Wrocław University of Science and Technology

ELECTRIONIC MEASUREMENTS
LABORATORY REPORT

Chair of Electronic and Photonic Metrology
ELECTRIONIC MEASUREMENTS LABORATORY

Theme of class: MEASUREMET OF VOLTAGE AND CURRENT SOURCE PARAMETERS

Group no: 1

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Contents

1 Introduction

1.1 Theory

1.2 Equipment

The following devices were used during the laboratory:

- power supply: DF1730SB3A;
- decade resistor: DR5b-16;
- digital meter: Agilent 34401A and UT803;
- oscilloscope;
- standard resistor.

2 Experiment

2.1 Measurement of voltage source parameters

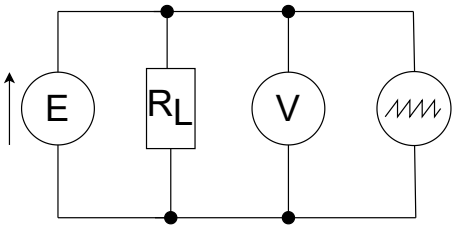


Figure 1

$V_o = 5.316\,15\,\mathrm{V}$

$R_L[\Omega]$	V[V]	$\frac{V}{V_o}$	V_{p-p}[mV]	I[mA]
10000	5.31131	0.99909	19.6	0.53113
9000	5.31236	0.99929	18	0.59026
8000	5.31491	0.99977	18.4	0.66436
7000	5.315501	0.99988	19.2	0.75936
6000	5.31475	0.99974	18.8	0.88579
5000	5.3145	0.99969	18	1.06290
4000	5.31252	0.99932	16.4	1.32813
3000	5.31252	0.99932	20.4	1.77084
2000	5.30828	0.99852	18.8	2.65414
1000	5.31172	0.99917	18	5.31172
900	5.31169	0.99916	19.6	5.90188
800	5.31252	0.99932	17.2	6.64065
700	5.31295	0.99940	19.6	7.58993
600	5.31366	0.99953	15.2	8.85610
500	5.31247	0.99931	17.6	10.62494
400	5.14929	0.96861	50.4	12.87323
300	4.92745	0.92688	100	16.42483

Table 1

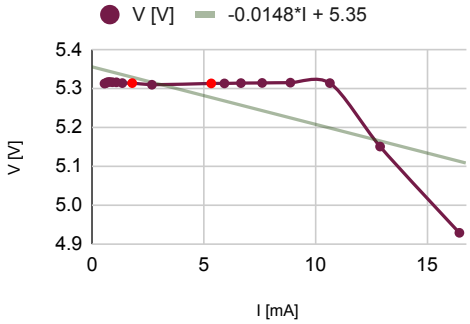


Figure 2

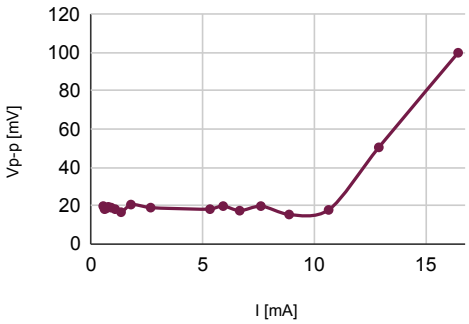


Figure 3

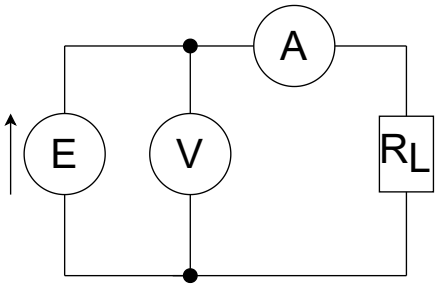


Figure 4

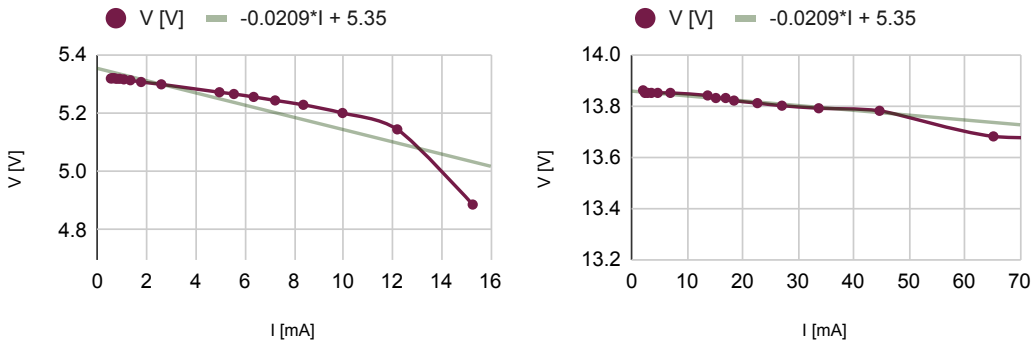
$R_L[\Omega]$	V[V]	$\frac{V}{V_o}$	I[mA]
10000	5.318	0.99906	0.53137
9000	5.319	0.99925	0.59025
8000	5.319	0.99925	0.66377
7000	5.317	0.99887	0.75821
6000	5.317	0.99887	0.88412
5000	5.315	0.99850	1.06036
4000	5.312	0.99793	1.3242
3000	5.306	0.99681	1.76291
2000	5.298	0.99530	2.58513
1000	5.271	0.99023	4.95231
900	5.265	0.98910	5.53997
800	5.255	0.98723	6.34545
700	5.243	0.98497	7.21971
600	5.228	0.98215	8.36787
500	5.200	0.97689	9.96317
400	5.144	0.96637	12.1929
300	4.887	0.91809	15.2643

(a) 1st voltage source: $V_o = 5.323\,\mathrm{V}$

$R_L[\Omega]$	V[V]	$\frac{V}{V_o}$	I[mA]
10000	13.86	0.99856	1.38284
9000	13.86	0.99856	1.51444
8000	13.86	0.99856	1.70754
7000	13.86	0.99856	1.95128
6000	13.85	0.99784	2.28445
5000	13.85	0.99784	2.76018
4000	13.85	0.99784	3.44949
3000	13.85	0.99784	4.59595
2000	13.85	0.99784	6.87844
1000	13.84	0.99712	13.6041
900	13.83	0.99640	15.0913
800	13.83	0.99640	16.8573
700	13.82	0.99568	18.3644
600	13.81	0.99496	22.5856
500	13.8	0.99424	27.0082
400	13.79	0.99352	33.6526
300	13.78	0.99280	44.6311
200	13.68	0.98559	65.1863
100	13.66	0.98415	132.8120
50	13.37	0.96326	251.9140

(b) 2nd voltage source: $V_o = 13.88\,\mathrm{V}$

Table 2



(a) 1st voltage source

(b) 2nd voltage source

Figure 5

2.2 Measurement of current source parameters

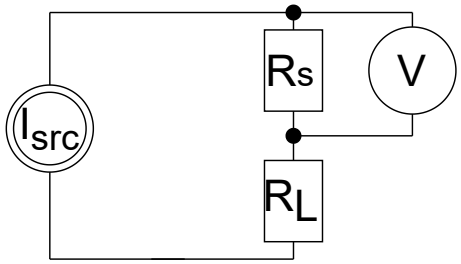


Figure 6

$R_s = 10\,\Omega$

$R_L[\Omega]$	V_v[mV]	$\frac{V_v}{V_o}$	I[mA]	V[V]
0	19.3363	1.00000	1.93363	0.0193363
10	19.4437	1.00555	1.94437	0.0388874
20	19.4527	1.00602	1.94527	0.0583581
30	19.4569	1.00624	1.94569	0.0778276
40	19.4585	1.00632	1.94585	0.0972925
50	19.4607	1.00643	1.94607	0.1167642
60	19.4627	1.00654	1.94627	0.1362389
70	19.4633	1.00657	1.94633	0.1557064
80	19.4639	1.00660	1.94639	0.1751751
90	19.464	1.00660	1.9464	0.19464
100	19.4647	1.00664	1.94647	0.2141117
200	19.4199	1.00432	1.94199	0.4078179
500	19.4347	1.00509	1.94347	0.9911697
1000	19.4332	1.00501	1.94332	1.9627532
2000	19.4207	1.00436	1.94207	3.9035607
5000	19.3332	0.99984	1.93332	9.6859332
6000	16.8815	0.87305	1.68815	10.1457815

Table 3

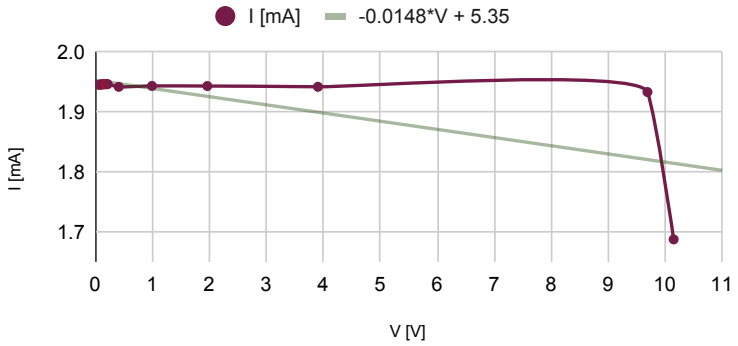


Figure 7

3 Conclusion