA7796P



DIP16-P-300-2.54A

TA7796Z



ZIP16-P-1.27

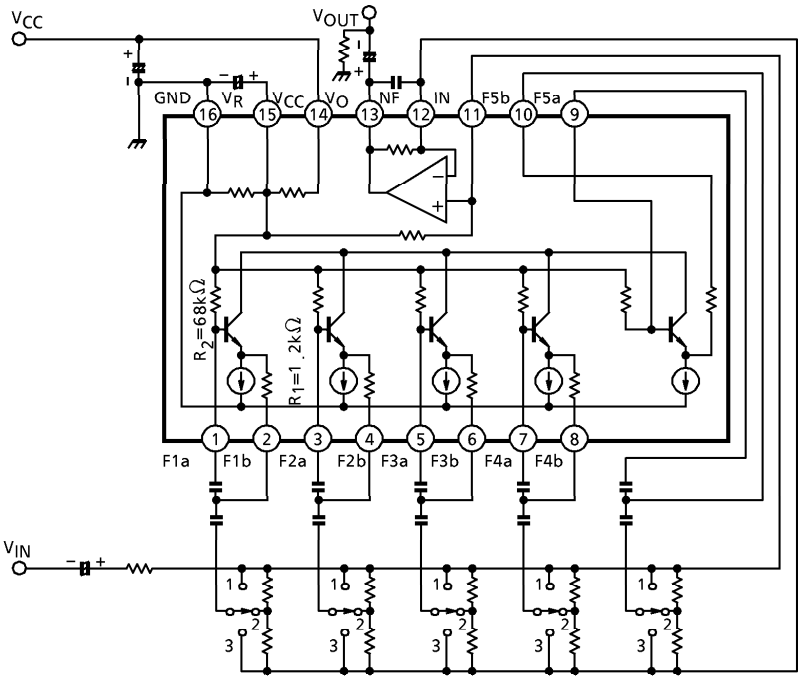
Weight
DIP16-P-300-2.54A : 1.0g (Typ.)
ZIP16-P-1.27 : 0.99g (Typ.)

FEATURES

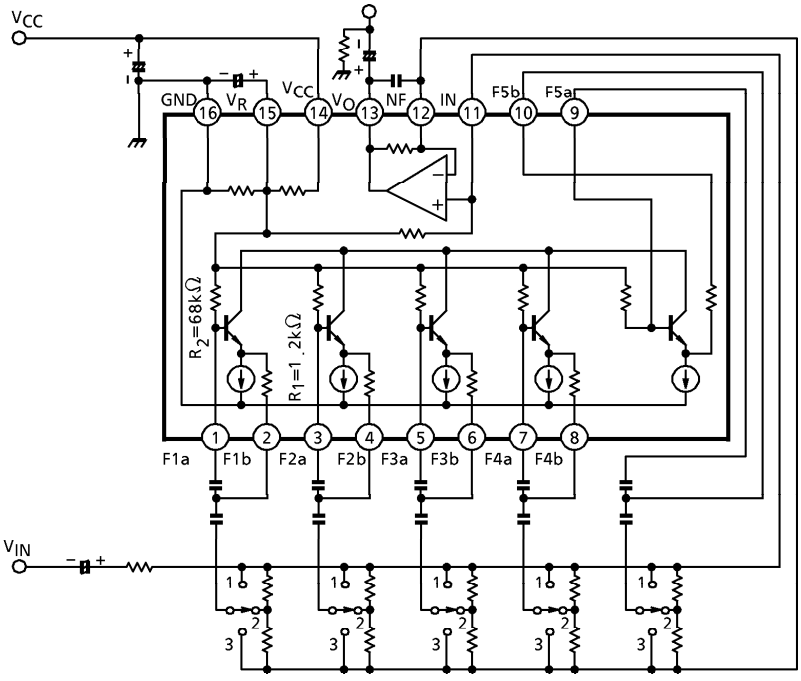
- Few External Parts
- Low Distortion
  : THD = 0.007% (Typ.)
  (V_O = 0.245Vrms (– 10dBm), f = 1.1kHz BW = 20~20kHz, FLAT)
- Low Noise
  : V_{no} = 3.0μV_{rms} (Typ.)
  (R_g = 620Ω, V_{in} = 0, BW = 20~20kHz, FLAT)
- Wide Operating Supply Voltage Range
  : V_{CC} = 4.0~16V (Ta = 25°C)

BLOCK DIAGRAM

TA7796P



TA7796Z



MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V_{CC}	16	V
Power Dissipation	P_D (Note)	750	mW
Operating Temperature	T_{opr}	−30~75	°C
Storage Temperature	T_{stg}	−55~150	°C

(Note) Derated above Ta = 25°C in the proportion of 6mW / °C for TA7796P, TA7796Z.

ELECTRICAL CHARACTERISTICS (Unless otherwise specified, V_{CC} = 8V, f = 1.1kHz, R_L = 10Ω, Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Quiescent Current	I_{CCQ}	—	V_{in} = 0	3.5	6.1	9.3	mA
Voltage Gain	G_V (FLT)	—	V_{out} = 0.775V_{rms} (0dBm)	−2.5	−0.5	1.5	dB
	G_V (BST)	—	V_{out} = 0.775V_{rms} (0dBm), f = 110Hz	10.0	11.5	14.0	
		—	V_{out} = 0.775V_{rms} (0dBm), f = 340Hz	10.0	11.5	14.0	
		—	V_{out} = 0.775V_{rms} (0dBm), f = 1.1kHz	10.0	11.5	14.0	
		—	V_{out} = 0.775V_{rms} (0dBm), f = 3.4kHz	10.0	11.5	14.0	
		—	V_{out} = 0.775V_{rms} (0dBm), f = 11kHz	10.0	11.5	14.0	
	G_V (CUT)	—	V_{out} = 0.775V_{rms} (0dBm), f = 110Hz	−14.0	−11.5	−10.0	
		—	V_{out} = 0.775V_{rms} (0dBm), f = 340Hz	−14.0	−11.5	−10.0	
		—	V_{out} = 0.775V_{rms} (0dBm), f = 1.1kHz	−14.0	−11.5	−10.0	
		—	V_{Out} = 0.775V_{rms} (0dBm), f = 3.4kHz	−14.0	−11.5	−10.0	
		—	V_{out} = 0.775V_{rms} (0dBm), f = 11kHz	−14.0	−11.5	−10.0	
Total Harmonic Distortion	THD (FLT)	—	V_{out} = 0.245V_{rms} (−10dBm)	—	0.007	0.10	%
Output Noise Voltage	V_{no} (FLT)	—	R_g = 620Ω, V_{in} = 0, BW = 20~20kHz	—	3.0	8.0	μV_{rms}

TYP. DC VOLTAGE OF EACH TERMINAL

TA7796P (V_{CC} = 8V, Ta = 25°C)

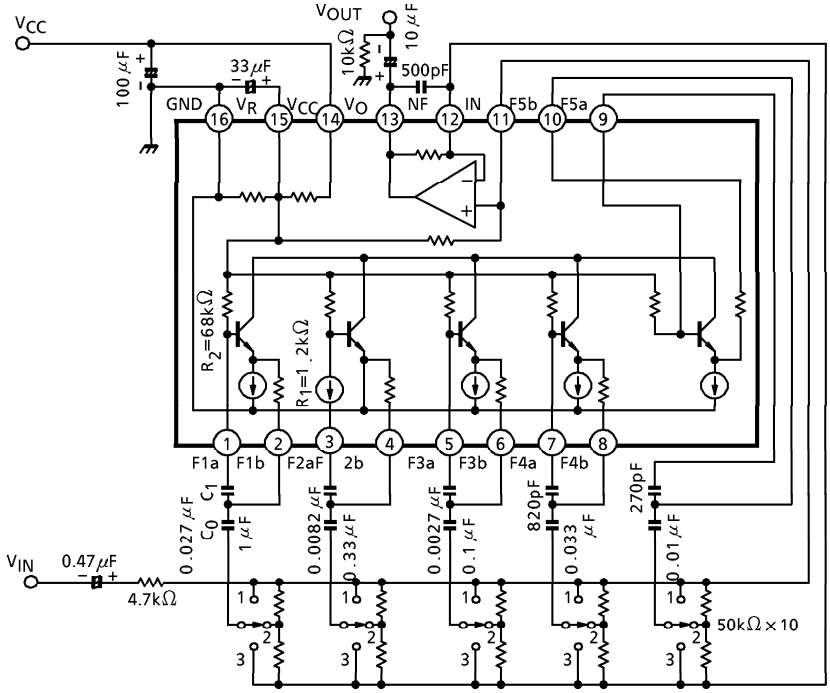
TERMINAL No.	1	2	3	4	5	6	7	8
DC-VOLTAGE (V)	4.70	3.35	4.70	3.35	4.70	3.35	4.70	3.35
TERMINAL No.	9	10	11	12	13	14	15	16
DC-VOLTAGE (V)	4.70	3.35	4.00	4.00	4.00	8.00	4.70	0

TA7796Z (V_{CC} = 8V, Ta = 25°C)

TERMINAL No.	1	2	3	4	5	6	7	8
DC-VOLTAGE (V)	4.70	3.35	4.00	4.00	4.00	8.00	4.70	0
TERMINAL No.	9	10	11	12	13	14	15	16
DC-VOLTAGE (V)	4.70	3.35	4.70	3.35	4.70	3.35	4.70	3.35

TEST CIRCUIT

TA7796P



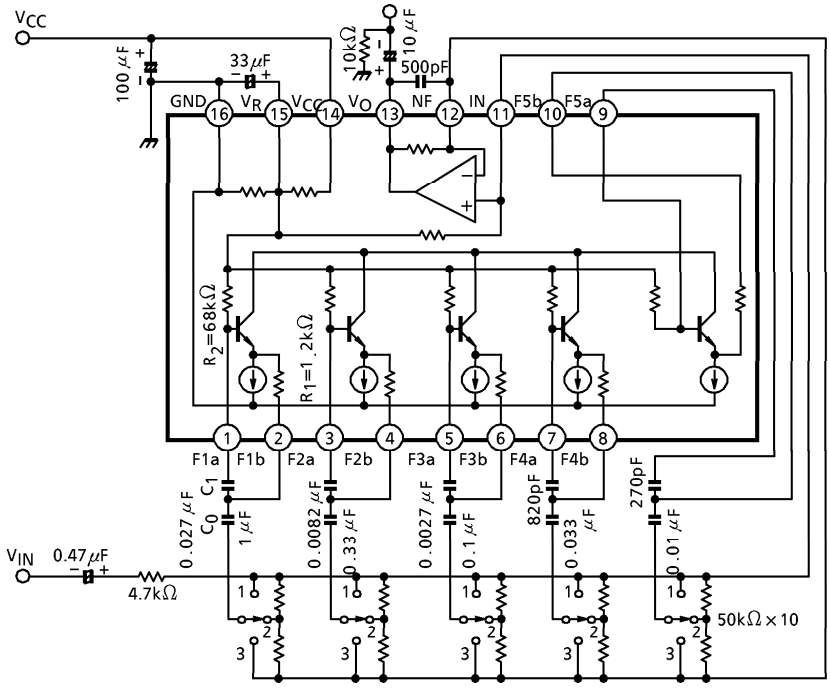
- 1 : CUT 2 : FLAT 3 : BOOST
- f_o (Resonance Frequency)

$$f_o = \frac{1}{2\pi\sqrt{C_0 \cdot C_1 \cdot R_1 \cdot R_2}}$$

($R_1 = 1.2k\Omega$, $R_2 = 68k\Omega$, on chip resistor)

C_0 (F)	C_1 (F)	f_o (Hz)
1μ	0.027μ	107
0.33μ	0.0082μ	340
0.1μ	0.0027μ	1.07k
0.033μ	820p	3.40k
0.01μ	270p	10.7k

TA7796Z



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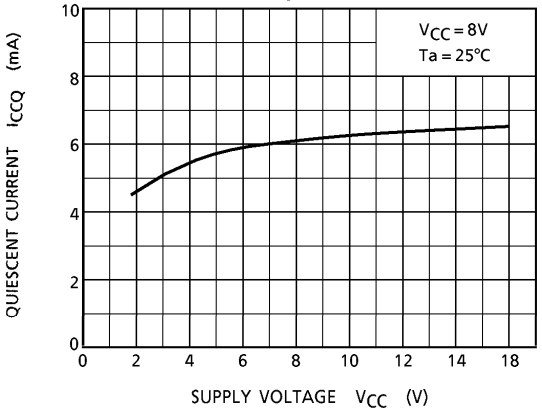
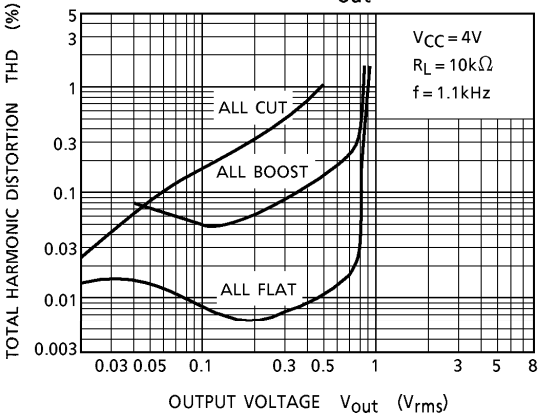
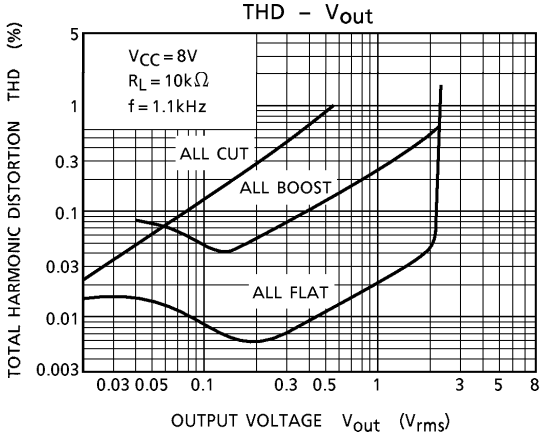
I_{CCQ} – V_{CC}



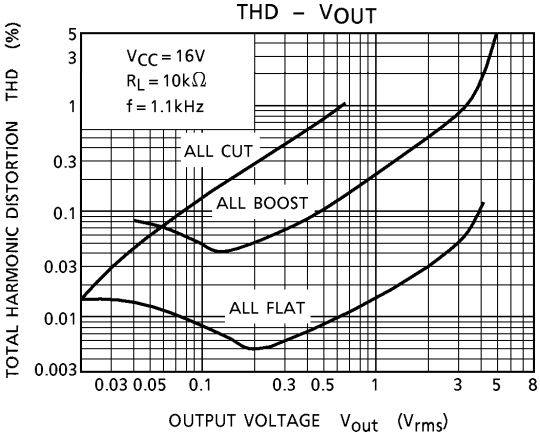
THD – V_{out}



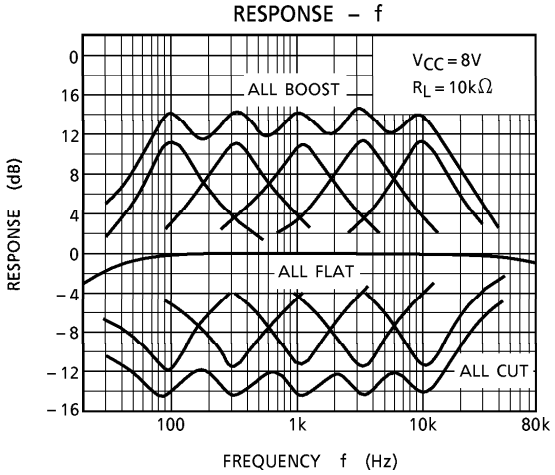
THD – V_{out}



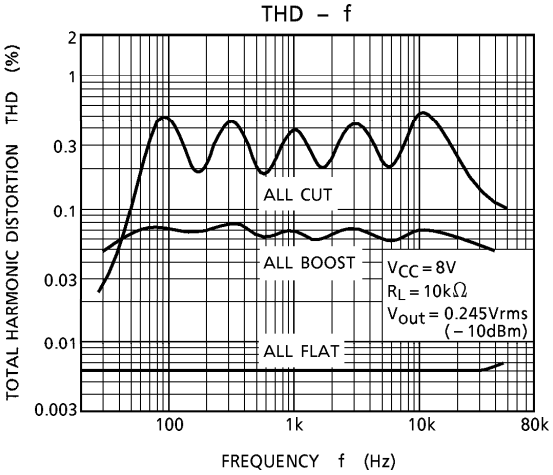
THD – V_{OUT}



RESPONSE – f

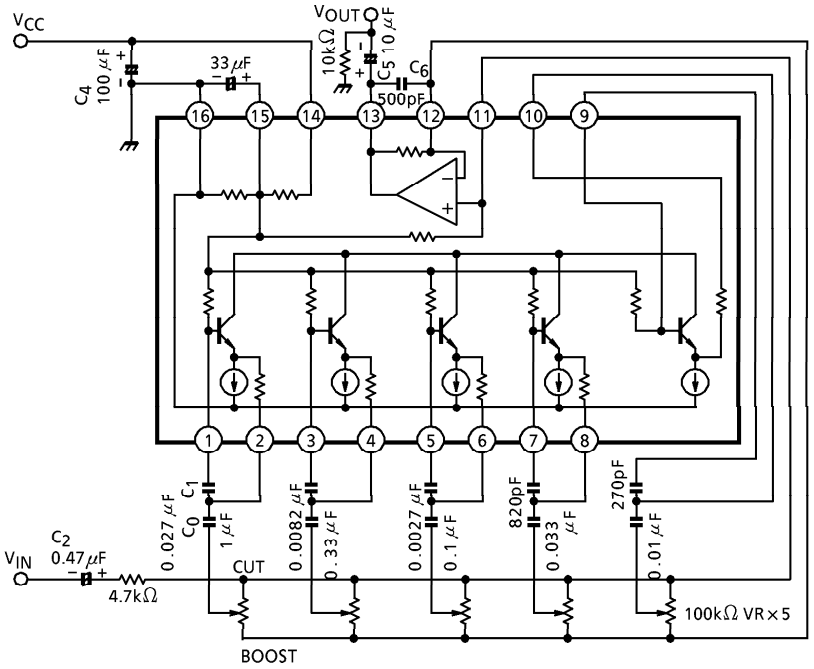


THD – f



APPLICATION

TA7796P



- Description of external parts.

  C_0, C_1 : Capacitors used to fix f_o (resonance frequency).

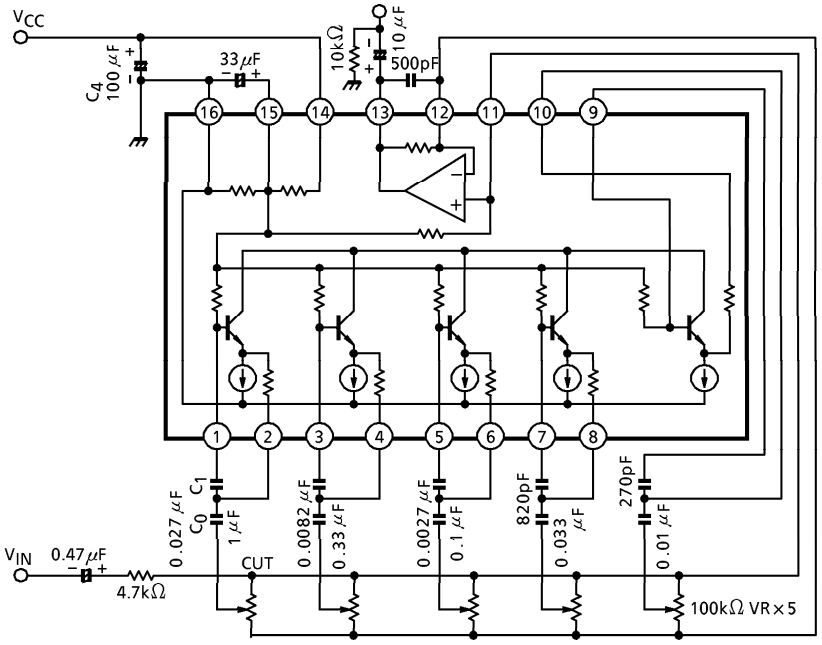
  C_2 : Input capacitor.

  C_3 : Decoupling capacitor.

  C_4 : Power capacitor.

  C_5 : Output capacitor.

TA7796Z



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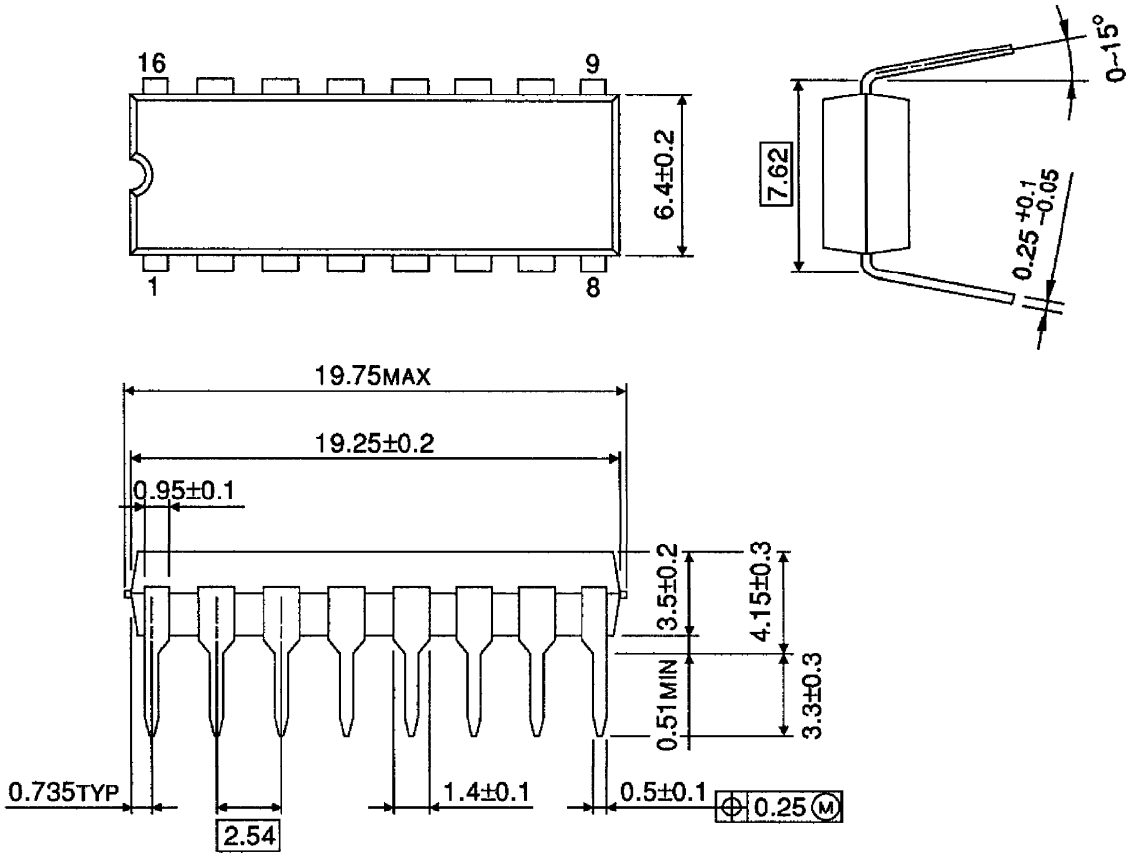
OUTLINE DRAWING

DIP16-P-300-2.54A

Unit : mm

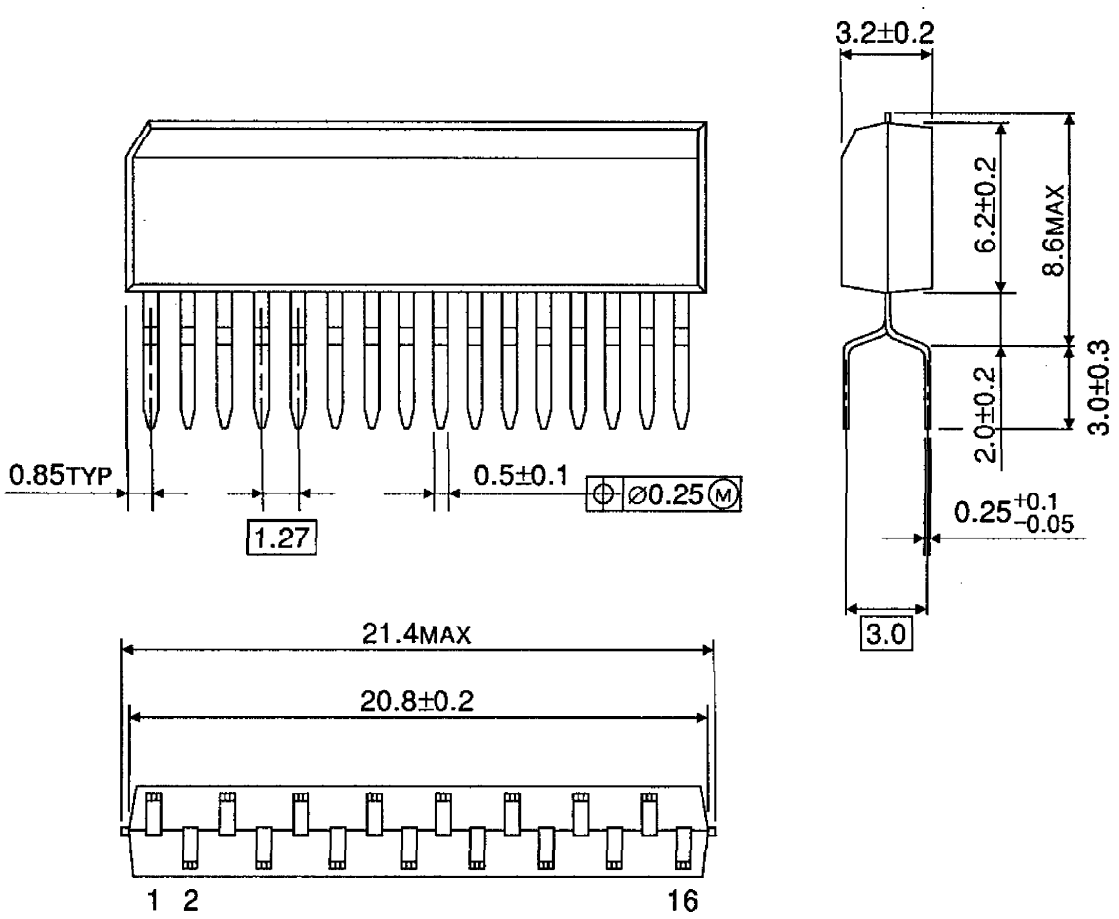


Weight : 1.0g (Typ.)

OUTLINE DRAWING

ZIP16-P-1.27

Unit : mm



Weight : 0.99g (Typ.)