

Negative Voltage Regulator

FEATURES

- Low Power Consumption.
- Low Temperature Coefficient.
- Output Short Circuit Protected.
- Wide Operating Voltage Range.
- Good Input Stability.
- Space-Saving Package: TO-92 or SOT-89

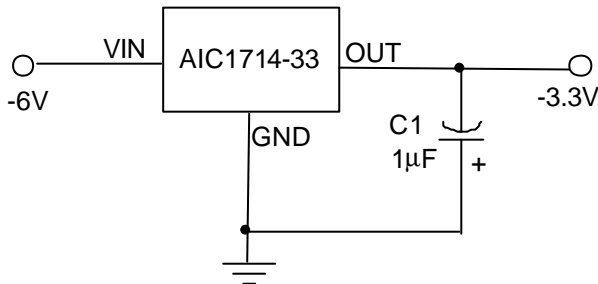
APPLICATIONS

- LCD for Printing Calculators
- Cameras
- Voltage References for Instrumentation

DESCRIPTION

The AIC1714 is a series of 3-terminal negative voltage regulators with output voltages internally set below the positive supply voltage. Since the AIC1714 consumes less current and only requires a small input/output voltage difference than existing industry standard 3-terminal voltage regulators, a battery-powered portable equipment is afforded a high capacity and longer service life. The AIC1714 is ideal for power source of liquid crystal displays.

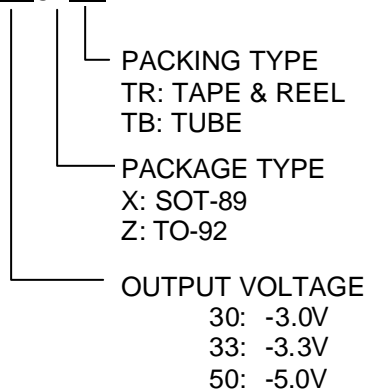
TYPICAL APPLICATION CIRCUIT



Negative Voltage Regulator

ORDERING INFORMATION

AIC1714-XXCXXX

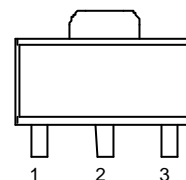


Example: AIC1714-30CXTR

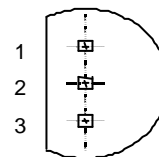
→ -3.0V Version, in SOT-89 Package
& Tape & Reel Packing Type

PIN CONFIGURATION

SOT-89
TOP VIEW
1. VIN
2. GND
3. VOUT



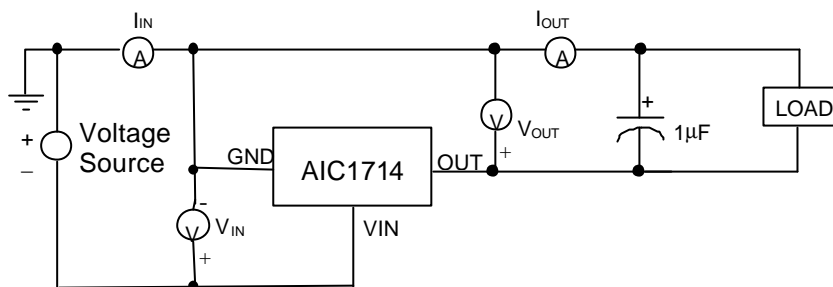
TO-92
TOP VIEW
1. VIN
2. GND
3. VOUT



■ ABSOLUTE MAXIMUM RATINGS

Supply Voltage	-13V
Operating Temperature Range	-20°C~80°C
Storage Temperature Range	-65°C~150°C
Power Dissipation	SOT-89 Package 0.80W
	TO-92 Package 0.78W

■ TEST CIRCUIT



■ ELECTRICAL CHARACTERISTICS ($V_{IN} = -6.0V$, $T_J = 25^\circ C$, unless otherwise specified.)

PARAMETER	TEST CONDITIONS	SYMBOL	MIN.	TYP.	MAX.	UNIT
Output Voltage	$I_{OUT} = 300\mu A$	AIC1714-30	-2.95	-3.0	-3.05	V
		AIC1714-33	-3.25	-3.3	-3.35	V
		AIC1714-50	-4.93	-5.0	-5.07	V
Load Regulation	$I_{OUT} = 0 \sim 5mA$	ΔV_{OUT}		20	100	mV
I/O Voltage Difference	$I_{OUT} = 300\mu A$	V_{DIFF}		50	200	mV
Supply Current	$I_{OUT} = 0$	I_{IN}		6	12	μA
Input Stability		$\frac{\Delta V_{OUT}}{\Delta V_{IN} \cdot V_{OUT}}$		0.05		%/V
Temperature Coefficient	$-25^\circ C \sim 85^\circ C$	T_C		50		ppm
Output Short Circuit Current	$R_{LOAD} = 0$		15	24		mA

TYPICAL PERFORMANCE CHARACTERISTICS

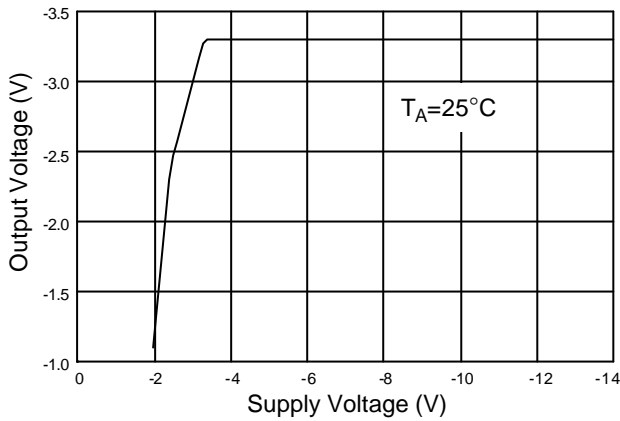
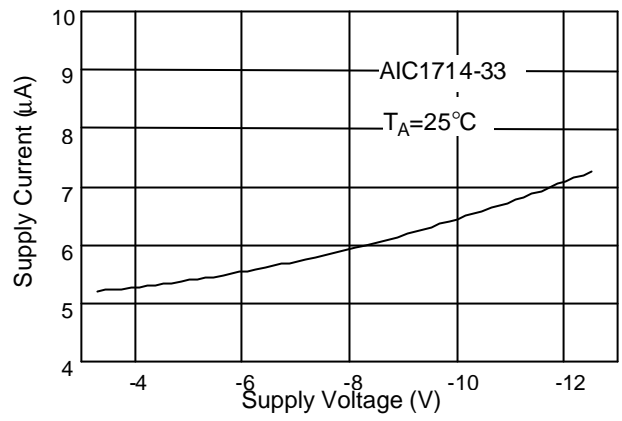


Fig. 1 Output Voltage vs. Supply Voltage (Load Current=300µA)



Supply Current Voltage vs. Supply Voltage (No Load)

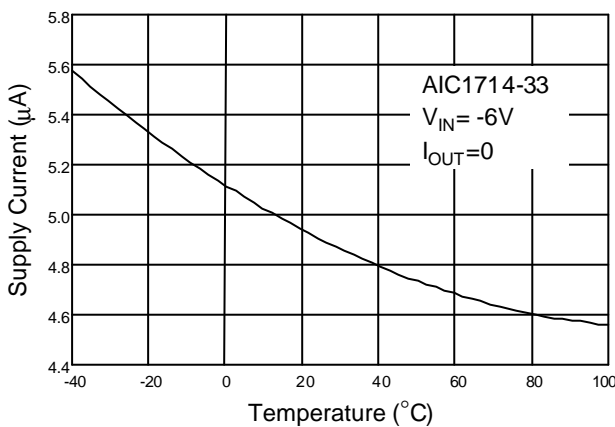


Fig. 3 Supply Current vs Temperature

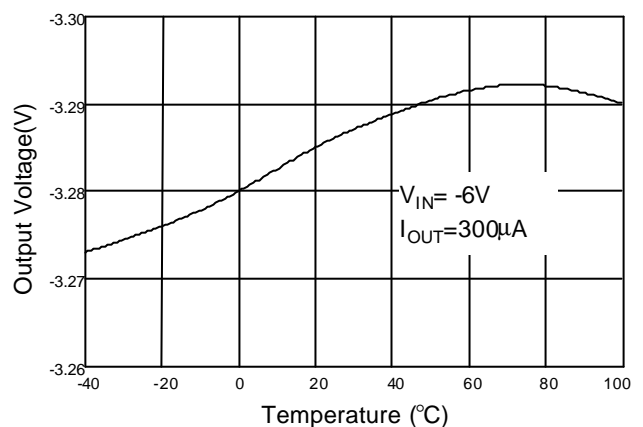


Fig 4 Output Voltage vs Temperature

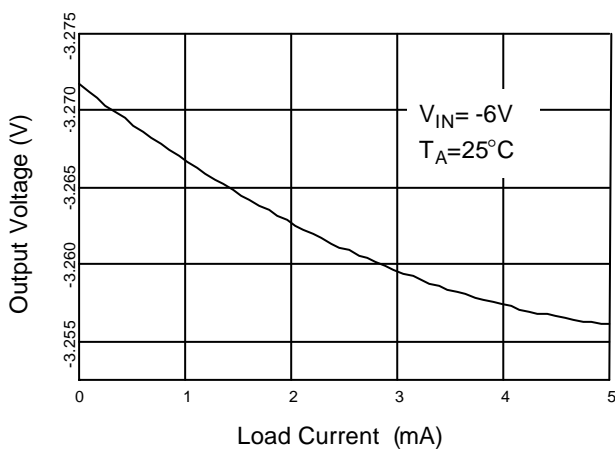
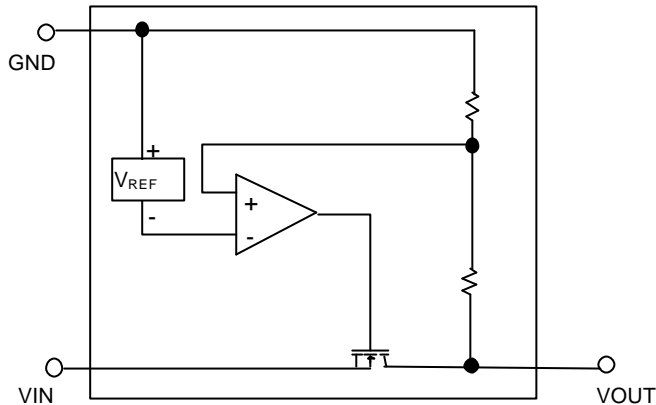


Fig. 5 Output Voltage vs Load Current

■ BLOCK DIAGRAM



■ PIN DESCRIPTIONS

VOUT PIN - Output pin.

GND PIN - Power GND.

VIN PIN - Power Supply Input.

■ APPLICATION INFORMATIONS

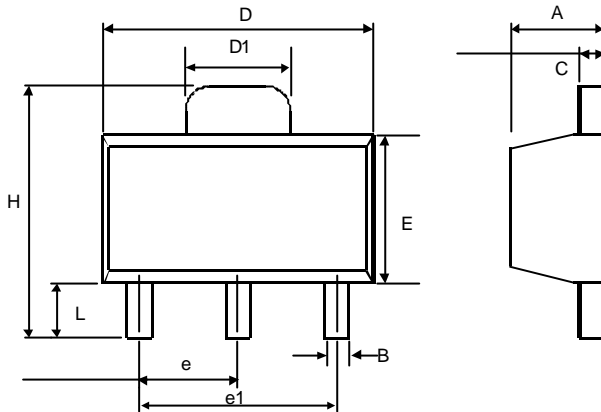
A 1 μ F (or greater) capacitor is required between the AIC1714 output and ground for stability. Without this capacitor the part will oscillate. Even though most types of capacitor may work, the equivalent series resistance (ESR) should be held to 5 Ω or less if Aluminum electrolytic type is used. Many 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 AIC1714 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)

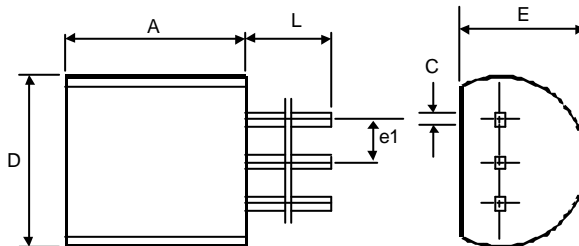


SYMBOL	MIN	MAX
A	1.40	1.60
B	0.36	0.48
C	0.35	0.44
D	4.40	4.60
D1	1.62	1.83
E	2.29	2.60
e	1.50 (TYP.)	
e1	3.00 (TYP.)	
H	3.94	4.25
L	0.89	1.20

- SOT89 Marking

Part No.	Marking
AIC1714-30	AP30
AIC1714-33	AP33
AIC1714-50	AP50

- 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	-