DESCRIPTION

The AMS1072 is a step-up converter designed for driving up to 39 white LEDs (13 strings of 3 LEDs each) from a 5V system rail. The AMS1072 uses a current mode, fixed frequency architecture to regulate the LED current, which is measured through an external current sense resistor. Its low 104mV feedback voltage reduces power loss and improves efficiency. The OV pin monitors the output voltage and turns off the converter if an over-voltage condition is present due to an open circuit condition.

The AMS1072 includes under-voltage lockout, current limiting and thermal overload protection preventing damage in the event of an output overload.

The AMS1072 is available in small 6-pin SOT23-6 packages.

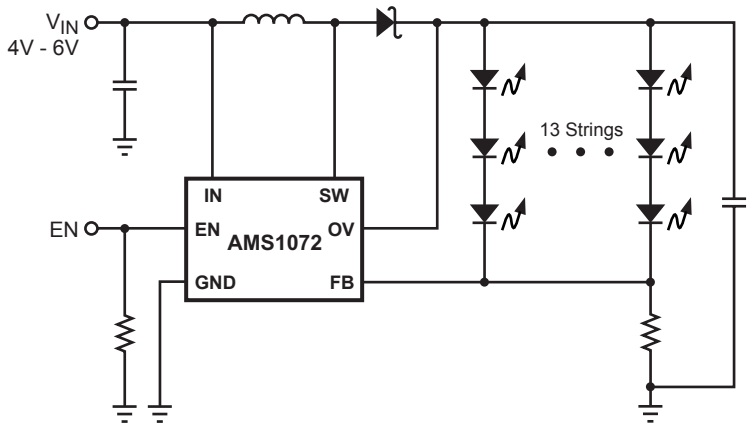
FEATURES

- 2.5V to 8V Input Voltage Range
- On Board Power MOSFET
- Drives up to 39 White LEDs at 5V Input
- Up to 92% Efficiency
- 1.3MHz Fixed Switching Frequency
- Open Load Shutdown
- Low 104mV Feedback Voltage
- Soft-Start/PWM Dimming
- UVLO, Thermal Shutdown
- Internal 1.3A Current Limit
- Available in SOT23-6 Packages

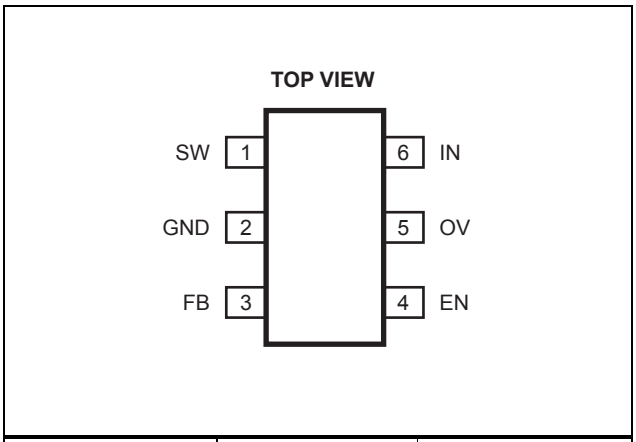
APPLICATIONS

- Cell Phones
- Handheld Computers and PDAs
- Digital Still Cameras
- Small LCD Displays

TYPICAL APPLICATION



PACKAGE REFERENCE



Part Number	Package	Temperature
AMS1072	SOT23-6	–40°C to +85°C

ABSOLUTE MAXIMUM RATINGS

SW Pin.....–0.5V to +28.5V
All Other Pins.....–0.3V to +8V
Storage Temperature..... –65°C to +150°C

Recommended Operating Conditions

IN Supply Voltage .....2.5V to 8V
Output Voltage.....V_{IN} to 25V
Operating Temperature..... –40°C to +85°C

ELECTRICAL CHARACTERISTICS

V_{IN} = V_{EN} = 5V, T_A = +25°C, unless otherwise noted.

Parameters	Symbol	Condition	Min	Typ	Max	Units
Operating Input Voltage	V_{IN}		2.5		8	V
Supply Current (Shutdown)		V_{EN} = 0V		0.1	1	µA
Supply Current (Quiescent)		V_{FB} = 0.15V		690	750	µA
Switching Frequency	f_{SW}		1.0	1.3	1.5	MHz
Maximum Duty Cycle		V_{FB} = 0V	85	92		%
Under Voltage Lockout						
IN Under Voltage Lockout	UVLO	V_{IN} Rising	2.25	2.45		V
Under Voltage Lockout Hysteresis				92		mV
Open Lamp Shutdown Threshold	V_{OV}	V_{OV} Rising		28		V

ELECTRICAL CHARACTERISTICS *(continued)*

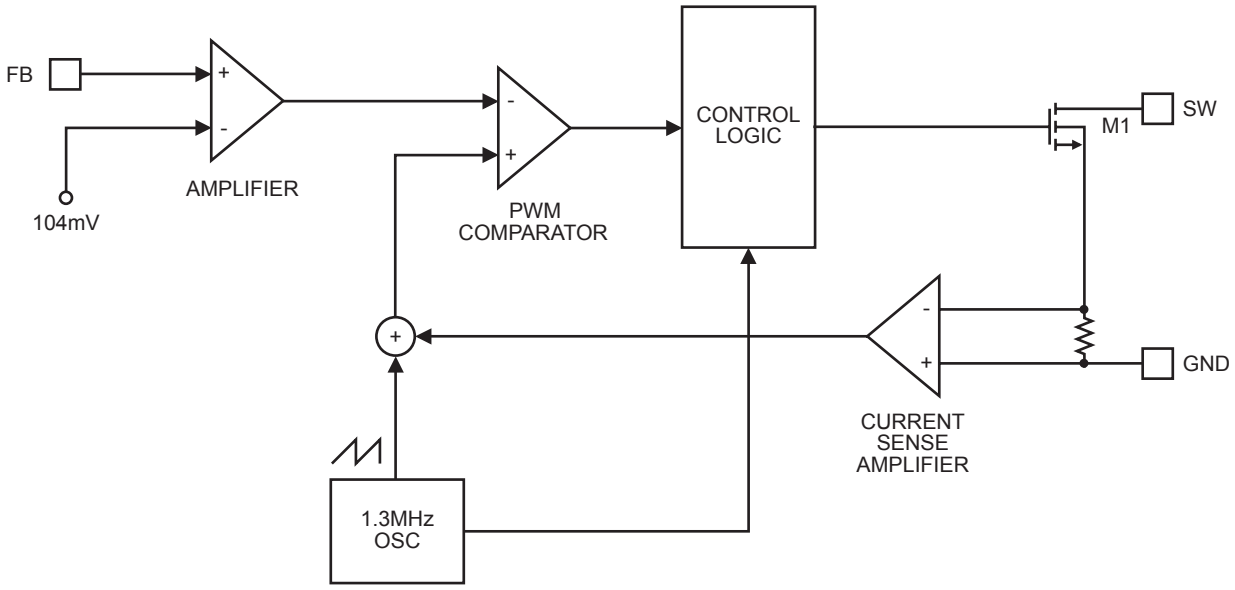
V_{IN} = V_{EN} = 5V, T_A = +25°C, unless otherwise noted.

Parameters	Symbol	Condition	Min	Typ	Max	Units
Enable						
EN Threshold		V_{EN} Rising, V_{IN} = 5V	1.1	1.35	1.6	V
EN Threshold		V_{EN} Rising, V_{IN} = 2.5V	0.8			V
EN Hysteresis				90		mV
EN Input Bias Current		V_{EN} = 0V, 5V		1		µA
Feedback						
FB Voltage			94	104	114	mV
FB Input Bias Current		V_{FB} = 0.1V	–600	–300		nA
Output Switch						
SW On-Resistance	R_{ON}			0.5		Ω
SW Current Limit		Duty Cycle = 60%		1.33		A
Thermal Shutdown				160		°C

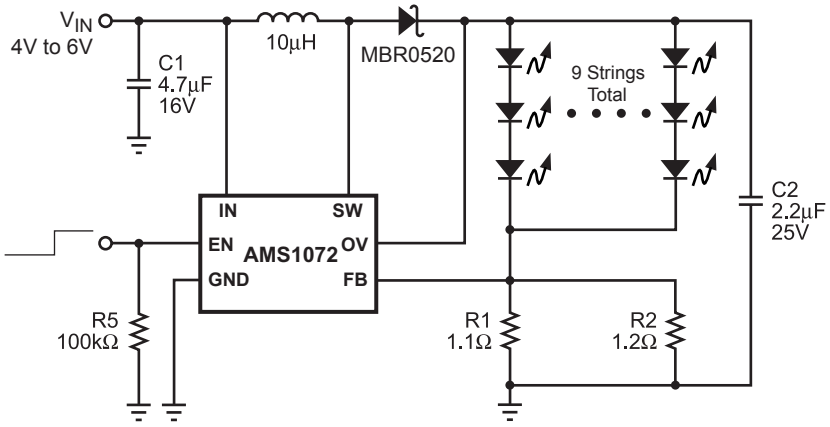
PIN FUNCTIONS

SOT23-6 Pin #		Name	Description
1		SW	Power Switch Output. SW is the drain of the internal MOSFET switch. Connect the power inductor and output rectifier to SW.
2		GND	Ground.
3		FB	Feedback Input. The AMS1072 regulates the voltage across the current sense resistor between FB and GND. Connect a current sense resistor from the bottom of the LED string to GND. Connect the bottom of the LED string to FB. The regulation voltage is 104mV.
4		EN	Regulator On/Off Control Input. A high input at EN turns on the converter, and a low input turns it off. When not used, connect EN to the input source for automatic startup. **The EN pin cannot be left floating.**
5		OV	Over Voltage Input. OV measures the output voltage for open circuit protection. Connect OV to the output at the top of the LED string.
6		IN	Input Supply Pin. Must be locally bypassed.

Functional Block Diagram

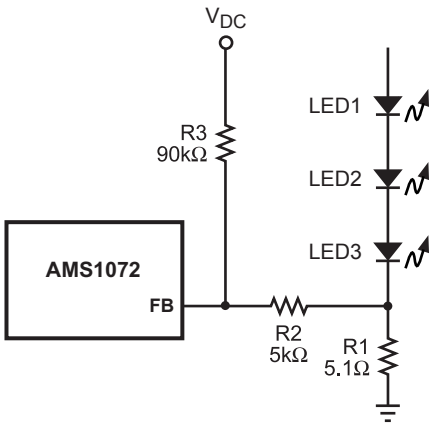


APPLICATION INFORMATION

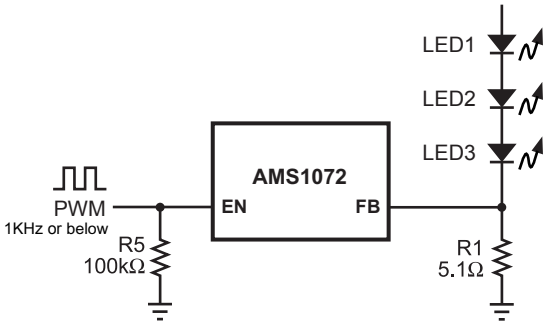


$$I_{LED} = 104mV \times \frac{R1 + R2}{R1 \times R2}$$

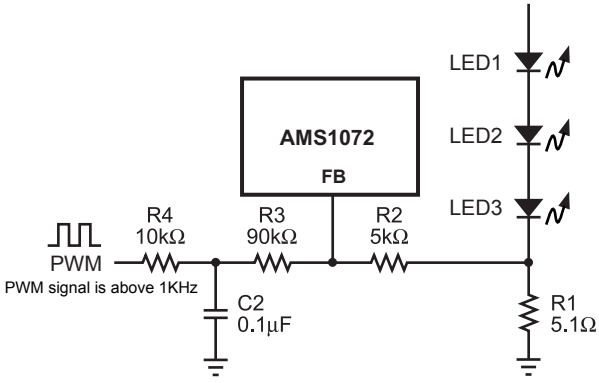
Dimming Control



Dimming Control Using a DC Voltage



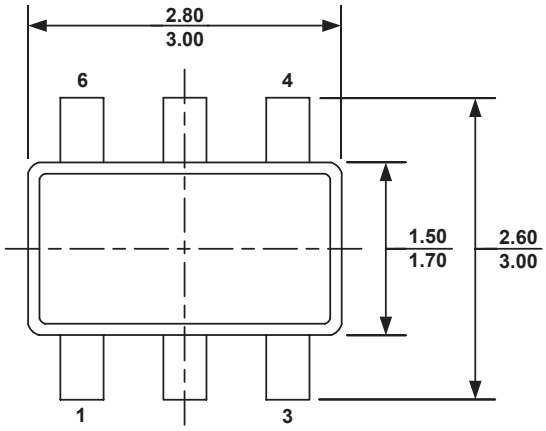
Dimming Control Using a Logic Signal



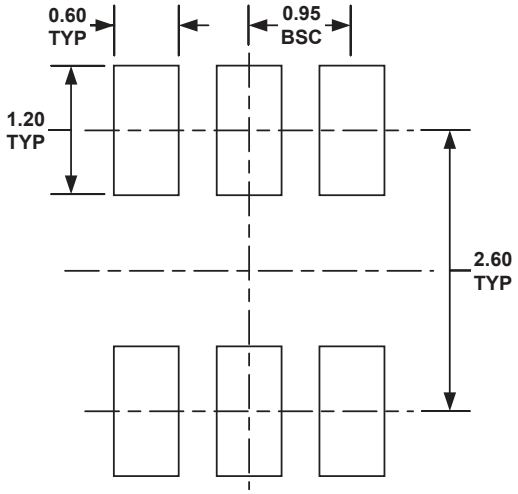
Dimming Control Using a Filtered PWM Signal

PACKAGE INFORMATION

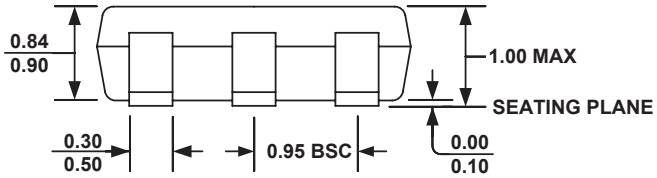
SOT23-6



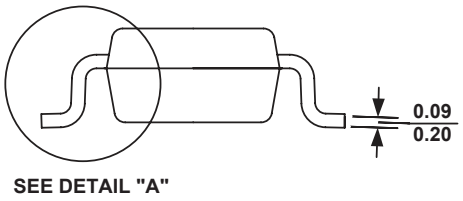
TOP VIEW



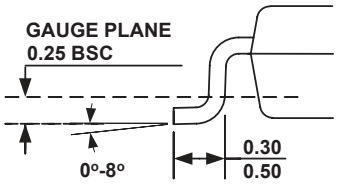
RECOMMENDED LAND PATTERN



FRONT VIEW



SIDE VIEW



NOTE:

ALL DIMENSIONS ARE IN MILLIMETERS.