

# **PCB 板回流焊接温度控制系统**

## **摘 要**

表面贴装技术(SMT)是电子组装行业里常见的一种技术和工艺。电子电路表面组装技术(Surface Mount Techmology,SMT),称为表面贴装或表面安装技术,它是一种将无引脚或短引线表面组装元器件(简称 SMC/SMD,中文称片状元器件)安装在印制电路板(Printed Circuit Board,PCB)的表面或其它基板的表面上,通过再流焊或浸焊等方法加以焊接组装的电路装连技术。

文中论述了一种基于单片机的 PCB 板回流焊接温度控制系统的设计过程。在已有回流焊简易加工设备的基础上,硬件方案设计采用了工作效率较高、运算速度较快的 AT89C51 单片机作为控制器的核心,并采用了热电偶作为前端温度采集传感器,配合转换精度高并带有冷端补偿的 AD 温度转换芯片,将采集到的现场参数送到 LCD 显示器中。使用过程中预先设置所需的温度上下限,用温度传感器采集实时温度传输给单片机,以加热膜模拟加热环境,以蜂鸣器来实现报警,最后用风扇来实现降温、排风等一系列操作。

软件程序设计部分,根据功能要求,先后完成了温度采集程序设计、温度显示程序设计、温度调节程序设计及相关调试任务。

**关键词:** 回流焊接; 单片机; K 型热电偶; MAX6675

## Abstract

SMT is a common technology and process in electronic assembly industry. Surface mount technology (SMT), known as surface mount or surface mount technology, is a kind of surface mount components without pins or short leads (SMC / SMD for short) installed on printed circuit board, On the surface of PCB) or other substrates, the circuit assembly technology is welded and assembled by reflow welding or immersion welding.

The subject is the design of PCB reflow soldering temperature control system. On the basis of the existing reflow soldering simple processing equipment, the hardware design adopts the AT89C51 single-chip microcomputer with high working efficiency and fast calculation speed as the core of the controller, and uses the thermocouple as the front-end temperature acquisition sensor, with the ad temperature conversion chip with high conversion accuracy and cold end compensation, to send the collected field parameters to the LCD display. In the process of use, the upper and lower limits of the required temperature are set in advance, the real-time temperature collected by the temperature sensor is sent back to the single chip microcomputer, the heating film is used to simulate the heating environment, the buzzer is used to realize the alarm, and finally different fans are used to realize a series of operations such as cooling, ventilation, etc.

In the part of software program design, according to the requirements of hardware, the temperature acquisition program design, the temperature display program design, the temperature regulation program design and the final debugging process have been completed.

**Keywords:**Reflow Soldering; Single Chip Microcomputer; K-type Thermocouple; MAX6675

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