300mA Low Dropout Linear Regulator

FEATURES

- Low Dropout Voltage of 130mV at 100mA Output Current (5.2V Output Version).
- Guaranteed 300mA Output Current.
- Low Ground Current at 55μA.
- Input Voltage Range up to 12V.
- Internal 1.3Ω P-MOSFET Draws no Base Current.
- 2% Accuracy Output Voltage of 3.3V/ 3.4V/ 3.5V/ 3.6V/ 3.7V/ 3.8V/ 5.0V/ 5.2V.
- Current Limiting and Thermal Protection.

APPLICATIONS

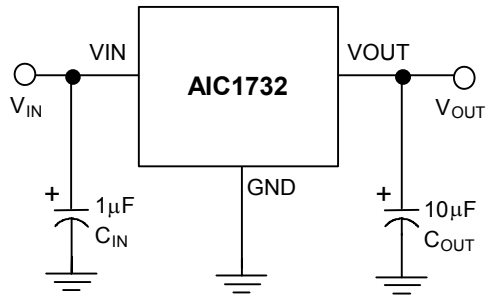
- CD-ROM Drivers.
- LAN Cards.
- Microprocessor.
- Wireless Communication Systems.
- Battery Powered Systems.

DESCRIPTION

The AIC1732 is a 3-pin low dropout linear regulator. The superior characteristics of the AIC1732 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 turns substantially low when output current is 100mA Built-in output current limiting and thermal limiting provide maximal protection to the AIC1732 against fault conditions.

The AIC1737 is available in popular 3-pin SOT-89 package.

TYPICAL APPLICATION CIRCUIT



Low Dropout Linear Regulator

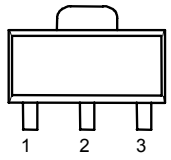
■ ORDERING INFORMATION

AIC1732-XXXXXX

- PACKING TYPE
  - TB: TUBE
  - TR: TAPING & REEL
- PACKAGING TYPE
  - X: SOT-89
- C: Commercial
  - P: Lead Free Commercial
- OUTPUT VOLTAGE
  - 33: 3.3V
  - 34: 3.4V
  - 35: 3.5V
  - 36: 3.6V
  - 37: 3.7V
  - 38: 3.8V
  - 50: 5.0V
  - 52: 5.2V

PIN CONFIGURATION

FRONT VIEW



Example: AIC1732-33CXTR

→ 3.3V version in SOT-89 Package & Taping & Reel Packing Type

AIC1732-33PXTR

→ 3.3V version in SOT-89 Lead Free Package & Taping & Reel Packing Type

- **SOT-89 MARKING**

Part No.	CX	PX
AIC1732-33	AR33	AR33P
AIC1732-34	AR34	AR34P
AIC1732-35	AR35	AR35P
AIC1732-36	AR36	AR36P
AIC1732-37	AR37	AR37P
AIC1732-38	AR38	AR38P
AIC1732-50	AR50	AR50P
AIC1732-52	AR52	AR52P

ABSOLUTE MAXIMUM RATINGS

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

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

Maximum Junction Temperature ..... 125°C

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

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

Power Dissipation SOT-89 Package ..... -0.5W

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

TEST CIRCUIT

Refer to TYPICAL APPLICATION CIRCUIT.

ELECTRICAL CHARACTERISTICS (T_A=25°C, C_{IN}=1μF, C_{OUT}=10μF, unless otherwise specified.)

PARAMETER	TEST CONDITIONS		MIN.	TYP.	MAX.	UNIT
Output Voltage	No Load					
	AIC1732-52	V_{IN}=5.5~12V	5.100	5.2	5.300	V
	AIC1732-50	V_{IN}=5.5~12V	4.900	5.0	5.100	
	AIC1732-38	V_{IN}=4.1~12V	3.725	3.8	3.875	
	AIC1732-37	V_{IN}=4.0~12V	3.625	3.7	3.775	
	AIC1732-35	V_{IN}=4.0~12V	3.430	3.5	3.570	
	AIC1732-33	V_{IN}=3.6~12V	3.235	3.3	3.365	
Output Voltage Temperature Coefficiency	(Note 1)			50	150	PPM/°C
Line Regulation	I_L=1mA					
	AIC1732-52	V_{IN}=5.5~12V		5	15	mV
	AIC1732-50	V_{IN}=5.5~12V		5	15	
	AIC1732-38	V_{IN}=4.1~12V		5	15	
	AIC1732-37	V_{IN}=4.0~12V		5	15	
	AIC1732-35	V_{IN}=4.0~12V		5	15	
	AIC1732-33	V_{IN}=3.6~12V		5	15	

ELECTRICAL CHARACTERISTICS (Continued)

PARAMETER	TEST CONDITIONS		MIN.	TYP.	MAX.	UNIT
Load Regulation	AIC1732-52	V_{IN}=7V, I_L=0.1~300mA		15	40	mV
(Note 2)	AIC1732-50	V_{IN}=7V, I_L=0.1~300mA		15	40	
	AIC1732-38	V_{IN}=5V, I_L=0.1~300mA		15	40	
	AIC1732-37	V_{IN}=5V, I_L=0.1~300mA		15	40	
	AIC1732-35	V_{IN}=5V, I_L=0.1~300mA		15	40	
	AIC1732-33	V_{IN}=5V, I_L=0.1~300mA		15	40	
Current Limit	AIC1732-52	V_{IN}=7V, V_{OUT}=0V	300	440		mA
(Note 3)	AIC1732-50	V_{IN}=7V, V_{OUT}=0V	300	440		
	AIC1732-38	V_{IN}=7V, V_{OUT}=0V	300	440		
	AIC1732-37	V_{IN}=5V, V_{OUT}=0V	300	440		
	AIC1732-35	V_{IN}=5V, V_{OUT}=0V	300	440		
	AIC1732-33	V_{IN}=5V, V_{OUT}=0V	300	440		
Dropout Voltage	AIC1732-52	I_L=300mA		400	500	mV
(Note 4)	AIC1732-50	I_L=300mA		400	500	
	AIC1732-38	I_L=300mA		540	640	
	AIC1732-37	I_L=300mA		540	640	
	AIC1732-35	I_L=300mA		540	640	
	AIC1732-33	I_L=300mA		540	640	
Ground Current	I_O=0.1mA~I_{MAX}					
	AIC1732-52	V_{IN}=5.5~12V		55	80	μA
	AIC1732-50	V_{IN}=5.5~12V		55	80	
	AIC1732-38	V_{IN}=4~12V		55	80	
	AIC1732-37	V_{IN}=4~12V		55	80	
	AIC1732-35	V_{IN}=4~12V		55	80	
	AIC1732-33	V_{IN}=4~12V		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 below the value measured with a 1V differential.
Note5: Specifications over -40°C to 85°C operating temperature range are guaranteed by design with Statistical Quality Controls (SQC), not production test.

TYPICAL PERFORMANCE CHARACTERISTICS

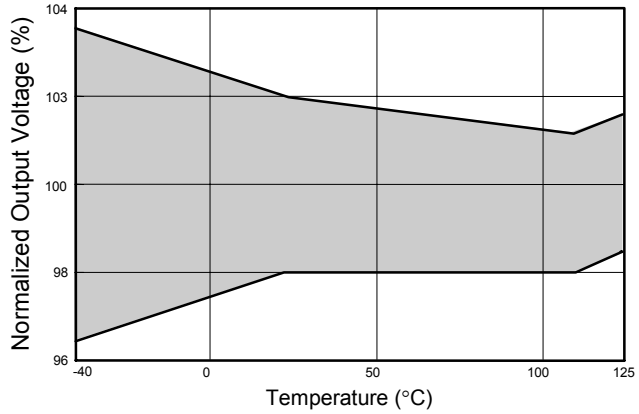


Fig. 1 Output Voltage vs. Temperature

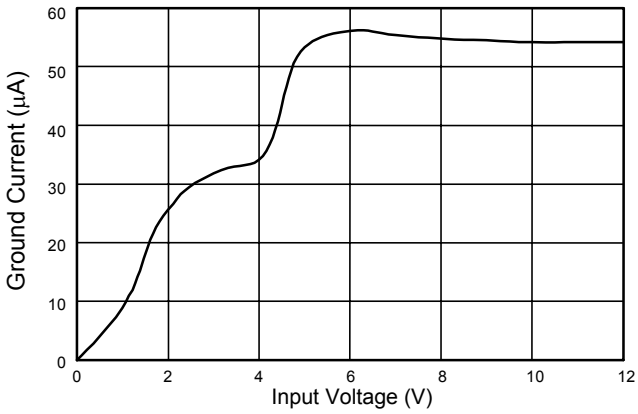


Fig. 2 Ground Current vs. Input Voltage

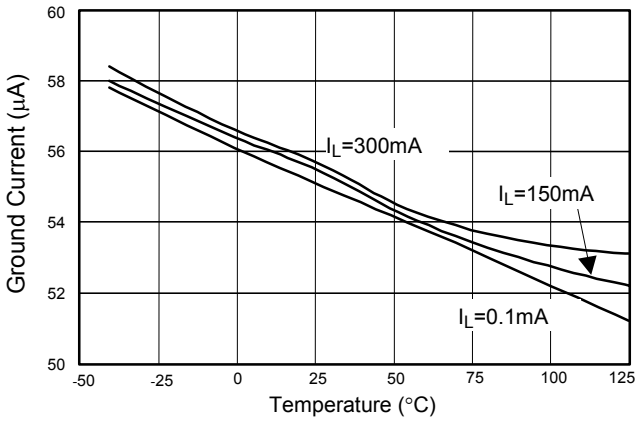


Fig. 3 Ground Current vs. Temperature

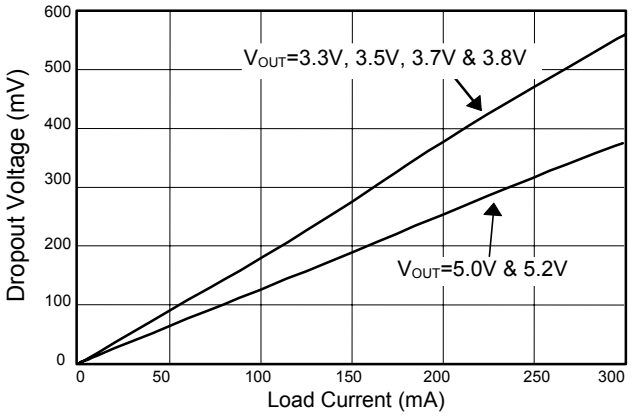


Fig. 4 Dropout Voltage vs. Load Current

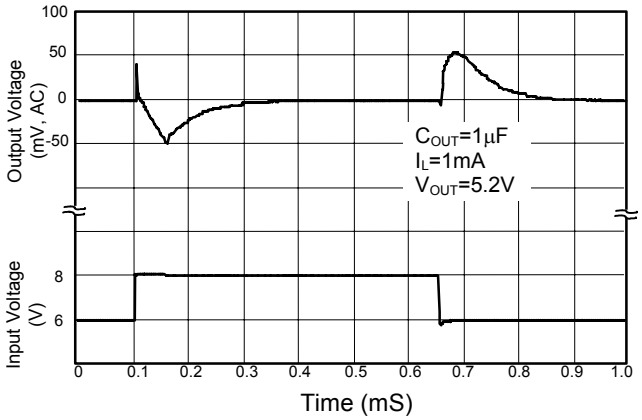


Fig. 5 Line Transient Response

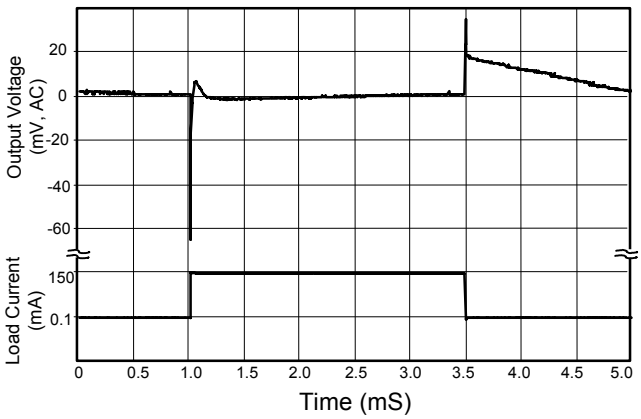


Fig. 6 Load transient Response

TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

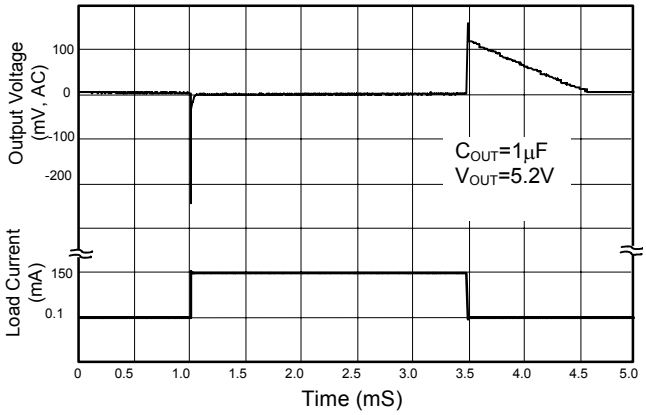


Fig. 7 Load Transient Response

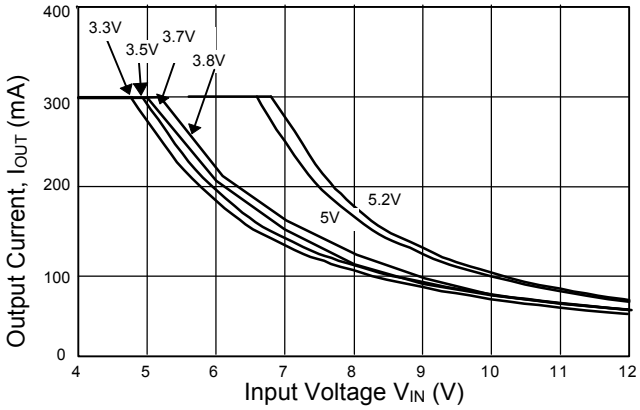
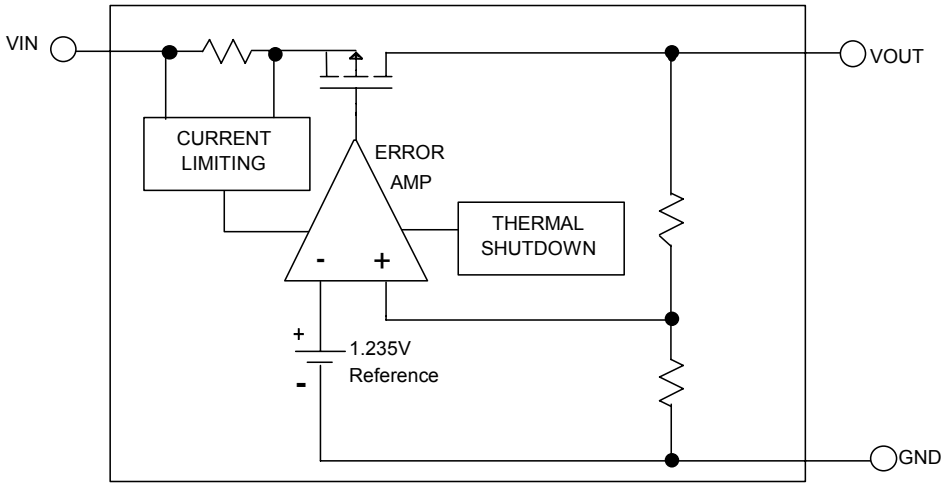


Fig. 8 Recommended Max. Output Current v.s. Input Voltage

BLOCK DIAGRAM



PIN DESCRIPTIONS

VOUT PIN - Output pin.

GND PIN - Power GND.

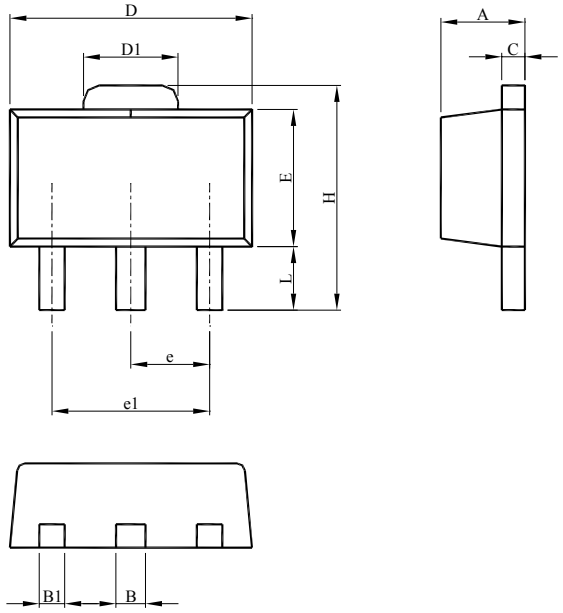
VIN PIN - Power Supply Input.

APPLICATION INFORMATION

A 10μF (or greater) capacitor is required between the AIC1732 output and ground for stability. Without this capacitor the part will oscillate. Even though most types of capacitor may work, the equivalent series resistance (ESR) should be held to 5Ω or less if Aluminum electrolytic type is used. Many Aluminum electrolytics have electrolytes that freeze at about -30°C, so solid tantalums are recommended for operation below -25°C. The value of this capacitor may be increased without limit.

PHYSICAL DIMENSIONS (Unit: mm)

- **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

Note:

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