Three Function Programmable Constant Current Source

■ General Description

XT2101 is a programmable constant current source, through an external resistor to set the output current.

XT2101'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.

XT2101 built-in short circuit protection, when IOUT 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

- SOP-8/PP

■ Application

- LED constant current source
- LED flashlight
- Low-side current-limiting switch
- Digital flash controlApplications

■ Application

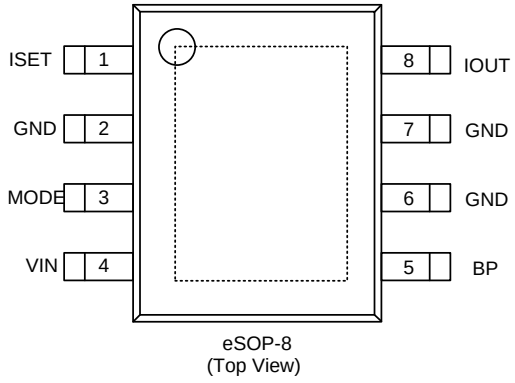
- Programmable output current,an external resistor control
- Built-in short circuit protection,short circuit current of 25mA
- Built-in linear temperature protection,over temperature automatically reduce the output current
- Three function modes,using the occasion to expand the customer
- By mirroring the current setting to minimize the minimum input voltage

■ Ordering Information

XT2101 ①②③

Designator	Symbol	Description
①	S	Package Type: SOP-8/PP
②	R	Embossed Tape :Standard Feed
	L	Embossed Tape :Reverse Feed

■ Functional Pin Description

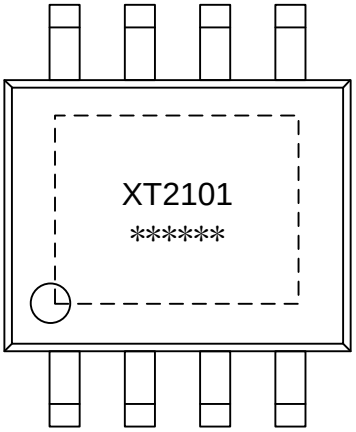


eSOP-8
(Top View)

Pin Name	Pin Number	Description
	SOP8	
ISET	1	Current set up port
VIN	4	Power supply input
BP	5	Internal logic power supply
MODE	3	Mode control
GND	2,6,7	Ground
IOUT	8	Current output

■ Marking Rule

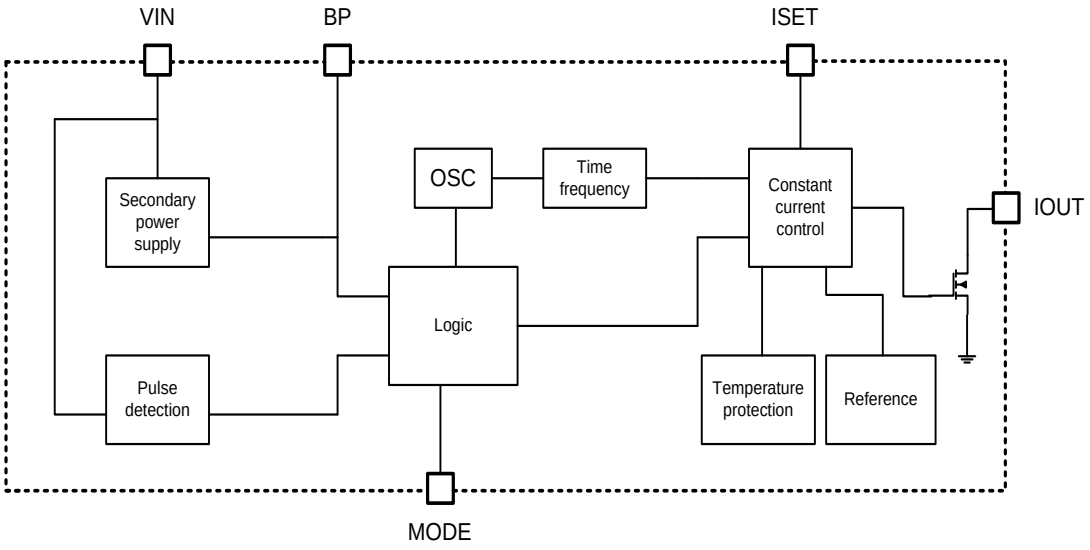
- SOP-8/PP



First line: Product Name

The second line: Production batch lot number

■ Function Block Diagram



■ Absolute Maximum Ratings

Parameter	Symbol	Ratings		Units
VIN,BP Voltage	V_{CC}	V_{SS}-0.3～V_{SS}+8		V
ISET,MODE,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.

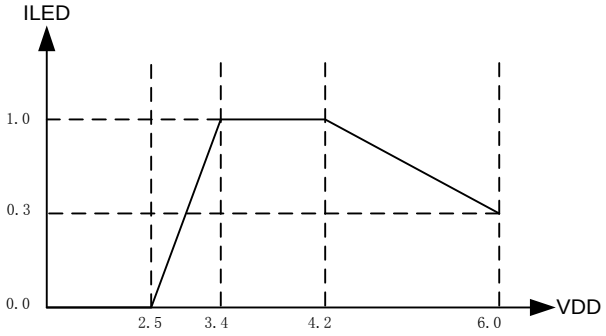
■ Electrical Characteristics

Parameter	Symbol	Conditions	MIN	TYP	MAX	Units
Input Voltage Range	V_{CC}		2		7	V
Quiescent Current	Iss	VIN=7V,R_{ISET}=64K	120	150	180	μA
Shutdown Current	I_{STB}	VIN=7V,MODE=1		0.6	1	μA
Power tube resistance	R_{DSON}	VIN=4.2V,R_{ISET}=0	80	120	180	Ω
Temperature Protection	T_P		110	130	150	℃
ISET Voltage	V_{ISET}		0.98	1	1.05	V
MODE Working Frequency	F_{MODE}		1	2	5	KHz
ISET Current	I_{SET}	VIN=7V,R_{ISET}=64K	110	120	130	μA

■ Application Information

- XT2101 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 XT2101 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 VF = (3.07V @ 1A))



- The method of calculating output current :

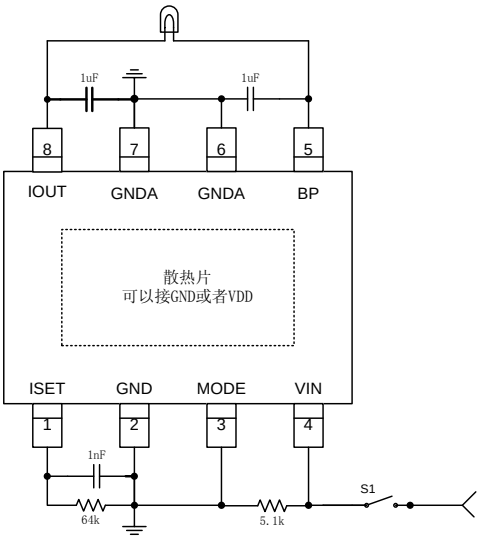
  Since design the mirror current source in the inside surface, so the resistance of the slip did not enter the output circuit, customers' programming resistor take a lot of choice to reduce costs.

  I_{LED} = 80000/R_{ISET} such as requiring the LED current is 1.0A, while R_{ISET} can be set to 80K.

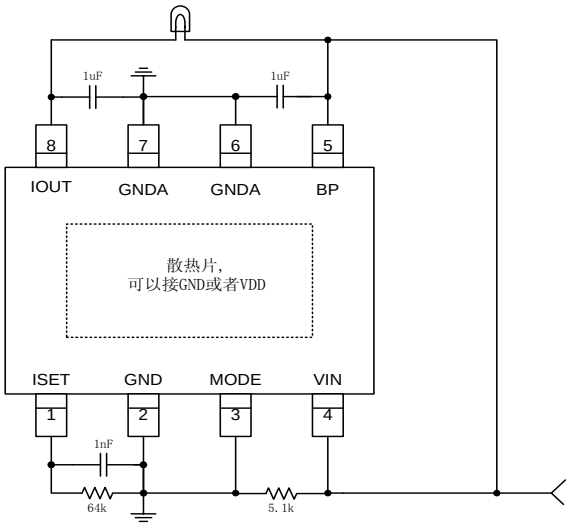
  If you require dimming, can be set in programmable resistor.

■ Typical Application Circuit

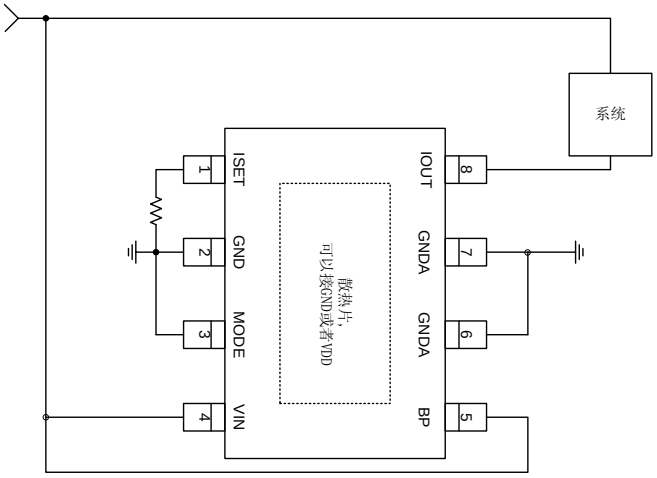
- **Application of three-function LED Flashlight**



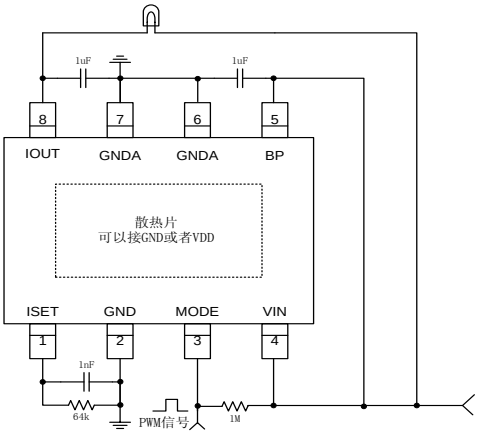
- **Single-function application of constant current**



- **Constant current source**



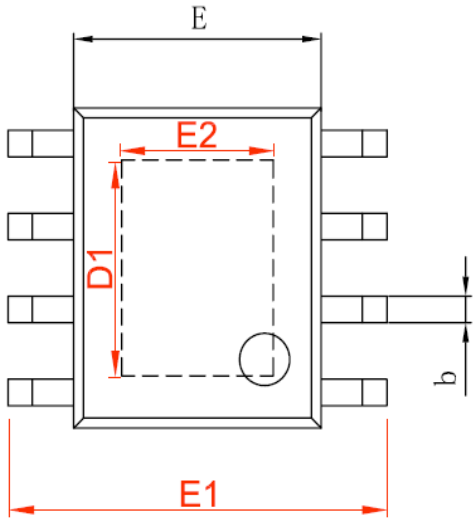
- **LED flash applications**

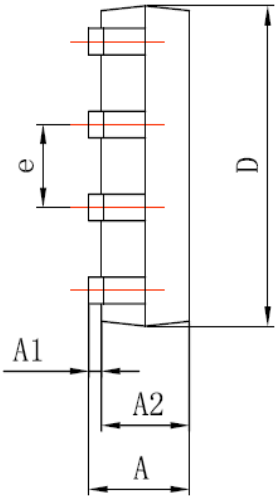


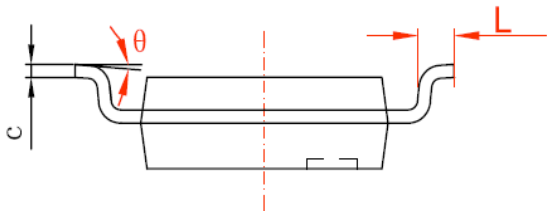
PWM信号的工作频率要求在10K-20KHz之间

■ Package Information

- SOP-8/PP







字符	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.050	0.150	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
D1	3.202	3.402	0.126	0.134
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
E2	2.313	2.513	0.091	0.099
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°