Smoke detectors save lives, but only when they are used properly.

3 out of 5 deaths result from fires in properties without working smoke alarms.

23% of deaths are caused by fires where smoke alarms were present, but were intentionally disabled due to false alarms.

83% less time available to escape a fire than in the 1970s due to the more synthetic materials in buildings.

New high performance sensing solutions from ADI are helping smoke and fire detector manufacturers to combat these challenges.

VISIT ANALOG.COM/SMOKEDETECTION
The Challenges for Manufacturers

High Occurrence of Nuisance Alarms, Which Results in:
- Turning off the detector
- Not changing batteries
- Covering the detector with plastic

Large Size and High Power
- Cannot be integrated into fixtures to meet architectural or aesthetic designs
- High power consumption
- Less suitable to meet demand for wireless detectors

Regulatory Compliance
- New products must pass UL 217 and EN 54/EN 14604 tests to reduce false alarms and detect fires caused by synthetic materials

The Solution from ADI

Space-saving integrated module—photodiode, AFE, and LEDs

On-chip calibration reduces factory end-of-line calibration requirements

Reduces power dissipation

Particle size estimation using two LEDs reduces false alarms

Enables UL 217-compliant detectors

**ADPD188BI**
An integrated smoke-to-bits sensor incorporating dual wavelength LEDs, a photodiode, and an AFE. The ADPD188BI has better smoke differentiation and fewer nuisance alarms due to its dual wavelength, wide dynamic range, and high SNR. It is engineered to meet the latest regulatory requirements such as UL 217 and EN 54/EN 14604.

Learn more at analog.com/smokedetection.

**Small Size, Easy to Mount, Designed for UL Listing**

**EVAL-CHAMBER/ EVAL-CHAMBER-10/28800X**
The patented ADI Smoke Chamber is designed for a controlled optical environment with maximum airflow. The background response of the chamber uses a small percentage of available dynamic range and provides self-diagnostic capability. It is engineered to meet the latest regulatory requirements. There are two evaluation models available, the EVAL-CHAMBER (2 pieces) and EVAL-CHAMBER-10 (10 pieces). The production version is the Accumold 28800X and is available from Accumold and Arrow.
UL Tested Smoke Detection Hardware and Software: Reduce Risk, Lower Development Cost, and Accelerate Time to Market

CN-0537 Smoke Detector Reference Design

This reference design plus related software is designed and tested to meet UL 217 8th edition and similar smoke/fire detection standards. To address the needs of different customers, a number of solution offerings are available, which are summarized in the table below. The hardware is Arduino form factor compatible and is designed to accelerate prototyping and the evaluation of the embedded smoke detection algorithm. The hardware is comprised of the EVAL-CN0537-AR0Z reference design, which is described in the CN-0537 circuit note, and the supporting EVAL-ADICUP3029 microcontroller board. The data (EVAL-CN0537-DATA) package provides an extensive smoke dataset taken at UL 217 certified facilities for those who wish to develop their own algorithm and the CN-0537 source code—excluding the detection algorithm. The algorithm (EVAL-CN0537-ALGO) package includes everything in the data package and a UL certified smoke detection algorithm with associated algorithm project files.

CN-0537 Reference Design Offerings

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<th>Solution Options</th>
<th>Description</th>
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| Hardware EVAL-CN0537-AR0Z EVAL-ADICUP3029 | Smoke detector reference design hardware for prototyping and solution evaluation. A tested and verified UL 217 smoke detection algorithm is embedded as part of the installer for evaluation. | Hardware  
▸ Smoke detector (CN-0537) reference design  
▸ Microcontroller development board (ADICUP3029)  
Software  
▸ UL 217 embedded SW executable (.hex)  
▸ ADPD188BI no-OS driver  
Documentation  
▸ CN-0537 circuit note  
▸ CN-0537 hardware user guide  
▸ Tested and verified UL 217 test result  |
| Data EVAL-CN0537-DATA | CN-0537 source code (excl. detection algorithm) plus over 1000 sample fire/smoke datasets taken at certified UL 217 facilities for algorithm development. | Data  
▸ UL 217 test datasets files  
Software  
▸ CN-0537 source code (excl. detection algorithm)  
Documentation  
▸ UL 217 test datasets user guide  |
| Algorithm EVAL-CN0537-ALGO | Full source code and UL 217 8th edition tested and verified algorithm, associated project files, CN-0537 source code and over 1000 sample fire/smoke datasets to accelerate system development. | Software  
▸ CN-0537 source code including UL 217 8th ed. detection algorithm (.c)  
▸ MATLAB® and Python UL 217 algorithm projects  
Data  
▸ UL 217 test datasets files  
Documentation  
▸ UL 217 algorithm documentation  
▸ UL 217 test datasets user guide  
▸ MATLAB/Python user guide  
Support  
▸ 10 hours of phone support  |