DESCRIPTION

A7630 is a step-up converter designed for driving up to 7 series white LED's from a single cell Lithium Ion battery. Its low 250mV feedback voltage reduces power loss and improves efficiency.

Optimized operation frequency can meet the requirement of small LC filters value and low operation current with high efficiency. Internal soft start function can reduce the inrush current. Tiny package type provides the best solution for PCB space saving and total BOM cost.

The A7630 is available in SOT-26 package.

ORDERING INFORMATION

Package Type	Part Number	
SOT-26	E6	A7630E6R
		A7630E6VR
Note	V: Halogen free Package R: Tape & Reel SPQ: 3,000pcs/Reel	
AiT provides all RoHS products		

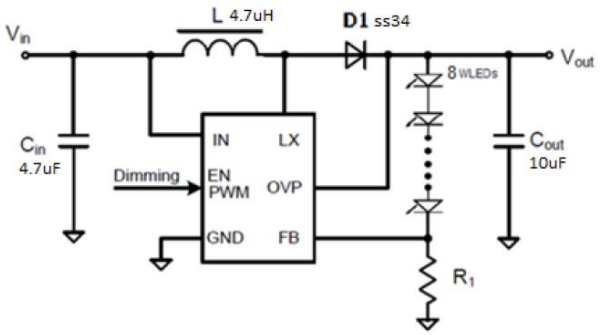
FEATURES

- 2.5V to 5.5V Input Voltage
- Drivers up to 8 Series WLEDs
- Low 250mV Feedback Voltage
- 1.2MHz Fixed Switching Frequency
- Internal 1.6A Switch Current Limit
- Internal Compensation
- Thermal Shutdown
- Over Voltage Protection
- Dimming with wide Frequency Range
- Available in SOT-26 Package

APPLICATION

- Camera Flash White LED
- PDA LED back light
- Digital still cameras

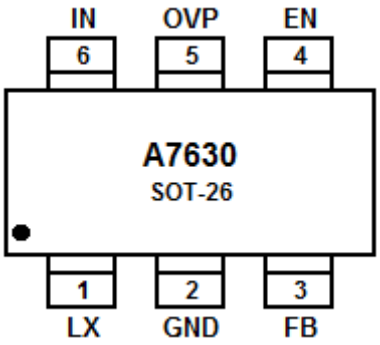
TYPICAL APPLICATION



NOTE: 1. $I_{LED}=\frac{0.25V}{R_1}$

2. The decupling capacitors Cin should be placed as close to the IC as possible.

PIN DESCRIPTION



Top View

Pin #	Symbol	Function
1	LX	Power Switch Output. LX is the drain of the internal MOSFET switch. Connect the power inductor and output rectifier to LX. LX can swing between GND and 30V.
2	GND	Ground.
3	FB	Feedback Input. The FB voltage is 0.25V. Connect a resistor divider to FB.
4	EN	Chip enable, but a PWM signal with various duty cycle can directly sent to EN pin to achieve the backlight dimming.
5	OVP	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	Power Supply. Must be locally bypassed.

ABSOLUTE MAXIMUM RATINGS

IN, EN Pin Voltage		-0.3V ~ 6V
SW Pin Voltage		-0.3V ~ 30V
All Other Pin Voltage		-0.3V~ 6V
T_J, Junction Temperature		150°C
T_A, Ambient Temperature		-40°C~ 85°C
Power Dissipation	SOT-26	600mW
θ_{JA}, Thermal Resistance	SOT-26	250°C /W
θ_{JC}, Thermal Resistance	SOT-26	130°C /W
T_S, Storage Temperature		-65°C ~ 150°C
Lead Temperature & Time		260°C, 10sec

Stress beyond above listed “Absolute Maximum Ratings” may lead permanent damage to the device. These are stress ratings only and operations of the device at these or any other conditions beyond those indicated in the operational sections of the specifications are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Value	Units
Input Voltage Range		2.5 to 5.5	V
Output Voltage Range		V_{IN} to 30	V
Operating Junction Temperature	T_J	-40 to 125	°C

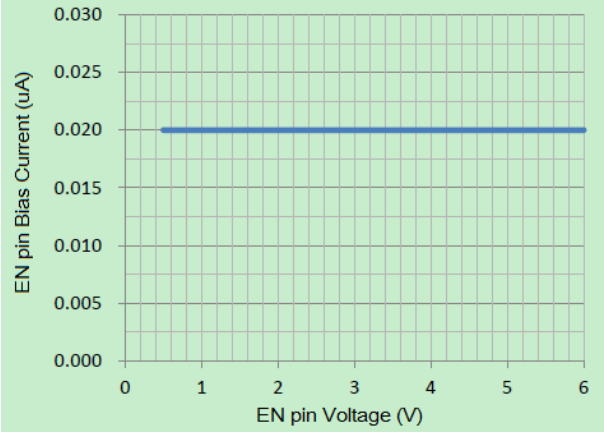
ELECTRICAL CHARACTERISTICS

T_A=25°C, unless otherwise noted

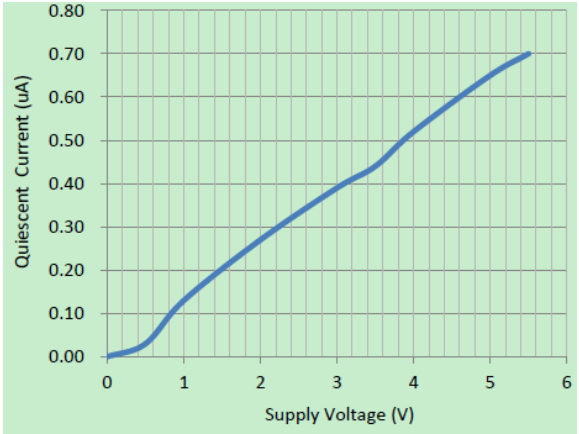
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Operating Input Voltage	V_{IN}		2.5	-	5.5	V
Feedback Voltage	V_{FB}		237	250	263	mV
FB input Bias Current	I_{FB}		-50	-10	-	nA
SW Leakage		V_{SW}=20V	-	-	1	μA
Quiescent Current	I_Q	V_{FB}=0.2V, Switch	-	0.15	0.3	mA
		V_{EN}=0V	-	0.1	1	μA
Oscillator Frequency	f_{SW}		-	1.2	-	MHz
Maximum Duty Cycle	D_{MAX}		-	90	-	%
EN Threshold	V_{EN}		-	1	-	V
OVP Threshold	V_{OVP}		-	28	-	V
SW On-Resistance			-	400	650	mΩ
Current Limit	I_{LIMIT}	V_{IN}=4V, Duty Cycle = 50%	-	1.6	-	A
Thermal Shutdown			-	160	-	°C

TYPICAL PERFORMANCE CHARACTERISTICS

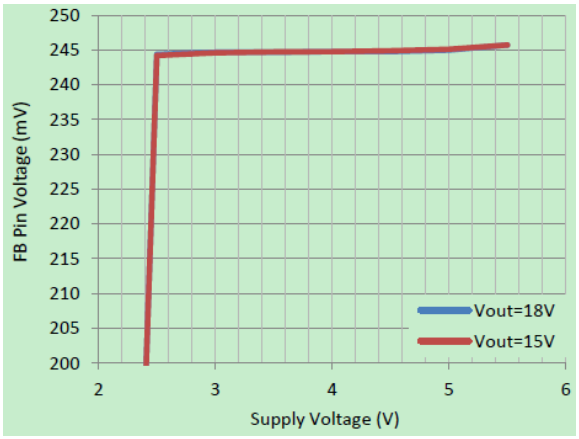
1. EN pin Bias Current vs. EN pin Voltage (V_{EN}=Vin)



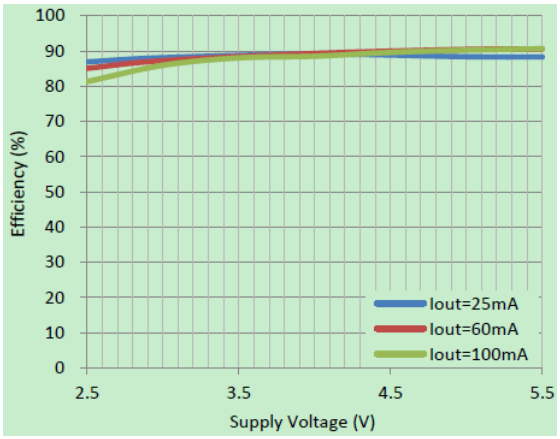
2. Quiescent Current vs. Supply Voltage (V_{EN}=0V)



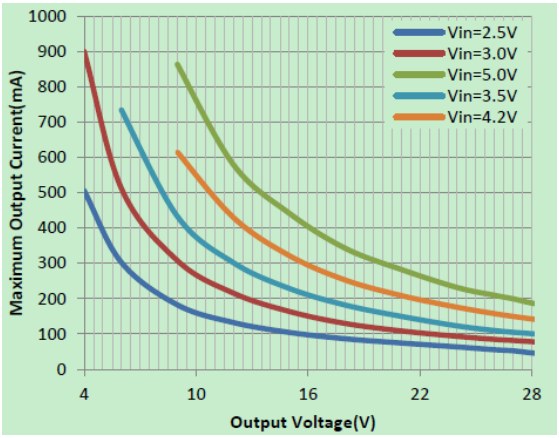
3. FB Pin Voltage vs. Supply Voltage



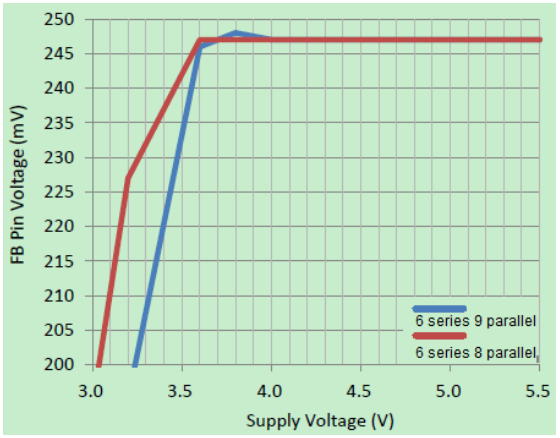
4. Efficiency vs. Output Current (4LEDs)



5. Max. Output Current vs. Output Voltage



6. FB Pin Voltage vs. Supply Voltage



PWM BRIGHTNESS DIMMING CONTROL at EN PIN

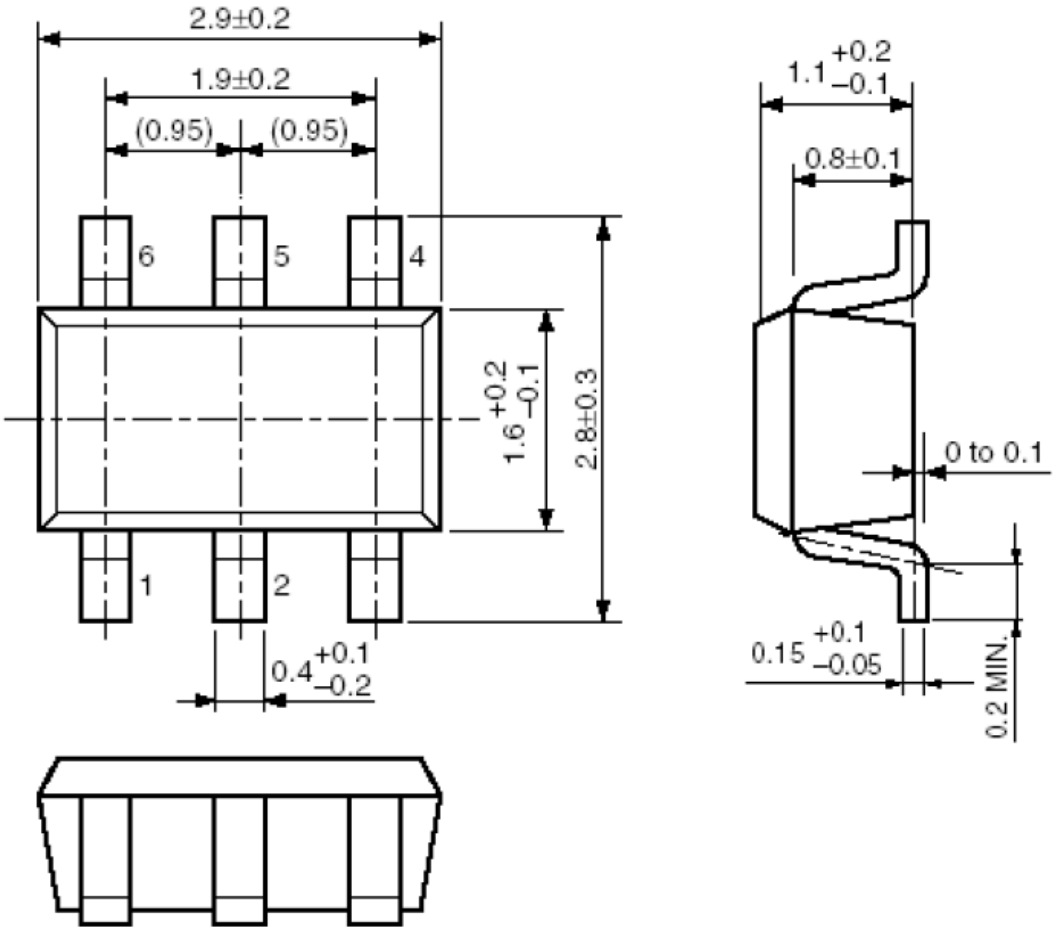
When EN pin is forced a PWM signal with frequency higher than 20kHz, the chip is in dimming mode. The internal circuit changes the feedback voltage according to the duty cycle of the PWM signal. The feedback voltage (V_{FB}) is simply defined as below:

$$V_{FB}=250mV \times Duty\ Cycle\ (\%)$$

To shut down the chip, one has to make the EN signal low, and keep its low state for more than 2.5ms.

PACKAGE INFORMATION

Dimension in SOT-26 (Unit: mm)



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