

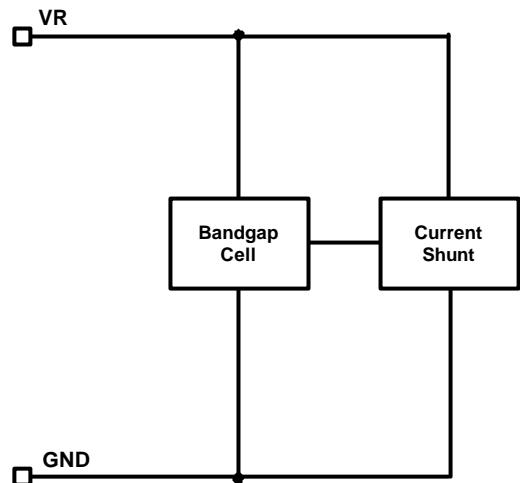


■ General Description

The AME385-2.5 is a micropower 2-terminal band-gap voltage regulator diode. It operates over a $20\mu\text{A}$ to 20mA current range. Each circuit is trimmed at wafer sort to provide a $\pm 0.20\%$ and $\pm 0.50\%$ initial tolerance. The design of the AME385-2.5 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 package as well as the space saving SOT-23.

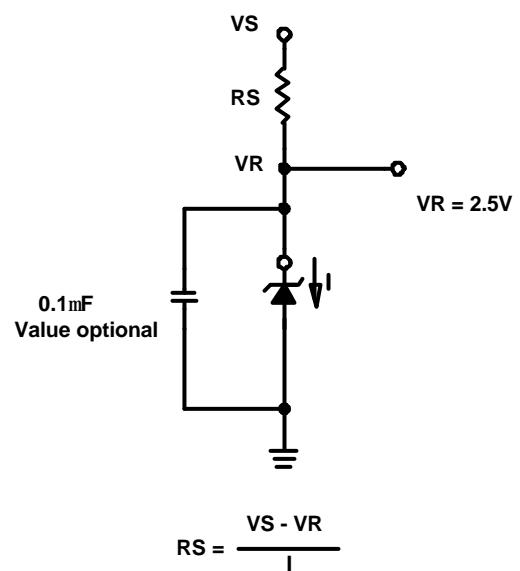
■ Functional Block Diagram



■ Features

- Small packages: SOT-23, TO-92, SO-8
- Tolerates capacitive loads
- Fixed reverse breakdown voltage of 2.5V
- Tight voltage tolerance ----- $\pm 0.20\%$, $\pm 0.5\%$
- Wide operating current ----- $20\mu\text{A}$ to 20mA
- Wide temperature range ----- -40°C to $+85^\circ\text{C}$
- Low temperature coefficient $-100\text{ppm}/^\circ\text{C}$ (_{max})
- Excellent transient response

■ Typical Application



■ Applications

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

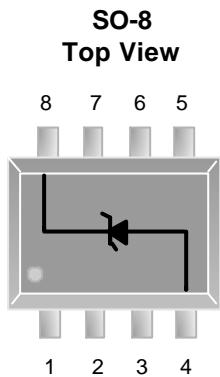


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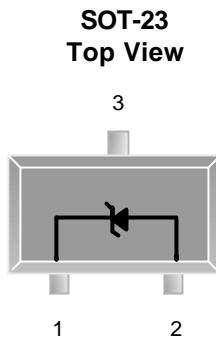
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Micropower Voltage Reference Diode

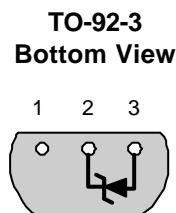
■ Pin Configuration



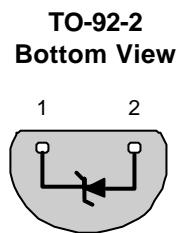
- AME 385-2.5**
- 1. NC
 - 2. NC
 - 3. NC
 - 4. -
 - 5. NC
 - 6. NC
 - 7. NC
 - 8. +



- AME 385-2.5**
- 1. +
 - 2. -
 - 3. NC*



- AME 385-2.5**
- 1. NC*
 - 2. +
 - 3. -



- AME 385-2.5**
- 1. +
 - 2. -

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

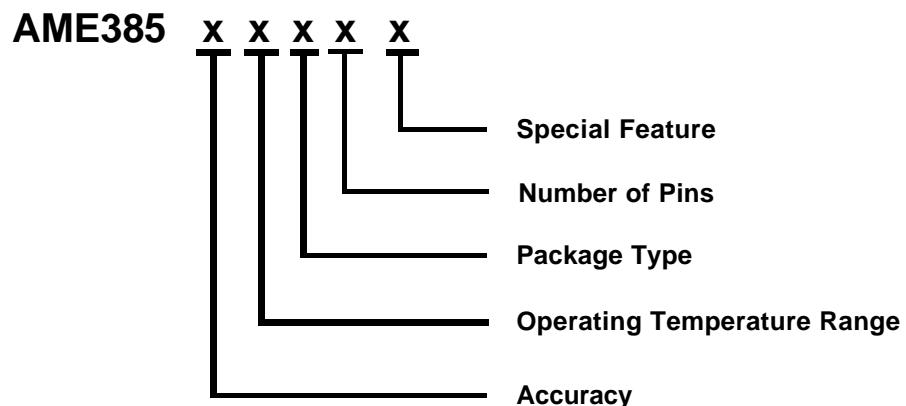


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AME385-2.5

Micropower Voltage Reference Diode

■ Ordering Information



Accuracy	Operating Temperature Range	Package Type	Number of Pins	Special Feature
D: 0.2% B: 0.5%	E: -40 ^o C to 85 ^o C	A: TO-92 E: SOT-2X H: SO-8	A: 8 S: 2 T: 3	L: Low Profile Y: Lead Free & Low Profile Z: Lead Free



■ Ordering Information (contd.)

Part Number	Marking	Accuracy	Package	Operating Temp. Range
AME385DEET	ACSww	0.2%	SOT-23	- 40°C to + 85°C
AME385DEETL	ACSww	0.2%	TSOT-23	- 40°C to + 85°C
AME385DEETY	ACSww	0.2%	TSOT-23	- 40°C to + 85°C
AME385DEETZ	ACSww	0.2%	SOT-23	- 40°C to + 85°C
AME385DEHA	385 DEHA yyww	0.2%	SO-8	- 40°C to + 85°C
AME385DEHAZ	385 DEHA yyww	0.2%	SO-8	- 40°C to + 85°C
AME385BEET	ABYww	0.5%	SOT-23	- 40°C to + 85°C
AME385BEETL	ABYww	0.5%	TSOT-23	- 40°C to + 85°C
AME385BEETY	ABYww	0.5%	TSOT-23	- 40°C to + 85°C
AME385BEETZ	ABYww	0.5%	SOT-23	- 40°C to + 85°C
AME385BEAT	AME 385 BEAT yyww	0.5%	TO-92-3	- 40°C to + 85°C
AME385BEATZ	AME 385 BEAT yyww	0.5%	TO-92-3	- 40°C to + 85°C
AME385BEAS	AME 385 BEAS yyww	0.5%	TO-92-2	- 40°C to + 85°C
AME385BEASZ	AME 385 BEAS yyww	0.5%	TO-92-2	- 40°C to + 85°C
AME385BEHA	385 BEHA yyww	0.5%	SO-8	- 40°C to + 85°C
AME385BEHAZ	385 BEHA yyww	0.5%	SO-8	- 40°C to + 85°C

* Package Option

Part Number	Package	Lead Pitch
AME385XEAX	TO-92 Taping	5.04mm
AME385XEAX-1	TO-92 Bulk	2.54mm

Note: yyww & ww represents the date code

* A line on top of the first letter represents lead free plating such as — ACS.

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



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Micropower Voltage Reference Diode

■ Absolute Maximum Ratings

Parameter	Maximum	Unit
Supply Current	50	mA

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

■ Recommended Operating Conditions

Parameter	Rating	Unit
Supply Current	100µA ~ 20mA	
Ambient Temperature Range	- 40 to + 85	°C
Junction Temperature	- 40 to + 125	°C

■ Thermal Information

Parameter	Maximum	Unit
Thermal Resistance	325	°C / W
	180	
	125	
Maximum Junction Temperature	150	°C
Maximum Lead Temperature (10 Sec)	300	°C



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Micropower Voltage Reference Diode

■ Electrical Specifications

Unless otherwise specified, TA = 0~70°C, I = 100µA

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
Reference Voltage, ±0.2%	V _{REF}	I _{REF} =100µA	2.495	2.50	2.505	V
Reference Voltage, ±0.5%			2.487	2.50	2.513	V
Minimum Current	I _{MIN}				20	µA
Reference Voltage Change With Current	dV _{REF/I}	I _{MIN} ≤ I ≤ 1mA		1.5	3	mV
		1mA ≤ I ≤ 20mA		5	20	
Maximum Operation Current	I _{Lmax}		20			mA
Reverse Dynamic Impedance	RDI	IR= 100mA, f=20Hz		1.5		Ohm
Wideband Noise (rms)	V _n	IR= 100mA, 10 Hz<f<10KHz		60		µV
Long term Stability		IR= 100mA, TA=25°C, T=1000 Hours		20		ppm
Reference Voltage Temp. Coeff.	V _{REFTC}	0°C < T _A < 70°C			100	ppm/°C

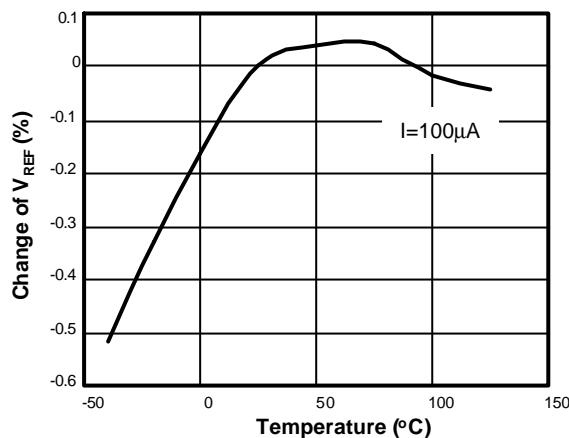


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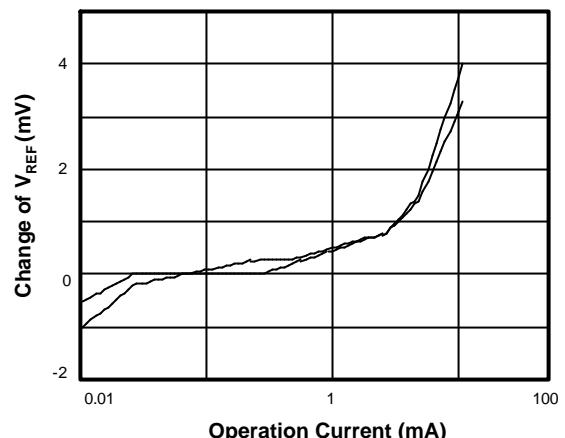
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Micropower Voltage Reference Diode

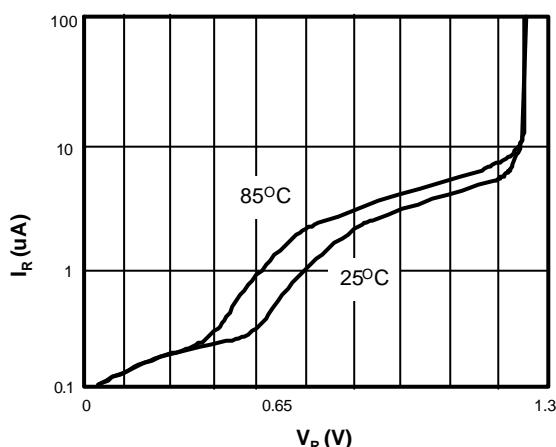
Normalized Percentage Change vs. Temp.



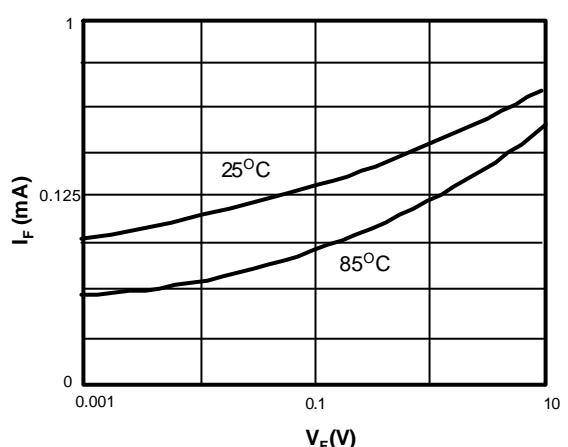
Reference Voltage Change vs. Current



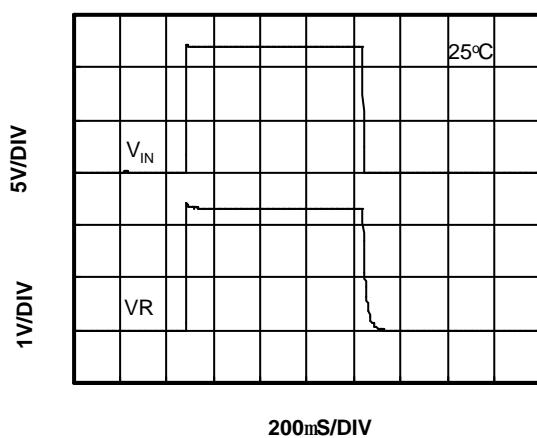
Reverse Characteristic



Forward Characteristic



Line Transient Response





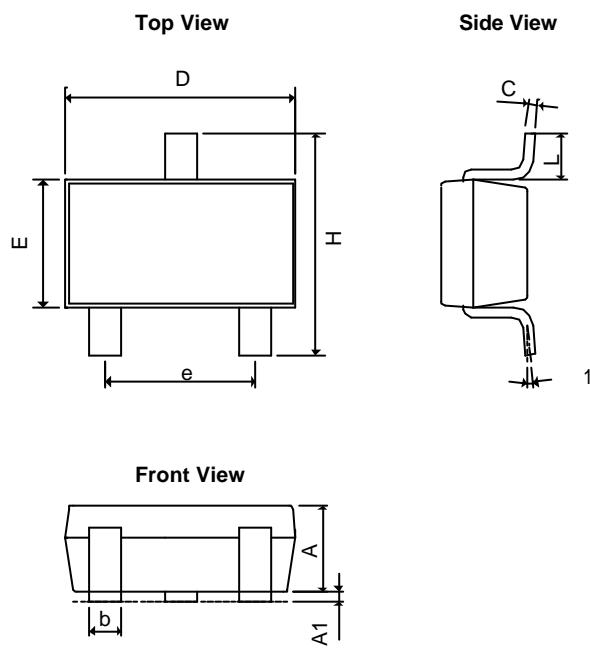
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Micropower Voltage Reference Diode

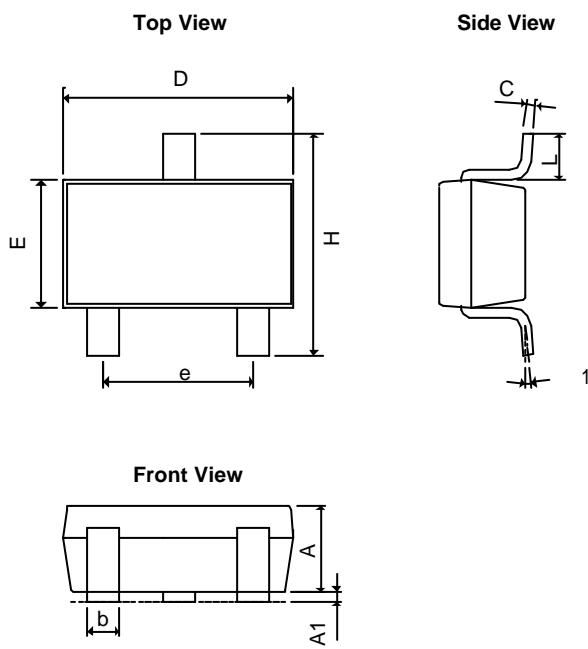
■ Package Dimension

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	2.40	3.00	0.09449	0.11811
L	0.35BSC		0.0138BSC	
q1	0°	10°	0°	10°

TSOT-23



SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A+A ₁	0.80	1.30	0.0315	0.0512
b	0.35	0.50	0.0138	0.0197
C	0.08	0.25	0.0031	0.0098
D	2.70	3.10	0.1063	0.1220
E	1.20	1.80	0.0472	0.0709
e	1.90 BSC		0.0748 BSC	
H	2.40	3.00	0.09449	0.11811
L	0.35BSC		0.0138BSC	
q1	0°	10°	0°	10°



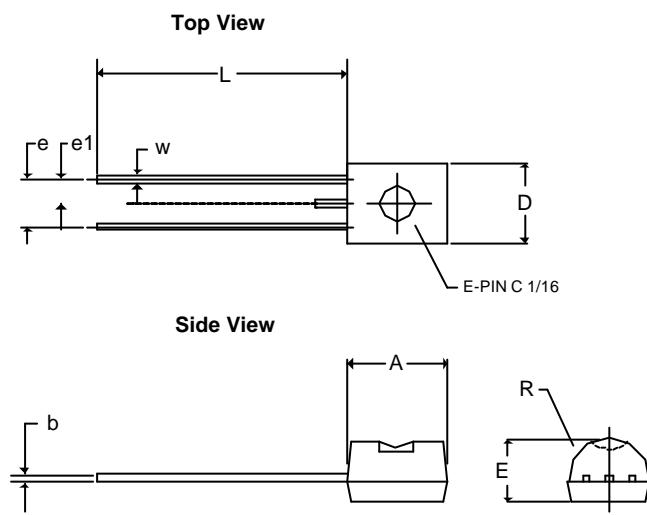
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Micropower Voltage Reference Diode

■ Package Dimension

TO-92-2 (bulk pack)

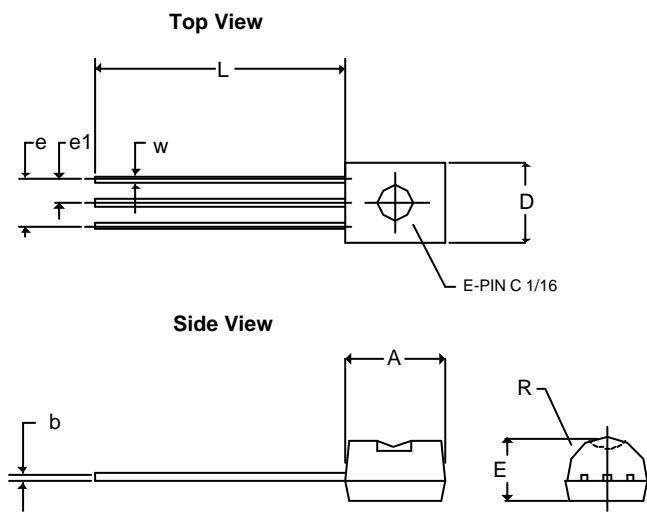


SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.00	4.95	0.1575	0.1949
b	0.40REF		0.0157REF	
E	3.94REF		0.1551REF	
e	2.54REF		0.1000REF	
e1	1.27REF		0.0500REF	
L	12.70	15.49	0.5000	0.6098
R	2.29		0.0902	
W	0.35	0.76	0.0138	0.0299
D	3.80	4.95	0.1496	0.1949

Notes:

1. Package outline exclusive of any mold flashes dimension.
2. Package outline exclusive of burr dimension.
3. Lead pitch=2.54mm is bulk pack.
4. Lead pitch=5.08mm is tape pack.

TO-92-3 (bulk pack)



SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.80	4.95	0.1102	0.1949
b	0.40REF		0.0157REF	
E	3.94REF		0.1551REF	
e	2.54REF		0.1000REF	
e1	1.27REF		0.0500REF	
L	12.70	15.49	0.5000	0.6098
R	2.29		0.0902	
W	0.35	0.76	0.0138	0.0299
D	3.80	4.95	0.1496	0.1949

Notes:

1. Package outline exclusive of any mold flashes dimension.
2. Package outline exclusive of burr dimension.
3. Lead pitch=2.54mm is bulk pack.
4. Lead pitch=5.08mm is tape pack.



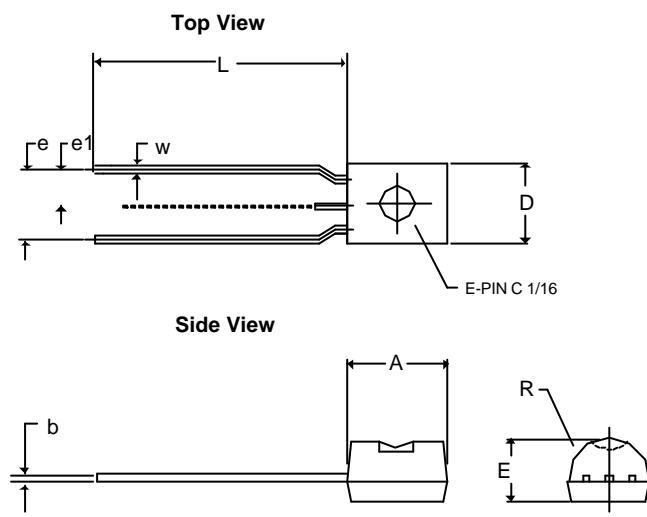
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Micropower Voltage Reference Diode

■ Package Dimension

TO-92-2 (tape pack)

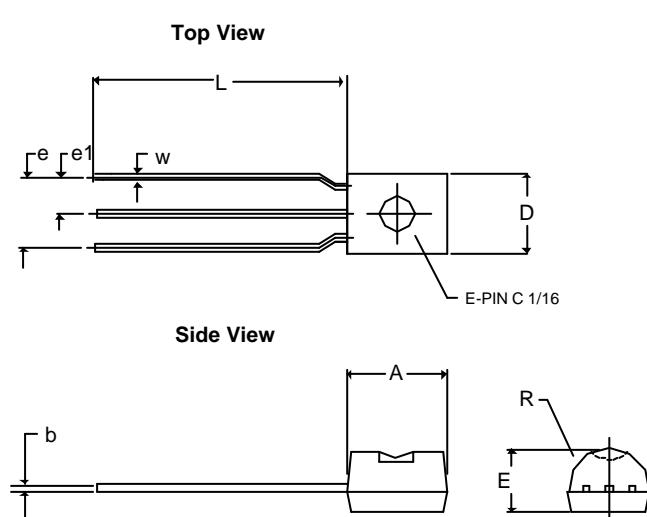


SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.80	4.95	0.1102	0.1949
b	0.40REF		0.0157REF	
E	2.40	3.94	0.0945	0.1551
e	5.08REF		0.2REF	
e1	2.54REF		0.1REF	
L	12.70	15.49	0.5000	0.6098
R	2.00		0.0787	
W	0.35	0.76	0.0138	0.0299
D	3.80	4.95	0.1496	0.1949

Notes:

1. Package outline exclusive of any mold flashes.
2. Package outline exclusive of burr dimension.
3. Lead pitch=2.54mm is bulk pack.
4. Lead pitch=5.08mm is tape pack.

TO-92-3 (tape pack)



SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.80	4.95	0.1102	0.1949
b	0.40REF		0.0157REF	
E	2.40	3.94	0.0945	0.1551
e	5.08REF		0.2REF	
e1	2.54REF		0.1REF	
L	12.70	15.49	0.5000	0.6098
R	2.00		0.0787	
W	0.35	0.76	0.0138	0.0299
D	3.80	4.95	0.1496	0.1949

Notes:

1. Package outline exclusive of any mold flashes.
2. Package outline exclusive of burr dimension.
3. Lead pitch=2.54mm is bulk pack.
4. Lead pitch=5.08mm is tape pack.



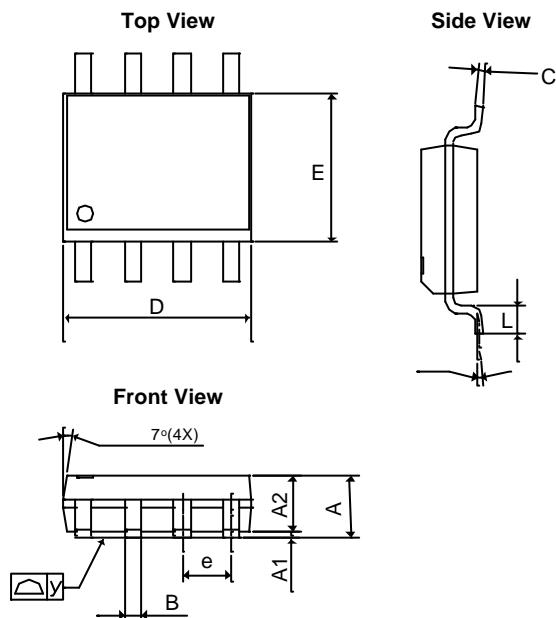
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Micropower Voltage Reference Diode

■ Package Dimension

SO-8



SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.35	1.75	0.05315	0.0689
A ₁	0.10	0.25	0.00394	0.00984
A2	1.473 REF		0.058 REF	
B	0.33	0.51	0.01299	0.02008
C	0.19	0.25	0.00748	0.00984
D	4.80	5.00	0.18898	0.19685
E	3.80	4.00	0.14961	0.15748
e	1.27 BSC		0.050 BSC	
L	0.40	1.27	0.01575	0.05
y	-	0.10	-	0.004
q	0°	8°	0°	8°



Life Support Policy:

These products of AME, Inc. are not authorized for use as critical components in life-support devices or systems, without the express written approval of the president of AME, Inc.

AME, Inc. reserves the right to make changes in the circuitry and specifications of its devices and advises its customers to obtain the latest version of relevant information.

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