

Ultra-Fast High PSRR
1.5A CMOS Voltage Regulator

CE6216 Series

■ **INTRODUCTION**

The CE6216 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 1µA in shutdown mode and can provide large output currents even when the difference of the input-output voltage is small. Each of the CE6216 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 battery-powered equipments, wireless communication applications, industry equipments and so on.

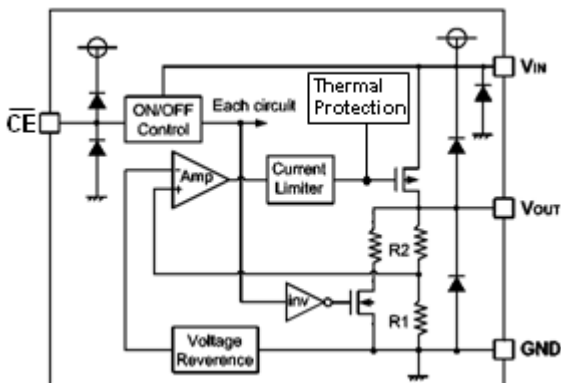
■ **FEATURES**

- Shutdown Current: < 1µA
- Guaranteed Output Current: 1.5A(Typ.)
- Low Quiescent Current: 50µA (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

■ **APPLICATIONS**

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

■ **BLOCK DIAGRAM**



■ **ORDER INFORMATION**

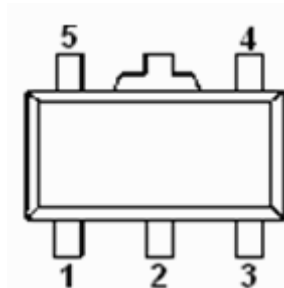
CE6216①②③④

DESIGNATOR	SYMBOL	DESCRIPTION
①	B	Standard
②③	Integer	Output Voltage(1.5~5.0V) e.g:3.0V=②:3, ③:0
④	P	Package: SOT-89-5
	ES	Package: SOP8-PP

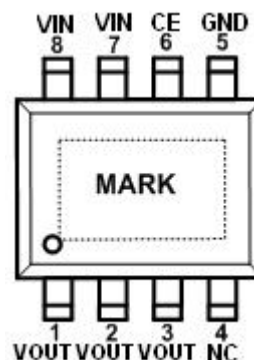
■ PIN CONFIGURATION

(Pin output sequence can be ordered by customer)

SOT-89-5



SOP8-PP



CE6216 (TO-252-5, TO-263-5)

PIN NUMBER		PIN NAME	FUNCTION
SOT-89-5	SOP8-PP		
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

■ ABSOLUTE MAXIMUM RATINGS

(Unless otherwise specified, $T_a=25^{\circ}\text{C}$)

PARAMETER	SYMBOL	RATINGS	UNITS
Input Voltage	V_{IN}	$V_{SS}-0.3\sim V_{SS}+7$	V
Output Current	I_{OUT}	2000	mA
Output Voltage	V_{OUT}	$V_{SS}-0.3\sim V_{IN}+0.3$	V
Power Dissipation	SOT-89-5	P_d	600
	SOP8-PP	P_d	1500
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	

■ ELECTRICAL CHARACTERISTICS

CE6216 Series

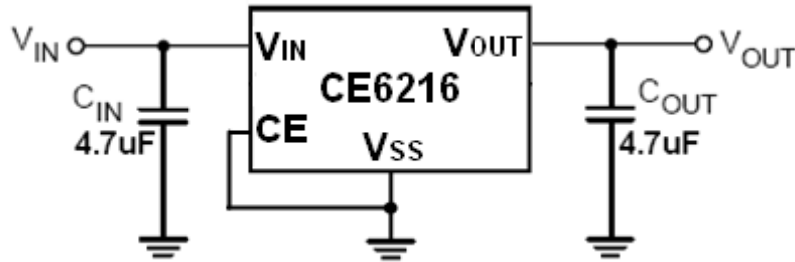
(C_{IN}=C_{OUT}=4.7μF, Ta=25°C, unless otherwise specified)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Output Voltage	V _{OUT(E)} (Note 2)	V _{IN} =V _{OUT} +1V I _{OUT} =100mA	V _{OUT} *0.98	V _{OUT} (Note 1)	V _{OUT} *1.02	V
Supply Current	I _Q	V _{IN} =V _{OUT} +1V, V _{CE} =GND		50	100	μA
Shutdown Current	I _{SHDN}	V _{CE} =V _{IN}		0.1	1.0	μA
Output Current	I _{OUT}	V _{IN} =V _{OUT} +2V (V _{OUT} <4V) V _{IN} =V _{OUT} +1V (V _{OUT} ≥4V)	1500			mA
Dropout Voltage (Note 3)	V _{dif}	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
Load Regulation	ΔV _{OUT}	V _{IN} =V _{OUT} +2V (V _{OUT} <4V) V _{IN} =V _{OUT} +1V (V _{OUT} ≥4V) 1mA≤I _{OUT} ≤1.5A		30	100	mV
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} * V_{OUT}}$	I _{OUT} =100mA V _{OUT} +1V≤V _{IN} ≤6V		0.02	0.2	%/V
Output Voltage Temperature Characteristics	$\frac{\Delta V_{OUT}}{\Delta T * V_{OUT}}$	I _{OUT} =100mA -40°C≤T≤+85°C		50		ppm/°C
Short Current	I _{Short}	V _{OUT} =V _{SS}		200		mA
Input Voltage	V _{IN}	—	2.5		6.0	V
Power Supply Rejection Rate	1KHz	PSRR	I _{OUT} =100mA	70		dB
	10KHz			50		
CE "High" Voltage	V _{CE} "H"		1.5		V _{IN}	V
CE "Low" Voltage	V _{CE} "L"				0.3	V
Thermal Shutdown Temperature	T _{SD}	—		150		°C
Thermal Shutdown Temperature Hysteresis	ΔT _{SD}	—		30		°C

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_{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 APPLICATION CIRCUIT



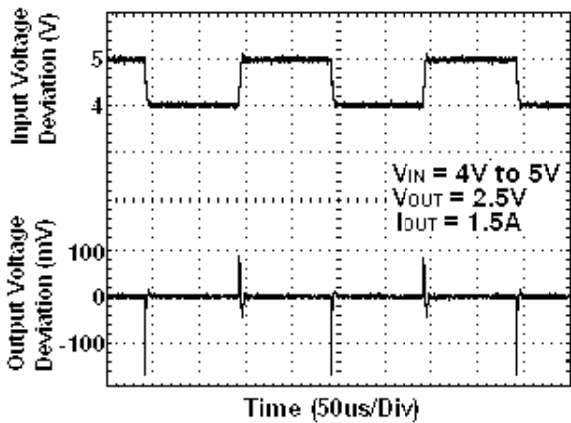
Input capacitor (C_{IN}): 4.7µF or more;

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

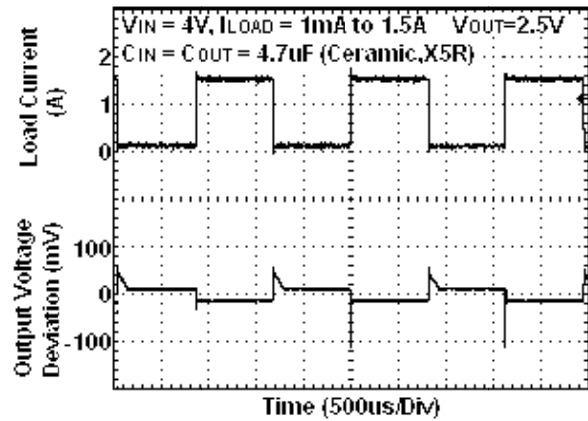
Caution: A general series regulator may oscillate, depending on the external components selected. Check that no oscillation occurs with the application using the above capacitor.

■ TYPICAL PERFORMANCE CHARACTERISTICS

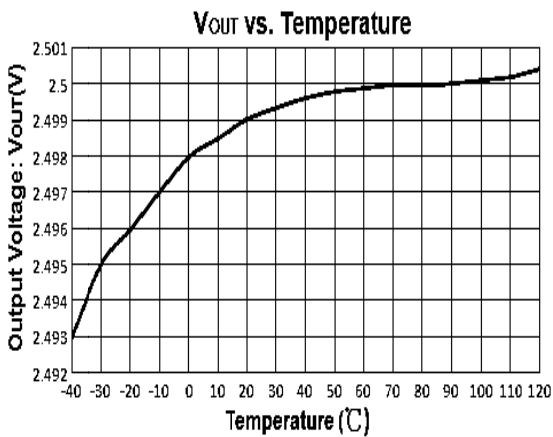
(1) Input Transient Response



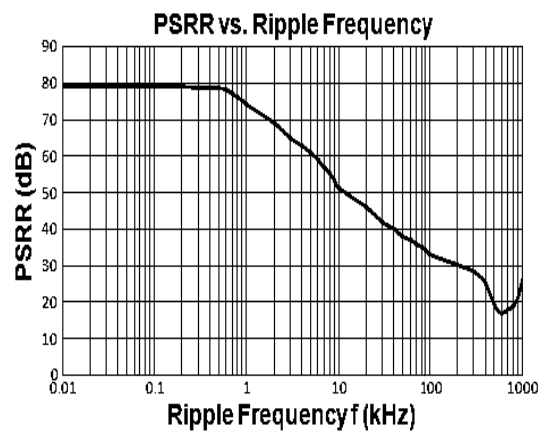
(2) Load Transient Response



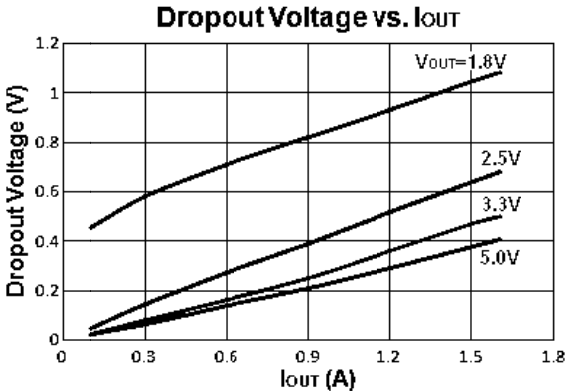
(3) Output Voltage vs. Temperature



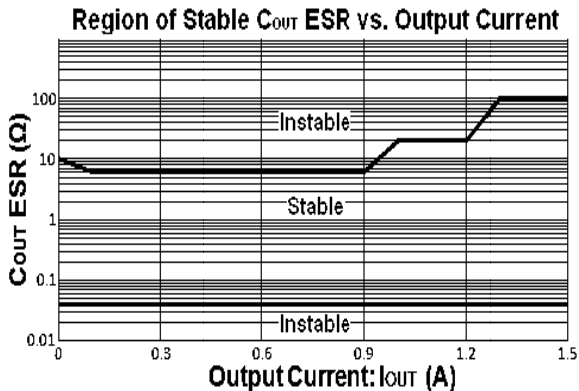
(4) Power Supply Rejection Ratio



(5) Dropout Voltage vs. Output Current

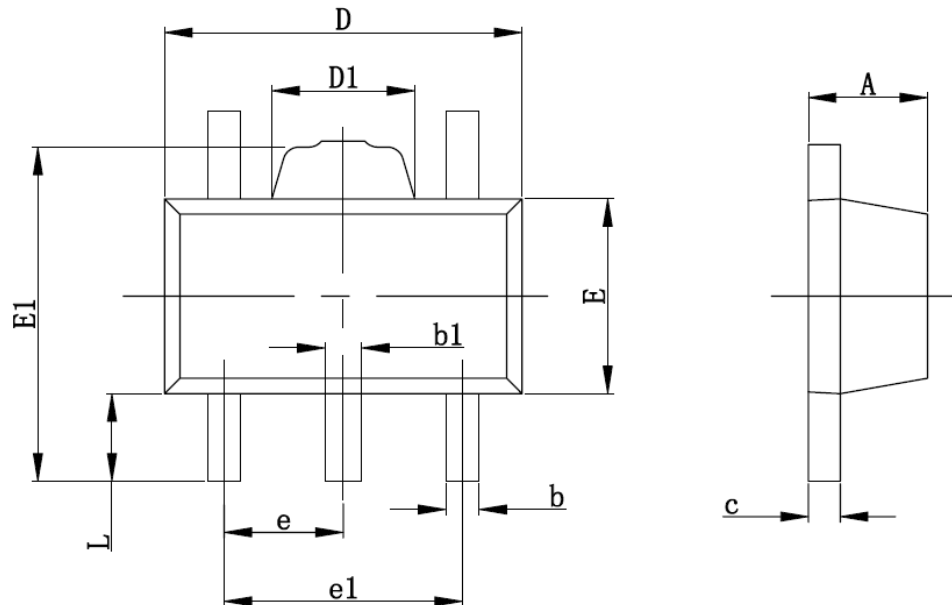


(6) Region of Stable C_{OUT} ESR vs. Load



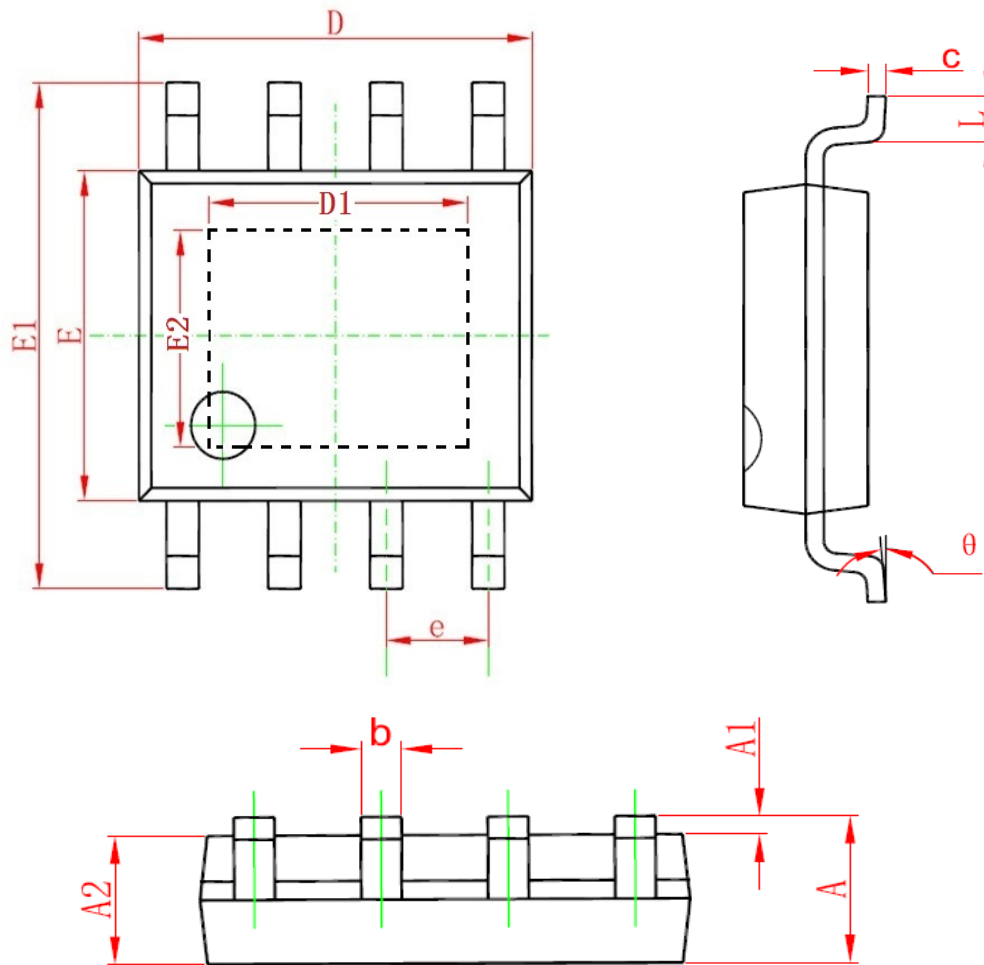
■ PACKAGING INFORMATION

● SOT-89-5 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

- SOP8-PP Package Outline Dimensions



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°

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