Ultra Fast High PSRR Low Noise CMOS Voltage Regulators

CJ6205 Series

■ INTRODUCTION

The CJ6205 series are a group of positive voltage regulators manufactured by CMOS technologies with high ripple rejection, ultra low noise, low power consumption and low dropout voltage, which can prolong battery life in portable electronics. The CJ6205 series work with low-ESR ceramic capacitors, reducing the amount of board space necessary for power applications. The CJ6205 series consume less than 0.1uA in shutdown mode and have fast turn-on time less than 50us.The series are very suitable for the battery-powered equipments, such as RF applications and other systems requiring a quiet voltage source.

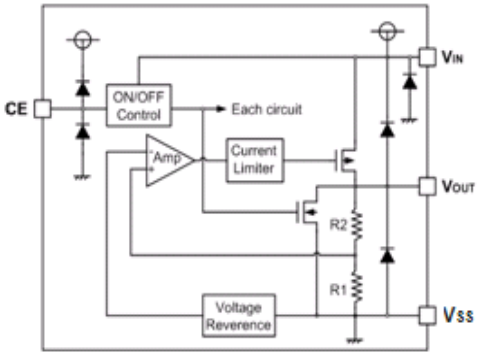
■ FEATURES

- Low Output Noise：40μV_{RMS} (10Hz~100kHz)
- Low Dropout Voltage：150mV@150mA
- Low Quiescent Current：50μA
- High Ripple Rejection：75dB@1kHz
- Excellent Line and Load Transient Response
- Operating Voltage：2.0V～6.0V
- Output Voltage：1.2 ~ 5.0V
- High Accuracy：±2％（Typ.）
- Built-in Current Limiter, Short-Circuit Protection
- TTL- Logic-Controlled Shutdown Input

■ APPLICATIONS

- Cellular and Smart Phones
- Laptop, Palmtops and PDA
- Digital Still and Video Cameras
- MP3, MP4 Player
- Radio control systems
- Battery-Powered Equipment

■ BLOCK DIAGRAM



■ ORDER INFORMATION

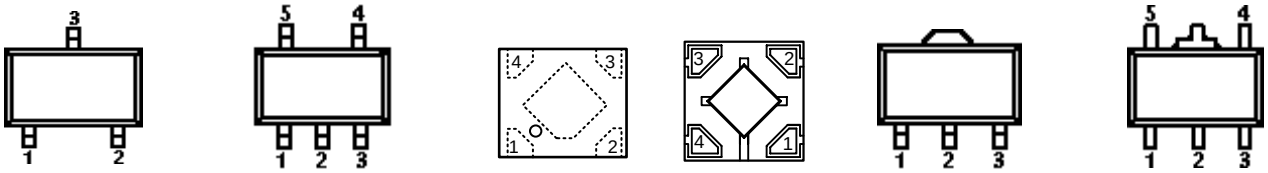
CJ6205①②③④

DESIGNATOR	SYMBOL	DESCRIPTION
①	A	Standard
	B	High Active, pull-down resistor built in, with C_{OUT} discharge resistor
	C	High Active, No pull-down resistor, No C_{OUT} discharge resistor
②③	Integer	Output Voltage e.g.1.8V=②:1, ③:8
④	M	Package:SOT-23-3L/5L
	U	Package:SOT-353
	P	Package:SOT-89-3L/5L
	F	Package:WBFBP-04C/DFNWB1x1-4

Pin Configuration

(Top view)

SOT-23-3L **SOT-23-5L/SOT-353** **DFNWB1×1-4** **WBFBP-04C** **SOT-89-3L** **SOT-89-5L**



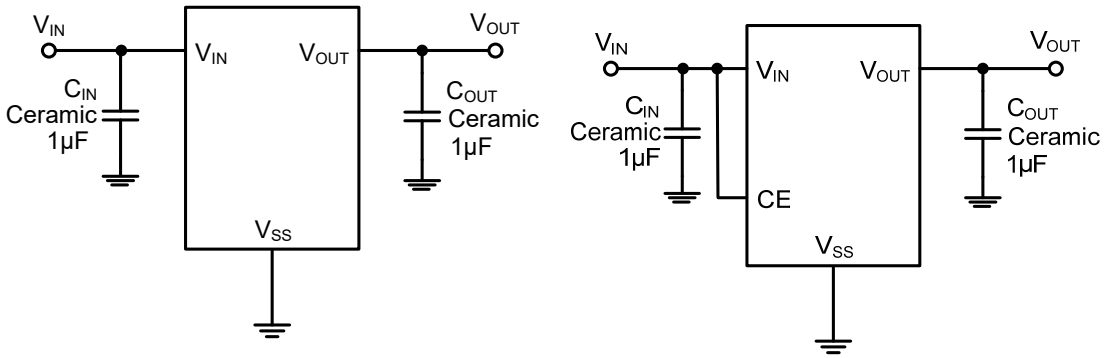
PIN NUMBER		PIN NAME	FUNCTION
SOT-23-3L	SOT-89-3L		
M	P		
1	1	V_{SS}	Ground
2	3	V_{OUT}	Output
3	2	V_{IN}	Power input

PIN NUMBER		SYMBOL	FUNCTION
SOT-23-5L/SOT-353	SOT-89-5L		
1	5	V_{IN}	Power Input Pin
2	2	V_{SS}	Ground
3	4	CE	Chip Enable Pin
4	3	NC	No Connection
5	1	V_{OUT}	Output Pin

DFNWB1×1-4/WBFBP-04C

PIN NUMBER	SYMBOL	FUNCTION
F		
1	V_{OUT}	Output Pin
2	V_{SS}	Ground
3	CE	Chip Enable Pin
4	V_{IN}	Power Input Pin

■ TYPICAL APPLICATION



■ ABSOLUTE MAXIMUM RATINGS

(Unless otherwise specified, Ta=25°C)

PARAMETER		SYMBOL	RATINGS	UNITS
Input Voltage		V_{IN}	V_{SS} -0.3~V_{SS}+7	V
Output Current		I_{OUT}	600	mA
Output Voltage		V_{OUT}	V_{SS} -0.3~V_{IN}+0.3	V
Power Dissipation	SOT-353	Pd	0.3	W
	SOT-23-3L/SOT-23-5L		0.4	W
	DFNWB1×1-4/WBFBP-4C		0.3	W
	SOT-89-3L/SOT-89-5L		0.6	W
Operating Temperature		T_{opr}	-40~+85	℃
Storage Temperature		T_{stg}	-40~+125	℃
Soldering Temperature & Time		T_{solder}	260℃, 10s	

■ ELECTRICAL CHARACTERISTICS

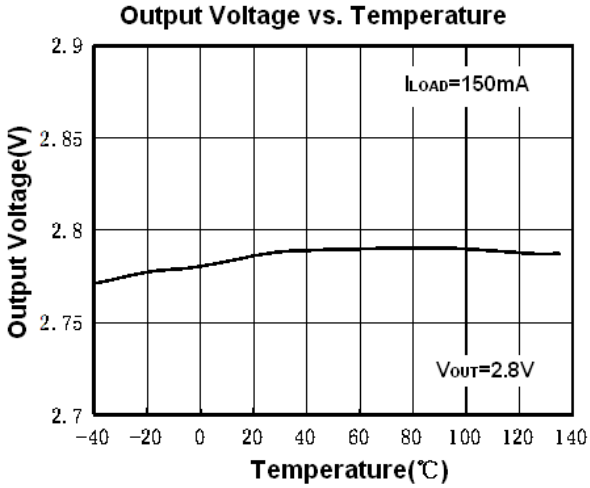
CJ6205 Series **(V_{IN}=V_{OUT}+1V, C_{IN}=C_{OUT}=1μF，Ta=25℃,unless otherwise specified)**

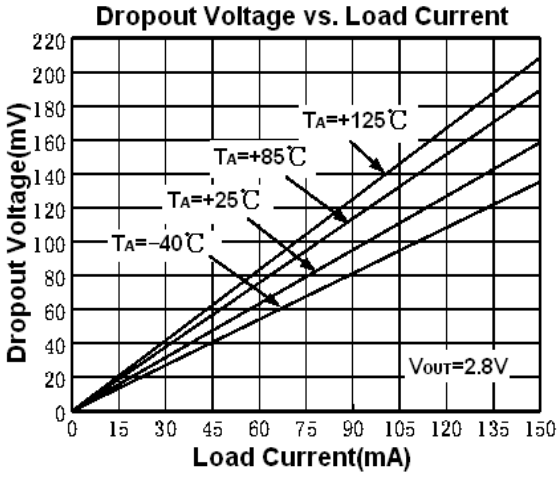
PARAMETER		SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNITS
Output Voltage		V_{OUT}(E) (Note 2)	I_{OUT}=1mA	V_{OUT} *0.98	V_{OUT}	V_{OUT} *1.02	V
Supply Current		I_{SS}	I_{OUT}=0		50	100	μA
Standby Current		I_{STBY}	CE = V_{SS}			0.1	μA
Output Current		I_{OUT}	—	500			mA
Dropout Voltage (Note 3)		V_{dif}	I_{OUT} =150mA V_{OUT}≥2.8V		150		mV
Load Regulation		ΔV_{OUT}	V_{IN}= V_{OUT} +1V, 1mA≤I_{OUT}≤100mA		10		mV
Line Regulation		$\frac{\Delta V_{OUT}}{V_{OUT} \times \Delta V_{IN}}$	I_{OUT} =10mA V_{OUT} +1V≤V_{IN}≤6V		0.01	0.2	%/V
Output Voltage Temperature Characteristics		$\frac{\Delta V_{OUT}}{\Delta T \times V_{OUT}}$	I_{OUT} =10mA -40≤T≤+85		100		ppm
Short Current		I_{Short}	V_{OUT} =V_{SS}		100		mA
Input Voltage		V_{IN}	—	2.0		6.0	V
Power Supply Rejection Rate	217Hz	PSRR	I_{OUT}=50mA		80		dB
	1kHz				75		
	10kHz				70		
CE "High" Voltage		V_{CE}"H"		1.5		V_{IN}	V
CE "Low" Voltage		V_{CE}"L"				0.3	V

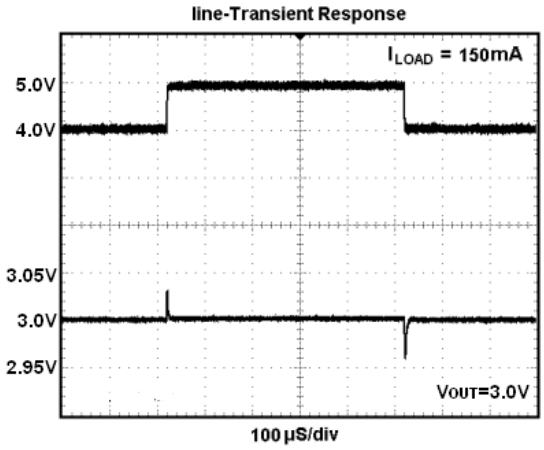
NOTE:

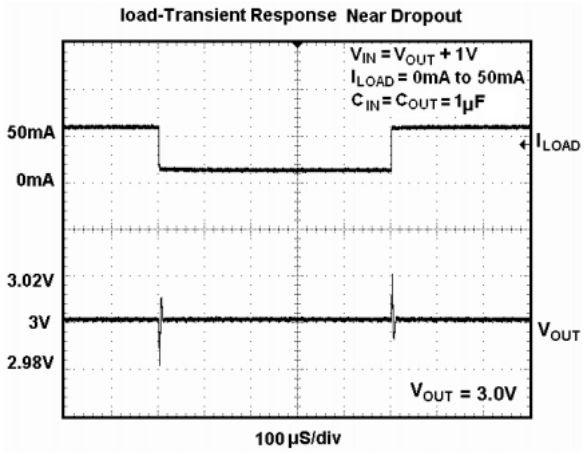
1. V_{OUT}：Specified Output Voltage.
2. V_{OUT} (E) ： Effective Output Voltage (Ie. The Output Voltage When V_{IN} = (V_{OUT} +1.0V) And Maintain A Certain I_{OUT} Value).
3. V_{dif}：The Difference Of Output Voltage And Input Voltage When Input Voltage Is Decreased Gradually Till Output Voltage Equals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

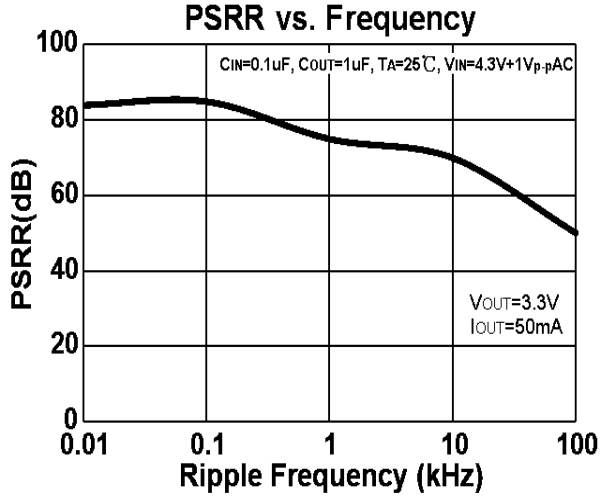
Typical Characteristics

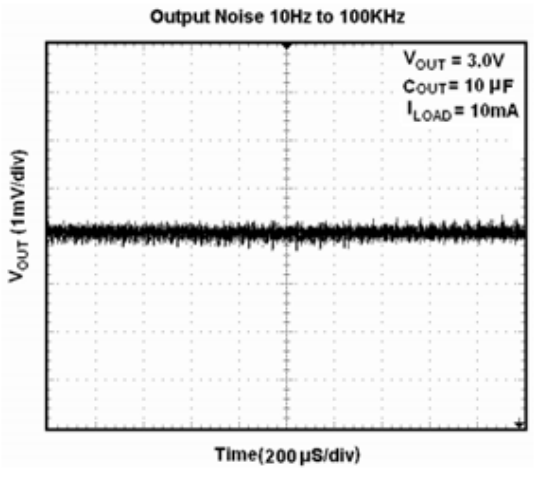




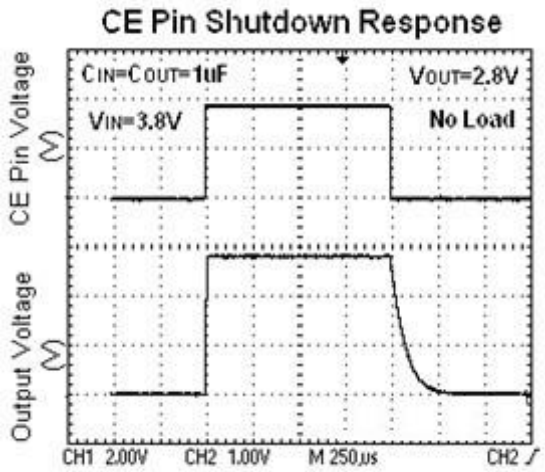


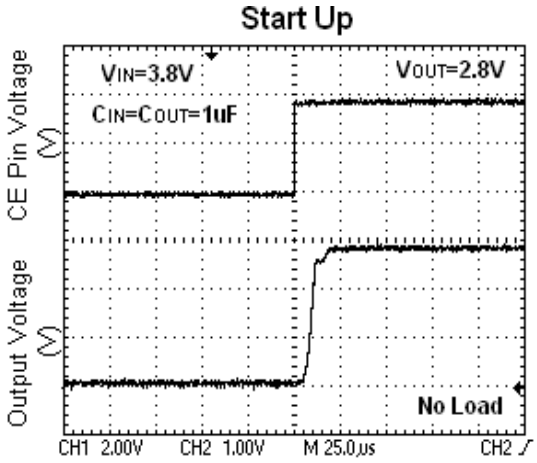




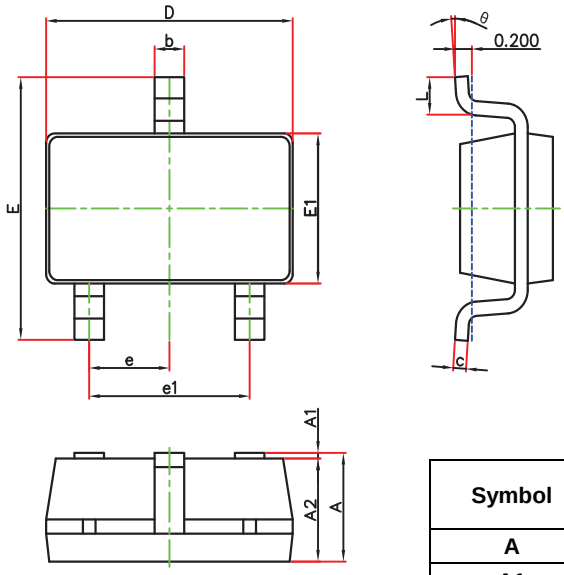


Typical Characteristics



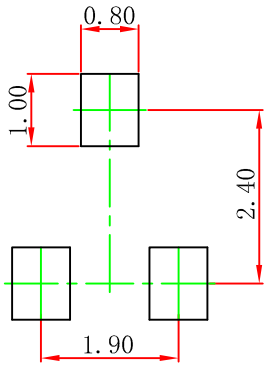


SOT-23-3L Package Outline Dimensions



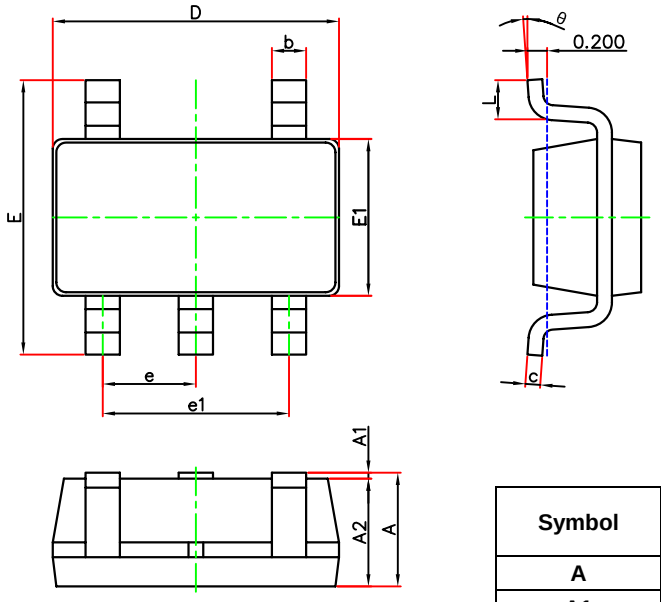
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	2.650	2.950	0.104	0.116
E1	1.500	1.700	0.059	0.067
e	0.950(BSC)		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°

SOT-23-3L Suggested Pad Layout



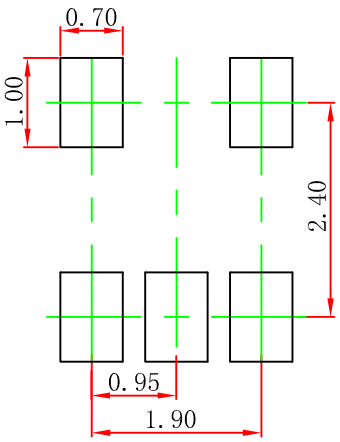
Note:
1.Controlling dimension:in millimeters.
2.General tolerance:± 0.05mm.
3.The pad layout is for reference purposes only.

SOT-23-5L Package Outline Dimensions



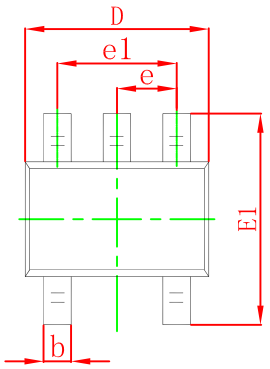
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	2.650	2.950	0.104	0.116
E1	1.500	1.700	0.059	0.067
e	0.950(BSC)		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°

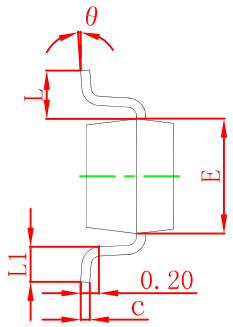
SOT-23-5L Suggested Pad Layout

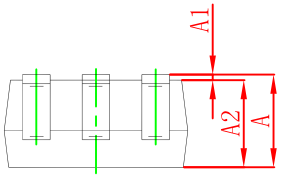


Note:
1.Controlling dimension:in millimeters.
2.General tolerance:± 0.05mm.
3.The pad layout is for reference purposes only.

SOT-353 Package Outline Dimensions

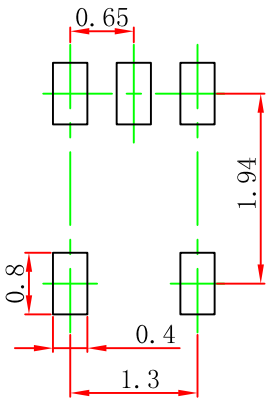






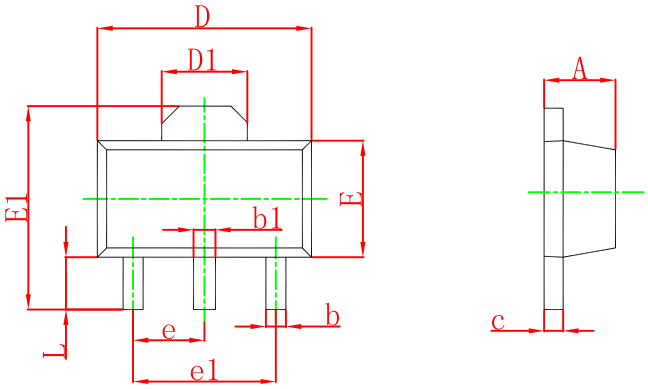
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.800	1.100	0.031	0.044
A1	0.000	0.100	0.000	0.004
A2	0.800	1.100	0.031	0.044
b	0.150	0.400	0.006	0.016
c	0.080	0.150	0.003	0.006
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.054
E1	2.150	2.450	0.085	0.096
e	0.650(TYP)		0.026(TYP)	
e1	1.200	1.400	0.047	0.055
L	0.525(REF)		0.021(REF)	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°

SOT-353 Suggested Pad Layout



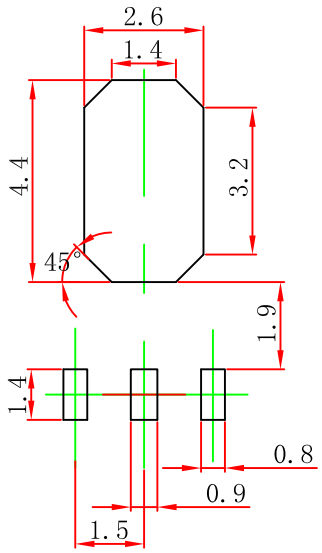
Note:
1.Controlling dimension:in millimeters.
2.General tolerance:±0.05mm.
3.The pad layout is for reference purposes only.

SOT-89-3L Package Outline Dimensions



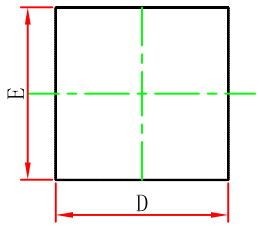
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.400	1.600	0.055	0.063
b	0.320	0.520	0.013	0.197
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550 REF		0.061 REF	
E	2.300	2.600	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500 TYP		0.060 TYP	
e1	3.000 TYP		0.118 TYP	
L	0.900	1.200	0.035	0.047

SOT-89-3L Suggested Pad Layout

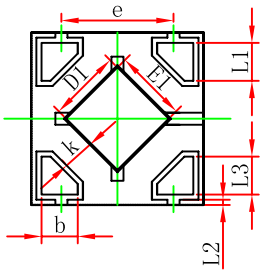


Note:
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2.General tolerance:±0.05mm.
3.The pad layout is for reference purposes only.

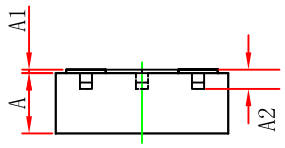
WBFBP-04C Package Outline Dimensions



TOP VIEW



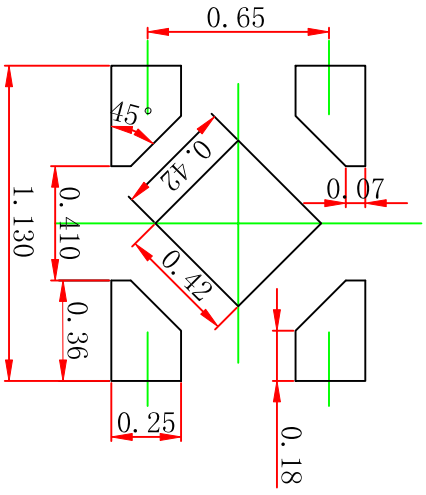
BOTTOM VIEW



SIDE VIEW

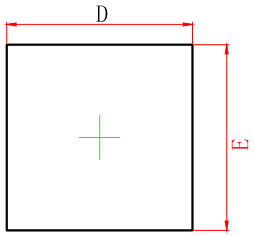
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.335	0.405	0.013	0.016
D	0.950	1.050	0.037	0.041
E	0.950	1.050	0.037	0.041
D1	0.370	0.470	0.015	0.019
E1	0.370	0.470	0.015	0.019
k	0.17MIN.		0.007MIN.	
b	0.160	0.260	0.006	0.010
c	0.010	0.090	0.000	0.004
e	0.600	0.700	0.024	0.028
L1	0.185	0.255	0.007	0.010
L2	0.030 REF.		0.001 REF.	
L3	0.185	0.255	0.007	0.010

WBFBP-04C Suggested Pad Layout

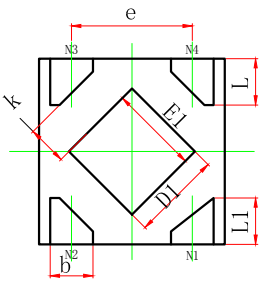


Note:
1.Controlling dimension:in millimeters.
2.General tolerance:± 0.05mm.
3.The pad layout is for reference purposes only.

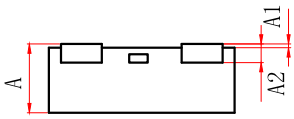
DFNWB1*1-4L Package Outline Dimensions



TOP VIEW



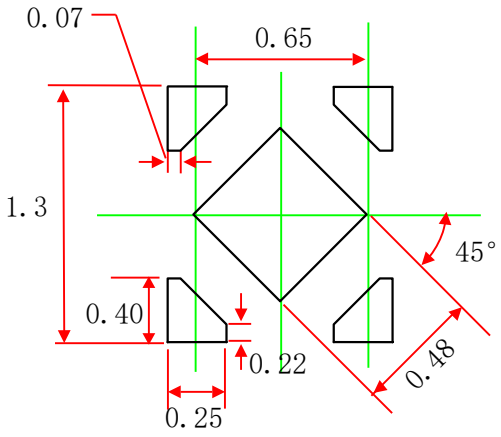
BOTTOM VIEW



SIDE VIEW

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.320	0.400	0.013	0.016
A1	0.000	0.050	0.000	0.002
A2	0.100 REF.		0.004 REF.	
D	0.950	1.050	0.037	0.041
E	0.950	1.050	0.037	0.041
D1	0.430	0.530	0.017	0.021
E1	0.430	0.530	0.017	0.021
k	0.150MIN.		0.006MIN.	
b	0.180	0.280	0.007	0.011
e	0.650TYP.		0.026TYP.	
L	0.200	0.300	0.008	0.012
L1	0.200	0.300	0.008	0.012

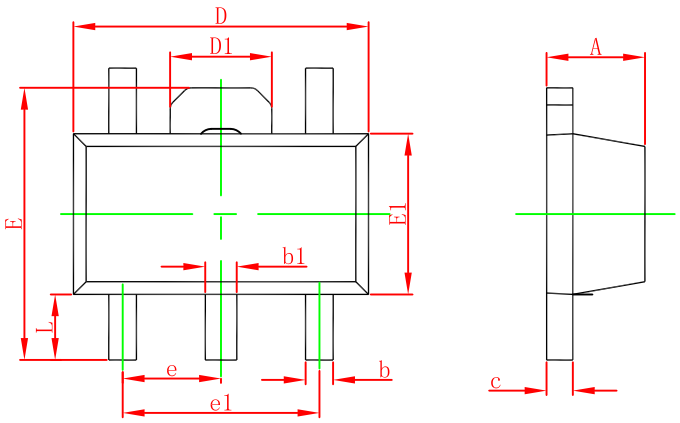
DFNWB1*1-4L Suggested Pad Layout

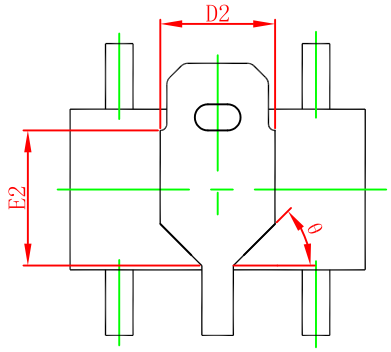


Note:

1. Controlling dimension: in millimeters.
2. General tolerance: ±0.05mm.
3. The pad layout is for reference purpose only.

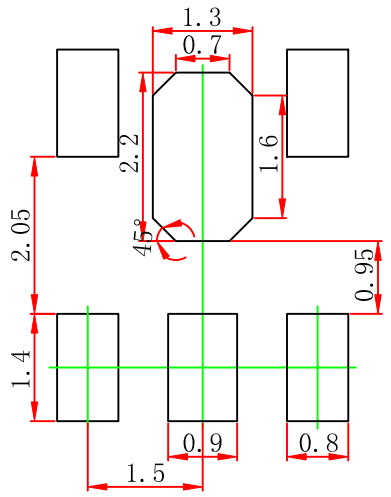
SOT-89-5L Package Outline Dimensions





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	0.020
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

SOT-89-5L Suggested Pad Layout



Note:
1.Controlling dimension:in millimeters.
2.General tolerance:±0.05mm.
3.The pad layout is for reference purposes only.

DISCLAIMER

IMPORTANT NOTICE, PLEASE READ CAREFULLY

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