They show typical I_D versus V_{DS} for a logic level gate drive of 5V. To indicate the improvement the IGBT structure gives over standard MOSFETs, a graph of the typical performance of an identical chip size MOSFET has been plotted for comparison.

ZCN0545A for Off-Line Fluorescent Lamp Ballast.

Figure 5 shows the circuit of an 11W off-line fluorescent lamp ballast using two ZCN0545A IGBTs. The efficiency of the circuit is such that it allows the E-Line IGBTs to replace the TO220 / TO126 bipolar or MOSFET transistors commonly used in this application. This both lowers component costs and gives a reduction in circuit size - critical in integral lamp/ballast designs.

The 300ns turn-off capability of the ZCN0545A would allow operation at up to 100kHz but the working frequency of the design was set at 40kHz to minimise losses and HF interference. By controlling the phase of the current flowing in the IGBTs so that cross-conduction does not occur, switching losses have been virtually eliminated. Also, the low effective $R_{DS(on)}$ of the ZCN0545A keeps conduction losses to around 60mW in each device. Figure 6 shows the voltage and current waveforms of the IGBTs. Figure 7 shows an expanded view of the critical turn-off behaviour of the ZCN0545A. Note in particular that the drain current falls to zero before the drain voltage rises significantly, ensuring low switching losses.

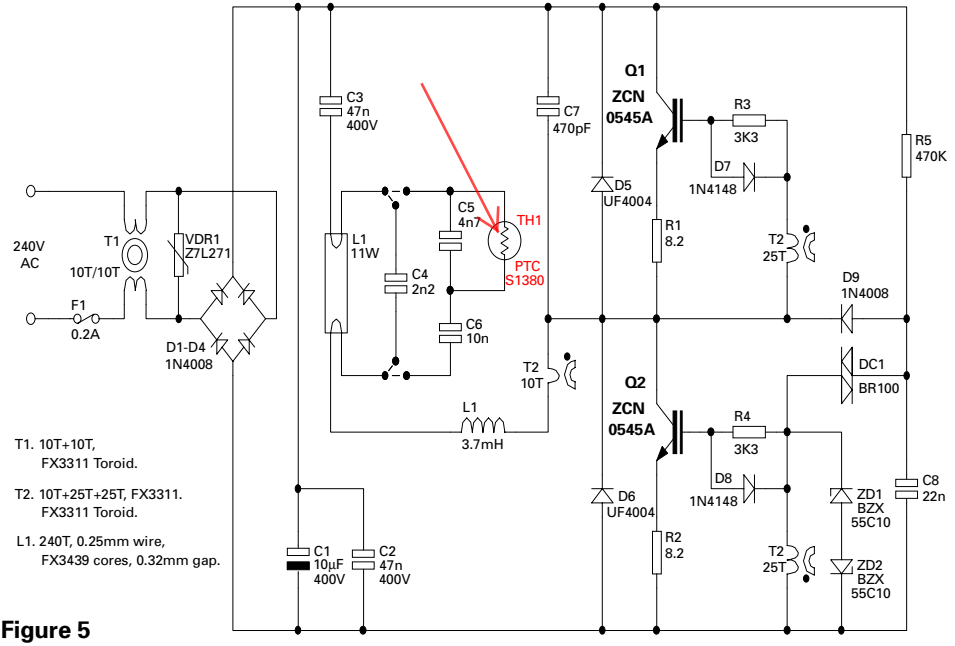

Figure 5
11W Off-line Compact Fluorescent Lamp (CFL) Ballast.