



ACE519C

500mA High PSRR, Linear Regulator

Description

ACE519C series are a group of positive voltage output, low power consumption, low dropout voltage regulators. It can provide foldback short-circuit protection and output current limit function.

ACE519C can provide output value in the range of 1.0V~4.5V every 0.1V step. It also can be customized on command. ACE519C can also work under a wide input voltage ranging from 2V to 7V.

ACE519C includes high accuracy voltage reference, error amplifier, current limit circuit and output driver module.

ACE519C has 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 $\pm 2\%$.

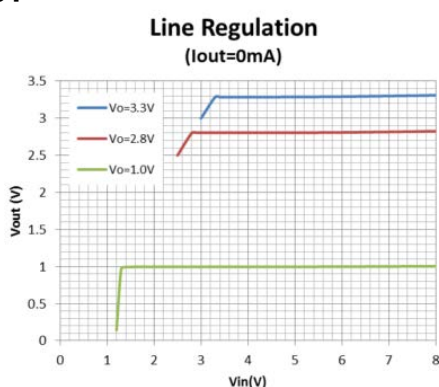
Features

- Input voltage range: 2~7V
- Output voltage range: 1.0V~4.5V (customized on command every 0.1V step)
- Low power consumption: 35uA (Typ.)
- Low output noise (47uVRMS)
- Shutdown mode: 0.1uA
- Low dropout voltage:
 - 300mV@300mA (Typ.)
 - 500mV@500mA (Typ.)
- High ripple rejection: 70dB@1KHz (Typ.)
- Low temperature coefficient: $\pm 100\text{ppm}/^\circ\text{C}$
- Excellent line regulation: 0.05%/V
- Build-in chip enable circuit
- Highly accurate: $\pm 2\%$
- Output current limit 700mA@ $V_{\text{OUT}}=3.3\text{V}$
- Fold-back short circuit current 250mA@ $V_{\text{OUT}}=3.3\text{V}$

Application

- Power source for cellular phones and various kind of PCSs
- Battery Powered equipment
- Power Management of MP3, PDA, DSC, Mouse, PS2 Games
- Voltage Reference
- Regulation after Switching Power

Typical Performance Characteristic:





ACE519C

500mA High PSRR, Linear Regulator

Absolute Maximum Ratings

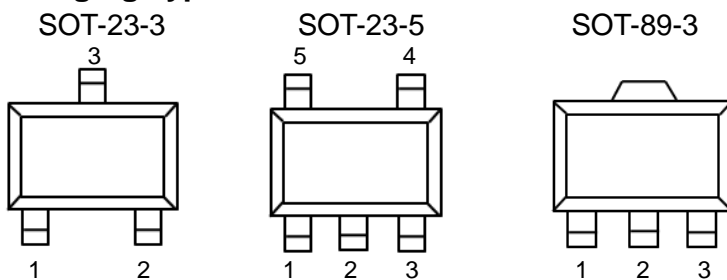
Parameter	Symbol	Max	Unit
Max Input Voltage	V_{IN}	7	V
Operating Junction Temperature	T_J	125	°C
Output Current		500	mA
Ambient Temperature	T_A	-40~85	°C
Power Dissipation SOT-23-3 SOT-23-5 SOT-89-3		250 250 250	mW
Storage temperature	T_S	-40~150	°C
Lead Temperature & Time		260 to 85	°C

Note:

Exceed these limits to damage to the device.

Exposure to absolute maximum rating conditions may affect device reliability.

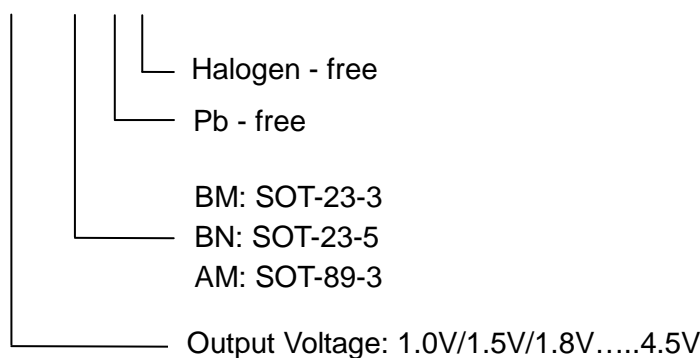
Packaging Type



SOT-23-3L	SOT-23-5	SOT-89-3	Description	Function
2	5	3	V_{out}	Output pin
3	1	2	V_{in}	Input pin
1	2	1	V_{SS}	Ground pin
	3		CE	Chip Enable pin
	4		NC	No Connection

Ordering information

ACE519C XX XX + H

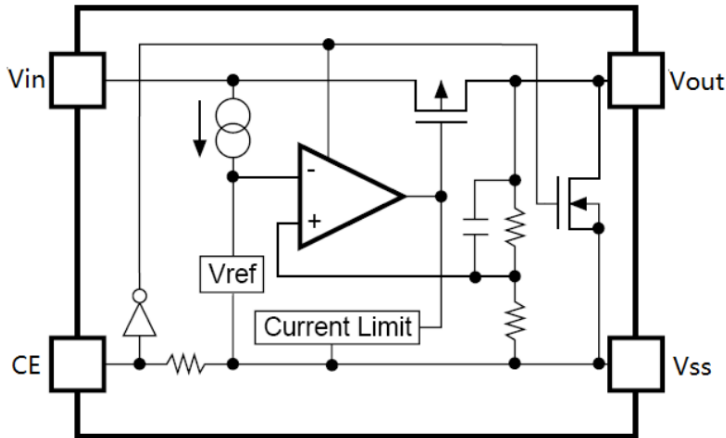




ACE519C

500mA High PSRR, Linear Regulator

Block Diagram



Recommended Work Conditions

Item	Min	Max	Unit
Input Voltage Range	2	7	V
Ambient Temperature	-40	85	°C

Electrical Characteristics

ACE519C, For Arbitrary Output Voltage. (Test Conditions: $C_{in}=1\mu F, C_{out}=1\mu F, T_A=25^\circ C$, unless otherwise specified.)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
V_{in}	Input Voltage		2		7	V
V_{out}	Output Voltage	$V_{out} > 1.5V$	$V_{out} \times 0.98$	V_{out}	$V_{out} \times 1.02$	V
		$V_{out} \leq 1.5V$	$V_{out} - 0.03$		$V_{out} + 0.03$	
$I_{out} (Max.)$	Maximum Output Current	$V_{in} - V_{out} = 1V$	500			mA
V_{drop}^1	Dropout Voltage, $V_{out} \geq 2.8V$	$I_{out} = 100mA$		100	150	mV
		$I_{out} = 300mA$		300	400	mV
		$I_{out} = 500mA$		500	800	mV
$\frac{\Delta V_{out}}{\Delta V_{in} \times V_{out}}$	Line Regulation	$I_{out} = 40mA$ $2.8V \leq V_{in} \leq 6V$		0.05	0.2	%/V
$\frac{\Delta V_{out}}{\Delta I_{out}}$	Load Regulation	$V_{in} = Set\ V_{out} + 1V$ $1mA \leq I_{out} \leq 500mA$		70	100	mV
I_{ss}	Supply Current	$V_{in} = Set\ V_{out} + 1V$		35	80	μA
$I_{standby}$	Supply Current (Standby)	$V_{in} = Set\ V_{out} + 1V$ $V_{ce} = V_{ss}$		0.1	1.0	μA
$\frac{\Delta V_{out}}{\Delta T \times V_{out}}$	Output Voltage Temperature Coefficient	$I_{out} = 30mA$		± 100		ppm/ $^\circ C$



ACE519C

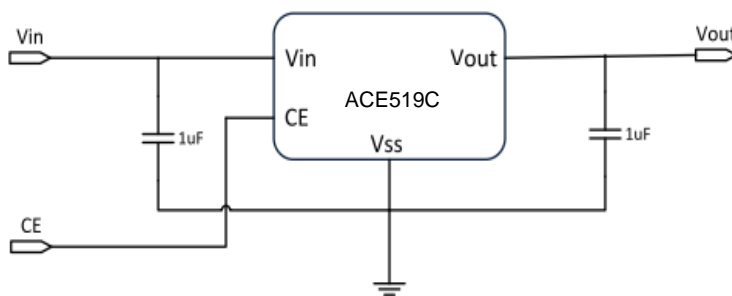
500mA High PSRR, Linear Regulator

PSRR	Ripple Rejection	F=1KHz, Ripple=0.5Vp-p Vin=Set Vout+1V		70		dB
Ilim	Current Limit			700		mA
Rcepd	CE pin pull down resistor	CE=Vin=5V		5		Mohm
Vceh	CE Input Voltage "H"		1.5		Vin	V
Vcel	CE Input Voltage "L"		0		0.25	V
en	Output Noise	BW=10Hz~100kHz		47		uVrms

Note: $V_{drop} = V_{in1} - (V_{out2} * 0.98)$ V_{out2} is the output voltage when $V_{in} = V_{out1} + 1.0V$ and $I_{out} = 500mA$.

V_{in1} is the input voltage at which the output voltage becomes 98% of V_{out1} after gradually decreasing the input voltage.

Typical Application Circuit



Note: Input capacitor ($C_{in} = 1\mu F$) and Output capacitor ($C_{out} = 1\mu F$) are recommended in all application circuit.

Explanation :

ACE519C series is a group of positive voltage output, low noise, low power consumption, low dropout voltage regulator.

ACE519C can provide output value in the range of 1.0V~4.5V every 0.1V step. It also can be customized on command.

ACE519C includes high accuracy voltage reference, error amplifier, current limit circuit and output driver module.

ACE519C has 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 $\pm 2\%$.

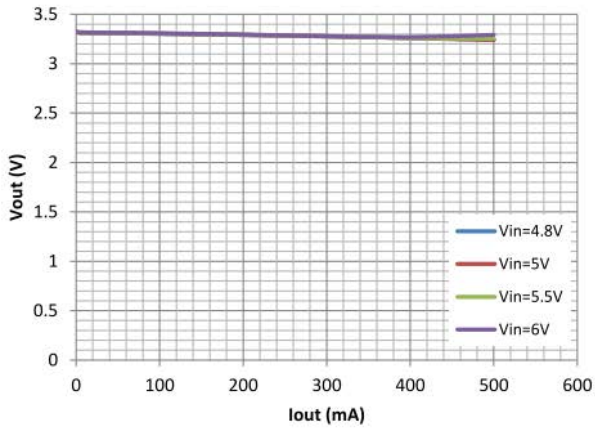


ACE519C

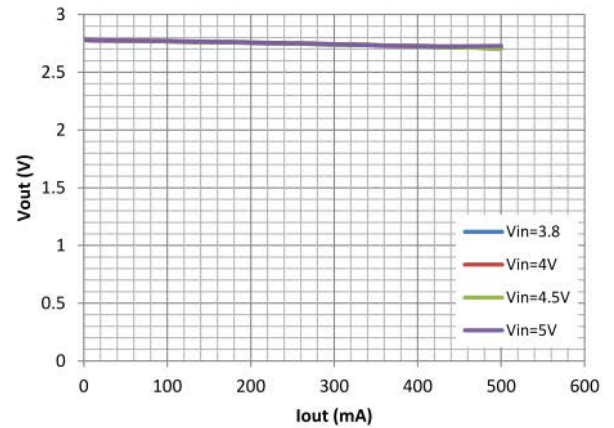
500mA High PSRR, Linear Regulator

Typical Performance Characteristics (T_A=25°C)

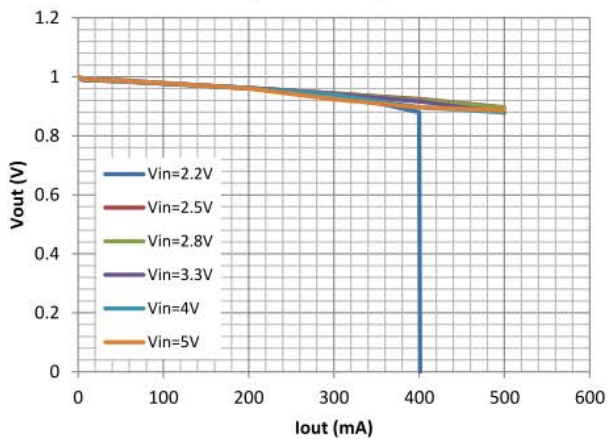
Load Regulation
(V_{out}=3.3V)



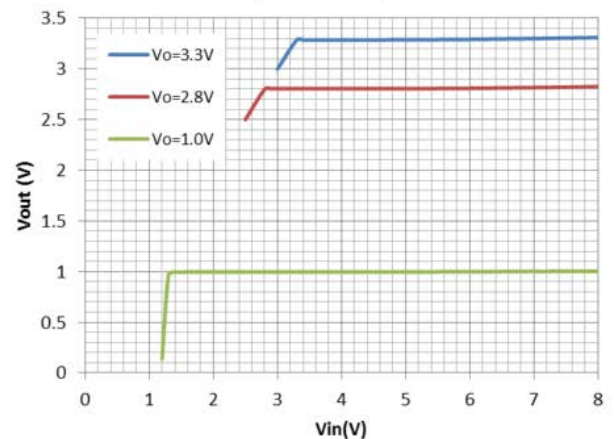
Load Regulation
(V_{out}=2.8V)



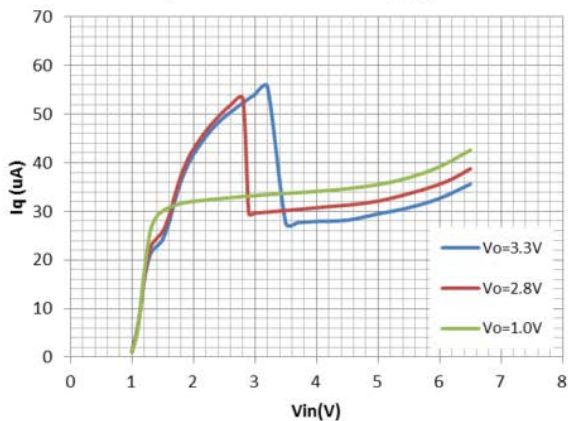
Load Regulation
(V_{out}=1.0V)



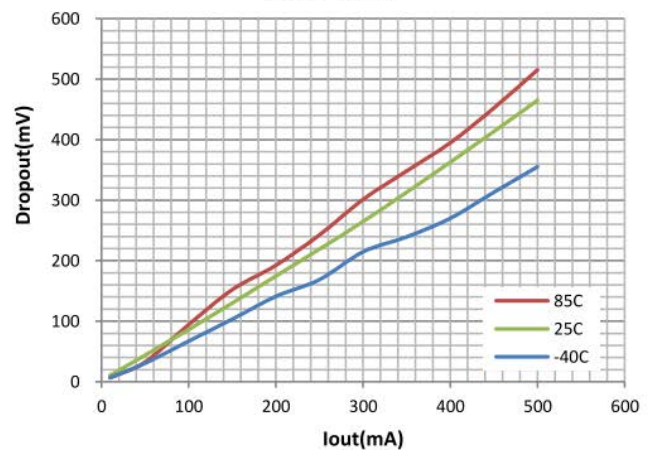
Line Regulation
(I_{out}=0mA)



Quiescent Current
(I_{out}=0mA and CE=high)



Dropout Voltage
(V_{out}=3.3V)



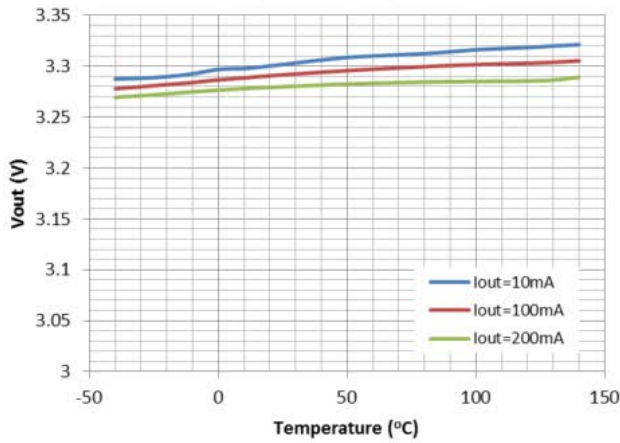


ACE519C

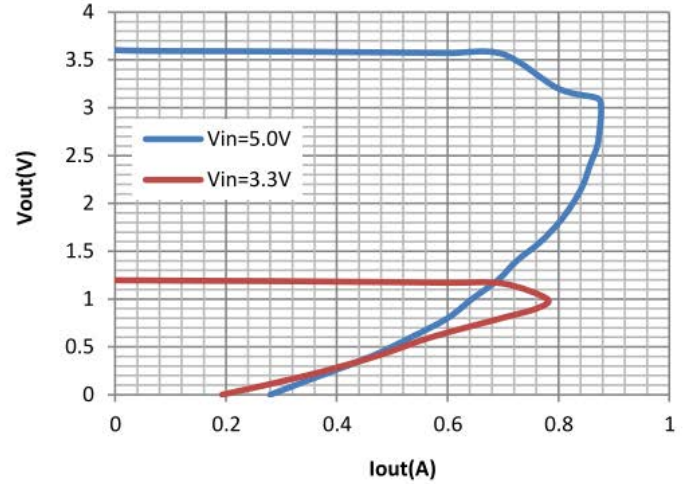
500mA High PSRR, Linear Regulator

Typical Performance Characteristics

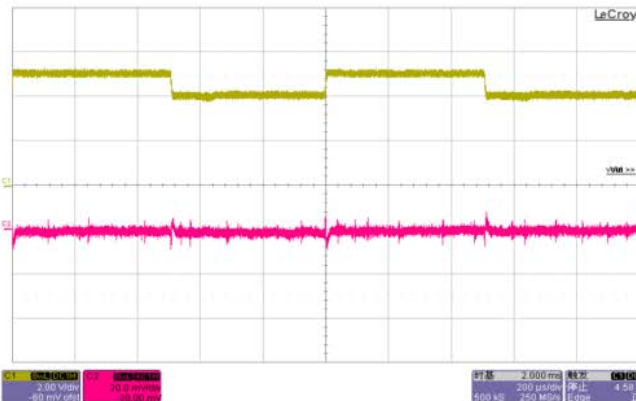
Vout Temperature Coefficient
(Vout=3.3V)



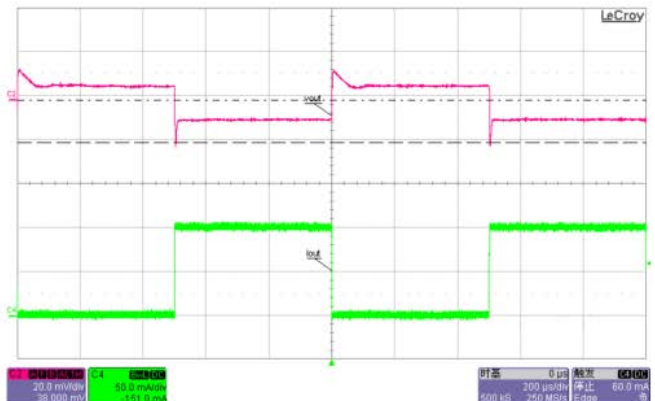
Current Limit



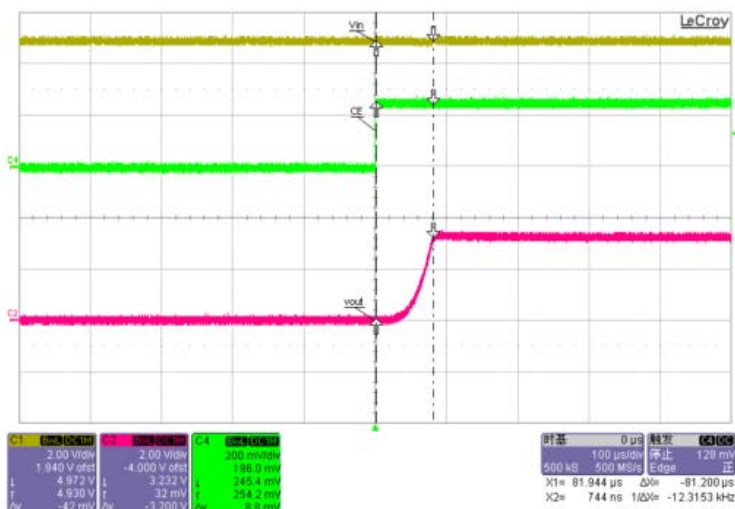
Line Transient Response
Vout=3.3V, Iout=20mA
(Brown: Vin; Red: Vout)



Load Transient Response
Vin=5V, Vout=3.3V, Iout=1-100mA
(Green: Iout; Red: Vout)



CE Chip Enable Response



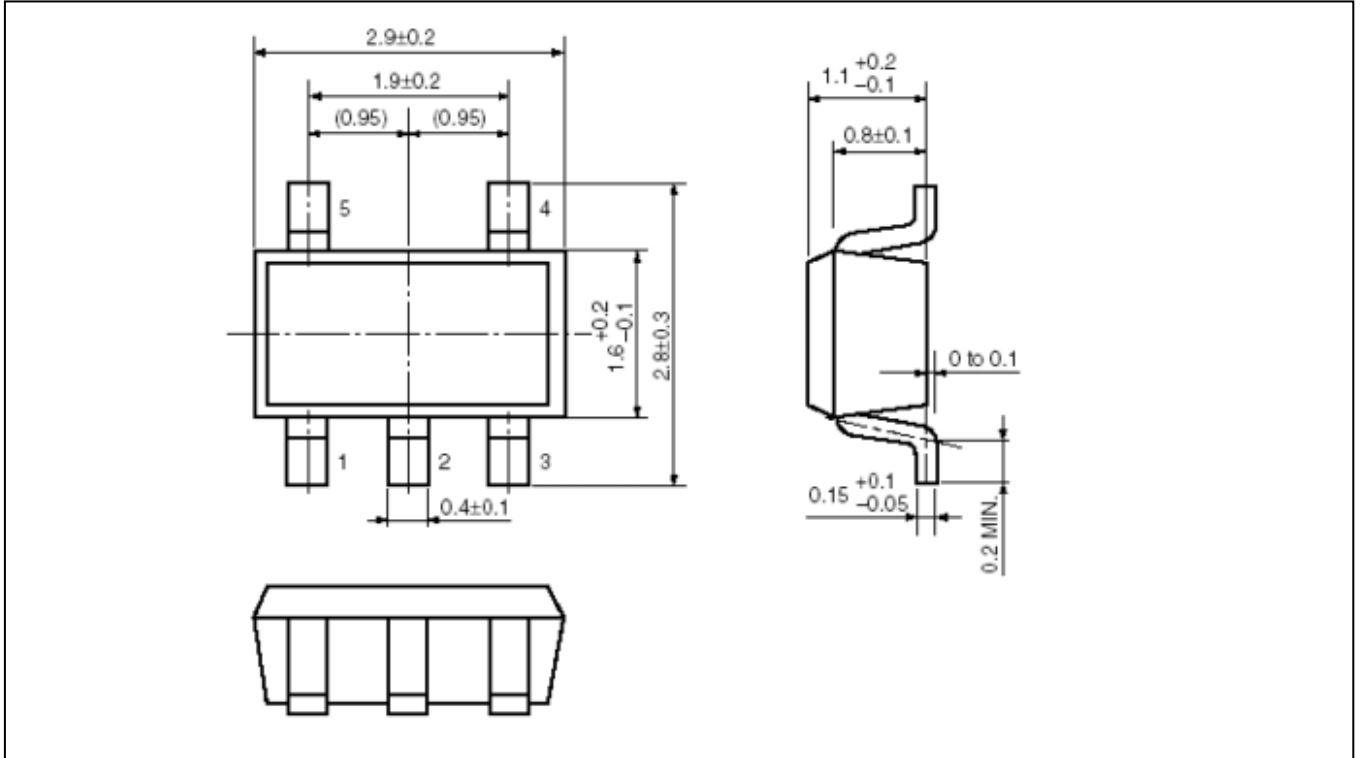


ACE519C

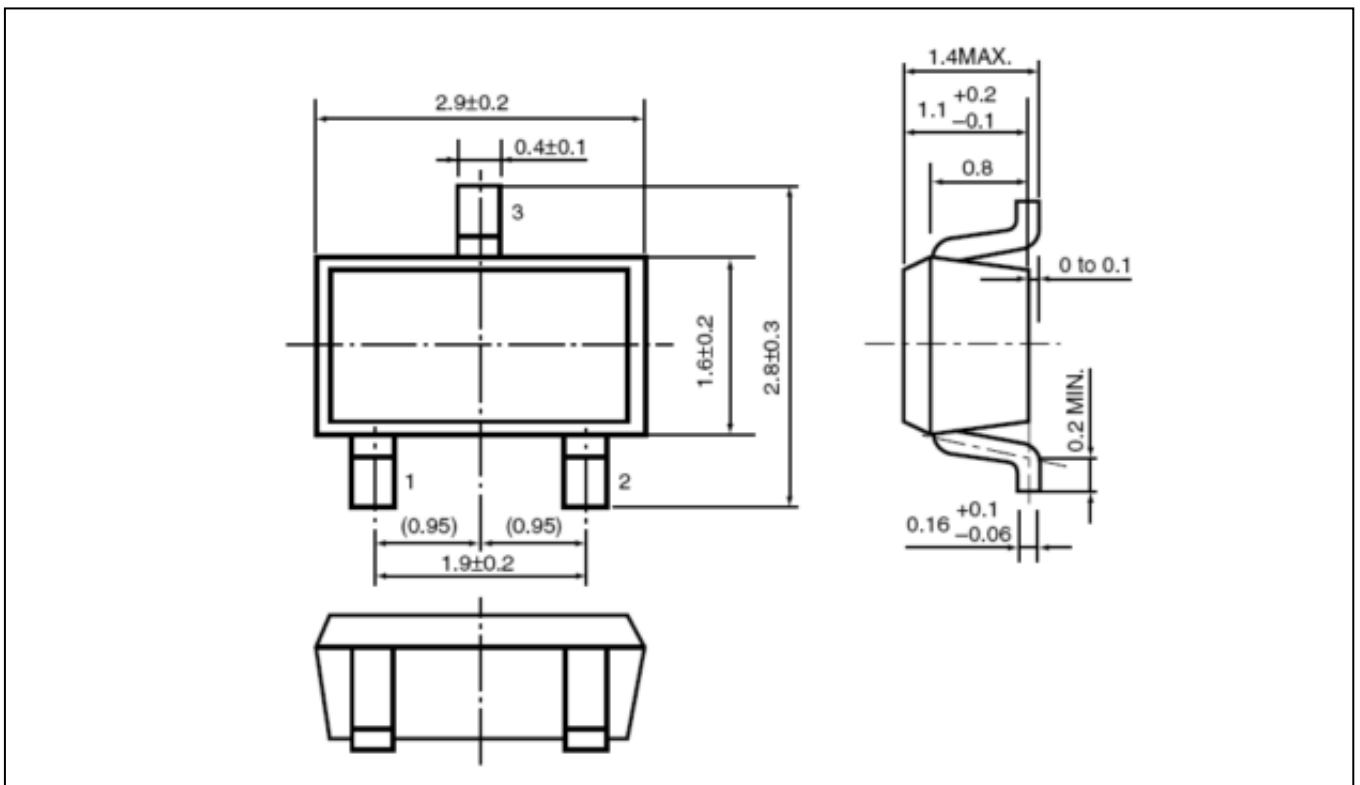
500mA High PSRR, Linear Regulator

Packing Information

SOT-23-5



SOT-23-5



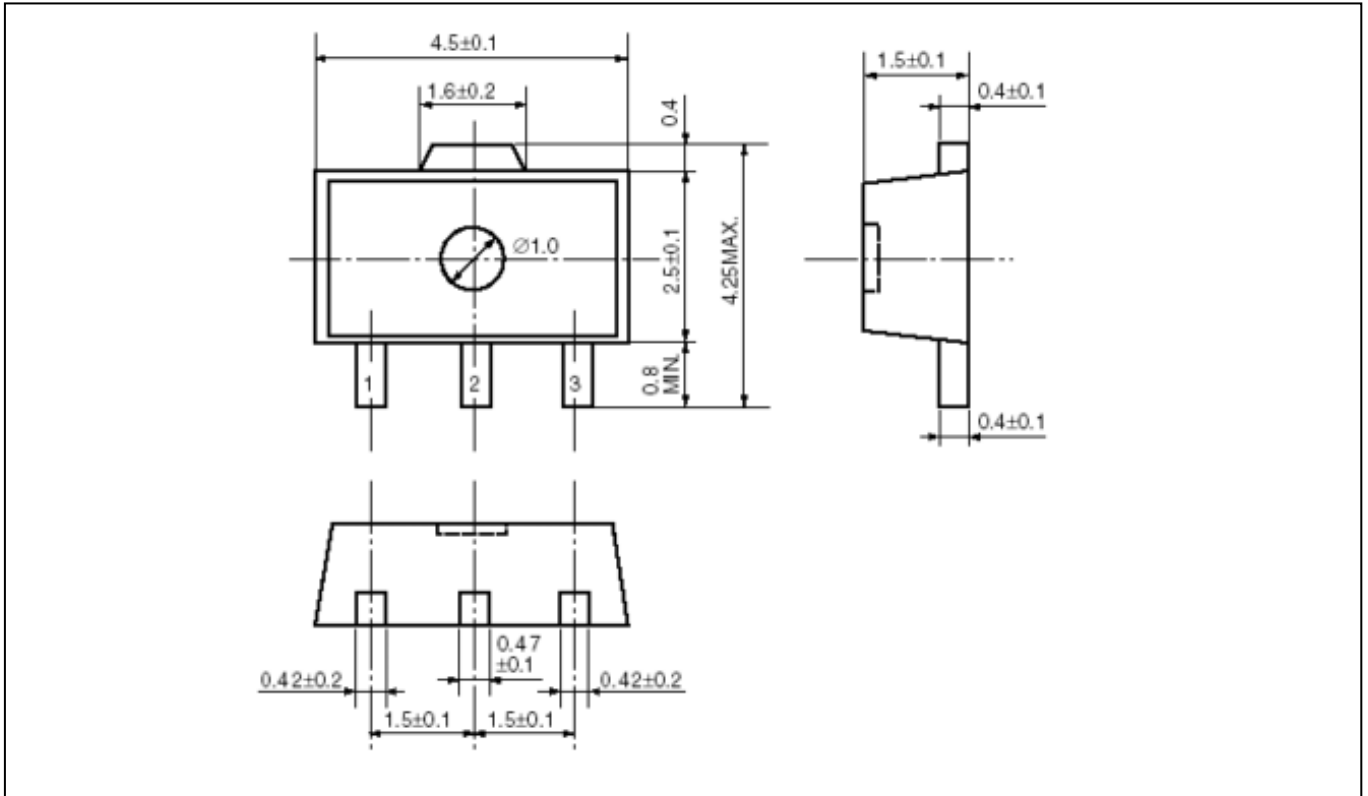


ACE519C

500mA High PSRR, Linear Regulator

Packing Information

SOT-89-3





ACE519C

500mA High PSRR, Linear Regulator

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 used 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.

ACE Technology Co., LTD.
<http://www.ace-ele.com/>