



ACE512C

1.5A Linear Regulator

Description

ACE512C series are a group of positive voltage output, high precise, and low power consumption voltage regulator. Voltages are selectable in 100mV steps within a range of 1.2V to 5.0V. It also can be customized on command.

ACE512C 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 $\pm 2\%$.

ACE512C series are available in SOT-223 package, which are lead (Pb)- free.

Features

- Low Quiescent Current: 100uA at 5V
- High PSRR: 70dB range to 1KHz
- Low Output Noise: 44uVRMS
- Low Dropout: 300mV at 1A load
- Maximum output current: 1.5A
- Highly Accurate: $\pm 2\%$
- Low ESR Ceramic Capacitor Compatible

Applications

- Reference Voltage Source
- Battery Powered Equipment
- PC Peripherals
- Wireless Devices
- Instrumentation

Absolute Maximum Ratings

Parameter		Value
Max Input voltage		8V
Operating Junction Temperature(T_J)		125°C
Ambient Temperature (T_A)		-40~85°C
Package Thermal Resistance	SOT-223	20°C/W
Storage temperature(T_S)		- 40 to 150°C
Lead Temperature & Time		260°C, 10 Sec

Note : Exceed these limits to damage to the device.

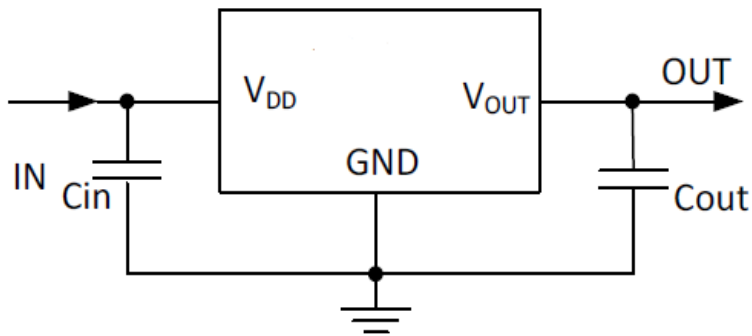
Exposure to absolute maximum rating conditions may affect device reliability.



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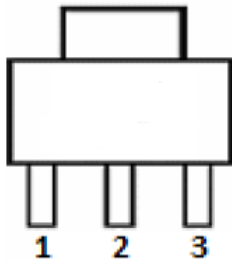
1.5A Linear Regulator

Typical Application



Packaging Type

SOT-223



SOT-223(A)	SOT-223(B)	Description
1	3	V_{DD}
2	1	G_{ND}
3	2	V_{OUT}

Recommended work conditions

Parameter	Value
Input Voltage Range	Max. 6V
Ambient Temperature	-40 ~ 85°C
Operating Junction Temperature (T_J)	125°C

Ordering information

ACE512C XX XXX + H

- Halogen - free
- Pb - free
- XMA : SOT-223(A)
- XMB : SOT-223(B)
- Output Voltage : Ex : 1.2V=12.....5.0V=50



ACE512C

1.5A Linear Regulator

Electrical Characteristics

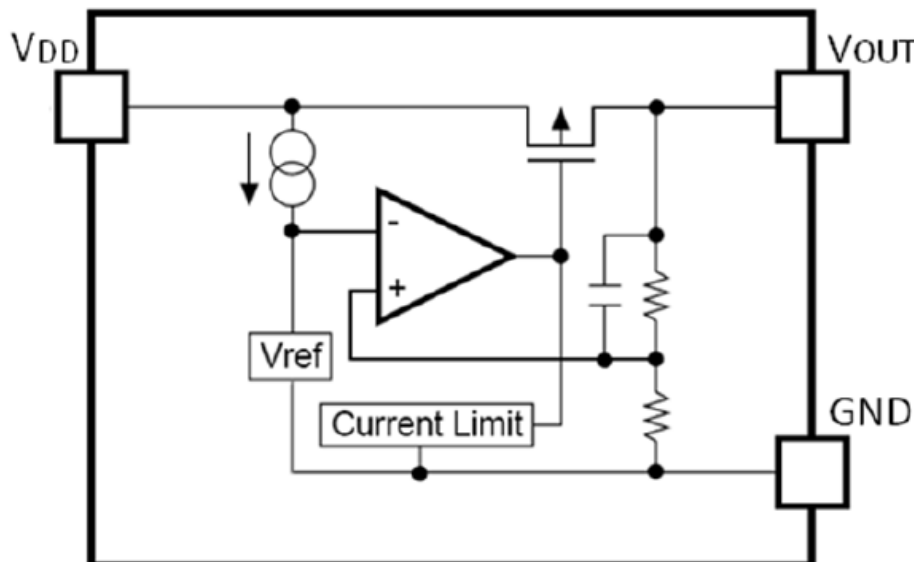
Test conditions: $C_{IN}=4.7\mu F$, $C_{OUT}=4.7\mu F$, $T_A=25^\circ C$, unless otherwise specified.

Parameter	Symbol	Test Conditions	Min	Typ	Mum	Unit
Input Voltage	V_{DD}		1.5*		6	V
Output Voltage	$V_{OUT}>1.5$	$V_{DD}=\text{Set } V_{OUT}+1V$ $1mA \leq I_{OUT} \leq 10mA$	$V_{OUT} * 0.98$	V_{OUT}	$V_{OUT} * 1.02$	V
	$V_{OUT} \leq 1.5$		$V_{OUT} - 0.03$		$V_{OUT} + 0.03$	
Maximum Output Current	$I_{OUT} (\text{Max.})^{**}$	$V_{DD} - V_{OUT} = 1V$	1.5			A
Dropout Voltage	V_{DROP}	$V_{OUT} = 3.3V$, $I_{OUT} = 1.5A$		300	500	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}	$V_{DD} = \text{Set } V_{OUT} + 1V$ $1mA \leq I_{OUT} \leq 2.5A$		30	60	mV
Supply Current	I_S	$V_{DD} = \text{Set } V_{OUT} + 1V$ V_{OUT} Floating		100	150	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 $V_{DD} = \text{Set } V_{OUT} + 1V$		70		dB
Output Noise	e_n	BW = 10Hz ~ 100KHz		44		μV_{rms}

Note: $I_{out} = 500mA @ V_{out} = 1.2V$

**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.

Block Diagram



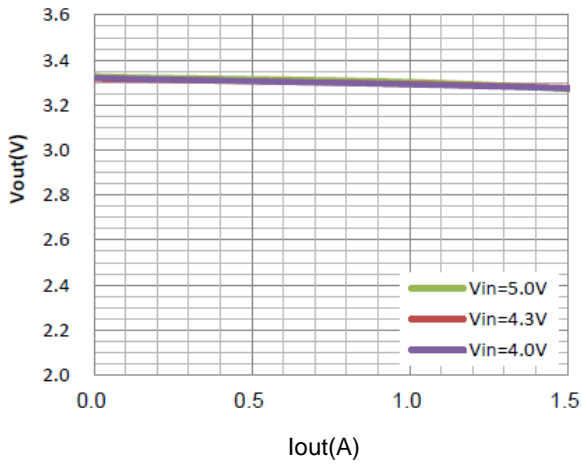


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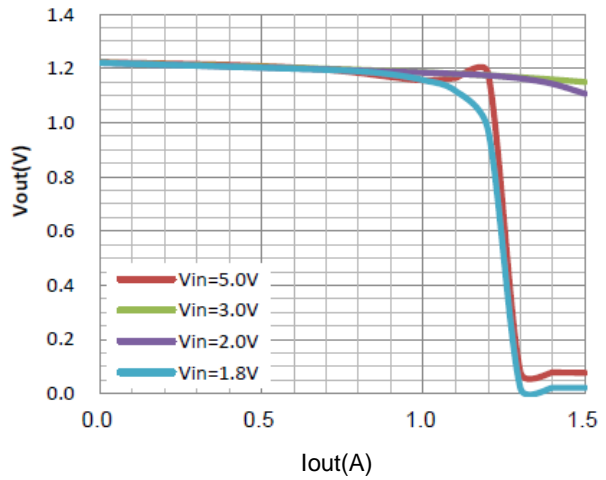
1.5A Linear Regulator

Typical Performance Characteristic

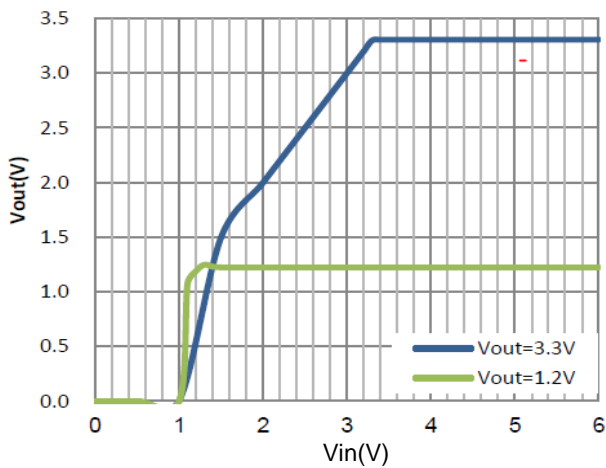
Load Regulation
($V_{out}=3.3V$)



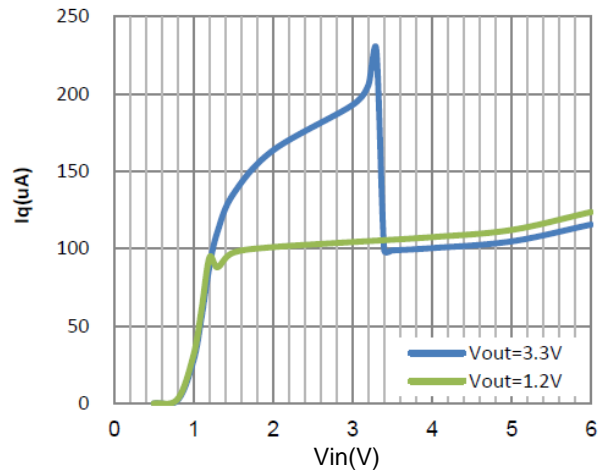
Load Regulation
($V_{out}=1.2V$)



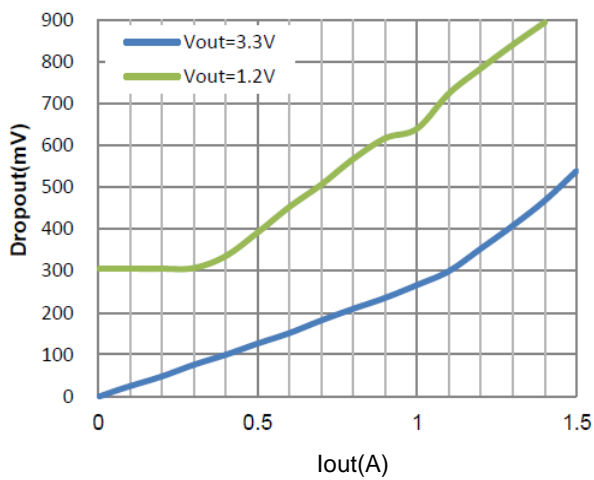
Line Regulation



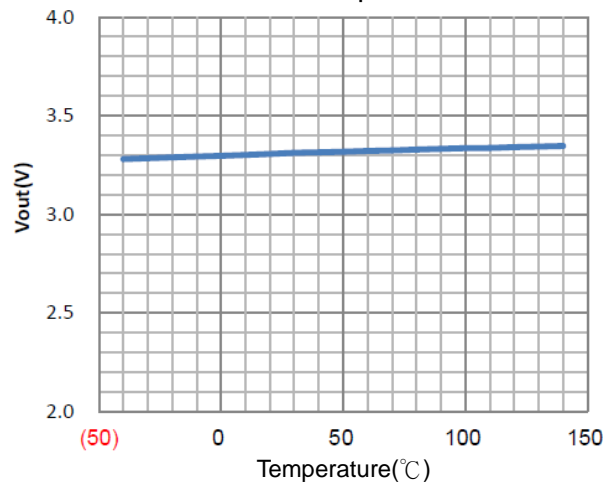
I_q



Dropout Voltage



V_{out} vs. Temperature



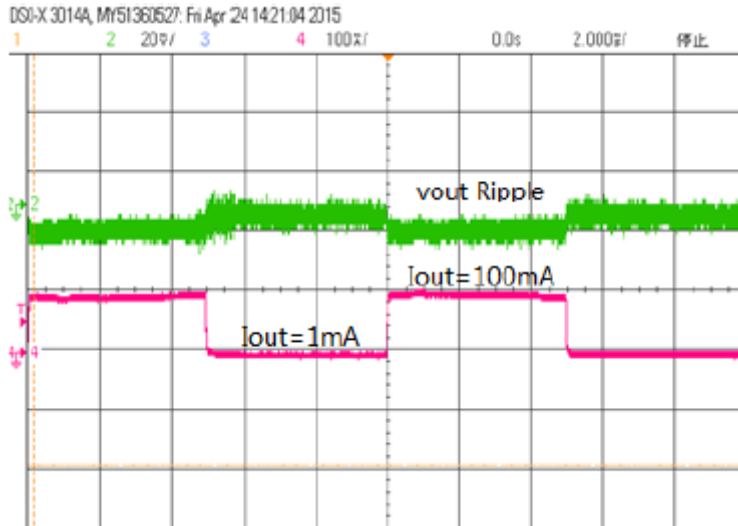


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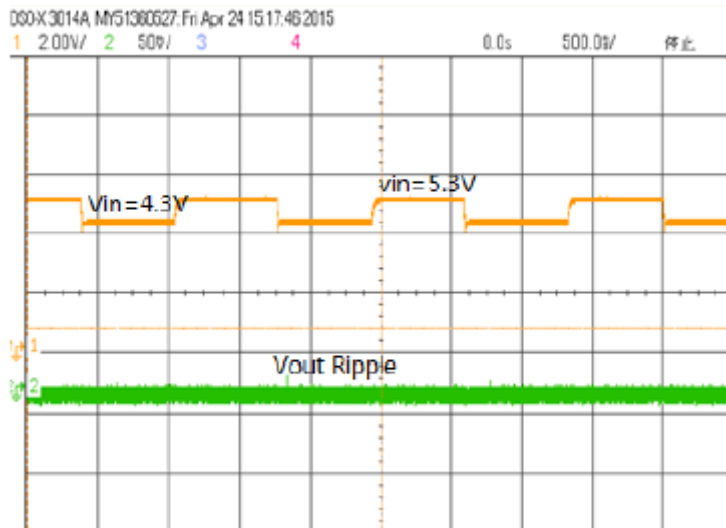
1.5A Linear Regulator

Test Waveforms

Load Transient Response($V_{in}=5V, V_{out}=3.3V$)
 $C_{in}=1\mu F, C_{out}=1\mu F, I_{out}=1mA-100mA$



Line Transient Response($V_{in}=5V, V_{out}=3.3V$)
 $C_{in}=1\mu F, C_{out}=1\mu F, I_{out}=10mA, V_{in}=4.3V-5.3V$



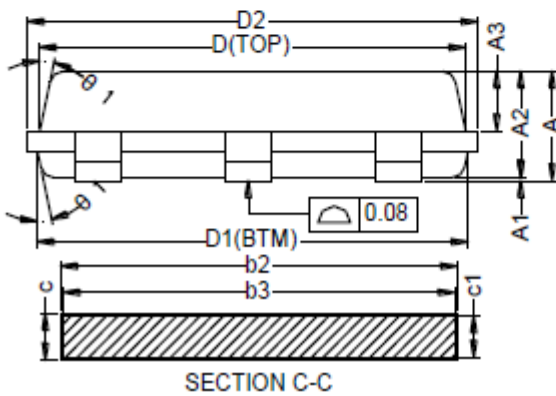
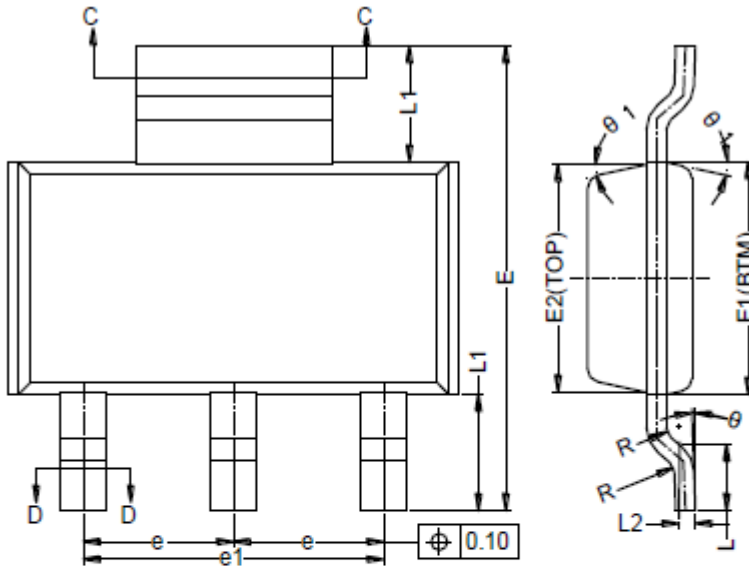


ACE512C

1.5A Linear Regulator

Packing Information

SOT-223



COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	NOM	MAX
A	-	-	1.80
A1	0.02	-	0.10
A2	1.50	1.60	1.70
A3	0.80	0.90	1.00
b	0.67	-	0.80
b1	0.66	0.71	0.78
b2	2.96	-	3.09
b3	2.95	3.00	3.05
c	0.30	-	0.35
c1	0.29	0.30	0.31
D	6.48	6.53	6.58
D1	6.55	6.60	6.65
D2	-	-	7.05
E	6.80	-	7.20
E1	3.40	3.50	3.60
E2	3.33	3.43	3.53
e	2.30BSC		
e1	4.60BSC		
L	0.80	1.00	1.20
L1	1.75REF		
L2	0.25BSC		
R	0.10	-	-
R1	0.10	-	-
θ	0°	-	8°
θ_1	10°	12°	14°

NOTES:
ALL DIMENSIONS REFER TO JEDEC STANDARD TO261-AA



ACE512C

1.5A 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 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.