

2024/25 Semester 1

EE 4341/EE6341: Advanced Analog Circuits

Home Assignment

Name:

Matriculation No.:

Notes:

- Submission deadline: 22 October 2024 (Tuesday)
- Submit by hardcopy to me at the LT or to my office: S2-B2C-112.

A Class-AB power amplifier is shown below. The part numbers of Q_1 , Q_2 , D_1 and D_2 are given. The input signal v_i is a 1 kHz sinusoidal waveform with peak voltage of 12 V. Use LTSPICE to construct the circuit and run the simulation (please select the correct part number of the transistors and diodes). Please attach your LTSPICE circuit and the necessary simulated waveforms to support your answers. Based on your simulation results, provide your answers to the following questions.

Note: Give you answers of i_{C1} , i_{C2} , i_D and v_{BB} in four decimal points.

- (a) Obtain the values of i_{C1} , i_{C2} , i_D and v_{BB} when $v_i = +12$ V. (30 Marks)
- (b) Repeat part (a) when $v_i = 0$ V. (30 Marks)
- (c) Repeat part (a) when $v_i = -12$ V. (30 Marks)
- (d) From the simulation results, please briefly explain the operating principle of a Class AB amplifier. (10 Mark)

