ACE707P
0.85V/12uA start-up Synchronous DC/DC Converter

Description

The ACE707P integrated PFM-mode synchronous step- up converter, only need one inductor and two capacitor. Because of boost proprietary design, it starts up at very low input voltage down to 850mV; make it an ideal choice for single cell alkaline/NiMH battery operations.

ACE707P integrates stable reference circuits and trimming technology, so it can afford high precision and low temperature-drift coefficient of the output voltage.

The ACE707P integrates a reference voltage source, an oscillator, and a comparator, enabling products with a low ripple over a wide range, high efficiency and ultra-low no-load current, high output current.

The ACE707P is available in SOT23-3&SOT23-5 packages (Rohs & HF)

Features

- Up to 96% Efficiency
- 300KHz PFM saving mode
- 12uA Ultra low No-load Current
- Low input voltage:0.9V-5.5V
- Accuracy of ±2%
- Internal 1A Current Limit
- SOT23-3 & SOT23-5 Packages(Rohs & HF)

Application

- 2.4G Wireless Mouse
- Toys
- Power supply for MCU
- Power supply for portable device

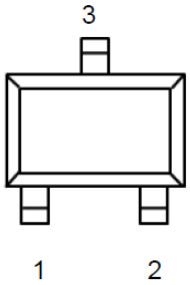
Absolute Maximum Ratings

Symbol	Items		Value	Unit
V_{IN}	Input Voltage		-0.3～6	V
V_{SW}	Voltage at SW Pin		-0.3～6	V
V_{pin}	All Other Pins		GND-0.3 to VDD+0.3	V
P_{DMAX}	Power Dissipation	SOT-23-3	0.3	W
		SOT-23-5	0.3	
T_J	Junction Temperature		-40~125	℃
T_{stg}	Storage Temperature		-55 to 150	℃
T_{solder}	Package Lead Soldering Temperature		260℃, 10s	
ESD	Human Body Mode		4000	V

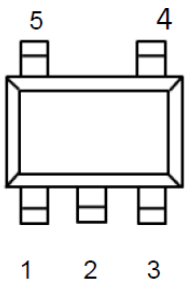
Note: Exceed these limits to damage to the device. Exposure to absolute maximum rating conditions may affect device reliability.

Packaging Type

SOT23-3



SOT23-5



Pin Description

PIN NO		SYMBOL	DESCRIPTTION
SOT23-3	SOT23-5		
	1	CE	Chip Enable
3	2	VOUT	Boost Output
	3	NC	Not Connect
1	4	GND	Ground
2	5	SW	Switch node

Ordering information

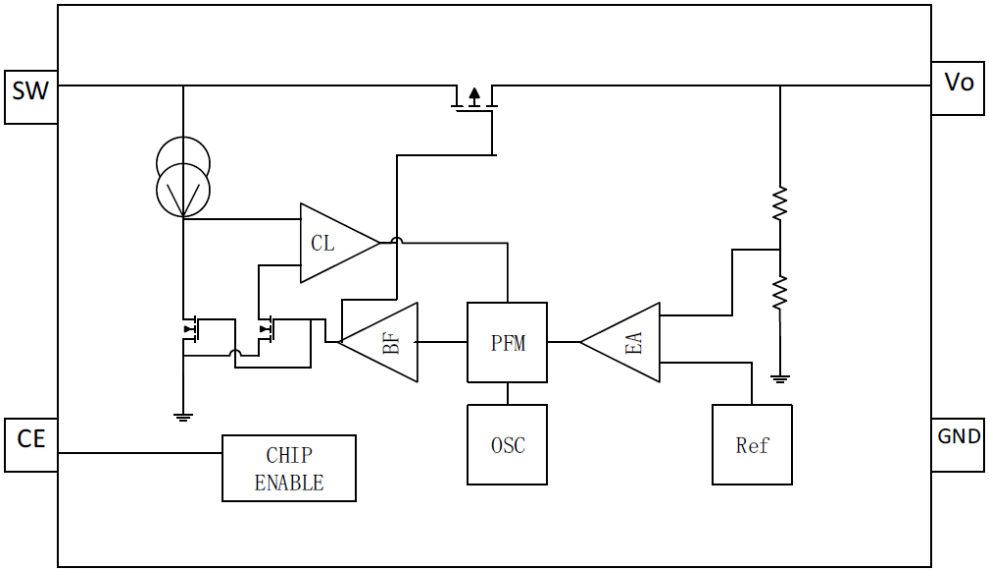
ACE707P XX XX + H

- Halogen - free
- Pb - free
- BM: SOT-23-3
  BN: SOT-23-5
- Output Voltage:2.2V/2.3V……/5.0V

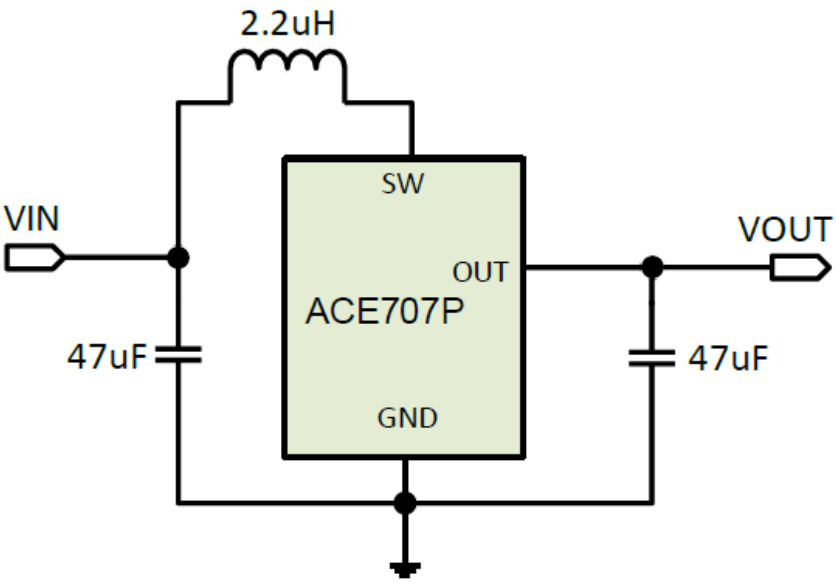
Recommended Operating Range

Symbol	Items	Value	Unit
V_{IN}	VIN Supply Voltage	0.9 to 5.5	V
V_{SW}	Switching Voltage	5.5	V
T_{OPT}	Operating Temperature	-40 to +85	℃

Block Diagram



Typical Application Circuit



Electrical Characteristics

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

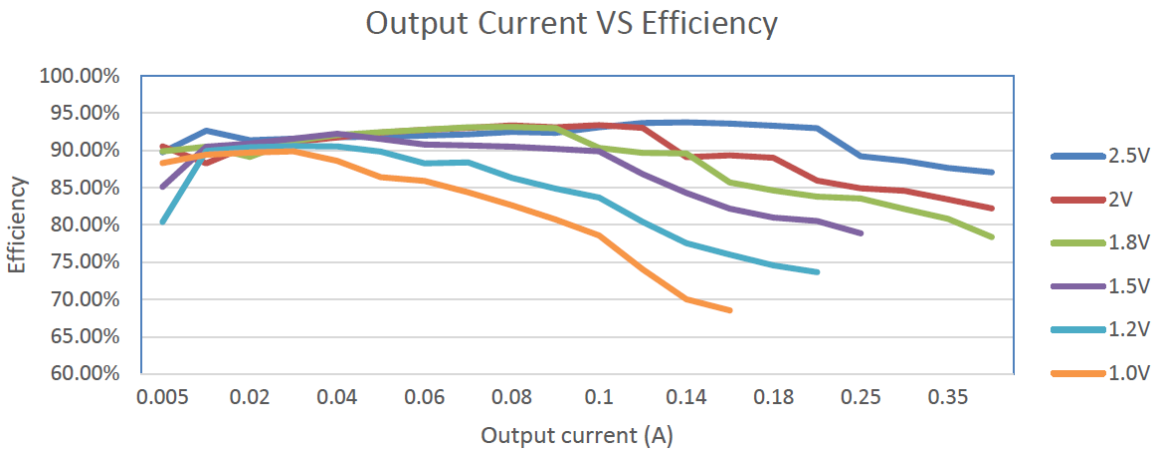
Symbol	Items	Conditions	Min	Typ	Max	Unit
V_{IN}	Input Voltage		0.9		5.5	V
V_{out}	Vout range	I_{Load}=1mA	-2%	Vout	2%	V
I_{noload}**	No Load Current	Vin=Vout*0.6		12		μA
f_{SW}	Switching Frequency	Open Loop，Vin=Vout*0.95		300		KHz
D_{MAX}	Maximum Duty Cycle	Open Loop，Vin=Vout*0.95		83		%
R_{top}*	SW Top Resistance(PMOS)	Vout=3.3		0.6		Ω
R_{bottom}*	SW Bottom Resistance(NMOS)	Vout=3.3		0.6		Ω
I_{LIMIT}*	SW Current Limit			350		A
I_{LEAK}	SW Leakage Current	V_{SW}=5V		0.1	1	μA
V_{star}	Start Voltage	0V-2V Iout=1mA		0.85		V
V_{hold}	Hold Voltage	2V-0V Iout=1mA	0.6			V

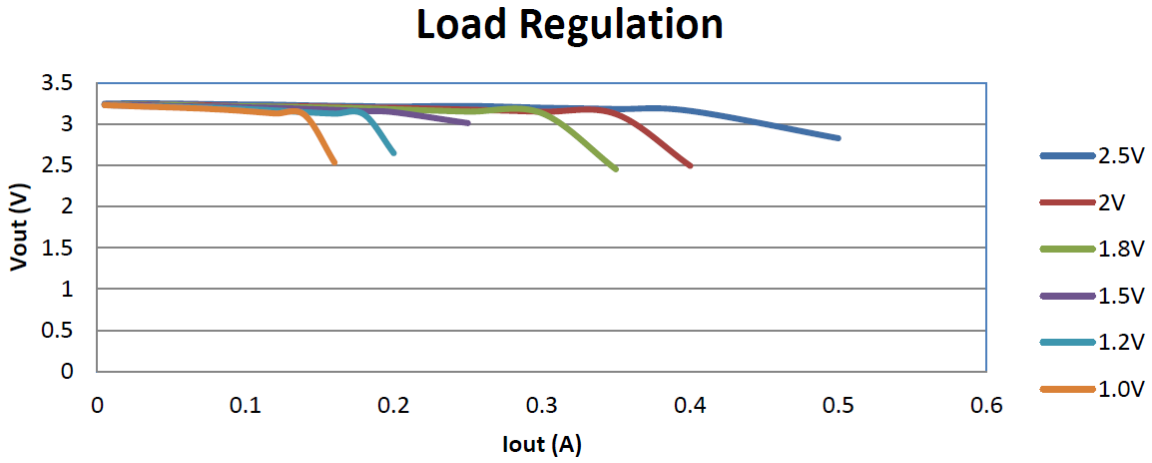
Note:* Guaranteed by design，not tested

** Maximum depends on Test condition.

Typical Performance Characteristics

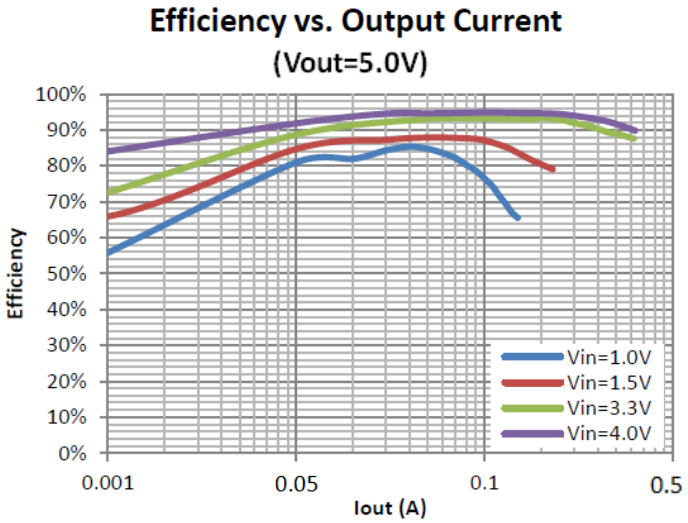
Cin=10uF, Cout=47uF, L=22uH, Topt=25 C, Vout=3.3V

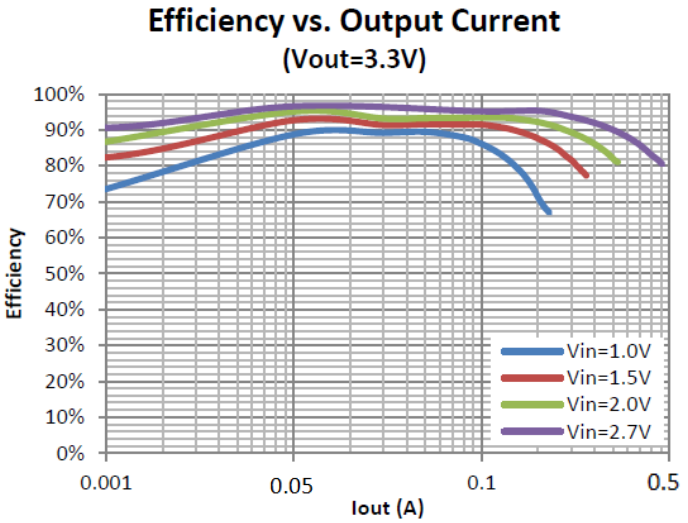


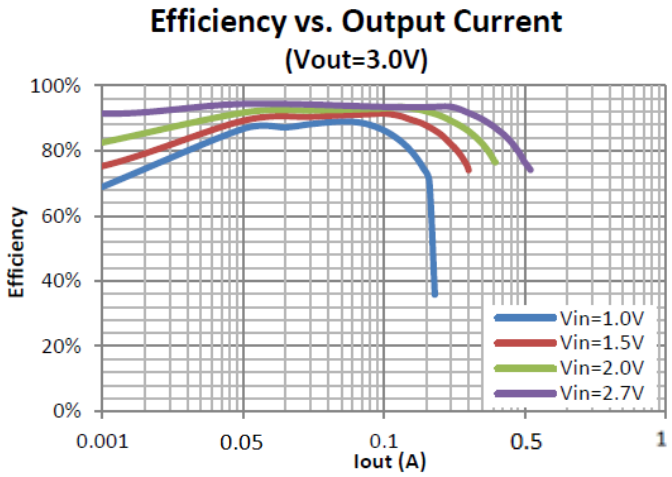


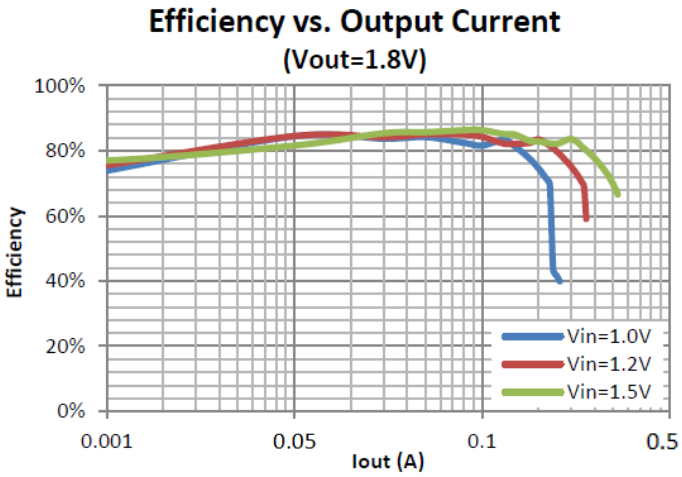
Electrical Performance

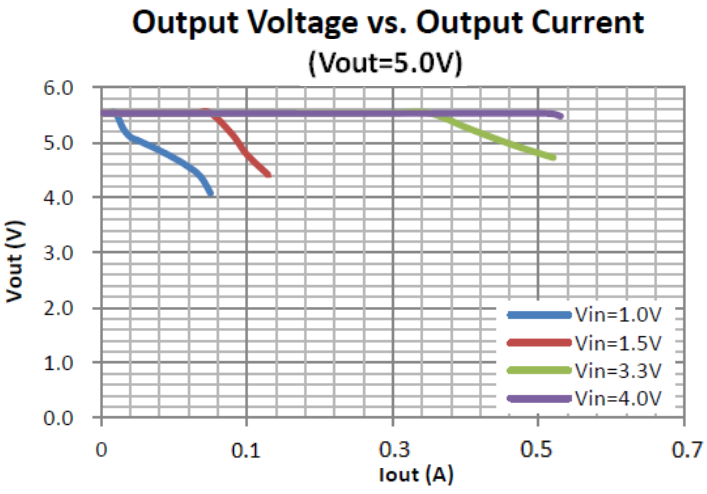
Tested under Cin=Cout=10uF, L=2.2uH, T_A=25 °C , unless otherwise specified

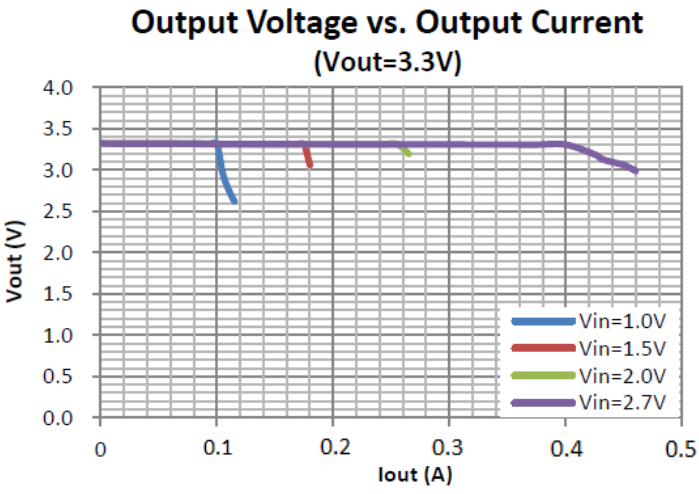


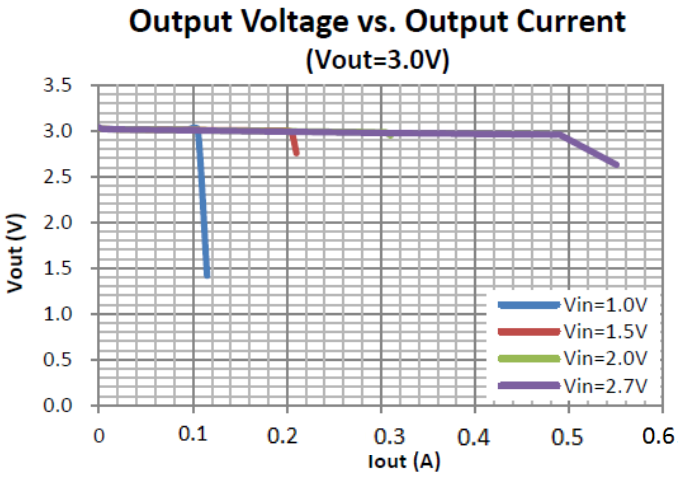


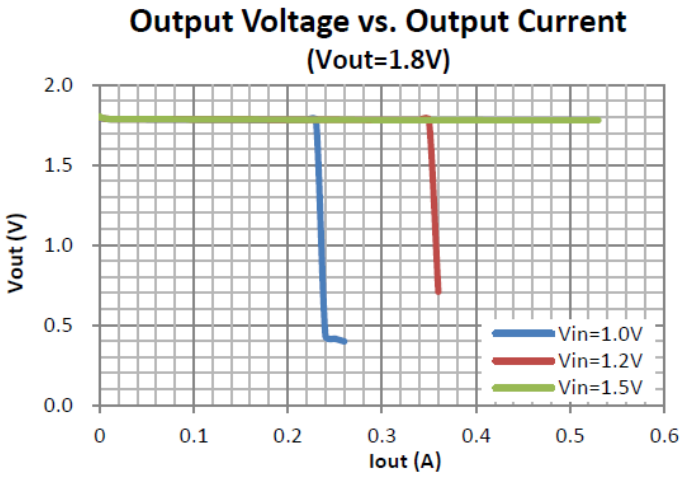


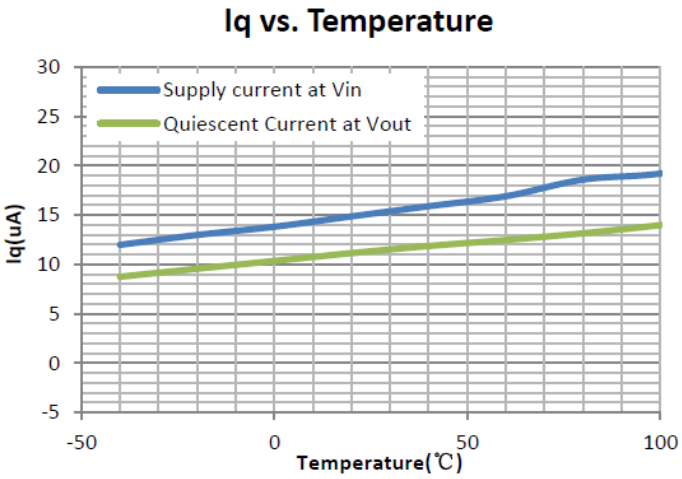


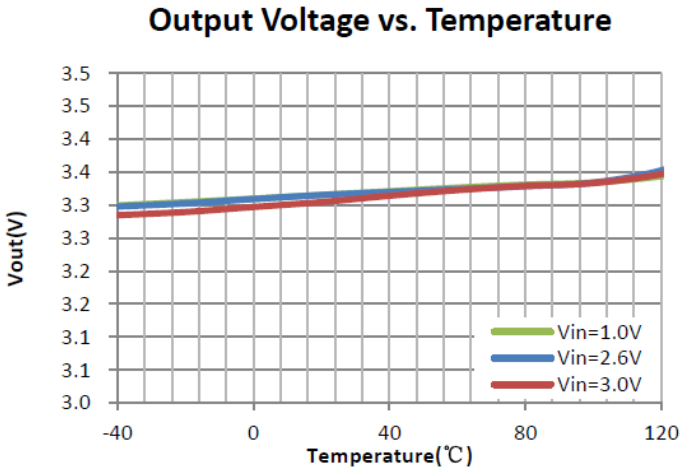





Output Voltage vs. Output Current
(Vout=3.0V)
Vout (V)
Iout (A)
Vin=1.0V
Vin=1.5V
Vin=2.0V
Vin=2.7V

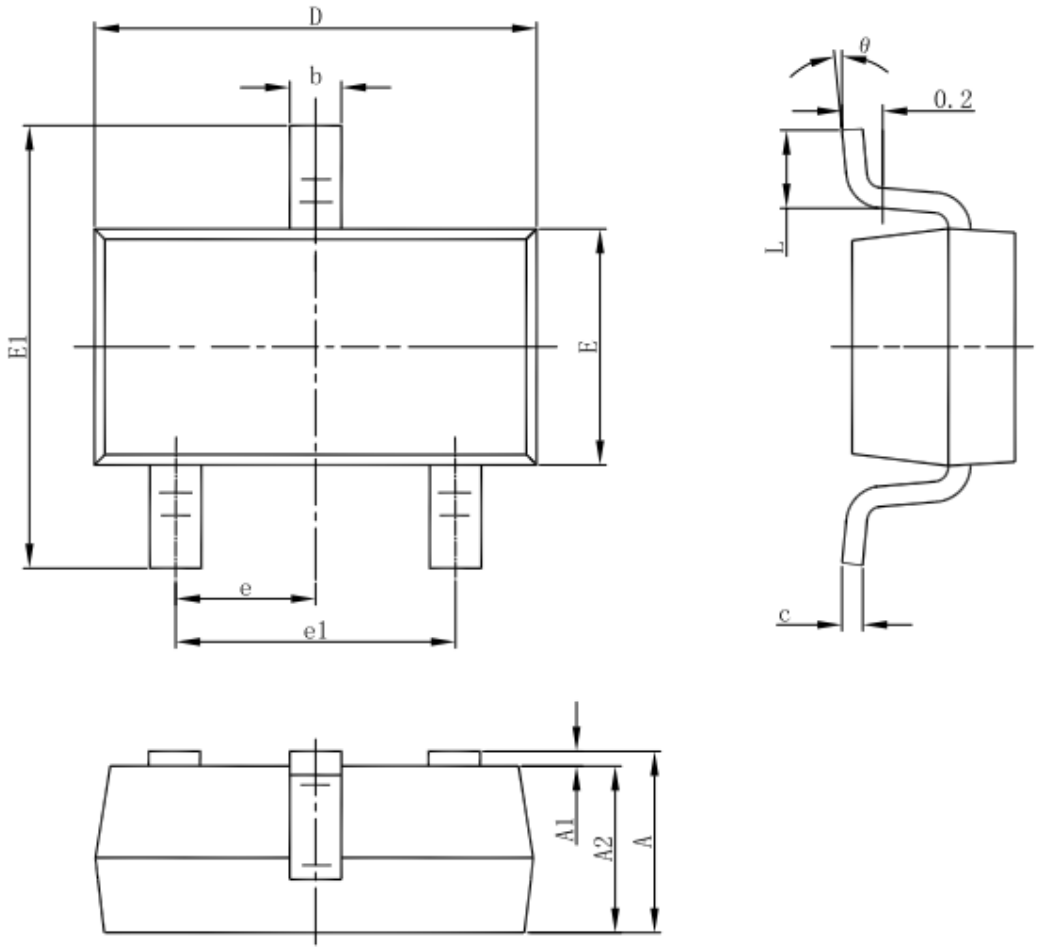

Output Voltage vs. Output Current
(Vout=1.8V)
Vout (V)
Iout (A)
Vin=1.0V
Vin=1.2V
Vin=1.5V


Iq vs. Temperature
Iq(uA)
Temperature(℃)
Supply current at Vin
Quiescent Current at Vout


Output Voltage vs. Temperature
Vout(V)
Temperature(℃)
Vin=1.0V
Vin=2.6V
Vin=3.0V

Packing Information

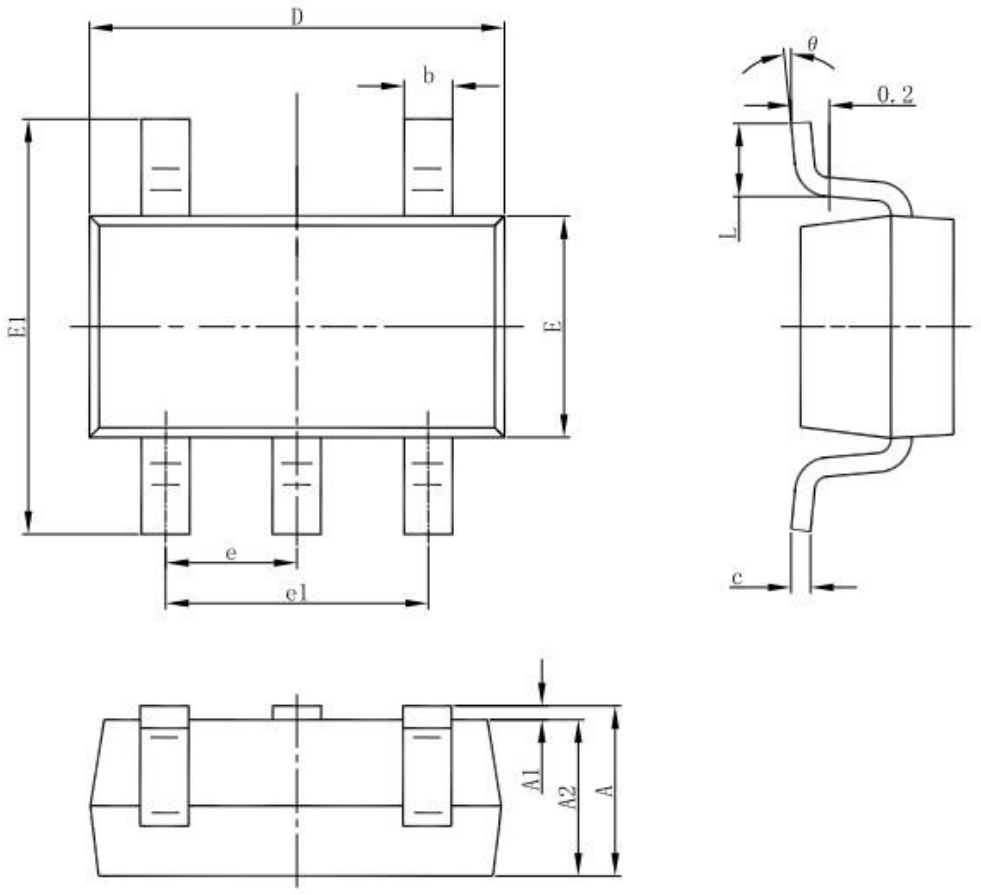
SOT-23-3



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-23-5



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e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
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.