PWM Control Step-up DC/DC Converter —Backlight Driver

■ General Description

The LN2112 Series is a fixed frequency, constant current step-up DC/DC converter ideal for driving LEDs used in backlighting applications on MR16 etc.

It uses high-voltage CMOS process, the maximum input voltage is 20V. When input voltage is high , LN2112 have a strong drive capability, so it can achieve high-power constant drive requirements.

LN2112 control constant current through an external resistor. As a result of both internal 1.4MHz PWM mode, allowing external inductors and capacitors can be greatly reduced. A heat sink SOP-8 package is used to get the maximum degree of reduction in the high-power drive.

■ Features

- Input voltage range : 6.8V—20V
- Output voltage range : up to 20V
- Oscillation frequency : 1.4MHz±20%
- Efficiency : 95%
- Control mode : PWM control
- Stand-by Current I_{STB}<6.0μA(MAX)

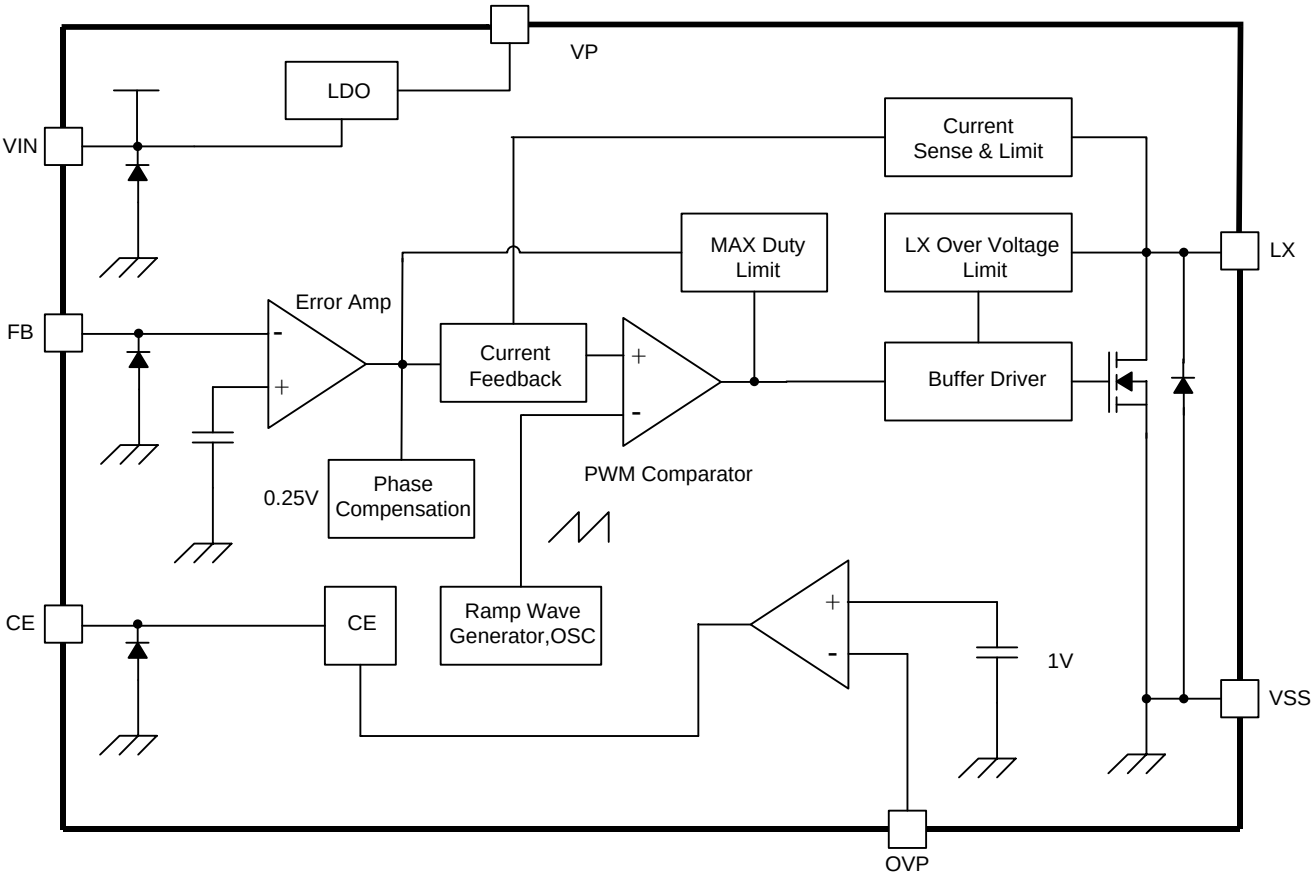
■ Applications

- MR16 LED Driver
- LED backlight driver

■ Package

- SOP-8/PP

■ Function Block Diagram

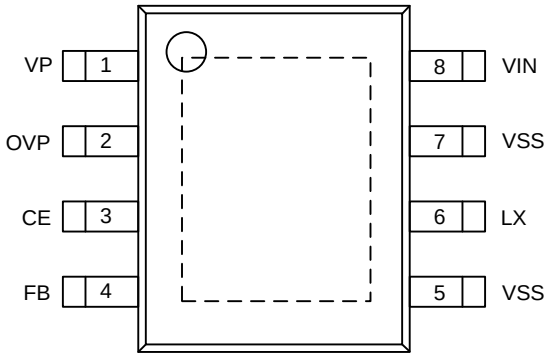


■ Ordering Information

LN2112 ①②③④⑤⑥

Item	Symbol	Function
①	B	Denotes lx overvoltage limit: Yes Denotes oscillation frequency:1.4MHz
②③④	010-149	Denotes FB Voltage e.g. ②=0 ③=2 ④=0 → 0.20V ②=1 ③=2 ④=3 → 1.23V
⑤	M	Denotes Package Type : SOP-8/PP
⑥	R	Embossed Tape : Standard Feed
	L	Embossed Tape : Reverse Feed

■ Functional Pin Description



SOP-8/PP

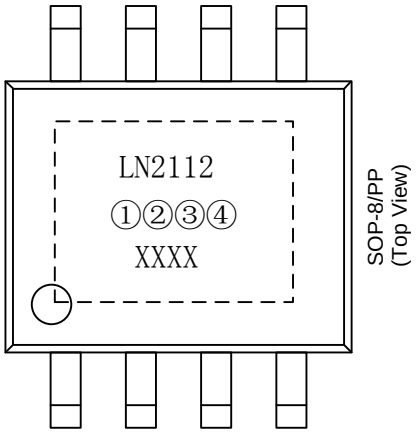
Pin Number	Pin Name	Function
1	VP	LDO output voltage
2	OVP	Output voltage
3	CE	Chip enable
4	FB	Feedback pin
5、7	VSS	Ground pin
6	LX	Switch pin
8	VIN	Input pin

■ Absolute Maximum Ratings

Item	Symbol		Absolute maximum ratings	Unit
VIN Pin Voltage	V_{IN}		Vss-0.3～Vss+22	V
OUT Pin Voltage	V_{OUT}		Vss-0.3～Vss+22	
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+22	
LX Pin Current	I_{LX}		2000	mA
Power Dissipation	PD	SOP-8/PP	1.33	W
Operating Temperature range	Topr		-40～＋85	℃
Storage Temperature range	Tstg		-55～＋125	

■ Marking Rule

- **SOP-8/PP**



①②③ Represents the voltage of FB pin

Symbol	Vfb	Part Number
025	0.25	LN2112*025**

④ Represents the Oscillation Frequency

Symbol	Frequency	Part Number
A	1.4MHZ	LN2112B*****

XXXX Represents the assembly lot No.

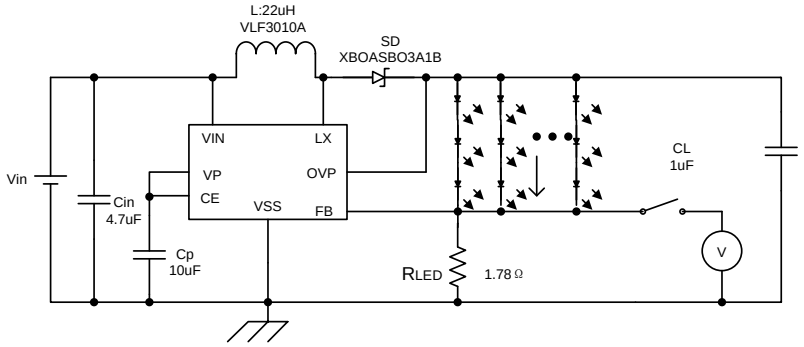
■ Electrical Characteristics

(Ta=25℃, unless otherwise noted)

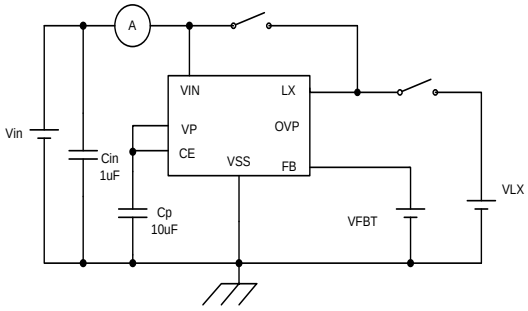
Item	Symbol	Condition	Min.	Typ.	Max.	Unit	Circuits
FB Control Voltage	V_{FB}	-	0.225	0.25	0.275	V	1
Output Voltage range	V_{OUT}	-	VIN	-	22		
Lx Operating Voltage range	V_{LX}		-	-	26		
Operating Voltage range	V_{IN}		6.8	-	20		
Stand-by Current	I_{STB}	V_{CE}=0V、V_{IN}=8V	—		6	μA	2
Supply Current 1	I_{DD1}			3650		μA	2
Supply Current 2	I_{DD2}	V_{IN}=V_{LX}、V_{FB}=0.4V	—	150			2
Oscillation Frequency	F_{OSC}		1.2	1.4	1.6	MHz	1
Maximum Duty Cycle	MAXDTY	V_{FB}=0V	78	85	92	%	2
Efficiency	EFFI		—	88	—	%	1
Current Limit	I_{LIM}	V_{IN}=8V		2000		mA	2
OVP Overvoltage Limit	OVP_{OVL}			22		V	3
LX On Resistance		V_{IN}=8V、V_{LX}=0.4V		0.2		Ω	2
LX Leak Current	I_{LXL}			0	1	A	2
CE ‘H’ Voltage	V_{CEH}		1			V	2
CE ‘L’ Voltage	V_{CEL}				0.6	V	2
CE ‘H’ Current	I_{CEH}	As I_{DD2}			0.1	μA	2
CE ‘L’ Current	I_{CEL}	As I_{STB}			-0.1	μA	2
FB ’H’ Current	I_{CEH}	As I_{DD2}			0.1	μA	2
FB ’L’ Current	I_{CEL}	As I_{STB}			-0.1	μA	2

■ Test Circuits

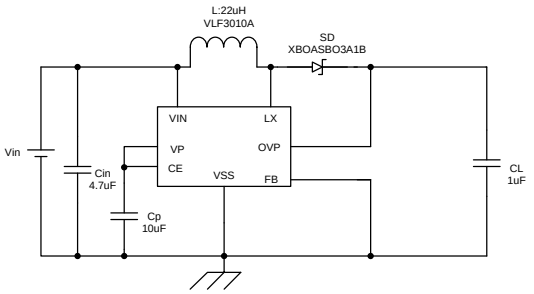
- **Circuit 1**



- **Circuit 2**

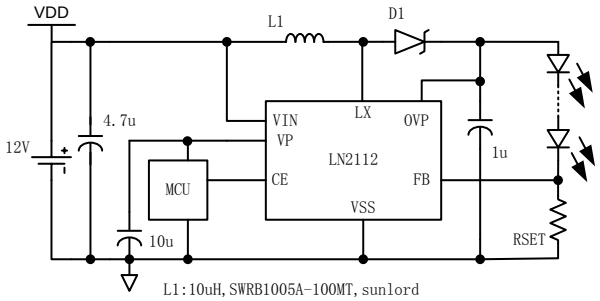


- **Circuit 3**



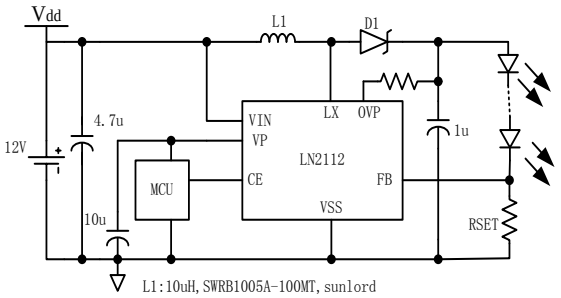
■ Typical Application Circuit

- **4-6W application**



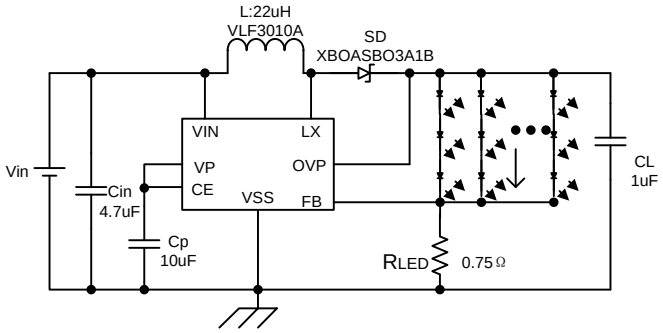
L1:10uH,SWRB1005A-100MT,sunlord
D: schottky,SS24
MCU产生1-3KHZ的PWM信号控制输出亮度变化

- **7-8W application**



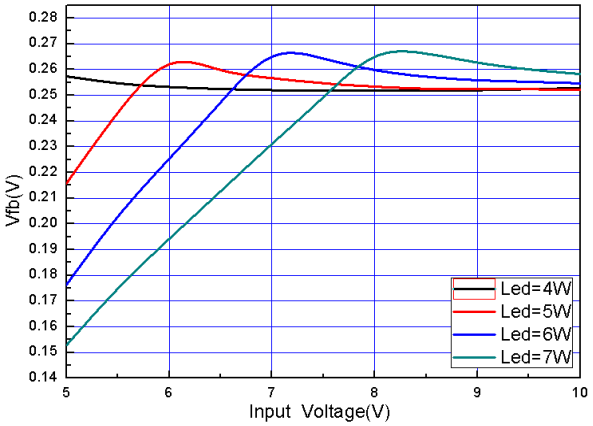
L1:10uH,SWRB1005A-100MT,sunlord
D: schottky,SS24
MCU产生1-3KHZ的PWM信号控制输出亮度变化

- **Large-screen LCD screen backlight applications**

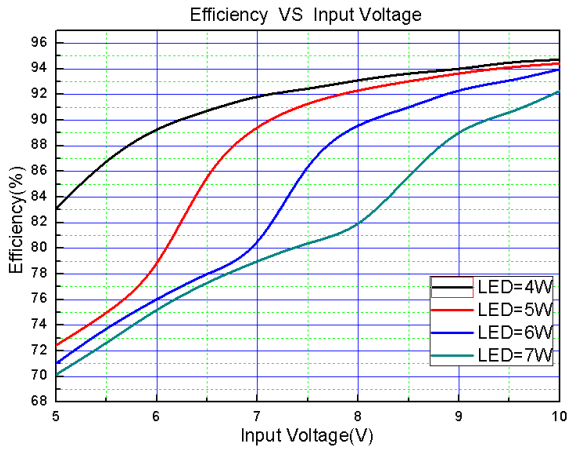


■ Typical Performance Characteristics

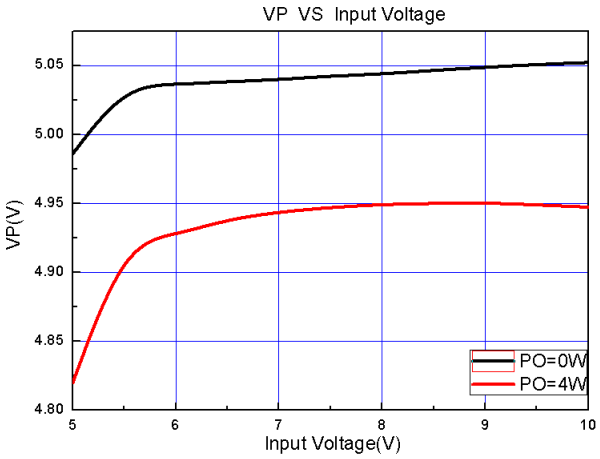
- **Input voltage VS output efficiency**



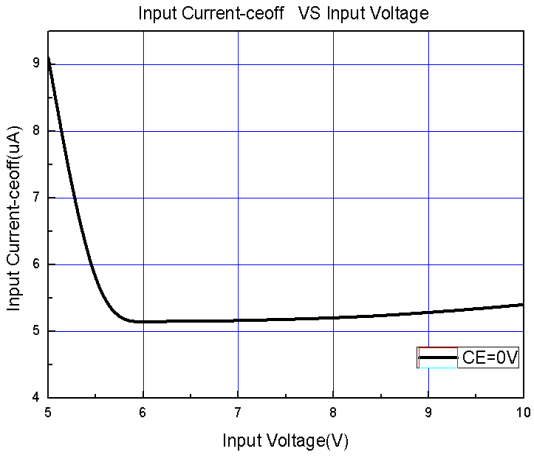
- **Input VS feedback voltage**



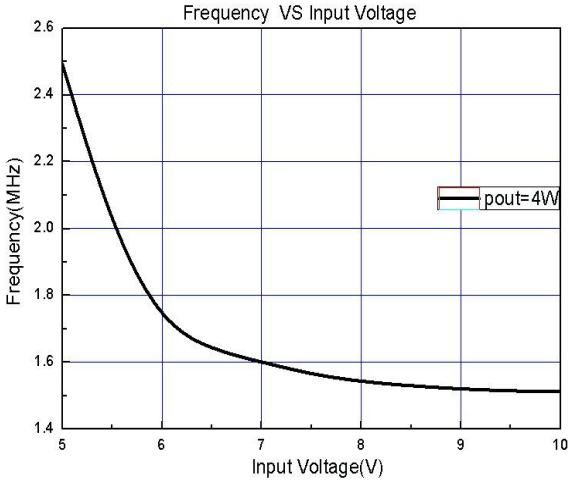
- **Input voltage VS VP output voltage**



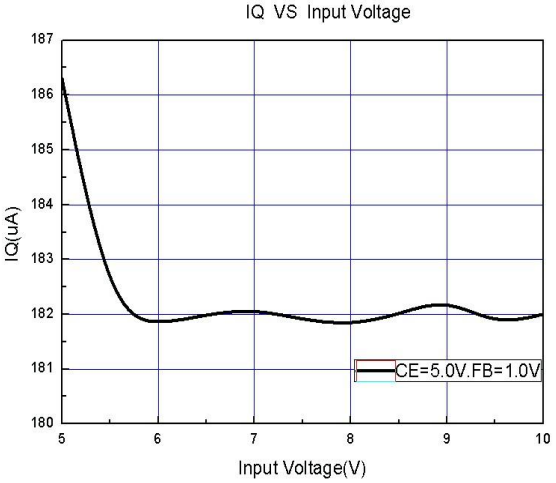
- **Input voltage VS shutdown current**



- **Input voltage VS frequency**

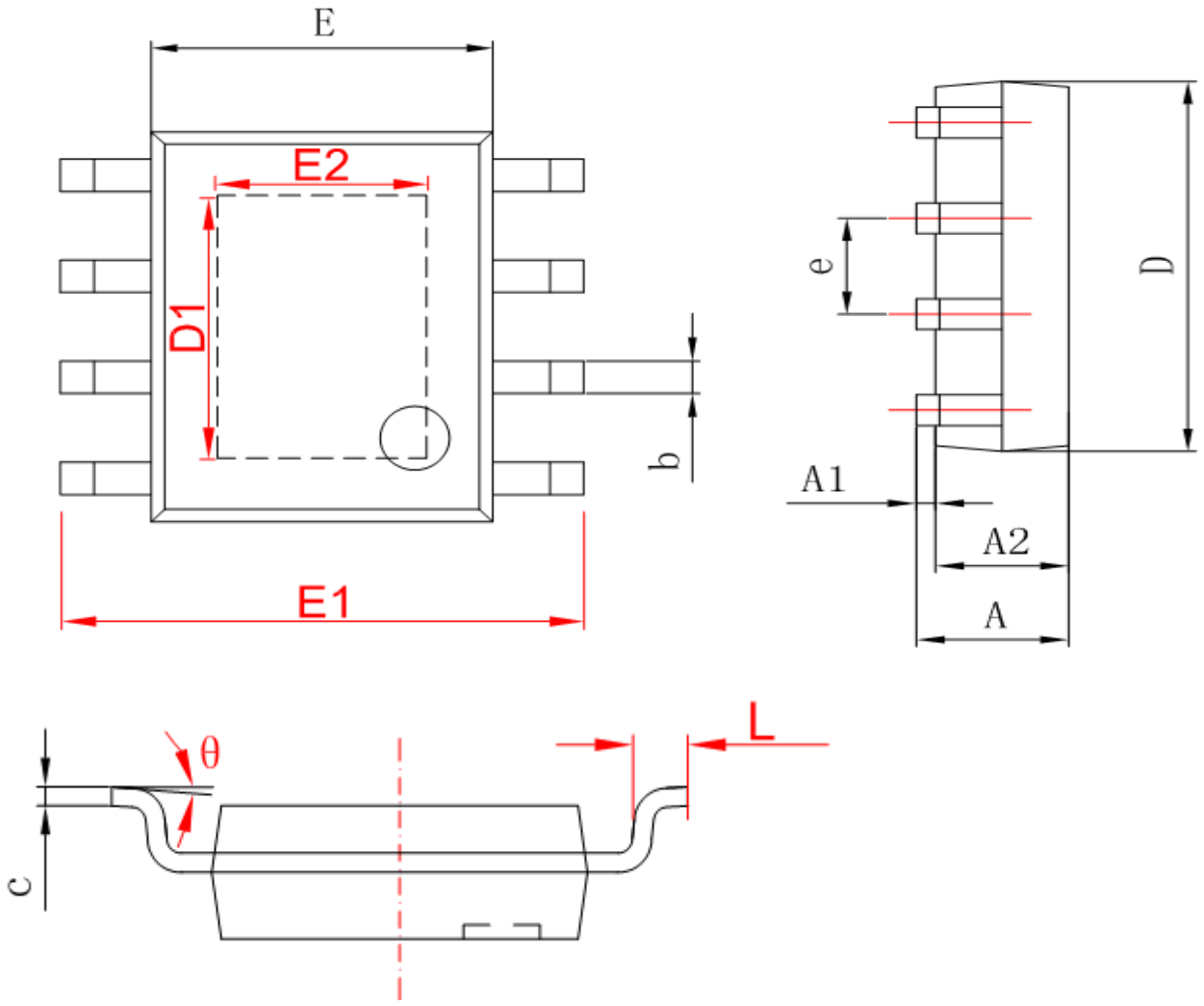


- **Input voltage VS quiescent current**



■ Package Information

- **SOP-8/PP**



字符	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.050	0.150	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
D1	3.202	3.402	0.126	0.134
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
E2	2.313	2.513	0.091	0.099
e	1.270 (BSC)		0.050 (BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°