

Assignment 6 – Infrared Transmitter and Receiver

This Assignment aims at verifying and expanding, with experiments and supporting simulations, your knowledge and understanding of the input stage of the infrared transmitters and receivers.

Please document each step with snapshots, pictures, and your observations. Please make visible on WaveForms the date and time fields (top left) and the serial number (bottom right) of your Analog Discovery. Also, please include this page.

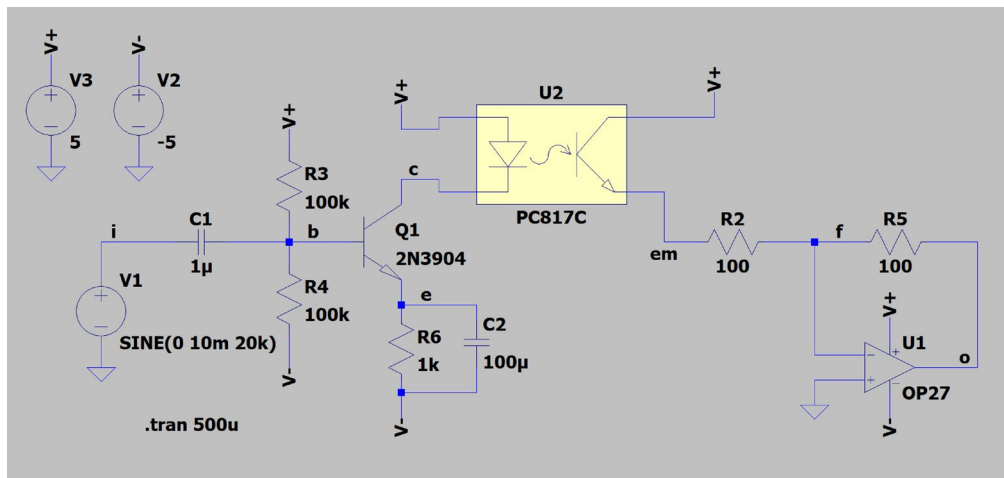


Figure 1

1) Using the simulator, design the circuit shown in Fig. 1 (the PTC817C can be found in the Optos library) **(30pts)**

- simulate the response and calculate the gain
- explain in your own words how the circuit operates

2) Build the circuit at (1) and experimentally reproduce the simulation by using the QED123 transmitter or similar and the QSD124 phototransistor or similar **(70pts)**

- measure the response and calculate the gain
- increase the input amplitude until you observe a visible distortion and report the value

Note: for maximum signal transfer consider placing the transmitter and receiver head-to-head