

SCHOTTKY BARRIER MIXER AND DETECTOR DIODES

ASI's Schottky Barrier Mixer and Detector Diodes are manufactured by the deposition of a suitable barrier metal on an epitaxial silicon layer to form a junction. These diodes are designed for applications up to 40 GHz for use in Waveguide, Coaxial and Stripline circuits.

Several barrier heights are available which include:

- LOW BARRIER (N-TYPE) - for applications where the local oscillator drive level is between -10 dBm and +10 dBm.
- MEDIUM BARRIER (N-TYPE) - for applications where the local oscillator drive level is between -5 dBm and +15 dBm.
- HIGH BARRIER (N-TYPE) - for applications where the local oscillator drive is between 0 dBm and +20 dBm.
- LOW BARRIER (P-TYPE) - for applications where low 1/f noise for use in Doppler Radar and Motion Detectors is required.

The Schottky Barrier Mixer Diodes are characterized by noise figure in four different frequency ranges: S, X, K μ and K α -Bands.

The Schottky Barrier Detector Diodes are characterized by Tangential Signal Sensitivity (TSS) in four different frequency ranges: S, X, K μ and K α -Bands.

In addition to being used in mixer and detector applications these Schottky Barrier Diodes can also be used for modulators, high speed switches and low power limiters.

All of the Schottky Barrier Mixer and Detector Diodes meet or exceed the Military Environmental Specifications of MIL-S-19500 and Methods from MIL-STD-750 and/or customer specifications.

ABSOLUTE MAXIMUM RATINGS:

Storage Temperature: -65° C to +175° C
Operation Temperature: -65° C to +150° C
Incident RF CW Power: 100 mW max

SCHOTTKY BARRIER MIXER DIODES

| LOW BARRIER (N-TYPE) | | | | | | |
|----------------------|-------------|-------------------|--------------------------------|-----|------|--------------------|
| FREQUENCY BAND | TYPE NUMBER | NF ⁽¹⁾ | Z _{IF} ⁽²⁾ | | VSWR | TEST FREQUENCY MHz |
| | | (dB) | (OHMS) | | MAX | |
| | | MAX | MIN | MAX | MAX | |
| S | AML3001 | 5.5 | 100 | 300 | 1.7 | 3060 |
| S | AML3002 | 6.0 | 100 | 300 | 1.8 | 3060 |
| S | AML3003 | 6.5 | 100 | 300 | 2.0 | 3060 |
| X | AML9001 | 5.5 | 200 | 500 | 1.6 | 9375 |
| X | AML9002 | 6.0 | 200 | 500 | 1.6 | 9375 |
| X | AML9003 | 6.5 | 200 | 500 | 1.6 | 9375 |
| X | AML9004 | 7.0 | 200 | 500 | 1.6 | 9375 |
| K _μ | AML1601 | 6.0 | 200 | 500 | 1.6 | 16000 |
| K _μ | AML1602 | 6.5 | 200 | 500 | 1.6 | 16000 |
| K _μ | AML1603 | 7.0 | 200 | 500 | 1.6 | 16000 |
| K _μ | AML1604 | 7.5 | 200 | 500 | 1.6 | 16000 |
| K _a | AML3501 | 7.0 | 300 | 700 | — | 34865 |
| K _a | AML3502 | 7.5 | 300 | 700 | — | 34865 |
| K _a | AML3503 | 8.0 | 300 | 700 | — | 34865 |
| K _a | AML3504 | 9.0 | 300 | 700 | — | 34865 |
| K _a | AML3505 | 10.0 | 300 | 700 | — | 34865 |

| MEDIUM BARRIER (N-TYPE) | | | | | | |
|-------------------------|-------------|-------------------|--------------------------------|-----|------|--------------------|
| FREQUENCY BAND | TYPE NUMBER | NF ⁽¹⁾ | Z _{IF} ⁽²⁾ | | VSWR | TEST FREQUENCY MHz |
| | | (dB) | (OHMS) | | MAX | |
| | | MAX | MIN | MAX | MAX | |
| S | AMM3001 | 5.5 | 150 | 400 | 1.7 | 3060 |
| S | AMM3002 | 6.0 | 150 | 400 | 1.8 | 3060 |
| S | AMM3003 | 6.5 | 150 | 400 | 2.0 | 3060 |
| S | AMM3004 | 7.0 | 150 | 400 | 2.0 | 3060 |
| X | AMM9001 | 6.0 | 200 | 450 | 1.6 | 9375 |
| X | AMM9002 | 6.5 | 200 | 450 | 1.6 | 9375 |
| X | AMM9003 | 7.0 | 200 | 450 | 1.6 | 9375 |
| X | AMM9004 | 7.5 | 200 | 450 | 1.8 | 9375 |
| X | AMM9005 | 8.0 | 200 | 450 | 2.0 | 9375 |
| K _μ | AMM1601 | 6.5 | 250 | 600 | 1.6 | 16000 |
| K _μ | AMM1602 | 7.0 | 250 | 600 | 1.8 | 16000 |
| K _μ | AMM1603 | 7.5 | 250 | 600 | 2.0 | 16000 |

| HIGH BARRIER (N-TYPE) | | | | | | |
|-----------------------|-------------|-------------------|--------------------------------|-----|------|--------------------|
| FREQUENCY BAND | TYPE NUMBER | NF ⁽¹⁾ | Z _{IF} ⁽²⁾ | | VSWR | TEST FREQUENCY MHz |
| | | (dB) | (OHMS) | | MAX | |
| | | MAX | MIN | MAX | MAX | |
| S | AMH3001 | 5.0 | 250 | 450 | 1.6 | 3060 |
| S | AMH3002 | 5.5 | 250 | 450 | 1.6 | 3060 |
| S | AMH3003 | 6.0 | 250 | 450 | 1.8 | 3060 |
| S | AMH3004 | 6.5 | 250 | 450 | 2.0 | 3060 |
| X | AMH9001 | 6.0 | 250 | 450 | 1.6 | 9375 |
| X | AMH9002 | 6.5 | 250 | 450 | 1.6 | 9375 |
| X | AMH9003 | 7.0 | 250 | 450 | 1.8 | 9375 |
| K _μ | AMH1601 | 6.5 | 250 | 600 | 1.6 | 16000 |
| K _μ | AMH1602 | 7.0 | 250 | 600 | 1.8 | 16000 |

| LOW BARRIER (P-TYPE) | | | | | | |
|----------------------|-------------|-------------------|--------------------------------|-----|------|--------------------|
| FREQUENCY BAND | TYPE NUMBER | NF ⁽¹⁾ | Z _{IF} ⁽²⁾ | | VSWR | TEST FREQUENCY MHz |
| | | (dB) | (OHMS) | | MAX | |
| | | MAX | MIN | MAX | MAX | |
| S | AMP3001 | 5.5 | 100 | 250 | 1.6 | 3060 |
| S | AMP3002 | 6.0 | 100 | 250 | 1.8 | 3060 |
| S | AMP3003 | 6.5 | 100 | 250 | 2.0 | 3060 |
| X | AMP9001 | 6.0 | 100 | 250 | 1.6 | 9375 |
| X | AMP9002 | 6.5 | 100 | 250 | 1.6 | 9375 |
| X | AMP9003 | 7.0 | 100 | 250 | 1.8 | 9375 |
| K _μ | AMP1601 | 6.5 | 150 | 500 | 1.6 | 16000 |
| K _μ | AMP1602 | 7.0 | 150 | 500 | 1.8 | 16000 |

NOTES:

- NF_{IF} = 1.5 dB; I_F = 30 MHz; R_L = 100 ohms; L.O. = 1 MW (for low and medium barrier types); L.O. = 2.0 MW (for high barrier types); K_a-Band NF is calculated.
- IF impedance is measured by modulating the specified test frequency with a 1000 Hz signal, R_L = 22 ohms, at the specified incident power level.
- These diodes are available as matched pairs and are supplied in either forward pairs (M) or forward/reverse pairs (MR). The matching criteria is: ΔL_C = 0.3 dB max
ΔZ_{IF} = 2.5 ohms, max
- When ordering add package style as a suffix to basic type number to denote desired package style; i.e. AML9002-44 is a 6.0 dB X-Band Low Barrier Mixer Diode in the -44 style package.
- All of the Schottky Barrier Mixer Diodes are available in chip form.

SCHOTTKY BARRIER DETECTOR DIODES

LOW BARRIER (N-TYPE)

| FREQUENCY BAND | TYPE NUMBER | TSS ⁽¹⁾ (dBm) | Z _v ⁽²⁾ (KOHMS) | | TEST FREQUENCY MHz |
|----------------|-------------|-----------------------------|--|-----|-----------------------|
| | | MIN | MIN | MAX | |
| S | ADN3001 | -48 | 1 | 2 | 3060 |
| S | ADN3002 | -50 | 1 | 2 | 3060 |
| S | ADN3003 | -55 | 1 | 2 | 3060 |
| X | ADN9001 | -50 | 1 | 2 | 10000 |
| X | ADN9002 | -52 | 1 | 2 | 10000 |
| X | ADN9003 | -55 | 1 | 2 | 10000 |
| K _μ | ADN1601 | -48 | 1 | 2 | 16000 |
| K _μ | ADN1602 | -50 | 1 | 2 | 16000 |
| K _μ | ADN1603 | -52 | 1 | 2 | 16000 |

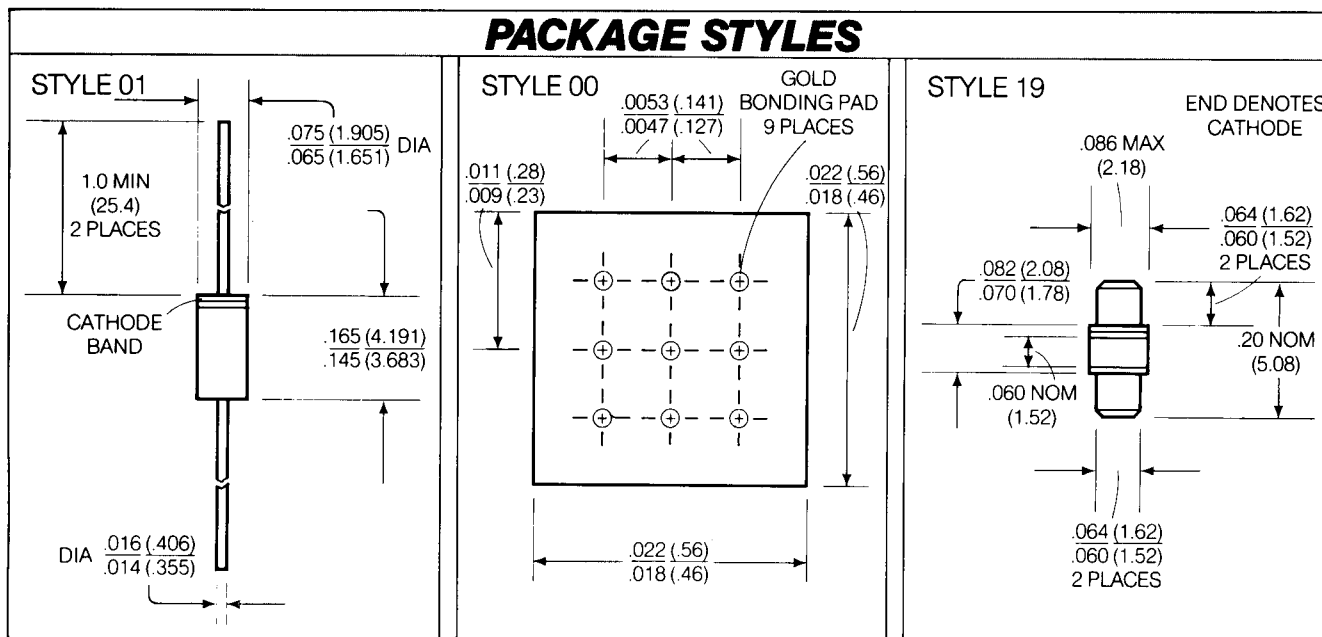
LOW BARRIER (P-TYPE)

| FREQUENCY BAND | TYPE NUMBER | TSS ⁽¹⁾ (dBm) | Z _v ⁽²⁾ (KOHMS) | | TEST FREQUENCY MHz |
|----------------|-------------|-----------------------------|--|-----|-----------------------|
| | | MIN | MIN | MAX | |
| X | ADP9001 | -50 | 1.2 | 1.8 | 10000 |
| X | ADP9002 | -52 | 1.2 | 1.8 | 10000 |
| X | ADP9003 | -55 | 1.2 | 1.8 | 10000 |
| K _μ | ADP1601 | -48 | 1.2 | 1.8 | 16000 |
| K _μ | ADP1602 | -50 | 1.2 | 1.8 | 16000 |
| K _μ | ADP1603 | -52 | 1.2 | 1.8 | 16000 |
| K _a | ADP3601 | -47 | 1.0 | 2.0 | 36000 |
| K _a | ADP3602 | -49 | 1.0 | 2.0 | 36000 |

NOTES:

1. DC Bias is +20μA, Video Bandwidth=2 MHz.
2. DC Bias is +20μA, P(incident)=-30 dBm.
3. All of the Schottky Barrier Mixer Diodes are available in chip form.
4. When ordering add package style as a suffix to basic type number to denote desired package style; i.e. ADN3003-19 is a -55 dBm Low Barrier (N-Type); 5-Band detector diode in the -19 style package.

PACKAGE STYLES

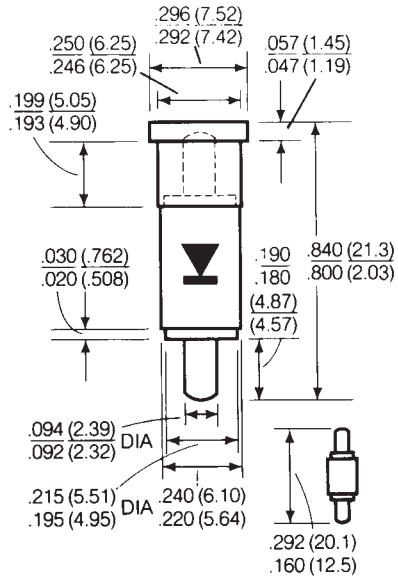


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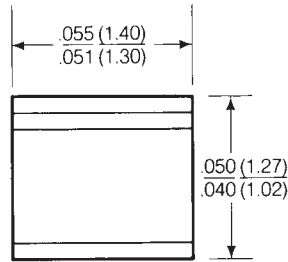
SCHOTTKY BARRIER MIXER DIODES

PACKAGE STYLES

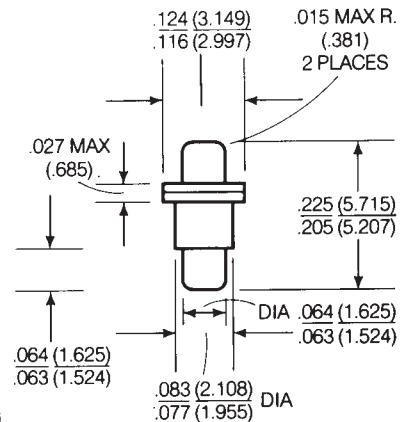
STYLE 23



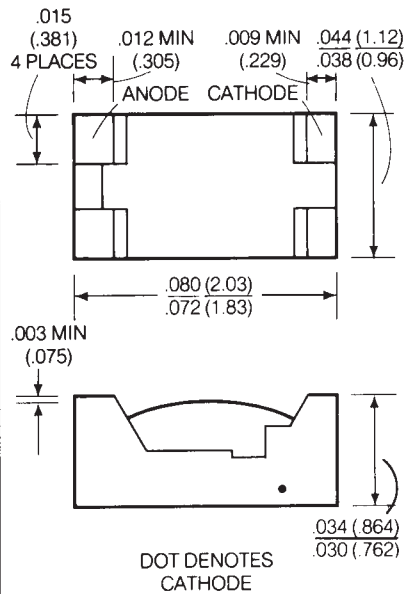
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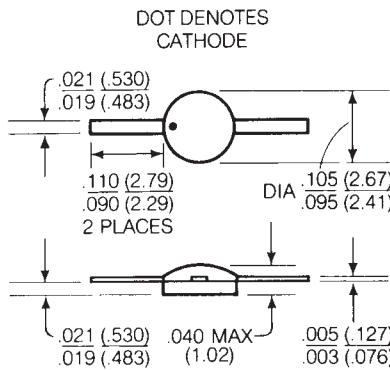
STYLE 51



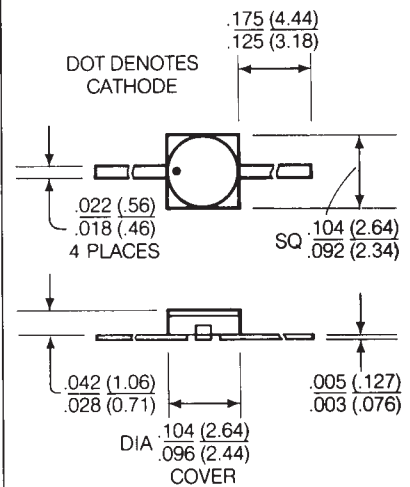
STYLE 91



STYLE 800



STYLE 860



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