IZ6018

MULTIFUNCTIONAL CMOS IC FOR ELECTRONIC WATCH WITH TEMPERATURE MEASUREMENT FUNCTION

Summary Characteristics

Functions

- 6 functions of counting time and calendar with readings of hours, minutes, seconds, months, dates, days of week;
- 6-bit stop-watch with counting discreteness one hundredth second;
- alarm clock with function of repeat of signal every 5 minutes;
- thermometer temperature measurement range:

from -20 up to +60°C
from -4 up to +140°F;

- user's choice of 12/24 hours time scale;
- hourly audio signal.

Pecularities

- control over Liquid Crystal Display (LCD) in four-level multiplexing mode;
- colon display;
- control of piesoelectric transducer
- embedded-in-chip elements of quarts generator with operation frequency 32768 Hz, capacity, resistor and voltage doubler;
- operation with one 3.0V battery, low consumption power;
- circuits of contacts chatter suppression on button inputs
- protection against statelectricity.

Operation temperature range

Operation temperature range is form -20°C up to +75 °C.

Limiting and extreme modes

Parameter	Parameter name	extreme mode		Limiting mode		Measurement unit
		not less	not more	not less	Not more	
U_{DD}	Supply voltage from voltage source	2,4	3,6	-0,3	4,0	V
U_{CC}	Supply voltage from voltage converter	3,6	5,4	-0,3	6,0	**V**
U_{IH}	High-level input voltage	U_{DD}-0,3	U_{DD}	-0,3	U_{DD}+0,3	V
U_{IL}	Low-level input voltage	Uss	Uss+0,3	-0,3	U_{DD}+0,3	V

Under limiting modes efficiency of ICs is not guaranteed. After limiting modes are cancelled the operation in extreme mode is guaranteed.

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Electric parameters. (Ta = 25°C)

| Parameter, measurement unit	Symbol	Measurement mode	Target		Note
			not less	not more	
Dynamic consumption current, mkA	I_{DD}	U_{DD} =3,0V	-	3,0	1,4
Buttons switch current, mkA	Isw	U_{DD}=3,0V U_{IN}=U_{DD}	0,1	30	-
Low-level output current on pins ALA, ALB, mkA	I_{OL}	U_{OL}=0,5V U_{DD}=2,4V	500	-	-
High-level output current on pins ALA, ALB, mkA	I_{OH}	U_{OH}=1,9V U_{DD}=2,4V	-500	-	3
Generator starting voltage, V	Uosc	control time 5sec	-	2,4	4

Notes:
1 Dynamic consumption current is measured without load.
2 Nominal value of embedded capacities on pins OSCI and OSCO (generator's input and output) - 20 pF.
3 «Minus» sign indicates only current direction.
4 Parameters are controlled with quarts resonator, ensuring series resonance frequency 32768 Hz at load capacity value C_L=10 pF.

GLI format

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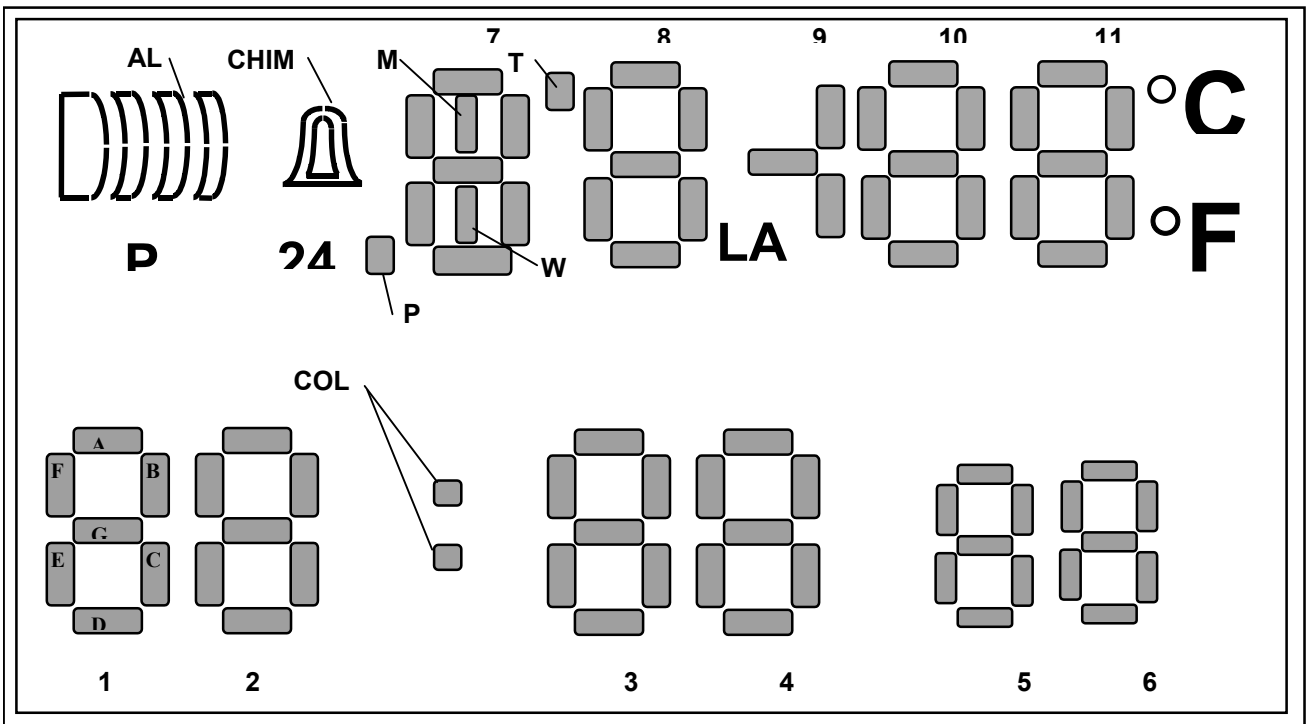
№ SEG	COM0	COM1	COM2	COM3	№ SEG	COM0	COM1	COM2	COM3
0	-	F5	E5	D5	12	-	C7	B7	M7
1	A5	B5	G5	C5	13	D7	W7	G7	A7
2	-	F6	E6	D6	14	P7	E7	F7	-
3	A6	B6	G6	C6	15	A4	B4	C4	-
4	-	°F	°C	B11	16	F4	G4	E4	D4
5	-	C11	G11	A11	17	A3	B3	C3	-
6	D11	E11	B10	F11	18	F3	G3	E3	D3
7	C10	G10	F10	A10	19	-	B2	COL	C2
8	D10	E10	BC9	-	20	24H	A2	G2	D2
9	-	LAP	G9	-	21	CHIME	B1	F2	E2
10	D8	C8	B8	A8	22	PM	A1	G1	C1
11	E8	G8	F8	T8	23	AL	F1	E1	D1

Application diagram
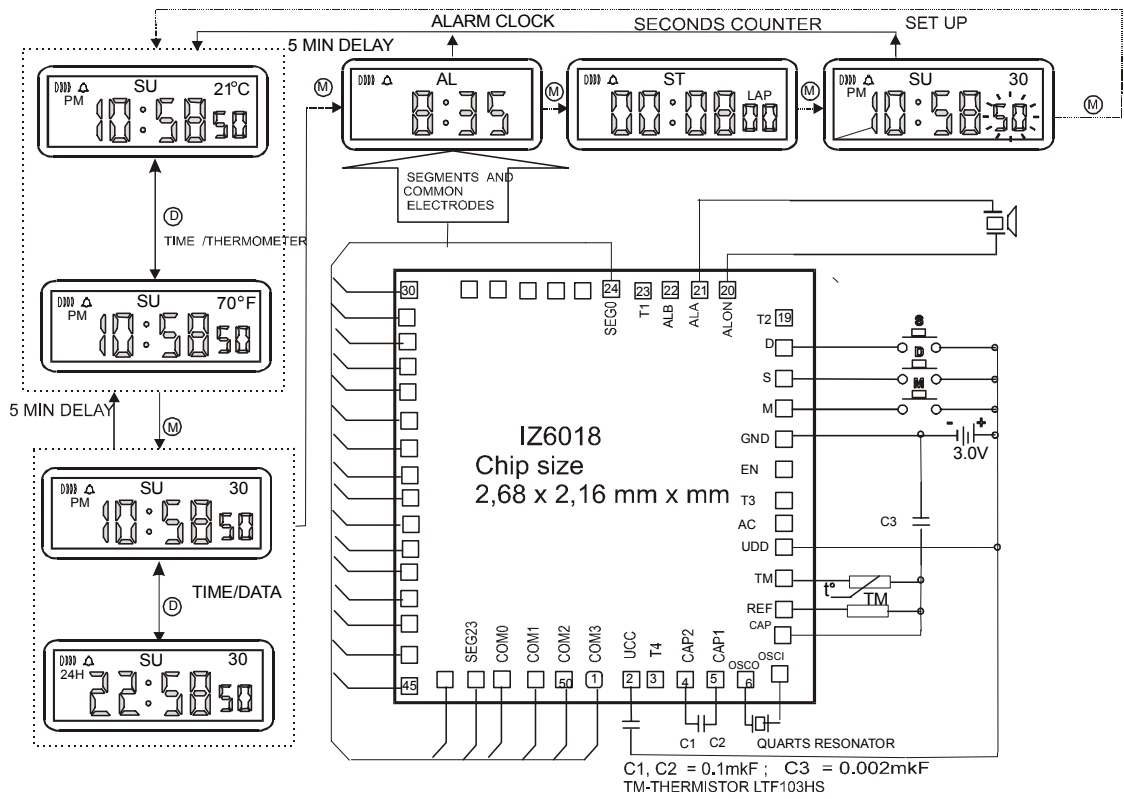
Quarts resonator parameters
Fp = 32768Hz, C_L = 10.0pF
C_1 = 0.004 pF, C_O = 2.5pF
Rs = 35kOhm, Q = 35000

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Table of pins purpose

No of contact pad	Symbol	Pin purpose	No of contact pad	Symbol	Pin purpose
01	COM3	Common GLI control electrode	26	SEG2	LCI digit electrode
02	Ucc	Supply output from voltage converter	27	SEG3	LCI digit electrode
03	T4	Input of accelerated control	28	SEG4	LCI digit electrode
04	CAP2	Voltage converter output	29	SEG5	LCI digit electrode
05	CAP1	Voltage converter output	30	SEG6	LCI digit electrode
06	OSCO	Oscillator output	31	SEG7	LCI digit electrode
07	OSCI	Oscillator input	32	SEG8	LCI digit electrode
08	CAP	Test oscillator input	33	SEG9	LCI digit electrode
09	REF	Test oscillator output	34	SEG10	LCI digit electrode
10	TM	Test oscillator output	35	SEG11	LCI digit electrode
11	Udd	Supply output from voltage source	36	SEG12	LCI digit electrode
12	AC	Output of accelerated control	37	SEG13	LCI digit electrode
13	T3	Output of accelerated control	38	SEG14	LCI digit electrode
14	EN	Control input	39	SEG15	LCI digit electrode
15	Vss	Common supply output	40	SEG16	LCI digit electrode
16	M	Control input	41	SEG17	LCI digit electrode
17	S	Control input	42	SEG18	LCI digit electrode
18	D	Control input	43	SEG19	LCI digit electrode
19	T2	Input of accelerated control	44	SEG20	LCI digit electrode
20	Udd	Supply output from voltage source	45	SEG21	LCI digit electrode
21	ALA	Audio signal control output	46	SEG22	LCI digit electrode
22	ALB	Audio signal control output	47	SEG23	LCI digit electrode
23	T1	Accelerated control input	48	COM0	Common GLI control electrode
24	SEG0	LCI digit electrode	49	COM1	Common GLI control electrode
25	SEG1	LCI digit electrode	50	COM2	Common GLI control electrode

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Chip layout

| 45 | 44 | 43 | 42 | 41 | 40 | 39 | 38 | 37 | 36 | 35 | 34 | 33 | 32 | 31 | 30 |

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Size of contact pads:

100 x 100mkm;

| 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
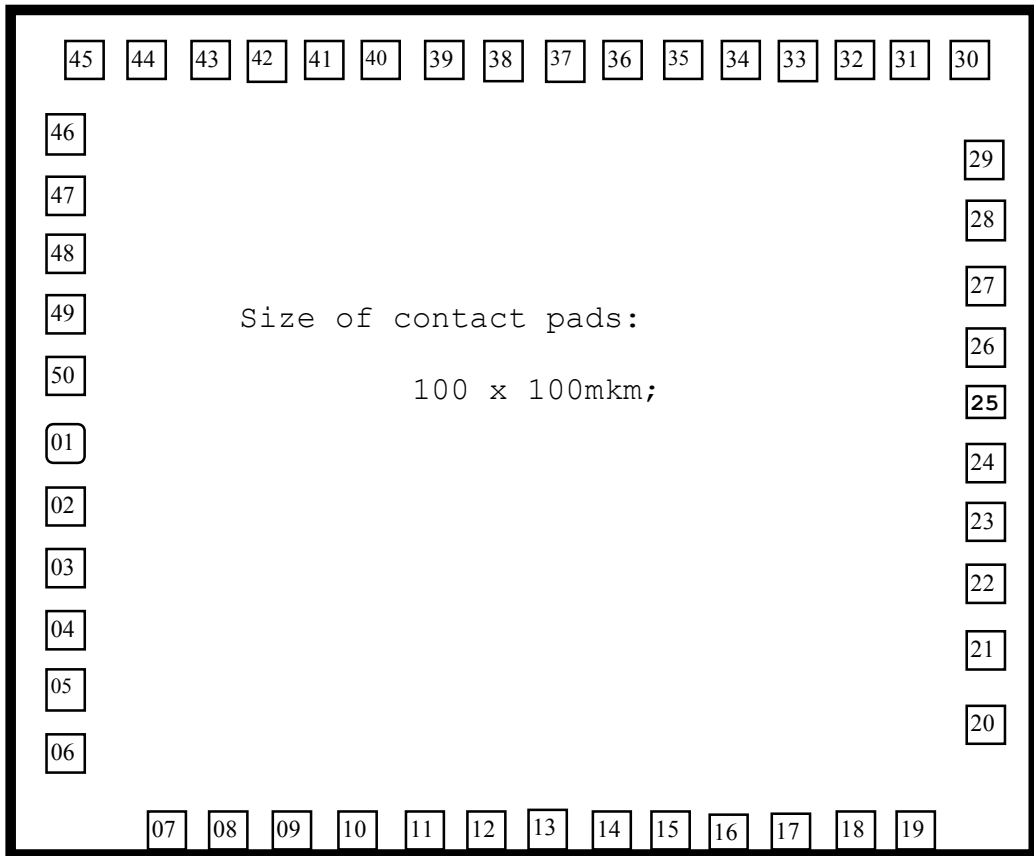
Chip size:
2680±30 × 2160±30 mkm.

Chip thickness:
460±20 mkm.

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Table of contact pads coordinates

Contact pad №	Symbol	Coordinates(mkm)		Contact pad №	Designation	Coordinates(mkm)	
		X	Y			X	Y
01	COM3	0.105	1.006	26	SEG2	2.467	1.280
02	Ucc	0.105	0.843	27	SEG3	2.467	1.430
03	T4	0.105	0.693	28	SEG4	2.467	1.581
04	CAP2	0.105	0.542	29	SEG5	2.467	1.731
05	CAP1	0.105	0.392	30	SEG6	2.413	1.940
06	OSCO	0.105	0.242	31	SEG7	2.262	1.955
07	OSCI	0.369	0.105	32	SEG8	2.112	1.955
08	CAP	0.519	0.105	33	SEG9	1.962	1.955
09	REF	0.670	0.105	34	SEG10	1.811	1.955
10	TM	0.820	0.105	35	SEG11	1.661	1.955
11	Udd	0.970	0.105	36	SEG12	1.510	1.955
12	AC	1.121	0.105	37	SEG13	1.360	1.955
13	T3	1.271	0.105	38	SEG14	1.210	1.955
14	EN	1.422	0.105	39	SEG15	1.059	1.955
15	Vss	1.572	0.105	40	SEG16	0.909	1.955
16	M	1.722	0.105	41	SEG17	0.758	1.955
17	S	1.873	0.105	42	SEG18	0.608	1.955
18	D	2.023	0.105	43	SEG19	0.458	1.955
19	T2	2.174	0.105	44	SEG20	0.307	1.955
20	Udd	2.467	0.378	45	SEG21	0.157	1.955
21	ALA	2 467	0.528	46	SEG22	0.105	1.746
22	ALB	2.467	0.678	47	SEG23	0.105	1.595
23	T1	2.467	0.829	48	COM0	0.105	1.445
24	SEG0	2.467	0.979	49	COM1	0.105	1.294
25	SEG1	2.467	1.130	50	COM2	0.105	1.144

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