

Microwave high temperature automatic control system design

Microwave high temperature automatic control system design high-temperature heating technology is through the use of microwave energy will be heated to above 400 ° heating object and sintering was carried out on the heated object or class of heat treatment technology,

compared with the traditional heating technology, the difference is that microwave directly heated for heating an object or the object itself as a whole, has the advantages of traditional heating does not have, so have a good application prospect.

intro[Microwave high temperature sintering equipment](#)By AT89C52 microcontroller as the core of the main control and operation module, temperature acquisition module, power control module, serial communication module and man-machine interface module.

Among them,AT89C52, as the core part of control, is the execution part of the whole system instruction.

Mainly responsible for collecting the temperature data transmitted by the temperature sensor and controlling the output power according to the user's information. At the same time, the system parameters are transmitted to the upper computer through serial communication.



[Microwave heating machinery](#)Microwave power source is composed of microwave electron tube, circulator and power monitor. The function of the temperature acquisition module is to detect the temperature of the heated material in real time through the temperature sensor. The man-machine interface module includes key input and LCD display. Key input is the interface for

operators to input control parameters. LCD is used to display the temperature of heated materials and the current state of the system.

The power control module is used to control the output power of the magnetron. The communication module makes use of the full duplex asynchronous serial port provided by AT89C52. The temperature acquisition module of the system takes AT89C52 as the core.

The temperature data collected by the infrared thermometer are filtered out by low-pass filter and then entered the AIN0 channel of TLC2543 for A/D conversion. The converted temperature value is displayed on the liquid crystal at the same time.

The TLC2543 12 serial adc is TI company, using switch capacitance successive approximation technology to complete A/D conversion process, is to have 11 serial A/D converter, analog input channels with simplified ratio conversion scale power control module in the system mainly realize the fast temperature control of heating material, avoid thermal runaway.

Because in the process of microwave heating, the dielectric loss of

the material changes, when the temperature reaches a certain value, the dielectric loss of the material will rise sharply.

Microwave power control in this system this paper USES microwave heating theory, computer interface technology, data acquisition and processing theory to complete the design of microwave high temperature automatic control system.

After debugging the hardware interface and software program, it is proved that the system has good practicability and application prospect.