

MICROCONTROLLER BASED BATTERY CHARGER

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This thesis is submitted as partial fulfillment of the requirements for the award of the degree of
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“I hereby acknowledge that the scope and quality of this thesis is qualified for the award of the degree of Bachelor of Electrical Engineering (Power System)”-

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Specially dedicated to

My beloved family who trust me in for all my life

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ABSTRACT

This thesis is about how power electronics can be implementing on embedded system program. Major in power electronics and controlling using embedded system is what the purpose of this project. This battery charger is supposed to be the fastest charging time among chargers that have nowadays. By using power electronics component that can handle big current and voltage this battery charger should be charging battery faster. Methodology that was use is SMPS topology that is Switch Mode Power Supply and using MOSFET as switching frequency. A switched-mode power supply, switching-mode power supply or SMPS, is an electronic power supply unit (PSU) that incorporates a switching regulator. The SMPS rapidly switches a power transistor between saturation and cutoff with a variable duty cycle whose average is the desired output voltage. The main advantage of this method is greater efficiency because the switching transistor dissipates little power in the saturated state and none in the off state. Other advantages include smaller size and lighter weight from the elimination of low frequency transformers and lower heat generation from the higher efficiency. Disadvantages include greater complexity, the generation of high amplitude, high frequency energy that the low-pass filter must block to avoid EMI, and a ripple voltage at the switching frequency.

ABSTRAK

Tesis ini adalah tentang bagaimana elektronik kuasa boleh melaksanakan rancangan sistem yang sedang tersirat. Utama di kuasa elektronik dan pengawalan menggunakan sistem terbenam adalah apa tujuan projek ini. Pengecas bateri ini adalah sepatutnya menjadi paling pantas mengenakan bayaran masa di kalangan pengecas-pengecas yang mempunyai sekarang. Dengan menggunakan elektronik kuasa komponen yang boleh menangani arus elektrik yang besar dan voltan pengecas bateri ini sepatutnya menjadi mengenakan bayaran bateri lebih cepat. Kaedah yang adalah penggunaan adalah topologi SMPS iaitu Switch Mode Power Supply dan menggunakan MOSFET sebagai kekerapan pensuisan. Satu bersuis mod bekalan kuasa, pensuisan mod bekalan kuasa atau SMPS, adalah satu kuasa elektronik unit bekalan (PSU) yang menggabungkan satu pengatur pensuisan. SMPS dengan pesat suis-suis satu transistor kuasa antara ketepuan dan potong dengan satu pemboleh ubah pusingan tugas yang purata adalah voltan keluaran terhasrat. Kelebihan utama cara ini adalah kecekapan lebih besar kerana peranti semikonduktor pensuisan menghilangkan tenaga kecil dalam negeri tepu dan tiada dalam negeri di luar. Kelebihan lain termasuk lebih kecil saiz dan pemetik api pemberat daripada penghapusan tranformer-transformer frekuensi rendah dan penjanaan haba lebih rendah daripada kecekapan lebih tinggi. Kelemahan termasuk lebih banyak kerumitan, generasi amplitud tinggi, tenaga frekuensi tinggi yang blok wajib turas laluan rendah bagi mengelakkan EMI, dan satu voltan riak di kekerapan pensuisan.

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