

DESCRIPTIONS

The EC49124 is an efficient linear voltage regulator. It has extra low dropout voltage. At light loads the typical dropout voltage is 15mV, at full load the typical dropout voltage is 800mV. The output voltage accuracy is better than 2%.

The EC49124 has low ground current at 65uA, so it can help prolong battery life. The EC49124 is specially designed for hand-held, battery-powered devices.

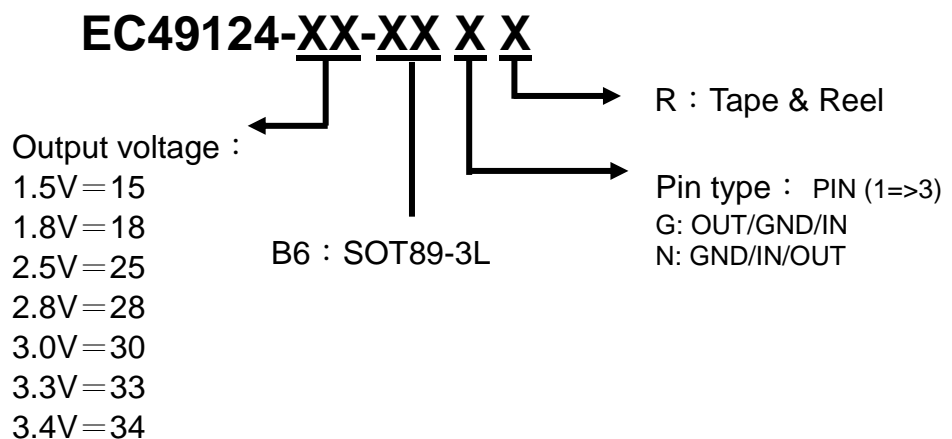
FEATURE

- Typical 175mV dropout voltage at 150mA.
- Low Ground current at 65uA. (Typ.)
- Guaranteed 500mA output over the full operating temperature range.
- Extremely tight load and line regulation.
- Low temperature coefficient.
- Current and thermal limiting.
- No-load stability.
- Standard SOT-89-3L package.

APPLICATION

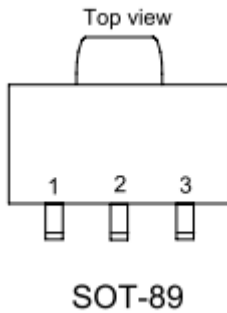
- Active SCSI terminators.
- Post regulators for switching supplies.
- Battery chargers.
- High-efficiency linear power supplies.
- Computer motherboard, display, graphic card
- DC/DC converter, such as 5V to 3.3V, 3.3V to 2.8V or 3.3V to 2.5V.

ORDERING INFORMATION

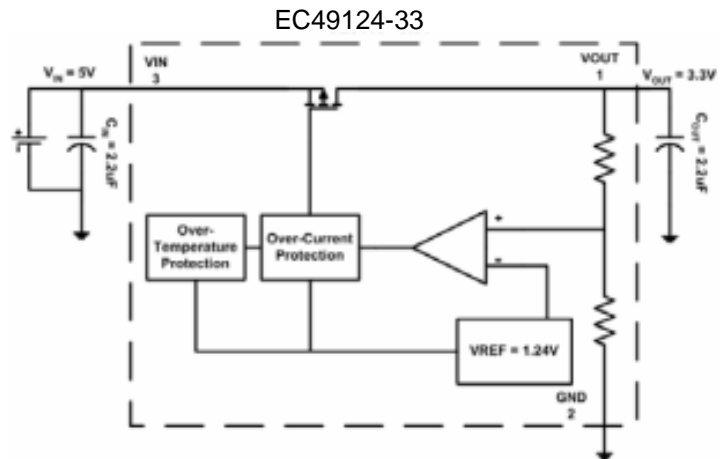


Part Number	Package	Marking	Marking Information
EC49124-XX-B6GR	SOT89-3L	49124 XXYWG	XX : Output Voltage(Ex : 15=1.5V) YW : Date Code
EC49124-XX-B6NR	SOT89-3L	49124 XXYWN	

Pin Configuration



Typical Application



Absolute Maximum Ratings⁽¹⁾

Supply Input Voltage (V_{IN})+6V
 Power Dissipation (PD) Internally Limited⁽³⁾
 Junction Temperature (T_J) 150°C
 Lead Temperature (soldering, 5 sec.) 260°C
 Storage Temperature (T_s) -40°C to +150°C

Operating Ratings⁽²⁾

Supply Input Voltage (V_{IN}) +2.8V to +5.5V
 Junction Temperature (T_J) 0°C to +125°C
 Package Thermal
 Resistance 180°C/W



Electrical Characteristics

V_{IN} = 5V; C_{IN} = 2.2μF; C_{OUT} = 2.2μF (Electrolytic capacitor) ; I_{OUT} = 10mA; T_J = 25°C; unless otherwise noted.

Symbol	Parameter	Conditions	Min	Typ	Max	Units
V _{OUT}	Output Voltage Accuracy	EC49124-1.5V(V _{IN} =3.3V)	1.470	1.5	1.530	V
		EC49124-1.8V(V _{IN} =3.3V)	1.764	1.8	1.836	
		EC49124-2.5V	2.450	2.5	2.550	
		EC49124-2.8V	2.744	2.8	2.856	
		EC49124-3.0V	2.940	3.0	3.060	
		EC49124-3.3V	3.234	3.3	3.366	
ΔV _{OUT} /ΔT	Output Voltage Temperature Coefficient	Note 4	--	50	--	ppm/°C
ΔV _{OUT} / V _{OUT}	Line Regulation	V _{IN} = V _{OUT} + 1V to 5.5V	--	1	--	%
ΔV _{OUT} / V _{OUT}	Load Regulation ⁽⁵⁾	I _{OUT} =10mA to 250mA ⁽⁵⁾	--	1	--	%
		I _{OUT} =10mA to 400mA ⁽⁵⁾	--	1.5	--	
V _{IN} - V _{OUT}	Dropout Voltage ⁽⁶⁾	I _{OUT} =10mA	--	15	--	mV
		I _{OUT} =150mA	--	175	--	
		I _{OUT} =250mA	--	320	--	
		I _{OUT} =500mA	--	800	--	
T _{PROTECTION}	Thermal Protection	Thermal Protection	--	150	--	°C
		Protection Hysterisys	--	20	--	°C
PSRR	Ripple Rejection	f =120Hz	--	51	--	dB
I _{GROUND}	Ground Current	I _{OUT} =10mA	--	65	--	uA
I _{LIMIT}	Current Limit	V _{OUT} =0V	--	700	--	mA

Note 1: Exceeding the absolute maximum rating may damage the device.

Note 2: The device is not guaranteed to function outside its operating rating.

Note 3: The maximum allowable power dissipation at any TA (ambient temperature) is calculated using:

$PD(MAX) = (T_J(MAX) - T_A) / \theta_{JA}$. Exceeding the maximum allowable power dissipation will result in excessive die temperature, and theregulator will go into thermal shutdown. See Table 1 and the “Thermal Considerations” section for details.

Note 4: Output voltage temperature coefficient is the worst-case voltage change divided by the total temperature range.

Note 5: Regulation is measured at constant junction temperature using low duty cycle pulse testing. Parts are tested for load regulation in the load range from 100μA to 500mA. Changes in output voltage due to heating effects are covered by the thermal regulation specification.

Note 6: Dropout voltage is defined as the input to output differential at which the output voltage drops 2% below its nominal value measured at 1V differential.

Note 7: The C_{in} or C_{out} should be chosen carefully. Please refer to the Application Hints

Application Hints

Like any Low dropout regulator, EC49124 requires external capacitors to ensure stability. The external capacitors must be carefully selected to ensure the performances.

Input Capacitor:

An Input Capacitor of at least 2.2uF is required. The inexpensive Electrolytic capacitor is preferred. The value can be increased without upper limit.

Output Capacitor:

An Output Capacitor is required for look stability. It must be located no more than 1cm away from the VOUT pin, and connected directly between VOUT and GND pins. The inexpensive Electrolytic capacitor is recommended. The minimum value is 2.2uF but once again its value can be increased without limit.

Thermal Consideration

It is important that the thermal limit of the package should not be exceeded. The EC49124 has built-in thermal protection. When the thermal limit is exceeded, the IC will enter protection, and the VOUT will be reset to zero. The power dissipation for a given application can be calculated as follows:

The Power Dissipation (PD) is

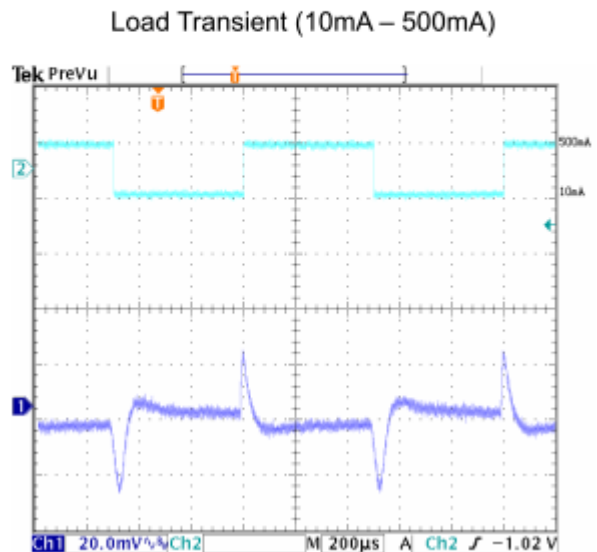
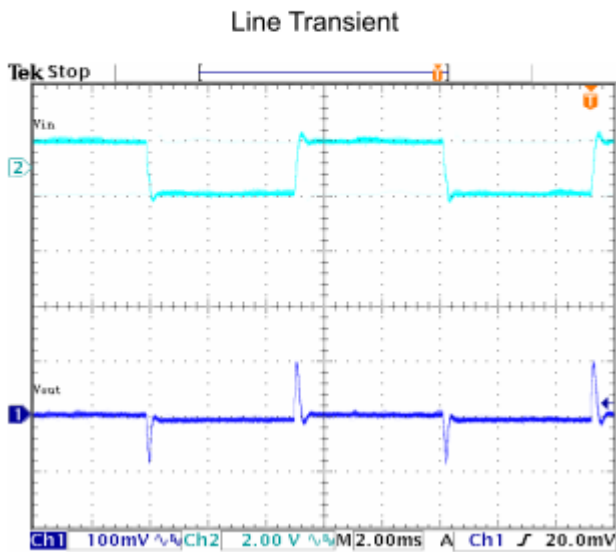
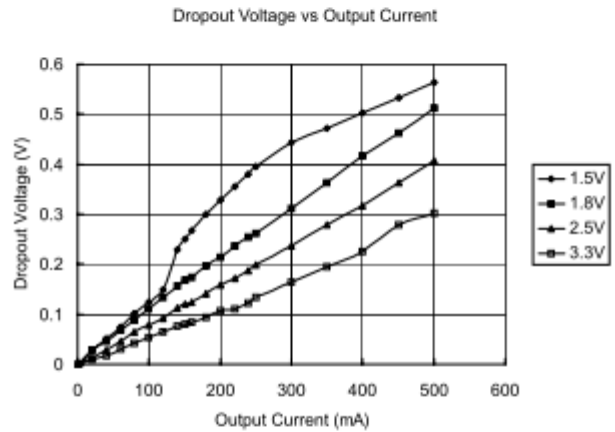
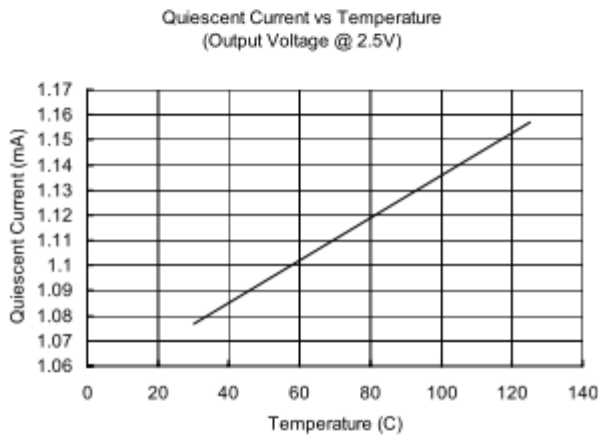
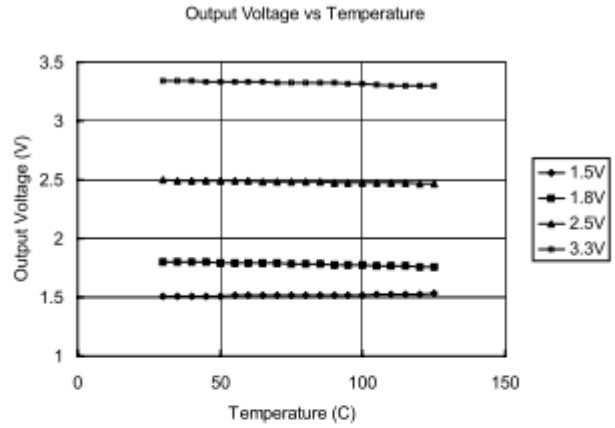
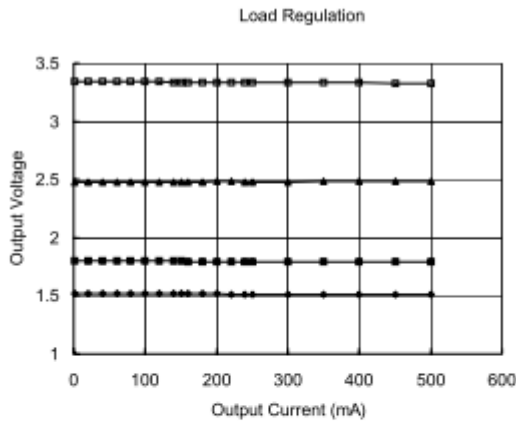
$$PD = I_{OUT} * [V_{IN} - V_{OUT}]$$

The thermal limit of the package is then limited to $PD_{(MAX)} = [T_J - T_A] / \theta_{JA}$ where T_J is the junction temperature, T_A is ambient temperature, and θ_{JA} is around 180°C/W for EC49124. EC49124 is designed to enter thermal protection at 150°C. For example, if T_A is 25°C then the max PD is limited to about 0.7W.

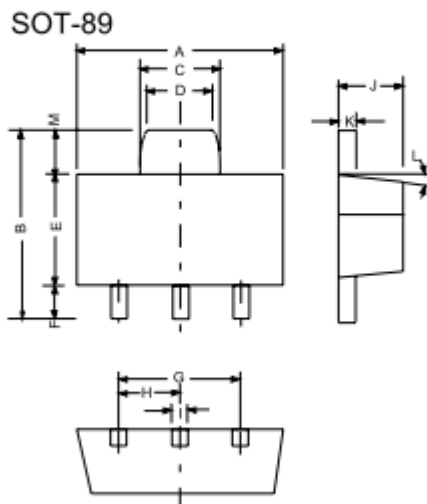
In other words, if $I_{OUT(MAX)} = 500mA$, then $[V_{IN} - V_{OUT}]$ can not exceed 1.4V.

Typical Performance Characteristics

($V_{IN} = 5V$, $C_{IN} = 2.2\mu F$, $C_{OUT} = 2.2\mu F$, $T_A = 25^\circ C$, unless otherwise noted.)



Outline Drawing for SOT-89



DIMENSIONS				
DIM ^N	INCHES		MM	
	MIN	MAX	MIN	MAX
A	0.173	0.181	4.400	4.600
B	0.159	0.167	4.050	4.250
C	0.067	0.075	1.700	1.900
D	0.051	0.059	1.300	1.500
E	0.094	0.102	2.400	2.600
F	0.035	0.047	0.890	1.200
G	0.118REF		3.00REF	
H	0.059REF		1.50REF	
I	0.016	0.020	0.400	0.520
J	0.055	0.063	1.400	1.600
K	0.014	0.016	0.350	0.410
L	10°TYP		10°TYP	
M	0.028REF		0.70REF	