ELEC-313
Lab 7: MOSFET Amplifier Circuits

November 13, 2013

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1 Objective

2 Equipment

Transistor: 2N7000   Power supply: HP E3631A
Function generator: HP 33120   Multimeter: HP 34401A
Oscilloscope: Agilent 54622D   Capacitors: $0.1\,\mu F$
Resistors: $100\,\Omega$, $300\,\Omega$, $470\,\Omega$, $1\,k\Omega$ (x2) $33\,k\Omega$, $100\,k\Omega$ (x2)

3 Schematics

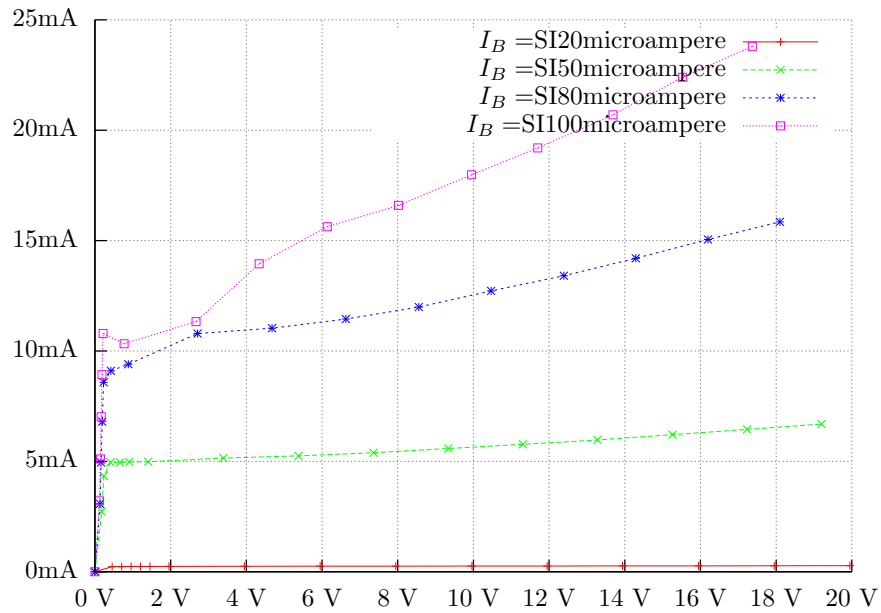# 4 Procedure

5 Results

Figure 1: V_{CE} vs. I_C

6   Conclusion

7   Equations

$$V_{o,L} = V_{o,NL} \frac{R_L}{R_o + R_L} \tag{1}$$

$$V_G = \frac{V_{DD} \cdot 33\,\text{k}\Omega}{100\,\text{k}\Omega + 33\,\text{k}\Omega} \tag{2}$$

$$V_S = V_G \cdot \sqrt{\frac{I_D}{K_N}} - V_{TN} \tag{3}$$

$$V_D = V_{DD} - I_D \cdot 1\,\text{k}\Omega \tag{4}$$

$$I_D = \frac{V_S}{R_S} \tag{5}$$

$$A_V = \frac{V_{out}}{V_{in}} = \frac{-g_m \cdot R_D}{1 + g_m \cdot R_S} \tag{6}$$

$$\%_{diff} = \frac{|measured - theoretical|}{theoretical} \times 100\% \tag{7}$$