

DIODE MATCHING

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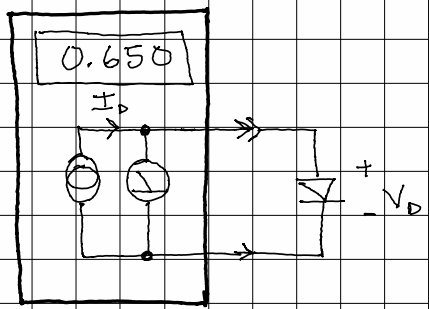
WZAEW

VARIOUS TECHNIQUES

- LOT MATCHING
- DMM DIODE CHECK FUNCTION
- SIMPLE POWER SUPPLY, RESISTOR, DMM CHECK
- I-V CURVE MATCHING
- OTHER MATCHING CONSIDERATIONS

- LOT MATCHING - DOESN'T WORK
- DMM DIODE CHECK

- DMM PUTS A FIXED CURRENT (I_D)
THRU DIODE & MEASURES VOLTAGE

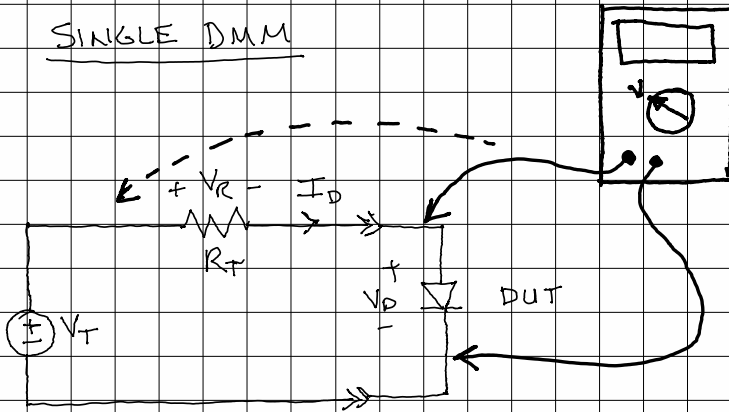


- + QUICK & EASY, MINIMAL SETUP
- ONLY TESTS AT ONE I_D CURRENT*

* BENCH DMM'S OFTEN LET YOU SELECT FROM
A FEW TEST CURRENTS

• POWER SUPPLY / RESISTOR / DMM TEST

SINGLE DMM



V_T = FIXED OR VARIABLE POWER SUPPLY

R_T = FIXED OR VARIABLE RESISTOR

V_R = VOLTAGE MEASURED ACROSS RESISTOR

V_D = VOLTAGE MEASURED ACROSS DIODE

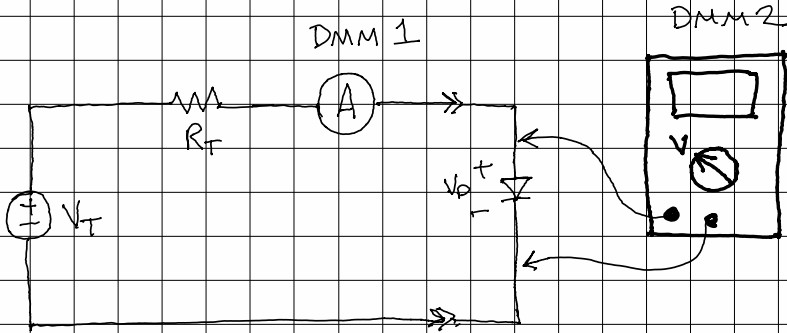
I_D = CURRENT THROUGH DIODE

$$V_T = V_R + V_D \quad I_D = \frac{V_R}{R_T} = \frac{V_T - V_D}{R_T}$$

+ YOU CAN PICK I_D TO MATCH APPLICATION

- MORE COMPLICATED SETUP

TWO DMMs...

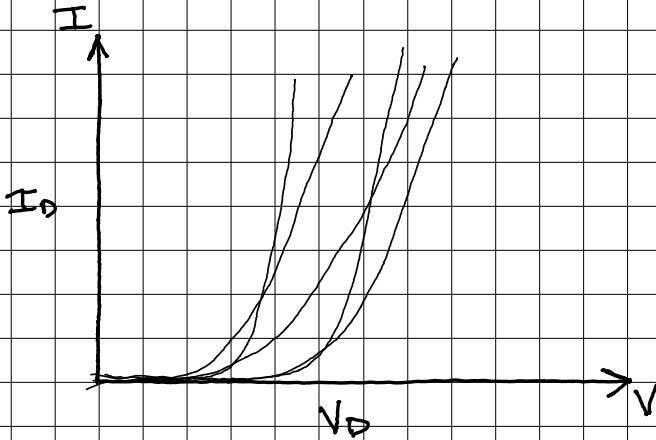


- DMM 1 MEASURES I_D
- DMM 2 MEASURES V_D

- ADJUST V_T OR R_T TO SET I_D
TO DESIRED VALUE

- + FAST/EASY TO MEASURE MULTIPLE DEVICES
- REQUIRES 2 DMMs

DIODE IV CURVE



- CURVES VARY

- MAY GIVE SAME V_D & I_D AT ONE POINT
BUT VERY DIFFERENT ELSEWHERE

TECHNIQUES

- USE PREVIOUS METHODS, MAKE MULTIPLE MEASUREMENTS
- USE A CURVE TRACER TO COMPARE DEVICES

OTHER MATCHING CONSIDERATIONS

- TEMPERATURE DEPENDENCE
 - $\approx 2\text{mV}/^\circ\text{C}$
 - WATCH SELF-HEATING, ESPECIALLY AT HIGHER I_D
- CONSIDER THE APPLICATION - WHAT NEEDS TO MATCH?
 - I-V RANGE / OPERATING POINT
 - REVERSE RECOVERY CHARACTERISTICS
 - DIODE CAPACITANCE
 - ETC...