

High Power LED Flashlight Demonstration

Intelligent Lighting & Control Solutions

Summary

Portable flashlights have been one of the earliest adopters of LEDs, and LED based flashlights are now the most prevalent solutions available on the market. However, many of these designs use simple resistor circuits that contribute to poor LED performance, decreased functionality, and diminished lifetimes.

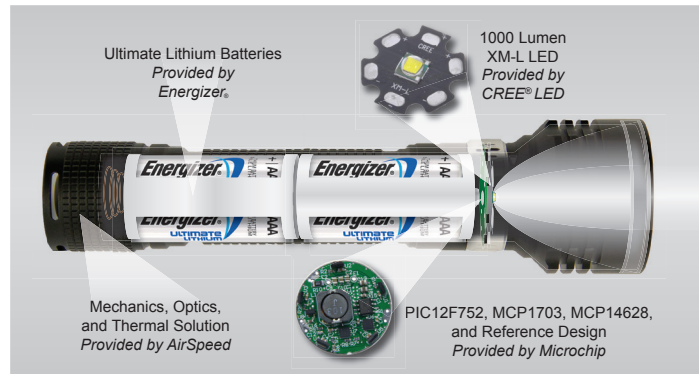


Industrial, military, and sport flashlight designers are some of the growing number of engineers recognizing the advanced control and functionality that a microcontroller (MCU) provides. With significantly longer lifetimes and better efficiencies than an incandescent bulb, LED lighting turns on instantly without any warm-up, provides accurate light placement, produces no radiated heat, and can perform well in both indoor and outdoor applications. The addition of an MCU powering & managing the LED provides opportunities for control of custom lighting patterns/sequencing, user interface control, and increased efficacy (lm/W) resulting in longer battery life at greater lumen output. Additionally, an MCU implementation benefits from the ability to modify or add functionality via a simple program update versus a hardware redesign.

The High Power LED Flashlight Demonstration is a collaborative platform showcasing the capabilities of Microchip, Cree®, Airspeed, and Energizer®. The 10W, > 1000 lumen premium flashlight, features a Microchip MCP1703, MCP14628 and PIC12F752 controlling a > 90% efficient buck power supply dropping 7.2V, supplied by Energizer® Ultimate Lithium batteries, to 3.3V/3.0A driving a single Cree XLamp® XM-L LED. The entire assembly fits inside an aluminium hard anodized enclosure, provided by Airspeed LLC, and is fully ruggedized for use in most any environment. With 1000 lumens at 10W, light output is approximately half of a single automotive headlamp while maintaining greater than 100 (lm/W) efficacy for efficient operation.

To learn more about additional products and capabilities of Microchip's lighting partners, visit:

www.CREE.com
www.energizer.com
www.AirSpeedLLC.com



Demonstration Highlights

- > 90% efficient buck power supply
- ~1000 lumen output at 10W
 - ~100 (lm/W) efficacy
- Ruggedized anodized aluminum enclosure
 - Waterproof to 10 meters
- Magnetic rotational mode selector ring
- Multiple operating modes
 - Low power (60 lumens at 0.6W)
 - Medium power (200 lumens at 2W)
 - High power (1000 lumens at 10W)
 - SOS (customized lighting sequence)
- Long life operation
 - Low power = 31 hours at 0.6W
 - Medium power = 8.5 hours at 2W
 - High power = 1.5 hours at 10W
- Storage/operating temperature: -40°C to +85°C

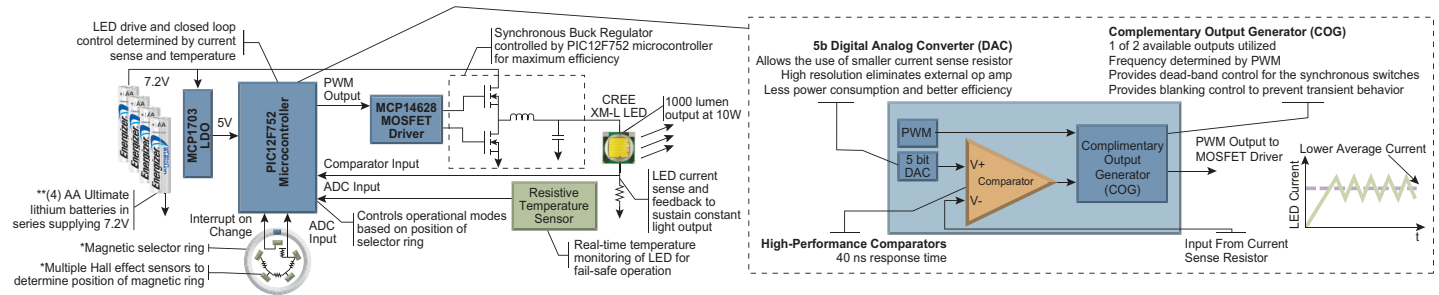
Resources

The High Power LED Flashlight Demonstration collateral is available as a FREE download that includes all schematics and 'C' source code that can easily be modified to your specific application needs—download at www.microchip.com/HPLEDFlashlight. To learn more about Microchip's lighting oriented products and solutions, go to www.microchip.com/lighting.



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High Power LED Flashlight System Diagram



* Magnetic selector ring design can be replaced to accommodate mechanical push buttons and switches.
 ** Battery capacity can be scaled to accommodate specific mechanical capacity and desired run times.

Development Made Easy

Start with the FREE download of schematic and 'C' source code that can easily be modified to your specific application needs – download at www.microchip.com/HPLEDFlashlight. Leveraging the expertise and products from Microchip's lighting partners further ensures quick development of high quality LED lighting applications.

Microchip Product and Sampling Information

- High Efficiency Solutions for Portable LED Lighting
- PIC12F(HV)752 Data Sheet, DS41576
- MCP14628 Data Sheet, DS22083
- MCP1703 Data Sheet, DS22049
- On-line sampling: sample.microchip.com
- On-line purchasing: www.microchipdirect.com

Energizer® Product and Technical Information

- Energizer® Ultimate Lithium AA Spec Sheet (Form No. EBC-4201R) <http://data.energizer.com/PDFs/I91.pdf>
- For addition technical information, please visit the Energizer® Technical Information web site at: <http://data.energizer.com>

CREE Product and Sampling Information

- XML LED Data Sheet: www.cree.com/products/pdf/XLampXM-L.pdf
- On-line sampling: www.cree.com/xlamp/sample_xml.asp
- On-line purchasing: www.cree.com/products/online_sales.asp

AirSpeed LLC Product and Logistical Support

- For additional information on how Airspeed can help you bring your Solid State Lighting products to market please email us at sales@airspeedllc.com or visit our corporate websites below:
 - www.AirSpeedLLC.com
 - www.clean-lighting.com

Partner Overview

	A leading provider of microcontroller and analog semiconductors, providing low-risk product development, lower total system cost and faster time to market. With an increasing focus on lighting applications, Microchip offers outstanding technical support along with dependable delivery and quality.
	Cree, Inc leads the industry through performance and application optimized lighting-class LEDs that simplify design and lower system costs to obsolete energy-wasting traditional lighting. Cree's relentless innovation drives the LED lighting revolution with products designed to accelerate LED adoption and push the boundaries of what's possible with LED lighting. Cree's LED product families include XLamp® and High Brightness LEDs.
	An experienced provider of innovative product solutions, Airspeed specializes in the design and manufacturing of complete mechanical packages with 20 years experience in plastics, metal fabrication, die cast, cable assemblies, and global logistics management, ensuring that our customer can offer the most competitive product to the market.
	Energizer Holdings, Inc., headquartered in St. Louis, MO, is one of the world's largest manufacturers of primary batteries, portable flashlights and lanterns. Energizer® Ultimate Lithium batteries deliver long-lasting power to keep up with today's high-tech devices like digital cameras, LED flashlights and handheld GPS devices.

Download the FREE schematics and 'C' source code at: www.microchip.com/HPLEDFlashlight.

Learn more about Microchip's lighting oriented products and solutions at: www.microchip.com/lighting.



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www.microchip.com/HPLEDFlashlight

Visit our web site for additional product information and to locate your local sales office.

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