

AS3687/AS3687XM

Flexible Lighting Management (Charge Pump, DCDC, Seven Current Sinks, ADC, LED Test, Audio Light control)



1 General Description

The AS3687/87XM is a highly-integrated CMOS Lighting Management Unit for mobile telephones, and other 1-cell Li+ or 3-cell NiMH powered devices.

The AS3687/87XM incorporates one Step Up DC/DC Converter for white backlight LEDs, one low noise Charge Pump for indicator- or RGB- LEDs, LED test circuit (production test of the soldered LEDs at the customer site), one Analog-to-Digital Converter, seven current sinks, a two wire serial interface, and control logic all onto a single device. Output voltages and output currents are fully programmable. The AS3687XM has an audio input to control one or two RGB LEDs.

The AS3687/87XM is a successor to the austriamicrosystems AS3689 and therefore **software compatible** to the **AS3689** (software written for the AS3689 can be easily reused for the AS3687/87XM).

2 Key Features

- High-Efficiency Step Up DC/DC Converter
 - Up to 25V/50mA for White LEDs
 - Programmable Output Voltage with External Resistors and Serial Interface
 - Overvoltage Protection
- High-Efficiency Low Noise Charge Pump
 - 1:1, 1:1.5, and 1:2 Mode
 - Automatic Up Switching (can be disabled and 1:2 mode can be blocked)
 - Output Current up to 100mA
 - Efficiency up to 95%
 - Only 4 External Capacitors Required: 2 x 500nF Flying Capacitors, 2 x 1µF Input/Output Capacitors
 - Supports LCD White Backlight or RGB LEDs
- Seven Current Sinks
 - All seven current sinks fully Programmable (8-bit) from: 0.15mA to 38.5mA (CURR1, CURR2, CURR6, CURR30, CURR31, CURR32, CURR33)
 - Three current sinks are High Voltage capable (CURR1, CURR2, CURR6)

- Selectively Enable/Disable Current Sinks
- Internal PWM Generation
 - 8 Bit resolution
 - Autonomous Logarithmic up/down dimming
- Led Pattern Generator
 - Autonomous driving for Fun RGB LEDs
 - Support indicator LEDs
- 10-bit Successive Approximation ADC
 - 27µs Conversion Time
 - Selectable Inputs: all current sources, VBAT, CP_OUT, DCDC_FB
 - Internal Temp. Measurement
- Support for automatic LED testing (open and shorted LEDs can be identified in-circuit)
- Standby LDO always on if serial interface is on
 - Regulated 2.5V max. output 10mA
 - 3µA Quiescent Current
 - Automatic wakeup if serial interface is enabled (allows ultra low power for device shutdown)
- Audio can be used to drive RGB LED (AS3687XM only)
 - RGB Color and Brightness is dependent on audio input amplitude
 - Can drive one or two RGB LEDs
- Wide Battery Supply Range: 3.0 to 5.5V
- Two Wire Serial Interface Control
- Overcurrent and Thermal Protection
- Small Package
WL-CSP 4x5 balls 0.5mm pitch

3 Application

Lighting-management for mobile telephones and other 1-cell Li+ or 3-cell NiMH powered devices.

4 Block Diagram

Figure 1 – Application Diagram of the AS3687

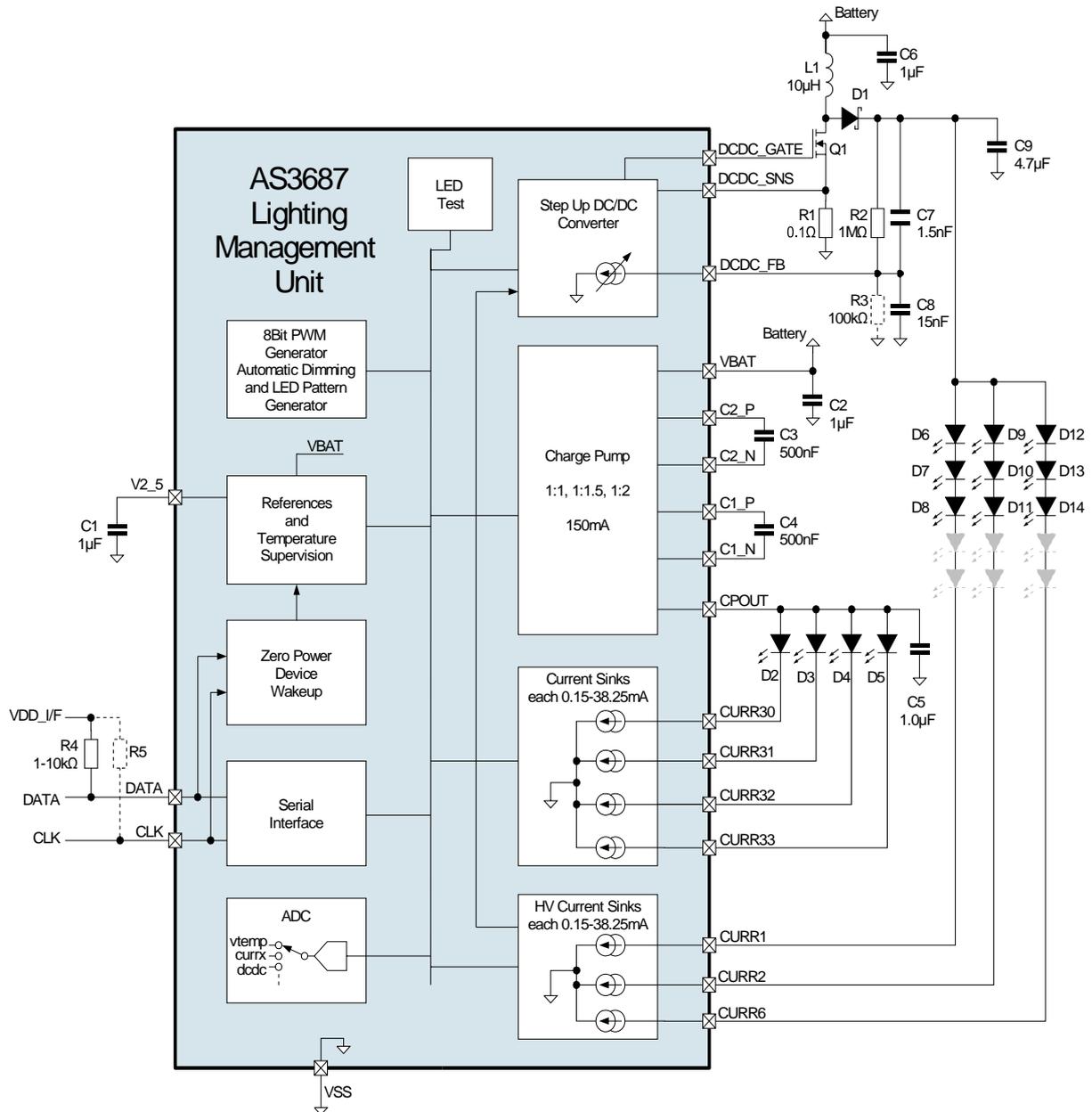
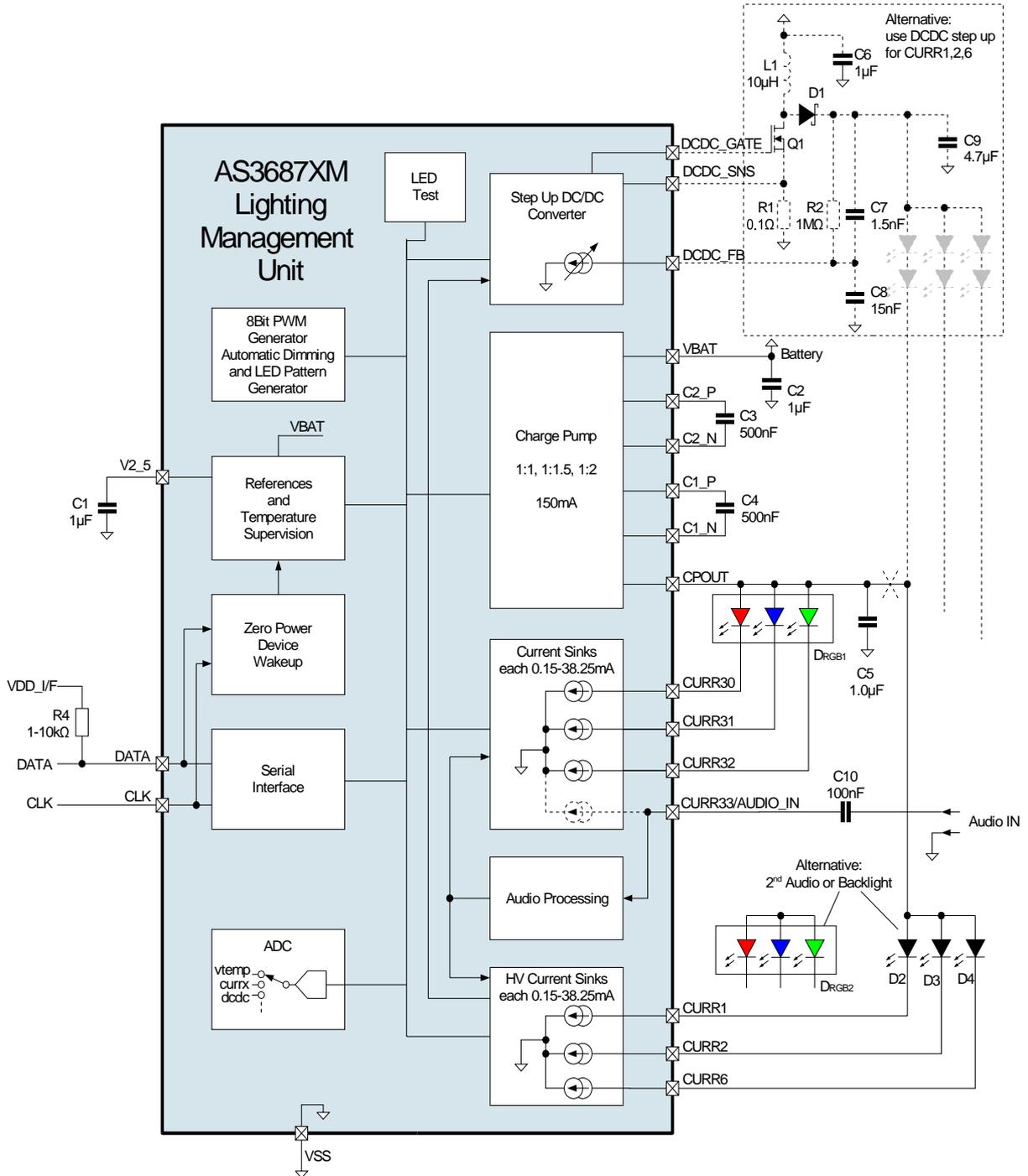


Figure 2 – Application Diagram of the AS3687XM



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