



**Bay Linear**

*Inspire the Linear Power*

## Surface Mount Zero Bias Schottky

### Detector Diodes

**B8250**

Series

### Description

The B-8250 line of zero bias Schottky detector diodes by Bay Linear have been engineered for use in small signal (Pin<-20 dBm) applications at frequencies below 2.0 GHz. The ideal applications are for RF/ID and RF Tags where primary (DC bias) power is not available.

At Bay Linear, our commitment to quality components gives our customers a reliable second source of products, which are tested at a more stringent level than our competitors. Manufacturing techniques assure that when two diodes are mounted into a single package they are taken from adjacent sites on the wafer.

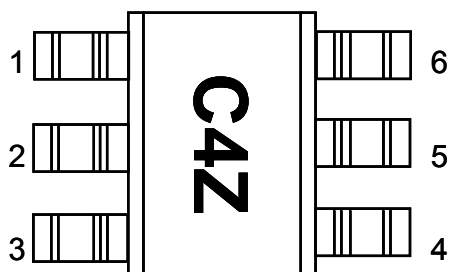
In cross referenced parts, we guarantee pin to pin compatibility. The various package configurations available provide a low cost solution to a wide variety of design problems.

### Features

- **Surface Mount SOT-23 3 Pin Packages**
- **SOT-143 Packages 4 Pin Packages**
- **Miniature SOT-323/363 3 pin and 6 pin**
- **High Detection Sensitivity:**  
up to 50mV/μW at 915 MHz
- **Low Flicker Noise: -165 dBV/Hz at 100Hz**
- **Low reverse leakage**
- **Matched Diodes**
- **High Thermal Conductivity for greater Power**

### Pin Connection

#### Pin Connections and Package Marking

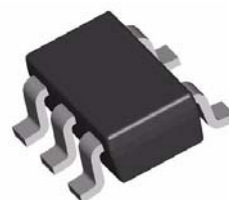


Notes:

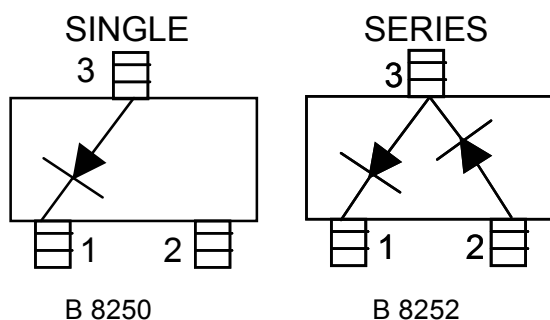
1. Package marking provides orientation and identification
2. See "Electrical Specifications" for appropriate package marking

### Ordering Information

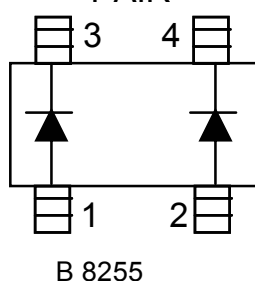
Package	Part No.
SOT-26	B850XK6 -X.X



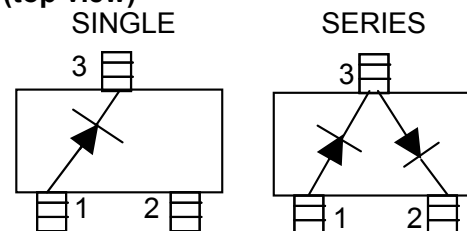
### SOT-23/SOT-143 Package Lead Code Identification (top view)



### UNCONNECTED PAIR

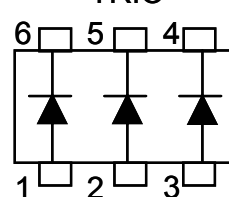


### SOT-323 Package Lead Code Identification (top view)

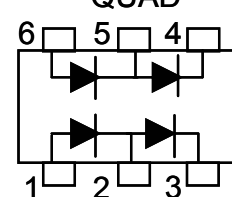


### SOT-23 Package 6 Lead Code Identification (top view)

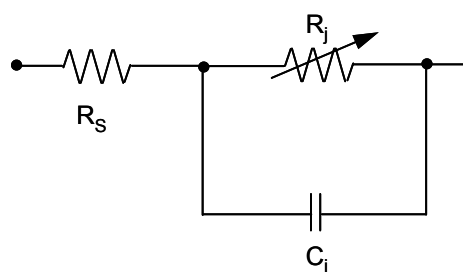
#### UNCONNECTED TRIO



#### BRIDGE QUAD



### Equivalent Linear Circuit Model



RS=series resistance (see Table of SPICE parameters)  
CJ = junction capacitance (see Table of SPICE parameters)  
RJ =  $8.33 \times 10^{-5} \text{ nT}$

where

Ib = externally applied bias current in amps  
Is = saturation current (see table of SPICE parameters)  
T = temperature, °K  
n = ideality factor (see table of SPICE parameters)

### SPICE PARAMETER

Parameter	Units	B 825X
B <sub>V</sub>	V	5.0
C <sub>JO</sub>	pF	0.175
E <sub>G</sub>	eV	0.68
I <sub>BV</sub>	A	2.9 E-4
I <sub>S</sub>	A	2.9 E-6
N		1.03
R <sub>S</sub>	Ω	26
P <sub>B</sub> (V <sub>J</sub> )	V	0.350
P <sub>T</sub> (XT1)		1.95
M		0.49

**Absolute Maximum Ratings**

Parameter	Symbol	SOT-23/143	SOT-323	Units
Peak Inverse Voltage	$P_{IV}$	2.0	2.0	V
Junction Temperature	$T_J$	150	150	°C
Storage Temperature	$T_{STG}$	-65 to 150	-65 to 150	°C
Operating Temperature	$T_{NP}$	-65 to 150	-65 to 150	°C
Thermal Resistance[2]	$\theta_{jc}$	500	150	°C/W

**DC Electrical Specifications ( $T_C = 25^\circ\text{C}$ , Single Diode)**

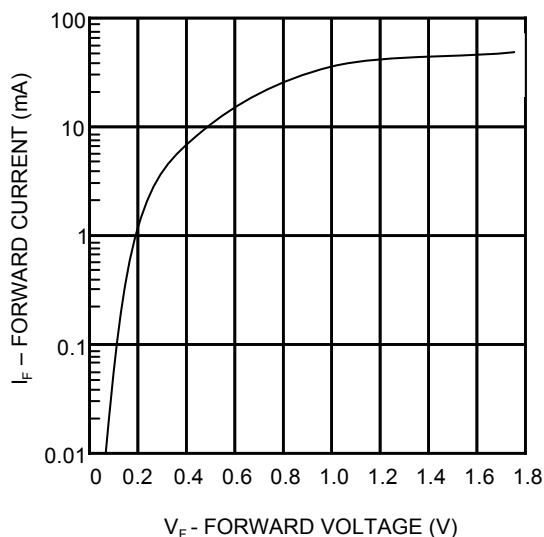
Part No.	Package Marking	Configuration	Maximum Forward Voltage VF (mV)		Typical Capacitance CT (pF)
8250	C0	Single	150	250	0.30
8251	C1	Single			
8252	C2	Series Pair[2,3]			
8253	C3	Series Pair[2,3]			
8254	C4	Bridge Quad			
8255	C5	Unconnected Pair[2,3]			
8256	C6	Unconnected Trio			
Test Conditions			$I_F = 0.1 \text{ mA}$	$I_F = 1.0 \text{ mA}$	$V_F = -0.5 \text{ V to } -1.0 \text{ V}$ $F = 1 \text{ MHz}$

**DC Electrical Specifications,  $T_C = +25^\circ\text{C}$ , Diode Pairs**

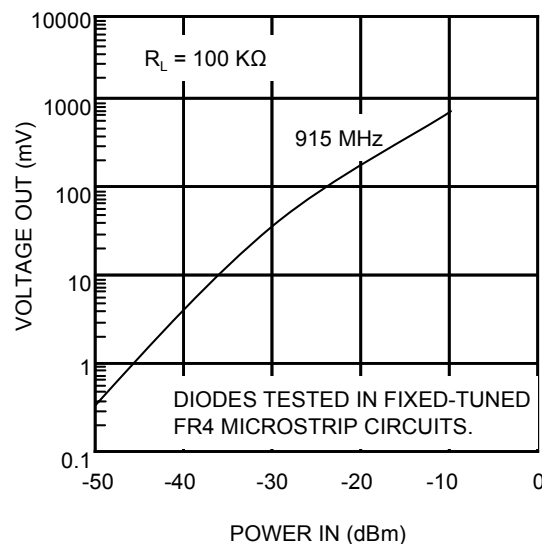
Part Number	Maximum Forward Voltage Difference $\Delta V_F$ (mV)	Maximum Capacitance Difference $\Delta C_T$ (pF)
8252 8253	15	-0.5
Test Conditions	$I_F = 0.1 \text{ mA}$	$V_F = -0.5 \text{ V to } -1.0 \text{ V}$ $F = 1 \text{ MHz}$

## Notes:

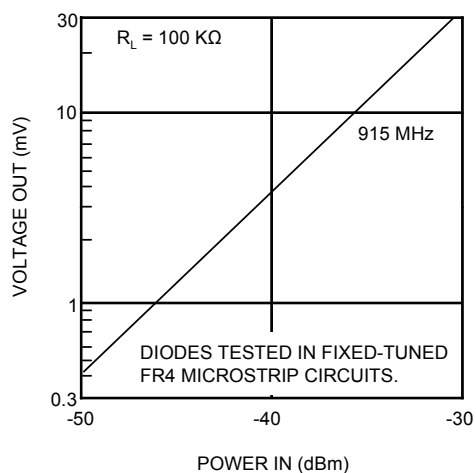
1. Operation in excess of any one of these conditions may result in permanent damage to the device
2.  $T_C = +25^\circ\text{C}$ , where  $T_C$  is defined to be the temperature at the package pins where contact is made to the circuit board



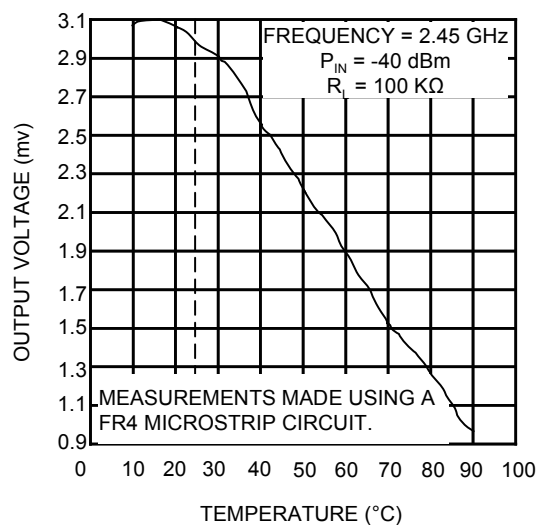
**Graph 1: Typical Forward Current vs. Forward Voltage**



**Graph 2: +25°C Output Voltage vs. Input Power at Zero Bias**



**Graph 3: +25°C Expanded Output Voltage vs. Input Power. See Figure 2.**



**Graph 4: +25°C Output Voltage vs. Temperature.**

**Advance Information-** These data sheets contain descriptions of products that are in development. The specifications are based on the engineering calculations, computer simulations and/ or initial prototype evaluation.

**Preliminary Information-** These data sheets contain minimum and maximum specifications that are based on the initial device characterizations. These limits are subject to change upon the completion of the full characterization over the specified temperature and supply voltage ranges.

The application circuit examples are only to explain the representative applications of the devices and are not intended to guarantee any circuit design or permit any industrial property right to other rights to execute. Bay Linear takes no responsibility for any problems related to any industrial property right resulting from the use of the contents shown in the data book. Typical parameters can and do vary in different applications. Customer's technical experts must validate all operating parameters including "Typical" for each customer application.

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## **LIFE SUPPORT AND NUCLEAR POLICY**

Bay Linear products are not authorized for and should not be used within life support systems which are intended for surgical implants into the body to support or sustain life, in aircraft, space equipment, submarine, or nuclear facility applications without the specific written consent of Bay Linear President.

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