

Group:

Protocolant:

Date:

Other Participants:

Lecturer:

**Task No 3: Bipolar Transistor**

1.

Measure the output characteristics  $I_C = f(U_{CE})$  of a transistor in the current range  $0 < I_C < 2\text{mA}$  and the voltage range  $0 < U_{CE} < 10\text{V}$  for 5 different base currents.

Calculate from your measurement the DC current gain and the Early-voltage.

2.

Measure the transfer characteristic  $I_C = f(U_{BE})$  for a constant voltage  $U_{CE} = 5\text{V}$  and a maximum current  $I_C$  of  $2\text{mA}$ . Determine the mutual conductance  $g_m$  for an operating point of  $I_C = 1\text{mA}$  and compare it with the theoretical value.

3.

Devise an amplifier with your transistor for the operating point of  $I_C = 1\text{mA}$  having an amplification factor of  $\nu = 100$ . Measure this amplification factor by means of a small AC-signal of  $10\text{mV}$  amplitude and a frequency of  $1\text{kHz}$ .