

TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

**TA7796P, TA7796Z****5 BAND GRAPHIC EQUALIZER**

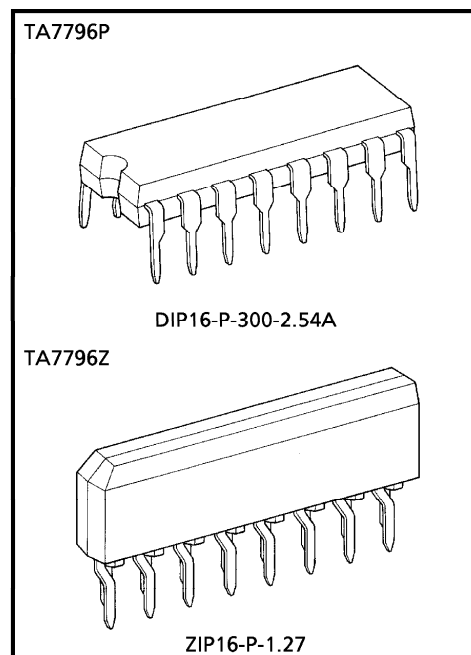
TA7796P, TA7796Z are 5-Band graphic equalizer IC, which have 5 resonance circuit and an output buffer amplifier. 5 band graphic equalizer for one channel can be formed easily by externally connecting capacitors and variable resistors which fix  $f_0$  (resonance frequency).

Dual inline package 16pin TA7796P

Zig-Zag inline package 16pin TA7796Z

**FEATURES**

- Few External Parts
- Low Distortion
  - : THD = 0.007% (Typ.)
  - ( $V_O = 0.245V_{rms}$  (-10dBm),  $f = 1.1kHz$  BW = 20~20kHz, FLAT)
- Low Noise
  - :  $V_{no} = 3.0\mu V_{rms}$  (Typ.)
  - ( $R_g = 620\Omega$ ,  $V_{in} = 0$ , BW = 20~20kHz, FLAT)
- Wide Operating Supply Voltage Range
  - :  $V_{CC} = 4.0\sim 16V$  ( $T_a = 25^\circ C$ )



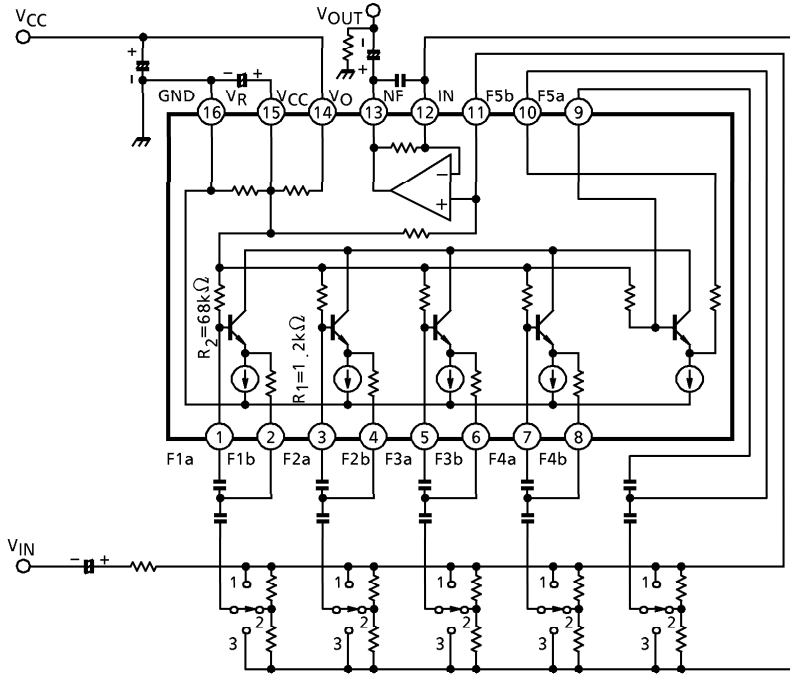
Weight  
 DIP16-P-300-2.54A : 1.0g (Typ.)  
 ZIP16-P-1.27 : 0.99g (Typ.)

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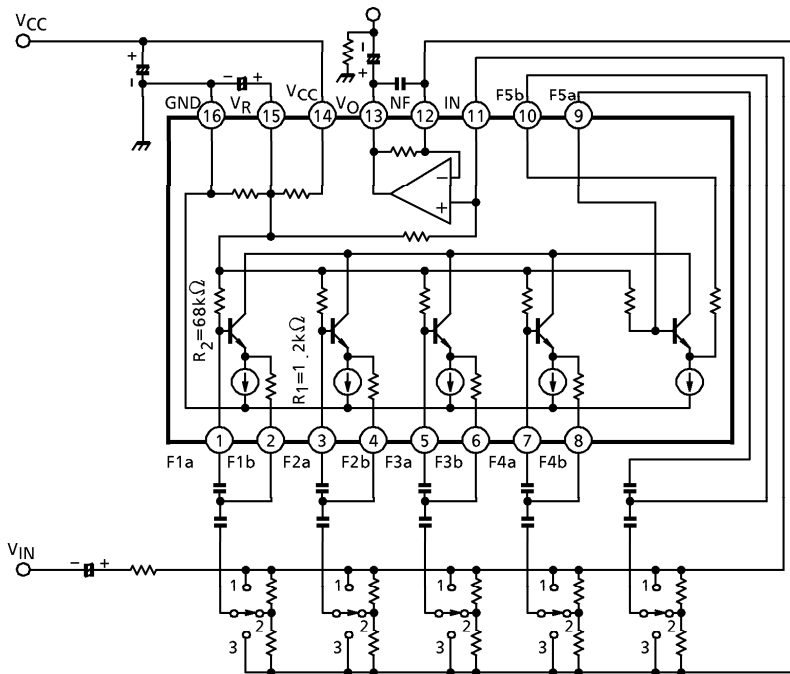
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**BLOCK DIAGRAM**

TA7796P



TA7796Z



**MAXIMUM RATINGS (Ta = 25°C)**

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V <sub>CC</sub>	16	V
Power Dissipation	P <sub>D</sub> (Note)	750	mW
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 TA7796P, TA7796Z.

**ELECTRICAL CHARACTERISTICS (Unless otherwise specified, V<sub>CC</sub> = 8V, f = 1.1kHz, R<sub>L</sub> = 10Ω, Ta = 25°C)**

CHARACTERISTIC	SYMBOL	TEST CIRCUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Quiescent Current	I <sub>CCQ</sub>	—	V <sub>in</sub> = 0	3.5	6.1	9.3	mA
Voltage Gain	G <sub>V</sub> (FLT)	—	V <sub>out</sub> = 0.775V <sub>rms</sub> (0dBm)	-2.5	-0.5	1.5	dB
		—	V <sub>out</sub> = 0.775V <sub>rms</sub> (0dBm), f = 110Hz	10.0	11.5	14.0	
	G <sub>V</sub> (BST)	—	V <sub>out</sub> = 0.775V <sub>rms</sub> (0dBm), f = 340Hz	10.0	11.5	14.0	
		—	V <sub>out</sub> = 0.775V <sub>rms</sub> (0dBm), f = 1.1kHz	10.0	11.5	14.0	
		—	V <sub>out</sub> = 0.775V <sub>rms</sub> (0dBm), f = 3.4kHz	10.0	11.5	14.0	
		—	V <sub>out</sub> = 0.775V <sub>rms</sub> (0dBm), f = 11kHz	10.0	11.5	14.0	
	G <sub>V</sub> (CUT)	—	V <sub>out</sub> = 0.775V <sub>rms</sub> (0dBm), f = 110Hz	-14.0	-11.5	-10.0	
		—	V <sub>out</sub> = 0.775V <sub>rms</sub> (0dBm), f = 340Hz	-14.0	-11.5	-10.0	
		—	V <sub>out</sub> = 0.775V <sub>rms</sub> (0dBm), f = 1.1kHz	-14.0	-11.5	-10.0	
		—	V <sub>out</sub> = 0.775V <sub>rms</sub> (0dBm), f = 3.4kHz	-14.0	-11.5	-10.0	
—		V <sub>out</sub> = 0.775V <sub>rms</sub> (0dBm), f = 11kHz	-14.0	-11.5	-10.0		
Total Harmonic Distortion	THD (FLT)	—	V <sub>out</sub> = 0.245V <sub>rms</sub> (-10dBm)	—	0.007	0.10	%
Output Noise Voltage	V <sub>no</sub> (FLT)	—	R <sub>g</sub> = 620Ω, V <sub>in</sub> = 0, BW = 20~20kHz	—	3.0	8.0	μV <sub>rms</sub>

**TYP. DC VOLTAGE OF EACH TERMINAL**

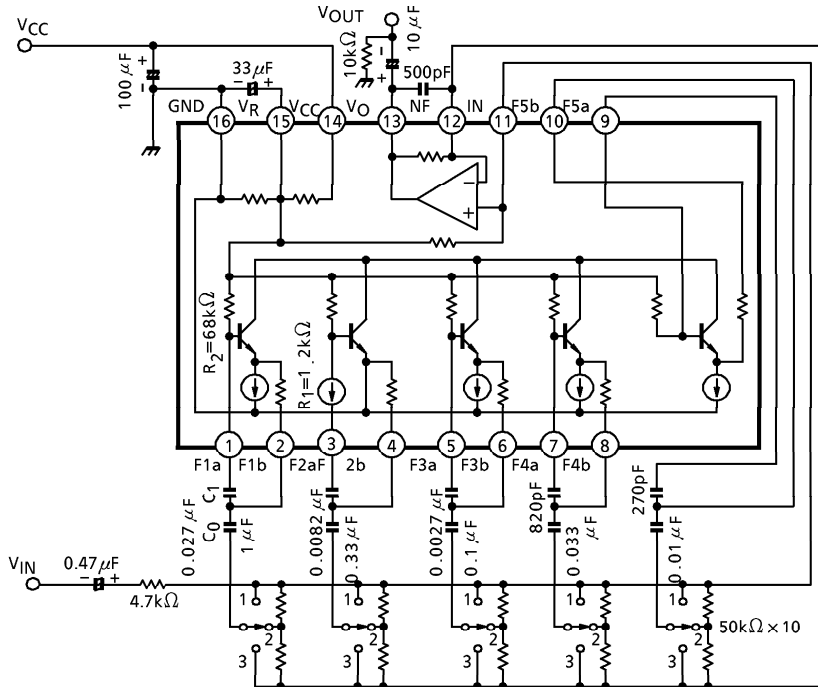
TA7796P (V<sub>CC</sub> = 8V, Ta = 25°C)

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<sub>CC</sub> = 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



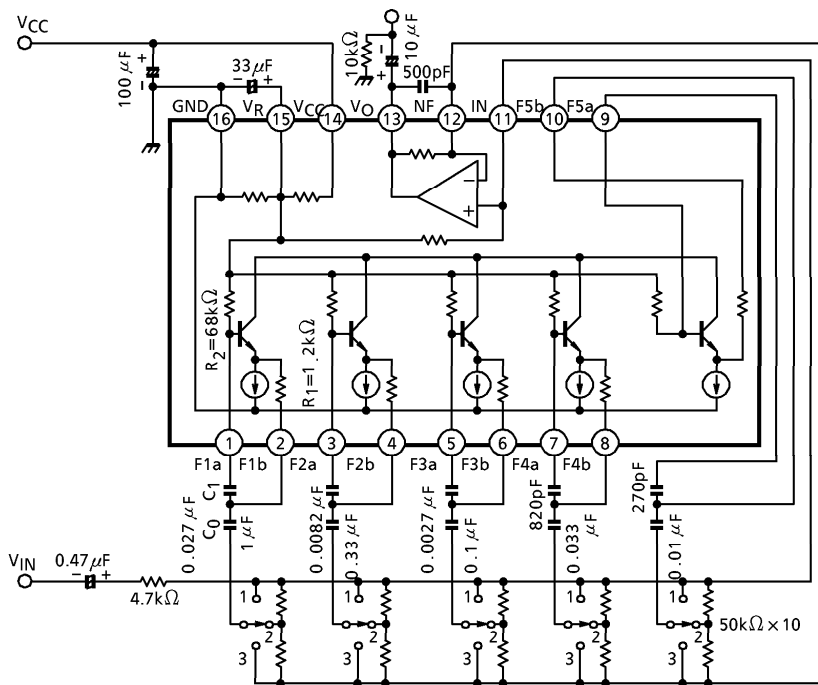
- 1 : CUT 2 : FLAT 3 : BOOST
- $f_o$  (Resonance Frequency)

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

( $R_1 = 1.2k\Omega$ ,  $R_2 = 68k\Omega$ ,  
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

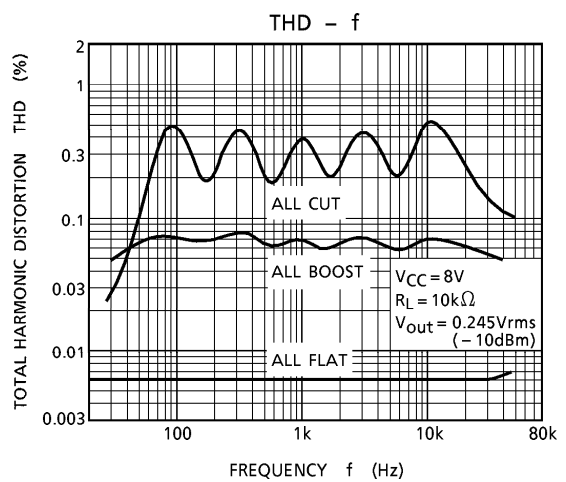
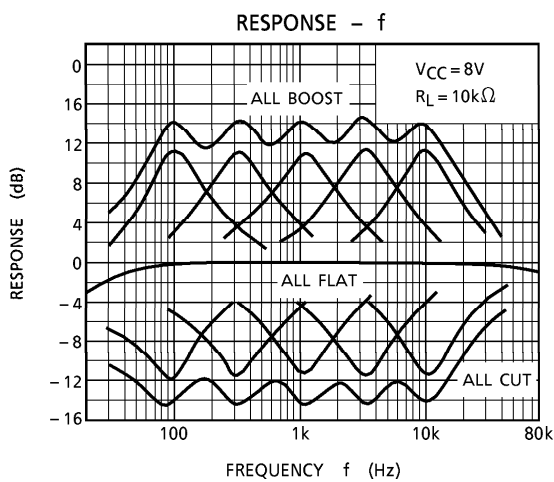
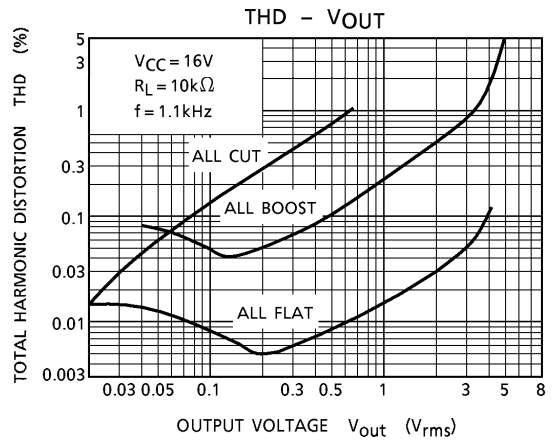
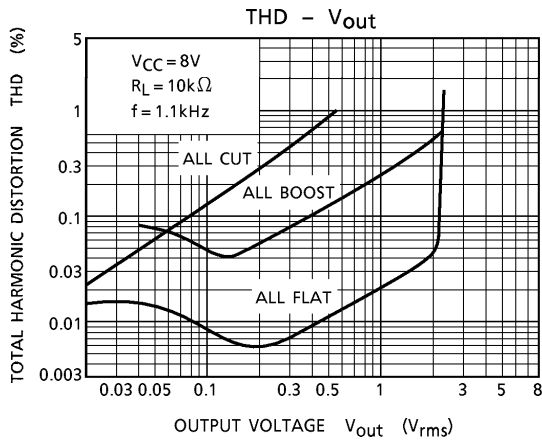
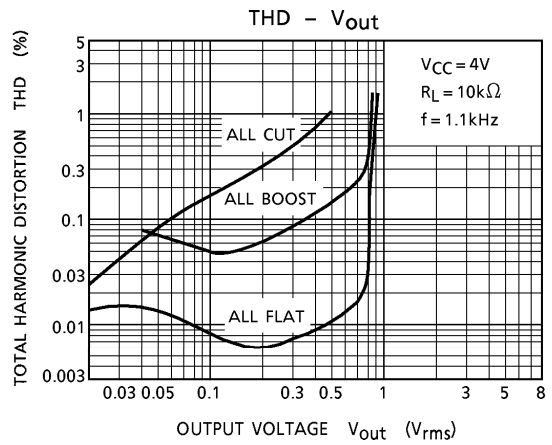
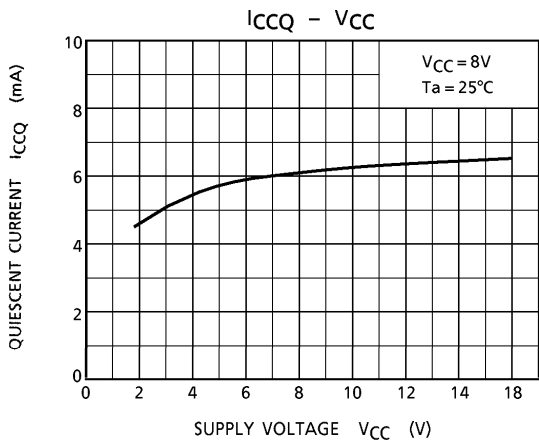


- 1 : CUT 2 : FLAT 3 : BOOST
- $f_o$  (Resonance Frequency)

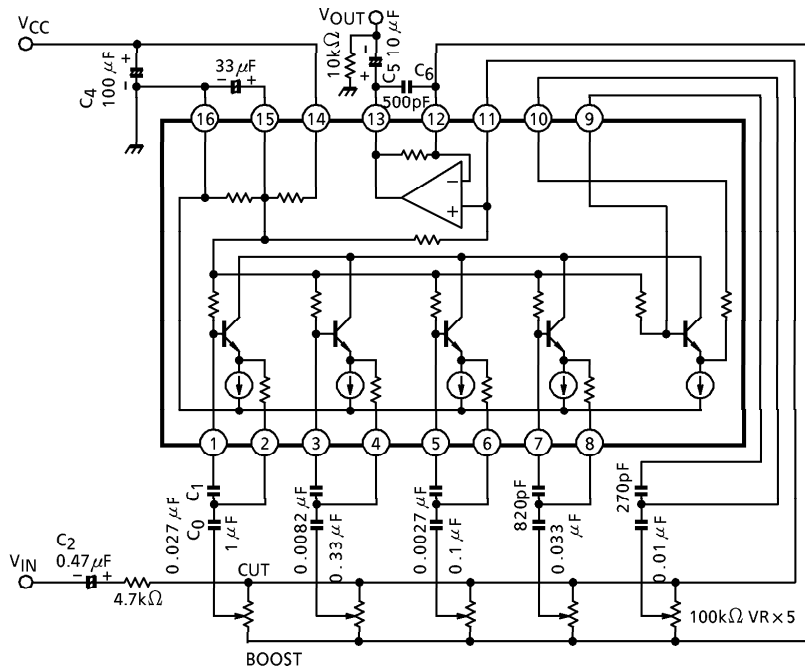
$$f_o = \frac{1}{2\pi \sqrt{C_0 \cdot C_1 \cdot R_1 \cdot R_2}}$$

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

$C_0$ (F)	$C_1$ (F)	$f_o$ (Hz)
1µ	0.027µ	107
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0.1µ	0.0027µ	1.07k
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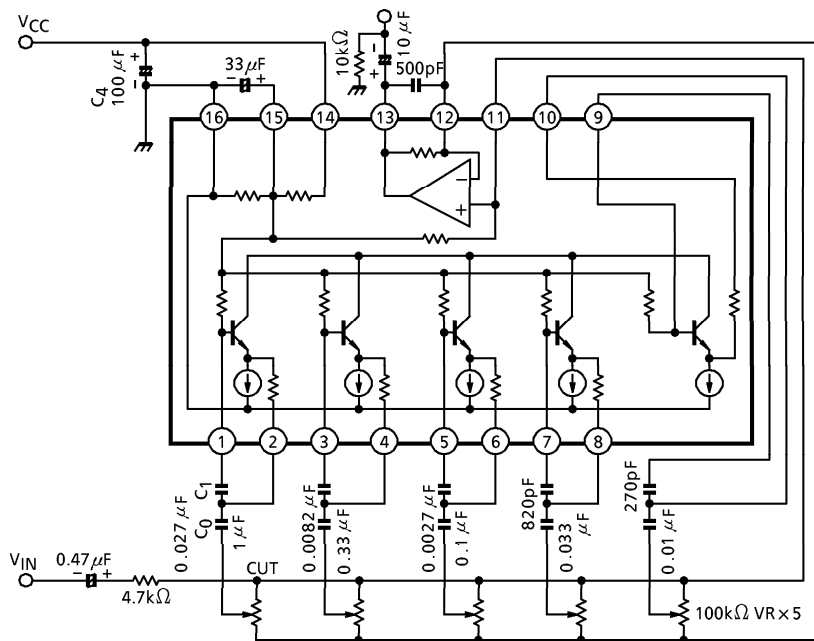


**APPLICATION**  
TA7796P



- Description of external parts.
- C<sub>0</sub>, C<sub>1</sub> : Capacitors used to fix f<sub>0</sub> (resonance frequency).
- C<sub>2</sub> : Input capacitor.
- C<sub>3</sub> : Decoupling capacitor.
- C<sub>4</sub> : Power capacitor.
- C<sub>5</sub> : Output capacitor.

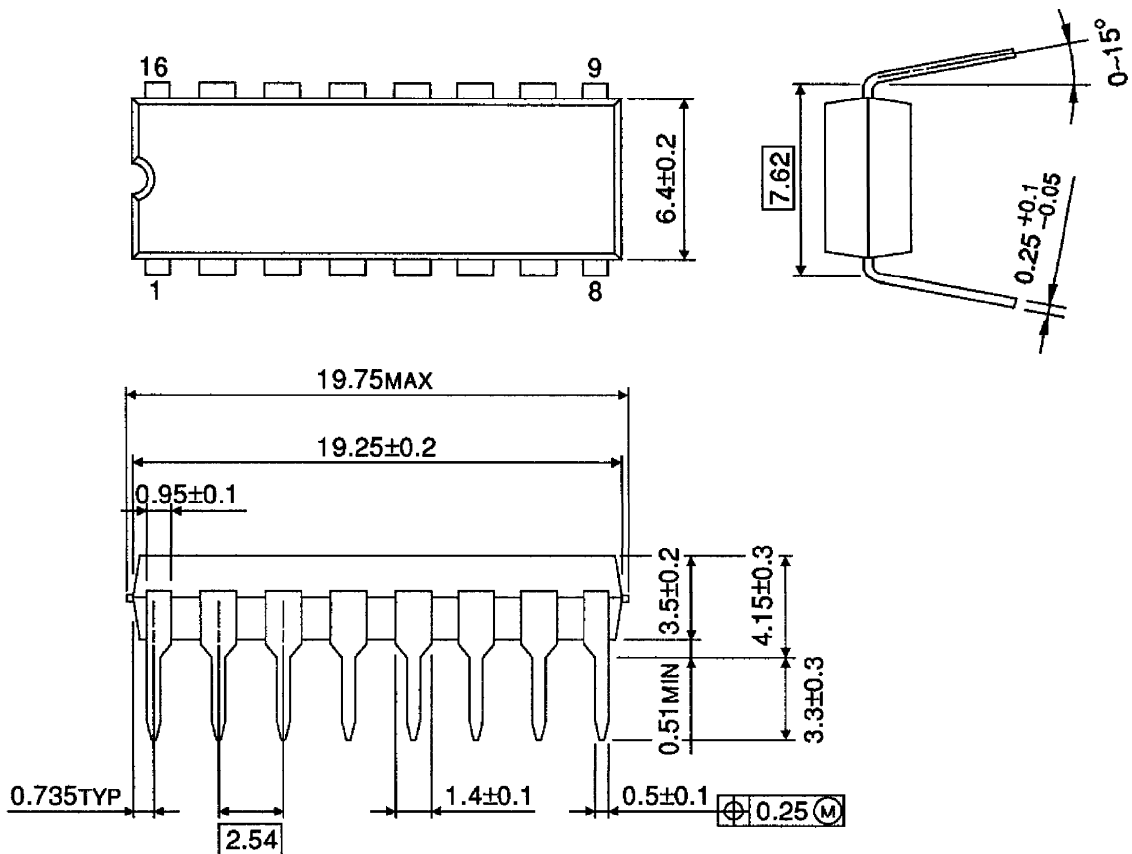
TA7796Z



- Description of external parts.
- C<sub>0</sub>, C<sub>1</sub> : Capacitors used to fix f<sub>0</sub> (resonance frequency).
- C<sub>2</sub> : Input capacitor.
- C<sub>3</sub> : Decoupling capacitor.
- C<sub>4</sub> : Power capacitor.
- C<sub>5</sub> : Output capacitor.

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

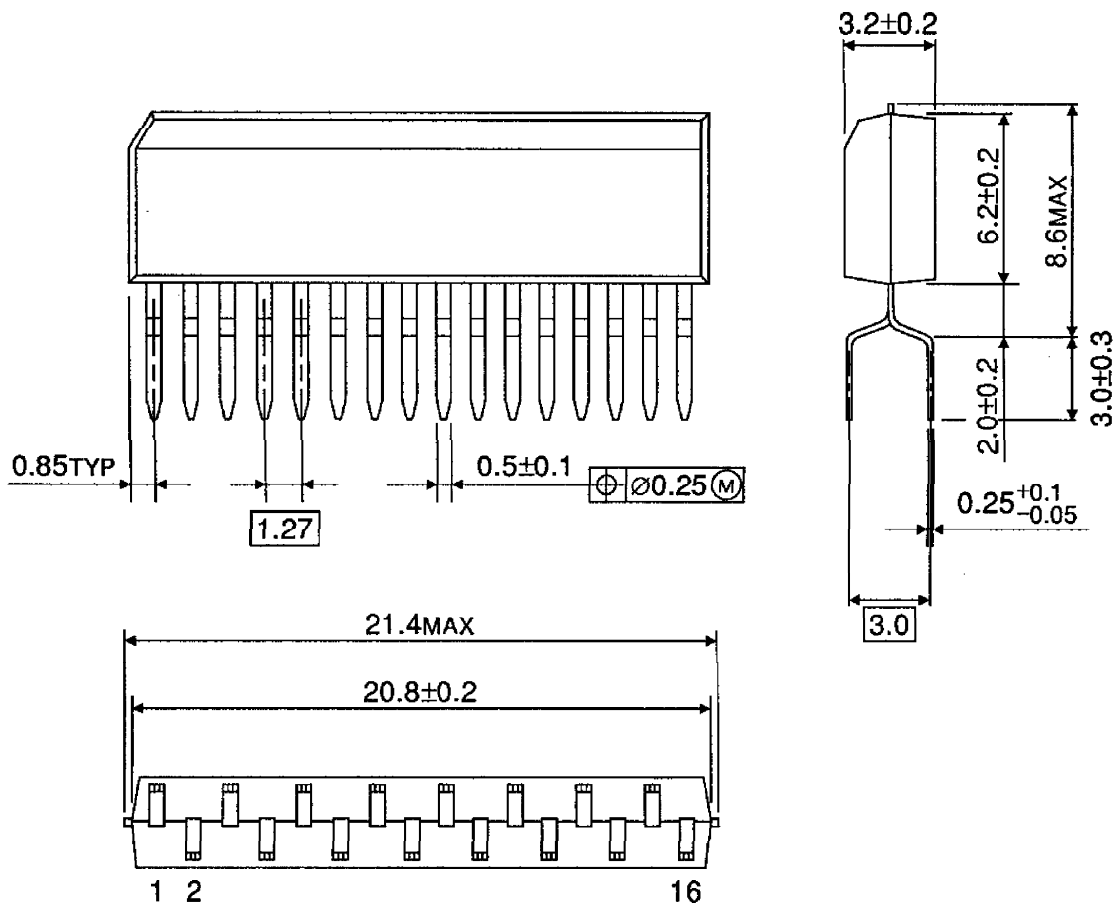
Unit : mm



Weight : 1.0g (Typ.)

OUTLINE DRAWING  
ZIP16-P-1.27

Unit : mm



Weight : 0.99g (Typ.)