ACE714B

Step-up DC/DC Converter Backlight Driver

Description

The ACE714B is a fixed frequency, constant current step-up DC/DC converter ideal for driving LEDs used in backlighting applications on cellular phones, PDAs and digital cameras etc. Output voltage of up to 28V can be derived, and from a 2.5V input three white LED's can be driven in series. Luminance of the LED's is controlled by changing the duty cycle of a PWM signal applied to the CE pin. In addition, an internal MOSFET with an Rds-on of 0.3Ω is used. Allow profile and small board area solution can be achieved using a chip coil and an ultra small ceramic output capacitor.

Features

- Input voltage range : 2.5V-5.5V
- Output voltage range : up to 28V
- Low 104mV feedback voltage
- Oscillation frequency : 1.2MHz
- Typical Efficiency : 88%.
- Control : PWM control.
- Stand-by Current : <1μA
- High Supply Capability: Deliver 10V 300mA from 3.5V supply
- Lx limit Current : 1.3A

Application

- For White LED Drivers
- Mobil phones, PHS, PDAs, Digital still cameras

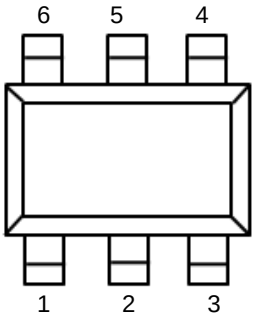
Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Vin Voltage	V_{IN}	V_{SS}-0.3~V_{SS}+6	V
Output Voltage	V_{OUT}	V_{SS}-0.3~V_{SS}+30	V
LX Voltage	V_{LX}	V_{SS}-0.3~V_{SS}+30	V
FB Voltage	V_{FB}	V_{SS}-0.3~V_{SS}+6	V
CE Voltage	V_{CE}	V_{SS}-0.3~+6	V
OVP Voltage	V_{OVP}	V_{SS}-0.3~V_{SS}+30	V
Power Dissipation	P_D	600	mW
Operating Junction Temperature	T_{OPR}	-25 to +85	℃
Storage Temperature Range	T_{STG}	-40 to +125	℃

Caution: The absolute maximum ratings are rated values exceeding which the product could suffer physical damage. These values must therefore not be exceeded under any conditions.

Packaging Type

SOT-23-6L



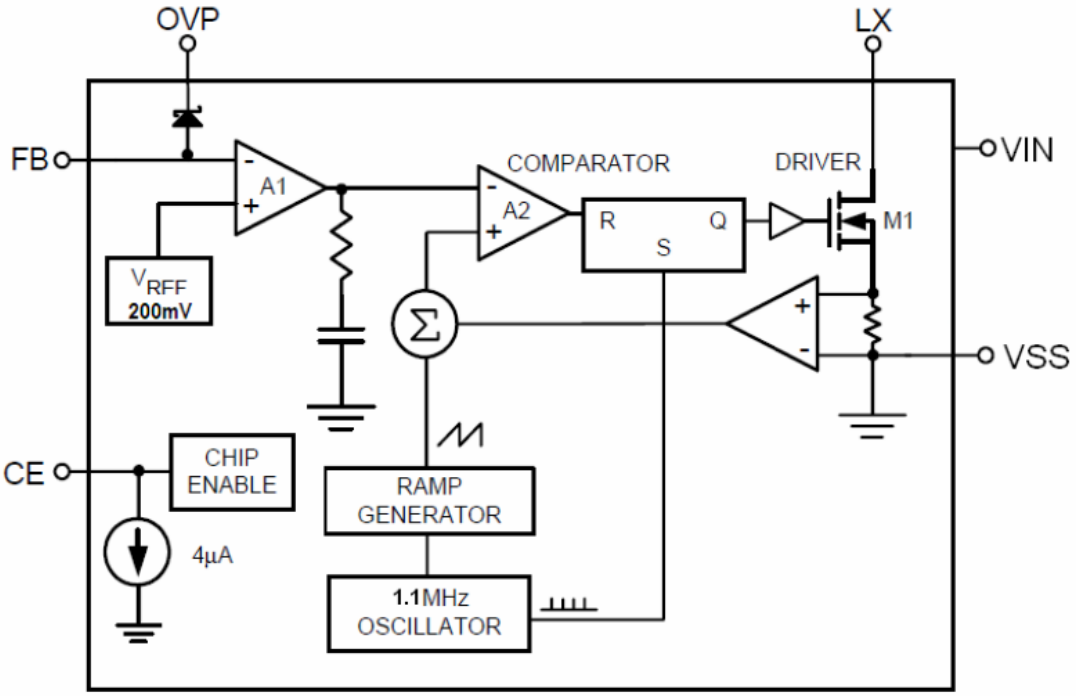
SOT-23-6L	Description	Function
1	LX	Switch
2	VSS	Ground
3	FB	Voltage Feedback
4	CE	Chip Enable
5	OVP	Over Voltage Protect
6	VIN	Power Input

Ordering information

ACE714B XX + H

- Halogen - free
- Pb - free
- GM : SOT-23-6L

Functional Block Diagram



Electrical Characteristics

V_{IN}=V_{CE}=3.7V, T_A=25℃, unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{FB}	FB Control Voltage		94	104	114	mV
V_{IN}	Operating Voltage Range		2.5		5.5	V
I_{STB}	Stand-by Current	V_{CE}=0, V_{IN}=5V			1	μA
F_{OSC}	Oscillation Frequency	I_{OUT}=100mA	1	1.2	1.5	MHz
MAX_{DTY}	Maximum Duty Cycle		85	92		%
EFFI	Efficiency	R_{LED}=5Ω		88		%
I_{LIMIT}	LX Current Limit			1.3		A
V_{OVP}	Overvoltage Protection			20 28		V
$R_{DS(ON)}$	LX On Resistance			300		mΩ
I_{LVL}	LX Leak Current			0	1	μA
V_{CEH}	CE “H” Voltage		1.5			V
V_{CEL}	CE “L” Voltage				0.4	V
	PWM dimming frequency		200		200K	Hz

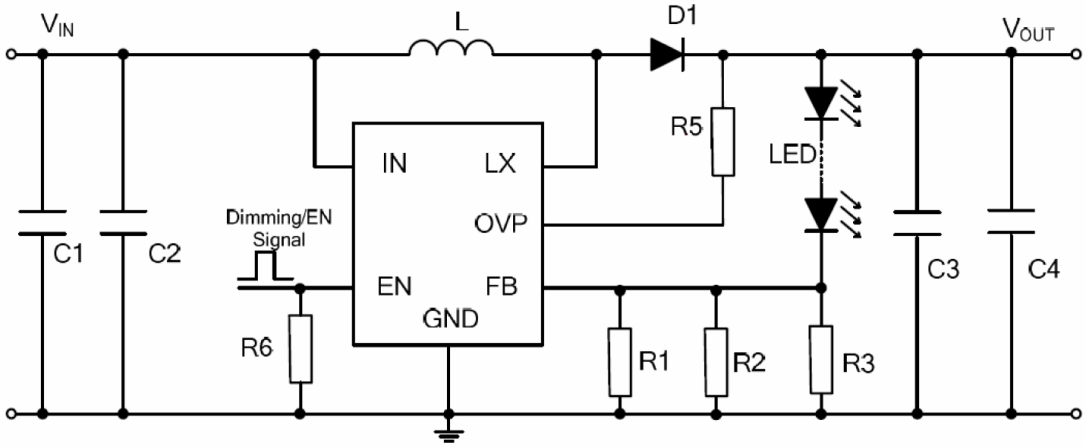
Note: 1. Stresses listed as the above “Absolute Maximum Ratings” may cause permanent damage to the device. These are for stress ratings. Functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may remain possibility to affect device reliability.

2. θJA is measured in the natural convection at T_A = 25°C on a low effective single layer thermal conductivity test board of JEDEC51-3 thermal measurement standard. Pin 2 of SOT23-6 packages is the case position for θJC measurement.

3. The device is not guaranteed to function outside its operating conditions.

4. EN pin voltage must be higher than 1.5V.

Typical Application Circuit



Design Specifications

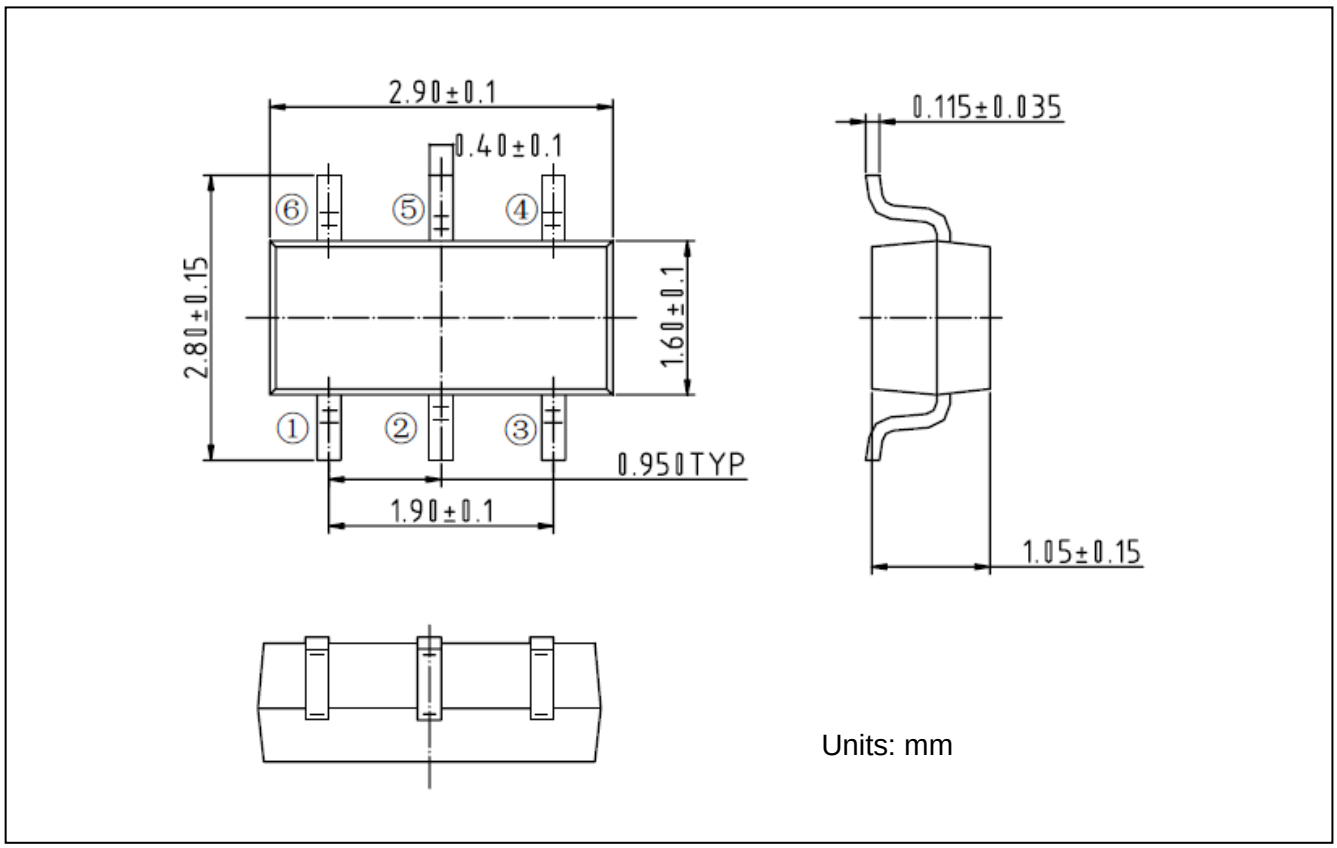
Input Voltage (V)	Input Current (A)	Output Current (A)	Test conditions
3.7V	0~1.5A	0.2A	3PCS LED Series

Bom List

Reference Designator	Description
L	4.7~22uH, Inductor
C1	47uH/50V,EC
C2	4.7uF/25V
C3, C4	10uF/50V
R2	1Ω, 1%, 0603
R3	2Ω, 1%, 0603
R5	0Ω, 1%, 0603
R6	1M, 1%, 0603
D1	SS34

Packing Information

SOT-23-6L



Notes

ACE does not assume any responsibility for use as critical components in life support devices or systems without the express written approval of the president and general counsel of ACE Electronics Co., LTD. As sued herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and shoes failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury to the user.
2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.