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# 14W CFL Ballast

Mains Voltage is filtered by L1 and a 0.1uF capacitor. A 0.82 Ohm resistor is also provided and is probably fusible. It is then rectified by the bridge formed by D1-D4 and filtered by a 10uF capacitor. As power is first applied, a 100nF 63V capacitor begins charging through a 820K resistor. Once this capacitor reaches 32V, the DIAC breaks over turning on Q2. Power then flows through Q2, the top winding of T1, L2, a filament of fluorescent bulb FL1, a 4.7nF capacitor, the other filament of

FL1, and a 0.1uF capacitor, current being limited by L2 and the resistance in the filaments. Transformer action also begins inducing power in the other two windings of T1. This tends to begin to turn on Q1 and turn off Q2. Once Q1 is on, the charge that has built up in the 0.1uF and 4.7nF capacitors attached to FL1 begins flowing back the other way through the filaments, L2, the top turn of T1 and Q1. This once again induces power into the other two windings of T1 except in the opposite

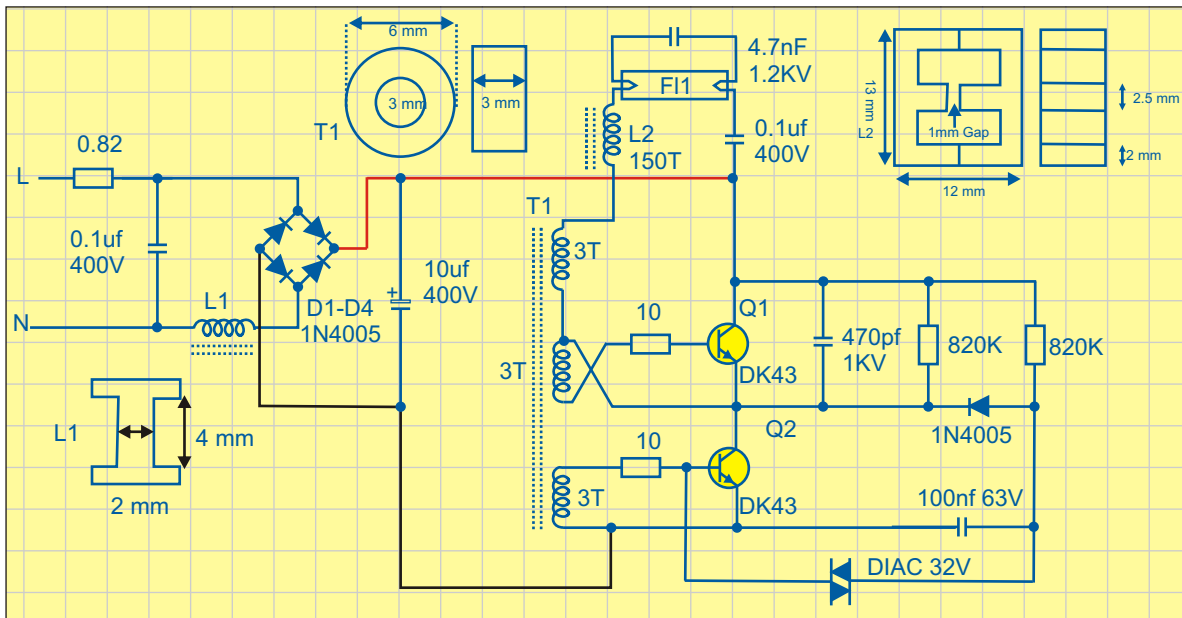


Fig.1. Circuit Diagram of 14W CFL Ballast

## [CIRCUIT IDEAS]

direction, eventually turning off Q1 and turning on Q2. The 470pF capacitor and other 820K resistor apparently make sure that both transistors are not on at the same time. Once the arc starts, most of the current flows directly between the filaments instead of through them. Only a small amount flows through them to keep them warm. All of the inductors and T1 are very small ferrites. L1 is 85 turns of 25-30 AWG magnet wire on a round I shaped ferrite core. The core is 2mm in diameter and the top and bottom are 5mm diameter with

4mm in between where the coil is wound. L2 is 150 turns of 25-30 AWG magnet wire on an E core with a 1mm gap precut in the center leg of one of the halves. The center leg measures 6 x 2.5mm in thickness. The outer legs measure 6 x 2mm. When the halves are put together, they are 13mm wide and 12mm tall. T1 is a tiny ferrite toroid with a 3mm hole, 6mm total diameter and is 3mm thick. Each of the 3 windings are 3 turns, counted in the usual way by the number of times the wire passes through the hole.

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