UMC

UM3252A/62A Series

Analog Clock With Alarm
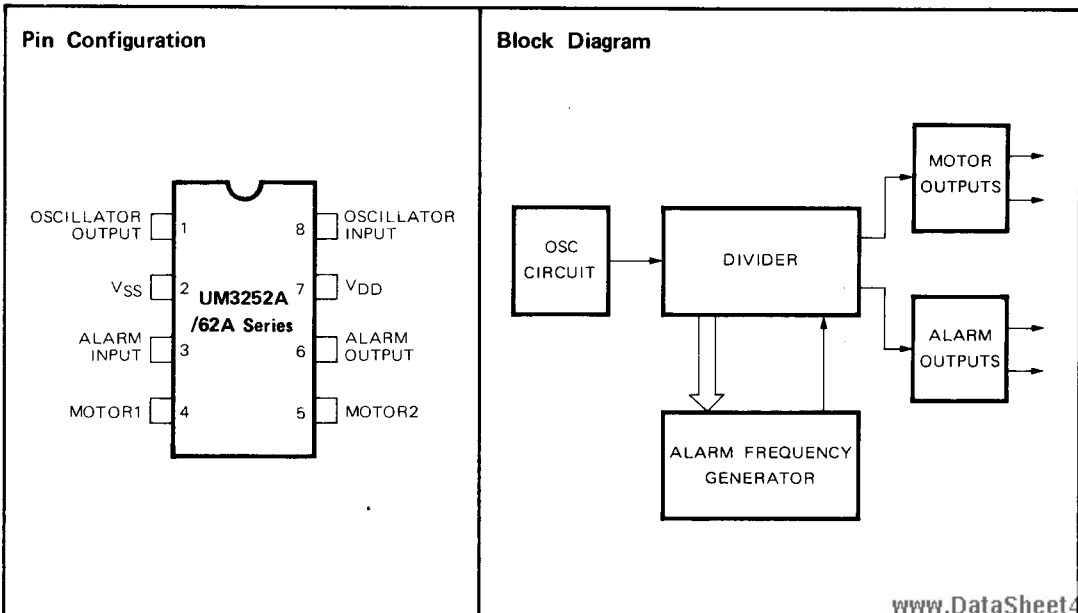
Features

- Single 1.5V battery operation
- Very low current consumption
- Output for 1 Hz stepper motor with three pulse duration options:
  - 48.6ms, 31.2ms & 15.6ms by bonding option

- Alarm outputs determined by mask option
  - UM3252A: 2048 x 8 x 1 Hz
  - UM3262A: 2048 x 8 x ½ x ¼ Hz
- With oscillator input/output capacitance by bonding option

General Description

The UM3252A/62A is a CMOS IC for a quartz clock circuit of 32768Hz oscillation frequency. It consists of an oscillator, a divider, an alarm, an output control circuit and output buffers for motor drive. In addition, the UM3252A/62A is prepared for many variations in motor output pulse duration, oscillator input/output capacitance and alarm output.

Pin Configuration

OSCILLATOR OUTPUT	1		8	OSCILLATOR INPUT
VSS	2	UM3252A /62A Series	7	VDD
ALARM INPUT	3		6	ALARM OUTPUT
MOTOR1	4		5	MOTOR2

Block Diagram

Absolute Maximum Ratings*

Supply Volatge, V_{DD} . . . . −1.7V to +3V

Oscillator Input/Output Voltage,

   V_{8-2} and V_{1-2} . . . . 0 to V_{DD}

Output Short Circuit Duration . . . . Indefinite

Operating Ambient Temperature . . . . −10°C to 60°C

Storage Temperature . . . . −30°C to 125°C

*Comments

Stresses above those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only. Functional operation of this device at these or any other conditions above those indicated in the operational sections of this specification is not implied and exposure to absolute maximum rating conditions for extended periods may affect device reliability.

Electrical Characteristics

(V_{DD} = 1.5, V_{SS} = 0V, F_{OSC} = 32768 Hz, T_A = 25°C, unless otherwise specified.)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Supply Voltage	V_{DD}	1.1	—	1.8	V	V_{SS} = 0V
Supply Current	I_{DD}	—	1.2	2.0	μA	No Load

Motor Output:
   Cycle Time
   Pulse Duration
   Impedance
	t_1
	t_{pl}
	R_{OUT}
		—
		—
		—
			2
			*
			60
				—
				—
				100
					S
					mS
					Ω
						$V_{DD} - V_{SS}$ = 1.4V
						R_{LOAD} = 200Ω
						I_{OUT} = 4.5mA

Alarm Output:
   Sink Current
   Driving Current
	I_6
	I_6
		0.3
		0.3
			—
			—
				—
				—
					mA
					mA
						R = 1kΩ V_{DD} = 1.4V

Alarm Input Debounce Alarm Input Current	t_A I_3	0 —	70 5	— 10	ms μA	— —
Oscillator Polarization Resistance	R_p	15	20	50	MΩ	—
Oscillator Output Capacitance (Pin 1)	C_{OUT}	—	**	—	pF	—
Oscillator Input Capacitance (Pin 8)	CIN	—	**	—	pF	—
Oscillator Stability	$\Delta F/F$	—	0.2	—	ppm	ΔV_{DD} = 100mV
Oscillator Start-up Time	T_S	—	—	2.0	sec	V_{DD} = 1.2V

Notes: * 46.8ms, 31.2ms & 15.6ms by bonding option
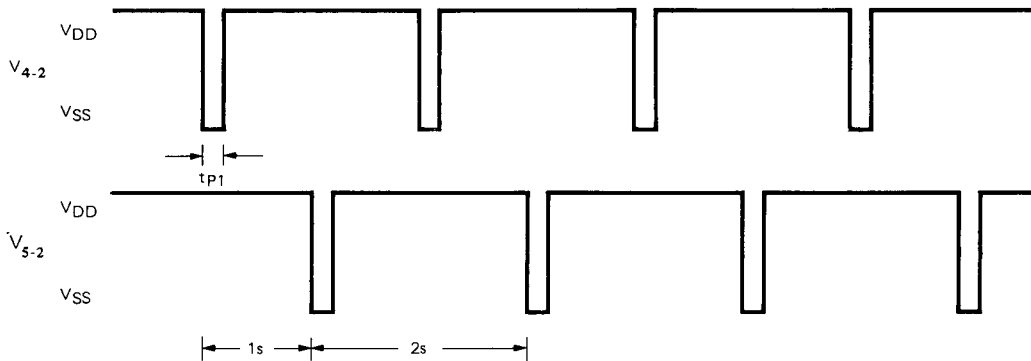
   ** C_{IN}: 2pF or 18pF by bonding option
   C_{OUT}: 2pF or 18pF by bonding option

   *** All pins are designed to withstand electro-static discharge (ESD) levels in excess of 1200V
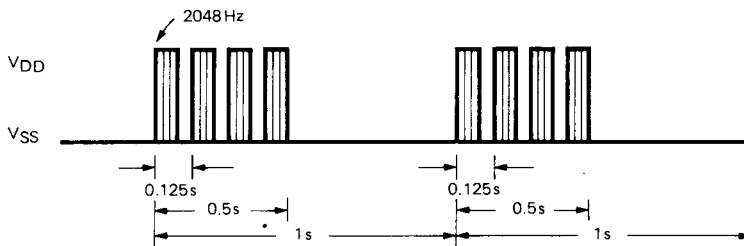
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Motor Output Waveforms

The UM3252A/62A series is used to generate a pulse per second to drive bipolar stepper motors. It also provides the alarm output pin which is a activated when the alarm input pin is pulled to V_{SS}.
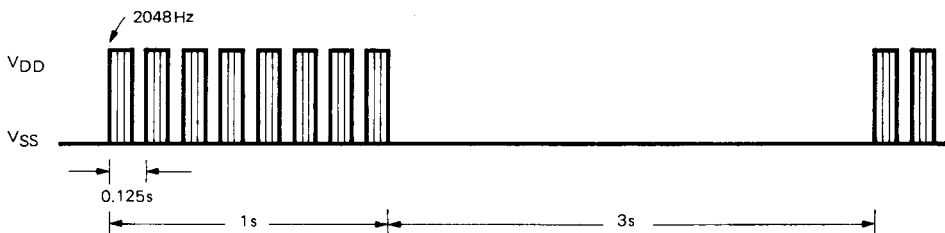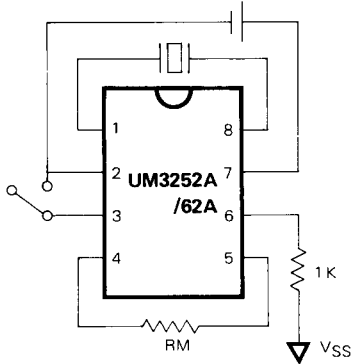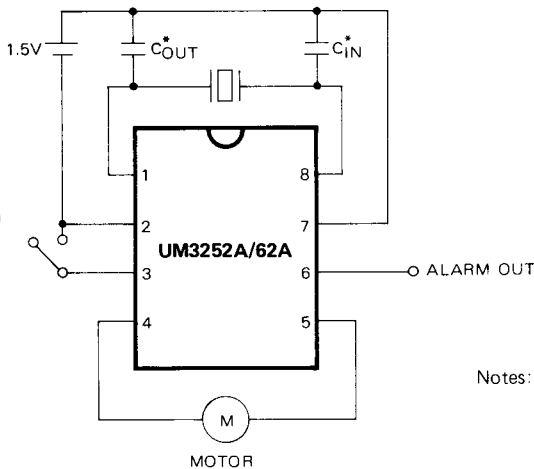

Alarm Output Waveforms

UM3252A

2048 x 8 x 1 Hz
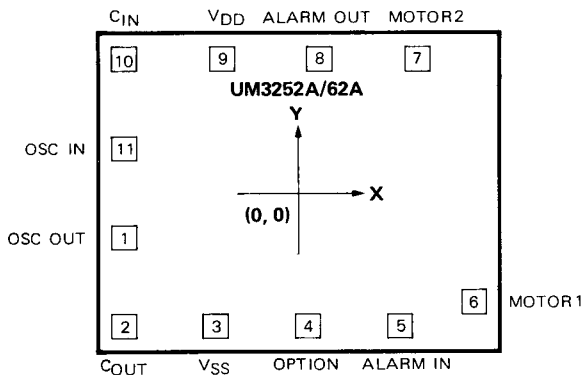

UM3262A

2048 x 8 x ½ x ¼ Hz

4—40

Test Circuit

$V_{DD} - V_{SS} = 1.4V$
Pin 3 Connected to V_{SS} when in Alarm mode
RM $= 200\,\Omega$ f = 32,768 Hz
Crystal Parameter: $C_1 = 2.5\,fF$
                  $C_0 = 1.5\,pF$
                  $R_s = 30\,K\Omega$
Built-in $C_{IN} = C_{OUT} = 18\,pF$

Package Application Circuit

Notes: External C_{IN} or C_{OUT} is not necessary for C_{IN} or C_{OUT} built-in versions.
C_{IN} May be a trimmer capacitor for precision adjustment.
Ctrim = 5—20pF is adequate.
C_{OUT} is the same function as C_{IN}.

Bonding Diagram

				unit: μm
Pad No.	Designation	X	Y	
1	OSC OUT	−858.52	−172.72	
2	C_{OUT}	−857.25	−574.04	
3	V_{SS}	−144.78	−571.5	
4	OPTION	58.42	−571.5	
5	ALM-IN	255.27	−571.5	
6	MOTOR1	461.01	−510.54	
7	MOTOR2	850.9	568.96	
8	ALM-OUT	85.09	571.5	
9	V_{DD}	−143.51	571.5	
10	C_{IN}	−858.52	570.23	
11	OSC IN	−858.52	367.03	

Pulse Duration by Bonding Option

Pulse Duration \ Pad No.	Pad 3	Pad 4
31.2 ms	YES	NO
15.6ms or 46.8ms	YES	YES

* YES: Pad is connected to V_{SS}
  NO: Pad is open

Oscillator Input/Output Capacitance Option

Items \ Type	Input Capacitance		Output Capacitance	
Pad No.	Pad 10	Pad 11	Pad 1	Pad 2
2 pF	NO	YES	YES	NO
18 pF	YES	YES	YES	YES

* YES: Pad is connected to crystal
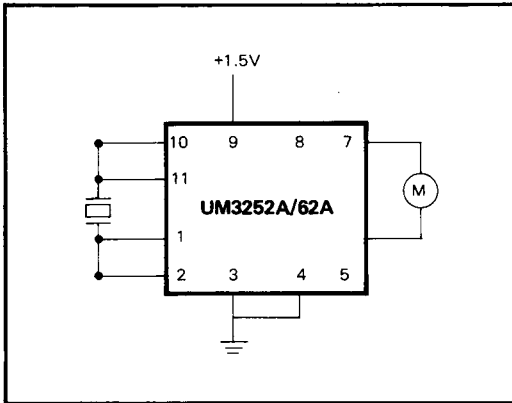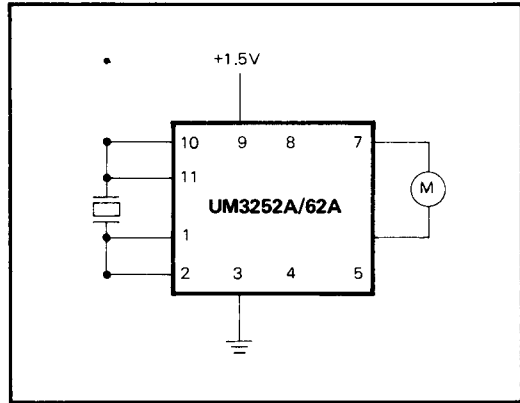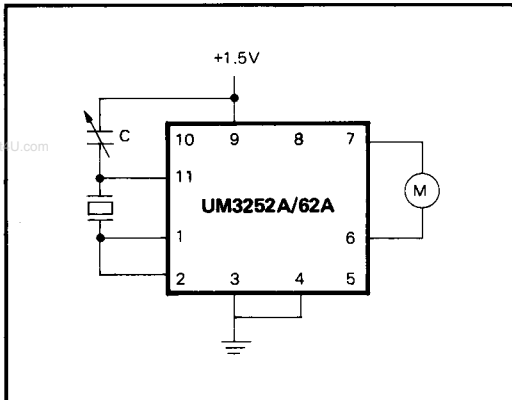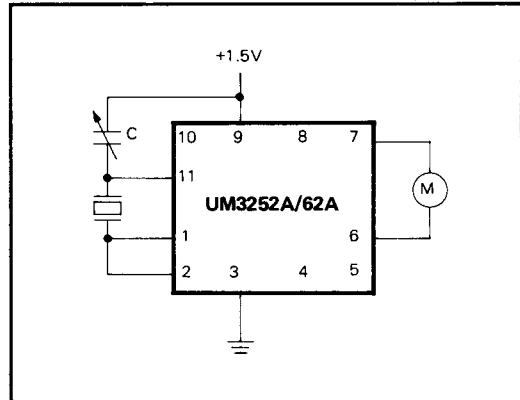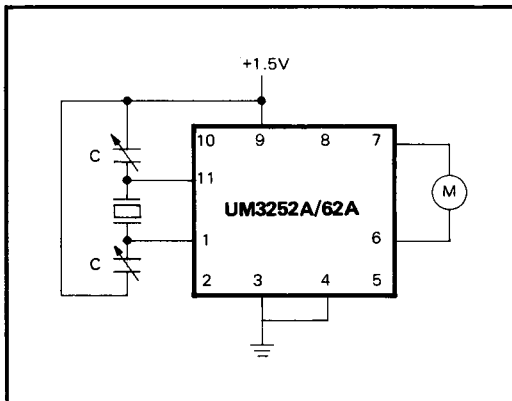 NO: Pad is open
** If the chip is UM3252BH, the C_{OUT} = 18pF binds either Pad 1 or Pad 2, and the C_{IN} = 18pF binds either Pad 10 or Pad 11.

Ordering Information

Pad No.	Package	Alarm Output	C_{IN}	C_{OUT}	Pulse Duration
UM3252A	Dip 8	2048 x 8 x 1 Hz	2pF	18pF	46.8 ms
UM3252B	Dip 8	2048 x 8 x 1 Hz	18pF	18pF	46.8 ms
UM3252C-1	Dip 8	2048 x 8 x 1 Hz	2pF	2pF	31.2 ms
UM3262A	Dip 8	2048 x 8 x ½ x ¼ Hz	2pF	18pF	46.8 ms
UM3262B	Dip 8	2048 x 8 x ½ x ¼ Hz	18pF	18pF	46.8 ms
UM3252AH	Chip	2048 x 8 x 1 Hz	Option	Option	Option(31.2 ms, 46.8 ms)
UM3252BH	Chip	2048 x 8 x 1 Hz	18pF	18pF	Option(31.2 ms, 46.8 ms)
UM3262AH	Chip	2048 x 8 x ½ x ¼ Hz	Option	Option	Option(31.2 ms, 46.8 ms)
UM3262A-2H	Chip	2048 x 8 x ½ x ¼ Hz	Option	Option	Option(15.6 ms, 31.2 ms)

UM3252A/62A Chip Application Circuits

A—1. WITHOUT TRIM CAP. AND 46.8ms DURATION

A—2. WITHOUT TRIM CAP. AND 31.2ms DURATION

B—1. WITH ONE TRIM CAP. AND 46.8ms DURATION

B—2. WITH ONE TRIM CAP. AND 31.2ms DURATION

C—1. WITH TWO TRIM CAP. AND 46.8ms DURATION

C—2. WITH TWO TRIM CAP. AND 31.2ms DURATION

Timekeeping