

3.5-Digit watch circuit for duplexed LCD

IZ6099C - multifunctional microcircuit for electronic watches with twelve hours scale

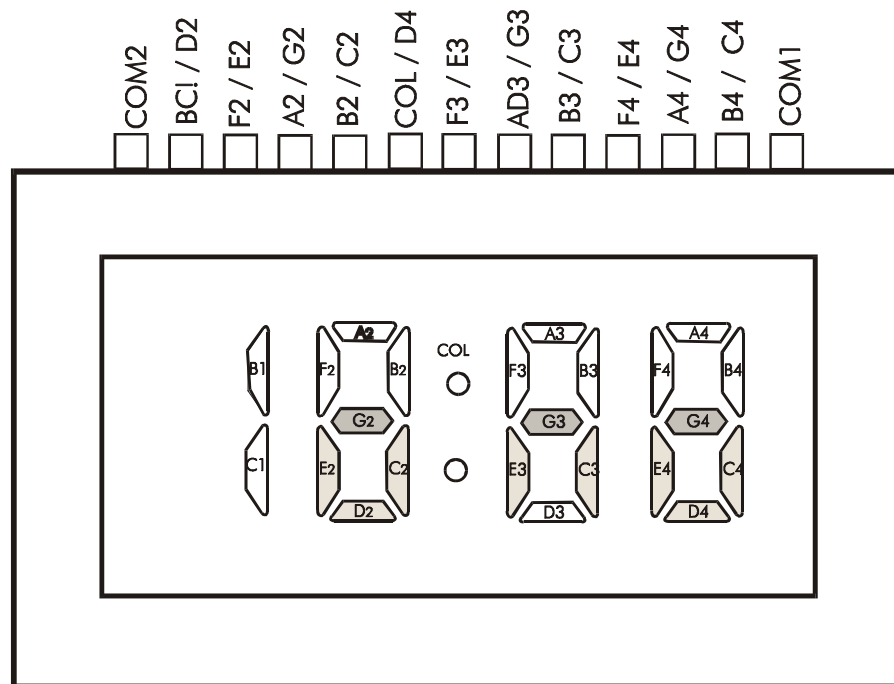
FEATURES

- Single-chip CMOS constructions
- Drives 3.5-digit duplexed LCD
- Low power consumption
- Colon display
- 32,768Hz cristal controlled operation
- Single 1.5V battery operation
- On-chip voltage doubler
- Debounce circuitry on switch inputs
- Protection against static discharge
- Built-in crystal oscillator input capacitor

FUNCTIONS

- 5 functions: month, date, hour, minute and second
- Selective alternation of time-date display mode
- One-touch correction of time error within \pm 30 seconds
- 4-year calendar
- 2-switch sequential operation
- LCD test

LCD FORMAT



ABSOLUTE MAXIMUM RATINGS

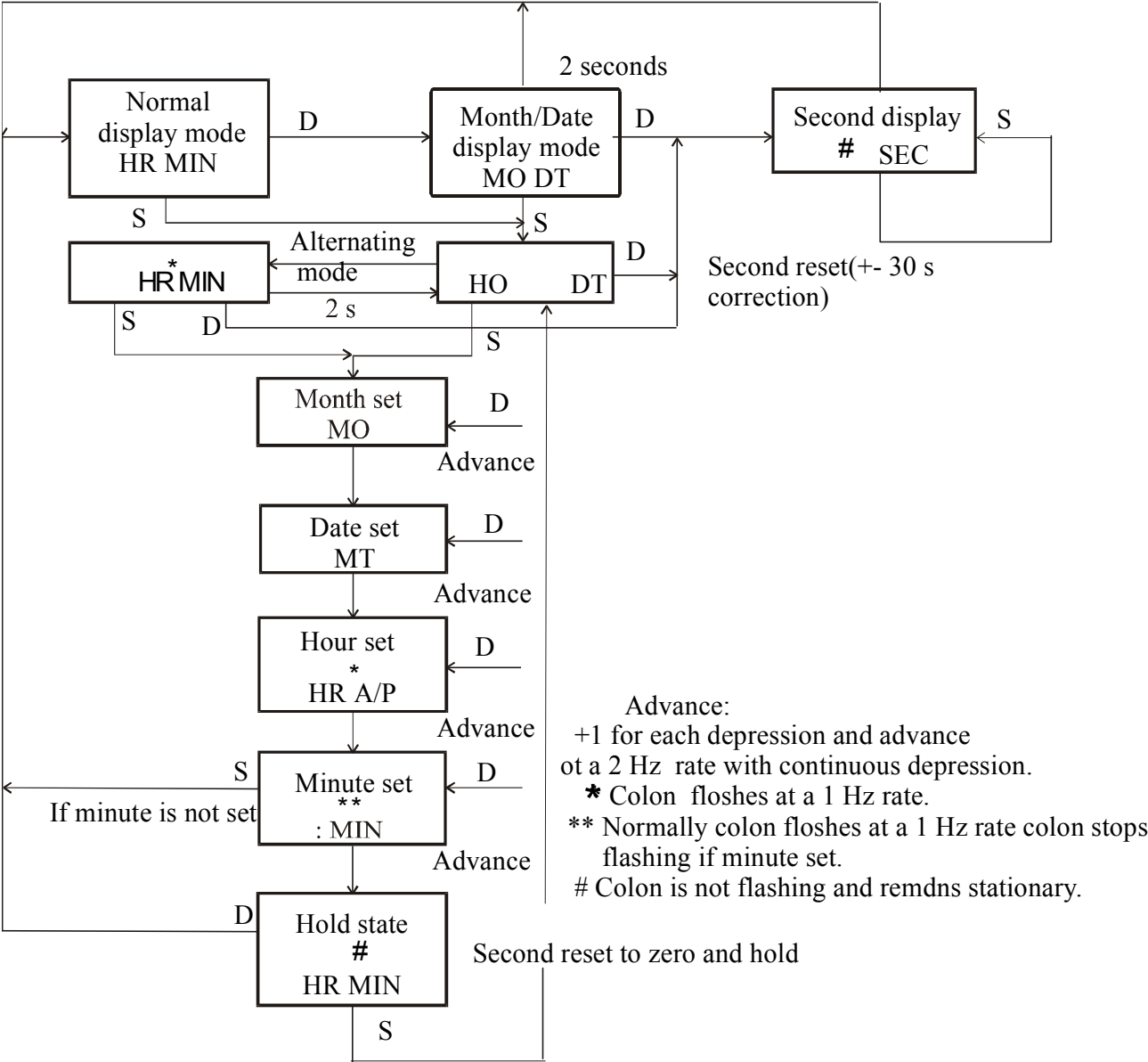
Characteristic	Symbol	Value	Unit
Supply Voltage	V_{CC}	- 0.3 ~ + 2.0	V
Display Voltage	V_{DD}	- 0.3 ~ + 4.0	V
Operating Temperature	T_{opr}	- 20 ~ + 75	°C
Storage Temperature	T_{stg}	- 55 ~ + 125	°C

* Voltage greater than above may damage the circuit

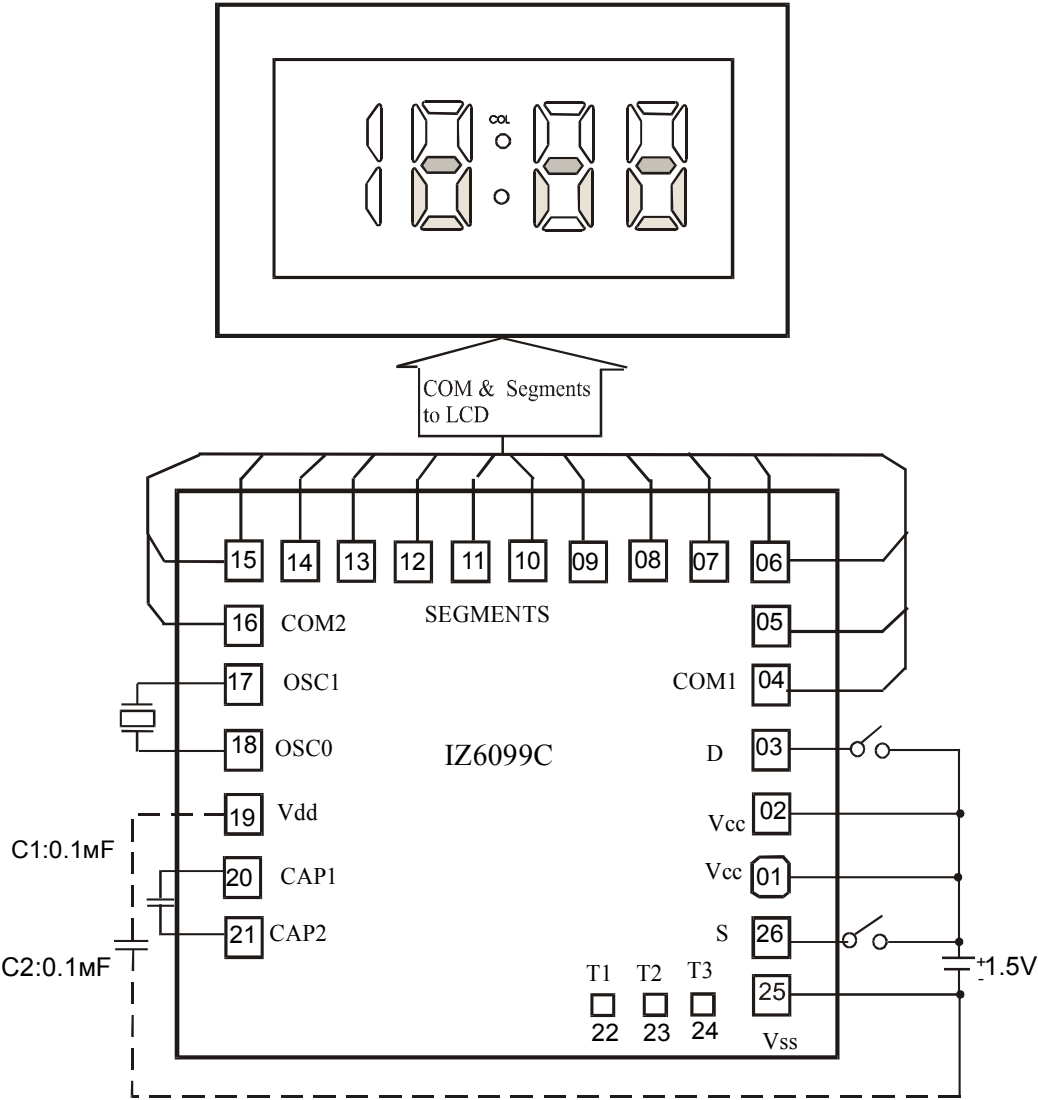
ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$, $V_{SS} = 0\text{V}$, $V_{CC} = 1.5\text{V}$; unless otherwise specified)

Characteristic	Symbol	Test Condition	Min	Max	Unit
Operating Voltage	V_{CC}		1.2	1.8	V
Display Voltage	V_{DD}		2.4	3.4	V
Supply Current	I_{CC}	Without Load		1.5	μA
Input Low Voltage	V_{IL}		V_{SS}	$V_{SS}+0.3$	V
Input High Voltage	V_{IH}		$V_{CC}-0.3$	V_{CC}	V
Oscillator Start Voltage	V_{OSC}	Within 5 sec		1.45	V
Oscillator Stop Voltage	V_{OSP}			1.25	V

SETTING AND DISPLAY SEQUENCE

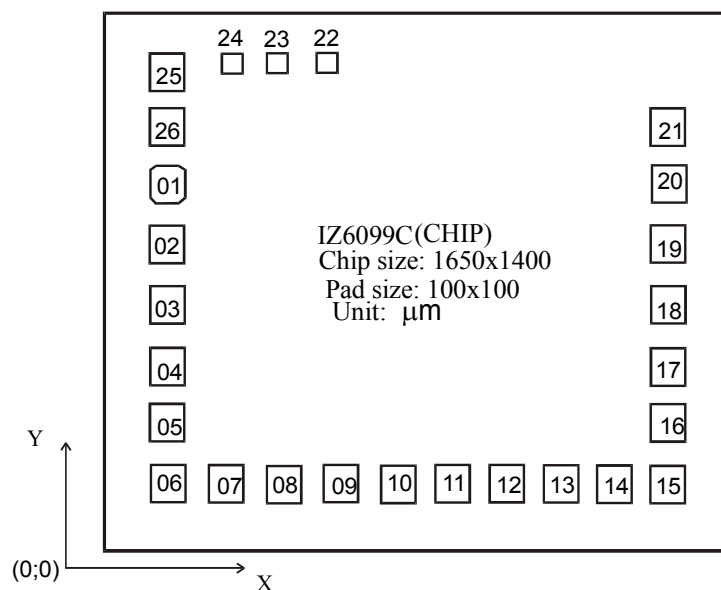


APPLICATION CIRCUIT



Quartz Crystal Parameter
Fp=32,768 Hz
CL=12,5 pF
C1=4 pF
C0=2,5 pF
Rc=35Ω
Q=35000

PAD DIAGRAM



PAD LOCATION

Pad No.	Pad Name	X	Y	Pad No.	Pad Name	X	Y	Pad No.	Pad Name	X	Y
1	Vcc ₁	0.080	0.890	10	F3/E3	0.700	0.080	19	V _{DD}	1.470	0.740
2	Vcc ₂	0.080	0.740	11	COL/D4	0.850	0.080	20	CAP1	1.470	0.890
3	D	0.080	0.590	12	B2/C2	1.000	0.080	21	CAP2	1.470	1.040
4	COM1	0.080	0.440	13	A2/G2	1.150	0.080	22	T1	0.585	1.236
5	B4/C4	0.080	0.290	14	F2/E2	1.300	0.080	23	T2	0.420	1.236
6	A4/G4	0.100	0.080	15	BC1/D2	1.450	0.880	24	T3	0.275	1.190
7	F4/E4	0.250	0.080	16	COM2	1.470	0.290	25	V _{SS}	0.080	1.040
8	B3/C3	0.400	0.080	17	OSC1	1.470	0.440	26	S	0.080	1.004
9	AD3/G3	0.550	0.080	18	OSCO	1.470	0.590				