Zero Bias Detector Diodes

Features
- Can Be Used Without External DC Bias
- Exhibit Uniform Rv Characteristics
- High Voltage Sensitivity
- Available in Packages, Chips and Beam Leads

Description
This family of Zero Bias Detector (ZBD) diodes is designed for use in video detectors and power monitors eliminating the need to provide external DC bias to the diode.

These diodes offer good output sensitivity and low junction capacitance.

M/A-COM's Zero Bias Detector diodes are available in two hermetic packages, and as bondable chips and beam leads. This series of diodes are offered with video impedances of 0.5 to 15 k Ohms at zero bias.

Applications
This series of diodes is useful as video detectors and power monitors through K-band and do not require external DC bias.
## Schottky ZBD Beam Lead Diodes
(Case Style 965A)

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Test Frequency Band</th>
<th>Minimum $^2$ $T_{SS}$ (-dBm)</th>
<th>Minimum $^2$ $E_o$, mV</th>
<th>$R_V^{3,4,5}$ (k Ohms)</th>
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## Silicon Packaged and Chip ZBD Diodes

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<th>Model Number</th>
<th>Case Style</th>
<th>Minimum $^2,6$ $T_{SS}$ (-dBm)</th>
<th>Minimum $^2,6$ $E_o$, mV</th>
<th>$R_V^{3,4,5}$ (k Ohms)</th>
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</table>

### Specifications @ $T_A = +25^\circ$C

**Maximum Ratings**

- **Temperature Ratings:**
  - Operating and Storage Temperature: $-65^\circ$C to $+150^\circ$C

- **Power Ratings:**
  - Maximum Peak Incident RF Power: 0.5 Watts for 1 µsec maximum
  - Maximum Peak CW RF Power: 100 mW at maximum operating temperature.

- **Solder Temperatures:**
  - For case style 54, 186: 230°C for 5 sec
  - (1mm from package)
  - For case style 119: 200°C for 5 sec (maximum)

**Notes:**
1. Schottky barrier diodes are thermocompression bonded in case styles 119 and 186. Case style 135A is a bondable chip. Other case styles may be available. For additional information, contact the factory.
2. Order chip parts add 135A as the suffix to the part number, i.e., MA4E929A-135A. Only the MA4E929 series is available as a chip.

**Specifications Subject to Change Without Notice.**

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Typical Performance Curves

**ZERO BIAS SCHOTTKY DETECTOR DIODE NOMINAL OUTPUT VOLTAGE AT 25°C AND 10 GHz WITH A FIXED TUNED HOLDER AN R_L = 10K OHMS.**

- **DIODES WITH R_L= 5-10K OHMS**
- **DIODES WITH R_L= 0.5-1K OHMS**
- **DIODES WITH R_L= 1.2K OHMS**
- **DIODES WITH R_L= 10-15K OHMS**

**VOLTAGE vs POWER IN dBm AT 10 GHz**

**ZERO BIAS SCHOTTKY DETECTOR VOLTAGE SENSITIVITY FOR DIODES WITH 2-8K OHM VIDEO IMPEDANCE.**

**TEST CONDITIONS**
- **F=10 GHz**
- **NO DC BIAS**
- **IN HOLDER FIX TUNED FOR OPTIMUM TSS AT 25°C AND 10K OHM**

**VOLTAGE vs POWER IN dBm**

**ZERO BIAS SCHOTTKY DETECTOR VOLTAGE SENSITIVITY CHARACTERISTICS UNDER TEMP FOR DIODE WITH 2-8K OHM VIDEO IMPEDANCE.**

- **F=10 GHz**
- **R_L= 10 kΩ**
- **IN HOLDER FIX TUNED FOR OPTIMUM TSS AT 25°C AND 10 KΩ LOAD**

**VOLTAGE vs POWER IN dBm**

**TSS CONVERSION FOR BANDWIDTHS OTHER THAN TEST BANDWIDTH.**

**ZERO BIAS SCHOTTKY DETECTOR DYNAMIC RESISTANCE (R_V) vs POWER FOR DIODES OF DIFFERENT IMPEDANCE RANGES.**

**TEST CONDITIONS**
- **25°C**
- **F=10 GHz**
- **R_L= 10 KΩ**
- **IN HOLDER FIX TUNED FOR OPTIMUM TSS AT 25°C AND 10 KΩ LOAD**

**RESISTANCE (OHMS) vs POWER IN dBm**