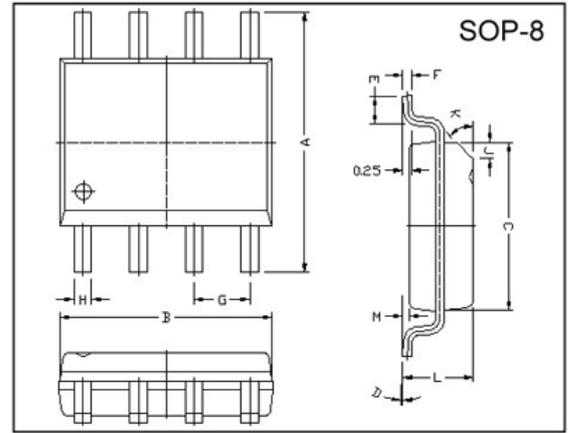


RoHS Compliant Product

Description

The SSC2128 series positive, linear regulators feature low quiescent current (45µA 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 SSC2128 is stable with an output capacitance of 4.7µF or greater.



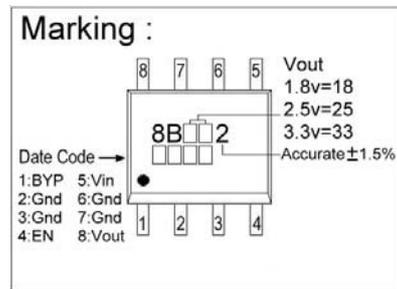
Features

- * Low Temperature Coefficient
- * Over-Temperature Shutdown
- * Highly Accurate ± 1.5%
- * Very Low Dropout Voltage
- * Noise Reduction Bypass Capacitor
- * Short Circuit Current Fold-back
- * Guaranteed 1.5A Output
- * Current Limiting
- * Power-Saving Shutdown Mode

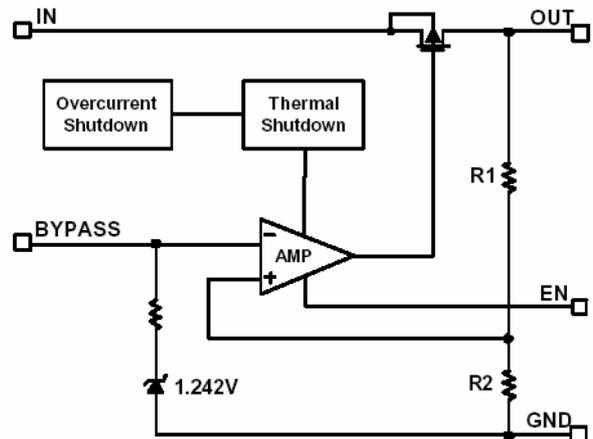
REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	5.80	6.20	M	0.10	0.25
B	4.80	5.00	H	0.35	0.49
C	3.80	4.00	L	1.35	1.75
D	0°	8°	J	0.375 REF.	
E	0.40	0.90	K	45°	
F	0.19	0.25	G	1.27 TYP.	

Applications

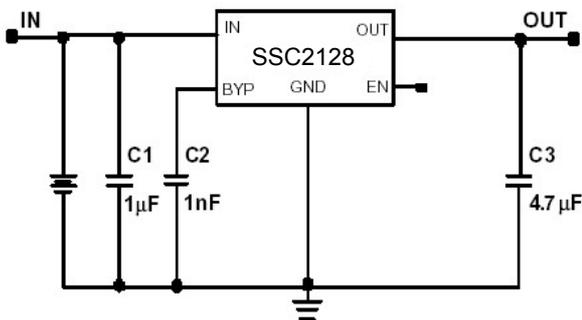
- * PC Peripherals
- * Wireless Devices
- * Portable Electronics
- * Battery Powered Widgets
- * Instrumentation



Functional Block Diagram



Typical Application Circuit



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	θ_{jc}	40	°C/W
Power Dissipation ($\Delta T=100^\circ\text{C}$)	P_D	810	mW
EDS Classification		B	

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	$V_{EN}=V_{EHmin}, I_o=1\text{mA}$
Output Current	I_o	1.5	-	-	A	$V_{OUT}>1.2V$
Current Limit	I_{LIM}	1.5	2	-	A	$V_{OUT}>1.2V$
Load Regulation	REG_{LOAD}	-1	0.2	1	%	$I_o=1\text{mA}\sim 1.5A$
Dropout Voltage	$V_{DROPOUT}$	-	-	1300	mV	$1.5V < V_{OUT}(T) \leq 2.0V$
		-	-	800		$2.0V < V_{OUT}(T) \leq 2.8V$
		-	-	600		$2.8V < V_{OUT}(T)$
						$I_o=750\text{mA}$ $V_o=V_{OUT}(E)-2\%$
Quiescent Current	I_Q	-	45	70	μA	$I_o=0\text{mA}$
Ground Pin Current	I_{GND}	-	45	-	μA	$I_o=1\text{mA}\sim 1.5A$
Line Regulation	REG_{LINE}	-0.15	-	0.15	%	$V_{OUT}(T) < 2.0V$
		-0.1	0.02	0.1		$2.0V \leq V_{OUT}(T) < 4.0V$
		-0.4	-	0.4		$4.0V \leq V_{OUT}(T)$
						$V_{IN}=V_{OUT}(T)+1$ to $V_{OUT}(T)+2$
Input Voltage	V_{IN}	Note ³	-	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	
Short Circuit Current	I_{SC}	-	750	-	mA	$V_{OUT}<0.4V$
Power Supply Rejection	PSRR	-	50	-	dB	$f=1\text{kHz}$
		-	20	-		$f=10\text{kHz}$
		-	75	-		$f=1\text{kHz}$
		-	55	-		$f=10\text{kHz}$
						$I_o=100\text{mA}$ $C_o=4.7\mu\text{F}$ (ceramic)
						$I_o=100\text{mA}$ $C_o=4.7\mu\text{F}$ (ceramic) $C_{BYP}=0.01\mu\text{F}$
Output Voltage Noise	eN	-	30	-	μV_{rms}	$f=10\text{Hz}\sim 100\text{kHz}$ $I_o=10\text{mA}$ $C_o=4.7\mu\text{F}$
EN Input Threshold	V_{EH}	2	-	V_{IN}	V	
	V_{EL}	0	-	0.4		
EN Input Bias Current	I_{EH}	-	-	0.1	μA	$V_{IN}=7V$
	I_{EL}	-	-	0.5		$V_{EN}=0V, V_{IN}=7V$
Shutdown Supply Current	I_{SD}	-	0.5	2	μA	$V_{IN}=5V, V_{OUT}=0V, V_{EN}=0V$

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

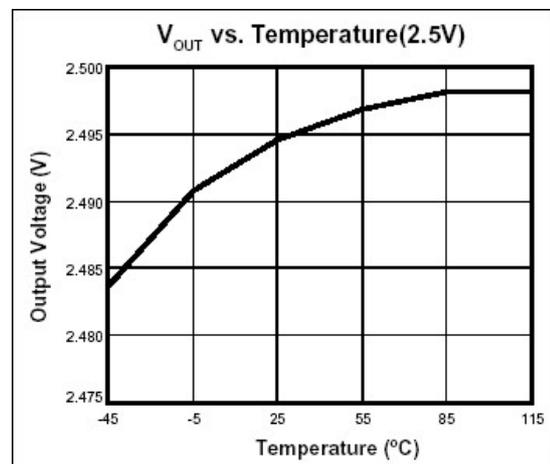
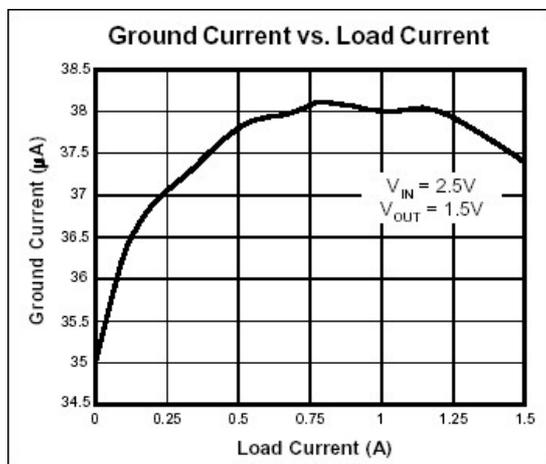
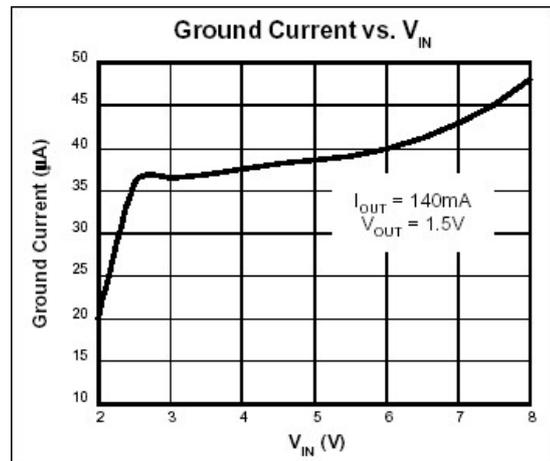
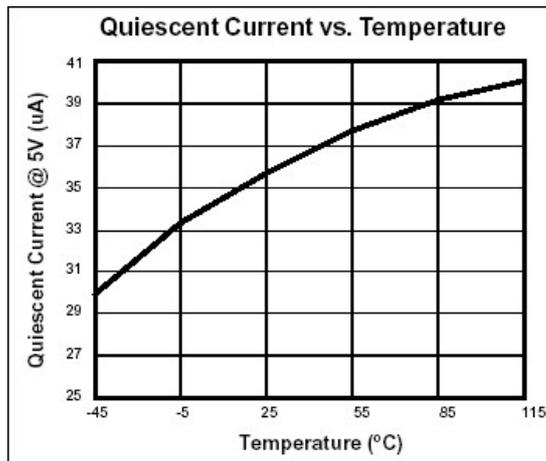
2: $V_{OUT}(T)$ =Specified Output Voltage

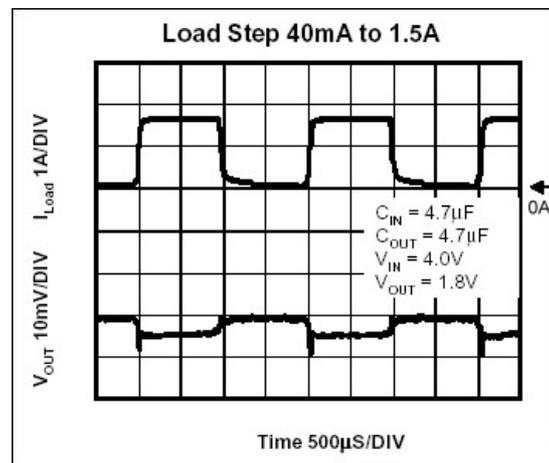
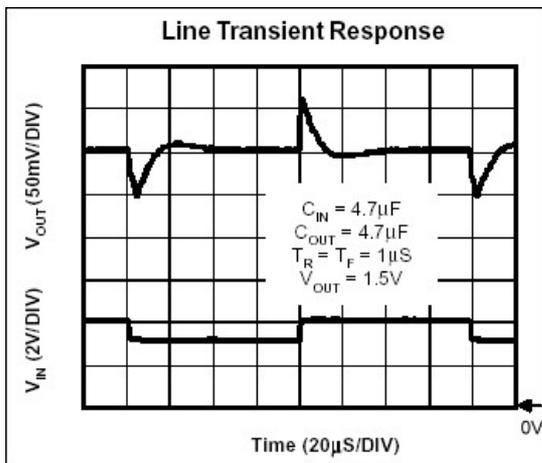
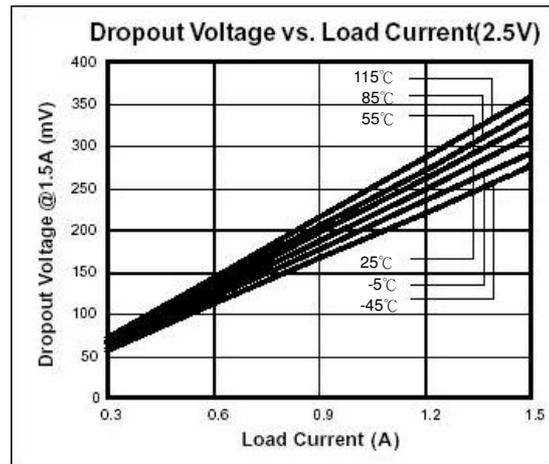
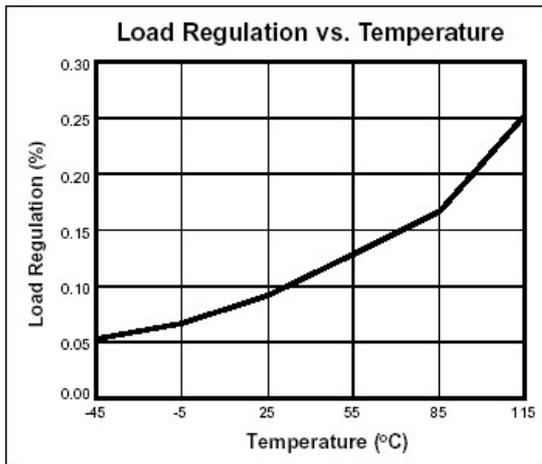
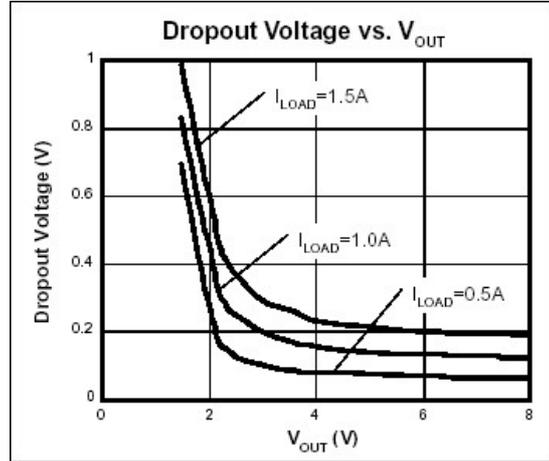
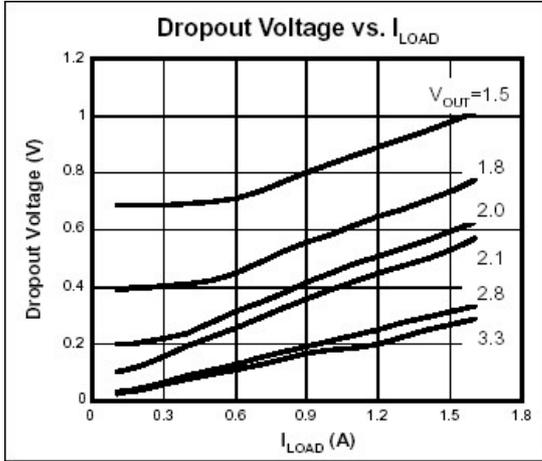
3: $V_{IN(MIN)} = V_{OUT} + V_{DROPOUT}$

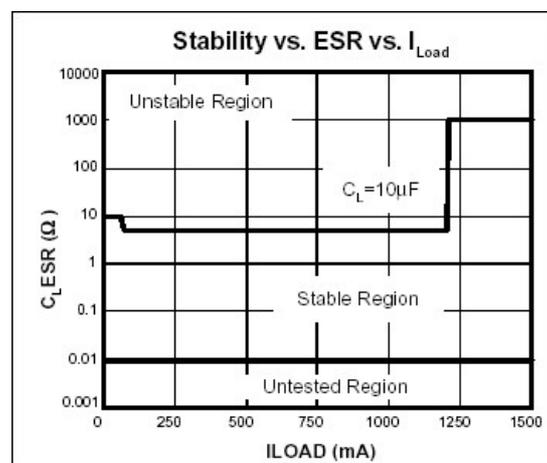
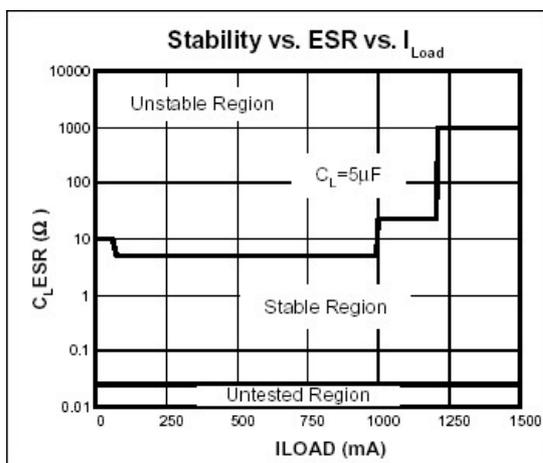
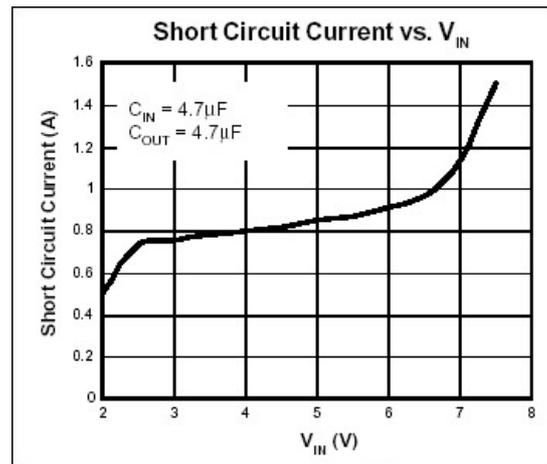
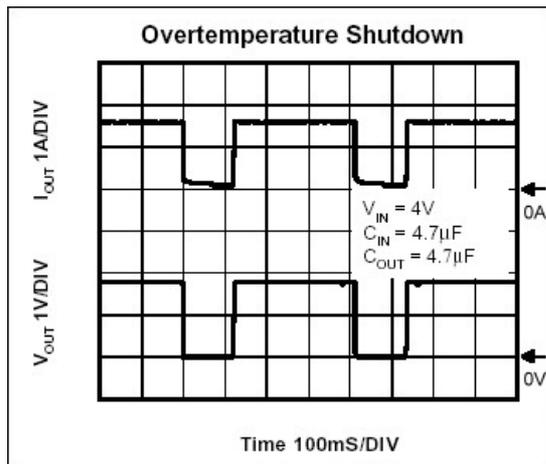
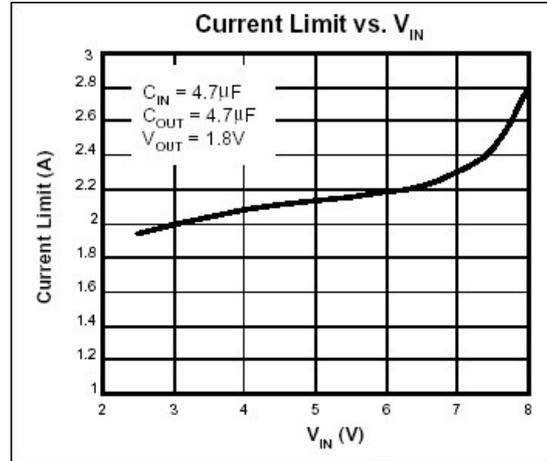
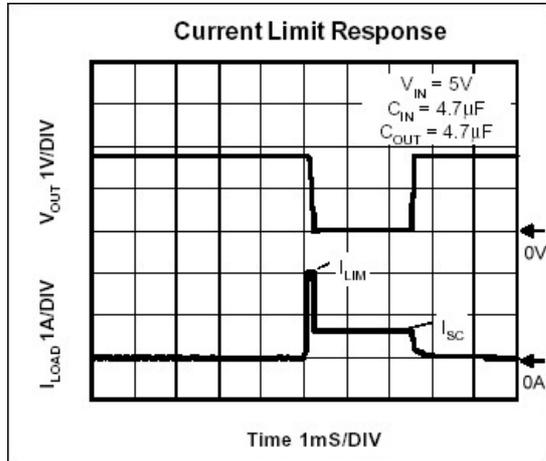
Ordering Information(contd.)

Part Number	Marking	Output Voltage	Part Number	Marking	Output Voltage
SSC2128-15	8B152 XXXX	1.5V	SSC2128-18	8B182 XXXX	1.8V
SSC2128-25	8B252 XXXX	2.5V	SSC2128-33	8B332 XXXX	3.3V
SSC2128-47	8B472 XXXX	4.7V	SSC2128-50	8B502 XXXX	5.0V

Characteristics Curve







Detailed Description

The SSC2128 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. The SSC2128 behaves like a current source when the load reaches 2.2A. However, if the load impedance drops below 0.3 Ω , the current drops back to 600mA to prevent excessive power dissipation. Normal operation is restored when the load resistance exceeds 0.75 Ω .

External Capacitors

The SSC2128 is stable with an output capacitance to ground of 4.7uF 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 0.1uF ceramic capacitor with a 10uF 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 0.1uF 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 0.001~0.01uF. 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 1uA. This pin behaves much like an electronic switch. 100K Ω resistor is necessary between V_{EN} source and EN pin when V_{EN} is high than V_{IN} . (Note: There is no internal pull-up for EN pin.)