

■ General Description

The AME78LXX is a fixed output positive regulator. The regulator can provide local on card regulation, eliminating the distribution problems associated with single point regulation. The AME78LXX can be used in logic systems, instrumentation, HiFi, and other solid state electronic equipments. When used as a Zener diode/resistor combination replacement, the AME78LXX usually results in an effective output impedance improvement of two orders of magnitude, and lower quiescent current.

With adequate heat sinking the AME78LXX can deliver 100mA output current. Current limiting is included to limit the peak output current to a safe value.

The AME78LXX is available in the plastic TO-92, SO-8 and SOT-89 packages.

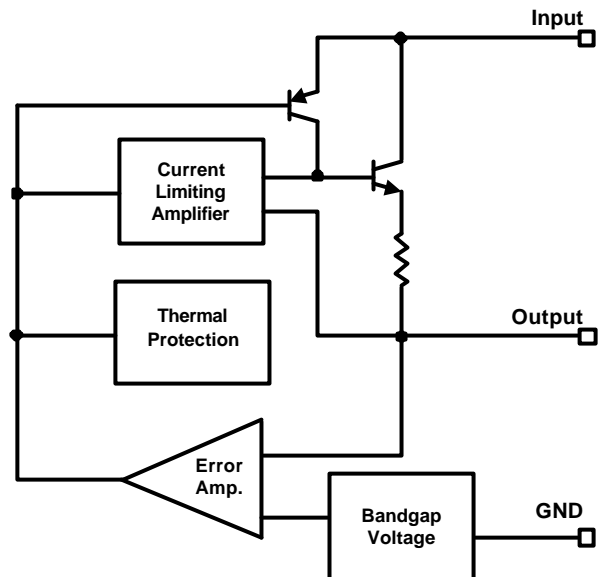
■ Features

- Guaranteed 100mA Output
- Fixed Output Voltage
- Typical Line Regulation $\leq 18\text{mV}$
- Accurate to Within $\pm 5\%$
- Internal Short Circuit Current-Limiting
- TO-92, SO-8, and SOT-89 Package

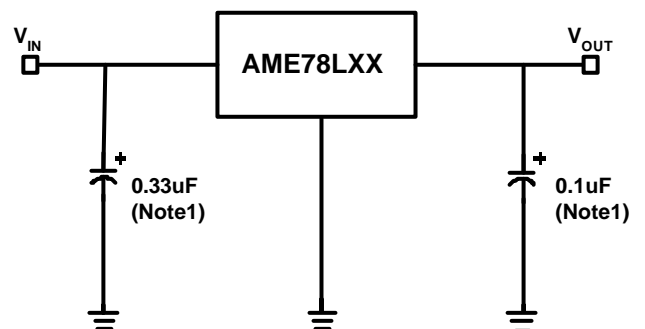
■ Applications

- Post Regulation for Switching Supply
- Microprocessor Power Supply
- Mother Board I/O Power Supply
- Battery Power Circuit
- Instrument

■ Functional Block Diagram

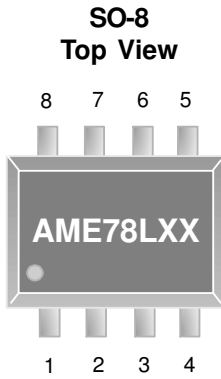


■ Typical Application



Note1: Bypass Capacitors are recommended for optimum stability and transient response and should be located as close as possible to the regulator

■ **Pin Configuration**



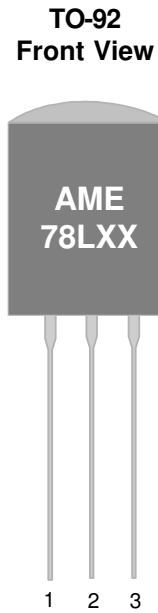
AME78LXXAJHA

1. V_{OUT}
2. GND
3. GND
4. N/C
5. N/C
6. GND
7. GND
8. V_{IN}



AME78LXXAJFT

1. V_{OUT}
2. GND
3. V_{IN}

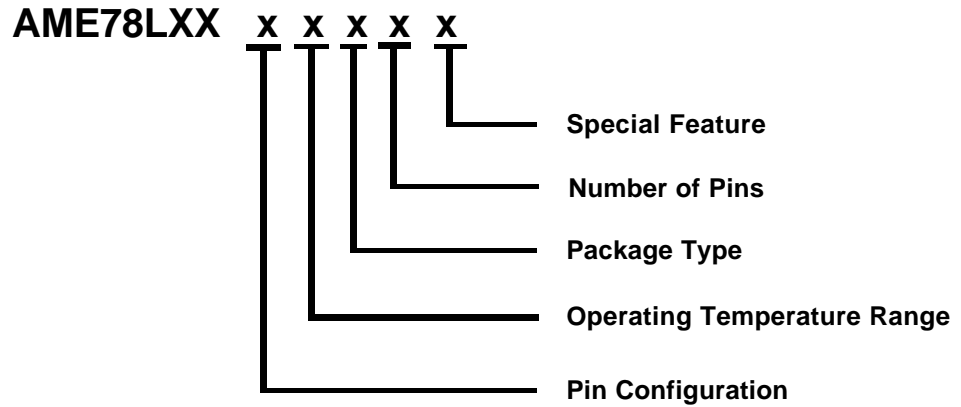


AME78LXXAJAT

1. V_{OUT}
2. GND
3. V_{IN}



■ Ordering Information



Pin Configuration	Operating Temperature Range	Package Type	Number of Pins	Special Feature
A 1 . V _{OUT} (SOT-89) 2 . GND 3 . V _{IN}	J: -40°C to 125°C	A: TO-92 F: SOT-89 H: SOIC (150 mil)	A: 8 T: 3	Z: Lead free
A 1 . V _{OUT} (SO-8) 2 . GND 3 . GND 4 . N/C 5 . N/C 6 . GND 7 . GND 8 . V _{IN}				
A 1 . V _{OUT} (TO-92) 2 . GND 3 . V _{IN}				

■ Ordering Information (contd.)

Part Number	Marking*	Output Voltage	Package	Operating Temp. Range
AME78L05AJFT	A78L05 AJFww	5V	SOT-89	-40°C to 125°C
AME78L05AJFTZ	A78L05 AJFww	5V	SOT-89	-40°C to 125°C
AME78L05AJHA	78L05 AJHA yyww	5V	SO-8	-40°C to 125°C
AME78L05AJHAZ	78L05 AJHA yyww	5V	SO-8	-40°C to 125°C
AME78L05AJAT	AME 78L05 AJAT yyww	5V	TO-92	-40°C to 125°C
AME78L05AJATZ	AME 78L05 AJAT yyww	5V	TO-92	-40°C to 125°C
AME78L08AJFT	A78L08 AJFww	8V	SOT-89	-40°C to 125°C
AME78L08AJFTZ	A78L08 AJFww	8V	SOT-89	-40°C to 125°C
AME78L08AJHA	78L08 AJHA yyww	8V	SO-8	-40°C to 125°C
AME78L08AJHAZ	78L08 AJHA yyww	8V	SO-8	-40°C to 125°C
AME78L08AJAT	AME 78L08 AJAT yyww	8V	TO-92	-40°C to 125°C
AME78L08AJATZ	AME 78L08 AJAT yyww	8V	TO-92	-40°C to 125°C
AME78L09AJFT	A78L09 AJFww	9V	SOT-89	-40°C to 125°C
AME78L09AJFTZ	A78L09 AJFww	9V	SOT-89	-40°C to 125°C

Note:yyww represents date code

* a line on top of the first letter represents lead free plating such as \bar{A} 78L05.

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

■ Ordering Information (contd.)

Part Number	Marking*	Output Voltage	Package	Operating Temp. Range
AME78L09AJHA	78L09 AJHA yyww	9V	SO-8	-40°C to 125°C
AME78L09AJHAZ	78L09 AJHA yyww	9V	SO-8	-40°C to 125°C
AME78L09AJAT	AME 78L09 AJAT yyww	9V	TO-92	-40°C to 125°C
AME78L09AJATZ	AME 78L09 AJAT yyww	9V	TO-92	-40°C to 125°C
AME78L12AJFT	A78L12 AJFww	12V	SOT-89	-40°C to 125°C
AME78L12AJFTZ	A78L12 AJFww	12V	SOT-89	-40°C to 125°C
AME78L12AJHA	78L12 AJHA yyww	12V	SO-8	-40°C to 125°C
AME78L12AJHAZ	78L12 AJHA yyww	12V	SO-8	-40°C to 125°C
AME78L12AJAT	AME 78L12 AJAT yyww	12V	TO-92	-40°C to 125°C
AME78L12AJATZ	AME 78L12 AJAT yyww	12V	TO-92	-40°C to 125°C

*** Package Options**

Part Number	Package	Lead Pitch
AME78LXXXJAT	TO-92 Taping	5.04mm
AME78LXXXJAT-1	TO-92 Bulk	2.54mm



■ Absolute Maximum Ratings

Parameter		Symbol	Maximum	Unit
Input Voltage		V_{IN}	20	V
Thermal Resistance (Junction to Ambient)	TO-92	θ_{JA}	180	°C/W
	SOT-89		180	
	SO-8		124	
Operating Junction Temperature Range		T_J	-40 to 125	°C
Storage Temperature Range		T_{STG}	- 65 to 150	
Lead Temperature (10 Sec)		T_{LEAD}	265	

■ Recommended Operating Conditions

Parameter	Rating	Unit
Operating Junction Temperature Range (T_J)	-40 to + 125	°C

■ Electrical Specifications-5V

Limits in standard typeface are for $T_j=25^{\circ}\text{C}$, $I_o=40\text{mA}$, $C_I=0.33\mu\text{F}$, $C_O=0.1\mu\text{F}$, $V_I=10\text{V}$, unless otherwise specified.

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
Output voltage	V_o		4.8	5	5.2	V
		$7.0\text{V} \leq V_{IN} \leq 15\text{V}$ $1.0\text{mA} \leq I_o \leq 40\text{mA}$ (Note1)	* 4.75		* 5.25	
Line Regulation	Reg_{LINE}	$7.0\text{V} \leq V_{IN} \leq 15\text{V}$		18	75	mV
Load Regulation	Reg_{LOAD}	$1.0\text{mA} \leq I_o \leq 100\text{mA}$		20	60	mV
Quiescent Current	I_Q			3	5	mA
Quiescent Current Change	I_Q	$8.0\text{V} \leq V_{IN} \leq 15\text{V}$			* 1.0	mA
		$1.0\text{mA} \leq I_o \leq 40\text{mA}$			* 0.1	
Output Voltage Noise	eN	$10\text{Hz} \leq f \leq 100\text{kHz}$ (Note2)		40		μV
Ripple Rejection	$\Delta V_{IN} / \Delta V_O$	$f=120\text{Hz}$, $8.0\text{V} \leq V_{IN} \leq 15\text{V}$	47	62		dB
Peak Output Current	I_{PK}			150		mA
Average Temperature Coefficient of Output Voltage	$\Delta V_O / \Delta T$	$I_o=5.0\text{mA}$		-0.65		mV / $^{\circ}\text{C}$
Minimum Value of Input Voltage Required to Maintain Line Regulation	$V_{IN(\text{MIN})}$			6.7	7	V

Note1: Power Dissipation $\leq 0.6\text{W}$

Note2: Recommended minimum load capacitance of $0.01\mu\text{F}$ to limit high frequency noise.



■ Electrical Specifications-8V

Limits in standard typeface are for T_J=25°C, I_O=40mA, C_I=0.33uF, C_O=0.1uF, V_I=14V, unless otherwise specified.

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
Output voltage	V _O		7.7	8	8.3	V
		11V ≤ V _{IN} ≤ 18V 1.0mA ≤ I _O ≤ 40mA (Note1)	* 7.6		* 8.4	
Line Regulation	Reg _{LINE}	11V ≤ V _{IN} ≤ 18V		18	75	mV
Load Regulation	Reg _{LOAD}	1.0mA ≤ I _O ≤ 100mA		20	90	mV
Quiescent Current	I _Q			3	5	mA
Quiescent Current Change	I _Q	11V ≤ V _{IN} ≤ 18V			* 1.5	mA
		1.0mA ≤ I _O ≤ 40mA			* 0.1	
Output Voltage Noise	e _N	10Hz ≤ f ≤ 100kHz (Note2)		60		μV
Ripple Rejection	ΔV _{IN} / ΔV _O	f=120Hz, 11V ≤ V _{IN} ≤ 18V	39	45		dB
Peak Output Current	I _{PK}			150		mA
Average Temperature Coefficient of Output Voltage	ΔV _O / ΔT	I _O =5.0mA		-0.80		mV / °C
Minimum Value of Input Voltage Required to Maintain Line Regulation	V _{IN (MIN)}			9.7		V

Note1: Power Dissipation ≤ 0.6W

Note2: Recommended minimum load capacitance of 0.01uF to limit high frequency noise.

■ Electrical Specifications-9V

Limits in standard typeface are for $T_J=25^{\circ}\text{C}$, $I_O=40\text{mA}$, $C_I=0.33\mu\text{F}$, $C_O=0.1\mu\text{F}$, $V_I=15\text{V}$, unless otherwise specified.

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
Output voltage	V_O		8.6	9	9.4	V
		$12\text{V} \leq V_{IN} \leq 18\text{V}$ $1.0\text{mA} \leq I_O \leq 40\text{mA}$ (Note1)	* 8.55		* 9.45	
Line Regulation	Reg_{LINE}	$12\text{V} \leq V_{IN} \leq 18\text{V}$		18	75	mV
Load Regulation	Reg_{LOAD}	$1.0\text{mA} \leq I_O \leq 100\text{mA}$		20	90	mV
Quiescent Current	I_Q			3	5	mA
Quiescent Current Change	I_Q	$12\text{V} \leq V_{IN} \leq 18\text{V}$			* 1.5	mA
		$1.0\text{mA} \leq I_O \leq 40\text{mA}$			* 0.1	
Output Voltage Noise	eN	$10\text{Hz} \leq f \leq 100\text{kHz}$ (Note2)		70		μV
Ripple Rejection	$\Delta V_{IN} / \Delta V_O$	$f=120\text{Hz}$, $12\text{V} \leq V_{IN} \leq 18\text{V}$	38	44		dB
Peak Output Current	I_{PK}			150		mA
Average Temperature Coefficient of Output Voltage	$\Delta V_O / \Delta T$	$I_O=5.0\text{mA}$		-0.90		mV / $^{\circ}\text{C}$
Minimum Value of Input Voltage Required to Maintain Line Regulation	$V_{IN(\text{MIN})}$			10.7		V

Note1: Power Dissipation $\leq 0.6\text{W}$

Note2: Recommended minimum load capacitance of $0.01\mu\text{F}$ to limit high frequency noise.

■ Electrical Specifications-12V

Limits in standard typeface are for $T_j=25^\circ\text{C}$, $I_o=40\text{mA}$, $C_I=0.33\mu\text{F}$, $C_O=0.1\mu\text{F}$, $V_I=18\text{V}$, unless otherwise specified.

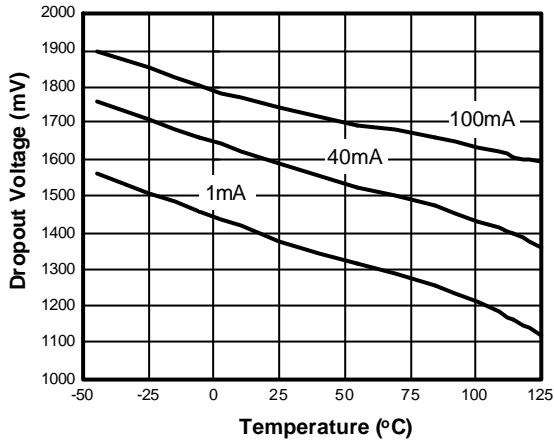
Parameter	Symbol	Test Condition	Min	Typ	Max	Units
Output voltage	V_o		11.5	12	12.5	V
		$15\text{V} \leq V_{IN} \leq 18\text{V}$ $1.0\text{mA} \leq I_o \leq 40\text{mA}$ (Note1)	* 11.4		* 12.6	
Line Regulation	Reg_{LINE}	$15\text{V} \leq V_{IN} \leq 18\text{V}$		18	75	mV
Load Regulation	Reg_{LOAD}	$1.0\text{mA} \leq I_o \leq 100\text{mA}$		20	90	mV
Quiescent Current	I_q			3	5	mA
Quiescent Current Change	I_q	$15\text{V} \leq V_{IN} \leq 18\text{V}$			* 1.5	mA
		$1.0\text{mA} \leq I_o \leq 40\text{mA}$			* 0.1	
Output Voltage Noise	eN	$10\text{Hz} \leq f \leq 100\text{kHz}$ (Note2)		80		μV
Ripple Rejection	$\Delta V_{IN} / \Delta V_O$	$f=120\text{Hz}$, $15\text{V} \leq V_{IN} \leq 18\text{V}$	40	54		dB
Peak Output Current	I_{PK}			150		mA
Average Temperature Coefficient of Output Voltage	$\Delta V_O / \Delta T$	$I_o=5.0\text{mA}$		-1.00		$\text{mV} / ^\circ\text{C}$
Minimum Value of Input Voltage Required to Maintain Line Regulation	$V_{IN(\text{MIN})}$			13.7		V

Note1: Power Dissipation $\leq 0.6\text{W}$

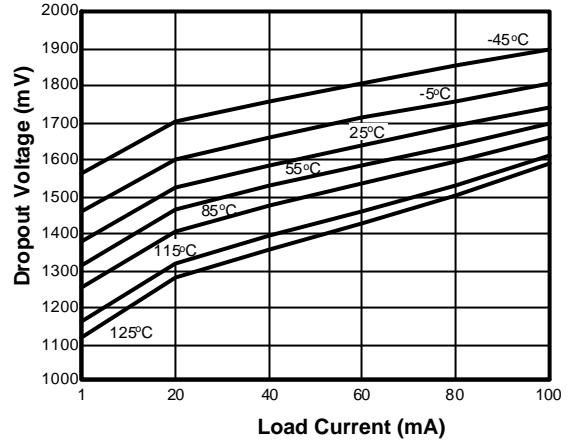
Note2: Recommended minimum load capacitance of 0.01 μF to limit high frequency noise.



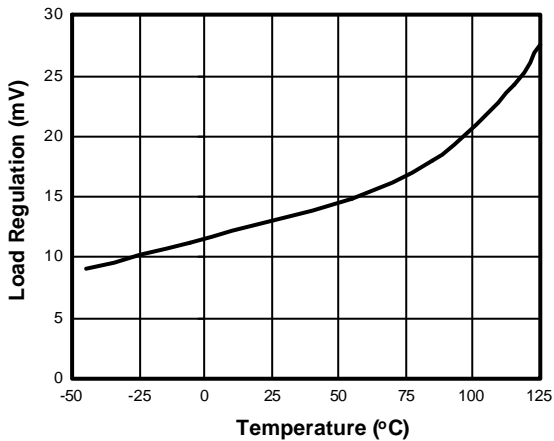
Dropout Voltage vs. Temperature



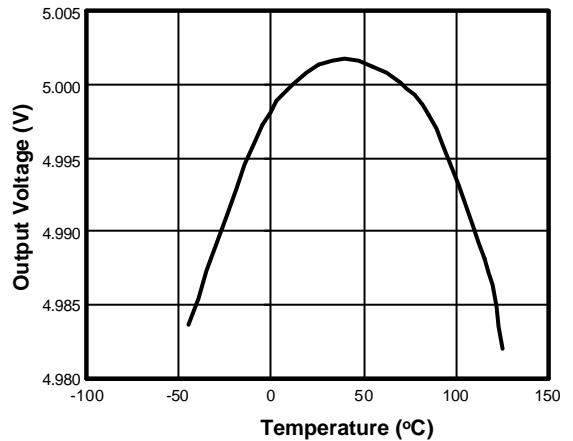
Dropout Voltage vs. Load Current



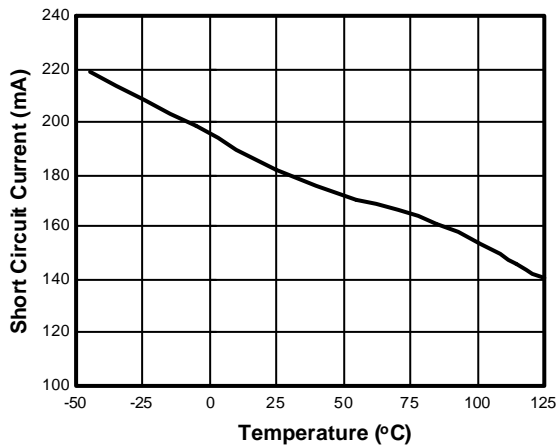
Load Regulation vs. Temperature



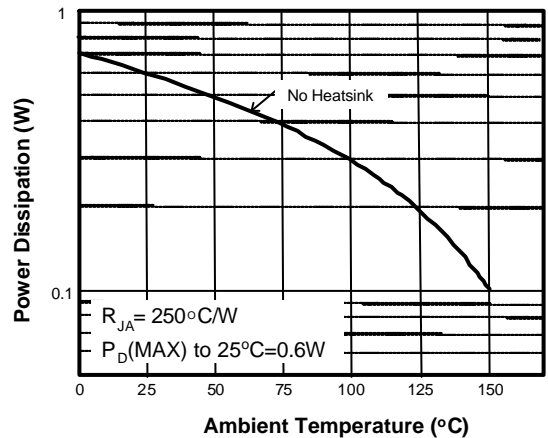
Output Voltage vs. Temperature

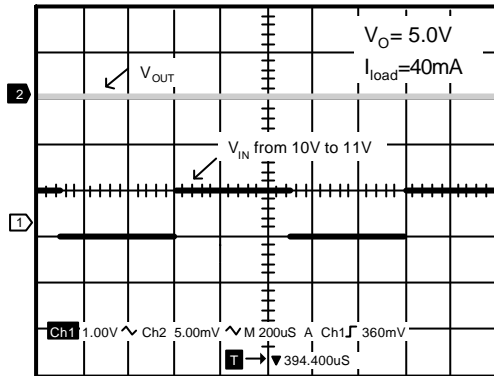
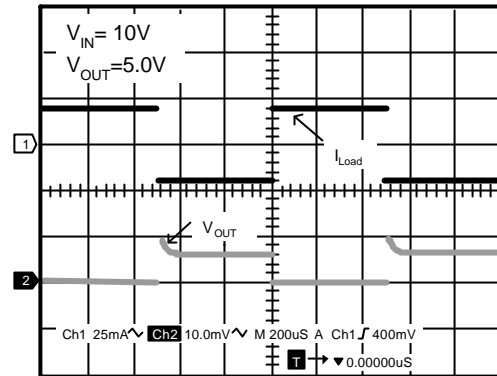
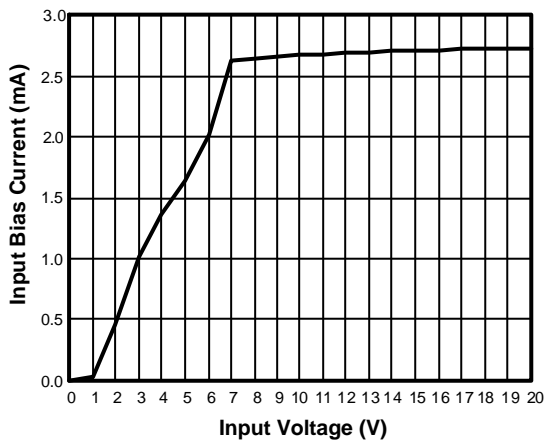
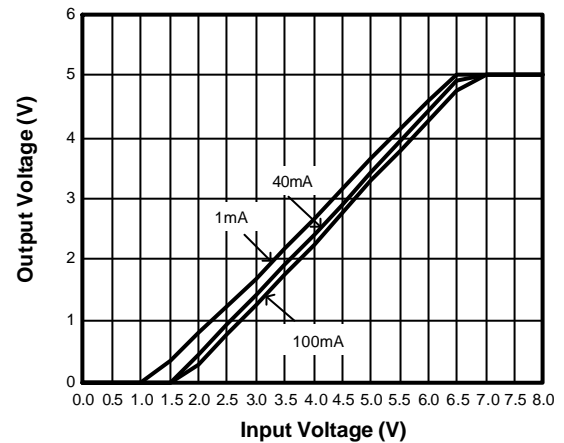
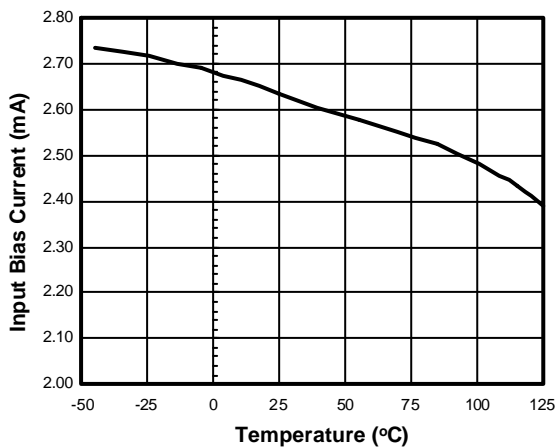


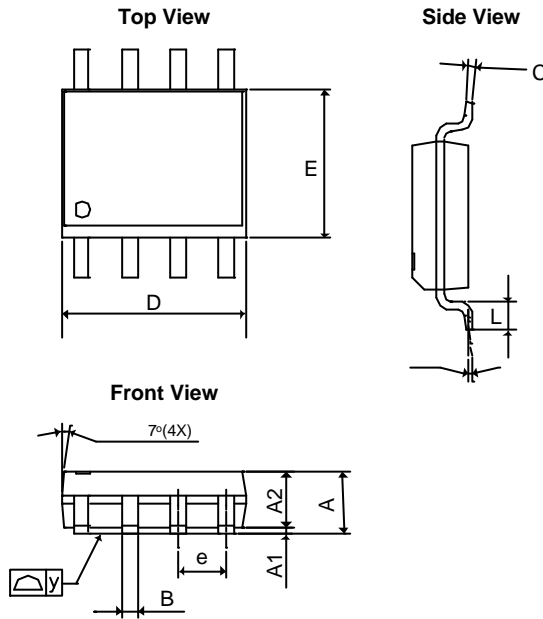
Short Circuit Current vs. Temperature



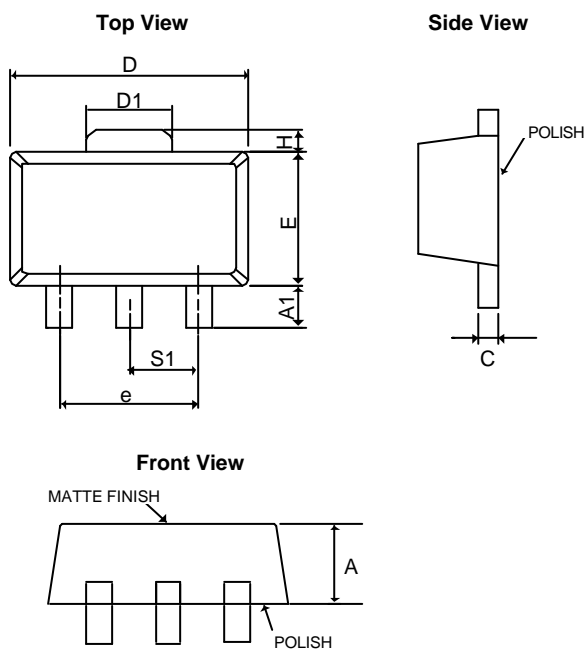
Maximum Power dissipation vs. Ambient Temperature (SO-8 Package)



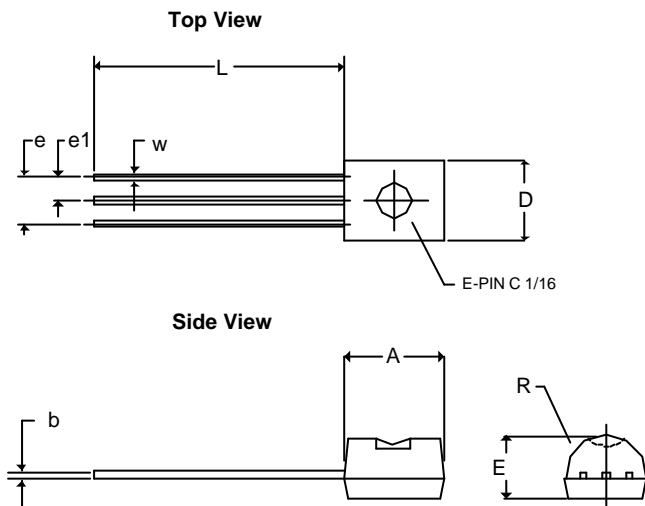
Line Transient Response

Load Transient Response

Input Bias Current vs. Input Voltage

Output Voltage vs. Input Voltage

Input Bias Current vs. Input Voltage


■ 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°

SOT-89


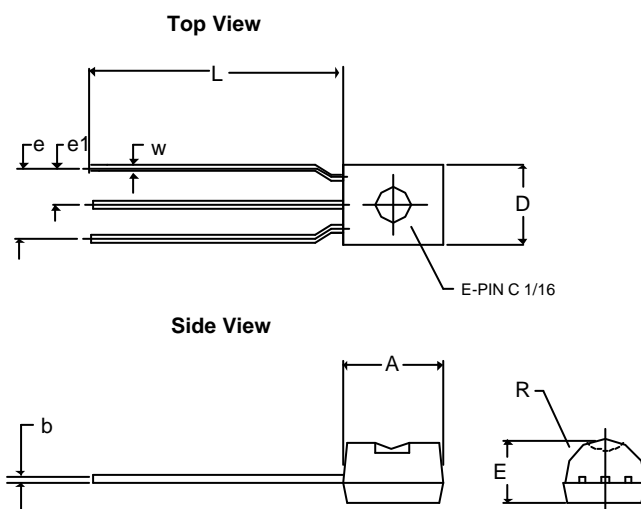
SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.39	1.60	0.05472	0.06299
A ₁	0.8REF		0.0315REF	
C	0.35	0.44	0.01378	0.01732
D	4.39	4.60	0.17283	0.1811
D ₁	1.35	1.83	0.05315	0.07205
E	2.28	3.60	0.08976	0.14173
e	3.00REF		0.1181REF	
H	0.70REF		0.0276REF	
S1	1.50REF		0.0590REF	

■ Package Dimension
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.

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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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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