

# Zero Bias Detector Diode

## MZB604

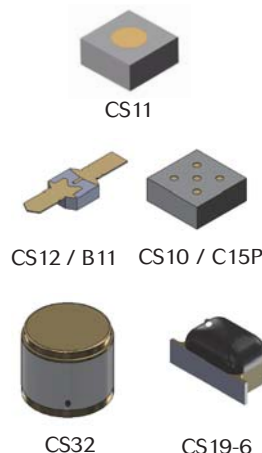


### Features

- Very Low Forward Voltage: 300 mV maximum @ 1 mA
- Low Tangential Signal Sensitivity: -42 dBm typical
- Low Junction Capacitance:  $C_J = 0.2$  pF typical
- High breakdown voltage: 4 V minimum
- Available in Beam Lead, Multijunction Chip or Packaged
- RoHS Compliant

### Applications

- Sensitive, low input power detectors



### Description

The MZB604 ZBD diode is a sensitive, very low barrier height Schottky diode designed for use in high frequency, low input power detectors. It is known as a zero bias detector (ZBD) since its very low barrier height results in excellent sensitivity to very small signals without the need for external bias current. This diode is available as a five-junction common-anode chip, as a single-junction beam lead or packaged in one of several suitable packages. It is manufactured using Aeroflex/Metelics proven diode fabrication process which optimizes diode characteristics for optimal electrical performance and excellent reliability.

The low junction capacitance (0.2 pF typical) of the MZB604 enables the device to be used in sensitive detector circuits with input signals up to 20 GHz.

This rugged device is capable of reliable operation in all military, commercial and industrial applications. The device is RoHS compliant.

### Environmental Capabilities

The MZB604 ZBD diode is capable of meeting the environmental requirements of MIL-STD-750 and MIL-STD-883.

### ESD Rating

As are all semiconductors, ZBD Diodes are susceptible to damage from ESD events. Proper ESD prevention procedures should be followed. The ESD rating for this device is Class 0 (HBM).

### MZB604 Electrical Specifications

$T_A = 25$  °C (unless otherwise noted)

Parameter	Symbol	Test Conditions	Minimum Value	Typical Value	Maximum Value	Units
Breakdown Voltage	$V_B$	$I_R = 100 \mu A$	4			V
Forward Voltage	$V_F$	$I_F = 1$ mA			300	mV
Video Resistance	$R_V$	$I_F = 75$ mA, $f = 1$ GHz		5000		$\Omega$
Junction Capacitance	$C_J$	$V_R = 0$ V, $f = 1$ MHz		0.2		pF



## Absolute Maximum Ratings

$T_A = 25\text{ }^\circ\text{C}$  (unless otherwise noted)

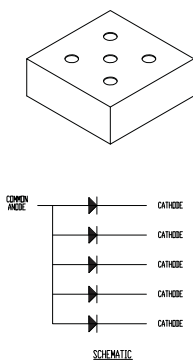
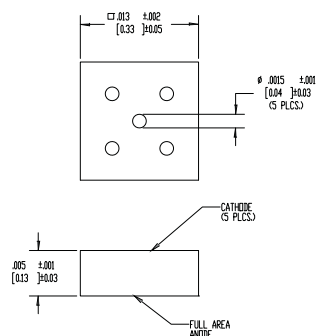
Parameter	Conditions	Absolute Maximum Value
Forward DC Current		100 mA
Reverse DC Voltage		4 V
Operating Temperature		-55 °C to 150 °C
Storage Temperature		-65 °C to 200 °C
Junction Temperature		150 °C
Total Dissipated Power	Infinite heat sink, $T_{\text{case}} = 25\text{ }^\circ\text{C}$ . Derate power linearly from 750 mW @ 85 °C to 0 W @ 175 °C	100 mW

## Assembly Instructions

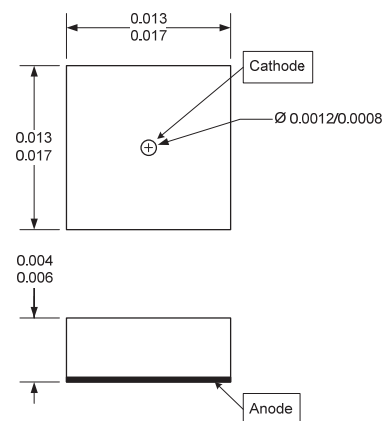
Die attach of the MZB604 ZBD common anode chip diodes may be accomplished with eutectic solders, such as 80 Au / 20 Sn, or conductive epoxy. The leads of the beam lead device may be attached to a hybrid circuit using thermocompression bonding or conductive epoxy.

## Outline Drawings

### Case Style CS10/C15P Outline:

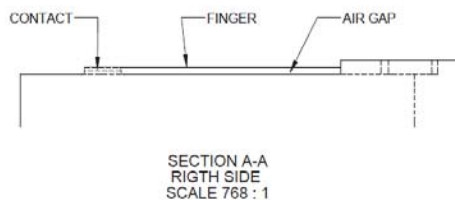
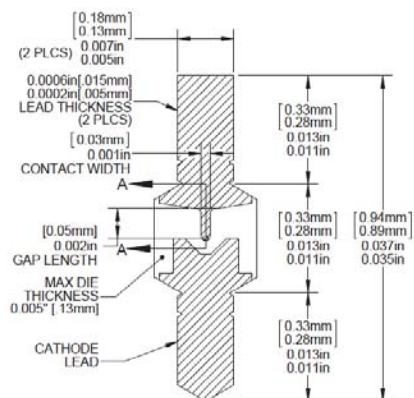


### Case Style CS11 Outline:



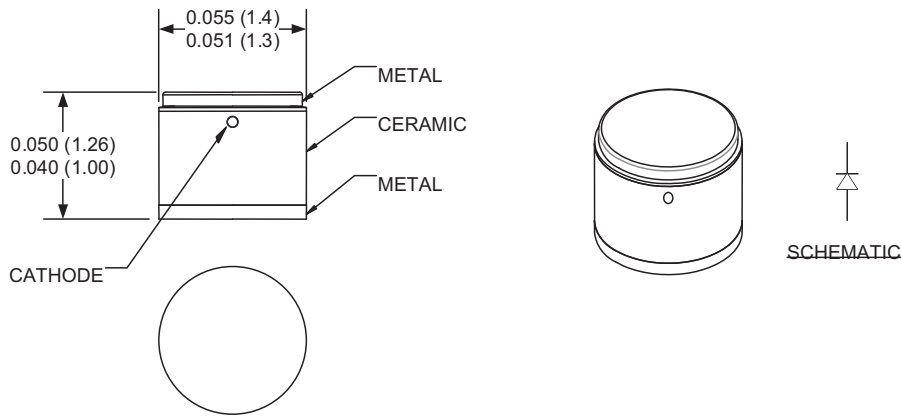
All dimensions in inches.

### Case Style CS12/B11 Outline:



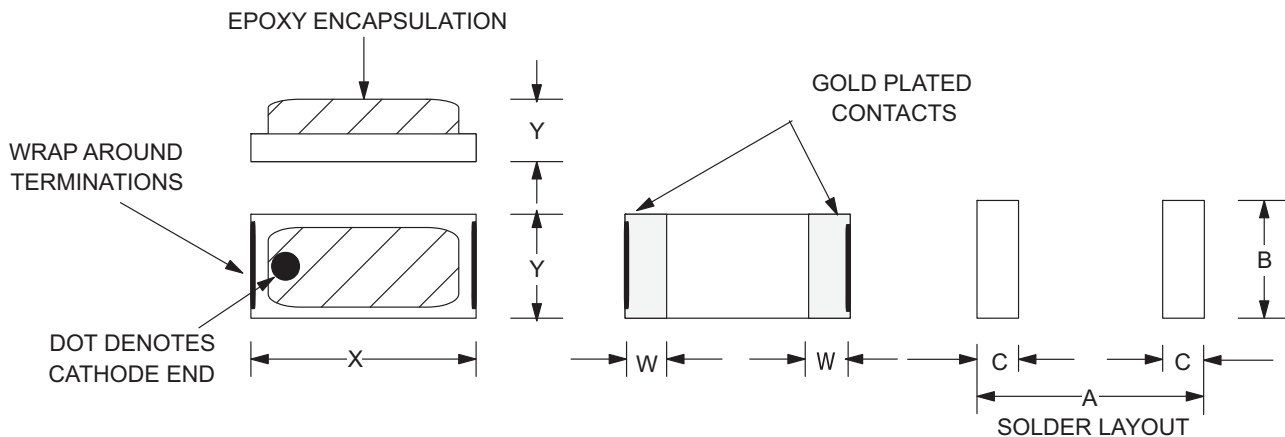
# MZB604 ZBD Diode

## Case Style CS32 Outline:



NOTE:  
DIMENSIONS IN INCHES (mm).

## Case Style CS19-X Outline:



PKG STYLE	DIMENSIONS				SOLDER LAYOUT (TYP.)			PACKAGE CP AND LP
	W DIM.	X DIM	Y DIM.	Z DIM.	A	B	C	
CS19-1	12 (.304)	60 (1.52)	40 (1.01)	30 (.762)	72 (1.83)	40 (1.52)	20 (.508)	.06 pF .4 nH
CS19-2	12 (.304)	75 (1.91)	50 (1.27)	35 (.889)	87 (2.21)	70 (1.78)	20 (.508)	.07 pF .4 nH
CS19-3	12 (.304)	100 (2.54)	50 (1.27)	35 (.889)	112 (2.84)	70 (1.78)	20 (.508)	.08 pF .5 nH
CS19-4	12 (.304)	120 (3.05)	60 (1.52)	35 (.889)	132 (3.35)	80 (2.03)	20 (.508)	.09 pF .6 nH
CS19-5	12 (.304)	200 (5.08)	100 (2.54)	35 (.889)	212 (5.38)	120 (3.05)	20 (.508)	.10 pF .6 nH
CS19-6	10 (.254)	40 (1.01)	20 (.508)	30 (.762)	50 (1.27)	30 (.762)	15 (.381)	.05 pF .4 nH
CS19-7	10 (.254)	60 (1.52)	20 (.508)	30 (.762)	70 (1.78)	30 (.762)	15 (.381)	.06 pF .4 nH
TOL. ±	2.0 (.051)	3.0 (.076)	3.0 (.076)	MAX.	NOM.	NOM.	NOM.	NOM.

## Part Number Ordering Information

Part Number	Description	Packaging
MZB604-CS11-W	ZBD Diode Chip	Waffle Pack (Quantity = 400)
MZB604-C15P-W	ZBD Diode Chip	Waffle Pack (Quantity = 400)
MZB604-B11-GP	ZBD Diode Beam Lead	GelPak™ (Quantity = 100)
MZB604-19-1-W	ZBD Diode in CS19-1 Package	Waffle Pack (Quantity = 100)
MZB604-19-1-R	ZBD Diode in CS19-1 Package	Tape & Reel (Quantity = 3000/reel)
MZB604-32-W	ZBD Diode in CS32 Pill Package	Waffle Pack (Quantity = 100)

Contact the factory for other packaging options.

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