



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 $\pm 3\%$. 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.

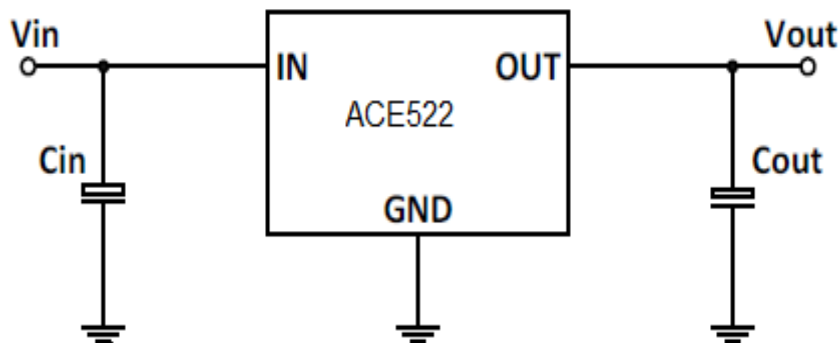
Features

- Maximum output current up to 150mA
- Output voltage tolerances of $\pm 3\%$ 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 ($C1=0.33\mu\text{F}$) and Output capacitor ($C2=0.1\mu\text{F}$) are recommended in all application circuit. Tantalum capacitor is recommended.

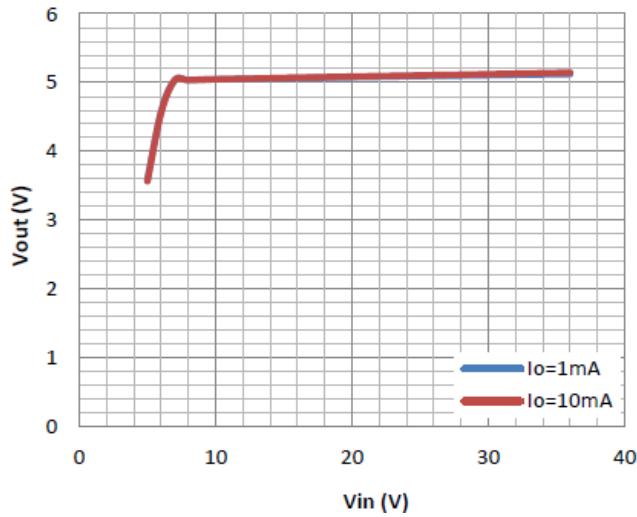


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Electrical Characteristics

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	0.5	W
TO-220	1.0	
SOT-89-3	0.5	
Storage Temperature(Ts)	-40°C - 150°C	°C
Lead Temperature & Time	260°C, 10s	°C

Note: Exceed these limits to damage to the device.

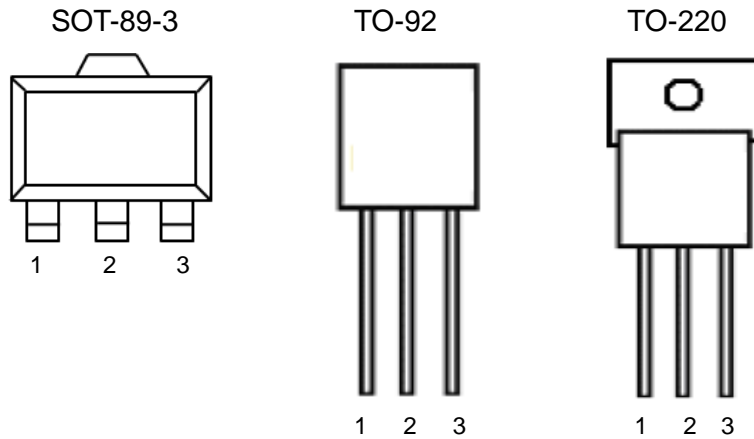
Exposure to absolute maximum rating conditions may affect device reliability.



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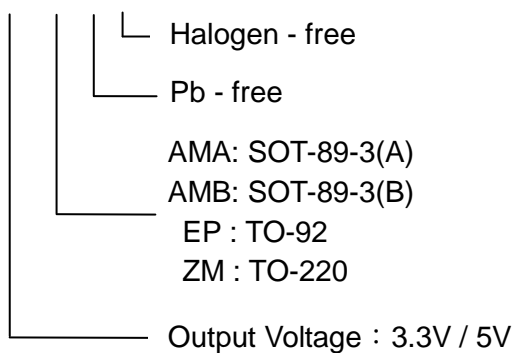
Packaging Type



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



Recommended Work Conditions

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



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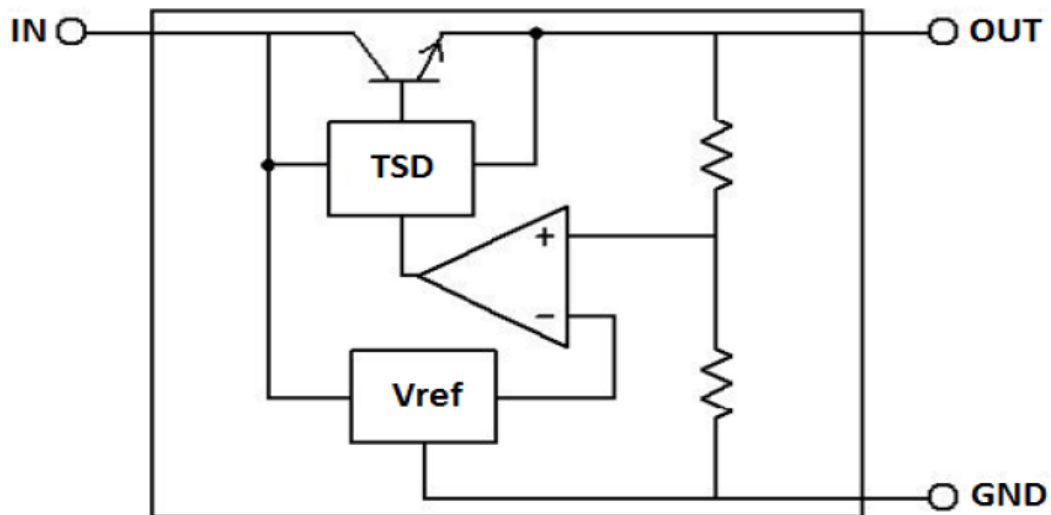
36V Input Linear Regulator

Electrical Characteristics

(Test Conditions : $C_{in}=0.33\mu F$, $C_{out}=0.1\mu F$, $T_A=25^\circ C$, Unless otherwise specified)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Input Voltage	V_{IN}				36	V
Output Voltage	V_{OUT}	$1mA \leq I_{out} \leq 40mA$ $7V \leq V_{in} \leq 30V$	4.85	5.0	5.15	V
Maximum Output Current	$I_{OUT}(Max.)$	$V_{in}-V_{out}=1.5V$	150			mA
Line Regulation	ΔV_{OUT}	$7V \leq V_{in} \leq 30V$		0.2	0.3	mV
Load Regulation	ΔV_{OUT}	$1mA \leq I_{out} \leq 100mA$		20	40	mV
Quiescent Current	I_q	$V_{IN}-V_{out}=1.25V$		0.1	0.15	uA
		ADJ version		10	20	
Temperature coefficient	$\Delta V/\Delta T$	$V_{in}=6.5V$, $25^\circ C \leq Temp \leq 85^\circ C$			± 100	ppm
Over Temperature Protection	TSD	$V_{in}=6.5V$, $I_{out}=1mA$	150			$^\circ C$
Thermal Resistor	θ_{JC}	SOT89-3		20		$^\circ C/W$
		TO-92		10		
		TO-220		4.5		

Block Diagram





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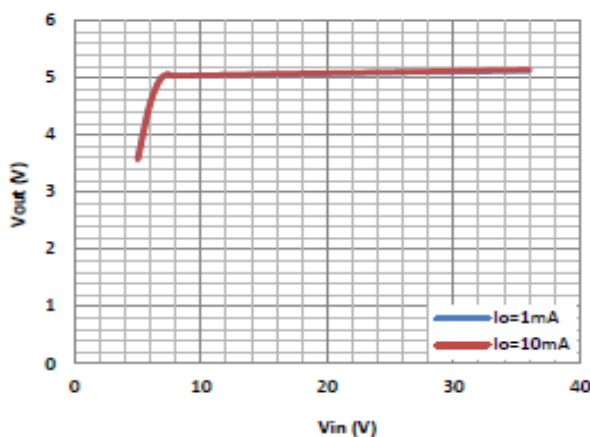
Explanation

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.

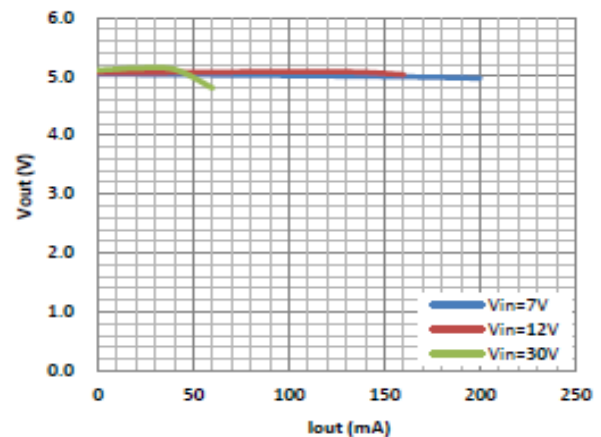
We have to take heat dissipation into great consideration when voltage of input is high. Because in such cases, the power dissipation consumed by ACE522 is very large. ACE522 uses SOT-89-3 package type and its thermal resistance is about $20^{\circ}\text{C}/\text{W}$. And the copper area of application board can affect the total thermal resistance. If copper area is $5\text{cm} \times 5\text{cm}$ (two sides), the resistance is about $30^{\circ}\text{C}/\text{W}$. So the total thermal resistance is about $20^{\circ}\text{C}/\text{W} + 30^{\circ}\text{C}/\text{W}$. 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 $120^{\circ}\text{C}/\text{W}$, 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

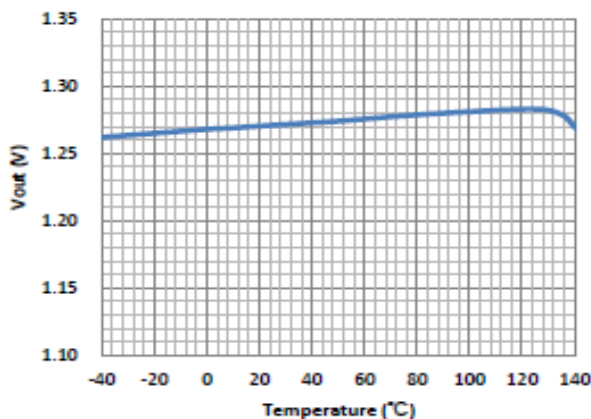
Line Regulation



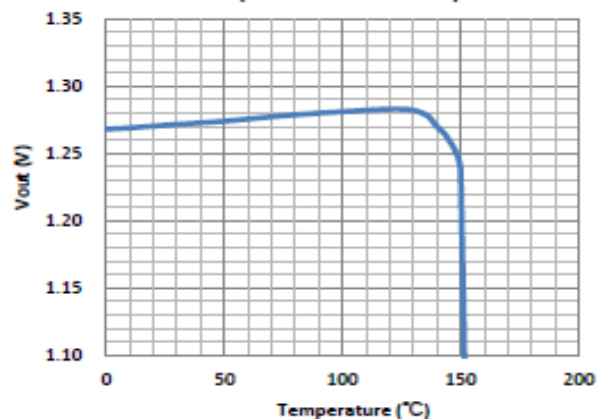
Load Regulation



Temperature Coefficient



TSD (Thermal Shutdown)



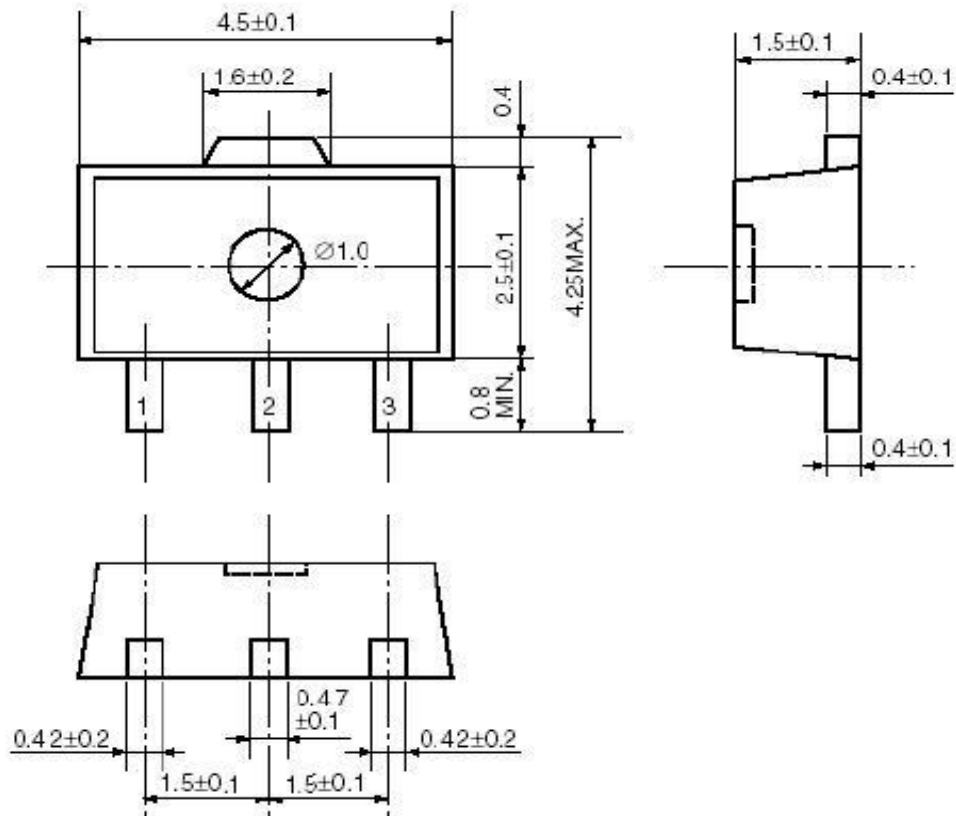


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Packing Information

SOT-89-3



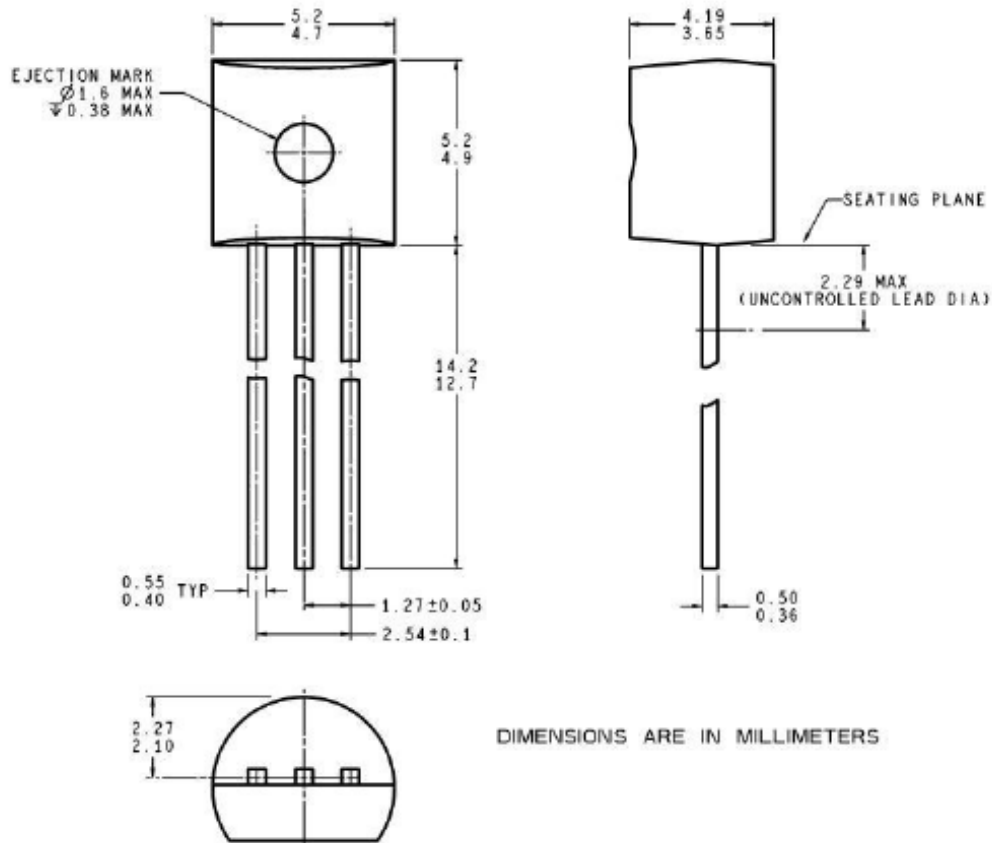


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Packing Information

TO-92



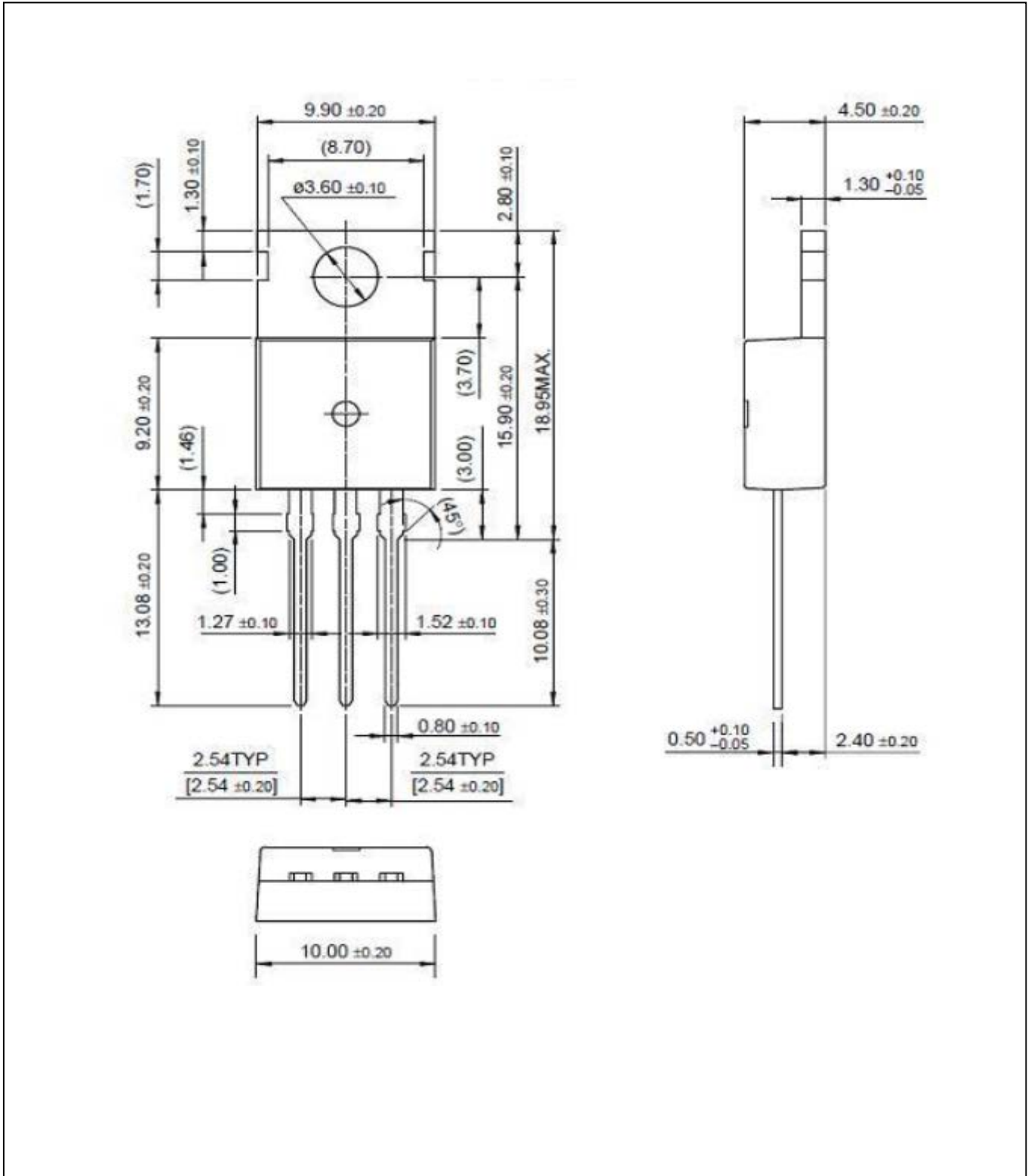


ACE522

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Packing Information

TO-220





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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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