

SMOKE DETECTION

A Better Way to Design Smoke Detectors. A Better Way to Save Lives.

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.

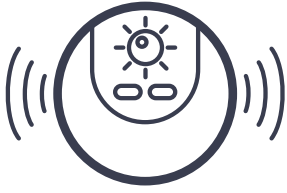


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 **ANALOG
DEVICES**

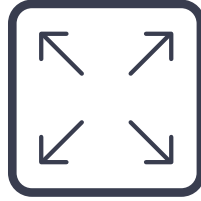
AHEAD OF WHAT'S POSSIBLE™

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

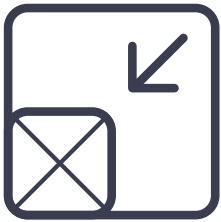
- 🔥 Cannot be integrated into fixtures to meet architectural or aesthetic designs
- 🔥 High power consumption
- 🔥 Less suitable to meet demand for wireless detectors



Regulatory Compliance

- 🔥 New products must pass UL 217/UL 268 and EN 54/EN 14604 tests to reduce false alarms and detect fires caused by synthetic materials

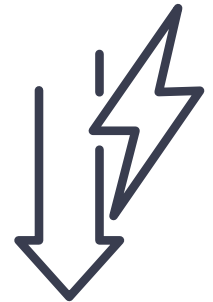
The Solution from ADI



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



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



Reduces power dissipation

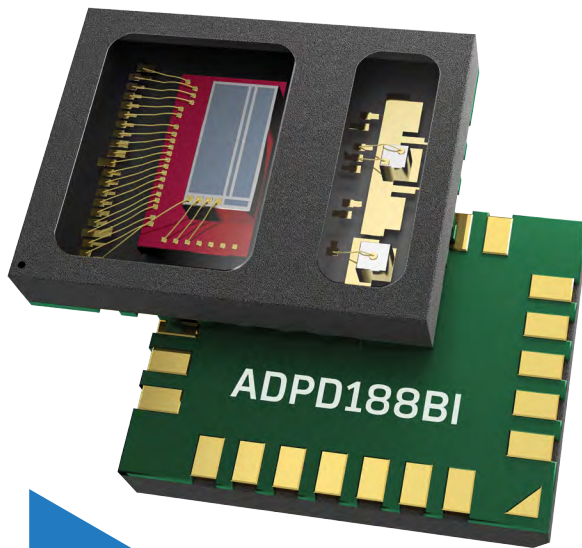


Particle size estimation using two LEDs reduces false alarms



Enables UL and EN compliant detectors

Better Performance. Greater Design Flexibility. Faster Time to Market.



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/UL 268 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, UL 268 7th 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-ARDZ 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 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

Solution Options	Description	Includes
Hardware EVAL-CN0537-ARDZ EVAL-ADICUP3029	Smoke detector reference design hardware for prototyping and solution evaluation. A tested and verified UL 217/UL 268 smoke detection algorithm is embedded as part of the installer for evaluation.	Hardware <ul style="list-style-type: none">▶ Smoke detector (CN-0537) reference design▶ Microcontroller development board (ADICUP3029) Software <ul style="list-style-type: none">▶ Embedded SW executable (.hex)▶ ADPD188BI no-OS driver Documentation <ul style="list-style-type: none">▶ CN-0537 circuit note▶ CN-0537 hardware user guide▶ Tested and verified UL 217/UL 268 test result
Data EVAL-CN0537-DATA	CN-0537 source code (excl. detection algorithm) plus over 1700 sample fire/smoke datasets taken at certified UL facilities for algorithm development.	Data <ul style="list-style-type: none">▶ UL test datasets files Software <ul style="list-style-type: none">▶ CN-0537 source code (excl. detection algorithm) Documentation <ul style="list-style-type: none">▶ UL test datasets user guide
Algorithm EVAL-CN0537-ALGO	Full source code and UL 217 8 th edition/UL 268 7 th edition tested and verified algorithm, associated project files, CN-0537 source code and over 1700 sample fire/smoke datasets to accelerate system development.	Software <ul style="list-style-type: none">▶ CN-0537 source code including UL detection algorithm (.c)▶ MATLAB® and Python UL algorithm projects Data <ul style="list-style-type: none">▶ UL test datasets files Documentation <ul style="list-style-type: none">▶ Algorithm documentation▶ UL test datasets user guide▶ MATLAB/Python user guide Support <ul style="list-style-type: none">▶ 10 hours of phone support