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 ±2%.

ACE519C is available in SOT-23-3, SOT-23-5 and SOT89-3 packages which are lead free.

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 (Vout=3.3V) 500mV@500mA (Vout=3.3V)
- High ripple rejection:70dB@1KHz (Typ.)
- Low temperature coefficient: ±100ppm/°C
- Excellent line regulation: 0.05%/V
- Build-in chip enable circuit
- Highly accurate: ±2%
- Output current limit 800mA@Vout=3.3V
- Fold-back short circuit current 250mA@Vout=3.3V

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

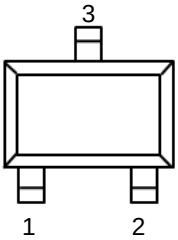
Absolute Maximum Ratings

Parameter		Value
Max Input Voltage		8V
Operating Junction Temperature(Tj)		125°C
Output Current		500mA
Ambient Temperature(Ta)		-40°C –85°C
Power Dissipation	SOT-23-3	250mW
	SOT-23-5	250mW
	SOT-89-3	500mW
Storage Temperature(Ts)		-40°C -150°C
Lead Temperature & Time		260°C,10S

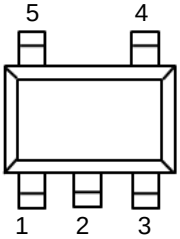
Note: Exceed these limits to damage to the device.
Exposure to absolute maximum rating conditions may affect device reliability.

Packaging Type

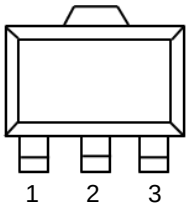
SOT-23-3



SOT-23-5



SOT-89-3



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

Ordering information

ACE519C XX XX + H

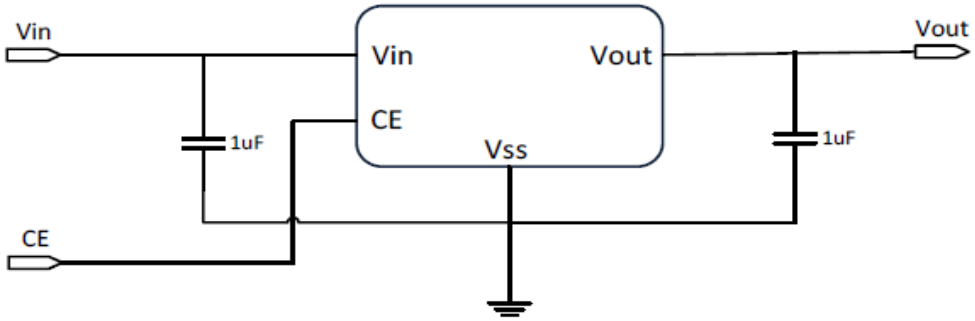
- XX: Output Voltage: 1.0V/1.5V/1.8V…..4.5V
- XX: BM: SOT-23-3; BN: SOT-23-5; AM: SOT-89-3
- Pb - free
- Halogen - free

Recommended Work Conditions

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

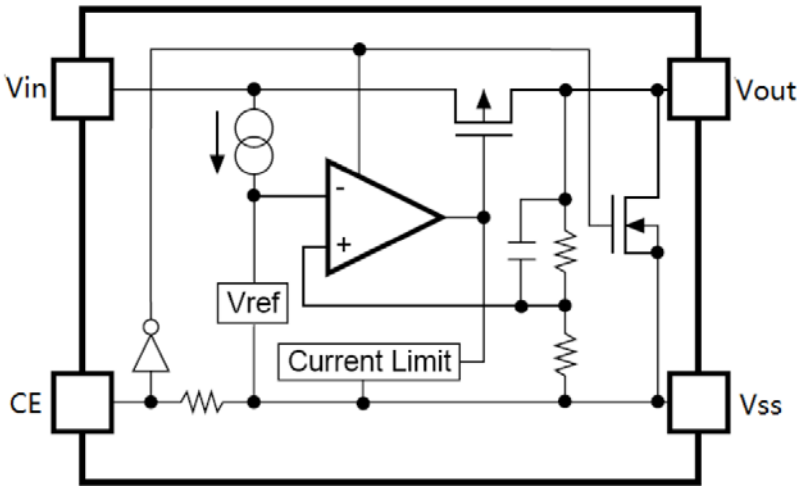
The operation ambient temperature range is verified on several test samples. Not a test condition for volume production whose test is only performed under 25°C.

Typical Application Circuit



Note: Input capacitor (Cin=1uF) and Output capacitor (Cout=1uF) are recommended in all application circuit.

Block Diagram



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.

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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±2%.

Electrical Characteristics

ACE519C, For Arbitrary Output Voltage.(Test Conditions: Cin=1uF,Cout=1uF,T_A=25°C, unless otherwise specified.)

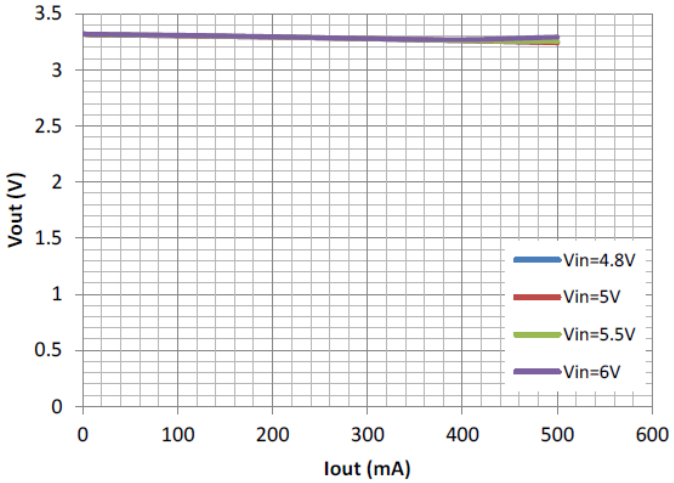
Symbol	Parameter		Conditions	Min	Typ	Max	Units
Vin	Input Voltage			2		7	V
Vout	Output Voltage	Vout>1.5V	Vin=Set Vout+1V 1mA≤Iout≤30mA	Vout x0.98	Vout	Vout x 1.02	V
		Vout<=1.5V		Vout -0.03		Vout +0.03	
Iout (Max.)	Maximun Output Current		Vin-Vout=1V	500			mA
Vdrop[1]	Dropout Voltage,Vout≥2.8V		Iout=100mA		100	150	mV
			Iout=300mA		300	400	mV
			Iout=500mA		500	800	mV
ΔVout / ΔVin x Vout	Line Regulation		Iout=40mA 2.8V≤Vin≤6V		0.05	0.2	%/V
ΔVout/ΔIout	Load Regulation		Vin=Set Vout+1V 1mA≤Iout≤500mA		70	100	mV
Iss	Supply Current		Vin=Set Vout+1V		35	80	uA
Istandby	Supply Current (Srandby)		Vin=Set Vout+1V Vce=Vss		0.1	1.0	uA
ΔVout / ΔT x Vout	Output Voltage Temperature Coefficient		Iout=30mA		±100		ppm/°C

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

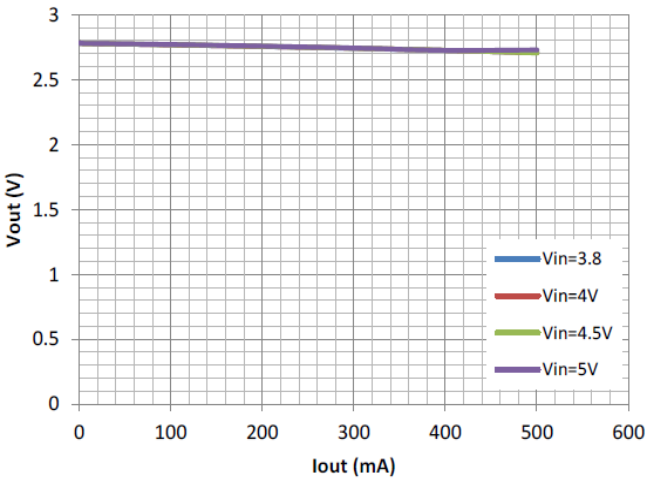
Note: Vdrop=Vin1-(Vout2*0.98) Vout2 is the output voltage when Vin=Vout1+1.0V and Iout=500mA.
Vin1 is the input voltage at which the output voltage becomes 98% of Vout1 after gradually decreasing the input voltage.

Typical Performance Characteristics (T_A=25℃)

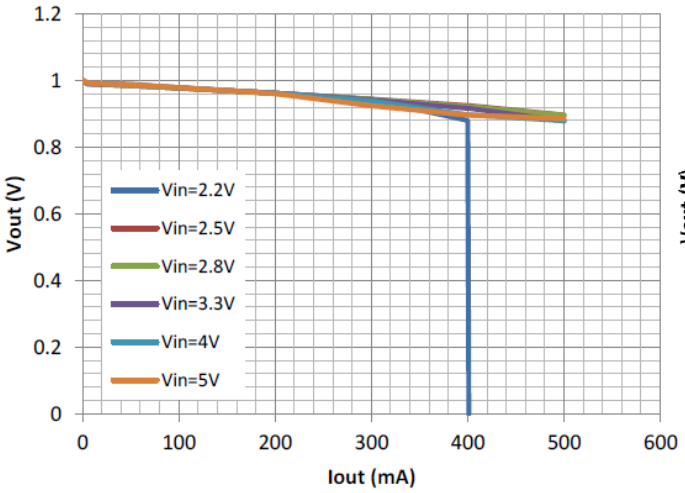
Load Regulation
(Vout=3.3V)



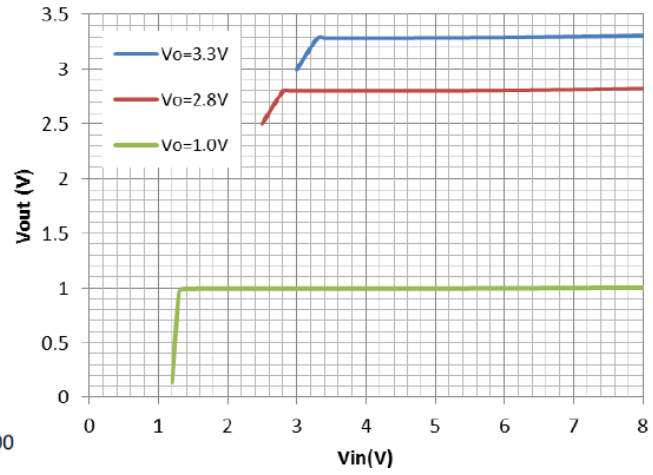
Load Regulation
(Vout=2.8V)



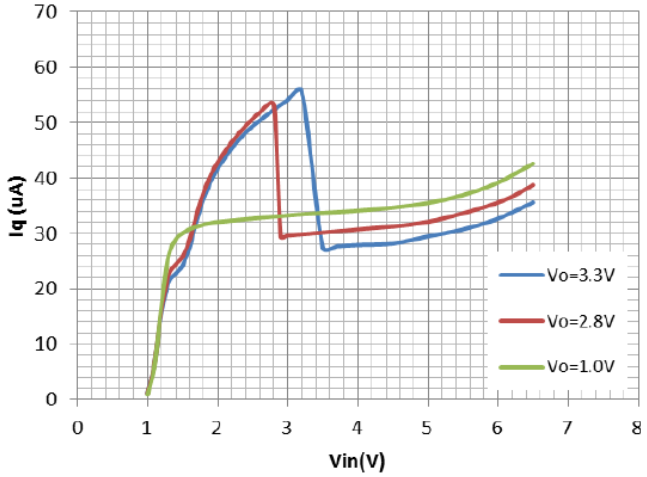
Load Regulation
(Vout=1.0V)



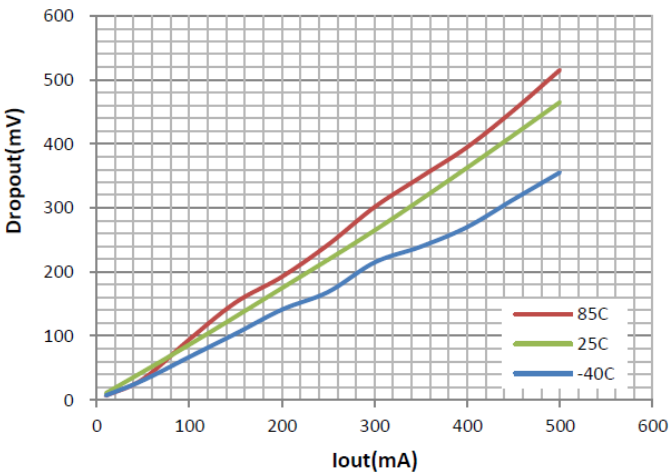
Line Regulation
(Iout=0mA)



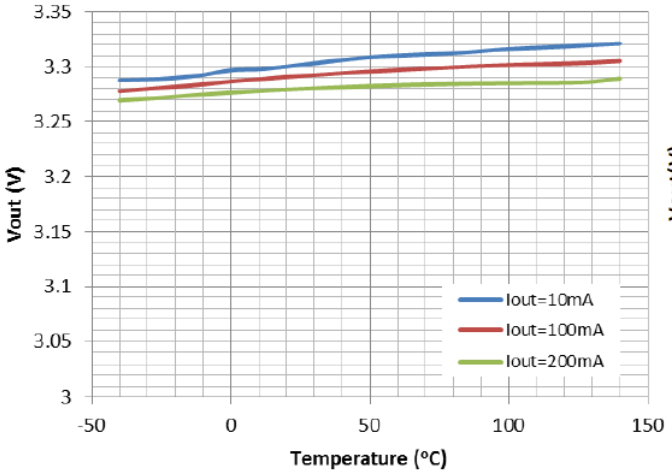
Quienscent Current
(Iout=0mA and CE=high)



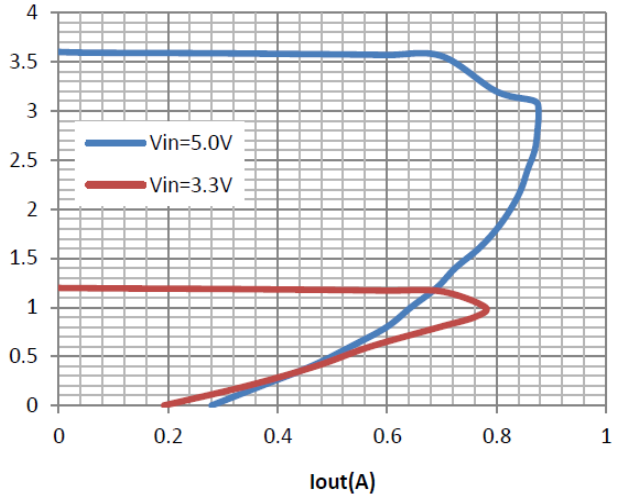
Dropout Voltage
(Vout=3.3V)



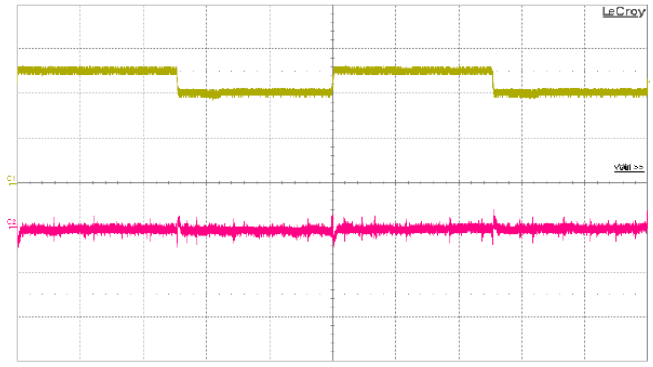
Vout Temperature Coefficient
(Vout=3.3V)



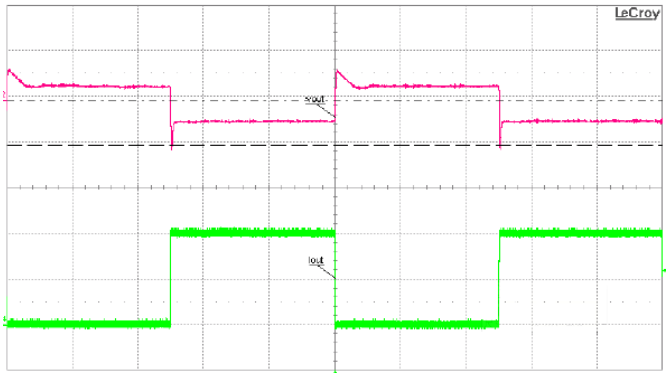
Current Limit



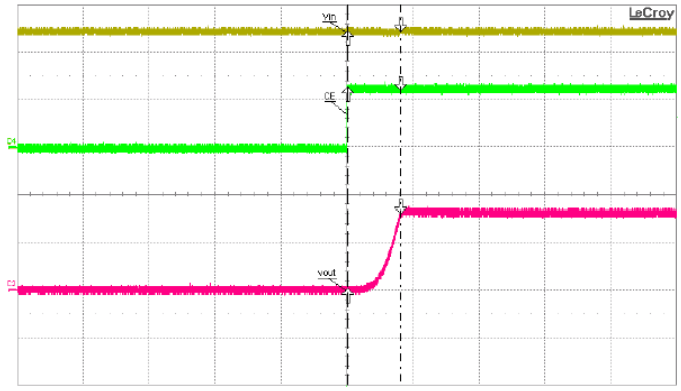
Line Transient Response
Vout=3.3V, Iout=20mA
(brown: Vin; Red: Vout)



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

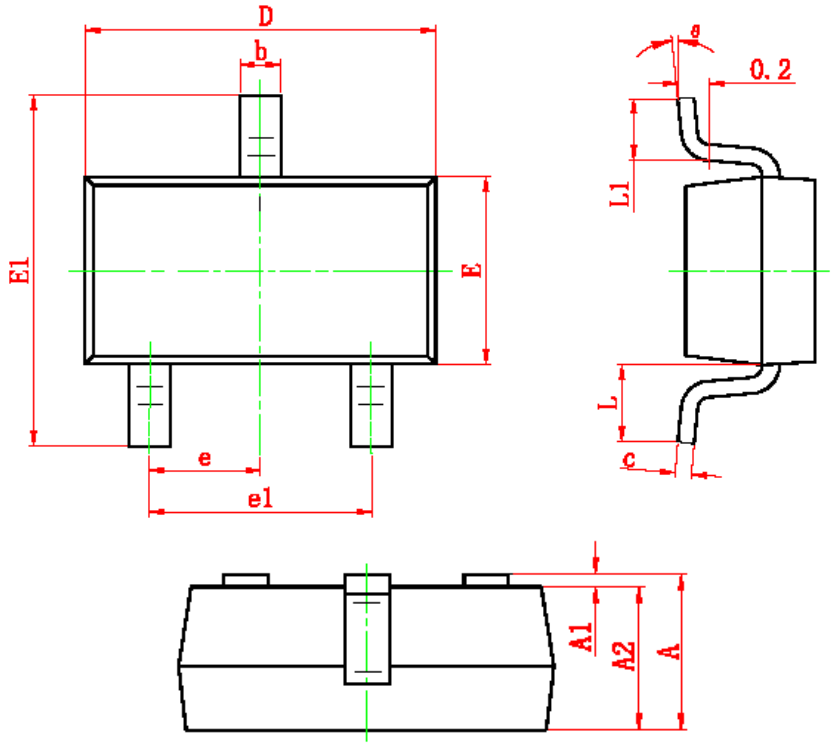


CE Chip Enable Response



Packing Information

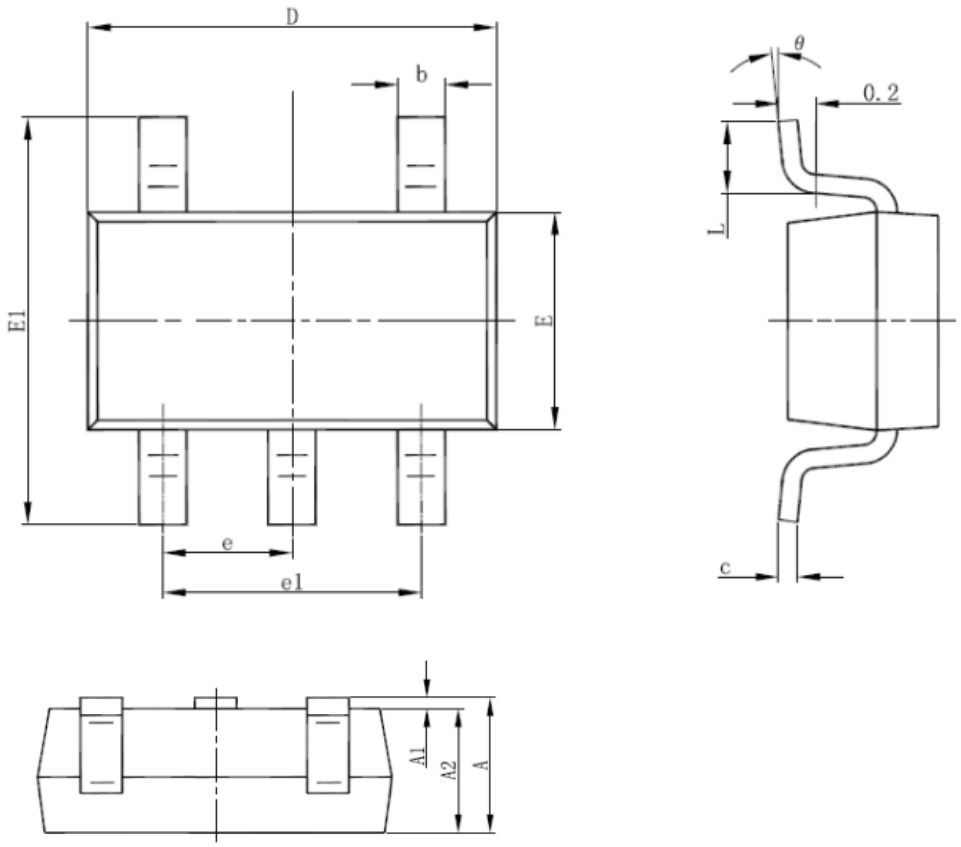
SOT-23-3



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.200	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.100	0.035	0.039
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	6°

Packing Information

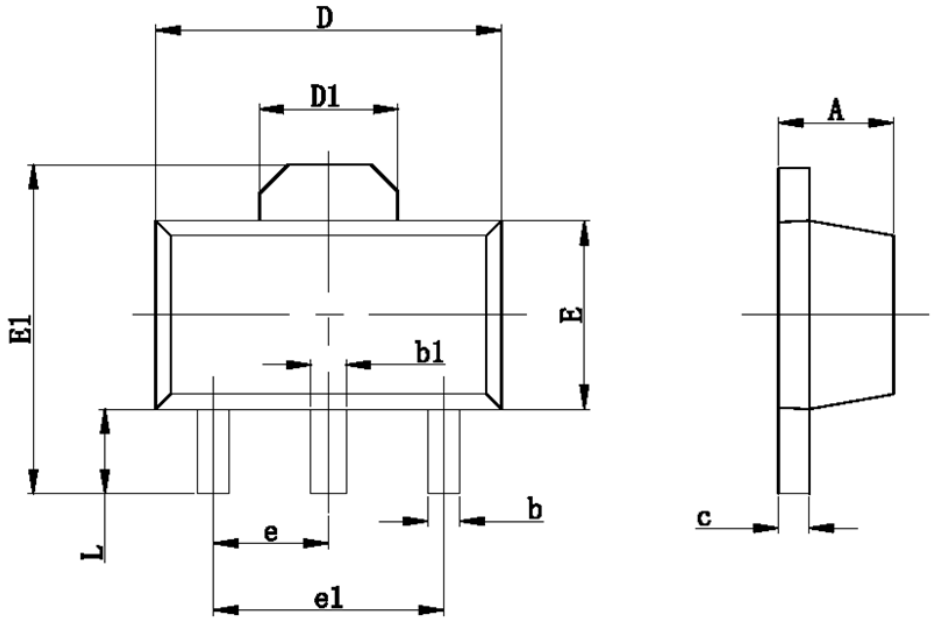
SOT-23-5



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

Packing Information

SOT-89-3



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.400	1.600	0.055	0.063
b	0.320	0.520	0.013	0.197
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550 REF		0.061 REF	
E	2.300	2.600	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500 TYP		0.060 TYP	
e1	3.000 TYP		0.118 TYP	
L	0.900	1.200	0.035	0.047

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 shoes 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.