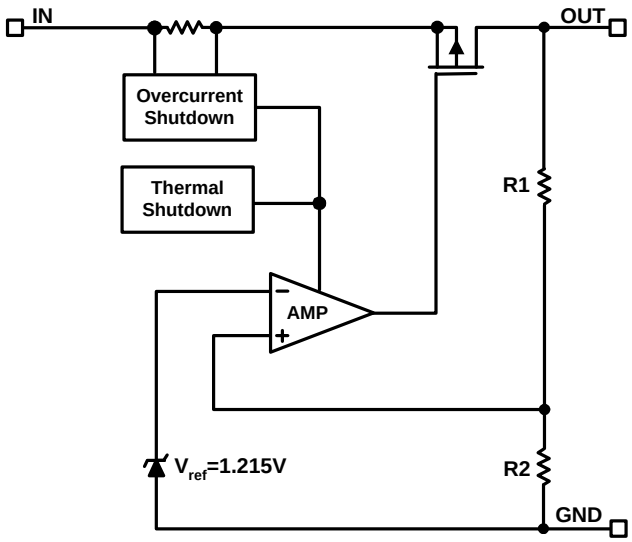
■ General Description

The AME8810 of positive, linear regulators feature low quiescent current (30μA typ.) with low dropout voltage, making them ideal for battery applications. The space-saving SOT-223 package is attractive for "Pocket" and "Hand Held" applications.

These rugged devices have both Thermal Shutdown, and Current Fold-back to prevent device failure under the "Worst" of operating conditions.

The AME8810 is stable with an output capacitance of 2.2μF or greater.

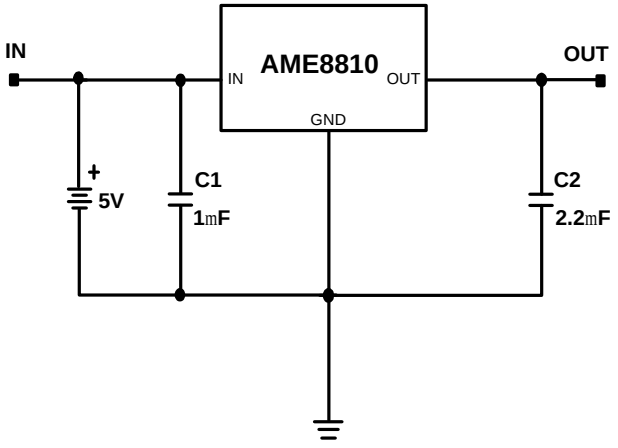
■ Functional Block Diagram



■ Features

- Very Low Dropout Voltage
- Guaranteed 600mA Output
- Accurate to within 1.5%
- 30μA Quiescent Current
- Over-Temperature Shutdown
- Current Limiting
- Short Circuit Current Fold-back
- Space-Saving SOT-223
- Factory Pre-set Output Voltages
- Low Temperature Coefficient
- All AME's Lead Free Products Meet RoHS Standards

■ Typical Application

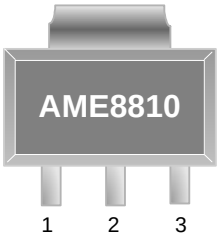


■ Applications

- Instrumentation
- Portable Electronics
- Wireless Devices
- Cordless Phones
- PC Peripherals
- Battery Powered Widgets
- Electronic Scales

■ Pin Configuration

SOT-223
Top View



AME8810

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

is the sole product of AME8810 family

Pls contact Sales Department if any other package or pin configuration is required.

*** Die Attach:**

Non-Conductive Epoxy

■ Ordering Information

AME8810 x x x x x

- **Special Feature**
- **Number of Pins**
- **Package Type**
- **Operating Ambient Temperature Range**
- **Product Grade or Option**

Product Grade or Option	Operating Ambient Temperature Range	Package Type	Number of Pins	Special Feature
A: 3.3V 1: 1.3V B: 3.0V 2: 2.0V C: 2.8V 3: 4.2V D: 2.5V 4: 4.0V E: 3.8V F: 3.6V G: 3.5V H: 2.7V I: 3.4V J: 2.85V K: 3.7V L: 1.5V M: 1.8V N: 2.9V O: 3.1V P: 4.1V Q: 4.75V R: 2.65V S: 5.0V U: 3.2V V: 3.15V W: 2.3V Y: 1.9V Z: 1.7V	E: -40°C to +85°C	G: SOT-223	T: 3	Z: Lead Free

■ Ordering Information

Part Number	Marking*	Output Voltage	Package	Operating Ambient Temperature Range
AME8810AEGT	ADIyww	3.3V	SOT-223	- 40°C to +85°C
AME8810AEGTZ	ADIyww	3.3V	SOT-223	- 40°C to +85°C
AME8810BEGT	ADJyww	3.0V	SOT-223	- 40°C to +85°C
AME8810BEGTZ	ADJyww	3.0V	SOT-223	- 40°C to +85°C
AME8810CEGT	ADKyww	2.8V	SOT-223	- 40°C to +85°C
AME8810CEGTZ	ADKyww	2.8V	SOT-223	- 40°C to +85°C
AME8810DEGT	ADLyww	2.5V	SOT-223	- 40°C to +85°C
AME8810DEGTZ	ADLyww	2.5V	SOT-223	- 40°C to +85°C
AME8810EEGT	ADMyww	3.8V	SOT-223	- 40°C to +85°C
AME8810EEGTZ	ADMyww	3.8V	SOT-223	- 40°C to +85°C
AME8810FEGT	ADNyww	3.6V	SOT-223	- 40°C to +85°C
AME8810FEGTZ	ADNyww	3.6V	SOT-223	- 40°C to +85°C
AME8810GEGT	ADOyww	3.5V	SOT-223	- 40°C to +85°C
AME8810GEGTZ	ADOyww	3.5V	SOT-223	- 40°C to +85°C
AME8810HEGT	AEKyww	2.7V	SOT-223	- 40°C to +85°C
AME8810HEGTZ	AEKyww	2.7V	SOT-223	- 40°C to +85°C
AME8810IEGT	AESyww	3.4V	SOT-223	- 40°C to +85°C
AME8810IEGTZ	AESyww	3.4V	SOT-223	- 40°C to +85°C
AME8810JEGT	AGVyww	2.85V	SOT-223	- 40°C to +85°C
AME8810JEGTZ	AGVyww	2.85V	SOT-223	- 40°C to +85°C

Note: yww represents the date code.

* A line on top of the first letter represents lead free plating such as $\overline{A}$DIyww.

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

■ Ordering Information (contd.)

Part Number	Marking*	Output Voltage	Package	Operating Ambient Temperature Range
AME8810KEGT	AHXyww	3.7V	SOT-223	- 40°C to +85°C
AME8810KEGTZ	AHXyww	3.7V	SOT-223	- 40°C to +85°C
AME8810LEGT	AJFyww	1.5V	SOT-223	- 40°C to +85°C
AME8810LEGTZ	AJFyww	1.5V	SOT-223	- 40°C to +85°C
AME8810MEGT	AJGyww	1.8V	SOT-223	- 40°C to +85°C
AME8810MEGTZ	AJGyww	1.8V	SOT-223	- 40°C to +85°C
AME8810NEGT	AKWyww	2.9V	SOT-223	- 40°C to +85°C
AME8810NEGTZ	AKWyww	2.9V	SOT-223	- 40°C to +85°C
AME8810OEGT	AKXyww	3.1V	SOT-223	- 40°C to +85°C
AME8810OEGTZ	AKXyww	3.1V	SOT-223	- 40°C to +85°C

■ Absolute Maximum Ratings

Parameter	Maximum	Unit
Input Voltage	8	V
Output Current	1	A
Input, Output Voltage	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	^oC
Junction Temperature Range	T_J	- 40 to +125	^oC

■ Thermal Information

Parameter	Package	Die Attach	Symbol	Maximum	Unit
Thermal Resistance* (Junction to Case)	SOT-223	Non-Conductive Epoxy	θ_{JC}	31	^oC / W
Thermal Resistance (Junction to Ambient)		Non-Conductive Epoxy	θ_{JA}	135	^oC / W
Internal Power Dissipation		Non-Conductive Epoxy	P_D	800	mW
Maximum Junction Temperature				150	^oC
Solder Iron(10 Sec)**				350	^oC

* Measure θ_{JC} on backside center of tab.
** MIL-STD-202G 210F

■ Electrical Specifications

TA = 25°C unless otherwise noted

Parameter	Symbol	Test Condition		Min	Typ	Max	Units
Input Voltage	V_{IN}			Note 1		7	V
Output Voltage Accuracy	V_O	I_O=1mA		-1.5		1.5	%
Dropout Voltage	$V_{DROPOUT}$	I_O=600mA V_O=$V_{O(NOM)}$-2.0%	1.3V<=$V_{O(NOM)}$<=1.4V		See chart	1900	mV
			1.4V<$V_{O(NOM)}$<=2.0V			1400	
			2.0V<$V_{O(NOM)}$<=2.8V			800	
			2.8V<$V_{O(NOM)}$			600	
Output Current	I_O	V_O>1.2V		600			mA
Current Limit	I_{LIM}	V_O>1.2V		600	800		mA
Short Circuit Current	I_{SC}	V_O<0.8V			300	600	mA
Quiescent Current	I_Q	I_O=0mA			30	50	µA
Ground Pin Current	I_{GND}	I_O=1mA to 600mA			35		µA
Line Regulation	REG_{LINE}	I_O=1mA V_{IN}=V_O+1 to V_O+2	1.3V <= V_O <= 1.4V	-0.2		0.2	%
			1.4V < V_O <= 2.0V	-0.15		0.15	
			2.0V < V_O < 4.0V	-0.1	0.02	0.1	
			V_O >= 4.0V	-0.4	0.2	0.4	
Load Regulation	REG_{LOAD}	I_O=1mA to 600mA			0.2	1	%
Over Temperature Shutdown	OTS				150		°C
Over Temperature Hysterisis	OTH				30		°C
V_O Temperature Coefficient	TC				30		ppm/°C
Power Supply Rejection	PSRR	I_O=100mA C_O=2.2µF	f =100Hz		60		dB
			f =1kHz		50		
			f =10kHz		20		
Output Voltage Noise	eN	f=10Hz to 100kHz I_O=10mA,C_{BYP}=0µF	Co=2.2µF		30		µVrms

Note1: $V_{IN(MIN)}$=V_{OUT}+$V_{DROPOUT}$

Note2: To prevent the Short Circuit Current protection feature from being prematurely activated, the input voltage must be applied before a current source load is applied.

■ Detailed Description

The AME8810 of CMOS regulators contains a PMOS pass transistor, voltage reference, error amplifier, over-current protection, and thermal shutdown.

The P-channel pass transistor receives data from the error amplifier, over-current shutdown, and thermal protection circuits. During normal operation, the error amplifier compares the output voltage to a precision reference. Over-current and Thermal shutdown circuits become active when the junction temperature exceeds 150^{o}C, or the current exceeds 600mA. During thermal shutdown, the output voltage remains low. Normal operation is restored when the junction temperature drops below 120^{o}C.

The AME8810 switches from voltage mode to current mode when the load exceeds the rated output current. This prevents over-stress. The AME8810 also incorporates current foldback to reduce power dissipation when the output is short circuited. This feature becomes active when the output drops below 0.8 volts, and reduces the current flow by 65%. Full current is restored when the voltage exceeds 0.8 volts.

■ External Capacitors

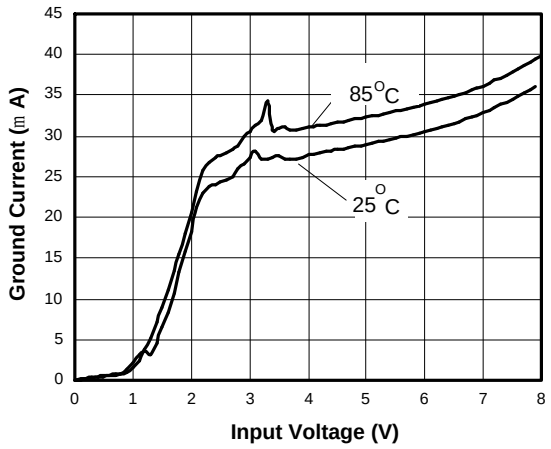
The AME8810 is stable with an output capacitor to ground of 2.2µF or greater. Ceramic capacitors have the lowest ESR, and will offer the best AC performance. Conversely, Aluminum Electrolytic capacitors exhibit the highest ESR, resulting in the poorest AC response. Unfortunately, large value ceramic capacitors are comparatively expensive. One option is to parallel a 0.1µF ceramic capacitor with a 10µF Aluminum Electrolytic. The benefit is low ESR, high capacitance, and low overall cost.

A second capacitor is recommended between the input and ground to stabilize Vin. The input capacitor should be at least 0.1µF to have a beneficial effect.

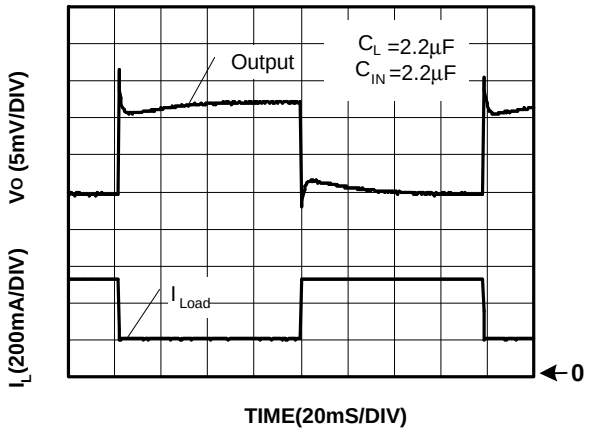
All capacitors should be placed in close proximity to the pins. A "Quiet" ground termination is desirable. This can be achieved with a "Star" connection.

■ Characterization Curve(For reference only)

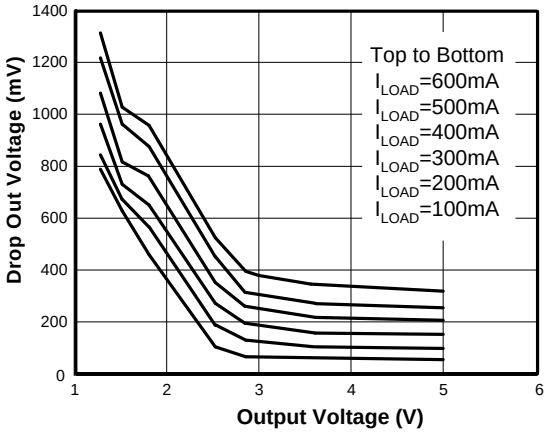
Ground Current vs. Input Voltage



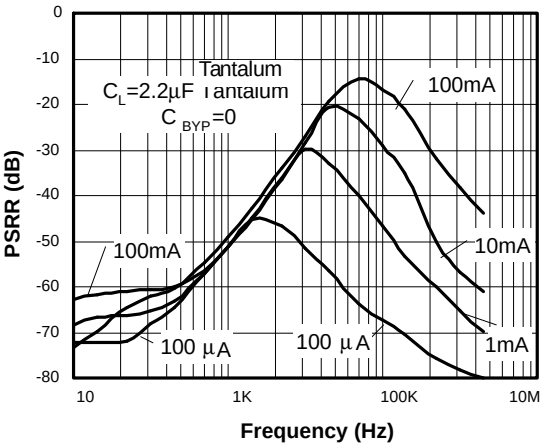
Load Step (1mA-600mA)



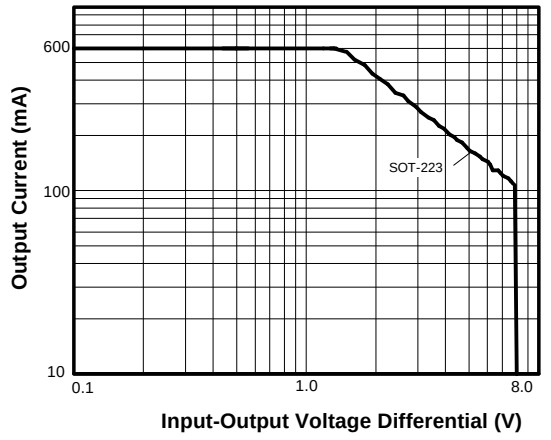
Drop Out Voltage vs. Output Voltage



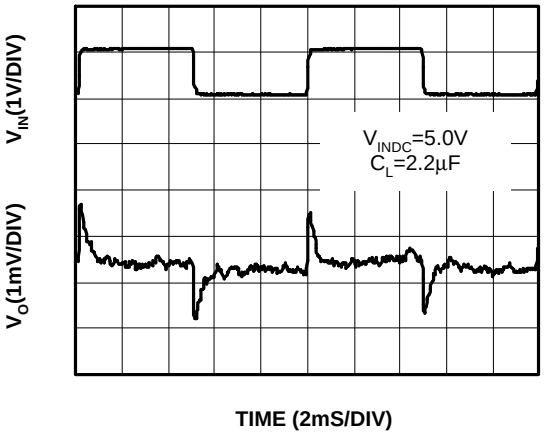
Power Supply Rejection Ratio



Safe Operating Area

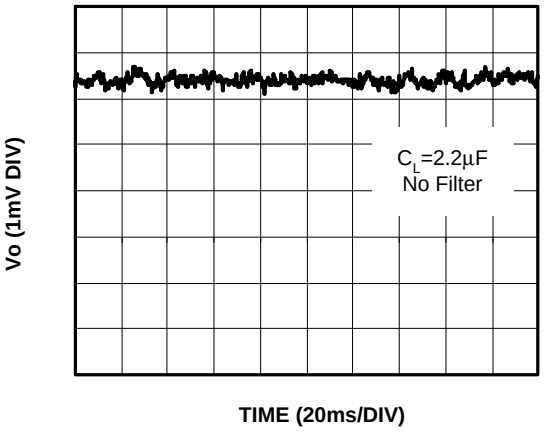


Line Transient Response

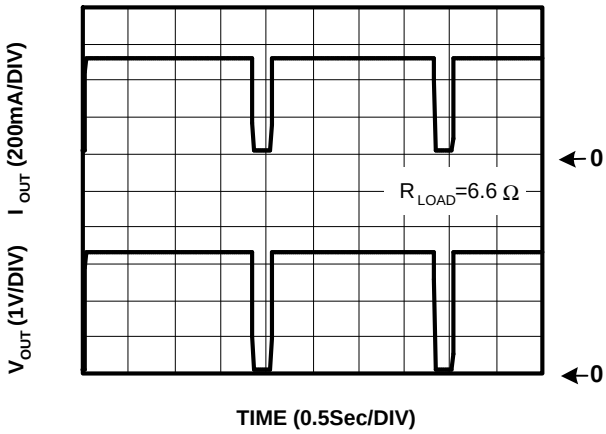


■ Characterization Curve(For reference only)

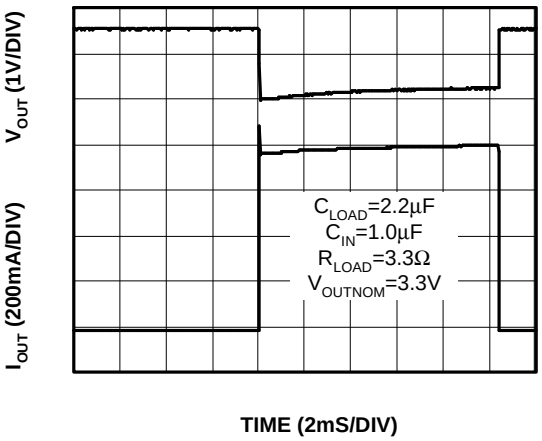
Noise Measurement



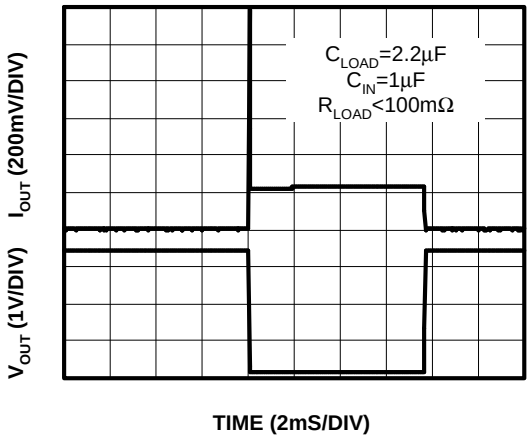
Overtemperature Shutdown



Current Limit Response

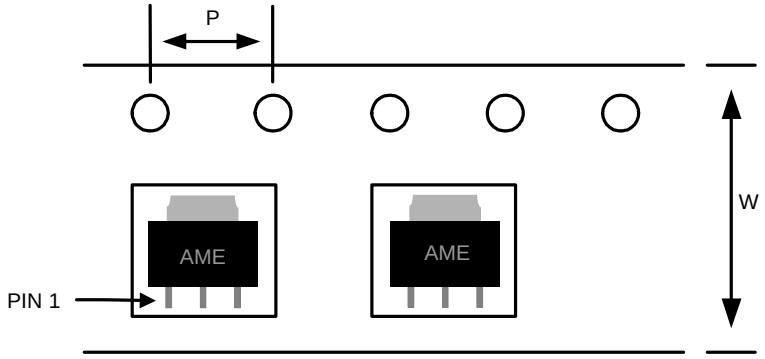


Short Circuit Response



■ Tape and Reel Dimension

SOT-223

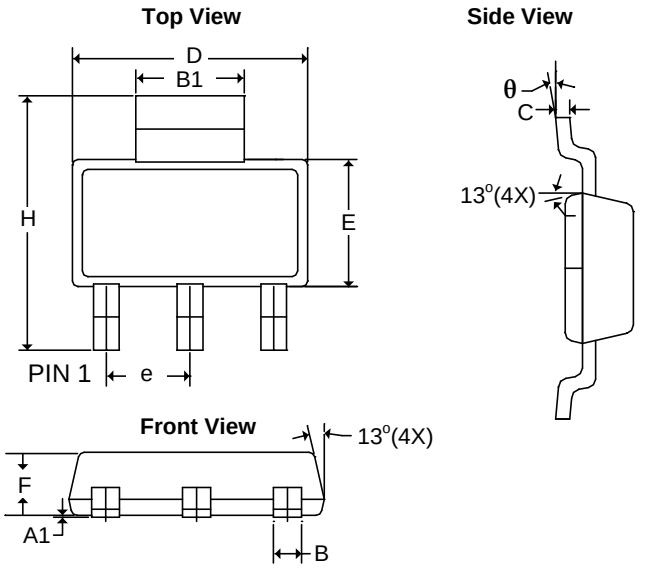


Carrier Tape, Number of Components Per Reel and Reel Size

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

■ 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	6.30	6.71	0.2480	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°



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