Charge Pump Driven 9-Channel LED Driver with Automated LED Lighting Effects

Preliminary Technical Data

ADP8866

FEATURES

- Charge pump with automatic gain selection of 1×, 1.5×, and 2× for maximum efficiency.
- 92% peak efficiency
- 9 independent and programmable LED drivers
- Each driver capable of 25 mA (full scale)
- Each driver has 7 bits (128 levels) of non-linear current settings
- Standby mode for <1 µA current consumption
- 16 programmable fade in and fade out times (0.0 sec to 1.75 sec) with choice of square or cubic rates
- Automated and customizable LED blinking for all 9 channels.
- Unique heartbeat mode for customizable double pulse lighting effects
- PWM input for implementing content adjustable brightness control (CABC)
- I^2C compatible interface for all programming
- Dedicated reset pin and built-in power on reset (POR)
- Short circuit, overvoltage, and overtemperature protection
- Internal soft start to limit inrush currents
- Input to output isolation during faults or shutdown
- Operates down to V_{IN} = 2.5 V, with undervoltage lockout (UVLO) at 2.0 V
- Small lead frame chip scale package (LFCSP)

APPLICATIONS

- Mobile display backlighting
- Mobile phone keypad backlighting
- LED indication and status lights
- Automated LED blinking

TYPICAL OPERATING CIRCUIT

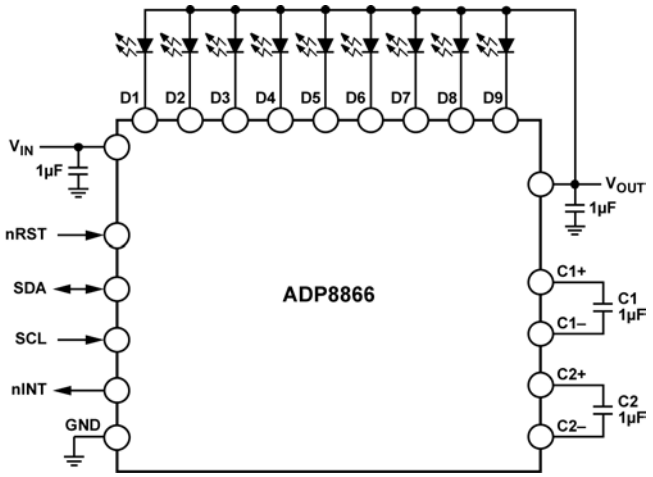


Figure 1.

GENERAL DESCRIPTION

The ADP8866 combines a programmable backlight LED charge pump driver with automatic blinking functions. Nine LED drivers can be independently programmed at currents up to 25 mA. The current level, fade time, and blinking rate can be programmed once and executed autonomously on a loop. Separate fade in and out times can be set for the backlight LEDs.

Driving all of this is a two capacitor charge pump with gains of 1×, 1.5×, and 2×. This setup is capable of driving a maximum I_{OUT} of 240 mA from a supply of 2.5 V to 5.5 V. A full suite of safety features including short-circuit, overvoltage, and over-temperature protection allow easy implementation of a safe and robust design. Additionally, input inrush currents are limited via an integrated soft start combined with controlled input to output isolation.

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OUTLINE DIMENSIONS

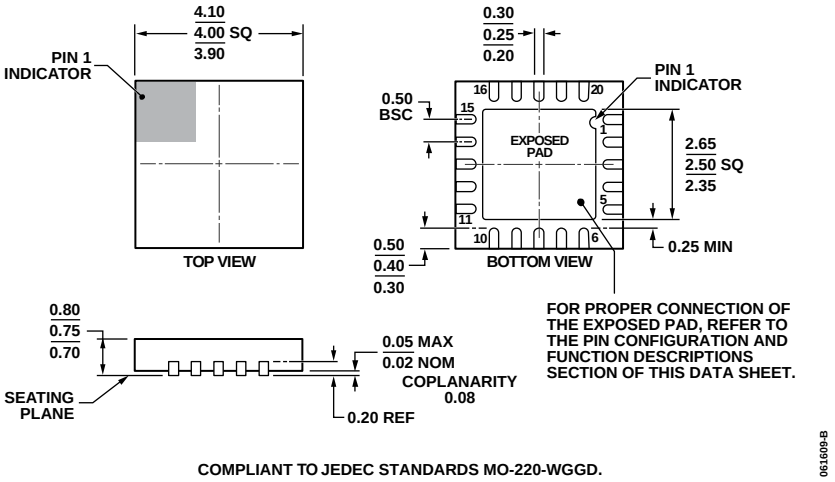


Figure 2. 20 Lead Lead Frame Chip Scale Package [LFCSP_WQ]
4 mm × 4 mm Body, Very Very Thin Quad
(CP-20-10)
Dimensions shown in millimeters

ORDERING GUIDE

Model[1]	Temperature Range	Package Description	Package Option
ADP8866ACPZ-R7	−40°C to +105°C	20-Lead LFCSP_WQ, Tape and Reel	CP-20-10

[1] Z = RoHS Compliant Part.

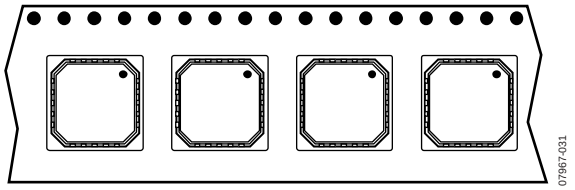


Figure 3. Tape and Reel Orientation for LFCSP Units

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