



36V,3A,150KHzConstant voltage and constant current loopBuck DC-DCconverter

Overview

ME3149It is a high-efficiency constant voltage and constant currentBuck DC-DCConvert device,8Varrive36VWide operating voltage range, low ripple, built-in low conduction Resistor powerMOS.ME3149Built-in loop compensation circuit can reduce Reduce the number of peripheral components. There is a constant voltage loop designed internally, which can pass through the external The external resistor sets the system working state. Built-in constant current loop available for led drive.

PWMThe control module can adjust the duty cycle from0~100%line between sexual changes. Built-in overvoltage protection, overcurrent protection, and temperature protection ensure that the system system application security.

Features

- Input voltage range8V~36V
- Maximum output current3A
- Oscillator frequency150KHz
- The output voltage is from1.25Varrive33VAdjustable
- Minimum pressure difference0.3V
- Built-in constant current loop
- Built-in low on-resistance power MOS
- Built-in frequency compensation saves peripheral components
- Overvoltage protection, overcurrent protection, temperature protection
- output5VRecommended maximum output power1W

Application occasions

- car charger
- battery charger
- Portable device charging
- monitorledbacklight
- Universalledillumination
- Buck constant current drive

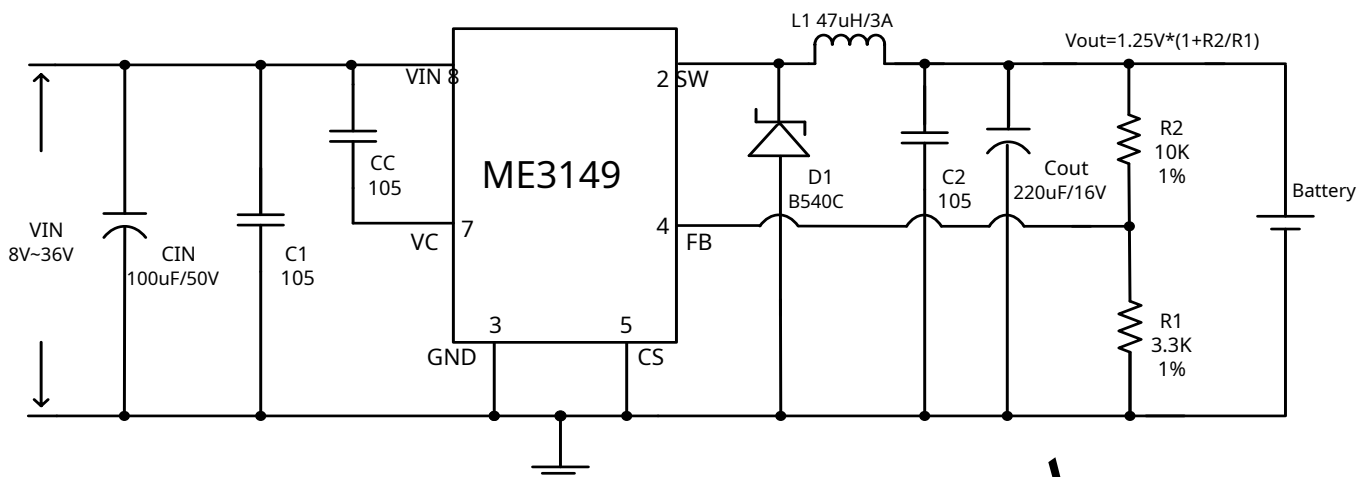
Package form

- 8-pin ESOP8



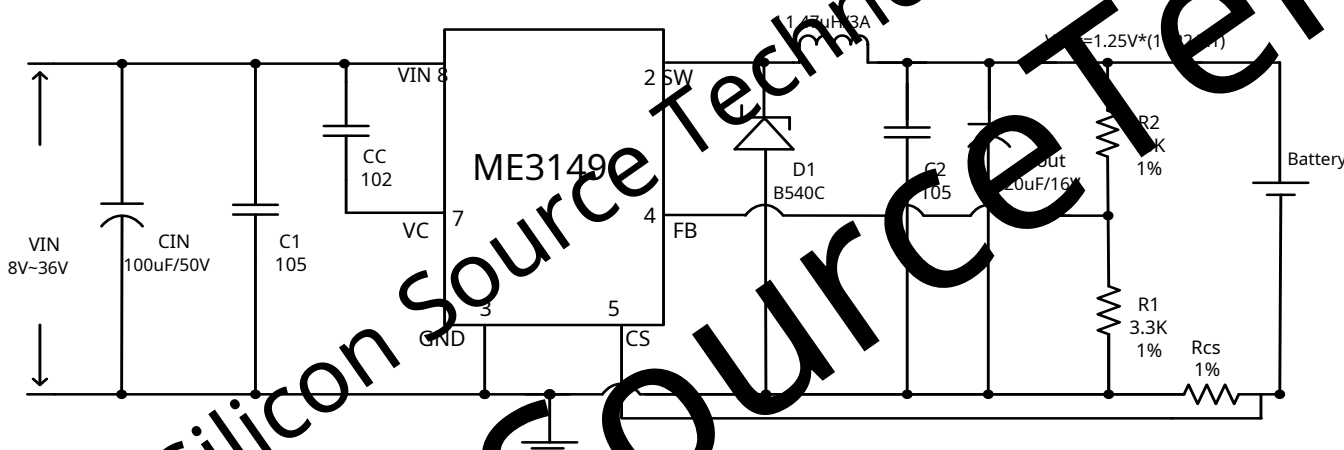
ME3149

Typical application diagram (constant voltage charging)



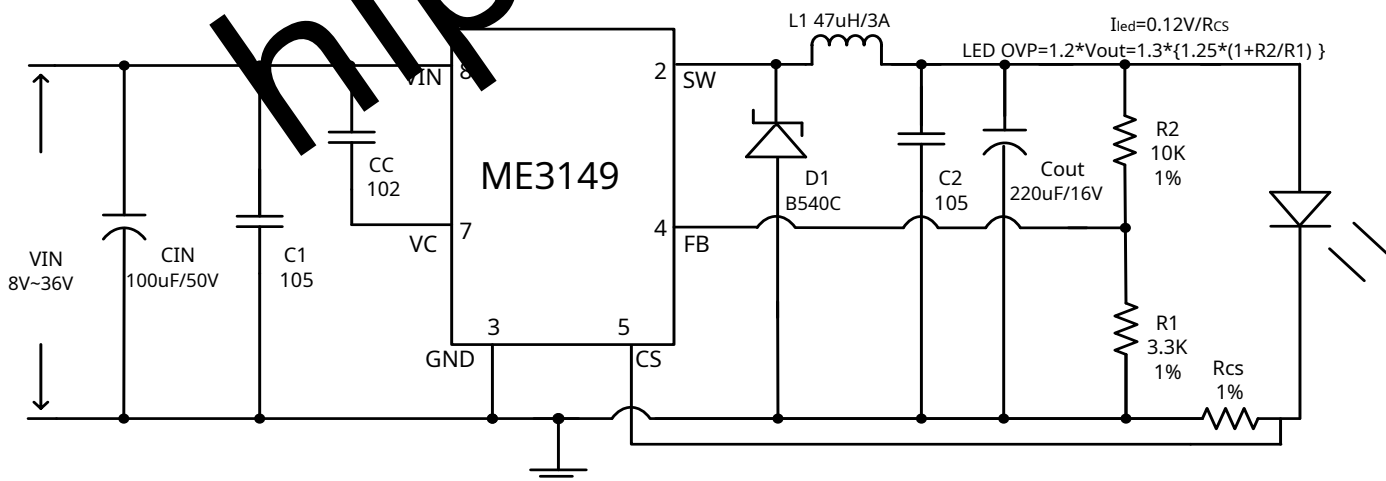
picture1.Constant voltage charging system circuit

Typical application diagram (external current limit, adjustable constant voltage and current limit charging, constant voltage and constant current charging)



picture2.Constant voltage current limit charging system circuit (VIN=8V~36V,VOUT=5V/0.1A~2.5A)

Typical application diagram (constant current LED drive)



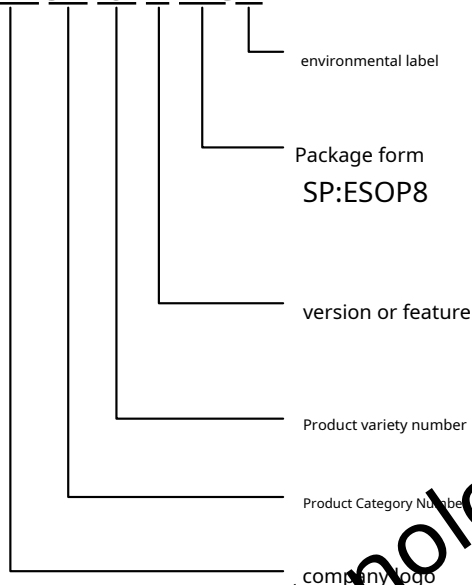
picture3.constant current LED drive system circuit



Buying Guide

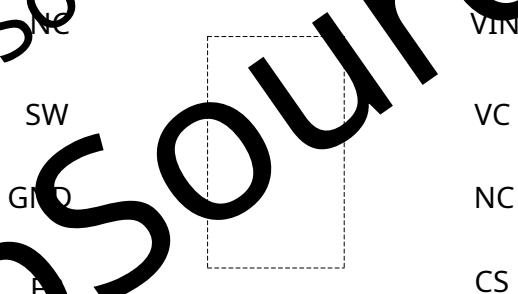
ME3149

ME 31 49 X XX G



Product number	Product Description
ME3149ASPG	Package form:ESOP8

Chip pin diagram



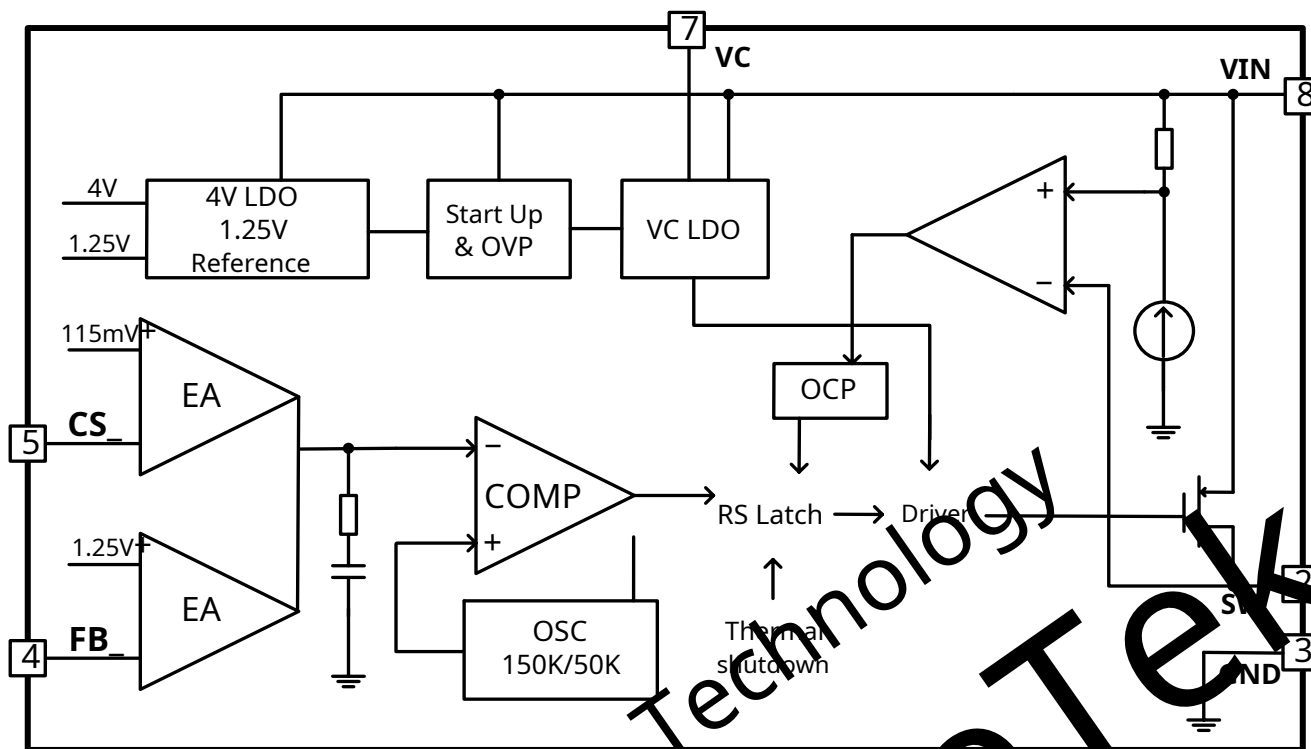
Pin function description

PINfoot position	symbol name	Function Description
1,6	NC	floating pin
2, back pad	SW	powerMOSoutput pin.SWIt is recommended that the large current at the terminal be drawn from the back pad.2The feet should not be exposed to excessive current
3	GND	Ground pin
4	FB	Voltage feedback pin, detects the output voltage through a voltage divider resistor, the reference voltage is1.25V
5	CS	Current detection pin, by detecting voltage drop, obtains constant current loop feedback
7	VC	Internal voltage regulation bypass capacitor pin, needs to be inVCandVINcapacitor in parallel
8	VIN	input power pin,8~36Vwide voltage range



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Chip function diagram



picture4.Module function diagram

absolute maximum ratings

parameter	unit Value	unit
voltage VIN	- 0.3~45	V
FEEDBACK PIN VOLTAGEVFB	- 0.3~45	V
Output switch pin voltage	- 0.3~VIN	V
Package thermal resistance	63	°C/W
Power consumption	Thermal limitations	W
junction temperature range	- 40~150	°C
range of working temperature	- 40~85	°C
Storage temperature range	- 55~150	°C
Welding temperature and time	260(10Second)	°C
ESD(mannequin)	>2000	V

Note: The absolute maximum rating is the maximum physical damage limit that this product can withstand. Please do not exceed this rating under any circumstances.



ME3149

ME3149Electrical parameters

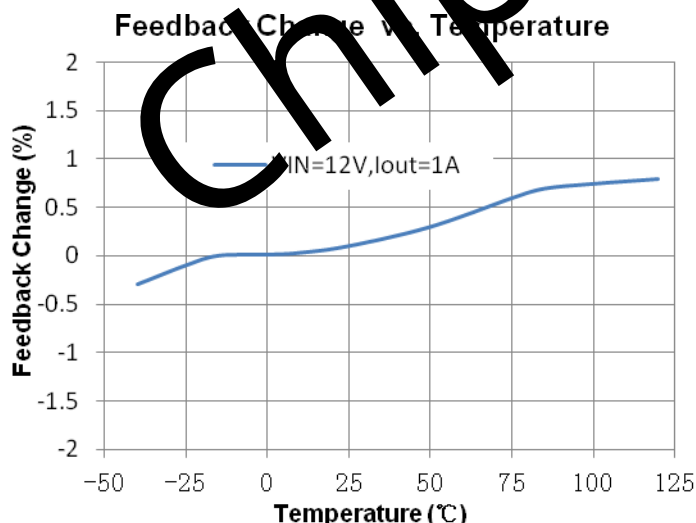
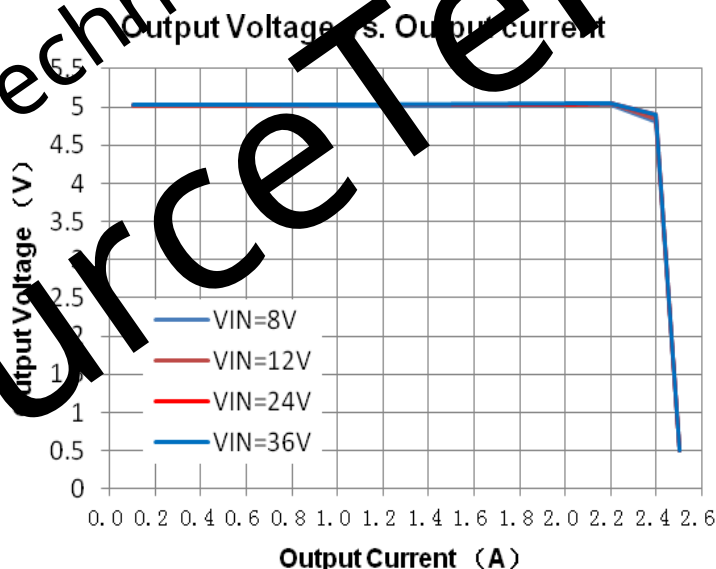
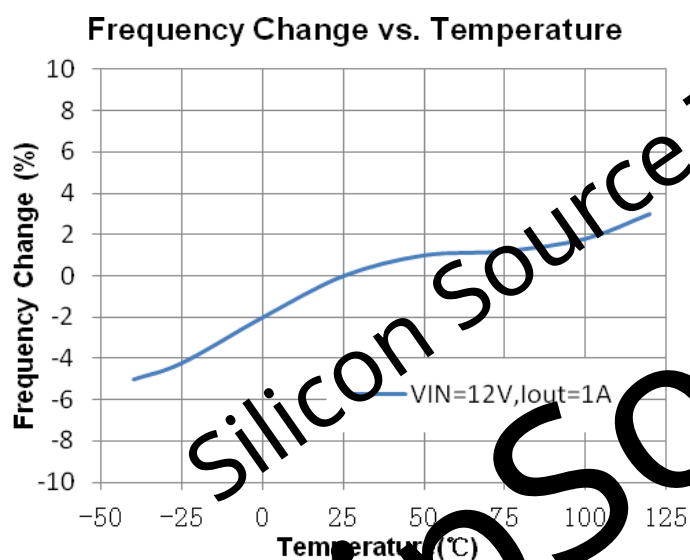
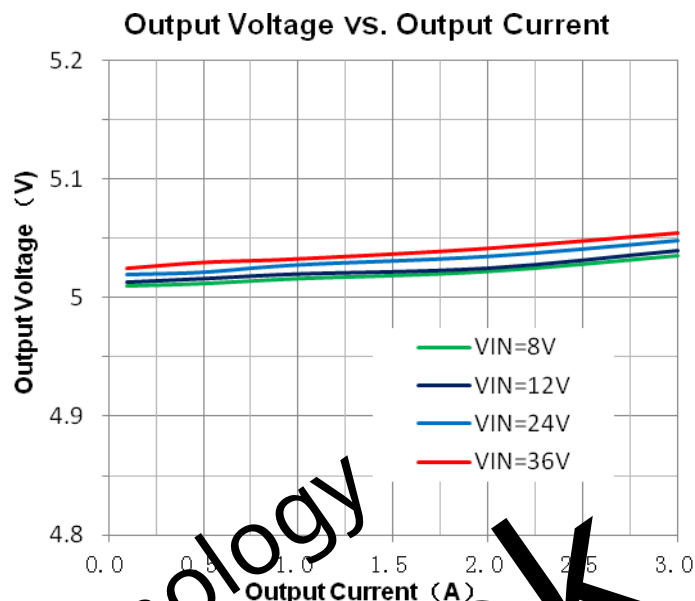
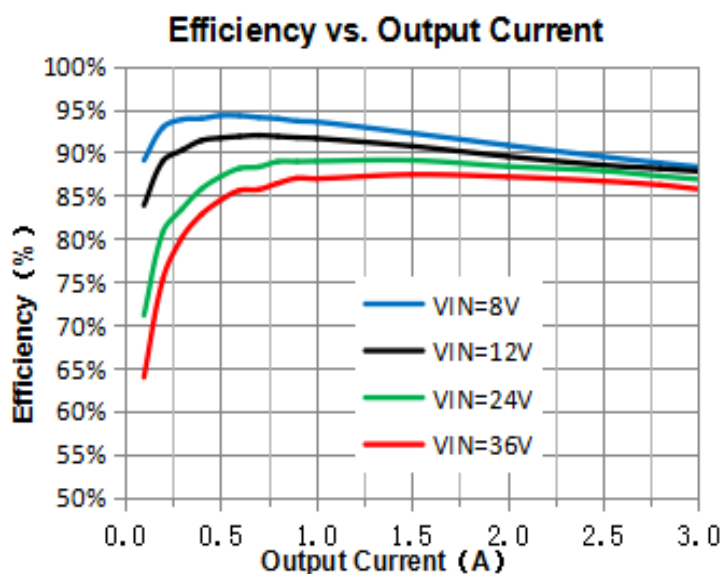
(Normal conditions $T_A = 25^\circ\text{C}$, $V_{in} = 12\text{V}$, $GND = 0\text{V}$, V_{in} and GND parallel connection between $100\mu\text{F}/50\text{V}$ capacitance, $I_{out} = 500\text{mA}$, unless otherwise noted)

symbol	parameter	Test Conditions	minimum value	Typical value	maximum value	unit
VIN	Input voltage		8	-	36	V
I _Q	Quiescent Current	$V_{FB} = 2\text{V}$		2	5	mA
SW	Oscillation frequency		130	150	170	KHz
UVLO	Under voltage protection			5		V
OVP	Overvoltage protection		37	42	45	V
V _{FB}	feedback voltage	$V_{in} = 8 \sim 36\text{V}, V_{out} = 5\text{V}$ $I_{load} = 0.2 \sim 2\text{A}$	1.232	1.250	1.268	V
η	efficiency	$V_{in} = 12\text{V}, V_{out} = 5\text{V}$ $I_{out} = 2.4\text{A}$		89		%
I _{CL}	Built-in current limiting protection			3.5		A
R _{dson}	power MOS On-resistance	$V_{FB} = 0\text{V}$ $V_{in} = 12\text{V}, I_{sw} = 3\text{A}$		73	95	mΩ
V _{CS}	Constant current sampling voltage		112.5	118	123.5	mV

Silicon source Technology
ChipSourceTek



Typical performance parameters (Figure2)(Vout=5V,Iout=0.1~2.5A, unless otherwise noted)

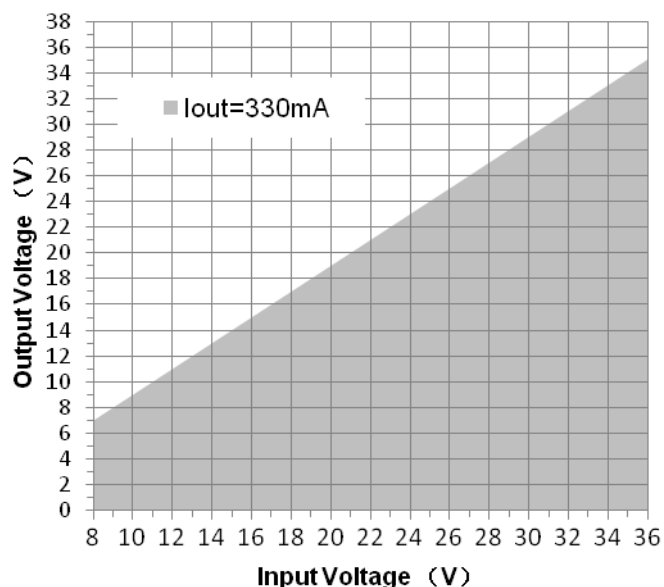


Note: The internal reference has a positive temperature coefficient. When the output power increases, resulting in increased heat generation and an increase in junction temperature, the feedback voltage will increase to compensate for line loss.

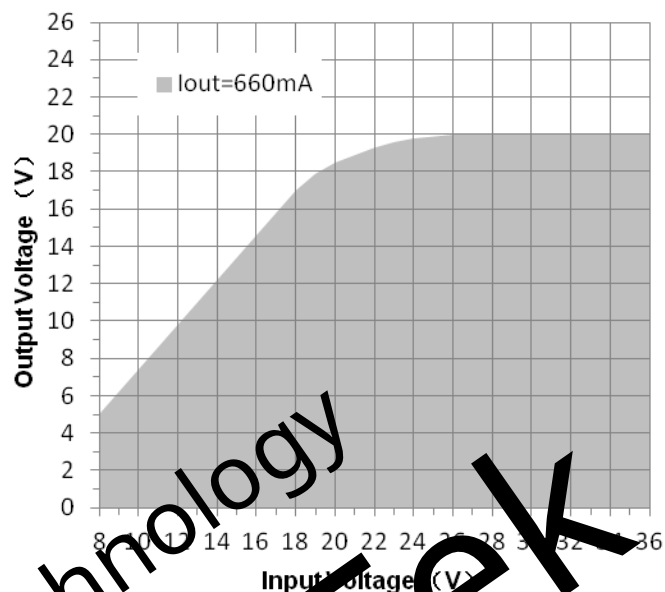


Typical performance parameters (Figure2)(ledApplication recommended output voltage safe operating range)

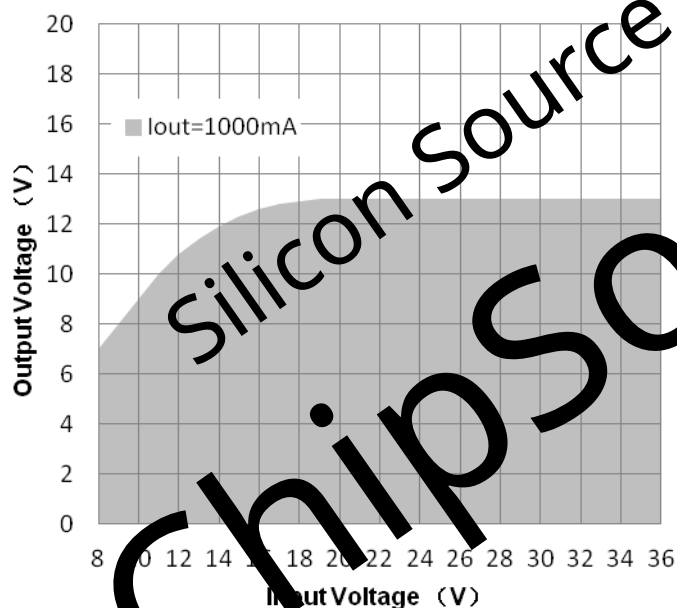
Recommend output voltage safe work range



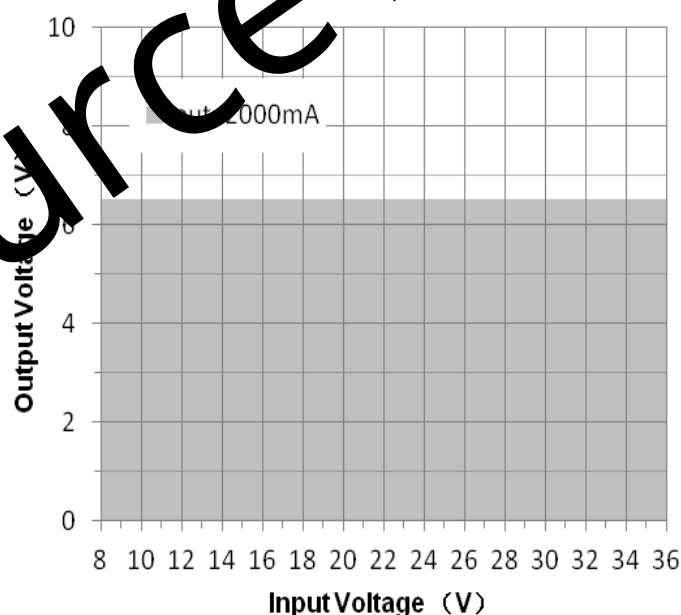
Recommend output voltage safe work range



Recommend output voltage safe work range

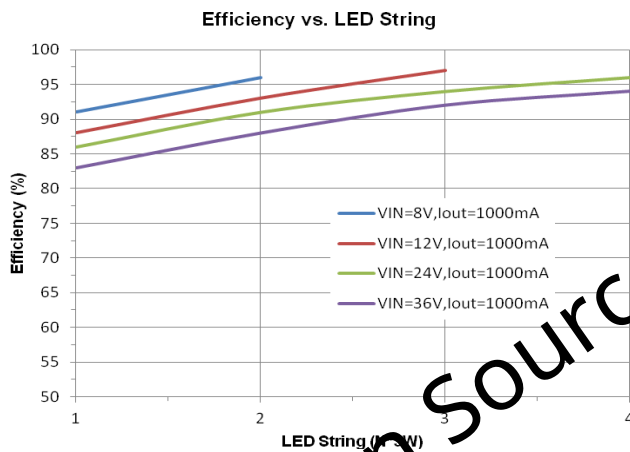
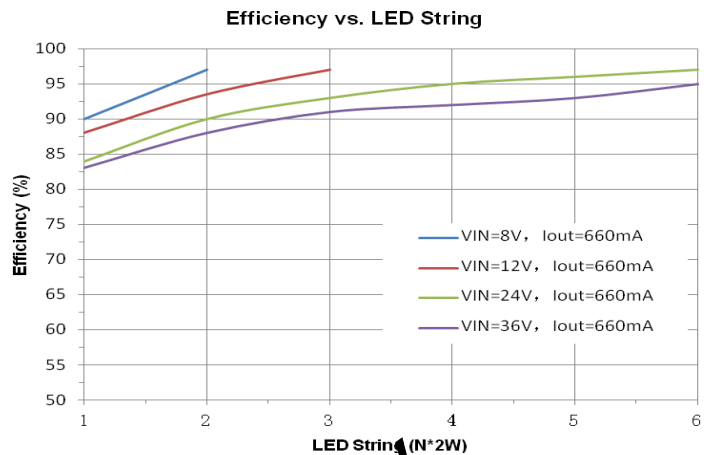
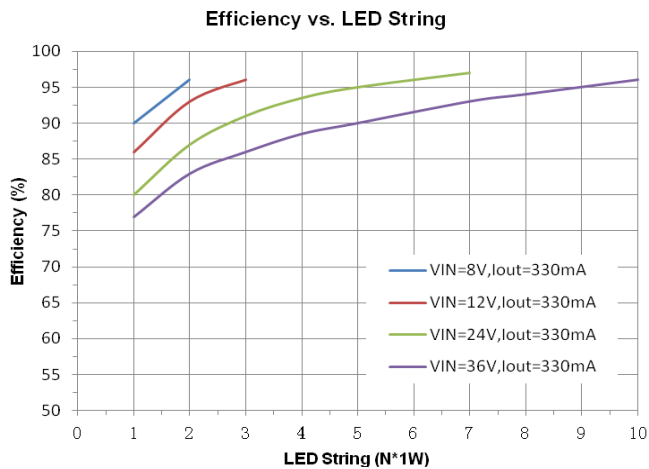


Recommend output voltage safe work range





Typical performance parameters (Figure3)



Application information

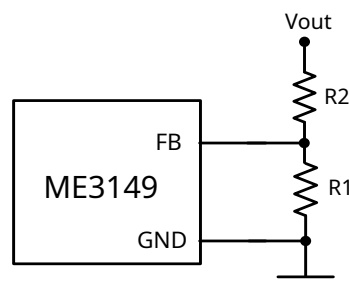
ME3149 There are corresponding functional circuits to protect the chip under normal operating conditions. The temperature protection module will monitor the junction temperature in real time. When the temperature is close to extreme

When the temperature reaches the limit, the chip will be shut down to prevent damage. When the temperature returns to the hysteresis threshold, the chip will restart and resume work. The input undervoltage lockout function can effectively prevent

Turn on the chip at a lower than normal operating voltage. Current limit function can limit the maximum current of the chip's power tube to prevent excessive current from damaging the chip.

Set output voltage

The output voltage can be determined by the resistor ratio, and the circuit is as shown below:



picture5. Output voltage setting circuit



To set the output voltage, you need to FB pins and proportional resistor connections. FB The voltage is 1.25V, so the output voltage is adjusted by setting the resistor ratio, the formula

for:

$$V_{out} = 1.25 \times \frac{R1+R2}{R1}$$

Maximum output power

The maximum output power is directly related to the heat dissipation situation. In normal environment 5V output recommended maximum output power 13W, optimizing the system heat dissipation environment can further

Step by step increase the output power. fast charge 9V, 12V It has higher efficiency and less heat generation during output, and the output power can be higher.

loop stability

When the system has higher requirements for the stability of the constant voltage loop, it can be FB and Vout The resistance between R2 Connect one in parallel at both ends 0.1uF feedforward capacitor, so

The stability of the constant voltage loop can be significantly improved. When applying a constant current loop, please adjust the 7 feet and 8 between the feet C The capacitor is 1~4nF Fan

Proper adjustment of the circumference can ensure the stability of the constant current loop.

system design

When only applying a constant voltage loop, you can CS pins with GND Short circuit, omit resistance, also turn on the chip's built-in current limiting protection, and temperature protection can ensure

The chip will not be damaged under abnormal conditions such as overcurrent and short circuit. Input and output terminals 105 Capacitors are used to filter out high-frequency glitch interference on the circuit and should not be omitted. Big electricity

If the inductor value is too small during current operation, the ripple will increase and the efficiency will decrease. 3A Current recommended selection 2uH, wire inductor 0.5mH of inductance.

PCB layout design

VIN, GND, SW, VOUT It is a large current path. Pay attention to the trace width to reduce the impact of parasitic parameters on system performance; the input capacitor is close to the chip. VIN and

GND Place, use electrolytic capacitors and chip ceramic capacitors in combination; FB Keep the traces away from places with switching signals such as inductors and Schottky; CS Keep the traces away from the inductor and Xiao

Teji and other places with switch signals; S, P Bit is better to surround the places with ground wires; chips inductors, and Schottky are the main heating components. Please note that PCB Even heat

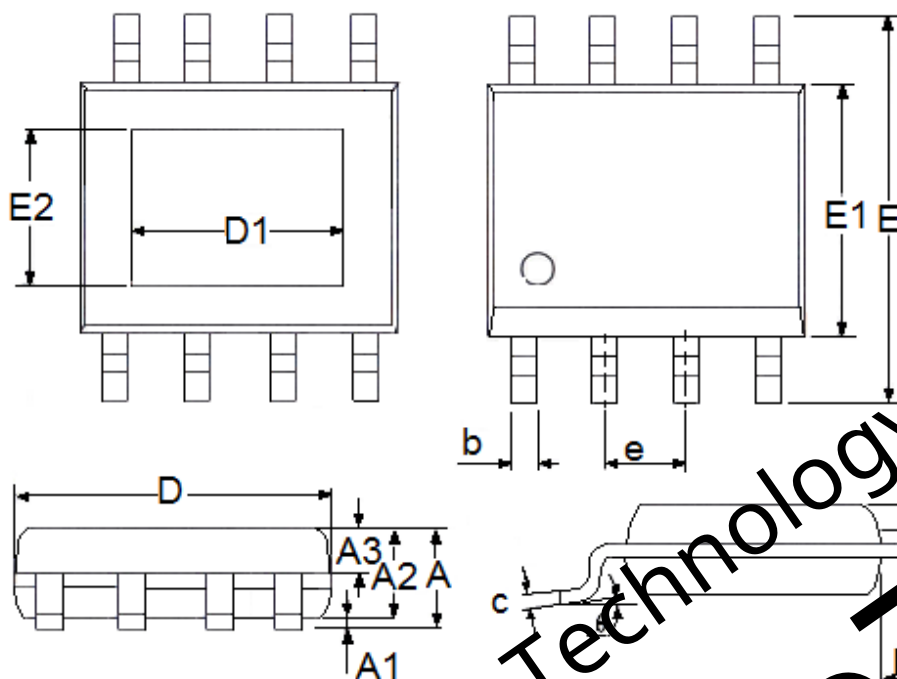
distribution to avoid local temperature rise.



ME3149

Package information

-Package type:ESOP8



parameter	size(mm)		size(Inch)	
	minimum value	maximum value	minimum value	maximum value
A	1.3	1.75	0.0512	0.0689
A1	0	0.2	0.0000	0.0079
A2	1.25	1.65	0.0492	0.0650
A3	0.5	0.7	0.0197	0.0276
b	0.33	0.41	0.0130	0.0201
c	0.17	0.25	0.0067	0.0098
D	4.7	5.1	0.1850	0.2008
E	5.8	6.2	0.2283	0.2441
E1	3.1	4	0.1496	0.1575
e	1.27(TYP)		0.05(TYP)	
h	0.25	0.5	0.0098	0.0197
L	0.4	1.27	0.0157	0.0500
L1	1.04(TYP)		0.0409(TYP)	
θ	0	8°	0.0000	8°
c1	0.25(TYP)		0.0098(TYP)	
D1(90*90)	2.09(TYP)		0.0823(TYP)	
D1(95*130)	3.1(TYP)		0.122(TYP)	
E2(90*90)	2.09(TYP)		0.0823(TYP)	
E2(95*130)	2.21(TYP)		0.087(TYP)	



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