

■ General Description

The AME8827 family of positive, CMOS linear regulators and provide low dropout voltage (340mV @ 1A) and excellent PSRR, thus making them ideal for power-saving systems. These rugged devices have both Thermal Shutdown, and Current limit to prevent device failure under the "Worst" of operating conditions.

The AME8827 is stable with an output capacitance of 4.7 μ F or larger.

■ Features

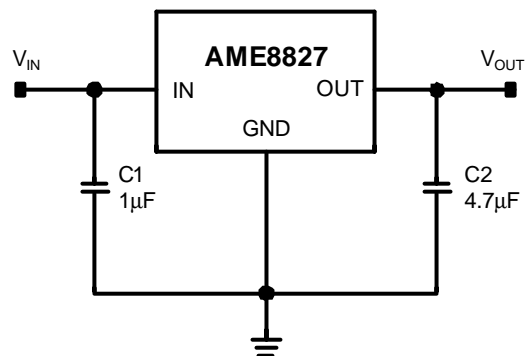
- Low Dropout Voltage:340mV @ 1A
- Guaranteed 1A Drive current
- Over-Temperature Shutdown
- Current Limiting protection
- Excellent PSRR : 60dB(typ.)
- Factory Pre-set Output Voltages
- Low Temperature Coefficient
- Input Voltage Range (2.5V - 5.5V)
- Output Voltage Range (1.2V - 3.6V)
- All AME's Green Products Meet RoHS Standards

■ Applications

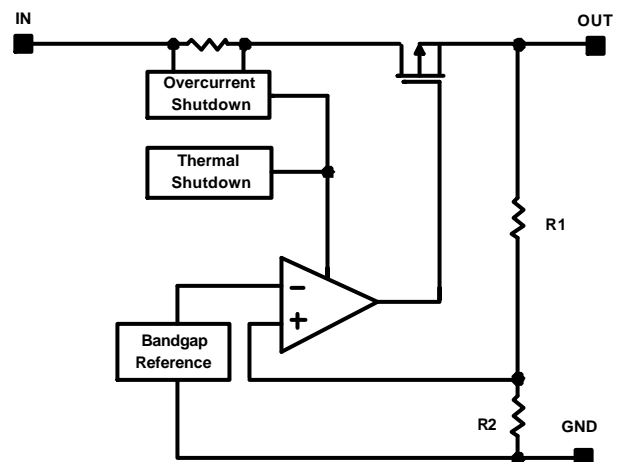
- Motherboard, Desktop, and Computer Peripherals
- LCD monitor
- Handheld Device
- Data-communication

■ Typical Application

(Fixed Version)



■ Function Block Diagram (Fixed Version)

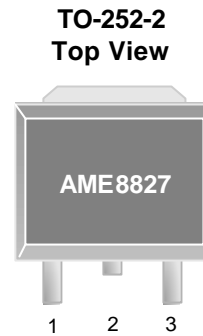


■ Pin Configuration


AME8827-AGTxxx

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

**Die Attach:
Conductive Epoxy**



AME8827-ACSxxx

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

**Die Attach:
Conductive Epoxy**

■ Pin Description

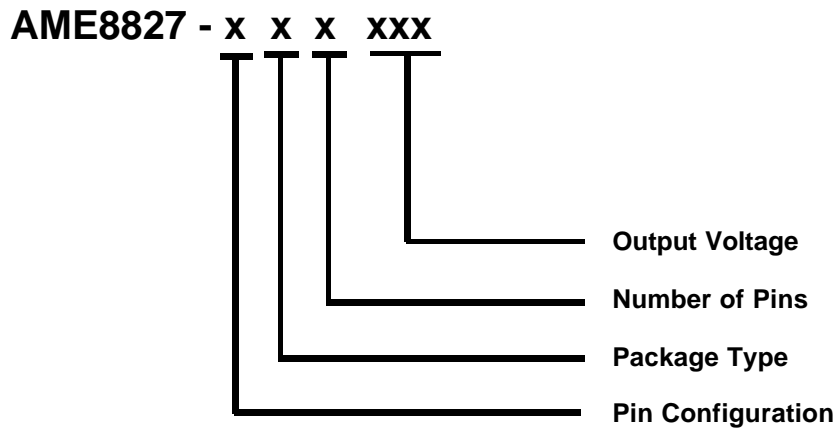
Pin Name	Pin Description
IN	Input voltage pin; should be decoupled with 1 μ F or greater capacitor.
GND	Ground connection pin.
OUT	LDO voltage regulator output pin; should be decoupled with a 4.7 μ F or greater value low ESR ceramic capacitor.



AME8827

Low Dropout 1A CMOS Regulator

■ Ordering Information



Pin Configuration	Package Type	Number of Pins	Output Voltage
A <small>(SOT-223)</small> 1. IN 2. GND 3. OUT	G: SOT-223 C: TO-252	T: 3 S: 2	120: 1.2V 150: 1.5V 180: 1.8V 250: 2.5V 300: 3.0V 330: 3.3V
A <small>(TO-252-2)</small> 1. IN 2. GND 3. OUT			

■ Available Options

Part Number	Marking*	Output Voltage	Package	Operating Ambient Temperature Range
AME8827-AGT120	A8827 AKyMXX	1.2V	SOT-223	-40°C to +85°C
AME8827-AGT180	A8827 AlyMXX	1.8V	SOT-223	-40°C to +85°C
AME8827-AGT250	A8827 AGyMXX	2.5V	SOT-223	-40°C to +85°C
AME8827-AGT330	A8827 AByMXX	3.3V	SOT-223	-40°C to +85°C
AME8827-ACS120	A8827 BKyMXX	1.2V	TO-252-2	-40°C to +85°C
AME8827-ACS180	A8827 BlyMXX	1.8V	TO-252-2	-40°C to +85°C
AME8827-ACS250	A8827 BGyMXX	2.5V	TO-252-2	-40°C to +85°C
AME8827-ACS330	A8827 BByMXX	3.3V	TO-252-2	-40°C to +85°C

Note:

1. The first 2 places represent product code. It is assigned by AME such as AK.
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 A8827.
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.

■ Absolute Maximum Ratings

Parameter	Symbol	Maximum	Unit
Input Voltage	V_{IN}	-0.3 to 6	V
Output Current	I_{OUT}	$P_D/(V_{IN}-V_{OUT})$	mA
Output Voltage	V_{OUT}	GND-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* (Junction to Case)	SOT-223	Conductive Epoxy	θ_{JC}	25	°C / W
Thermal Resistance (Junction to Ambient)			θ_{JA}	120	
Internal Power Dissipation			P_D	900	mW
Thermal Resistance* (Junction to Case)	TO-252-2	Conductive Epoxy	θ_{JC}	5	°C / W
Thermal Resistance (Junction to Ambient)			θ_{JA}	90	
Internal Power Dissipation			P_D	1200	mW
Solder Iron (10 Sec)**				350	°C

* Measure θ_{JC} on backside center of tab.

** MIL-STD-202G 210F

■ Electrical Specifications

$V_{IN} = V_{OUT(nom)} + 0.5V$, (for $V_{OUT} < 2V$, $V_{IN}=2.5V$), $V_{EN}=V_{IN}$, $I_{OUT} = 1mA$, and $C_{OUT} = 4.7\mu F$, $C_{IN}=1\mu F$ unless otherwise noted. Typical values are at $T_A = 25^\circ C$.

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
Input Voltage	V_{IN}		(Note 1)		5.5	V
ADJ Input Bias Current	I_{ADJ}	$V_{IN}=5V$, $V_{ADJ}=0.980$		1		μA
ADJ Reference Voltage	V_{REF}		0.970	0.980	0.990	V
Output Accuracy	$V_{OUT,ACC}$		-2		2	%
Dropout Voltage	V_{DROP}	$I_O=1A$, $V_{OUT(nom)} = 2.0V$		(Note2)		mV
		$I_O=1A$, $2.0V < V_{OUT(nom)} < 2.5V$		430	500	
		$I_O=1A$, $2.6V < V_{OUT(nom)} < 3.0V$		380	450	
		$I_O=1A$, $V_{OUT(nom)} > 3.1V$		340	400	
Quiescent Current	I_Q	$V_{IN}=5.5V$, $I_{OUT}=1mA$		70	110	μA
Line Regulation $\frac{\Delta V_{OUT}}{V_{OUT}} \times 100\%$ $\frac{\Delta V_{IN}}{V_{OUT}}$	REG_{LINE}	for $V_{OUT} = 2.0$ $2.5V < V_{IN} < 3.5V$	-0.15	0.1	0.15	% / V
		for $2.0V < V_{OUT} < 2.8V$ $V_{OUT}+1V < V_{IN} < V_{OUT}+2V$	-0.1	0.02	0.1	
		for $V_{OUT} > 2.8V$ $V_{OUT}+1V < V_{IN} < V_{OUT}+2V$	-0.055	0.02	0.055	
Load Regulation $\frac{\Delta V_{OUT}}{V_{OUT}} \times 100\%$ $\frac{\Delta I_{OUT}}{I_{OUT}}$	REG_{LOAD}	$V_{IN}=V_{OUT}+1V$ $10mA < I_{LOAD} < 1A$	-0.001	0.0005	0.001	% / mA
Output Current Limit	I_{LIM}	$V_{OUT}=0.9 \times V_{OUT(nom)}$	1.3	1.5		A
Short Circuit Current	I_{SC}	$V_{IN}=V_{OUT(nom)}+1V$, $V_O < 0.6V$		0.6		A
Power Supply Rejection Ratio	PSRR	$C_{OUT}=4.7\mu F$, $F=1KHz$, $I_{OUT}=100mA$		60		dB
Enable High (enabled)	$V_{EN(HI)}$	$V_{IN(min)}$ $V_{IN} = 5.5V$	1.4		V_{IN}	V
Enable Low (shutdown)	$V_{EN(LO)}$	$V_{IN(min)}$ $V_{IN} = 5.5V$	0		0.4	V
Enable Pin Current (enabled)	I_{EN}	$V_{EN} = V_{IN}$		0.1	1	μA
Shutdown Current	I_{SHDN}	$V_{EN}=0V$, $V_{IN(min)}$ $V_{IN} = 5.5V$		5	10	μA

■ Electrical Specifications (Contd.)

$V_{IN} = V_{OUT(nom)} + 0.5V$, (for $V_{OUT} < 2V$, $V_{IN}=2.5V$), $V_{EN}=V_{IN}$, $I_{OUT} = 1mA$, and $C_{OUT} = 4.7\mu F$, $C_{IN}=1\mu F$ unless otherwise noted. Typical values are at $T_A = 25^\circ C$.

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
Thermal Shutdown Temperature	T_{SHDN}	Shutdown, temperature increasing		150		°C
		Restore, temperature decreasing		130		

Note 1: $V_{IN(MIN)} = V_{OUT} + V_{DROP}$ or $V_{IN(min)} = 2.5V$, whichever is greater.

Note 2: For V_{OUT} below 2.0V, Dropout Voltage is the input to output differential.



■ **Detailed Description**

The AME8827 is low-dropout; low quiescent current linear regulator designed for motherboard, notebook and LCD monitor applications. The output voltage range from 1.2V to 3.6V, and can drive 1A loading current.

Capacitor Selection and Regulator Stability

Use 1μF for input capacitor and 4.7μF for great for output capacitor on the AME8827. Larger input capacitor value and low ESR provide better supply noise rejection and improve line transient response. To reduce output noise and load transient response, use output capacitor greater than 4.7μF.

Calculating the Maximum Output Power

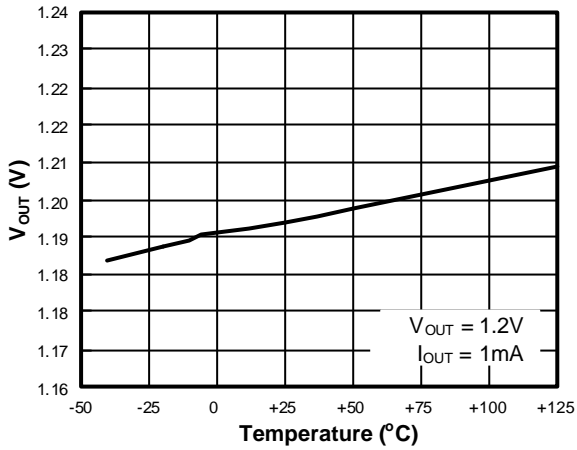
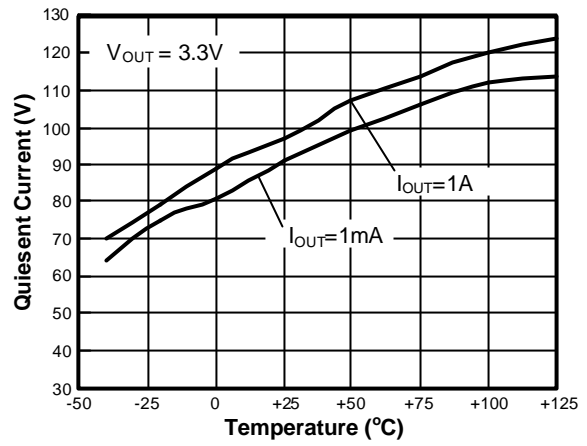
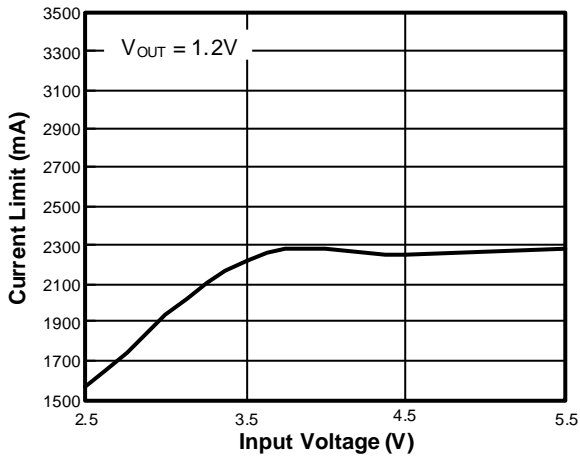
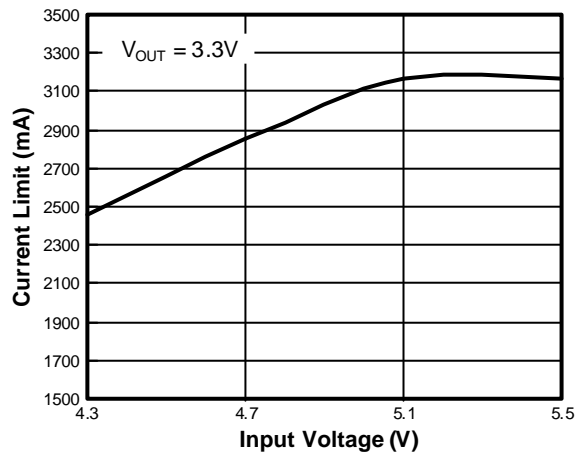
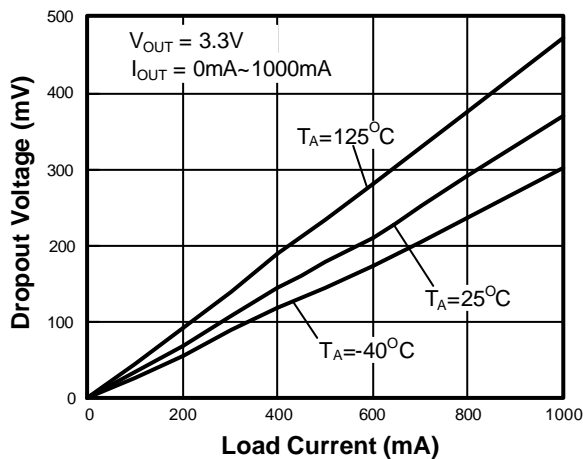
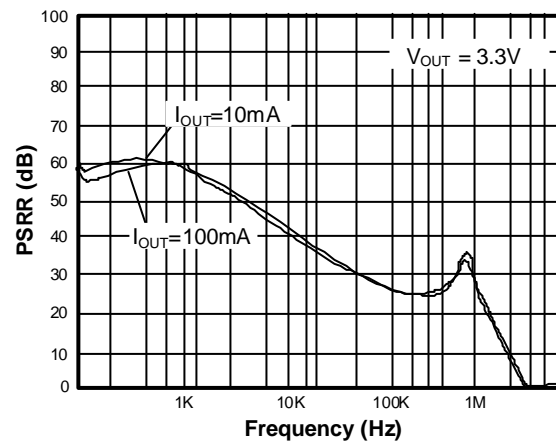
The maximum output power of the AME8827 is limited by the maximum power dissipation of the package. By calculation the power dissipation of the package as a function of the input voltage, output voltage and output current, the maximum input voltage can be obtained. The maximum power dissipation should not exceed the package's maximum power rating.

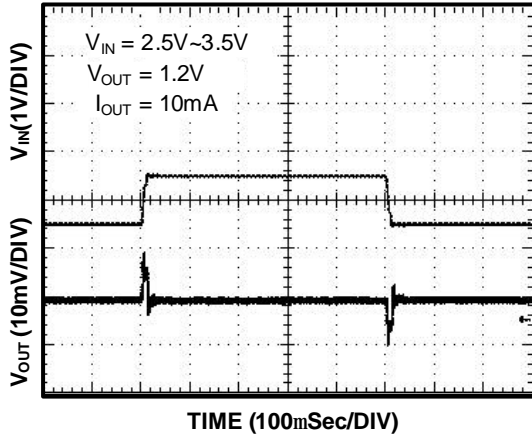
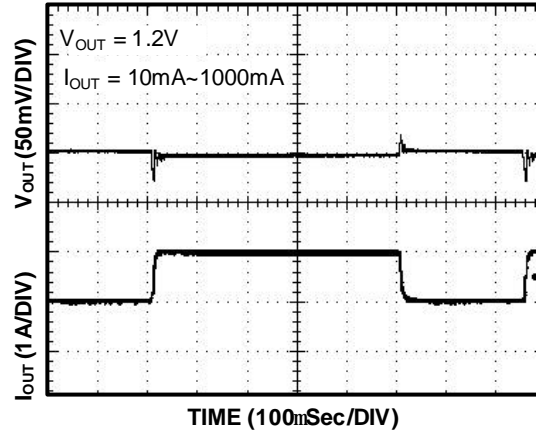
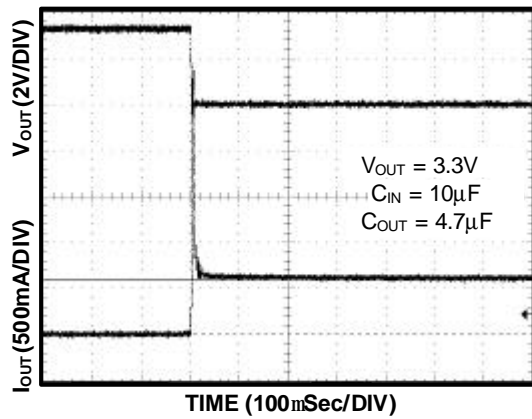
$$P_{MAX} = (V_{IN,MAX} - V_{OUT}) \times I_{OUT}$$

Where:

$V_{IN,MAX}$ = maximum input voltage

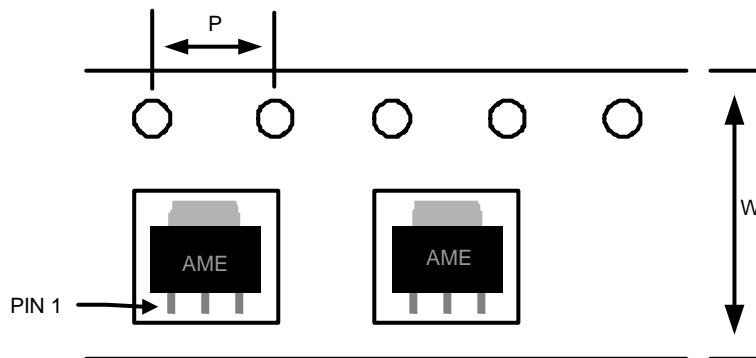
P_{MAX} = maximum power dissipation of the package

V_{OUT} vs. Temperature

Quiescent Current vs Temperature

Current Limit vs Input Voltage

Current Limit vs Input Voltage

Dropout Voltage vs Load Current

Power Supply Rejection Ratio


Line Transient Response

Load Transient Response

Short Circuit Current


■ Date Code Rule

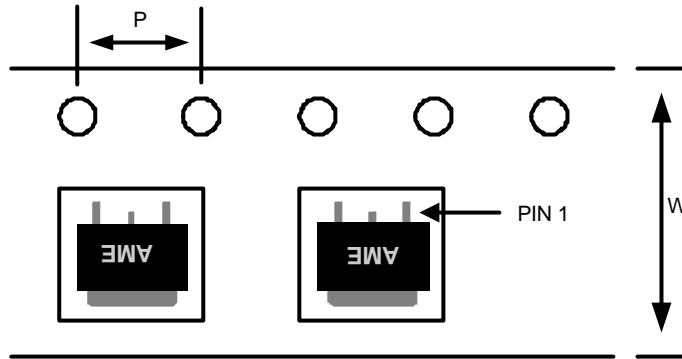
Month Code	
1: January	7: July
2: February	8: August
3: March	9: September
4: April	A: October
5: May	B: November
6: June	C: December

■ Tape & Reel Dimensions
SOT-223

Carrier Tape, Number of Components Per Reel and Reel Size

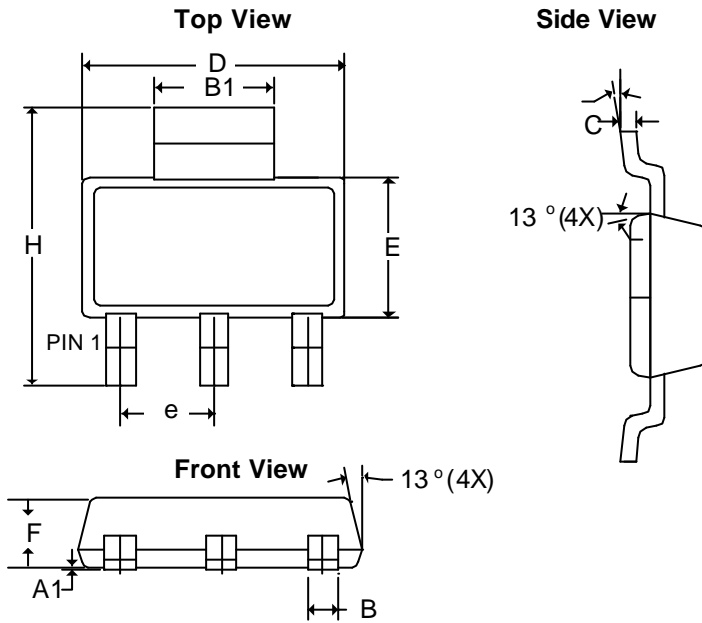
Package	Carrier Width (W)	Pitch (P)	Part Per Full Reel	Reel Size
SOT-223	12.0±0.1 mm	4.0±0.1 mm	2500pcs	330±1 mm

■ Tape & Reel Dimensions

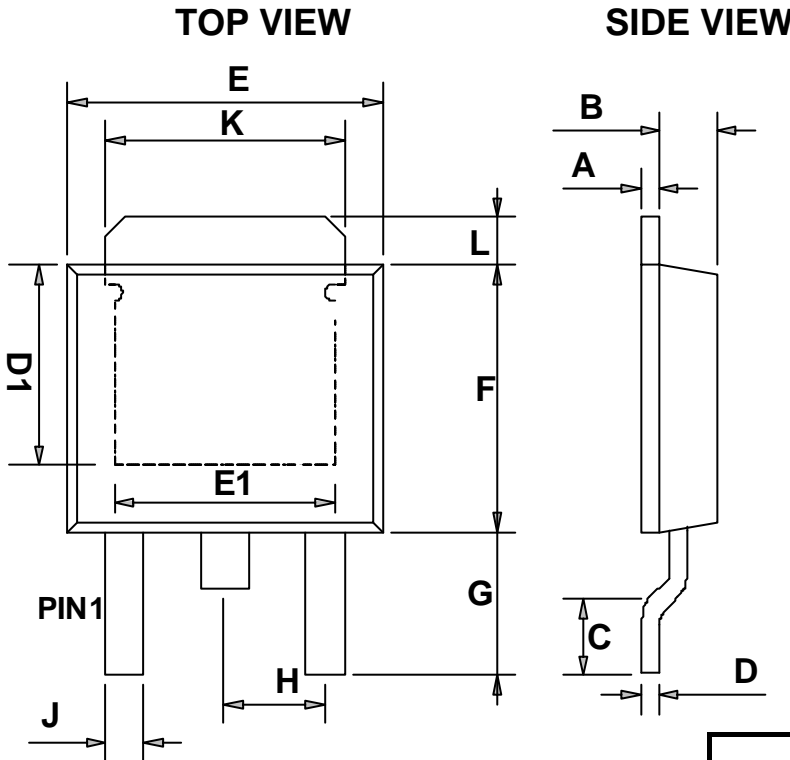
TO-252-2


Carrier Tape, Number of Components Per Reel and Reel Size

Package	Carrier Width (W)	Pitch (P)	Part Per Full Reel	Reel Size
TO-252	16.0±0.1 mm	4.0±0.1 mm	2500pcs	330±1 mm

■ 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°	10°	0°	10°

■ Package Dimension
TO-252-2


SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.43	0.58	0.0169	0.0230
B	1.60	1.95	0.0630	0.0768
C	0.51	1.78	0.0200	0.0701
D	0.43	0.60	0.0169	0.0236
E	6.35	6.80	0.2500	0.2677
F	5.36	7.20	0.2110	0.2835
G	2.20	3.00	0.0866	0.1181
H		* 2.30		*0.0906
J	0.50	0.97	0.0197	0.0380
K	5.20	5.50	0.2047	0.2165
L	1.35	1.65	0.0531	0.0650
D1	3.80 REF		0.1496 REF	
E1	3.81	5.10	0.1500	0.2008

*: Typical Value

Notes:

1. Controlling dimension: Millimeters.
2. Maximum lead thickness includes lead finish thickness. Minimum lead thickness is the minimum thickness of base material.



www.ame.com.tw
E-Mail: sales@ame.com.tw

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.

© AME, Inc. , June 2009

Document: 1271-DS8827-A.02

Corporate Headquarter

AME, Inc.

2F, 302 Rui-Guang Road, Nei-Hu District

Taipei 114, Taiwan, R.O.C.

Tel: 886 2 2627-8687

Fax: 886 2 2659-2989