FEATyRES
• Low Temperature Coefficient
• Wide Operating Current Range
  AMS04..........................15 µA to 20 mA
  AMS05..........................20 µA to 20 mA
• Max. 1Ω Dynamic Impedance
• Typ. 2% Output tolerance

APPLICATIONS
• Battery Powered Systems
• Instrumentation
• A/D, D/A Converters
• Current sources
• Power Supplies
• Telecommunication

GENERAL DESCRIPTION
The AMS04 and the AMS05 are two-terminal, band-gap voltage reference diodes, with an output voltage of 1.25V for the AMS04 and 2.5V for the AMS05. These devices feature low dynamic impedance and good temperature coefficient, operating over a wide current range. Since the band-gap reference of these devices uses only transistors and resistors, low noise and good long term stability result. The wide dynamic operating range allows its use with widely varying supplies with excellent regulation. The AMS04 and AMS05 can be used for portable meters, regulators, data acquisition converters and telecommunication.

The AMS04 and AMS05 are operational over a temperature range of 0°C to 70°C and are available in TO-92 and SO-8 packages.

ORDERING INFORMATION:

<table>
<thead>
<tr>
<th>MAX. TEMPCO</th>
<th>PACKAGE TYPE</th>
<th>OPERATING TEMPERATURE RANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>TO-92</td>
<td>8 LEAD SOIC</td>
</tr>
<tr>
<td>50ppm/°C</td>
<td>AMS04AN</td>
<td>AMS04AS</td>
</tr>
<tr>
<td>100ppm/°C</td>
<td>AMS04BN</td>
<td>AMS04BS</td>
</tr>
<tr>
<td>50ppm/°C</td>
<td>AMS05AN</td>
<td>AMS05AS</td>
</tr>
<tr>
<td>100ppm/°C</td>
<td>AMS05BN</td>
<td>AMS05BS</td>
</tr>
</tbody>
</table>

PIN CONNECTIONS

TO-92
Plastic Package (N)

SO-8
SO Package (S)

Bottom View

Top View

Advanced Monolithic Systems, Inc.  www.advanced-monolithic.com  Phone (925) 443-0722  Fax (925) 443-0723
**ABSOLUTE MAXIMUM RATINGS**

Reverse Current  
Forward Current  
Operating Temperature Range  
Storage temperature  

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**ELECTRICAL CHARACTERISTICS**

Electrical Characteristics at $I_R = 100 \, \mu A$, and $T_A = +25^\circ C$ unless otherwise specified.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Conditions</th>
<th>AMS04 Min</th>
<th>AMS04 Typ</th>
<th>AMS04 Max</th>
<th>AMS05 Min</th>
<th>AMS05 Typ</th>
<th>AMS05 Max</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reverse Breakdown Voltage</td>
<td>$I_R = 100 , \mu A$</td>
<td>1.235</td>
<td>1.250</td>
<td>1.265</td>
<td>2.475</td>
<td>2.50</td>
<td>2.525</td>
<td>V</td>
</tr>
<tr>
<td>Reverse Dynamic Impedance</td>
<td>$I_R = 100 , \mu A$</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>1</td>
<td></td>
<td>Ω</td>
</tr>
<tr>
<td>Reverse Breakdown Voltage Change</td>
<td>$15 \mu A \leq I_R \leq 20 \mu A$</td>
<td>10</td>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>mV</td>
</tr>
<tr>
<td></td>
<td>$20 \mu A \leq I_R \leq 1 \mu A$</td>
<td>0.25</td>
<td>1.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>mV</td>
</tr>
<tr>
<td>Min. Operating Current</td>
<td></td>
<td>10</td>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>μA</td>
</tr>
<tr>
<td>Wide Band Noise</td>
<td>$10Hz \leq f \leq 10kHz$</td>
<td>60</td>
<td>60</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>μV</td>
</tr>
<tr>
<td>Temperature Coeff.</td>
<td>$I_R = 100 , \mu A$ (Note 3)</td>
<td>50</td>
<td>100</td>
<td></td>
<td>50</td>
<td>100</td>
<td></td>
<td>ppm/°C</td>
</tr>
</tbody>
</table>

**Note 1:** Absolute Maximum Ratings indicate limits beyond which damage to the device may occur. Operating Ratings indicate conditions for which the device is intended to be functional, but do not guarantee specific performance limits. For guaranteed specifications and test conditions, see the Electrical Characteristics. The guaranteed specifications apply only for the test conditions listed.

**Note 2:** For elevated temperature operation, $T_J \max$ is +100°C

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<table>
<thead>
<tr>
<th>Thermal Resistance</th>
<th>TO-92</th>
<th>SO-8</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\phi_{JA}$ (junction to ambient)</td>
<td>170°C/W (0.125” leads)</td>
<td>165°C/W</td>
</tr>
</tbody>
</table>

**Note 3:** The average temperature coefficient is defined as the maximum deviation of reference voltage at all measured temperatures between the operating $T_{\text{MAX}}$ and $T_{\text{MIN}}$, divided by $T_{\text{MAX}} - T_{\text{MIN}}$. The measured temperatures are 0°C, 25°C and 70°C.

**TYPICAL APPLICATIONS**

**Precision Current Source**

**Battery Powered 1.25V Reference**

**10V Reference**

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AMS04/AMS05

TYPICAL PERFORMANCE CHARACTERISTICS

AMS04 Reverse Characteristics

AMS04 Forward Characteristics

AMS04 Response Time

AMS05 Reverse Characteristics

AMS05 Forward Characteristics

AMS05 Response Time
PACKAGE DIMENSIONS inches (millimeters) unless otherwise noted.

3 LEAD TO-92 PLASTIC PACKAGE (N)

8 LEAD SOIC PLASTIC PACKAGE (S)

*DIMENSION DOES NOT INCLUDE MOLD FLASH. MOLD FLASH SHALL NOT EXCEED 0.006" (0.152mm) PER SIDE

**DIMENSION DOES NOT INCLUDE INTERLEAD FLASH. INTERLEAD FLASH SHALL NOT EXCEED 0.010" (0.254mm) PER SIDE