■ General Description

The AME8750 dual, low dropout, linear regulators operate from Higher V_{OUT}+$V_{DROPOUT}$ to 5.5V input and deliver up to 150mA / 150mA output current each. It has a bypass pin option allows users to decouple the bandgap reference for reducing the output noise. Low dropout voltage and low quiescent current(70μA typ.)make them ideal for battery applications.

The AME8750 is available with a wide variety of voltage options as standard and can be trimmed to 1.5% accuracy.

For protection purpose, AME8750 has both thermal shutdown and current fold-back to prevent device failure under the "worst" of operating conditions.

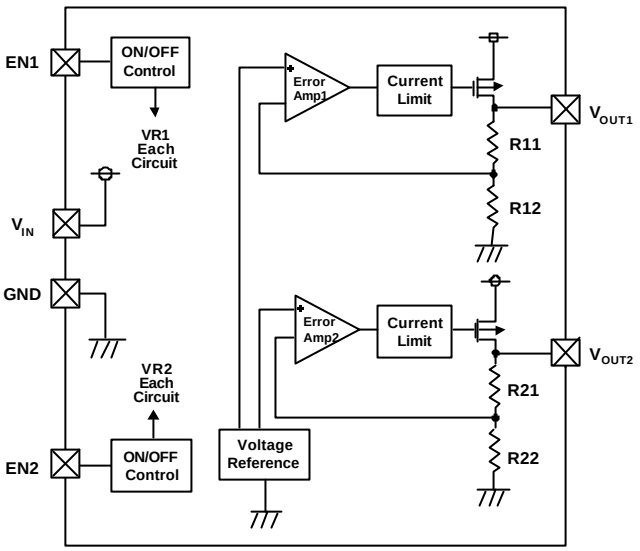
■ Features

- Very Low Dropout Voltage
- Guaranteed 150mA / 150mA Each Output
- Accurate to Within 1.5% For Both Outputs
- Typical 70 μA Quiescent Current
- Over-Temperature Shutdown
- Current Limiting
- Short Circuit Current Fold-back
- Noise Reduction Bypass Cap
- Power-Saving Shutdwon Mode
- All AME's Lead Free Product Meet RoHS Standards

■ Applications

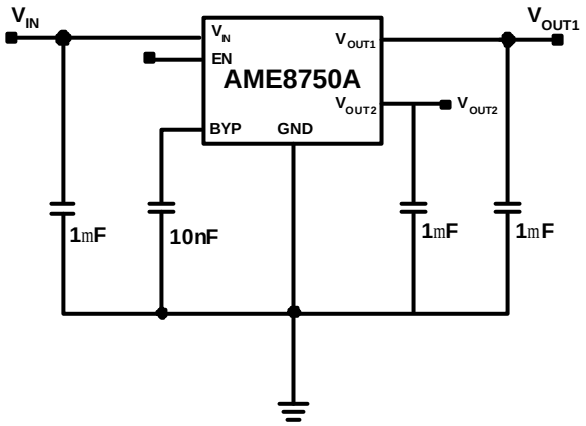
- Cellular Phones
- Palm / Notebook
- Battery Power Equipment
- Handheld Instruments

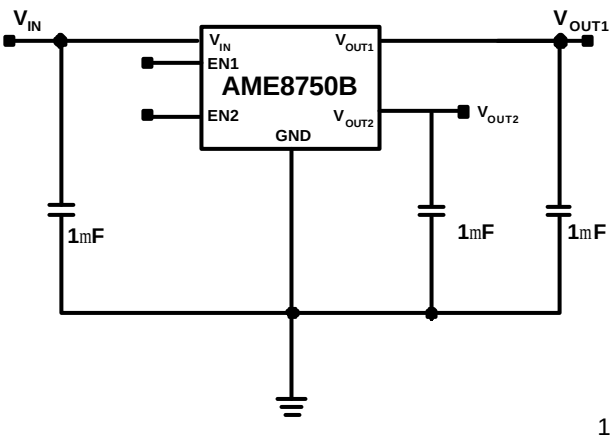
■ Functional Block Diagram



■ Typical Applications

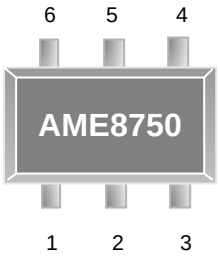
Fixed Version





■ Pin Configuration

SOT-26
Top View

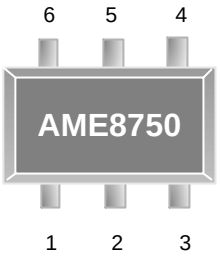


AME 8750AEEY

1. V_{OUT2}
2. GND
3. BYP
4. EN
5. V_{IN}
6. V_{OUT1}

*** Die Attach:**
Conductive Epoxy

SOT-26
Top View



AME 8750BEEY

1. V_{OUT2}
2. GND
3. EN1
4. EN2
5. V_{IN}
6. V_{OUT1}

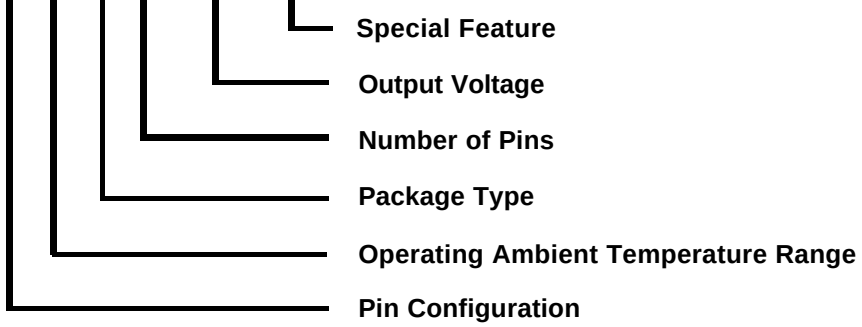
*** Die Attach:**
Conductive Epoxy

■ Pin Description

Pin Number		Pin Name	Description
AME8750A	AME8750B		
1	1	V_{OUT2}	Regulator 2 Output. Sources up to 150mA continuous current. Bypass with a 1µF (< 0.5Ω typ ESR) capacitor to GND.
2	2	GND	Ground. This pin also functions as heatsink. Solder to a large pad or the circuit-board ground plane to maximize thermal dissipation.
3	N/A	BYP	Reference Noise Bypass. Bypass with a low leakage 10nF ceramic capacitor for reduced nise at both outputs.
N/A	3	EN1	Shutdown 1 Input. A logic low shuts down regulator 1. If EN1 and EN2 are both low, both regulators and the reference turn off. If either EN1 and EN2 is a logic high, the reference is on. Connect to V_{IN} for normal operation.
4	N/A	EN	Shutdown Input. A logic low shuts down both regulators. Connect to V_{IN} for normal operation.
N/A	4	EN2	Shutdown 2 Input. A logic low shuts down regulator 2. If EN1 and EN2 are both low, both regulators and the reference turn off. If either EN1 and EN2 is a logic high, the reference is on. Connect to V_{IN} for normal operation.
5	5	V_{IN}	Regulator Input. Supply voltage can range from Higher V_{OUT}+$V_{DROPOUT}$ to 5.5V. This input also supplies the on-chip reference. Bypass with 1µF to GND.
6	6	V_{OUT1}	Regulator 1 Output. Sources up to 150mA continuous current. Bypass with a 1µF (< 0.5Ω typ ESR) capacitor to GND.

■ Ordering Information (contd.)

AME8750 x x x x xxxx x



Pin Configuration	Operating Ambient Temperature Range	Package Type	Number of Pins	Output Voltage (Both LDOs)	Special Feature
A (SOT-26) 1. V_{OUT2} 2. GND 3. BYP 4. EN 5. V_{IN} 6. V_{OUT1} B (SOT-26) 1. V_{OUT2} 2. GND 3. EN2 4. EN1 5. V_{IN} 6. V_{OUT1}	E: -40°C to +85°C	E: SOT-2X	Y: 6	1825: V_{OUT1}=1.8V V_{OUT2}=2.5V 1828: V_{OUT1}=1.8V V_{OUT2}=2.8V	Y: Lead free & Low profile Z: Lead free

■ Ordering Information

Part Number	Marking*	Output Voltage	Package	Operating Ambient Temperature Range
AME8750AEEY1828Z	BCKww	V_{OUT1}=1.8V V_{OUT2}=2.8V	SOT-26	- 40°C to + 85°C
AME8750AEEY1828Y	BCKww	V_{OUT1}=1.8V V_{OUT2}=2.8V	TSOT-26	- 40°C to + 85°C
AME8750BEEY1828Z	BCJww	V_{OUT1}=1.8V V_{OUT2}=2.8V	SOT-26	- 40°C to + 85°C
AME8750BEEY1828Y	BCJww	V_{OUT1}=1.8V V_{OUT2}=2.8V	TSOT-26	- 40°C to + 85°C
AME8750BEEY1825Z	BBHww	V_{OUT1}=1.8V V_{OUT2}=2.5V	SOT-26	- 40°C to + 85°C
AME8750BEEY1825Y	BBHww	V_{OUT1}=1.8V V_{OUT2}=2.5V	TSOT-26	- 40°C to + 85°C

Note:ww represents date code and pls refer to Date Code Rule before Package Dimension.
* A line on top of the first letter represents lead free plating such as BCKww.
Please consult AME sales office or authorized Rep./Distributor for voltage accuracy and package type availability.

■ Absolute Maximum Ratings

Parameter	Maximum	Unit
Input Voltage	6	V
Output Current	$P_D/2V_{IN}-(V_{OUT1}+V_{OUT2})$	mA
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-26	Conductive Epoxy	θ_{JC}	81	^oC / W
Thermal Resistance (Junction to Ambient)			θ_{JA}	260	
Internal Power Dissipation			P_D	400	mW
Maximum Junction Temperature				150	^oC
Solder Iron (10 Sec)**				350	^oC

* Measure θ_{JC} on center of molding compound if IC has no tab.
** MIL-STD-202G 210F

■ Electrical Specifications

Unless specified: T_J=25°C, V_{IN}=Higher V_{OUT}+1V, I_{OUT1}=I_{OUT2}=1mA, C_{IN}=C_{OUT}=1.0µF, V_{EN1}=V_{EN2}=V_{IN}
Typical values are at T_J=25°C

Parameter	Symbol	Test Condition		Min	Typ	Max	Units
IN							
Input Supply Voltage	V_{IN}			Note1		5.5	V
Quiescent Current	I_Q				70	160	µA
OUT1, OUT2							
Output Voltage	V_O	I_{OUT}=1mA		-1.5	V_{OUT}	1.5	%
		0mA<I_{OUT}<=150mA V_{OUT}+1V<V_{IN}<5.5V	T_J=-40°C to +125°C	-2		2	
Line Regulation	REG_{LINE}	V_{OUT}+1V<V_{IN}<5.5V, I_{OUT}=1mA	T_J=25°C	-0.2		0.2	%/V
			T_J=-40°C to +125°C	-0.25		0.25	
Load Regulation	REG_{LOAD}	1mA<I_{OUT}	T_J=-40°C to +125°C	-0.005	+0.0025	0.005	%/mA
Dropout Voltage	V_{DROP}	I_{OUT1}=I_{OUT2}=150mA (V_O=$V_{O(NOM)}$-2%), $V_{O(NOM)}$<2.5V	T_J=-40°C to +125°C			350	mV
		I_{OUT1}=I_{OUT2}=150mA (V_O=$V_{O(NOM)}$-2%), $V_{O(NOM)}$>=2.5V				300	mV
Current Limit	I_{LIM}			180		600	mA
Short Circuit Current	I_{SC}				200	350	
Ripple Rejection	PSRR	f=100Hz, C_{BYP}=10nF, I_{OUT}=1mA			55		dB
		f=1kHz, C_{BYP}=10nF, I_{OUT}=1mA			55		
		f=10kHz, C_{BYP}=10nF, I_{OUT}=1mA			48		
Output Voltage Noise	e_n	f=1kHz to 100kHz C_{BYP}=10nF, C_{OUT}=1µF			550		µVRMS
		f=1kHz to 100kHz C_{BYP}=10nF, C_{OUT}=1µF			5.5		µV/√Hz
EN1, EN2							
Enable Input Threshold	V_{EH}	V_{IN}=2.4V to 5.5V	T_J=-40°C to +125°C	2.4			V
	V_{EL}	V_{IN}=2.4V to 5.5V				0.4	V
EN Input Bias Current	I_{EL}	V_{IN}=5.0V	EN=0V	-1	0.5	1	µA
	I_{EH}		EN=5V				
Shutdown Current	I_{SHDN}	V_{IN}=5.0V, EN1=EN2=0V			0.3	1	
BYP							
Start-Up Rise Time		C_{BYP}=10nF			1.25		ms
Over Temperature Protection							
Over Temperature Shutdown	OTS				150		°C
Over Temperature Hysteresis	OTH				20		°C

Note1: $V_{IN(min)}$=Higher V_{OUT}+ $V_{Dropout}$

■ Detailed Description

The AME8750 is low-dropout, low quiescent-current linear regulatior designed primarily for battery-powered applications. These parts are available with preset output voltage ranging from 1.8V to 3.3V, and the parts can supply loads up 150mA.

Shutdown

AME8750A

The AME8750A has a single shutdown control input(EN). Drive EN low to shut down both outputs, reducing supply current to 0.3µA. Connect EN to a logic-high, or IN, for normal operation.

AME8750B

The AME8750B has independent shutdown control inputs (EN1 and EN2). Drive EN1 low to shutdown V_{OUT1}. Drive EN2 low to shut down V_{OUT2}. Drive both EN1 and EN2 low to shut down the entire chip, reducing supply current to 0.3mA. Connect both EN1 and EN2 to a logic-high, or IN, for normal operation.

Internal P-Channel Pass Transistor

The AME8750A/AME8750B feature two 1Ω P-Channel MOSFET pass transistors. A P-Channel MOSEFT provides several advantages over similar designs using PNP pass transistors, including longer battery life. It requires no base drive, which reduces quiescent current significantly. The AME8750A/AME8750B only consume 70µA of quiescent current whether in dropout, light-load, or heavy-load applications.

Current Limit

The AME8750A/8750B contain two independent current limiters, one for each regulator, which monitor and control the pass transistor's gate voltage, limiting the guaranteed maximum output current to 150mA minimum. The output can be shorted to ground for an indefinite time without damaging the part.

Thermal-Overload Protection

Thermal -overload protection limits toatl power dissipation in the AME8750A/AME8750B. When the junction trmperature exceeds T_J=150ºC, the themal sensor signals the shutdown logic, turning off the pass transistor and allowing the IC to cool.

■ Application Information

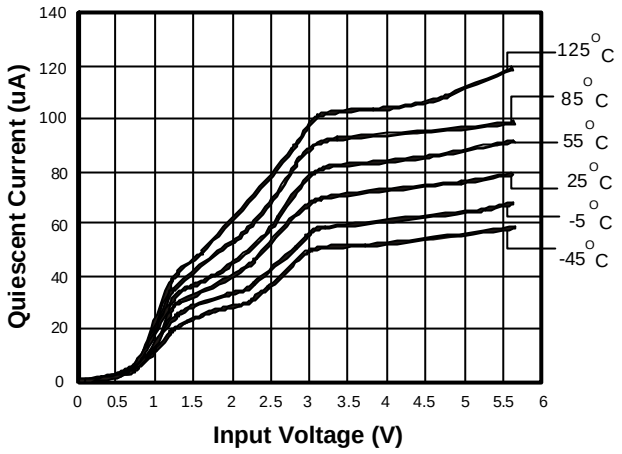
Capacitor Selection and Regulator Stability

Use a 1µF capacitor on the AME8750A/ AME8750B input and a 1µF capacitor on the outputs. Larger input capacitor values and lower ESRs provide better supplynoise rejection and line transient response.

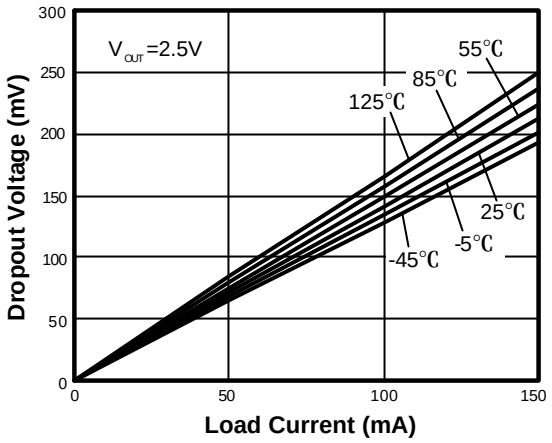
PSRR and Operation from Sources Other than Batteries

The AME8750A/AME8750B are designed to deliver low dopout voltages and low quiescent currents in batterypowered systems. Power-supply rejection is 54dB at low frequencies.
(See the PSRR vs. Frequency graph)

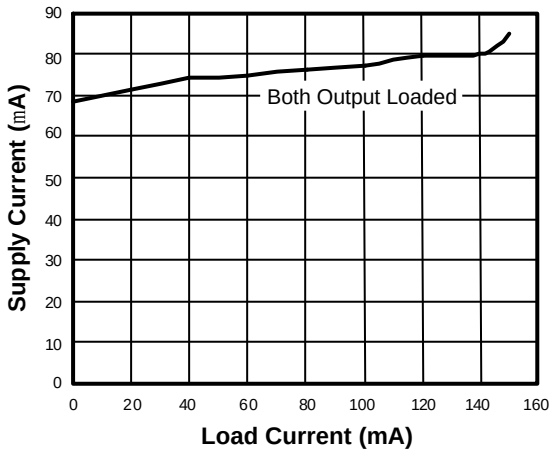
Quiescent Current vs Input Voltage



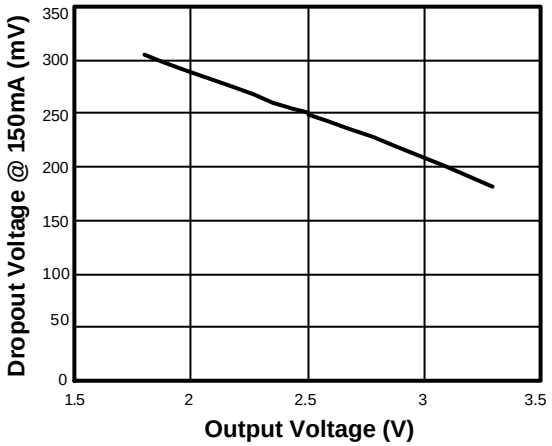
Dropout Voltage vs Load Current



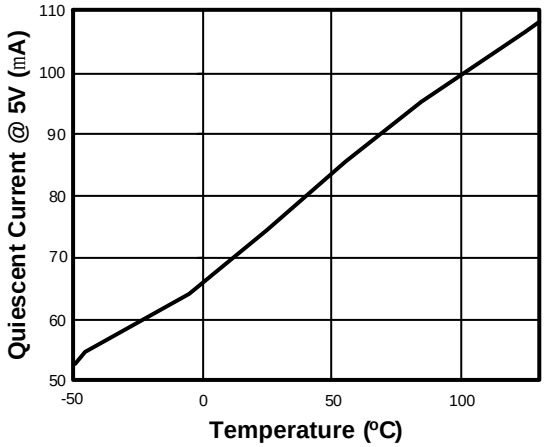
Supply Current vs. Load current



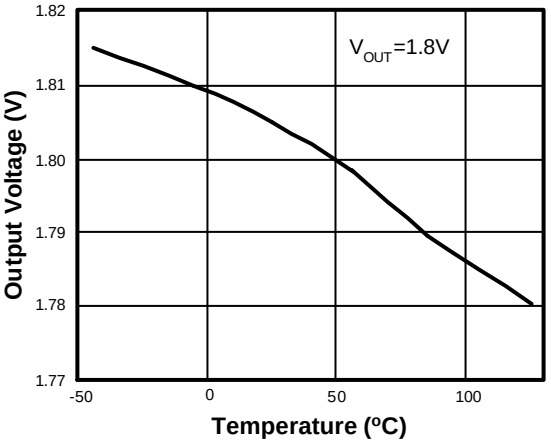
Dropout Voltage vs Output Voltage



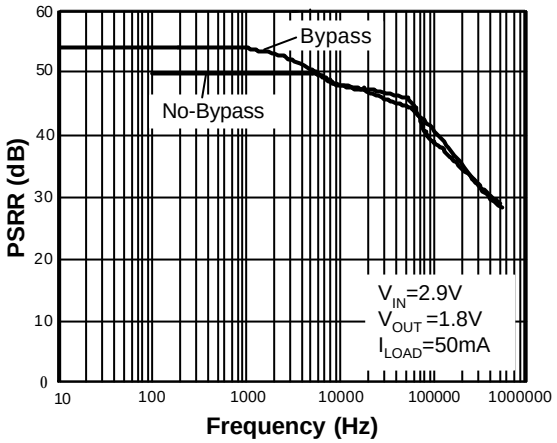
Quiescent Current vs Temperature



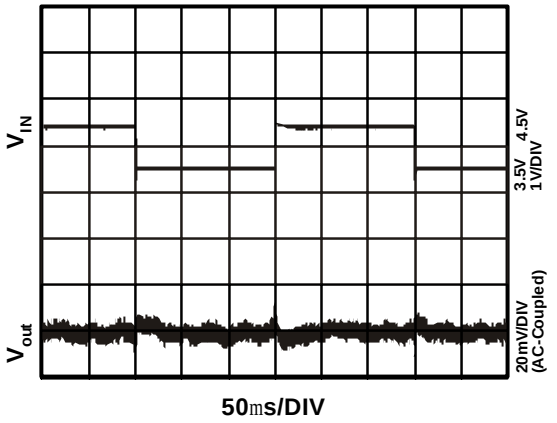
Output Voltage vs Temperature



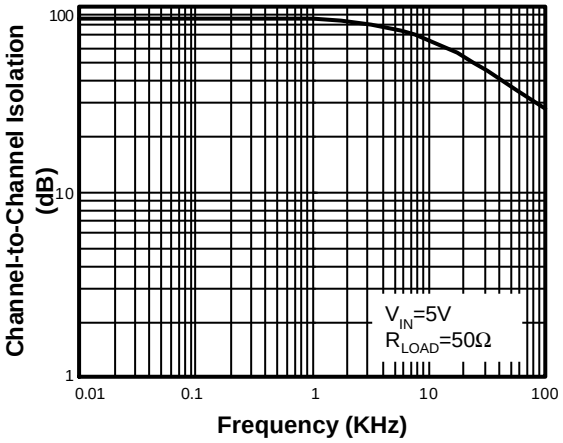
PSRR vs. Frequency



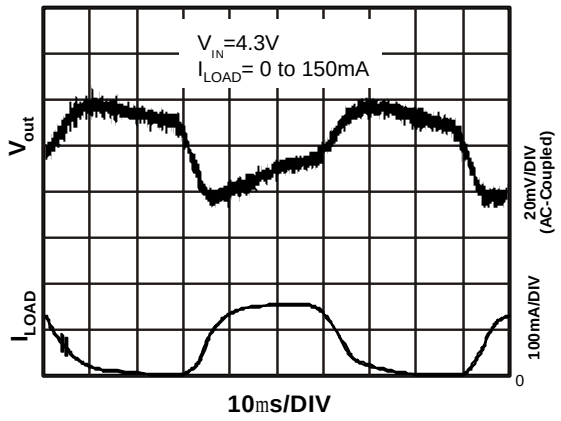
Line Transient



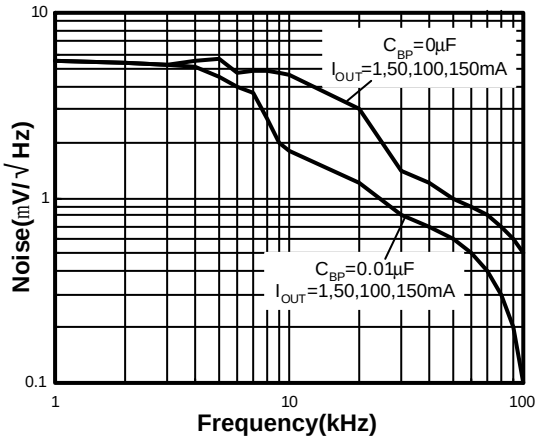
Channel-to-Channel Isolation vs Frequency



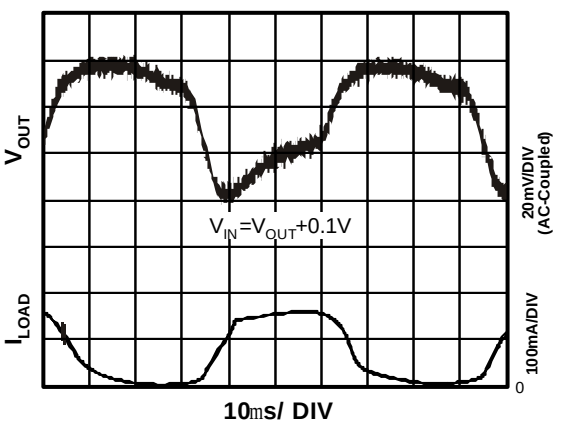
Load Transient



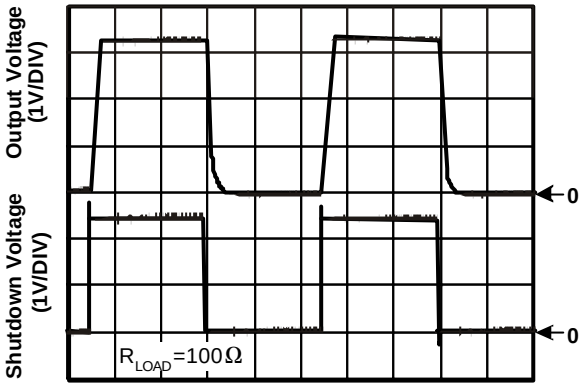
Output Noise Spectral Density



Load Transient Near Dropout



Shutdown Response

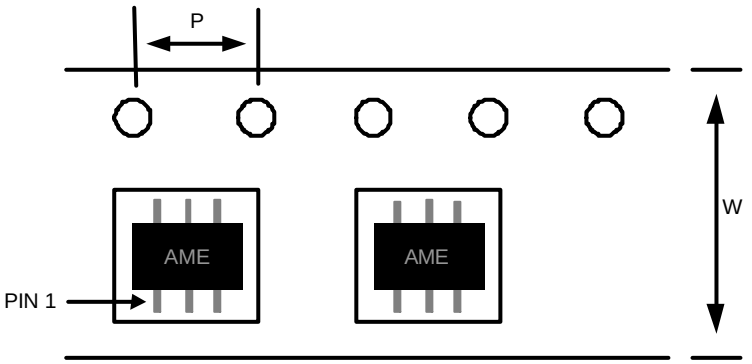


■ Date Code Rule

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

■ Tape & Reel Dimension

SOT-26

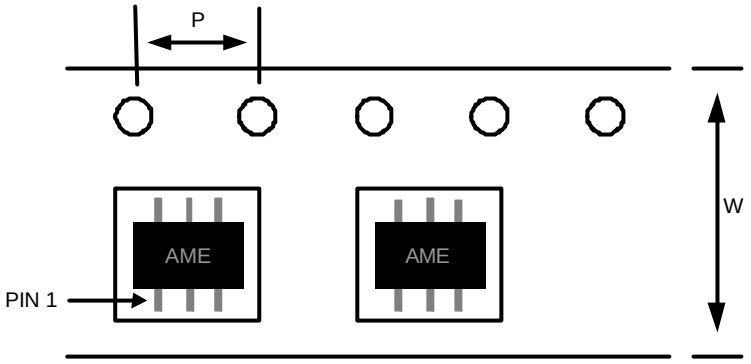


Carrier Tape, Number of Components Per Reel and Reel Size

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 & Reel Dimension

TSOT-26

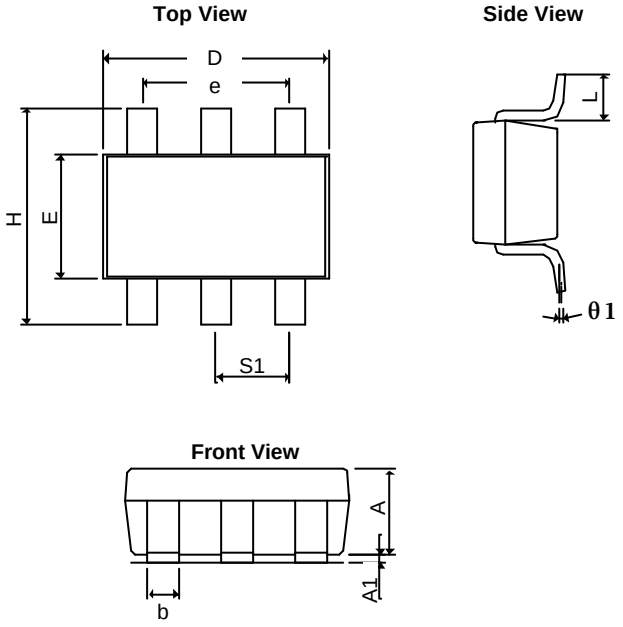


Carrier Tape, Number of Components Per Reel and Reel Size

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TSOT-26	8.0±0.1 mm	4.0±0.1 mm	3000pcs	180±1 mm

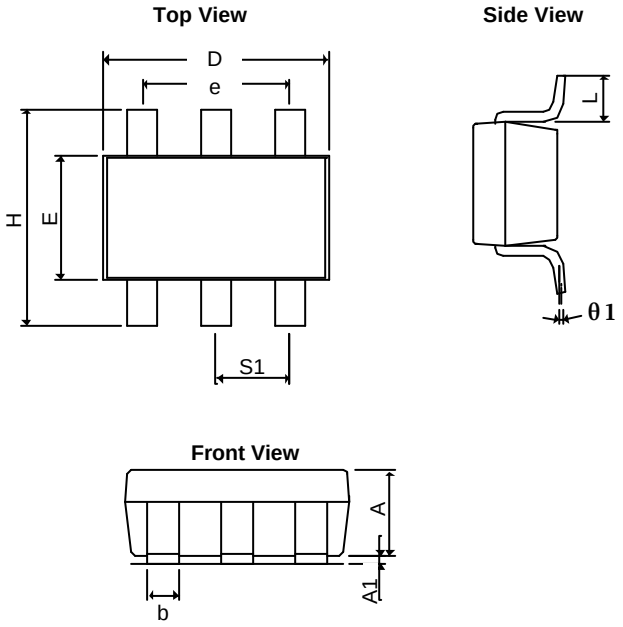
■ Package Dimension

SOT-26



SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.20REF		0.0472REF	
A_1	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		0.0748 BSC	
H	2.60	3.00	0.10236	0.11811
L	0.37REF		0.0146REF	
q1	0^o	10^o	0^o	10^o
S_1	0.95REF		0.0374REF	

TSOT-26



SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
$A+A_1$	0.90	1.25	0.0354	0.0492
b	0.30	0.50	0.0118	0.0197
c	0.09	0.25	0.0035	0.0098
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	2.40	3.00	0.09449	0.11811
L	0.35BSC		0.0138BSC	
q1	0^o	10^o	0^o	10^o
S_1	0.95BSC		0.0374BSC	



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