Optoelectronics – Small Low-Profile Package – 3 x 2 x 1 (mm)

Vishay’s 1 mm height emitters and detector have the best performance on the market. The emitters have the highest radiant intensity and feature the highest DC operating current up to 52 °C. At a 40 °C ambient temperature, the radiant intensity of the Vishay part is higher than the competing emitters by more than a factor of 2. The photo PIN diode has the lowest dark current, which results in the best signal-to-noise ratio.

FEATURES AND BENEFITS
Detector – VEMD10940F
- Wavelength of peak sensitivity, \( \lambda_p = 920 \text{ nm} \)
- Reverse light current, \( I_{\text{rs}} = 3 \mu A \)
- Low dark current: \( I_{\text{ro}} = 1 \text{ nA} \)
- Daylight filter
- Operating temperature range: −40 °C to +100 °C

Emitters
- Emitting wavelength, \( \lambda_p \)
  - VSMB10940 = 940 nm
  - VSMG10850 = 850 nm
- Angle of half intensity:
  - Horizontal: \( \phi_H = \pm 77.5° \)
  - Vertical: \( \phi_V = \pm 72.5° \)
- Radiant intensity, \( I_e = 1 \text{ mW/sr} \)
- Operating temperature range: −40 °C to + 85 °C

APPLICATIONS
- Infrared touch panels
- Space-constrained assemblies

RESOURCES
- Datasheet: VSMB10940, VSMG10850, VEMD10940F
- For technical questions contact sensorstechsupport@vishay.com
- Material categorization: For definitions of compliance please see http://www.vishay.com/doc?99912
The VEMD10940F, VSMB10940, and VSMG10850 have a wide angle of half sensitivity and intensity profile, typically ±75°. The VSMB10940 has a peak intensity of 940 nm while the VSMG10850 peaks at 850 nm. Both emitters provide a radiant intensity of typically 1 mW/sr at 20 mA drive current. The VEMD10940F has a peak sensitivity of 920 nm and is optimized to maintain over 95% sensitivity for the wavelength range of 840 nm to 970 nm. Therefore, it is ideally matched to both emitters. The VEMD10940F includes a filter to block visible light and provides a typical photo current of 3 µA given an irradiance of 1 mW/cm², \( V_r = 5 \), \( \lambda = 950 \) nm.

### BENCHMARK PERFORMANCE

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>TYPE</th>
<th>COMPETITION</th>
<th>ANGLE OF HALF SENSITIVITY ( \Phi ) (°)</th>
<th>WAVELENGTH OF PEAK SENSITIVITY ( \lambda_p ) (nm)</th>
<th>SPECTRAL SENSITIVITY RANGE (nm)</th>
<th>LIGHT CURRENT ( I_{P, TYP} ) (µA)</th>
<th>DARK CURRENT ( I_{P, MAX} ) (µA)</th>
<th>OPERATING TEMPERATURE RANGE (°C)</th>
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</thead>
<tbody>
<tr>
<td>VEMD10940F</td>
<td>Diode</td>
<td>Vishay</td>
<td>75</td>
<td>920</td>
<td>780 to 1050</td>
<td>3</td>
<td>10</td>
<td>- 40 to 85</td>
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<tr>
<td>PP1191FB</td>
<td>Diode</td>
<td>Stanley</td>
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<td>950</td>
<td>780 to 1050</td>
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<tr>
<td>LTR-S320</td>
<td>Diode</td>
<td>Liteon</td>
<td>65</td>
<td>940</td>
<td>750 to 1100</td>
<td>3.6</td>
<td>10</td>
<td>- 40 to 85</td>
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