ESP32 and TSOP1738 Integrated Control Circuit

This document presents a solution to integrate an ESP32 with the provided circuit, allowing remote control of an appliance using both an IR remote (via TSOP1738) and an ESP32. The solution involves diode ORing to control the relay through the output of the 4017 IC or the GPIO pin of the ESP32.

1. Identifying the Key Points

- The relay is controlled by the transistor Q1 (BC548), which is driven by the output of the 4017 IC.
- Diode ORing will be implemented to allow the ESP32 to also control the relay, enabling on/off switching either via the IR remote or the ESP32.

2. Adding the Diode ORing

- Use two diodes in an OR configuration. One diode connects the 4017 IC to the base of Q1, and the other connects the ESP32 GPIO pin to the base of Q1.
- A pull-down resistor is added between the base of Q1 and ground to keep the transistor off when neither the 4017 IC nor the ESP32 is active.

3. Circuit Connections

- Diode D1: Anode to 4017 output, cathode to base of Q1.
- Diode D2: Anode to ESP32 GPIO pin, cathode to base of Q1.
- Pull-Down Resistor: 10k ohm between base of Q1 and ground.

4. Operation

- When the 4017 IC outputs a high signal, D1 forward biases and drives the base of Q1, turning on the relay.
- When the ESP32 GPIO pin outputs a high signal, D2 forward biases and also drives the base of Q1, turning on the relay.
- If both signals are low, the pull-down resistor keeps the base of Q1 low, turning off the relay.

5. Conclusion

This configuration allows either the IR remote or the ESP32 to control the relay, providing flexibility in controlling the appliance remotely or locally.