



ACE506C

300mA Low Consumption Linear Regulator

Description

ACE506C series are a group of positive voltage output, high precise and high PSRR and low power consumption voltage regulator. Voltages are selectable in 100mV steps within a range of 1.2V to 3.6V. It also can be customized on command.

ACE506C series have excellent load and line transient response and good temperature characteristics, which can assure the stability of chip and power system. And it uses trimming technique to guarantee output voltage accuracy within $\pm 2\%$.

ACE506C series are available in TSOT-23-3, SOT-23-5 and SOT-89-3 packages, which are lead (Pb)-free.

Features

- Low Quiescent Current: 2uA at 5V
- 60dB PSRR at 100Hz
- Low Output Noise: 44uVRMS
- Low Dropout: 280mV at 150mA load
- Low Temperature Coefficient: $\pm 100\text{ppm}/^\circ\text{C}$
- Excellent Line Regulation: 0.05%/V
- Highly Accurate: $\pm 2\%$

Application

- Reference Voltage Source
- Battery Powered Equipment
- Hand-Hold Equipment
- Wireless LAN
- GPS Receivers

Absolute Maximum Ratings

Parameter		Value
Max Input Voltage		8V
Operating Junction Temperature (TJ)		125°C
Ambient Temperature (TA)		-40°C ~85°C
Power Dissipation	TSOT-23-3, SOT-23-5	250mW
	SOT-89-3	500mW
Storage Temperature (TS)		-40°C~150°C
Lead Temperature & Time		260°C, 10 Sec

Note: Exceed these limits to damage to the device.

Exposure to absolute maximum rating conditions may affect device reliability.

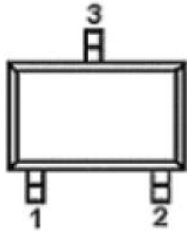


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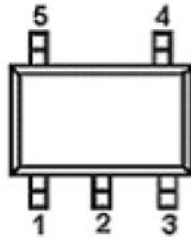
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Packaging Type

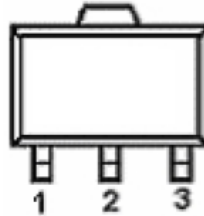
TSOT-23-3



SOT-23-5



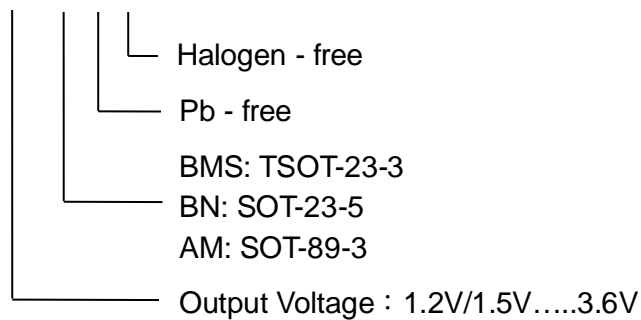
SOT-89-3



TSOT-23-3	SOT-23-5	SOT-89-3	Description	Function
2	3	3	V_{OUT}	Output pin
3	2	2	V_{DD}	Input Pin
1	1	1	V_{SS}	Ground Pin
	4		NC	
	5		NC	

Ordering information

ACE506C XX XX + H



Recommended Work Conditions

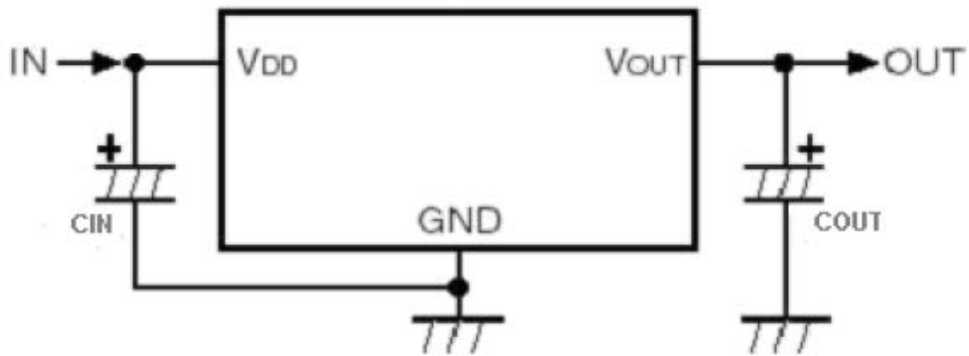
Item	Min
Input Voltage Range	Max. 8V
Ambient Temperature	-40°C ~85°C



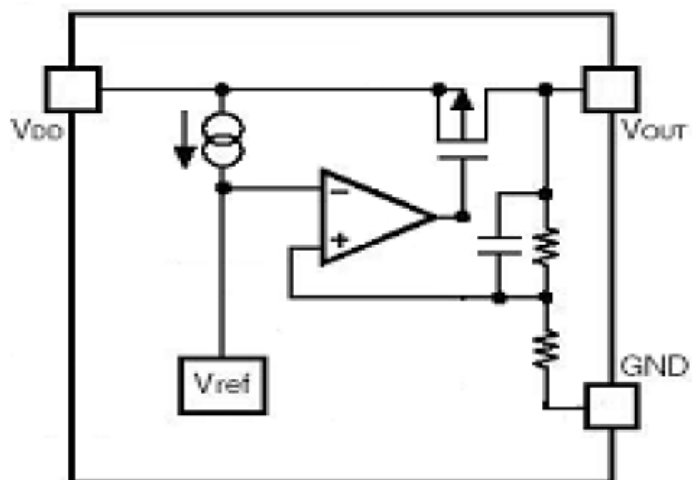
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Typical Application Circuit



Block Diagram





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Electrical Characteristics

(Test Conditions: $C_{in}=1\mu F$, $C_{out}=1\mu F$, $T_A=25^\circ C$, unless otherwise specified.)

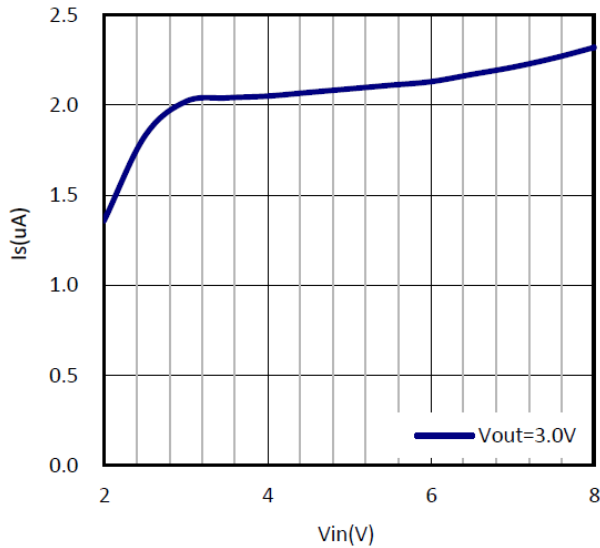
Parameter	Symbol	Conditions	Min	Typ	Max	Units
Input Voltage	V_{DD}				8	V
Output Voltage	$V_{OUT} > 1.5V$	$V_{DD} = \text{Set } V_{OUT} + 1V$ $1mA \leq I_{OUT} \leq 10mA$	V_{OUT} X0.98	V_{OUT}	V_{OUT} X1.02	V
	$V_{OUT} \leq 1.5V$		V_{OUT} -0.03	V_{OUT}	V_{OUT} +0.03	V
Maximum Output Current	I_{OUT} (Max.) (Note 4)	$V_{DD} - V_{OUT} = 1V$	300			mA
Dropout Voltage	V_{DROP}	$I_{OUT} = 150mA$ $V_{OUT} = 3.0V$		280		mV
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \cdot V_{OUT}}$	$I_{OUT} = 10mA$ $4V \leq V_{DD} \leq 6V$		0.05	0.2	%/V
Load Regulation	ΔV_{OUT}	$V_{DD} = \text{Set } V_{OUT} + 1V$ $1mA \leq I_{OUT} \leq 300mA$		150		mV
Supply Current	I_S	$V_{DD} = \text{Set } V_{OUT} + 1V$ V_{OUT} Floating		1	3	μA
Output Voltage Temperature Coefficient	$\frac{\Delta V_{OUT}}{\Delta T \cdot V_{OUT}}$	$I_{OUT} = 10mA$		± 100		ppm/ $^\circ C$
Ripple Rejection	PSRR	$f = 100Hz$, Ripple = 0.5Vp-p, $V_{DD} = \text{Set } V_{OUT} + 1V$		60		dB
Output Noise	en	BW = 10Hz ~ 100KHz		44		μV_{rms}

Note: The maximum power rating of each package is a constant, so along with the change of ILOAD, the $V_{DD} - V_{OUT}$ should be controlled to a certain range to ensure the normal operation.

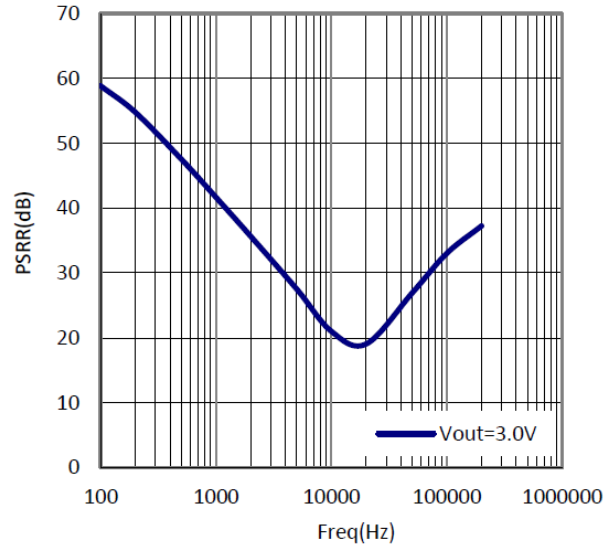


Typical Performance Characteristics

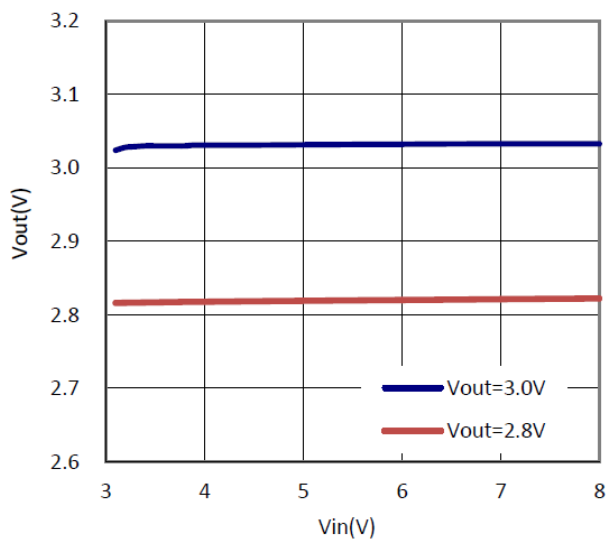
Supply Current vs. Input Voltage



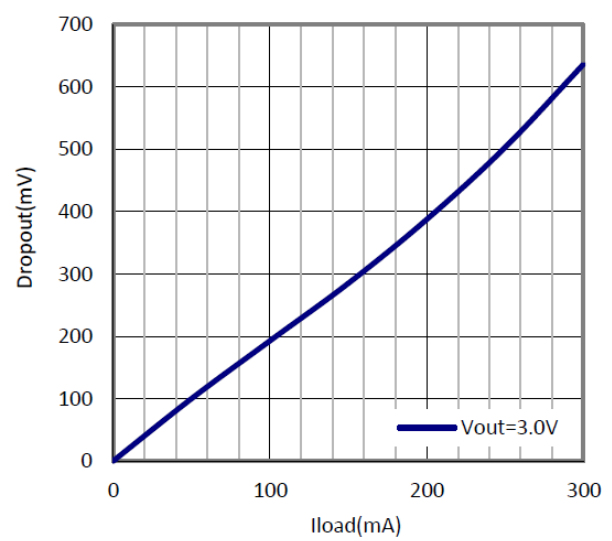
PSRR



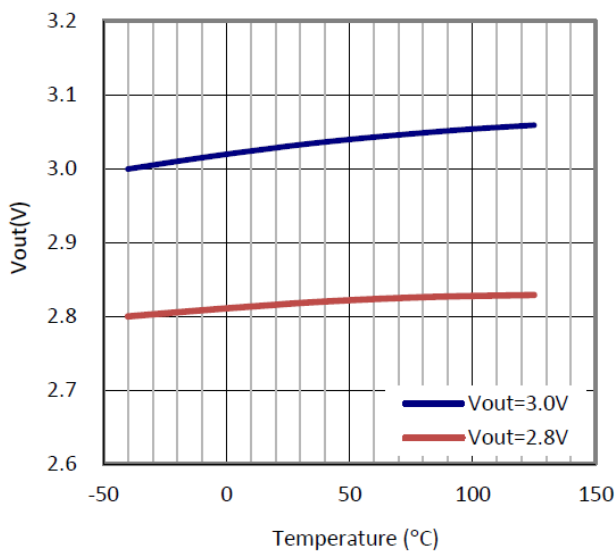
Output Voltage vs. Input Voltage



Dropout Voltage vs. Output Current



Output Voltage vs. Temperature





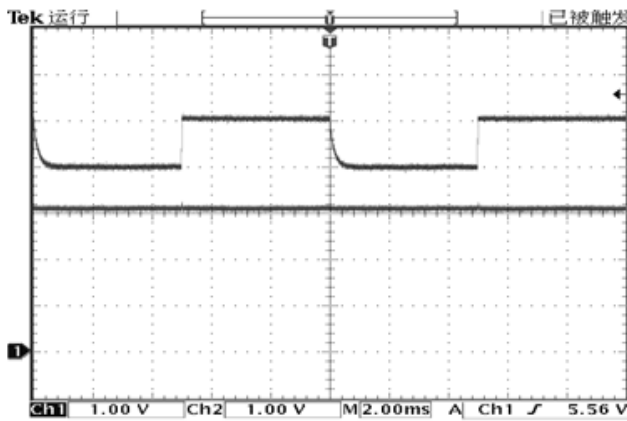
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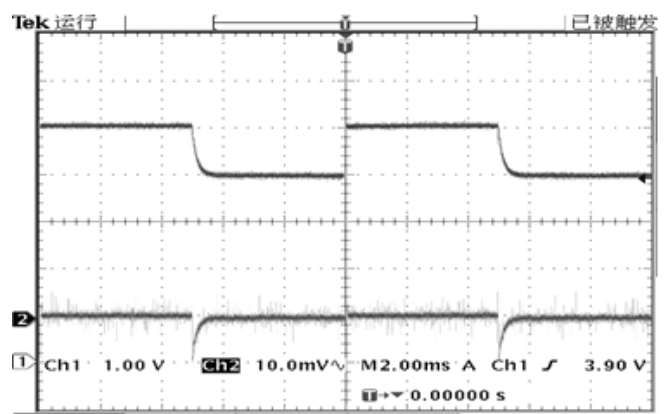
Test Waveforms

Line Transient Response ($C_{IN}=C_{OUT}=1\mu F$, $V_{IN}=4\leftrightarrow 5V$, $V_{OUT}=3V$)

Channel 1: Input Voltage

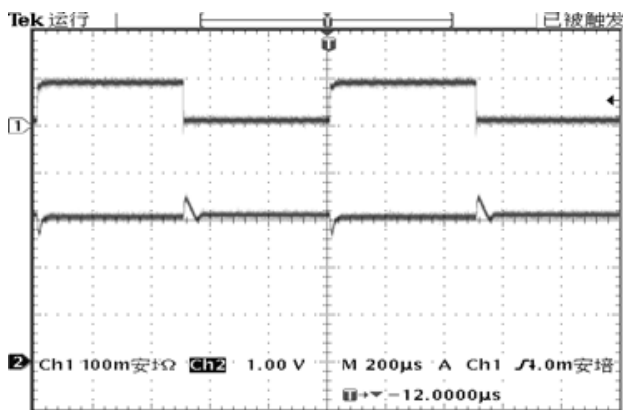


Channel 2: Output Voltage

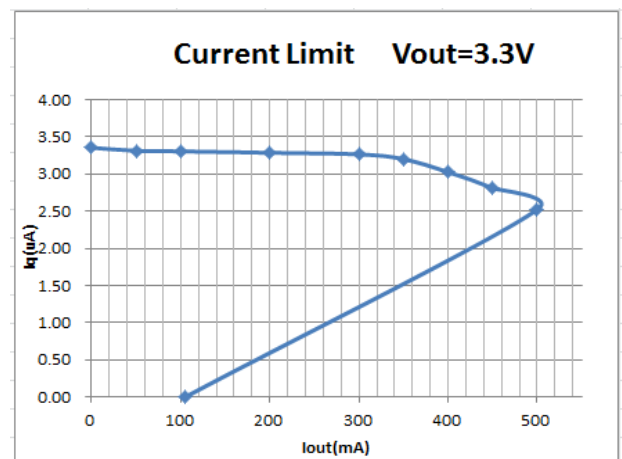
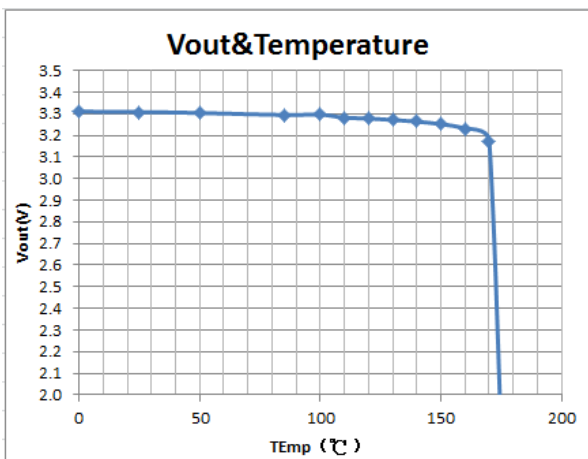
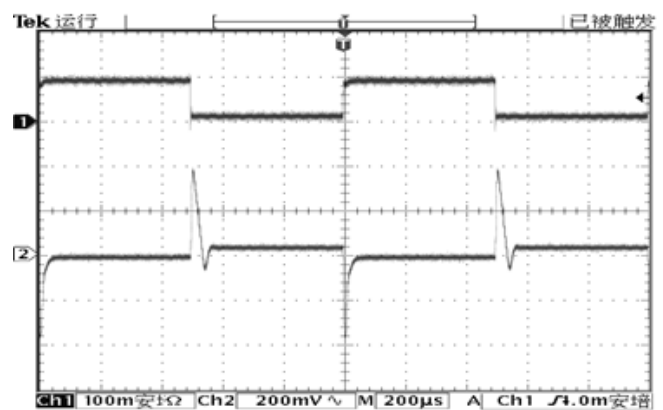


Load Transient Response ($C_{IN}=C_{OUT}=1\mu F$, $I_{OUT}=1\leftrightarrow 100mA$, $V_{OUT}=3V$)

Channel 1: Output Current



Channel 2: Output Voltage



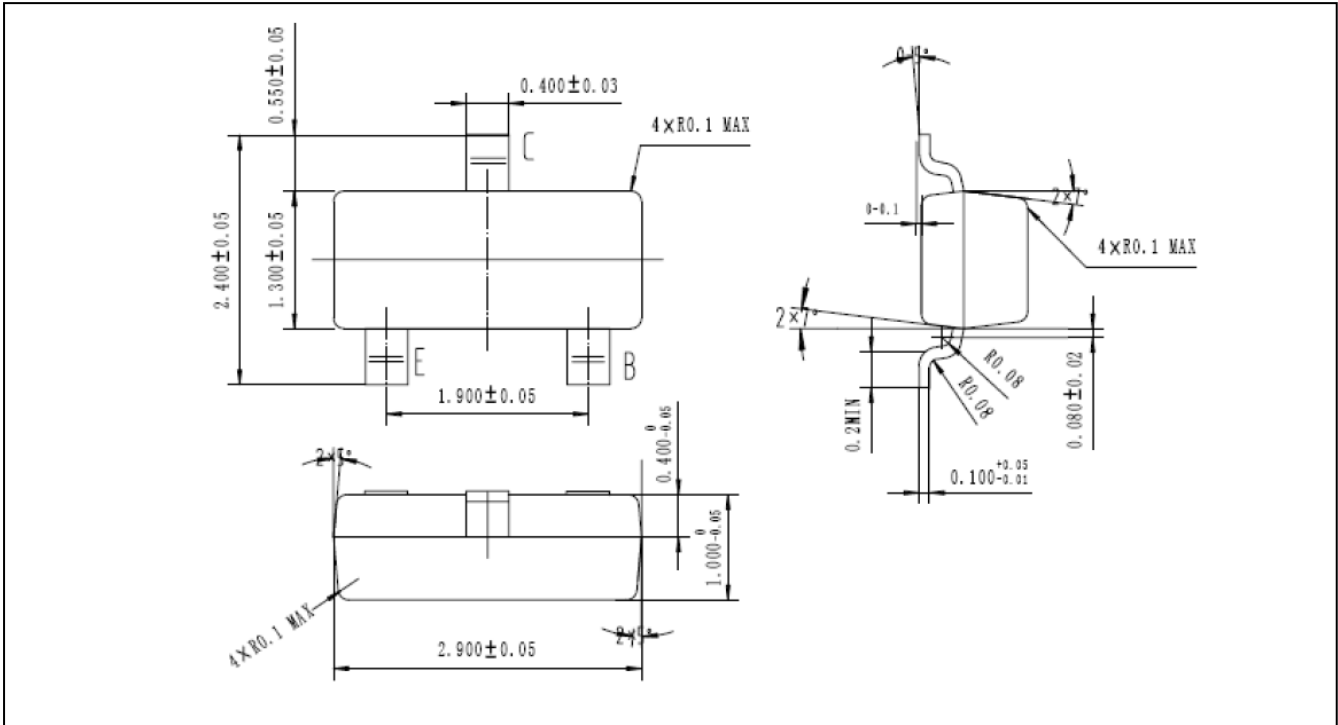


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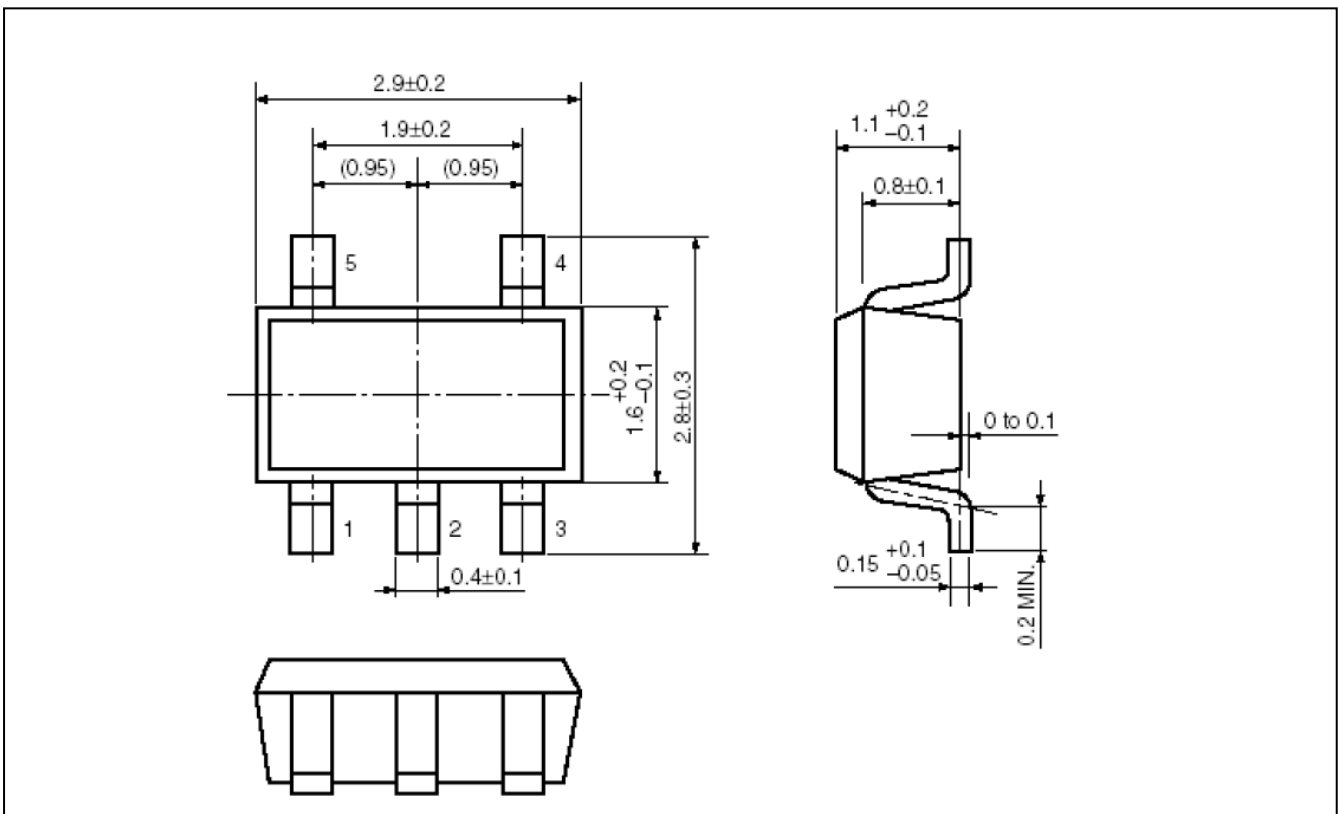
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Packing Information

TSOT-23-3



SOT-23-5



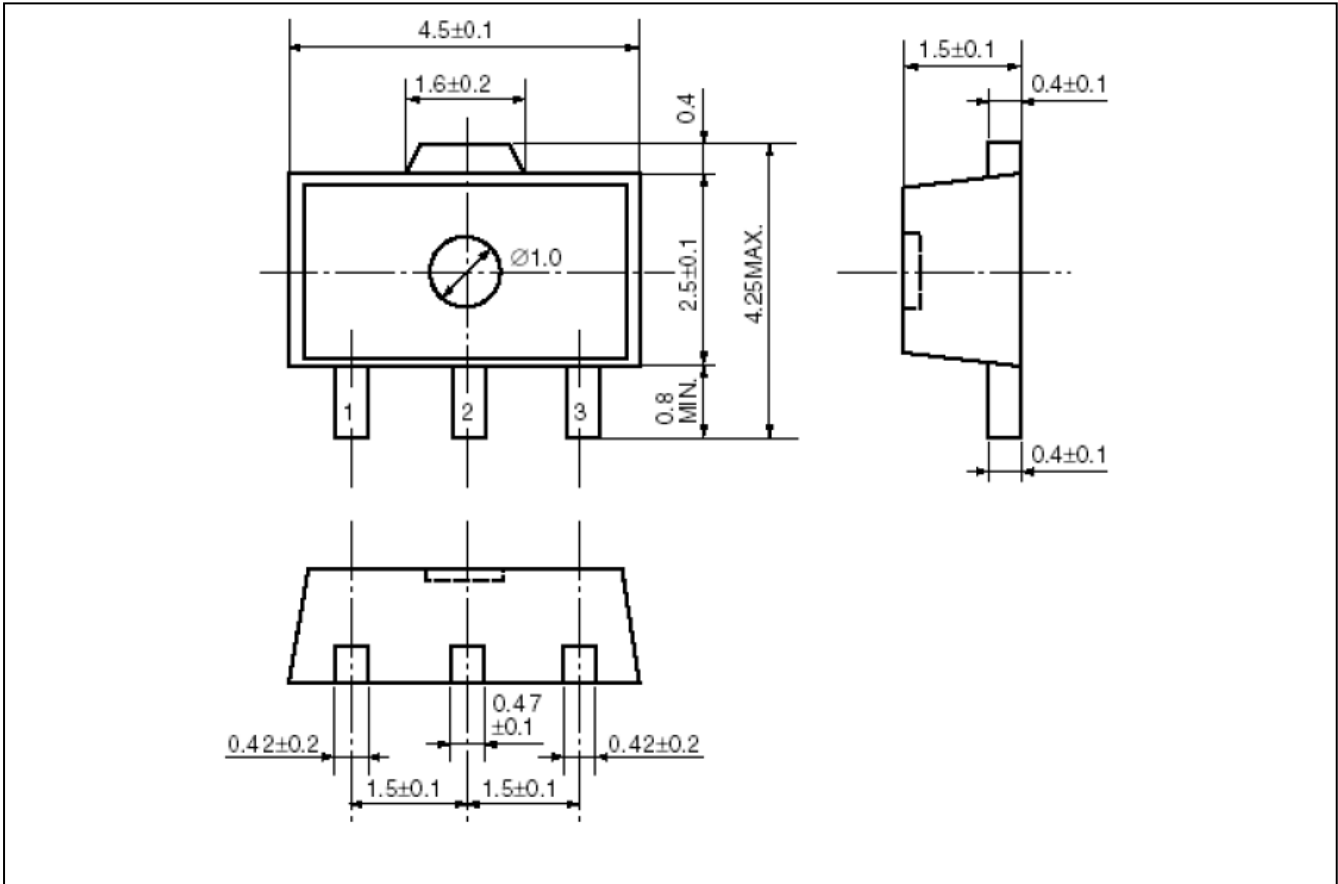


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Packing Information

SOT-89-3





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Notes

ACE does not assume any responsibility for use as critical components in life support devices or systems without the express written approval of the president and general counsel of ACE Electronics Co., LTD. As sued herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury to the user.
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.