

MICONTROLLER BASED HIGH FREQUENCY MULTITASKING INVERTER WITH POWER FACTOR CORRECTOR

M. G. WANI¹ AND V. N. GOHOKAR²

¹ Assistant Professor, Maharashtra Academy of Engineering, Alandi(D), Pune, Maharashtra,India.

² Principal, Shri Sant Gajanan Maharaj College of Engineering, Shegaon, Maharashtra, India.

Abstract

As we are well aware about the power crisis faced by we in recent times and we are bound to face the same for some time in future. This situation leads to frequent load shedding and power failure. Needless to say that this has boosted the requirement of uninterrupted power supply requirement. Major chunk of the requirement is met using storage batteries and DC to AC Converters. Presently 50Hz/230V power generation is met using transformer (magnetic core based on metals and metal alloys). However they are heavy in weight, bulky in Volume and gives rise to weighty boxes and overall much higher volume. Additionally metal transformer has inherent loss factor of about 10%.To overcome these problems it is proposed to use high frequency ferrite based transformer less system. (Conventionally transformer is referred to metal based magnetic cores). As can be seen this process provides weight reduction by one fifth of conventional inverters, one third of volumetric reduction, 5 to 10 % better efficiency (and hence equally longer back up) and overall cost reduction by almost 25 to 35 %. Hence let us hope that this will provide emerging technology boost in recent future continual reduction in ferrite, and power drive system and ferrite prices will provide very good scope for further price reduction in future. As a pilot project under development is with the specifications 12 V DC to 220 V 50 Hz, 300 watt system. The same design with some modification can easily be adopted up to 2KW power levels. At higher power, however much more precautions and care is needed for circuit and component layout, PCB design, proper shielding.

Keywords : High Frequency, Inverter, Microcontroller, SMPS, and UPS.