

**IC WITH PROGRAMMABLE MODE OF LED CONTROL**

**Functional description**

IZ1517 – digital CMOS IC of light emitting diodes control with opportunity of selection of LED operating mode, single button start mode, automated turn-off function. It has embedded RC-oscillator with typical 100 kHz frequency, inside current-limiting resistors 75 Ohm. Recommended operating current on LED pins – 20mA. LEDs operate with duty j. Duration of turn-off delay – 8 seconds. Possibility of modification of mode, rate, duty and duration of operation during fabrication of layer «metal» is envisaged. Design features

**Functions**

- Operating mode – random or sequential
- Selection of on/off mode
- Duty ratio - 1 / 4
- Duration of switch-off delay – 8 seconds
- Control of five light emitting diodes

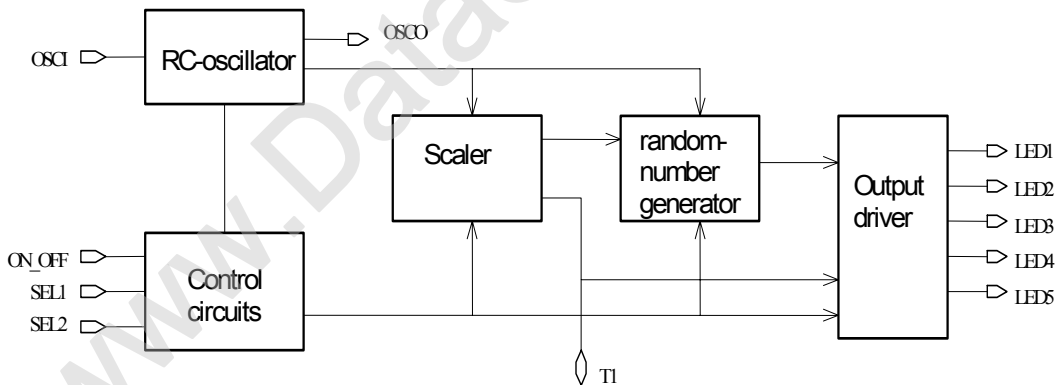
**Features**

- CMOS technology
- Low power consumption
- Operation from 3V power element
- Embedded RC-oscillator
- «Open drain» output

**Operating mode**

SEL1 not connected	SEL2 not connected	Operating mode Random, ON_OFF
VSS	not connected	Random, single start ON_OFF
not connected	VCC	sequential, ON_OFF
VSS	VCC	sequential, <b>single</b> start ON_OFF

**Block diagram**



IC is fabricated in unpacked version. Chip size is 1,6 x 0,95 mm. Contact pad size is 100 x 100 μm, their quantity – 13 pcs. Chip substrate is connected to VDD pin electrically.

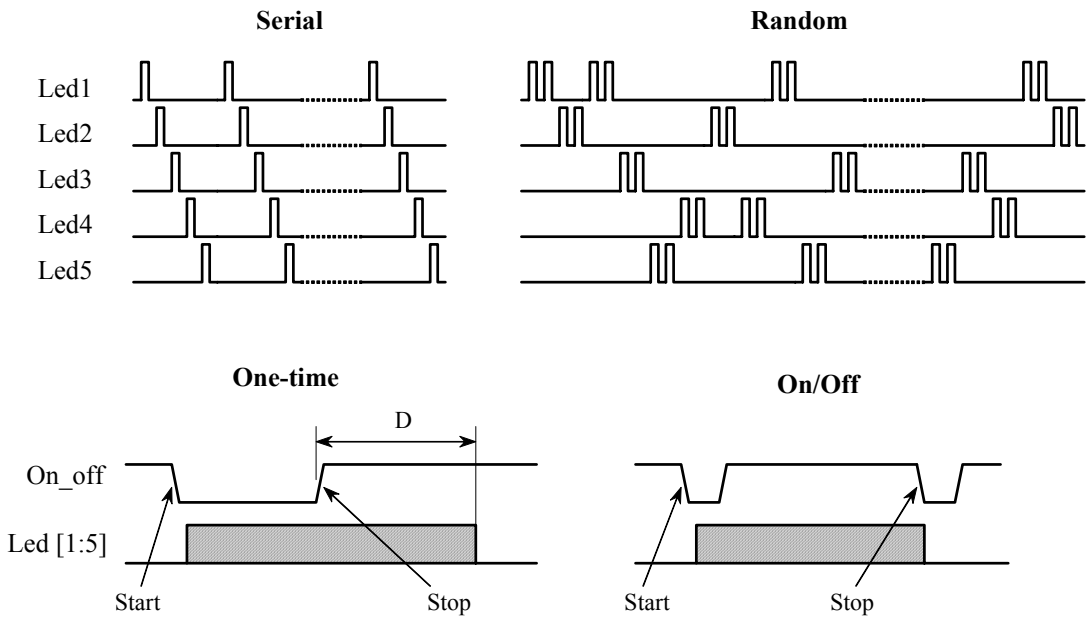


# IZ1517

**Pin purpose table**

Pad number	Name	Purpose	Pad number	Name	Purpose
1	VSS	Common pin	8	OSCO	RC-oscillator pin
2	Led5	LEDs pins	9	VCC	Power +3V
3	Led4		10	T1	Test pin
4	Led3		11	SEL2	Mode selection pins
5	Led2		12	SEL1	
6	Led1		13	ON_OFF	Control pin
7	OSCI	RC-oscillator pin			

**Diagram of operation in modes**



D – delay of switching off in one-time mode, 8 sec (nominally )

### Operating temperature range

Operating temperature range  $T_{opr} = -20^{\circ}\text{C} \dots +75^{\circ}\text{C}$ .

### Limiting and limiting tolerable modes

Parameter name, Unit of measurement	Designation	Norm			
		Limiting tolerable		Limiting	
		not less	not more	not less	not more
Supply voltage, V	V <sub>CC</sub>	2.0	3.6	— 0.3	5.0
Input voltage, V	V <sub>iL</sub>	0		— 0.2	V <sub>CC</sub> + 0.2
	V <sub>iH</sub>		V <sub>CC</sub>	— 0.2	V <sub>CC</sub> + 0.2

Having been affected by limiting mode, IC serviceability is not guaranteed. After cancellation of limiting mode, serviceability in limiting tolerable mode is guaranteed.

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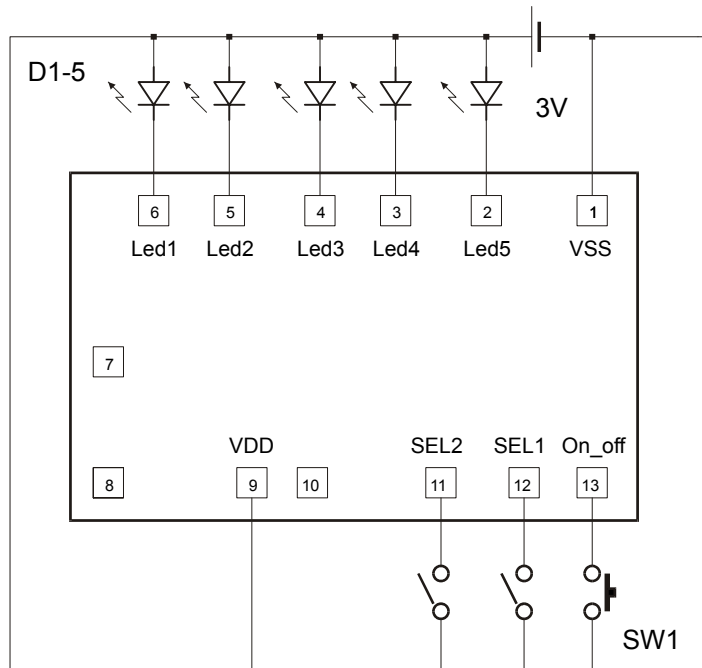
## Electrical parameters

Electrical parameters in operating temperature range  $-20^{\circ}\text{C} \dots +75^{\circ}\text{C}$  are given in table

Parameter name,  Unit of measurement	Designation	Measurement conditions	Norm		Note
			Not less	Not more	
Supply voltage, V	Vcc		2.0	3.6	$T=25^{\circ}\text{C}\pm 5^{\circ}\text{C}$
Static consumption current, $\mu\text{A}$	Icc1	without load, mode «No playing»		2.5	
Dynamic consumption current, $\mu\text{A}$	Icc2	without load, mode «Playing»		100	
Input current of control pins, $\mu\text{A}$	Iil	pins SEL1, ON_OFF $V_{in}=0.5\text{ V}$		18	
	Iih	pin SEL2 $V_{in}=2.5\text{ V}$		18	
RC-oscillator start voltage, V	Vosc			2	
Output current of LED pins, mA	Iol	$V_{oh}=0.5\text{ V}$	5		
Oscillation frequency, kHz	Fosc	$V_{cc}=3.0\text{ V}$	70	130	

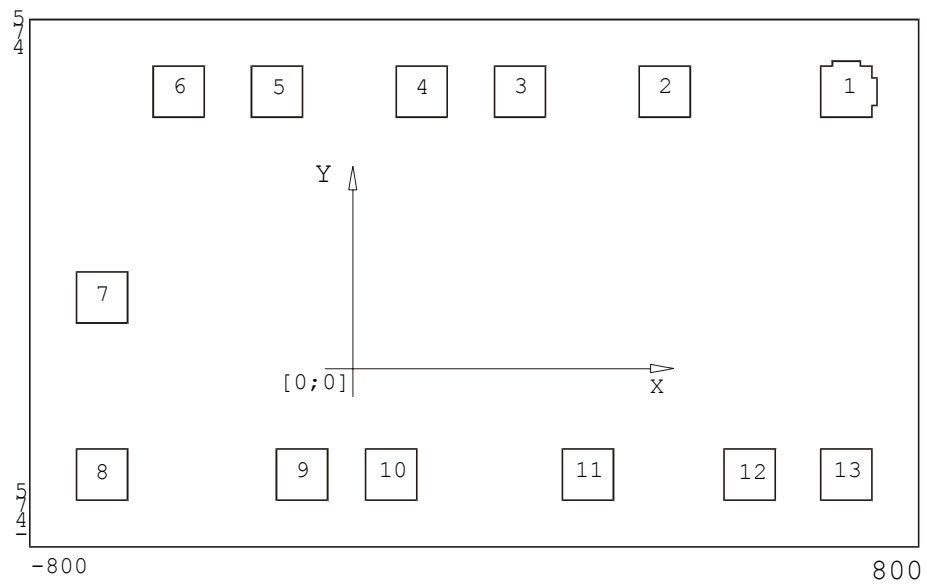
### Typical application diagram

By pressing SW1 button, IC operating mode is activated, inside RC-oscillator starts, LEDs begin flashing according to time diagram of operation.



**D1 – D5 – light emitting diodes with  $V_0 = 1.5 - 2.2\text{ V}$ ,  $I_{OPR} = 5 - 50\text{ mA}$ ,  
 load current for pins Led1 – Led5 – not more than 25 mA**

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**Figure 1 - Chip Diagram IZ1517**

### Coordinates of contact pads

No	Name	X( $\mu\text{m}$ )	Y( $\mu\text{m}$ )	No	Name	X( $\mu\text{m}$ )	Y( $\mu\text{m}$ )
1	VSS	674	349	8	OSCO	-666	-341
2	Led5	347	349	9	VCC	-306	-341
3	Led4	87	349	10	T1	-145	-341
4	Led3	-90	349	11	SEL2	209	-341
5	Led2	-351	349	12	SEL1	500	-341
6	Led1	-528	349	13	ON_OFF	674	-341
7	OSCI	-666	-22				

**Chip size:**  $1600 \pm 30 \times 950 \pm 30 \mu\text{m}$ .

**Chip thickness:**  $460 \pm 20 \mu\text{m}$