

## 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  $\pm 2\%$  accuracy, which allows accurate limiting of the average current in the inductors, independent of peak current.

The PT1307 is available in SOT23-6.

### FEATURES

- $\pm 2\%$  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

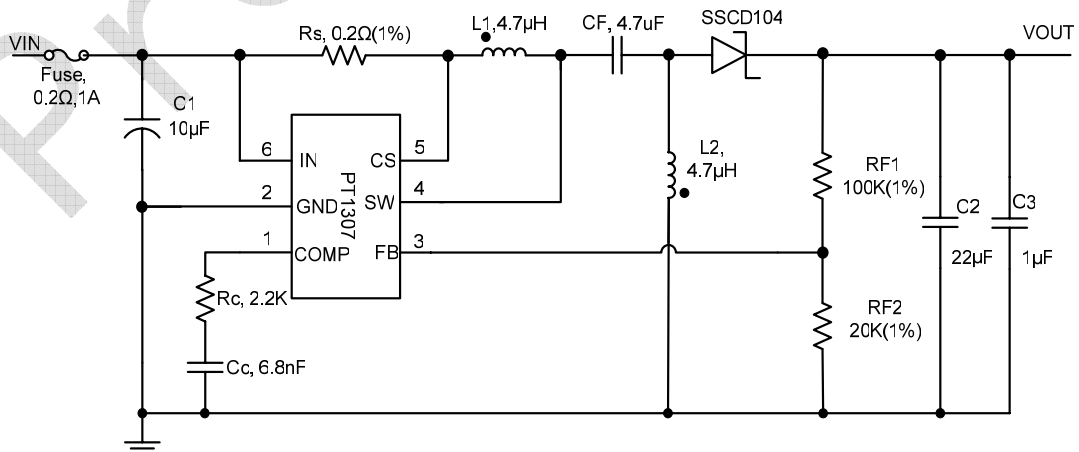
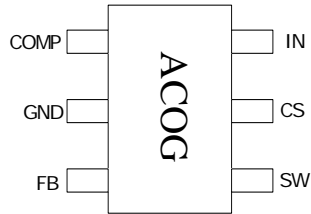


Fig. 1

**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 resistor 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 <sub>TR1</sub>	Thermal Resistance, SOT-23-6 $\theta_{JA}$ $\theta_{JC}$	250	°C/W
		145	
T <sub>J</sub>	Junction Temperature	125	°C
T <sub>SOLDER</sub>	Lead Temperature (Soldering, 10 sec)	260	°C
T <sub>OPT</sub>	Operation temperature	-40~+85	°C
T <sub>STG</sub>	Storage temperature range	-55~+125	°C

**RECOMMENDED OPERATING CONDITIONS (NOTE2)**

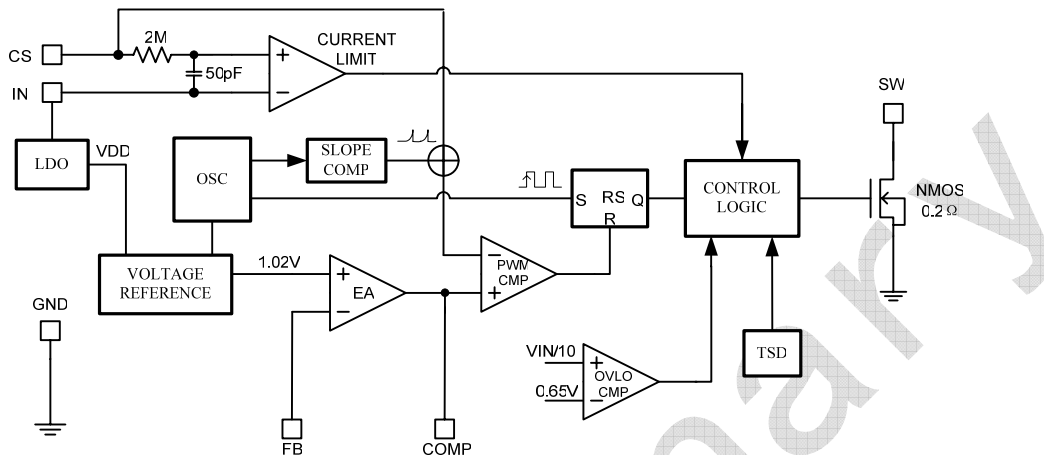
SYMBOL	DESCRIPTION	VALUE	UNITS
VFB	Feedback pin voltage	0~5.5	V
VIN	Supply voltage	0~20	V
VCS	CS pin input voltage	0~20	V
VSW	SW pin input voltage	0~20	V
ISW	SW pin output current	1.5	A

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### 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



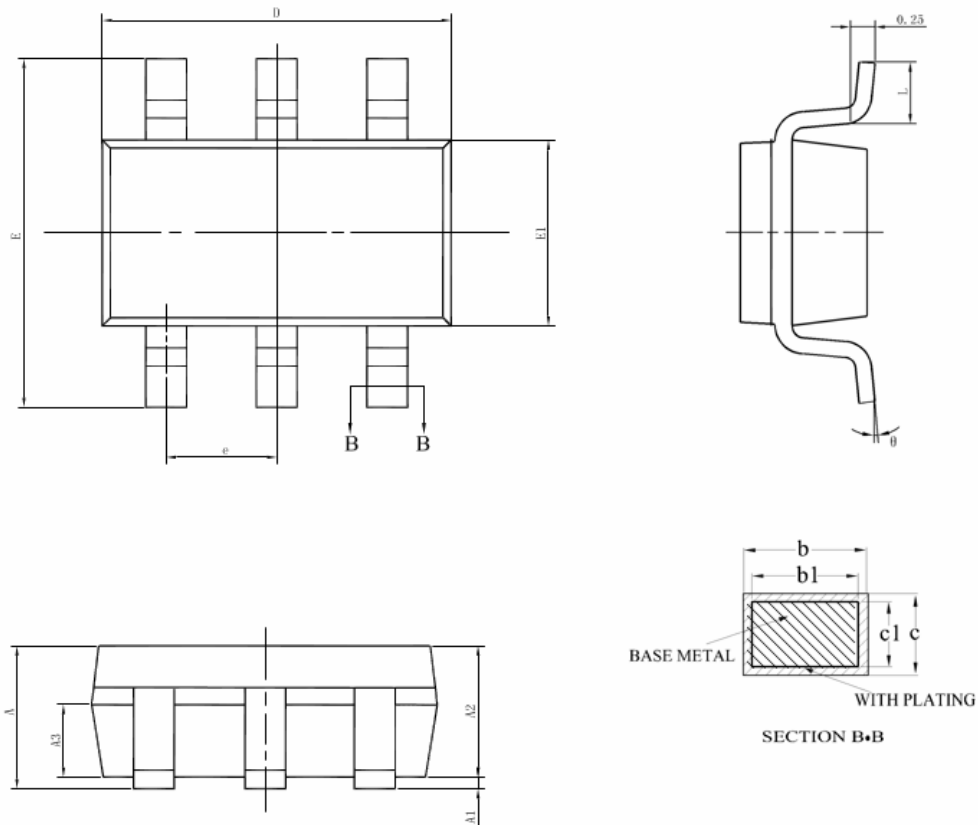
### ELECTRICAL CHARACTERISTICS

( $V_{IN} = 5V$ ,  $T_A = 25^\circ C$ , 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
$\Delta V_{OVLO}$	Input Over Voltage LockOut Threshold Hysteresis			200		mV
$F_S$	Switching Frequency		0.8	1	1.2	MHz
$I_{IN}$	Input Current Limit	$R_{CS} = 0.2\Omega$ , $V_{IN} = 4.75 \sim 5.25V$ , $V_{OUT} = 0 \sim 6.3V$	475.0	483.5	493.0	mA
$V_{OUT}$	Output Voltage	$R_{CS} = 0.2\Omega$ , $V_{IN} = 4.75V \sim 5.25V$ , $I_{OUT} = 0mA$	6		6.3	V
		$R_{CS} = 0.2\Omega$ , $V_{IN} = 4.75V \sim 5.25V$ , $I_{OUT} = 300mA$	5.800			
		$R_{CS} = 0.2\Omega$ , $V_{IN} = 4.75V \sim 5.25V$ , $I_{OUT} = 450mA$	3.250			
$I_{OUT}$	Output Current	$R_{CS} = 0.2\Omega$ , $V_{IN} = 4.75V \sim 5.25V$ , $V_{OUT} = 1V$			940	mA
		$R_{CS} = 0.2\Omega$ , $V_{IN} = 4.75V \sim 5.25V$ , $V_{OUT} = 0V$			1200	
$R_{DS_{ON}}$	Switch On Resistance			0.2		$\Omega$
TSD	Thermal Shut Down	$I_{OUT} = 0$		160		$^\circ C$
$\Delta TSD$	Thermal Shut Down Hysteresis			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
$\theta$	0	-	8°