

## Description

The EC4223 is a low dropout current regulator rated for 350mA/250mA constant sink current. The constant sink current will ensure that the same amount of power is applied to the power LED and consequently maintain the uniform brightness throughout the possible voltage variations from the power source. The IC also features low quiescent current and is typically at 212uA. This will minimize the power consumption from the IC itself.

The IC has EN function built-in for applications where EN function or Dim function is needed. Please contact us directly if EN function is required.

EC4223 is presently available in low profile SOT89-3L packages.

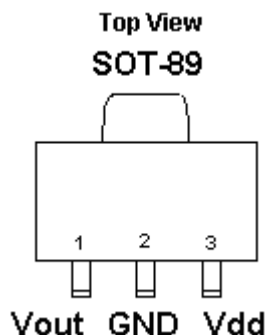
## Features

- No external component required.
- Constant 350mA/250mA constant sink current.
- Output short / open circuit protection.
- Low dropout voltage.
- Low quiescent current at 212uA typical.
- Build-in thermal protection.
- Supply voltage range 2.7V ~ 6V.
- 2KV HBM ESD protection.
- Advanced CMOS process.
- SOT-89 package
- EN function is available upon request.

## Application

- Power LED Driver.
- LED Flashlight Torch.
- LED Miner's Lamp.
- Lighting.

## Pin Configuration



## Application Diagram

## Ordering Information

**EC4223 XX XX X**

Output voltage :  
AN : 350mA  
BN : 250mA

B6 : SOT89-3L

R : Tape & Reel

## Absolute Maximum Rating (1)

Parameter	Symbol	Value	Units
Input Voltage	$V_{DD}$	-0.3~7V	V
Output Voltage	$V_{OUT}$	-0.3 to 4.6	V
Output Sink Current	$I_{OUT}$	400	mA
Thermal Resistance, Junction-to-Ambient (SOT89)	$\Theta_{JA}$	180	°C/W
Lead Temperature (Soldering, 5 sec.)		260	°C
Junction Temperature	$T_J$	0 to +150	°C
Storage Temperature	$T_S$	-40 to +150	°C

## Electrical Characteristics

$V_{DD} = 3.7V$ ; No Load;  $T_J = 25^{\circ}C$ ; unless otherwise noted

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Output Sink Current	I <sub>SINK</sub>	V <sub>OUT</sub> =0.4V	EC4223ANB6R	300	350	400	mA
			EC4223BNB6R	200	250	300	
Load Regulation		V <sub>OUT</sub> =0.2V to 3V			22		mA/V
Line Regulation		V <sub>DD</sub> =3V to 6V , V <sub>OUT</sub> =0.2V			1.88		mA/V
Output Dropout Voltage (2)	V <sub>OUTL</sub>				150		mV
Supply Current Consumption	I <sub>DD</sub>				212		μA

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

Note 2: Output dropout voltage: 90% x  $I_{OUT}$  @  $V_{OUT}=200mV$

## Thermal Considerations

It is important that the thermal limit of the package is not exceeded. The EC4223 has built-in thermal protection. When the thermal limit is exceeded, the IC will enter protection, and  $V_{OUT}$  will be pulled to ground. The power

dissipation for a given application can be calculated as following:

The power dissipation ( $P_D$ ) is  $P_D = I_{OUT} * [V_{IN} - V_{OUT}]$

The thermal limit of the package is then limited to  $P_{D(MAX)} = [T_J - T_A]/\Theta_{JA}$  where  $T_J$  is the junction temperature,  $T_A$  is the ambient temperature, and  $\Theta_{JA}$  is around 180°C/W for EC4223. EC4223 is designed to enter thermal protection at 150°C. For example, if  $T_A$  is 25°C then the maximum  $P_D$  is limited to about 0.7W. In other words, if  $I_{OUT(MAX)} = 350mA$ , then  $[V_{IN} - V_{OUT}]$  cannot exceed 2V.

## OUTLINE DRAWING SOT89-3L

DIMENSIONS				
DIM <sup>N</sup>	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	