5 FUNCTIONS 4 DIGITS ALARM

The is a CMOS IC with alarm function that provides to drive a 4 digit duplexed LCD with Colon, PM-Time and Snooze Mark.

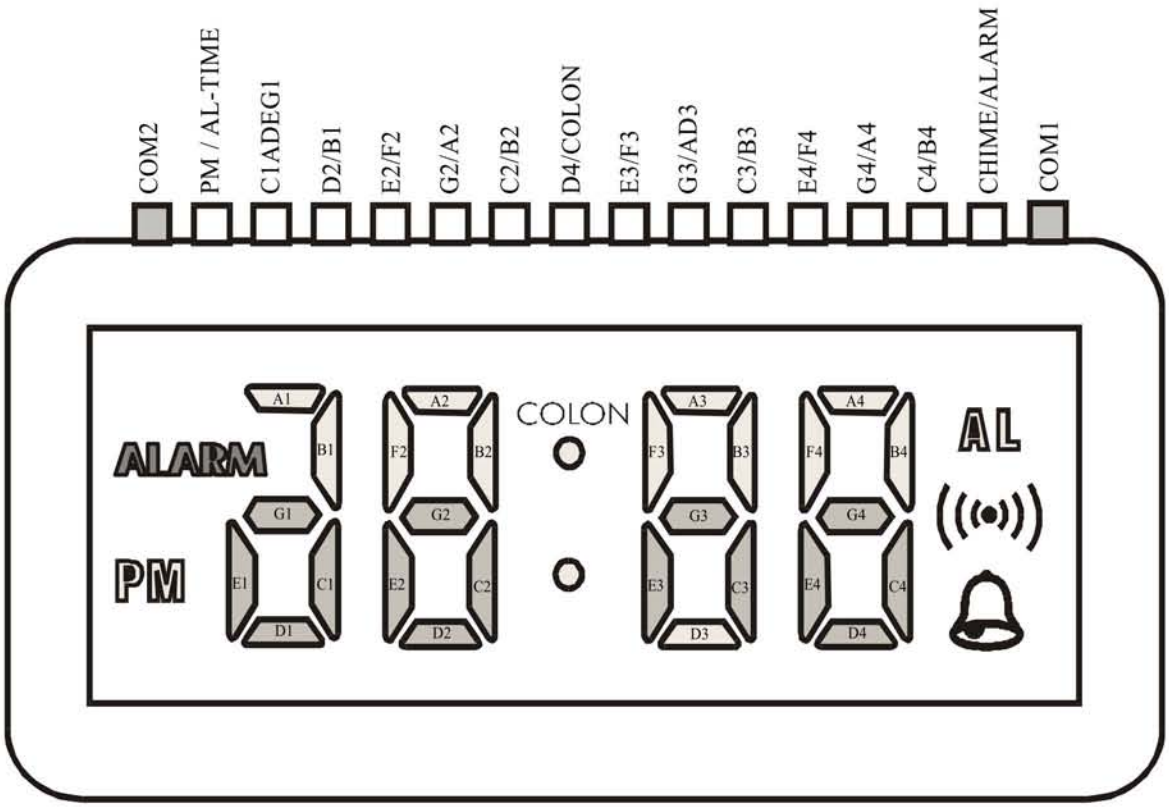
FEATURES

- Single-chip CMOS construction
- Drives 4-digit duplexed LCD with PM/AL-Time, Alarm and Chime mark
- Colon display
- On-chip oscillator, capacitor, resistor and voltage doubler
- 32,768Hz crystal frequency
- Direct drive of piezoelectric transducer
- Single 1.5V battery operation

FUNCTIONS

- 5 Functions: Month, Date, Hour, Minute, Second
- 30 second alarm sound
- Chime on every hour
- Selectable 12/24-hour format
- 4-year calendar
- One-touch correction of time error withing 30 seconds
- Alarm, Chime enable/disable
- 2-switch sequential operation
- LCD test

LCD FORMAT



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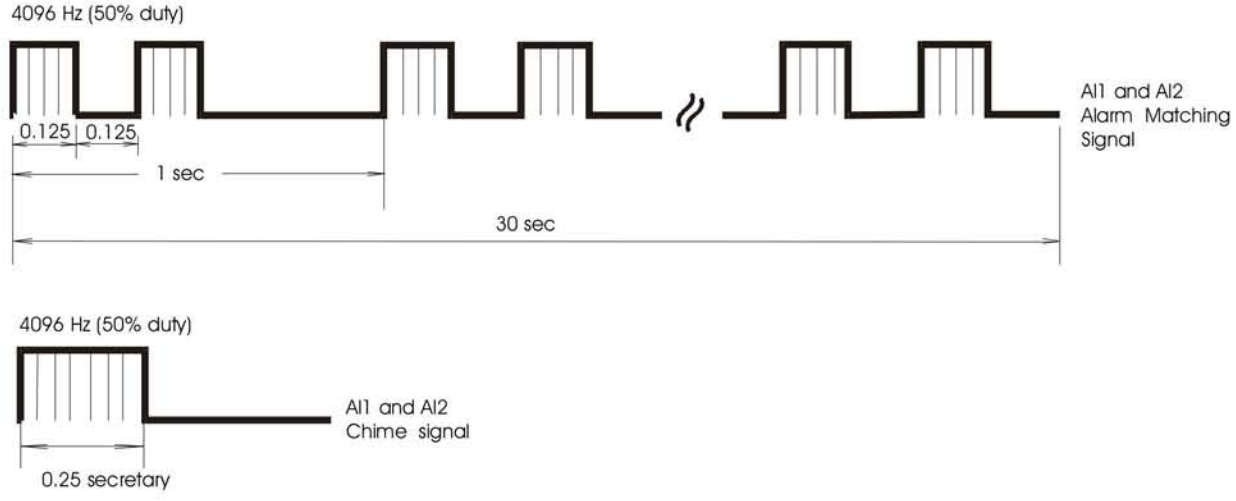
ABSOLUTE MAXIMUM RATINGS

Characteristic	Symbol	Value	Unit
Supply Voltage (V_{DD1} – Vss)	V_{DS1}	- 0.3 ~ + 2.0	V
Supply Voltage (V_{DD2} – Vss)	V_{DS2}	- 0.3 ~ + 4.0	V
Operating Temperature	Ta	- 20 ~ + 75	°C
Storage Temperature	T_{stg}	- 40 ~ + 125	°C

ELECTRICAL CHARACTERISTICS (Ta = 25°C, V_{SS} = 0 V, V_{DD1} = 1.5 V unless otherwise specified)

Characteristic	Symbol	Test Condition	Min	Typ	Max	Unit
Operating Voltage	V_{DD1}		1.2	1.5	1.8	V
	V_{DD2}		2.4	3.0	3.6	
Supply Current	I_{DD}	Without load		1.0	2.0	µA
Input High Voltage	V_{IH}		V_{DD}–0.3V		V_{DD}	V
Input Low Voltage	V_{IL}		V_{SS}		V_{SS}+0.3V	V
Switch Activation Current	I_{SW}	$V_{IH} = V_{DD}$	0.1	1.0	3.0	µA
Oscillator Start Voltage	V_{OSC}	Withing 5 Sec			1.45	V
Oscillator Stop Voltage	V_{OSP}				1.45	V
Alarm Drive Current	I_{ALA}	V_{sat} = 0.5V (Both Direction)	0.5	2.0		mA
Oscillator Frequency	F_{OSC}			32,768		Hz
DC-DC Conversion Frequency	F_{CON}	C1 = C2 = 0.1µF		1,024		Hz
LCD Frequency	F_D			32		Hz
Oscillator Input Capacitor	C_{IN}			20		pF
Time Stability	T_{stb}	V_{DD} = 1.3 ÷ 1.8V		1	3	ppm
Switch Debouncing Time	T_{deb}				62.5	mSec

ALARM OUTPUT WAVEFORM



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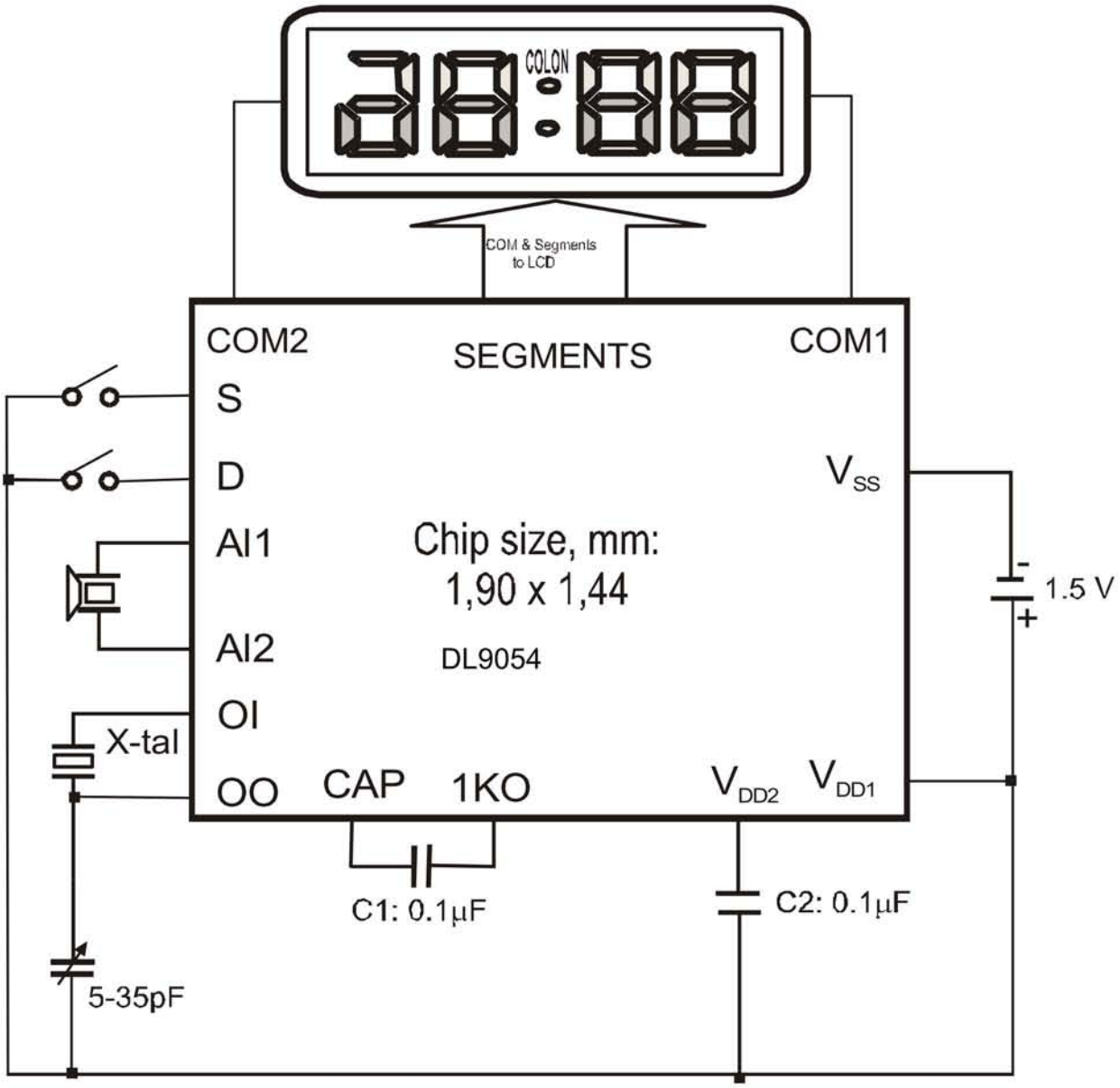
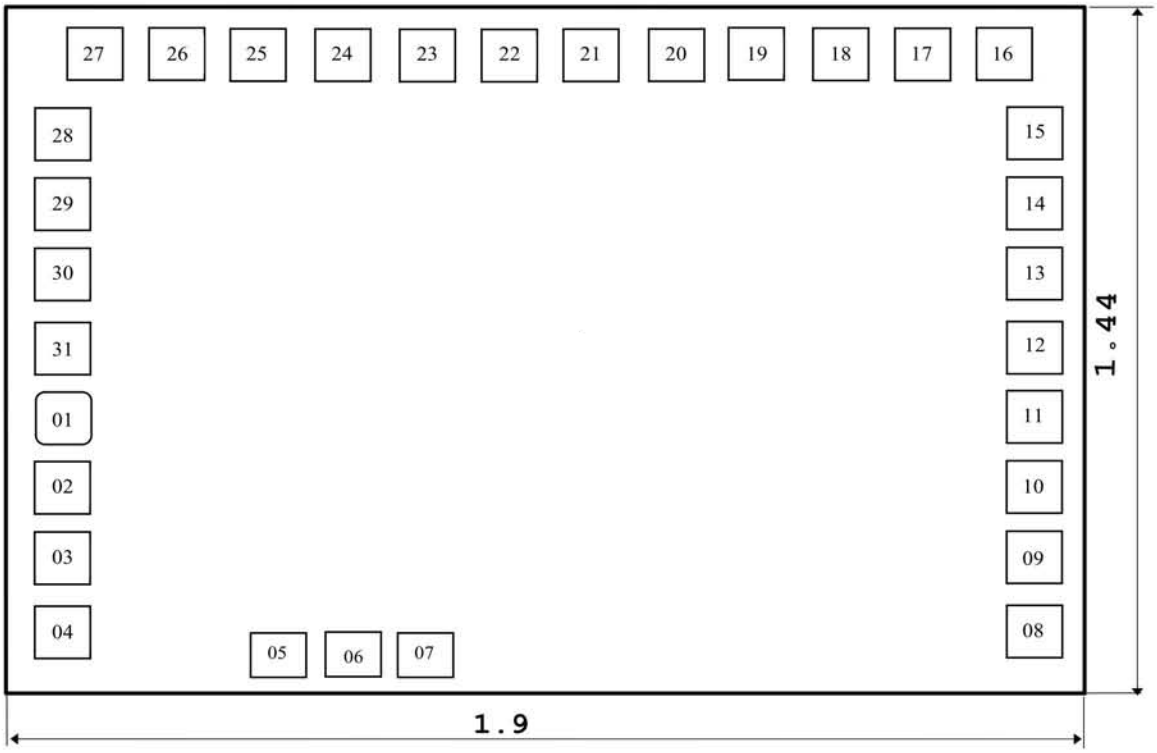
APPLICATION CIRCUIT



* Quartz Crystal Parameter
Fp = 32,768 Hz
CL = 12.5 pF
C1 = 4 pF
C2 = 2.5 pF
Rc = 35 KΩ
Q = 35,000

PAD DIAGRAM



PAD LOCATION (Left lower corner)

Pad No	Pad Name	X	Y	Pad No	Pad Name	X	Y
1	V_{DD1}	0.080	0.520	17	G4/A4	1.530	1.260
2	1KO	0.080	0.380	18	E4/F4	1.390	1.260
3	CAP	0.080	0.240	19	C3/B3	1.250	1.260
4	S	0.080	0.100	20	G3/D3	1.110	1.260
5	T1	0.490	0.075	21	E3/F3	0.970	1.260
6	T2	0.640	0.075	22	D4/COL	0.830	1.260
7	T3	0.788	0.075	23	C2/B2	0.690	1.260
8	V_{DD2}	1.720	0.100	24	G2/A2	0.550	1.260
9	V_{DD1}	1.720	0.240	25	E2/F2	0.410	1.260
10	Vss	1.720	0.380	26	D2/B1	0.270	1.260
11	D	1.720	0.520	27	C1/ADEG1	0.130	1.260
12	AL2	1.720	0.660	28	PM/AL TIME	0.080	1.080
13	AL1	1.720	0.800	29	COM2	0.080	0.940
14	COM1	1.720	0.940	30	OI	0.080	0.800
15	CHIME ALM	1.720	1.080	31	OO	0.080	0.660
16	C4/B4	1.670	1.260				