

**AS3682****Product Brief****480mA Camera Lighting Management Unit****1 General Description**

The AS3682 is a low-noise, high-current charge pump designed for camera flash LEDs and LCD backlighting applications. The device is capable of driving up to 480mA of load current.

The AS3682 integrates two independent LED blocks for driving a single flash LED (CURR<sub>11</sub> to CURR<sub>13</sub>) with up to 480mA, and general purpose LEDs (CURR<sub>2</sub> to CURR<sub>4</sub>) with up to 160mA/LED. The general purpose LEDs are controlled individually and can be used for backlighting, but also in support of an RGB fun-light or a movie indicator lamp.

The AS3682 utilizes austriamicrosystems's patent-pending Intelligent Adaptive Mode Setting (IAMS) to switch between 1:1, 1:1.5, and 1: 2 modes. In combination with very-low-drop-out current sinks, the device achieves high efficiency over the full single-cell Li+ battery voltage range. The charge pump operates at a fixed frequency of 1MHz allowing for tiny external components and its design ensures low EMI and low input-ripple.

The ultra-flexible brightness control scheme allows for simple adaptation of the device to different system architectures.

In Normal and Softflash Modes the device is controlled by an I<sup>2</sup>C interface. In these modes the LED brightness, flash duration, GPIOs and various charge pump states are controlled by internal register settings. The GPIO pins can act as programmable input or output pins and can also be set to trigger preview and flash light directly by a camera module.

In Hardflash Mode, the LED brightness is controlled by the Enable pins. Those programming pins can be used as simple enable pins, as PWM input, again offering ample flexibility for setting the LED brightness.

**2 Key Features**

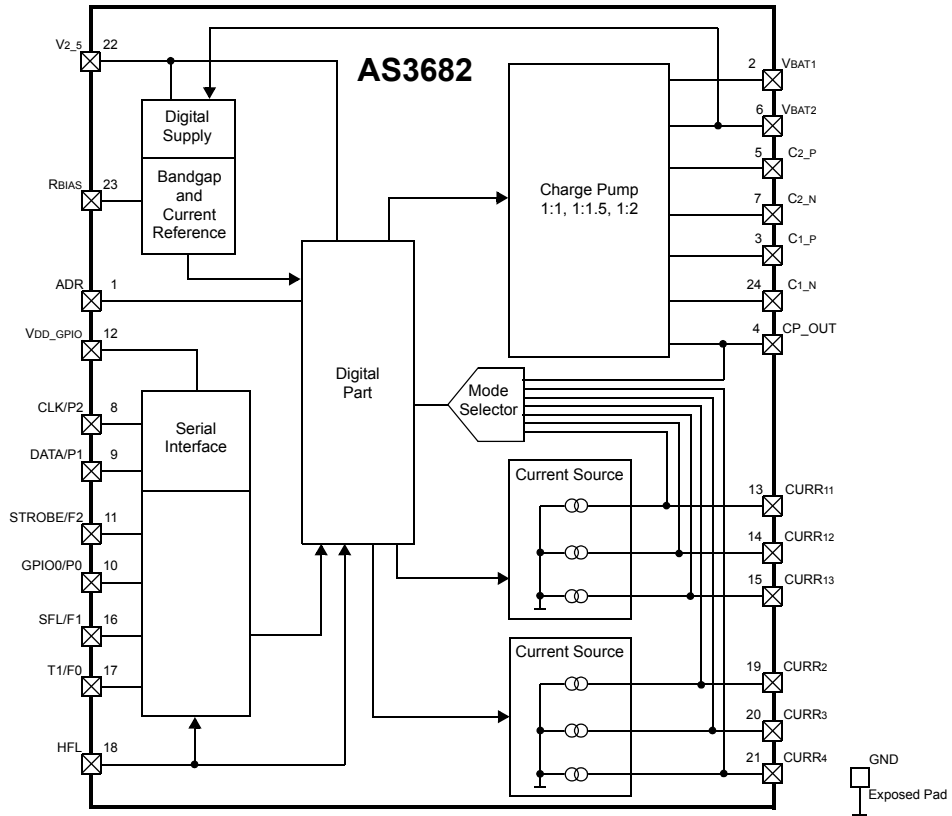
- High-Efficiency High-Power Charge Pump
  - 1:1, 1:1.5, and 1:2 Intelligent Adaptive Mode Setting (IAMS)
  - Efficiency up to 95%
  - Soft Start to Reduce Inrush Current
  - Low-Noise Constant-Frequency Operation
- Current Sinks
  - 400mA Continuous Flash Current (@V<sub>IN</sub> = 3.2 to 5V, V<sub>OUT</sub> = 5V)
  - 480mA Maximum Pulsed Flash Current
  - Programmable: 0 to 160mA, 0.625mA Resolution
- Flexible Brightness Control
  - Three 0 to 160mA LEDs
  - Individually Addressable via I<sup>2</sup>C Interface
- Three Operating Modes
  - Normal Mode (I<sup>2</sup>C Interface)
  - Softflash Mode (I<sup>2</sup>C Interface)
  - Dedicated Control Pins for Hardflash Modes
- Two General Purpose Inputs/Outputs
  - Digital Input, Output, and Tristate
  - Programmable Pull-Up and Pull-Down
  - Strobe Pin can be used for Camera Flash Control
- LED Disconnect in Shutdown
- Open LED Detection
- Low Stand-By Current (6μA), Interface Fully Operating
- Low Shut-Down Current (0.2μA)
- Wide Battery Supply Range: 3.0 to 5.5V
- Thermal Protection
- 24-Pin, Small Form-Factor QFN Package
  - 4 x 4 x 0.85mm, 0.5mm Pitch
  - Enhanced Thermal Characteristics

**3 Applications**

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

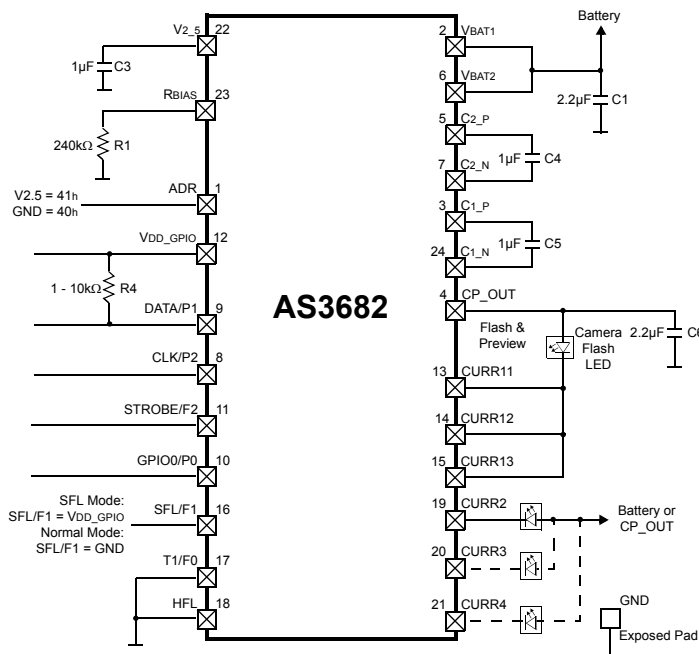
## 4 Block Diagram

Figure 1. AS3682 Block Diagram



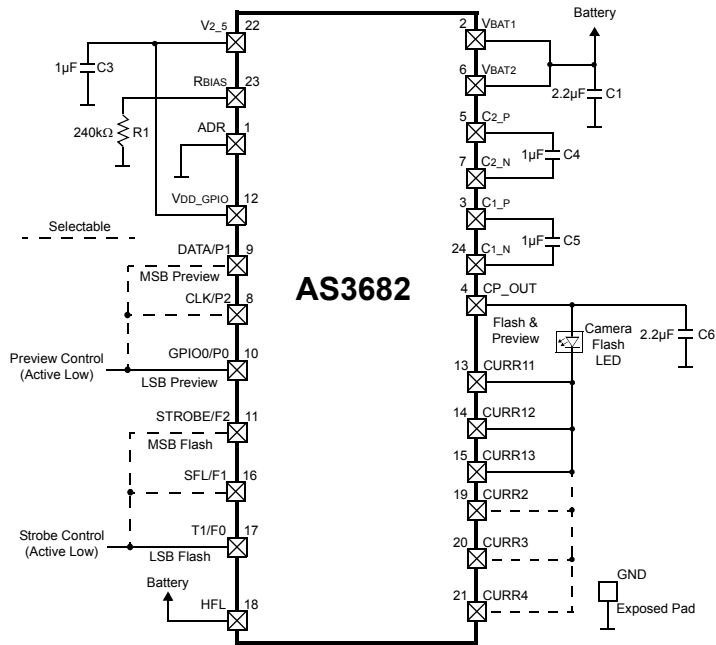
## 5 Application Diagrams

Figure 2. Normal and Softflash Mode Application Diagram



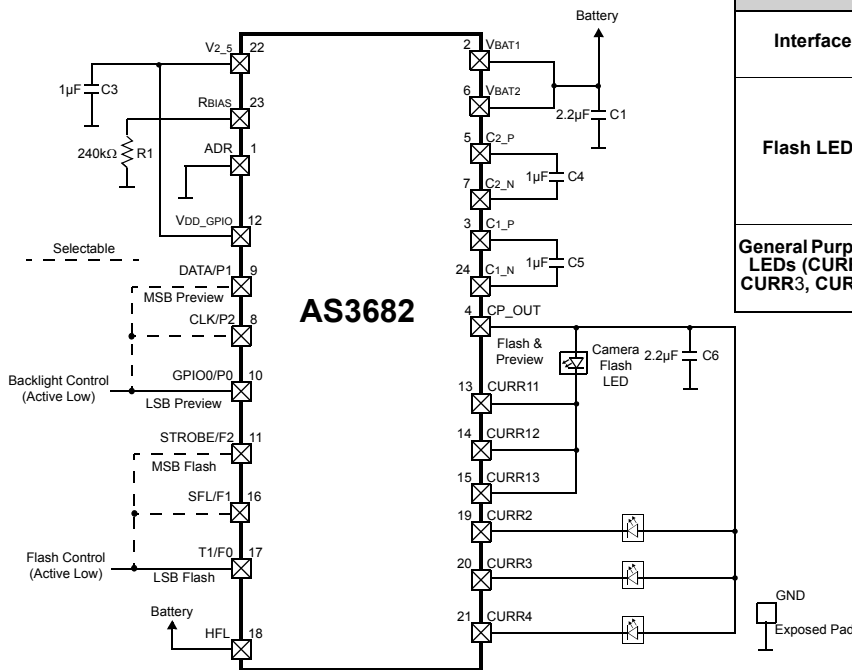
Feature	Normal Mode	Softflash Mode	
<b>Interface</b>	I <sup>2</sup> C	I <sup>2</sup> C	
<b>Flash LEDs</b>	Current Sinks	3	3
	Total Current	0 to 450mA	0 to 480mA
	Addressable	Block	Block
	Strobe Trigger	STROBE/F2 or software	STROBE/F2 or software
	Strobe Preview	GPIO0/P0 or software	GPIO0/P0 or software
<b>General Purpose LEDs (CURR2, CURR3, CURR4)</b>	Current Sinks	3	3
	Current per Sink	0 to 37.5mA	0 to 160mA
	Addressable	Individual	Individual

Figure 3. Hardflash Mode 1 Application Diagram



Feature		Hardflash Mode 1
Interface		Dedicated Control Pins for Strobe (3x) & Preview (3x)
	Current Sinks	6
Flash LEDs	Total Current	Strobe: 0 to 450mA Preview: 0 to 400mA
	Addressable	Block
	Strobe Trigger	By Strobe Control Pins
	Strobe Preview	By Preview Control Pins
	General Purpose LEDs (CURR2, CURR3, CURR4)	Current Sinks
	Current per Sink	N/A
	Addressable	N/A

Figure 4. Hardflash Mode 2 Application Diagram



Feature		Hardflash Mode 2
Interface		Dedicated Control Pins for Flash (3x) & General Purpose (3x)
	Current Sinks	3
Flash LEDs	Total Current	Flash: 0 to 450mA
	Addressable	Block
	Strobe Trigger	By Flash Control Pin
	Strobe Preview	
General Purpose LEDs (CURR2, CURR3, CURR4)	Current Sinks	3
	Current per Sink	0 to 20/37.5mA
	Addressable	Block

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