

MP4033 集成可控硅与模拟调光二合一方案

产品概述:

MP4033 是美国芯源 (MPS) 一款具有高效率, 高精度的 LED 控制芯片。原边控制方式省掉了次级反馈电路; 支持可控硅和模拟调光二合一; 具有很好的线性和负载调整率; 临界工作模式具有高的 PF 值; 具有输出短路, 过压, 过温等保护功能。

典型应用

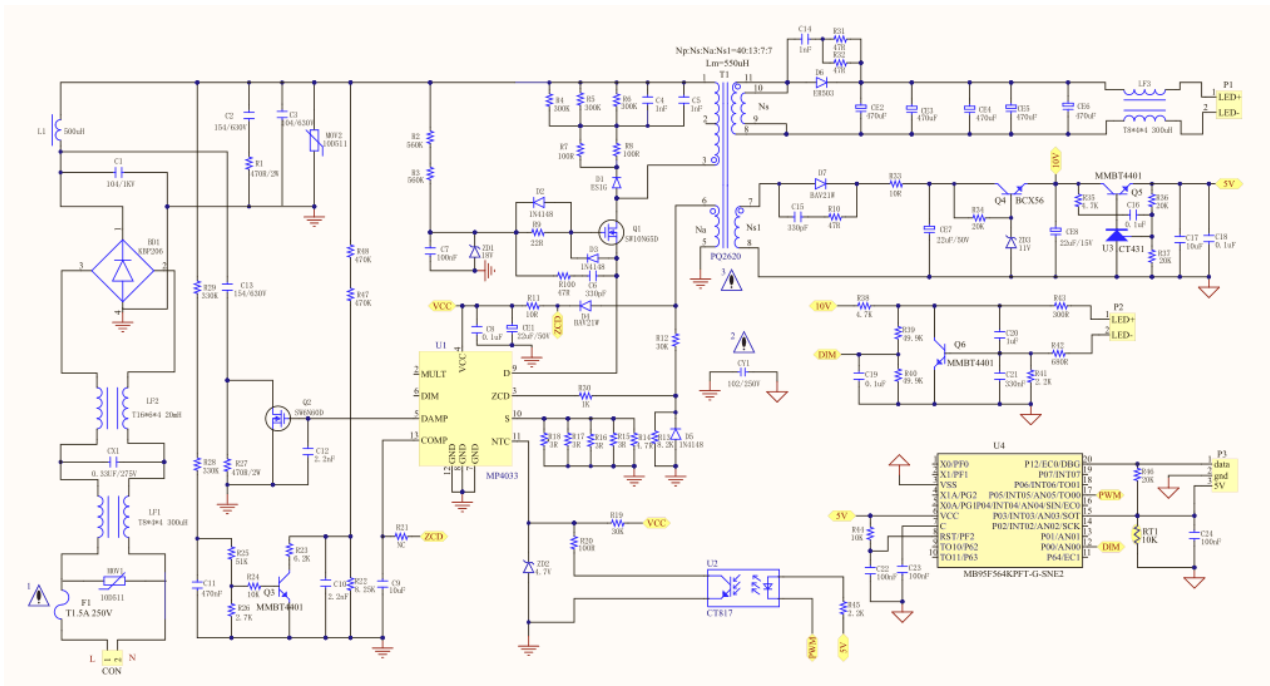


图 1 系统应用原理图

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系统 BOM 清单：

| 序号 | 元件名称 | 规格型号 | 用量 | 位号 | 封装要求 |
|----|------|--------------------|----|------------------|---------|
| 1 | 保险丝 | 250V,1.5A | 1 | F1 | DIP |
| 2 | 插件电阻 | 470Ω, RL2W ±5%, | 1 | R1 | DIP |
| 3 | 贴片电阻 | 560KΩ, 0.25W ±5%, | 2 | R2,R3 | SMD1206 |
| 4 | 贴片电阻 | 300KΩ 0.25W ±5%, | 3 | R4,R5,R6 | SMD1206 |
| 5 | 贴片电阻 | 100Ω, 0.125W ±5%, | 2 | R7,R8 | SMD1206 |
| 6 | 贴片电阻 | 22Ω, 0.125W ±5%, | 1 | R9 | SMD0805 |
| 7 | 贴片电阻 | 47Ω, 0.25W ±5%, | 1 | R10 | SMD1206 |
| 8 | 贴片电阻 | 10Ω, 0.25W ±5%, | 1 | R11 | SMD1206 |
| 9 | 贴片电阻 | 30KΩ, 0.25W ±5%, | 1 | R12 | SMD1206 |
| 10 | 贴片电阻 | 8.2KΩ, 0.25W ±5%, | 1 | R13 | SMD1206 |
| 11 | 贴片电阻 | 4.7Ω, 0.25W ±5% | 1 | R14 | SMD1206 |
| 12 | 贴片电阻 | 3Ω, 0.25W ±1% | 4 | R15, R16,R17,R18 | SMD1206 |
| 13 | 贴片电阻 | 30KΩ 0.1W ±1% | 1 | R19 | SMD0603 |
| 14 | 贴片电阻 | 100Ω 0.1W ±5%, | 1 | R20 | SMD0603 |
| 15 | 贴片电阻 | 8.25KΩ, 0.125W ±1% | 1 | R22 | SMD0805 |
| 16 | 贴片电阻 | 6.2KΩ, 0.1W ±1% | 2 | R23 | SMD0603 |
| 17 | 贴片电阻 | 10KΩ, 0.1W ±1%, | 1 | R24,R44 | SMD0603 |
| 18 | 贴片电阻 | 51KΩ, 0.1W ±1% | 1 | R25 | SMD0603 |
| 19 | 贴片电阻 | 2.7KΩ, 0.1W ±1% | 1 | R26 | SMD0603 |
| 20 | 插件电阻 | 470Ω, RL2W ±5%, | 1 | R27 | DIP |
| 21 | 贴片电阻 | 330KΩ, 0.25W ±5%, | 1 | R28,R29 | SMD1206 |
| 22 | 贴片电阻 | 30KΩ, 0.125W ±1% | 1 | R30 | SMD0805 |
| 23 | 贴片电阻 | 47Ω, 0.25W ±5%, | 1 | R31,R32 | SMD1206 |
| 24 | 贴片电阻 | 10Ω, 0.25W ±5%, | 1 | R33 | SMD1206 |
| 25 | 贴片电阻 | 20KΩ, 0.1W ±5%, | 1 | R34, R36,R37 | SMD0603 |
| 26 | 贴片电阻 | 20KΩ, 0.1W ±5%, | 1 | R35,R46 | SMD0603 |
| 27 | 贴片电阻 | 4.7KΩ, 0.1W ±5% | 1 | R38 | SMD0603 |
| 28 | 贴片电阻 | 49.9KΩ, 0.1W ±5% | 2 | R39,R40 | SMD0603 |
| 29 | 贴片电阻 | 2.2KΩ, 0.1W ±5% | 1 | R41,R45 | SMD0603 |
| 30 | 贴片电阻 | 680Ω, 0.1W ±5% | 1 | R42 | SMD0603 |
| 31 | 贴片电阻 | 300Ω, 0.1W ±5% | 1 | R43 | SMD0603 |

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|----|--------|-------------------|----|--------------------------------|---------|
| 32 | 贴片电容 | 100nF,1KV,±10% | 2 | C1,C3 | SMD1206 |
| 33 | 贴片电容 | 1nF,630V,±10% | 4 | C4,C5,C7,C14 | SMD1206 |
| 34 | 贴片电容 | 330pF,500V,±10% | 1 | C6 | SMD1206 |
| 35 | 贴片电容 | 100nF,50V,±10% | 1 | C8,C16,C18,C19 ,C22,C23,C24 | SMD0805 |
| 36 | 贴片电容 | 10uF,50V,±10% | 1 | C9,C17 | SMD0805 |
| 37 | 贴片电容 | 2.2nF,50V,±10% | 2 | C10,C12 | SMD0603 |
| 38 | 贴片电容 | 470nF,50V,±10% | 1 | C11 | SMD0603 |
| 39 | 贴片电容 | 330pF,250V,±10% | 1 | C15 | SMD1206 |
| 40 | 贴片电容 | 1uF,50V,±10% | 1 | C20 | SMD0603 |
| 41 | 贴片电容 | 330nF,50V,±10% | 1 | C21 | SMD0603 |
| 42 | 共模电感 | 0.3mH, | 1 | LF1 | DIP |
| 43 | X 电容 | 0.33uF, 275V,±20% | 1 | CX1 | DIP |
| 44 | 共模电感 | 20mH | 1 | LF2 | DIP |
| 45 | 整流桥 | KBP206,2A,600V | 1 | BD1 | DIP |
| 46 | 高压 MOS | SW6N60D,6A/600V | 1 | Q2 | TO-220 |
| 47 | 高压 MOS | SW10N65D,10A/650V | 1 | Q1 | TO-220 |
| 48 | 三极管 | MMBT4401 | 1 | Q3,Q5,Q6 | SOT23-3 |
| 49 | 三极管 | BCX56 | 1 | Q4 | SOT23-3 |
| 50 | 二极管 | ES1G | 1 | D1 | SMD |
| 51 | 二极管 | 1N4148 | 3 | D2,D3,D5 | SMD |
| 52 | 二极管 | BAV21W | 2 | D4,D7 | SMD |
| 53 | 二极管 | ER503 | 1 | D6 | SMD |
| 54 | 稳压二极管 | Vz=18V | 1 | ZD1 | SMD |
| 55 | 稳压二极管 | Vz=4.7V | 1 | ZD2 | SMD |
| 56 | 稳压二极管 | Vz=11V | 1 | ZD3 | SMD |
| 57 | CBB 电容 | 0.15uF, 630V,±20% | 1 | C2,C13 | DIP |

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|----|-----------|--------------------------|----|-----------|------|
| 58 | 压敏电阻 | 10D511 | 2 | MOV1,MOV2 | DIP |
| 59 | 共模电感 | 300uH | 1 | LF3 | DIP |
| 60 | 差模电感 | 500uH | 1 | L1 | DIP |
| 61 | PWM 控制 IC | MP4033 | 1 | U1 | SOP |
| 62 | 光耦 | CT817 | 1 | U2 | DIP |
| 63 | Y 电容 | 2200pF, 275V, $\pm 20\%$ | 1 | CY1 | DIP |
| 64 | 调光单片机 | MB95F564KPFT-G-SNE2 | 1 | U4 | SOP |
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