



BAŞKENT UNIVERSITY
ELECTRIC & ELECTRONICS ENGINEERING

EEM 214 ~ ELECTRONICS–I
LABORATORY
REPORT

Experiment Name : Bipolar Junction Transistor
--

Experiment Number : 7

Student Name : XXXXXXXXXX
--

Student Number XXXXXXXXXX
--

Experiment Date/Day: 28 / 4 / 2006

Laboratory Number:

Honor Pledge:

I did this preliminary work or lab report by myself and I have neither cheat from anybody nor let anybody cheat from me at the any part of this work.

Student Signature:

.....

1-) We set the $I_B = 0 \mu A$

$$I_C = 0,01 \text{ mV} / 1 \text{ K} = 0,01 \mu A$$

$$V_{CE} = 15,13 \text{ V}$$

2-)

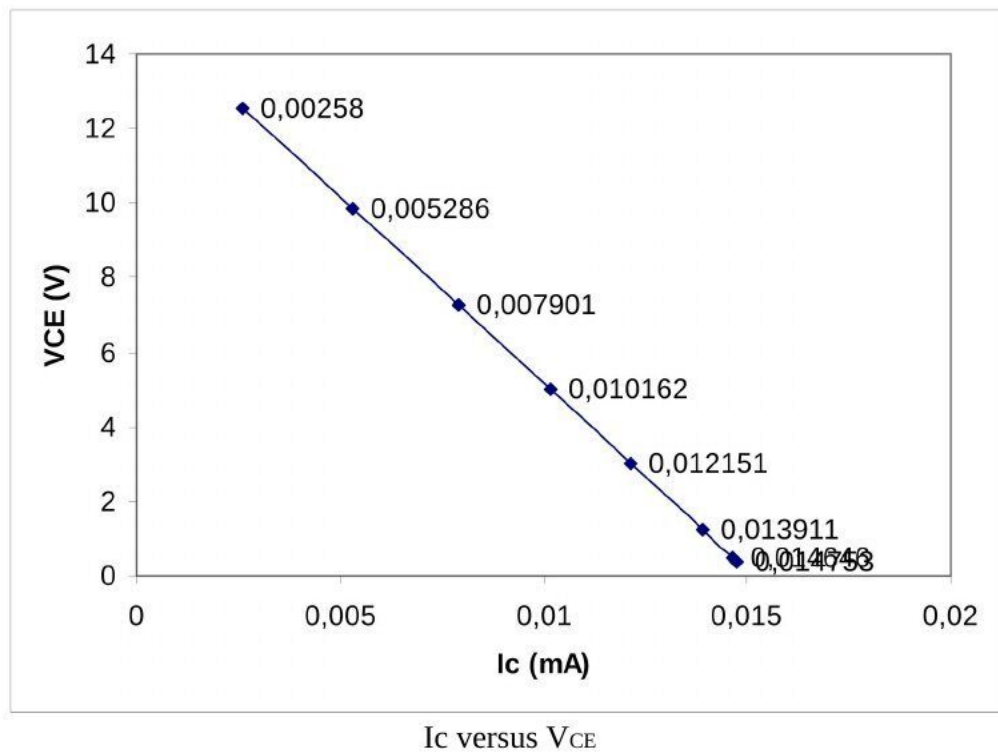
I_B	I_B	I_C	V_{CE}	β (Calculated)
5 μ	5,05 μA	2,58 mA	12,565 V	510
10 μ	10,005 μA	5,286 mA	9,870 V	528
15 μ	15,09 μA	7,901 mA	7,247 V	523
20 μ	19,96 μA	10,162 mA	4,997 V	509
25 μ	24,94 μA	12,151 mA	3,003 V	487
30 μ	30,18 μA	13,911 mA	1,240 V	460
35 μ	35,11 μA	14,646 mA	0,493 V	417
40 μ	40,01 μA	14,753 mA	0,387 V	368

$$I_C = \beta \times I_B, \beta = I_C / I_B$$

$$\beta_{\text{average}} = 3082 / 8 = 475$$

$$\beta_{\text{measured}} = 510$$

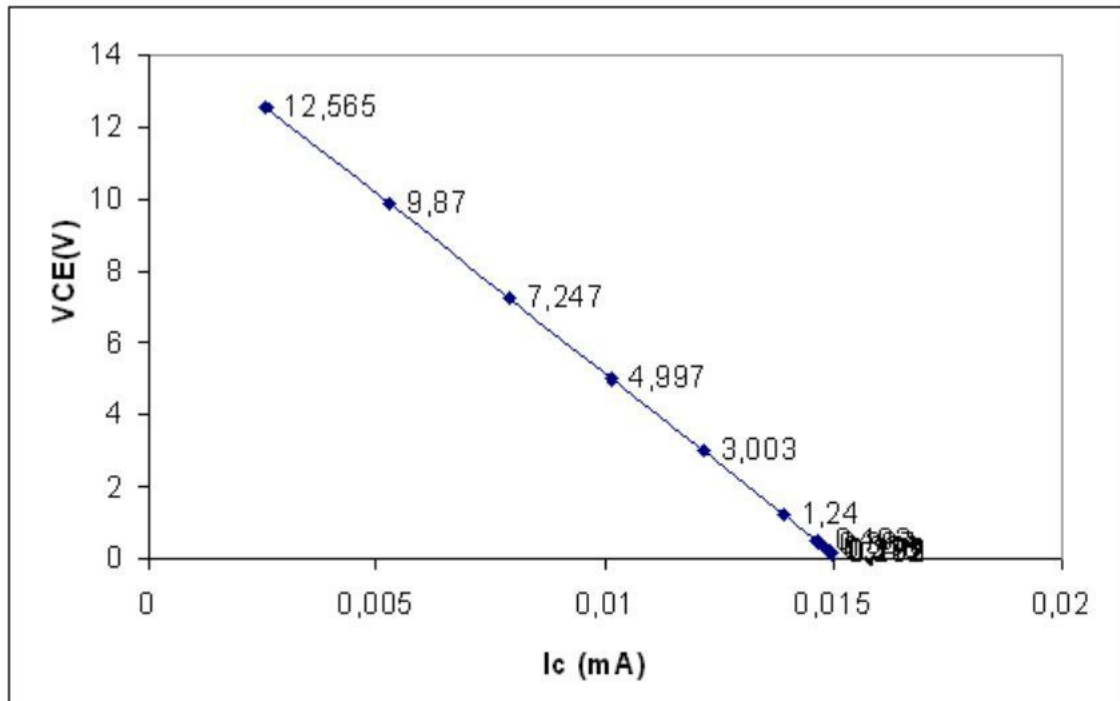
3-)



4-)

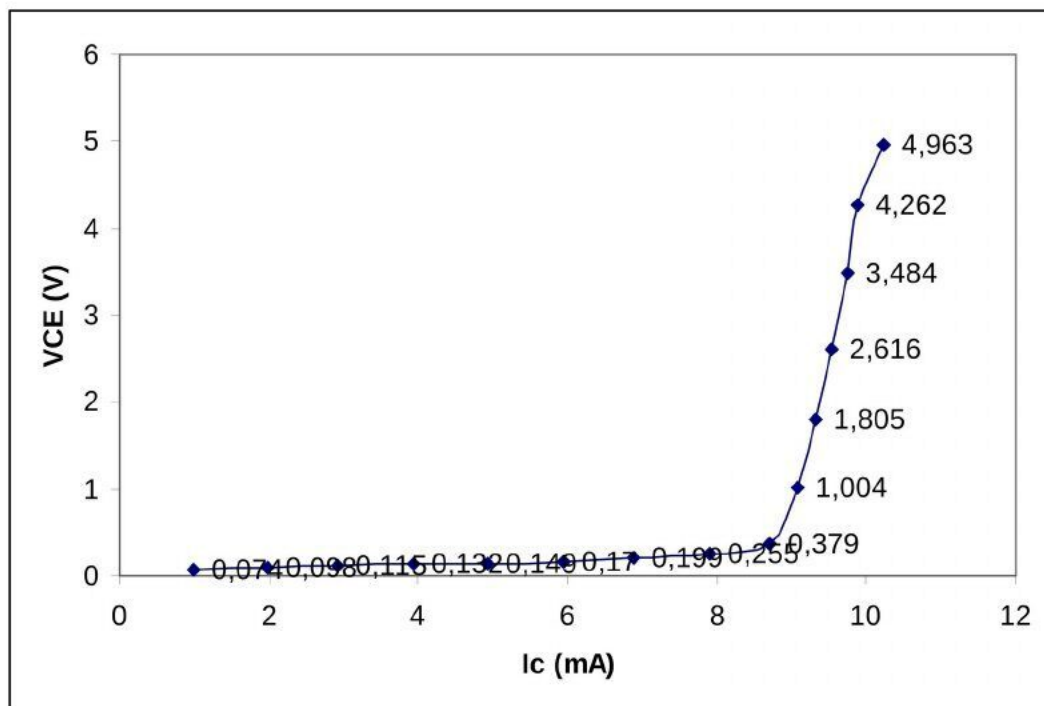
I_B	I_C	V_{CE}	β (Calculated)
50 μ	14,86 mA	0,278 V	297
60 μ	14,919 mA	0,227 V	248
70 μ	14,945 mA	0,202 V	213
80 μ	14,961 mA	0,182 V	187
90 μ	14,972 mA	0,175 V	166
100 μ	14,980 mA	0,167 V	149

5-)



6-)

V_{CC}	I_C (mA)	V_{CE} (V)
15V	10,230	4,963
14 V	9,890	4,262
13 V	9,750	3,484
12 V	9,533	2,616
11 V	9,313	1,805
10 V	9,093	1,004
9 V	8,717	0,379
8 V	7,893	0,255
7 V	6,894	0,199
6 V	5,939	0,170
5 V	4,918	0,149
4 V	3,943	0,132
3 V	2,927	0,115
2 V	1,988	0,098
1 V	0,992	0,074



7-)

8-)

I_B	I_B (μA)	I_C (mA)	V_{CE} (V)	β (Calculated)
5 μ	5,72	2,82	8,858	493
10 μ	9,91	4,77	4,534	481
15 μ	15,68	6,72	0,280	428
20 μ	20,20	6,77	0,188	335
25 μ	24,58	6,78	0,165	275
30 μ	30,64	6,78	0,149	221
35 μ	35,34	6,79	0,140	192
40 μ	40,18	6,79	0,134	168
50 μ	50,59	6,79	0,124	134
60 μ	59,74	6,80	0,117	113
70 μ	70,26	6,80	0,111	96
80 μ	80,43	6,80	0,106	84