

MCD

High performance multi-channel infrared detector

Key Features:

- Four discrete high sensitivity optical channels in one package
 - Support simultaneous measurement of multiple materials
- MCD-13 and MCD-15 product lines cover 1 to 3 and 1 to 5.5 microns, respectively, for near- and mid-IR applications
- Compact, TO-5 package maximizes potential applications
 - Ideal for portable instruments where size is critical
 - Hermetically sealed for use in harsh environments
- Standard MCD-15 configuration available with optical filters
 - Filters target CO₂, CO and hydrocarbon measurements
- Designed for reliability to promote long life in the field



New application demands are driving instrument manufacturers to measure more materials or gases in smaller devices while still maintaining high sensitivity and quality. To meet these challenges, the MCD (multi-channel detector) product family provides four discrete optical channels in a compact TO-5 package. Offering Cal Sensors' renowned long-life, high-sensitivity PbS or PbSe detectors, MCD products cover from 1 micron up to 5.5 microns wavelengths for near- and mid-infrared applications.

These multi-channel detectors are designed in a quadrant configuration. A standard MCD 15 solution provides four isolated optical bandpass filters mounted on four discrete elements. Well suited for a variety of applications, including air quality monitoring and emissions analysis, the filters have peak wavelengths of 3.34, 4.26 and 4.60 microns to cover for hydrocarbon (such as methane), CO₂ and CO test requirements.

For over 25 years, Cal Sensors has been manufacturing and selling high performance PbS and PbSe infrared detectors.

Having established a reputation for highly controlled manufacturing processes, customers can rely on consistent, repeatable performance and superior customer service. Supporting all stages of development, from early prototyping to high volume production, Cal Sensors is dedicated to helping customers develop market-leading instruments. Custom requirements can be addressed by contacting the Cal Sensors' sales team.

Applications:

- Medical gas analysis
- Industrial gas analysis
- Auto and aviation emissions monitoring
- Air quality monitoring or analysis
 - Environmental
 - In tunnels
 - Underground

MCD Specifications¹

Model #	Part #	Element Size (mm)	Op. Temp.	Wave-length (pk signal, μm)	D* (cm Hz ^{1/2} /W)		Responsivity (λ_{pk} , 650Hz, V/W)		Dark Resistance (@23°C, M Ω /sq)	Time Constant (μs)	Max Rated Element Temp	Std Pkg (TO)
					(λ_{pk} , 650Hz, 1Hz)	(500K, 650Hz, 1Hz)	Min	Typ				
MCD-13 PbS multi-channel detector without filters												
MAP-15-4	40683	1x1/4	+23°C	2.4 typ	8x10 ¹⁰ min 1x10 ¹¹ typ	7.5x10 ⁸ min 9.4x10 ⁸ typ	5.3 x10 ⁵	8.0 x10 ⁵	0.5 - 2.0 1.0 typ	200 typ 400 max	65°C	5
MCD-15 PbSe multi-channel detector with optical filters specified below²												
MBXP-15-4	40642	1x1/4	+23°C	3.8 typ	7.0 x 10 ⁹ min 1.5x10 ¹⁰ typ	1.0x10 ⁸ min 1.5x10 ⁹ typ	1.5 x10 ⁴	3.0 x10 ⁴	0.1 - 2.5 0.8 typ	2 typ 5 max	85°C	5

¹ Specifications apply at a bias voltage of 35 V/mm across a detector and 1Mohm load resistor (in series) or 25V/mm directly across the detector

² Specifications apply prior to filter attenuation.

MCD-15 (Item # 40642) Filter Specifications

	CWL (μm)	HBW (μm)	Transmission at CWL (%)
CO	4.60 +/- .05	+/- .07 +/- .007	> 85
CO ₂	4.26 +/- .04	+/- .07 +/- .007	> 85
HC	3.34 +/- .03	+/- .07 +/- .007	> 55
REF	3.85 +/- .04	+/- .10 +/- .01	> 85

CWL = Center wavelength
HBW – Normal Band Pass

Mechanical Drawing

