PT1307

Step-up DC/DC Converter with Accurate Input Current Limit

GENERAL DESCRIPTION

The PT1307 is a current mode DC-DC converter with accurate input current limit. It is suitable for use in topologies requiring low side MOSFET, such as boost, fly-back or SEPIC. The PT1307 has built in fault condition protection features such as short-circuit protection, and Thermal shut down protection. The PT1307 also has an OVLO function that locks out the switch when the input voltage is higher than 6.5V, although the, IN, and CS can stand up to 20V. The PT1307 provides programmable average current limiting with ±2% accuracy, which allows accurate limiting of the average current in the inductors, independent of peak current.

The PT1307 is available in SOT23-6.

FEATURES

- ±2% Programmable Average Current Limiting
- 1MHz Switching Frequency
- Short-Circuit Protection
- OVLO with Hysteresis

APPLICATIONS

- Battery Chargers
- Li-ion and USB Powered Systems
- Portable Instruments
- Step-up DC-DC Converters
- Step-up/step-down and Isolated dc/dc converters

ORDERING INFORMATION

PACKAGE	TEMPERATURE RANGE	ORDERING PART NUMBER	TRANSPORT MEDIA	MARK
SOT-23-6	-40°C to 85°C	PT1307X23F	Tape and Reel 3000 units	ACOG

Note：

PT1307X23F
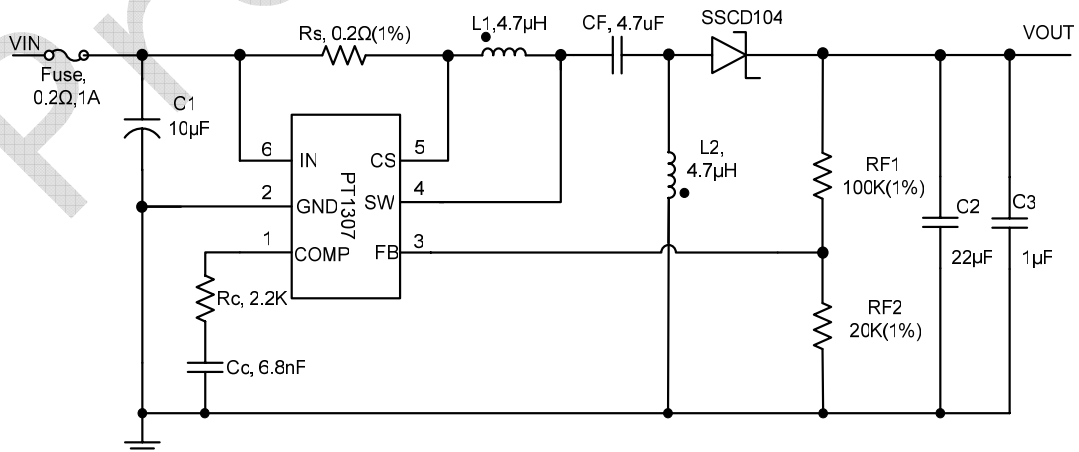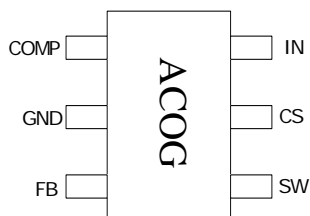
└——————Assembly Factory Code

TYPICAL APPLICATIONS

Fig. 1

PIN ASSIGNMENT

PIN DESCRIPTIONS

PIN NO	SYMBOL	FUNCTION
1	COMP	Compensation Pin, an RC network connected to this pin provides compensation for the control loop
2	GND	Ground Pin
3	FB	Feedback Pin, a portion of the output voltage is sensed at this pin
4	SW	Output for Internal Power Switch
5	CS	Current sense Pin, voltage generated across an external resister is fed into this pin
6	IN	Power supply input Pin

ABSOLUTE MAXIMUM RATINGS (NOTE1)

SYMBOL	DESCRIPTION	VALUE	UNITS
COMP	Comp pin voltage	-0.3~7	V
VFB	Feedback pin voltage	-0.3~7	V
VSW	SW pin input voltage	-0.3~25	V
ISW	SW pin output current	2	A
VIN	Supply voltage	-0.3~25	V
VCS	CS pin input voltage	-0.3~25	V
P_{TR1}	Thermal Resistance，SOT-23-6 θ_{JA} θ_{JC}	250 145	℃/W
T_J	Junction Temperature	125	°C
T_{SOLDER}	Lead Temperature (Soldering, 10 sec)	260	°C
T_{OPT}	Operation temperature	-40~+85	℃
T_{STG}	Storage temperature range	-55~+125	℃

RECOMMENDED OPERATING CONDITIONS (NOTE2)

SYMBOL	DESCRIPTION	VALUE	UNITS
VFB	Feedback pin voltage	0~5.5	V
VIN	Supply voltage	0~20	V
VCS	CS pin input voltage	0~20	V
VSW	SW pin input voltage	0~20	V
ISW	SW pin output current	1.5	A

Notes:

1. Exceeding these ratings may damage the device
2. The device is not guaranteed to function outside of its operating rating

SIMPLIFIED BLOCK DIAGRAM
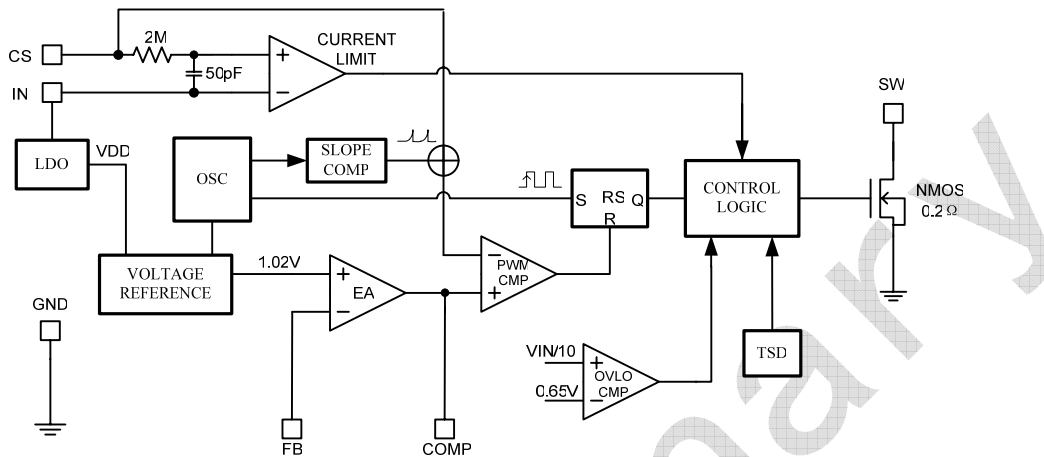
ELECTRICAL CHARACTERISTICS

(V_{IN} = 5V, TA = 25℃, Fig.1, unless otherwise specified.)

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNIT
V_{IN}	Input Voltage Range		4.75		5.25	V
I_S	Input DC Bias Current	No Load		0.5	2	mA
V_{OVLO}	Input Over Voltage LockOut Threshold		6	6.5	7	V
$\triangle V_{OVLO}$	Input Over Voltage LockOut Threshold Hysteresis			200		mV
Fs	Switching Frequency		0.8	1	1.2	MHz
I_{IN}	Input Current Limit	R_{CS} = 0.2Ω, V_{IN} = 4.75 ~5.25V, V_{OUT} = 0~6.3V	475.0	483.5	493.0	mA
V_{OUT}	Output Voltage	R_{CS} = 0.2Ω, V_{IN} = 4.75V~5.25V, I_{OUT} = 0mA	6		6.3	V
		R_{CS} = 0.2Ω, V_{IN} = 4.75V~5.25V, I_{OUT} = 300mA	5.800			
		R_{CS} = 0.2Ω, V_{IN} = 4.75V~5.25V, I_{OUT} = 450mA	3.250			
I_{OUT}	Output Current	R_{CS} = 0.2Ω, V_{IN} =4.75V~5.25V V_{OUT} = 1V			940	mA
		R_{CS} = 0.2Ω, V_{IN} =4.75V~5.25V V_{OUT} = 0V			1200	
RDS_{ON}	Switch On Resistance			0.2		Ω
TSD	Thermal Shut Down	I_{OUT} = 0		160		℃
$\triangle$TSD	Thermal Shut Down Hystersis			20		

PACKAGE INFORMATION

SOT23-6 Package
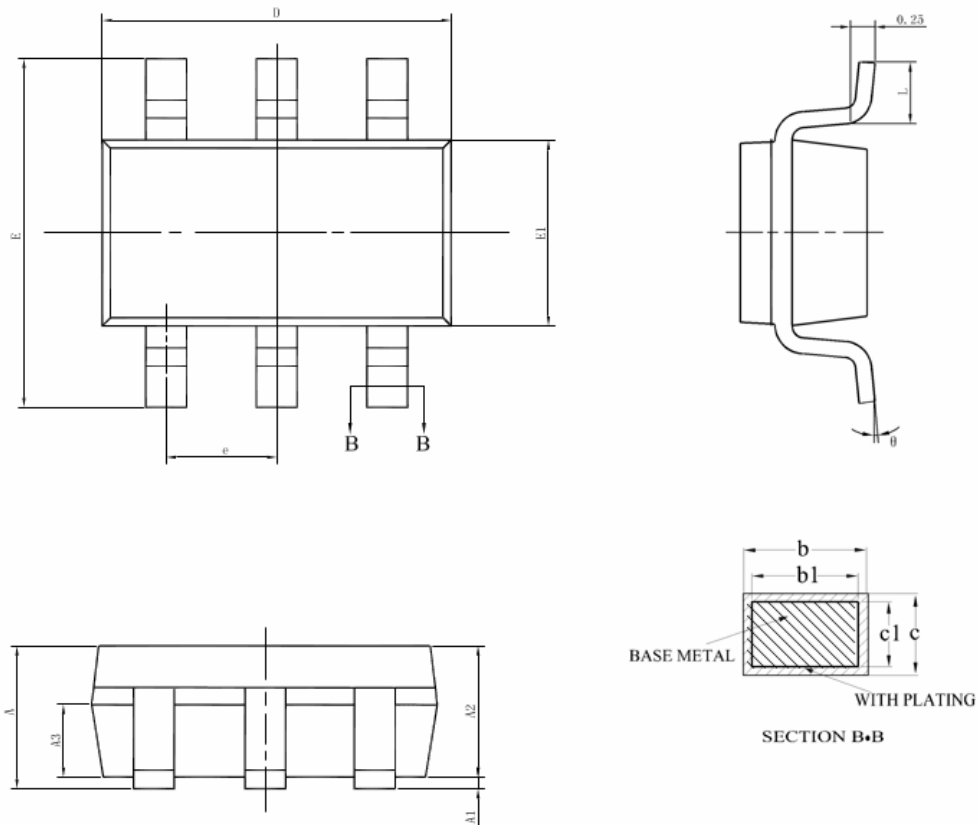
SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	-	-	1.30
A1	0.04	0.07	0.10
A2	1.00	1.10	1.20
A3	0.55	0.65	0.75
b	0.34	-	0.43
b1	0.33	0.35	0.38
c	0.15	-	0.21
c1	0.14	0.15	0.16
D	2.72	2.92	3.12
E	2.60	2.80	3.00
E1	1.40	1.60	1.80
e	0.95BSC		
L	0.30	-	0.60
θ	0	-	8°