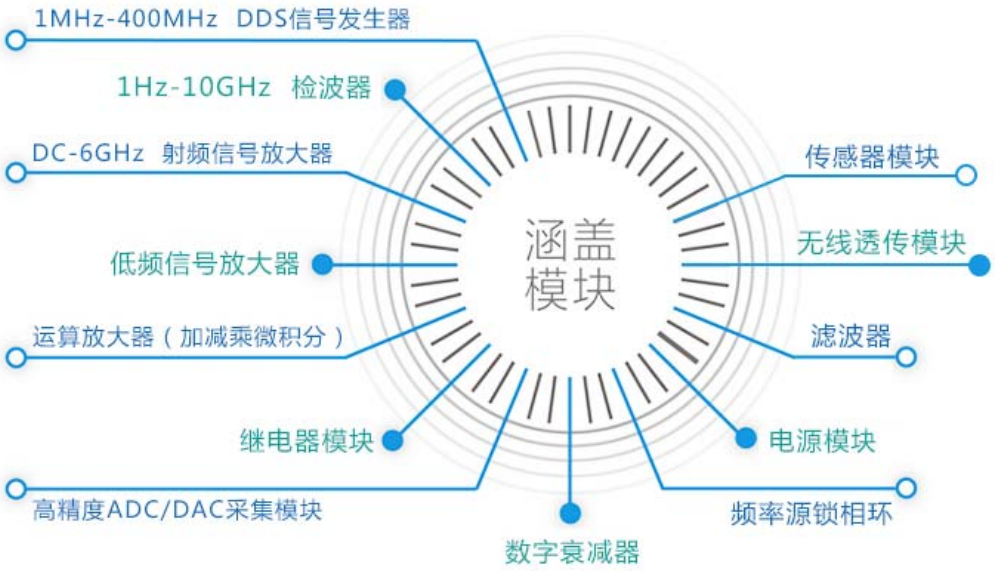
2 模块参数

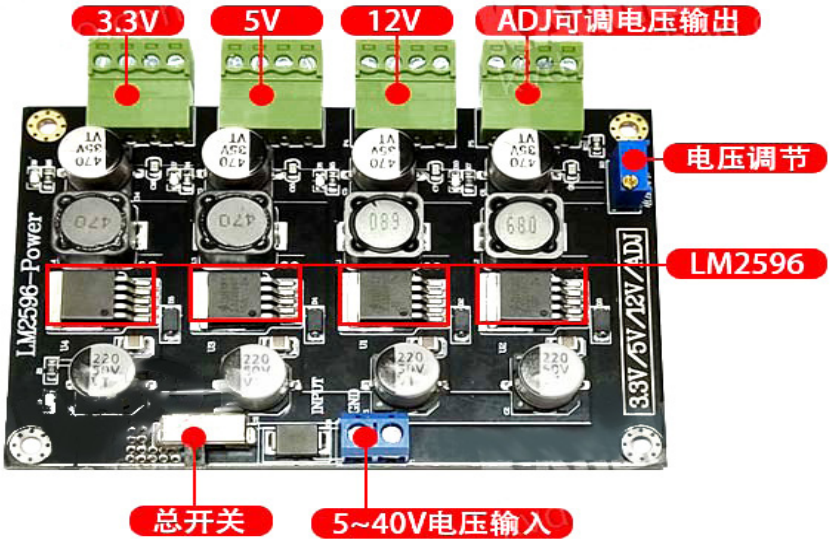
模块参数		
参数名称	参数值	备注
模块型号	LM2596多路电源	
模块类型	开关电源	
输入电压	13V-32V	
输出电压	多路	3.3V、5V、12V、ADJ
输出电流	3A(MAX)	模块单路电流最大3A,总电流不超过5A
转换效率	85%	
输出功率	9.9W	3.3V
	15W	5V
	36W	12V
	36W	ADJ
静态功耗	26mA	
开关频率	150KHz	
输出纹波	15mV	空载
	优于60mV	12V@2A带载测试
模块使能	无	
模块保护	反接保护	
模块特点	多种	低噪声、低纹波；带输入输出电源指示灯；带定位孔
模块应用	多种	工业自动化控制、LED照明、工控设备、通讯设备、电力设备、仪器仪表
模块重量	65g	
模块尺寸	101×68×12	长×宽×高(mm)
模块发热	带载越大、发热越大	输出电流大于2.5A(或输出功率大于10W)及长时间工作请加散热片
工作温度	0—70℃	民用级
模块接口		输入：5.08-2P；输出：3.81-4P*4



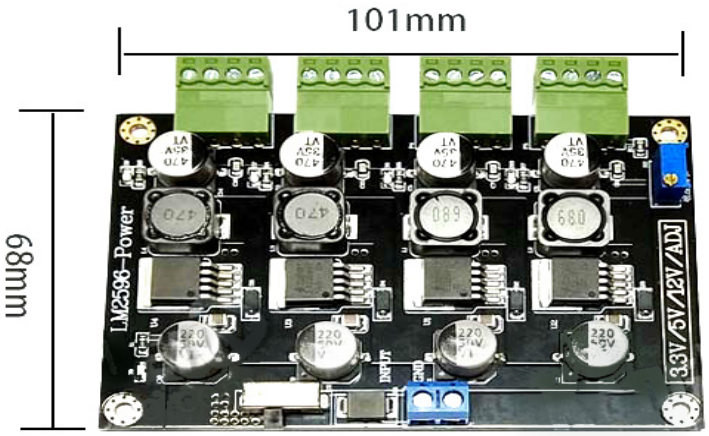
3 模块描述

LM2596是降压型电源管理单片集成电路的开关电压调节器，能够输出3A的驱动电流，同时具有很好的线性和负载调节特性。本模块集成4颗LM2596，可同时输出3.3V、5V、12V、ADJ四组电源，模块严格按照电源电路的设计规范来布局布线；用材大方，采用贴片铝电解电容、高Q值大功率电感以保证输出电压稳定，PCB板背面开窗处理更利于LM2596芯片的散热。适用于学生学习竞赛和公司或个人项目开发中的电源需求。

4 模块接口图



5 模块尺寸图



6 模块使用注意事项

（1）模块属于降压型模块，输入电压需要大于输出1V以上可稳定输出。

（2）模块发热主要是输入输出电压差以及带载电流决定的，请合理选择和使用电源模块，一般需要预留30%的余量。

（3）模块在使用中发热，请买家根据实际情况增强散热，带大负载时，可适当增加散热片、风冷等。

（4）在使用容性或者感性负载时，负载的瞬时电流不能过大，否则可能损坏模块。

8 常见问题解答

Q: ADJ输出范围是多少？输出电流多大?

A：ADJ输出范围是1.2V到Vin-1V。最大3A,输入输出压差大时输出电流会小于3A。

Q: 模块输出可以并联或者串联吗?

A：在输出电压相等的情况下可以并联，但是不能串联，每一路是独立的，但是不会隔离的，不能串联。

Q:安装孔是接地的吗？模块可以输出负电压么?

A:安装孔没有接地，模块只能正压降压，不能输出负电压。

National Semiconductor

PRELIMINARY
February 1996

LM2596 SIMPLE SWITCHER® Power Converter 150 kHz 3A Step-Down Voltage Regulator

General Description

The LM2596 series of regulators are monolithic integrated circuits that provide all the active functions for a step-down (buck) switching regulator, capable of driving a 3A load with excellent line and load regulation. These devices are available in fixed output voltages of 3.3V, 5V, 12V, and an adjustable output version.

Requiring a minimum number of external components, these regulators are simple to use and include internal frequency compensation†, and a fixed-frequency oscillator.

The LM2596 series operates at a switching frequency of 150 kHz thus allowing smaller sized filter components than what would be needed with lower frequency switching regulators. Available in a standard 5-lead TO-220 package with several different lead bend options, and a 5-lead TO-263 surface mount package.

A standard series of inductors are available from several different manufacturers optimized for use with the LM2596 series. This feature greatly simplifies the design of switch-mode power supplies.

Other features include a guaranteed ±4% tolerance on output voltage under specified input voltage and output load conditions, and ±15% on the oscillator frequency. External shutdown is included, featuring typically 80 μA standby current. Self protection features include a two stage frequency reducing current limit for the output switch and an over temperature shutdown for complete protection under fault conditions.

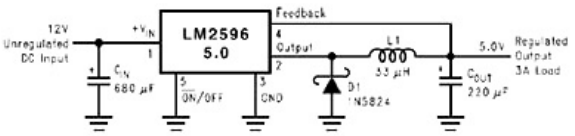
Features

- 3.3V, 5V, 12V, and adjustable output versions
- Adjustable version output voltage range, 1.2V to 37V ±4% max over line and load conditions
- Available in TO-220 and TO-263 packages
- Guaranteed 3A output load current
- Input voltage range up to 40V
- Requires only 4 external components
- Excellent line and load regulation specifications
- 150 kHz fixed frequency internal oscillator
- TTL shutdown capability
- Low power standby mode, I_Q typically 80 μA
- High efficiency
- Uses readily available standard inductors
- Thermal shutdown and current limit protection

Applications

- Simple high-efficiency step-down (buck) regulator
- On-card switching regulators
- Positive to negative converter

Typical Application (Fixed Output Voltage Versions)



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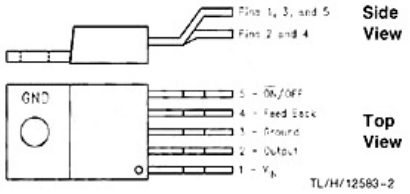
Connection Diagrams and Ordering Information

Bent and Staggered Leads, Through Hole Package
5-Lead TO-220 (T)



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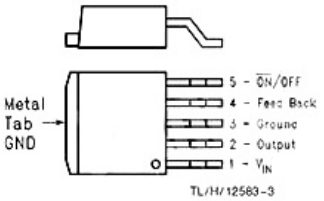
Order Number LM2596T-3.3, LM2596T-5.0, LM2596T-12 or LM2596T-ADJ
See NS Package Number T05D

Surface Mount Package
5-Lead TO-263 (S)



TL/H/12583–3

Order Number LM2596S-3.3, LM2596S-5.0, LM2596S-12 or LM2596S-ADJ
See NS Package Number TS5B

†Patent Number 5,382,918.

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