



Analog, Mixed Signal and Power Management

## MC34845

### 6-channel LED backlight driver with integrated power supply

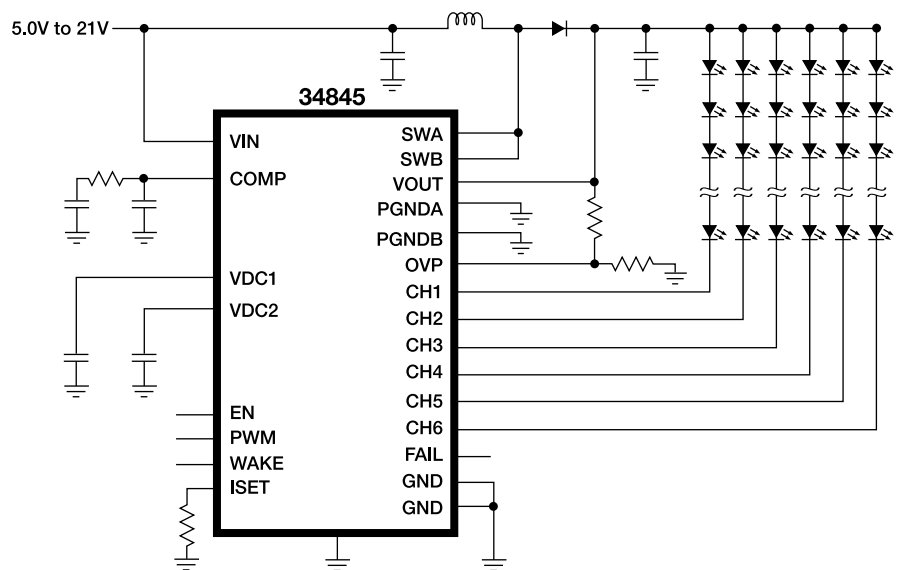
#### MC34845 Applications

- PC notebooks
- Netbooks
- GPS screens
- Portable DVDs
- Picture frames
- Smaller screen televisions
- Gaming consoles
- Industrial/instrumentation displays
- Health care device displays

Freescale's MC34845 is a 6-channel light emitting diode (LED) driver with integrated boost converter for use in liquid crystal display (LCD) backlights. Capable of driving up to 96 LEDs, the MC34845 is suitable for notebook displays from 10 to 17 inches and larger, as well as general applications with screens of seven inches or larger requiring up to 10W of LED backlight power.

The highly integrated MC34845 requires very few external components to provide a complete backlight driver solution. The internal boost power supply generates the required output voltage needed to drive the LEDs. A dynamic headroom control (DHC) circuit detects the voltage required to drive each string of LEDs and sets the boost output accordingly, reducing

#### MC34845 Application Circuit



power dissipation and increasing overall efficiency of the system. By integrating the boost FET, the MC34845 provides for simplified design while improving device performance.

The high-speed drivers feature highly accurate current matching of  $\pm 2$  percent, while also providing for very fast turn on and turn off times of  $\sim 50$  ns. This allows a very narrow

minimum pulse, which increases dimming range and provides for higher linearity. The PWM waveform of the outputs is controlled directly by the PWM input signal on the PWM pin.

The MC34845 incorporates a number of power saving techniques to increase the battery life in portable equipment. In addition to a low operating supply current, the device features a shut down mode where supply current is cut to just 2 uA. This enables direct connection to the battery without a sequential supply switch, reducing cost and improving efficiency. The mode can be selected using the enable pin, or the device can be configured to enter the low current mode when the PWM signal is low for a certain period.

### MC34845 Key Features

- Output voltage up to 60V
- Dynamic headroom control (DHC)
- 2.0A integrated boost FET
- 90 percent efficiency (DC:DC)
- 6-channel current mirror with  $\pm 2$  percent
- Direct PWM input control
  - o PWM frequency up to 100 kHz
  - o 50,000:1 dimming resolution
  - o 200 ns minimum pulse
- User-programmable OVP



EP SUFFIX (Pb-Free)  
98ASA00087D  
24-pin QFN-EP

### Ordering Information

Part Number	Temperature Range	Package
MC34845AEP/R2	-40°C to +105°C	24-pin QFN-EP
MC34845CEP/R2	-40°C to +105°C	24-pin QFN-EP
MC34845DEP/R2	-40°C to +105°C	24-pin QFN-EP

### Performance

Parameter	Typical Values
Outputs (channels)	6 ( $\pm 2\%$ current match)
Operating voltage	5.0–21V
Peak current (per channel)	30 mA
Boost switching frequency	1200 kHz (34845A) 600 kHz (34845C) 300 kHz (34845D)
ESD	$\pm 2000V$
Ambient operating temperature	$-40^\circ C \leq T_A \leq 105^\circ C$

### Protection

	Detect	Shut Down	Auto Retry	Status Reporting
Short circuit	●	●		●
Over temperature	●	●	●	●
Over current	●	●		●
Over voltage	●	●		●
Under voltage	●	●		●
Open load detect	●			●
Shorted load detect	●			

### Development Tools

Part Number	Description
KIT34845EPEVME	LED backlight driver evaluation board
KITLEDBKLT16EVBE	LED load board

### Documentation

Document Number	Description	Type
MC34845	6-channel LED backlight driver with integrated power supply	Data Sheet
SG1002	Analog, mixed signal and power management	Selector Guide
AN1902	Quad Flat Pack No-Lead (QFN) Micro Dual Flat Pack No-Lead (uDFN)	Application Note

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