

适用于高达 100W 的 LED 照明应用并集成高压启动的单级高 PF、低 THD 原边 AC/DC 控制器

1 说明

iW3677 是一款具有功率因数校正 (PFC) 功能的单级高性能 AC/DC 原边反馈 PWM 控制器。iW3677 支持高达 100W 输出功率，针对反激和升降压拓扑。该 IC 集成了高压启动电路，可以减少 BOM 数量、简化设计并提高整体可靠性。

iW3677 支持不同类型的负载，包括恒定功率 (CP) 负载，例如次级 DC/DC 转换器。

iW3677 采用 Renesas 的 **PrimAccurate™** 技术，在各种 AC 电压和负载条件下提供精确的恒压 (CV) 和恒流 (CC) 控制。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 Renesas 专利的 **PF-Boost™** 技术，在整个 AC 电压范围内，当负载为 50% 或更大时，iW3677 的功率因数 (PF) 大于 0.9，总谐波失真 (THD) 低于 20%。

在 CV 模式下，iW3677 可以实现低于 150mW 的待机功耗，同时保持出色的负载瞬态响应。此外，在负载瞬态或启动期间没有可听噪声，而大多数 PFC CV 控制器通常不具备这一优势。iW3677 集成高压启动电路和具有快速启机控制功能，启动时间不足 0.25s。

iW3677 还具有各种保护功能，如输出过压、输出短路、AC 过压、AC 欠压、电流检测电阻短路、过流及过温保护。这样可确保出色的系统可靠性。

2 功能特性

- 集成高压启动电路
- AC 输入电压范围：90V_{AC} ~ 305V_{AC}
- 采用微型 SOIC-7 封装，支持高达 100W 的输出功率
- CV 模式 AC 输入电压和负载调节 < ±3%
- CC 模式 AC 输入电压和负载调节 < ±5%
- 在整个 AC 电压范围内，当负载大于 50% 时，PF > 0.9，THD < 20%
- 快速启动时间 < 0.25s
- 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，以及负载瞬态或启动期间，可听噪声均为零
- 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
 - » 输出短路保护
 - » AC 过压保护
 - » AC 欠压保护
 - » 逐开关周期峰值电流限制
 - » 电流检测电阻短路保护
 - » 过温保护

3 应用

- 两级或单级 LED 照明驱动器
- 需要功率因数的 AC-DC 适配器、电视、显示器电源

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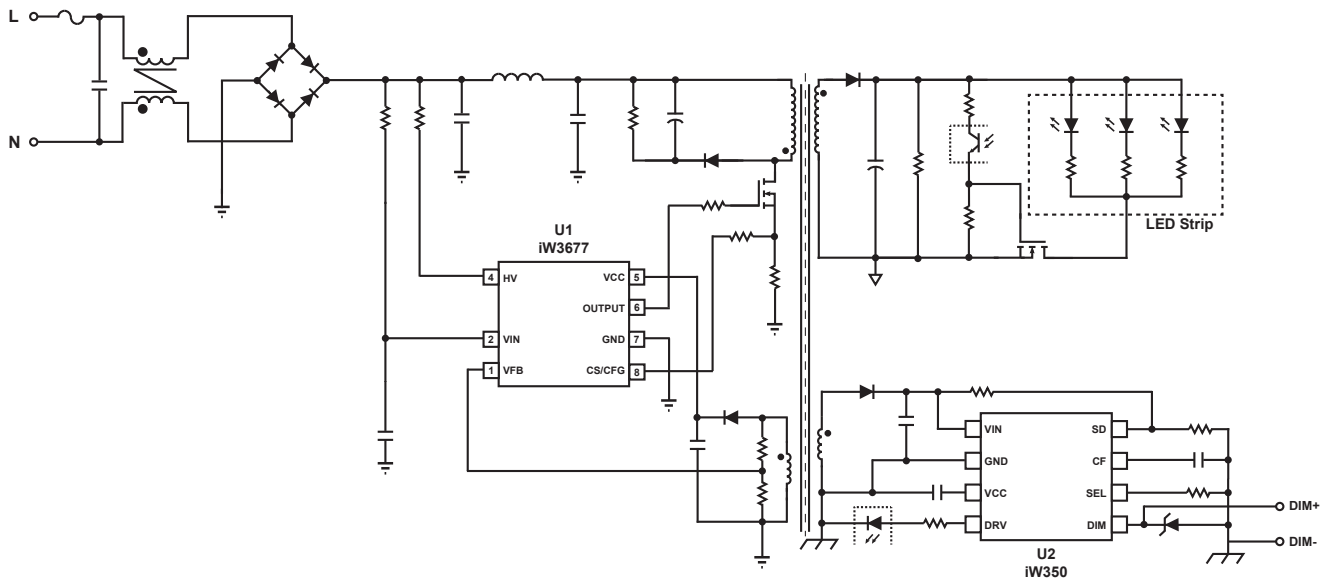


图 3.3 : 适用于可调光 LED 灯带驱动器 (配合 iW350) 的 iW3677 应用

4 引脚分配说明

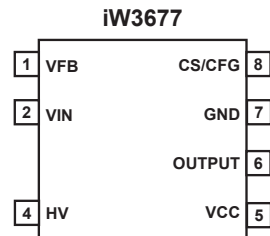


图 4.1 : 7 引脚 SOIC 封装

| 引脚编号 | 引脚名称 | 类型 | 引脚说明 |
|------|--------|------|-------------------|
| 1 | VFB | 模拟输入 | 输出电压和变压器退磁检测 |
| 2 | VIN | 模拟输入 | 输入 AC 电压检测 |
| 4 | HV | 模拟输入 | 高压启动 |
| 5 | VCC | 功率 | IC 电源 |
| 6 | OUTPUT | 模拟输出 | 功率 MOSFET 栅极驱动 |
| 7 | GND | 接地 | 接地 |
| 8 | CS/CFG | 模拟输入 | 功率 MOSFET 电流检测和配置 |

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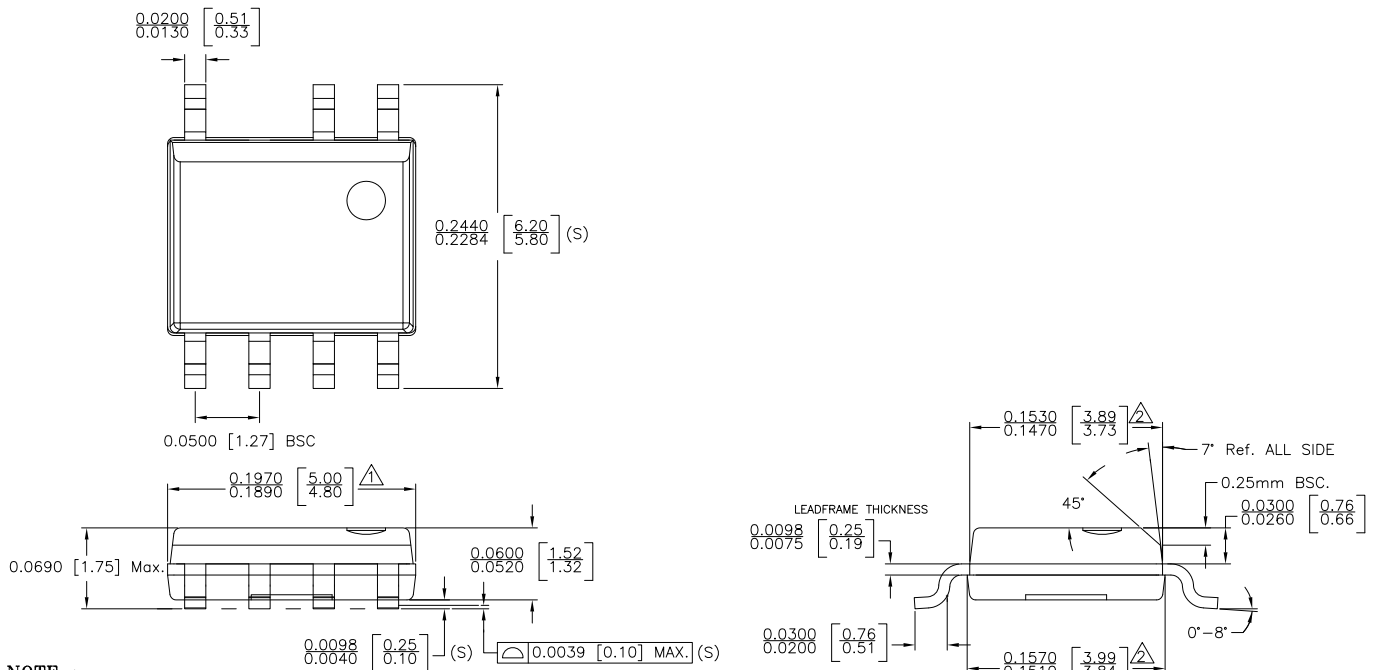
5 绝对最大额定值

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 5, $I_{VCC} = 20\text{mA max}$) | V_{VCC} | -0.3 to 22.0 | V |
| Continuous DC supply current at VCC pin ($V_{VCC} = 15\text{V}$) | I_{VCC} | 20 | mA |
| V_{VIN} (pin 2) | | -0.3 to 20.0 | V |
| OUTPUT (pin 6) | | -0.3 to 20.0 | V |
| V_{VFB} (pin 1, $I_{VFB} \leq 10\text{mA}$) | | -0.7 to 5.0 | V |
| CS/CFG input (pin 8) | | -0.3 to 5.0 | V |
| HV startup voltage (pin 4) | | -0.3 to 600 | V |
| HV startup current (pin 4) | | 25 | mA |
| 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} | 100 | °C/W |
| ESD rating per JEDEC JS-001-2017 | | $\pm 2,000$ | V |
| Latch-up test per JESD78E | | ± 100 | mA |

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6 外形尺寸



NOTE :

- △ DOES NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS. MOLD FLASH, PROTRUSIONS AND GATE BURRS SHALL NOT EXCEED .006 INCH PER SIDE.
- △ DOES NOT INCLUDE INTER-LEAD FLASH OR PROTRUSIONS. INTER-LEAD FLASH AND PROTRUSIONS SHALL NOT EXCEED .010 INCH PER SIDE.
- PACKAGE DIMENSION CONFORM TO JEDEC SPECIFICATION MS-012
- LEAD SPAN/STAND OFF HEIGHT/COPLANARITY ARE CONSIDERED AS SPECIAL CHARACTERISTIC.(S)
- CONTROLLING DIMENSIONS IN INCHES.[mm]

| | |
|---|---------------------------------------|
| STATUS: RELEASED | SCALE: DO NOT SCALE |
| TERMINAL FINISH: 100% Sn or NiPdAu (PPF) | |
| TITLE: 7 SOIC (NO PIN 3) PACKAGE OUTLINE | |
| REV: C | REVISION NOTE: ADD PACKAGE CHAMFER |
| DATE: 01-JUNE-2015 | |

7 订购信息

| 部件编号 | 说明 | 封装 | 说明 |
|--------------------------------------|-----------------|--------|-----------------|
| iW3677-00 ¹ iW3677-00C | 针对单级或双级 CV 应用优化 | SOIC-7 | 卷带 ² |

注 1: 不建议用于新设计, 请使用-xxC版本

注 2: 卷带封装数量为 2,500 件/卷。最小封装数量为 2,500 件。

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Corporate Headquarters

TOYOSU FORESIA, 3-2-24 Toyosu
Koto-ku, Tokyo 135-0061, Japan
www.renesas.com

Contact Information

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