

**BIPOLAR STEPPING MOTOR DRIVE  
ANALOG CLOCK**

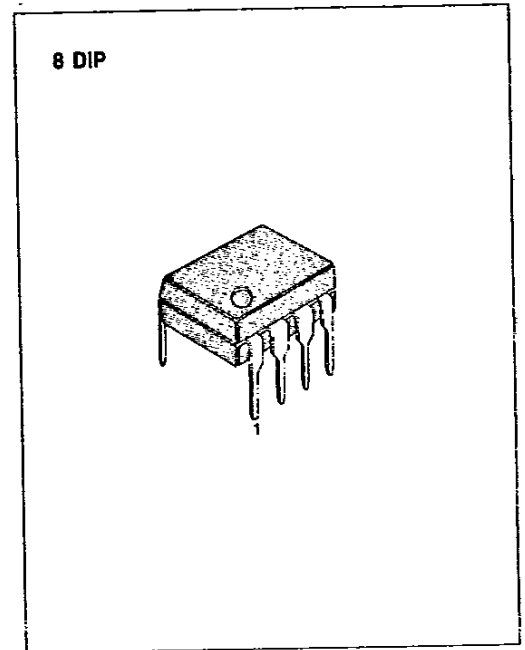
The KS5207 series with 1HR function is a C-MOS integrated circuit for use in clock with bipolar stepping motor.

**FUNCTIONS**

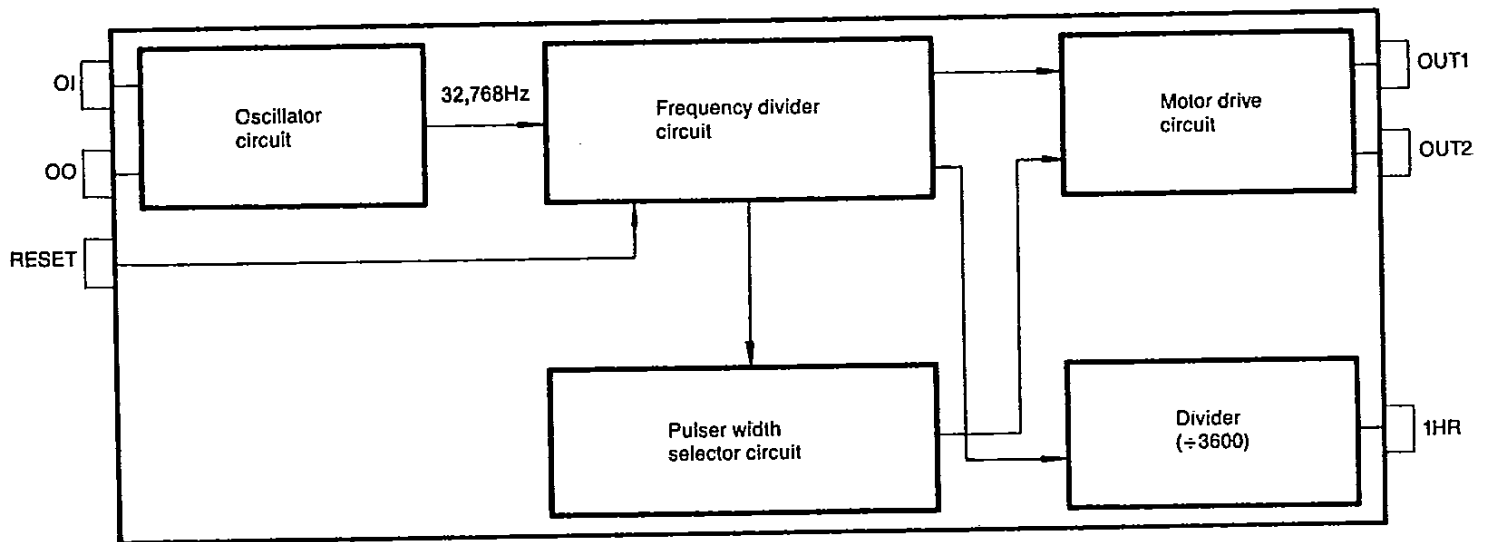
- Output pulse duration KS5207A=0.5Hz, 1sec.  
KS5207E=0.5Hz, 46.9msec  
KS5207F=0.5Hz, 31.2msec
- A 2sec-width pulse output per one hour.
- Active-high, RESET input for disable motor output.

**FEATURES**

- 32.768KHz crystal oscillator.
- Single 1.5V battery operation.
- Low power dissipation.
- 8 pin dual-in-line plastic package.



**BLOCK DIAGRAM**



**ABSOLUTE MAXIMUM RATINGS** ( $T_a = 25^\circ\text{C}$ )

Characteristic	Symbol	Value	Unit
Supply Voltage	$V_{SS}$	-2.0 ~ 0.3	V
Power Dissipation	$P_D$	300	mW
Operating Temperature	$T_{opr}$	-10 ~ +60	$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-55 ~ +125	$^\circ\text{C}$

**ELECTRICAL CHARACTERISTICS**

( $V_{DD} = 0\text{V}$ ,  $V_{SS} = -1.5\text{V}$ ,  $T_a = 25^\circ\text{C}$ ,  $F_{osc} = 32.768\text{KHz}$ ; Unless otherwise specified)

Characteristic	Symbol	Test Conditions	Min	Typ	Max	Unit
Operating Voltage	$ V_{SS} $	$R_m = \infty$ , $V_{SS} = -1.5\text{V}$	1.2	1.5	1.7	V
Supply Current	$I_{DD}$			2.0	2.5	$\mu\text{A}$
Output Drive Current	$I_{L1}$	$R_m = 200\Omega$ , $V_{SS} = -1.2\text{V}$	4.0			mA
	$I_{L2}$		4.0			mA
Reset Switch Current	$I_{RS}$			55	70	$\mu\text{A}$
OSC Start Voltage	$ V_{OSCl} $	Within 5 seconds			1.45	V
OSC Stop Voltage	$ V_{OSPl} $				1.0	V

**GENERAL DESCRIPTION**

The KS5207 series is a CMOS analog clock IC, driving a stepping motor precisely once in one second, when external 32,768KHz quartz crystal and single battery are connected.

Basically it consists of oscillator circuit, frequency divider, output pulse former, push-pull motor driver and 1HR output.

The two output of KS5207A has 0.5Hz, 1sec-width pulse waves with a phase shift of 180 degrees. (Fig. 1-1)

The output of KS5207E has 0.5Hz, 46.9msec-width pulse waves and KS5207F has 0.5Hz, 31.2msec-width pulse waves.

(Fig. 1-2)

Also the KS5207 series has a RESET input. As long as the RESET input is connected to  $V_{DD}$ , there is no motor output pulse.

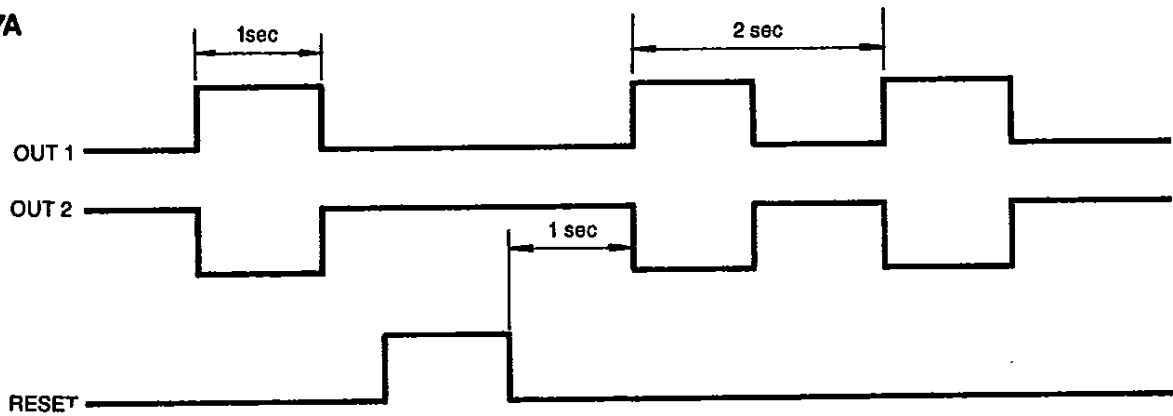
One second after releasing this connection a motor pulse of relative to the prior one is generated. (Fig. 1)

Particularly, the KS5207 series has a 2sec-width pulse output per one hour. (Fig. 2)

When you want to hear melody sound once per one hour, you have to connect melody IC to the 1HR output. (pin 6)

OUT 1 AND OUT 2 WAVEFORMS

1) KS5207A



2) KS5207E/F

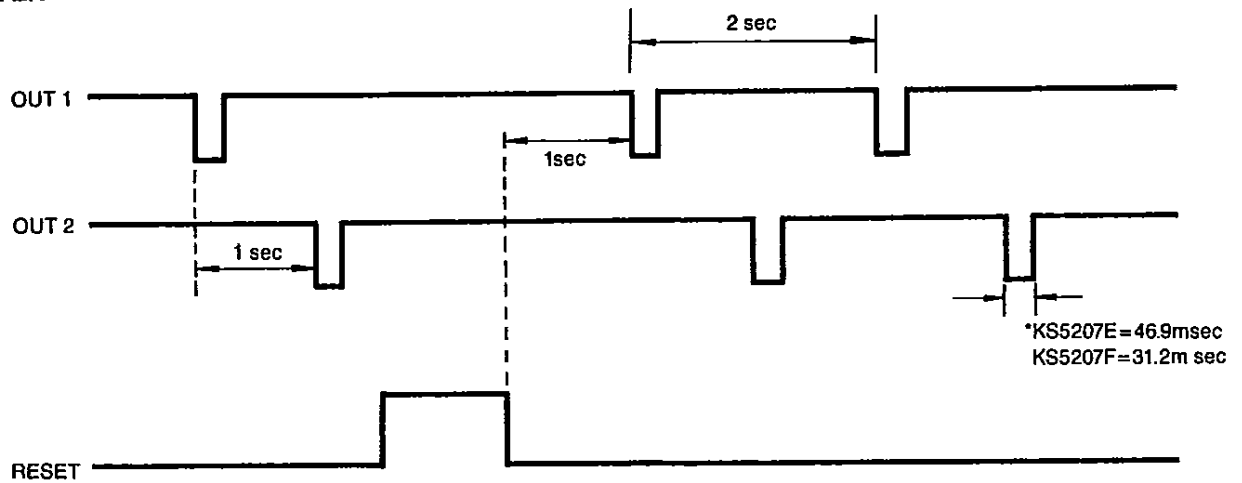


Fig. 1

1 HR OUTPUT WAVEFORM (KS5207A, E, F)

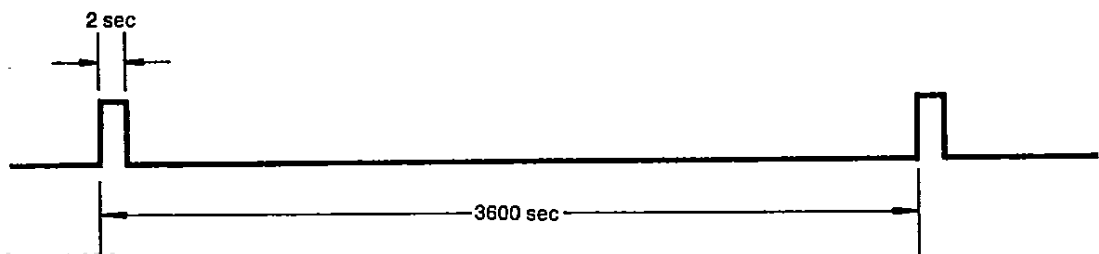
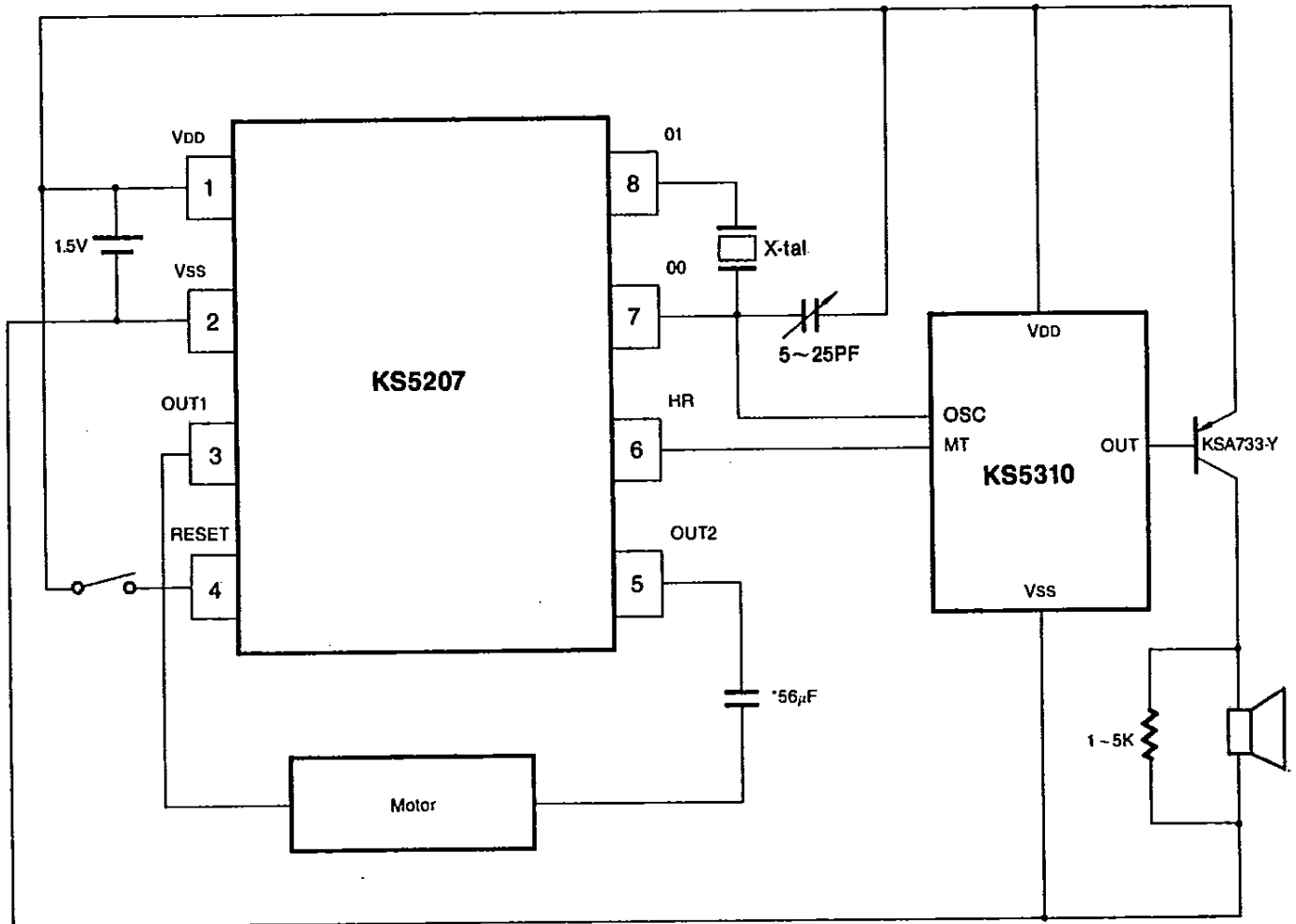


Fig. 2

APPLICATION CIRCUIT



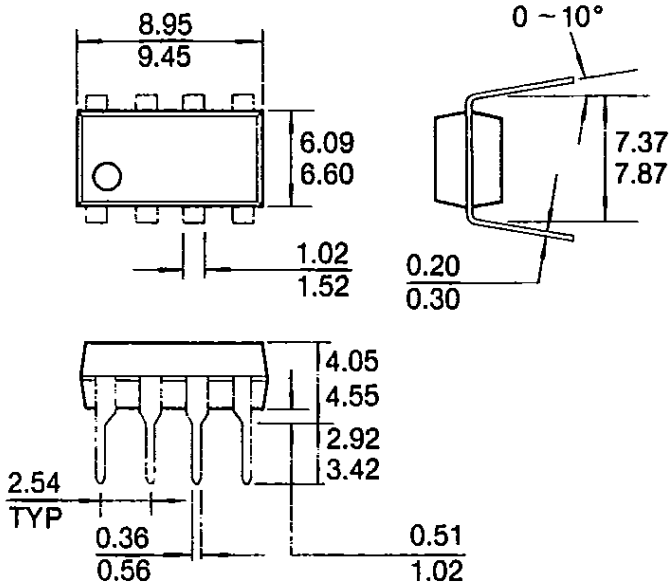
Quartz Crystal Parameters  
 $f_p = 32,768\text{Hz}$   
 $C_L = 10\text{pF}$   
 $C_1 = 4\text{pF}$   
 $C_0 = 2.5\text{pF}$   
 $R_S = 36\text{K}$   
 $Q = 35000$

\* No NEED CAPACITOR in KS5207E, F

Fig. 3

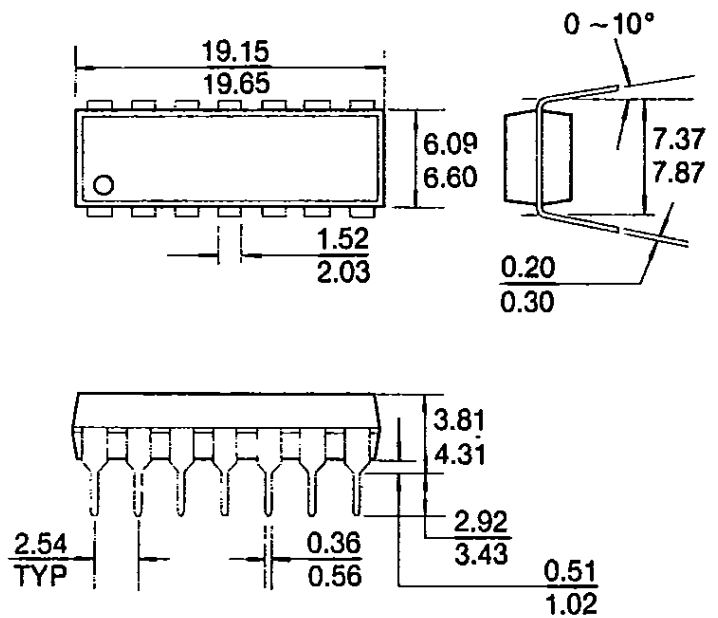
### 8 DIP

Unit: mm



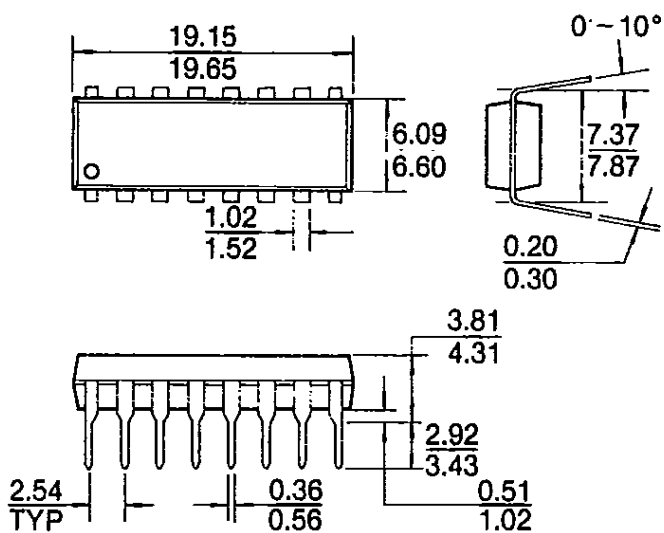
### 14 DIP

Unit: mm



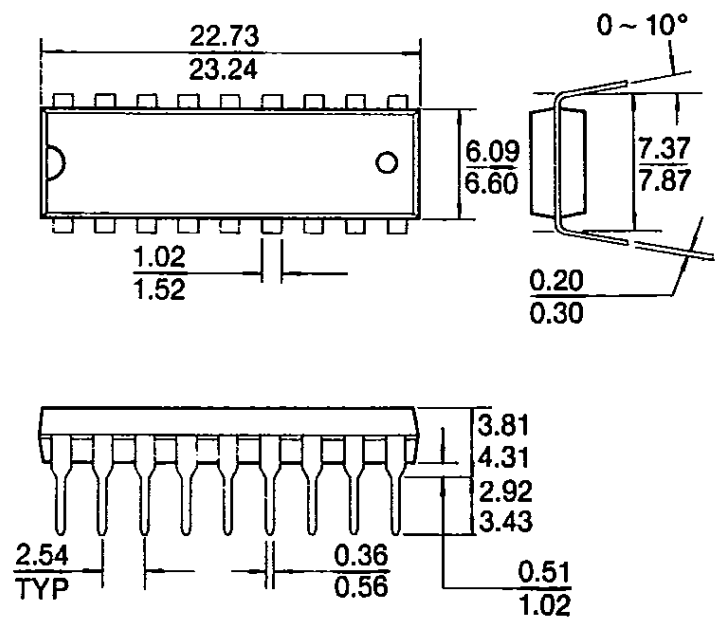
### 16 DIP

Unit: mm



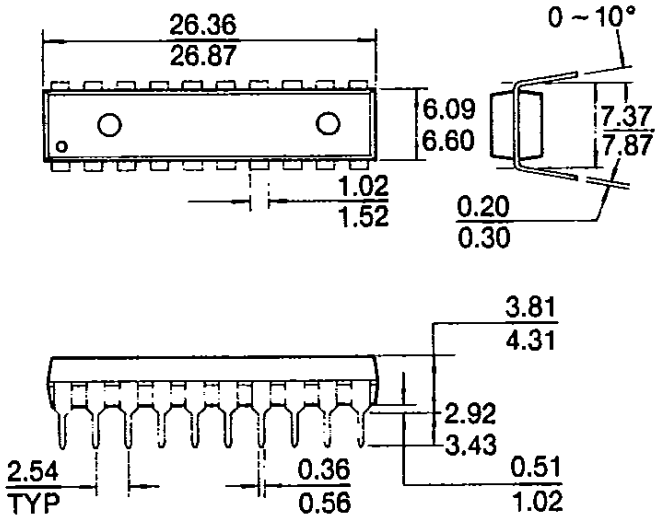
### 18 DIP

Unit: mm



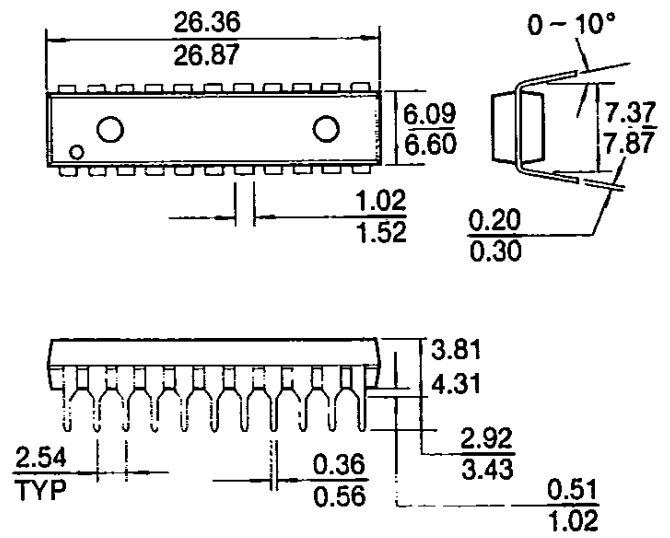
### 20 DIP

Unit: mm



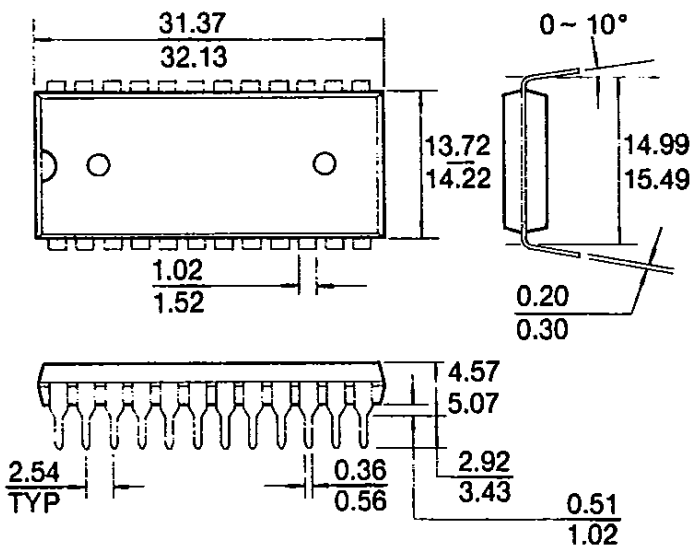
### 22 DIP

Unit: mm



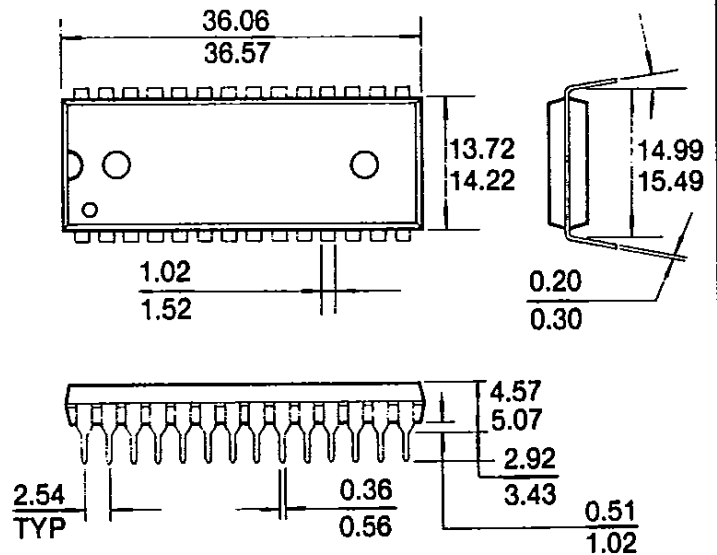
### 24 DIP

Unit: mm



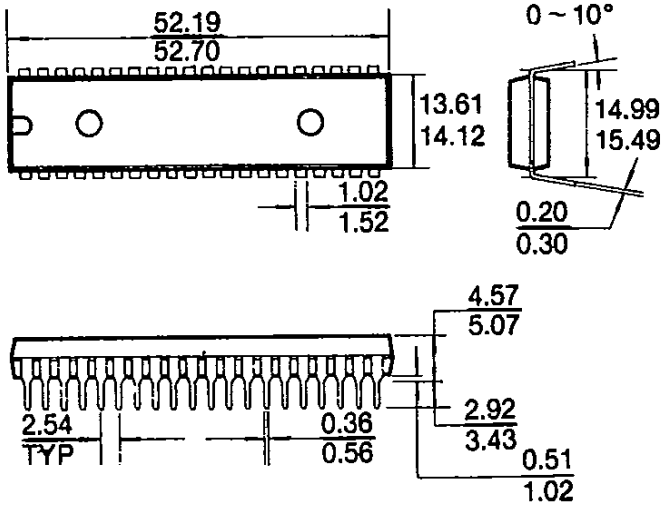
### 28 DIP

Unit: mm



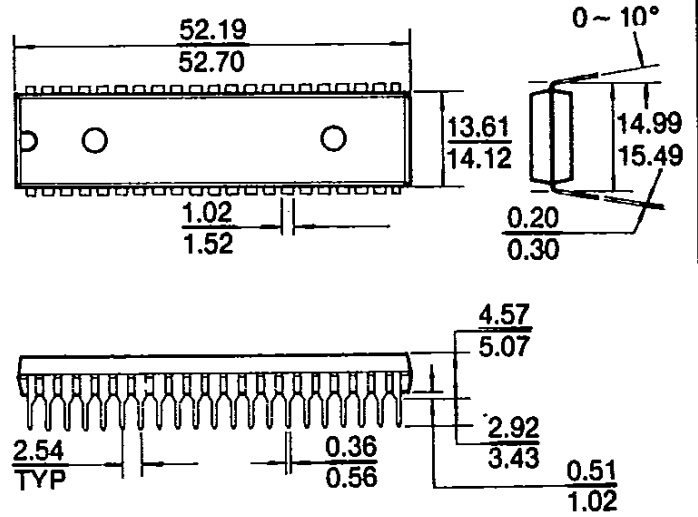
### 40 DIP

Unit: mm



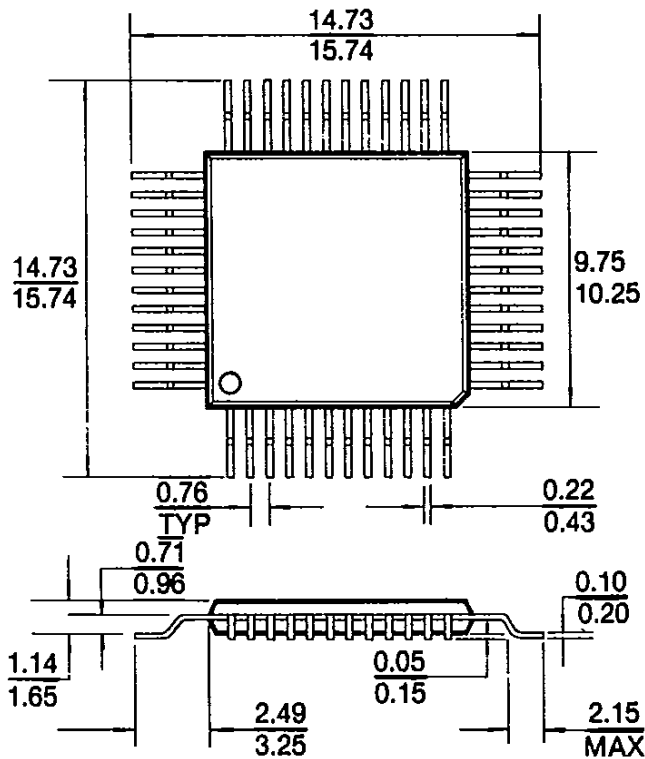
### 42 DIP

Unit: mm



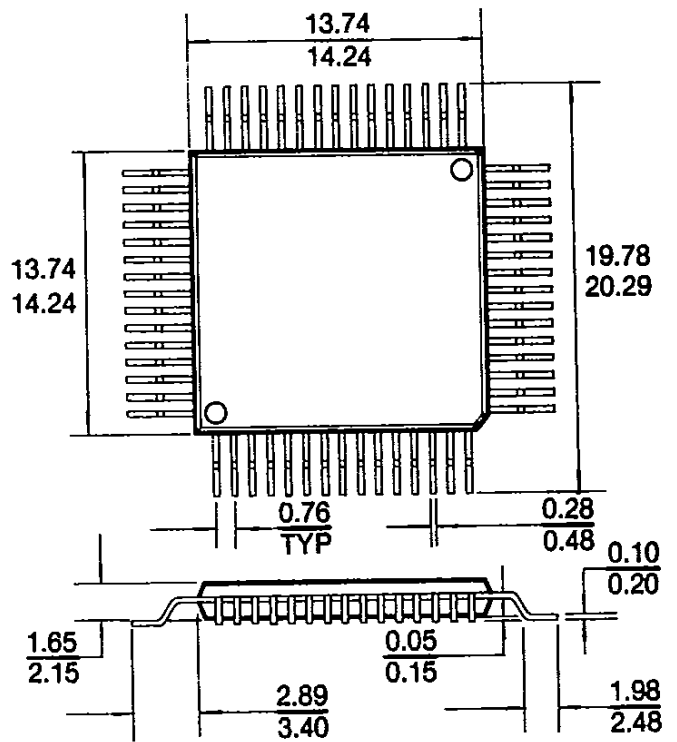
### 48 FQP

Unit: mm



### 60 FQP

Unit: mm



60 FQP

Unit: mm

