

**INTRODUCTION**

The DL9069 is a 12 digit LCD watch which display Hour: Minute Second, Date and Weekday. 12/24Hour display format user select. Hourly chime function. Alarm function. 1/100 second stop watch counter. It is simple four keys operation. It has low power consumption.

**FUNCTIONS**

- 6 Function: Month, Date, Day-of-Week, Hour, Minute, Second
- 8-digit chronograph (23:59:59:99)
- User selectable 12/24-hour format.
- 4 year calendar
- Fast advance for time and alarm time setting.
- Chime on every hour, alarm, Snooze.
- 4-keys operation.
- LCD test.

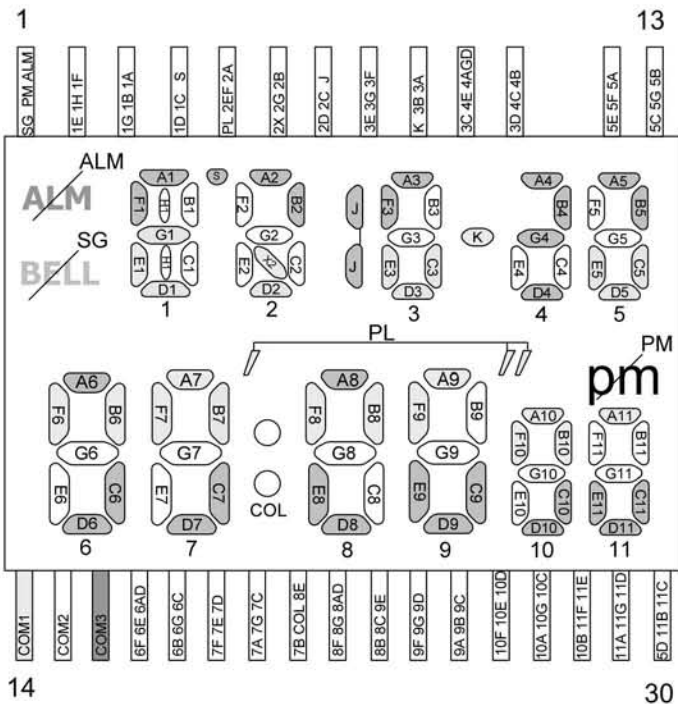
**FEATURES**

- Single-chip CMOS construction.
- Drives 12-digit LCD
- LCD drive mode: triplex (1/3 duty, 1/2 bias)
- 32.768Hz crystal frequency
- Two buzzer driver (differential).
- On-chip oscillator with resistor and capacitor.
- Single 3.0V battery operation.
- Touch-tone signal
- ESD ( 2000V ).
- 3 + 4 second EL-backlight timer.
- EL backlight Driver.

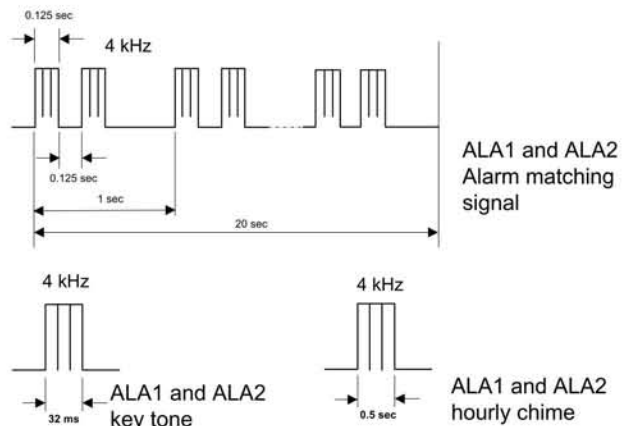
**ELECTRICAL CHARACTERISTICS** (T<sub>A</sub> = 25°C, V<sub>DD</sub> = 3.0 B, V<sub>SS</sub> = 0V; unless otherwise specified)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Operating Voltage	V <sub>DD</sub>		2.4	3.0	3.6	V
Supply Current	I <sub>DD</sub>	Without Load		0.75	1.5	μA
Switch Activation Current	I <sub>SW</sub>	V <sub>in</sub> = V <sub>DD</sub>	1	4	10	μA
Oscillator Start Voltage	V <sub>OSC</sub>	Within 2 sec			2.4	V
Alarm Drive Current	I <sub>ALA1</sub> (drive/sink)		0.75/7.5	1.0/10		mA
	I <sub>ALA2</sub>	V <sub>sat</sub> = 0.5V (Both Ditection)	0.75	1.5		
Output Voltage for EL Driver	V <sub>EL</sub>			110		V
Oscillator Frequency	F <sub>OSC</sub>			32,768		Hz
LCD Frequency	F <sub>d</sub>			64		Hz
Oscillator Input Capacitor	C <sub>IN</sub>			22		pF
Oscillator Output Capacitor	C <sub>OUT</sub>			22		pF
Time Stability	T <sub>stb</sub>	V <sub>DD</sub> = +2.4~+3.6		1	2	ppm
Switch Debunking Time	T <sub>deb</sub>				31.25	msec

**LCD FORMAT**



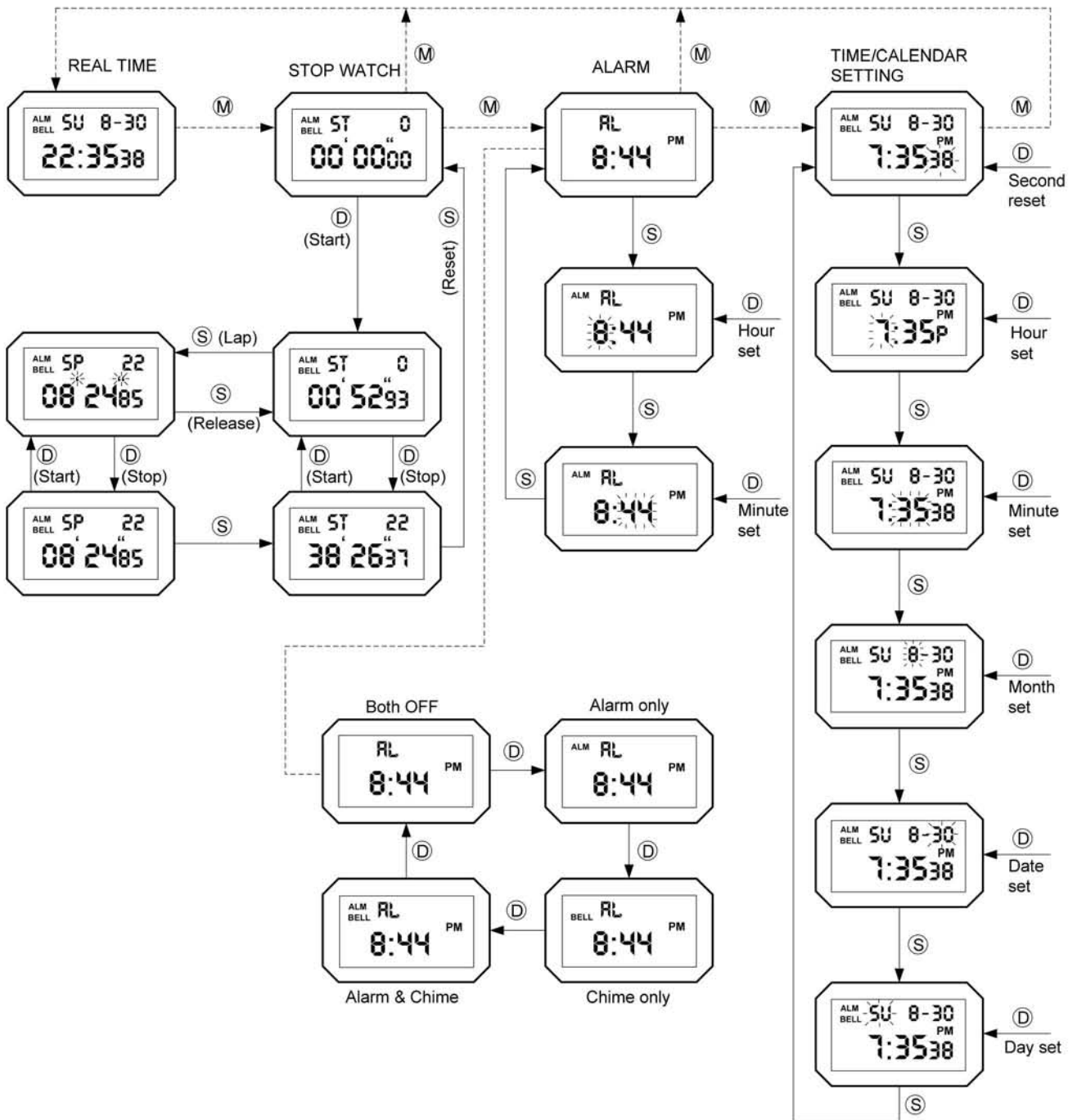
**OUTPUT WAVEFORMS**  
ALA1 and ALA2 outputs



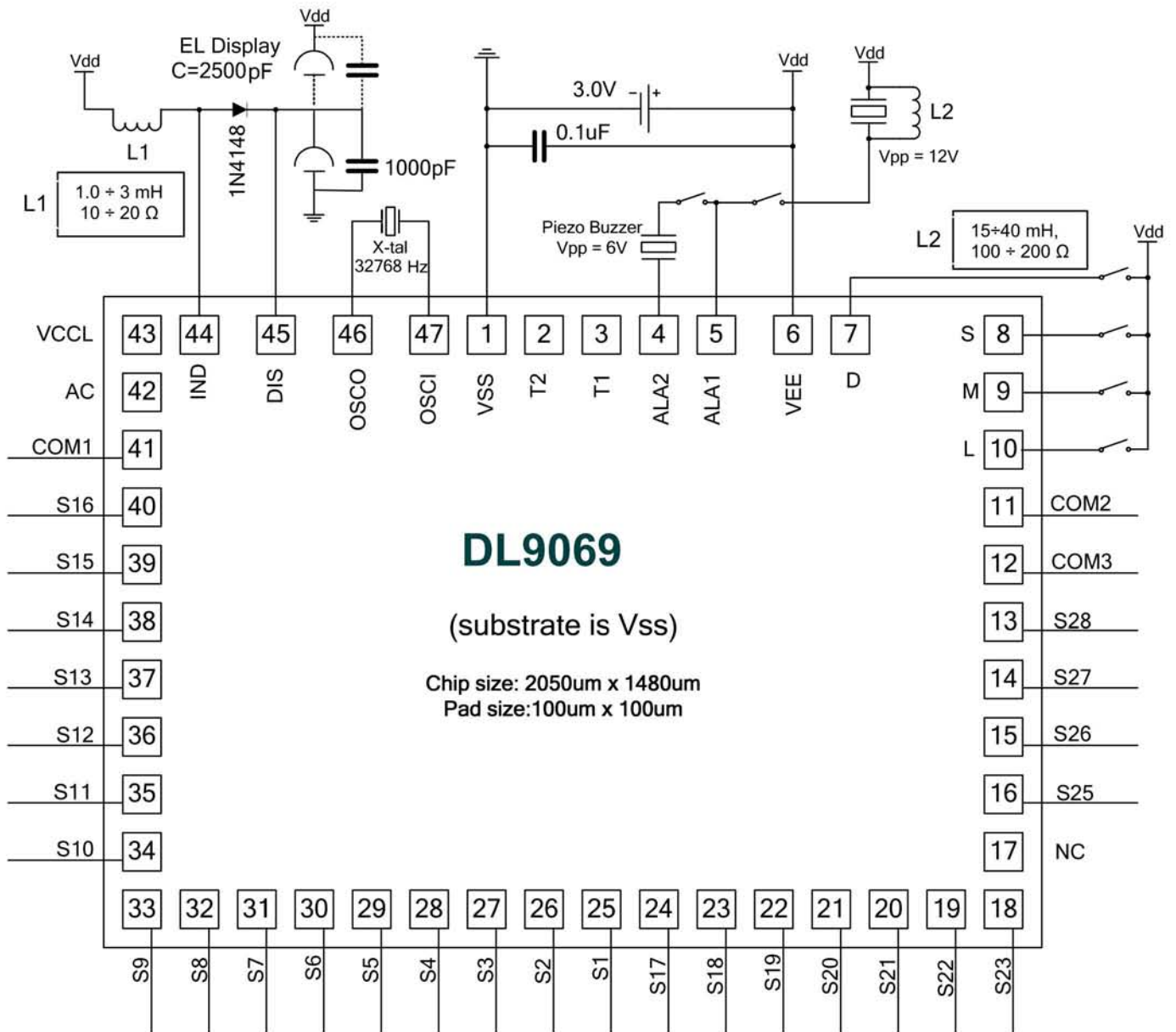
## LCD Table

PIN	I.C PAD	COM2	COM1	COM3
1	SEG28	PM	SG	ALM
2	SEG27	1H	1E	1F
3	SEG26	1B	1G	1A
4	SEG25	1C	1D	S
5	SEG23	2EF	PL	2A
6	SEG22	2G	2X	2B
7	SEG21	2C	2D	J
8	SEG20	3G	3E	3F
9	SEG19	3B	K	3A
10	SEG18	4E	3C	4AGD
11	SEG17	4C	3D	4B
12	SEG1	5F	5E	5A
13	SEG2	5G	5C	5B
14	COM1		COM1	
15	COM2	COM2		
16	COM3			COM3
17	SEG16	6E	6F	6AD
18	SEG15	6G	6B	6C
19	SEG14	7E	7F	7D
20	SEG13	7G	7A	7C
21	SEG12	COL	7B	8E
22	SEG11	8G	8F	8AD
23	SEG10	8C	8B	9E
24	SEG9	9G	9F	9D
25	SEG8	9B	9A	9C
26	SEG7	10E	10F	10D
27	SEG6	10G	10A	10C
28	SEG5	11F	10B	11E
29	SEG4	11G	11A	11D
30	SEG3	11B	5D	11C

Setting Sequence and Operation



APPLICATION CIRCUIT



PAD DESCRIPTION

Pad No	Pad Name	I/O	Description	X(μm)	Y(μm)	Pad No	Pad Name	I/O	Description	X(μm)	Y(μm)
1	Vss		Ground	-270	615	25	SEG1	O	LCD segment output	60	-615
2	T2	I p.d.	Test input	-150	615	26	SEG2	O	LCD segment output	-60	-615
3	T1	I p.d.	Test input	-30	615	27	SEG3	O	LCD segment output	-180	-615
4	ALA2	O	Inverted Alarm signal driver	90	615	28	SEG4	O	LCD segment output	-300	-615
5	ALA1	O	Direct Alarm signal driver	210	615	29	SEG5	O	LCD segment output	-420	-615
6	Vdd	-	3.0V battery source	330	615	30	SEG6	O	LCD segment output	-540	-615
7	D	I p.d.	Switch input	450	615	31	SEG7	O	LCD segment output	-660	-615
8	S	I p.d.	Switch input	900	615	32	SEG8	O	LCD segment output	-780	-615
9	M	I p.d.	Switch input	900	495	33	SEG9	O	LCD segment output	-900	-615
10	L	I p.d.	Switch input	900	375	34	SEG10	O	LCD segment output	-900	-465
11	COM2	O	LCD common output	900	255	35	SEG11	O	LCD segment output	-900	-345
12	COM3	O	LCD common output	900	135	36	SEG12	O	LCD segment output	-900	-225
13	SEG28	O	LCD segment output	900	15	37	SEG13	O	LCD segment output	-900	-105
14	SEG27	O	LCD segment output	900	-105	38	SEG14	O	LCD segment output	-900	15
15	SEG26	O	LCD segment output	900	-225	39	SEG15	O	LCD segment output	-900	135
16	SEG25	O	LCD segment output	900	-345	40	SEG16	O	LCD segment output	-900	255
17	NC	O	NC	900	-465	41	COM1	O	LCD common output	-900	375
18	SEG23	O	LCD segment output	900	-615	42	AC	I p.d.	NC	-900	495
19	SEG22	O	LCD segment output	780	-615	43	NC	O	NC	-900	615
20	SEG21	O	LCD segment output	660	-615	44	IND	O	EL Driver IND output	-750	615
21	SEG20	O	LCD segment output	540	-615	45	DIS	O	EL Driver DIS output	-630	615
22	SEG19	O	LCD segment output	420	-615	46	OSCO	O	Crystal oscillator	-510	615
23	SEG18	O	LCD segment output	300	-615	47	OSCI	I	Crystal oscillator	-390	615
24	SEG17	O	LCD segment output	180	-615						

p.d. - pull-down, p.u. - pull-up