

CHARGER CIRCUIT

1. Introduction

The Charger Circuit is designed to provide a regulated 12V DC output from an AC input. This circuit is useful for charging batteries or powering devices that require a stable 12V DC supply.

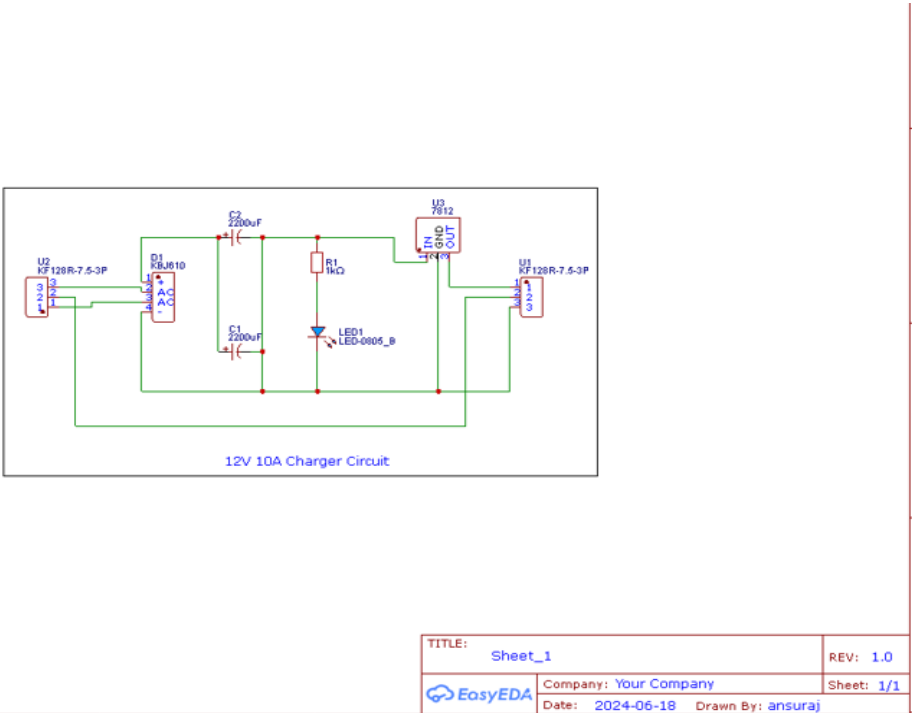
2. Components List

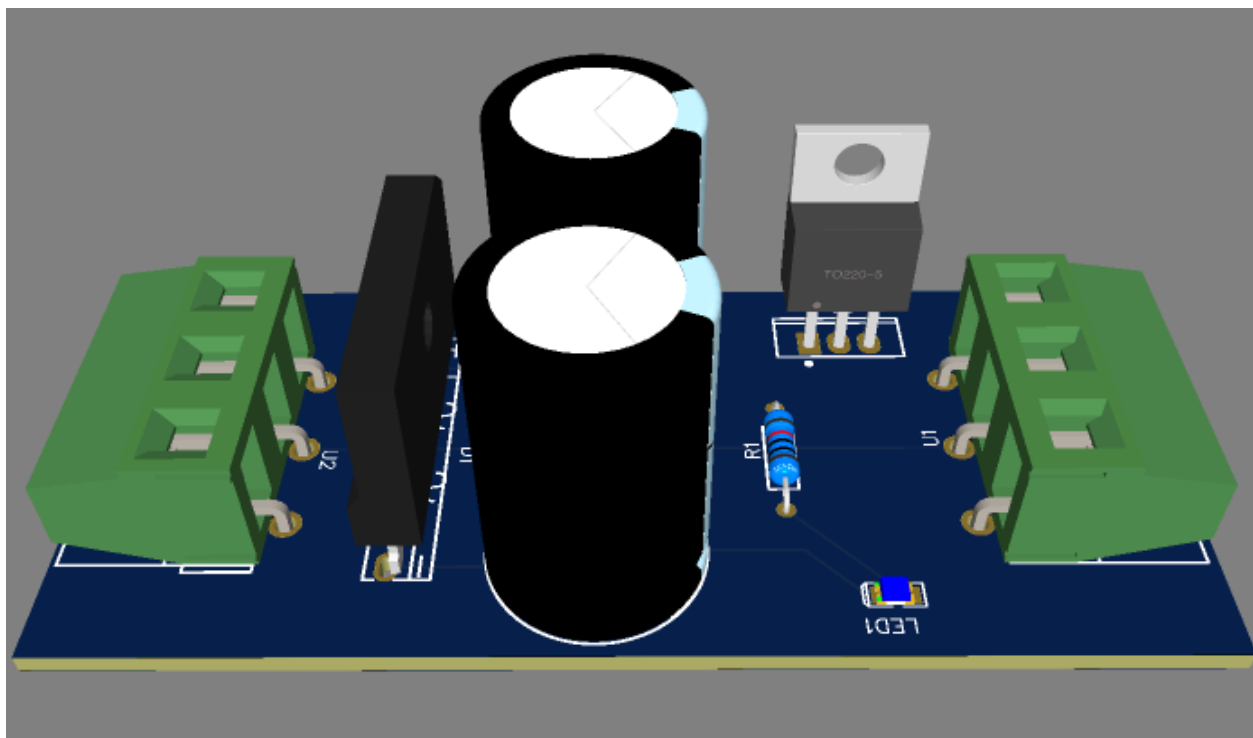
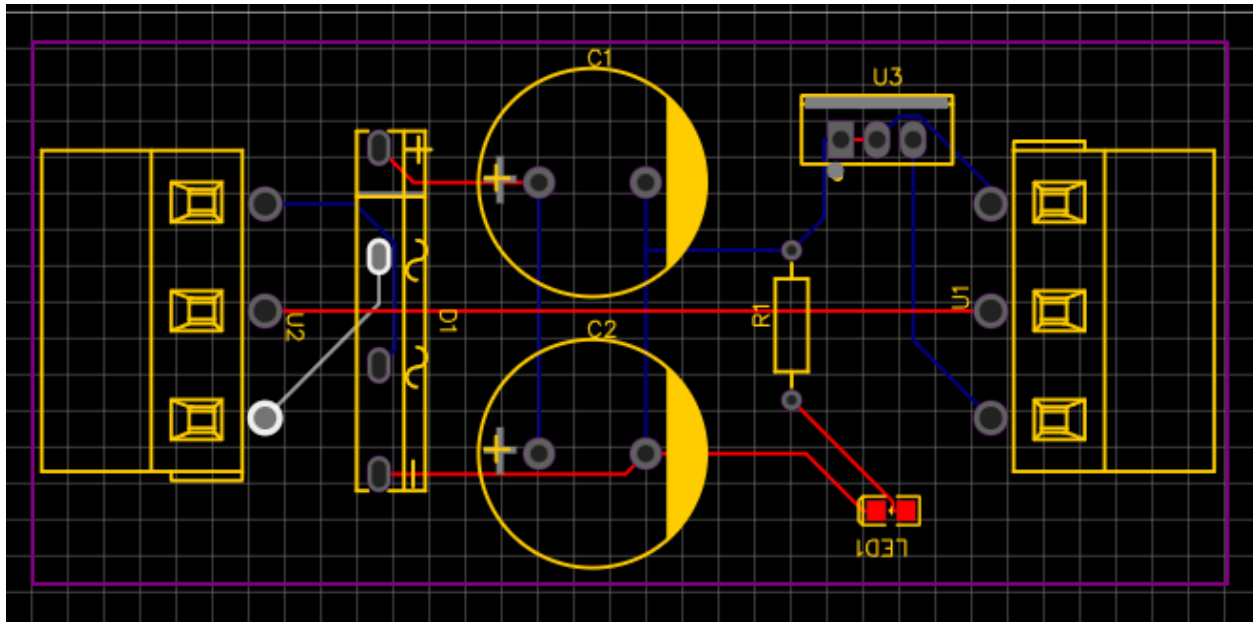
The circuit comprises various components as detailed below:

ID	Name	Quantity	Description
C1, C2	2200uF	2	Electrolytic Capacitors
D1	KBJ610	1	Bridge Rectifier
LED1	LED-0805_B	1	Blue LED
R1	1kΩ	1	Resistor
U1, U2	KF128R-7.5-3P	2	Connectors
U3	7812	1	Voltage Regulator

3. Schematic Diagram

The schematic diagram of the Charger Circuit is shown below:





4. Circuit Description

The circuit consists of the following sections:

- **Bridge Rectifier:** The KBJ610 bridge rectifier (D1) converts AC input to pulsating DC.
- **Smoothing Capacitors:** The 2200uF capacitors (C1, C2) smooth the pulsating DC to a more stable DC voltage.

- **Voltage Regulator:** The 7812 voltage regulator (U3) provides a stable 12V DC output.
- **Indicator LED:** The LED-0805_B (LED1) indicates the presence of the output voltage.
- **Resistor:** The 1k Ω resistor (R1) limits the current through the LED.
- **Connectors:** KF128R-7.5-3P (U1, U2) are used for input and output connections.

5. Working Principle

1. **AC Input to DC Conversion:**
 - The AC input is fed to the bridge rectifier (D1), which converts the AC voltage to pulsating DC voltage.
2. **Smoothing the DC Voltage:**
 - The pulsating DC voltage is then smoothed by the 2200uF capacitors (C1, C2) to reduce the ripple and provide a more stable DC voltage.
3. **Voltage Regulation:**
 - The smoothed DC voltage is fed to the 7812 voltage regulator (U3), which regulates it to a stable 12V DC output.
4. **Indicator LED:**
 - The LED (LED1) lights up to indicate the presence of the output voltage. The current through the LED is limited by the 1k Ω resistor (R1).

6. Applications

- **Battery Charging:** Suitable for charging 12V batteries.
- **Power Supply:** Can be used as a 12V power supply for various electronic devices.
- **Prototyping:** Useful in electronic projects and prototyping where a stable 12V DC supply is required.

7. Advantages

- **Stability:** Provides a stable 12V DC output.
- **Simplicity:** Simple design with easily available components.
- **Versatility:** Can be used in various applications requiring a 12V DC supply.

8. Conclusion

The Charger Circuit is an efficient and reliable solution for converting AC input to a stable 12V DC output. Its simple design and easy implementation make it suitable for various applications, including battery charging and powering electronic devices.