



■ General Description

The AME41-4096 is a micropower 2-terminal band-gap voltage regulator diode. It operates over a 40µA to 20mA current range. Each circuit is trimmed at wafer sort to provide a ±0.20% and ±0.50% initial tolerance. The design of the AME41-4096 allows for a large range of load capacitances and operating currents. The low start-up current makes these part ideal for battery applications.

Analog Microelectronics offers this part in a TO-92 and SO-8 packages as well as the space saving SOT-23.

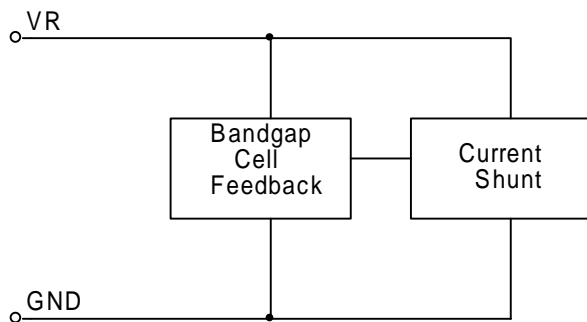
■ Key Features

- Small packages: SOT-23, TO-92, SO-8
- Tolerates capacitive loads
- Fixed reverse breakdown voltage of 4.096V
- Tight voltage tolerance ----- ±0.20%, ±0.50%
- Wide operating current ----- 40µA to 20mA
- Wide temperature range ----- -40°C to 85°C
- Low temperature coefficient --- 100ppm/°C (max)
- Excellent transient response

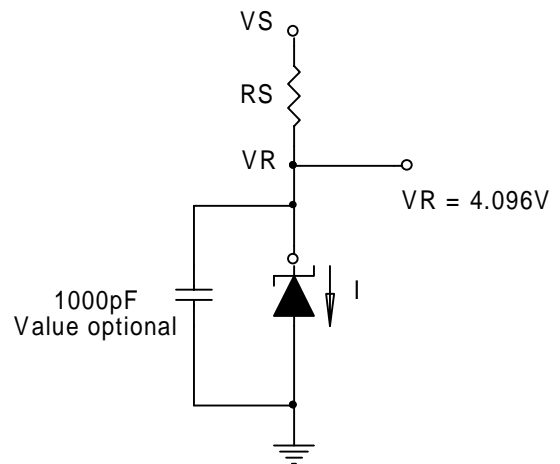
■ Applications

- Portable electronics
- Power supplies
- Computer peripherals
- Data acquisition systems
- Battery chargers
- Consumer electronics

■ Functional Block Diagram



■ Typical Application

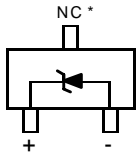


$$R_S = \frac{V_S - V_R}{I}$$

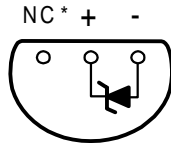


■ Package Outline

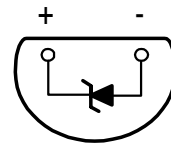
SOT-23 Top View



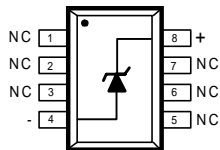
TO-92-3 Bottom View



TO-92-2 Bottom View



SO-8 Top View



* The NC pin must float or be connected to - (negative)

■ Ordering Information

| Part Number | Accuracy | Marking | Package | Operating Temp. Range |
|-------------|----------|---------------------------|---------|-----------------------|
| AME41FEET | 0.2% | ADAww | SOT-23 | -40°C to +85°C |
| AME41FEHA | 0.2% | AME 41FEHA yyww | SO-8 | -40°C to +85°C |
| AME41CEET | 0.5% | ACCww | SOT-23 | -40°C to +85°C |
| AME41CEAS | 0.5% | AME 41 CEAS yyww | TO-92-2 | -40°C to +85°C |
| AME41CEAT | 0.5% | AME 41 CEAT yyww | TO-92-3 | -40°C to +85°C |
| AME41CEHA | 0.5% | AME 41CEHA yyww | SO-8 | -40°C to +85°C |

Please consult AME sales office or authorized Rep./Distributor for other voltage accuracy and package type availability.



■ Absolute Maximum Ratings

| Parameter | Maximum | Unit |
|----------------|---------|------|
| Supply Current | 50 | mA |

■ Recommended Operating Conditions

| Parameter | Rating | Unit |
|---------------------------|--------------------|--------------|
| Supply Current | 100 μ A ~ 20mA | |
| Ambient Temperature Range | -40 to +85 | $^{\circ}$ C |
| Junction Temperature | -40 to +125 | $^{\circ}$ C |

■ Thermal Information

| Parameter | | Maximum | Unit |
|------------------------------------|--------|---------|------------------|
| Thermal Resistance | SOT-23 | 325 | $^{\circ}$ C / W |
| | TO-92 | 180 | |
| | SO-8 | 124 | |
| Maximum Junction Temperature | | 150 | $^{\circ}$ C |
| Maximum Lead Temperature (10 Sec) | | 300 | $^{\circ}$ C |

Caution: Stress above the listed absolute rating may cause permanent damage to the device



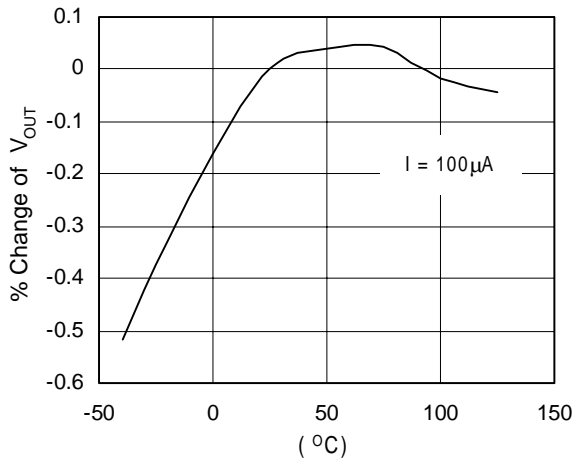
■ Electrical Specifications

Unless otherwise specified, $T_A = 25^\circ C$, $I = 100\mu A$

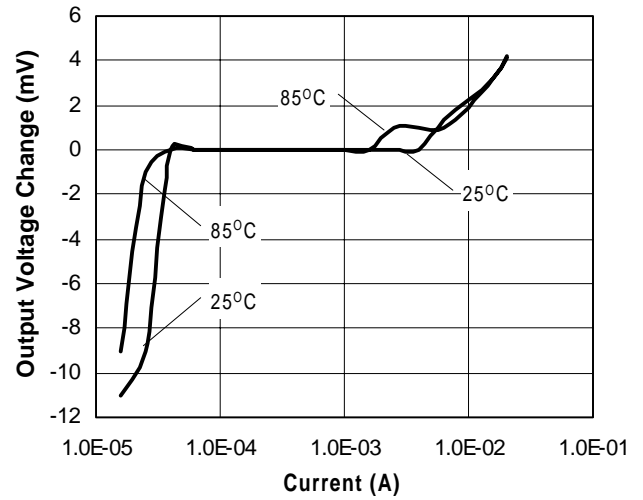
| PARAMETER | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNITS |
|---------------------------------------|--------------|---|-------|-------|-------|-----------------|
| Reference Voltage, $\pm 0.2\%$ | V_{REF} | $T_A = 25^\circ C$, $I_{REF} = 100\mu A$ | 4.088 | 4.096 | 4.104 | V |
| Reference Voltage, $\pm 0.5\%$ | | | 4.075 | 4.096 | 4.117 | V |
| Minimum Current | I_{MIN} | | | | 40 | μA |
| Reference Voltage Change With Current | $dV_{REF/I}$ | $I_{MIN} \leq I \leq 1mA$ | | 1.5 | 3 | mV |
| | | $1mA \leq I \leq 20mA$ | | 10 | 20 | |
| Reference Voltage Temp. Coeff. | V_{REFTC} | $0^\circ C < T_A < 70^\circ C$ | | | 100 | ppm/ $^\circ C$ |



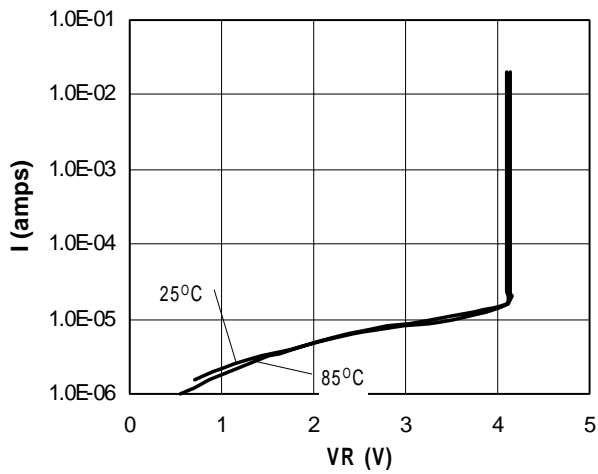
Normalized Percentage Change vs. Temperature



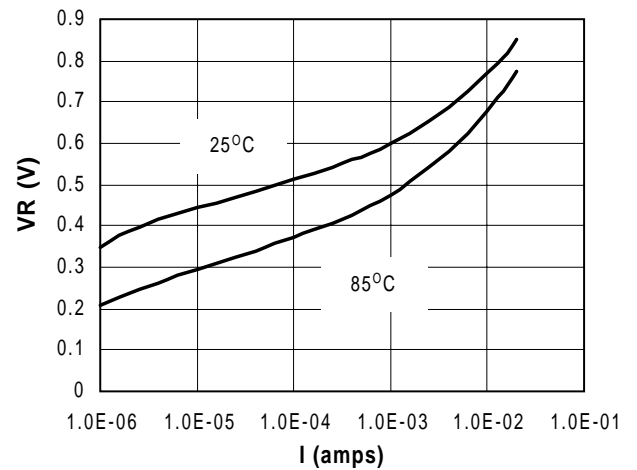
Output Voltage Change vs. Current



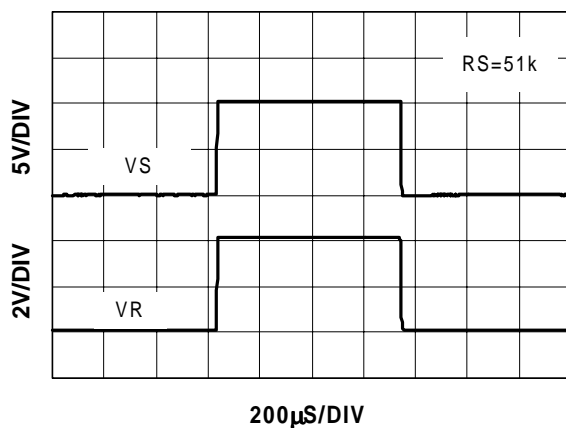
Reverse Characteristic



Forward Characteristic



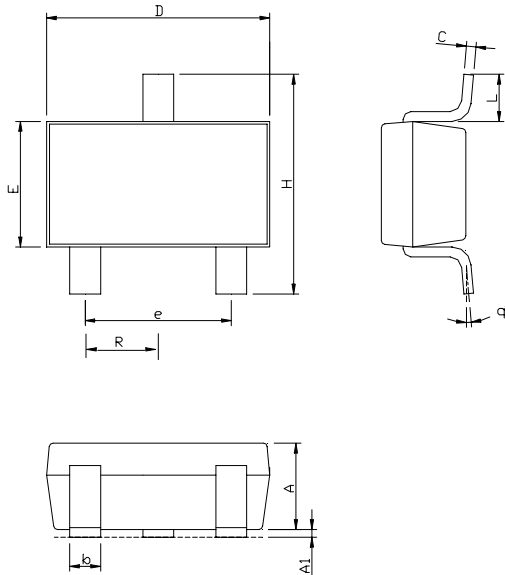
Transient Response





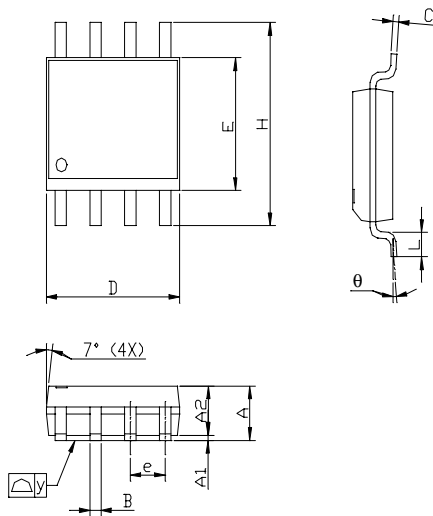
■ Package Dimension

SOT-23



| SYMBOLS | MILLIMETERS | | INCHES | |
|----------------|-------------|------|-------------|--------|
| | MIN | MAX | MIN | MAX |
| A | 1.00 | 1.40 | 0.0394 | 0.0551 |
| A ₁ | 0.00 | 0.15 | 0.0000 | 0.0059 |
| b | 0.35 | 0.50 | 0.0138 | 0.0197 |
| C | 0.09 | 0.25 | 0.0035 | 0.0098 |
| D | 2.70 | 3.10 | 0.1063 | 0.1220 |
| E | 1.40 | 1.80 | 0.0551 | 0.0709 |
| e | 1.90 BSC | | 0.0748 BSC | |
| H | 2.60 | 3.00 | 0.1024 | 0.1181 |
| L | 0.35 | 0.55 | 0.0138 | 0.0197 |
| θ ₁ | 0° | 9° | 0° | 9° |
| R | 0.95(TYP) | | 0.0374(TYP) | |

SO-8

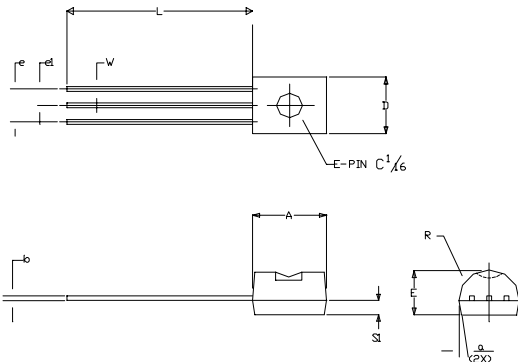


| SYMBOLS | MILLIMETERS | | INCHES | |
|----------------|-------------|------|-----------|--------|
| | MIN | MAX | MIN | MAX |
| A | 1.35 | 1.75 | 0.053 | 0.069 |
| A ₁ | 0.10 | 0.25 | 0.004 | 0.010 |
| A ₂ | 1.45 REF | | 0.057 REF | |
| B | 0.33 | 0.51 | 0.013 | 0.020 |
| C | 0.19 | 0.25 | 0.007 | 0.010 |
| D | 4.80 | 5.00 | 0.189 | 0.1970 |
| E | 3.80 | 4.00 | 0.150 | 0.157 |
| e | 1.27 BSC | | 0.050 BSC | |
| H | 5.80 | 6.20 | 0.228 | 0.244 |
| L | 0.40 | 1.27 | 0.016 | 0.050 |
| y | | 0.10 | | 0.004 |
| θ | 0° | 8° | 0° | 8° |



■ Package Dimension

TO-92-3

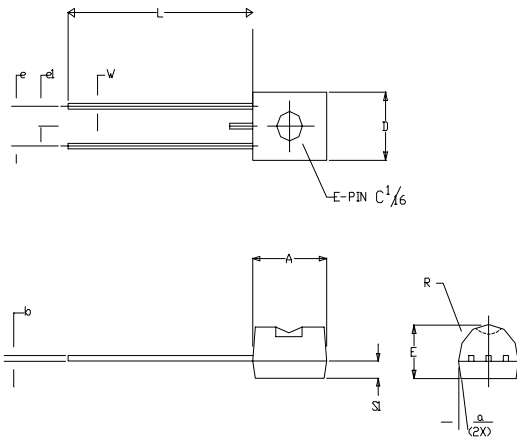


| SYMBOLS | MILLIMETERS | | INCHES | |
|---------|-------------|-------|--------|-------|
| | MIN | MAX | MIN | MAX |
| A | 4.32 | 4.95 | 0.170 | 0.195 |
| b | 0.36 | 0.51 | 0.014 | 0.020 |
| E | 3.30 | 3.94 | 0.130 | 0.155 |
| e | 2.41 | 2.67 | 0.095 | 0.105 |
| e1 | 1.14 | 1.40 | 0.045 | 0.055 |
| L | 12.70 | 15.49 | 0.500 | 0.610 |
| R | 2.16 | 2.41 | 0.085 | 0.095 |
| S1 | 1.14 | 1.52 | 0.045 | 0.060 |
| W | 0.41 | 0.56 | 0.016 | 0.022 |
| D | 4.45 | 4.95 | 0.175 | 0.195 |
| a | 4° | 6° | 4° | 6° |

NOTE:

1. PACKAGE OUTLINE EXCLUSIVE OF ANY MOLD FLASHES DIMENSION
2. PACKAGE OUTLINE EXCLUSIVE OF BURR DIMENSION

TO-92-2



| SYMBOLS | MILLIMETERS | | INCHES | |
|---------|-------------|-------|--------|-------|
| | MIN | MAX | MIN | MAX |
| A | 4.32 | 4.95 | 0.170 | 0.195 |
| b | 0.36 | 0.51 | 0.014 | 0.020 |
| E | 3.30 | 3.94 | 0.130 | 0.155 |
| e | 2.41 | 2.67 | 0.095 | 0.105 |
| e1 | 1.14 | 1.40 | 0.045 | 0.055 |
| L | 12.70 | 15.49 | 0.500 | 0.610 |
| R | 2.16 | 2.41 | 0.085 | 0.095 |
| S1 | 1.14 | 1.52 | 0.045 | 0.060 |
| W | 0.41 | 0.56 | 0.016 | 0.022 |
| D | 4.45 | 4.95 | 0.175 | 0.195 |
| a | 4° | 6° | 4° | 6° |

NOTE:

1. PACKAGE OUTLINE EXCLUSIVE OF ANY MOLD FLASHES DIMENSION
2. PACKAGE OUTLINE EXCLUSIVE OF BURR DIMENSION



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Document: 2003-DS41-4096-D

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