Step-up DC/DC Converter —Backlight Driver

■ General Description

The LN2115 Series 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 3.2V input four white Led's cab be driven in series or alternatively, using a 3.0V input, a network of six LEDs may be driven. Luminance of the LED's is controlled by changing the duty cycle of a PWM signal applied to the CE pin.

■ Features

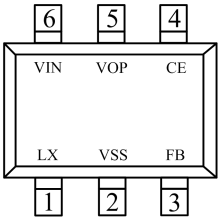
- Input voltage range 2.5V—6V
- Output voltage range up to 28V
- Oscillation frequency 1.5MHz±20%
- Efficiency 88%(When driving 3 white LEDs in series VIN=3.6V ILED=20mA)
- Control PWM control
- Stand-by Current ISTB=1.0uA(MAX)
- Load capacitor 10uF,ceramic
- LX limit Current 1000mA

■ Applications

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

■ Package

- SOT-23-6L



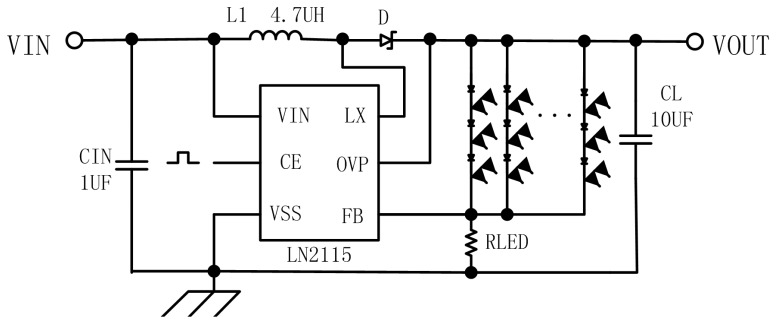
SOT-23-6L
(Top View)

■ Ordering Information

LN2115 ①②③④⑤⑥

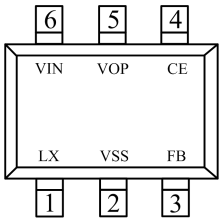
Item	Symbol	Function
①	B	Denotes Lx Overvoltage Limit: Yes Denotes Oscillation Frequency:1.5MHZ
②③④	025	Denotes FB Voltage:0.25V
⑤	M	Denotes Package Type : SOT-23-6L
⑥	R	Embossed Tape :Standard Feed
	L	Embossed Tape :Reverse Feed

■ Typical Application Circuit



Caution The value of the resistance named RLED: $R_{LED}=V_{FB}/I_{LED}$; V_{FB} is the voltage 0f the FB pin; I_{LED} is the current of LED.

■ Functional Pin Description

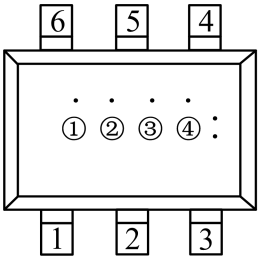


SOT-23-6L
(Top View)

Pin Number	Pin Name	Function
1	LX	SWITCH
2	VSS	Ground
3	FB	Voltage Feedback
4	CE	Chip Enable
5	OVP	Over voltage protect
6	VIN	Power Input

■ Marking Rule

- **SOT-23-6L**



SOT-23-6L
(Top View)

① **Represents the product name**

Symbol	Part Number
Z	LN2115****M*

② ③**Represents he voltage of FB pin and the type of regulator**

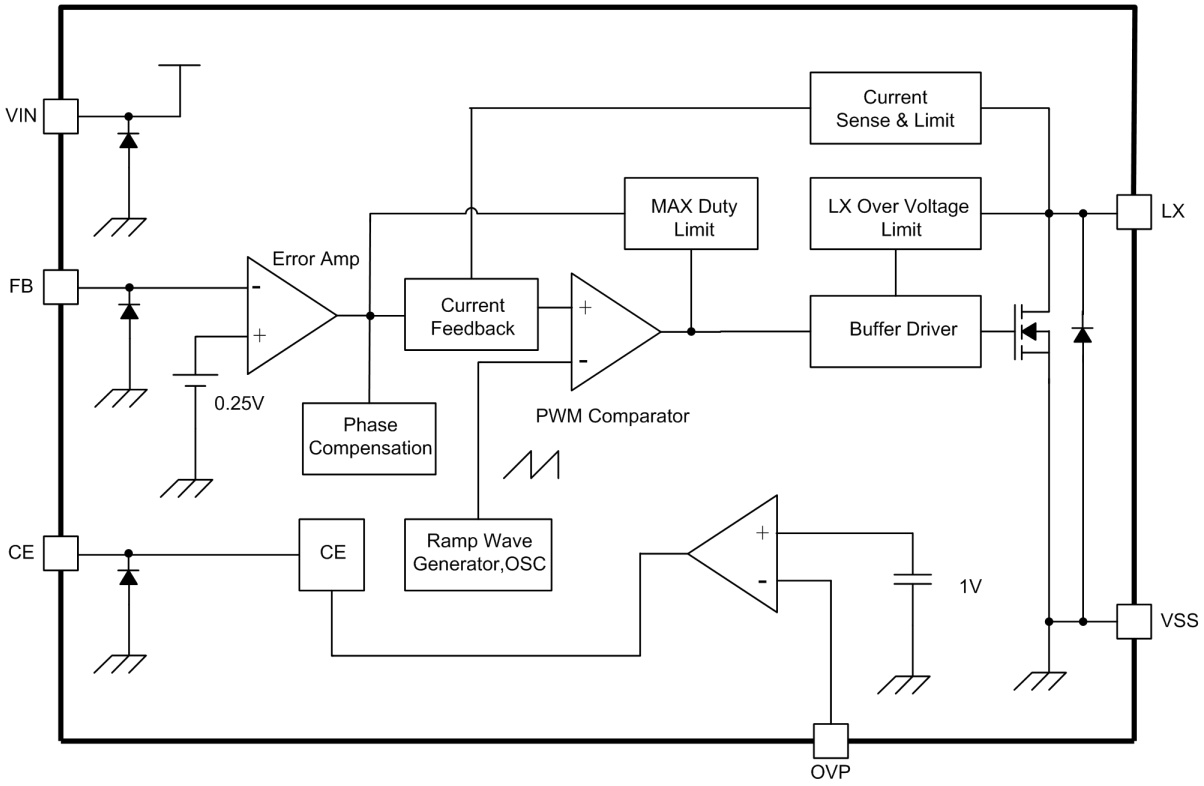
Symbol	Vfb
L5	0.25V±0.01V

③ **Represents the assembly lot no**

0～9，A～Z ,Reverts 0～9，A～Z repeated (G,I,J,O,Q,W expected)

Note: the dots around the marking are represents the product quality tracking infromations.

■ Function Block Diagram



■ Absolute Maximum Ratings

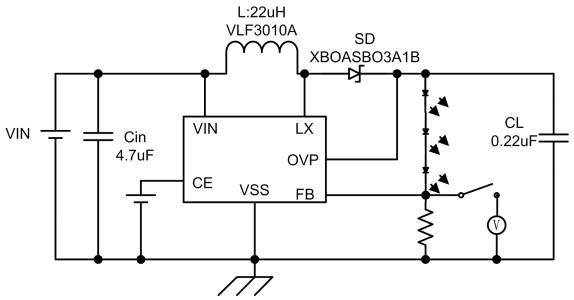
Item	Symbol		Absolute maximum ratings	Unit
VIN Pin Voltage	V_{IN}		Vss-0.3～Vss+7	V
OUT Pin Voltage	V_{OUT}		Vss-0.3～Vss+28	
LX Pin Voltage	V_{LX}		Vss-0.3～Vss+28	
FB Pin Voltage	V_{FB}		Vss-0.3～Vss+7	V
CE Pin Voltage	V_{CE}		Vss-0.3～Vss+7	V
OVP Pin Voltage	V_{OVP}		Vss-0.3～Vss+28	
LX Pin Current	I_{LX}		1000	mA
Power Dissipation	PD	SOT-23-6	250	mW
Operating Temperature range	Topr		-40～＋85	℃
Storage Temperature range	Tstg		-55～＋125	

■ Electrical Characteristics

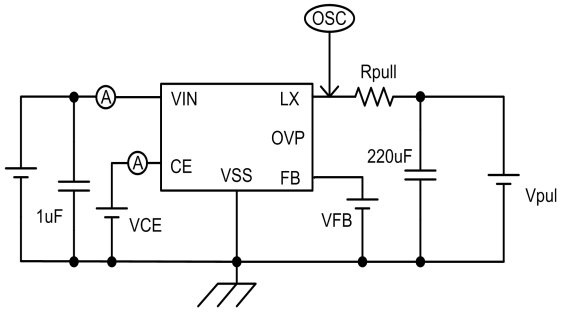
(Ta=25℃, unless otherwise noted)

Item	Symbol	Condtion	Min.	Typ.	Max.	Unit	Circuits
FB Control Voltage	VFB	-	0.24	0.25	0.26	V	1
Output Voltage range	VOUT	-	VIN	-	28		
Lx Operating Voltage range	VLX		-	-	29		
Operating Voltage range	VIN		2.5	-	6		
Stand-by Current	ISTB	VCE=0V、VLX=5V	—		1	μA	3
Supply Current 1	IDD1			550		μA	2
Supply Current 2	IDD2	VIN=VLX、VFB=0.4V	—	65			3
Oscillation Frequency	FOSC		1.2	1.5	1.8	MHz	2
Maximum Duty Cycle	MAXDTY	VCONT=0.4V	86	92	98	%	2
Efficiency	EFFI	VIN=3.6V;RLED=20Ω	—	88	—	%	1
Current Limit	ILIM	VIN=3.6		1000		mA	4
OVP Overvoltage Limit	OVPVL		20	22.5	25	V	2
LX On Resistance		VIN=3.6V、VLX=0.4V		2.0		Ω	2
LX Leak Current	ILXL			0	1	μA	3
CE 'H' Voltage	VCEH		0.65			V	2
CE 'L' Voltage	VCEL				0.2	V	2
CE 'H' Current	ICEH	VIN=VLX、VFB=0.4V			0.1	μA	3
CE 'L' Current	ICEL	VCE=0V、 VLX=5V			-0.1	μA	3
FB 'H' Current	ICEH	VIN=VLX、VFB=0.4V			0.1	μA	3
FB 'L' Current	ICEL	VCE=0V、 VLX=5V			-0.1	μA	3

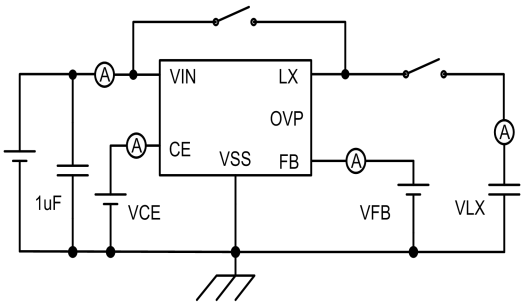
■ Test Circuits



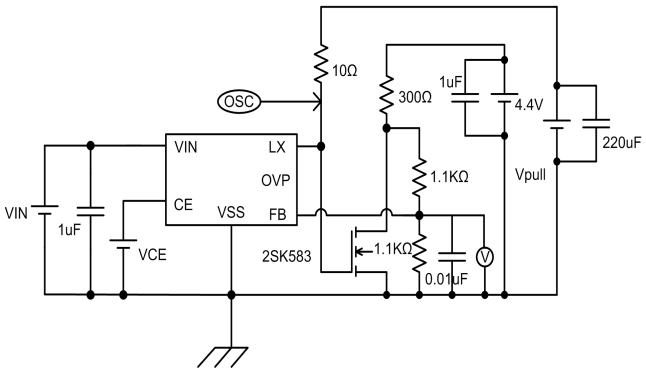
Circuit 1



Circuit 2



Circuit 3

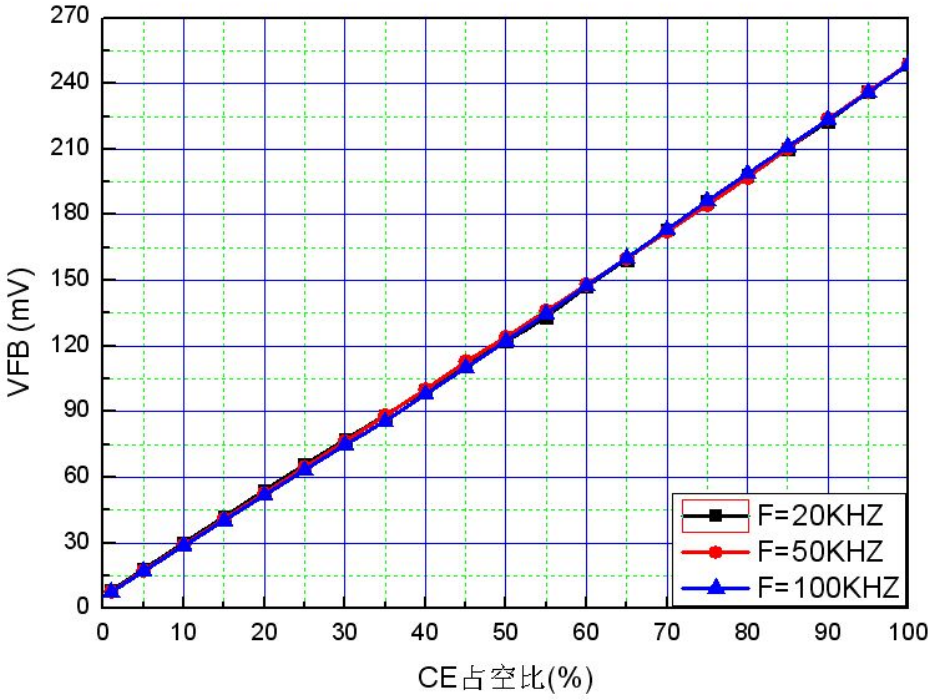


Circuit 4

Caution The value of the resistance named RLED: RLED=VFB/ILED；VFB is the voltage 0f the FB pin; ILED is the current of LED and equal to 20mA usually.

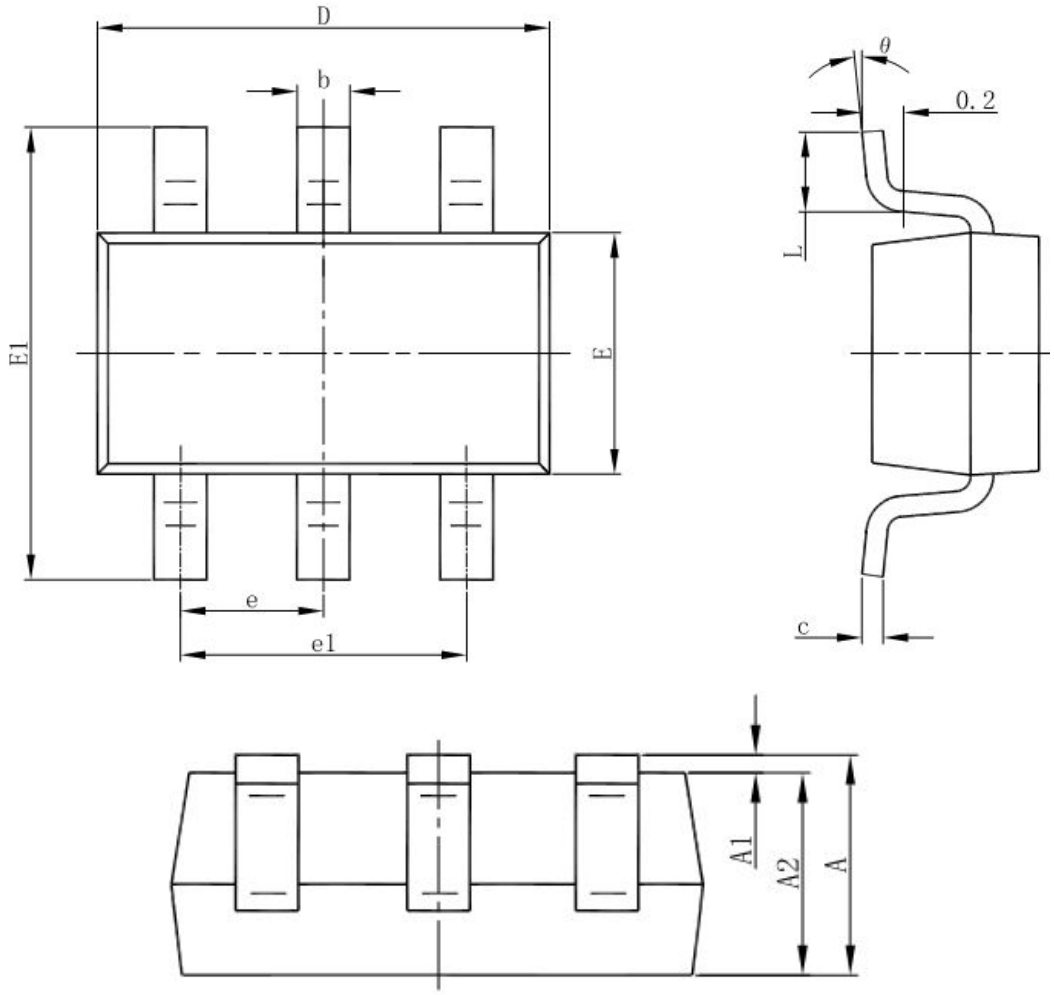
■ Typical Performance Characteristics

PWM duty vs LED CURRENT



■ Package Information

- **SOT-23-6L**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°