AC/DC 电源用高性能数字功率因数校正控制器

1 说明

iW2206 是一款高性能升压控制器，用于需要功率因数校正的 AC/DC 电源。该器件采用 Transition Mode 工作方式，使用微型 SOT23-6 封装，可支持高达 250W 输出功率。

iW2206 能够在各种 AC 输入电压和负载条件下精确控制输出 DC 总线电压。该器件采用数字控制，因此无需外部环路补偿，同时可在所有工作条件下保持环路稳定。凭借 Dialog 的专利 PF-BOOST™ 技术，在整个 AC 输入电压范围的 33% 至 100% 额定负载条件下，iW2206 的功率因数 (PF) 大于 0.9，总谐波失真 (THD) 低于 20%。

iW2206 自身在高达 100W 的应用中可以实现低于 150mW 待机功耗。这样，在许多应用中，无需关闭 PFC 级即可满足空载待机要求。该器件具有自适应电流限制功能，可最大限度减小负载瞬变和启动期间的可听噪声， 并且 PFC 就绪时间不到 0.2s。iW2206 的输出 DC 总线电压电平可由用户配置，同时支持“输出跟随 AC 输入电压”或“固定输出电压”的工作方式，满足不同应用需求。

iW2206 还具有各种保护功能，如输出过压、过功率、AC 过压、AC 欠压、电流检测电阻短路、过流、开环和过热保护。这样可以确保实现稳健、可靠的系统性能。

2 功能特性

- AC 输入电压范围：$90V_{AC}$ ~ $305V_{AC}$
- 采用微型 SOT-23-6 封装，支持高达 250W 输出功率
- AC 线性和负载调整率 < ±3%
- 在整个 AC 电压范围内大于 33% 额定负载时，PF > 0.9，THD < 20%
- PFC 就绪时间 < 0.2s
- 待机功耗 < 150mW（$230V_{AC}$ 输入电压，小于或等于 100W）
- 在各种 AC 电压和负载条件下，以及负载瞬变或启动期间，可听噪声均接近为零
- 可配置输出 DC 总线电压
- 宽工作电源电压 (V_{VCC}) 范围：8.0V 至 20V
- 全面的保护功能
  - » 输出过压保护
  - » 输出过功率保护
  - » AC 过压保护
  - » AC 欠压保护
  - » 逐开关周期峰值电流限制
  - » 环路开路保护
  - » 电流检测电阻短路保护
  - » 过温保护

3 应用

- 两级 LED 照明驱动器
- 两级适配器、AC/DC 电源

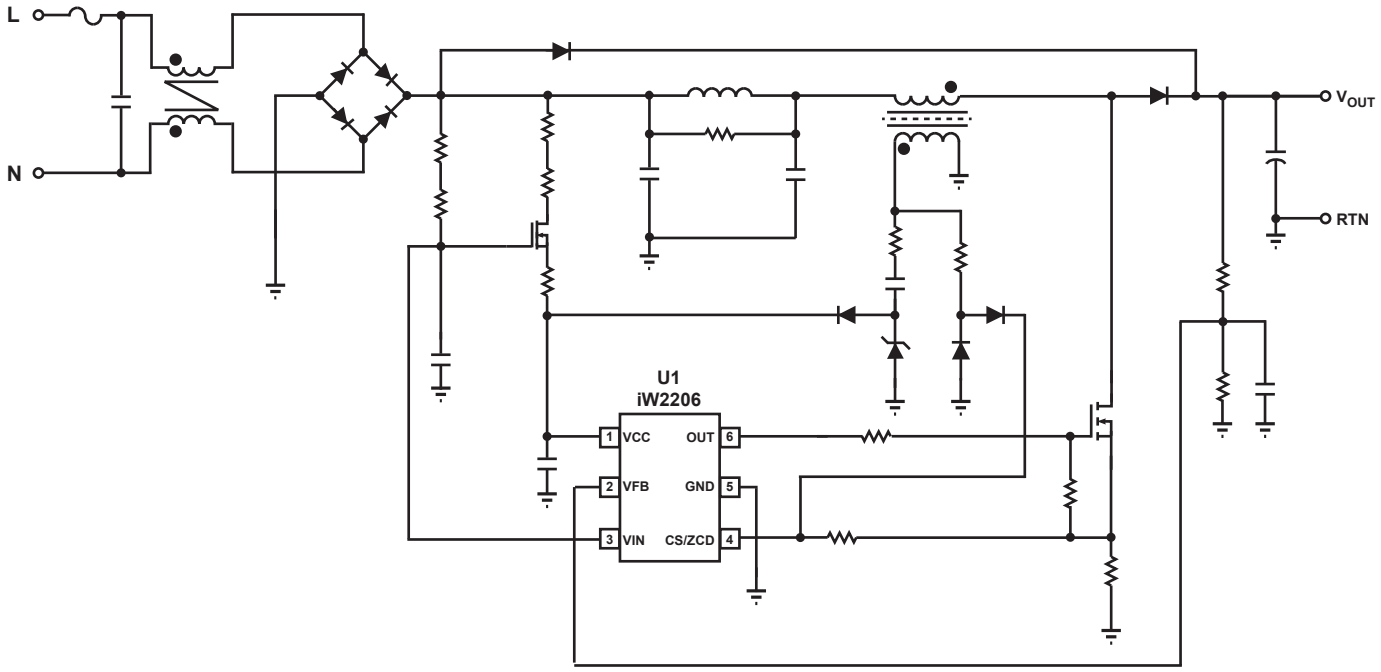


图 3.1 : iW2206 PFC 升压应用电路

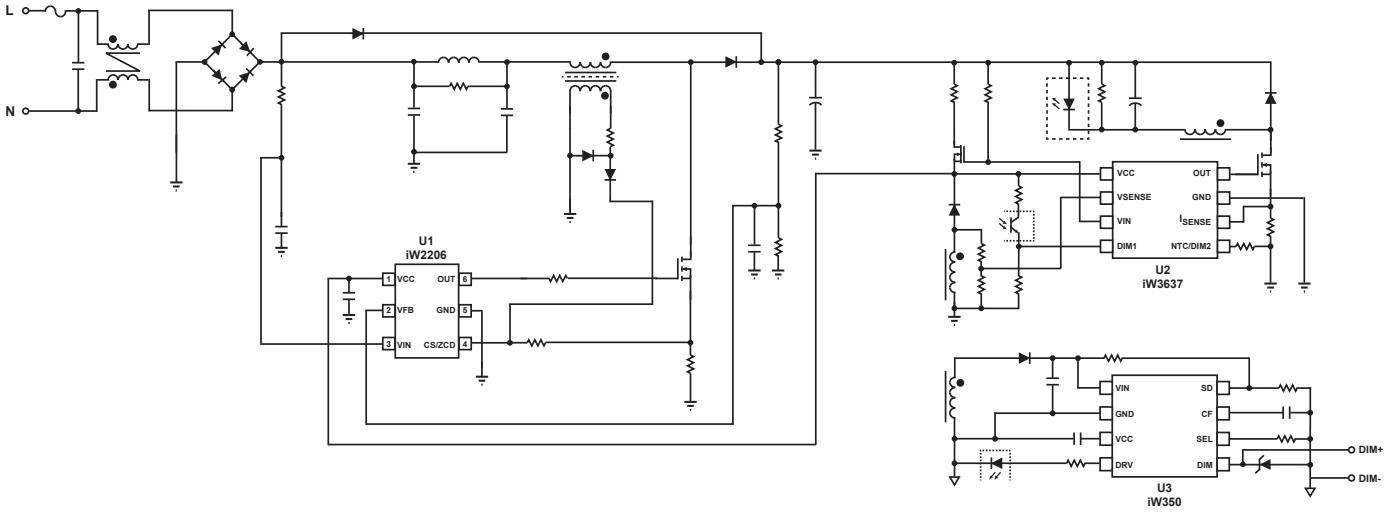


图 3.2 : 用于非隔离式两级可调光 LED 驱动器(配合 iW3637 和 iW350)的 iW2206 应用

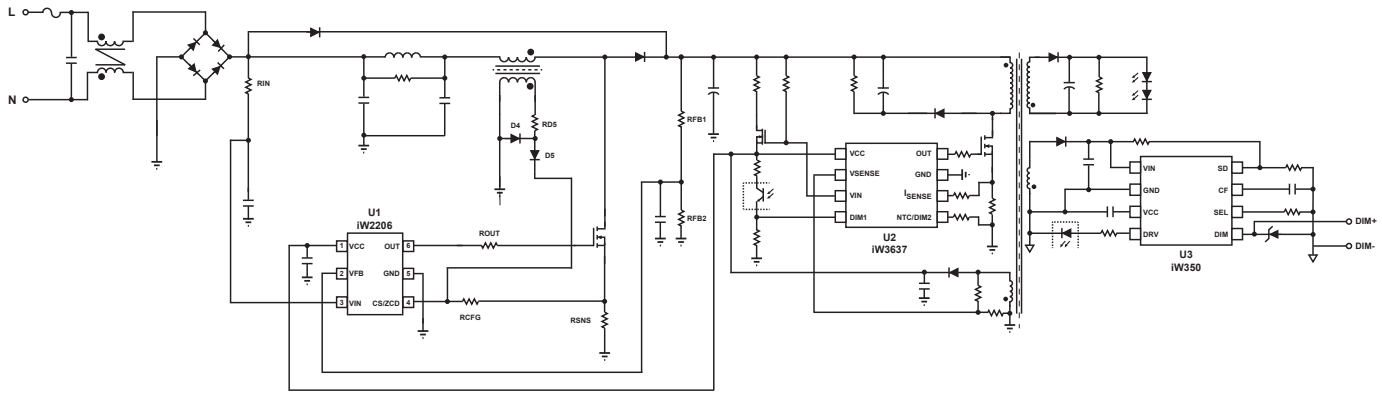


图 3.3 : 用于隔离式两级可调光 LED 驱动器(配合 iW3637 和 iW350)的 iW2206 应用

4 引脚分配说明

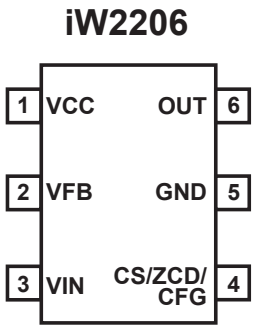


图 4.1 : 6 引脚 SOT23 封装

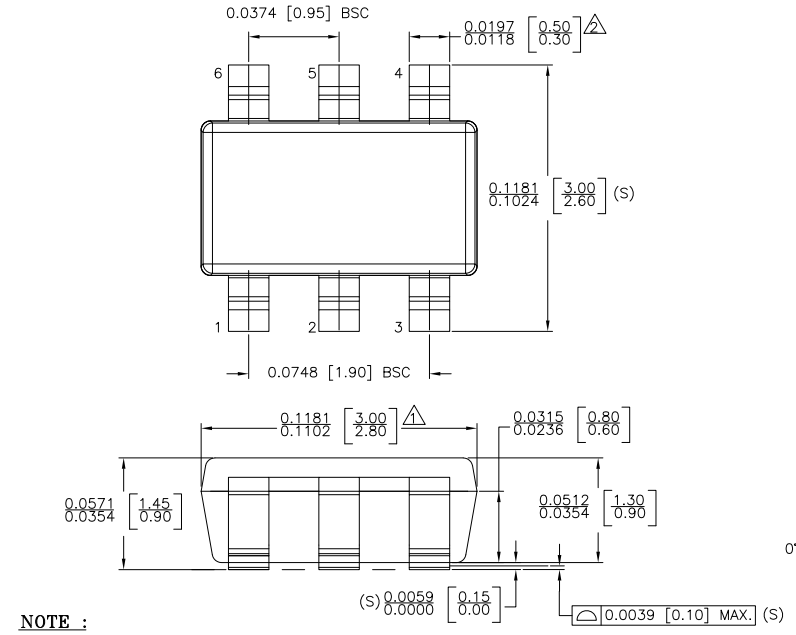
引脚编号	引脚名称	类型	引脚说明
1	VCC	电源输入	IC 电源。
2	VFB	模拟输入	输出 DC 总线电压检测。
3	VIN	模拟输入	输入 AC 电压检测。
4	CS/ZCD/CFG	模拟输入	功率 MOSFET 电流检测、电感退磁检测和配置。
5	GND	接地	接地。
6	OUTPUT	模拟输出	功率 MOSFET 栅极驱动。

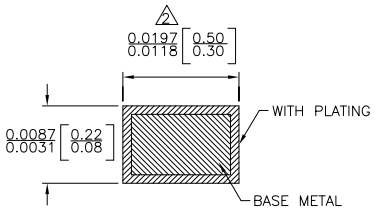
5 绝对最大额定值

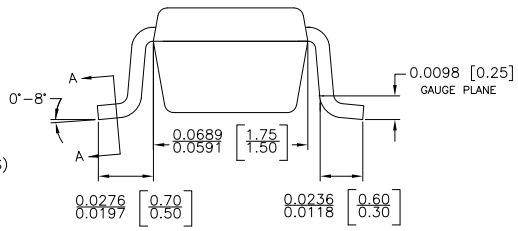
绝对最大额定值是参数值或范围，如果超过绝对最大额定值，可能导致永久性损坏。

参数	符号	值	单位
DC supply voltage range (pin 1, I_{VCC} = 20mA max)	V_{VCC}	-0.3 to 22.0	V
Continuous DC supply current at VCC pin (V_{VCC} = 15V)	I_{VCC}	20	mA
V_{VIN} (pin 3)		-0.3 to 20.0	V
OUTPUT (pin 6)		-0.3 to 20.0	V
V_{VFB} (pin 2, I_{FB} ≤ 10mA)		-0.7 to 5.0	V
CS/ZCD/CFG input (pin 4)		-0.3 to 5.0	V
Maximum junction temperature	T_{JMAX}	150	°C
Operating junction temperature	T_{JOPT}	-40 to 150	°C
Storage temperature	T_{STG}	-65 to 150	°C
Thermal resistance junction-to-ambient	θ_{JA}	190	°C/W
ESD rating per JEDEC JS-001-2017		±2,000	V
Latch-up test per JESD78E		±100	mA

6 外形尺寸







NOTE :

1. DOES NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS. MOLD FLASH, PROTRUSIONS AND GATE BURRS SHALL NOT EXCEED 0.127 MM PER SIDE.
2. DOES NOT INCLUDE INTER-LEAD FLASH OR PROTRUSIONS. INTER-LEAD FLASH AND PROTRUSIONS SHALL NOT EXCEED 0.127 MM PER SIDE.
3. DIE IS FACING UP FOR MOLD.DIE IS FACING DOWN FOR TRIM/FORM.
4. THIS PART IS COMPLIANT WITH EIAJ SPECIFICATION SC74A AND JEDEC SPECIFICATION MO-178AB.
5. LEAD SPAN/STAND OFF HEIGHT/COPLANARITY ARE CONSIDERED AS SPECIAL CHARACTERISTIC.(S)
6. CONTROLLING DIMENSIONS IN INCHES. [mm]

dialog SEMICONDUCTOR		
STATUS: RELEASED	SCALE: DO NOT SCALE	
TERMINAL FINISH: 100% Sn or NiPdAu (PPF)		
TITLE: 6 SOT23 PACKAGE OUTLINE		
REV: A	REVISION NOTE: NEW DRAWING	DATE: 02-MAR-2015

7 订购信息

部件编号	说明	封装	说明
iW2206-00	为二极管下拉驱动电路优化	SOT-23	卷带 [1]
iW2206-10	为PNP快速关断驱动电路优化	SOT-23	卷带 [1]
iW2206-11	支持高达347V_{AC}输入电压	SOT-23	卷带 [1]
iW2206-20	关闭OVP, OPP和standby模式来优化恒流应用	SOT-23	卷带 [1]

注 1:卷带封装数量为 3,000 件/卷。最小封装数量为 3,000 件。

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