Small Package PFM Control Step-Up DC/DC Converter

CJ9118 Series

■ INTRODUCTION

The CJ9118 Series is a CMOS PFM-control step-up switching DC/DC converter. This products with a low ripple over a wide range, high efficiency, and high output current. With the CJ9118 Series, a step-up switching DC/ DC converter can be configured by using an external coil and capacitor. The built-in MOSFET is turned off by a protection circuit when the voltage at the LX pin exceeds the limit to prevent it from being damaged. This feature, along with the mini package and low current consumption, makes the SCJ9118 Series ideal for applications such as the power supply unit of portable equipment.

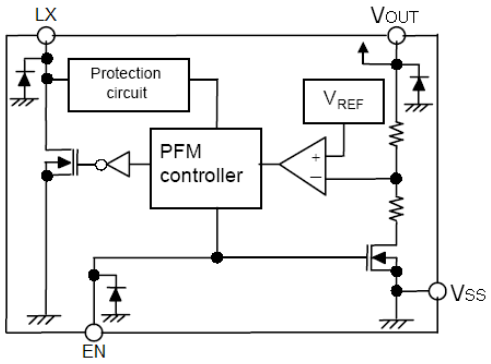
■ FEATURES

- External parts: Coil, capacitor
- Output voltage: Settable to between 2.1V to 5.5 V in 0.1 V steps
- Accuracy of ±2%
- High efficiency：±95%
- Standard function (product type A)
- Shutdown function (product type B)
- Maximum Oscillation Frequency:300KHz

■ APPLICATIONS

- Digital cameras
- Electronic notebooks and PDAs
- Portable CD/MD players
- Cameras, video equipment,
- Communications equipment
- Power supply for microcomputers

■ BLOCK DIAGRAM



■ DEVICE INFORMATION:

CJ9118①②③④

DESIGNATOR	SYMBOL	DESCRIPTION
①	A	Standard LX
	B	With shutdown, LX
②③	Integer	e.g.：3.0V=②:3; ③:0
④	T3/T5	Package：SOT-23-3/5L
	K	Package：SOT-23
	R/H	Package：SOT-89-3/5L
	L	Package：TO-92

Pin Configuration

SOT-23/SOT-23-3L
Top view

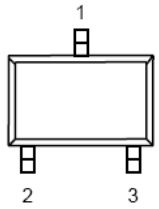


Table 1 CJ9118A Series（SOT-23/SOT-23-3L）

PIN NO.	PIN NAME	FUNCTION
1	V_{OUT}	Output voltage pin
2	V_{SS}	GND pin
3	LX	External inductor connection pin

SOT-23-5L
Top view

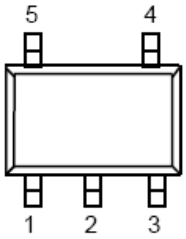


Table 2 CJ9118B Series（SOT-23-5L）

PIN NO.	PIN NAME	FUNCTION
1	EN	Shutdown pin “H”: Normal operation “L”: Step-up stopped
2	V_{OUT}	Output voltage pin
3	NC	(N.C.)
4	V_{SS}	GND pin
5	LX	External inductor connection pin

SOT-89-3L
Top view

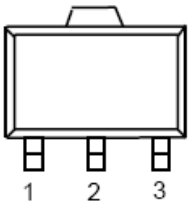


Table 3 CJ9118A Series （SOT-89-3L）

PIN NO.	PIN NAME	FUNCTION
1	V_{SS}	GND pin
2	V_{OUT}	Output voltage pin
3	LX	External inductor connection pin

TO-92
Bottom view

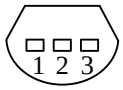


Table 4 CJ9118A Series （TO-92）

PIN NO.	PIN NAME	FUNCTION
1	V_{SS}	GND pin
2	V_{OUT}	Output voltage pin
3	LX	External inductor connection pin

■ ABSOLUTE MAXIMUM RATINGS

(Unless otherwise specified, Ta=25°C)

PARAMETER		SYMBOL	RATINGS	UNITS
V_{OUT} pin voltage		V_{OUT}	V_{SS}-0.3 ~ V_{SS}+8	V
EN pin voltage		EN	V_{SS}-0.3 ~ V_{SS}+8	V
LX pin voltage		V_{LX}	V_{SS}-0.3 ~ V_{SS}+8	V
LX pin current		I_{LX}	1000	mA
Power dissipation	SOT-23/SOT-23-3L	PD	300	mW
	SOT-23-5L		400	mW
	SOT-89-3L		500	mW
	TO-92		200	mW
Operating temperature		T_{opr}	-40 ~+85	°C
Storage temperature		T_{stg}	-40 ~+125	°C
Soldering Temperature & Time		T_{solder}	260°C, 10s	

Note: These are stress ratings only. Stresses exceeding the range specified under “Absolute Maximum Ratings” may cause substantial damage to the device. Functional operation of this device at other conditions beyond those listed in the specification is not implied and prolonged exposure to extreme conditions may affect device reliability.

■ ELECTRICAL CHARACTERISTICS

(Unless otherwise specified, Ta=25°C)

PARAMETER	SYMBOL	CONDITION	MIN	TYP	MAX	UNITS
Output Voltage	V_{OUT}	-	$V_{OUT(S)}$ X0.98	V_{OUT}	$V_{OUT(S)}$ X1.02	V
Input Voltage	V_{IN}	-	-	-	7.5	V
Operation Start Voltage	V_{ST1}	I_{OUT}=1mA，V_{OUT}=2.2V~4.2V	-	-	0.9	V
Operation Start Voltage	V_{ST2}	I_{OUT}=1mA，V_{OUT}=4.2V~5.5V	-	-	1.2	V
Input Current At No Load	I_{SS1}	V_{IN}=1.8V, V_{OUT}=3.0V	-	15	-	uA
Current Consumption	I_{SS2}	V_{OUT}=$V_{OUT(s)}$+0.5V	-	6	10	uA
Current Consumption During Shutdown	I_{SSS}	V_{EN}=0V	-	-	1.0	uA
Maximum Oscillation Frequency	fosc	V_{OUT}=0.95x$V_{OUT(s)}$, measure Waveform at LX pin		300		KHz
Duty Ratio	Duty	V_{OUT}=0.95x$V_{OUT(s)}$	70	78	85	%
Efficiency	EFF			90		%
Shutdown Pin Input Voltage	V_{SH}	V_{OUT}=0.95x$V_{OUT(s)}$, judge Oscillation at LX pin	0.75	-	-	V
	V_{SL}	V_{OUT}=0.95x$V_{OUT(s)}$, judge stop at LX pin	-	-	0.3	V
Shutdown Pin input Current	I_{SH}	V_{EN}=6V	-0.1	-	0.1	uA
	I_{SL}	V_{EN}=0V	-0.1	-	0.1	uA

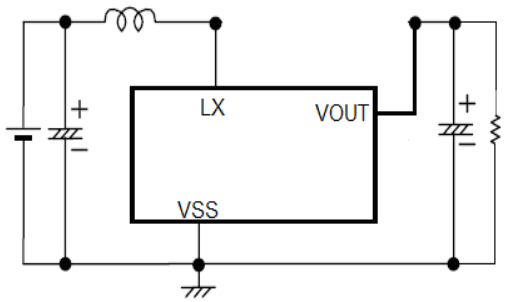
Remark: VOUT(S) specified above is the set output voltage value,and VOUT is the typical value of the actual output voltage

■ STANDARD CIRCUITS

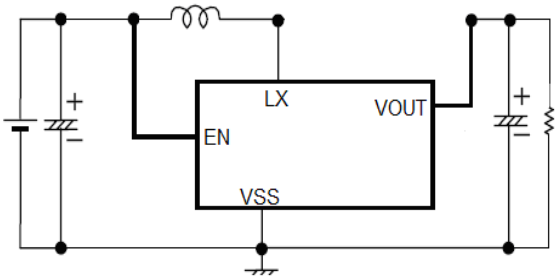
Component: Inductor：47uH(Sumida)

Capacitor：100uF/16V(Tantalum)

1、CJ9118A Circuits：

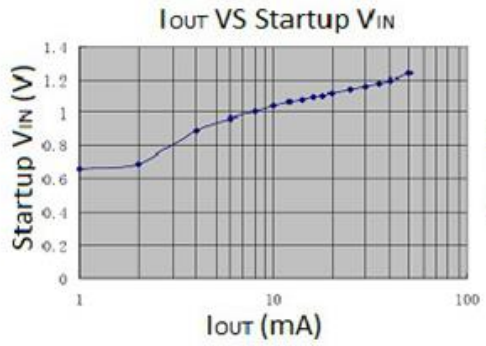


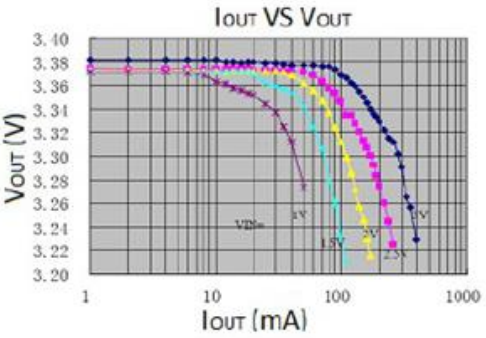
2 、CJ9118B Circuits：

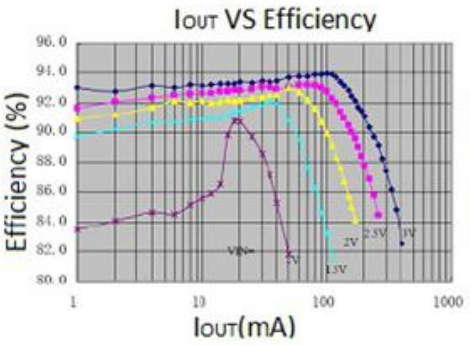


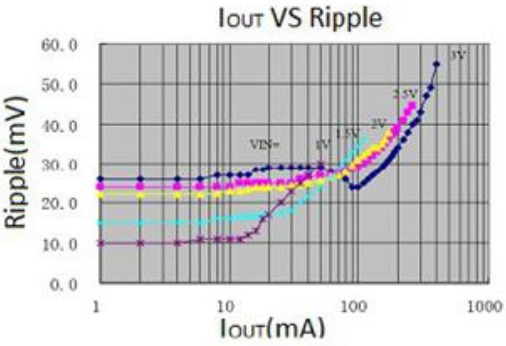
■ TYPICAL PERFORMANCE CHARACTERISTICS

(Cin=Cout=100uF,L=47uH)

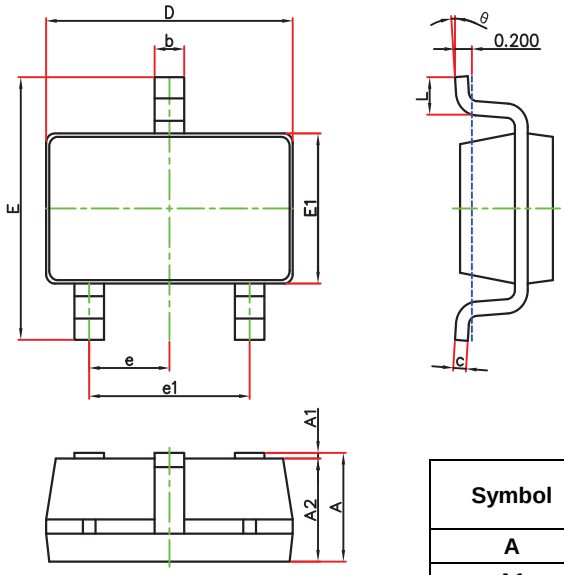






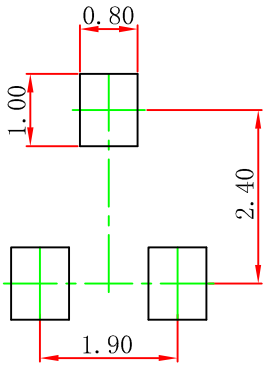


SOT-23-3L Package Outline Dimensions



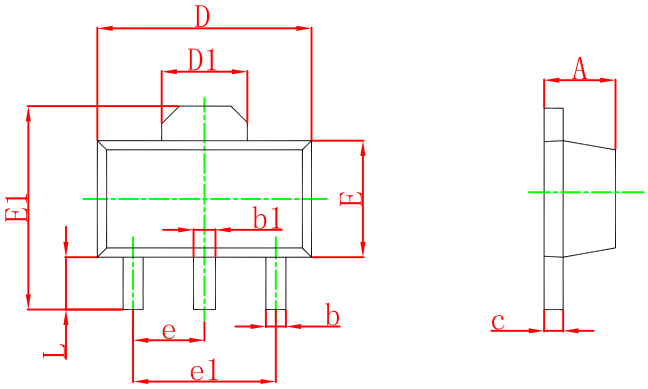
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		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°

SOT-23-3L Suggested Pad Layout



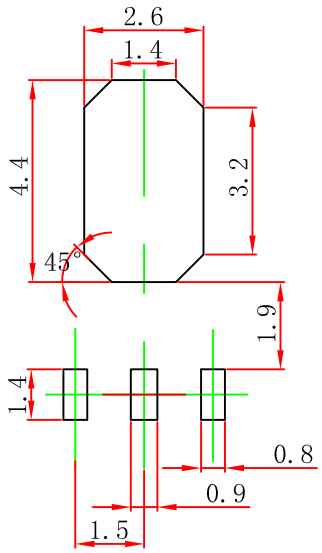
Note:
1.Controlling dimension:in millimeters.
2.General tolerance:± 0.05mm.
3.The pad layout is for reference purposes only.

SOT-89-3L Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.400	1.600	0.055	0.063
b	0.320	0.520	0.013	0.197
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550 REF		0.061 REF	
E	2.300	2.600	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500 TYP		0.060 TYP	
e1	3.000 TYP		0.118 TYP	
L	0.900	1.200	0.035	0.047

SOT-89-3L Suggested Pad Layout



Note:
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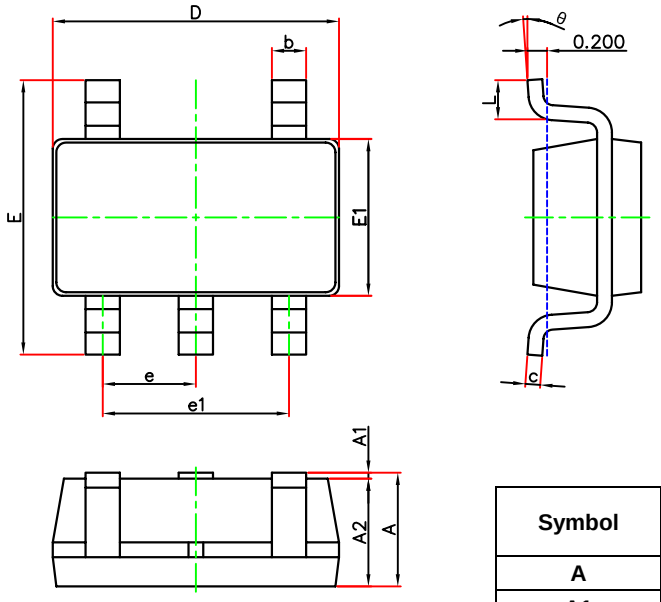
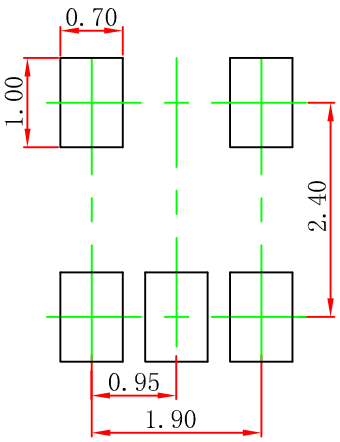
SOT-23-5L Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In 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°

SOT-23-5L Suggested Pad Layout



Note:
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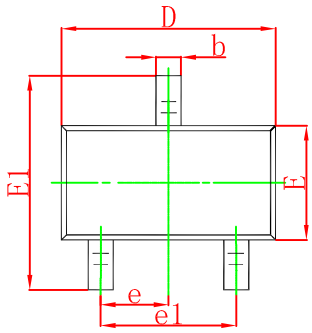
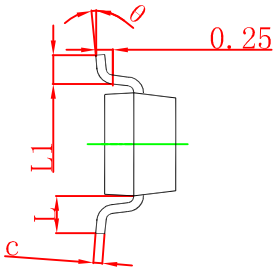
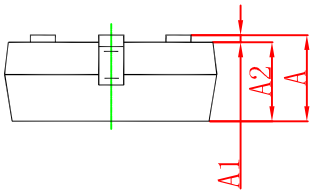
2.General tolerance:±0.05mm.
3.The pad layout is for reference purposes only.

SOT-23 Package Outline Dimensions

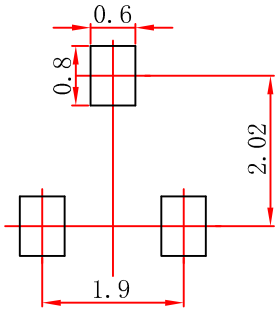






Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP.		0.037 TYP.	
e1	1.800	2.000	0.071	0.079
L	0.550 REF.		0.022 REF.	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

SOT-23 Suggested Pad Layout



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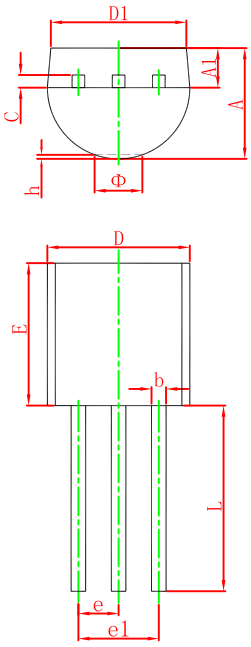
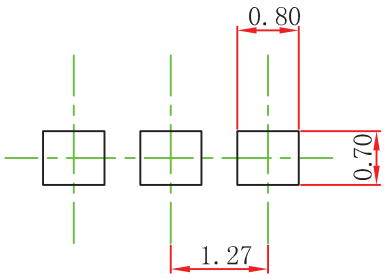
TO-92 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	3.300	3.700	0.130	0.146
A1	1.100	1.400	0.043	0.055
b	0.380	0.550	0.015	0.022
c	0.360	0.510	0.014	0.020
D	4.400	4.700	0.173	0.185
D1	3.430		0.135	
E	4.300	1.400	0.169	0.185
e	1.270 TYP		0.050 TYP	
e1	2.440	2.640	0.096	0.104
L	14.100	14.500	0.555	0.571
Φ		1.600		0.063
h	0.000	0.380	0.000	0.015

TO-92 Suggested Pad Layout



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