

## ■ General Description

The AME8824 family of positive, linear regulators feature low quiescent current (30µA typ.) with low dropout voltage, making them ideal for battery applications. The space-saving SOT-26 package are 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 SOT-26 version also features a "Power Good" detector, which pulls low when the output is out of regulation.

The AME8824 is stable with an output capacitance of 2.2µF or greater.

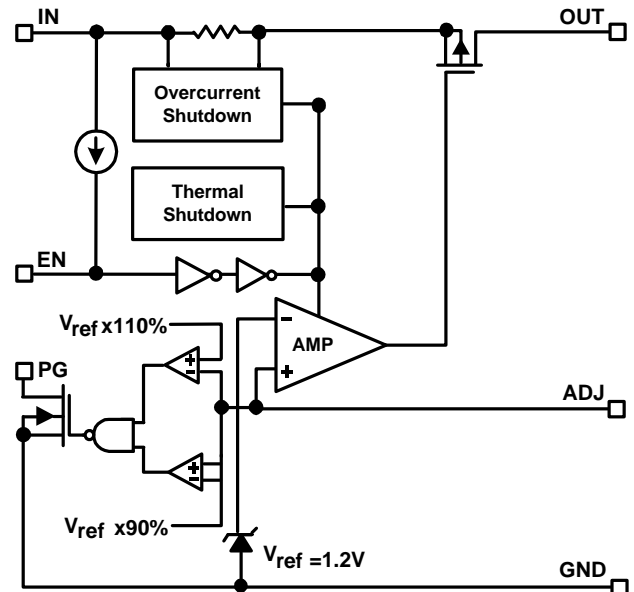
## ■ Features

- Very Low Dropout Voltage
- Guaranteed 300mA Output
- Typical accuracy within 2%
- 30µA Quiescent Current
- Over-Temperature Shutdown
- Current Limiting
- Short Circuit Current Fold-back
- Power Good Detector (6 pin version only)
- Power-Saving Shutdown Mode
- Space-Saving SOT-26
- Adjustable Output Voltages
- Low Temperature Coefficient
- All AME's Lead Free Products Meet RoHS Standards

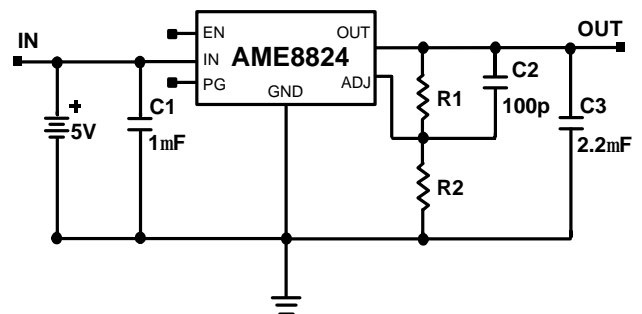
## ■ Applications

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

## ■ Functional Block Diagram



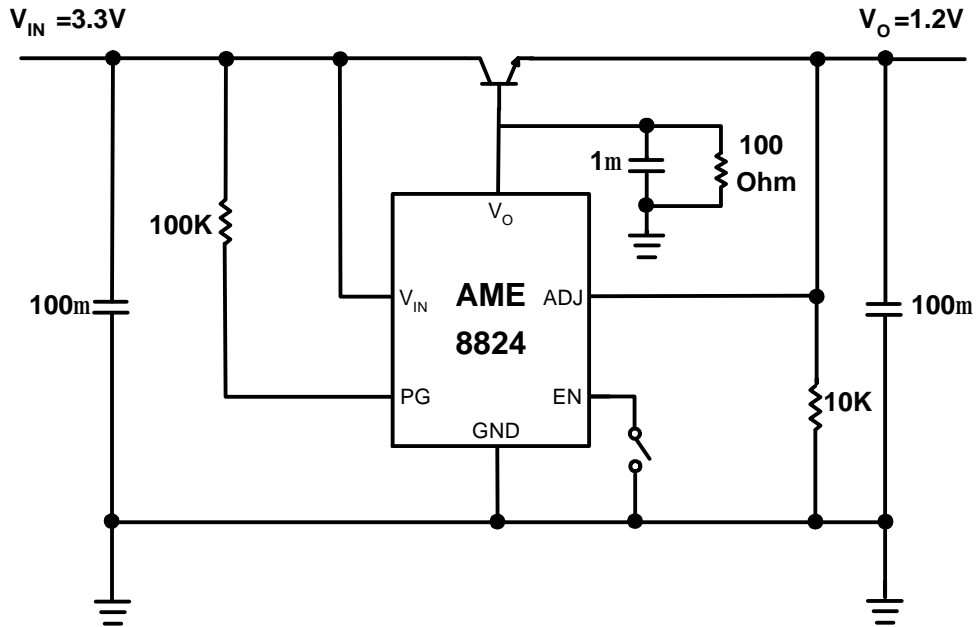
## ■ Typical Application



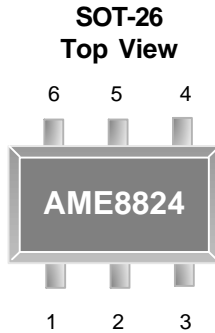
$$V_{OUT} = 1.2 (R1 + R2) / R2$$

C2 is unnecessary when R1 or R2 < 20K  
PG pin is only available in the SOT-26 package option

## ■ Advanced Application



### ■ Pin Configuration

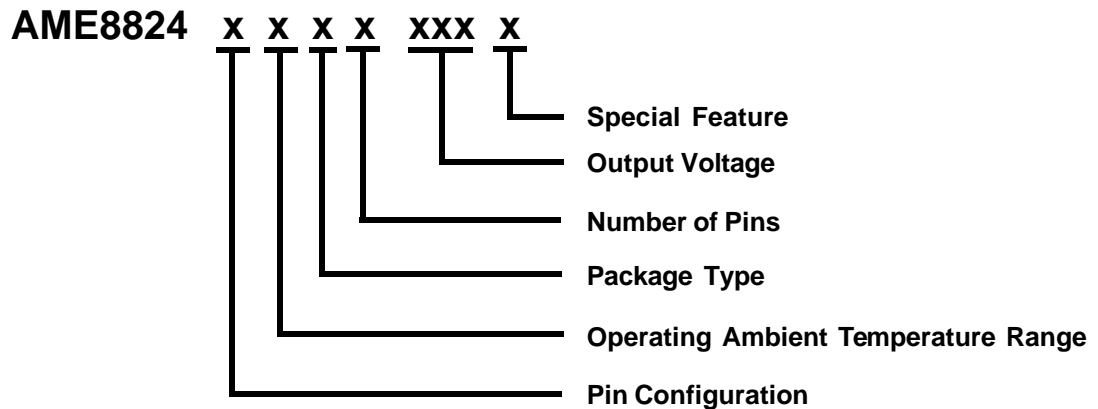

**AME8824**

1.  $V_{IN}$
2. GND
3. EN
4. PG
5. ADJ
6.  $V_{OUT}$

\* Die Attach:

Non-Conductive Epoxy

### ■ Ordering Information



Product Grade or Option	Operating Ambient Temperature Range	Package Type	Number of Pins	Special Feature
A: ADJ	E: -40°C to +85°C	E: SOT-2X	Y: 6	L: Low Profile Y: Lead Free & Low Profile Z: Lead Free

### ■ Ordering Information

Part Number	Marking*	Output Voltage	Package	Operating Ambient Temperature Range
AME8824AEEY	AUEww	ADJ	SOT-26	- 40°C to +85°C
AME8824AEEYL	AUEww	ADJ	TSOT-26	- 40°C to +85°C
AME8824AEEYY	AUEww	ADJ	TSOT-26	- 40°C to +85°C
AME8824AEEYZ	AUEww	ADJ	SOT-26	- 40°C to +85°C

ww: represents the date code and pls refer to Date Code Rule before Package Dimension.

\* A line on top of the first character represents lead free plating such as AUEww

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

**■ Absolute Maximum Ratings**

Parameter	Maximum	Unit
Input Voltage	8	V
Output Current	$P_D / (V_{IN} - V_O)$	mA
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	°C
Junction Temperature Range	$T_J$	- 40 to +125	°C

**■ Thermal Information**

Parameter	Package	Die Attach	Symbol	Maximum	Unit
Thermal Resistance* (Junction to Case)	SOT-26	Non-Conductive Epoxy	$\theta_{JC}$	140	°C / W
Thermal Resistance (Junction to Ambient)			$\theta_{JA}$	280	
Internal Power Dissipation			$P_D$	400	mW
Maximum Junction Temperature				150	°C
Solder Iron (10 Sec)**				350	°C

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

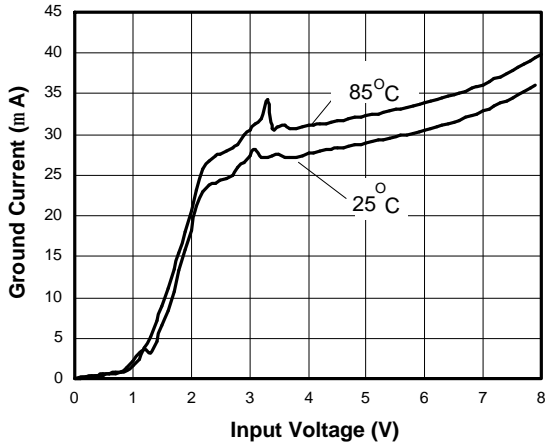
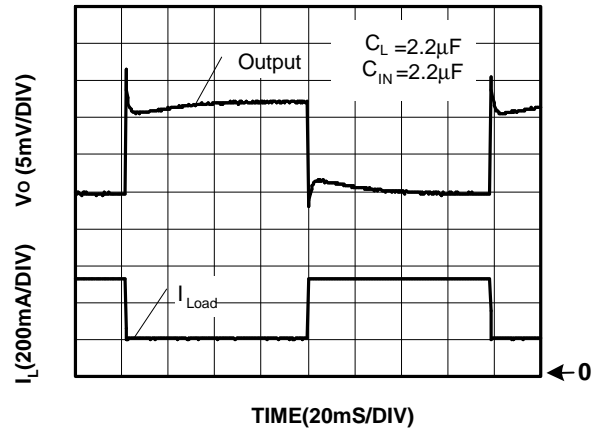
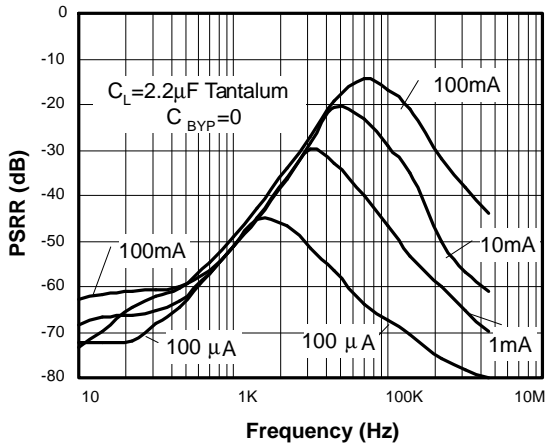
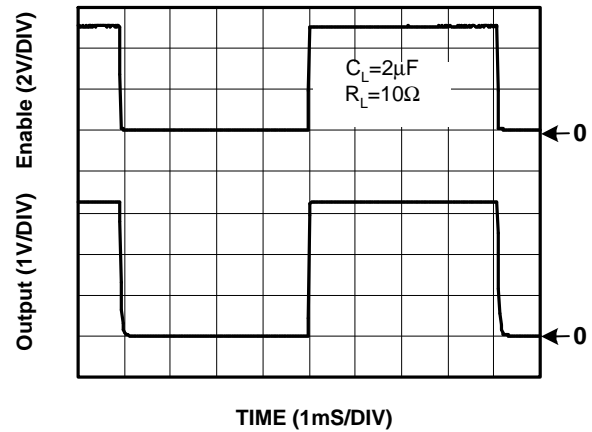
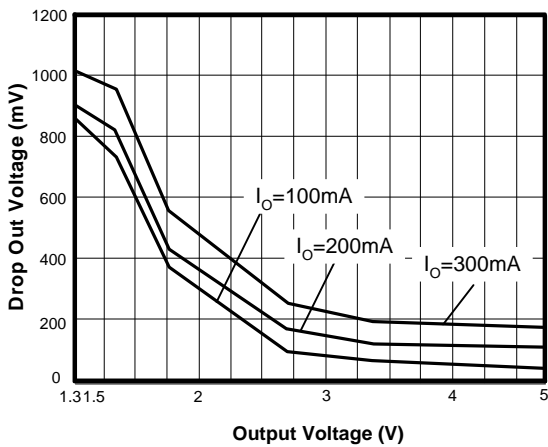
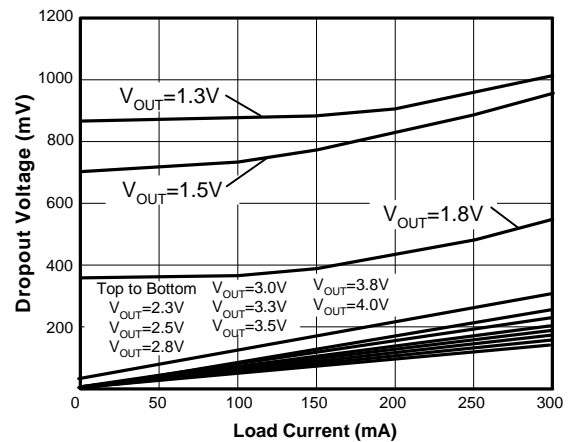
\*\* MIL-STD-202G 210F

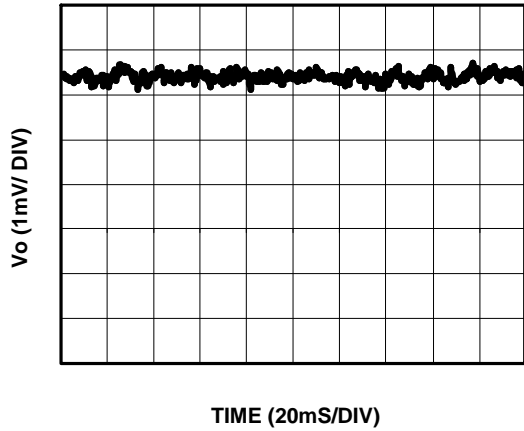
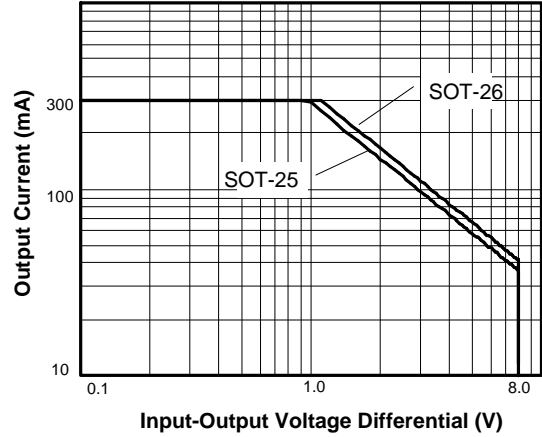
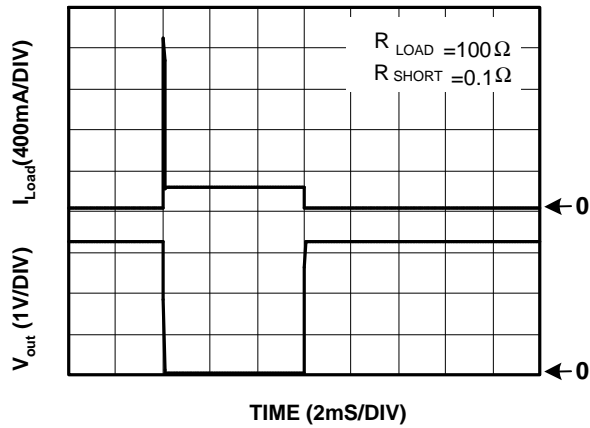
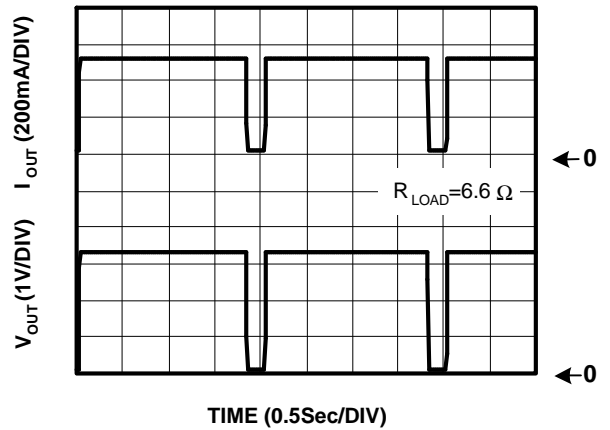
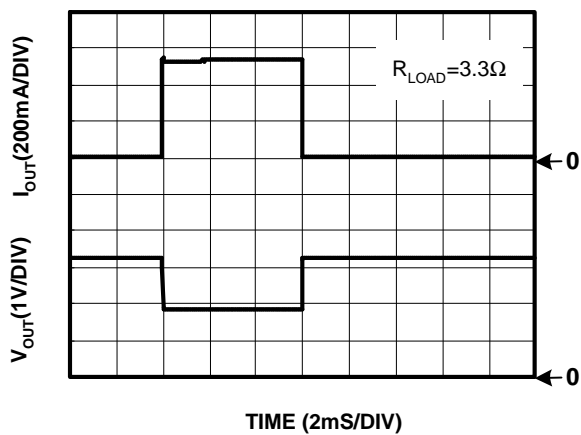
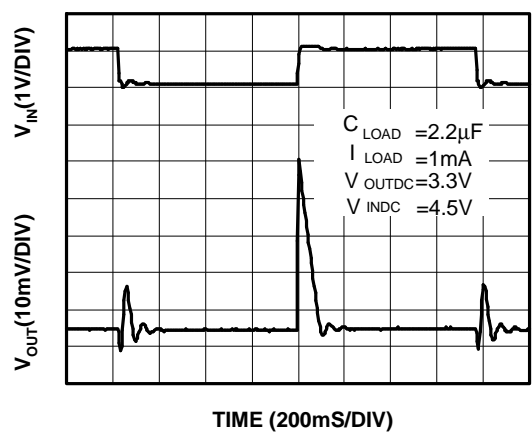
## ■ Electrical Specifications

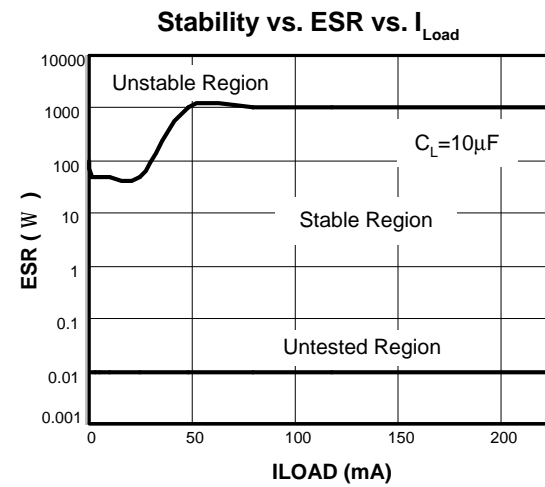
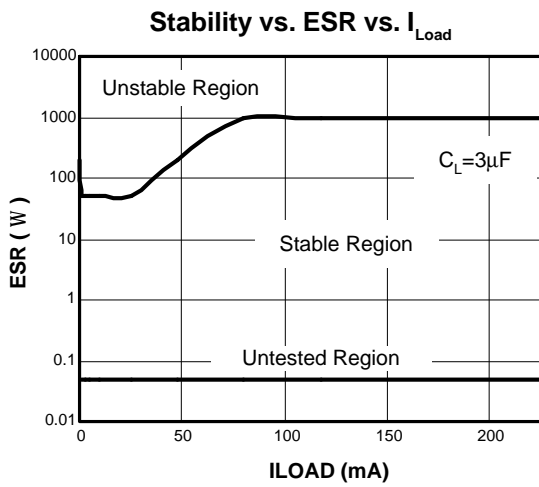
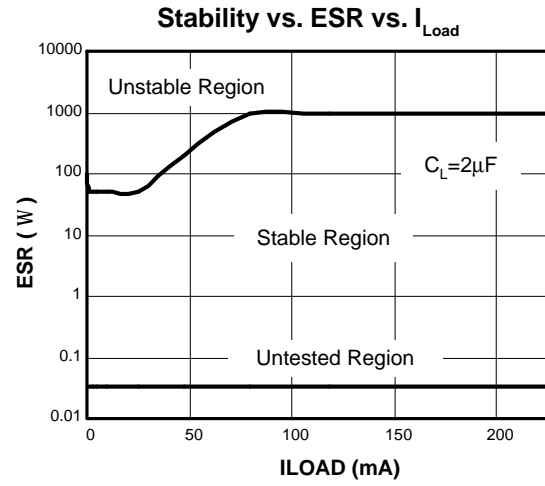
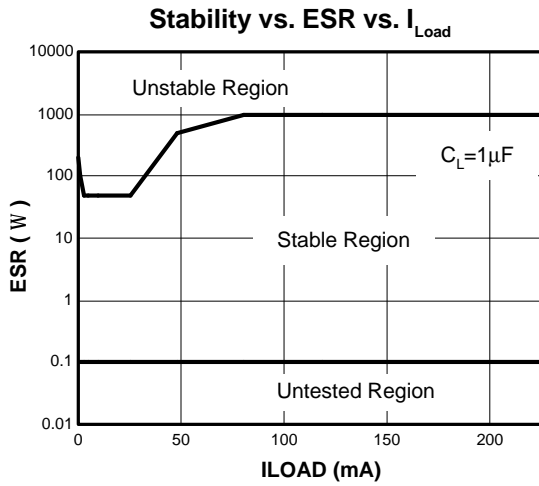
TA = 25°C, V<sub>IN</sub> = 5V unless otherwise noted

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
Input Voltage	V <sub>IN</sub>		Note 1		7	V
Output Voltage	V <sub>O</sub>	I <sub>O</sub> = 1mA	-3		3	%
Dropout Voltage	V <sub>DROPOUT</sub>	I <sub>O</sub> = 300mA V <sub>O</sub> = V <sub>ONOM</sub> - 2.0%	1.2V ≤ V <sub>O(NOM)</sub> ≤ 2.0V		1300	mV
			2.0V < V <sub>O(NOM)</sub> ≤ 2.8V		400	
			2.8V < V <sub>O(NOM)</sub> < 3.8V		300	
Output Current	I <sub>O</sub>	V <sub>O</sub> > 1.2V	300			mA
Current Limit	I <sub>LIM</sub>	V <sub>O</sub> > 1.2V	300	450		mA
Short Circuit Current	I <sub>SC</sub>	V <sub>O</sub> < 0.8V		150	300	mA
Quiescent Current	I <sub>Q</sub>	I <sub>O</sub> = 0mA		30	50	μA
Ground Pin Current	I <sub>GND</sub>	I <sub>O</sub> = 1mA to 300mA		35		μA
Line Regulation	REG <sub>LINE</sub>	I <sub>O</sub> = 5mA V <sub>IN</sub> = V <sub>O</sub> + 1 to V <sub>O</sub> + 2	V <sub>O</sub> < 2.0V		0.15	%
			V <sub>O</sub> ≥ 2.0V	0.02	0.1	
Load Regulation	REG <sub>LOAD</sub>	I <sub>O</sub> = 1mA to 300mA		0.2	1	%
Over Temperature Shutdown	OTS			150		°C
Over Temperature Hysteresis	OTH			30		°C
V <sub>O</sub> Temperature Coefficient	TC			30		ppm/°C
Power Supply Rejection	PSRR	I <sub>O</sub> = 100mA C <sub>O</sub> = 2.2μF	f = 1kHz		50	dB
			f = 10kHz		20	
			f = 100kHz		15	
Output Voltage Noise	eN	f = 10Hz to 100kHz I <sub>O</sub> = 10mA, C <sub>BYP</sub> = 0μF			30	μVrms
ADJ Input Bias Current	I <sub>ADJ</sub>			1		μA
ADJ Reference Voltage	V <sub>REF</sub>		1.176	1.2	1.224	V
EN Input Threshold	V <sub>EH</sub>	V <sub>IN</sub> = 2.7V to 7V	2.0		V <sub>IN</sub>	V
	V <sub>EL</sub>	V <sub>IN</sub> = 2.7V to 7V	0		0.4	V
EN Input Bias Current	I <sub>EH</sub>	V <sub>EN</sub> = V <sub>IN</sub> , V <sub>IN</sub> = 2.7V to 7V			0.1	μA
	I <sub>EL</sub>	V <sub>EN</sub> = 0V, V <sub>IN</sub> = 2.7V to 7V			0.5	μA
Shutdown Supply Current	I <sub>SD</sub>	V <sub>IN</sub> = 5V, V <sub>O</sub> = 0V, V <sub>EN</sub> < V <sub>EL</sub>		0.5	1	μA
Shutdown Output Voltage	V <sub>O,SD</sub>	I <sub>O</sub> = 35μA, V <sub>EN</sub> < V <sub>EL</sub>	0		0.1	V
Output Under Voltage	V <sub>UV</sub>				85	% V <sub>O(NOM)</sub>
Output Over Voltage	V <sub>OV</sub>		115			% V <sub>O(NOM)</sub>
PG Leakage Current	I <sub>LC</sub>	V <sub>PG</sub> = 7V			1	μA
PG Voltage Rating	V <sub>PG</sub>	V <sub>O</sub> in regulation			7	V
PG Voltage Low	V <sub>OL</sub>	I <sub>SINK</sub> = 0.4mA			0.4	V

Note 1: V<sub>IN(min)</sub> = V<sub>OUT</sub> + V<sub>DROPOUT</sub>

**Ground Current vs. Input Voltage**

**Load Step (1mA-300mA)**

**Power Supply Rejection Ratio**

**Chip Enable Transient Response**

**Drop Out Voltage vs. Output Voltage**

**Drop Out Voltage vs. Load Current**


**Noise Measurement**

**Safe Operating Area**

**Short Circuit Response**

**Overtemperature Shutdown**

**Current Limit Response**

**Line Transient Response**






**External Resistor Divider Table**

R1 (K Ohm)	1	2	5	10	20	50	100	200	500	1000
Vout	$R2(K\text{ Ohm})=(1.2*R1(K\text{ Ohm}))/(Vout-1.2)$									
1.25	24.00	48.00	120.00	240.00	480.00	1200.00				
1.30	12.00	24.00	60.00	120.00	240.00	600.00				
1.35	8.00	16.00	40.00	80.00	160.00	400.00				
1.40	6.00	12.00	30.00	60.00	120.00	300.00				
1.45	4.80	9.60	24.00	48.00	96.00	240.00	480.00			
1.50	4.00	8.00	20.00	40.00	80.00	200.00	400.00	800.00		
1.55	3.43	6.86	17.14	34.29	68.57	171.43	342.86	685.71		
1.60	3.00	6.00	15.00	30.00	60.00	150.00	300.00	600.00		
1.65	2.67	5.33	13.33	26.67	53.33	133.33	266.67	533.33		
1.70	2.40	4.80	12.00	24.00	48.00	120.00	240.00	480.00		
1.75	2.18	4.36	10.91	21.82	43.64	109.09	218.18	436.36		
1.80	2.00	4.00	10.00	20.00	40.00	100.00	200.00	400.00		
1.85	1.85	3.69	9.23	18.46	36.92	92.31	184.62	369.23		
1.90	1.71	3.43	8.57	17.14	34.29	85.71	171.43	342.86		
1.95	1.60	3.20	8.00	16.00	32.00	80.00	160.00	320.00	800.00	
2.00	1.50	3.00	7.50	15.00	30.00	75.00	150.00	300.00	750.00	
2.05	1.41	2.82	7.06	14.12	28.24	70.59	141.18	282.35	705.88	
2.10	1.33	2.67	6.67	13.33	26.67	66.67	133.33	266.67	666.67	
2.15	1.26	2.53	6.32	12.63	25.26	63.16	126.32	252.63	631.58	
2.20	1.20	2.40	6.00	12.00	24.00	60.00	120.00	240.00	600.00	
2.25	1.14	2.29	5.71	11.43	22.86	57.14	114.29	228.57	571.43	
2.30	1.09	2.18	5.45	10.91	21.82	54.55	109.09	218.18	545.45	
2.35	1.04	2.09	5.22	10.43	20.87	52.17	104.35	208.70	521.74	
2.40	1.00	2.00	5.00	10.00	20.00	50.00	100.00	200.00	500.00	
2.45	0.96	1.92	4.80	9.60	19.20	48.00	96.00	192.00	480.00	
2.50	0.92	1.85	4.62	9.23	18.46	46.15	92.31	184.62	461.54	
2.55	0.89	1.78	4.44	8.89	17.78	44.44	88.89	177.78	444.44	
2.60	0.86	1.71	4.29	8.57	17.14	42.86	85.71	171.43	428.57	857.14
2.65	0.83	1.66	4.14	8.28	16.55	41.38	82.76	165.52	413.79	827.59
2.70	0.80	1.60	4.00	8.00	16.00	40.00	80.00	160.00	400.00	800.00
2.75	0.77	1.55	3.87	7.74	15.48	38.71	77.42	154.84	387.10	774.19
2.80	0.75	1.50	3.75	7.50	15.00	37.50	75.00	150.00	375.00	750.00
2.85	0.73	1.45	3.64	7.27	14.55	36.36	72.73	145.45	363.64	727.27
2.90	0.71	1.41	3.53	7.06	14.12	35.29	70.59	141.18	352.94	705.88
2.95	0.69	1.37	3.43	6.86	13.71	34.29	68.57	137.14	342.86	685.71
3.00	0.67	1.33	3.33	6.67	13.33	33.33	66.67	133.33	333.33	666.67
3.05	0.65	1.30	3.24	6.49	12.97	32.43	64.86	129.73	324.32	648.65
3.10	0.63	1.26	3.16	6.32	12.63	31.58	63.16	126.32	315.79	631.58

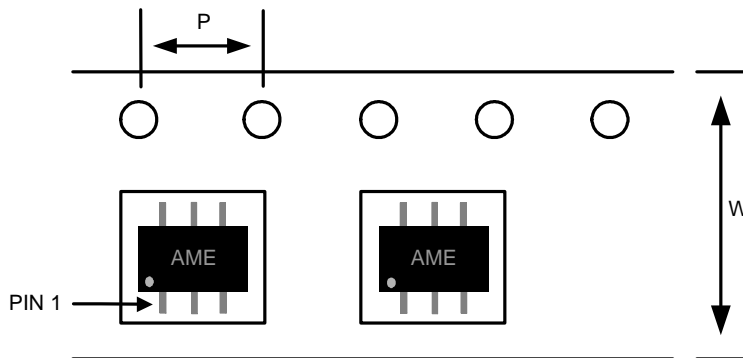
**■ External Resistor Divider Table**

R1 (K Ohm)	1	2	5	10	20	50	100	200	500	1000
Vout	$R2(K\ Ohm)=(1.2 \cdot R1(K\ Ohm))/(Vout-1.2)$									
3.15	0.62	1.23	3.08	6.15	12.31	30.77	61.54	123.08	307.69	615.38
3.20	0.60	1.20	3.00	6.00	12.00	30.00	60.00	120.00	300.00	600.00
3.25	0.59	1.17	2.93	5.85	11.71	29.27	58.54	117.07	292.68	585.37
3.30	0.57	1.14	2.86	5.71	11.43	28.57	57.14	114.29	285.71	571.43
3.35	0.56	1.12	2.79	5.58	11.16	27.91	55.81	111.63	279.07	558.14
3.40	0.55	1.09	2.73	5.45	10.91	27.27	54.55	109.09	272.73	545.45
3.45	0.53	1.07	2.67	5.33	10.67	26.67	53.33	106.67	266.67	533.33
3.50	0.52	1.04	2.61	5.22	10.43	26.09	52.17	104.35	260.87	521.74
3.55	0.51	1.02	2.55	5.11	10.21	25.53	51.06	102.13	255.32	510.64
3.60	0.50	1.00	2.50	5.00	10.00	25.00	50.00	100.00	250.00	500.00
3.65	0.49	0.98	2.45	4.90	9.80	24.49	48.98	97.96	244.90	489.80
3.70	0.48	0.96	2.40	4.80	9.60	24.00	48.00	96.00	240.00	480.00
3.75	0.47	0.94	2.35	4.71	9.41	23.53	47.06	94.12	235.29	470.59
3.80	0.46	0.92	2.31	4.62	9.23	23.08	46.15	92.31	230.77	461.54
3.85	0.45	0.91	2.26	4.53	9.06	22.64	45.28	90.57	226.42	452.83
3.90	0.44	0.89	2.22	4.44	8.89	22.22	44.44	88.89	222.22	444.44
3.95	0.44	0.87	2.18	4.36	8.73	21.82	43.64	87.27	218.18	436.36
4.00	0.43	0.86	2.14	4.29	8.57	21.43	42.86	85.71	214.29	428.57
4.05	0.42	0.84	2.11	4.21	8.42	21.05	42.11	84.21	210.53	421.05
4.10	0.41	0.83	2.07	4.14	8.28	20.69	41.38	82.76	206.90	413.79
4.15	0.41	0.81	2.03	4.07	8.14	20.34	40.68	81.36	203.39	406.78
4.20	0.40	0.80	2.00	4.00	8.00	20.00	40.00	80.00	200.00	400.00
4.25	0.39	0.79	1.97	3.93	7.87	19.67	39.34	78.69	196.72	393.44
4.30	0.39	0.77	1.94	3.87	7.74	19.35	38.71	77.42	193.55	387.10
4.35	0.38	0.76	1.90	3.81	7.62	19.05	38.10	76.19	190.48	380.95
4.40	0.37	0.75	1.87	3.75	7.50	18.75	37.50	75.00	187.50	375.00
4.45	0.37	0.74	1.85	3.69	7.38	18.46	36.92	73.85	184.62	369.23
4.50	0.36	0.73	1.82	3.64	7.27	18.18	36.36	72.73	181.82	363.64
4.55	0.36	0.72	1.79	3.58	7.16	17.91	35.82	71.64	179.10	358.21
4.60	0.35	0.71	1.76	3.53	7.06	17.65	35.29	70.59	176.47	352.94
4.65	0.35	0.70	1.74	3.48	6.96	17.39	34.78	69.57	173.91	347.83
4.70	0.34	0.69	1.71	3.43	6.86	17.14	34.29	68.57	171.43	342.86
4.75	0.34	0.68	1.69	3.38	6.76	16.90	33.80	67.61	169.01	338.03
4.80	0.33	0.67	1.67	3.33	6.67	16.67	33.33	66.67	166.67	333.33
4.85	0.33	0.66	1.64	3.29	6.58	16.44	32.88	65.75	164.38	328.77
4.90	0.32	0.65	1.62	3.24	6.49	16.22	32.43	64.86	162.16	324.32
4.95	0.32	0.64	1.60	3.20	6.40	16.00	32.00	64.00	160.00	320.00
5.00	0.32	0.63	1.58	3.16	6.32	15.79	31.58	63.16	157.89	315.79

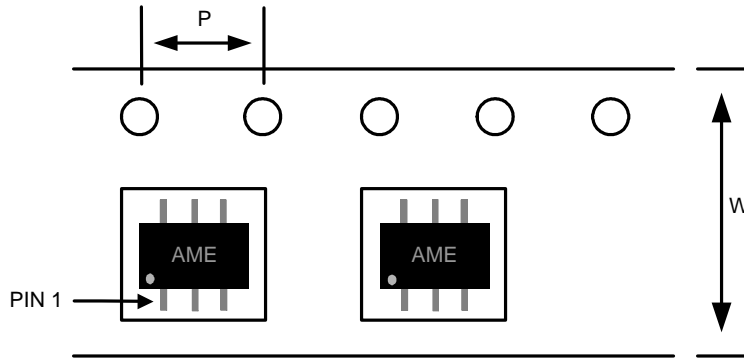
Note: Small Load (greater than 2mA) is necessary as R1 or R2 is larger than 50 Kohm. Otherwise, output voltage probably cannot be pulled down to 0V on disable mode.

**■ Date Code Rule**

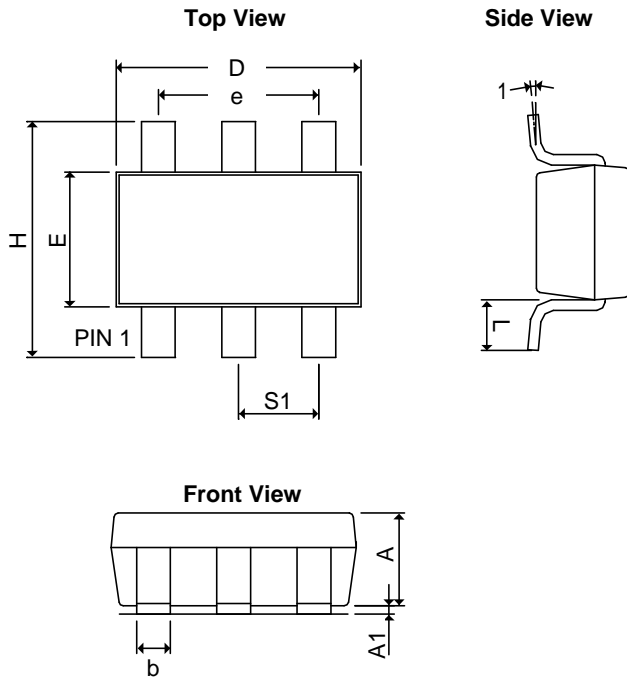
Marking			Date Code		Year
A	A	A	W	W	xxx0
A	A	A	W	<u>W</u>	xxx1
A	A	A	<u>W</u>	W	xxx2
A	A	A	<u>W</u>	<u>W</u>	xxx3
A	A	<u>A</u>	W	W	xxx4
A	A	<u>A</u>	W	<u>W</u>	xxx5
A	A	<u>A</u>	<u>W</u>	W	xxx6
A	A	<u>A</u>	<u>W</u>	<u>W</u>	xxx7
A	<u>A</u>	A	W	W	xxx8
A	<u>A</u>	A	W	<u>W</u>	xxx9

**■ Tape and Reel Dimension**
**SOT-26**


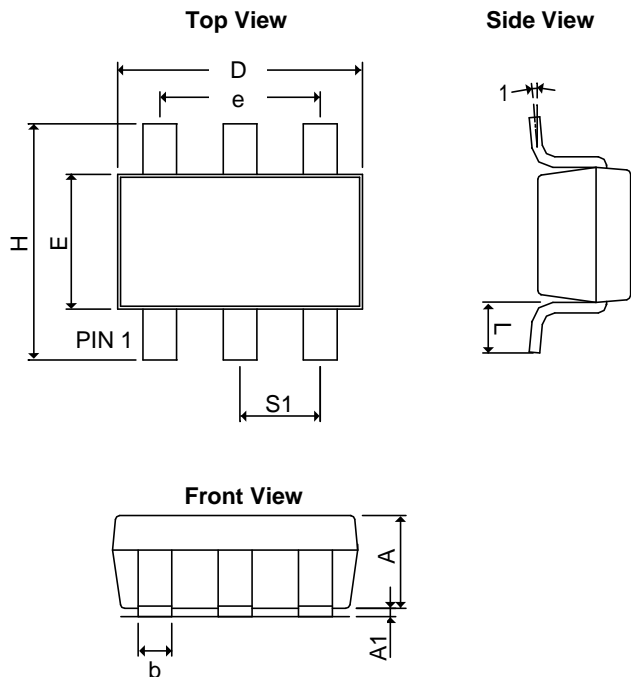
Package	Carrier Width (W)	Pitch (P)	Part Per Full Reel	Reel Size
SOT-26	8.0±0.1 mm	4.0±0.1 mm	3000pcs	180±1 mm

**■ Tape and Reel Dimension**
**TSOT-26**

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

Package	Carrier Width (W)	Pitch (P)	Part Per Full Reel	Reel Size
TSOT-26	8.0±0.1 mm	4.0±0.1 mm	3000pcs	180±1 mm

**■ Package Dimension**
**SOT-26**


SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
<b>A</b>	1.20REF		0.0472REF	
<b>A<sub>1</sub></b>	0.00	0.15	0.0000	0.0059
<b>b</b>	0.30	0.55	0.0118	0.0217
<b>D</b>	2.70	3.10	0.1063	0.1220
<b>E</b>	1.40	1.80	0.0551	0.0709
<b>e</b>	1.90 BSC		0.0748 BSC	
<b>H</b>	2.60	3.00	0.10236	0.11811
<b>L</b>	0.37REF		0.0146REF	
<b>q1</b>	0°	10°	0°	10°
<b>S<sub>1</sub></b>	0.95REF		0.0374REF	

**TSOT-26**


SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
<b>A+A<sub>1</sub></b>	0.90	1.25	0.0354	0.0492
<b>b</b>	0.30	0.50	0.0118	0.0197
<b>D</b>	2.70	3.10	0.1063	0.1220
<b>E</b>	1.40	1.80	0.0551	0.0709
<b>e</b>	1.90 BSC		0.07480 BSC	
<b>H</b>	2.40	3.00	0.09449	0.11811
<b>L</b>	0.35BSC		0.0138BSC	
<b>q1</b>	0°	10°	0°	10°
<b>S<sub>1</sub></b>	0.95BSC		0.0374BSC	



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