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.

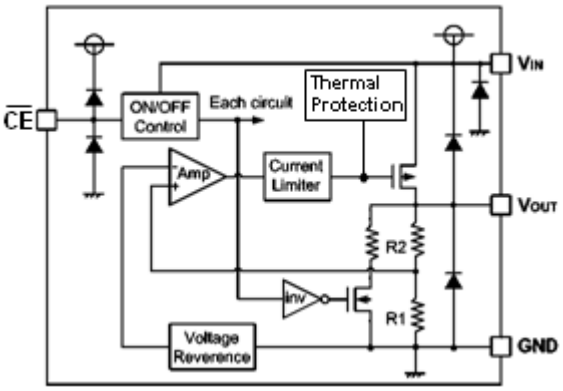
■ FEATURES

- 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

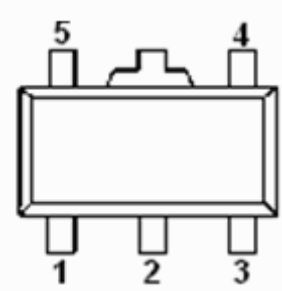
CE6216①②③④

DESIGNATOR	SYMBOL	DESCRIPITION
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

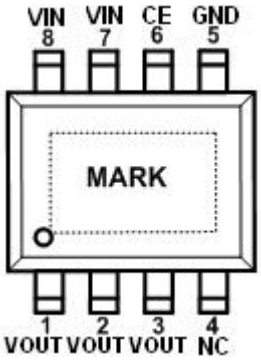
■ PIN CONFIGURATION

（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, Ta=25°C)

PARAMETER		SYMBOL	RATINGS	UNITS
Input Voltage		V_{IN}	V_{SS}-0.3~V_{SS}+7	V
Output Current		I_{OUT}	2000	mA
Output Voltage		V_{OUT}	V_{SS}-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	℃
Storage Temperature		T_{stg}	-40~+125	℃
Soldering Temperature & Time		T_{solder}	260℃, 10s	

■ ELECTRICAL CHARACTERISTICS

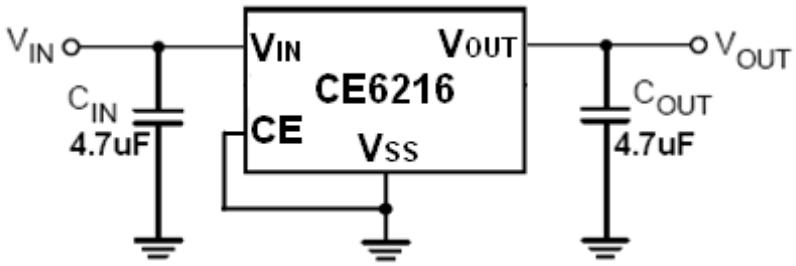
CE6216 Series **(C_{IN}=C_{OUT}=4.7μF, Ta=25℃, unless otherwise specified)**

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℃≤T≤+85℃			50		ppm/℃
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		℃
Thermal Shutdown Temperature Hysteresis	$\triangle T_{SD}$	——			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 CIRCUIT



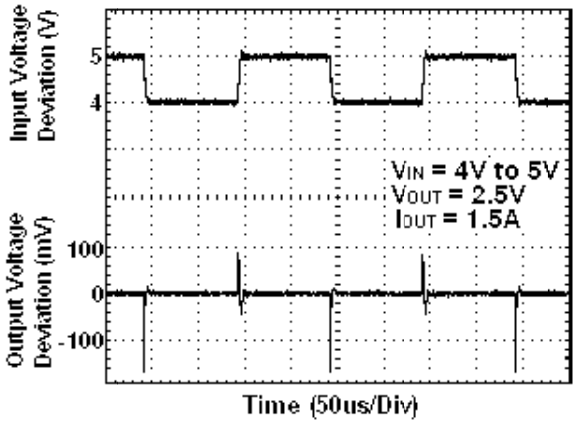
Input capacitor (C_{IN}): 4.7μF or more;

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

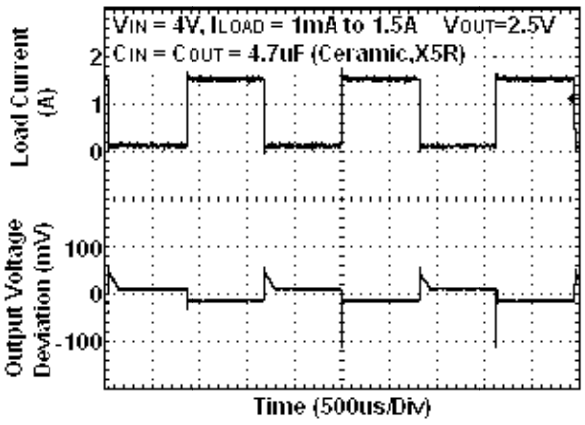
Caution: A general series regulator may oscillate, depending on the external components selected. Check that no oscillation occurs with the application using the above capacitor.

■ TYPICAL PERFORMANCE CHARACTERISTICS

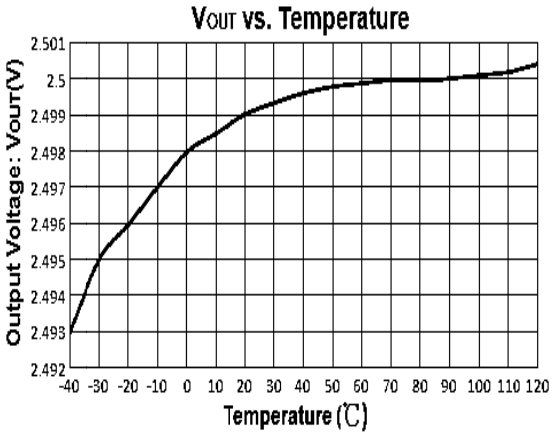
（1）Input Transient Response



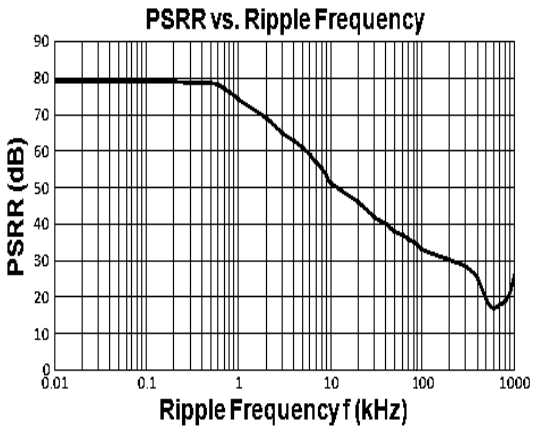
（2）Load Transient Response



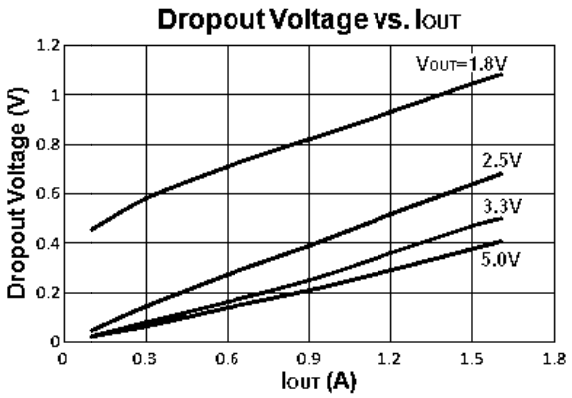
（3）Output Voltage vs. Temperature



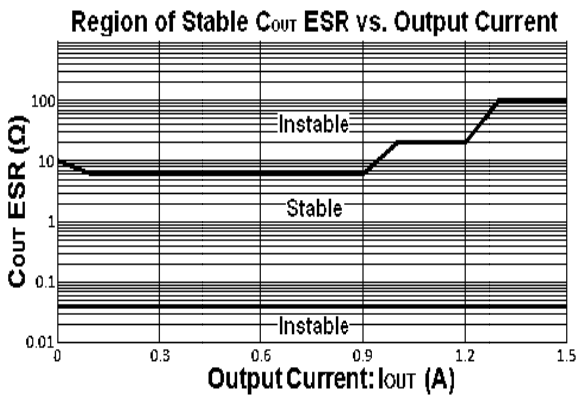
（4）Power Supply Rejection Ratio



（5）Dropout Voltage vs. Output Current

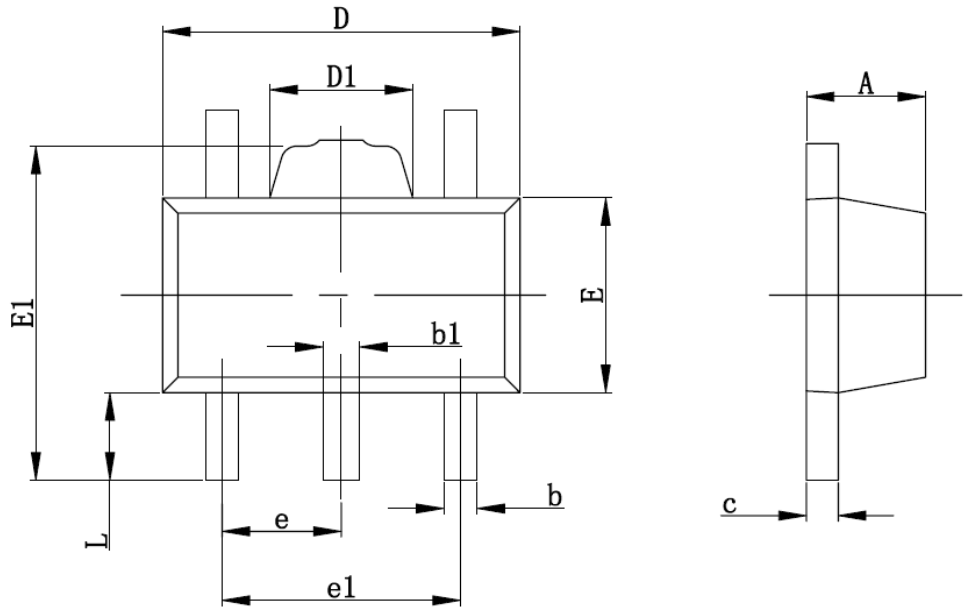


（6）Region of Stable C_{OUT} ESR vs. Load



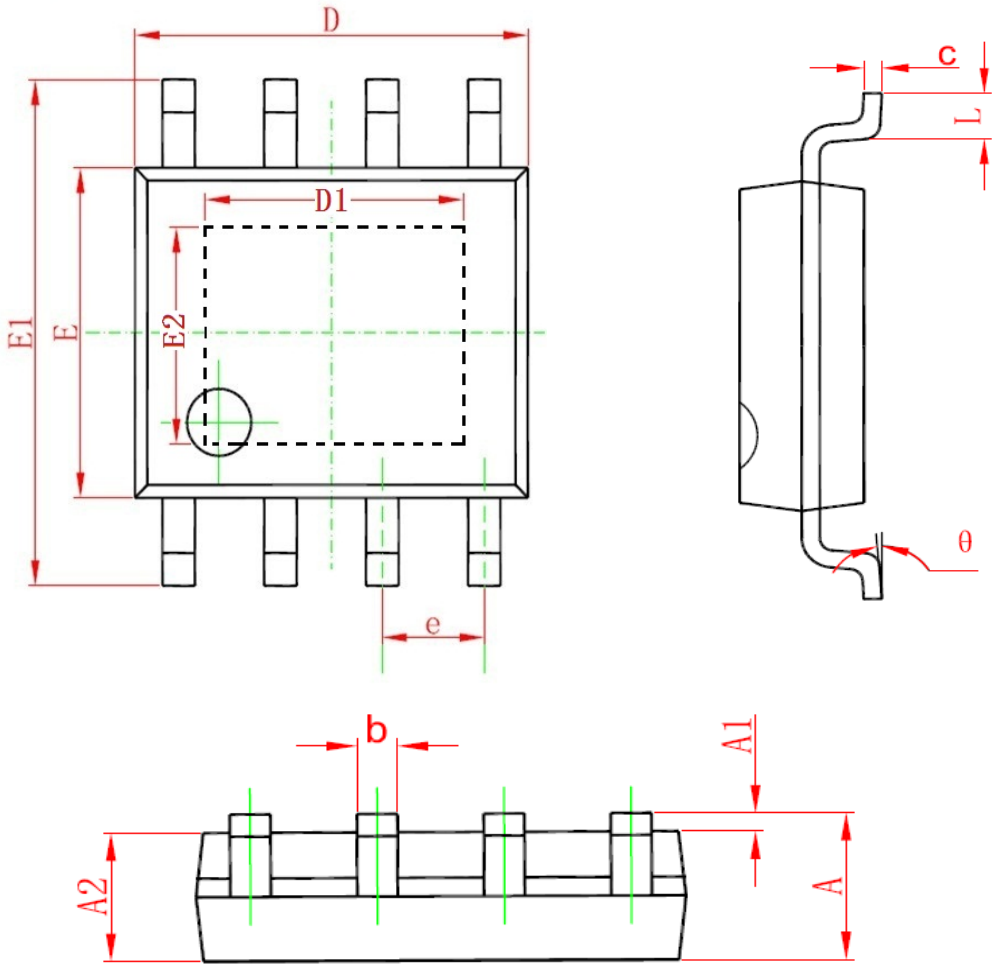
■ PACKAGING INFORMATION

• 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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