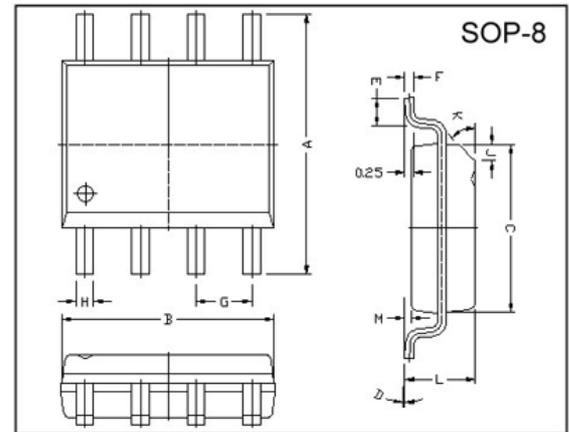


RoHS Compliant Product

Description

The SSC2146 series of positive, linear regulators feature low quiescent current (30µA typ.) with low dropout voltage, making them ideal for battery applications. The space-saving SOP-8 package is attractive for "Pocket" and "Hand Held" applications. 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 SSC2146 is stable with an output capacitance of 2.2µF or greater.



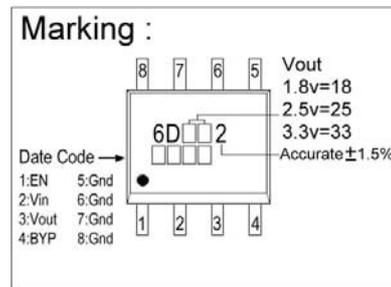
REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	5.80	6.20	M	0.10	0.25
B	4.80	5.00	H	0.35	0.49
C	3.80	4.00	L	1.35	1.75
D	0°	8°	J	0.375 REF.	
E	0.40	0.90	K	45°	
F	0.19	0.25	G	1.27 TYP.	

Features

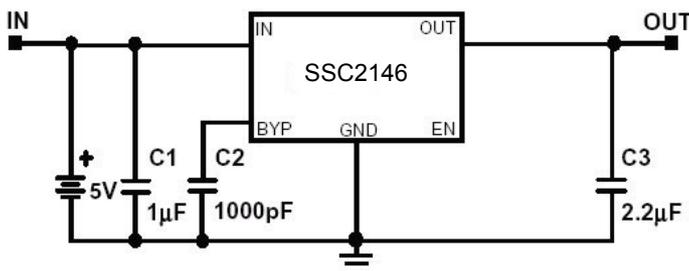
- * Low Temperature Coefficient
- * Over-Temperature Shutdown
- * Factory Pre-set Output Fold-Back
- * Very Low Dropout Voltage
- * Noise Reduction Bypass Capacitor
- * Short Circuit Current Fold-back
- * Guaranteed 600mA output
- * Current Limiting
- * Highly Accurate ±1.5%

Applications

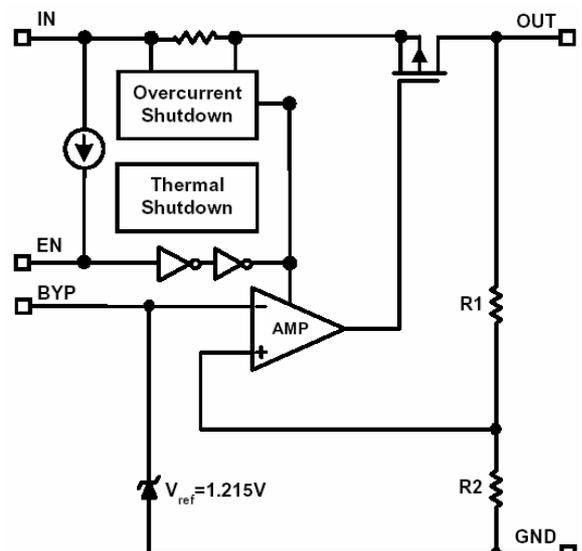
- * PC Peripherals
- * Wireless Devices
- * Portable Electronics
- * Battery Powered Widgets
- * Instrumentation
- * Cordless Phones
- * Electronic Scales



Typical Application Circuit



Functional Block Diagram



Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Input Voltage	V_{IN}	8	V
Output Current	I_{OUT}	$P_D/(V_{IN}-V_O)$	mA
Output Voltage	V_{OUT}	1.5~3.8	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_{ja}	123.7	°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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Output Voltage	$V_{OUT(E)}^1$	-1.5%	$V_{OUT(T)}^2$	1.5%	V	$V_{IN}=V_{OUT(T)}+2V, I_o=1\text{mA}$
Output Current	I_o	600	-	-	mA	$V_{IN}=V_{OUT(T)}+2V, V_O>1.2V$
Current Limit	I_{LIM}	600	800	-	mA	$V_{IN}=V_{OUT(T)}+2V, V_O>1.2V$
Load Regulation	REG_{LOAD}	-	0.2	1	%	$V_{IN}=V_{OUT(T)}+2V, I_o=1\text{mA} \sim 600\text{mA}$
Dropout Voltage	$V_{DROPOUT}$	-	-	1900	mV	$1.3V \leq V_{OUT(T)} \leq 1.4V$
		-	-	1400		$1.4V < V_{OUT(T)} \leq 2.0V$
		-	-	800		$2.0V < V_{OUT(T)} \leq 2.8V$
		-	-	600		$2.8V < V_{OUT(T)}$
$V_O = V_{OUT(E)} - 2\%$						
Quiescent Current	I_Q	-	30	50	uA	$V_{IN}=V_{OUT(T)}+1V, I_o=0\text{mA}$
Line Regulation	REG_{LINE}	-0.2	-	0.2	%	$1.3V \leq V_{OUT(T)} \leq 1.4V$
		-0.15	-	0.15		$1.4V < V_{OUT(T)} \leq 2.0V$
		-0.1	0.02	0.1		$2.0V < V_{OUT(T)}$
$V_{IN}=V_{OUT(T)}+1$ 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 ⁴	I_{SC}	-	300	600	mA	$V_{IN}=V_{OUT(T)}+1V, V_{OUT}<0.8V$
Power Supply Rejection	PSRR	-	75	-	dB	$f=1\text{kHz}$
		-	55	-		$f=10\text{kHz}$
		-	30	-		$f=100\text{Hz}$
$I_o=100\text{mA}$ $C_o=2.2\mu\text{F}$ (ceramic) $C_{BYP}=0.01\mu\text{F}$						
Output Voltage Noise	eN	-	30	-	uVrms	$f=10\text{Hz} \sim 100\text{kHz}, I_o=10\text{mA}$ $C_o=2.2\mu\text{F}, C_{BYP}=0.01\mu\text{F}$
EN Input Threshold	V_{EH}	2	-	V_{IN}	V	$V_{IN}=2.7V$ to $7V$
	V_{EL}	0	-	0.4		
EN Input Bias Current	I_{EH}	-	-	0.1	uA	$V_{EN}=V_{IN}, V_{IN}=2.7V$ to $7V$
	I_{EL}	-	-	0.5		$V_{EN}=0V, V_{IN}=2.7V$ to $7V$
Shutdown Supply Current	I_{SD}	-	0.5	0.1	uA	$V_{IN}=5V, V_O=0V, V_{EN}<V_{EL}$

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

4: To prevent the Short Circuit Current protection feature from being prematurely activated, the input voltage must be applied before a current source load is applied.



Elektronische Bauelemente

SSC2146

600mA CMOS

Positive Voltage Regulator

www.DataSheet4U.com

Ordering Information(contd.)

Part Number	Marking	Output Voltage	Part Number	Marking	Output Voltage
SSC2146-15	6D152 XXXX	1.5V	SSC2146-18	6D182 XXXX	1.8V
SSC2146-25	6D252 XXXX	2.5V	SSC2146-27	6D272 XXXX	2.7V
SSC2146-28	6D282 XXXX	2.8V	SSC2146-2H	6D2H2 XXXX	2.85V
SSC2146-29	6D292 XXXX	2.9V	SSC2146-30	6D302 XXXX	3.0V
SSC2146-31	6D312 XXXX	3.1V	SSC2146-33	6D332 XXXX	3.3V
SSC2146-34	6D342 XXXX	3.4V	SSC2146-35	6D352 XXXX	3.5V
SSC2146-36	6D362 XXXX	3.6V	SSC2146-37	6D372 XXXX	3.7V
SSC2146-38	6D382 XXXX	3.8V			

Detailed Description

The SSC2146 series 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 150°C, or the current exceeds 600mA. During thermal shutdown, the output voltage remains low. Normal operation is restored when the junction temperature drops below 120°C. The SSC2146 switches from voltage mode to current mode when the load exceeds the rated output current. This prevents over-stress. The SSC2146 also incorporates current fold-back to reduce power dissipation when the output is short circuited. The feature becomes active when the output drops below 0.8 V, and reduces the current flow by 65%. Full current is restored when the voltage exceeds 0.8 V.

External Capacitors

The SSC2146 is stable with an output capacitance to ground of 2.2uF 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 EN pin is pulled low, the PMOS pass transistor shuts off, and all internal circuits are powered down. In this state, the quiescent current is less than 2uA. This pin behaves much like an electronic switch.

Characteristics Curve

