

150mA/300mA Low Dropout Linear Regulator with 1% Output Accuracy

FEATURES

- Low Dropout Voltage of 130mV at 100mA Output Current (5V Output Version).
- Guaranteed 150mA/300mA Output Current.
- Internal 1.3Ω P-MOSFET Draws no Base Current.
- Low Ground Current: 55μA.
- 1% Accuracy Output Voltage of 3.3V/5V.
- Input Voltage Range up to 12V (5V Output Version).
- Extremely Tight Load and Line Regulation.
- Fast Transient Response.
- Needs only 1μF Output Capacitor for Stability.
- Current Limiting and Thermal Protection.

APPLICATIONS

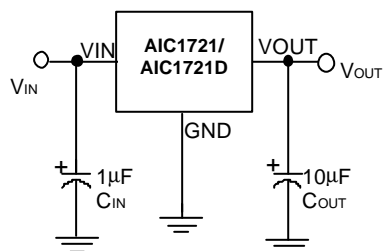
- Voltage Regulator for LAN Cards.
- Wireless Communication Systems.
- Battery Powered Systems.

DESCRIPTION

The AIC1721/1721D is the enhanced CMOS version of the LP2950. The superior characteristics of the AIC1721/1721D include zero-base current loss, very low dropout voltage, and 1% accuracy output voltage. Typical ground current remains approximately 55μA, under the output condition of from zero up to the maximum Load. Dropout voltage at 100mA output current is significantly lower than its bipolar counterpart: 130mV for the AIC1721-50/1721D-50, and 180mV for the AIC1721/ 1721D. Output current limiting and thermal protections are built to protect AIC1721/1721D against fault condition.

AIC1721 and AIC1721D come with SOT-89 and TO-92 packages of 3-pins, whose definitions are the same as those of LP2950 and standard 78XX.

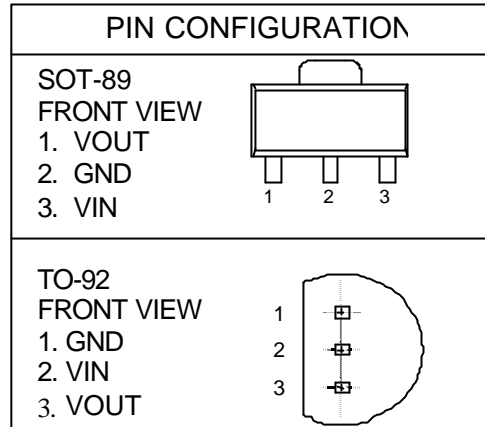
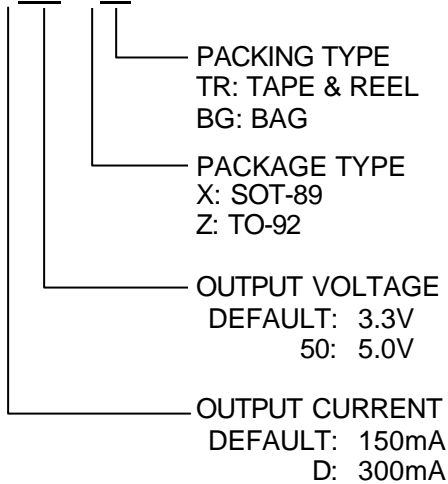
TYPICAL APPLICATION CIRCUIT



Low Dropout Linear Regulator

ORDERING INFORMATION

AIC1721 X-XXCXXX



Example: AIC1721C XTR
 → 150mA, 3.3V Version, in SOT-89
 Package & Tape & Reel Packing Type

ABSOLUTE MAXIMUM RATINGS

Input Supply Voltage	-0.3~12V
Operating Junction Temperature Range	-40°C~ 125°C
Storage Temperature Range	-65°C~150°C
Power Dissipation	
SOT-89 Package	0. 80W
TO-92 Package	0. 78W

TEST CIRCUIT

Refer to the TYPICAL APPLICATION CIRCUIT

ELECTRICAL CHARACTERISTICS ($T_J=25^\circ\text{C}$, $C_{IN}=1\text{mF}$, $C_{OUT}=10\text{mF}$, unless otherwise specified.)

PARAMETER	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Voltage	AIC1721/1721D-50 $V_{IN}=5.5\sim 12\text{V}$, $I_{OUT}=0\text{mA}$	4.950	5.0	5.050	V
	AIC1721/1721D $V_{IN}=3.6\sim 12\text{V}$, $I_{OUT}=0\text{mA}$	3.267	3.3	3.333	
Output Voltage Temperature Coefficiency	(Note 1)		50	150	PPM/ $^\circ\text{C}$
Line Regulation	$I_{OUT}=1\text{mA}$ AIC1721/1721D-50 $V_{IN}=5.5\sim 12\text{V}$		3	10	mV
	AIC1721/1721D $V_{IN}=3.6\sim 12\text{V}$		3	10	
Load Regulation (Note 2)	AIC1721-50 $V_{IN}=7\text{V}$, $I_{OUT}=0.1\sim 150\text{mA}$		7	15	mV
	AIC1721D-50 $V_{IN}=7\text{V}$, $I_{OUT}=0.1\sim 300\text{mA}$		7	25	
	AIC1721 $V_{IN}=5\text{V}$, $I_{OUT}=0.1\sim 150\text{mA}$		7	15	
	AIC1721D $V_{IN}=5\text{V}$, $I_{OUT}=0.1\sim 300\text{mA}$		7	25	
Current Limit (Note 3)	AIC1721-50 $V_{IN}=7\text{V}$, $V_{OUT}=0\text{V}$	300	440		mA
	AIC1721 $V_{IN}=5\text{V}$, $V_{OUT}=0\text{V}$	300	440		
	AIC1721D-50 $V_{IN}=7\text{V}$, $V_{OUT}=0\text{V}$	300	440		
	AIC1721D $V_{IN}=5\text{V}$, $V_{OUT}=0\text{V}$	300	440		
Dropout Voltage (Note 4)	AIC1721-50 $I_{OUT}=150\text{mA}$		200	300	mV
	AIC1721 $I_{OUT}=150\text{mA}$		270	370	
	AIC1721D-50 $I_{OUT}=300\text{mA}$		400	500	
	AIC1721D $I_{OUT}=300\text{mA}$		540	640	
Ground Current	$I_{OUT}=0.1\text{mA}\sim I_{MAX}$ AIC1721/1721D-50 $V_{IN}=5.5\sim 12\text{V}$		55	80	μA
	AIC1721/1721D $V_{IN}=4\sim 12\text{V}$		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.

TYPICAL PERFORMANCE CHARACTERISTICS

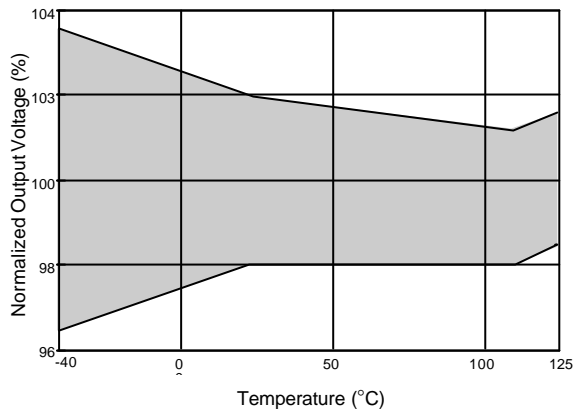


Fig. 1 Output Voltage vs. Temperature

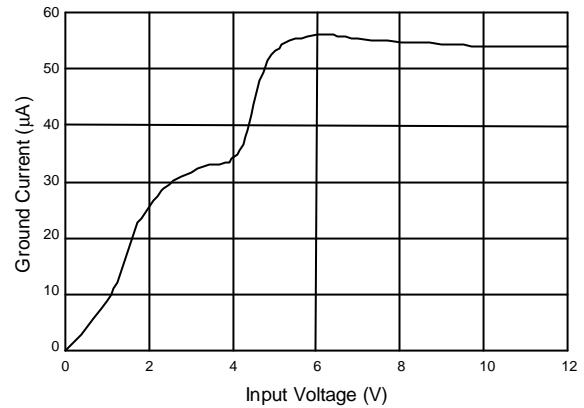


Fig. 2 Ground Current vs. Input Voltage

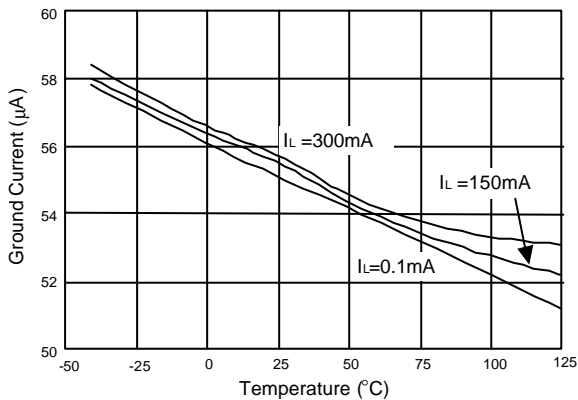


Fig. 3 Ground Current vs. Temperature

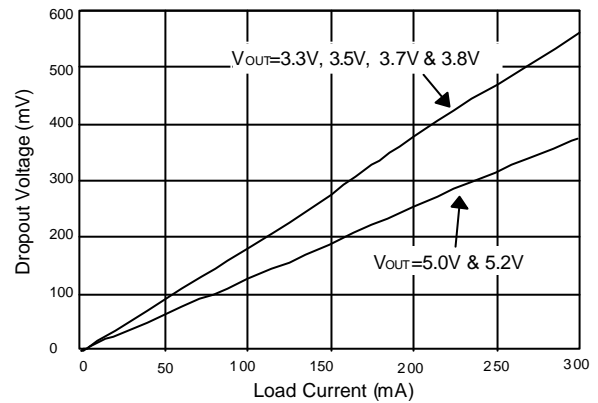


Fig. 4 Dropout Voltage vs. Load Current

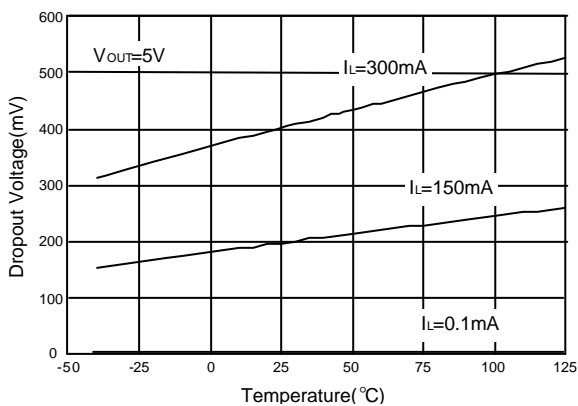


Fig. 5 Dropout Voltage vs Temperature

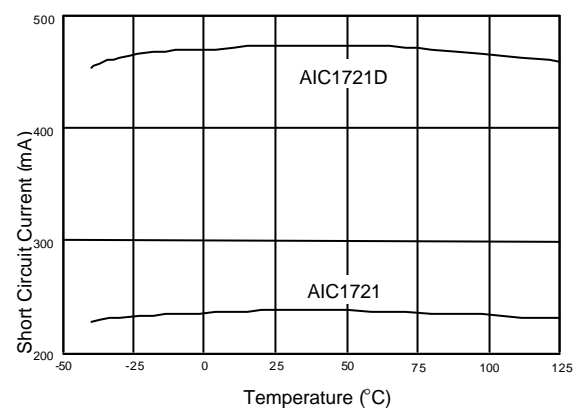


Fig. 6 Short Circuit Current vs. Temperature

TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

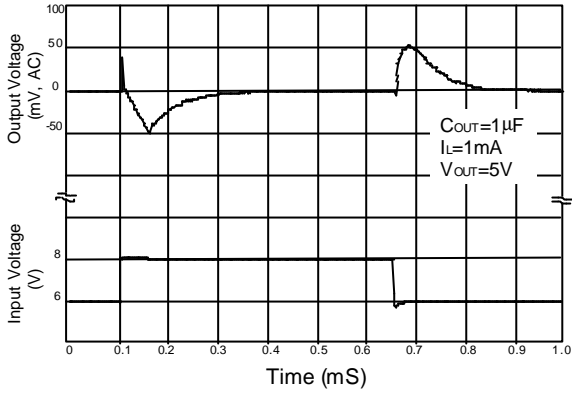


Fig. 7 Line Transient Response

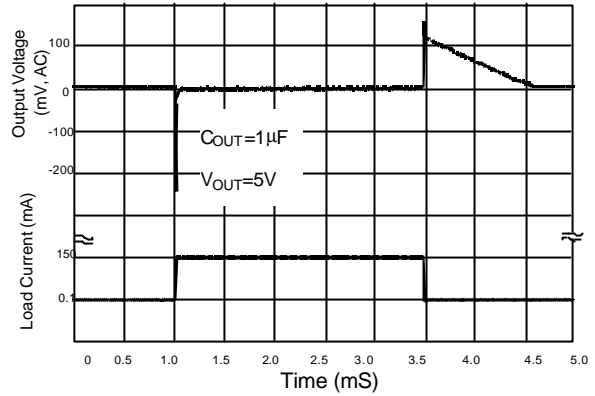


Fig. 8 Load Transient Response

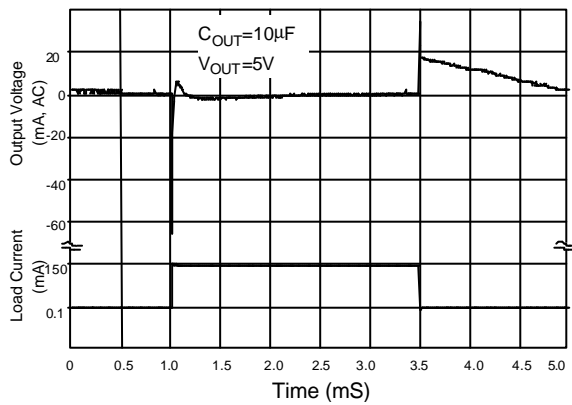
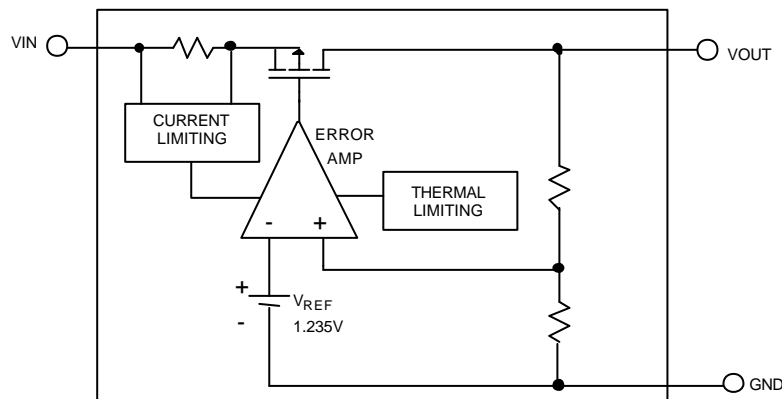


Fig. 9 Load Transient Response

BLOCK DIAGRAM



■ PIN DESCRIPTIONS

VOUT PIN - Output pin.

GND PIN - Power GND.

VIN PIN - Power Supply Input.

■ APPLICATION INFORMATIONS

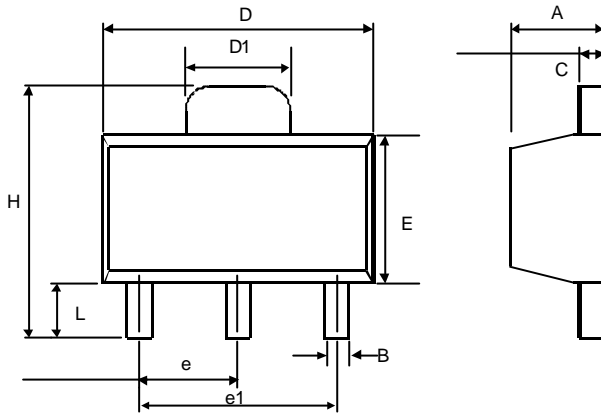
A 1 μ F (or greater) capacitor is required between the AIC1721/1721D output and ground for stability. Without this capacitor the part will oscillate. Even though most types of capacitor may work, the equivalent series resistance (ESR) should be held to 5 Ω or less if Aluminum electrolytic type is used. Many Aluminum electrolytic 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 0.1 μ F capacitor (or greater) should be placed from the AIC1721/1721D 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)

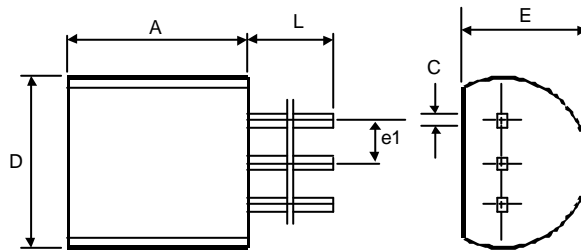


SYMBOL	MIN	MAX
A	1.40	1.60
B	0.36	0.48
C	0.35	0.44
D	4.40	4.60
D1	1.62	1.83
E	2.29	2.60
e	1.50 (TYP.)	
e1	3.00 (TYP.)	
H	3.94	4.25
L	0.89	1.20

- SOT89 Marking

Part No.	Marking	Part No.	Marking
AIC1721	AF33	AIC1721D	AG33
AIC1721-50	AF50	AIC1721D-50	AG50

- 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	-