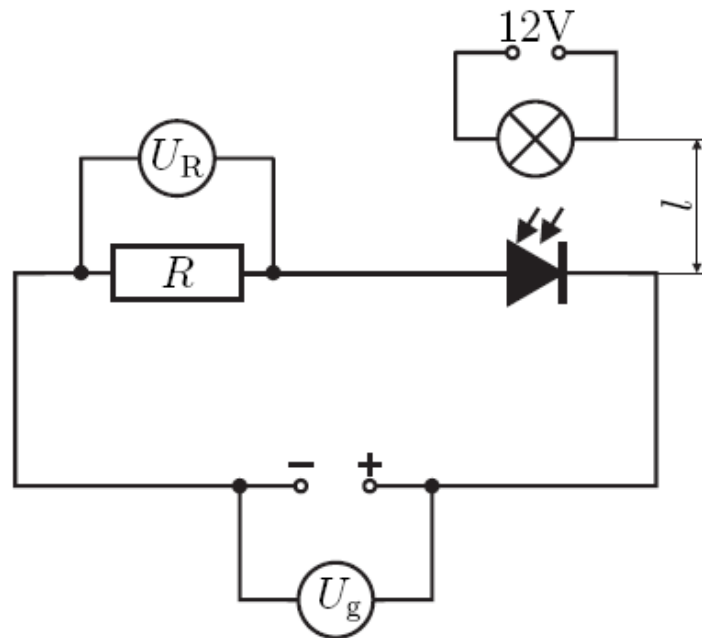


Vaja 8: Karakteristika fotodiode

Skica poskusa:



Uporabljene enačbe:

$$I_d = I_R = \frac{U_R}{R}$$

$$U_d = U_g - U_R$$

$$j = \frac{P_z}{4\pi l^2}$$

$$P_z = P_{ež} \eta = \frac{U_z^2}{R_z} \eta$$

Rešitev naloge:

$$R = 1000\Omega$$

$$U_z = 12V$$

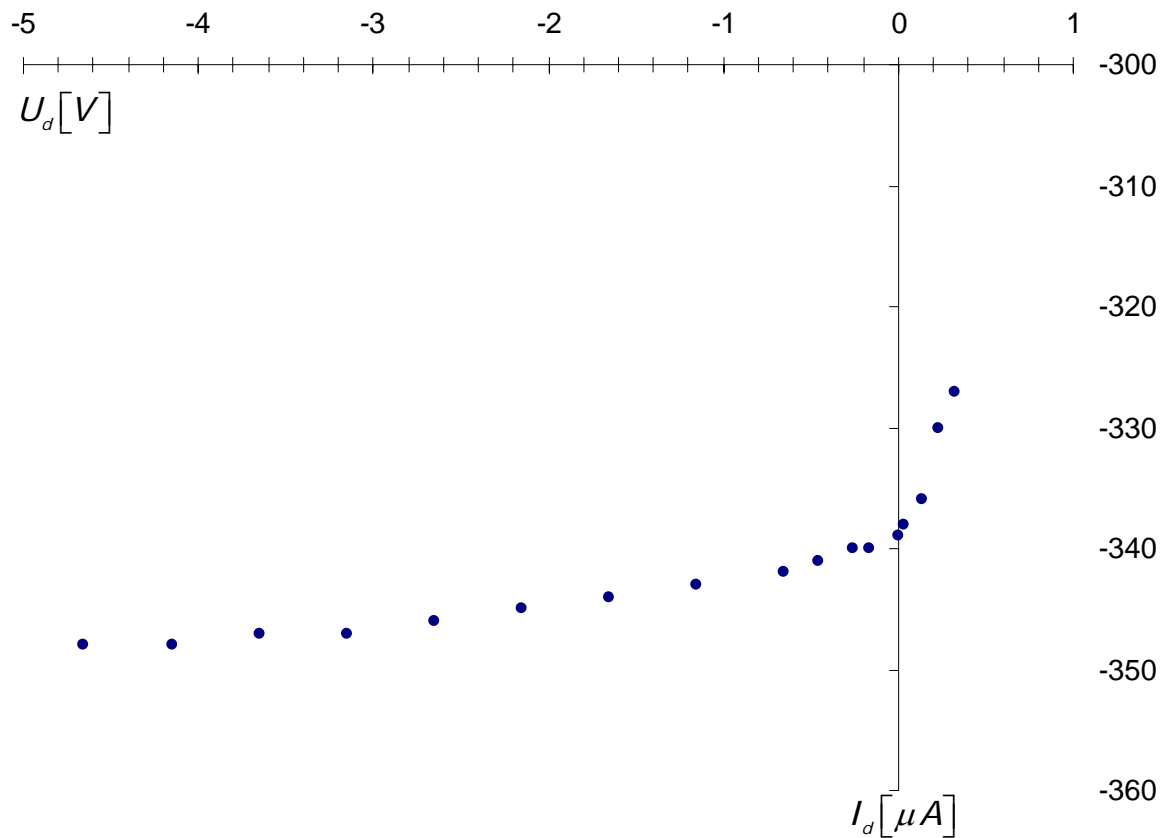
$$R_z = 30\Omega$$

$$\eta = 0,05$$

1.

$$I_d = I_R = \frac{U_R}{R}, \quad U_d = U_g - U_R$$

$U_g[V]$	$U_R[mV]$	$I_d[\mu A]$	$U_d[V]$
0,0	-327	-327	0,327
-0,1	-330	-330	0,230
-0,2	-336	-336	0,136
-0,3	-338	-338	0,038
-0,4	-339	-339	-0,001
-0,5	-340	-340	-0,160
-0,6	-340	-340	-0,260
-0,8	-341	-341	-0,459
-1,0	-342	-342	-0,658
-1,5	-343	-343	-1,157
-2,0	-344	-344	-1,656
-2,5	-345	-345	-2,155
-3,0	-346	-346	-2,654
-3,5	-347	-347	-3,153
-4,0	-347	-347	-3,653
-4,5	-348	-348	-4,152
-5,0	-348	-348	-4,652



Graf $I_d(U_d)$

2.

$$R = 1000\Omega$$

$$U_z = 12V$$

$$R_z = 30\Omega$$

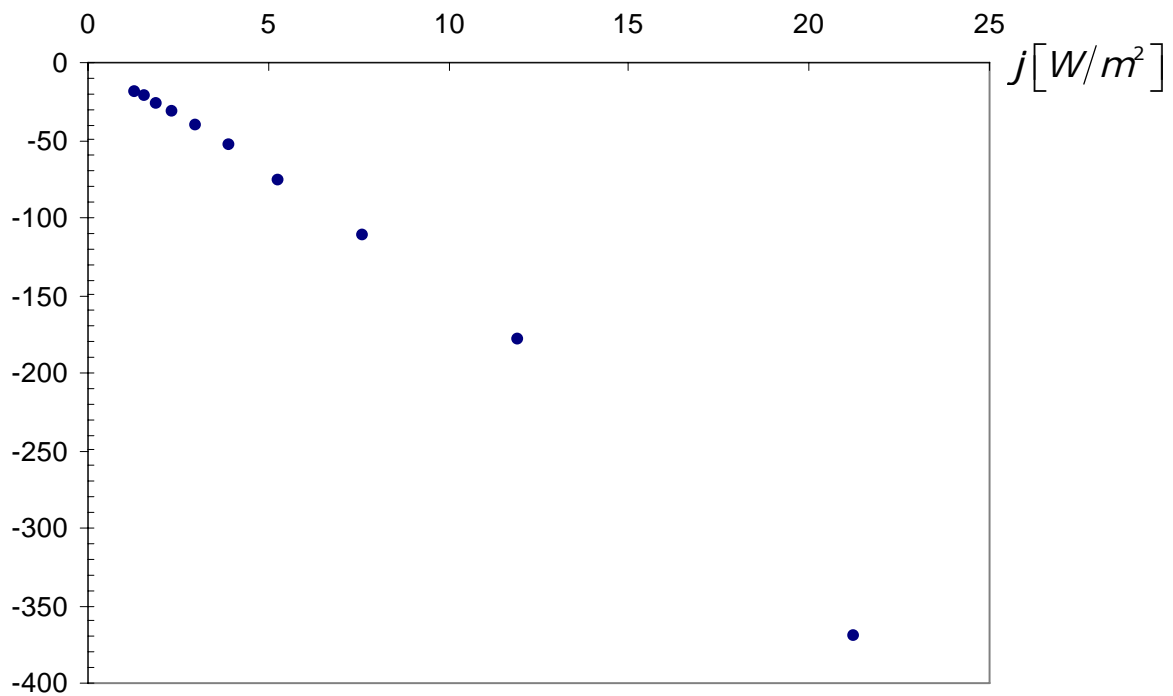
$$\eta = 0,05$$

$$I_{dn} = \frac{U_R}{R}$$

$$j = \frac{P_z}{4\pi I^2}$$

$$P_z = P_{e^z} \eta = \frac{U_z^2}{R_z} \eta = \frac{(12V)^2}{30\Omega} 0,05 = \underline{\underline{0,24W}}$$

l [cm]	U_R [mV]	I_{dn} [μA]	j [W/m^2]
3,0	-370	-370	21,221
4,0	-179	-179	11,937
5,0	-111	-111	7,639
6,0	-76	-76	5,305
7,0	-53	-53	3,898
8,0	-40	-40	2,984
9,0	-32	-32	2,358
10	-26	-26	1,910
11	-22	-22	1,578
12	-19	-19	1,326



I_{dn} [μA]

3.

$$R = 1000\Omega$$

$$U_R = -3mV$$

$$\delta I_{dn} = \frac{U_R}{R} = \frac{-3mV}{1000\Omega} = \underline{\underline{-3\mu A}}$$