ACE522

36V Input Linear Regulator

Description

ACE522 is a three-terminal positive regulator with an output voltage of 5.0V and output current up to 150mA. The device features a typical output tolerance of ±3%. And its input voltage can stand a voltage as high as 36V.

ACE522 includes high accuracy voltage reference, error amplifier, TSD circuit and output driver module.

ACE522 offers thermal shut down functions to assure the stability of chip and power system. ACE522 is available in SOT89-3, TO-92 and TO-220 power packages.

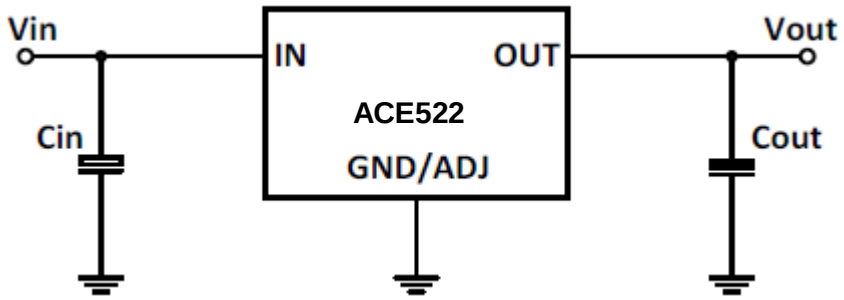
Features

- Maximum output current up to 150mA
- Output voltage tolerances of ±3% over the temperature range
- Internal thermal over-temperature protection
- High input voltage (up to 36V)
- Low Power Consumption:100uA (Typ.)
- No external components

Application

- Battery Powered equipment
- Communication equipment
- Audio/Video equipment

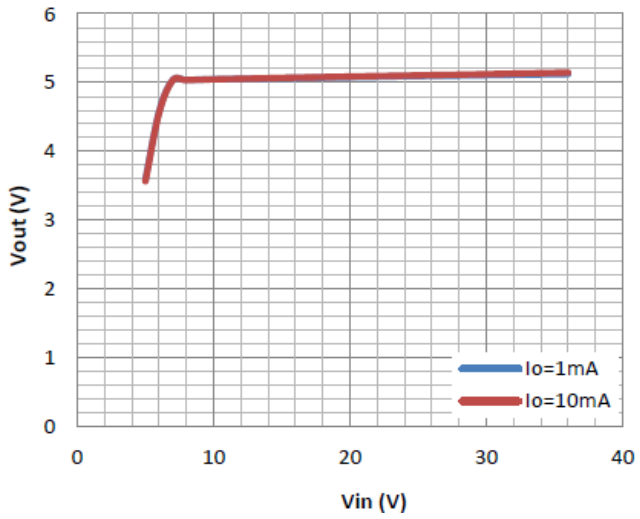
Typical Application



Note:Input capacitor (C1=0.33uF) and Output capacitor (C2=0.1uF) are recommended in all application circuit. Tantalum capacitor is recommended.

Electrical Characteristics

Line Regulation



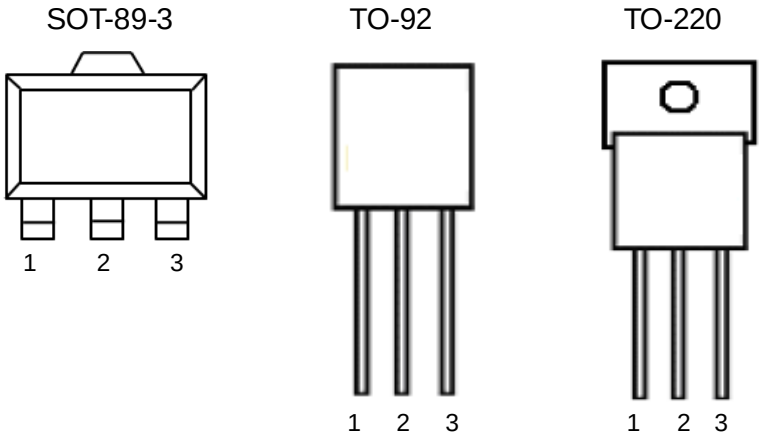
Absolute Maximum Ratings

Parameter	Value	Unit
Max Input Voltage	40	V
Max Output Current	150	mA
Operating Junction Temperature(Tj)	150	°C
Ambient Temperature(Ta)	-40°C – 85°C	°C
Power Dissipation TO-92 TO-220 SOT-89-3	 0.5 1.0 0.5	W
Storage Temperature(Ts)	-40°C – 150°C	°C
Lead Temperature & Time	260°C,10s	°C

Note: Exceed these limits to damage to the device.

Exposure to absolute maximum rating conditions may affect device reliability.

Packaging Type



SOT-89-3(A)	SOT-89-3(B)	TO-92	TO-220	Description
1	2	2	1	GND
3	1	1	2	Vout
2	3	3	3	Vin

Ordering information

ACE522 XX XX + H

- Halogen - free
- Pb - free
- AMA: SOT-89-3(A)
  AMB: SOT-89-3(B)
  EP : TO-92
  ZM : TO-220
- Output Voltage：3.3V / 5V

Recommended Work Conditions

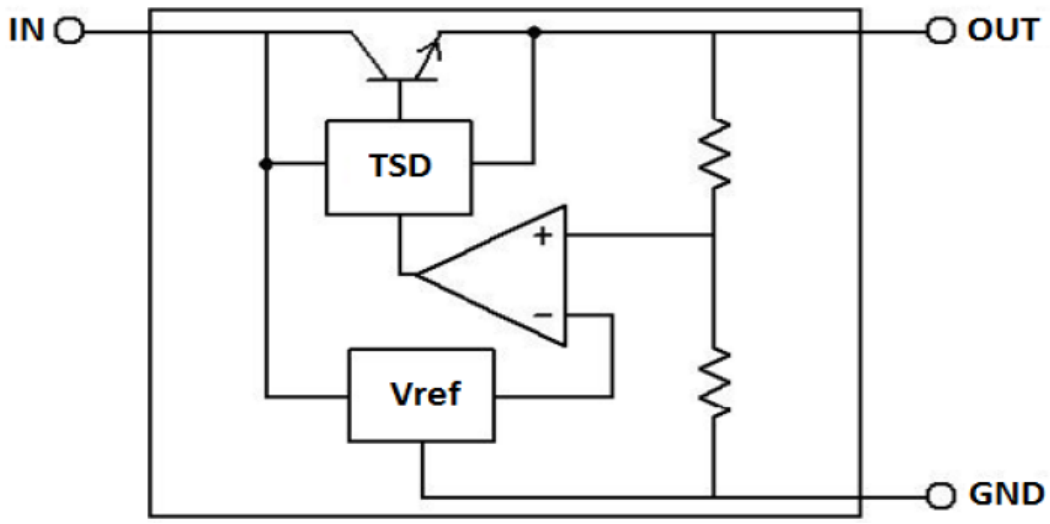
Item	Min	Max	Unit
Input Voltage Range		36	V
Operating Junction Temperature(Tj)	-20	+85	℃

Electrical Characteristics

(Test Conditions：Cin=0.33uF, Cout=0.1uF,TA=25℃, Unless otherwise specified)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Input Voltage	V_{IN}				36	V
Output Voltage	V_{OUT}	1mA≤Iout≤40mA 7V≤Vin≤30V	4.85	5.0	5.15	V
Maximum Output Current	I_{OUT}(Max.)	Vin-Vout=1.5V	150			mA
Line Regulation	ΔV_{OUT}	7V≤Vin≤30V		0.2	0.3	mV
Load Regulation	ΔV_{OUT}	1mA≤Iout≤100mA		20	40	mV
Quiescent Current	Iq	V_{IN}-Vout=1.25V		0.1	0.15	uA
		ADJ version		10	20	
Temperature coefficient	△V/ΔT	Vin=6.5V, 25℃≤ Temp ≤85℃			±100	ppm
Over Temperature Procetion	TSD	Vin=6.5V, Iout=1mA	150			℃
Thermal Resistor	θ_{JC}	SOT89-3		20		℃/W
		TO-92		10		
		TO-220		4.5		

Block Diagram



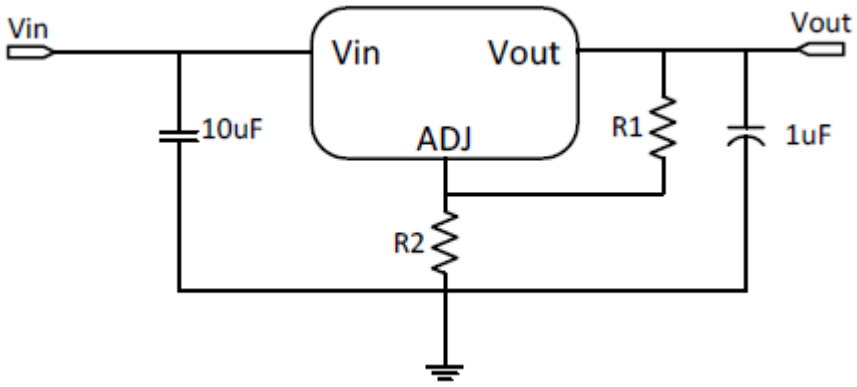
DETAILED DESCRIPTION

ACE522 is a series of low dropout voltage and low power consumption regulator. Its application circuit is very simple, which only needs two outside capacitors.

ADJUSTABLE OUTPUT VOLTAGE VERSION

ACE522-ADJ provides a 1.25V reference voltage. Any output voltage between 1.25V~18V can be achievable by choosing two external resistors (schematic is shown below), R1 and R2

ACE522-ADJ



Application Circuit of ACE522-ADJ

The output voltage of adjustable version follows the equation: Vout=1.25 □(1+R2

ignore IAdj because IAdj (about 15uA) is much less than the current of R1 (about 2~10mA).

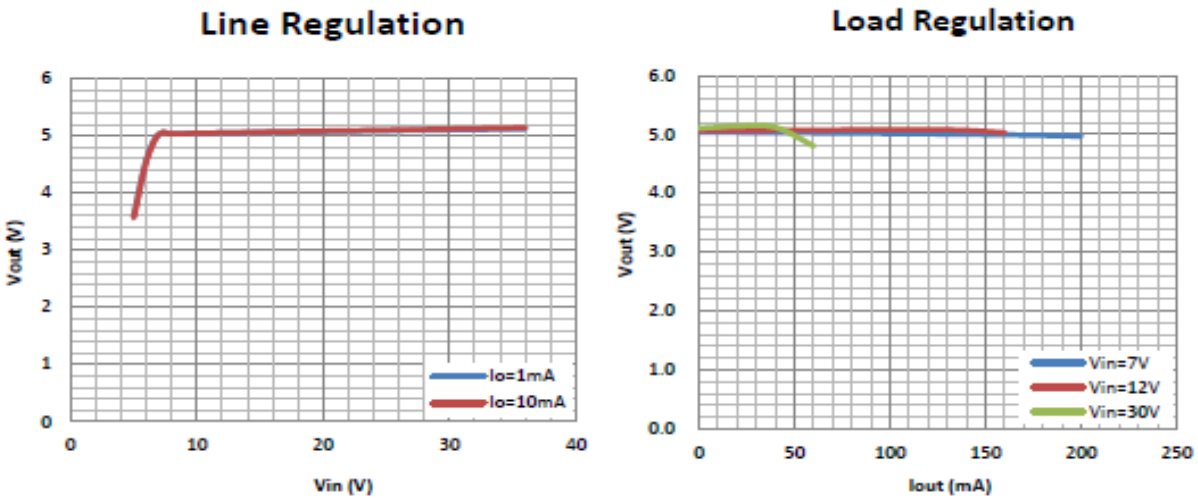
1. To meet the minimum load current (>10mA) requirement, R1 is recommended to be 125ohm or lower. As ACE522-ADJ can keep itself stable at load current about 2mA, R1 is not allowed to be higher than 625ohm.
2. Using a bypass capacitor (CADJ) between the ADJ pin and ground can improve ripple rejection. This bypass capacitor prevents ripple from being amplified as the output voltage is increased. The impedance of CADJ should be less than R1 to prevent ripple from being amplified. As R1 is normally in the range of 100Ω~500Ω, the value of CADJ should satisfy this equation: 1/(2 π fripple CADJ)<R1.

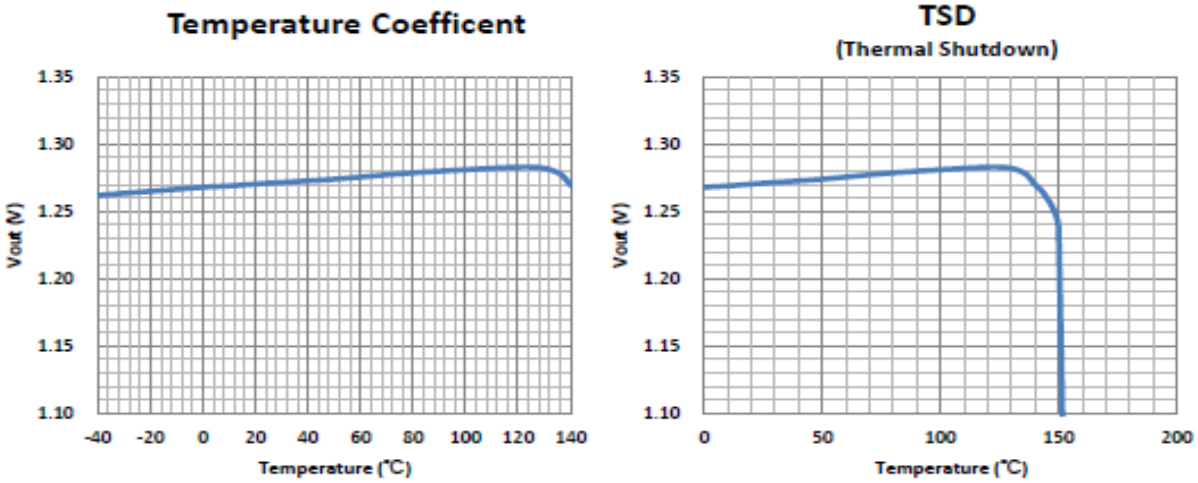
Explanation

ACE522 is a series of low dropout voltage and low power consumption regulator. Its application circuit is very simple, which only needs two outside capacitors.

We have to take heat dissipation into great consideration when voltage of input is high. Because in such cases, the power dissipation consumed by ACE522 is very large. ACE522 uses SOT-89-3 package type and its thermal resistance is about 20°C/W. And the copper area of application board can affect the total thermal resistance. If copper area is 5cm*5cm (two sides), the resistance is about 30°C/W. So the total thermal resistance is about 20°C/W + 30°C/W. We can decrease total thermal resistance by increasing copper area in application board. When there is no good heat dissipation copper are in PCB, the total thermal resistance will be as high as 120°C/W, then the power dissipation of ACE522 could allow on itself is less than 1W. And furthermore, ACE522 will work at junction temperature higher than 125°C under such condition and no lifetime is guaranteed.

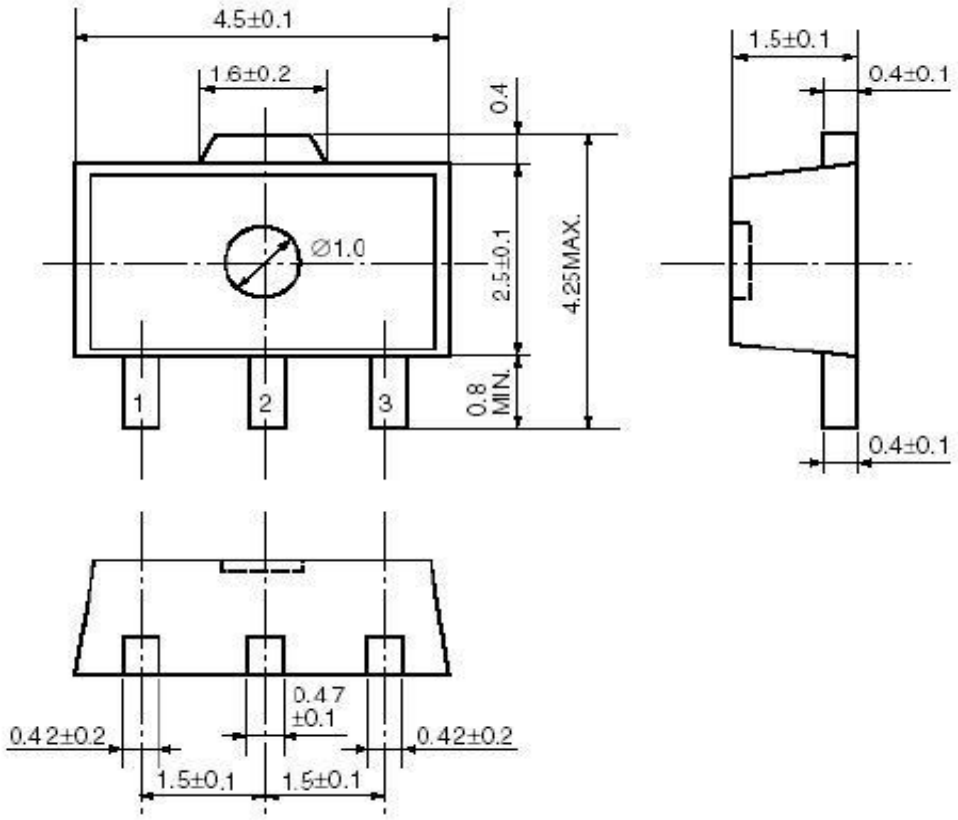
Typical Performance Characteristics





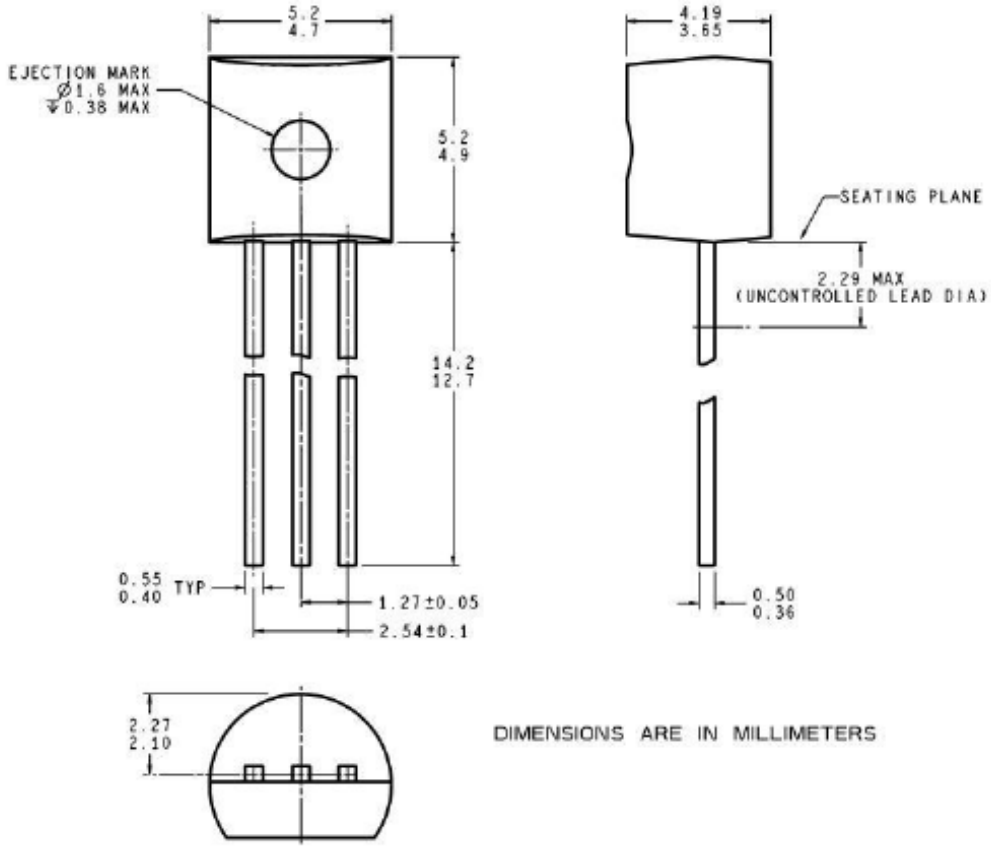
Packing Information

SOT-89-3



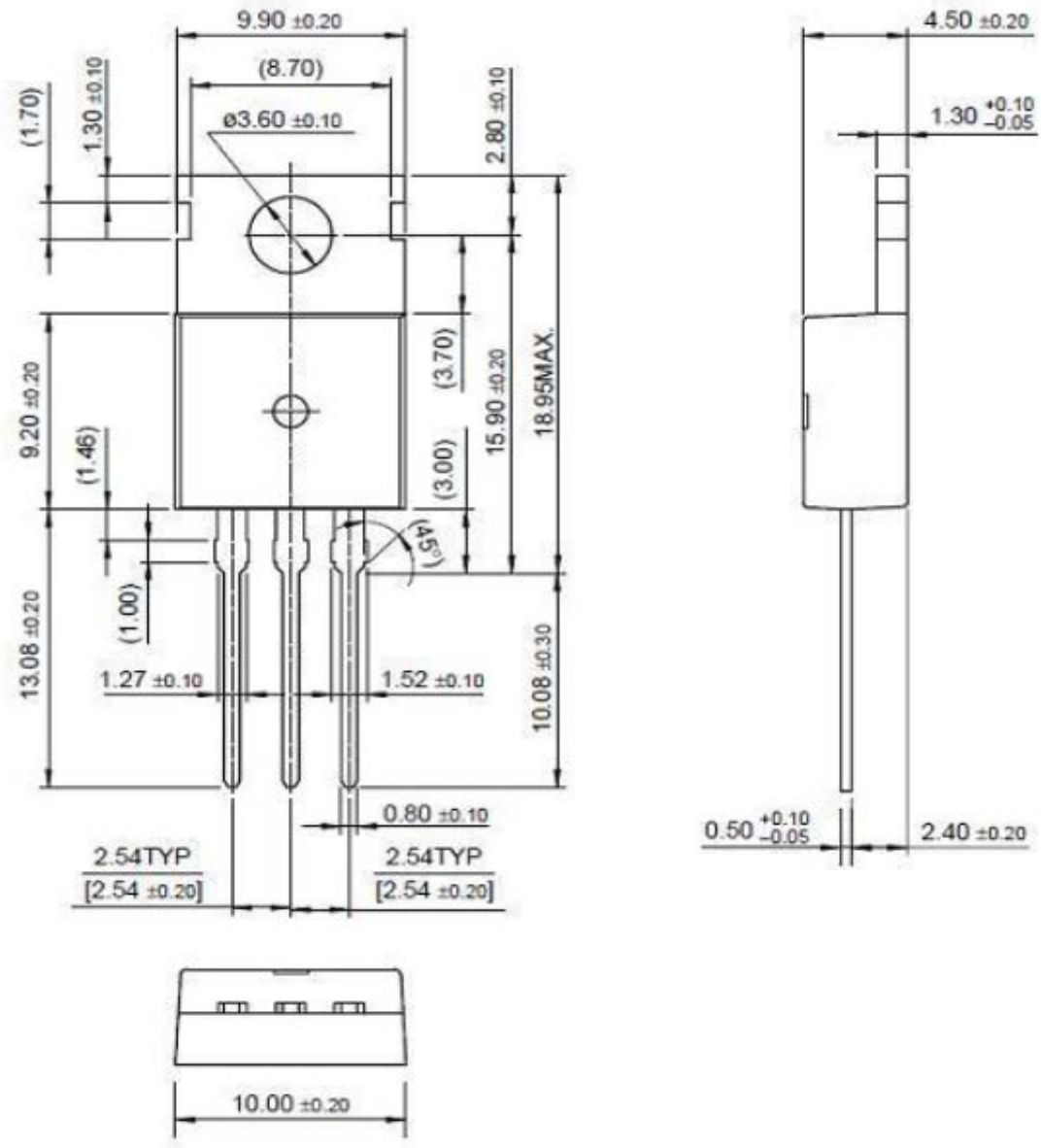
Packing Information

TO-92



Packing Information

TO-220



Notes

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2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

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