

## 声表面波煤矿瓦斯传感器声光报警系统的设计与制备

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**摘要:** 基于传统瓦斯传感器对应的打点声光报警设计, 具有反应周期长, 并不能完成自动控制的缺点, 应对新出现的声表面波瓦斯传感器的应用, 选用高性能处理器 STC89C52RC 芯片, 采用直接计数测频法, 完成对高频移信号的自动循环频率检测, 驱动语音芯片产生声光报警动作。该设计中 SAW 器件传感器频率测量具有与微处理器接口简单、工程上容易实现的高精度频率测量, 并使用 12 MHz 的有源晶振以提供时基频率, 以更好地提高频率测量过程中的精度, 从而满足应用需求。

**关键词:** 声表面波; 传感器; 瓦斯检测; 高频移; 声光报警

**中图分类号:** TD76

**文献标识码:** A

**文章编号:** 1000-7180(2015)12-0122-04

### The Sound and Light Alarm Circuit Design for Surface Acoustic Wave Methane Sensor

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**Abstract:** The sound and light alarm circuit of methane sensor based on traditional RBI needs a long response period, and it can't act with the automatic control. With the Surface Acoustic Wave (SAW) methane sensor being investigated, the better choice of high-performance processors STC89C52RC chip, using a direct frequency counting method, realizes the high-frequency signal automatic cycle detection among 50~450 kHz. With this design, the chip will drive voice chip to generate sound and light alarm action. The frequency measurement system for the SAW methane sensor has many features such as the simple microprocessor and easy implement of high precision frequency measurement. The application of active 12MHz time dependent frequency resonator can better improve the accuracy of the frequency measurement, which is mostly adapted for the application of SAW methane sensors.

**Key words:** SAW sensors; Methane detection; High frequency; Sound and light alarm

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**收稿日期:** 2015-04-03; **修回日期:** 2015-05-22

**基金项目:** 国家自然科学基金项目(61201088), 陕西省科技统筹计划项目(2012KTCL01-12); 教育部博士点新教师基金(No. 20106121120001); 陕西省教育厅产业化项目(2011JG10)