Smoke Detection Modules & Components

OpticBlocks™, Chambers and Components

Applications

- Electro-optical smoke detection

Features and Benefits

- Complete Smoke Sensor with the OpticBlock plus Smoke Chamber with Mesh
- Precise component positioning for the OpticBlock
- 100% tested transfer function that is correlated to smoke sensitivity
- OpticBlock reflow solderable
- Smoke Chambers can be snapped onto PCB or the OpticBlock
- High quality components: Photodiodes, IREDs, and Blue LEDs (both emitters UL-listed)

Product Description

A complete electro-optical smoke detector module consists of an emitter (IRED or Blue LED) and Photodiode (PD) in a defined optical arrangement (OpticBlock) that detects scattered optical signal when smoke flows inside a Smoke Chamber. Signal range in the presence and absence of smoke (clean-air condition) and their long term stability are key features of a smoke detector module. The OpticBlock transfer function, i.e. the signal received at the PD under a test that simulates presence of smoke, is set to a specific range which helps to narrow and stabilize the smoke sensitivity range and the detection threshold. The Smoke Chambers are designed such that clean-air signals are kept to a minimum, enabling high signal-to-background ratio. The emitters (IRED or Blue LED) are all UL-certified for Smoke Detection, and together with legacy and time-tested photodiodes, a reliable smoke detection solution is realized. The OpticBlock and Smoke Chambers are produced in high volumes. Excelitas can offer customization if you want custom design for your smoke detection product. Please contact Excelitas to discuss your requirements.

Product Table

Selected Photodiodes Used in Smoke Detection Applications

Symbol / Unit	Package	Active Area (mm^2) mm	Minimum Short Circuit Current @ 100fc, 2850K µA	Maximum Dark Current @ VR = 10V nA	Maximun Junction Capacitance (pF)	Radiometric Sensitivity @ λ_P typ S_R A/W	Spectral Range λ_{RANGE} nm	Peak Wavelength λ_P nm	Noise Equivalent Power typ NEP W/√Hz
VTP1188SH	Lensed Ceramic	11	200 (Typical)	30 @V_R = 10mV	300 @V_R = 0V	0.55	400-1100	925	-
VTP1232H	T-1 3/4 lensed	2.326	100	25	100 @V_R = 0V	0.6	400-1100	920	-
VTP3410LAH	T-1 lensed IRT	0.684	15	35 @V_R = 50V	25 @V_R = 3V	0.55	700-1150	925	1.9 X 10-13
VTP3420LA	T-1 lensed IRT	1.64	34	35	150 @V_R = 15V	0.55	700-1150	925	-
VTP3430LA	T-1 lensed IRT	1.64	41	35	150 @V_R = 15V	0.55	400-1150	925	-

Product Table

Selected LEDs (IREDs and Blue LED) Used in Smoke Detection Applications

Symbol / Unit	Package	TypicalTotal Power (mW)	Typical Irradiance (mW/cm^2)	Test Current/ Pulsed (mA)	Typical Forward Voltage Drop (V)	Wavelength (nm)	Half Power Beam Angle
VTE1291-1H	T-1 3/4 lensed	20	3.3(1)	100	1.5	880	±12°
VTE1291-2H	T-1 3/4 lensed	25	6.5(1)	100	1.5	880	±12°
VTE1295H	T-1 3/4 lensed BULLET	20	5.5(1)	100	1.5	880	±8°
VTE3374LAH	T-1 lensed	5	5.2(2)	20	1.3	880	±10°
VTE3375LA	T-1 lensed	3	2(2) (Min.)	20	1.3	880	±12.5°
VTE3310	T-1 lensed	1	0.5 (2) (Min.)	20	3.2	460	±5°

(1): Tested at 36mm on a 6.4mm diameter.
(2): Tested at 10.16mm on a 2.1mm diameter.