

Dark Charger Using LDR and BC 547

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Abstract—Nowadays with the invent of new technologies the processors in the electronic devices have improved both in performance and speed. QUALCOMM has come up with its design like the MSM7225 which is a 1 core up to 800 MHz Cortex-A5(ARMv7): 32K+32K L1, 256K L2 and the APQ8055 fro the Series 2 which is a 1 core up to 1.4 GHz Scorpion: 32K+32K L1, 384K L2 and Media Tech is in competition with them, but everything comes at a price in this world and here the price paid is the battery life of the devices which results in less TOS(Time on Screen) .Now to maintain that TOS frequent charging is done hence consumption of power or electricity is more resulting in more use of resources which is a concern for third world countries. We need to reduce that use to some extent. In this paper a simple technique of cascading 2 circuits namely the dark sensor using a light dependent resistor and a charging circuit of a charger using IC7805 voltage regulator is being used .The result is dark charger which can be used to charge when there is no electricity hence increasing the TOS and use of less electricity .

Index Terms—IEEE, IEEEtran, journal, L^AT_EX, paper, template.

I. INTRODUCTION

My Idea in this paper is to provide a technology which will continuously charge the battery at the expense of no electricity .If we keep the Device in a quiet dark place or even mild dark the battery would keep charging. Hence providing to the following advantages.

- 1) Less use of resource (Electricity)
- 2) Charging when there is no electricity.

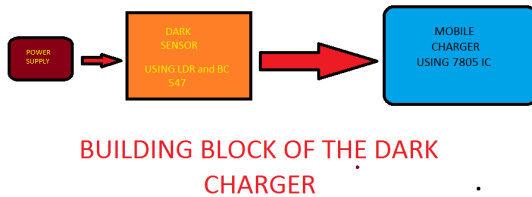


Fig. 1. Block diagram of a dark charger

A. Abbreviations and Acronyms

TOS (Time on Screen)

IC (Integrated Circuit)

BC 547 (B stands for Silicon and C is the abbreviation of a three terminal device.)

1) **Apparatus Discussion:** IC 7805 Voltage sources in a circuit may have fluctuations resulting in not providing fixed voltage outputs.IC 7805 is a member of the 78XX series and is used to maintain such fluctuations .(Please refer the datasheet for further details).The XX indicates the output of the voltage it provides .7805 IC is also a preferred as it has a heat sink.

LED

Its primary use is to reveal the functionality of the circuit like whether the desired output is being furnished or not.In its place in reality if a chager is being connected then the device connected to the charger will start charging.

BC 547 —It is a NPN transistor which is used to build a dark sensor. Its main functionality is to negate the function of an LDR as discussed in the further topics.

LDR The main component for the construction of LDR is Cadmium Sulphide (Cds),which is used as the photo-conductor .It has high resistance in the absence of light and hence not allowing the flow of current and low resistance when there is light, which is being negated with the help of the BC 547 transistor. .

Connecting Wire-They are used for the connection on the Ferro board or any bread board .Specially it is required for the cascading of the Charger circuit with the dark sensor circuit.

9V battery- In my circuit we would always require a power supply .9V battery is the solution for this.

B. Equations

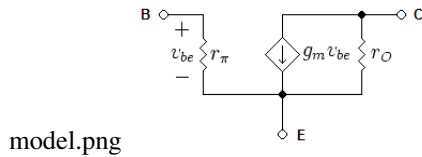
The equation to show the relationship between the resistance and illumination is -:

$$R = (A.E^a) \quad (1)$$

where E is illumination (LUX), R is Resistance (ohms) and A, a are constants.

C. WORKING of THE CIRCUIT

When light falls on the LDR then the sensor circuit becomes short and allows the current to pass to the charging circuit. We needed to negate that mechanism. Here the BC 547 (NPN) transistor comes into play which shifts the whole operation of the Ldr circuit by 180 degree. The negation operation can be proved with the help of the below hybrid figure as from the hybrid model the voltage gets phase shifted by 180 degrees. Now with the application of the light the LDR becomes of theoretically infinite resistance and hence current does not flow



into the charging circuit according to the results of the graph hence now if the device is kept in the dark the voltage in the output of the voltage regulator IC 7805 increases and hence the current as well as the charging speed. Please refer to the fig . 2for further reference.

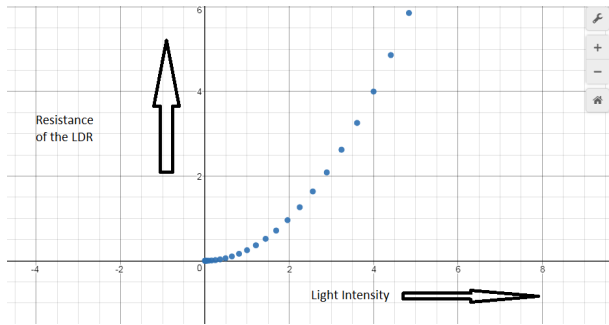


Fig. 2. This figure describes the relationship between the current and the resistance of Ldr using BC 547

D. DECOUPLING CAPACITORS

A decoupling capacitor is a capacitor used to decouple one part of an electrical network (circuit) from another. Noise caused by other circuit elements is shunted through the capacitor, reducing the effect it has on the rest of the circuit. An alternative name is bypass capacitor as it is used to bypass the power supply or other high impedance component of a circuit.

Here we will be using the decoupling capacitors as an active current source, like when there is power in the property then the capacitors will get charged and will provide a backup power supply for the transistor and the Ic to work.

They should be connected parallel to the voltage supply so that it can act as an active current source when there is no power supply.

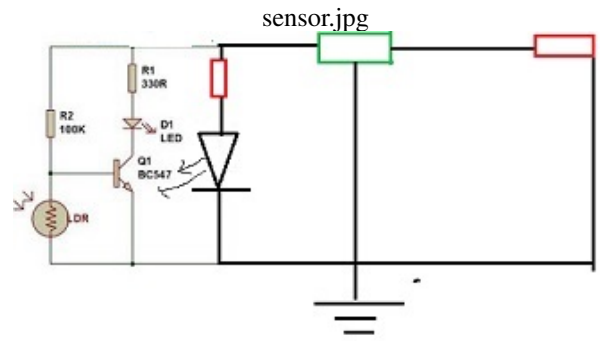
E. Home made circuit

II. CONCLUSION

This project is done keeping in mind an automatic charger .here the Ldr is being used as a sensor which senses darkness or rather no electric power.

Other ways which we can develop it is by a microcontroller-based sensor or a simple photoresistor for more power.

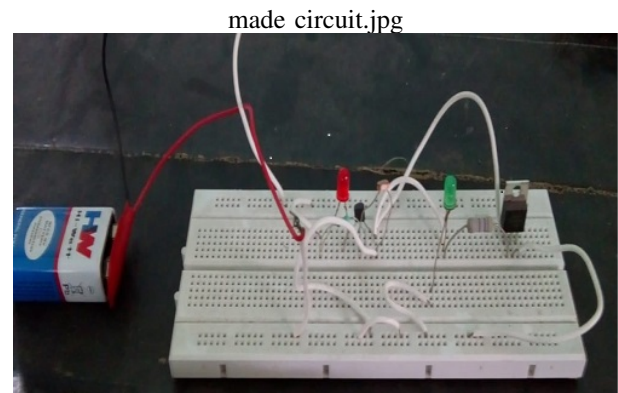
Its the beginning of a new era of automation. Lets make it large.



The blue box is the USB which is the output of the whole circuit or the USB

The small redbox is a 10 k resistance to protect the LED

The green box is the IC 7805 or the voltage regulator



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