



ACL406AS - Direct AC Line LED Driver

UP TO 6W OUTPUT

ACL406AS-AC G9 lights-AN-V1.3 – JUNE 2021



Application Notes



MATURITY
In Production

1. FEATURES

ACL406AS up to 6W output,

- Direct AC Line LED Driver requiring few external components,
- Wide AC Input Range: 50 to 280V AC,
- High Power Factor: > 0.98 with optimized LED configuration,
- Low harmonic content: THD < 15% (typ.),
- Low quiescent current: 120µA,
- High Efficiency: 85% typical,
- Ultra-Flexible LED Forward Voltage Configuration,
- Up to 4 LED stages capability,
- Low Flicker: according to applications (need to external components: see application note for more information),
- Percentage flicker: 25%,
- Flicker index: 10%,
- Over Temperature Power derating

2. APPLICATIONS

- General Solid-State Lighting,
- Medium Power LED Lamp,
- Connected Medium Power Led Lamp,
- Industrial High power LED Lamp.

3. DESCRIPTION

The ACL406AS is an AC direct LED driver requiring few external components: a diode bridge to rectify the AC voltage and a resistor to tune the LED current.

Multiple ACL406AS AC line drivers can be used in parallel to drive high power LED systems for industrial applications.

4. PIN CONNECTIONS

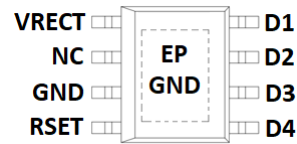


Figure 1: SO8 with Exposed Pad (TOP VIEW)

5. TYPICAL APPLICATION: AC 230V_{AC} LOW-COST LIGHT WITHOUT ELECTRIC PROTECTION

Schematic:

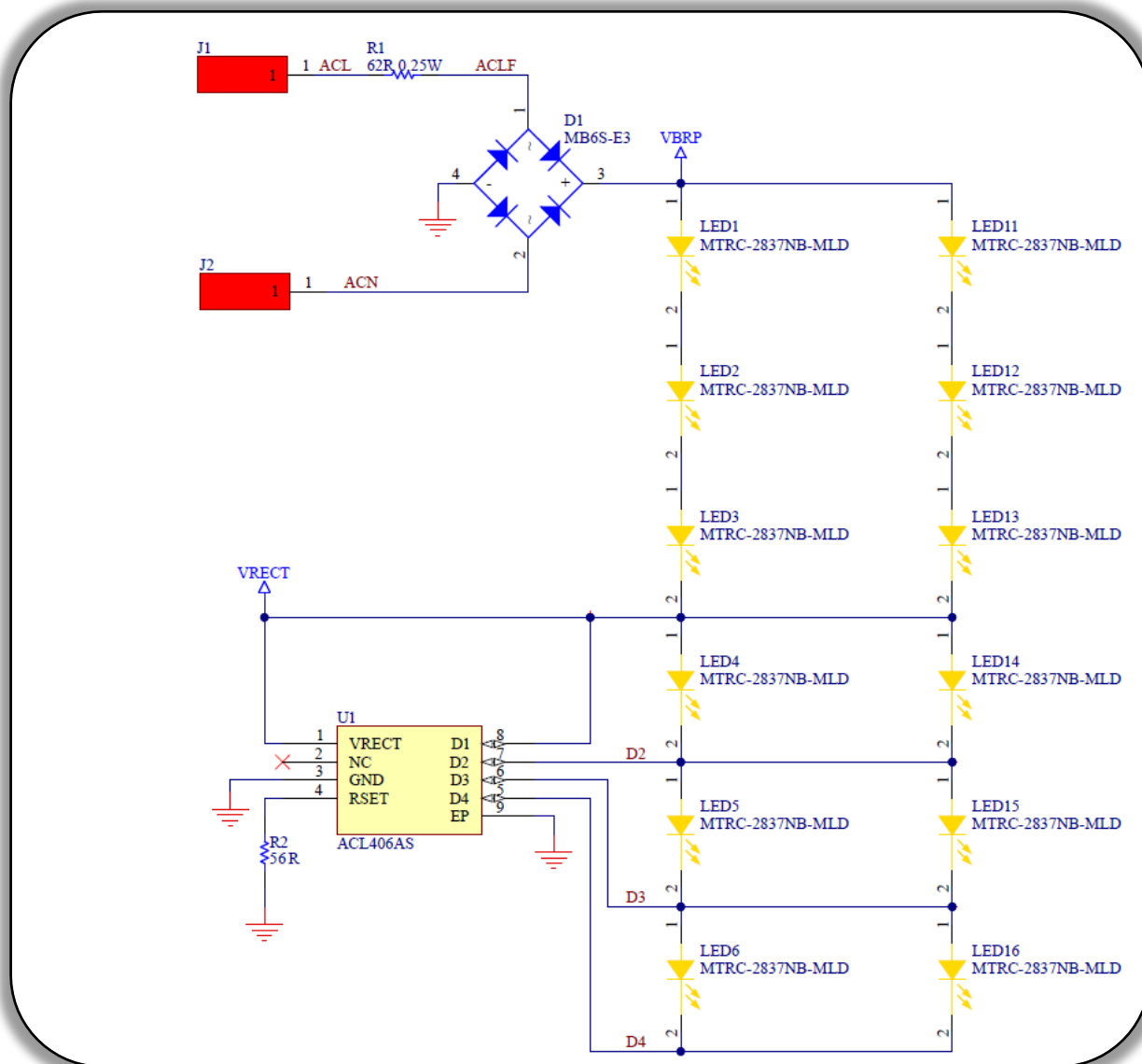


Figure 2: Low-cost application schematic for G9 lights 230V_{AC}

In this design, the light is like the recommended schematic but without electric protections! Only the fuse resistor is placed before the bridge rectifier. In this case, it's only 4 components on the PCB to have 330 lumen lights (or 10 components with LED).

RSET = 56 Ω, the light is at 330 lumens with 12 LED. In this design, only 4 components + 12 LEDs on the PCB.

R _{SET}	P sector	PLED	PLUM	PF	Efficiency	Percentage flicker (%)	Flicker index (%)
56 Ω	3.15 W	2.75 W	330 lm	0.98	87.1 %	100 %	33.9 %

BOM:

Item	QTY	Designator	Description
1	1	D1	Bridge Rectifier 500mA 600V SMD TO-269AA
2	12	LED1 to LED6, LED11 to LED16	LED 48V, 20mA, 4000K, BIN=5, 120lm, code 40M, case 2835
3	1	R1	Resistor, Thin Film, 62 Ω, 5%, 0.25W, 1206
4	1	R2	RES SMD 56 Ω 5% 1/4W 0603
5	1	U1	ACL406AS Direct AC line LED driver Full range SO8 package

Table 1: BOM for reference only

Example of PCBA:



Figure 3: G9 light PCBA with ACL406AS at 230V_{AC}
CEM3 PCB, size 37 x 13 mm, thickness 1.6 mm.

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