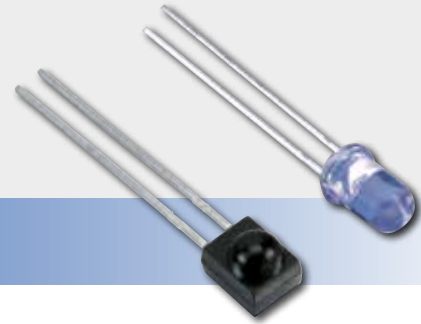


Application Specific Components For Smoke Detection



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Selected Photodiodes and Infrared Emitting Diodes (IREDs)

Applications

- Electro-optical smoke detection

Features and Benefits

- High quality components: photodiodes, IREDs (UL- listed)
- Binning for optimized transfer function
- Customized optical block (PD+IRED) assemblies
- Smoke chamber assemblies according specified transfer function

Product Description

An electro-optical smoke detector consists of an Infrared LED (IRED) and Photodiode (PD) assembly, which exhibits a signal under the presence of smoke in the detection volume (smoke chamber). Signal range under smoke and clean-air conditions and their long term stability are key features of a smoke detector module. Excelitas offers IRED and PD components as well as customized assemblies with specified signal level range. Such an assembly can be an optical block containing an IRED and PD for (SMD) board soldering or the complete smoke chamber, which are produced in high-volumes. Please contact Excelitas to discuss your requirements. In addition to the components presented in the table below, Excelitas can provide higher value-add assemblies, including the following for smoke detection applications:

- 1) An optics block which consists in a Photodiode-IRED pair selected, assembled into a plastic housing and tested to have a controlled range of transfer function between the IRED to photodiode signal under given smoke conditions.
- 2) A smoke chamber with base which can be easily integrated on a PCB for use with the optics block.

For further details on these or other sub-assemblies, including readout ICs, please contact Excelitas.

Product Table

Selected Photodiodes Used in Smoke Detection Applications

| Symbol | Package | Active Area (mm ²) | Minimum Short Circuit Current @ 100fc, 2850K | Maximum Dark Current @ VR = 10V | Maximum Junction Capacitance | Radiometric Sensitivity @ λp | Spectral Range | Peak Wavelength | Noise Equivalent Power |
|------------|-----------------------|--------------------------------|--|---------------------------------|------------------------------|------------------------------|--------------------|-----------------|------------------------|
| Unit | | mm | μA | nA | (pF) | typ | λ _{RANGE} | λ _P | typ |
| | | | | | | S _R | nm | nm | NEP |
| | | | | | | A/W | | | W/√Hz |
| VTP7840H | Lensed Sidelooker IRT | 5.27 | 50 | 20 | 40 @V _R = 3V | 0.55 | 725-1150 | 925 | 5.3 X 10-14 |
| VTP413H | Lensed Sidelooker IRT | 7 | 120 (Typical) | 20 | 50 @V _R = 0V | 0.55 | 725-1150 | 925 | 2.3 X 10-14 |
| VTP100H | Flat Sidelooker IRT | 7.45 | 35 | 30 | 50 @V _R = 3V | 0.5 | 725-1150 | 925 | 2.5 X 10-14 |
| 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 Infrared LEDs (IREDs) Used in Smoke Detection Applications

| Symbol | Package | Typical Total 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 | 20 | 5.5 ⁽¹⁾ | 100 | 1.5 | 895 | ±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 (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.