DESCRIPTION

The XZ5121 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 17.5V can be derived, and from a 3.2V input four white Led's cab be driven in series or alternatively, using a 2.5V input, a network of two parallel legs with three in each may be driven.

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 2Ω is used. Allow profile and small board area solution can be achieved using a chip coil and an ultra small ceramic output capacitor (CL) of 0.22uF.

FEATURES

- input voltage range : 2.5V—6V
- Output voltage range : up to 17.5V externally set-up reference voltage 0.2V±5%
- Oscillation frequency : 1.0MHZ±20% :
- On resistance : 2.0Ω
- 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 : 0.22uF,ceramic
- Lx limit Current :300mA

APPLICATIONS

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

PACKAGE

SOT23—6

BLOCK DIAGRAM

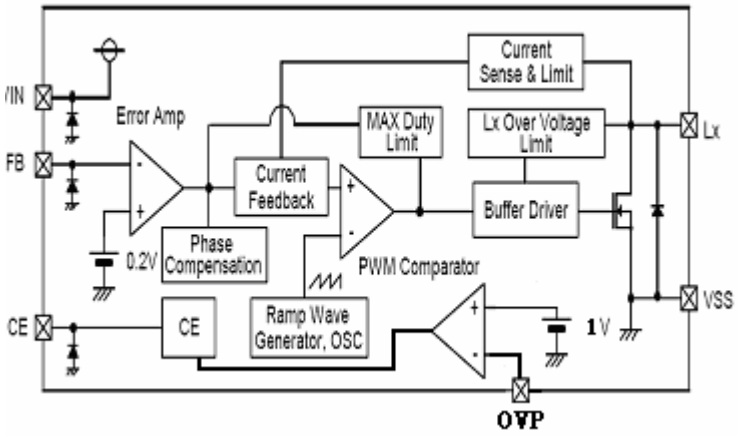


Figure 1

■ ABSOLUTE MAXIMUM RATINGS

Item	Symbol		Absolute maximum ratings	Unit
VIN Pin Voltage	VIN		Vss-0.3～Vss+7	V
OUT Pin Voltage	VOUT		Vss-0.3～Vss+7	
LX Pin Voltage	VLX		Vss-0.3～Vss+22	
FB Pin Voltage	Vfb		Vss-0.3～Vss+7	V
CE Pin Voltage	Vce		Vss-0.3～Vss+7	V
OVP Pin Voltage	Vovp		Vss-0.3～Vss+22	
LX Pin Current	ILX		1000	mA
Power Dissipation	PD	SOT23-6	250	mW
Operating Temperature range	Topr		-40～＋85	℃
Storage Temperature range	Tstg		-55～＋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.

■ Electrical Characteristics

(Ta=25°C,except specify)

Item	Symbol	Condtion	Min.	Typ.	Max.	Unit	Circuits
FB Control Voltage(*1)	VFB	-	Vfbt*0.95	Vfbt	Vfbt*1.05	V	1
Output Voltage range	VOUT	-	VIN	-	17.5		
Lx Operating Voltage range	VLX		-	-	20·0		
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		0.8	1.0	1.2	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		300		mA	4
LX Overvoltage Limit	LXOVL		18.0	19.0		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	VIN=VLX、VFB=0.4V			-0.1	μA	3
FB 'H' Current	ICEH	VIN=VLX、VFB=0.4V			0.1	μA	3
FB 'L' Current	ICEL	VIN=VLX、VFB=0.4V			-0.1	μA	3

(*1) Vfbt may take between 0.01V-1.49V certain value, now a major center value 0.01V, 0.2V,0.23V,0.25V;

■ TEST CIRCUITS

Circuit ①

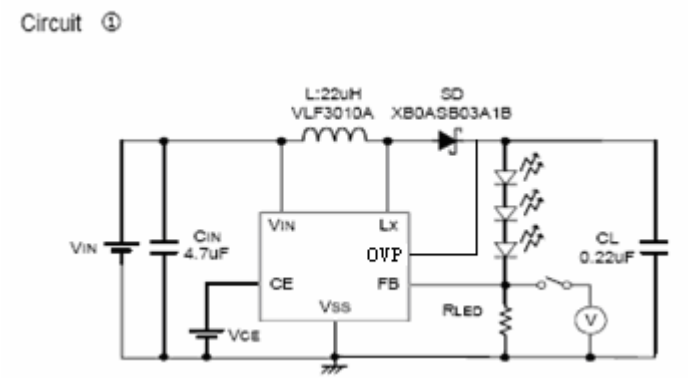


Figure 2

Circuit ②

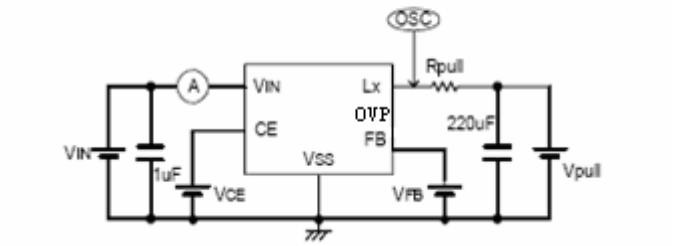


Figure 3

Circuit ③

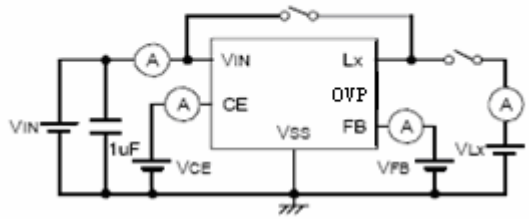


Figure 4

Circuit ④

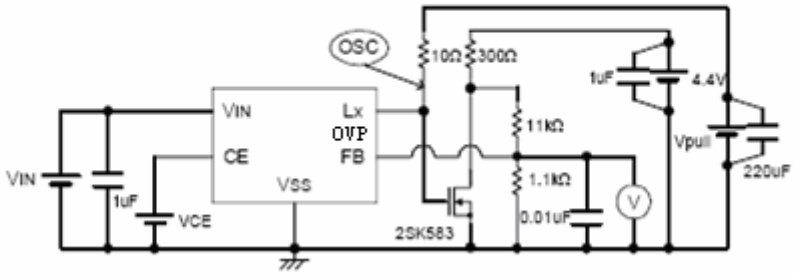


Figure 5

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 APPLICATION CIRCUIT

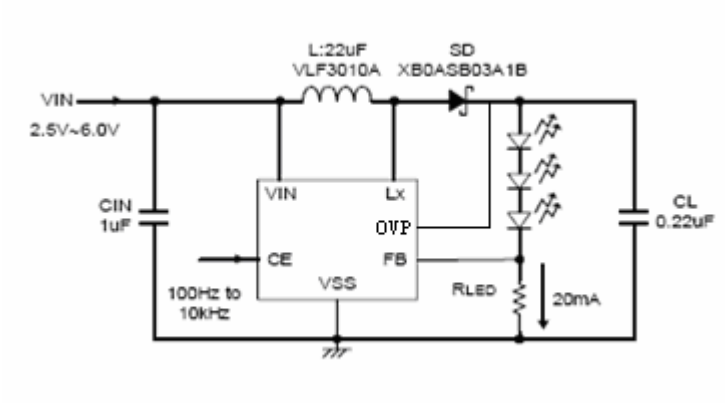
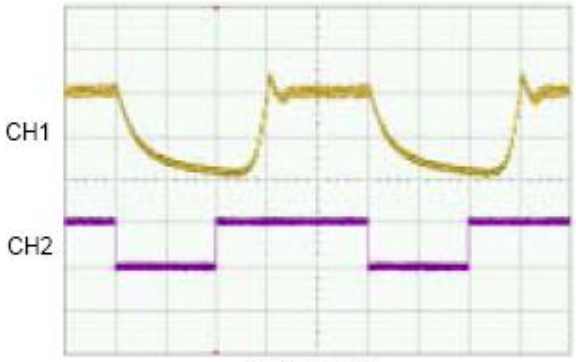


图 6

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;

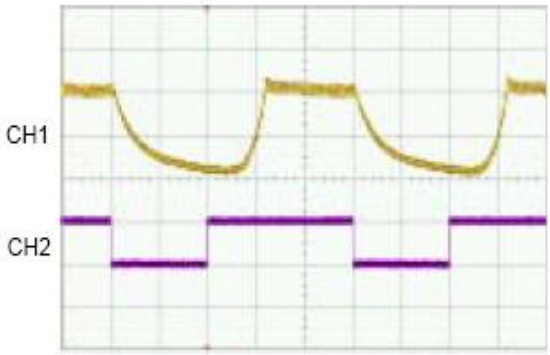
■ TYPICAL PERFORMANCE CHARACTERISTICS

10kHz, 3 series LED, ILED = 20mA



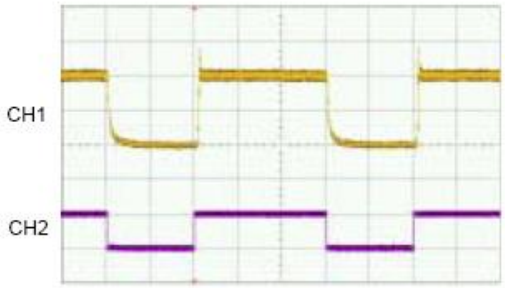
20µsec / div
CH1 : FB, 100mV / div, CH2 : CE, 1V / div

10kHz, 4 series LED, ILED = 20mA



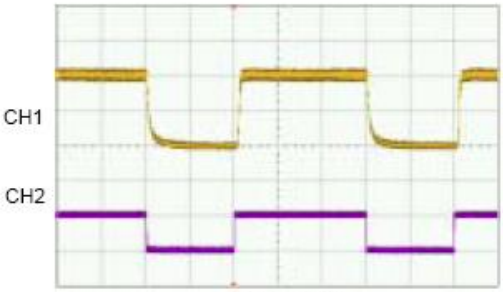
20µsec / div
CH1 : FB, 100mV / div, CH2 : CE, 1V / div

1kHz, 3 series LED, ILED = 20mA



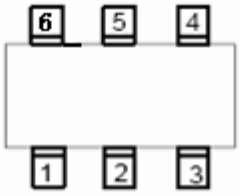
200µsec / div
CH1 : FB, 100mV / div, CH2 : CE, 1V / div

1kHz, 3 series LED, ILED = 20mA



200µsec / div
CH1 : FB, 100mV / div, CH2 : CE, 1V / div

■ Pin Configuration



SOT23-6(TOP VIEW)

■ Pin Assignment

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

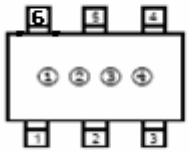
■ ORDERING INFORMATION

XZ5121①②③④⑤⑥

Item	Symbol	Function
①	B	Denotes Lx Overvoltage Limit: Yes Denotes Oscillation Frequency:1MHZ
②③④	010-149	Denotes FB Voltage eg：② =0 ③ =2 ④ =0 0.20V ② =1 ③ =2 ④ =3 1.23V
⑤	M	Denotes Package Type : SOT23-6
⑥	R	Embossed Tape :Standard Feed
	L	Embossed Tape :Reverse Feed

■ MARKING

SOT23-6



①Represents the product name

Symbol	Part Number
Z	XZ5121****M*

②Represents the type of regulator

Symbol	Vfb(V)	Part Number
S	0.050-0.195	XZ5121B***M*
L	0.20-0.49	XZ5121B***M*
H	1.20-1.49	XZ5121B***M*

③Represents the voltage of FB pin

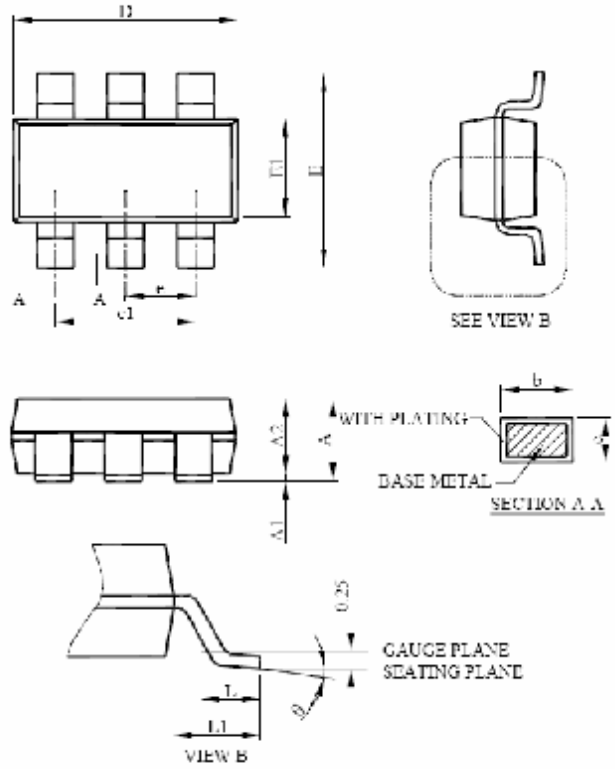
Symbol	Vfb(V)			Symbol	Vfb(V)		
0	0.20	0.050	1.20	F	0.35	0.125	1.35
1	0.21	0.055	1.21	H	0.36	0.130	1.36
2	0.22	0.060	1.22	K	0.37	0.135	1.37
3	0.23	0.065	1.23	L	0.38	0.140	1.38
4	0.24	0.070	1.24	M	0.39	0.145	1.39
5	0.25	0.075	1.25	N	0.40	0.150	1.40
6	0.26	0.080	1.26	P	0.41	0.155	1.41
7	0.27	0.085	1.27	R	0.42	0.160	1.42
8	0.28	0.090	1.28	S	0.43	0.165	1.43
9	0.29	0.095	1.29	T	0.44	0.170	1.44
A	0.30	0.100	1.30	U	0.45	0.175	1.45
B	0.31	0.105	1.31	V	0.46	0.180	1.46
C	0.32	0.110	1.32	X	0.47	0.185	1.47
D	0.33	0.115	1.33	Y	0.48	0.190	1.48
E	0.34	0.120	1.34	Z	0.49	0.195	1.49

④ Represents the assembly lot no.

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

■ PACKAGING INFORMATION

- **SOT-23-6**



SYMBOL	SOT-26	
	MILLIMETERS	
	MIN	MAX
A	0.95	1.45
A1	0.05	0.15
A2	0.90	1.30
b	0.30	0.50
c	0.08	0.22
D	2.80	3.00
E	2.60	3.00
E1	1.50	1.70
e	0.95 BSC	
e1	1.90 BSC	
L	0.30	0.60
L1	0.60 REF	
θ	0°	8°