

# SeCoS

Elektronische Bauelemente

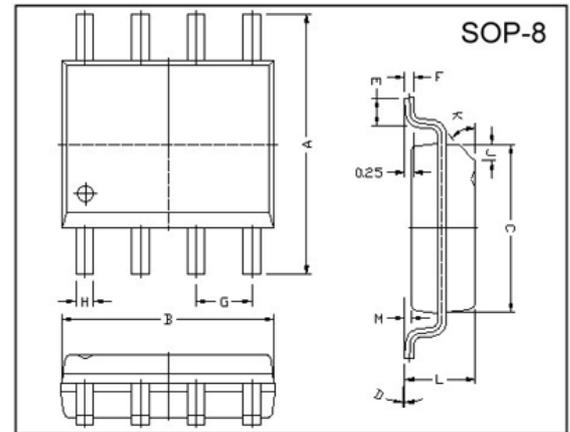
## SSC2129

### CMOS Low Dropout Voltage Regulator

RoHS Compliant Product

## Description

The SSC2129 series positive, linear regulators feature low quiescent current (45 $\mu$ A typ.) with low dropout voltage, making them ideal for battery applications. Output voltage are set at the factory and trimmed to 1.5% accuracy. These rugged devices have both Thermal Shutdown and Current Fold-back to prevent device failure under the "Worst" of operating conditions. In applications requiring a low noise, regulated supply, place a 1000pF capacitor between Bypass and Ground. The SSC2129 is stable with an output capacitance of 4.7 $\mu$ F or greater.

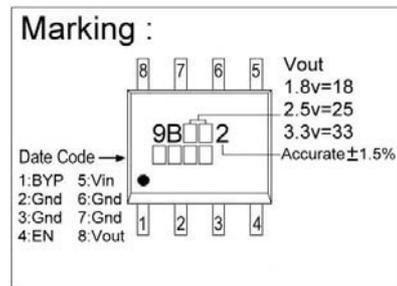


REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	5.80	6.20	M	0.10	0.25
B	4.80	5.00	H	0.35	0.49
C	3.80	4.00	L	1.35	1.75
D	0°	8°	J	0.375 REF.	
E	0.40	0.90	K	45°	
F	0.19	0.25	G	1.27 TYP.	

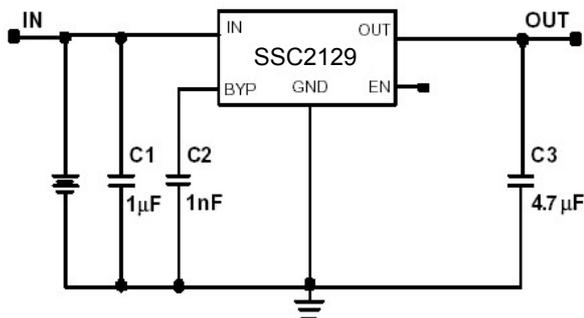
- \* Low Temperature Coefficient
- \* Over-Temperature Shutdown
- \* Highly Accurate  $\pm 1.5\%$
- \* Very Low Dropout Voltage
- \* Noise Reduction Bypass Capacitor
- \* Guaranteed 1.55A Output
- \* Current Limiting
- \* Power-Saving Shutdown Mode

## Applications

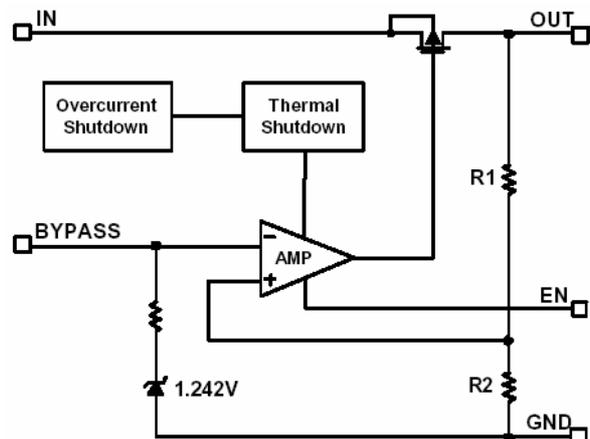
- \* PC Peripherals
- \* Wireless Devices
- \* Portable Electronics
- \* Battery Powered Widgets
- \* Instrumentation



## Typical Application Circuit



## Functional Block Diagram



## Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Input Voltage	$V_{IN}$	8	V
Output Current	$I_{OUT}$	$P_D/(V_{IN}-V_O)$	A
Output Voltage	$V_{OUT}$	1.5-5.0	V
Operating Ambient Temperature	$T_{opr}$	-40~+85	°C
Junction Temperature	$T_j$	-40~+125	°C
Max. Junction Temperature	$T_j \text{ Max.}$	150	°C
Thermal Resistance	$\theta_{jc}$	20**	°C/W
Power Dissipation ( $\Delta T=100^\circ\text{C}$ )*	$P_D$	2.5	W
EDS Classification		B	

\*Assuming a heat sink capable of twice times ( $\theta_{jc}$ )

\*\*Estimated

## Electrical Characteristics $T_a=25^\circ\text{C}$ unless otherwise noted ( $V_{IN}=V_{OUT}(T)+2V, V_{EN}=V_{IN}$ )

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Output Voltage	$V_{OUT}(E)^1$	-1.5%	$V_{OUT}(T)^2$	1.5%	V	$I_o=1\text{mA}$
Output Current	$I_o$	1.55	-	-	A	$V_{OUT}>1.2V$
Current Limit	$I_{LIM}$	1.55	2	-	A	$V_{OUT}>1.2V$
Load Regulation	$REG_{LOAD}$	-1	0.2	1	%	$I_o=1\text{mA}\sim 1.5A$
Dropout Voltage	$V_{DROPOUT}$	-	-	1000	mV	$1.5V < V_{OUT}(T) \leq 2.0V$
		-	-	800		$2.0V < V_{OUT}(T) \leq 2.8V$
		-	-	600		$2.8V < V_{OUT}(T)$
						$I_o=1.55A$ $V_o=V_{OUT}(E)-2\%$
Quiescent Current	$I_q$	-	45	70	$\mu\text{A}$	$I_o=0\text{mA}$
Ground Pin Current	$I_{GND}$	-	45	-	$\mu\text{A}$	$I_o=1\text{mA}\sim 1.5A$
Line Regulation	$REG_{LINE}$	-	-	0.15	%	$V_{OUT}(T) < 2.0V$
		-	0.02	0.1		$2.0V \leq V_{OUT}(T)$
						$I_o=1\text{mA}$ $V_{IN}=V_{OUT}(T)+1$ to $V_{OUT}(T)+2$
Input Voltage	$V_{IN}$	Note <sup>3</sup>	-	7	V	
Over Temperature Shutdown	$O_{TS}$	-	150	-	°C	
Over Temperature Hysteresis	$O_{TH}$	-	30	-	°C	
Output Voltage Temperature Coefficient	$T_C$	-	30	-	ppm/°C	
Power Supply Rejection	PSRR	-	50	-	dB	$f=1\text{kHz}$
		-	20	-		$f=10\text{kHz}$
		-	15	-		$f=100\text{kHz}$
		-	75	-		$f=1\text{kHz}$
		-	55	-		$f=10\text{kHz}$
		-	30	-		$f=100\text{kHz}$
						$I_o=100\text{mA}$ $C_o=4.7\mu\text{F}$ (ceramic)
Output Voltage Noise	eN	-	30	-	$\mu\text{Vrms}$	$f=10\text{Hz}\sim 100\text{kHz}$ $I_o=10\text{mA}$ $C_o=4.7\mu\text{F}$
						$C_{BYP}=0\mu\text{F}$
						$C_{BYP}=0.01\mu\text{F}$
EN Input Threshold	$V_{EH}$	2	-	$V_{IN}$	V	$V_{IN}=2.7V\sim 7V$
	$V_{EL}$	0	-	0.4		
EN Input Bias Current	$I_{EH}$	-	-	0.1	$\mu\text{A}$	$V_{EN}=V_{IN}, V_{IN}=2.7V\sim 7V$
	$I_{EL}$	-	-	0.5		$V_{EN}=0V, V_{IN}=2.7V\sim 7V$
Shutdown Supply Current	$I_{SD}$	-	30	-	$\mu\text{A}$	$V_{IN}=5V, V_o=0V, V_{EN}<V_{EL}$
		-	0.5	2		$V_{IN}=2.5V, V_o=0V, V_{EN}<V_{EL}$



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Note 1:  $V_{OUT}(E)$  =Effective Output Voltage (i.e. the output voltage when " $V_{OUT}(T) + 2.0V$ " is provided at the VIN pin while maintaining a certain  $I_{OUT}$  value).

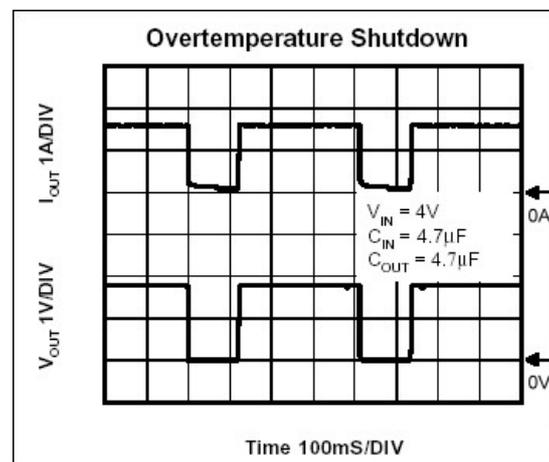
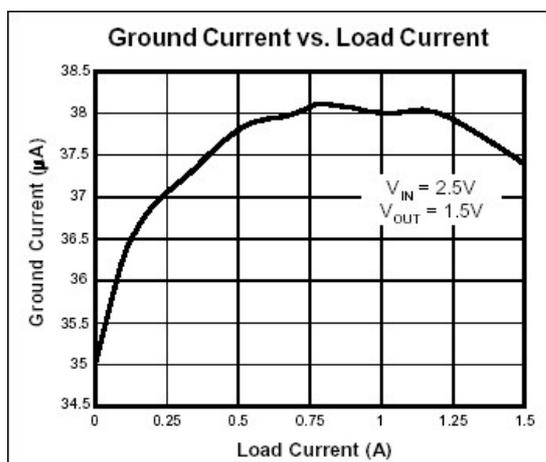
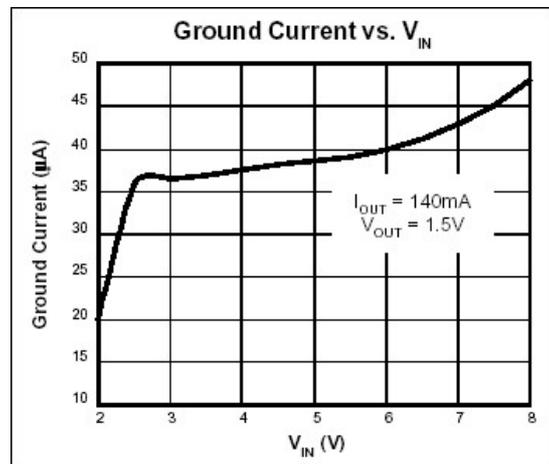
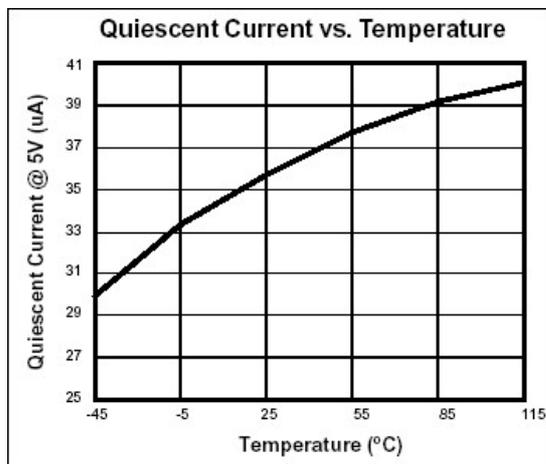
2:  $V_{OUT}(T)$  =Specified Output Voltage

3:  $V_{IN(MIN)} = V_{OUT} + V_{DROPOUT}$

## Ordering Information(contd.)

Part Number	Marking	Output Voltage	Part Number	Marking	Output Voltage
SSC2129-15	9B152 XXXX	1.5V	SSC2129-18	9B182 XXXX	1.8V
SSC2129-25	9B252 XXXX	2.5V	SSC2129-33	9B332 XXXX	3.3V
SSC2129-47	9B472 XXXX	4.75V	SSC2129-50	9B502 XXXX	5.0V

## Characteristics Curve



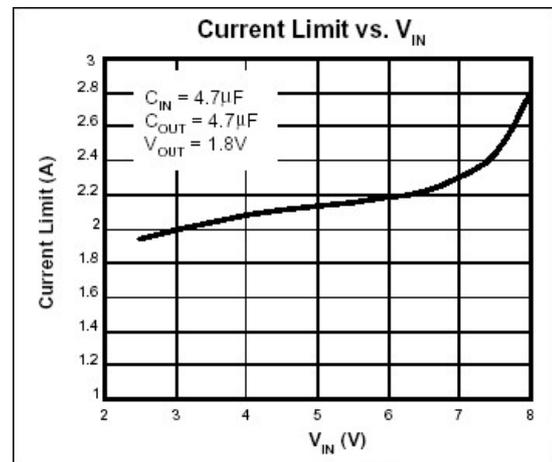
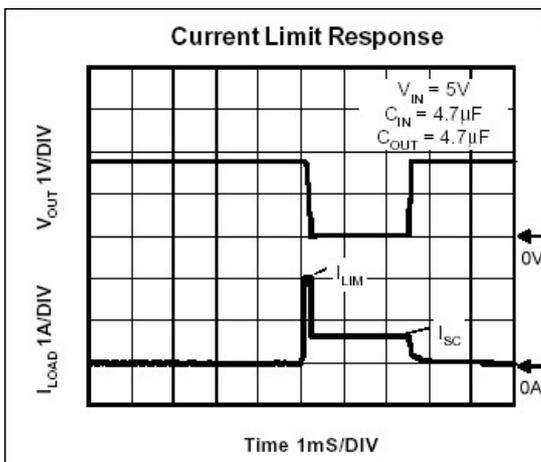
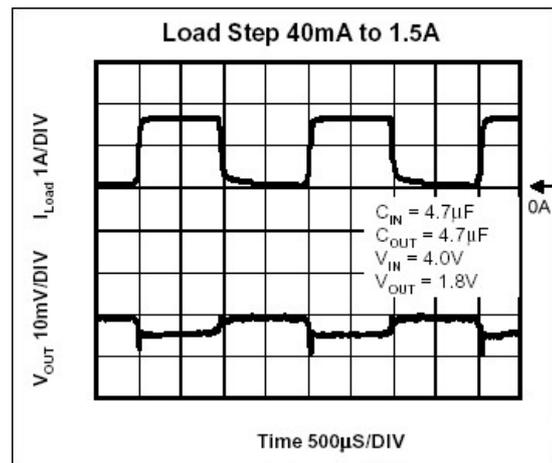
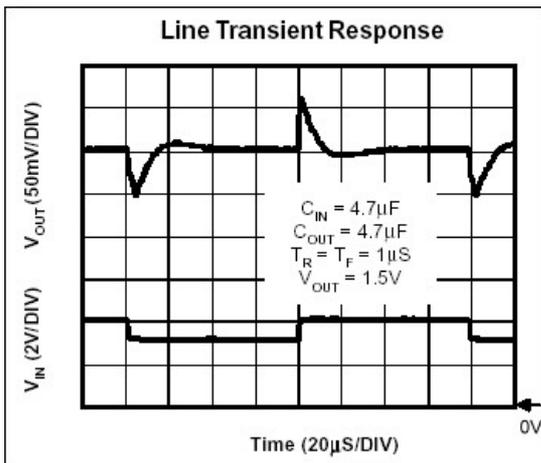
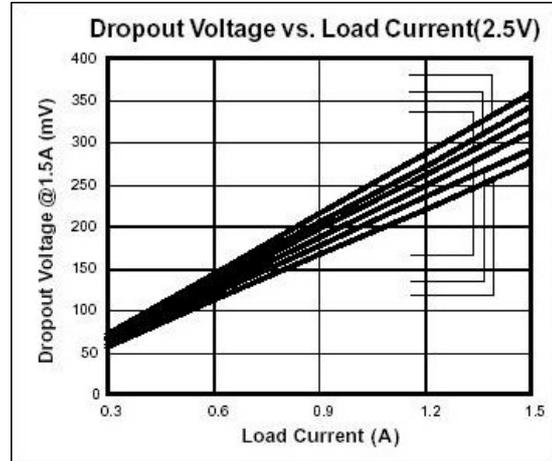
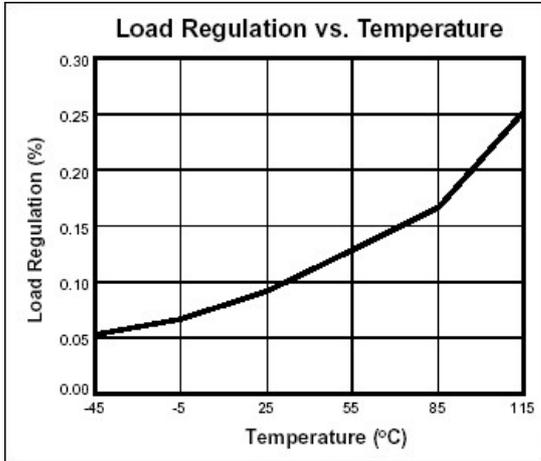


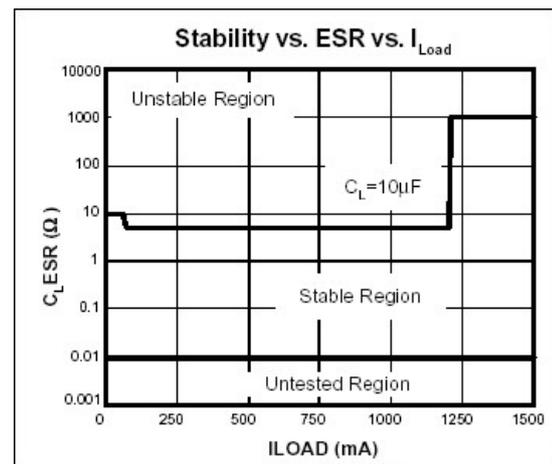
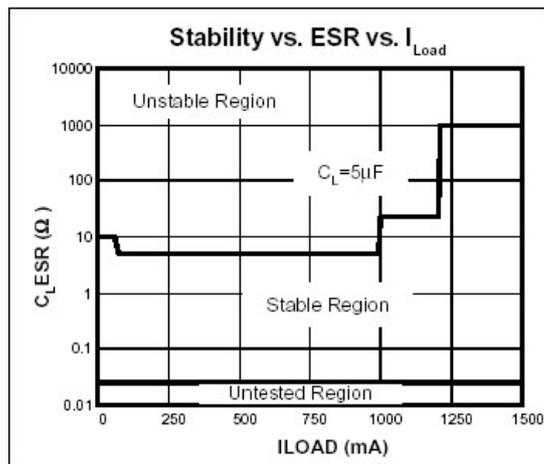
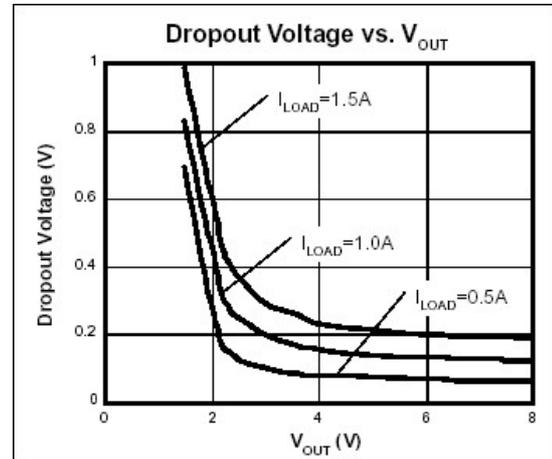
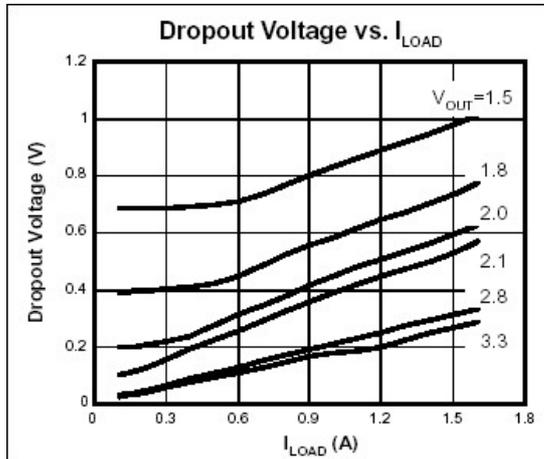
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CMOS Low Dropout

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### Detailed Description

The SSC2129 of COMS regulators contain a PMOS pass transistor, voltage reference, error amplifier, over-current protection and thermal shutdown. The P-channel pass transistor receives data from the error amplifier, over-current shutdown, and thermal protection circuits. During normal operation, the error amplifier compares the output voltage to a precision reference. Over-current and Thermal shutdown circuits become active when the junction temperature exceeds 140°C, or the current exceeds 2.2A. During thermal shutdown, the output voltage remains low. Normal operation is restored when the junction temperature drops below 120°C.

### External Capacitors

The SSC2129 is stable with an output capacitance to ground of 4.7µF or greater. Ceramic capacitors have the lowest ESR, and will offer the best AC performance. Conversely, Aluminum Electrolytic capacitors exhibit the highest ESR, resulting in the poorest AC response. Unfortunately, large value ceramic capacitors are comparatively expensive. One option is to parallel a 0.1µF ceramic capacitor with a 10µF Aluminum Electrolytic. The benefit is low ESR, high capacitance, and low overall cost. A second capacitor is recommended between the input and ground to stabilize  $V_{IN}$ . The input capacitor should be at least 0.1µF to have a beneficial effect. A third capacitor can be connected between the BY-PASS pin and GND. This capacitor can be a low cost Polyester Film variety between the value of 0.001~0.01µF. A large capacitor improves the AC ripple rejection, but also makes the output come up slowly. This "Soft" turn-on is desirable in some applications to limit turn-on surges. All capacitors should be placed in close proximity to the pins. A "Quiet" ground termination is desirable. This can be achieved with a "Star" connection.

### Enable

When pulled low, the PMOS pass transistor shuts off, and all internal circuits are powered down. In this state, the quiescent current is less than 1µA. This pin behaves much like an electronic switch.