

Three Function Programmable Constant Current Source

■ General Description

XT2102 is a programmable constant current source, through an external resistor to set the output current.

XT2102's internal control circuit that can achieve full current, 1 / 4 current and burst flash three functions. Three functions controlled by external switch cycle occurs.

XT2102 built-in short circuit protection, when IOOUT and VDD form a short circuit, the chip will automatically adjust the output current to 25mA, to ensure that the chip is not damaged. Meanwhile Chip built-in linear temperature protection, as the temperature rises, automatically reduce the output current to ensure that loss does not exceed the package chip power consumption to allow the scope to provide a high reliability protection.

■ Package

- SOT89-5L

■ Ordering Information

XT2102 ①②③

Designator	Symbol	Description
①	P	Package Type: SOT89-5L
②	R	Embossed Tape :Standard Feed
	L	Embossed Tape :Reverse Feed

■ Functional Pin Description

Pin Name	Pin Number	Description
	SOT89-5L	
ISET	1	Current set up port
VIN	3	Power supply input
BP	4	Internal logic power supply
GND	2	Ground
IOOUT	5	Current output

■ Application

LED constant current source

LED flashlight

Low-side current-limiting switch

Digital flash controlApplications

■ Application

Programmable output current,an external resistor control

Built-in short circuit protection,short circuit current of 25mA

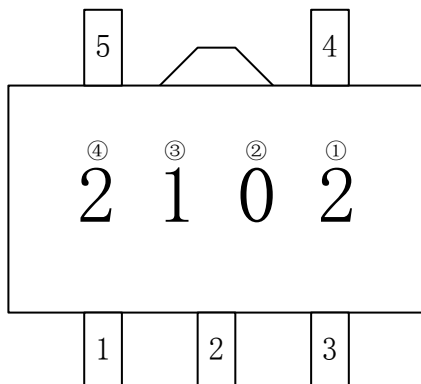
Built-in linear temperature protection,over temperature automatically reduce the output current

Three function modes,using the occasion to expand the customer

By mirroring the current setting to minimize the minimum input voltage

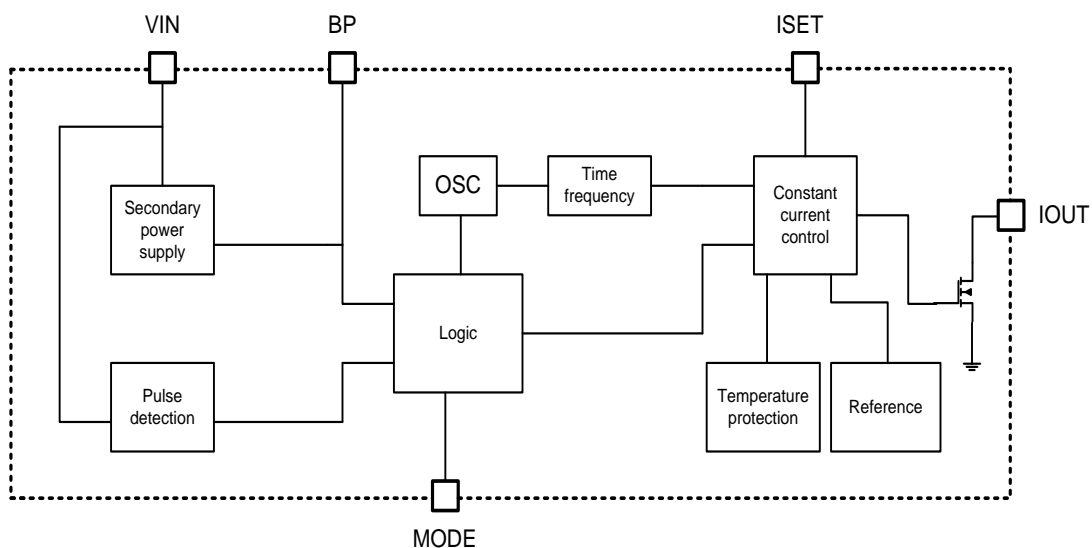
■ Marking Rule

- SOT89-5L



①②③④ represent the product information about process, manufacture and so on.

■ Function Block Diagram



■ Absolute Maximum Ratings

Parameter	Symbol	Ratings		Units
VIN,BP Voltage	V _{CC}	V _{SS} -0.3~V _{SS} +8		V
ISET,IOUT Pin Voltage		V _{SS} -0.3~V _{CC} +0.3		
Power Dissipation	P _D	SOP-8/PP	1200	mW
Operating Temperature Range	Topr	-40~+85		℃
Storage Temperature Range	Tstg	-65~+125		

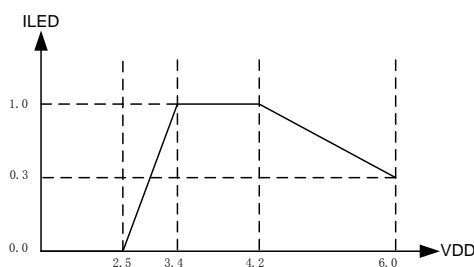
Note: Absolute Maximum Ratings are those values beyond which the life of a device may be impaired.

Electrical Characteristics

Parameter	Symbol	Conditions	MIN	TYP	MAX	Units
Input Voltage Range	V_{CC}		2		7	V
Quiescent Current	I_{SS}	$V_{IN}=7V, R_{ISET}=64K$	120	150	180	μA
Shutdown Current	I_{STB}	$V_{IN}=7V$		0.6	1	μA
Power tube resistance	$R_{DS(on)}$	$V_{IN}=4.2V, R_{ISET}=0$	80	120	180	Ω
Temperature Protection	T_P		110	130	150	$^{\circ}C$
ISET Voltage	V_{ISET}		0.98	1	1.05	V
ISET Current	I_{SET}	$V_{IN}=7V, R_{ISET}=64K$	110	120	130	μA

Application Information

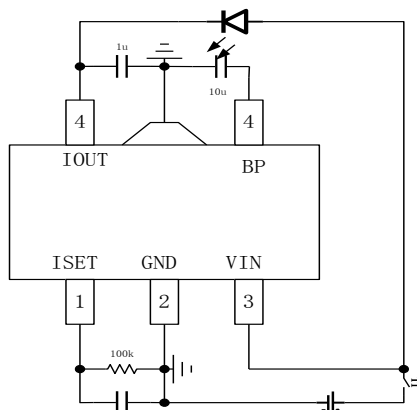
- XT2102 is a linear constant current controller, so the input and output pressure is too large, it will generate a lot of heat in the chip. As XT2102 interior design a linear temperature control, so the chip temperature reaches a set value, the chip will automatically reduce the output current to ensure the safety of LED lights and chips.
- The figure is the LED current and input voltage curve: (set current is 1A, LED's $V_F = (3.07V @ 1A)$)



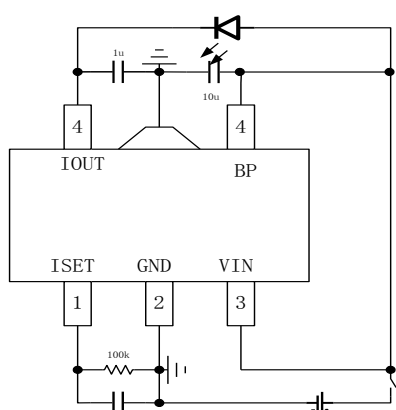
- The method of calculating output current :
Since design the mirror current source in the inside surface, so the resistance of the slip did not enter the output circuit, customers' programming resistor take a lot of choice to reduce costs.
 $I_{LED} = 80000/R_{ISET}$ such as requiring the LED current is 1.0A, while R_{ISET} can be set to 80K.
If you require dimming, can be set in programmable resistor.

Typical Application Circuit

Application of three-function LED Flashlight

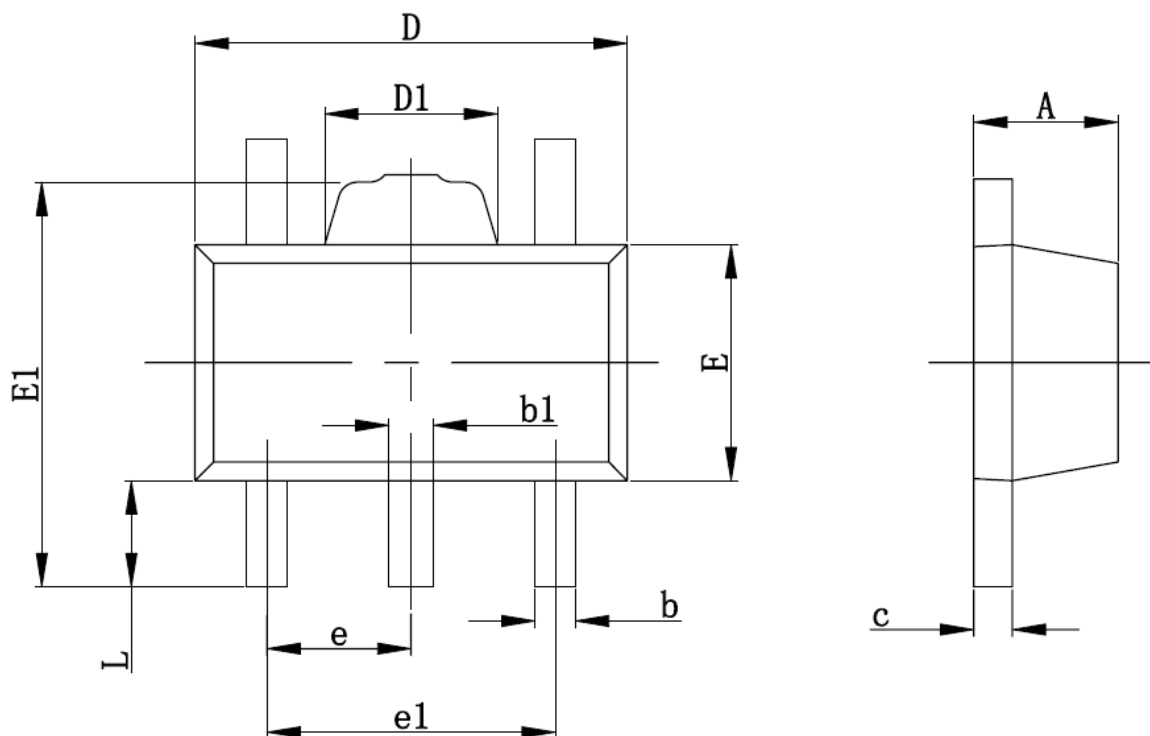


Single-function application of constant current



■ Package Information

● SOT89-5



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.400	1.600	0.055	0.063
b	0.320	0.520	0.013	0.020
b1	0.360	0.560	0.014	0.022
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.400	1.800	0.055	0.071
E	2.300	2.600	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500TYP		0.060TYP	
e1	2.900	3.100	0.114	0.122
L	0.900	1.100	0.035	0.043