ACE621E

Ultra-Fast High PSRR 1.5A CMOS Voltage Regulator

Description

ACE621E series are a group of positive voltage regulators manufactured by CMOS technology with high ripple rejection, ultra-fast transient response and low dropout voltage, which consume less than 1uA in shutdown mode and can provide large output currents even when the difference of the input-output voltage is small. Each of the ACE621E series consists of a high-precision voltage reference, an error correction circuit, and a current limited output driver. Thus the series are very suitable for the batter-powered equipments, wireless communication applications, industry equipments and so on.

Features

- Shutdown Current: <1uA
- Guaranteed Output Current: 1.5A (Typ.)
- Low Quiescent Current: 50uA (Typ.)
- Output Voltage Range: 1.5V~5.0V
- Input Voltage Range: 2.5V~6.0V
- High Accuracy: ±2% (Typ.)
- Dropout Voltage: 600mV@1.5A (3.0V Typ.)
- Excellent Line Regulation: 0.02%/V
- High PSRR: 70dB@1KHz
- Built-in Current Limiter & Thermal Protection.
- Short Circuit Current Fold-back

Application

- Battery powered systems
- Portable instrumentations
- PC peripherals
- CD/DVD-ROM, CD/RW
- Wireless devices
- Battery charger

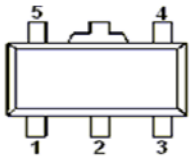
Absolute Maximum Ratings

(Unless otherwise specified, Ta=25°C)

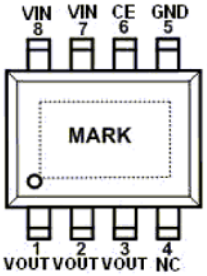
Parameter		Symbol	Ratings	Units
Input Voltage		V_{IN}	Vss-0.3~Vss+7	V
Output Current		I_{OUT}	1.5	mA
Output Voltage		V_{out}	Vss-0.3~V_{IN}+0.3	V
Power Dissipation	SOT-89-5	Pd	600	mW
	SOP8-PP	Pd	1500	mW
Operating Temperature		T_{opr}	-40~+85	°C
Storage Temperature		T_{stg}	-40~+125	°C
Soldering Temperature & Time		T_{solder}	260°C,10s	

Packaging Type

SOT-89-5



SOP-8



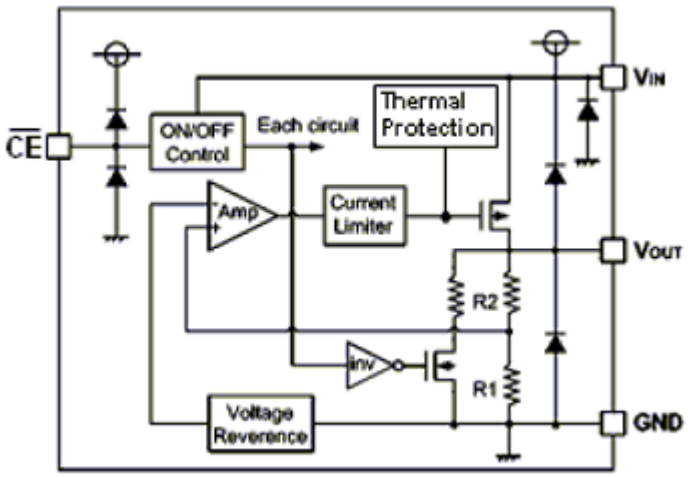
PIN NUMBER		PIN NAME	*Function*
SOT-89-5	SOP-8		
1	6	CE	Chip Enable
4	7.8	V_{in}	Ground
2	5	V_{SS}	Power input
5	1.2.3	V_{out}	Output
3	4	NC	No Connection
	Exposed Thermal PAD	Thermal PAD	Connect to GND

Ordering information

ACE621E XX XX + H

- Halogen-free
- Pb - free
- AN: SOT-89-5
  FM: SOP-8
- Output Voltage : 1.5V/1.8V/3.3V~5.0V

Block Diagram



Electrical Characteristics

ACE621E, For Arbitrary Output Voltage.(Test Conditions: Cin=C_{OUT}=4.7uF, Ta=25°C, unless otherwise specified.)

Symbol	Parameter	Conditions		Min	Typ	Max	Units
$V_{OUT.}$ (E) (Note 2)	Output Voltage	$V_{IN}=V_{OUT}+1V$ I_{OUT}=100mA		V_{OUT} *0.98	V_{OUT} (Note1)	V_{OUT} *1.02	V
I_Q	Supply Current	$V_{IN}=V_{OUT}+1V$, V_{CE}=GND			50	100	uA
I_{SHDN}	Shutdown Current	$V_{CE}=V_{IN}$			0.1	1.0	uA
I_{OUT}	Output Current	$V_{IN}=V_{OUT}+2V$ (V_{OUT}<4V) $V_{IN}=V_{OUT}+1V$ ($V_{OUT}\geqq$4V)		1500			mA
V_{dif}	Dropout Voltage (Note 3)	I_{OUT} =1.5A	1.5V≤V_{OUT}≤2.0V		1300		mV
			2.0V<V_{OUT}≤2.8V		800		mV
			2.8V< V_{OUT}		600		mV
ΔV_{out}	Load Regulation	$V_{IN}=V_{OUT}+2V$ (V_{OUT}<4V) $V_{IN}=V_{OUT}+1V$ ($V_{OUT}\geqq$4V) 1mA≤I_{OUT}≤1.5A			30	100	mV
ΔV_{out} / ΔV_{IN}*V_{OUT}	Line Regulation	I_{OUT}=100mA V_{OUT}+1V≤V_{IN}≤6V			0.02	0.2	%/V
ΔV_{out} / ΔT*V_{OUT}	Output Voltage Temperature Characteristics	I_{OUT}=100mA -40℃≤T≤85℃			50		ppm/℃
I_{Short}	Short Current	$V_{OUT}=V_{SS}$			200		mA

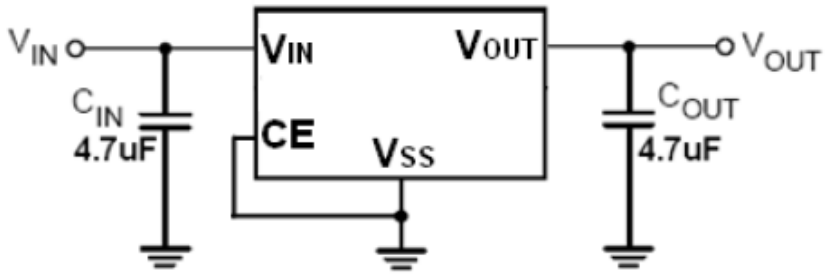
V_{IN}	Input Voltage		—	2.5		6.0	V
PSRR	Power Supply Rejection Rate	1KHz	I_{OUT}=100mA		70		dB
PSRR V_{CE}"H"	Power Supply Rejection Rate CE "High" Voltage	10KHz	I_{OUT}=100mA 1.5		50 V_{IN}	V	dB
V_{CE}"L"	CE "Low" Voltage					0.3	V
T_{SD}	Thermal Shutdown Temperature		—		150		℃
ΔT_{SD}	Thermal Shutdown Temperature Hysteresis		—		30		℃

Note: 1. V_{OUT}：Specified Output Voltage.

2. V_{OUT} (E)：Effective Output Voltage (I.e. The Output Voltage When V_{IN}=(V_{OUT}+1.0V) And Maintain A Certain I_{OUT} Value).

3. V_{diff}：The Difference Of Output Voltage And Input Voltage When Input Voltage Is Decreased Gradually Till Output Voltage Equals To 98% Of V_{OUT} (E).

Typical Application Circu



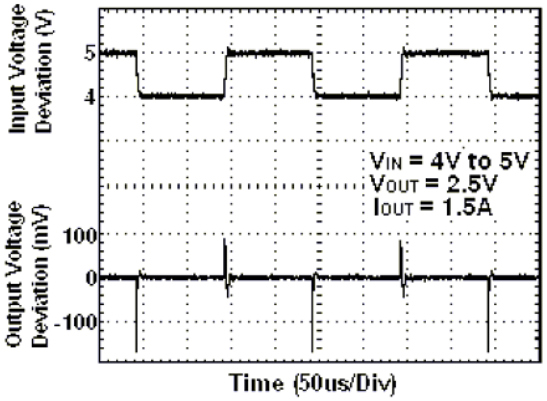
Note: Input capacitor (C_{IN}) ：4.7 uF or more；

Output capacitor(C_{OUT}): ：4.7 uF or more；

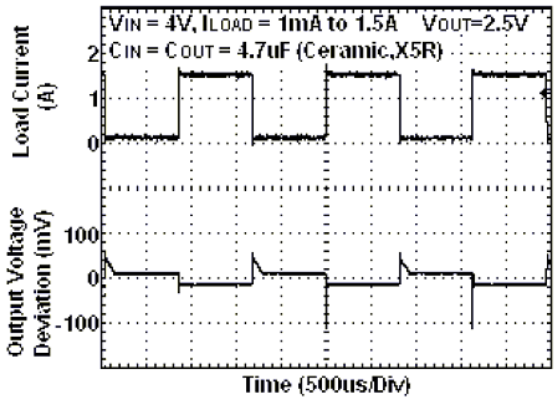
Caution： A general series regulator may oscillate, depending on the external components selected. Check that no oscillation occurs with the application using the above capacitor.

Typical Performance Characteristic:

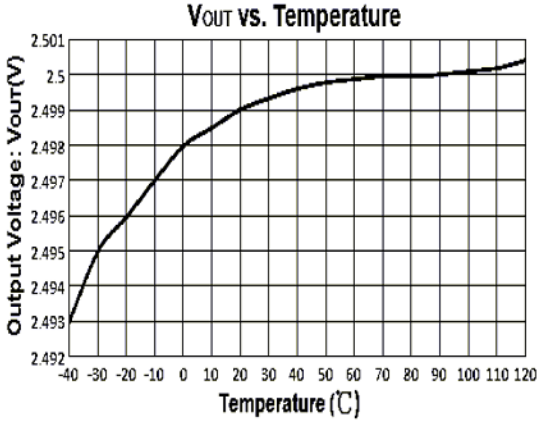
（1）Input Transient Response



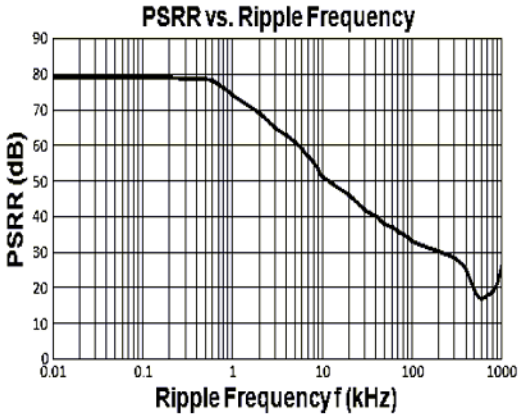
（2）Load Transient Response



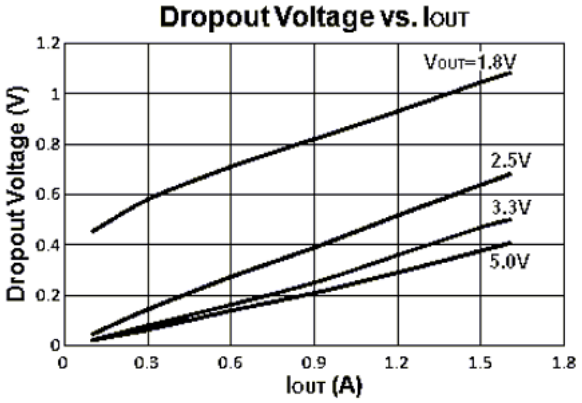
（3）Output Voltage vs. Temperature



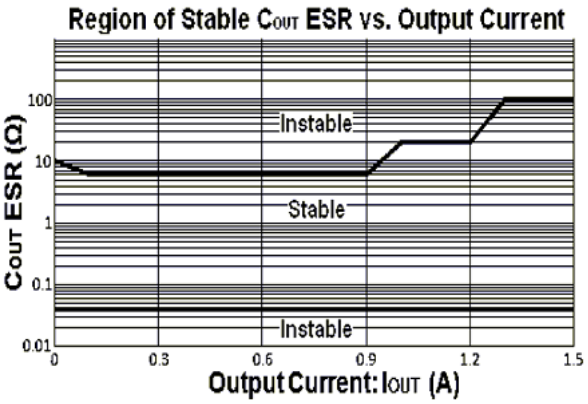
（4）Power Supply Rejection Ratio



（5）Dropout Voltage vs. Output Current

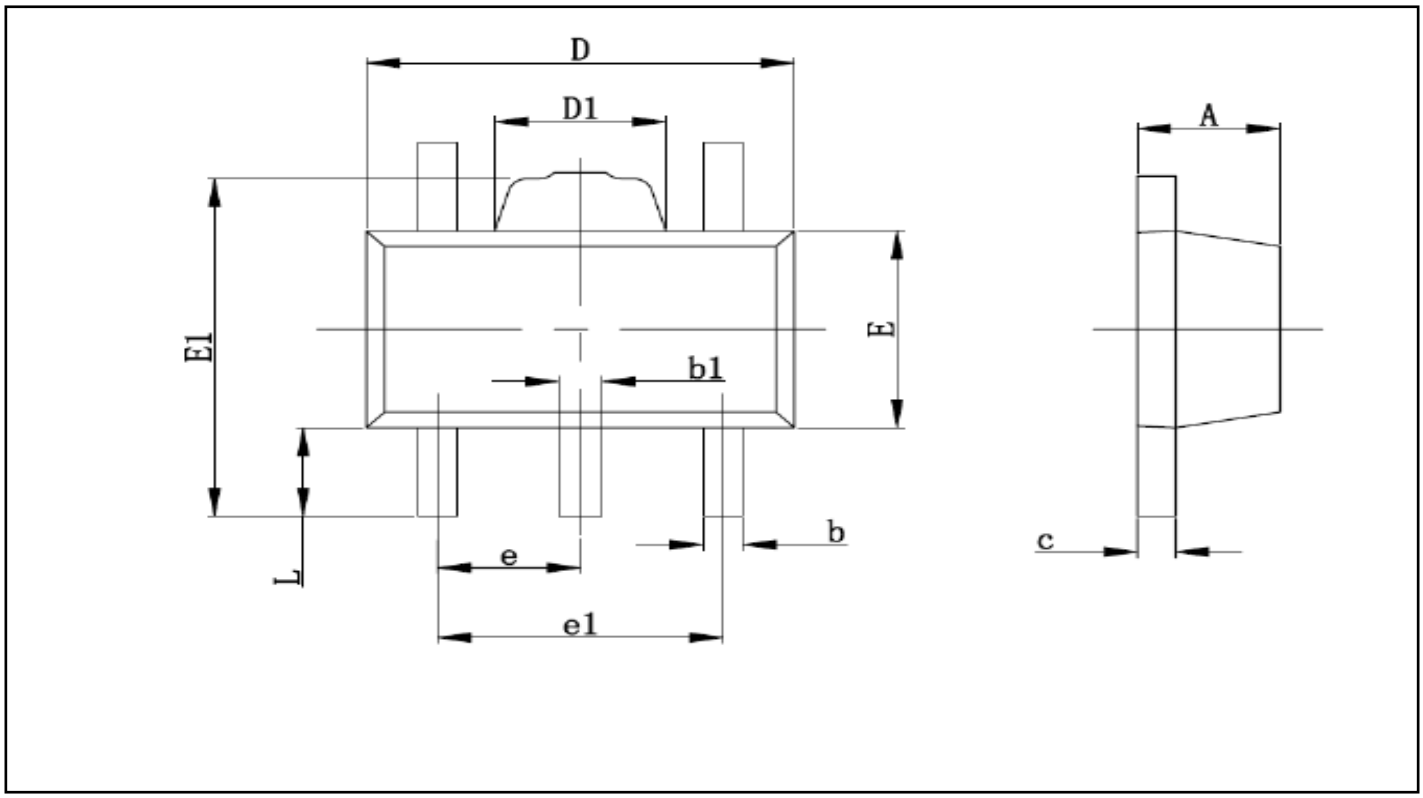


（6）Region of Stable C_{OUT} ESR vs. Load



Packing Information

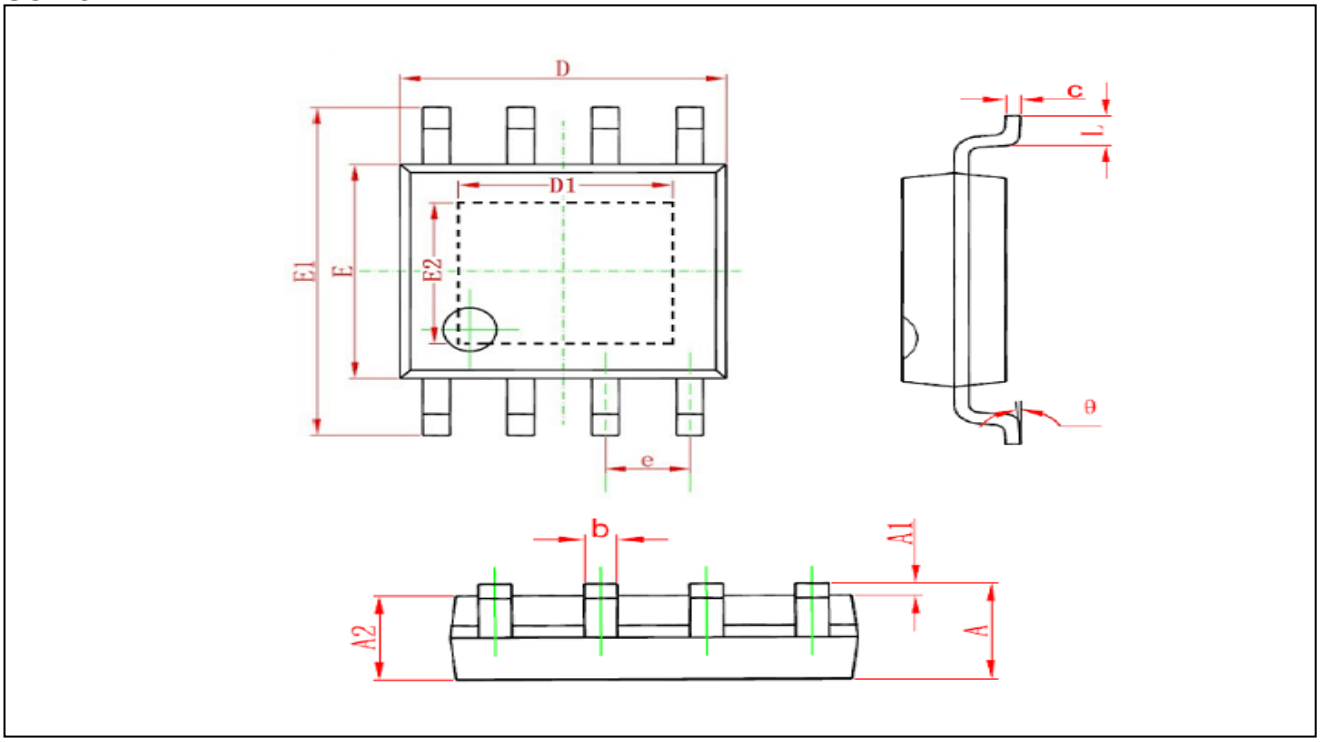
SOP-89-5 PCAKAGE OUTLING DIMENSIONS



Symbol	Dimenslons 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	0.020
b1	0.360	0.560	0.014	0.022
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.400	1.800	0.055	0.071
E	2.300	2.600	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500TYP		0.060TYP	
e1	2.900	3.100	0.114	0.122
L	0.900	1.100	0.035	0.043

Packing Information

SOP-8



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
D1	3.100	3.500	0.122	0.137
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
E2	2.200	2.600	0.086	0.102
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
Θ	0°	8°	0°	8°

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.

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