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XINBOLE

Product Specification

XBLW XBL6019

60V 5A 220KHz Step-UP DC/DC Converter

WEB | www.xinboleic.com

Description

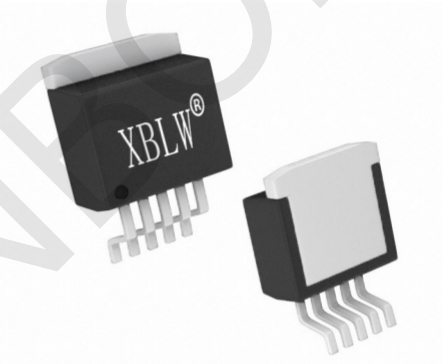
The XBL6019 is a monolithic integrated circuit that provide all of the power and control functions for step-up (boost), flyback, and forward converter switching regulators.Included on the chip is a 5A PMOSFET switch and its associated protection circuitry, consisting of current and thermal limiting, and undervoltage lockout. Other features include a 220 kHz fixed-frequency oscillator that requires no external components, a soft start mode to reduce in-rush current during start-up, and current mode control for improved rejection of input voltage and output load transients.

Features

- Wide Input Voltage Range: 3.6V to 48V
- Output Voltage Versions: 12V, 24V, and Adj
- Fixed 220KHz Switching Frequency
- Max 5A Switching Current Capability
- Up to 92% efficiency
- EN PIN TTL shutdown capability
- Excellent line and load regulation
- Internal Optimize Power MOSFET
- Built in Frequency Compensation
- Built in Soft-Start Function
- Built in Thermal Shutdown Function
- Built in Current Limit Function

Applications

- Simple boost regulator
- Fly back and forward regulators
- Multiple - output regulator



TO-263-5L

Ordering Information

Product Model	Package Type	Marking	Packing	Packing Qty	Out Votage
XBLW XBL6019E1TB	TO-263-5L	XBL6019E1	Tube	1000Pcs/Box	ADJ
XBLW XBL6019E1DTR	TO-263-5L	XBL6019E1	Tape	800Pcs/Reel	ADJ
XBLW XBL6019-12E1TB	TO-263-5L	XBL6019-12E1	Tube	1000Pcs/Box	Fixed 12V
XBLW XBL6019-12E1DTR	TO-263-5L	XBL6019-12E1	Tape	800Pcs/Reel	Fixed 12V
XBLW XBL6019-24E1TB	TO-263-5L	XBL6019-24E1	Tube	1000Pcs/Box	Fixed 24V
XBLW XBL6019-24E1DTR	TO-263-5L	XBL6019-24E1	Tape	800Pcs/Reel	Fixed 24V

Pin Configurations

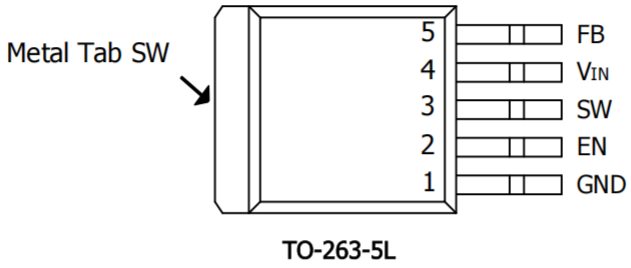


Figure 1 . Pin Configuration of XBL6019 (Top View)

Pin Description

Pin Number	Pin Name	Description
1	GND	Ground Pin.
2	EN	Enable Pin. Drive EN pin low to turn off the device, drive it high to turn it on. Floating is default high.
3	SW	Power Switch Output Pin (SW). Output is the switch node that supplies power to the output.
4	VIN	Supply Voltage Input Pin. XBL6019 operates from a 3.6V to 48V DC voltage. Bypass Vin to GND with a suitably large capacitor to eliminate noise on the input.
5	FB	Feedback Pin (FB),The feedback threshold voltage is 1.25V.
Tab	SW	Power Switch Output Pin (SW). Output is the switch node that supplies power to the output.

Function Block

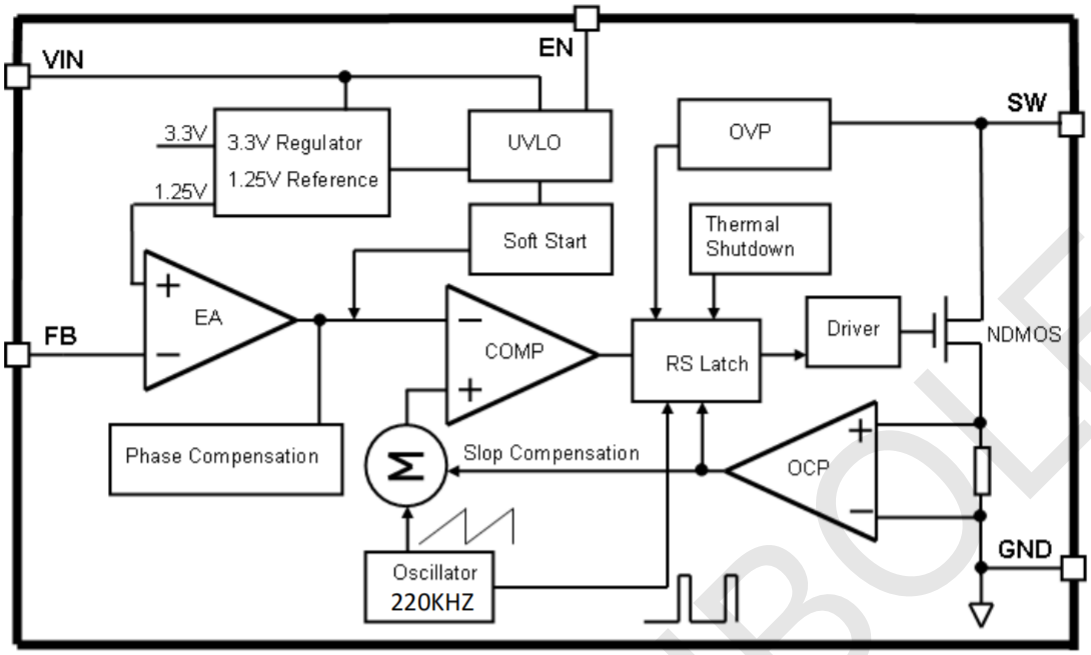


Figure 2 . Function Block Diagram of XBL6019

Absolute Maximum Ratings

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.

Parameter	Symbol	Value	Unit
Input Voltage	V_{IN}	-0.3 to 60	V
Feedback Pin Voltage	V_{FB}	-0.3 to VIN	V
Enable Pin Voltage	V_{EN}	-0.3 to VIN	V
Switch Pin Voltage	V_{SW}	-0.3 to VIN	V
Power Dissipation	P_D	Internally limited	mW
Operating Junction Temperature	T_J	-40~125	°C
Storage Temperature	T_{STG}	-65 to 150	°C
Lead Temperature (Soldering, 10 sec)	T_{LEAD}	260	°C
ESD (HBM)		2000	V
MSL		Level3	
Thermal Resistance-Junction to Ambient	RθJA	85	°C / W
Thermal Resistance-Junction to Case	RθJC	45	°C / W

Typical Application Circuit

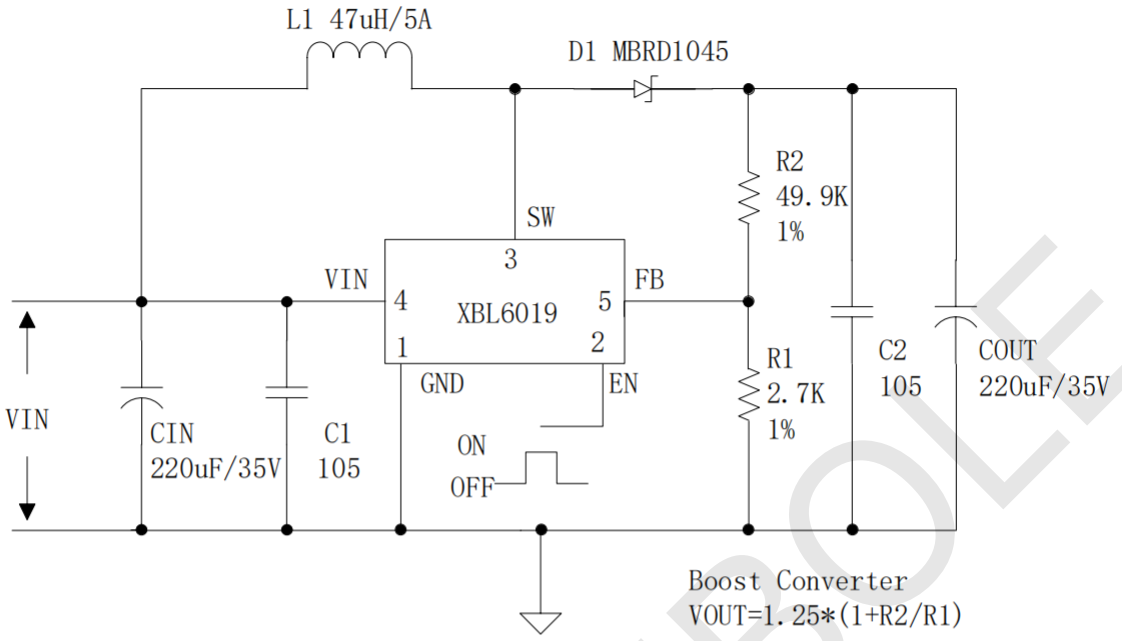


Figure 3. XBL6019 Typical Application Circuit (VIN=12V~22V, VOUT=24V/1.5A)

Electrical Characteristics

T_a = 25°C;unless otherwise specified,System para mrters test circuit figure 3.

Characteristic		Conditions	Min .	Typ .	Max	Unit
Feedback voltage	VFB	Vin =5 V to 12 V , Vout= 24V Iload =0.1 ~ 1A	1.230	1.250	1.270	V
Efficiency	η	Vin = 12 V , Vout= 24V Iout= 1 A		93		%
Fixed Voltage 12V	Vout	Vin =5V , Iout= 1A	11.76	12	12.24	V
Fixed Voltage 24V	Vout	Vin = 12V , Iout= 1A	23.52	24	24.48	V

Electrical Characteristics (DC Parameters)

(VIN =12 V , GND = 0 V , Iout = 0.1A , T_a=25°C; the others floating unless otherwise specified .)

Parameters	Symbol	Conditions	Min .	Typ .	Max	Unit
Input operation voltage	Vin		3.6		48	V
Shutdown supply current	I_{STBY}	V_{EN}= 0 V		70	100	μ A
Quiescent supply current	Iq	V_{EN}= 2 V , V_{FB}= V in		2.5	5	mA
Oscillator frequency	F_{OSC}		176	220	264	kHz
Switch current limit	IL	V_{FB}= 0		5		A
Output power N MOS	Rdson	Vin = 12V , IS W= 5A		110	120	m ohm
EN pin threshold	V_{EN}	High (regulator ON) Low(regulator OFF)		1.4 0.8		V
EN pin input leakage current	I_H	V_{EN}= 2V(ON)		3	10	μ A
	I_L	V_{EN}= 0V(OFF)		3	10	μ A
Max . duty cycle	D_{MAX}	V_{FB}= 0 V		90		%

Typical System Application (Recommended safe working range for output current)

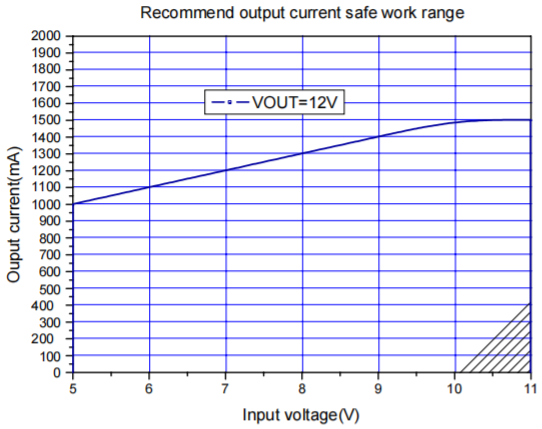


Figure 4.Maximum output current (VOUT=12V)

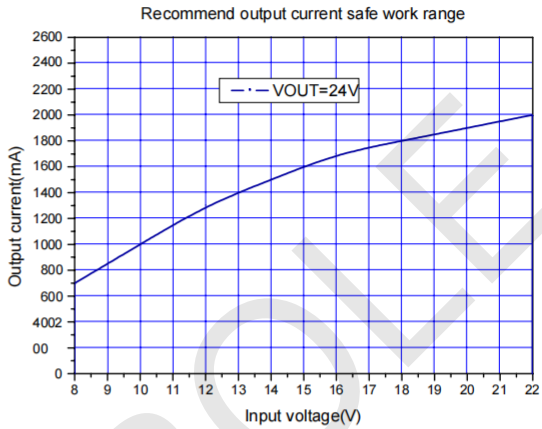


Figure 5.Maximum output current (VOUT=24V)

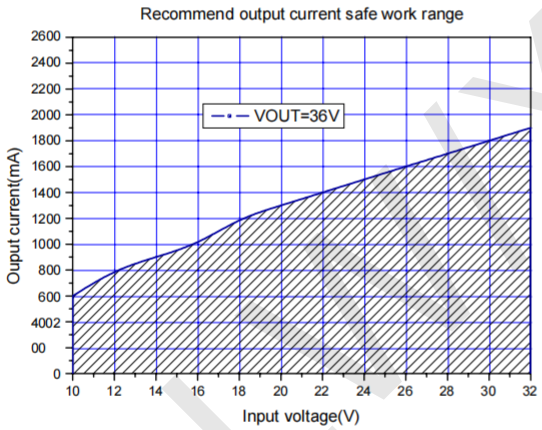


Figure 6.Maximum output current (VOUT=36V)

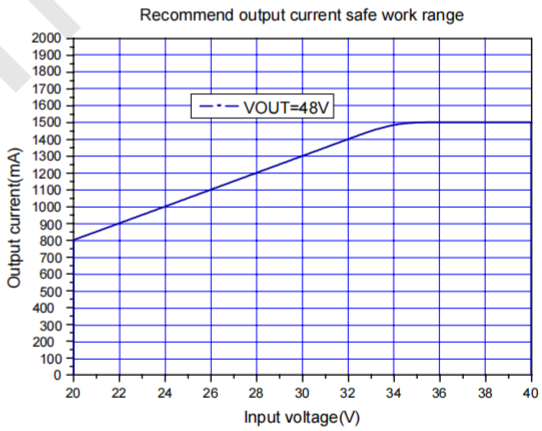


Figure 7.Maximum output current (VOUT=48V)

Typical System Application (VIN=12V, VOUT=24V)

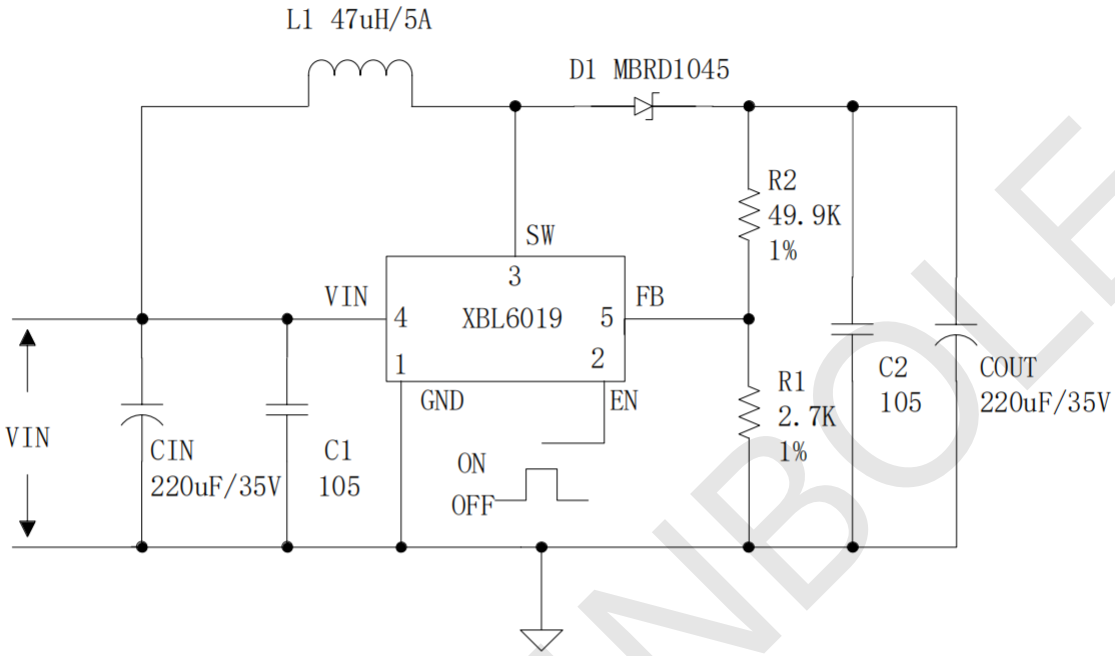


Figure 8 . XBL6019 System Parameters Test Circuit (VIN=12V,VOUT=24V)

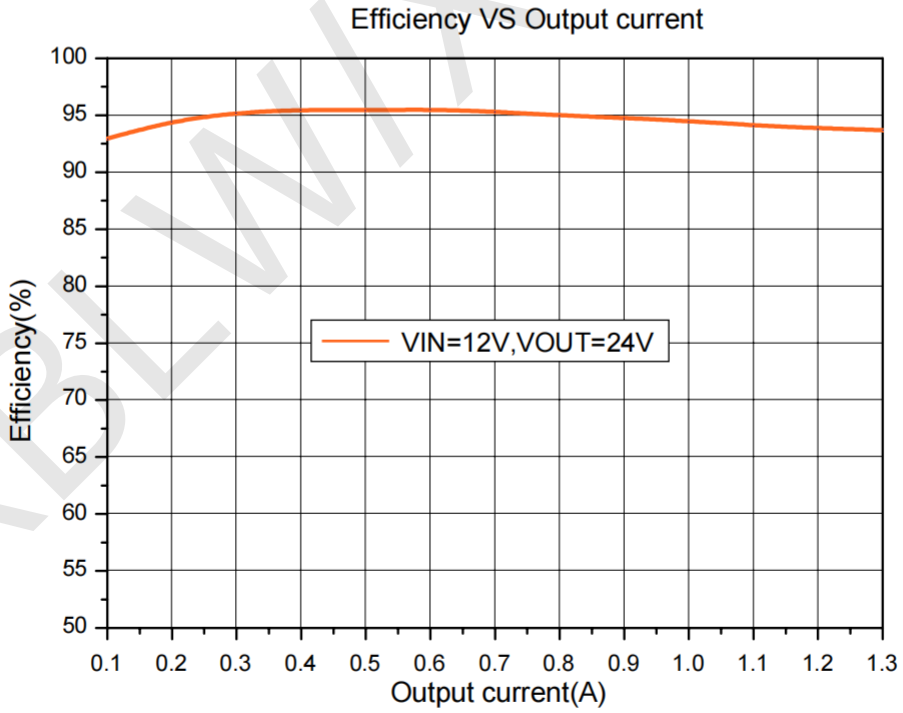


Figure 9. XBL6019 System Efficiency Curve

Typical System Application (VIN=5V, VOUT=12V)

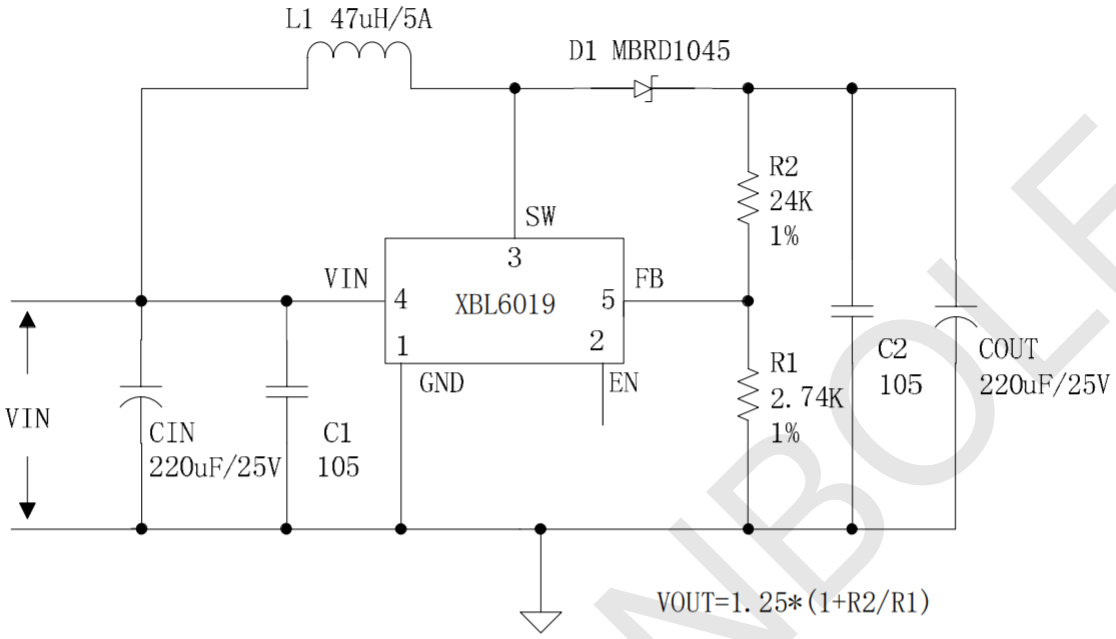


Figure 10. XBL6019 System Parameters Test Circuit (VIN=5V,VOUT=12V)

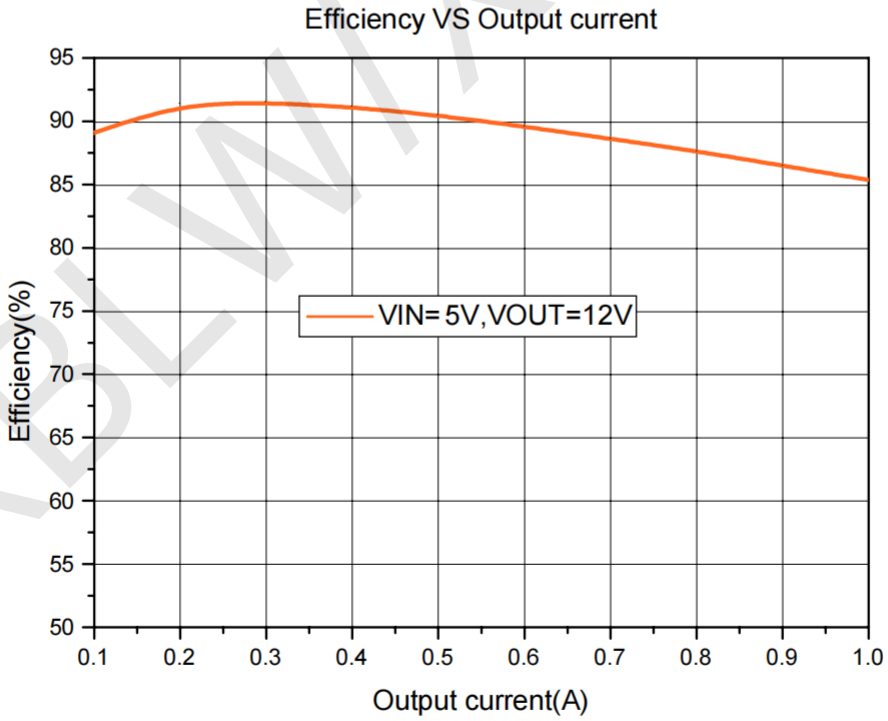


Figure 11. XBL6019 System Efficiency Curve

Typical System Application (VIN=10~32V, VOUT=36V)

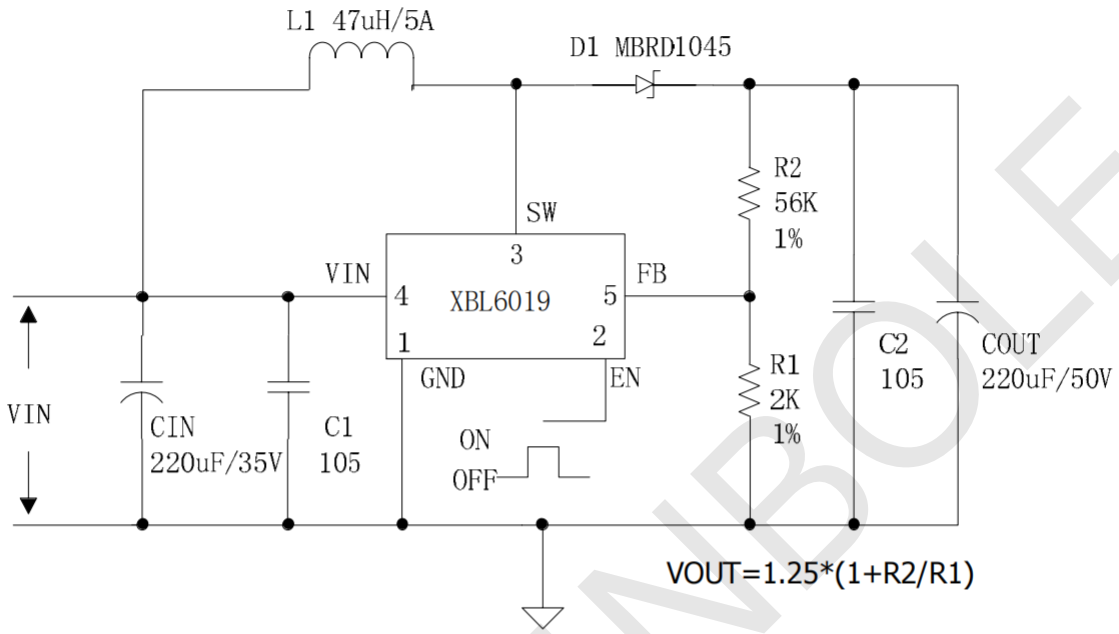


Figure 12. XBL6019 System Parameters Test Circuit (VIN=10~32V,VOUT=36V)

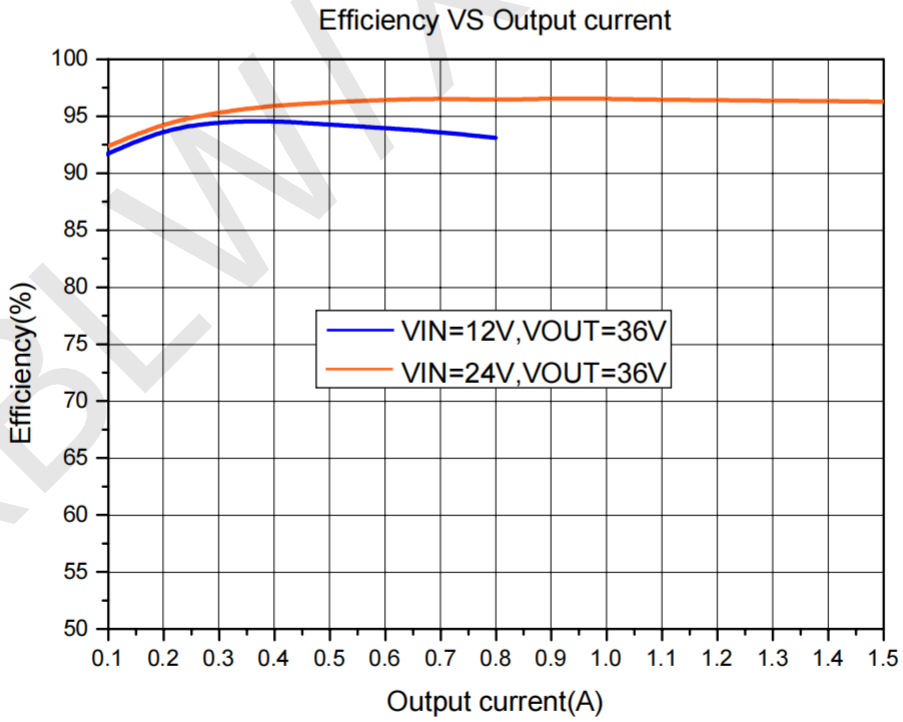


Figure 13. XBL6019 System Efficiency Curve

Typical System Application (VIN=20~40V, VOUT=48V)

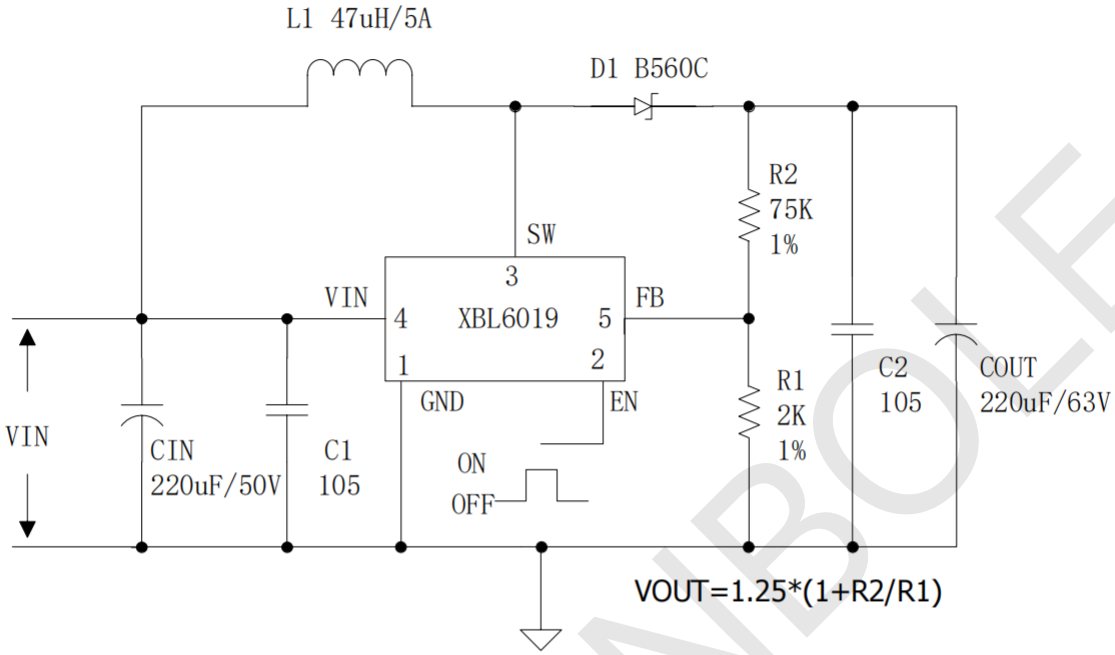


Figure 14. XBL6019 System Parameters Test Circuit (VIN=20~40V,VOUT=48V)

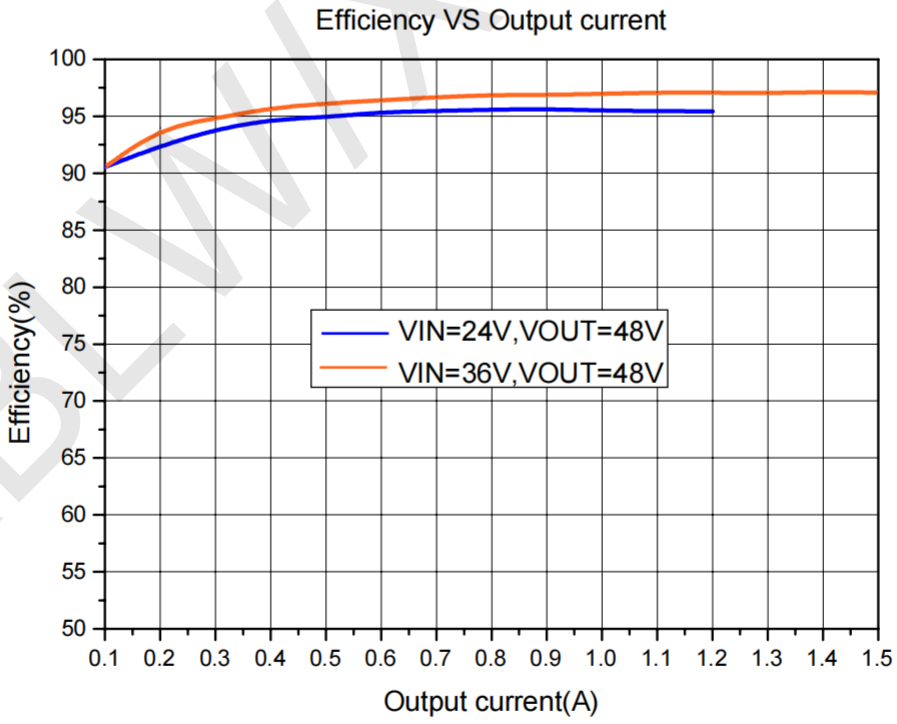


Figure 15. XBL6019 System Efficiency Curve

Typical System Application (SEPIC Converter VIN=10~30V,VOUT=12V)

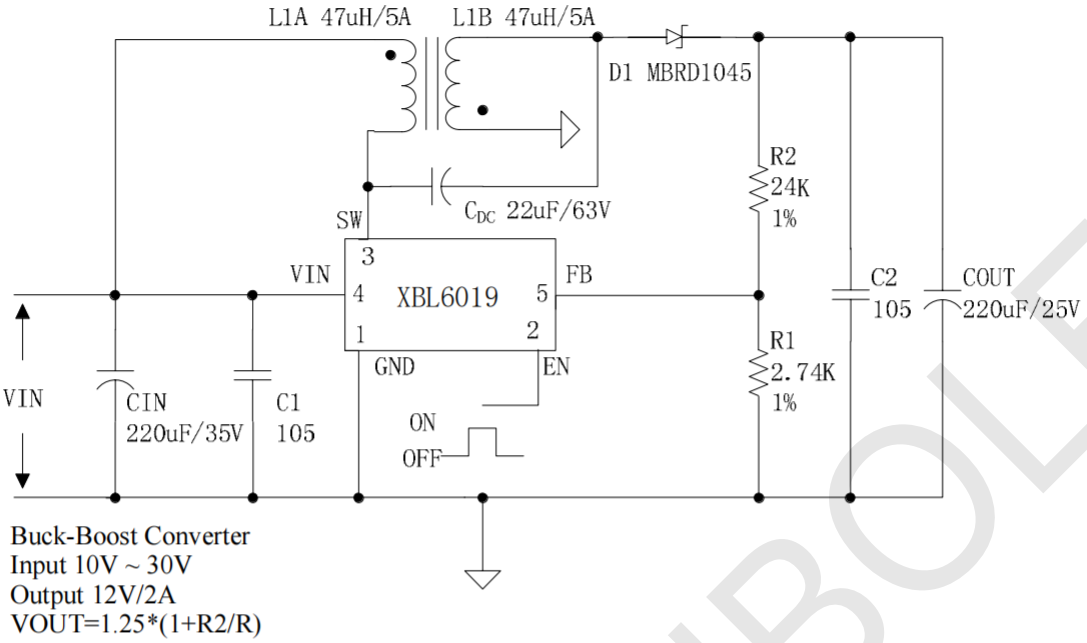


Figure 16. XBL6019 System Parameters Test Circuit

Typical System Application (SEPIC Converter VIN=10~30V,VOUT=±12V)

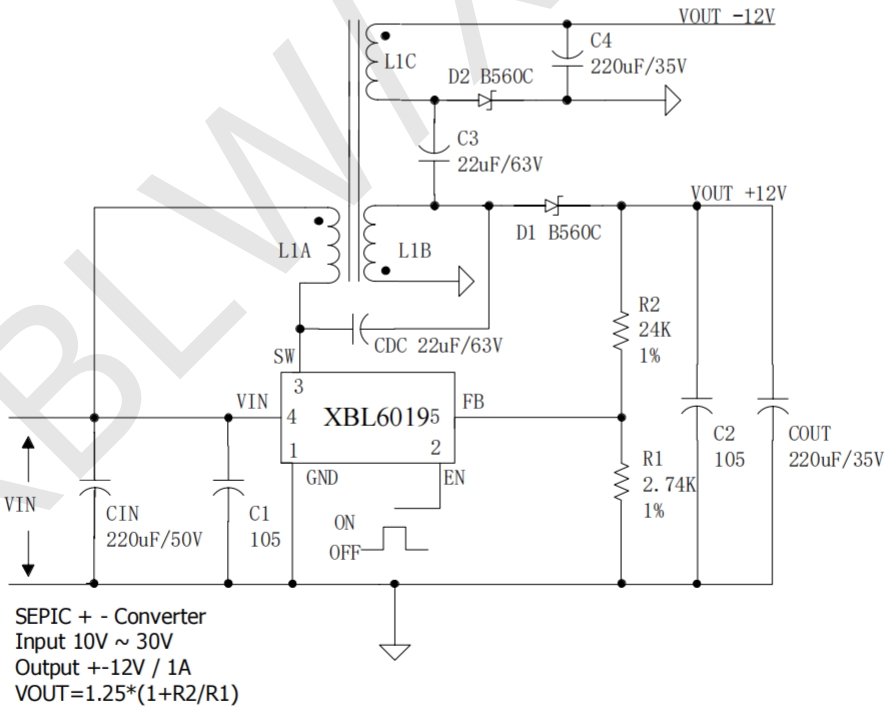


Figure 17. XBL6019 System Parameters Test Circuit

Typical System Application (Fixed Output Voltage 12V,VIN=3.6~10V)

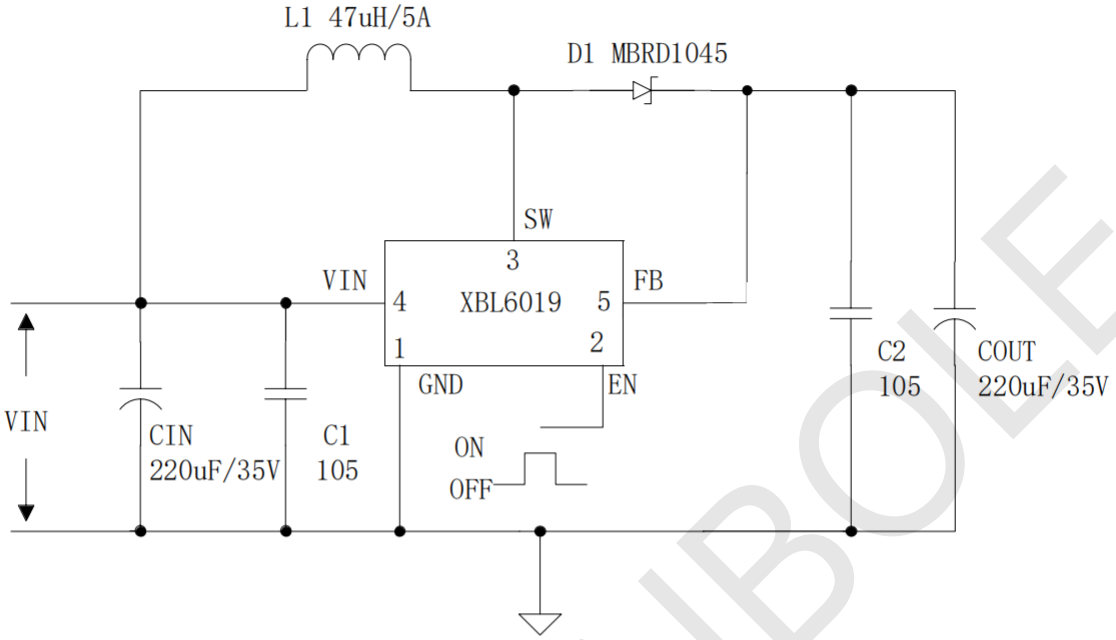


Figure 18. XBL6019 System Parameters Test Circuit

Typical System Application (Fixed Output Voltage 24V,VIN=5~20V)

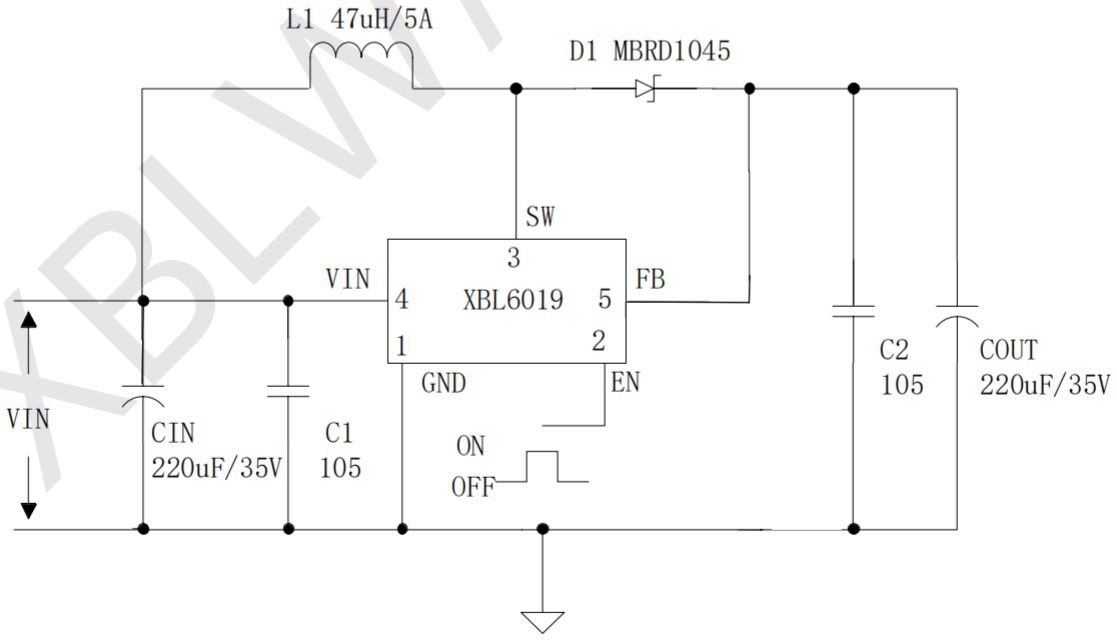
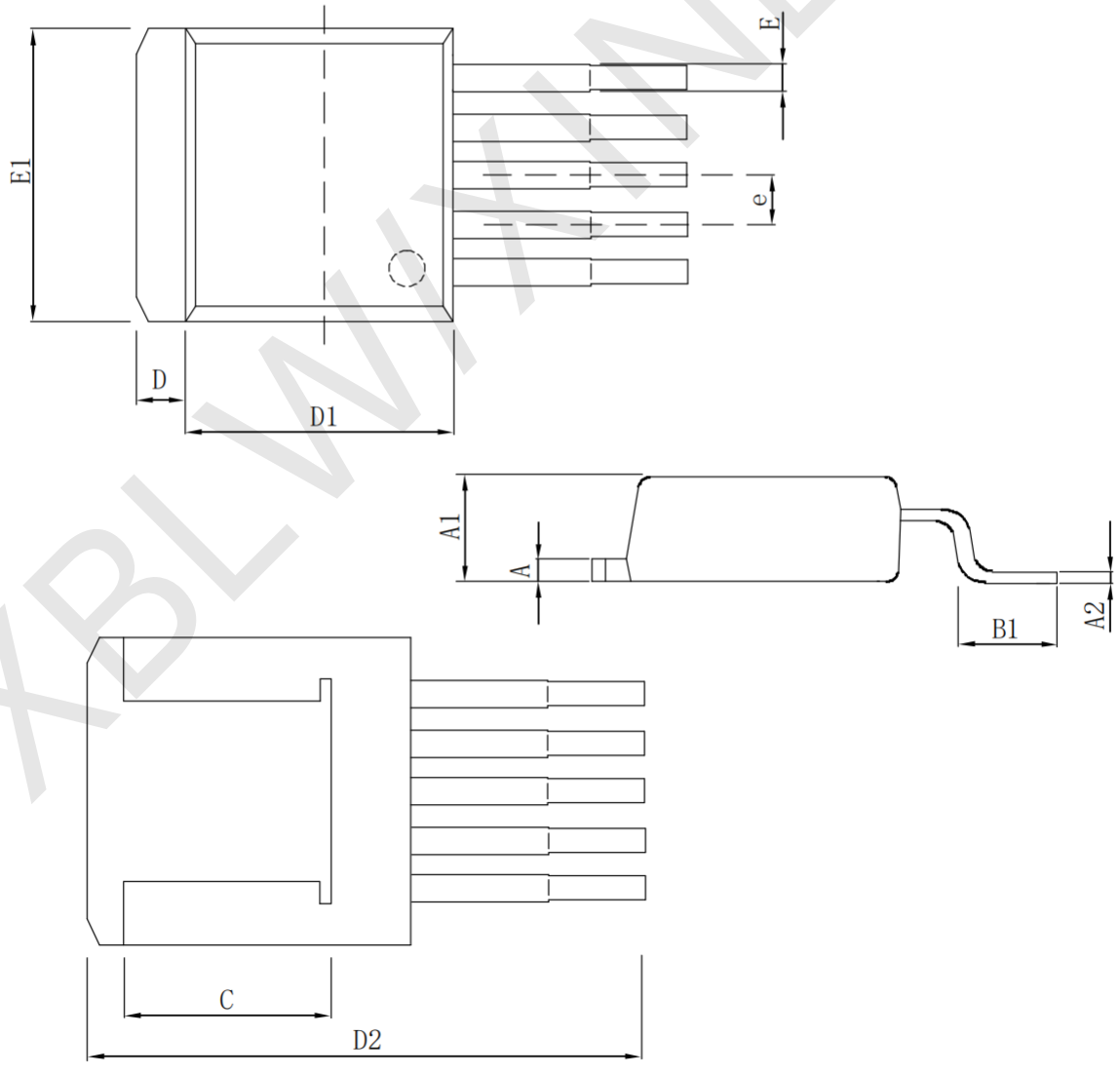


Figure 19 . XBL6019 System Parameters Test Circuit

Package Information

· TO-263-5L

Size / Symbol	Dimensions In Millimeters		Size / Symbol	Dimensions In Inches	
	Min(mm)	Max(mm)		Min(in)	Max(in)
A	1.170	1.370	A	0.046	0.054
A1	4.470	4.670	A1	0.176	0.184
A2	0.310	0.530	A2	0.012	0.021
B1	2.340	2.740	B1	0.092	0.108
C	5.080(REF)		C	0.200(REF)	
D	1.170	1.370	D	0.046	0.054
D1	8.500	8.900	D1	0.335	0.350
D2	14.55	15.55	D2	0.572	0.612
E	0.660	0.860	E	0.025	0.034
E1	10.01	10.31	E1	0.394	0.406
e	1.700(BSC)		e	0.067(BSC)	



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