

**Features**

- Operation Voltage from 12V to 90V
- Maximum Duty Cycle up to 100%
- Minimum Drop Out 0.5V
- Adjust VOUT from 1.25V to 20V
- Max. IOUT=0.6A at VOUT=5V
- Max. IOUT=0.3A at VOUT=12V or 15V
- Max. output power less than 5W
- Fixed 150KHz Switching Frequency
- Internal Optimize HV Power MOSFET
- High efficiency up to 85%
- Excellent line and load regulation
- Built in output short Protection Function
- Built in current limit function
- SOP8-EP (Exposed PAD) package

**Applications**

- Ebike Controller Power Supply
- Telecom / Networking Equipment

**General Description**

The XL7026 is a 150KHz fixed frequency PWM buck (step-down) DC/DC converter, capable of driving a 0.6A load with high efficiency, low ripple and excellent line and load regulation. Requiring a minimum number of external components, the regulator is simple to use and include internal frequency compensation and a fixed-frequency oscillator.

The PWM control circuit is able to adjust the duty ratio linearly from 0 to 100%.

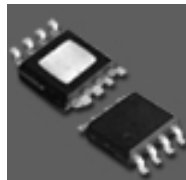


Figure1. Package Type of XL7026

## Pin Configurations

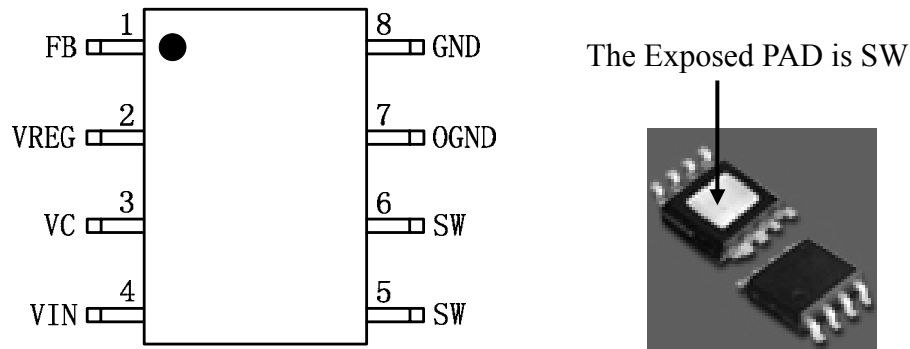


Figure2. Pin Configuration of XL7026 (Top View)

Table 1 Pin Description

Pin Number	Pin Name	Description
1	FB	Feedback Pin (FB). Through an external resistor divider network, Feedback senses the output voltage and regulates it. The feedback threshold voltage is 1.25V.
2	VREG	Supply Voltage Input Pin. A 10 $\mu$ F ceramic decoupling capacitor is required. An external voltage between 7V and 9V can be applied to this pin to reduce internal power dissipation.
3	VC	Internal Voltage Regulator Bypass Capacity. In typical system application, The VC pin connect a 1uF capacitor to VIN.
4	VIN	Supply Voltage Input Pin. XL7026 operates from 12V to 90V DC voltage. Bypass Vin to GND with a suitably large capacitor to eliminate noise on the input.
5,6	SW	Power Switch Output Pin (SW). Output is the switch node that supplies power to the output. The exposed PAD is SW.
7	OGND	Output Ground Pin.
8	GND	Ground Pin. Care must be taken in layout. This pin should be placed outside of the Schottky Diode to output capacitor ground path to prevent switching current spikes from inducing voltage noise into XL7026.

## Function Block

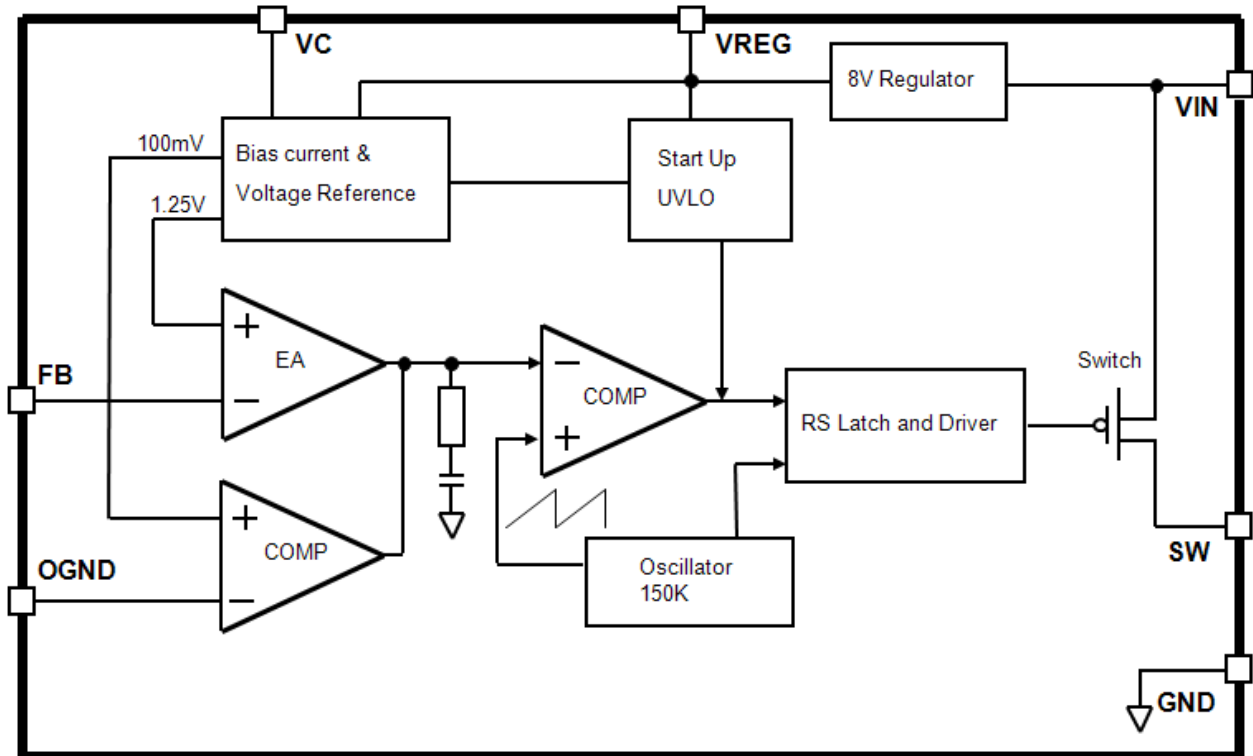
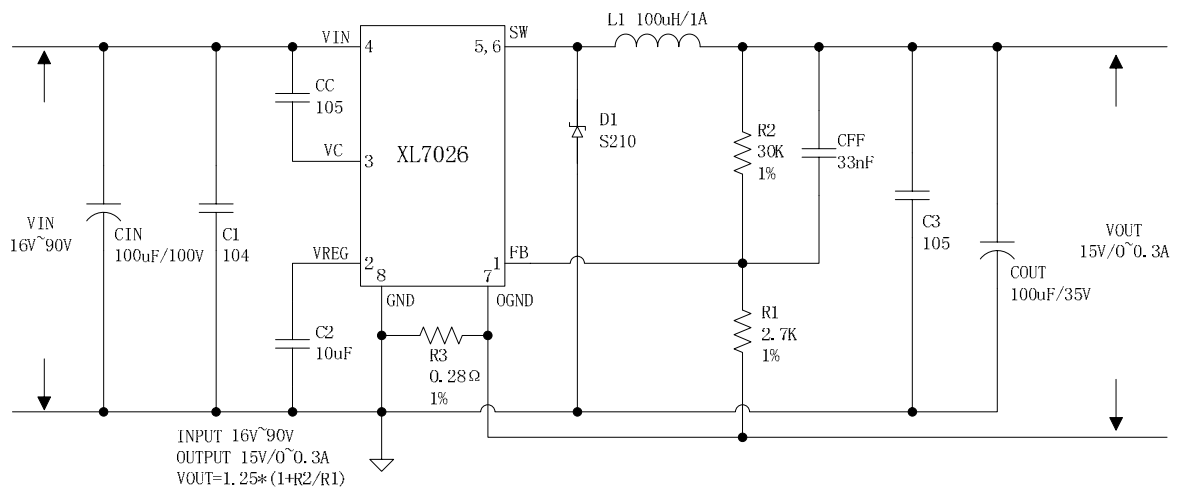


Figure3. Function Block Diagram of XL7026

## Typical Application Circuit



R3 for limit maximum output current, R3 choose 0.15ohm in VOUT = 5V application; R3 choose 0.28ohm in VOUT > 5V application.

Figure4. XL7026 Typical Application Circuit

0.6A 150KHz 100V Buck DC to DC Converter

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## Ordering Information

Order Information	Marking ID	Package Type	Packing Type Supplied As
XL7026E1	XL7026E1	SOP8-EP	2500 Units on Tape & Reel

XLSEMI Pb-free products, as designated with “E1” suffix in the par number, are RoHS compliant.

## Absolute Maximum Ratings ( Note1 )

Parameter	Symbol	Value	Unit
VIN Pin Voltage	V <sub>IN</sub>	-0.3 to 100	V
FB Pin Voltage	V <sub>FB</sub>	-0.3 to V <sub>IN</sub>	V
SW Pin Voltage	V <sub>SW</sub>	-0.3 to V <sub>IN</sub>	V
Power Dissipation	P <sub>D</sub>	Internally limited	mW
Thermal Resistance (SOP8-EP) (Junction to Ambient, No Heatsink, Free Air)	R <sub>JA</sub>	60	°C/W
Maximum Junction Temperature	T <sub>J</sub>	-40 to 150	°C
Operating Junction Temperature	T <sub>J</sub>	-40 to 125	°C
Storage Temperature	T <sub>STG</sub>	-65 to 150	°C
Lead Temperature (Soldering, 10 sec)	T <sub>LEAD</sub>	260	°C
ESD (HBM)		>3000	V

**Note1:** Stresses greater than those listed under Maximum Ratings may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operation is not implied. Exposure to absolute maximum rating conditions for extended periods may affect reliability.

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## XL7026 Electrical Characteristics

$T_a = 25$  ; unless otherwise specified.

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
<i>System parameters test circuit figure4</i>						
VFB	FB Voltage	$V_{in} = 20V \text{ to } 90V$ , $V_{out} = 15V$ $I_{load} = 0.1A \text{ to } 0.3A$	1.225	1.25	1.275	V
$\eta$	Efficiency	$V_{in} = 24V$ , $V_{out} = 15V$ $I_{out} = 0.3A$	-	93	-	%
$\eta$	Efficiency	$V_{in} = 36V$ , $V_{out} = 15V$ $I_{out} = 0.3A$	-	88	-	%
$\eta$	Efficiency	$V_{in} = 48V$ , $V_{out} = 15V$ $I_{out} = 0.3A$	-	85	-	%
$\eta$	Efficiency	$V_{in} = 60V$ , $V_{out} = 15V$ $I_{out} = 0.3A$	-	80	-	%

## Electrical Characteristics (DC Parameters)

$V_{in} = 48V$ ,  $GND = 0V$ ,  $V_{in}$  &  $GND$  parallel connect a 33uf/100V capacitor;  $I_{out} = 0.2A$ ,  $T_a = 25$  ; the others floating unless otherwise specified.

Parameters	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Input operation voltage	$V_{in}$		12		90	V
VIN UVLO	$V_{in\_uvlo}$			10	11	V
VREG voltage	$V_{reg}$			8		V
Quiescent Supply Current	$I_q$	$V_{FB} = 2V$		2.5	5	mA
Oscillator Frequency	$F_{osc}$		120	150	180	KHz
Switch Current Limit	$I_L$	$V_{FB} = 0$ , $R3 = 0.15$		0.667		A
Output Power PMOS	$R_{dson}$	$V_{in} = 48V$ , $I_{SW} = 0.3A$		180	210	mohm
Max. Duty Cycle	$D_{MAX}$	$V_{FB} = 0V$		100		%

## Typical Performance Characteristics

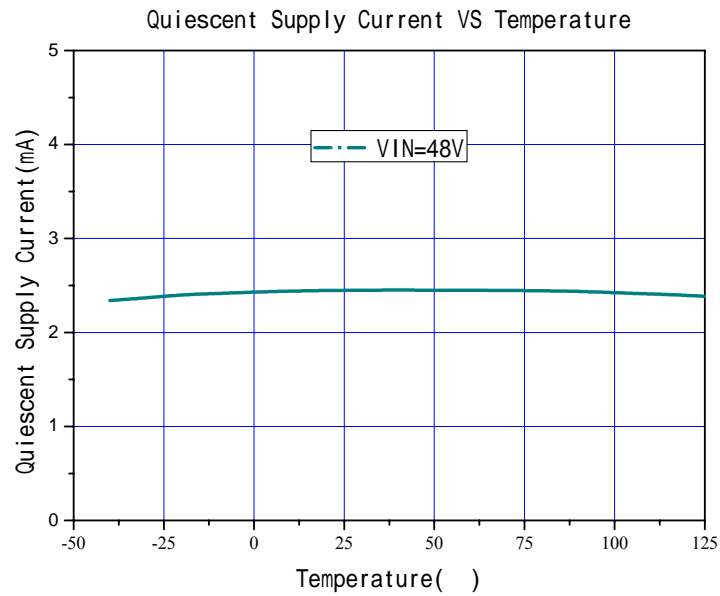


Figure5. Quiescent Current Curve

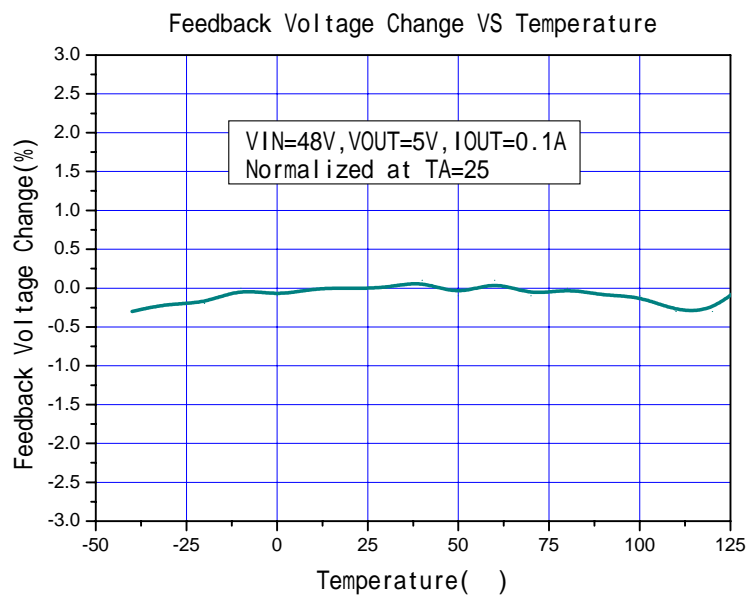


Figure6. Feedback Voltage Curve

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### Typical System Application (VOUT=15V, IOU=0~0.3A)

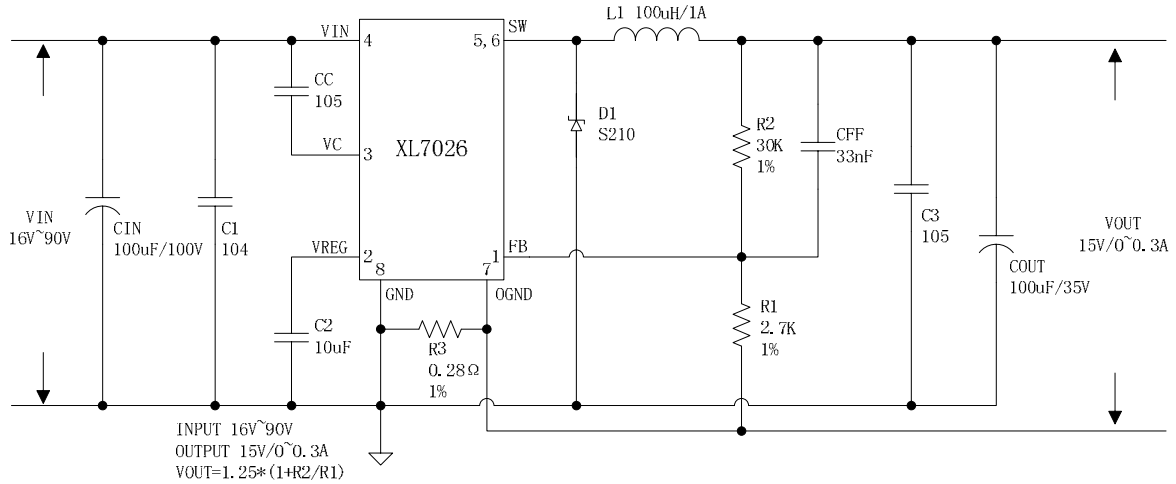


Figure7. XL7026 System Application (VIN=16V~90V, VOUT=15V, IOU=0~0.3A)

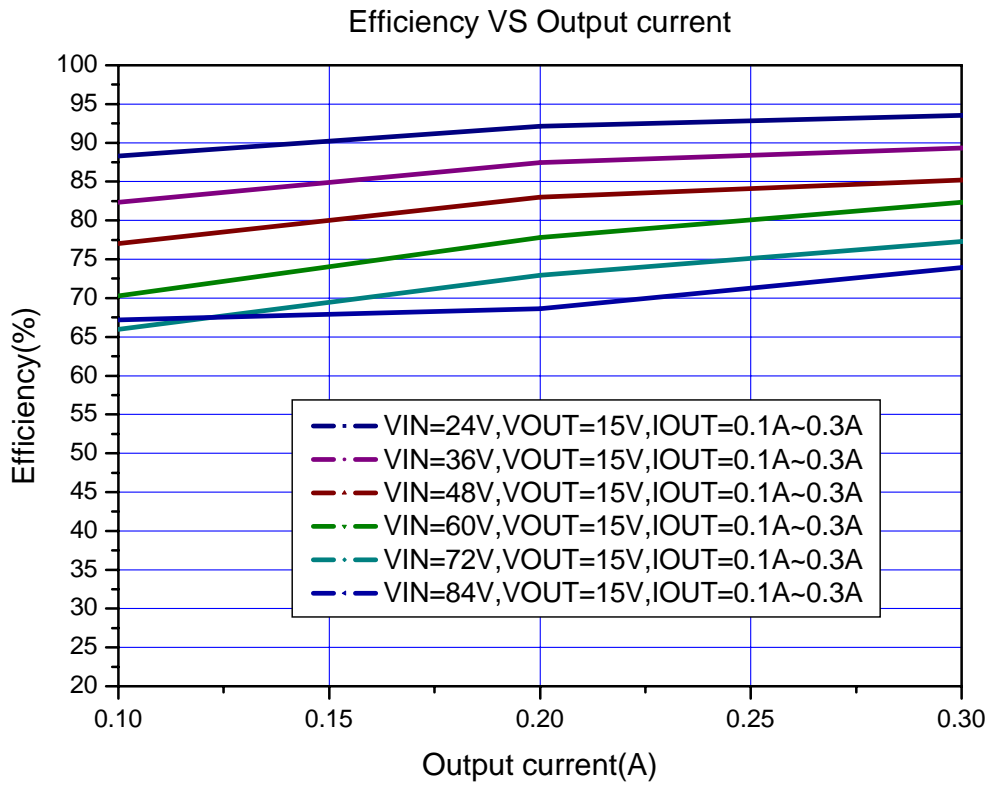


Figure8. XL7026 System Application (Efficiency VS Output Current)

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### Typical System Application (VOUT=5V, IOU=0~0.6A)

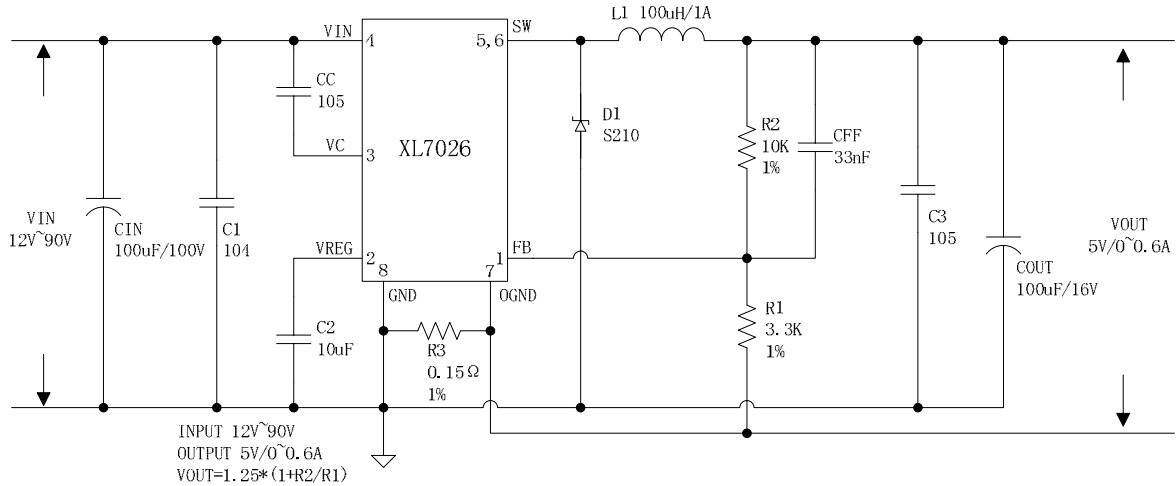


Figure9. XL7026 System Application (VIN=12V~90V, VOUT=5V, IOU=0~0.6A)

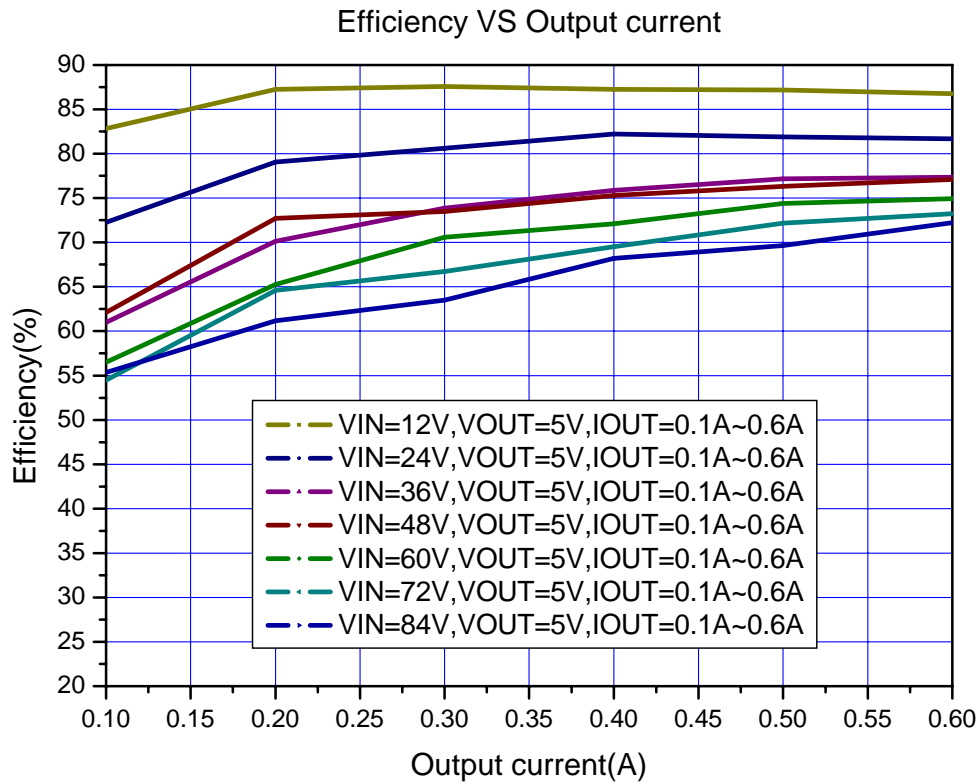
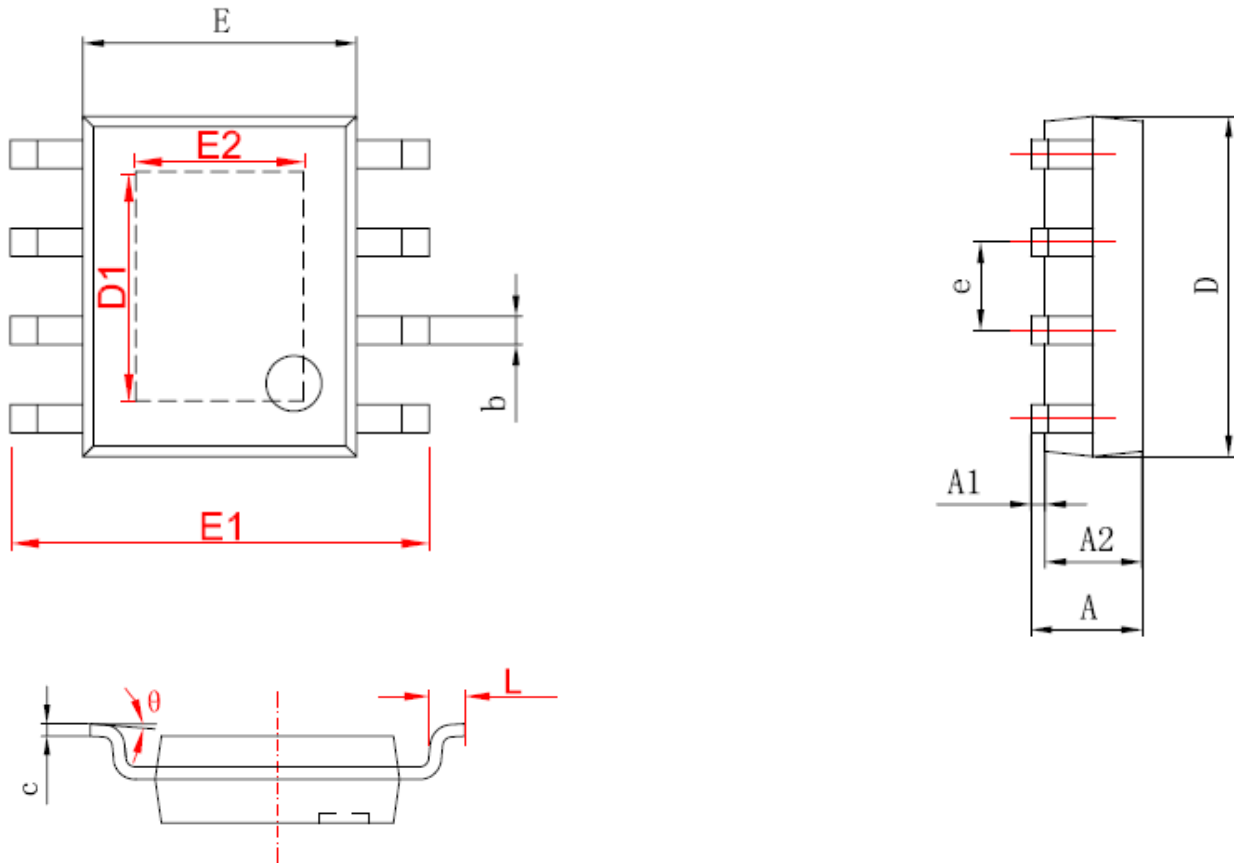


Figure10. XL7026 System Application (Efficiency VS Output Current)



## Package Information

### Package Information (SOP8-EP)



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
theta	0°	8°	0°	8°

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**0.6A 150KHz 100V Buck DC to DC Converter****XL7026**

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