

## ■ General Description

The AME8819 is a CMOS linear regulator. It operated from 2.8V to 5.5V input voltage and delivers up to 600mA output current. The AME8819 provide low quiescent current (70 $\mu$ A typ) low dropout voltage ( $V_{out}=3.3V$ , 540mV @ 600mA typ), and excellent PSRR, thus marking them ideal for Data-Communications and battery applications.

The AME8819 provide over temperature and over current protected functions. It is stable with an output capacitance of 2.2 $\mu$ F or larger.

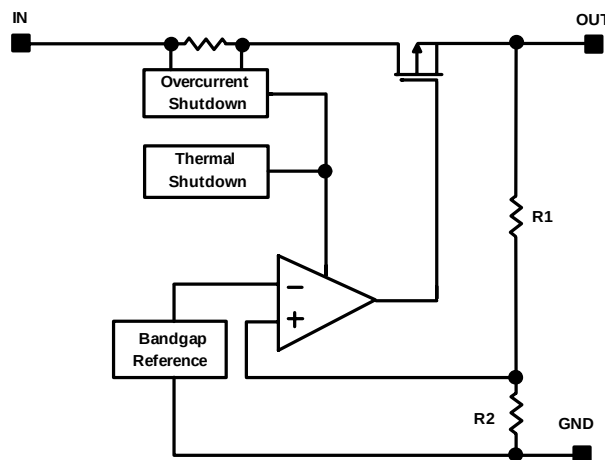
## ■ Features

- Input voltage range is from 2.8V to 5.5V
- Output Voltage Range:
  - Fixed Version is from 1.2V to 4.5V
  - ADJ Version is from 0.98V to 4.5V
- Low Dropout: 540mV @ 600mA,  $V_{OUT} = 3.3V$
- Guaranteed 600mA Drive Current
- Factory Pre-set output voltage
- Only 2.2 $\mu$ F Output Capacitor Required for Stability (Low ESR MLCC is allowable)
- Provided OTP, current limit
- Green Products Meet RoHS Standards

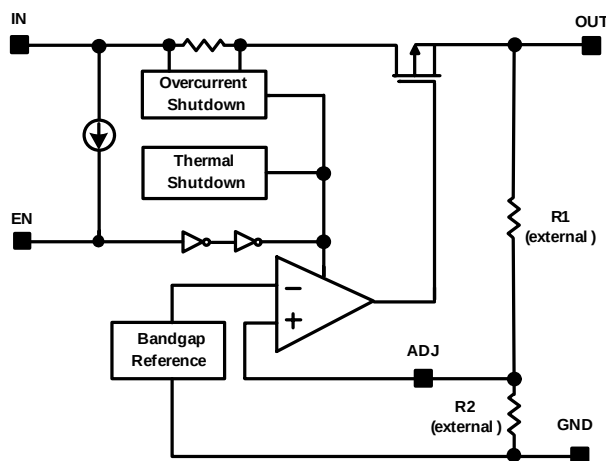
## ■ Applications

- Data-Communication
- Laptop, Palmtops, Notebook computers
- Battery Power Equipment
- Handheld Device
- PCMCIA Cards

## ■ Functional Block Diagram (Fixed Version)



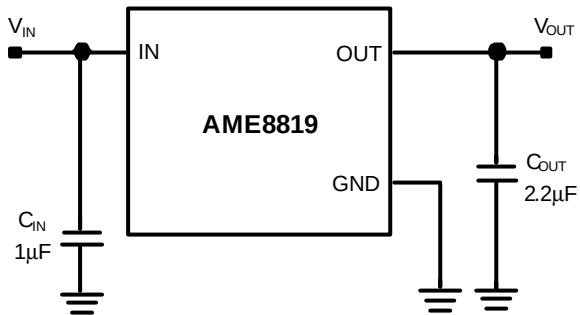
## (Adjustable Version)



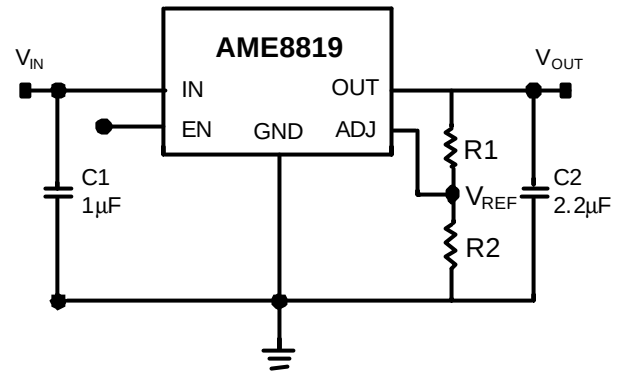
## AME8819

### ■ Typical Application

**(Fixed Version)**

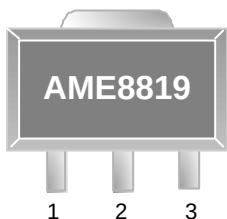


**(Adjustable Version)**



## ■ Pin Configuration

**SOT-89  
Top View**

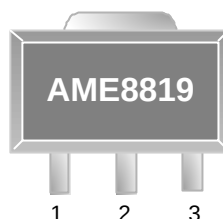


**AME8819AEFT**

1. IN
2. GND (TAB)
3. OUT

**Die Attach:  
Conductive Epoxy**

**SOT-89  
Top View**

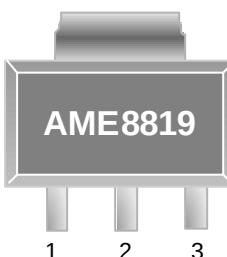


**AME8819BEFT**

1. GND
2. IN (TAB)
3. OUT

**Die Attach:  
Non-Conductive Epoxy**

**SOT-223  
Top View**

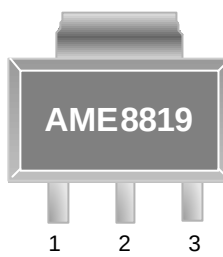


**AME8819AEGT**

1. IN
2. GND (TAB)
3. OUT

**Die Attach:  
Conductive Epoxy**

**SOT-223  
Top View**

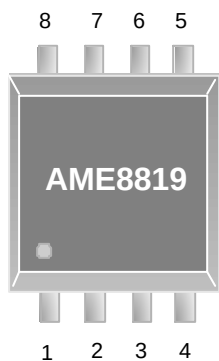


**AME8819BEGT**

1. GND
2. OUT (TAB)
3. IN

**Die Attach:  
Non-Conductive Epoxy**

**SOP-8  
Top View**

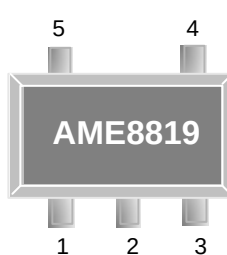


**AME8819AEHAADJ**

1. EN
2. IN
3. OUT
4. ADJ
5. GND
6. GND
7. GND
8. GND

**Die Attach:  
Conductive Epoxy**

**SOT-25  
Top View**



**AME8819DEEVADJ**

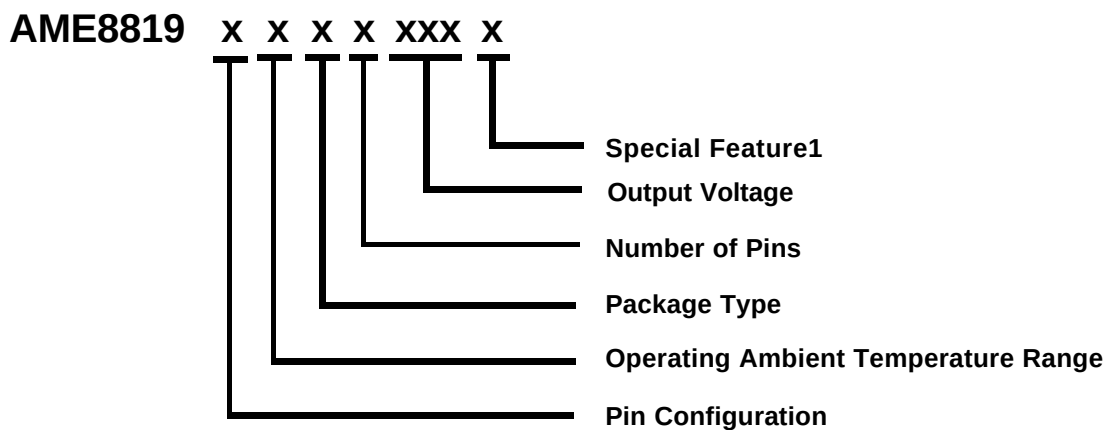
1. IN
2. GND
3. EN
4. ADJ
5. OUT

**Die Attach:  
Conductive Epoxy**

**■ Pin Description**

| Pin Name | Pin Description                                                                                                            |
|----------|----------------------------------------------------------------------------------------------------------------------------|
| IN       | Input voltage pin.<br>It should be decoupled with 1 $\mu$ F or greater capacitor.                                          |
| GND      | Ground connection pin.                                                                                                     |
| OUT      | LDO voltage regulator output pin.<br>It should be decoupled with a 2.2 $\mu$ F or greater value low ESR ceramic capacitor. |
| EN       | Enable pin.<br>When pulled low, the PMOS pass transistor turns off, current consuming less than 10 $\mu$ A.                |
| ADJ      | Feedback output voltage for adjustable device.                                                                             |

## ■ Ordering Information



| Pin Configuration                                                                                                                                                                                                                                                                                                                                                              | Operating Ambient Temperature Range         | Package Type                                   | Number of Pins       | Output Voltage                                                                                                                                                                        | Special Feature 1 |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|------------------------------------------------|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| A: 1. IN<br><small>(SOT-89)</small> 2. GND<br><small>(SOT-223)</small> 3. OUT<br><br>B: 1.GND<br><small>(SOT-89)</small> 2.IN<br>3.OUT<br><br>B: 1.GND<br><small>(SOT-223)</small> 2.OUT<br>3.IN<br><br>A: 1.EN<br><small>(SOP-8)</small> 2.IN<br>3.OUT<br>4.ADJ<br>5.GND<br>6.GND<br>7.GND<br>8.GND<br><br>D: 1.IN<br><small>(SOT-25)</small> 2.GND<br>3.EN<br>4.ADJ<br>5.OUT | E: -40 <sup>o</sup> C to +85 <sup>o</sup> C | E: SOT-2X<br>F: SOT-89<br>G: SOT-223<br>H: SOP | T: 3<br>V: 5<br>A: 8 | 120: V=1.2V<br>150: V=1.5V<br>180: V=1.8V<br>250: V=2.5V<br>280: V=2.8V<br>285: V=2.85V<br>290: V=2.9V<br>300: V=3.0V<br>310: V=3.1V<br>330: V=3.3V<br>360: V=3.6V<br>ADJ: Adjustable | Z: Green          |

## AME8819

### ■ Available Options

| Part Number     | Marking         | Output Voltage | Package | Operating Ambient Temperature Range |
|-----------------|-----------------|----------------|---------|-------------------------------------|
| AME8819AEFT120Z | A8819<br>CKyMXX | 1.2V           | SOT-89  | -40°C to +85°C                      |
| AME8819AEFT150Z | A8819<br>CJyMXX | 1.5V           | SOT-89  | -40°C to +85°C                      |
| AME8819AEFT180Z | A8819<br>ClYmXX | 1.8V           | SOT-89  | -40°C to +85°C                      |
| AME8819AEFT250Z | A8819<br>CGyMXX | 2.5V           | SOT-89  | -40°C to +85°C                      |
| AME8819AEFT300Z | A8819<br>CDyMXX | 3.0V           | SOT-89  | -40°C to +85°C                      |
| AME8819AEFT330Z | A8819<br>CByMXX | 3.3V           | SOT-89  | -40°C to +85°C                      |
| AME8819BEFT120Z | A8819<br>DKyMXX | 1.2V           | SOT-89  | -40°C to +85°C                      |
| AME8819BEFT150Z | A8819<br>DJyMXX | 1.5V           | SOT-89  | -40°C to +85°C                      |
| AME8819BEFT180Z | A8819<br>DlYmXX | 1.8V           | SOT-89  | -40°C to +85°C                      |
| AME8819BEFT250Z | A8819<br>DGyMXX | 2.5V           | SOT-89  | -40°C to +85°C                      |
| AME8819BEFT300Z | A8819<br>DDyMXX | 3.0V           | SOT-89  | -40°C to +85°C                      |
| AME8819BEFT330Z | A8819<br>DByMXX | 3.3V           | SOT-89  | -40°C to +85°C                      |
| AME8819BEFT360Z | A8819<br>DAyMXX | 3.6V           | SOT-89  | -40°C to +85°C                      |
| AME8819AEGT120Z | A8819<br>AKyMXX | 1.2V           | SOT-223 | -40°C to +85°C                      |
| AME8819AEGT150Z | A8819<br>AJyMXX | 1.5V           | SOT-223 | -40°C to +85°C                      |
| AME8819AEGT180Z | A8819<br>AlYmXX | 1.8V           | SOT-223 | -40°C to +85°C                      |
| AME8819AEGT250Z | A8819<br>AGyMXX | 2.5V           | SOT-223 | -40°C to +85°C                      |
| AME8819AEGT300Z | A8819<br>ADyMXX | 3.0V           | SOT-223 | -40°C to +85°C                      |

**■ Available Options**

| Part Number     | Marking         | Output Voltage | Package | Operating Ambient Temperature Range |
|-----------------|-----------------|----------------|---------|-------------------------------------|
| AME8819AEGT310Z | A8819<br>ACyMXX | 3.1V           | SOT-223 | -40°C to +85°C                      |
| AME8819AEGT330Z | A8819<br>AByMXX | 3.3V           | SOT-223 | -40°C to +85°C                      |
| AME8819BEGT120Z | A8819<br>BKyMXX | 1.2V           | SOT-223 | -40°C to +85°C                      |
| AME8819BEGT150Z | A8819<br>BJyMXX | 1.5V           | SOT-223 | -40°C to +85°C                      |
| AME8819BEGT180Z | A8819<br>BlyMXX | 1.8V           | SOT-223 | -40°C to +85°C                      |
| AME8819BEGT250Z | A8819<br>BGyMXX | 2.5V           | SOT-223 | -40°C to +85°C                      |
| AME8819BEGT300Z | A8819<br>BDyMXX | 3.0V           | SOT-223 | -40°C to +85°C                      |
| AME8819BEGT330Z | A8819<br>BByMXX | 3.3V           | SOT-223 | -40°C to +85°C                      |
| AME8819AEHAADJZ | A8819<br>EMyMXX | ADJ            | SOP-8   | -40°C to +85°C                      |
| AME8819DEEVADJZ | A8819<br>CNUMXX | ADJ            | SOT-25  | -40°C to +85°C                      |

Note:

1. The first 2 places represent product code. It is assigned by AME such as CK.
2. y is year code and is the last number of a year. Such as the year code of 2008 is 8.
3. A bar on top of first letter represents Green Part such as  $\bar{A}$ 8819.
4. The last 3 places MXX represent Marking Code. It contains M as date code in "month", XX as LN code and that is for AME internal use only. Please refer to date code rule section for detail information.
5. Please consult AME sales office or authorized Rep./Distributor for the availability of output voltage and package type.

## AME8819

### ■ Absolute Maximum Ratings

| Parameter          | Symbol    | Maximum                    | Unit |
|--------------------|-----------|----------------------------|------|
| Input Voltage      | $V_{IN}$  | -0.3 to 6                  | V    |
| EN Voltage         | $V_{EN}$  | -0.3 to 6                  | V    |
| Output Current     | $I_{OUT}$ | $P_D / (V_{IN} - V_{OUT})$ | mA   |
| Output Voltage     | $V_{OUT}$ | -0.3 to $V_{IN} + 0.3$     | V    |
| ESD Classification | B*        |                            |      |

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

\* HBM B:2000V~3999V

### ■ Recommended Operating Conditions

| Parameter                  | Symbol    | Rating      | Unit |
|----------------------------|-----------|-------------|------|
| Ambient Temperature Range  | $T_A$     | -40 to +85  | °C   |
| Junction Temperature Range | $T_J$     | -40 to +125 |      |
| Storage Temperature Range  | $T_{STG}$ | -65 to +150 |      |



**■ Thermal Information**

| Parameter                                   | Package  | Die Attach           | Symbol        | Maximum | Unit                          |
|---------------------------------------------|----------|----------------------|---------------|---------|-------------------------------|
| Thermal Resistance<br>(Junction to Case)    | SOT-89*  | Conductive Epoxy     | $\theta_{JC}$ | 40      | $^{\circ}\text{C} / \text{W}$ |
|                                             |          | Non-Conductive Epoxy |               | 46      |                               |
|                                             | SOT-223* | Conductive Epoxy     |               | 25      |                               |
|                                             |          | Non-Conductive Epoxy |               | 31      |                               |
|                                             | SOP-8**  | Conductive Epoxy     |               | 60      |                               |
|                                             | SOT-25   | Conductive Epoxy     |               | 81      |                               |
| Thermal Resistance<br>(Junction to Ambient) | SOT-89   | Conductive Epoxy     | $\theta_{JA}$ | 180     | $^{\circ}\text{C} / \text{W}$ |
|                                             |          | Non-Conductive Epoxy |               | 180     |                               |
|                                             | SOT-223  | Conductive Epoxy     |               | 120     |                               |
|                                             |          | Non-Conductive Epoxy |               | 135     |                               |
|                                             | SOP-8    | Conductive Epoxy     |               | 150     |                               |
|                                             | SOT-25   | Conductive Epoxy     |               | 260     |                               |
| Internal Power Dissipation                  | SOT-89   | Conductive Epoxy     | $P_D$         | 550     | mW                            |
|                                             |          | Non-Conductive Epoxy |               | 550     |                               |
|                                             | SOT-223  | Conductive Epoxy     |               | 900     |                               |
|                                             |          | Non-Conductive Epoxy |               | 800     |                               |
|                                             | SOP-8    | Conductive Epoxy     |               | 810     |                               |
|                                             | SOT-25   | Conductive Epoxy     |               | 400     |                               |
| Maximum Junction Temperature                |          |                      |               | 150     | $^{\circ}\text{C}$            |
| Solder Iron(10 Sec)***                      |          |                      |               | 350     | $^{\circ}\text{C}$            |

\* Measure  $\theta_{JC}$  on backside center of tab.

\*\* Measure  $\theta_{JC}$  on center of molding compound if IC has no tab.

\*\*\* MIL-STD-202G 210F

## AME8819

### ■ Electrical Specifications

$V_{IN} = V_{OUT(NOM)} + 1V$ ,  $I_{OUT} = 1mA$ ,  $C_{IN} = 1\mu F$ ,  $C_{OUT} = 4.7\mu F$ , Typical values at  $T_A = 25^\circ C$ , unless otherwise noted.

| Parameter                                                                                    | Symbol        | Test Conditions                                     |                                                         | Min    | Typ   | Max   | Units   |
|----------------------------------------------------------------------------------------------|---------------|-----------------------------------------------------|---------------------------------------------------------|--------|-------|-------|---------|
| Input Voltage                                                                                | $V_{IN}$      |                                                     |                                                         | Note1  |       | 5.5   | V       |
| ADJ Input Bias Current                                                                       | $I_{ADJ}$     | $V_{IN}=5V$ , $V_{ADJ}=0.980$                       |                                                         |        | 1     |       | $\mu A$ |
| ADJ Reference Voltage                                                                        | $V_{REF}$     |                                                     |                                                         | 0.965  | 0.980 | 0.995 | V       |
| Output Voltage Accuracy                                                                      | $V_{OUT,ACC}$ |                                                     |                                                         | -2     |       | 2     | %       |
| Output Voltage Range                                                                         | $V_{OUT}$     |                                                     |                                                         | 1.2    |       | 4.5   | V       |
| Output Current                                                                               | $I_{OUT}$     |                                                     |                                                         | 600    |       |       | mA      |
| Quiescent Current                                                                            | $I_Q$         | $V_{IN} = 5.5V$ , $I_{OUT} = 1mA$                   |                                                         |        | 70    | 100   | $\mu A$ |
| Dropout Voltage                                                                              | $V_{DROP}$    | $I_{OUT} = 600mA$                                   | $1.2V \leq V_{OUT} < 1.8V$                              |        | Note2 |       | mV      |
|                                                                                              |               |                                                     | $1.8V \leq V_{OUT} \leq 2.5V$                           |        | 800   | 1000  |         |
|                                                                                              |               |                                                     | $2.5V < V_{OUT} \leq 3.3V$                              |        | 540   | 800   |         |
|                                                                                              |               |                                                     | $3.3V < V_{OUT} \leq 4.5V$                              |        | 470   | 650   |         |
| Output Voltage Line Regulation<br>[( $\Delta V_{OUT} / \Delta V_{IN}$ )x100%] / $V_{OUT}$    | $REG_{LINE}$  | $2.8V \leq V_{IN} \leq V_{IN(MAX)}$                 | $1.2V \leq V_{OUT} < 1.8V$                              | -0.4   | 0.1   | 0.4   | % / V   |
|                                                                                              |               | $V_{IN(MIN)} \leq V_{IN} \leq V_{IN(MAX)}$          | $1.8V \leq V_{OUT} < 2.5V$                              | -0.4   | 0.1   | 0.4   |         |
|                                                                                              |               | $V_{IN(MIN)} \leq V_{IN} \leq V_{IN(MAX)}$          | $2.5V \leq V_{OUT} < 3.3V$                              | -0.2   | 0.03  | 0.2   |         |
|                                                                                              |               | $V_{OUT}+0.3V \leq V_{IN} \leq V_{IN(MAX)}$         | $3.3V \leq V_{OUT} < 4.5V$                              | -0.1   | 0.01  | 0.1   |         |
| Output Voltage Load Regulation<br>[( $\Delta V_{OUT} / V_{OUT}$ ) x 100%] / $\Delta I_{OUT}$ | $REG_{LOAD}$  | $1mA \leq I_{OUT} \leq 600mA$                       | $1.2V \leq V_{OUT} < 1.8V$ ,<br>$V_{IN}=V_{IN(MIN)}$    | -0.015 |       | 0.01  | % / mA  |
|                                                                                              |               |                                                     | $1.8V \leq V_{OUT} < 2.5V$ ,<br>$V_{IN}=V_{IN(MIN)}$    | -0.015 |       | 0.01  |         |
|                                                                                              |               |                                                     | $2.5V \leq V_{OUT} < 3.3V$ ,<br>$V_{IN}=V_{IN(MIN)}$    | -0.005 |       | 0.004 |         |
|                                                                                              |               |                                                     | $3.3V \leq V_{OUT} \leq 4.5V$ ,<br>$V_{IN}=V_{IN(MIN)}$ | -0.003 |       | 0.002 |         |
| Output Current Limit                                                                         | $I_{LIM}$     | $V_{OUT} = 0.8 \times V_{OUT(NOM)}$                 |                                                         | 650    | 800   |       | mA      |
| Shutdown Current                                                                             | $I_{SHDN}$    | $V_{EN} = 0V$ , $V_{IN(MIN)} \leq V_{IN} \leq 5.5V$ |                                                         |        | 5     | 10    | $\mu A$ |
| Power Supply Ripple Rejection                                                                | PSRR          | $f = 1KHz$ , $I_{OUT} = 100mA$ , $C_{OUT}=1\mu F$   |                                                         |        | 60    |       | dB      |

## ■ Electrical Specifications

| Parameter                    | Symbol       | Test Conditions                     | Min | Typ | Max      | Units       |
|------------------------------|--------------|-------------------------------------|-----|-----|----------|-------------|
| Enable High (enabled)        | $V_{EN(HI)}$ | $V_{IN(MIN)} \leq V_{IN} \leq 5.5V$ | 1.4 |     | $V_{IN}$ | V           |
| Enable Low (shutdown)        | $V_{EN(LO)}$ | $V_{IN(MIN)} \leq V_{IN} \leq 5.5V$ | 0   |     | 0.4      | V           |
| Enable Pin Current (enabled) | $I_{EN}$     | $V_{EN} = V_{IN}$                   |     | 0.1 | 1        | $\mu A$     |
| Thermal Shutdown Temperature | $T_{SHDN}$   | Shutdown, temperature increasing    |     | 150 |          | $^{\circ}C$ |
|                              | $T_{RS}$     | Restore, temperature decreasing     |     | 130 |          |             |

Note 1: If  $V_{OUT} \geq 1.8V$ ,  $V_{IN(MIN)} = V_{OUT} + V_{DROP}$ . If  $V_{OUT} < 1.8V$ ,  $V_{IN(MIN)} = 2.8V$ .

Note 2: For  $V_{OUT}$  below 1.8V, Dropout Voltage is the input<sub>(MIN)</sub> to output differential.

## ■ Detailed Description

The AME8819 is low-dropout, low quiescent-current linear regulator designed primarily for battery-powered applications. It is available with present output voltage ranging from 1.2V to 4.5V, and can supply loads up to 600mA.

## ■ Circuit Limit

The AME8819 contains current limiters which monitor and control the pass transistor's Gate voltage, limiting the guaranteed maximum output current to 650mA minimum. The output can be shorted to ground for an indefinite time without damaging the part.

## ■ Thermal-Overload Protection

Thermal-overload protection limits total power dissipation in the AME8819. When the junction temperature arrive  $T_j = 160^\circ\text{C}$  approximately, the thermal sensor signals the shut-down logic, turning off the pass transistor and allowing the IC to cool.

## ■ PSRR and Operation from sources Other than Batteries

The AME8819 is designed to deliver low-dropout voltage and low quiescent currents in battery-powered system. Power-supply rejection ratio is 60dB(Typ.) at 1KHz (see PSRR vs Frequency Curve). When operating from sources other than batteries, PSRR and transient response can be improved by increasing input, output capacitors.

## ■ Capacitor Selection and Regulator Stability

Use  $1\mu\text{F}$  capacitor on the OUT. Larger input capacitor values and lower ESR provide better supply noise rejection and line transient response. To reduce output noise and improve load transient voltage dips, use larger output capacitors up to  $4.7\mu\text{F}$ . For stable operation over the full temperature range with load currents up to 600mA, input and output capacitors should be a minimum of  $2.2\mu\text{F}$  by X7R.

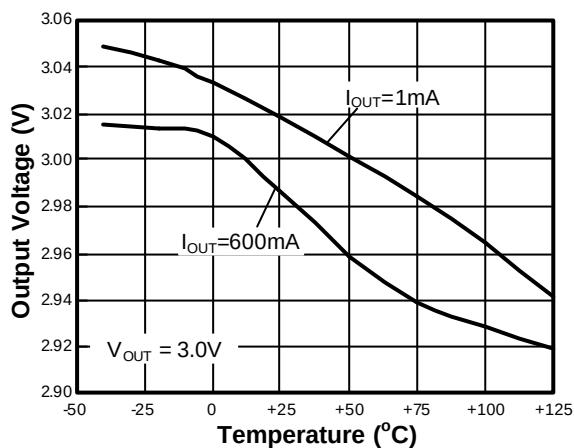
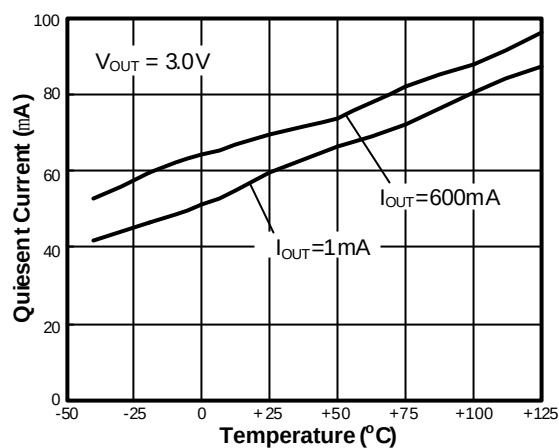
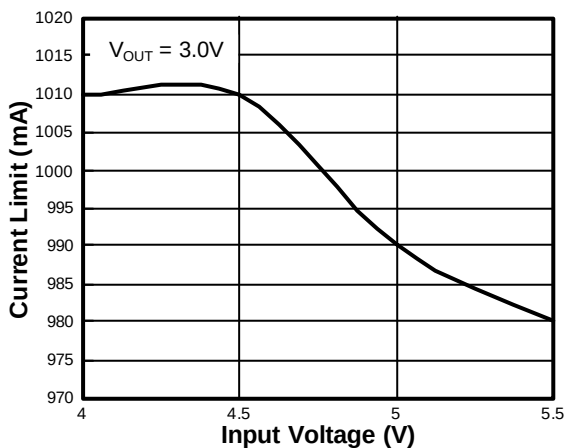
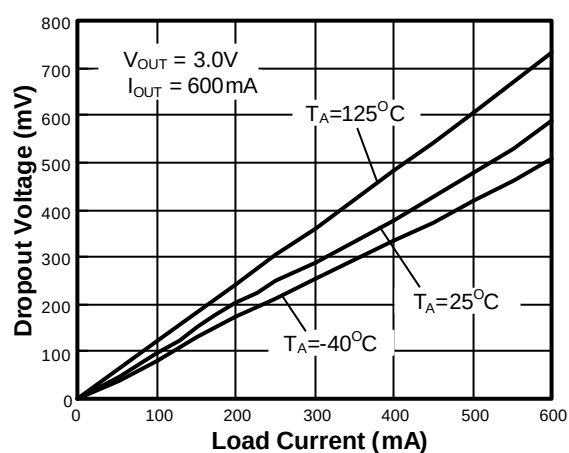
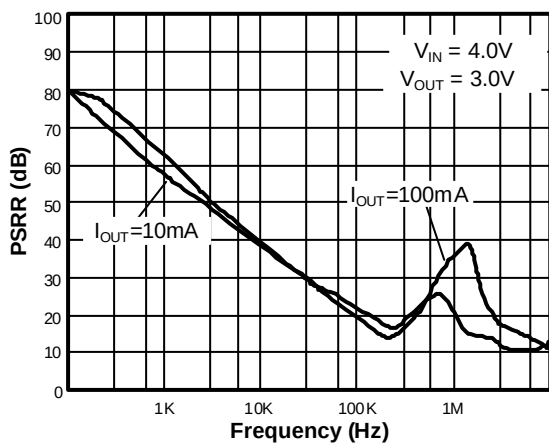
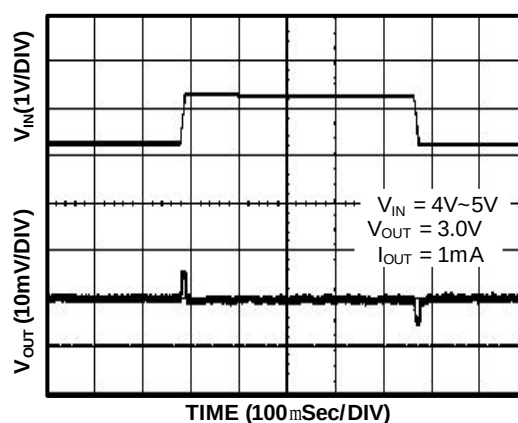
Note that some ceramic dielectrics large capacitance and ESR variation with temperature. With dielectrics such as Z5U and Y5V, it may be necessary to use  $4.7\mu\text{F}$  or more for up to 600mA load current to ensure stability at temperatures below  $-10^\circ\text{C}$ . With X7R or X5R dielectrics,  $2.2\mu\text{F}$  is sufficient at all operating temperatures. These regulators are optimized for ceramic capacitors. Tantalum capacitors are not recommended.

## ■ Adjustable Version

The adjustable version uses external feedback resistors to generate an output voltage anywhere from 0.98V to 4.5V.  $V_{\text{ADJ}}$  is trimmed to 0.98V and  $V_{\text{OUT}}$  is given by the equation:

$$V_{\text{OUT}} = V_{\text{ADJ}} (1 + R1 / R2)$$

Feedback resistors R1 and R2 should be high enough to keep quiescent current low, but increasing  $R1 + R2$  will reduce stability. In general, R1 and R2 in the 10's of  $k\Omega$  will produce adequate stability, given reasonable layout precautions. To improve stability characteristics, keep parasitics on the ADJ pin to a minimum, and lower R1 and R2 values.

**■ Characterization Curve(For reference only)**
**Output Voltage vs Temperature**

**Quiescent Current vs Temperature**

**Current Limit vs Input Voltage**

**Dropout Voltage vs Load Current**

**Power Supply Rejection Ratio**

**Line Transient Response**




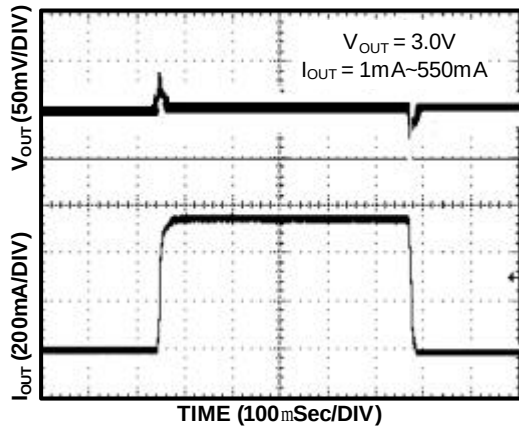
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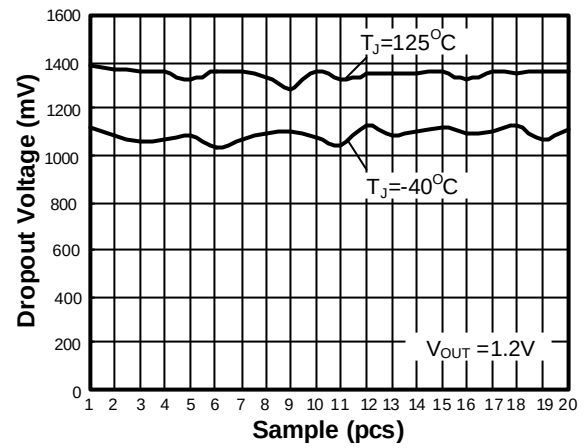
## Low Dropout 600mA CMOS Regulator

### ■ Characterization Curve(For reference only)

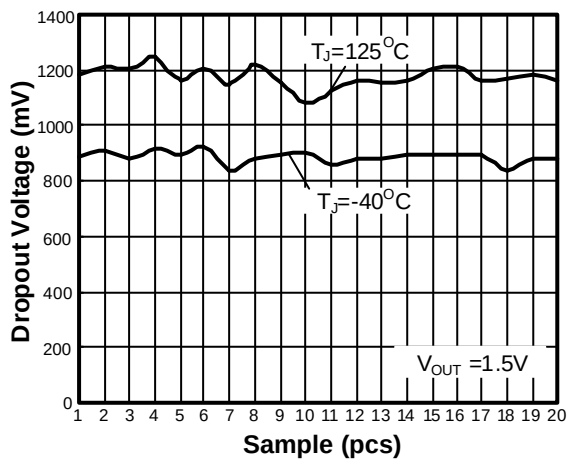
Load Transient Response



Dropout Voltage



Dropout Voltage



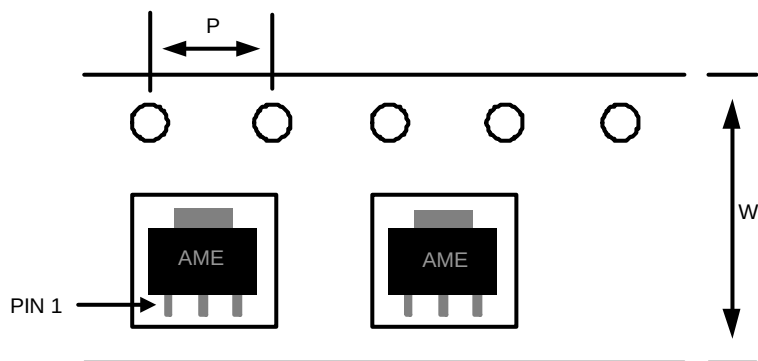
## ■ Date Code Rule

| Month Code  |              |
|-------------|--------------|
| 1: January  | 7: July      |
| 2: February | 8: August    |
| 3: March    | 9: September |
| 4: April    | A: October   |
| 5: May      | B: November  |
| 6: June     | C: December  |

| Marking |   |          |          |          |          | Year |
|---------|---|----------|----------|----------|----------|------|
| A       | A | A        | M        | X        | X        | xxx0 |
| A       | A | A        | M        | X        | <u>X</u> | xxx1 |
| A       | A | A        | M        | <u>X</u> | X        | xxx2 |
| A       | A | A        | M        | <u>X</u> | <u>X</u> | xxx3 |
| A       | A | A        | <u>M</u> | X        | X        | xxx4 |
| A       | A | A        | <u>M</u> | X        | <u>X</u> | xxx5 |
| A       | A | A        | <u>M</u> | <u>X</u> | X        | xxx6 |
| A       | A | A        | <u>M</u> | <u>X</u> | <u>X</u> | xxx7 |
| A       | A | <u>A</u> | M        | X        | X        | xxx8 |
| A       | A | <u>A</u> | M        | X        | <u>X</u> | xxx9 |

## ■ Tape and Reel Dimension

### SOT-89



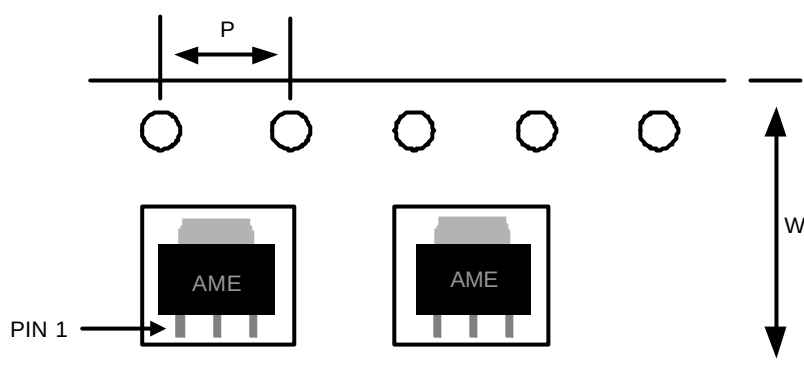
Carrier Tape, Number of Components Per Reel and Reel Size

| Package | Carrier Width (W) | Pitch (P)  | Part Per Full Reel | Reel Size |
|---------|-------------------|------------|--------------------|-----------|
| SOT-89  | 12.0±0.1 mm       | 4.0±0.1 mm | 1000pcs            | 180±1 mm  |

## AME8819

### ■ Tape and Reel Dimension

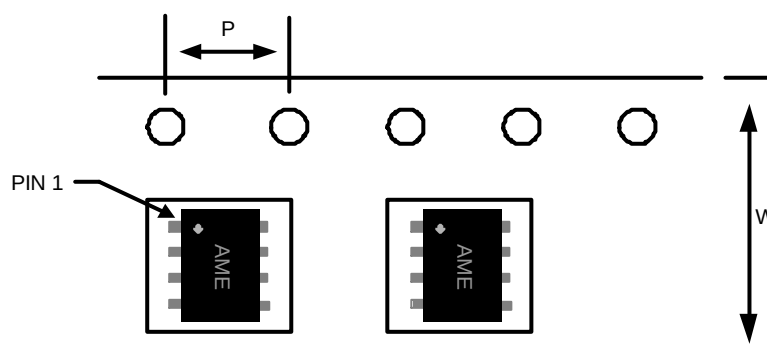
#### SOT-223



Carrier Tape, Number of Components Per Reel and Reel Size

| Package | Carrier Width (W) | Pitch (P)  | Part Per Full Reel | Reel Size |
|---------|-------------------|------------|--------------------|-----------|
| SOT-223 | 12.0±0.1 mm       | 4.0±0.1 mm | 2500pcs            | 330±1 mm  |

#### SOP-8



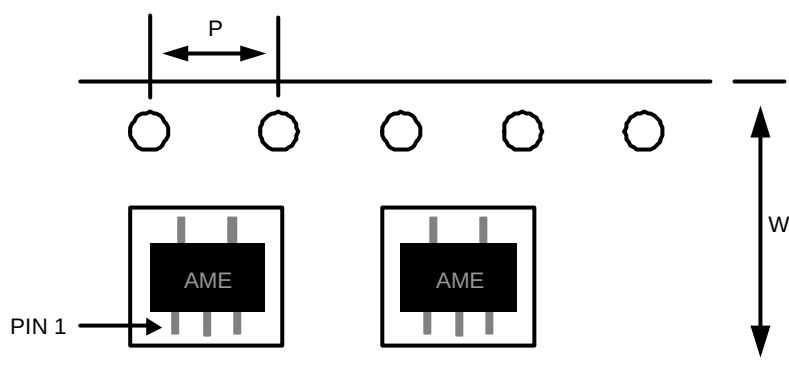
Carrier Tape, Number of Components Per Reel and Reel Size

| Package | Carrier Width (W) | Pitch (P)  | Part Per Full Reel | Reel Size |
|---------|-------------------|------------|--------------------|-----------|
| SOP-8   | 12.0±0.1 mm       | 4.0±0.1 mm | 2500pcs            | 330±1 mm  |



# **■ Tape and Reel Dimension (Contd.)**

SOT-25

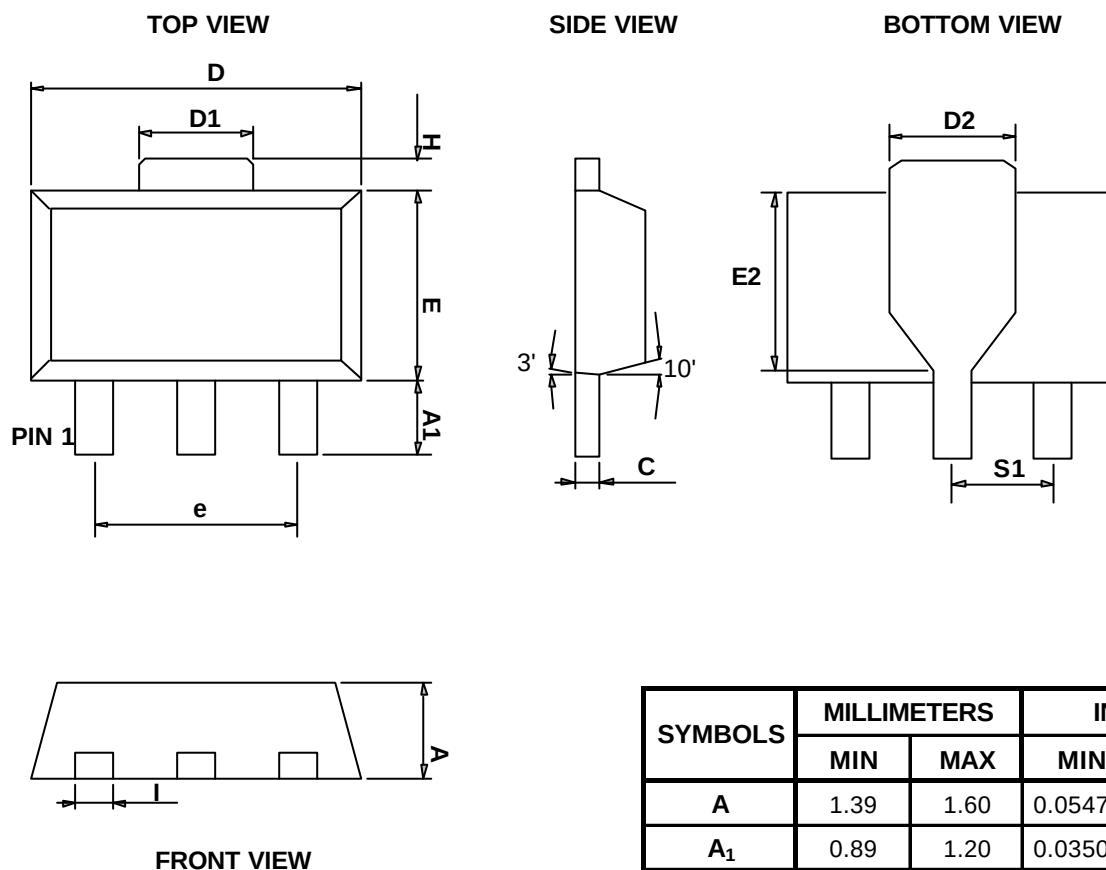


**Carrier Tape, Number of Components Per Reel and Reel Size**

| Package | Carrier Width (W) | Pitch (P)  | Part Per Full Reel | Reel Size |
|---------|-------------------|------------|--------------------|-----------|
| SOT-25  | 8.0±0.1 mm        | 4.0±0.1 mm | 3000pcs            | 180±1 mm  |

## ■ Package Dimension

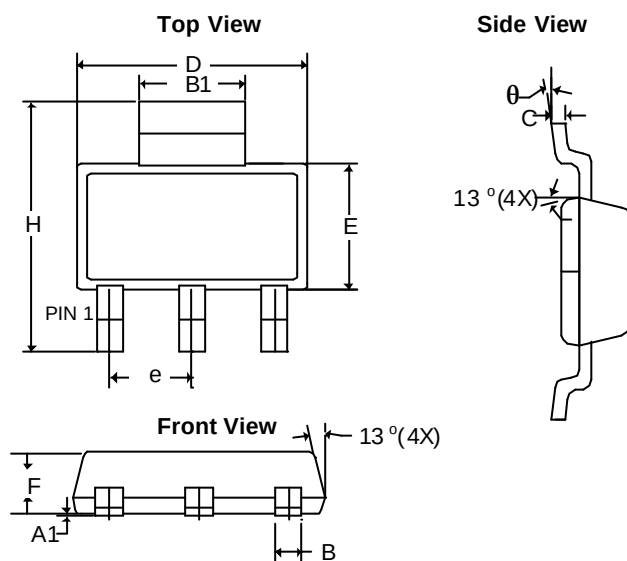
### SOT-89



| SYMBOLS        | MILLIMETERS |      | INCHES      |         |
|----------------|-------------|------|-------------|---------|
|                | MIN         | MAX  | MIN         | MAX     |
| A              | 1.39        | 1.60 | 0.05472     | 0.06299 |
| A <sub>1</sub> | 0.89        | 1.20 | 0.03503     | 0.04724 |
| C              | 0.35        | 0.44 | 0.01378     | 0.01732 |
| D              | 4.39        | 4.60 | 0.17283     | 0.18110 |
| D <sub>1</sub> | 1.35        | 1.83 | 0.05315     | 0.07205 |
| E              | 2.28        | 2.60 | 0.08976     | 0.10236 |
| l              | 0.36        | 0.56 | 0.01256     | 0.02204 |
| e              | 3.00 REF    |      | 0.11811 REF |         |
| H              | 0.70 REF    |      | 0.02756 REF |         |
| S <sub>1</sub> | 1.50 REF    |      | 0.05906 REF |         |
| E <sub>2</sub> | 2.05        | 2.60 | 0.08071     | 0.10236 |
| D <sub>2</sub> | 1.50        | 1.85 | 0.05905     | 0.07283 |

# **■ Package Dimension**

## **SOT-223**

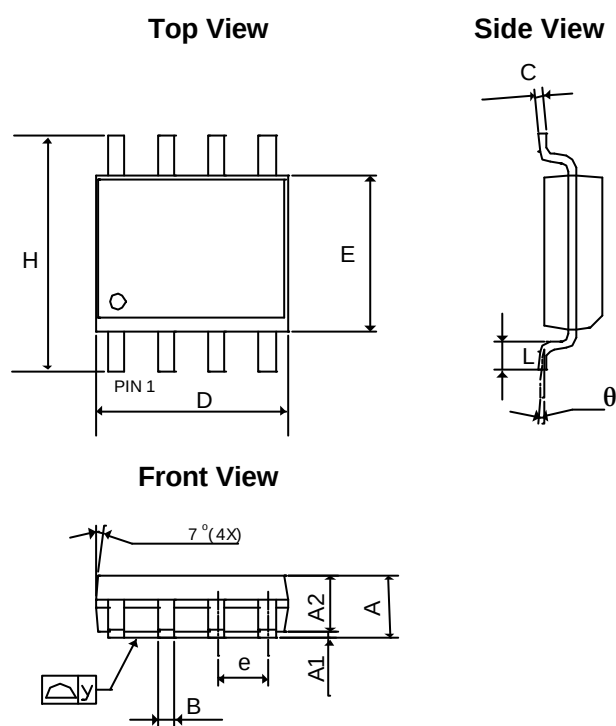


| SYMBOLS | MILLIMETERS |            | INCHES     |            |
|---------|-------------|------------|------------|------------|
|         | MIN         | MAX        | MIN        | MAX        |
| $A_1$   | 0.01        | 0.10       | 0.0004     | 0.0039     |
| $B$     | 0.60        | 0.84       | 0.0236     | 0.0330     |
| $B_1$   | 2.90        | 3.15       | 0.1140     | 0.1240     |
| $C$     | 0.24        | 0.38       | 0.0094     | 0.0150     |
| $D$     | 6.20        | 6.71       | 0.2441     | 0.2640     |
| $E$     | 3.30        | 3.71       | 0.1299     | 0.1460     |
| $e$     | 2.30 BSC    |            | 0.0906 BSC |            |
| $F$     | 1.40        | 1.80       | 0.0551     | 0.0709     |
| $H$     | 6.70        | 7.30       | 0.2638     | 0.2874     |
| $q$     | $0^\circ$   | $10^\circ$ | $0^\circ$  | $10^\circ$ |

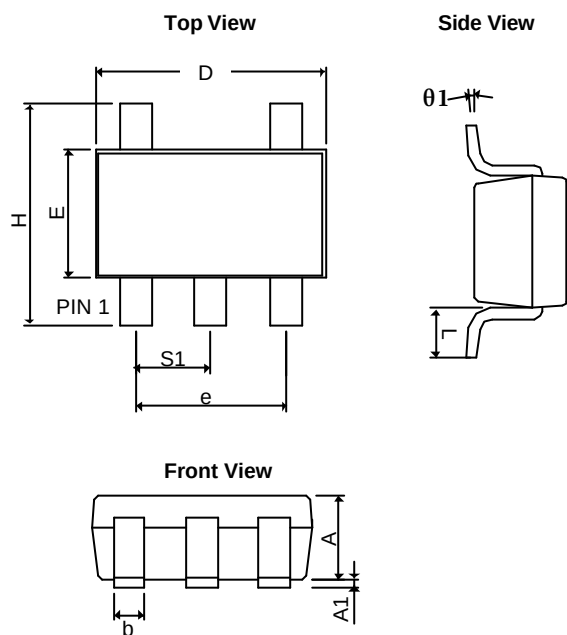
## AME8819

### ■ Package Dimension

#### SOP-8



| SYMBOLS        | MILLIMETERS |      | INCHES      |        |
|----------------|-------------|------|-------------|--------|
|                | MIN         | MAX  | MIN         | MAX    |
| A              | 1.35        | 1.75 | 0.0531      | 0.0689 |
| A <sub>1</sub> | 0.10        | 0.30 | 0.0039      | 0.0118 |
| A <sub>2</sub> | 1.473 REF   |      | 0.05799 REF |        |
| B              | 0.33        | 0.51 | 0.0130      | 0.0201 |
| C              | 0.17        | 0.25 | 0.0067      | 0.0098 |
| D              | 4.70        | 5.33 | 0.1850      | 0.2098 |
| E              | 3.80        | 4.00 | 0.1496      | 0.1575 |
| e              | 1.27 BSC    |      | 0.05000 BSC |        |
| L              | 0.40        | 1.27 | 0.0157      | 0.0500 |
| H              | 5.80        | 6.30 | 0.2283      | 0.2480 |
| y              | -           | 0.10 | -           | 0.0039 |
| q              | 0°          | 8°   | 0°          | 8°     |

**■ Package Dimension (Contd.)**
**SOT-25**


| SYMBOLS        | MILLIMETERS |      | INCHES      |         |
|----------------|-------------|------|-------------|---------|
|                | MIN         | MAX  | MIN         | MAX     |
| A              | 0.90        | 1.30 | 0.0354      | 0.0512  |
| A <sub>1</sub> | 0.00        | 0.15 | 0.0000      | 0.0059  |
| b              | 0.30        | 0.55 | 0.0118      | 0.0217  |
| D              | 2.70        | 3.10 | 0.1063      | 0.1220  |
| E              | 1.40        | 1.80 | 0.0551      | 0.0709  |
| e              | 1.90 BSC    |      | 0.07480 BSC |         |
| H              | 2.60        | 3.00 | 0.10236     | 0.11811 |
| L              | 0.37BSC     |      | 0.0146BSC   |         |
| q1             | 0°          | 10°  | 0°          | 10°     |
| S <sub>1</sub> | 0.95BSC     |      | 0.0374BSC   |         |



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