CHAPTER 8

DISCUSSION

From this study, it has been found that the design procedure for driven type and self oscillating type are similar. Differences between them, however, are the source for base current and the maximum flux density. The maximum flux density for self-oscillating type must equal to the saturation flux density of the core material. (Ref. 2) For driven type it must be less than the saturation flux density or power dissipation in collector junction will be high. Normally, converters must be designed to operate in cutoff and saturation region only. If driven converters operate in active region they become constant current sourses which possesses low efficiency.

A self-oscillating converter is more suitable for general power supply than a driven converter. It possesses higher efficiency and simplier circuit. From sections 5.1 and 5.2, the efficiency of the self-oscillating converter is 86.2 %, while the driven converter yields only 75.4 % . However, in some cases a driven converter has greater advantages. A driven converter is suitable for supplying heavy load at starting, especially for high power converter (ranging from a few kilowatts and upwards). A variable high voltage power source is another application for a driven converter. Its output voltage can be varied from 0 volt up to several kilovolts by varying the input voltage. A self-oscillating type is not suitable in this case because it will not oscillate at rated load when the input voltage is much lower than its

designed input voltage. A driven type is more suitable for an inverter because it possesses a more constant frequency than that of a self-oscillating type.

A converter which is designed according to chapter 3 and chapter 4 will result in high efficiency. The efficiency of a self-oscillating type will be about 85 % at rated load. The Feedback Voltage Table gives the value of the feedback voltage which will not cause too much losses in the biasing resistances R_1 and R_2 . The core selection criterion by frequency calculation gives a small core size which will be able to handle rated power. The current density calculated from eq. (3-11) gives a conductor wire which is small but possesses low loss and low voltage drop. The core seletion and current density selection by these criterions will reduce size, weight and cost of converters but at the same time will maintain high efficiency of operation.