

# RECHARGEABLE TORCH BASED ON WHITE LED

■ T.A. BABU

Rechargeable torches don't come without problems. You need to replace the bulbs and charge the batteries frequently. The average incandescent light-emitting diode (LED) based torch, for instance,

AC) limits the current to the charger circuit. The resistor across the capacitors provides a discharge path for the capacitors after the battery is charged. The red LED1 indicates that the circuit is active for charging.

The torch uses three NiMH rechargeable button cells, each of

1.2V, 225 mA.H. A normal recharge will take at least 12 hours. Each full recharge will give a continuous operational time of approximately 2.5 hours. Recharge the battery to full capacity immediately after use to ensure its reliability and durability. The charging current is around 25 mA.

A voltage booster circuit is required for powering the white LEDs (LED2 through LED4). An inverter circuit is used to achieve voltage boosting. Winding details of the inverter transformer using an insulated ferrite toroidal core is given in the schematic. The number of 35 SWG wire turns in the primary and secondary coils ( $N_p$  and  $N_s$ ) are 30 and 3, respectively. If the inverter does not oscillate,

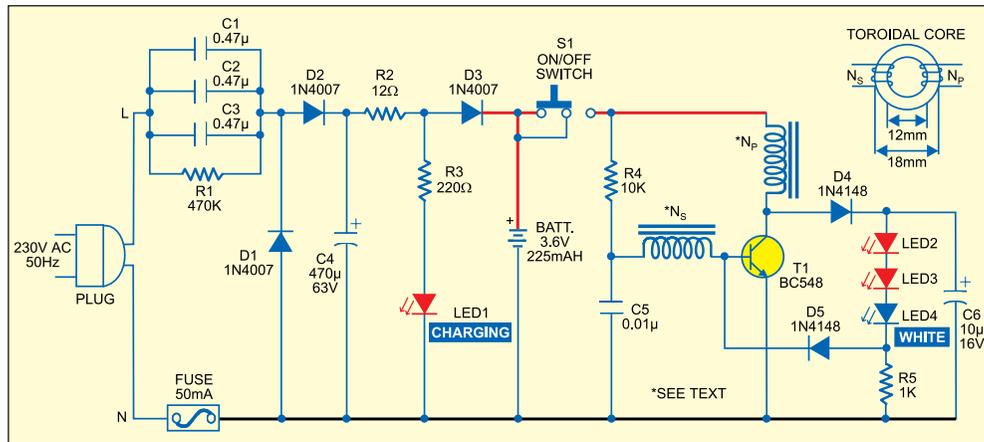


Fig. 1: Circuit diagram of rechargeable torch

consumes around 2 watts. Here's a rechargeable white LED-based torch that consumes just 300 mW and has 60 per cent longer service life than an average incandescent torch.

Fig. 1 shows the circuit of the rechargeable white LED-based torch. The reactive impedance of capacitors C1 through C3 (rated for 250V

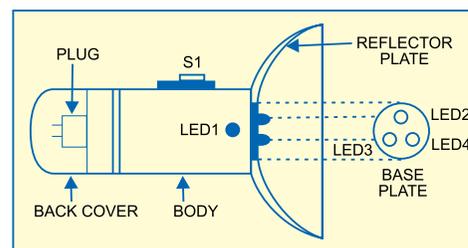


Fig. 2: Suggested enclosure for the torch

(but not both) the primary or the secondary winding. A reference voltage from resistor R5 provides a reflected biasing to the transistor, and keeps the output constant and regulated.

The suggested enclosure for the torch is shown in Fig. 2. ●