

IC Controlled Emergency Light with Charger

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The circuit shown here is that of the IC controlled emergency light. Its main features are: automatic switching-on of the light on mains failure and battery charger with overcharge protection.

When mains is absent, relay RL2 is in de-energised state, feeding battery supply to inverter section via its N/C contacts and switch S1. The inverter section comprises IC2 (NE555) which is used in stable mode to produce sharp pulses at the rate of 50 Hz for driving the MOSFETs. The output of IC3 is fed to gate of MOSFET (T4) directly while it is applied to MOSFET (T3) gate after inversion by transistor T2. Thus the power amplifier built around MOSFETs T3 and T4 functions in push-pull mode.

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Battery overcharge preventer circuit (LM308). Its non-inverting pin is held at a reference voltage of approximately 6.9 volts which is obtained using diode D5 (IN4148) and 6.2-volt zener D6. The inverting pin of IM is connected to the positive terminal of battery. Thus when mains supply is present, IM comparator output is high, unless battery voltage exceeds 6.9 volts. So transistor T1 is normally forward biased, which energises relay RL1. In this state the battery remains on charge via N10 contacts of relay RL1 and current limiting resistor R2.

When battery voltage exceeds 6.9 volts (overcharged condition), IM output goes low and relay RL1 gets de-energised, and thus stops charging of battery.

MOSFETs T3 and T4 may be mounted on suitable heat sinks.

