300mA Low Dropout Linear Regulator

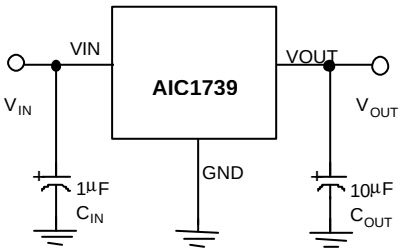
FEATURES

- Low Dropout Voltage of 180mV at 100mA Output Current (3.0V Output Version).
- Guaranteed 300mA Output Current.
- Internal 1.3Ω P-MOSFET Draws no Base Current.
- Low Ground Current at 55μA.
- 2% Accuracy Output Voltage of 1.8V/ 2.0V/ 2.5V/ 2.7V/ 3.0V.
- Input Voltage Range up to 12V.
- Needs only 1μF for Stability.
- Current and Thermal Limiting.

APPLICATIONS

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

TYPICAL APPLICATION CIRCUIT



Low Dropout Linear Regulator

DESCRIPTION

The AIC1739 is a 3-pin low dropout linear regulator. The superior characteristics of the AIC1739 include zero base current loss, very low dropout voltage, and 2% accuracy output voltage. Typical ground current remains approximately 55μA, from no load to maximum loading conditions. Dropout voltage is exceptionally low. Output current limiting and thermal limiting are built in to provide maximal protection to the AIC1739 against fault conditions.

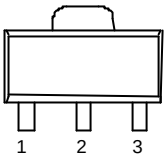
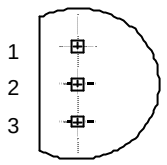
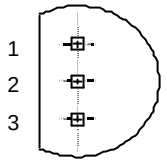
The AIC1739 comes in the popular 3-pin SOT-89 and TO-92 packages.

ORDERING INFORMATION

AIC1739-XCX

PACKAGING TYPE
X: SOT89
ZT: TO92
ZL: TO92

OUTPUT VOLTAGE
18: 1.8V
20: 2.0V
25: 2.5V
27: 2.7V
30: 3.0V

ORDER NUMBER	PIN CONFIGURATION
AIC1739-18CX AIC1739-20CX AIC1739-25CX AIC1739-27CX AIC1739-30CX (SOT-89)	FRONT VIEW 1: VOUT 2: GND 3: VIN 
AIC1739-18CZT AIC1739-20CZT AIC1739-25CZT AIC1739-27CZT AIC1739-30CZT (TO-92)	TOP VIEW 1: GND 2: VIN 3: VOUT 
AIC1739-18CZL AIC1739-20CZL AIC1739-25CZL AIC1739-27CZL AIC1739-30CZL (TO-92 L TYPE)	TOP VIEW 1: VIN 2: GND 3: VOUT 

ABSOLUTE MAXIMUM RATINGS

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

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

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

Power Dissipation SOT-89 Package 0.5W

TO-92 Package 0.5W

TEST CIRCUIT

Refer to the TYPICAL APPLICATION CIRCUIT

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

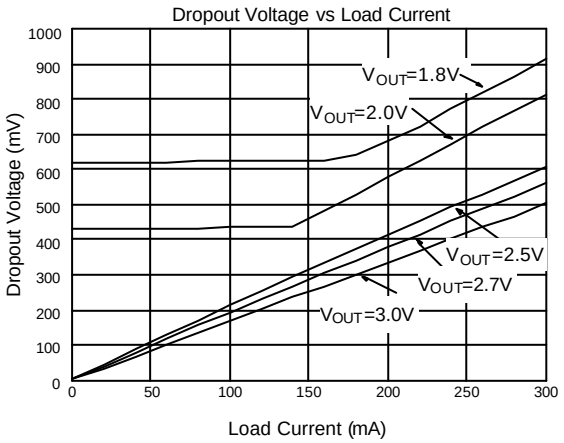
PARAMETER	TEST CONDITIONS		MIN.	TYP.	MAX.	UNIT
Output Voltage	No Load					
	AIC1739-30	V_{IN}=4.0~12V	2.940	3.000	3.060	V
	AIC1739-27	V_{IN}=4.0~12V	2.646	2.700	2.754	
	AIC1739-25	V_{IN}=4.0~12V	2.550	2.500	2.550	
	AIC1739-20	V_{IN}=4.0~12V	1.960	2.000	2.040	
	AIC1739-18	V_{IN}=4.0~12V	1.764	1.800	1.836	
Output Voltage Temperature Coefficiency	(Note 1)			50	150	PPM/°C

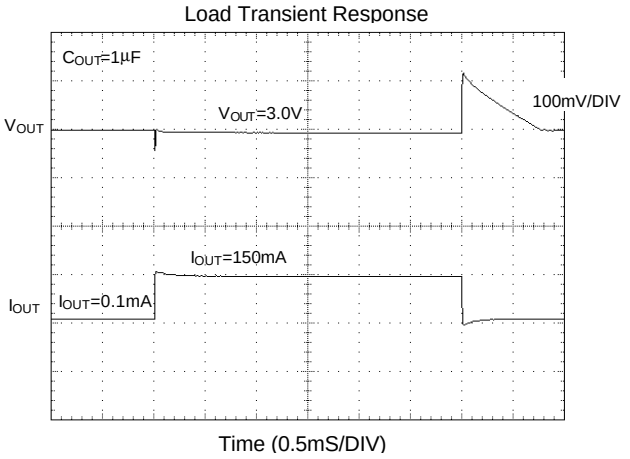
ELECTRICAL CHARACTERISTICS (Continued)

PARAMETER	TEST CONDITIONS		MIN.	TYP.	MAX.	UNIT
Line Regulation	I_L=1mA	V_{IN}=4.0~12V		3	10	mV
Load Regulation (Note 2)		V_{IN}=5V, I_L=0.1~300mA		7	25	mV
Current Limit (Note 3)		V_{IN}=5V, V_{OUT}=0V	320	440		mA
Dropout Voltage (Note 4)	AIC1739s	I_L=0.1mA		0.2	10	mV
	AIC1739-30	I_L=300mA		540	640	
	AIC1739-27	I_L=300mA		570	670	
	AIC1739-25	I_L=300mA		610	710	
	AIC1739-20	I_L=300mA		820	970	
	AIC1739-18	I_L=300mA		920	1070	
Ground Current	I_O=0.1mA~I_{MAX}	V_{IN}=4~12V		55	80	µA

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.

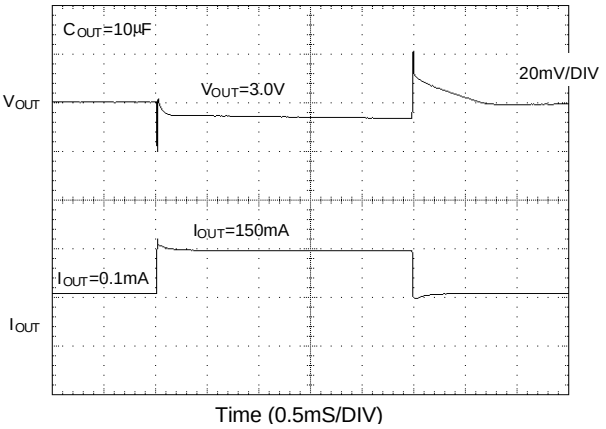
TYPICAL PERFORMANCE CHARACTERISTICS



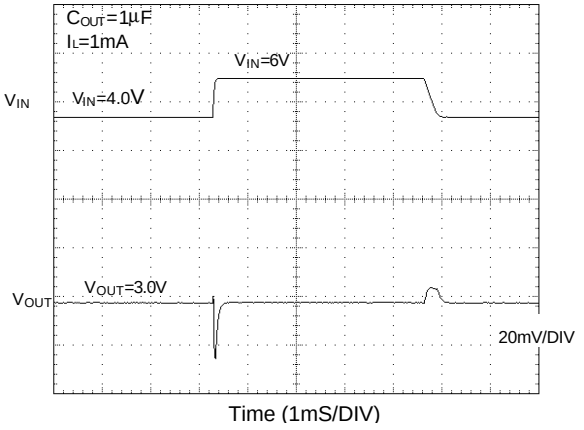


TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

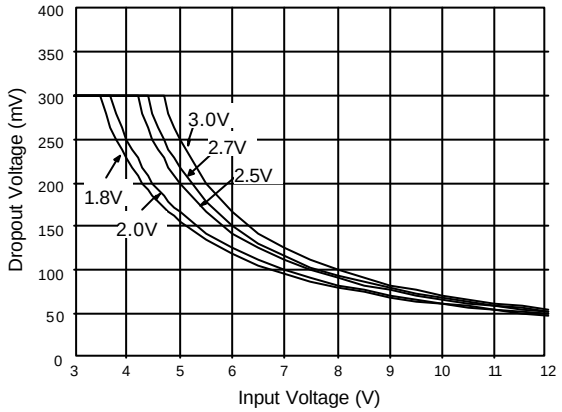
Load Transient Response



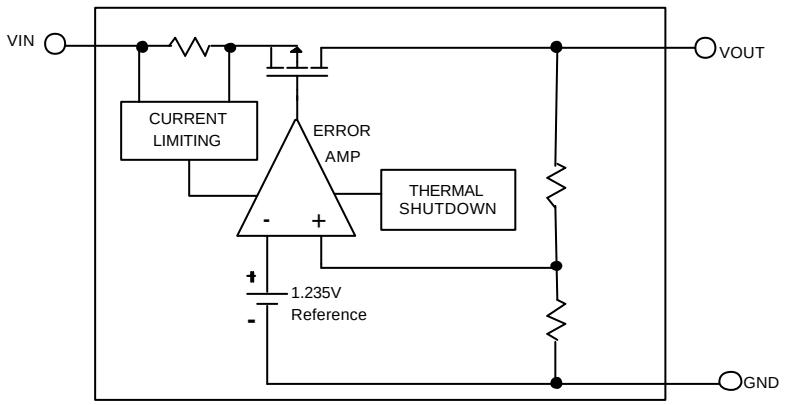
Line Transient Response



Recommended max. Output Current vs. Input voltage



BLOCK DIAGRAM



PIN DESCRIPTION

VOUT PIN - Output pin.
GND PIN - Power GND.
VIN PIN - Power Supply Input.

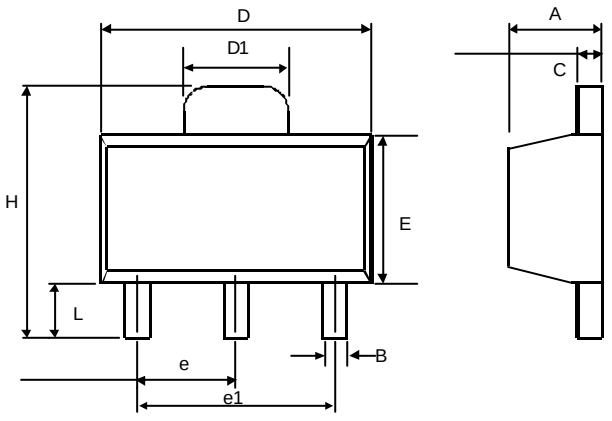
APPLICATION INFORMATIONS

A 1μF (or greater) capacitor is required between the AIC1739 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.

A 0.1μF capacitor (or greater) should be placed from the AIC1739 input to ground if the lead inductance between the input and power source exceeds 500nH (approximately 10 inches of trace).

PHYSICAL DIMENSIONS

- **SOT-89 (unit: mm)**

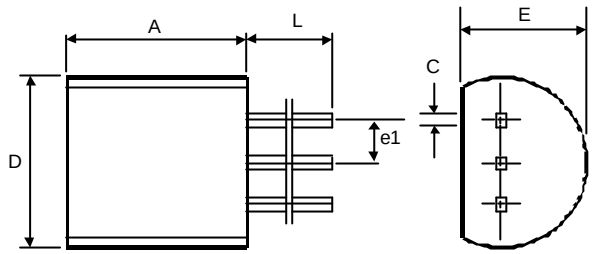


SYMBOL	MIN	MAX
A	1.40	1.60
B	0.36	0.48
C	0.35	0.44
D	4.40	4.60
D1	1.62	1.83
E	2.29	2.60
e	1.50 (TYP.)	
e1	3.00 (TYP.)	
H	3.94	4.25
L	0.89	1.20

SOT-89 MARKING

Part No.	Marking
AIC1739-18	AY18
AIC1739-20	AY20
AIC1739-25	AY25
AIC1739-27	AY27
AIC1739-30	AY30

- **TO-92 (unit: mm)**



SYMBOL	MIN	MAX
A	4.32	5.33
C	0.38 (TYP.)	
D	4.40	5.20
E	3.17	4.20
e1	1.27 (TYP.)	
L	12.7	-