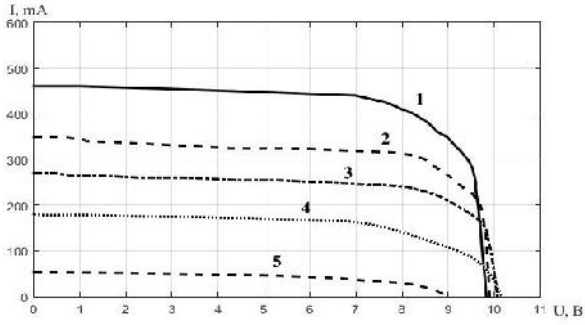


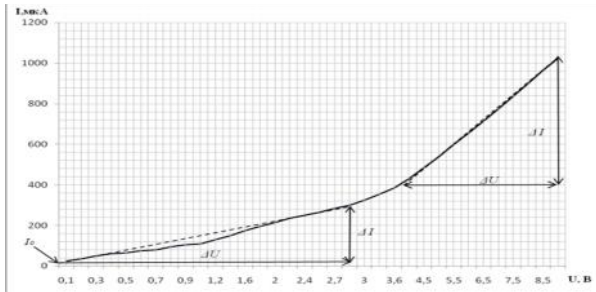


( ).  $R = 333$  .  
 $1000, 800, 600 / ^2,$   
 $- 35 \ 15 / ^2.$   
 $-07$   
 $-1000$  FYGT300-IR7S  
 $-150.$  .1

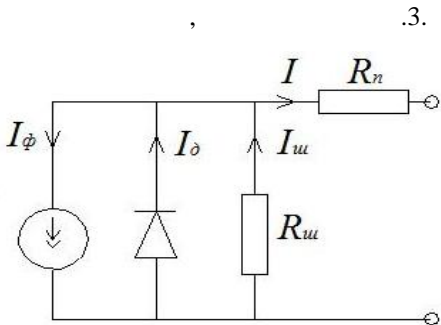


.1. - ALM-50M  
 : 1-1000 / ^2, 2-800 / ^2, 3-  
 600 / ^2, 4-35 / ^2, 5-15 / ^2  
 .2

p-n ALM-50M.

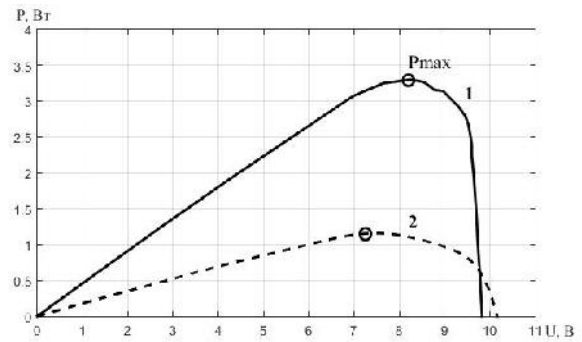


.2. ALM-50M



.3.

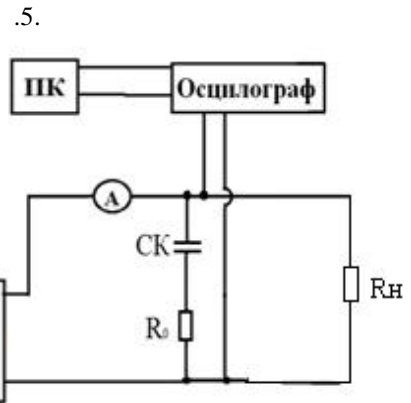
p-n  
 $R_p=0,8 - 20$  .  
 .4.  
 $U_{max}$   
 $= 7,3 - 8,25$  ;  $I_{max} = 0,158 - 0,4$  .  
 $FF = 0,63 - 0,73.$



.4.

: 1-1000 / ^2, 2-35 / ^2

12 .

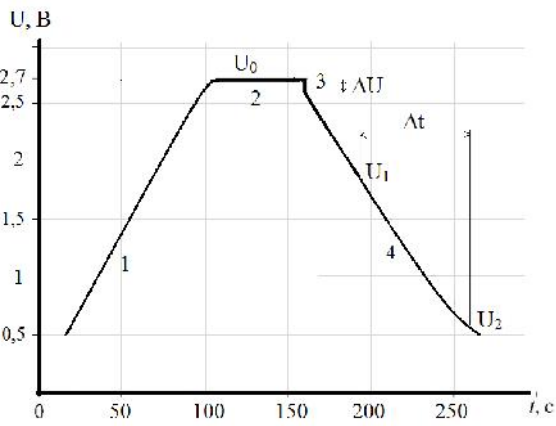


.5.

[7-10],

0,02. INSTRUSTAR ISDS205C. 500 .  $U_0$  2,3 2,7 135 155

cap[6]. Samvha Green-



$U_0 = 2,7$   
5 . 360  
5 .

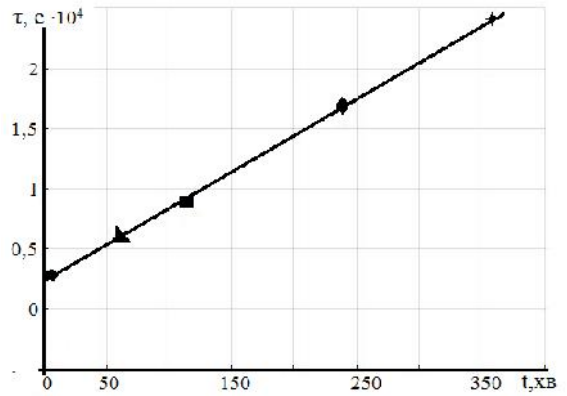
.6.

. 6

: 1 - ; 2 -  
; 3 - ; 4 -  
( 4)

$$C = -\Delta t \left( R \cdot \ln(U_2 / U_1) \right)^{-1}$$

t - ; R -  
;  $U_2/U_1$  -



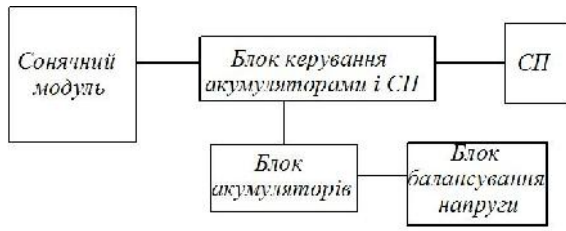
.7.

3  
0,5 m

Altek ALM-50M.

$\Delta U$   $\Delta I$  -  
.8.

R = 10<sup>-2</sup>

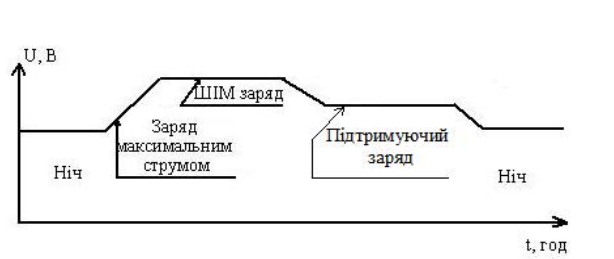


.8.

50M, ALM-

( ), ( ).

22, PWM SDN-40W -

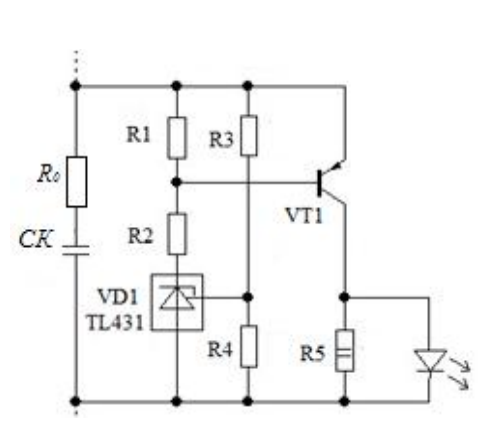


.9. SDN-40W

SDN-40W -

SDN-40W

.10. TL431 BC327.



.10.



.11.

05 -25-1-325.

.11.

ALM-50M  
Green-cap.

p-n

PWM SL-

02A-20A

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Green-cap.

SDN-40W

ALM-50M

05

p-n-

## SELF-CONTAINED POWER SUPPLY SYSTEM OF OUTDOOR LIGHTING

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*Outdoor lighting installation with 05 lighting devices and self-contained power supply consisting of ALM-50M solar cell panel and Green-cap supercapacitor battery were considered. Measuring techniques of solar cell lights and dark current-voltage characteristics were described and parameters for maximum consumer power, output factor of current-voltage characteristics, reverse saturation current of solar cell p-n junction, internal resistance and battery capacity of supercapacitors were determined. Experimental research on supercapacitor self-discharge processes and impact on its duration in constant electric field was conducted. The self-discharge process is caused by charge redistribution between the inner layers of a supercapacitor.*

*Supercapacitor charge/discharge automatic control system and self-adjustment of lighting installation based on SDN-40W controller with pulse-width modulation was proposed. To sustain natural electric parameters followed by multiple charge/discharge cycles and to avoid supercapacitor overcharge a voltage balancing system within every single battery element was employed.*

*05 -25-1-325 LED device was selected for outdoor lighting, which is used for illumination of roads, highways, areas of different types and can be operated at -40 to +40° temperature extremes.*

**Keywords:** *solar cells, ultracapacitors, supercapacitor, lighting installation, the controller charge / discharge, self-discharge supercapacitors.*