DESCRIPTION

The A8169-025 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 23V can be derived, and from a 3.2V input six 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 EN pin. In addition, an internal MOSFET with an $R_{DS(ON)}$ of 0.8Ω 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 A8169-025 is available in SOT-26 package.

ORDERING INFORMATION

Package Type	Part Number	
SOT-26	E6	A8169E6R-025
		A8169E6VR-025
Note	R: Tape & Reel V: Halogen free Package	
AiT provides all RoHS free products		

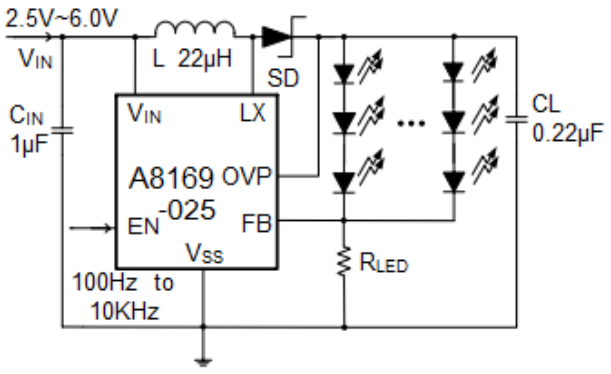
FEATURES

- Input voltage range: 2.5V~6V
- Output voltage range: up to 23V externally set-up reference voltage 0.25V
- Oscillation frequency: 1.0MHz
- On resistance: 0.8Ω
- Efficiency: 88%(When driving 3 white LEDs in series V_{IN}=3.6V I_{LED}=20mA)
- Control: PWM control
- Stand-by Current: I_{STB}=1.0uA
- Load capacitor: 0.22uF ceramic
- Lx limit Current:1.0A
- Available in SOT-26 package

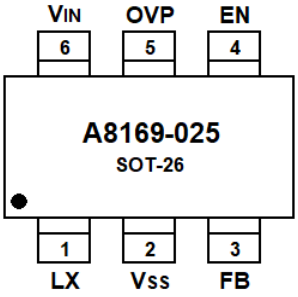
APPLICATIONS

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

TYPICAL APPLICATION



PIN DESCRIPTION



Top View

Pin #	Symbol	Function
1	LX	Switch
2	V_{SS}	Ground
3	FB	Voltage Feedback
4	EN	Chip Enable
5	OVP	Over Voltage Protection
6	V_{IN}	Power Supply

ABSOLUTE MAXIMUM RATINGS

V_{IN} Pin Voltage	Vss-0.3V ~ Vss+7V
LX Pin Voltage	Vss-0.3V ~ Vss+28V
FB Pin Voltage	Vss-0.3V ~ Vss+7V
EN Pin Voltage	Vss-0.3V ~ Vss+7V
OVP Pin Voltage	Vss-0.3V ~ Vss+28V
LX Pin Current	1300mA
Power Dissipation	250mW
Operating Temperature Range	-40℃ ~ + 85℃
Storage Temperature Range	-55℃ ~ + 125℃
Lead Temperature (Soldering, 10s)	260℃

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.

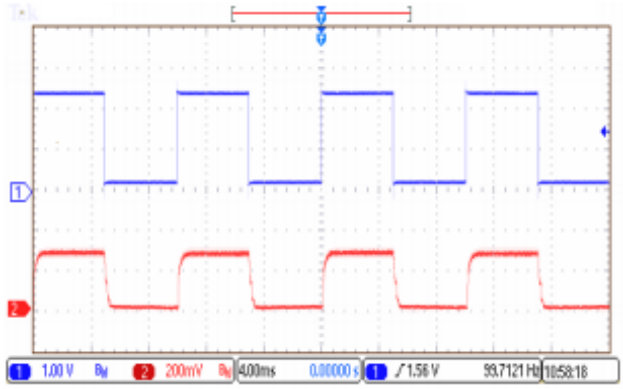
ELECTRICAL CHARACTERISTICS

T_A=25°C, unless otherwise noted

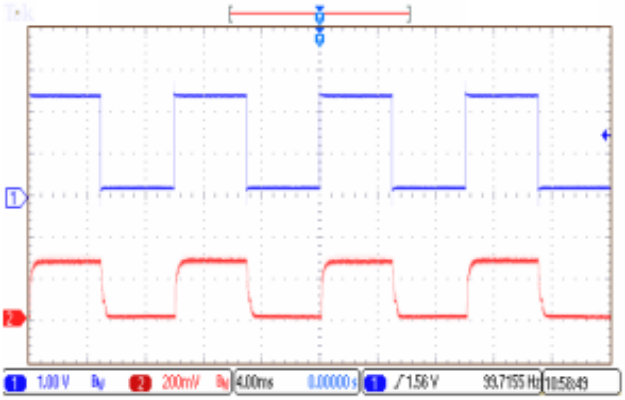
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit	Circuits
FB Control Voltage	V_{FB}		0.235	0.25	0.265	V	1
Output Voltage Range	V_{OUT}		V_{IN}	-	23	V	
Lx Operating Voltage Range	V_{LX}		-	-	23	V	
Operating Voltage Range	V_{IN}		2.5	-	6	V	
Stand-by Current	I_{STB}	V_{EN}=0V, V_{LX}=5V	-	1	-	uA	3
Supply Current 1	I_{DD1}		-	550	-	uA	2
Supply Current 2	I_{DD2}	V_{IN}=V_{LX}, V_{FB}=0.4V	-	400	-	uA	3
Oscillation Frequency	F_{OSC}		0.8	1.0	1.2	MHz	2
Maximum Duty Cycle	MAXDY	V_{CONT}=0.4V	86	92	98	%	2
Efficiency	EFFI	V_{IN}=3.6V; R_{LED}=12.5Ω	-	88	-	%	1
Current Limit	I_{LIM}	V_{IN}=3.6	-	1.0	-	A	4
LX Overvoltage Limit	LXOVL		23	25	27	V	2
LX On Resistance		V_{IN}=3.6V, V_{LX}=0.4V	-	0.8	-	Ω	2
LX Leak Current	I_{LXL}		-	0	1	uA	3
EN “H” Voltage	V_{ENH}		1.4	-	-	V	2
EN “L” Voltage	V_{ENL}		-	-	0.5	V	2
EN “H” Current	I_{ENH}	V_{IN}=V_{LX}, V_{FB}=0.4V	-	1	-	uA	3
EN “L” Current	I_{ENL}	V_{IN} =V_{LX}, V_{FB}=0.4V	-	1	-	uA	3
FB “H” Current	I_{FBH}	V_{IN} = V_{LX}, V_{FB}=0.4V	-	-	0.1	uA	3
FB “L” Current	I_{FBL}	V_{IN} = V_{LX}, V_{FB}=0.4V	-	-	-0.1	uA	3

TYPICAL PERFORMANCE CHARACTERISTICS

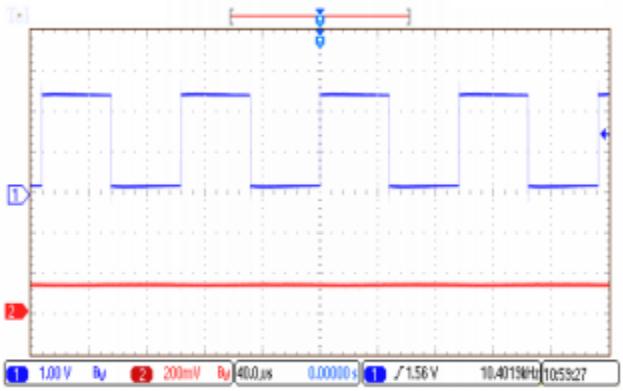
1. CH1=EN, CH2=FB
   100Hz, 4 series LED, I_{LED}=20mA



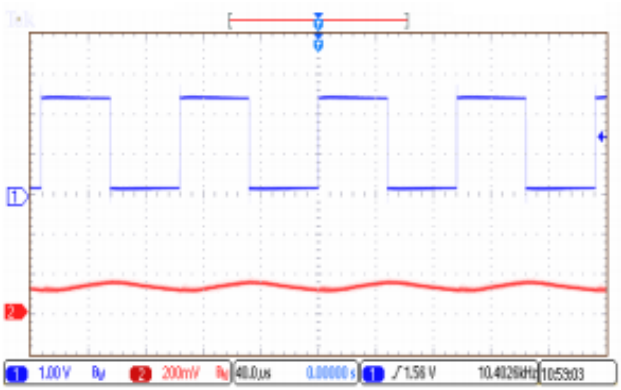
2. 100Hz, 6 series LED, I_{LED}=20mA



3. 10kHz, 4 series LED, I_{LED}=20mA

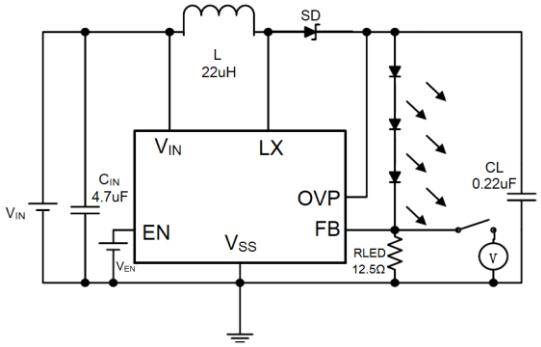


4. 10kHz, 6 series LED, I_{LED}=20mA

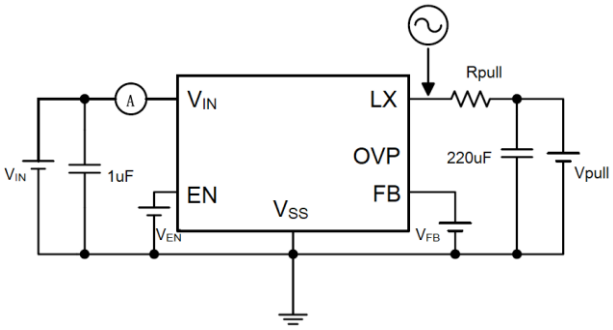


TEST CIRCUIT

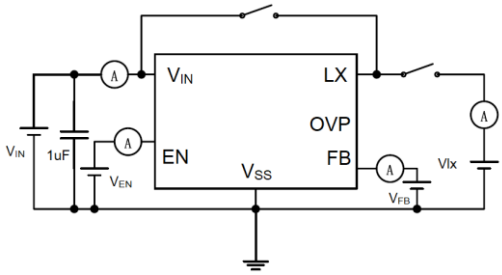
1. Circuit 1



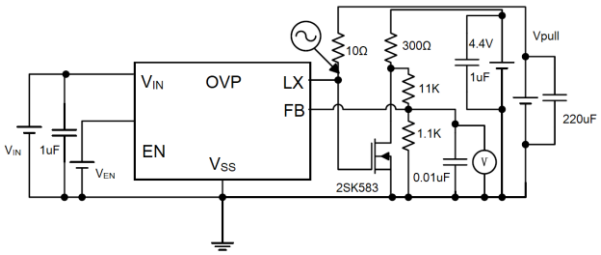
2. Circuit 2



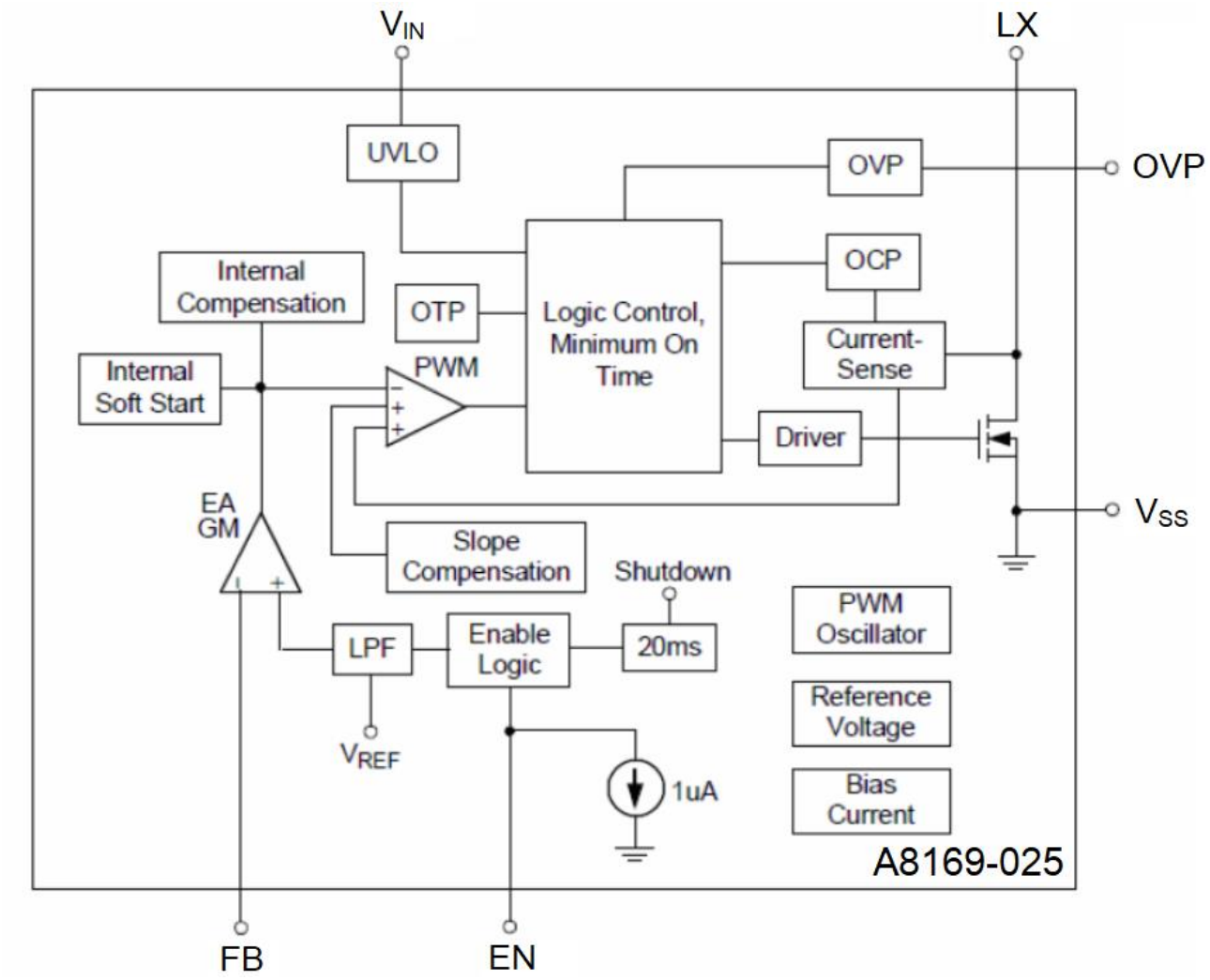
3. Circuit 3



4. Circuit 4

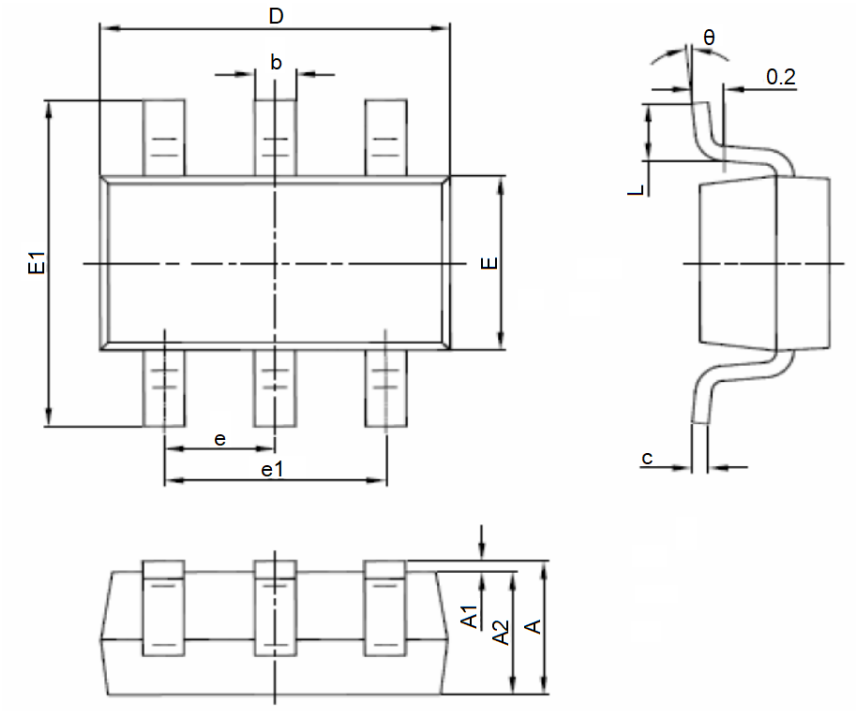


BLOCK DIAGRAM



PACKAGING INFORMATION

Dimension in SOT-26 Package (Unit: mm)



Symbol	Millimeters		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°

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