



ACE555

300mA High PSRR, Linear Regulator

Description

ACE555 series are a group of positive voltage output, low power consumption, low dropout voltage regulators.

ACE555 can provide output value in the range of 1.0V~4.5V every 0.1V step. It also can be customized on command. ACE555 can also work under a wide input voltage ranging from 1.5V to 6V.

ACE555 includes high accuracy voltage reference, error amplifier, current limit circuit and output driver module.

ACE555 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 $\pm 1\%$ 、 $\pm 2\%$.

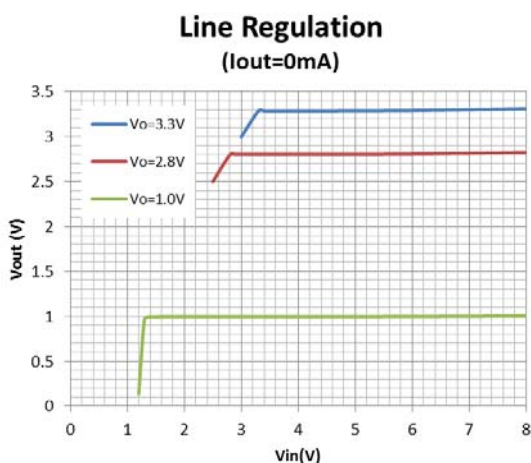
Features

- Input voltage range: 1.5~6V
- Output voltage range: 1.0V~4.5V (customized on command every 0.1V step)
- Low power consumption: 25uA (Typ.)
- Low output noise (47uVRMS)
- Shutdown mode: 0.1uA
- Low dropout voltage: 300mV@300mA (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: $\pm 1\%$ 、 $\pm 2\%$
- Output current limit
- Fold-back output short circuit protection

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:





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Absolute Maximum Ratings

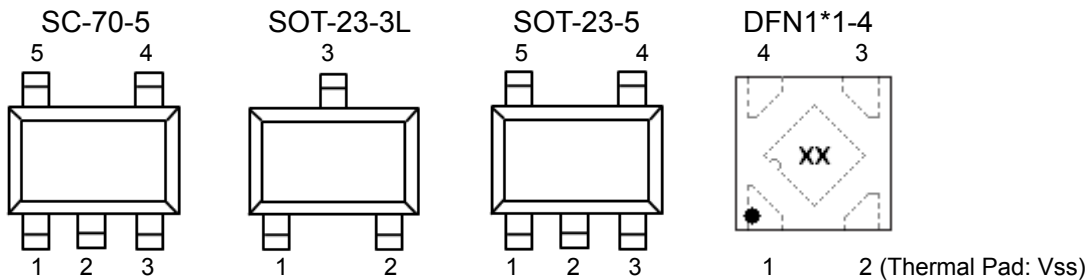
Parameter	Symbol	Max	Unit
Max Input voltage	V_{IN}	8	V
Power Dissipation SC-70-5 SOT-23-3L SOT-23-5 DFN1*1-4		250 250 250 600	mW
Junction temperature	T_J	125	°C
Storage temperature	T_S	- 45 to 150	°C
Output Current		300	mA
Ambient Temperature	T_A	-40 to 85	°C

Note: Heat Sink Area of PCB for DFN1x1-4 is recommended at least 2.5mmx4mm.

Exceed these limits to damage to the device.

Exposure to absolute maximum rating conditions may affect device reliability.

Packaging Type



SC-70-5	SOT-23-3L	SOT-23-5	DFN1*1-4	Description	Function
5	2	5	1	Vout	Output pin
1	3	1	4	Vin	Input pin
2	1	2	2	V_{SS}	Ground pin
3		3	3	CE	Chip Enable pin
4		4		NC	No Connection



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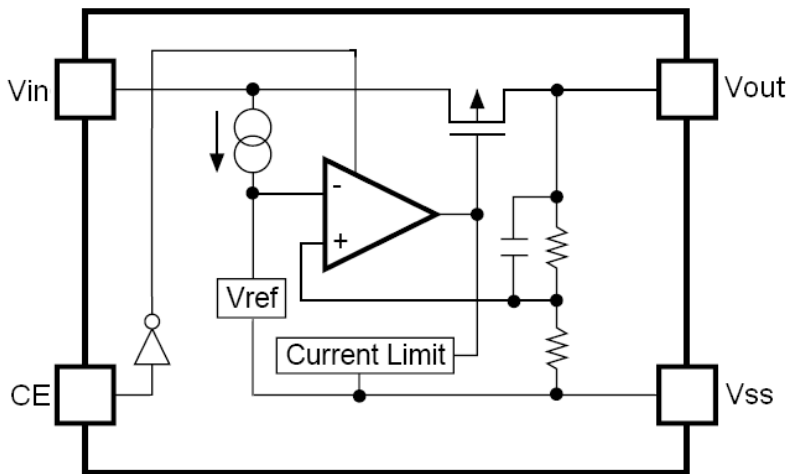
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Ordering information

ACE555 X XX XX + H

- Halogen - free
- Pb - free
- HN: SC-70-5
- BM: SOT-23-3L
- BN: SOT-23-5
- IN: DFN1*1-4
- Output Voltage: 1.0V/1.5V/1.8V.....4.5V
- Reference Voltage accuracy :
 - A : 1%
 - B : 2%

Block Diagram



Recommended Work Conditions

Item	Min	Max	Unit
Input Voltage Range	1.5	6	V
Ambient Temperature	-40	85	°C



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Electrical Characteristics

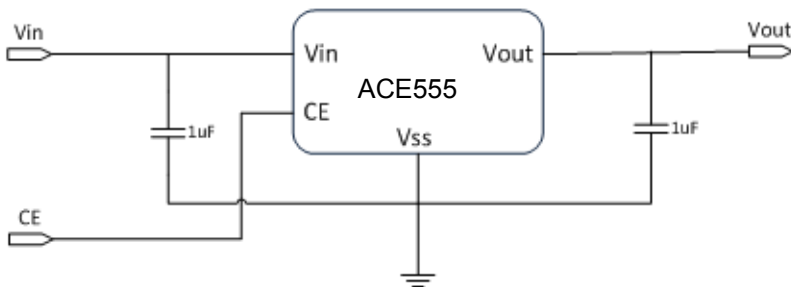
ACE555, For Arbitrary Output Voltage.(Test Conditions: $C_{in}=1\mu F, C_{out}=1\mu F, T_A=25^\circ C$, unless otherwise specified.)

Symbol	Parameter		Conditions	Min	Typ	Max	Units
V_{in}	Input Voltage			1.5		6	V
V_{out}	Output Voltage	$V_{out} > 1.5V$	$V_{in} = \text{Set } V_{out} + 1V$ $1mA \leq I_{out} \leq 30mA$	$V_{out} \times 0.98$	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		$V_{in} - V_{out} = 1V$	300			mA
V_{drop1}	Dropout Voltage, $V_{out} \geq 2.8V$		$I_{out} = 100mA$		100	150	mV
			$I_{out} = 300mA$		300	400	mV
$\Delta V_{out} / \Delta V_{in} \times V_{out}$	Line Regulation		$I_{out} = 40mA$ $2.8V \leq V_{in} \leq 6V$		0.05	0.2	%/V
ΔV_{out}	Load Regulation		$V_{in} = \text{Set } V_{out} + 1V$ $1mA \leq I_{out} \leq 300mA$		50	80	mV
I_{ss}	Supply Current		$V_{in} = \text{Set } V_{out} + 1V$		25		μA
$I_{standby}$	Supply Current (Standby)		$V_{in} = \text{Set } V_{out} + 1V$ $V_{ce} = V_{ss}$		0.1	1.0	μA
$\Delta V_{out} / \Delta T \times V_{out}$	Output Voltage Temperature Coefficient		$I_{out} = 30mA$		± 100		ppm/ $^\circ C$
PSRR	Ripple Rejection		$F = 1KHz$, Ripple = 0.5Vp-p $V_{in} = \text{Set } V_{out} + 1V$		70		dB
I_{lim}	Current Limit			300			mA
V_{ceh}	CE Input Voltage "H"			1.5		V_{in}	V
V_{cel}	CE Input Voltage "L"			0		0.25	V
η	Output Noise		$BW = 10Hz \sim 100kHz$		47		μV_{rms}

Note: $V_{drop} = V_{in1} - (V_{out2} \times 0.98)$ V_{out2} is the output voltage when $V_{in} = V_{out1} + 1.0V$ and $I_{out} = 300mA$.

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.



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Explanation :

ACE555 series is a group of positive voltage output, low noise, low power consumption, low dropout voltage regulator.

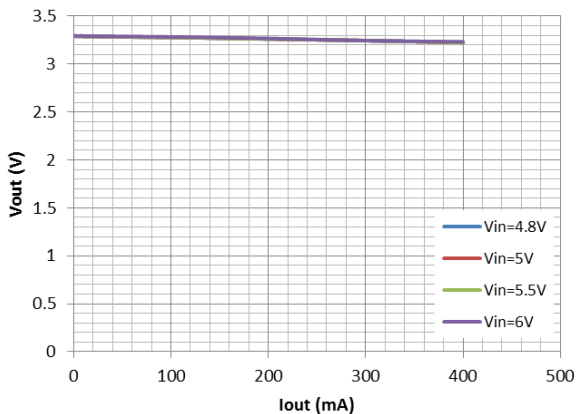
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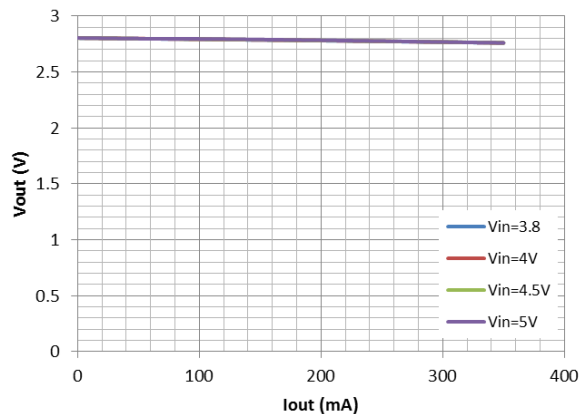
ACE555 has excellent load and line transient response and good temperature characteristics, which can assure the stability of chip and power system. And it uses trimming technique to guarantee output voltage accuracy within $\pm 1\%$ 、 $\pm 2\%$.

Typical Performance Characteristics ($T_A=25^\circ\text{C}$)

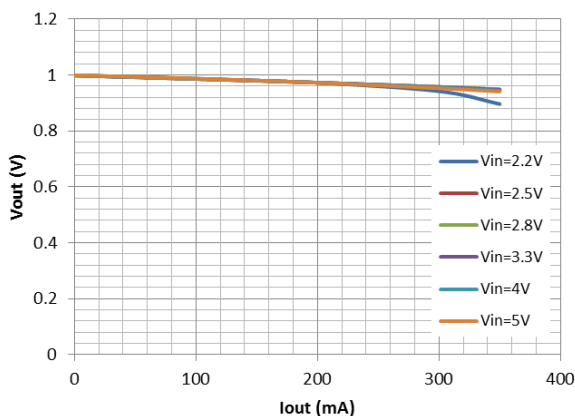
Load Regulation
($V_{out}=3.3V$)



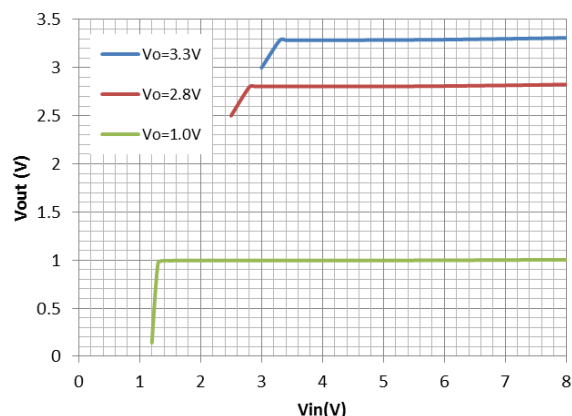
Load Regulation
($V_{out}=2.8V$)



Load Regulation
($V_{out}=1.0V$)



Line Regulation
($I_{out}=0mA$)



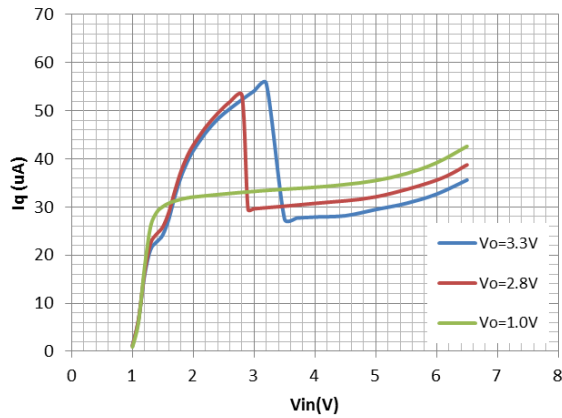


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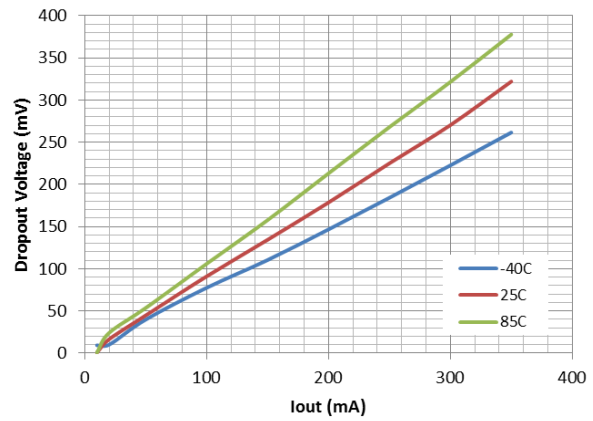
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Typical Performance Characteristics

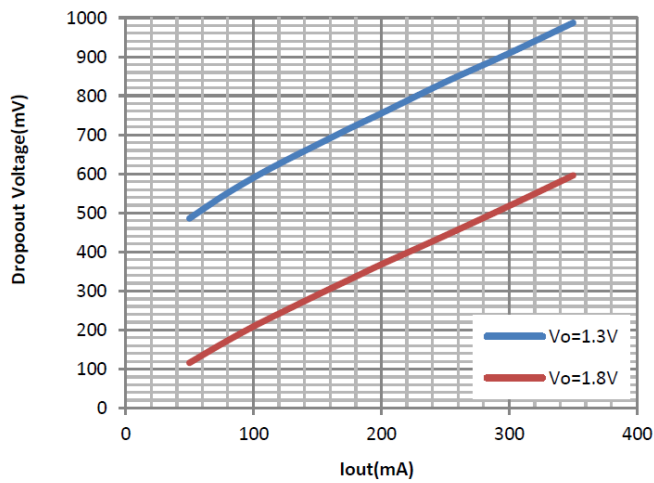
Quiescent Current
($I_{out}=0\text{mA}$ and $CE=\text{high}$)



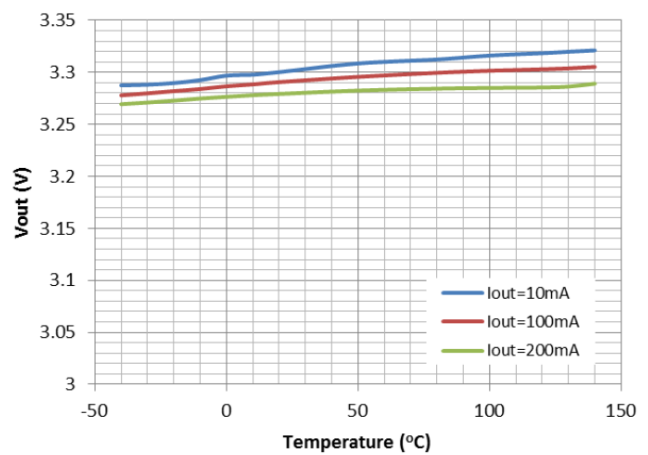
Dropout Voltage
($V_{out}=3.3\text{V}$)



Dropout Voltage



V_{out} Temperature Coefficient
($V_{out}=3.3\text{V}$)



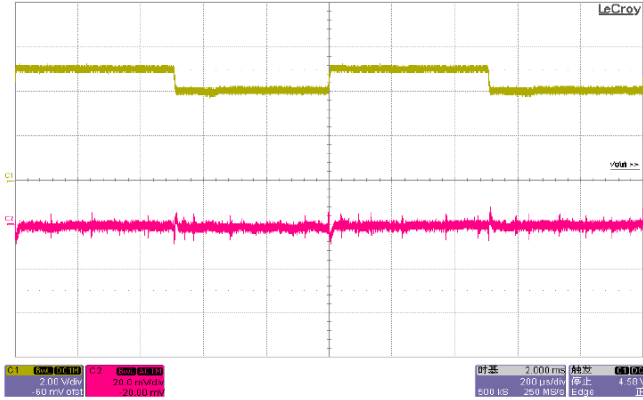


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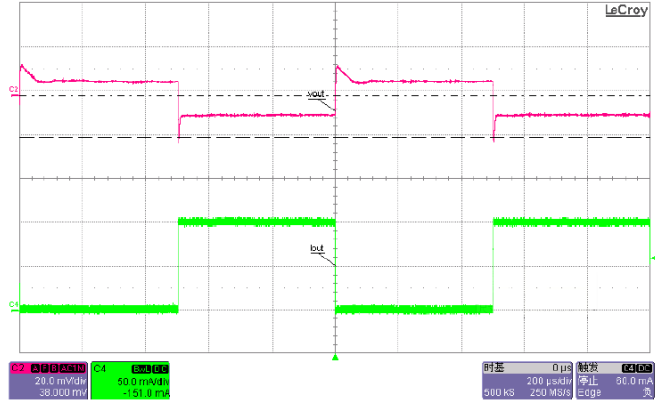
Line Transient Response

$V_{out}=3.3V$, $I_{out}=20mA$
(brown: V_{in} ; Red: V_{out})

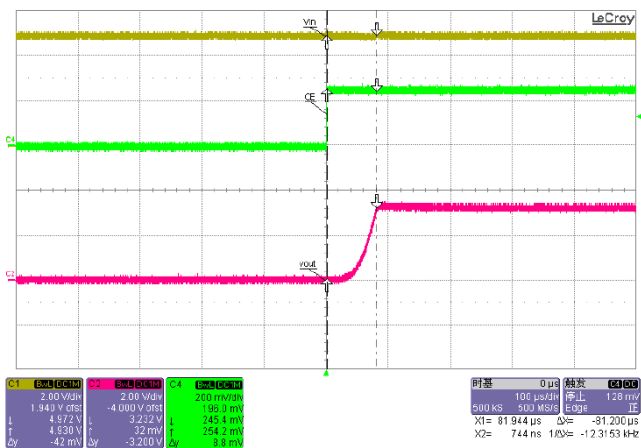


Load Transient Response

$V_{in}=5V$, $V_{out}=3.3V$, $I_{out}=1-100mA$
(Green: I_{out} ; Red: V_{out})



CE Chip Enable Response



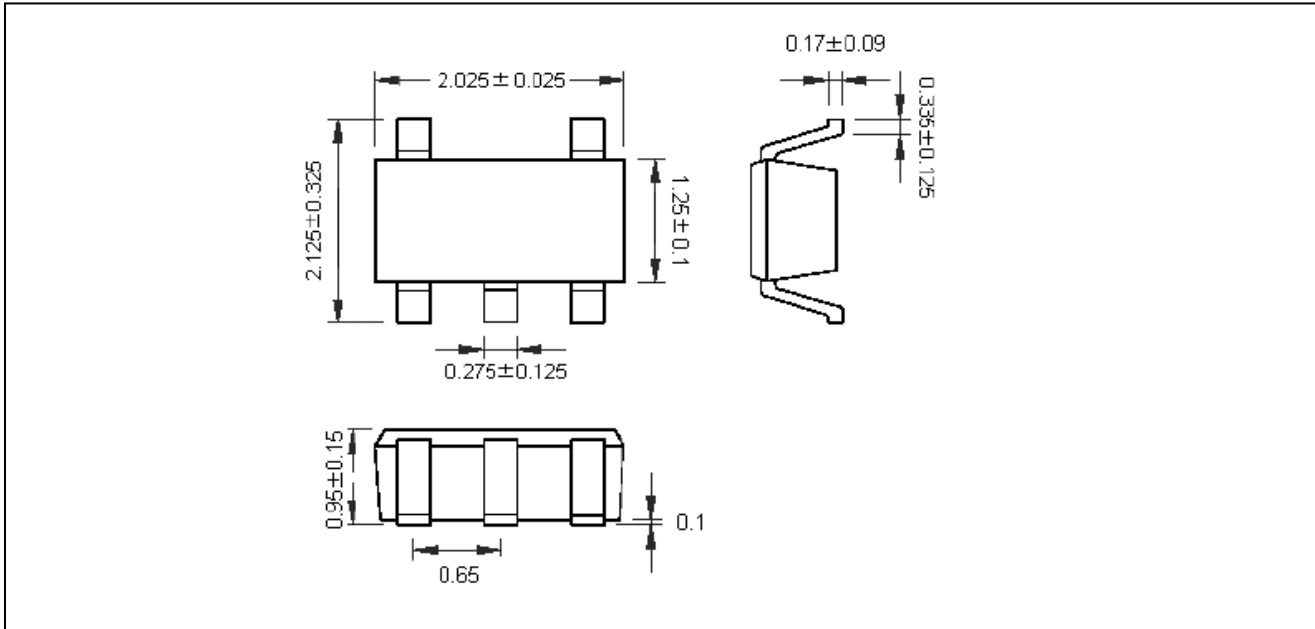


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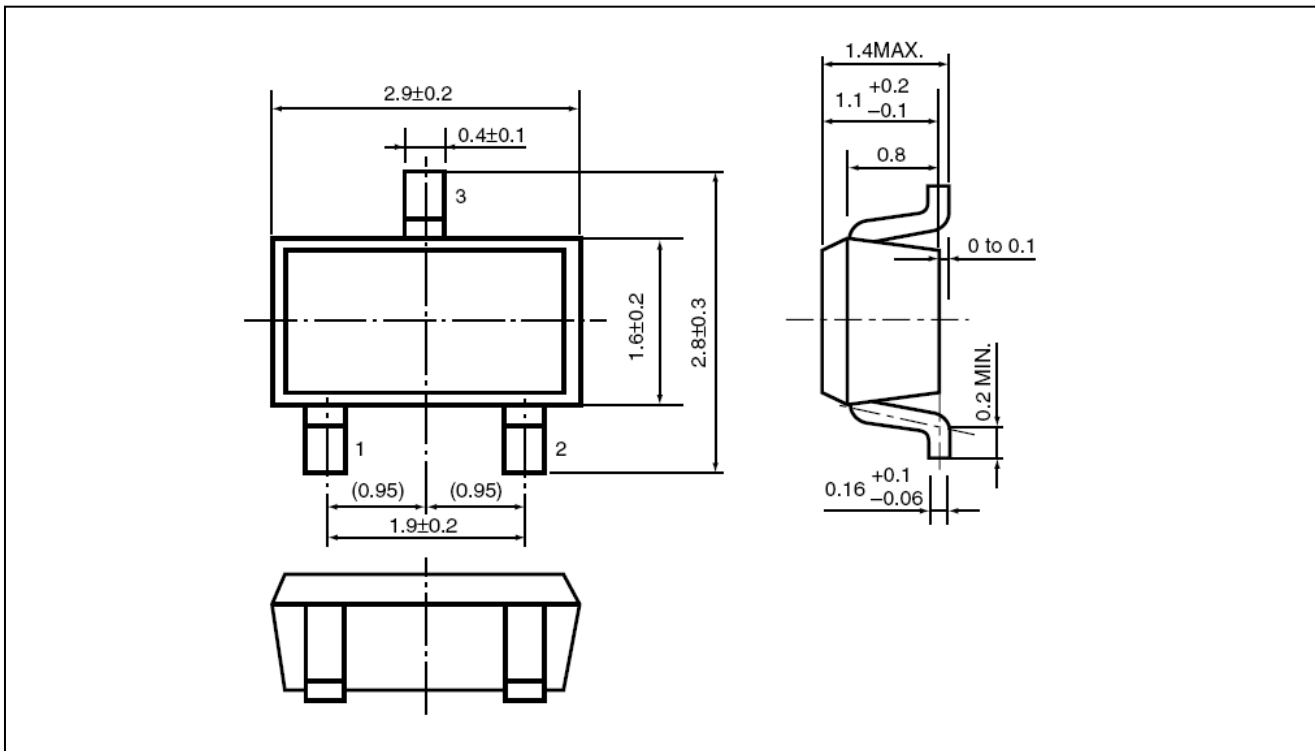
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Packing Information

SC-70-5



SOT-23-3L



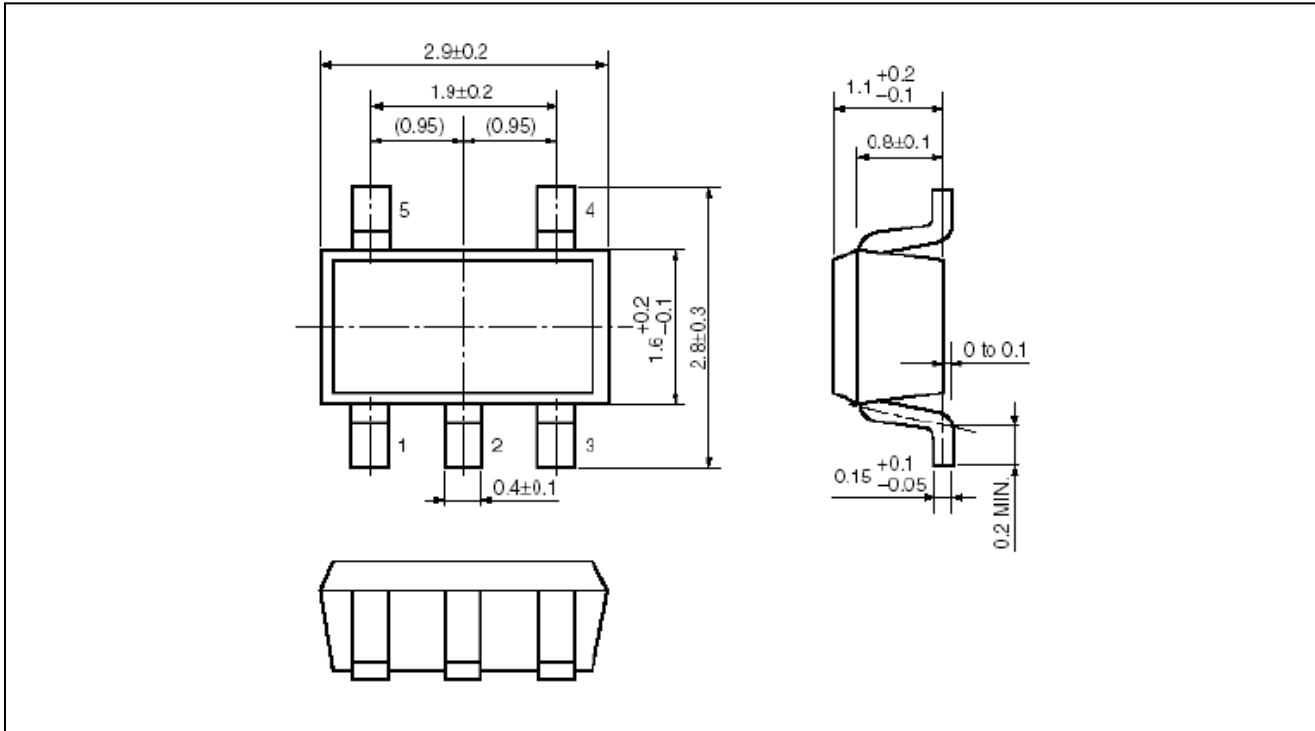


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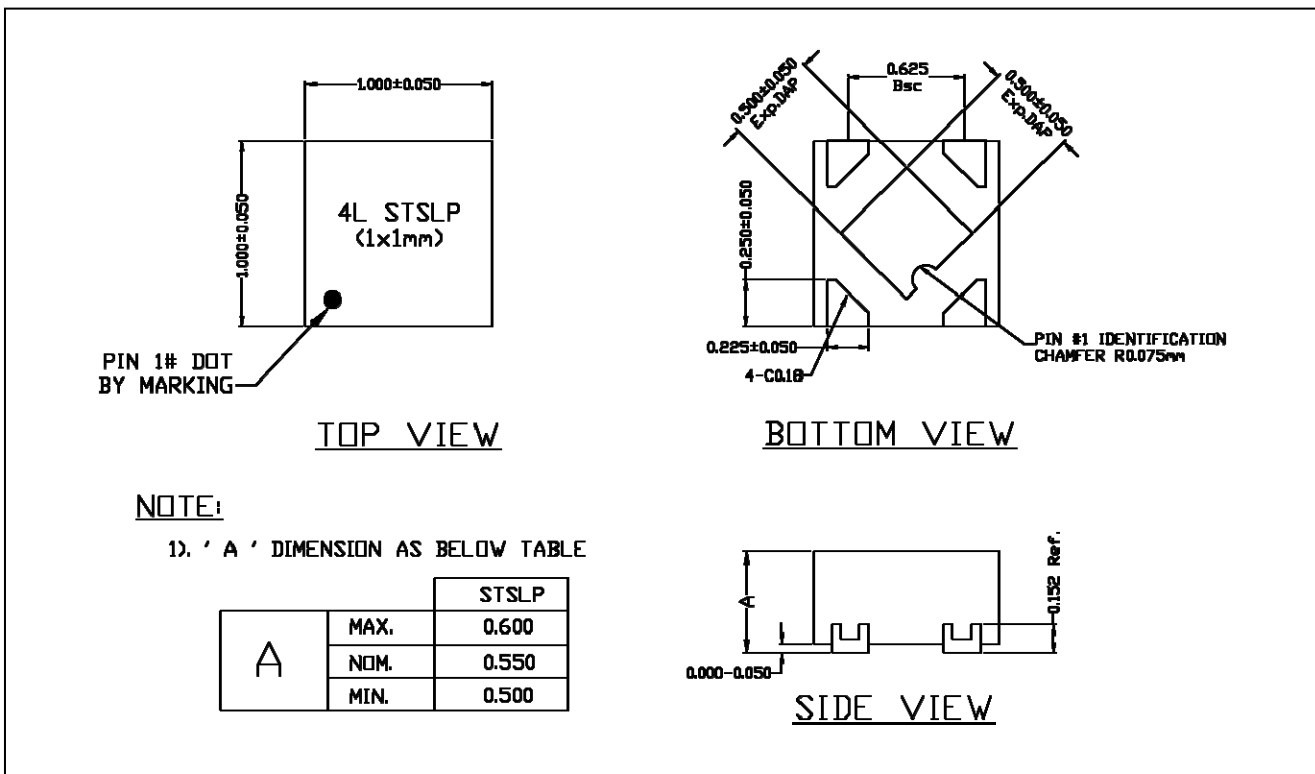
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Packing Information

SOT-23-5



DFN1*1-4





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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:

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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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