ACE5013T

300mA, Low Consumption Low Dropout, CMOS LDO

Description

The ACE5013T series are low dropout linear regulators and optimized to provide a high performance solution for battery power system to delivery low quiescent current. The device offer a new level of cost effective performance in cellular phones, laptop and notebook computers, and other portable devices.

ACE5013T can provide output value in the range of 1.0V~3.6V by every 0.1V step.

The ACE5013T series are designed to make use of low cost ceramic capacitors which ensure the stability of the output current, and enhance the efficiency in order to prolong the battery life of those portable devices.

Features

- Input voltage: 2.5V~7V
- Output range: 1.0V~3.6V (customized by every 0.1V step)
- Output current: 300mA @ V_{IN}-V_{OUT}=1V
- Dropout voltage: 190mV @ IOUT=100mA
- Quiescent current : 1.5μA Typ.
- PSRR: 50dB @ 100Hz
- Recommend capacitor: 1μF

Application

- Reference voltage source
- Toys
- Bluetooth, wireless handsets
- Low Consumption Device
- Others portable electronics device

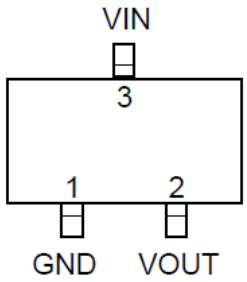
Absolute Maximum Ratings (Note)

Symbol	Items		Value	Unit
V_{IN}	Input Voltage		-0.3~8	V
I_{OUT}	Output Current		370	mA
P_{DMAX}	Power Dissipation	SOT-23-3	0.25	W
$R_{\theta JA}$	Thermal Resistance	SOT-23-3	220	℃/ W
T_J	Junction Temperature		-40~125	℃
T_A	Ambient Temperature		-40~85	℃
T_{STG}	Storage Temperature		-55~150	℃
T_{SOLDER}	Package Lead Soldering Temperature (10s)		260	℃

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

Packaging Type

SOT-23-3



Pin Description

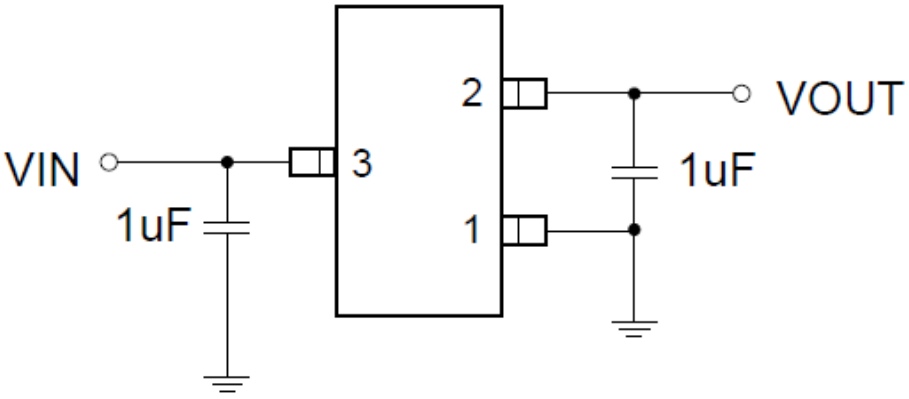
Pin No	Symbol	I/O	Description
1	GND	Ground	Ground
2	VOUT	O	Output
3	VIN	Power	Input

Ordering information

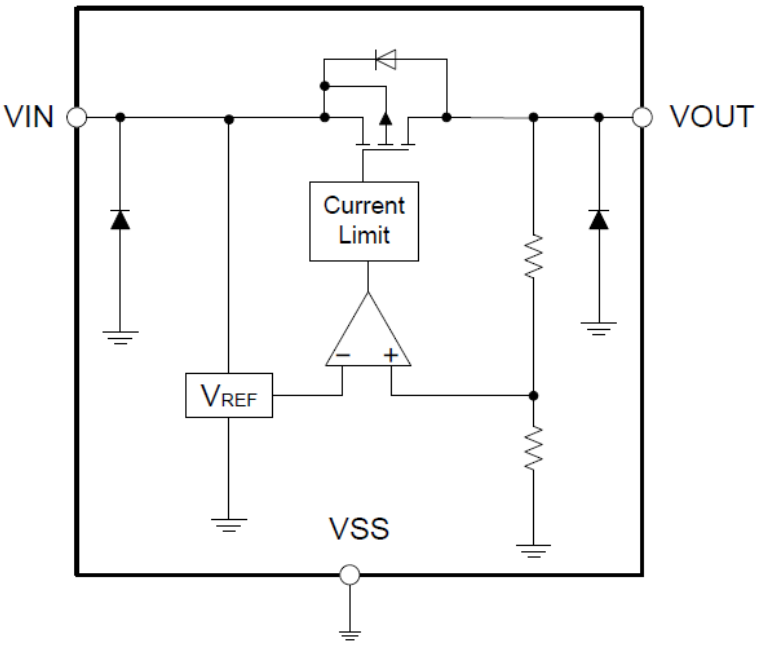
ACE5013T XX XX+H

- Halogen - free
- Pb - free
- BM：SOT-23-3
- Output Voltage：1.0V/1.1V……/3.6V

Typical Application Circuit



Block Diagram



Recommended Operation Range

Symbol	Items	Value	Unit
V_{IN}	VIN Supply Voltage	2.5 to 7	V
T_{OPT}	Operating Temperature	-40 to 85	℃

Electrical Characteristics

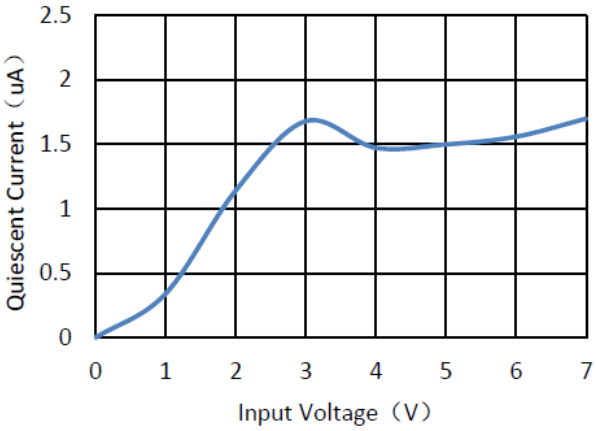
The following specifications apply for V_{OUT}=3.3V T_A=25℃unless specified otherwise.

Items	Symbol	Conditions	Min	Typ	Max	Unit
V_{IN}	Input Voltage				7	V
V_{OUT}	V_{OUT} Range	V_{OUT} >1.2V, V_{IN}=V_{OUT}+1V, I_{OUT}=1mA	V_{OUT} x 0.98	V_{OUT}	V_{OUT} x 1.02	V
		V_{OUT}<=1.2V,V_{IN}=2.5V, I_{OUT}=1mA	V_{OUT} – 25mV	V_{OUT}	V_{OUT} +25mV	
I_Q	Quiescent Current	V_{OUT}=3.3V, I_{OUT}=0		1.5	3	μA
I_{LIMIT}	Current Limit	V_{IN}-V_{OUT}=0.5V		370		mA
V_{DROP}	Dropout Voltage	V_{OUT} = 3.3 V, I_{OUT} = 50mA,		95		mV
		V_{OUT} = 3.3 V, I_{OUT} = 100 mA,		190		
ΔV_{LINE}	Line Regulation	V_{IN} = 4.3~5.5 V, I_{OUT} = 1 mA			6	%/V
ΔV_{LOAD}	Load Regulation	V_{IN} = V_{OUT} + 1V, I_{OUT} = 1~300 mA			36	mV
I_{SHORT}	Short Current	V_{OUT} Short to GND with 1Ω	50	90	190	mA

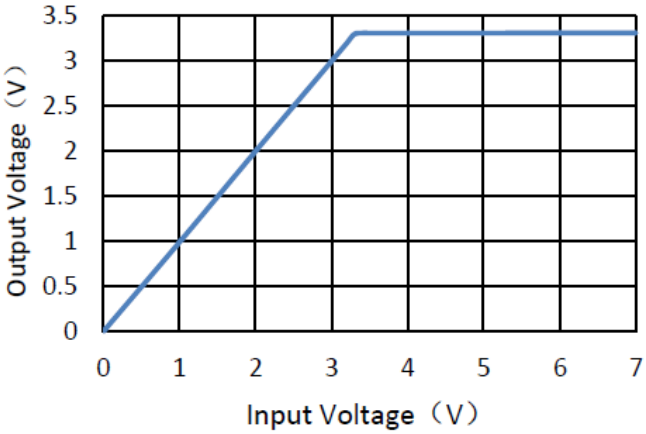
Typical Characteristics

C_{IN}=1μF, C_{OUT}=1μF, T_{OPT}=25℃, V_{IN}=5V, V_{OUT}=3.3V, unless otherwise noted.

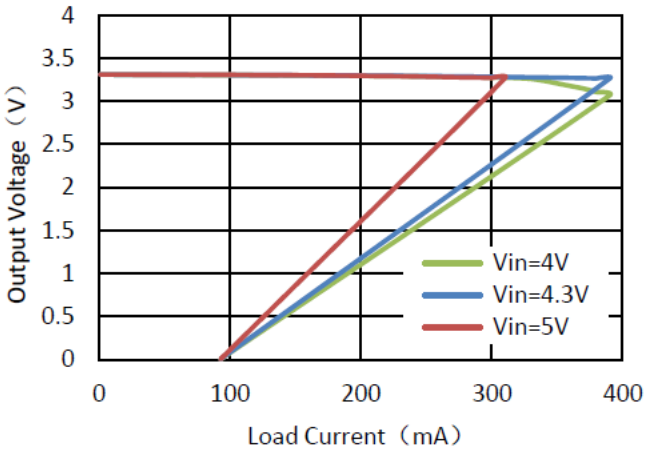
Quiescent Current vs. Input Voltage



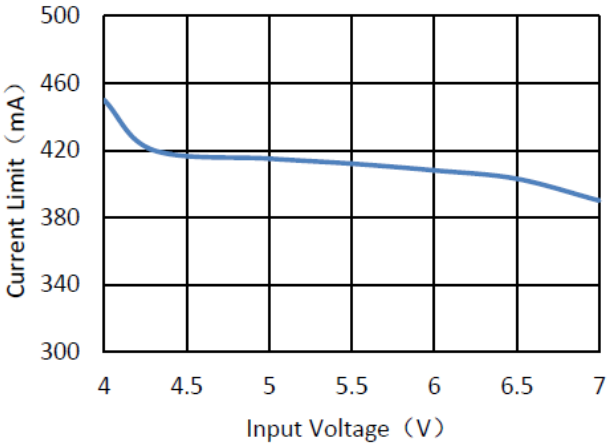
Output Voltage vs. Input Voltage



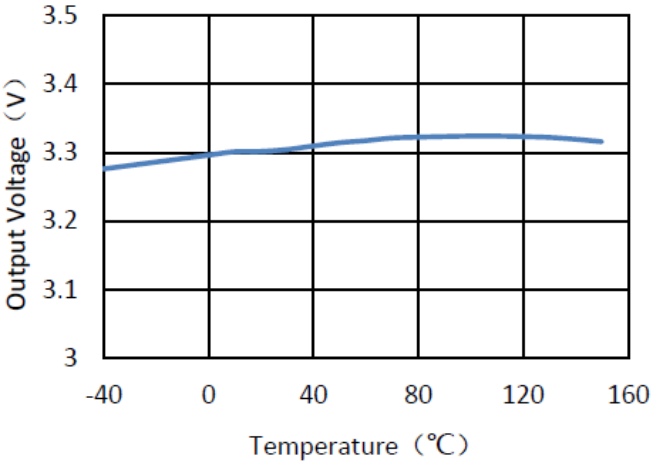
Output Voltage vs. Load Current



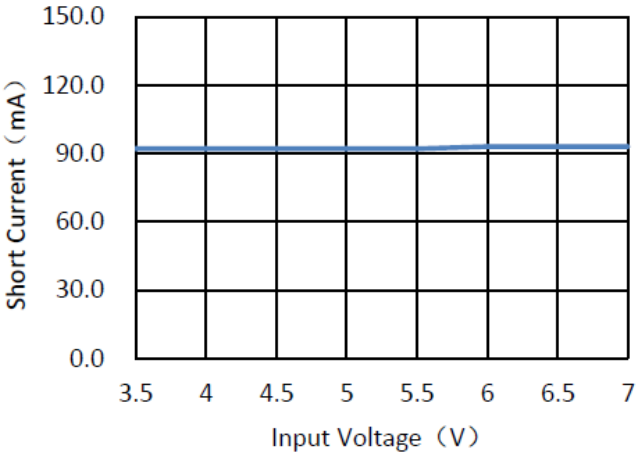
Current Limit vs. Input Voltage



Output Voltage vs. Temperature

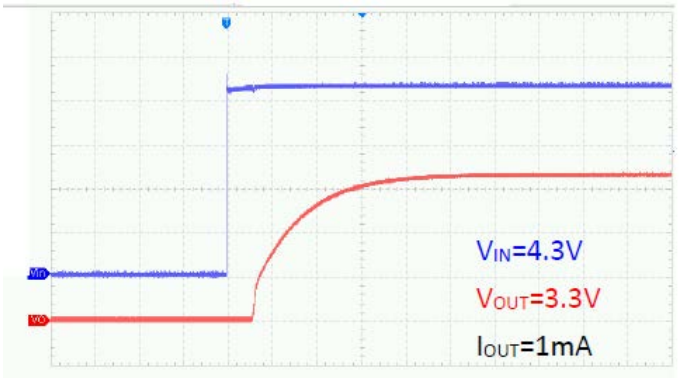


Short Current vs. Input Voltage



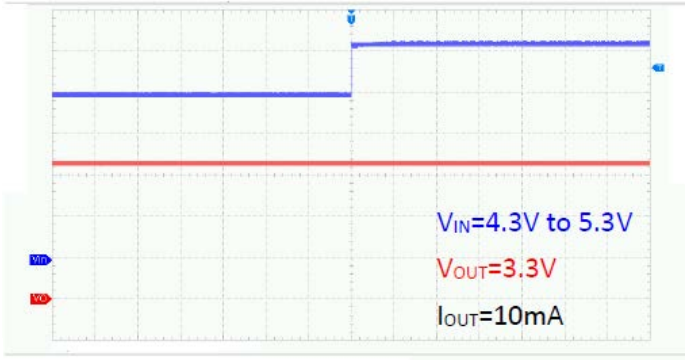
Power ON

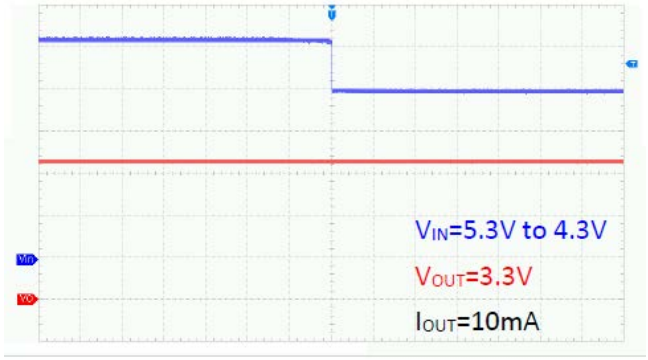
CH1：V_{IN} CH2：V_{OUT}

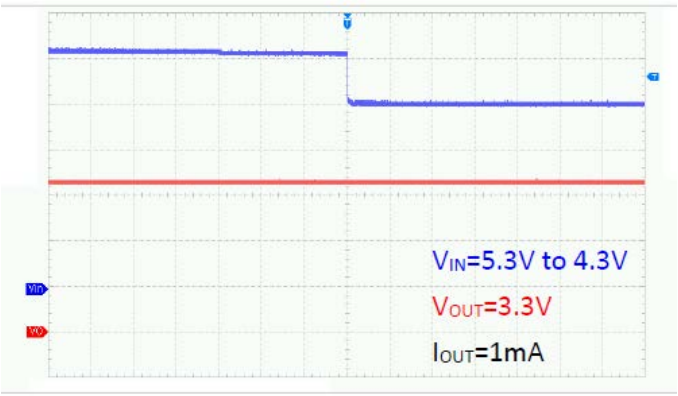


Load Transient Response

CH1：V_{IN} CH2：V_{OUT}

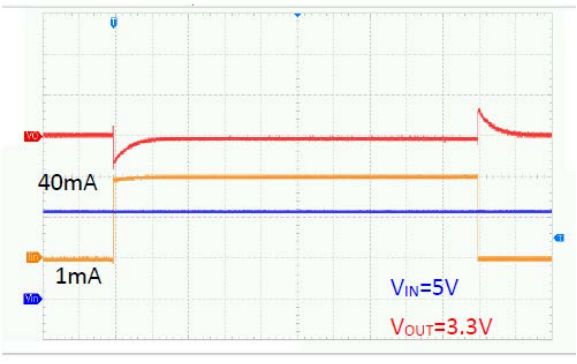


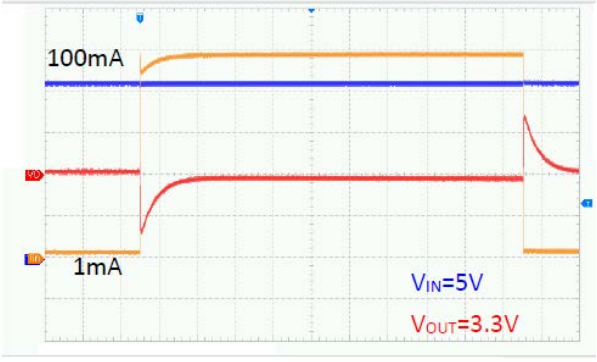




Load Transient Response

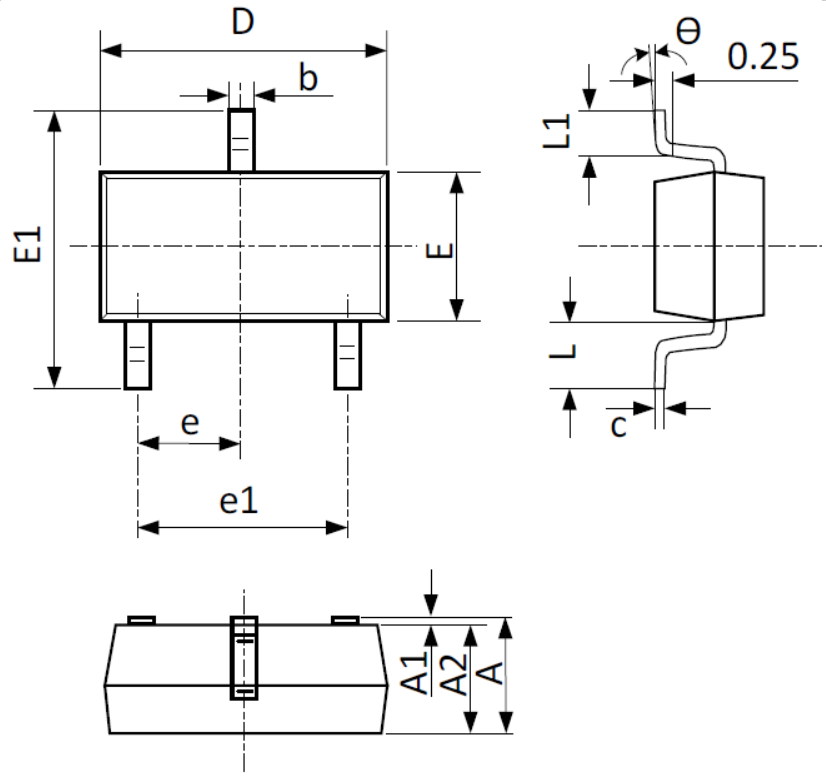
CH1：V_{IN} CH2：V_{OUT} CH4：I_{OUT}





Packing Information

SOT-23-3



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
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 (BSC)		0.037 (BSC)	
e1	1.800	2.000	0.071	0.079
L	0.550 (BSC)		0.022 (BSC)	
L1	0.300	0.500	0.012	0.020
θ	0°C	8°C	0°C	8°C

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.