

INTRODUCTION

The An8112A is a CMOS LSI which contains all the logic necessary to implement a five-function six-digit liquid crystal display watch. The circuit contains an oscillator amplifier with an internal feedback resistor for the use of 32,768Hz quartz crystals. The circuit operates from a single 1.5-volt battery and contains an internal voltage doubler. Only 2 switches are required to control all functions. These switch inputs have a pull down resistor and can be debounced by internal circuitry.

FUNCTIONS

- 5-functions: Month, Date, Hour, Minute and Second
- 12-hour format.
- Selectable display for hour, minute, second/month, date.
- One-touch correction of time error within ± 30 seconds.
- 2-switch sequential operation.
- 4-year calendar.
- LCD test

FEATURES

- One-chip CMOS construction.
- Drives 5½ -digit triplexes LCD.
- Colon and PM display.
- Low power consumption.
- 32,768Hz \pm 20ppm crystal oscillator.
- Single 1.5V battery operation.
- Built-in voltage doubler circuit.
- Built-in crystal oscillator input capacitor.
- Trimmer capacitor included
- Reset on power-on.

ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

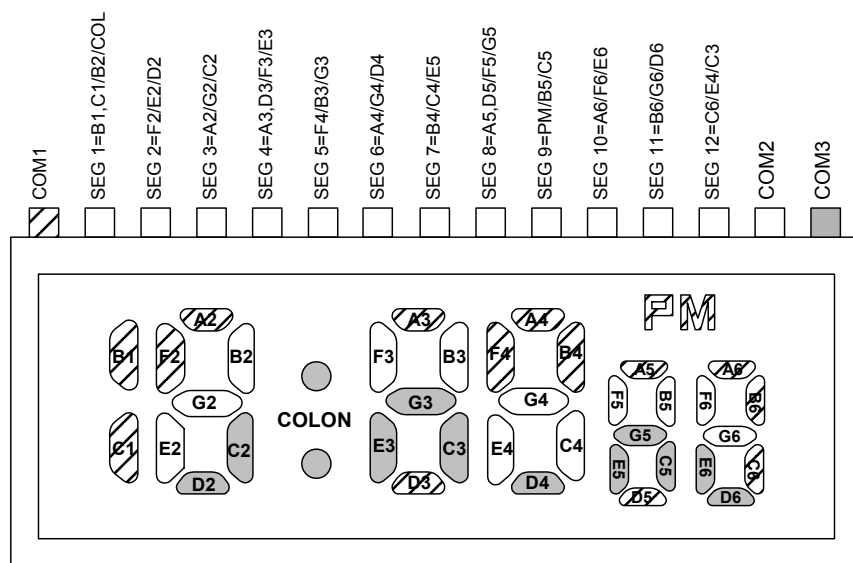
Parameter	Symbol	Value	Unit
Supply Voltage ($V_{DD} - V_{SS}$)	V_{DS1}	- 0.3 ~ + 5.0	V
Supply Voltage ($V_{EE} - V_{SS}$)	V_{DS2}	-0.3 ~ + 5.0	V
Operating Temperature	T_{OPR}	0 ~ + 70	°C
Storage Temperature	T_{STG}	-55 ~ +150	°C

*Voltage greater than above may damage the circuit.

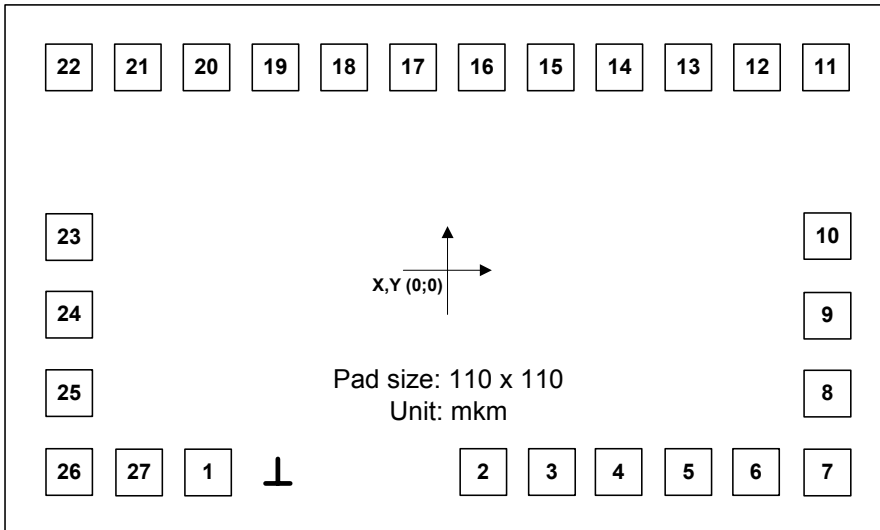
ELECTRICAL CHARACTERISTICS (Ta =25°C, V_{DD} =1.5V, V_{SS} =0V; unless otherwise specified)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Operating Voltage	V_{DD}		1.2	1.5	1.8	V
	V_{EE}		2.4	3.0	3.6	V
Supply Current	I_{DD}	Without Load		0.8	2.0	μ A
Input High Voltage	V_{IH}		$V_{DD} - 0.3$		V_{DD}	V
Input Low Voltage	V_{IL}		V_{SS}		$V_{SS} + 0.3$	V
Switch Activation Current	I_{SW}	$V_{IN} = V_{DD}$	0.1	0.5	3	μ A
Oscillator Start Voltage	V_{OSC}	Within 5 sec			1.45	V
Oscillator Stop Voltage	V_{OSP}				1.15	V
Oscillator Frequency	F_{OSC}			32.768		Hz
DC-DC Conversion Frequency	F_{CON}	$C1 = C2 = 0.1\mu F$		1.024		Hz
LCD Frequency	F_d			43		Hz
Oscillator Capacitor	C_{IN}			22		pF
	C_{OUT}			22		pF
Switch Debouncing Time	T_{DEB}				31.25	msec

LCD FORMAT



PAD DIAGRAM



PAD LOCATION

Pad No	Pad name	Pad No	Pad name
1	Vss	15	SEG8
2	T1	16	SEG7
3	T2	17	SEG6
4	VDD	18	SEG5
5	D	19	SEG4
6	S	20	SEG3
7	V _{EE}	21	SEG2
8	Vss	22	SEG1
9	COM3	23	COM1
10	COM2	24	GOO
11	SEG12	25	GOI
12	SEG11	26	512HZ
13	SEG10	27	CAP
14	SEG9		

APPLICATION CIRCUIT

