具有功率因数校正功能的离线数字恒压 LED 驱动器

1.0 说明

iW3627 是一款具有高功率因数校正功能的单级AC/DC 恒压 (CV) 控制器。它支持各种最常用的隔离和非隔离拓扑结构, 包括 flyback, buck-boost, 及 buck。它可以实现极低的负载及线电压调整率而无需次级反馈电路。它还无需外部环路补偿元件, 即可保证在不同负载类型 (后端 DC-DC 转换器、恒定电流 (CC) 负载、LED 负载和恒定电阻 (CR) 负载)及空载到满载范围内稳定工作。专利的自适应调节输出电压限制技术可确保任何负载下瞬态响应 <10%。iW3627在轻负载时工作于脉冲频率调制 (PFM) 模式, 从而在消除噪声的同时, 达到空载待机功耗小于200mW。

iW3627 提供了两个多功能引脚, 允许用户设置最大及最小开关频率。除了提供输入低电压防护检测外, V_{IN} 管脚还使用了主动启动方式, 可以在不降低效率的情况下实现最短启动时间。

2.0 特点

- 支持 flyback, buck-boost, 以及buck拓扑
- 同时支持交流输入和直流输入
- 极低的线电压和负载调整率 (±3%)
- 小型 SOT-23 封装, 支持高达 90W 或以上的输出功率
- 待机功耗小于 200mW
- 内部回路补偿无需外加补偿元件
- 自适应调节输出电压限制, 确保任何负载下瞬态响应 <10%
- 内置单点故障保护功能：输出过载, 输出过压, 输出短路及输入电压欠电压保护
- 内置过温保护
- 整个工作范围内无音频噪音

3.0 应用

- 智能 LED 照明
- LED 照明镇流器
- 前端预调节器

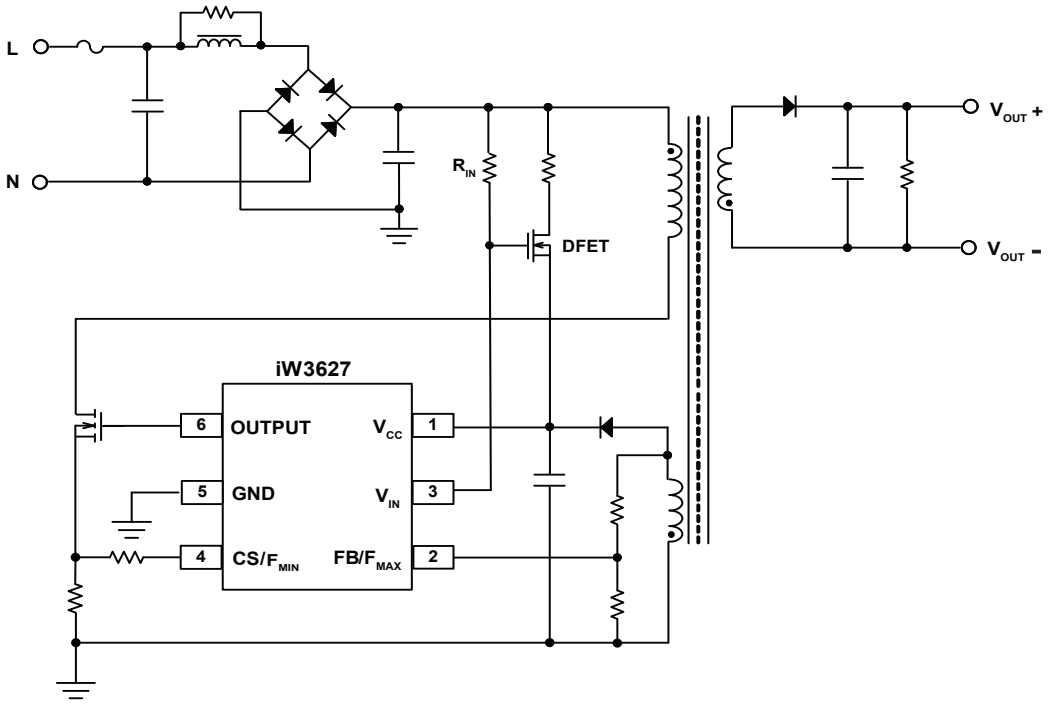


图 3.1: iW3627 典型应用电路 (*flyback*)

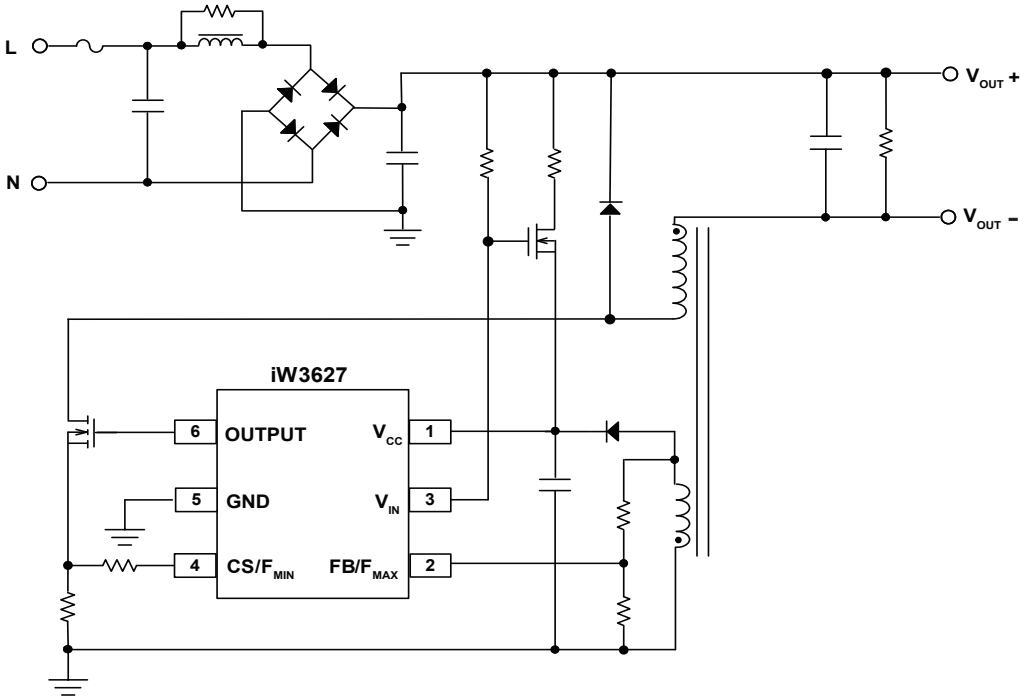


图 3.2: iW3627 典型应用电路 (*buck*)

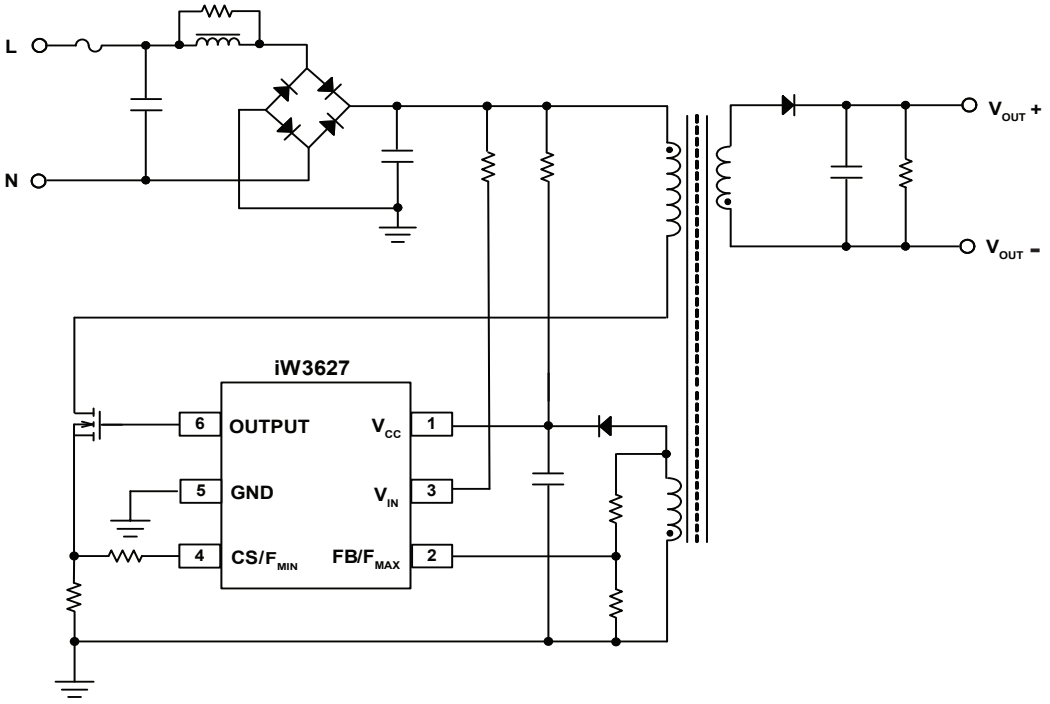


图 3.3: iW3627 典型应用电路 (flyback, 不使用主动启动器件)

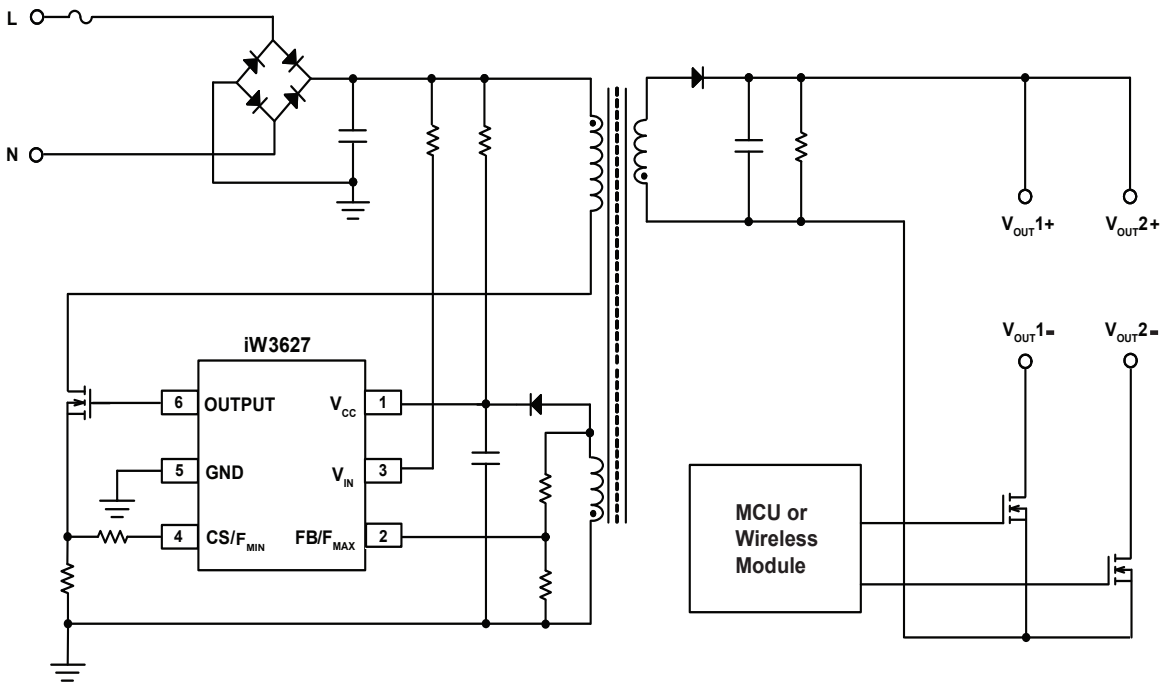


图 3.4: iW3627 典型应用电路（智能调光）

4.0 引脚说明

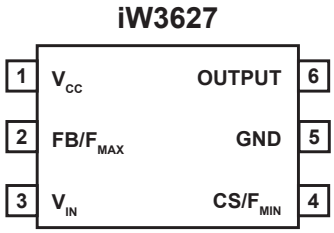


图 4.1: 6 引脚 SOT-23 封装

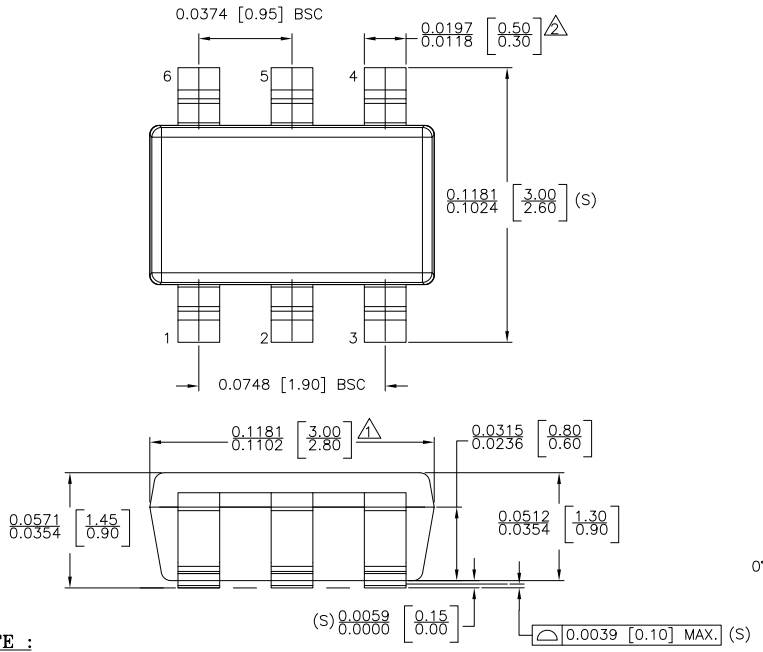
引脚编号	名称	类型	引脚说明
1	V_{CC}	电源输入	逻辑控制及 MOSFET 驱动电源
2	FB/F_{MAX}	模拟输入	多功能引脚: 用于设置最大开关频率以及启用/禁用过载保护，它还在正常运行期间为原边控制提供输出电压检测
3	V_{IN}	模拟输入	多功能引脚: 用于控制主动启动器件和检测输入电压
4	CS/F_{MIN}	模拟输入	多功能引脚: 用于设置最小开关频率，它还是初级电流检测输入脚
5	GND	接地	接地
6	OUTPUT	输出	用于驱动外部 MOSFET

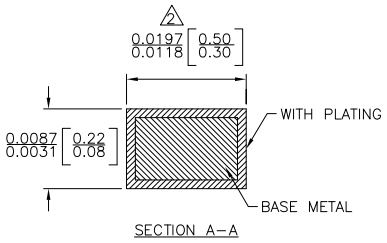
5.0 绝对最大额定值

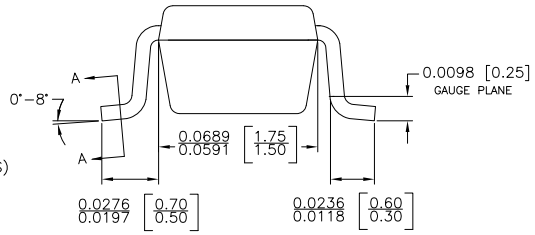
绝对最大额定值是指超出后可以导致永久性损害的参数值或范围。

参数	符号	数值	单位
直流电压范围 (引脚 1, I_{CC} = 最大 20mA)	V_{CC}	-0.3 到 18.0	V
V_{CC} 引脚的持续直流电流 (V_{CC} = 15V)	I_{CC}	20	mA
V_{IN} (引脚 3)		-0.3 到 18.0	V
输出 (引脚 6)		-0.3 到 18.0	V
FB/F_{MAX} 输入 (引脚 2, $I_{FB/OTP}$ ≤ 10mA)		-0.7 到 4.0	V
CS/F_{MIN} 输入 (引脚 4)		-0.3 到 4.0	V
最大结温	T_{JMAX}	150	°C
工作结温	T_{JOPT}	-40 到 150	°C
储存温度	T_{STG}	-65 到 150	°C
PN结至环境热阻	θ_{JA}	190	°C/W
按照 JEDEC JESD22-A114 的 ESD 额定值		±2,000	V
按照 JESD78A 的latchup测试		±100	mA

6.0 物理尺寸







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]

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

7.0 订购信息

部件编号	说明	封装	说明
iW3627-00	$V_{IPK(LOW)}$ = 0.16V, 最大 NV_O 可至 90伏	SOT-23	胶带和卷带[1]
iW3627-01	$V_{IPK(LOW)}$ = 0.2V, 最大NV_O 可至 145伏	SOT-23	胶带和卷带[1]

备注 1: 胶带和卷带包装, 每卷数量为 3,000。最小订购数量为 3,000。

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