

UM-SJTU PHYSICS LABORATORY VP241
DATA SHEET (EXERCISE 3)

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NOTICE. Please remember to show the data sheet to your instructor before leaving the laboratory. The data sheet will not be accepted if the data are recorded with pencil or modified by correction fluid/tape. If a mistake is made in recording a datum item, cancel the wrong value by drawing a fine line through it, record the correct value legibly, and ask your instructor to confirm the correction. Please remember to take a record of the precision of the instruments used. You are required to hand in the original data with your lab report, so please keep the data sheet properly.

QUANTITY	PRECISION
DC voltage	$\pm(0.5\%+0.01)$ [V]
DC current	$\pm(1.5\%+0.1)$ [mA]
distance	± 0.1 [cm]
solar power	± 10 [W/m ²]

Table 1. Multimeter precision.

length [cm]	width [cm]
26.1	20.9

Table 2. Measurement data for area.

	1	2	3	4	5	6
$P_{80.6}$ [W/m ²]	265	273	255	264 263	285	287
$P_{101.5}$ [W/m ²]	234	220	162	172	184	190

Table 3. Measurement data for solar power.

	single device at 80.6 cm	single device at 101.5 cm	series	parallel
U_{oc} [V]	8.46	7.59	17.51	8.72
I_{sc} [mA]	67.6	47.0	59.2	121.2

Table 4. Measurement data for U_{oc} and I_{sc} .

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	series		parallel			
	U [V]	I [mA]	U [V]	I [mA]		
1	0.68	58.3	0.83	120.6		
2	3.90	53.5	3.51	105.0	2.04	114.5
3	6.48	49.7	5.33	87.1	3.16	107.7
4	7.76	47.9	6.26	75.5	3.92	101.2
5	7.97	47.6	4.22	98.4		
6	8.37	46.8	4.55	95.5		
7	8.64	46.3	4.99	91.1		
8	8.80	46.1	5.14	89.1		
9	9.04	45.4	5.33	87.1		
10	9.20	45.0	5.51	85.1		
11	9.33	44.7	5.69	82.9		
12	9.48	44.2	5.85	80.8		
13	9.57	44.1	5.99	78.9		
14	9.75	43.8	6.07	77.9		
15	9.83	43.6	6.17	76.2		
16	9.99	43.0	6.32	73.8		
17	10.10	42.8	6.5 6.52	71.0		
18	10.18	42.7	6.75	67.1		
19	10.30	42.3	6.96	62.4		
20	10.52	41.8	7.31	54.2		
21	10.94	40.6	7.56	47.5		
22	11.32	39.6	7.78	40.7		
23	12.44	36.5	7.98	33.7		
24	14.16	29.3	8.36	17.4		
25	16.03	16.3	8.52	9.2		

Table 5. Measurement data for the U vs. I relation (series/parallel configuration).

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	80.6 cm		101.5 cm	
	U [V]	I [mA]	U [V]	I [mA]
1	0.46	67.0	0.32	46.8
2	1.01	65.8	1.36	43.5
3	1.49	64.3	2.15	41.0
4	2.20	60.7	2.66	39.3
5	2.95	57.6	3.04	37.8
6	3.49	54.9	3.47	35.7
7	3.98	52.1	3.84	33.8
8	4.52	48.4	4.16	31.9
9	4.94	45.4	4.21	31.7
10	5.12	44.1	4.35	30.9
11	5.20	43.4	4.47	30.3
12	5.34	42.4	4.59	29.5
13	5.44	41.6	4.71	28.7
14	5.58	40.5	4.81	28.0
15	5.71	39.5	4.91	27.5
16	5.89	38.1	5.05	26.5
17	6.01	37.2	5.21	25.6
18	6.14	36.2	5.34	24.8
19	6.34	34.5	5.57	23.2
20	6.54	32.4	5.78	21.6
21	6.85	28.8	5.96	20.1
22	7.18	24.3	6.20	18.0
23	7.53	18.5	6.43	15.6
24	7.80	13.5	6.81	11.3
25	8.15	7.2	7.10	6.1

Table 6. Measurement data for the U vs. I relation (80.6cm/101.5cm configuration).

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