



# ACE5016A

## Ultra Low Current Consumption 300mA CMOS Voltage Regulator

### Description

The ACE5016A series are a group of positive voltage regulators manufactured by CMOS technologies with ultra low power consumption and low dropout voltage, which can prolong battery life in portable electronics. The ACE5016A series work with low-ESR ceramic capacitors, reducing the amount of board space necessary for power applications. The series are very suitable for the battery-powered equipments, such as RF applications and other systems requiring a quiet voltage source.

### Features

- Low Quiescent Current: 0.8 $\mu$ A
- Operating Voltage: 1.8V~7V
- Output Current: 300mA
- Low Dropout Voltage: 300mV@100mA
- Excellent Line and Load Transient Response
- Output Voltage: 0.9~5.0V
- High Accuracy:  $\pm 2\%$  (Typ.)
- Built-in Current Limiter, Short-Circuit Protection
- Ceramic Capacitor Compatible

### Application

- Portable consumer equipments
- Laptop, Palmtops and PDA
- Digital Still and Video Cameras
- MP3, MP4 Player
- Radio control systems
- Battery-Powered Equipment

### Absolute Maximum Ratings

 Unless otherwise specified,  $T_A=25^{\circ}\text{C}$ 

Parameter	Symbol	Max	Unit
Input Voltage	$V_{IN}$	$V_{SS} - 0.3 \sim V_{SS} + 8$	V
Output Current	$I_{OUT}$	500	mA
Output Voltage	$V_{OUT}$	$V_{SS} - 0.3 \sim V_{IN} + 0.3$	V
Power Dissipation	SOT-23-3	250	mW
	SOT-23-5	250	
	SOT-89-3	500	
	DFN1*1-4	400	
Operating Temperature	$T_{opr}$	-40~85	$^{\circ}\text{C}$
Storage Temperature	$T_{stg}$	-40~125	$^{\circ}\text{C}$
Soldering Temperature & Time	$T_{solder}$	260 $^{\circ}\text{C}$ , 10s	

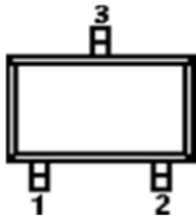


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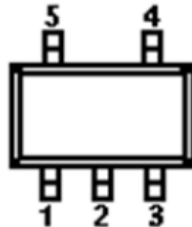
## Ultra Low Current Consumption 300mA CMOS Voltage Regulator

### Packaging Type

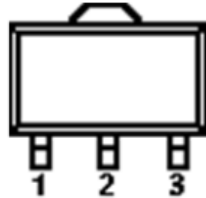
SOT-23-3



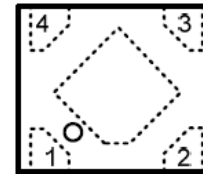
SOT-23-5



SOT-89-3



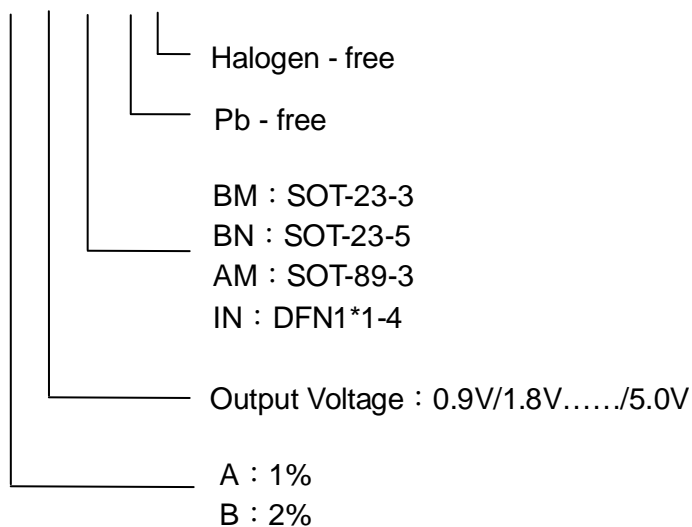
DFN1\*1-4



SOT-23-3	SOT-23-5	SOT-89-3	DFN1*1-4	Pin Name	Function
1	2	1	2	$V_{SS}$	Ground
2	5	3	1	$V_{OUT}$	Output
3	1	2	4	$V_{IN}$	Power input
	3.4		3	NC	No Connection

### Ordering information

ACE5016A X XX XX + H

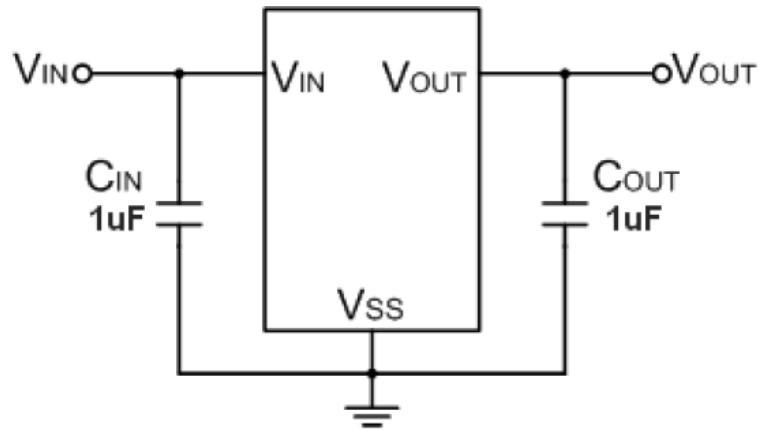




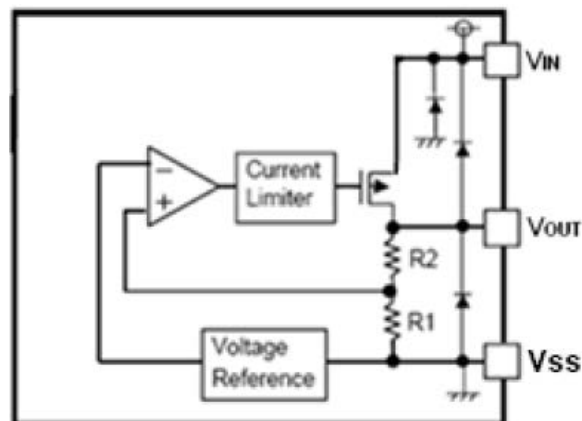
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## Ultra Low Current Consumption 300mA CMOS Voltage Regulator

### Typical Application Circuit



### Block Diagram





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## Ultra Low Current Consumption 300mA CMOS Voltage Regulator

**Electrical Characteristics** ( $V_{IN}=V_{OUT}+1V$ ,  $C_{IN}=C_{OUT}=2.2\mu F$ ,  $T_A=25^\circ C$ , unless otherwise specified)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Output Voltage	$V_{OUT}$	$I_{OUT}=10mA$	$V_{OUT} * 0.98$	$V_{OUT}$	$V_{OUT} * 1.02$	V
			$V_{OUT} * 0.99$	$V_{OUT}$	$V_{OUT} * 1.01$	
Supply Current	$I_{SS}$	$I_{OUT}=0$		0.8	2.0	$\mu A$
Output Current	$I_{OUT}$	$V_{OUT} \geq 3.0V$	300			mA
Dropout Voltage	$V_{dif}$	$I_{OUT}=100mA$ , $V_{OUT} \geq 3.0V$		300		mV
Load Regulation	$\Delta V_{OUT}$	$V_{IN} = V_{OUT} + 1V$ , $1mA \leq I_{OUT} \leq 100mA$		10		mV
Line Regulation	$\frac{\Delta V_{OUT}}{V_{OUT} \times \Delta V_{IN}}$	$I_{OUT} = 10mA$ $V_{OUT} + 1V \leq V_{IN} \leq 6V$		0.01	0.3	%/V
Temperature Coefficient	$\frac{\Delta V_{OUT}}{V_{OUT} \times \Delta T_A}$	$I_{OUT}=10mA$ , $-40^\circ C < T_A \leq 85^\circ C$		100		ppm
Short Current	$I_{SHORT}$	$V_{OUT} = V_{SS}$		30		mA
Input Voltage	$V_{IN}$		1.8		7.0	V

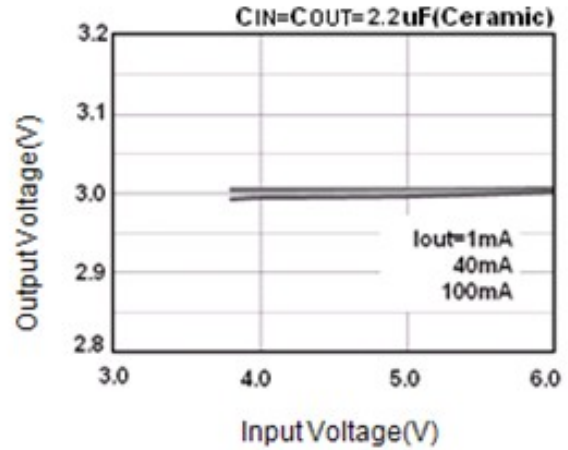
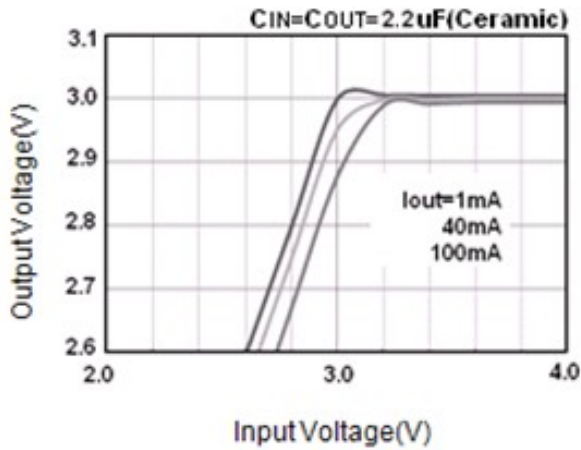
NOTE:

- $V_{OUT}$ : Specified Output Voltage.
- $V_{OUT(E)}$ : Effective Output Voltage ( i.e. The Output Voltage When  $V_{IN} = (V_{OUT} + 1.0V)$  and Maintain A Certain  $I_{OUT}$  Value).
- $V_{dif}$ : The Difference Of Output Voltage And Input Voltage When Input Voltage Is Decreased Gradually Till Output Voltage Equals To 98% Of  $V_{OUT(E)}$ .

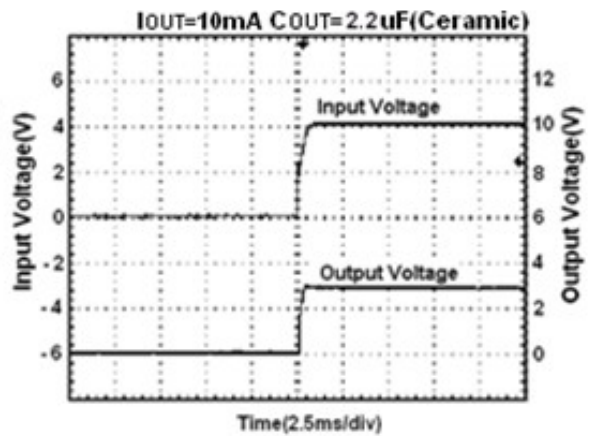
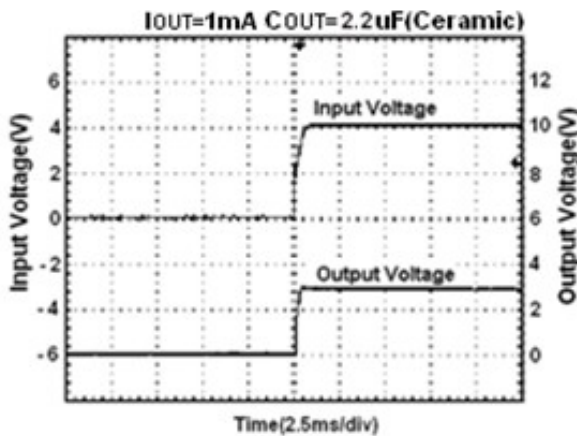


### Typical Performance Characteristics

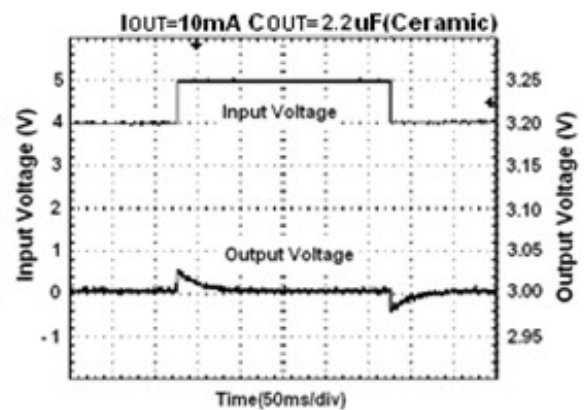
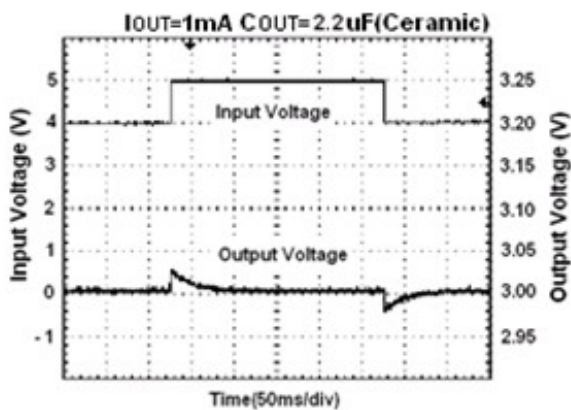
( 1 ) Output Voltage vs. Input Voltage



(2) Input Transient Response 1



(3) Input Transient Response 2

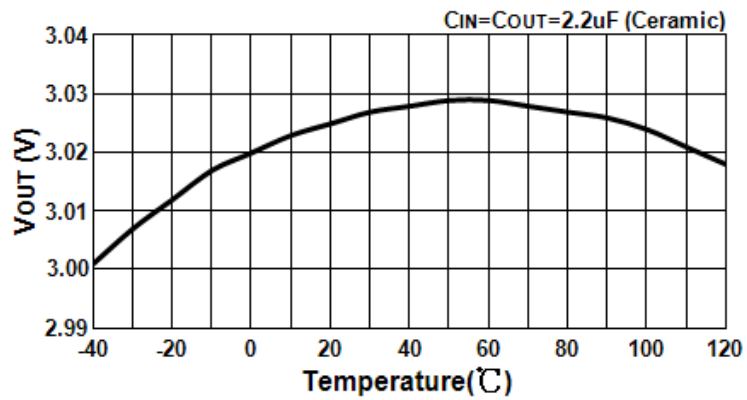




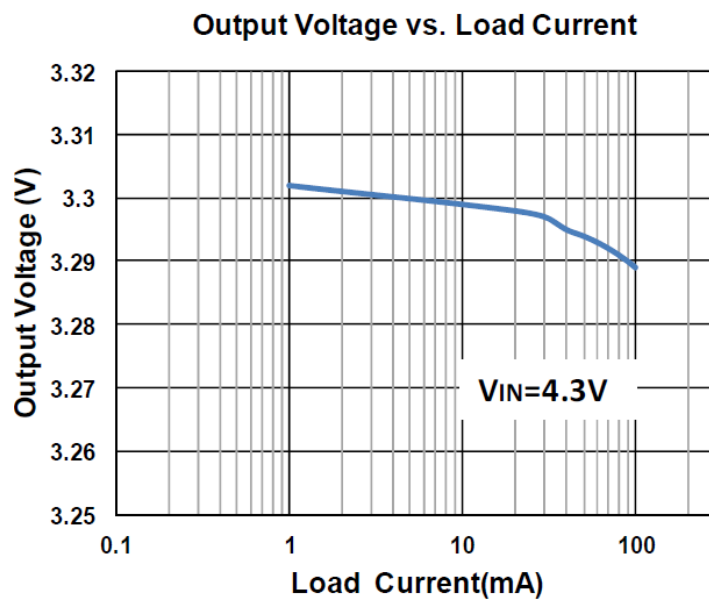
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### (4) Output Voltage vs. Temperature



### (5) Output Voltage vs. Load Current



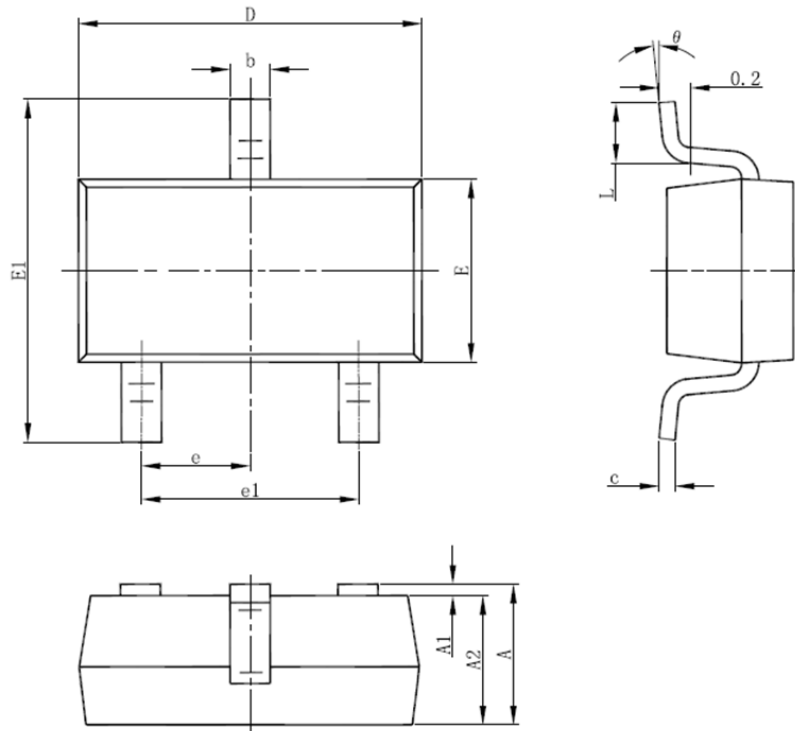


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## Ultra Low Current Consumption 300mA CMOS Voltage Regulator

### 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°

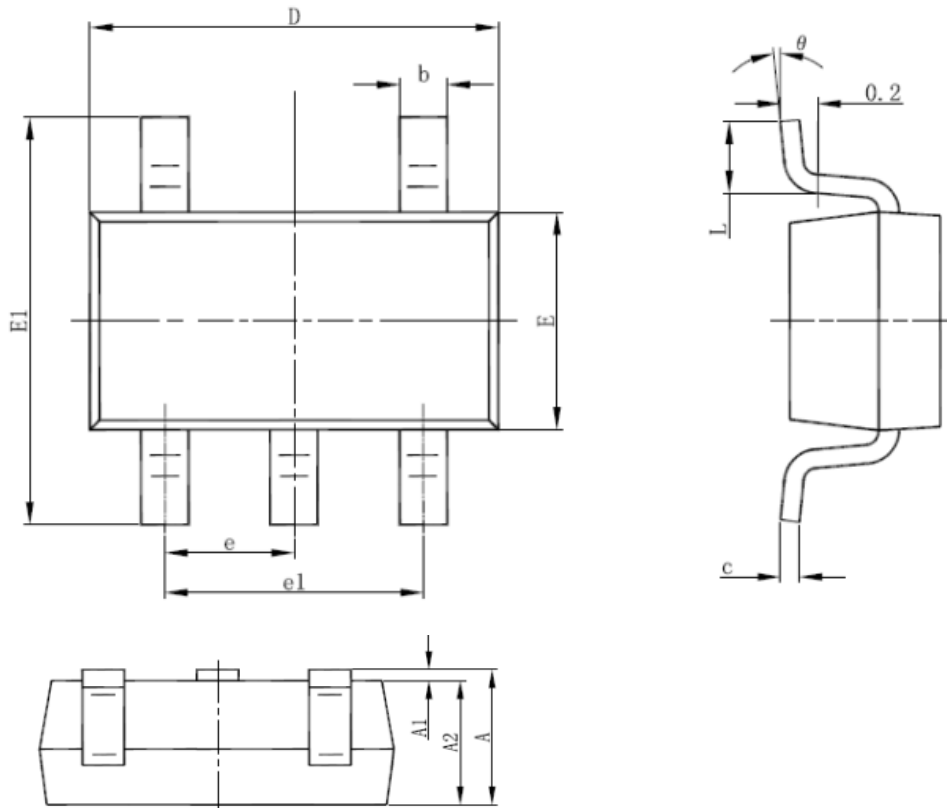


# ACE5016A

## Ultra Low Current Consumption 300mA CMOS Voltage Regulator

### Packing Information

#### SOT-23-5



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°



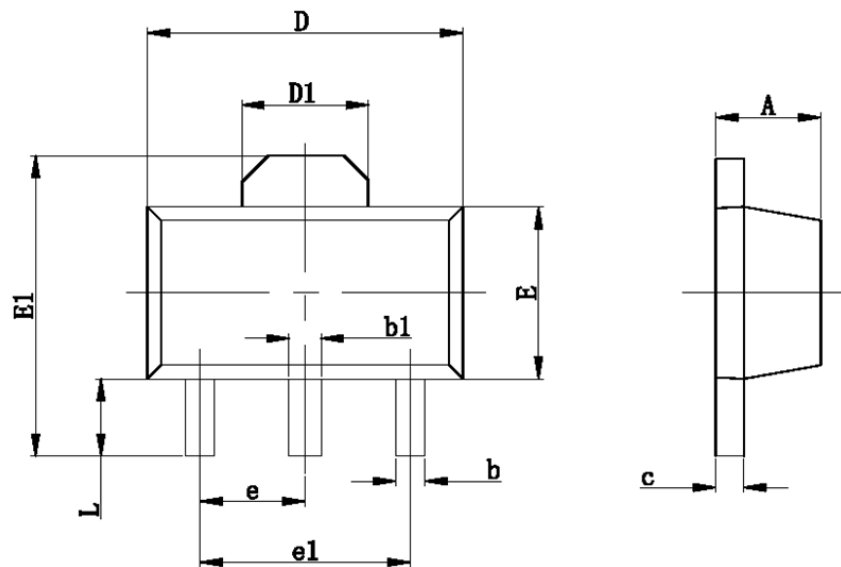


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## Ultra Low Current Consumption 300mA CMOS Voltage Regulator

### Packing Information

#### SOT-89-3



Symbol	Dimensions 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	0.197
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550 REF		0.061 REF	
E	2.300	2.600	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500 TYP		0.060 TYP	
e1	3.000 TYP		0.118 TYP	
L	0.900	1.200	0.035	0.047

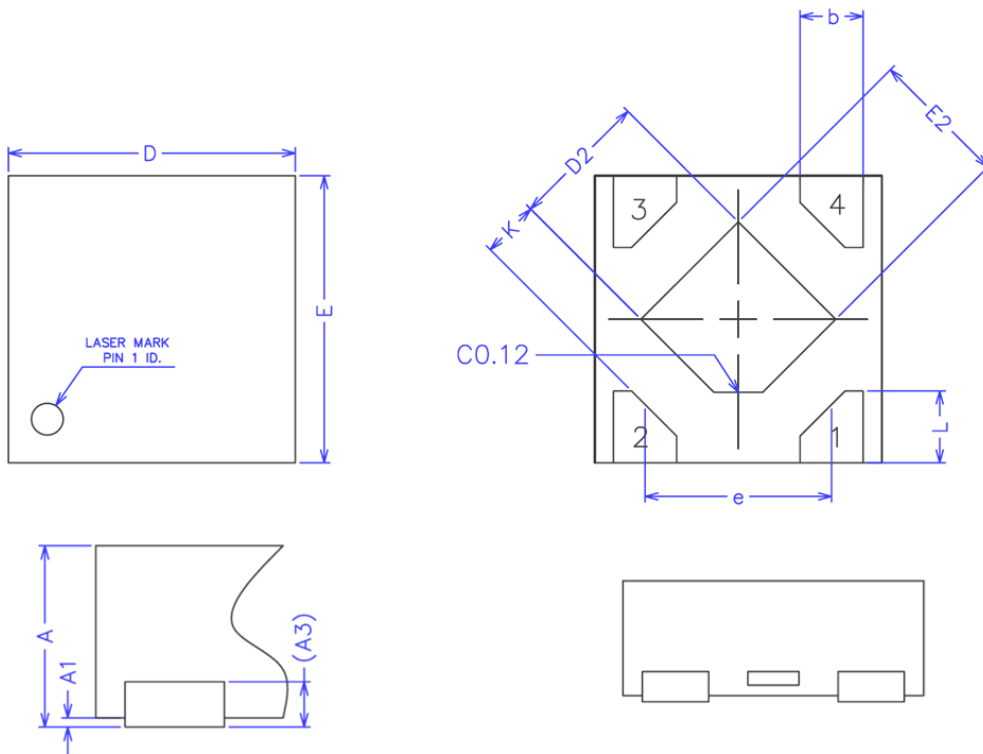


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### Packing Information

DFN1\*1-4



COMMON DIMENSIONS  
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	NOM	MAX
A	0.34	0.37	0.40
A1	0.00	0.02	0.05
A3	0.100REF		
b	0.17	0.22	0.27
D	0.95	1.00	1.05
E	0.95	1.00	1.05
D2	0.43	0.48	0.53
E2	0.43	0.48	0.53
L	0.20	0.25	0.30
e		0.65	
K	0.15		



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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:

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.

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