

0.5A 150KHz 100V PWM Buck DC/DC Converter

Features

- Wide 4.5V to 80V Input Voltage Range
- 5V,12V,15V and adjustable versions
- Output Adjustable from 1.25V to 24V
- Maximum Duty Cycle 100%
- Minimum Drop Out 2.0V
- Fixed 150KHz Switching Frequency
- Recommend output power less than 8W
- 0.5A Constant Output Current Capability
- Internal Optimize Power Transistor
- TTL shutdown capability
- Excellent line and load regulation
- Built in thermal shutdown function
- Built in current limit function
- Built in output short protection function
- Built in second current limit function
- Available in SOP8L packages

Applications

- bike Controller Power Supply
- elecom / Networking Equipment

Package Types

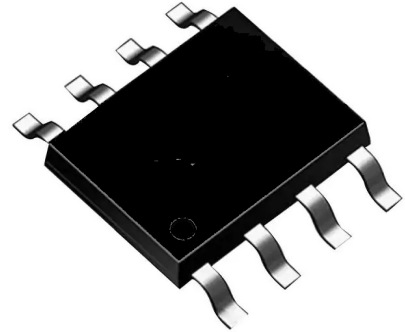


Figure 1. Package Types of CXL7005

Pin Configurations

VIN	1	8	GND
SW	2	7	GND
CXL70XX			
FB	3	6	GND
EN	4	5	GND

Figure 2 Pin Configuration of CXL70XX (Top View)

Pin Description

Pin Number	Pin Name	Description
1	VIN	Supply Voltage Input Pin. CXL70XX operates from a 4.5V to 80V DC voltage. Bypass Vin to GND with a suitably large capacitor to eliminate noise on the input.
2	SW	Power Switch Output Pin (SW). Output is the switch node that supplies power to the output.
3	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.
4	EN	Enable Pin. Drive EN pin low to turn on the device, drive it high to turn it off. Floating is default low.
5/6/7/8	GND	Ground Pin.

Function Block

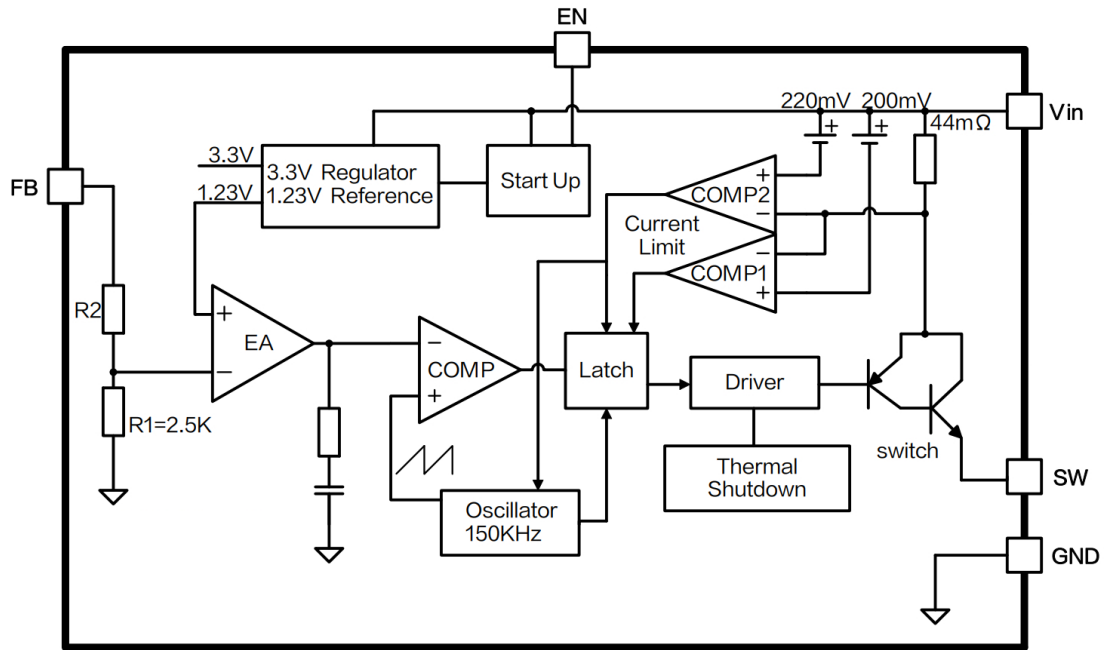


Figure 3 Function Block Diagram of CXL70XX

Typical Application Circuit

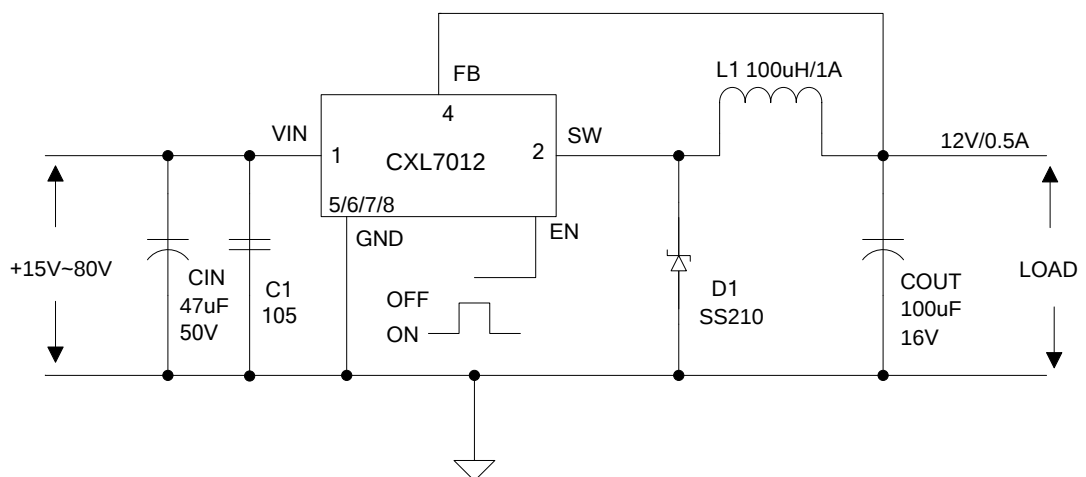


Figure4. CXL7012 Typical Application Circuit (VIN=15V~80V, VOUT=12V/0.5A)

Ordering Information

Order Information	Marking ID	Package Type	Eco Plan	Packing Type Supplied As
CXL7000	XL7000	SOP8L	RoHS & HF	2500 Units on Reel
CXL7005A	XL7005A	SOP8L	RoHS & HF	2500 Units on Reel
CXL7012	XL7012	SOP8L	RoHS & HF	2500 Units on Reel
CXL7015A	XL7015	SOP8L	RoHS & HF	2500 Units on Reel

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 100	V
Feedback Pin Voltage	V_{FB}	-0.3 to V_{IN}	V
Enable Pin Voltage	V_{EN}	-0.3 to V_{IN}	V
Switch Pin Voltage	V_{SW}	-0.3 to V_{IN}	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	$R_{\theta JA}$	85	°C / W
Thermal Resistance-Junction to Case	$R_{\theta JC}$	45	°C / W

CXL7005 Electrical Characteristics

$T_a = 25^{\circ}\text{C}$; unless otherwise specified.

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
System parameters test circuit figure6						
VOUT	Output Voltage	Vin = 8.0V to 80V Iload=0.1A to 0.5A	4.8	5	5.2	V
η	Efficiency	Vin=48V ,Vout=5.0V Iout=0.2A	–	82	–	%

CXL7012 Electrical Characteristics

$T_a = 25^{\circ}\text{C}$; unless otherwise specified.

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
System parameters test circuit figure7						
VOUT	Output Voltage	Vin =15V to 80V , Iload=0.1A to 0.5A	11.52	12	12.48	V
η	Efficiency	Vin=48V ,Vout=12V Iout=0.2A	–	86	–	%

CXL7015 Electrical Characteristics

$T_a = 25^{\circ}\text{C}$; unless otherwise specified.

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
System parameters test circuit figure8						
VOUT	Output Voltage	Vin = 18V to 80V , Iload=0.1A to 0.5A	14.40	15	15.60	V
η	Efficiency	Vin=48V ,Vout=15V Iout=0.2A	–	87	–	%

CXL7000 Electrical Characteristics

$T_a = 25^{\circ}\text{C}$; unless otherwise specified.

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
System parameters test circuit figure9						
VOUT	Output Voltage	Vin = 4.5V to 80V , Iload=0.1A to 0.5A	1.225	1.25	1.275	V
η	Efficiency	Vin=48V ,Vout=15V Iout=0.2A	–	87	–	%

Electrical Characteristics (DC Parameters)

$V_{in} = 48V$ for the 5V,12V,15V,and Adjustable versions, $GND=0V$, V_{in} & GND parallel connect a 100uF/100V capacitor; $I_{out}=200mA$, $T_a = 25^{\circ}C$;the others floating unless otherwise specified.

Parameters	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Input operation voltage	V_{in}		4.5		80	V
Shutdown Supply Current	I_s	$V_{EN}=5V$		50	200	μA
Quiescent Supply Current	I_q	$V_{EN}=0V$, $V_{FB}=High$		4.5	10	mA
Oscillator Frequency	F_{osc}		127	150	173	Khz
Switch Current Limit	I_L	$V_{FB}=0V$		1.5		A
EN Pin Threshold	V_{EN}	High (Regulator OFF) Low (Regulator ON)		1.4 0.8		V
EN Pin Input Leakage Current	I_H	$V_{EN}=2.5V$ (OFF)		8	15	μA
	I_L	$V_{EN}=0.5V$ (ON)		0.5	5	μA
Output Saturation Voltage	V_{CE}	$V_{FB}=0V$ $I_{out}=1.5A$		1.2	1.5	V
Max. Duty Cycle	D_{MAX}	$V_{FB}=0V$		100		%

Test Circuit and Layout guidelines

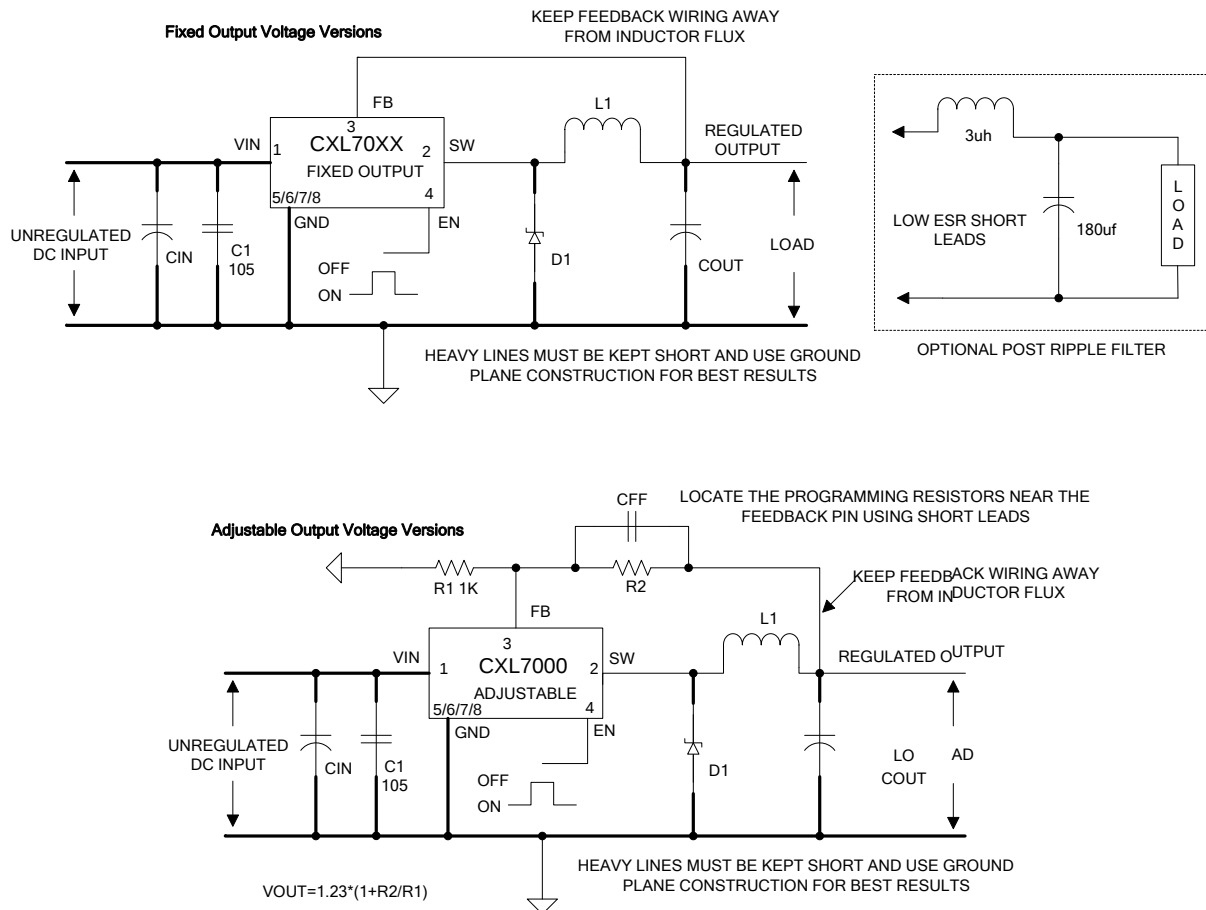


Figure4. Standard Test Circuits and Layout Guides

Select R1 to be approximately 1K, use a 1% resistor for best stability.

C1 and CFF are optional; in order to increase stability and reduce the input power line noise, C1 must be placed near to PIN1 and PIN3;

For output voltages greater than approximately 12V, an additional capacitor CFF is required. The compensation capacitor is typically between 100 pf and 33 nf, and is wired in parallel with the output voltage setting resistor, R2. It provides additional stability for high output voltage, low input-output voltages, and/or very low ESR output capacitors, such as solid tantalum capacitors.

$CFF = 1 / (31 * 1000 * R2)$; This capacitor type can be ceramic, plastic, silver mica, etc. (Because of the unstable characteristics of ceramic capacitors made with Z5U material, they are not recommended.)

Typical System Application (Recommend output current safe work range)

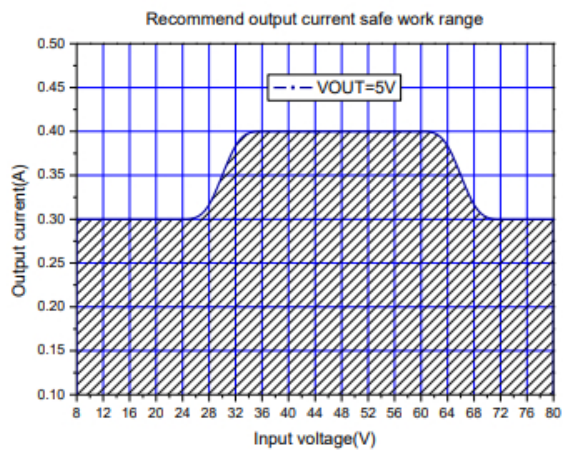


Figure5.Max output current(VOUT=5V)

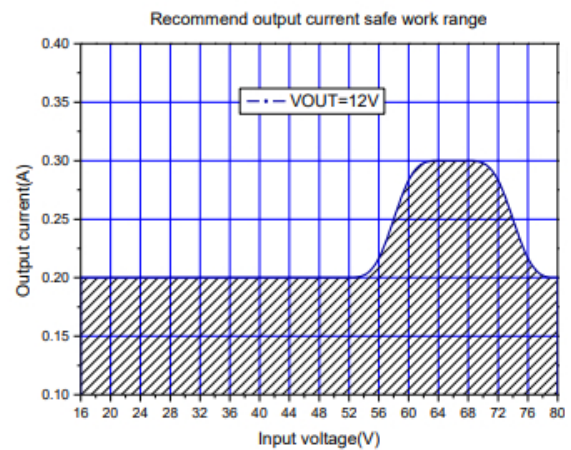


Figure6.Max output current(VOUT=12V)

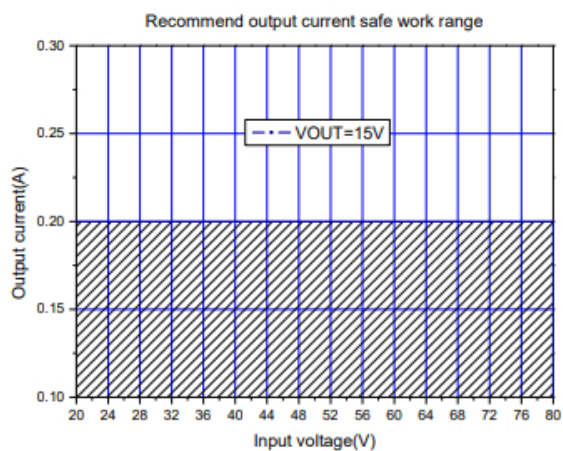


Figure7.Max output current(VOUT=15V)

Typical System Application for 5.0V Version

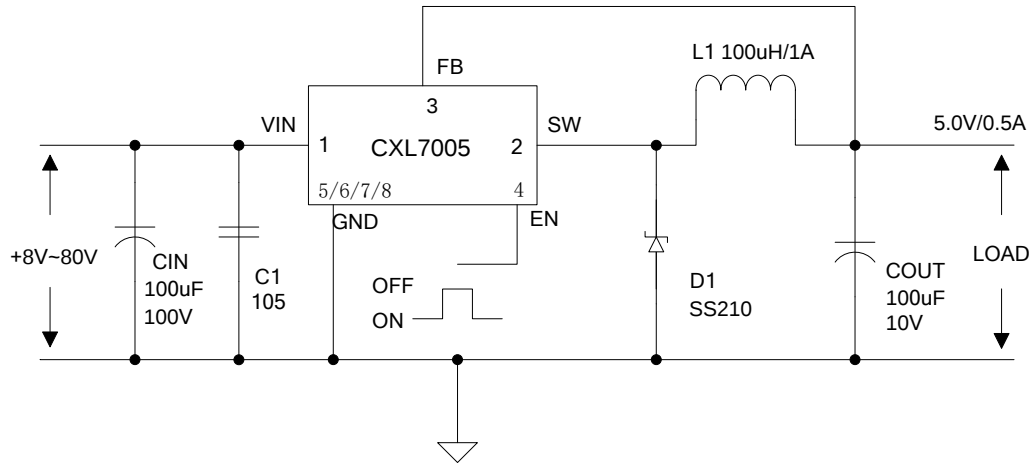


Figure8. CXL7005 System Parameters Test Circuit

Typical System Application for 12V Version

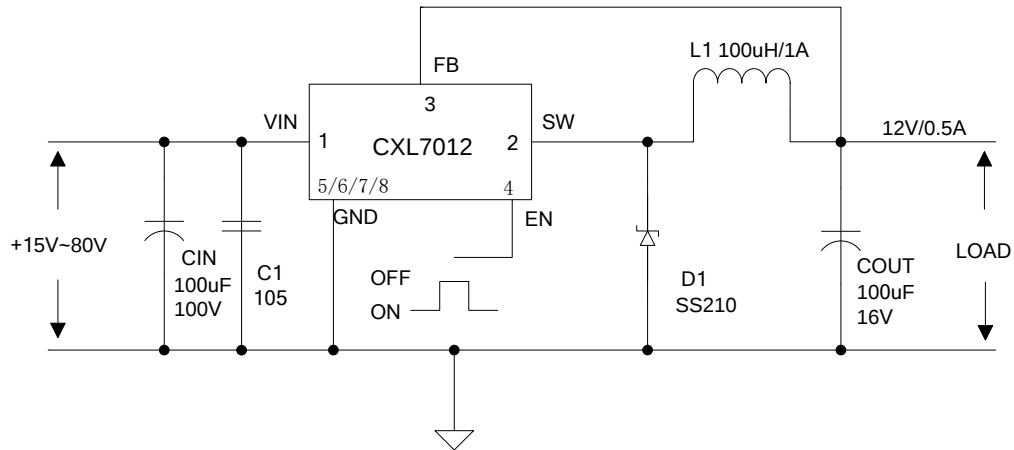


Figure9. CXL7012 System Parameters Test Circuit

Typical System Application for 15V Version

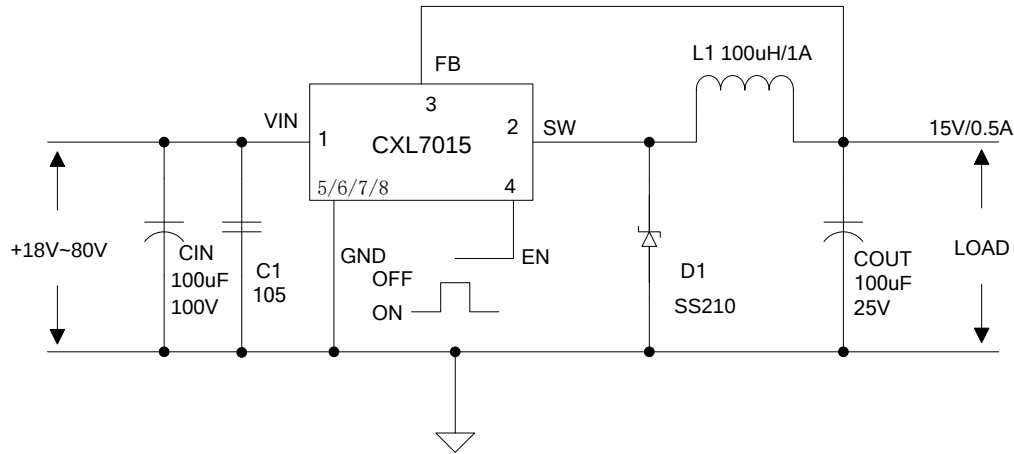


Figure10. CXL7015 System Parameters Test Circuit

Typical System Application for ADJ Version

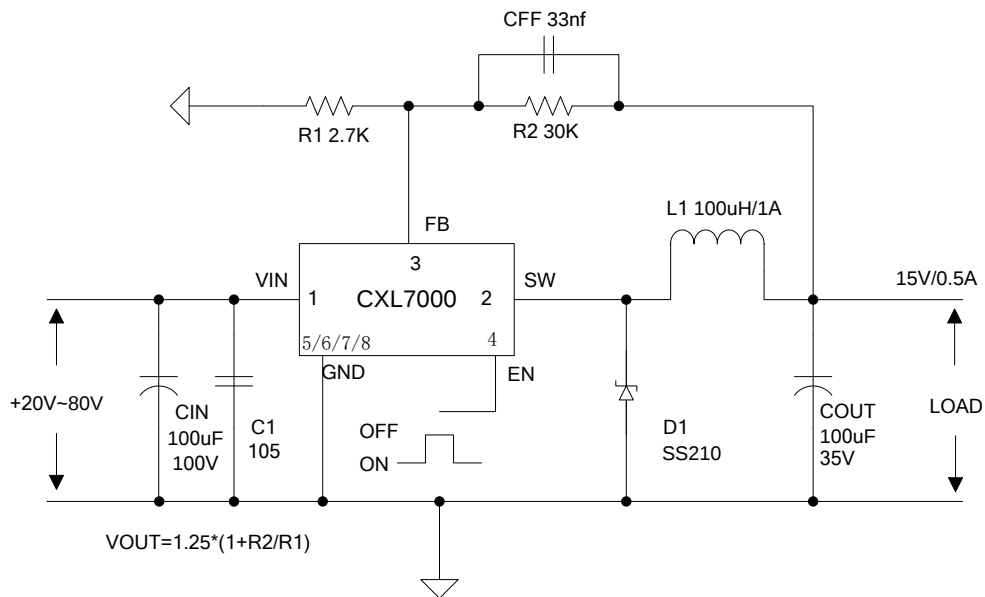
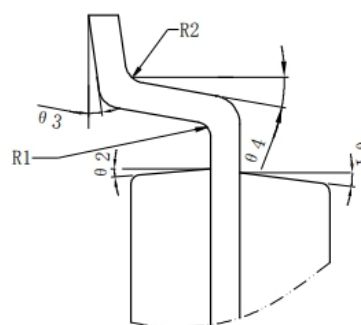
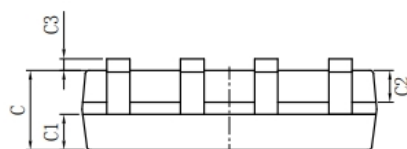
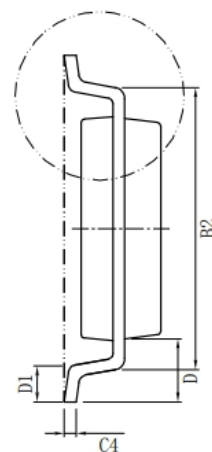
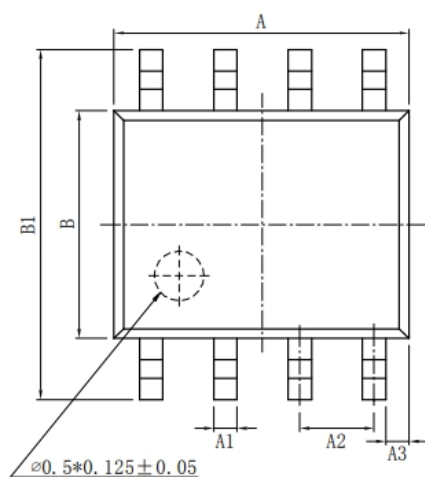


Figure11 CXL7000 System Parameters Test Circuit

SOP8L Package Outline Dimensions



标注	尺寸	MIN(mm)	MAX(mm)	标注	尺寸	MIN(mm)	MAX(mm)
A		4.80	5.00	C3		0.05	0.20
A1		0.356	0.456	C4		0.203	0.233
A2		1.27TYP		D		1.05TYP	
A3		0.345TYP		D1		0.40	0.80
B		3.80	4.00	R1		0.20TYP	
B1		5.80	6.20	R2		0.20TYP	
B2		5.00TYP		$\theta 1$		17° TYP4	
C		1.30	1.60	$\theta 2$		13° TYP4	
C1		0.55	0.65	$\theta 3$		0° ~ 8°	
C2		0.55	0.65	$\theta 4$		4° ~ 12°	