

## C415424 : MAJOR ELECTRONIC DESIGN

KEY WORD:

ELECTRONIC BALLAST / FLUORESCENT LAMP

KITTI SUKUTAMATUNTI: A COMPARATIVE STUDY OF TWO ELECTRONIC BALLAST DESIGNS

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This thesis presents a comparative study of two types of electronic ballast for the 40-W fluorescent lamp, namely, the high-frequency (HF) type and the ultralow-frequency (ULF) type. Both types of the designated ballast obtain power from a single-phase, 220-volt, 50-hertz ac source. The HF ballast gives a sinusoidal output voltage at about 50 kHz whereas the ULF ballast gives a squarewave output voltage at a frequency in the 0.07 - 70 mHz range. The front end of both ballasts use the Siemens TDA4814 IC to obtain a nearly sinusoidal input current, correct the power factor to about 1.00, and deliver a dc voltage to the back-end inverter, which converts the dc voltage to an ac voltage to be fed to the fluorescent lamp. From comparison between the two types of ballast considering design, construction, and experimental application, it can be concluded that the HF-type ballast has advantages over the ULF-type because the former has a higher efficiency, uses fewer components, and can control the output power and the start-up of the fluorescent lamp more easily than the latter.