6 FUNCTIONS 6 DIGITS ALARM WATCH WITH MELODY

The DL1214 is a CMOS digital 6-function watch integrated circuit with alarm and autoranging chronograph function; designed to for a 6-digit duplexed liquid crystal display, 7-day mark, date mark, AM/PM mark and colon.

The alarm signal is melody – different for each day of week.

FEATURES

- Single-chip CMOS constraction
- Drives 6-digit duplexed LCD with 7-day mark, AM/PM mark, date mark and alarm mark
- Colon display
- Drive piezoelectric transducer with external transistor
- 32,768Hz crystal frequency
- On chip oscillator, capacitor, resistor and voltage doubler
- Single 1.5V batter operation
- Low power dissipation
- Debounce circuitry on switch inputs

FUNCTIONS

- 6 Functions: Month, Date, Day-of-Week, Hour, Minute, Second
- · 6-digit Chronograph: Autoranging after 30 minutes to hour, minute; second
- · User selectable 12-hour/24-hour format
- · Alarm output with melody
- · 4-year calendar
- · One-touch correction of time error within ± 30 seconds
- · Fast advance for time and alarm time set
- · Chime on every hour
- · 3-switch sequential operation

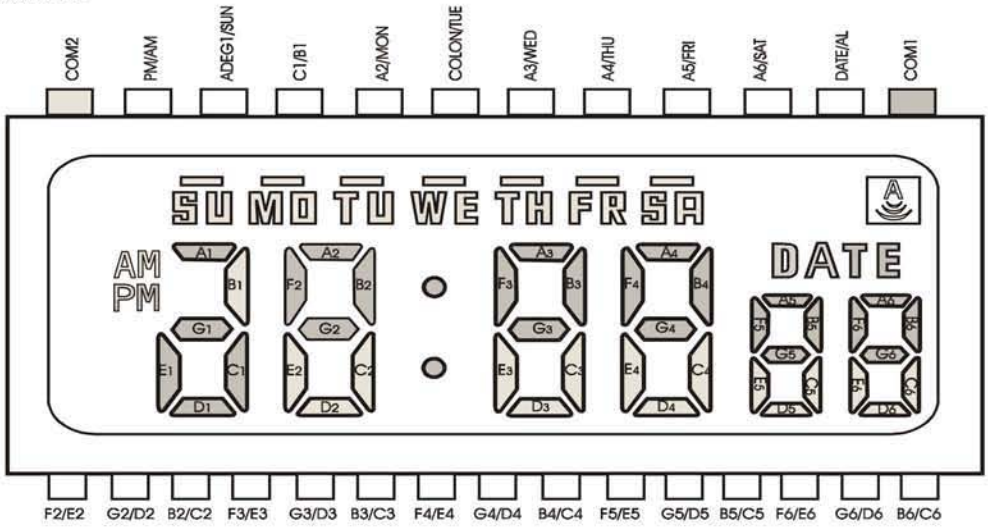
ABSOLUTE MAXIMUM RATINGS

Characteristic	Symbol	Value	Unit
Supply Voltage	V_{CC}	- 0.3 ~ + 2.0	V
LSD Voltage (Doubler)	V_{DD}	- 0.3 ~ + 4.0	V
Operating Temperature	T_{opr}	- 10 ~ + 60	°C
Storage Temperature	T_{stg}	- 55 ~ + 125	°C

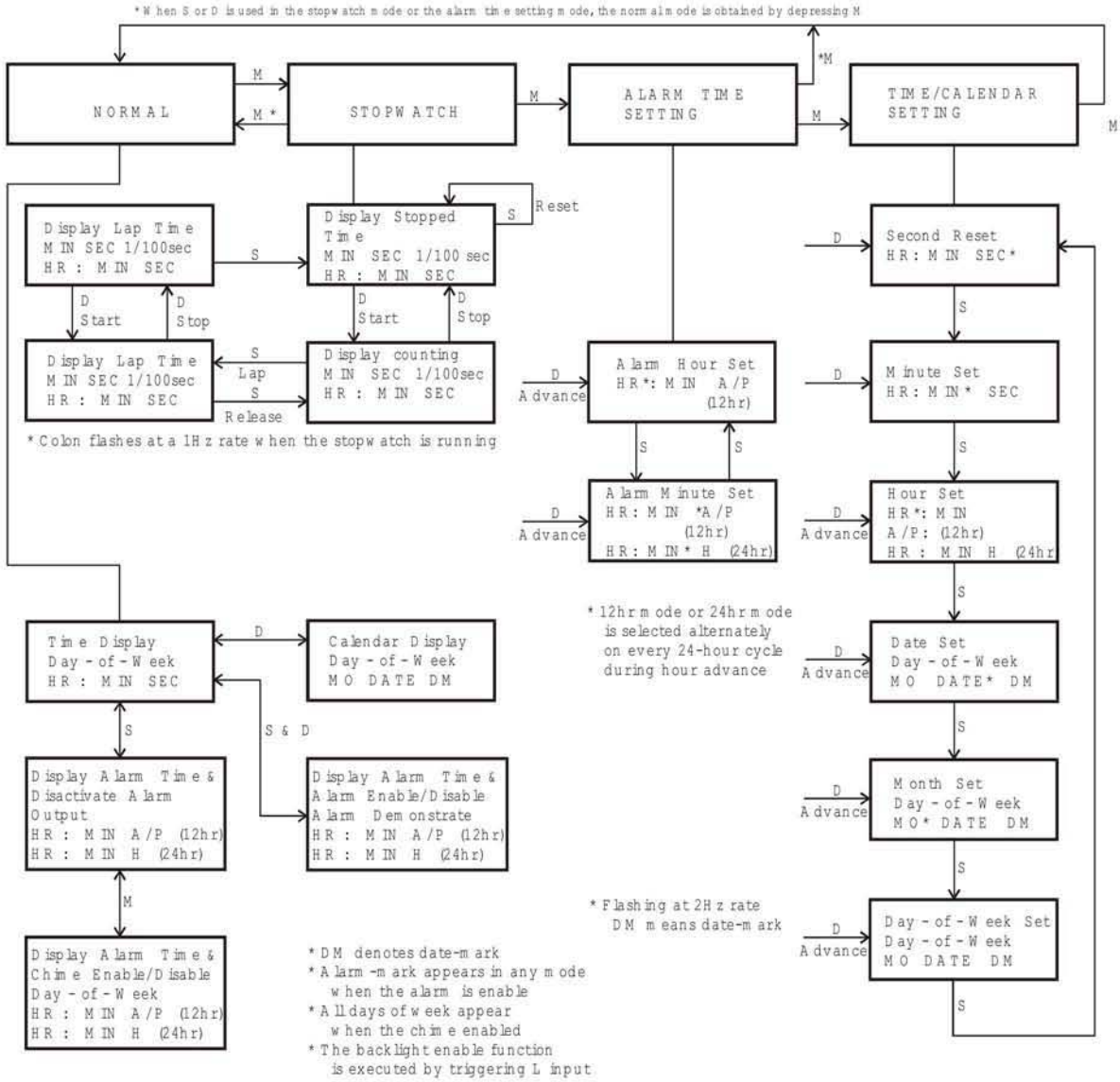
ELECTRICAL CHARACTERISTICS (Ta = 25°C, V_{SS} = 0V, V_{CC} = 1.5V unless otherwise specified)

Characteristic	Symbol	Test Condition	Min	Typ	Max	Unit
Operating Voltage	V_{CC}		1.2	1.5	1.8	V
LCD Voltage	V_{DD}		2.4	3.0	3.6	V
Supply Current	I_{DD}	Without load		2.0	5.0	µA
Input Current	I_{IH}	$V_{IH} = V_{CC}$	0.1	0.5	3.0	µA
Oscillator Start Voltage	V_{OSC}				1.45	V
Oscillator Stop Voltage	V_{OSP}				1.15	V
Oscillator Frequency	F_{OSC}			32,768		Hz
Oscillator Input Capacitor	C_{IN}			25		pF
Oscillator Output Capacitor	C_{OUT}			25		pF
Melody Drive Current	I_O	V_O = 0.7V	20			µA
Time Stability	T_{stb}	V_{CC} = 1.3 ÷ 1.8V		1	3	ppm

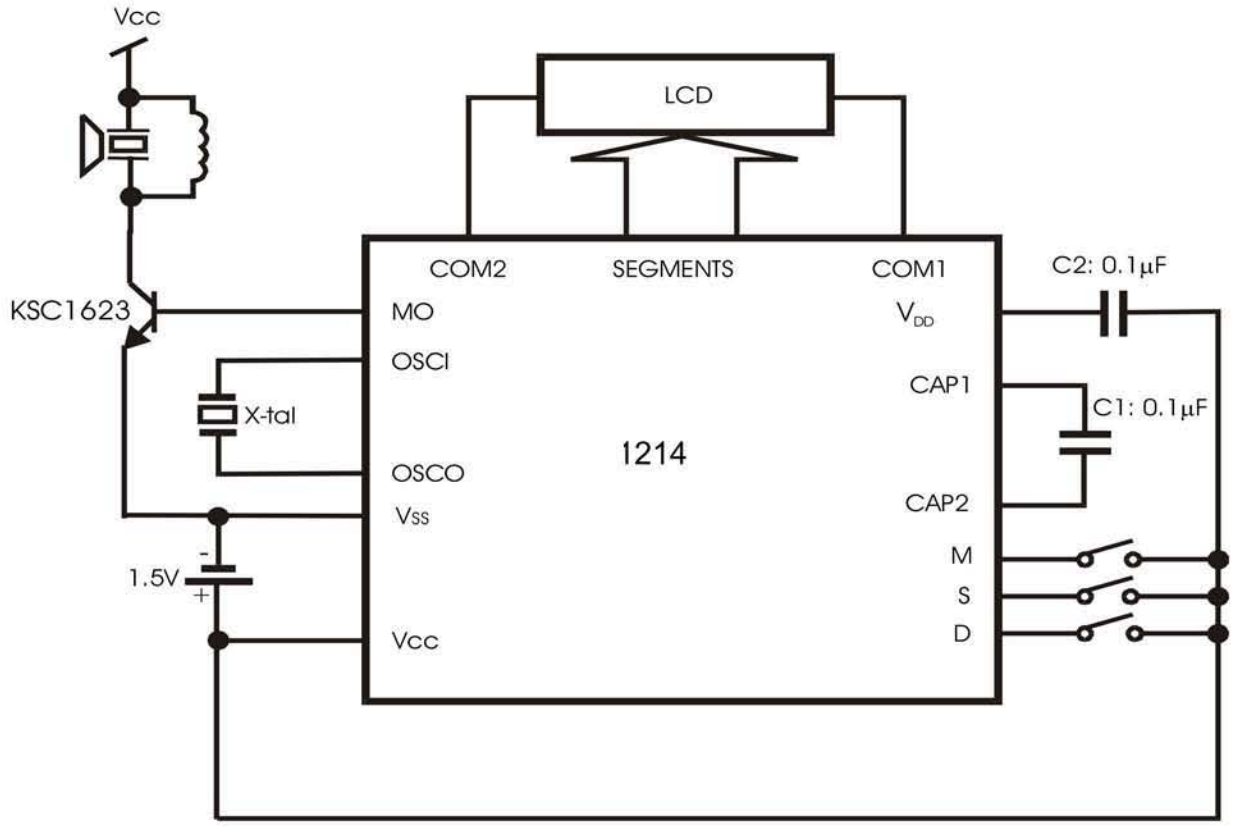
LCD FORMAT



SETTING SEQUENCE AND SWITCH OPERATION



APPLICATION CIRCUIT

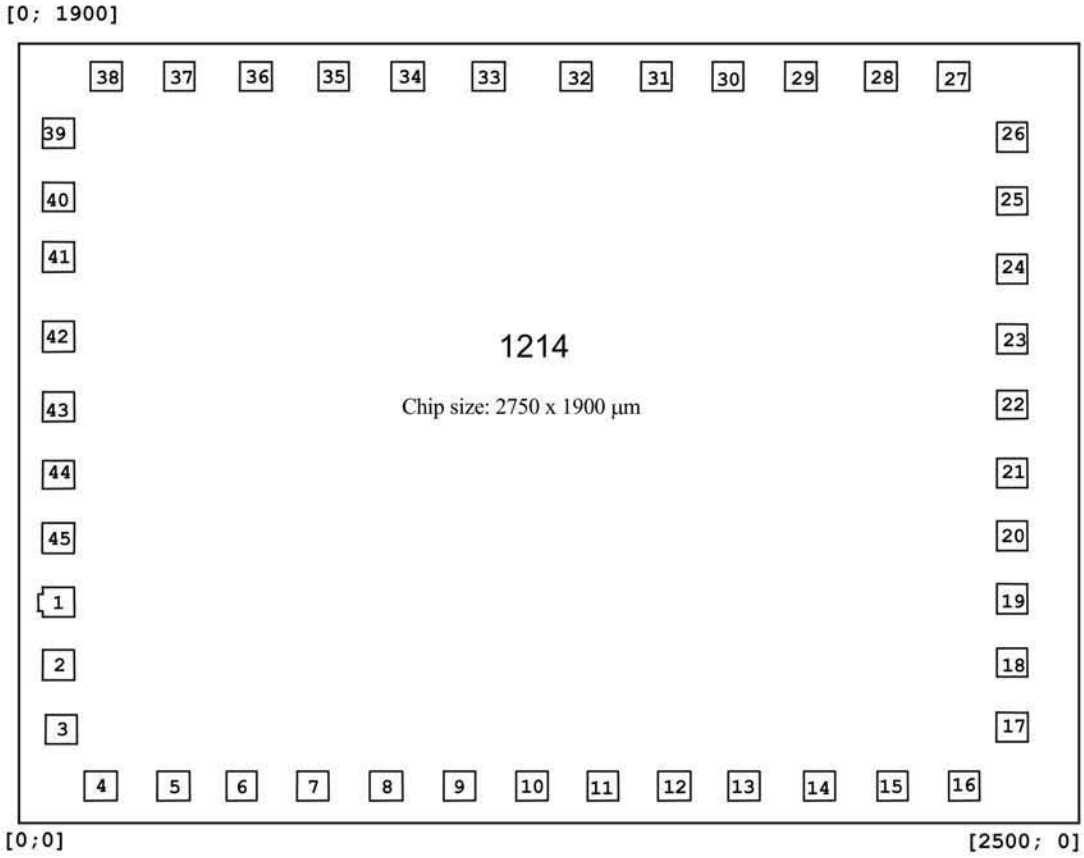


* Quartz Crystal Parameter
Fp = 32,768 Hz
CL = 12.5 pF
C1 = 4 pF
C0 = 2.5 pF
Rc = 35 KΩ
Q = 35,000

SONG LIST

No.	1214
1	Home sweet Home
2	Oh! Susanna
3	Whispering Hope
4	Dreaming of Home and Mother
5	Oh! My Darling Clementine
6	Beautiful Dreamer
7	Red River Valley

PAD DIAGRAM



№	Name	X(um)	Y(um)	№	Name	X(um)	Y(um)	№	Name	X(um)	Y(um)
1	OSCO	109	492	16	C6_D6	2360	109	31	A4_THU	1601	1697
2	OSCI	109	336	17	B6_C6	2547	174	32	A3_WED	1419	1697
3	F2_E2	109	174	18	V_{CC}	2547	336	33	CL_TUE	1237	1697
4	G2_D2	296	109	19	T1	2547	498	34	A2_MON	1055	1697
5	B2_C2	468	109	20	T2	2547	660	35	C1_B1	873	1697
6	F3_E3	640	109	21	V_{DD}	2547	822	36	A1_SUN	691	1697
7	G3-D3	812	109	22	CAP2	2547	984	37	PM_AM	509	1697
8	B3_C3	984	109	23	CAP1	2547	1146	38	COM2	327	1697
9	F4_E4	1156	109	24	S	2547	1308	39	M	109	1632
10	G4_D4	1328	109	25	D	2547	1470	40	V_{CC}	109	1470
11	B4_C4	1500	109	26	T3	2547	1632	41	V_{SS}	109	1308
12	F5_E5	1672	109	27	COM1	2329	1697	42	MO	109	1146
13	G5_D5	1844	109	28	DTE_AL	2147	1697	43	T4	109	984
14	B5_C5	2016	109	29	A6_SAT	1965	1697	44	T5	109	822
15	F6_E6	2188	109	30	A5_FRI	1783	1697	45	T6	109	660

Pads size: 96 × 96 µm ("passivation" layer).