

White

PERFORMANCE

MODEL: QD-075-P  
SERIAL NO.: 409018  
JOB NO.: ~~3877~~ 7057

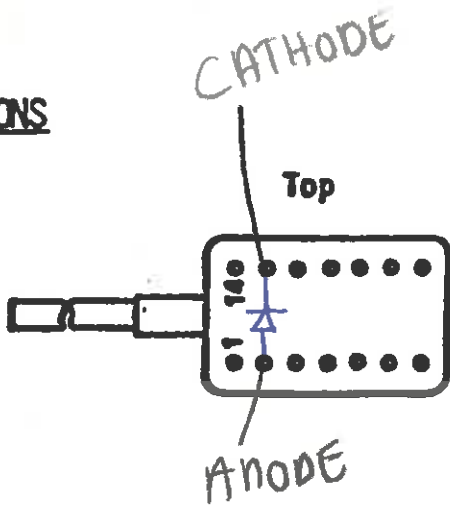
DATE: 2-20-85  
ENGR.: *Rm*

DETECTOR CHARACTERISTICS

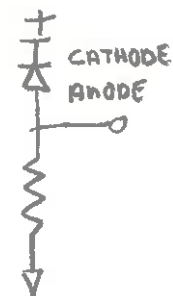
RESPONSIVITY: 175 A/W @ 1.3  $\mu$ m, -5V bias.

Temperature (°C)	Voltage (V)	Dark Current (nA)	Capacitance (pF)	Rise Time (ns)	Fall Time (ns)
20	-5	2	.42	< 1	< 1
20	-10	5	.32	< 1	< 1
20	-15	10	.27	< 1	< 1

PIN CONNECTIONS



- Pin 13 Cathode
- 3 Case Ground
- 2 Anode
- All others not connected



FIBER PIGTAIL

Model No.: 0000105-005004  
Manufacture: STECOR  
Core/Cladding: 50/125  
NA: .2

Documentation certified by *PDA*

Date 02-20-85

LASERTRON 9/08/83

black

PERFORMANCE

II

MODEL: AD-E-075-P  
SERIAL NO.: P501211  
JOB NO.: 7063

DATE: 3-20-85  
ENGR.: (Signature)

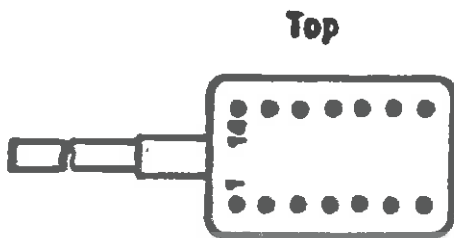
Second working one

DETECTOR CHARACTERISTICS

RESPONSIVITY: .76 A/W @ 1.3  $\mu$ m, -5V bias.

Temperature (°C)	Voltage (V)	Dark Current (nA)	Capacitance (pF)	Rise Time (ns)	Fall Time (ns)
20	-5	2	.40	< 1	< 1
20	-10	8		< 1	< 1
20	-15	14		< 1	< 1

PIN CONNECTIONS



- Pin  
 18 Cathode  
 3 Case Ground  
 2 Anode  
 All others not connected

FIBER PIGTAIL

Model No.: 0000105-005004  
Manufacture: SIECOR  
Core/Cladding: 50/125  
NA: .2

Documentation certified by (Signature) Date APR 18 1985

LASERTRON 9/08/83



# Lasertron

37 North Avenue  
 Burlington, MA 01803  
 Telephone: (617) 272-6462  
 TWX 710 332 8906 LASERTRON BURL

INVOICE NO. 7037 **5349**

INVOICE DATE \_\_\_\_\_

ORDER DATE 2/16/85

INVOICE TO: WORCESTER POLYTECHNIC INSTITUTE  
 Dr. Fred Luft  
 C/O Dept. Elec. Engineering  
 1000 Institute Road  
 Worcester, MA 01609

SHIP TO: SAHE

Lasertron Reference Number <u>7037</u>	Customer P.O. Number	Ship Date <u>2/16/85</u>	Ship Via <u>UPS</u>
Taxable <input type="checkbox"/> Yes <input type="checkbox"/> No	Terms <input checked="" type="checkbox"/> Net 30 <input type="checkbox"/>	F.O.B. <input checked="" type="checkbox"/> Burlington <input type="checkbox"/>	Shipment <input type="checkbox"/> Partial <input checked="" type="checkbox"/> Complete

Item	Product Description		Quantity Ordered	Quantity Shipped	Previous Shipped	Balance Due	Unit Price	Amount
	Model	Part Number						
1	QDE-075 Pin Detector	QDE-075-P  Serial Number: 4090119  <i>blown kaboom knut krrpow</i>  For evaluation only.		1	0	0	N/C	N/C

Lasertron's acceptance of your order is expressly conditioned on your agreement to the provisions on the face and reverse side of this form, which shall constitute the exclusive contract between us covering your order. Specific provisions disclaiming certain warranties appear on the reverse side of this form and govern this contract.

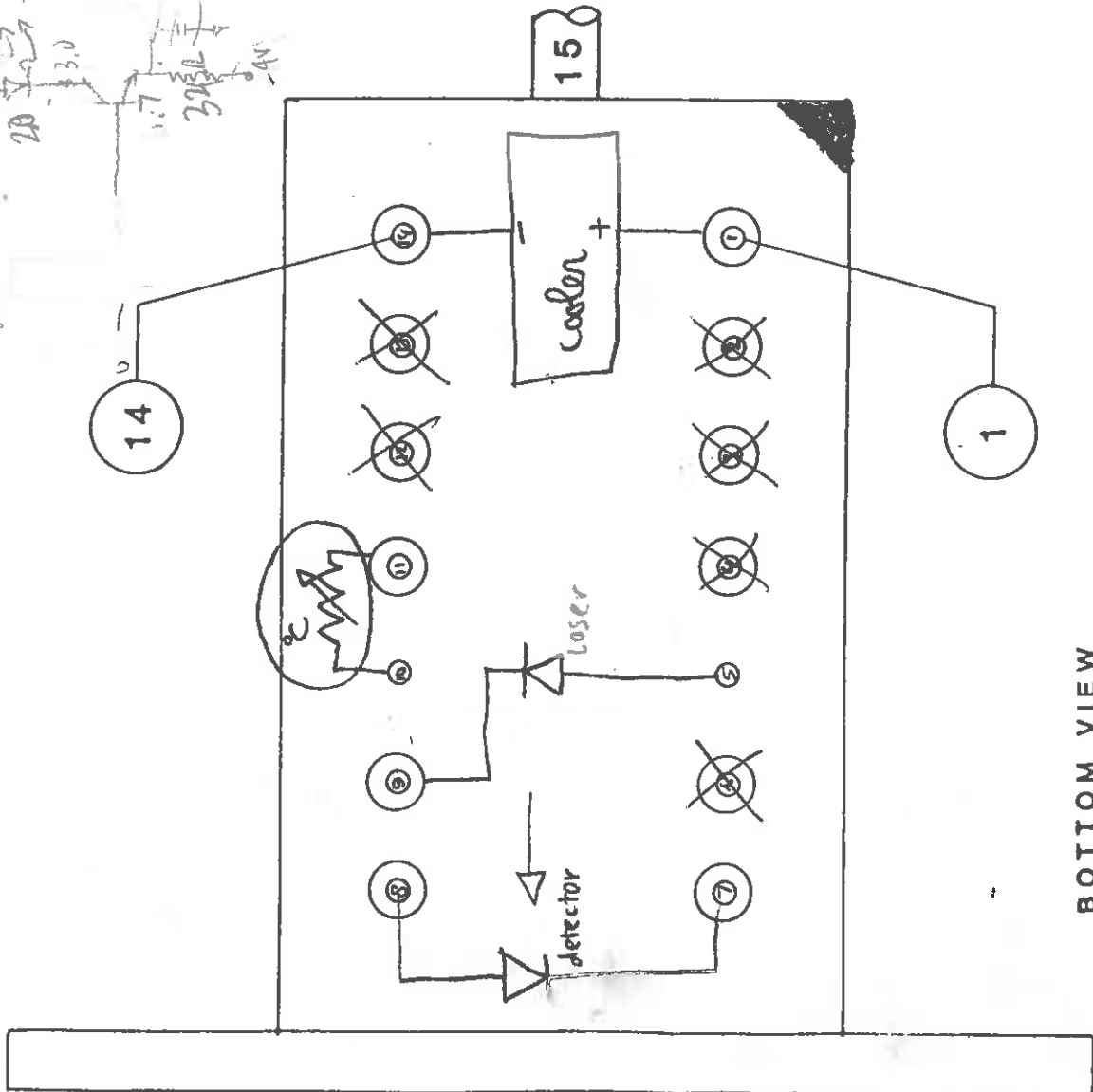
MADE IN USA. These commodities are licensed by the United States for ultimate destination \_\_\_\_\_

Diversion contrary to U.S. laws prohibited.

All claims for loss or damage in transit must be made against the carrier. Prices are F.O.B. Burlington unless otherwise specified.

Sub Total	N/C
Sales Tax	
Freight	N/C
<b>TOTAL</b>	N/C

**PACKING**



BOTTOM VIEW

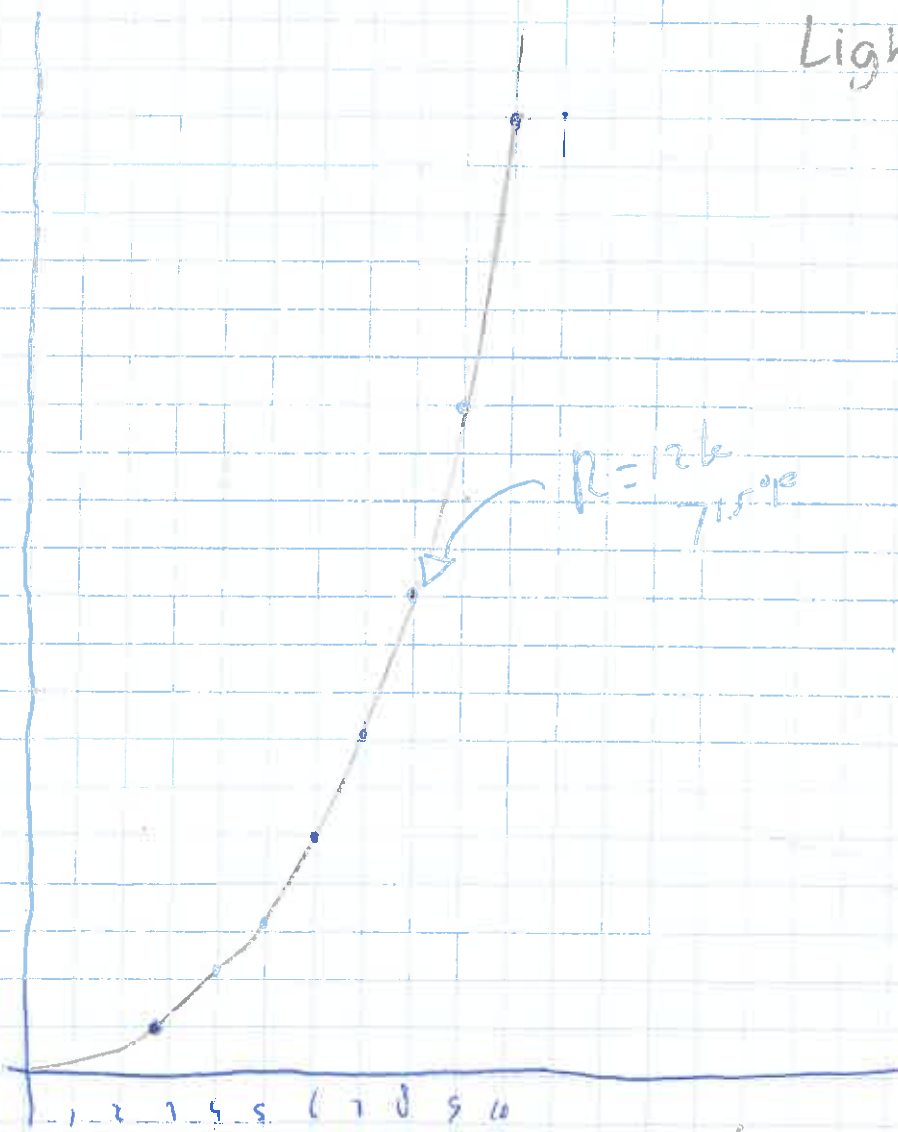
1. COOLER ANODE (+)
2. NOT USED
3. NOT USED
4. NOT USED
5. LASER ANODE (+), CASE GROUND
6. NOT USED
7. DETECTOR CATHODE (-)
8. DETECTOR ANODE (+)
9. LASER CATHODE (-)
10. CASE GROUND, THERMISTOR
11. THERMISTOR
12. NOT USED
13. NOT USED
14. COOLER CATHODE (-)
15. FIBER PIGTAIL

PACKAGE PIN-OUT  
 MLD PART NO.



M/A-COM LASER DIODE, INC.  
 1130 SOMERSET STREET  
 NEW BRUNSWICK, NJ 08901  
 (201) 249-7000  
 TWX 710-998-0597

$V_{out}$   
 2  
 1.9  
 1.8  
 1.7  
 1.6  
 1.5  
 1.4  
 1.3  
 1.2  
 1.1  
 1  
 9  
 8  
 7  
 6  
 5  
 4  
 3  
 2  
 1  
 0

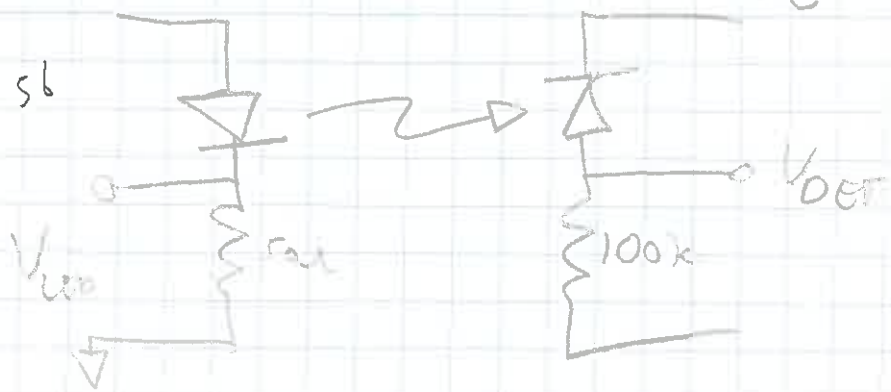


Light out vs current  
 In  
 SLD

$R = 12k$   
 $71.5\%$

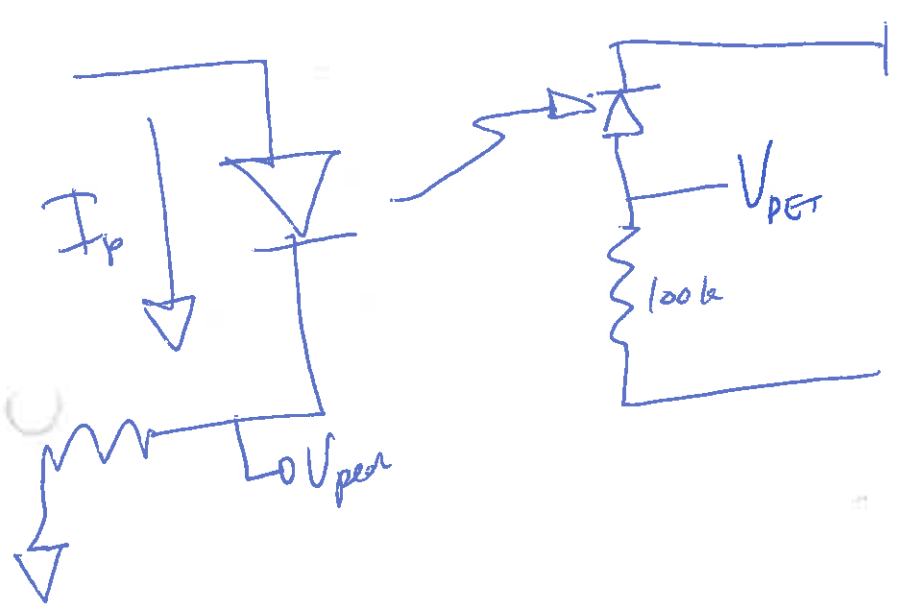
1 2 3 4 5 6 7 8 9 10  
 20 40 60 80 100 120 140 160 180 200

$V_{LED}$



See where

$I_{peak}$ mA	$V_{det}$
2.8	.1
4	.22
5	.32
6	<del>0.4</del> .5
7	.72
8	1
9	1.4
10	2



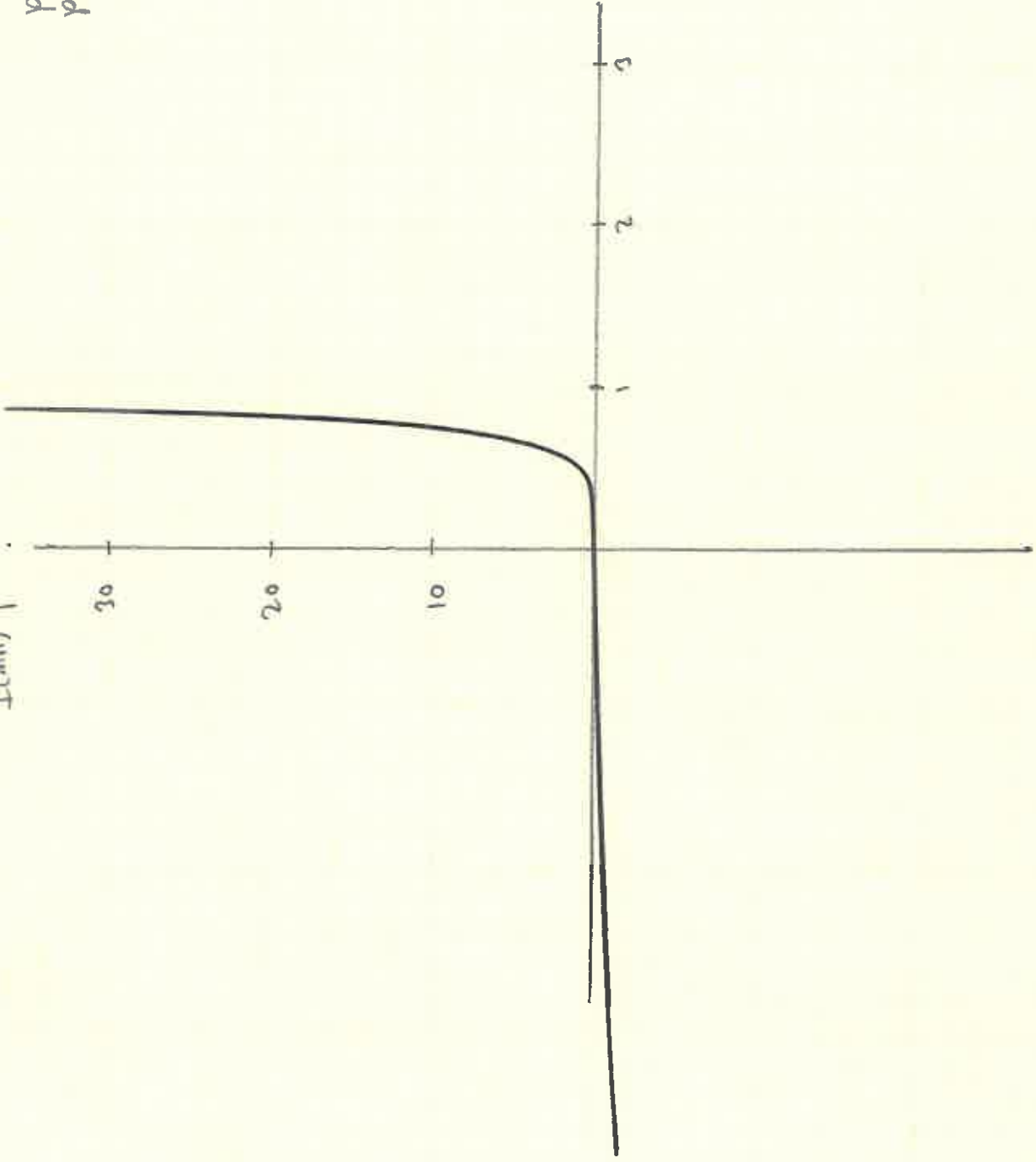
Curve fit  
 $\downarrow$   
 $R = 0.99328$   
 $8.65 \cdot 10^{-5} \times 2.306$

V-I

LASER DIODE

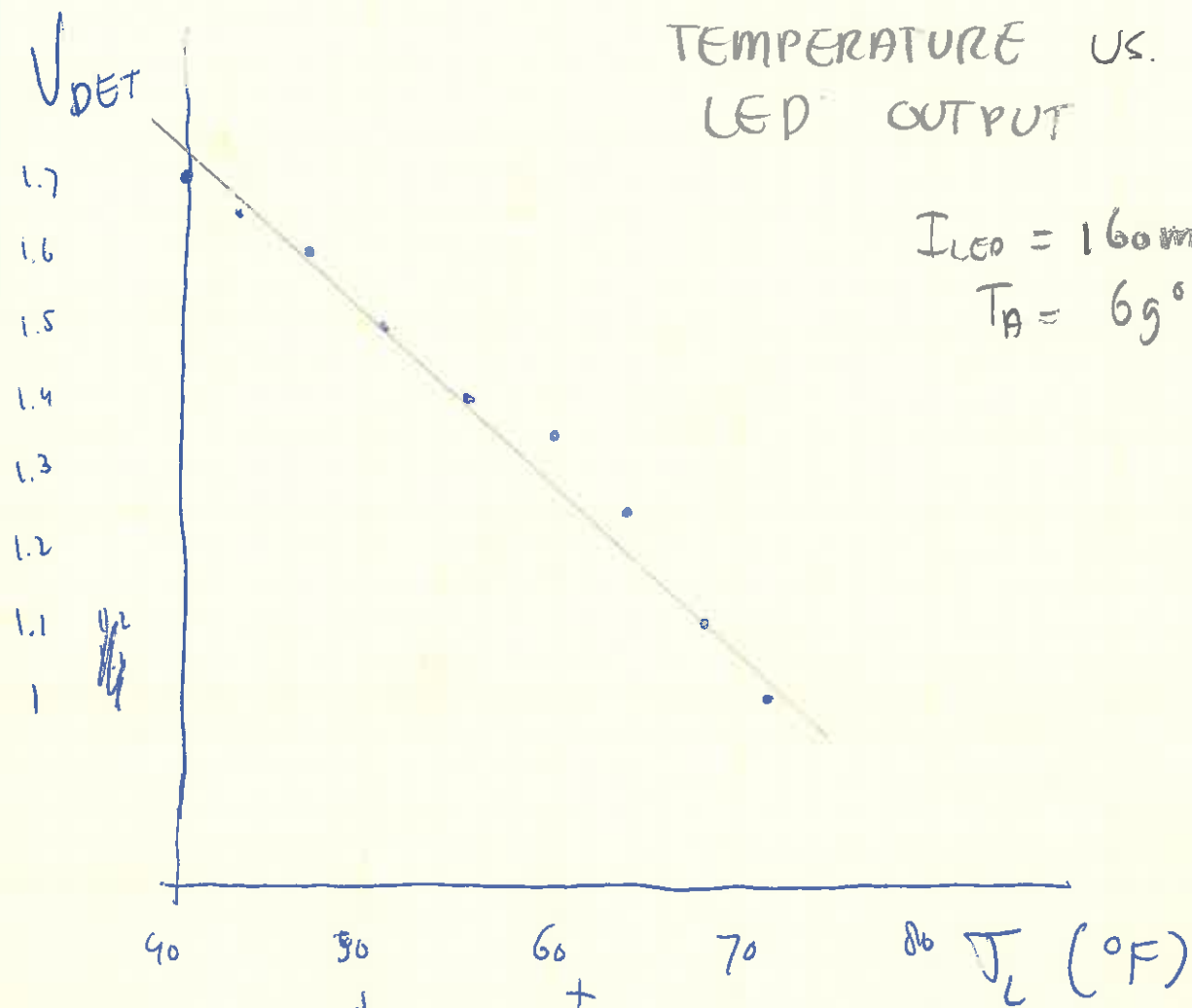
pin 5 (+)  
pin 9 (-)

I (mA) ↑

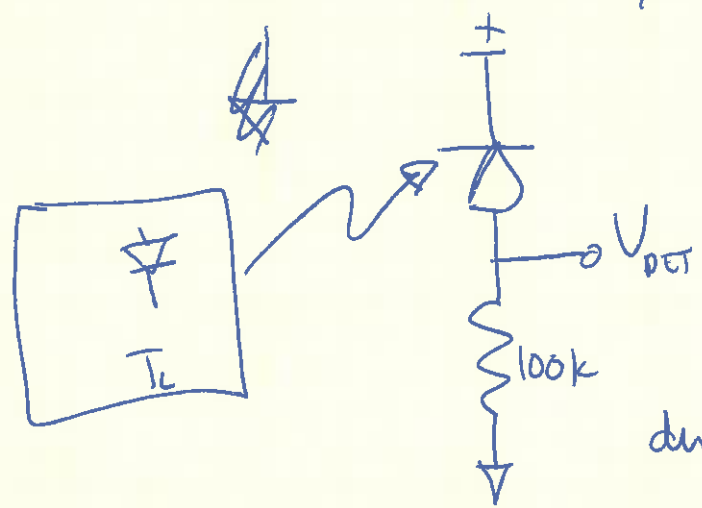


V →

# TEMPERATURE VS. LED OUTPUT



$I_{LED} = 160\text{mA}$   
 $T_A = 69^{\circ}F$



pulsed ~~so~~  
 Laser current  
 160 mA  
 (constant)  
 $T_A = 69^{\circ}F$   
 duty cycle:  
 1 msec on  
 100 msec off

@  $R = 21.2\text{K}$      $I_{LED} = 200\text{mA}$   
 $P_{LED}$      $V_{DET} = 4V$     :  $40\mu A$     :  $80\mu W$ ?



Current:  $V_{LED} = 8V = 160mA$

$R_{(k)}$	$V_{pvt}$	$T$	$I_{mA}$
<del>11.9</del>	1	71.7	<del>200</del>
13	1.1	68	20
14.2	1.25	64	40
15.	1.35	60	60
16.7	1.4	55.6	80
18,	1.5	51.3	100
19.	1.6	46.6	120
20.3	1.65	43.6	140
<del>21.9</del> 21.9	1.7	<del>40</del> 39.9	150.7

$T_A = 60^\circ C$

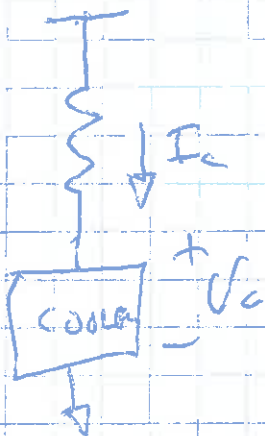
$$\delta T = \delta T_{amb} + k_e \frac{P_{Laser}}{V_c}$$

no heatsink

LASER

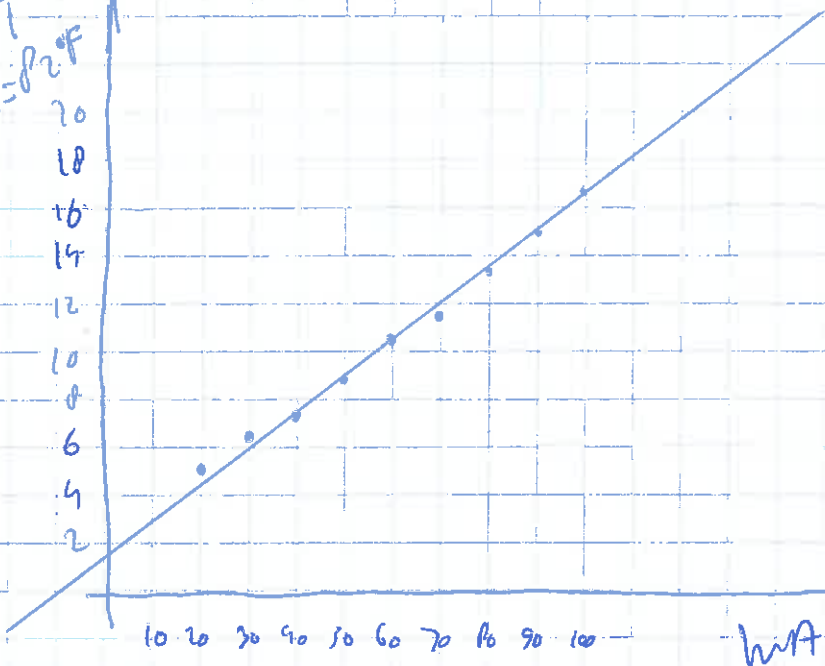
OFF

+V



$I_e$	$T$	$k_e$	$\delta T$	$V_c$
20 mA	76.8	10.40	5.2	
30 mA	75.7	10.72	6.3	
40 mA	74.8	11.0	7.2	
50 mA	73.9	11.4	8.6	
60 mA	71.7	11.9	10.3	.102
70 mA	70.4	12.3	11.6	.117
80 mA	68.7	12.8	13.3	.135
90 mA	67.0	13.3	15.0	.149
100 mA	65.4	13.8	16.6	.163

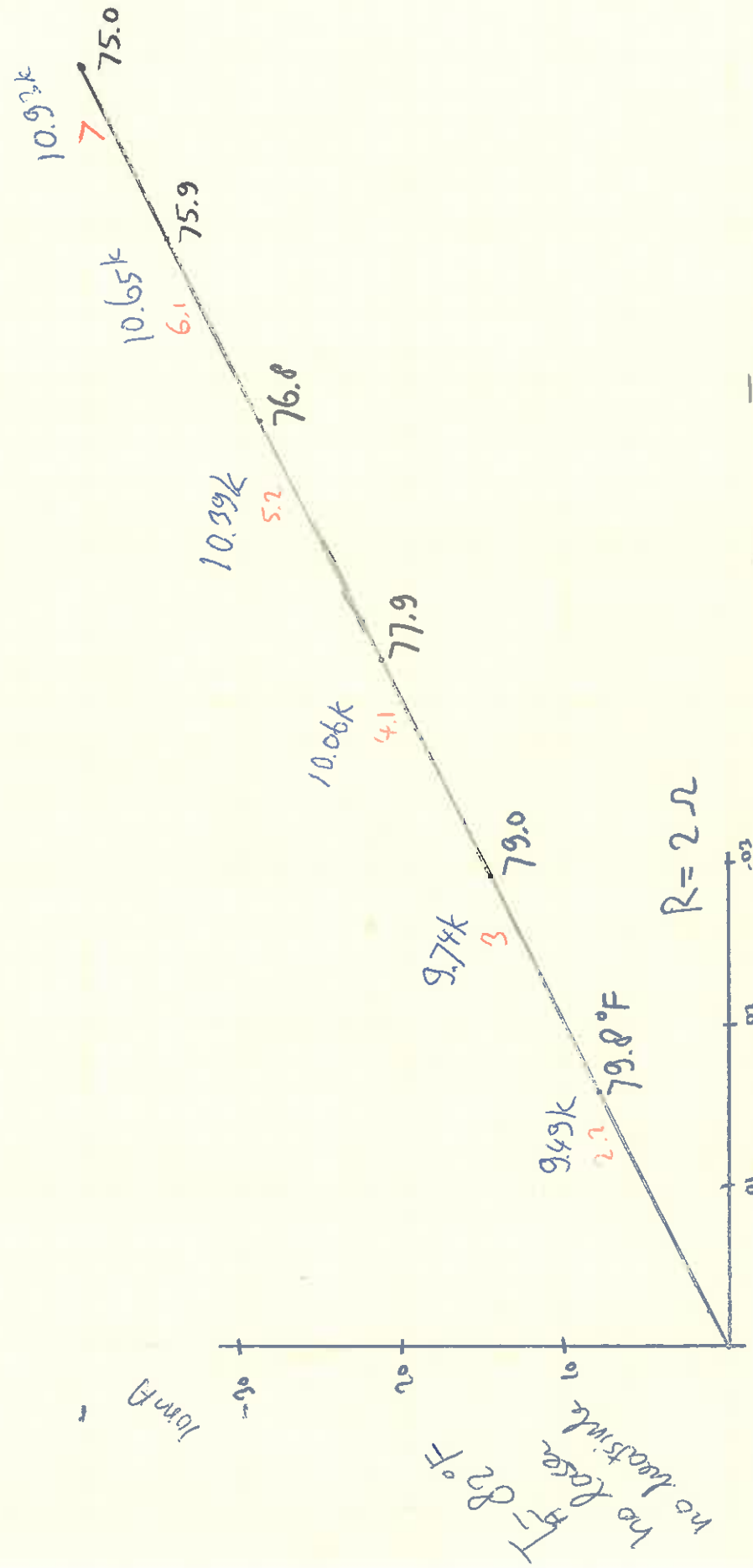
$\delta T$   
 $T_H = T_{amb} + \delta T$



Cooler:  
 numbers

code U-I after stable

10mA/div



R = 2 Ω

Numbers are thermistor resistance, Temperature

WPI: 28381

0.01 V/div

Code V-I from Dr. F increase suddenly

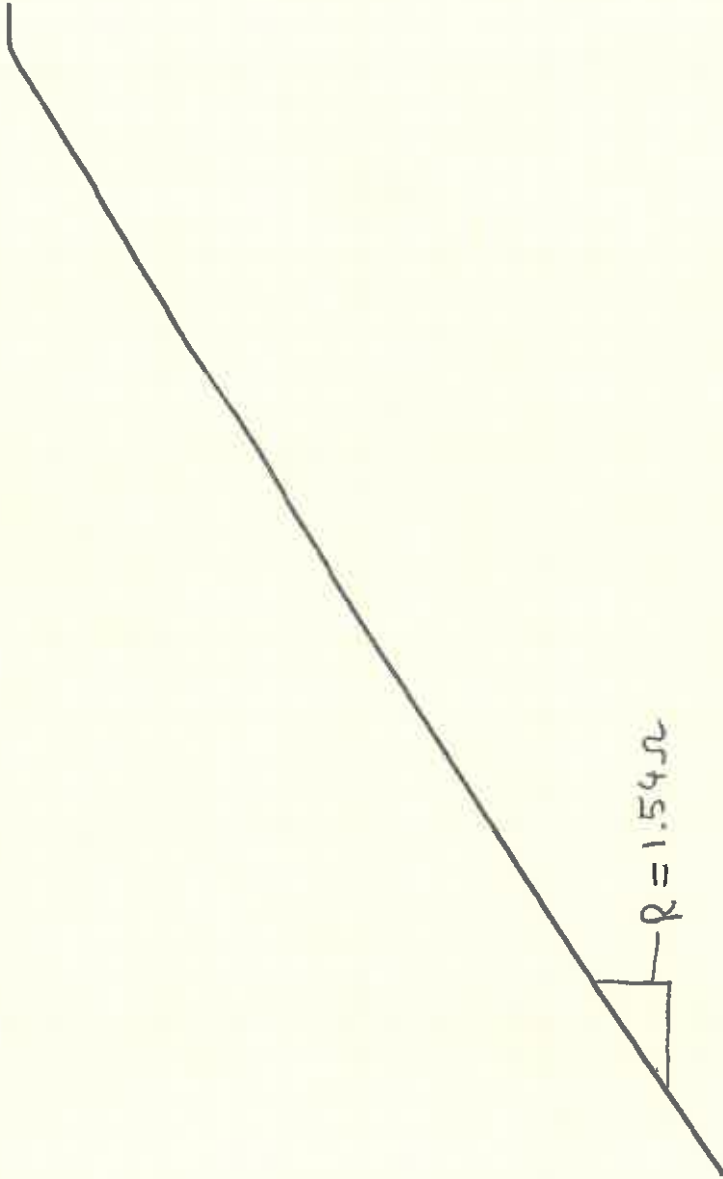
water in case

water in case

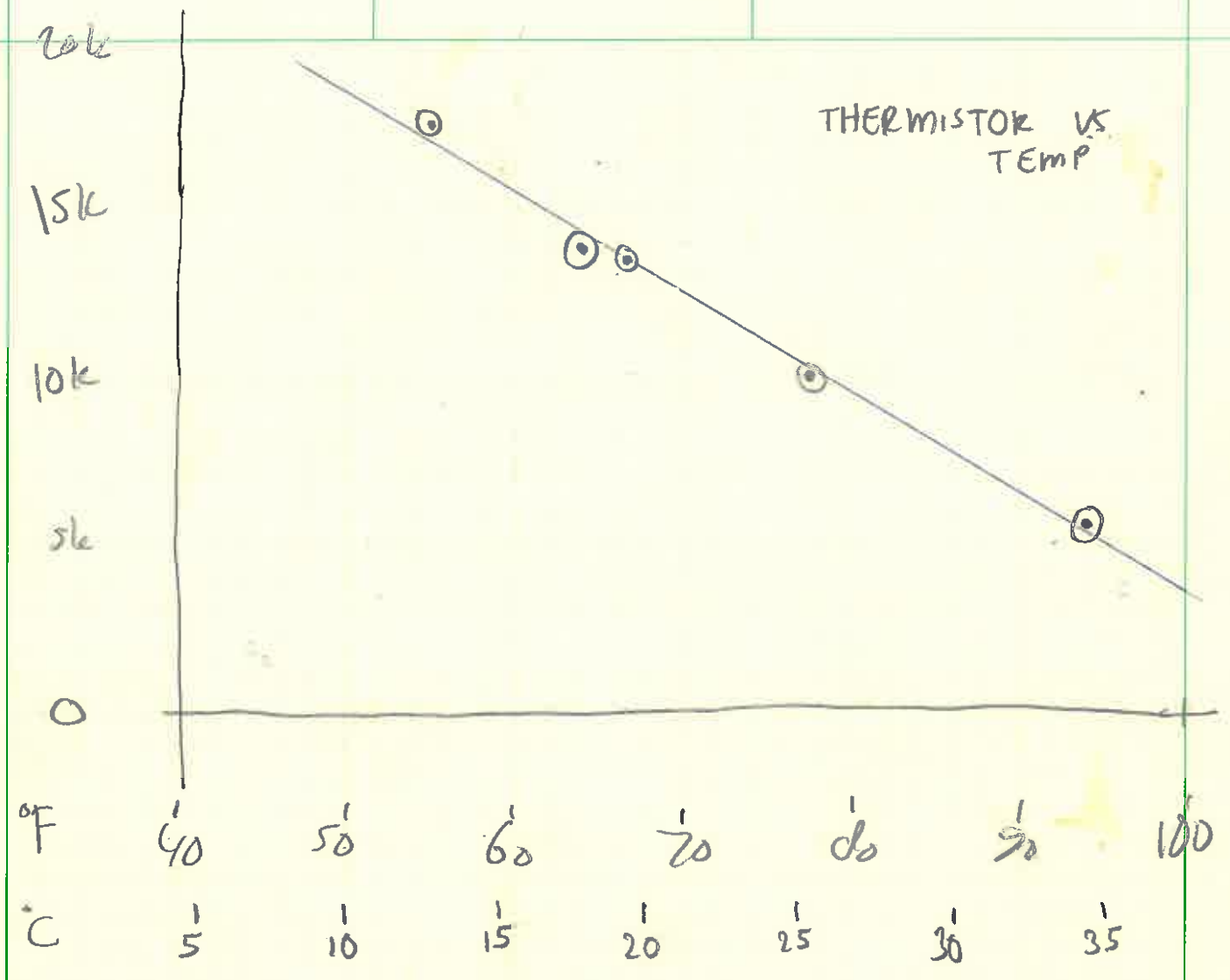
10 mA  
 12

10

$R = 1.54 \Omega$



$V_a / I_a$

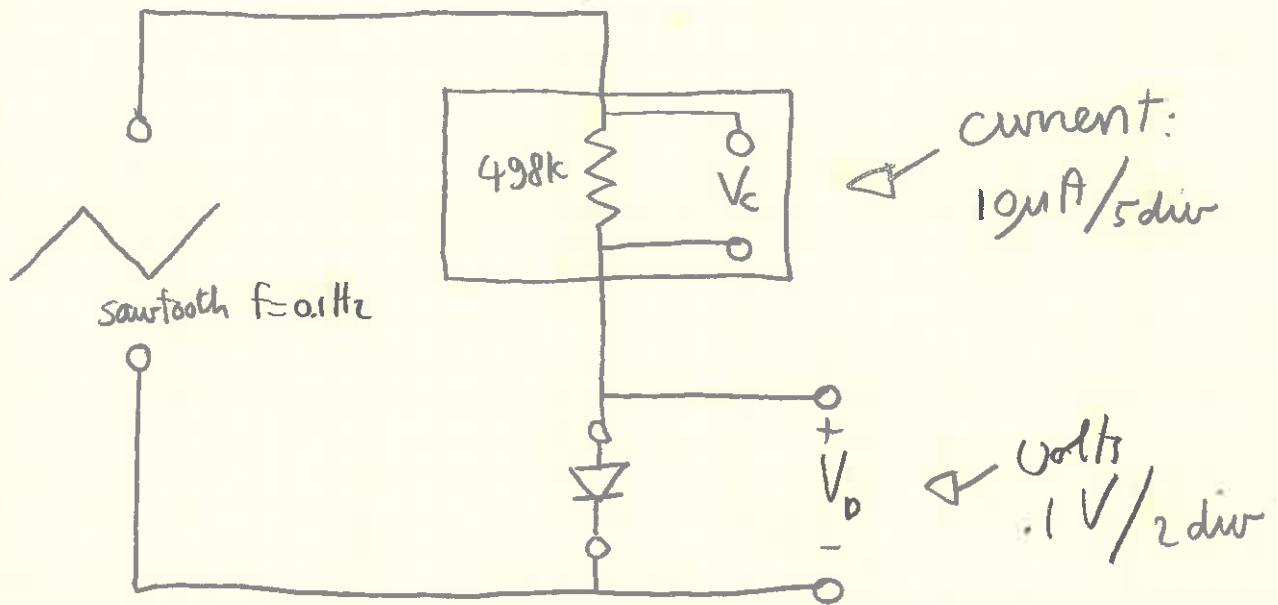


$$R_2 = 0.98998$$

$$R = 33.2942 - F \cdot 0.29823 \quad (\text{k}\Omega)$$

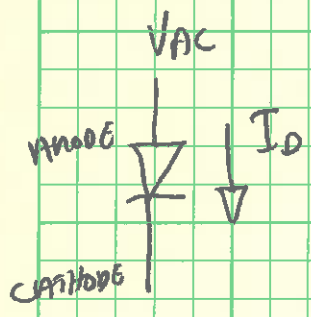
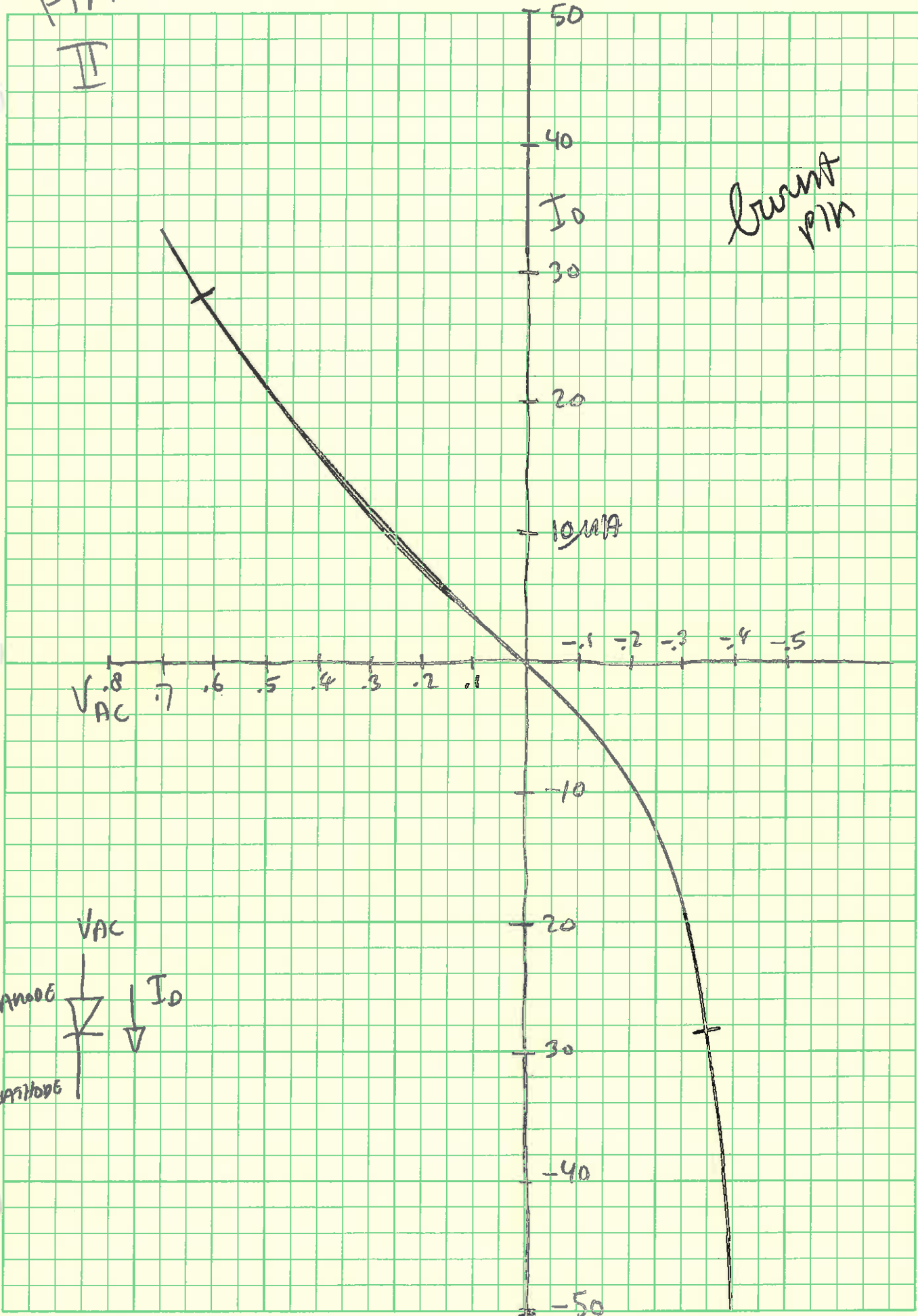
$$F \approx 100 - 3 R_k$$

# Curve Tracer

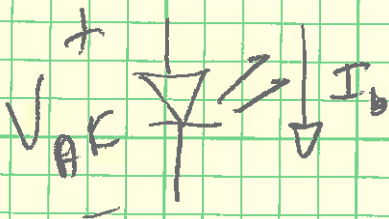
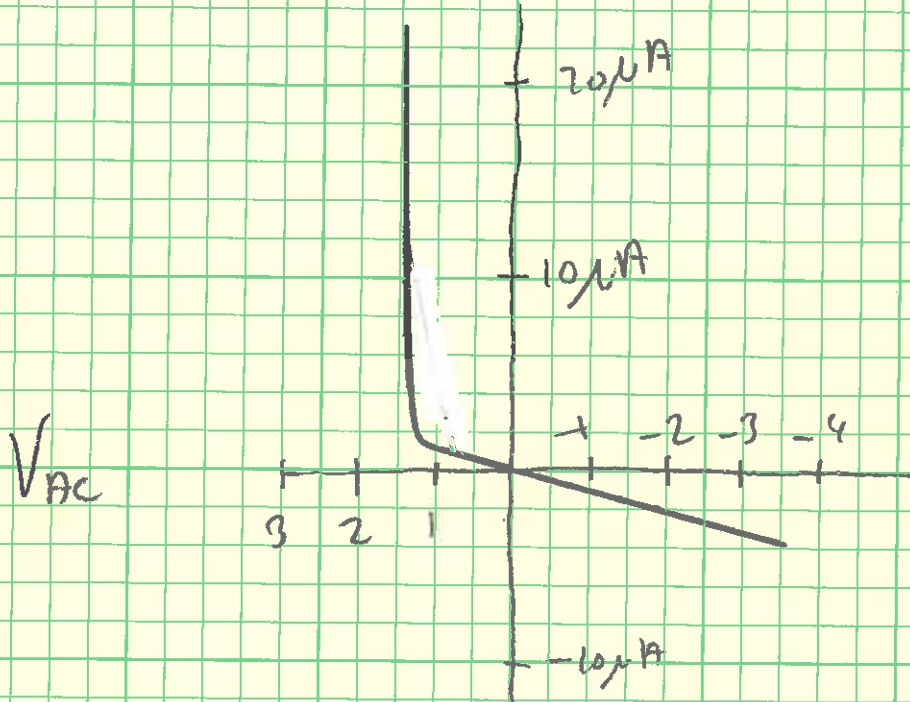


On HP Plotter  
Plotter takes differential inputs

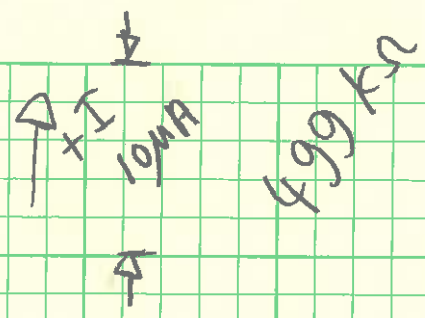
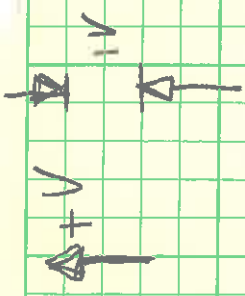
Pin  
II



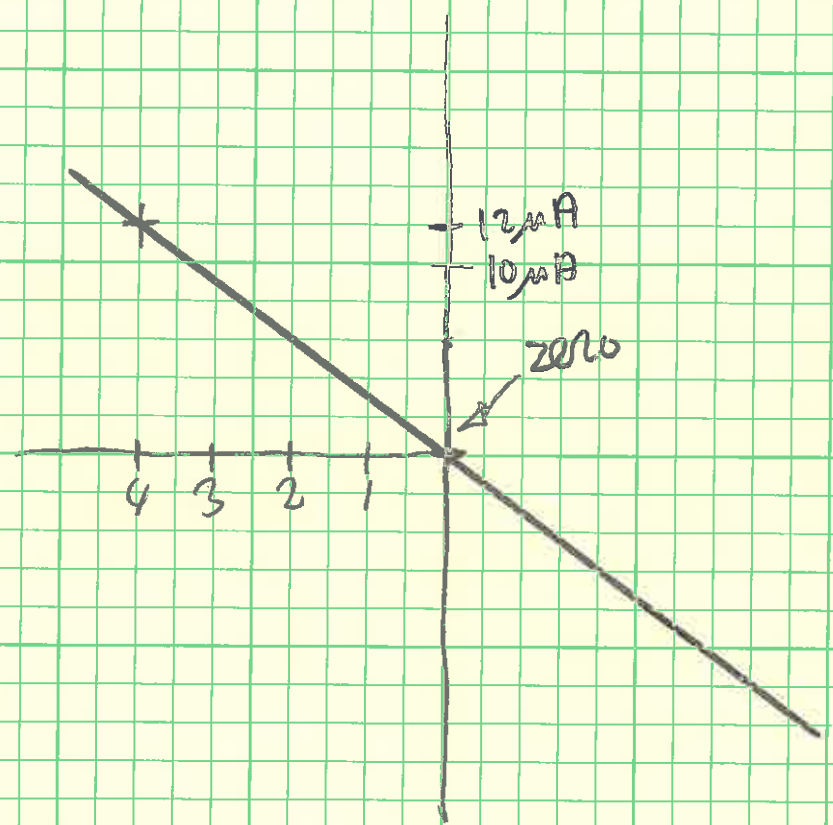
LED



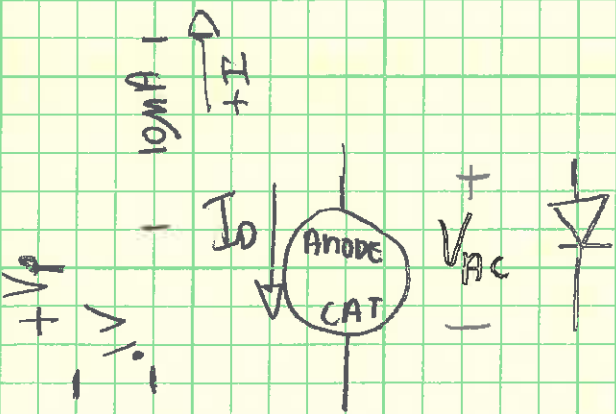
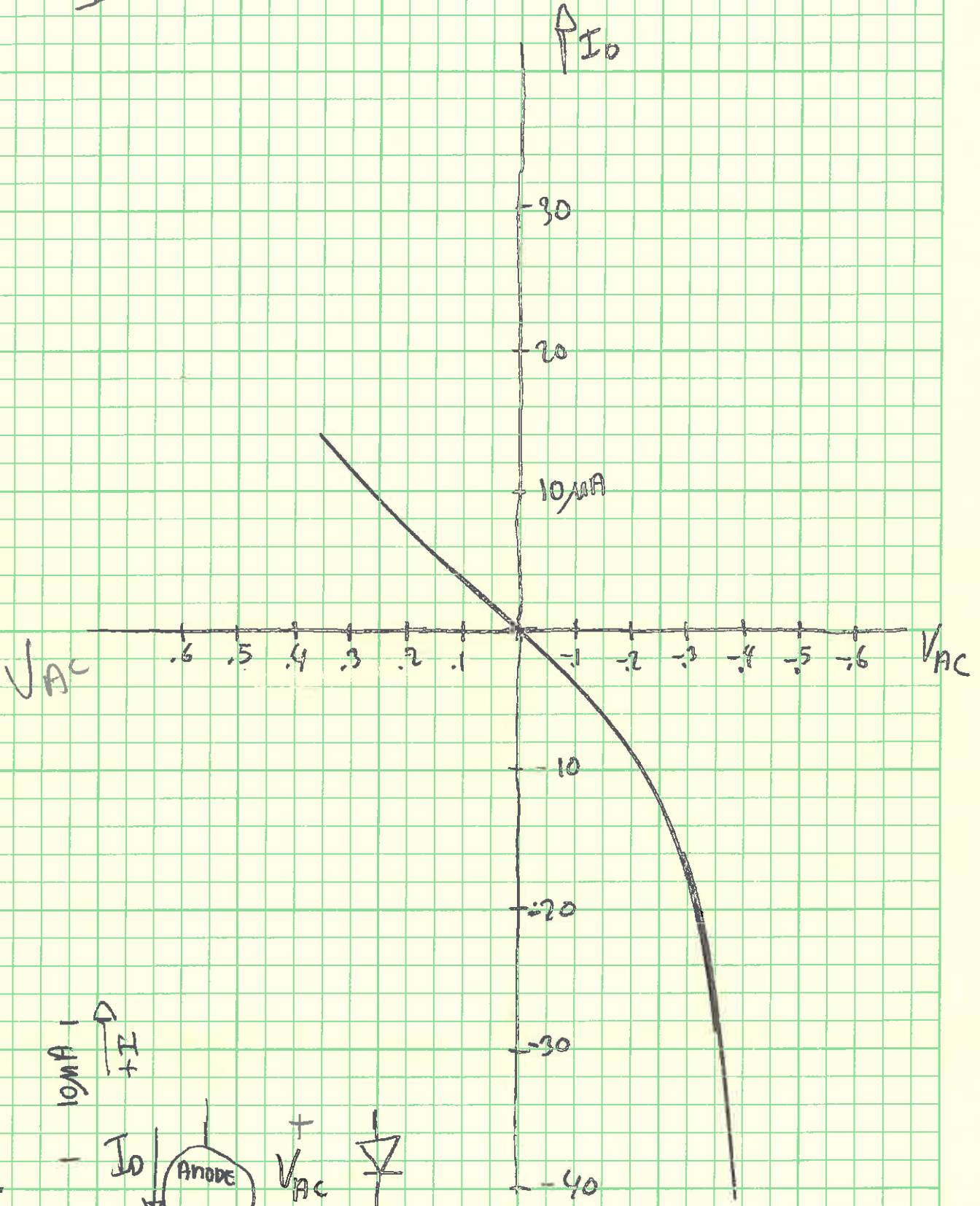




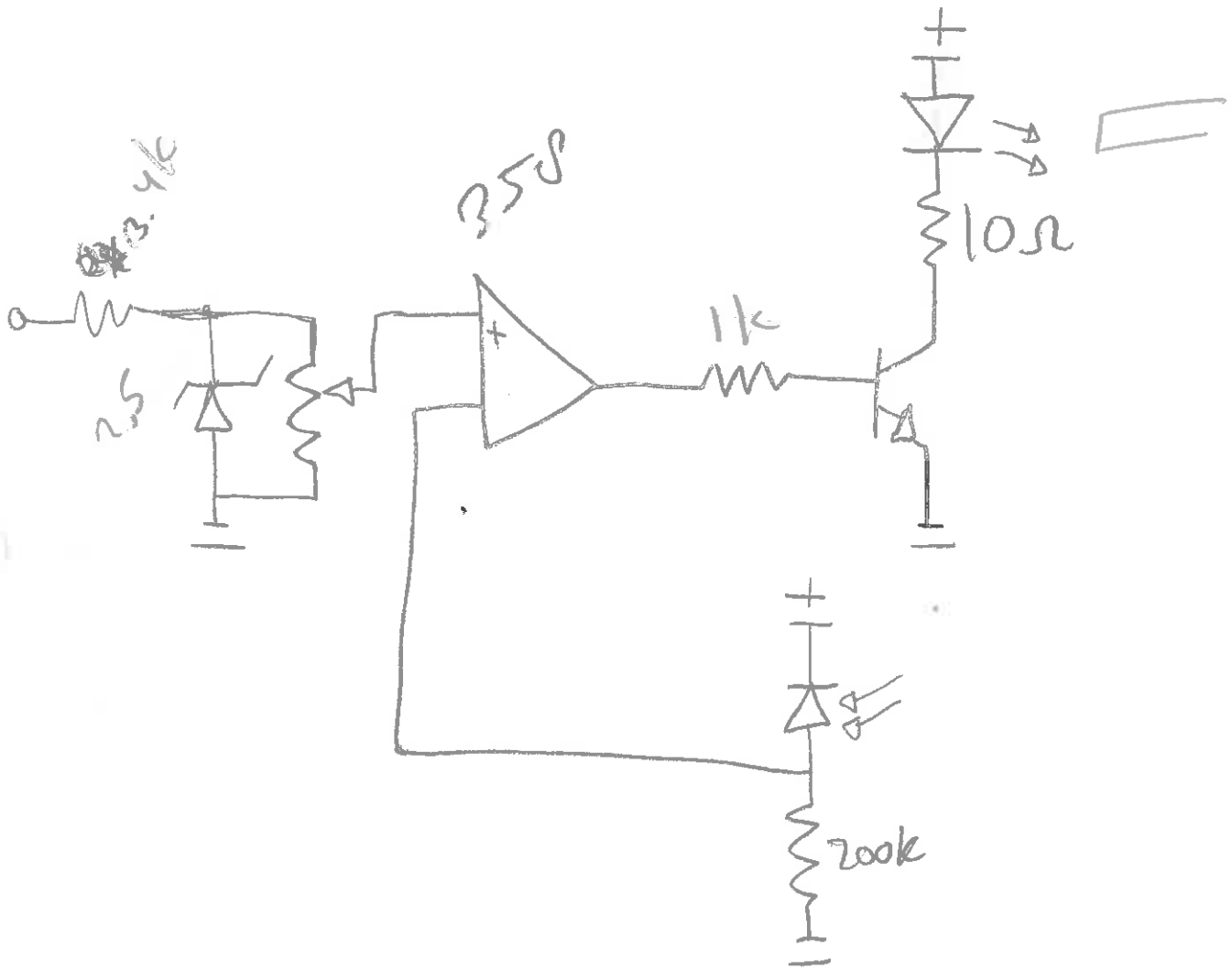
slope =  $333\text{ k}$   
 input impedance of  
 plotter:  $1\text{ M}\Omega$

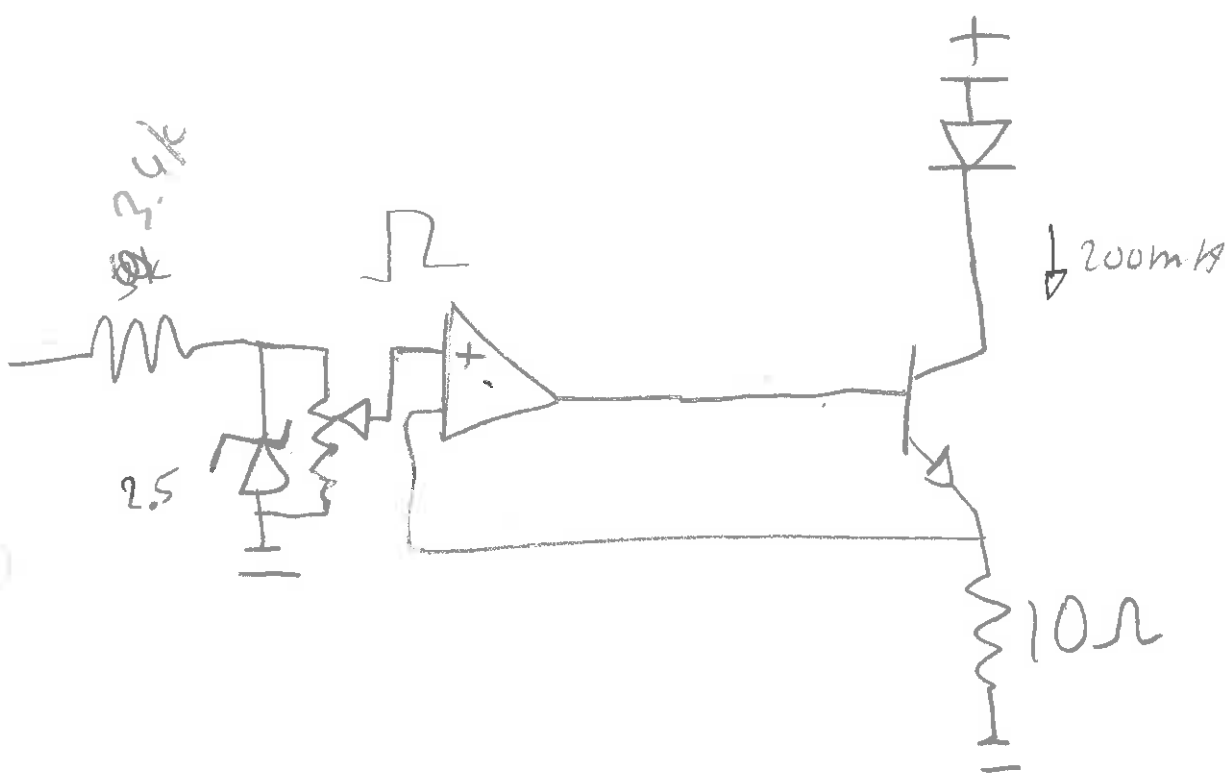


P117  
I



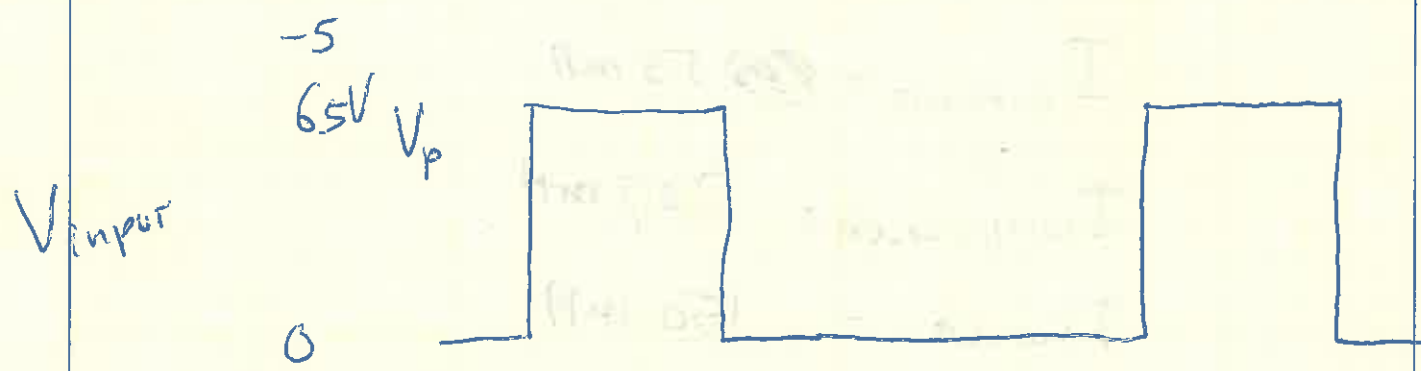
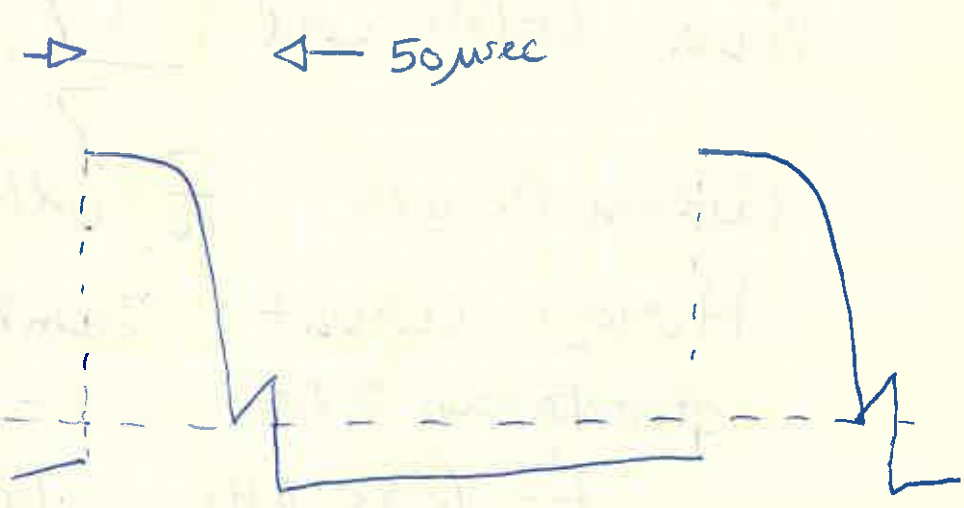
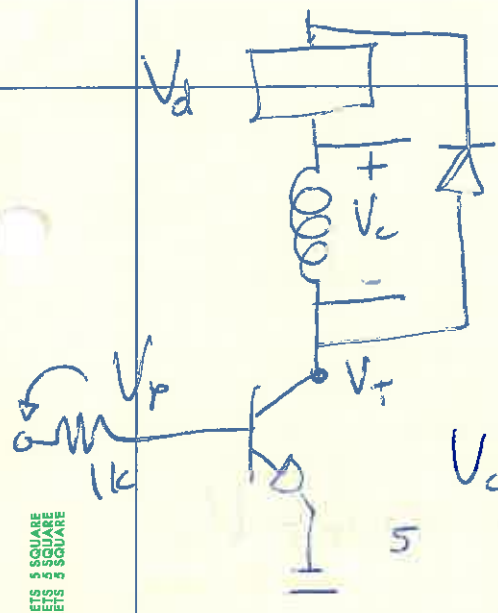
tested down to  
5.1 V



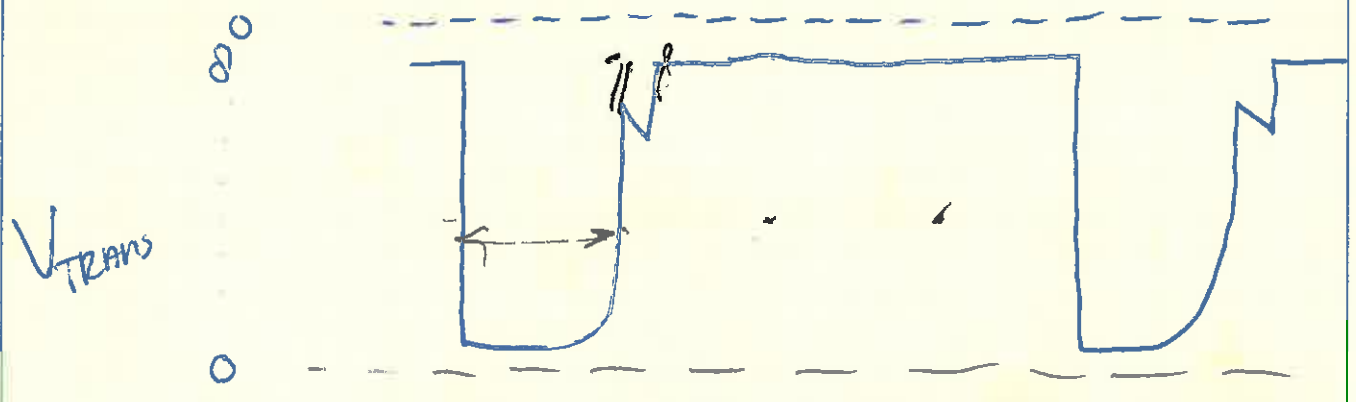


$\frac{100}{\phi}$

DC-DC Converter  
 $C = 180 \mu F$

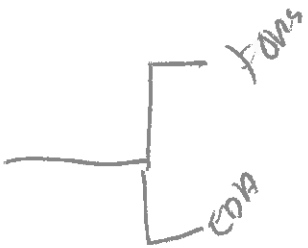
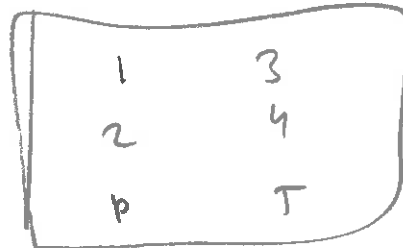


$I_{avg} = 300mA$



Connect 3

EDA



- A nc
- B hc
- C GND
- D POWER
- E DATA
- F READY
- G MAG READY
- H MAG DATA
- I GND
- J GND