

■ General Description

The AME385-2.5 is a micropower 2-terminal band-gap voltage regulator diode. It operates over a 20 μ 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.

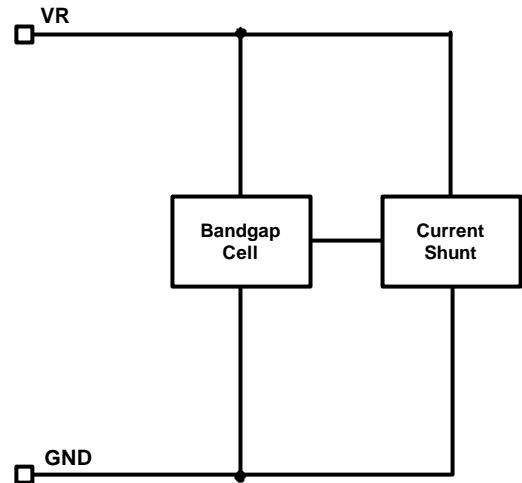
■ Features

- 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 μ A to 20mA
- Wide temperature range ----- -40 $^{\circ}$ C to +85 $^{\circ}$ C
- Low temperature coefficient --100ppm/ $^{\circ}$ C ($_{max}$)
- Excellent transient response

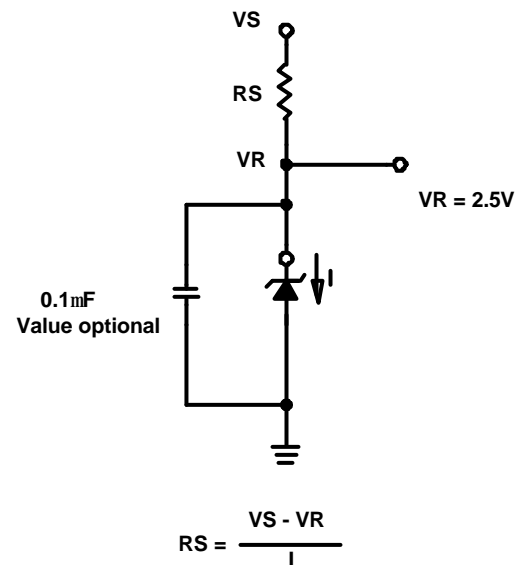
■ Applications

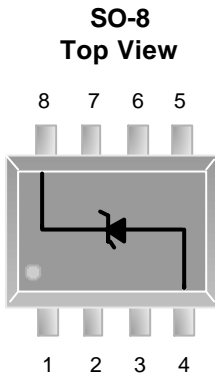
- Portable electronics
- Power supplies
- Computer peripherals
- Data acquisition systems
- Battery chargers
- Consumer electronics

■ Functional Block Diagram

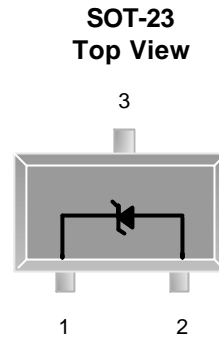


■ Typical Application

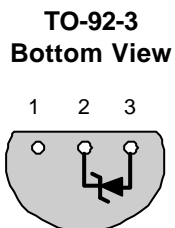


■ Pin Configuration

AME 385-2.5

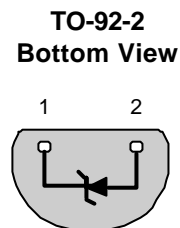
1. NC
2. NC
3. NC
4. -
5. NC
6. NC
7. NC
8. +


AME 385-2.5

1. +
2. -
3. NC*


AME 385-2.5

1. NC*
2. +
3. -

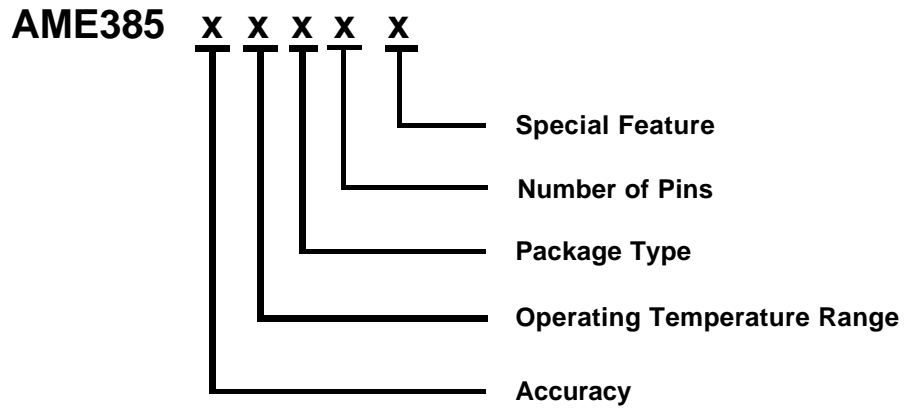

AME 385-2.5

1. +
2. -

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



■ Ordering Information



Accuracy	Operating Temperature Range	Package Type	Number of Pins	Special Feature
D: 0.2% B: 0.5%	E: -40°C to 85°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 $\overline{\text{ACS}}$.

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

■ 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	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



AME385-2.5

Micropower Voltage Reference Diode

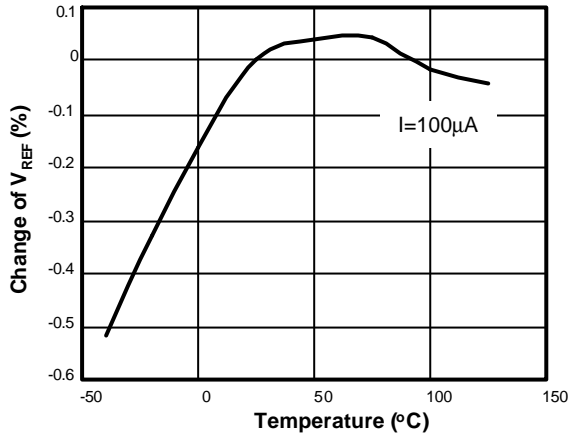
■ Electrical Specifications

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

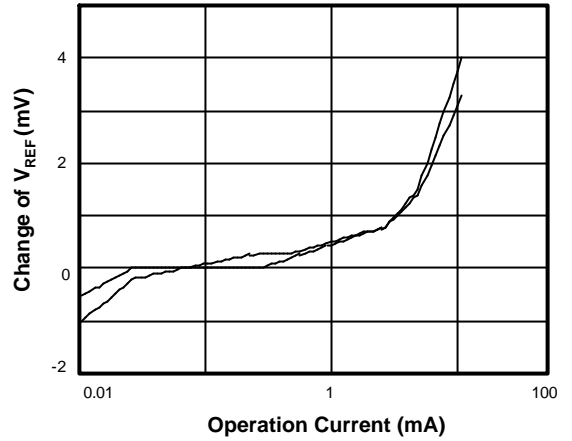
Parameter	Symbol	Test Condition	Min	Typ	Max	Units
Reference Voltage, ±0.2%	V _{REF}	I _{REF} = 100µA	2.495	2.50	2.505	V
Reference Voltage, ±0.5%			2.487	2.50	2.513	V
Minimum Current	I _{MIN}				20	µA
Reference Voltage Change With Current	dV _{REF/I}	I _{MIN} ≤ I ≤ 1mA		1.5	3	mV
		1mA ≤ I ≤ 20mA		5	20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



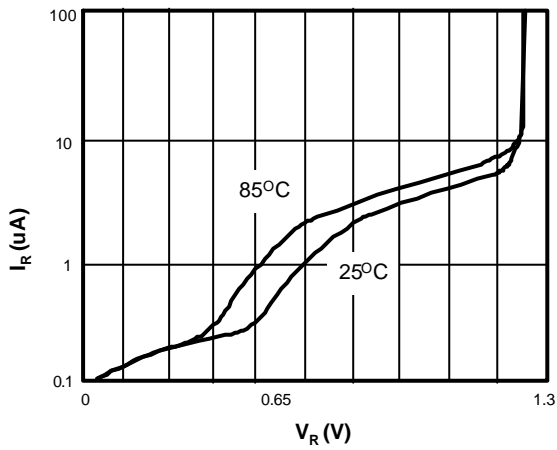
Normalized Percentage Change vs. Temp.



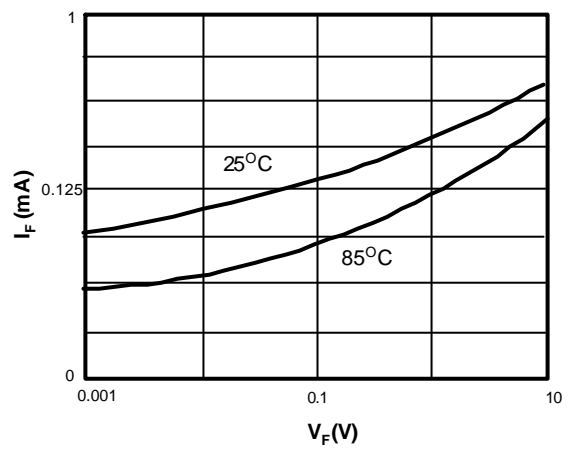
Reference Voltage Change vs. Current



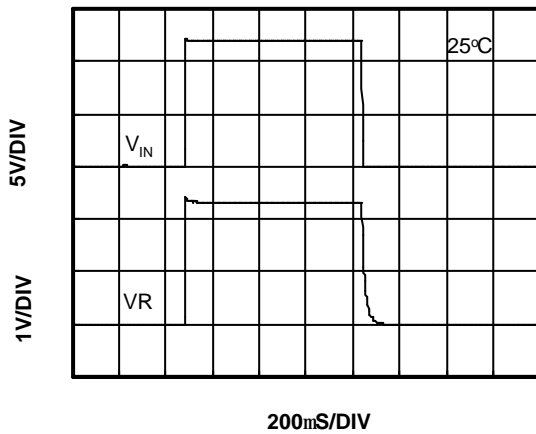
Reverse Characteristic

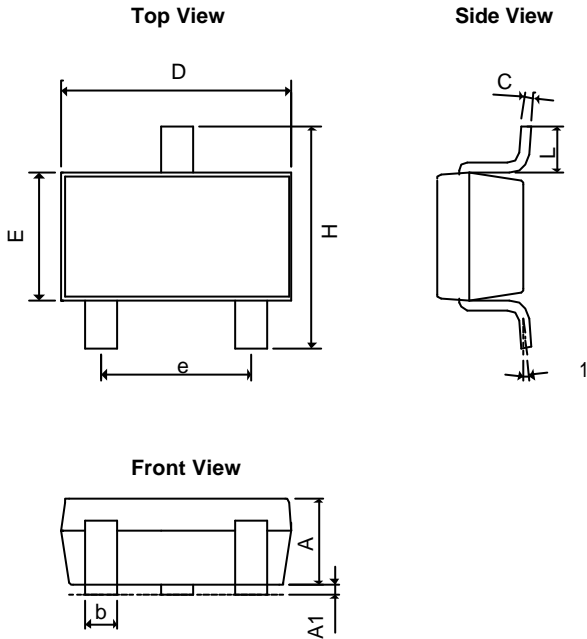


Forward Characteristic

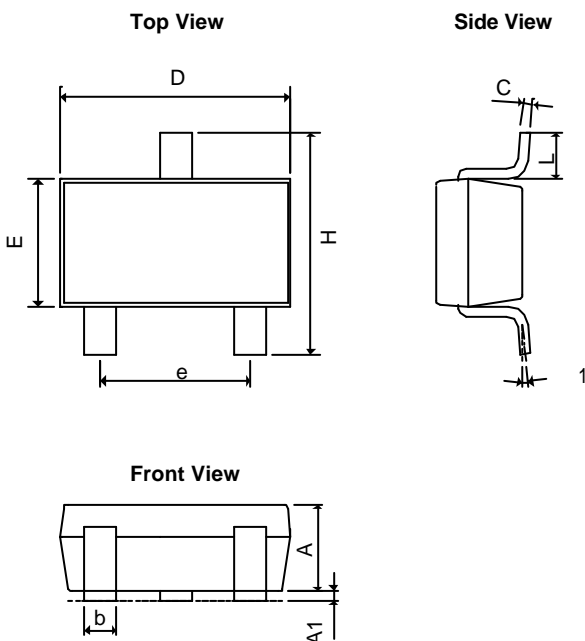


Line Transient Response



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

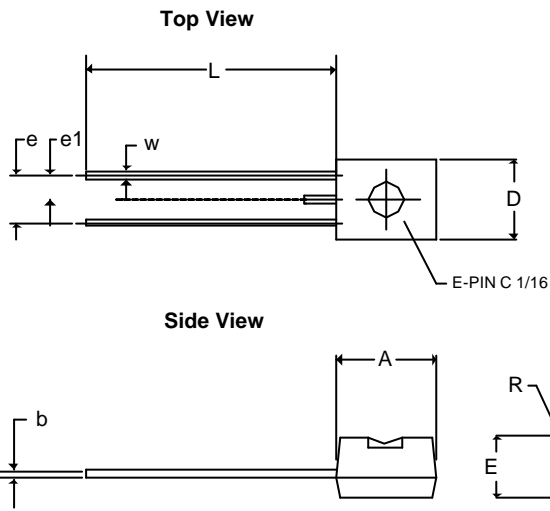
TSOT-23


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°



■ Package Dimension

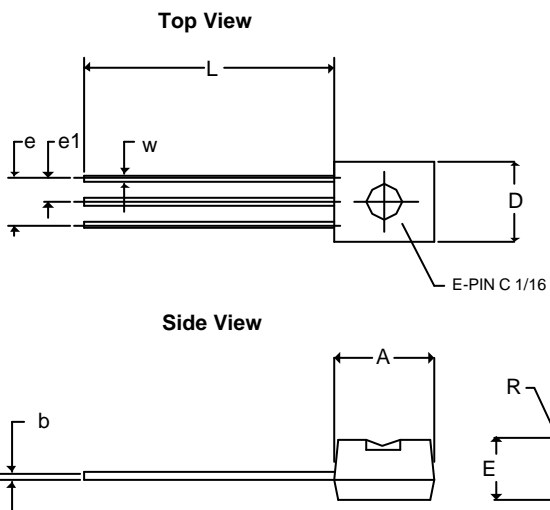
TO-92-2 (bulk pack)



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

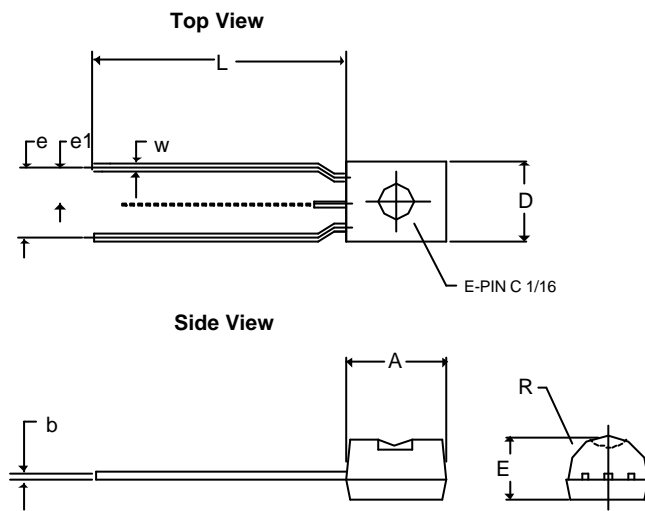
- Notes:
1. Package outline exclusive of any mold flashes dimension.
 2. Package outline exclusive of burr dimension.
 3. Lead pitch=2.54mm is bulk pack.
 4. Lead pitch=5.08mm is tape pack.

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

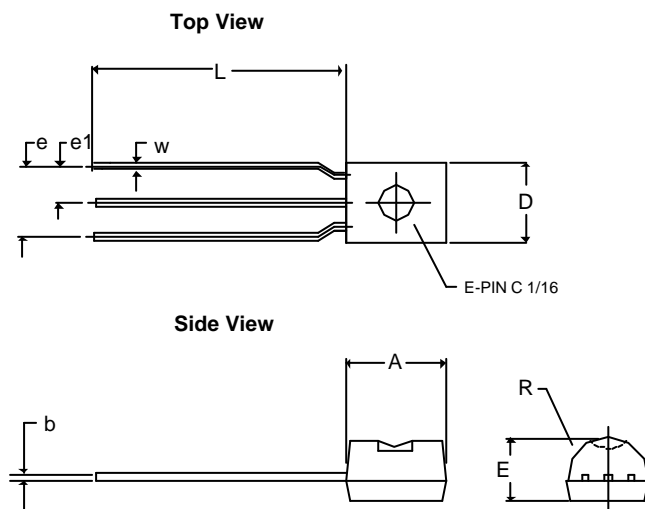
- Notes:
1. Package outline exclusive of any mold flashes dimension.
 2. Package outline exclusive of burr dimension.
 3. Lead pitch=2.54mm is bulk pack.
 4. Lead pitch=5.08mm is tape pack.

■ 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

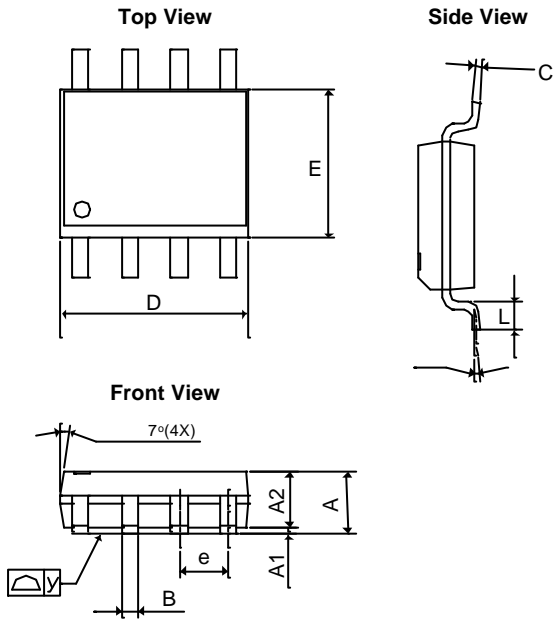
Notes:

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.



■ 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
A ₂	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:

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