■ INTRODUCTION

The CE6218 Series are a group of positive voltage regulators manufactured by CMOS technologies with high ripple rejection, extremely low power consumption and low dropout voltage, which consume less than 0.1μA in shutdown mode and can provide large output currents even when the difference of the input-output voltage is small. Thus the series are very suitable for the battery-powered equipments, such as Portable/Palm computers, Portable consumer equipments, industry equipments and so on, which want to prolong the using life of the battery.

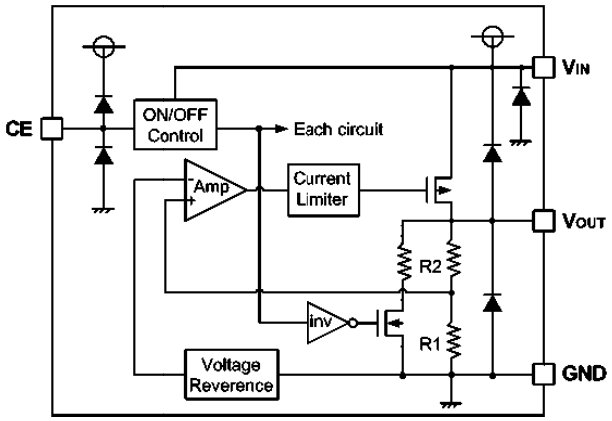
■ FEATURES

- Shutdown Current: < 0.1μA
- Output Current: 300mA
- Output Voltage Range: 0.9V～5.0V, （selectable in 0.1V steps）
- High Accuracy: ±2%（Typ.）
- Dropout Voltage: 150mV@100mA（3.0V Typ.）
- Excellent Line Regulation: 0.1%/V
- Built-in Current Limiter
- Built-in Short Circuit Protection
- Static safety: 2KV@HBM
- TC: 100ppm/℃
- Low ESR Ceramic Capacitor Compatible

■ APPLICATIONS

- Battery powered systems
- Portable instrumentations
- Reference Voltage Sources
- Portable consumer equipments
- Portable/Palm computers
- Radio control systems

■ BLOCK DIAGRAM



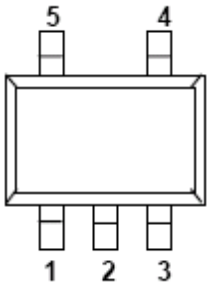
■ ORDER INFORMATION

CE6218①②③④

DESIGNATOR	SYMBOL	DESCRIPTION
①	E	With Shutdown Function
②③	Integer	Output Voltage (0.9~5V) e. g: 3.0V=②:3,③:0
④	M	Package: SOT-23-5
	P	Package: SOT-89-5

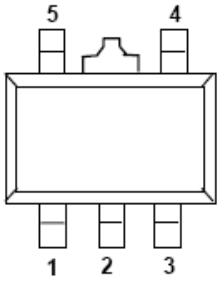
■ PIN CONFIGURATION （Pin output sequence can be ordered by customer）

SOT-23-5



PIN NUMBER	SYMBOL	FUNCTION
1	V_{IN}	Power Input Pin
2	V_{SS}	Ground
3	CE	Chip Enable Pin
4	NC	No Connection
5	V_{OUT}	Output Pin

SOT-89-5



PIN NUMBER	SYMBOL	FUNCTION
1	V_{OUT}	Output Pin
2	V_{SS}	Ground
3	NC	No Connection
4	CE	Chip Enable Pin
5	V_{IN}	Power Input Pin

■ ABSOLUTE MAXIMUM RATINGS

PARAMETER		SYMBOL	RATINGS	UNITS
Input Voltage		V_{IN}	V_{SS} -0.3~V_{SS}+8	V
Output Current		I_{OUT}	600	mA
Output Voltage		V_{OUT}	V_{SS} -0.3~V_{IN}+0.3	V
Power Dissipation	SOT-23	Pd	250	mW
	SOT-89	Pd	500	mW
Operating Temperature		T_{opr}	-40~+85	℃
Storage Temperature		T_{stg}	-40~+125	℃
Soldering Temperature & Time		T_{solder}	260℃, 10s	

■ ELECTRICAL CHARACTERISTICS

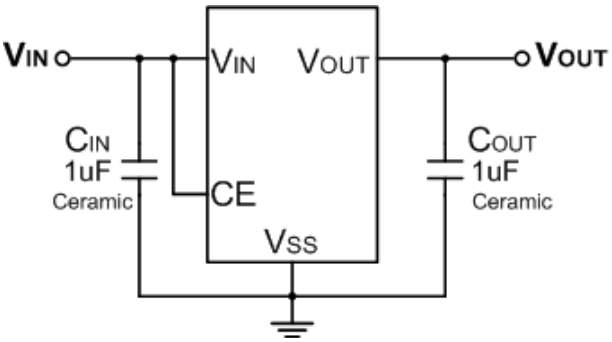
CE6218 Series **(C_{IN} = C_{OUT} = 1μF，Ta=25℃)**

PARAMETER	SYMBOL	CONDITIONS		MIN	TYP	MAX	UNITS
Output Voltage	V_{OUT}(E) (Note 2)	I_{OUT}=40mA V_{IN}=V_{OUT}+1V	1.5V<V_{OUT}≤5.0V	V_{OUT} *0.98	V_{OUT}	V_{OUT} *1.02	V
			0.9V≤V_{OUT}≤1.5V	V_{OUT} -0.03	V_{OUT}	V_{OUT} +0.03	V
Supply Current	I_{SS}	V_{CE}=V_{IN}=V_{OUT}+1V			5	10	μA
Shutdown Current	I_{SHDN}	V_{CE} = V_{SS}				0.1	μA
Output Current	I_{OUT}	—		300			mA
Dropout Voltage (Note 3)	V_{dif1}	I_{OUT} = 40mA			60		mV
	V_{dif2}	I_{OUT} = 100mA			150		mV
Load Regulation	ΔV_{OUT}	V_{IN}= V_{OUT} +1V, 1mA≤I_{OUT}≤100mA			10		mV
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} * V_{OUT}}$	I_{OUT} = 40mA V_{OUT} +1V≤V_{IN}≤6V			0.1	0.3	%/V
Output Voltage Temperature Characteristics	$\frac{\Delta V_{OUT}}{\Delta T * V_{OUT}}$	I_{OUT} = 40mA -40≤T≤+85			100		ppm/℃
Power Supply Ripple Rejection	PSRR	I_{OUT} =10mA f = 1kHz			60		dB
Short Current	I_{Short}	V_{OUT} = V_{SS}			30		mA
Current Limit	I_{Lim}	V_{IN}= V_{OUT} +1V			600		mA
Input Voltage	V_{IN}	—		2.0		6.0	V
CE "High" Voltage	V_{CE} “H”			1.0		V_{IN}	V
CE "Low" Voltage	V_{CE} “L”					0.3	V
C_{OUT} Auto-Discharge Resistance	$R_{DISCHRG}$	V_{IN}=5V, V_{OUT}=3.0V, V_{CE}=V_{SS}			100		Ω

NOTE:

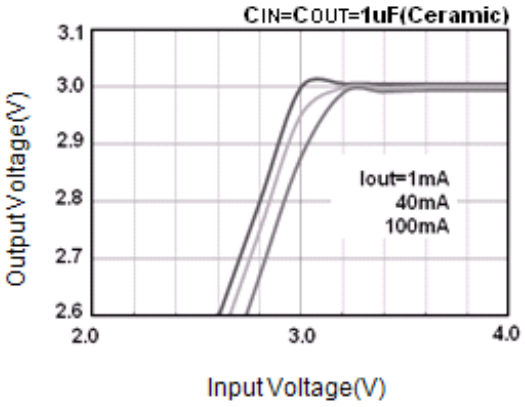
1. V_{OUT}：Specified Output Voltage.
2. V_{OUT} (E) ： Effective Output Voltage (I.e. The Output Voltage When V_{IN} = (V_{OUT} +1.0V) And Maintain A Certain I_{OUT} Value).
3. V_{diff}：The Difference Of Output Voltage And Input Voltage When Input Voltage Is Decreased Gradually Till Output Voltage Equals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

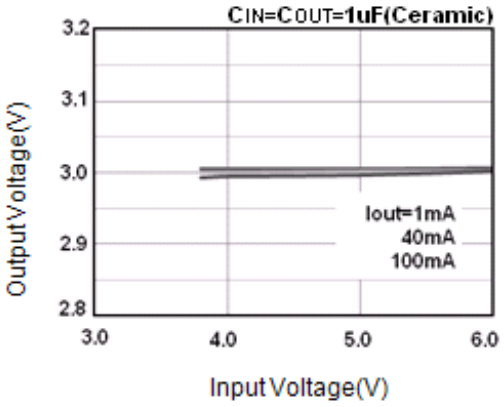
■ TYPICAL APPLICATION



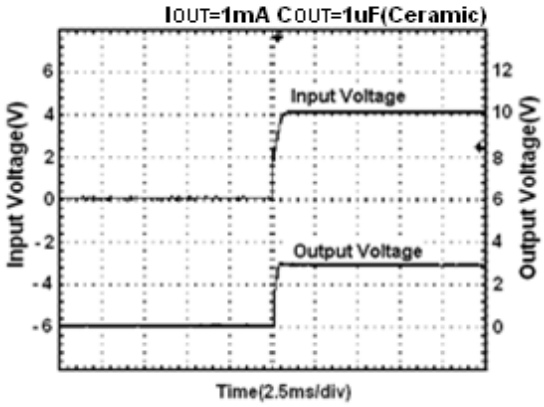
■ TYPICAL PERFORMANCE CHARACTERISTICS（CE6218E30M, for instance）

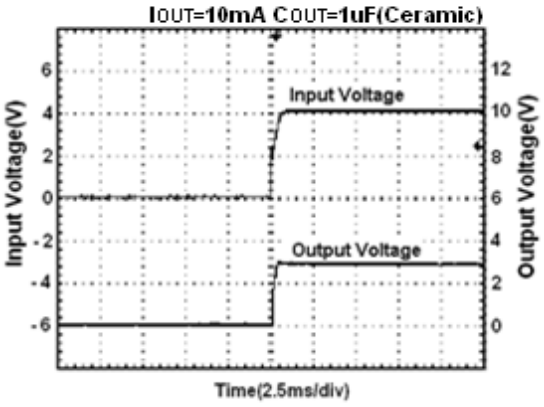
（1）Output Voltage vs. Input Voltage



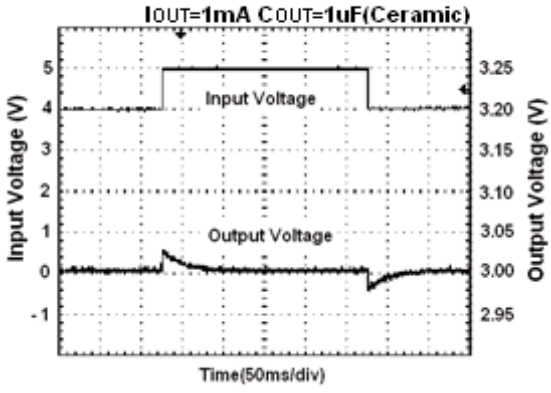


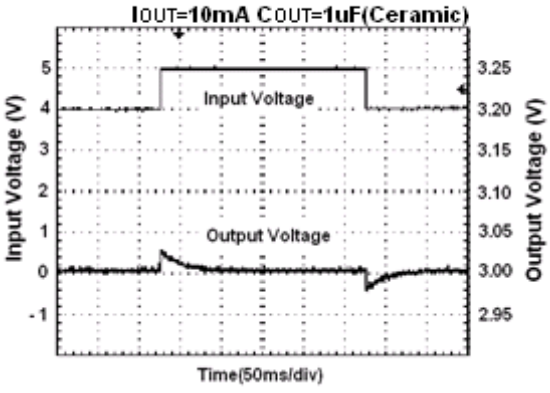
（2）Input Transient Response 1



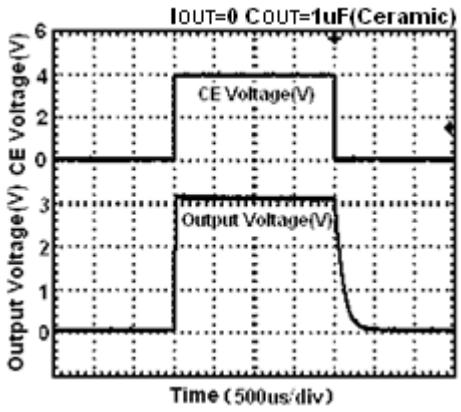


（3）Input Transient Response 2

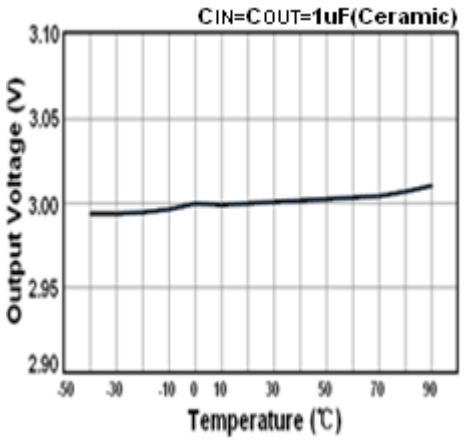




（4）CE Shutdown Response



（5）Output Voltage vs. Temperature



C_{OUT} Auto-Discharge Function

CE6218 series can discharge the electric charge in the output capacitor (C_{OUT}), when a low signal to the CE pin, which enables a whole IC circuit turn off, is inputted via the N-channel transistor located between the V_{OUT} pin and the V_{SS} pin (cf. BLOCK DIAGRAM). The C_{OUT} auto-discharge resistance value is set at 100Ω (V_{OUT}=3.0V @ V_{IN}=5.0V at typical). The discharge time of the output capacitor (C_{OUT}) is set by the C_{OUT} auto-discharge resistance (R) and the output capacitor (C_{OUT}). By setting time constant of a C_{OUT} auto-discharge resistance value [$R_{DISCHRG}$] and an output capacitor value (C_{OUT}) as τ (τ=C x $R_{DISCHRG}$), the output voltage after discharge via the N-channel transistor is calculated by the following formulas.

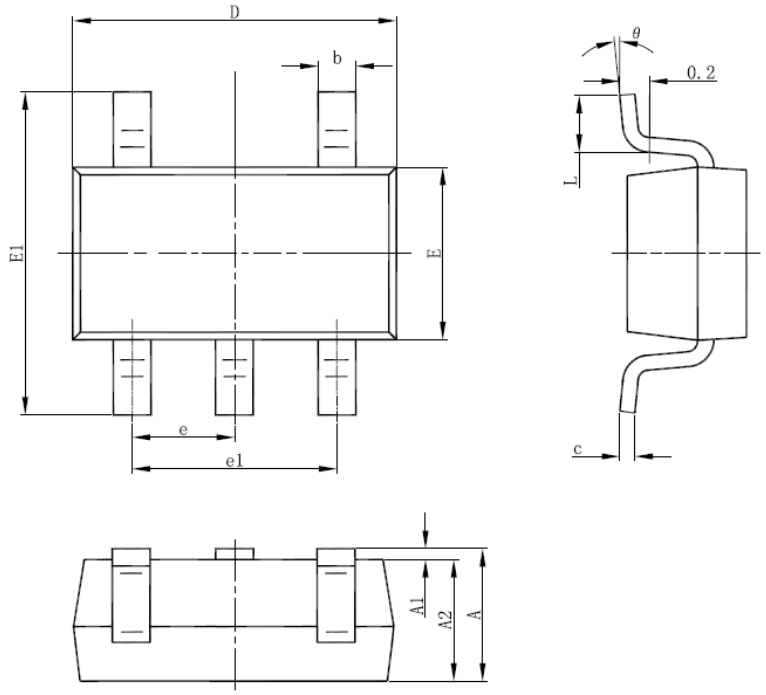
$V = V_{OUT(E)} \times e^{-t/\tau}$, or $t = \tau \ln (V / V_{OUT(E)})$

(V : Output voltage after discharge, $V_{OUT(E)}$: Output voltage, t: Discharge time,

τ: C_{OUT} auto-discharge resistance $R_{DISCHRG}$×Output capacitor (C_{OUT}) value C)

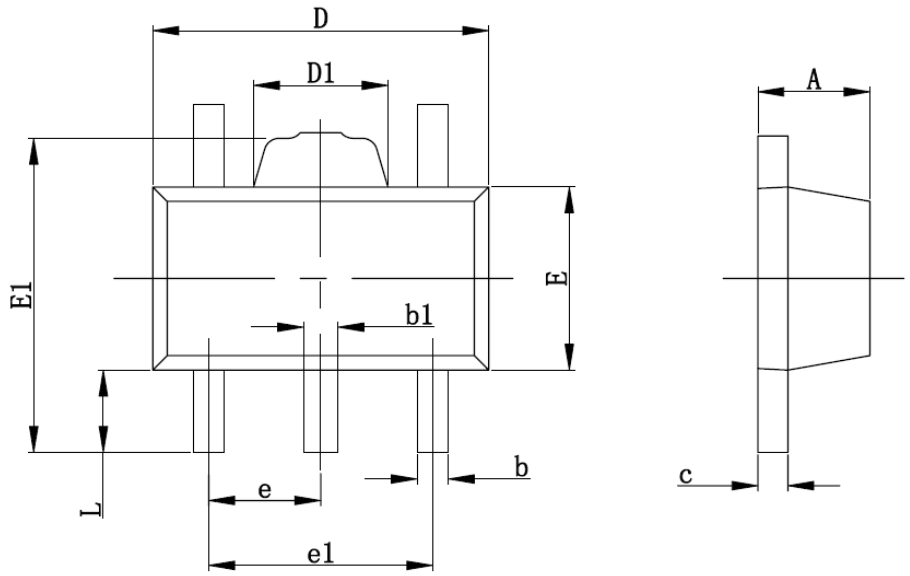
■ PACKAGING INFORMATION

● SOT-23-5 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	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°

● 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