



AME385-1.2

Micropower Voltage Reference Diode

■ General Description

The AME385-1.2 is a micropower 2-terminal band-gap voltage regulator diode. It operates over a 15µA to 20mA current range. Each circuit is trimmed at wafer sort to provide a ±0.2% and ±0.5% initial tolerance. The design of the AME385-1.2 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.

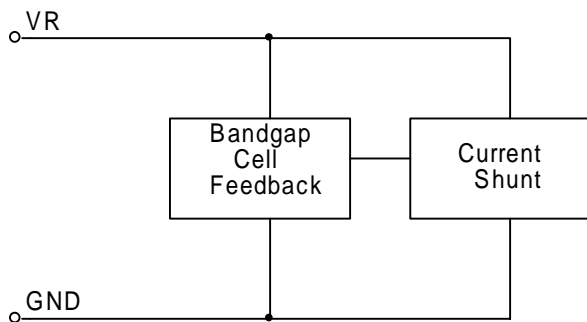
■ Key Features

- Small packages: SOT-23, TO-92, SO-8
- Tolerates capacitive loads
- Fixed reverse breakdown voltage of 1.235V
- Tight voltage tolerance ----- ±0.20%, ±0.5%
- Wide operating current ----- 15µA to 20mA
- Wide temperature range ----- -40°C to +85°C
- Low temperature coefficient --- 100ppm/°C (max)
- Excellent transient response

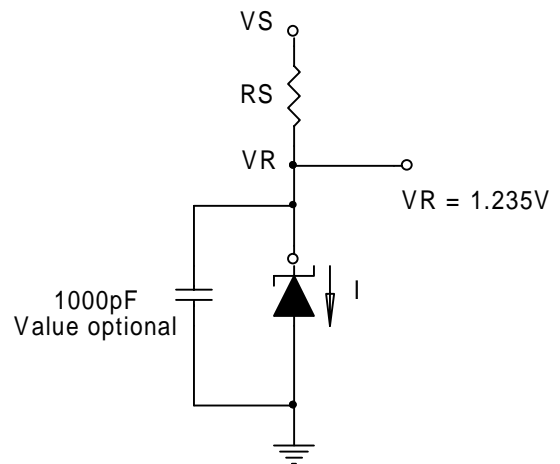
■ Applications

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

■ Functional Block Diagram



■ Typical Application

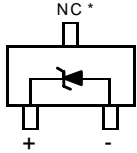


$$R_S = \frac{V_S - V_R}{I}$$

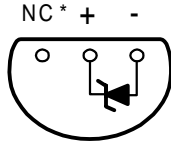


■ Package Outline

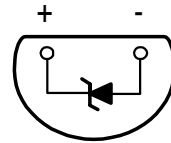
SOT-23 Top View



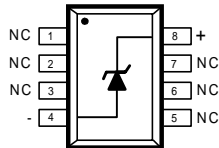
TO-92-3 Bottom View



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
AME385CEET	0.2%	ACQww	SOT-23	-40°C to +85°C
AME385CEHA	0.2%	AME 385CEHA yyww	SO-8	-40°C to +85°C
AME385AEAS	0.5%	AME 385 AEAS yyww	TO-92-2	-40°C to +85°C
AME385AEAT	0.5%	AME 385 AEAT yyww	TO-92-3	-40°C to +85°C
AME385AEET	0.5%	ABXww	SOT-23	-40°C to +85°C
AME385AEHA	0.5%	AME 385AEHA 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	125	
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



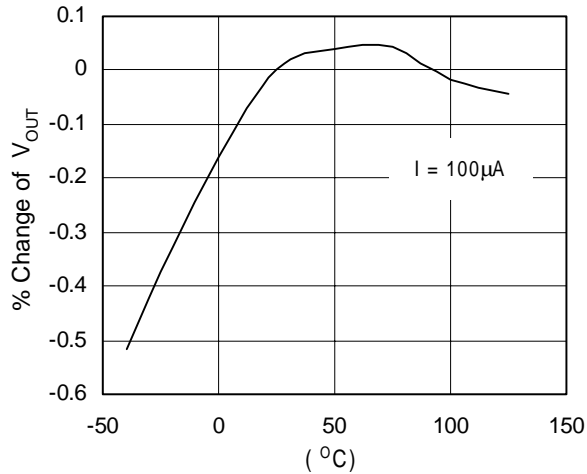
■ Electrical Specifications

Unless otherwise specified, $T_A = 0 \sim 70^\circ C$, $I_R = 100\mu A$

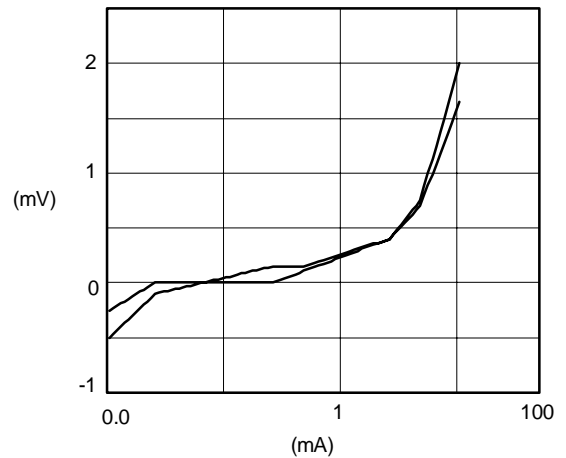
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNITS
Reference Voltage, $\pm 0.2\%$	V_{REF}	$I_{REF} = 100\mu A$	1.232	1.235	1.238	V
Reference Voltage, $\pm 0.5\%$			1.229	1.235	1.241	V
Minimum Current	I_{MIN}				15	μA
Reference Voltage Change With Current	$dV_{REF/I}$	$I_{MIN} \leq I \leq 1mA$		1.5	3	mV
		$1mA \leq I \leq 20mA$		5	20	
Maximum Operation Current	I_{Lmax}		20			mA
Reverse Dynamic Impedence	RDI	$I_R = 100\mu A$, $f = 20Hz$		1.5		Ohm
Wideband Noise (rms)	V_n	$I_R = 100\mu A$, $10 Hz < f < 10KHz$		60		μV
Long term Stability		$I_R = 100\mu A$, $T_A = 25^\circ C$, $T = 1000$ Hours		20		ppm
Reference Voltage Temp. Coeff.	V_{REFTC}	$0^\circ C < T_A < 70^\circ C$			100	ppm/ $^\circ C$



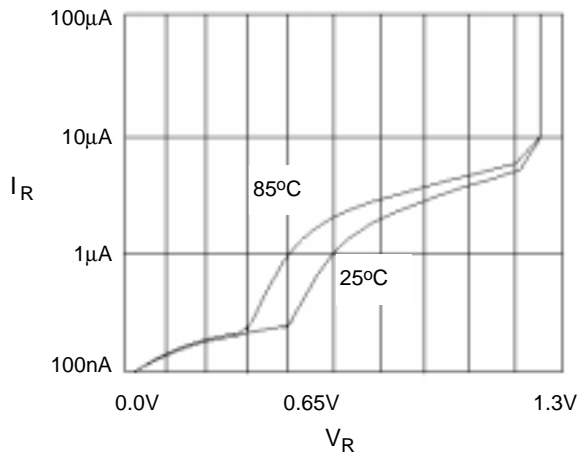
Normalized Percentage Change vs. Temperature



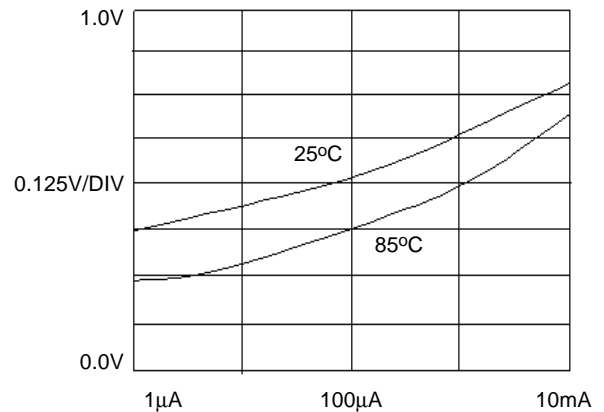
Output Voltage Change vs. Current



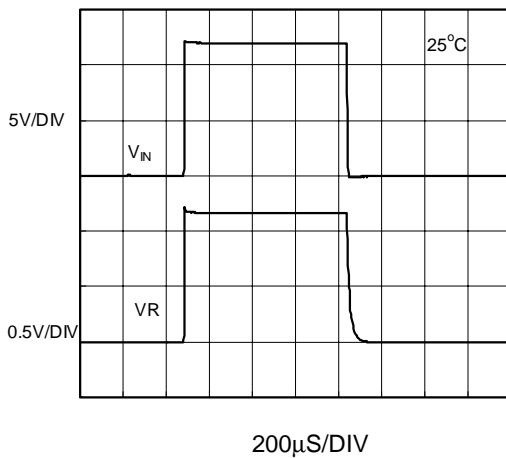
Reverse Characteristic



Forward Characteristic



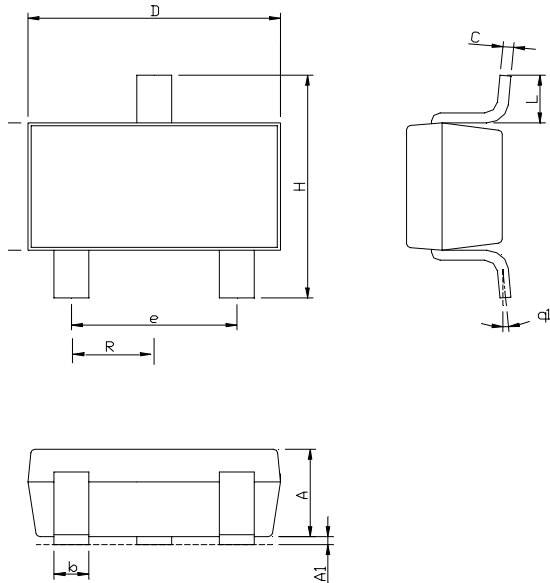
Transient Response





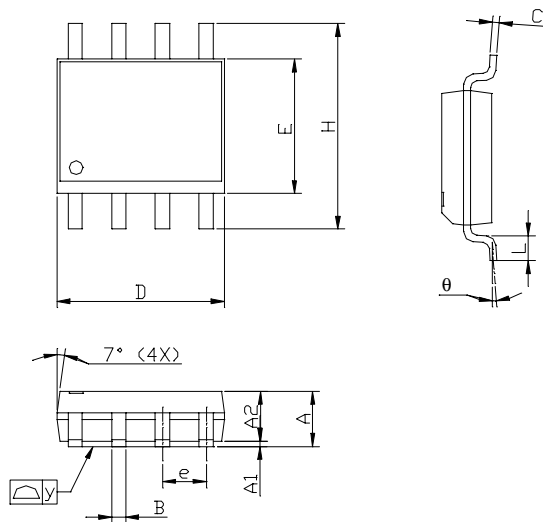
■ Package Dimension

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

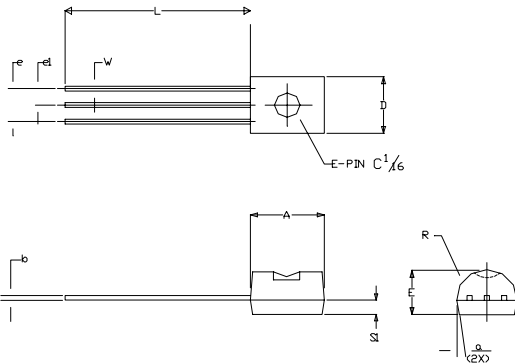


SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.35	1.75	0.053	0.069
A ₁	0.10	0.25	0.004	0.010
A ₂	1.45 REF		0.057 REF	
B	0.33	0.51	0.013	0.020
C	0.19	0.25	0.007	0.010
D	4.80	5.00	0.189	0.1970
E	3.80	4.00	0.150	0.157
e	1.27 BSC		0.050 BSC	
H	5.80	6.20	0.228	0.244
L	0.40	1.27	0.016	0.050
y		0.10		0.004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



■ Package Dimension

TO-92-3

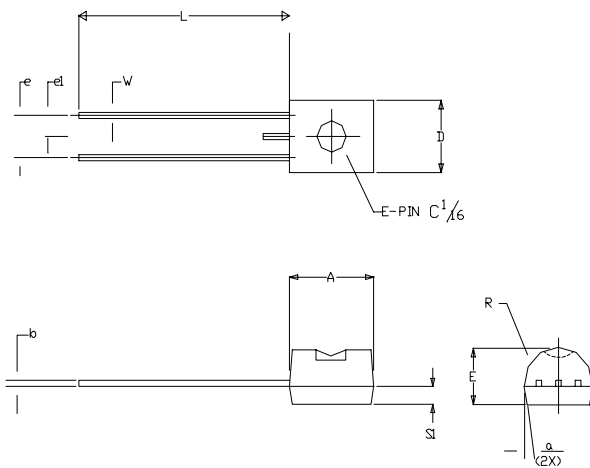


SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.32	4.95	0.170	0.195
b	0.36	0.51	0.014	0.020
E	3.30	3.94	0.130	0.155
e	2.41	2.67	0.095	0.105
e1	1.14	1.40	0.045	0.055
L	12.70	15.49	0.500	0.610
R	2.16	2.41	0.085	0.095
S1	1.14	1.52	0.045	0.060
W	0.41	0.56	0.016	0.022
D	4.45	4.95	0.175	0.195
a	4°	6°	4°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

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