300mA Low Dropout Linear Regulator

FEATURES

- Low Dropout Voltage of 470mV at 300mA Output Current (3.0V Output Version).
- Guaranteed 300mA Output Current.
- Low Ground Current at 55μA.
- 2% Accuracy Output Voltage of 1.8V/ 2.0V /2.5V /2.7V/ 3.0V/ 3.3V/ 3.5V/ 3.7V/ 3.8V/ 5.0V/ 5.2V.
- Only needs 1μF Output Capacitor for Stability.
- Current and Thermal Limiting.

APPLICATIONS

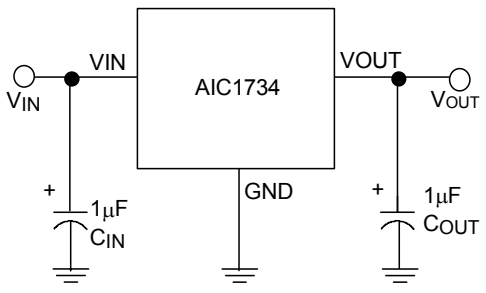
- CD-ROM Drivers.
- LAN Cards.
- Microprocessor.
- RAM Module.
- Wireless Communication Systems.
- Battery Powered Systems.

DESCRIPTION

The AIC1734 is a 3-pin low dropout linear regulator. The superior characteristics of the AIC1734 include zero base current loss, very low dropout voltage, and 2% accuracy output voltage. Typical ground current remains approximately 55μA, for loading ranging from zero to maximum. Dropout voltage at 300mA output current is exceptionally low. Built-in output current limiting and thermal limiting provide maximal protection to the AIC1734 against fault conditions.

The AIC1734 is available in popular SOT-23, SOT-89 and TO-92 packages.

TYPICAL APPLICATION CIRCUIT



Low Dropout Linear Regulator

■ ORDERING INFORMATION

AIC1734-XXXXX XX

- PACKING TYPE
  - TR: TAPE & REEL
  - BG: BAG
- PACKAGE TYPE
  - U: SOT-23
  - XA: SOT-89
  - XT: SOT-89
  - ZT: TO-92
  - ZL: TO-92
- C: Commercial
  P: Lead Free Commercial
- OUTPUT VOLTAGE
  - 18: 1.8V
  - 20: 2.0V
  - 25: 2.5V
  - 27: 2.7V
  - 30: 3.0V
  - 33: 3.3V
  - 35: 3.5V
  - 37: 3.7V
  - 38: 3.8V
  - 50: 5.0V
  - 52: 5.2V

Example: AIC1734-18CXATR

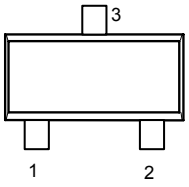
→ 1.8V Version, in SOT-89 Package & Tape & Reel Packing Type

AIC1734-18PXATR

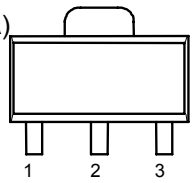
→ 1.8V Version, in SOT-89 Lead Free Package & Tape & Reel Packing Type

PIN CONFIGURATION

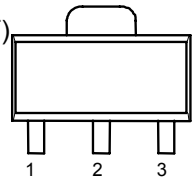
SOT-23 (CU & PU)
TOP VIEW
1: GND
2: VOUT
3: VIN



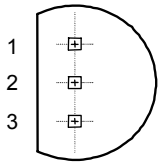
SOT-89 (CXA & PXA)
TOP VIEW
1: GND
2. VIN
3. VOUT



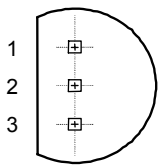
SOT-89 (CXT & PXT)
TOP VIEW
1: VOUT
2. GND
3. VIN



TO-92 (CZT & PZT)
TOP VIEW
1: GND
2. VIN
3. VOUT



TO-92 (CZL & PZL)
TOP VIEW
1: VIN
2. GND
3. VOUT



- **SOT-23 MARKING**

Part No.	CU	PU	Part No.	CU	PU
AIC1734-18XU	CD18	CD18P	AIC1734-35XU	CD35	CD35P
AIC1734-20XU	CD20	CD20P	AIC1734-37XU	CD37	CD37P
AIC1734-25XU	CD25	CD25P	AIC1734-38XU	CD38	CD38P
AIC1734-27XU	CD27	CD27P	AIC1734-50XU	CD50	CD50P
AIC1734-30XU	CD30	CD30P	AIC1734-52XU	CD52	CD52P
AIC1734-33XU	CD33	CD33P			

- **SOT-89 MARKING**

Part No.	CXA	PXA	Part No.	CXT	PXT
AIC1734-18XXA	CA18	CA18P	AIC1734-18XXT	CB18	CB18P
AIC1734-20XXA	CA20	CA20P	AIC1734-20XXT	CB20	CB20P
AIC1734-25XXA	CA25	CA25P	AIC1734-25XXT	CB25	CB25P
AIC1734-27XXA	CA27	CA27P	AIC1734-27XXT	CB27	CB27P
AIC1734-30XXA	CA30	CA30P	AIC1734-30XXT	CB30	CB30P
AIC1734-33XXA	CA33	CA33P	AIC1734-33XXT	CB33	CB33P
AIC1734-35XXA	CA35	CA35P	AIC1734-35XXT	CB35	CB35P
AIC1734-37XXA	CA37	CA37P	AIC1734-37XXT	CB37	CB37P
AIC1734-38XXA	CA38	CA38P	AIC1734-38XXT	CB38	CB38P
AIC1734-50XXA	CA50	CA50P	AIC1734-50XXT	CB50	CB50P
AIC1734-52XXA	CA52	CA52P	AIC1734-52XXT	CB52	CB52P

■ ABSOLUTE MAXIMUM RATINGS

Input Supply Voltage ..... -0.3 ~12V

Operating Temperature Range ..... -40°C~ 85°C

Storage Temperature Range ..... -65°C~150°C

Maximum Junction Temperature ..... 125°C

Lead Temperature (Soldering) 10 sec. ..... 260°C

Thermal Resistance Junction to Ambient (Assume no Ambient Airflow, no Heatsink)

SOT-89 Package ..... 160°C/W

TO-92 Package ..... 150°C/W

SOT-23 Package ..... 180°C/W

Absolute Maximum Ratings are those values beyond which the life of a device may be impaired.

■ TEST CIRCUIT

Refer to the TYPICAL APPLICATION CIRCUIT

ELECTRICAL CHARACTERISTICS (T_A=25°C, C_{IN}=1μF, C_{OUT}=1μF, unless otherwise specified.)

PARAMETER	TEST CONDITIONS		MIN.	TYP.	MAX.	UNIT
Output Voltage	No Load					V
	AIC1734-52	V_{IN}=5.5~12V	5.100	5.200	5.300	
	AIC1734-50	V_{IN}=5.5~12V	4.900	5.000	5.100	
	AIC1734-38	V_{IN}=4.1~12V	3.725	3.800	3.875	
	AIC1734-37	V_{IN}=4.0~12V	3.625	3.700	3.775	
	AIC1734-35	V_{IN}=4.0~12V	3.430	3.500	3.570	
	AIC1734-33	V_{IN}=4.0~12V	3.235	3.300	3.365	
	AIC1734-30	V_{IN}=4.0~12V	2.940	3.000	3.060	
	AIC1734-27	V_{IN}=4.0~12V	2.646	2.700	2.754	
	AIC1734-25	V_{IN}=4.0~12V	2.450	2.500	2.550	
	AIC1734-20	V_{IN}=4.0~12V	1.960	2.000	2.040	
	AIC1734-18	V_{IN}=4.0~12V	1.764	1.800	1.836	
Output Voltage Temperature Coefficiency	(Note 1)			50		PPM/°C
Line Regulation	I_L=1mA,					mV
	1.4V≤V_{OUT}≤3.2V	V_{IN}=4V~12V		3	10	
	3.3V≤V_{OUT}≤5.2V	V_{IN}=5.5V~12V		3	10	
Load Regulation (Note 2)	I_L=0.1~300mA					mV
	1.4V≤V_{OUT}≤3.9V	V_{IN}=5V		7	20	
	4.0V≤V_{OUT}≤5.2V	V_{IN}=7V		15	40	
Current Limit (Note 3)	V_{IN}=7V, V_{OUT}=0V		300			mA
Dropout Voltage (Note 4)	I_L=300mA	4.0V≤V_{OUT}≤5.2V		400		mV
		3.0V≤V_{OUT}≤3.9V		470		
		2.5V≤V_{OUT}≤2.9V		570		
		2.0V≤V_{OUT}≤2.4V		800		
		1.4V≤V_{OUT}≤1.9V		1260		
Ground Current	I_O=0.1mA~I_{MAX}					μA
	1.4V≤V_{OUT}≤3.9V	V_{IN}=5~12V		55	80	
	4.0V≤V_{OUT}≤5.2V	V_{IN}=7~12V		55	80	

Note 1: Guaranteed by design.
Note 2: Regulation is measured at constant junction temperature, using pulse testing with a low ON time.
Note 3: Current limit is measured by pulsing a short time.
Note 4: Dropout voltage is defined as the input to output differential at which the output voltage drops 100mV.
Note5: Specifications are guaranteed by Statistical Quality Controls (SQC), with no production test proved, when operating temperature ranges from -40°C to 85°C.

TYPICAL PERFORMANCE CHARACTERISTICS

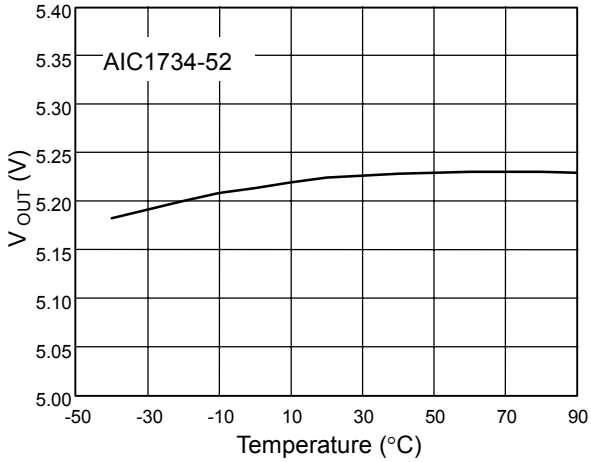


Fig. 1 V_{OUT} vs. Temperature

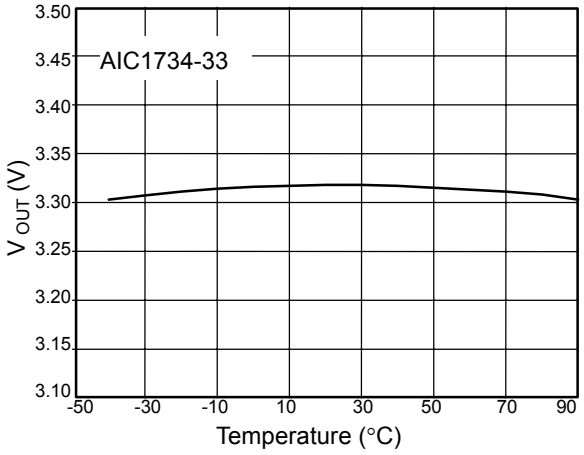


Fig. 2 V_{OUT} vs. Temperature

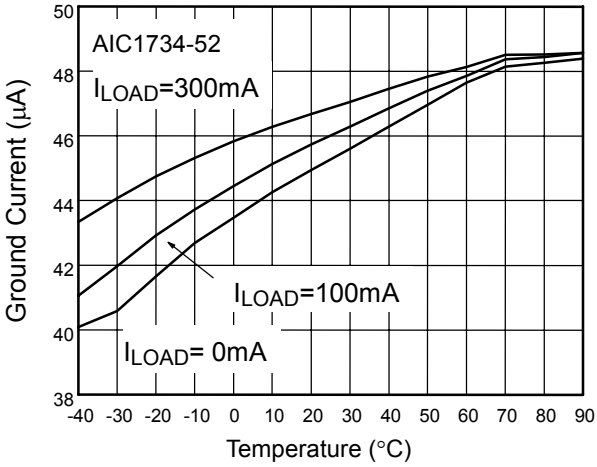


Fig. 3 Ground Current vs. Temperature

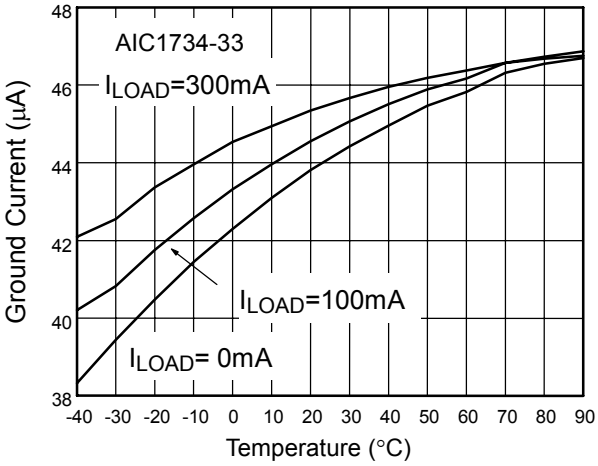


Fig. 4 Ground Current vs. Temperature

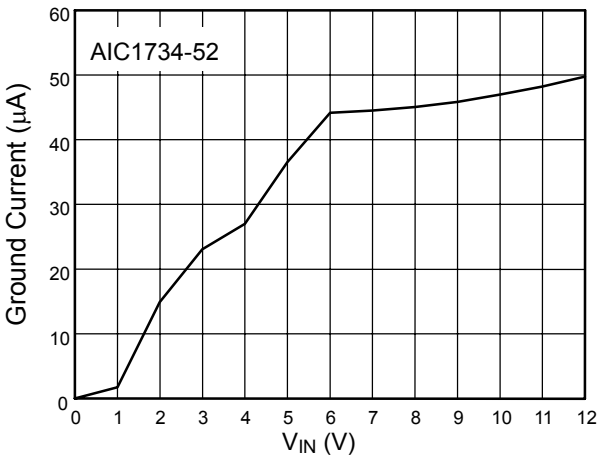


Fig. 5 Ground Current vs. V_{IN}

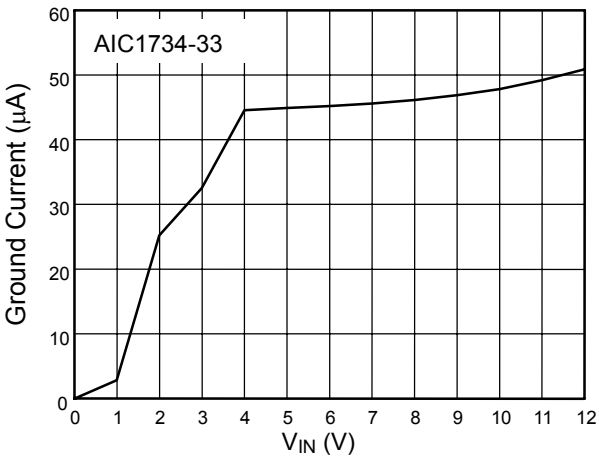


Fig. 6 Ground Current vs. V_{IN}

TYPICAL PERFORMANCE CHARACTERISTIC (Continued)

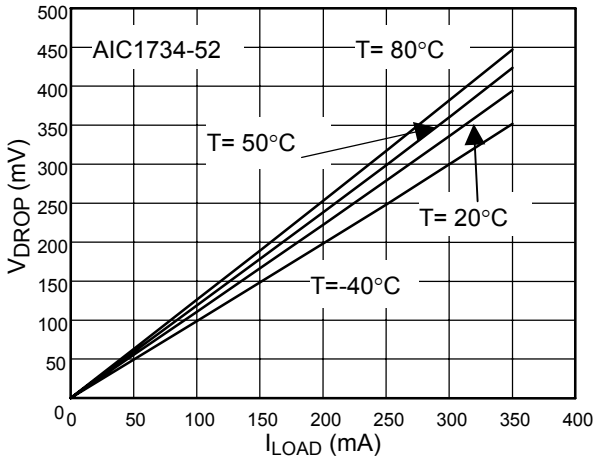


Fig. 7 V_{DROP} vs. I_{LOAD}

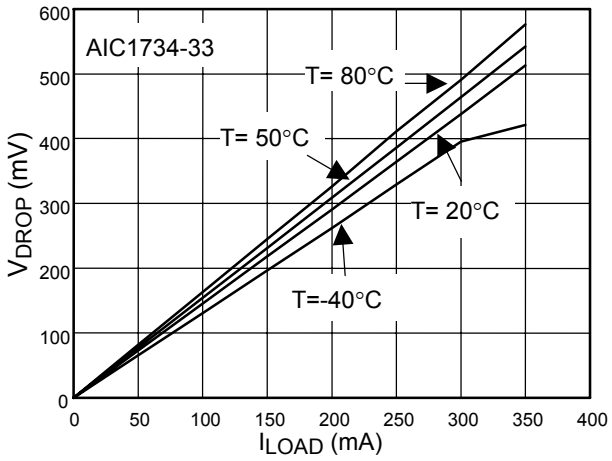


Fig. 8 V_{DROP} vs. I_{LOAD}

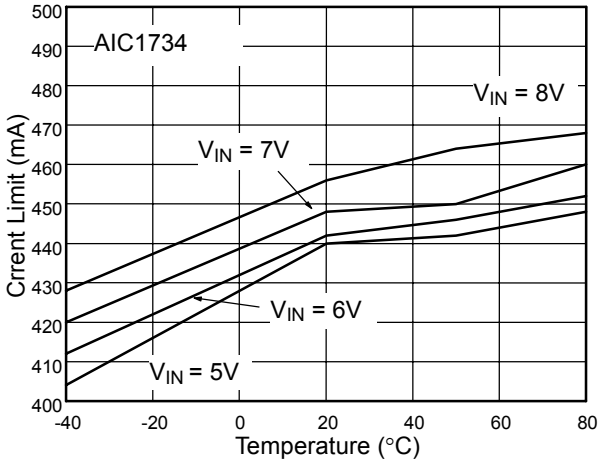
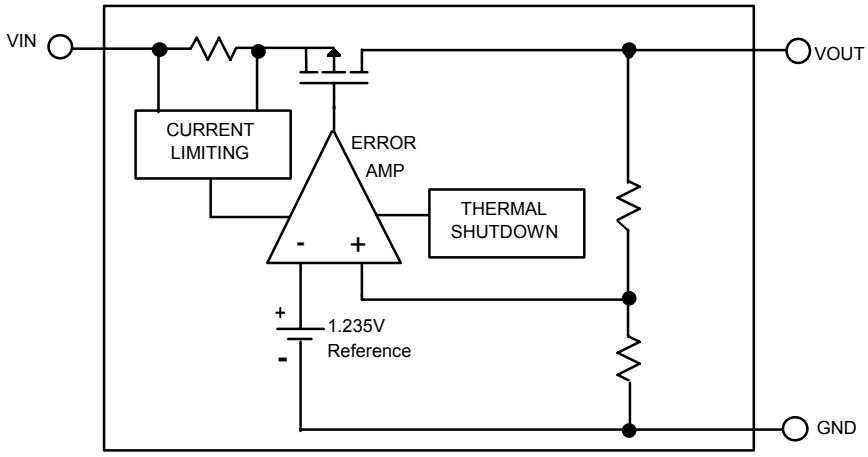


Fig. 9 Current Limit vs. Temperature

BLOCK DIAGRAM



PIN DESCRIPTIONS

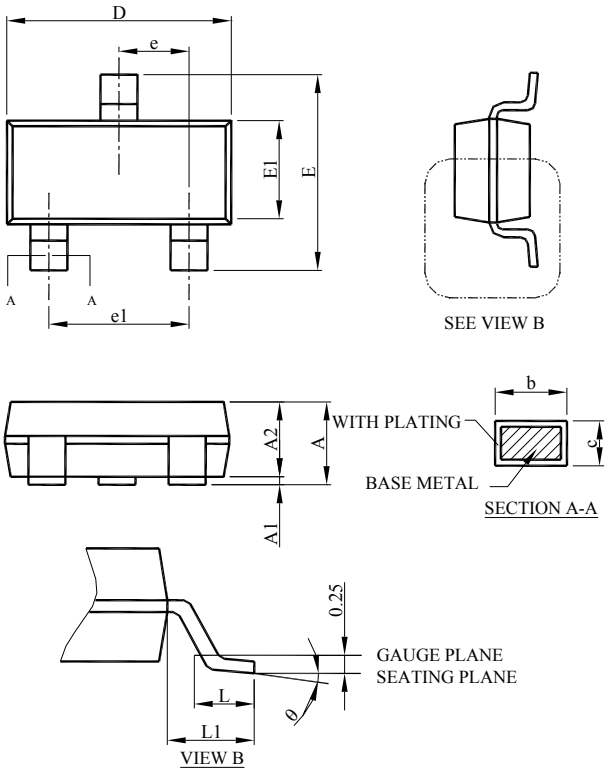
VOUT PIN - Output pin.

GND PIN - Power GND.

VIN PIN - Power Supply Input.

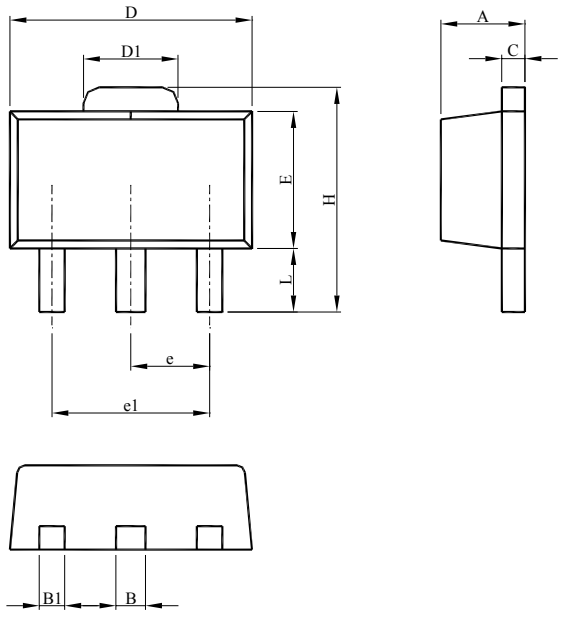
PHYSICAL DIMENSIONS (unit: mm)

- **SOT-23**



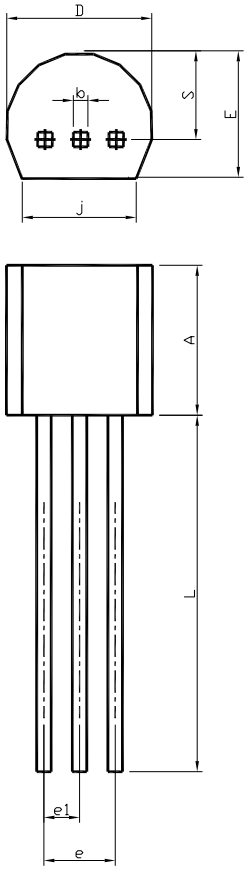
SYMBOL	SOT-23	
	MILLIMETERS	
	MIN.	MAX.
A	0.95	1.45
A1	0.05	0.15
A2	0.90	1.30
b	0.30	0.50
c	0.08	0.22
D	2.80	3.00
E	2.60	3.00
E1	1.50	1.70
e	0.95 BSC	
e1	1.90 BSC	
L	0.30	0.60
L1	0.60 REF	
θ	0°	8°

- **SOT-89**



SYMBOL	SOT-89	
	MILLIMETERS	
	MIN.	MAX.
A	1.40	1.60
B	0.44	0.56
B1	0.36	0.48
C	0.35	0.44
D	4.40	4.60
D1	1.50	1.83
E	2.29	2.60
e	1.50 BSC	
e1	3.00 BSC	
H	3.94	4.25
L	0.89	1.20

- **TO-92**



SYMBOL	TO-92	
	MILLIMETERS	
	MIN.	MAX.
A	4.32	5.33
b	0.36	0.47
D	4.45	5.20
E	3.18	4.19
e	2.42	2.66
e1	1.15	1.39
j	3.43	
L	12.70	
S	2.03	2.66

Note:

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