DESCRIPTION

The A8168 Series is a fixed frequency, constant current step-up DC/DC converter idea for driving LEDs used in backlighting application 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 can 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 $R_{DS(ON)}$ 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.

The A8168 is available in SOT-26 Package.

FEATURES

- Oscillation frequency : 1.0 MHZ
- Output voltage range ; up to 17.5V externally set-up reference voltage 0.2V
- On resistance : 2.0Ω
- Efficiency : 88%(When driving 3 white LEDs in series Vin=3.6V I_{LED}=20mA)
- Control : PWM control
- Stand-by Current : I_{STB}=1.0μA(MAX)
- Load capacitor : 0.22μF, ceramic
- Lx Limit Current : 300mA
- Available in SOT-26 package

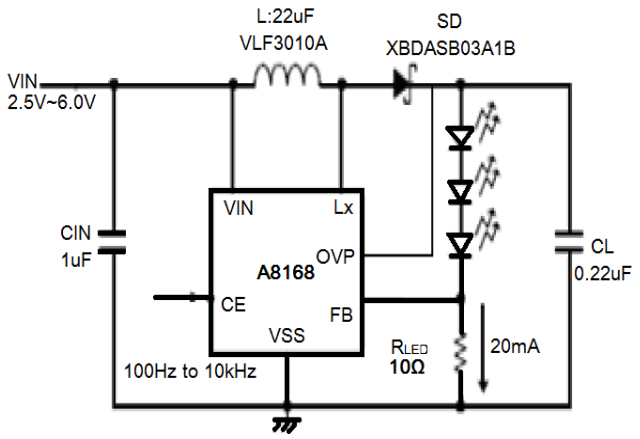
APPLICATIONS

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

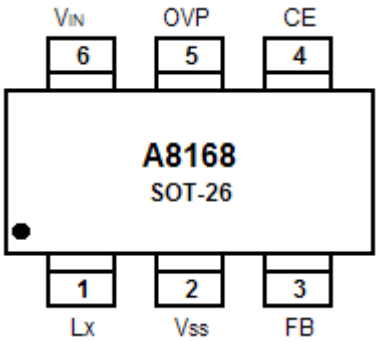
ORDERING INFORMATION

Package Type	Part Number	
SOT-26	E6	A8168E6R-XXX
		A8168e6vr-xxx
Note	XXX: FeedBack Voltage 020~149=0.2V~1.49V 0.20~0.49V:Low 1.20 ~ 1.49V:High R: Tape & Reel V: Green Package	
AiT provides all Pb free products Suffix " V " means Green Package		

TYPICAL APPLICATION



PIN DESCRIPTION



Top View

Pin #	Pin Name	Function
1	LX	Switch
2	V_{SS}	Ground
3	FB	Voltage Feedback
4	CE	Chip Enable
5	OVP	Over Voltage Protect
6	V_{IN}	Power Input

ABSOLUTE MAXIMUM RATINGS

V_{IN} Pin Voltage (V_{IN})	Vss-0.3V ~ Vss+7V
OUTPUT Pin Voltage (V_{OUT})	Vss-0.3V ~ Vss+7V
LX Pin Voltage (V_{LX})	Vss-0.3V ~ Vss+22V
FB Pin Voltage (V_{FB})	Vss-0.3V ~ Vss+7V
CE Pin Voltage (V_{CE})	Vss-0.3V ~ Vss+7V
OVP Pin Voltage(V_{OVP})	Vss-0.3V ~ Vss+22V
LX Pin Current (I_{LX})	1000mA
Power Dissipation (P_D ,SOT26)	250mW
Operating Temperature Range(T_{OPR})	-40℃ ~ + 85℃
Storage Temperature range (T_{STG})	-55℃ ~ + 125℃

Stresses above may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the Electrical Characteristics is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

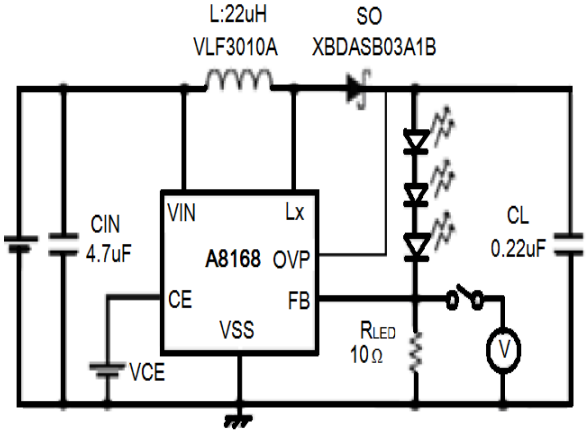
ELECTRICAL CHARACTERISTICS

T_A=25°C, Unless Otherwise Specified

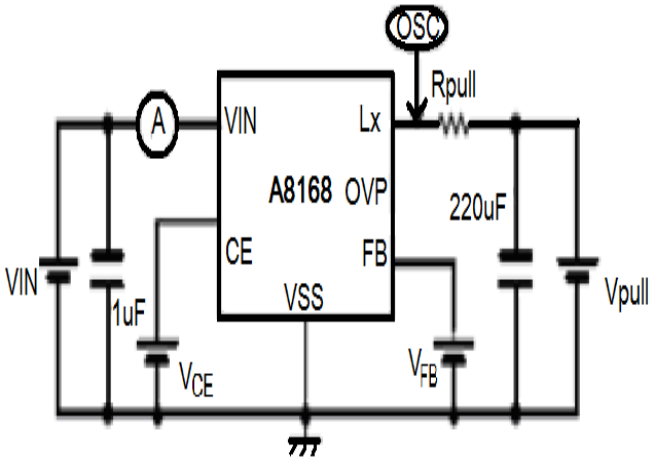
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit	Schematics #
FB Control Voltage	V_{FB}		0.24	0.25	0.26	V	1
Output Voltage Range	V_{OUT}		V_{IN}		17.5		
Lx Operating Voltage Range	V_{LX}				20		
Operating Voltage Range	V_{IN}		2.5		6		
Stand-By Current	I_{STB}	V_{CE}=0V,V_{LX}=5V			1	μA	3
Supply Current 1	I_{DD1}			550		μA	2
Supply Current 2	I_{DD2}	V_{IN}=V_{LX} V_{FB}=0.4V		65			3
Oscillation Frequency	F_{OSC}		0.8	1.0	1.2	MHz	2
Maximum Duty Cycle	MAX_{DTY}	V_{CONT}=0.4V	86	92	98	%	2
Efficiency	η	V_{IN}=3.6V; R_{LED}=20Ω		88		%	1
Current Limit	I_{LIM}	V_{IN}=3.6		300		mA	4
LX Overvoltage Limit	LX_{OVL}		18	19		V	2
LX On Resistance		V_{IN}=3.6V、 V_{LX}=0.4V		2		Ω	2
LX Leak Current	I_{LXL}			0	1	μA	3
CE 'H' Voltage	V_{CEH}		0.65			V	2
CE 'L' Voltage	V_{CEL}				0.2	V	2
CE 'H' Current	I_{CEH}	V_{IN}=V_{LX} V_{FB}=0.4V			0.1	μA	3
CE 'L' Current	I_{CEL}	V_{IN}=V_{LX} V_{FB}=0.4V			-0.1	μA	3
FB 'H' Current	I_{CEH}	V_{IN}=V_{LX} V_{FB}=0.4V			0.1	μA	3
FB 'L' Current	I_{CEL}	V_{IN}=V_{LX} V_{FB}=0.4V			-0.1	μA	3

TEST SCHEMATICS

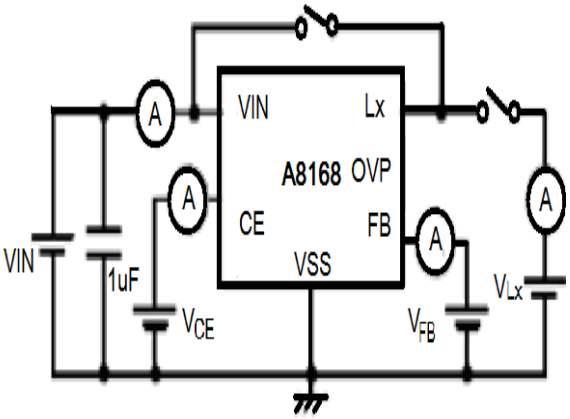
Schematics #1



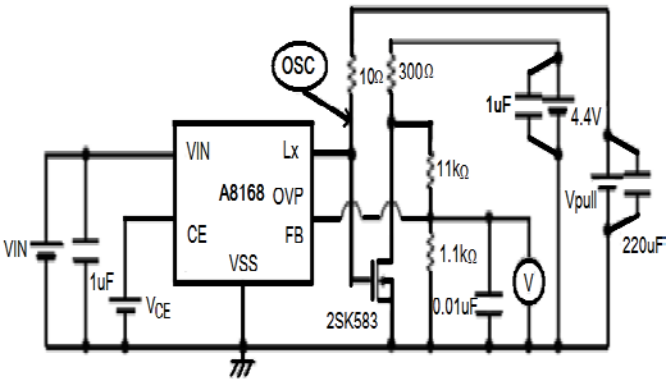
Schematics #2



Schematics #3

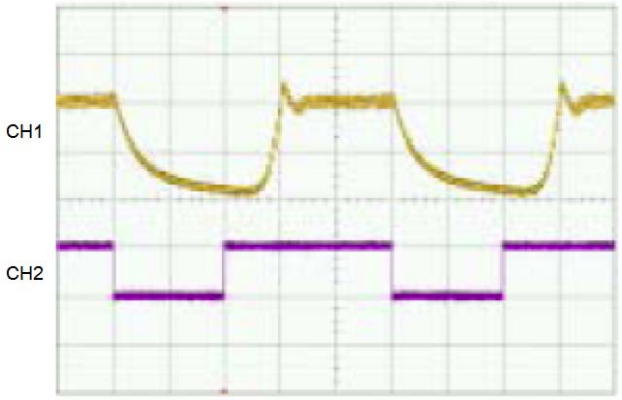


Schematics #4



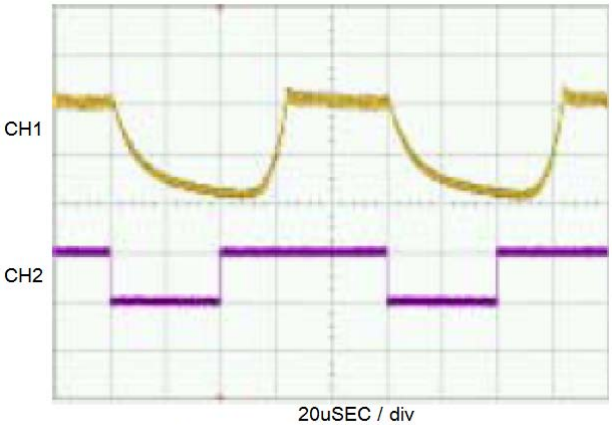
TYPICAL PERFORMANCE CHARACTERISTICS

1. 10KHz, 3 series LED, I_{LED}=20mA



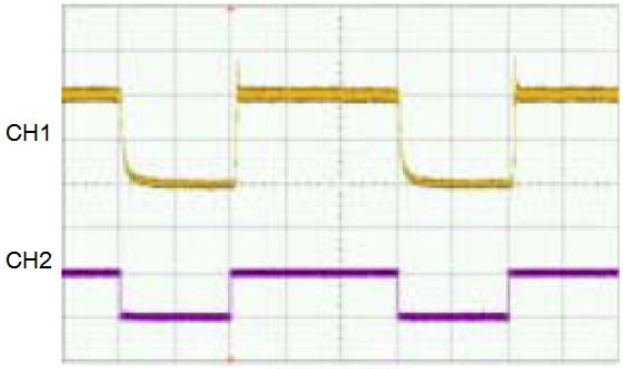
20uSEC / div
CH1 : FB, 100mV / div, CH2 : CE, 1V / div

2. 10KHz, 4 series LED, I_{LED}=20mA



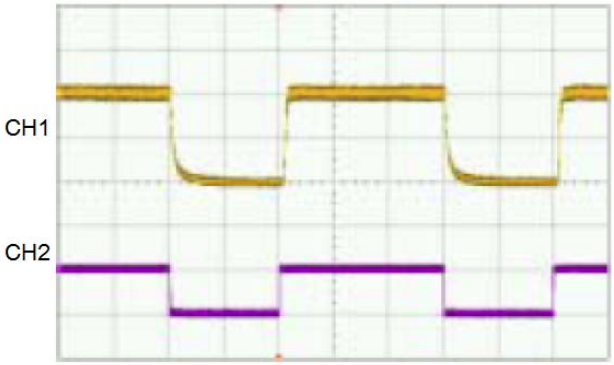
20uSEC / div
CH1 : FB, 100mV / div, CH2 : CE, 1V / div

3. 1KHz, 3 series LED, I_{LED}=20mA



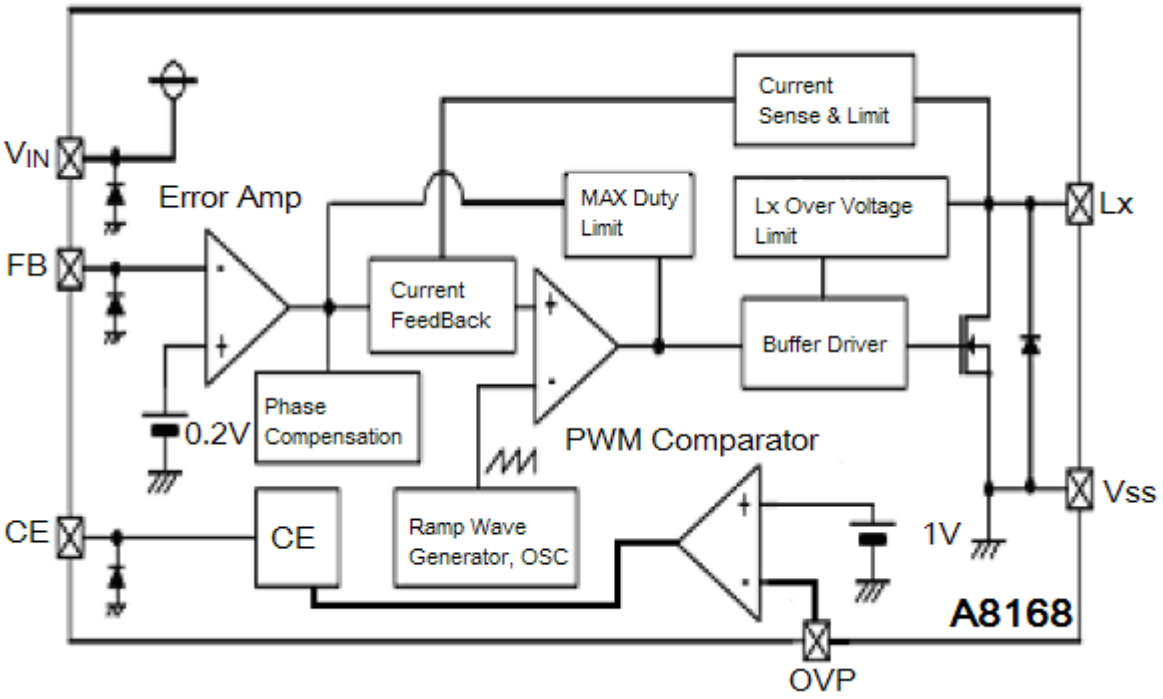
200usec / div
CH1 : FB, 100mV / div, CH2 : CE, 1V / div

4. 1KHz, 4 series LED, I_{LED}=20mA



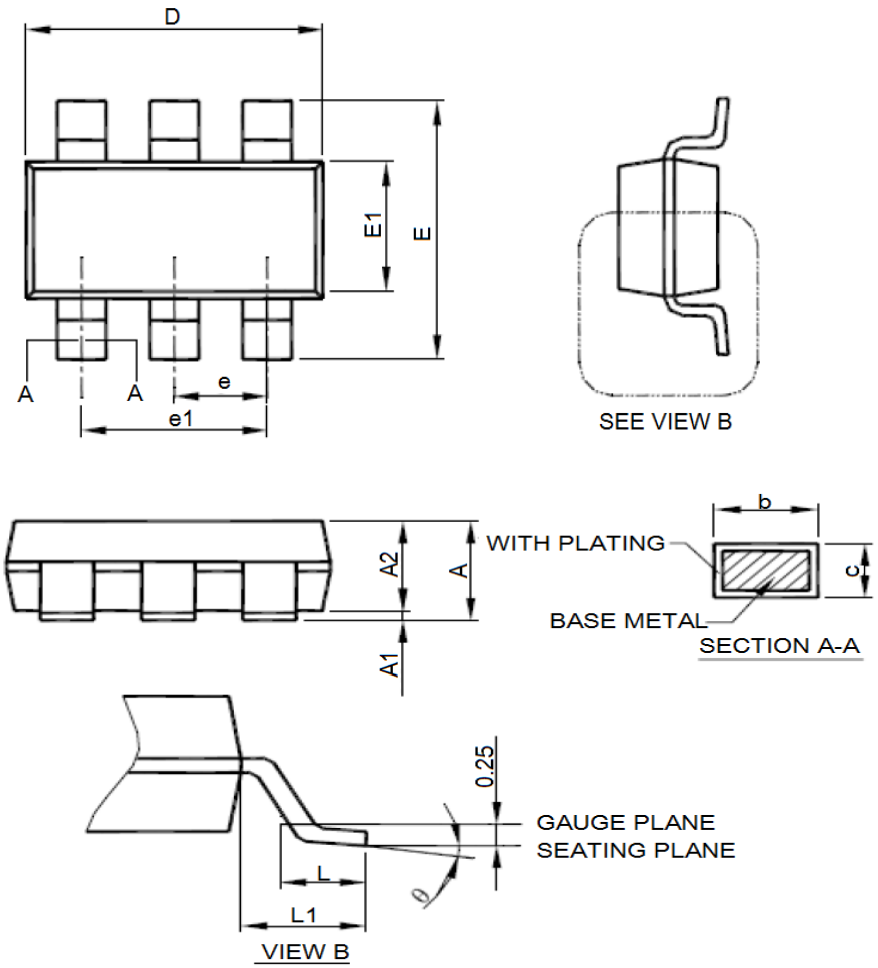
200usec / div
CH1 : FB, 100mV / div, CH2 : CE, 1V / div

BLOCK DIAGRAM



PACKAGING INFORMATION

Dimension in SOT-26 (Unit: mm)



SYMBOL	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	0.95BSC	
e1	1.90BSC	
L	0.30	0.60
L1	0.60REF	
θ	0°	8°

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