AS3675
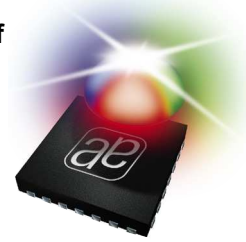
Flexible Lighting Management Unit (Charge Pump, DCDC, 13 Current Sinks, ADC, LED Test, LDO, Audio Controlled Light)

1 General Description

The AS3675 is a highly-integrated CMOS Power and Lighting Management Unit for mobile telephones, and other 1-cell Li+ or 3-cell NiMH powered devices.

The AS3675 incorporates one Step Up DC/DC Converter for white backlight LEDs, one high-power Charge Pump, one Analog-to-Digital Converter, 13 current sinks, the RGB and white LEDs can be controlled by an audio input, LED in-circuit function test, a two wire serial interface, and control logic all onto a single device. Output voltages and output currents are fully programmable.

The AS3675 is a successor to the austriamicro-systems AS3687/87XM and AS3689. It is software compatible to AS3687/87XM and AS3689.
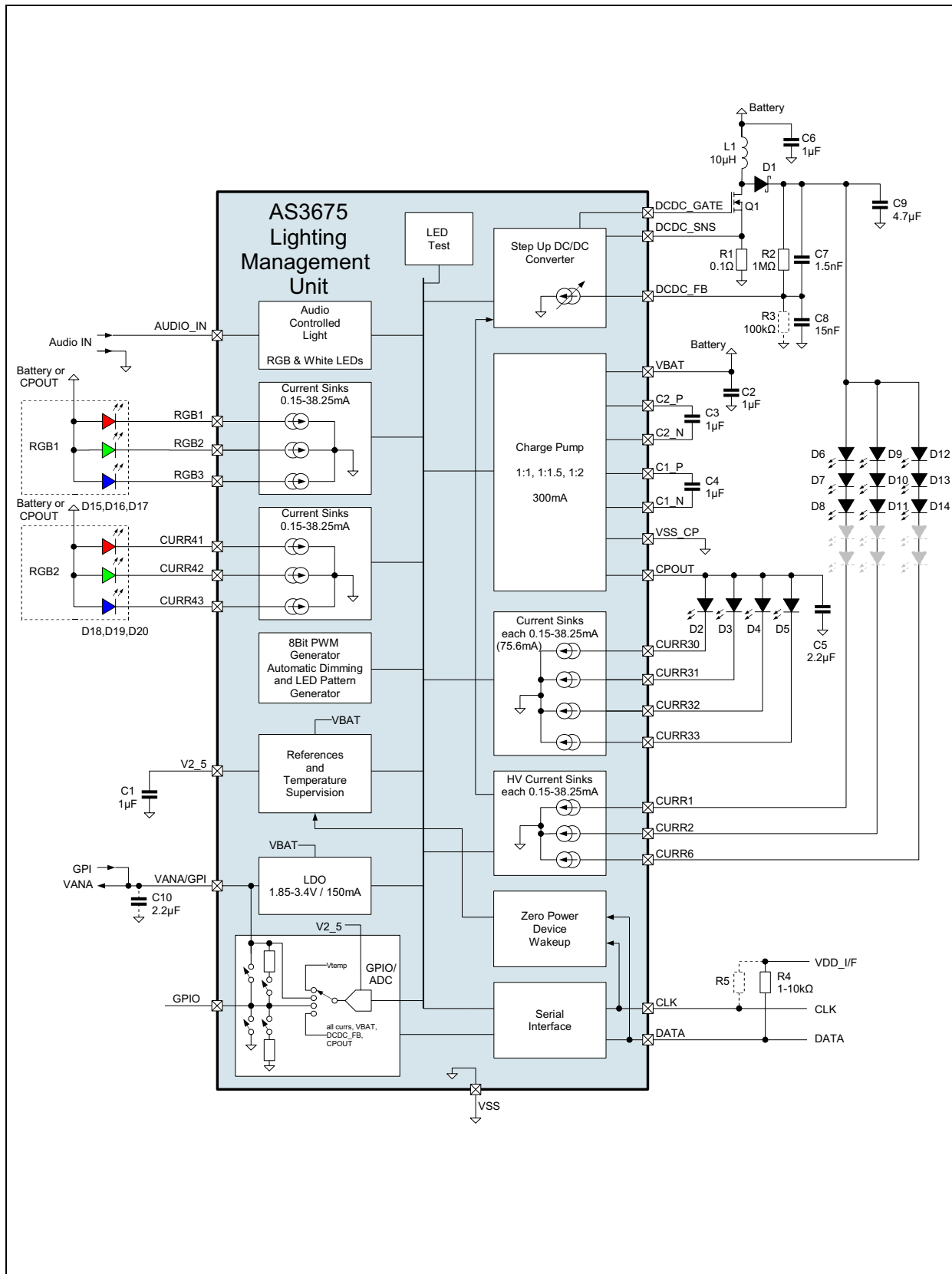
2 Key Features

- High-Efficiency Step Up DC/DC Converter
  - Up to 16V/55mA (or 25V/35mA) for White LEDs
  - Programmable Output Voltage with External Resistors and Serial Interface
  - Over voltage Protection
- High-Efficiency High-Power 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 300mA/500mA pulsed
  - Efficiency up to 95%
  - Very Low effective Resistance (2.5Ω typ. in 1:1.5)
  - Only 4 External Capacitors Required:
    2 x 1µF Flying Capacitors, 2 x 2.2µF Input/Output Capacitors
  - Supports LCD White Backlight LEDs, or RGB LEDs
- 13 Current Sinks
  - All 13 current sinks fully Programmable (8-bit) from: 0.15mA to 38.5mA (up to 75.6mA for CURR30...CURR33)
  - Three current sinks are High Voltage capable (CURR1, CURR2, CURR6)
  - Programmable Hardware Control (Strobe, and Preview or PWM)
  - 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: GPIO, all current sources, VBAT, CPOUT, DCDC_FB
  - Internal Temp. Measurement
  - Light Sensor input
- Support for automatic LED testing (open and shorted LEDs can be identified)
- Support for external Temperature Sensor for high current LED protection (CURR3x)
- Strobe Timeout protection
  - Up to 1600ms
  - Three different timing modes
- Two General Purpose Inputs/Output
  - VANA/GPI Input, GPIO Input/Output
  - Digital Input, Digital Output using VANA/GPI supply and Tristate
  - VANA/GPI internal pull down
  - GPIO Programmable Pull-Up/Down
- Programmable LDO
  - 1.85 to 3.4V, 150mA
  - Programmable via Serial Interface
- Standby LDO always on
  - Regulated 2.5V max. output 10mA
  - 3µA Quiescent Current
- Audio can be used to drive RGB LED or up to four white LEDs
  - RGB Color and Brightness is dependent on audio input amplitude or frequency
- White LEDs can be controlled by amplitude or frequency (different modes like bar-type or two and two LEDs driven by frequency filters)
- Wide Battery Supply Range: 3.0 to 5.5V
- Two Wire Serial Interface Control
- Over current and Thermal Protection
- WL-CSP30 3x2.5mm, 0.5mm pitch Package

3 Applications

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

Figure 1. Block Diagram

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