

Features

- Guaranteed Start-Up from below 1.12V
- Low Input Quiescent Current: 30 μ A
- High Output Voltage Accuracy $\pm 2.5\%$
- Small Number of External Components needed
- Output Voltage from 1.2V to 5.5V
- Space Saving SO-8 or TSSOP8 package

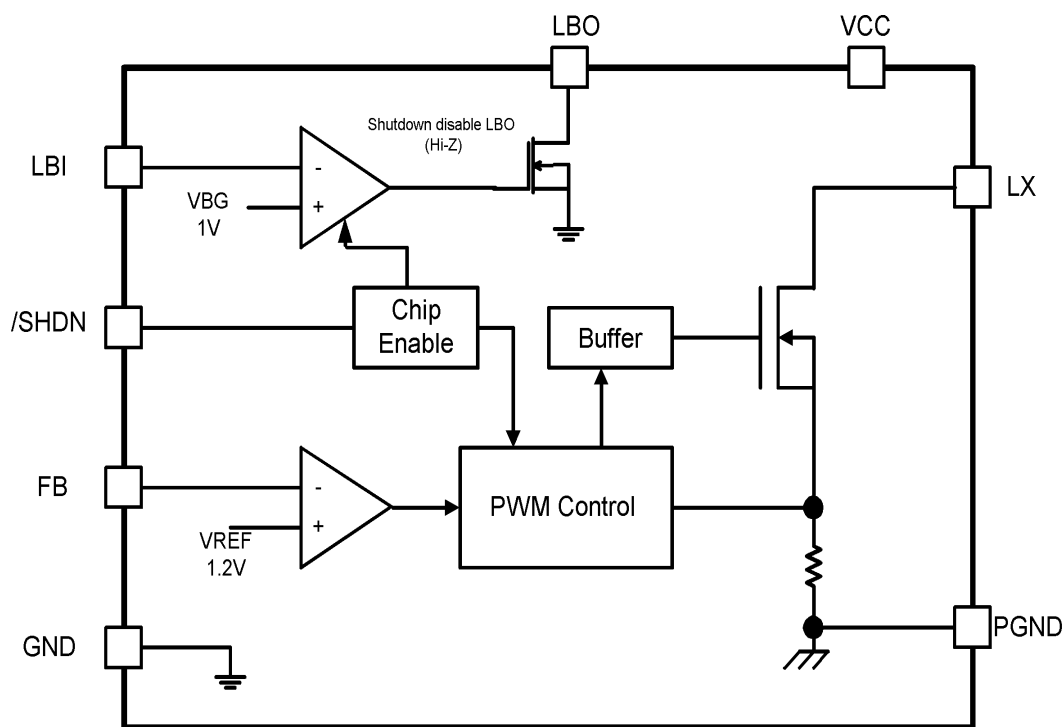
Applications

- Personal Digital Assistant (PDA)
- Digital Camera
- Portable Audio (MP3)
- Electronic Game

General Description

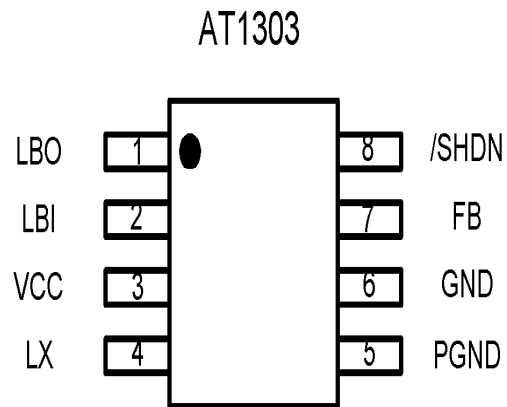
The AT1303 is a high efficiency current mode PWM step-up DC/DC converter with light load control for applications using battery-powered system. The device will automatically skip switching cycles under light load condition to maintain high efficiency at light load. The small SOP-8 or TSSOP-8 packages make the AT1303 an ideal choice of DC/DC Converter for space conscious applications.

Block Diagram



Aimtron reserves the right without notice to change this circuitry and specifications.

Pin Configuration



Pin Description

Pin No.	Symbol	I/O	Description
1	LBO	O	Low Battery Detected output (active Hi-Z)
2	LBI	I	Low Battery Detected input
3	VCC	P	Power Supply
4	LX	O	Switching Pin
5	PGND	P	Power Ground
6	GND	P	Ground
7	FB	I	Error Amplifier Input
8	/SHDN	I	Chip Enable Input

Ordering Information

Part number	Package	Remarks
AT1303	8-pin Plastic SOP	AT1303S
	8-pin TSSOP	AT1303P

Absolute Maximum Ratings

($T_a = +25^{\circ}\text{C}$)

Parameter	Symbol	Condition	Rated Value		Unit
			Min.	Max.	
Power supply voltage	V_{CC}	—	—	6.0	V
LX pin voltage	V_{LX}	—	—	6.0	V
LX pin output current	I_{LX}	—	—	1.2	A
Allowable dissipation	P_D	SOP8	—	570	mW
		TSSOP8	—	430	mW
Operating temperature	T_{OP}	—	-30	+85	$^{\circ}\text{C}$
Storage temperature	T_{stg}	—	-55	+125	$^{\circ}\text{C}$

WARNING: Semiconductor devices can be permanently damaged by application of stress (voltage, current, temperature, etc.) in excess of absolute maximum ratings. Do not exceed these ratings.

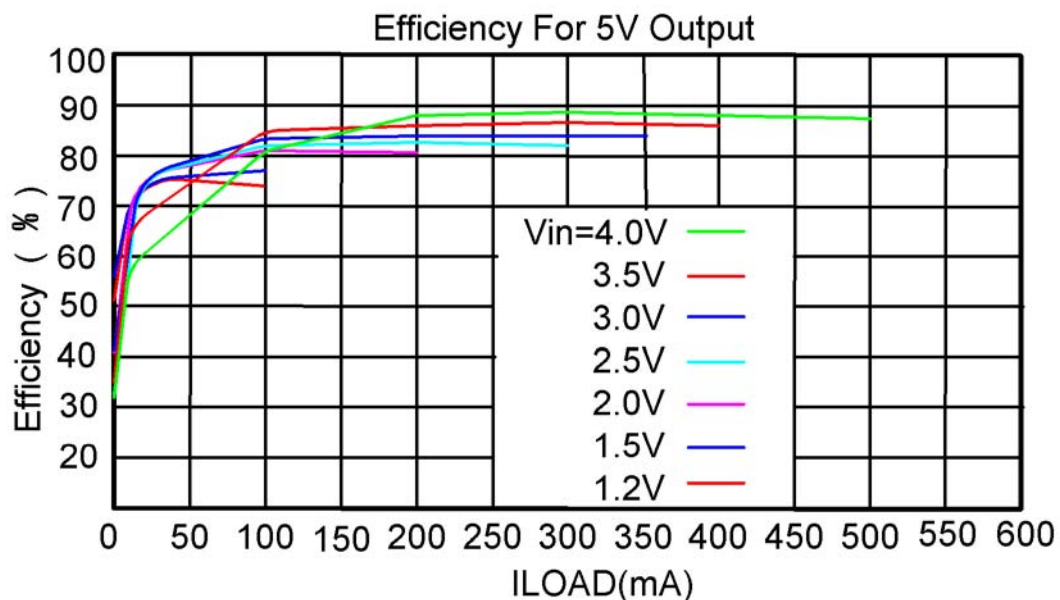
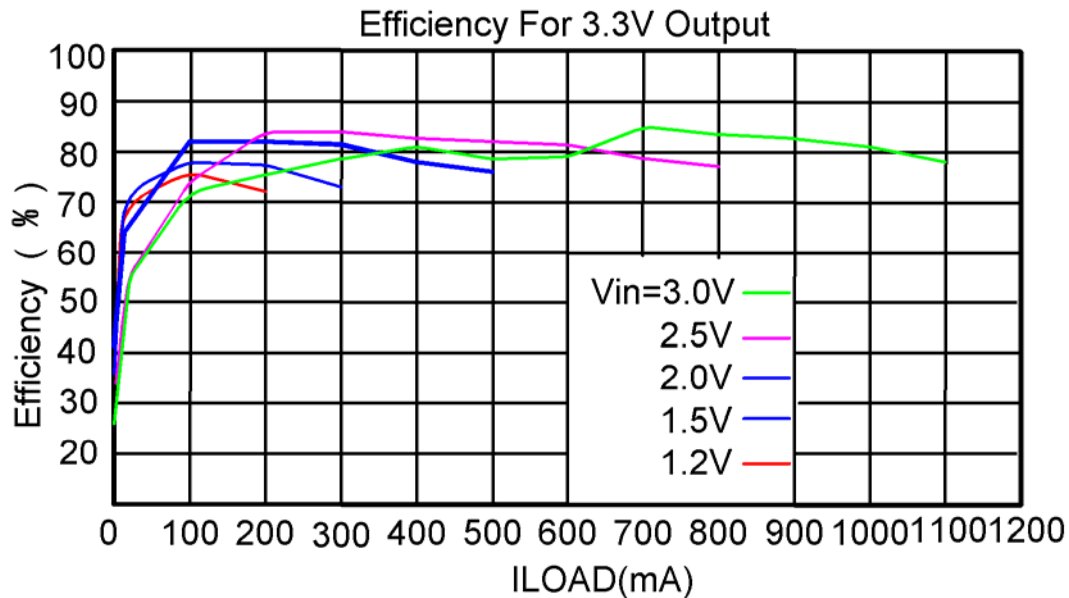
Electrical Characteristics

($T_a = +25^{\circ}\text{C}$)

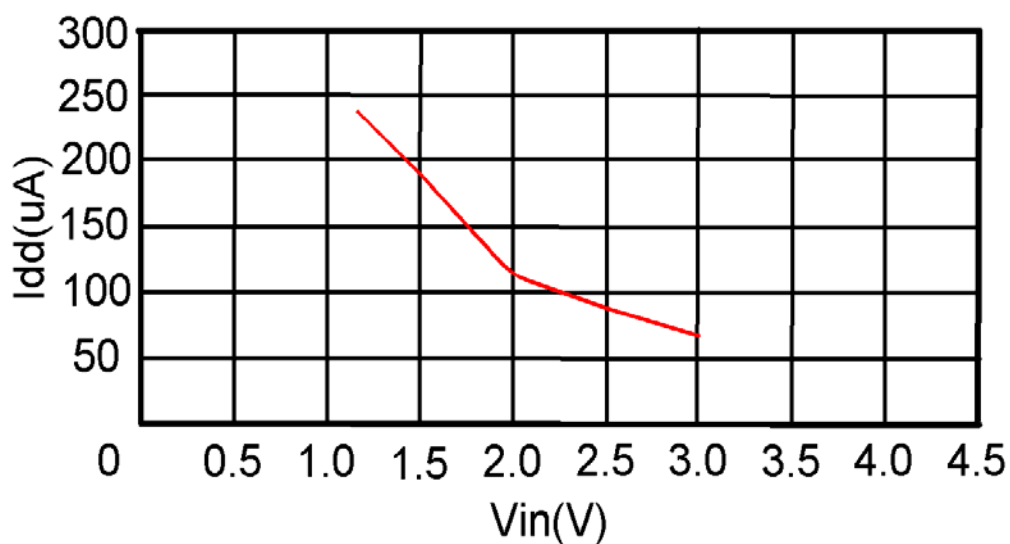
Parameter	Symbol	Condition	Values			Unit
			Min.	Typ.	Max.	
Input Voltage	V_{IN}		1.5	-	5.5	V
Start-Up Voltage	V_{Start}	$I_{OUT} = 1\text{mA}$ $V_{IN} = 0 \rightarrow 2\text{V}$	1.12	1.2	-	V
Switch off Current	I_2	$V_{IN} = V_{OUT} + 0.5\text{V}$	-	30	50	μA
Shutdown Current	I_3	/SHDN=0V, $V_{IN} = 5.5\text{V}$	-	1	5	μA
Feedback Reference	V_{REF}	Close loop, $V_{OUT} = 3.3\text{V}$	1.17	1.2	1.23	V
Switching Frequency	F_S	$V_{OUT} = 3.3\text{V}$	-	380	-	KHz
Maximum Duty	D_{max}	$V_{OUT} = 3.3\text{V}$	-	85	90	%
LX ON Resistance		$V_{OUT} = 3.3\text{V}$	-	0.3	0.35	Ω
Current Limit	I_{Limit}	$V_{OUT} = 3.3\text{V}$	-	0.8	1.0	A
/SHDN Trip Level		$V_{OUT} = 3.3\text{V}$	0.4	0.8	1.2	V
LBI Trip Level			0.98	1.0	1.02	V
LBO/LD Sink current	I_{LBO}	LBO/LD=0.4V	-	1	-	mA
Thermal shutdown			-	170	-	$^{\circ}\text{C}$
Thermal shutdown Hysterises			-	20	1	$^{\circ}\text{C}$

*Unless otherwise provided, $V_{IN} = 1.5\text{V}$ (when $V_{OUT} = 3.3\text{V}$), and use External Circuit of Typical Application (Fig 1).

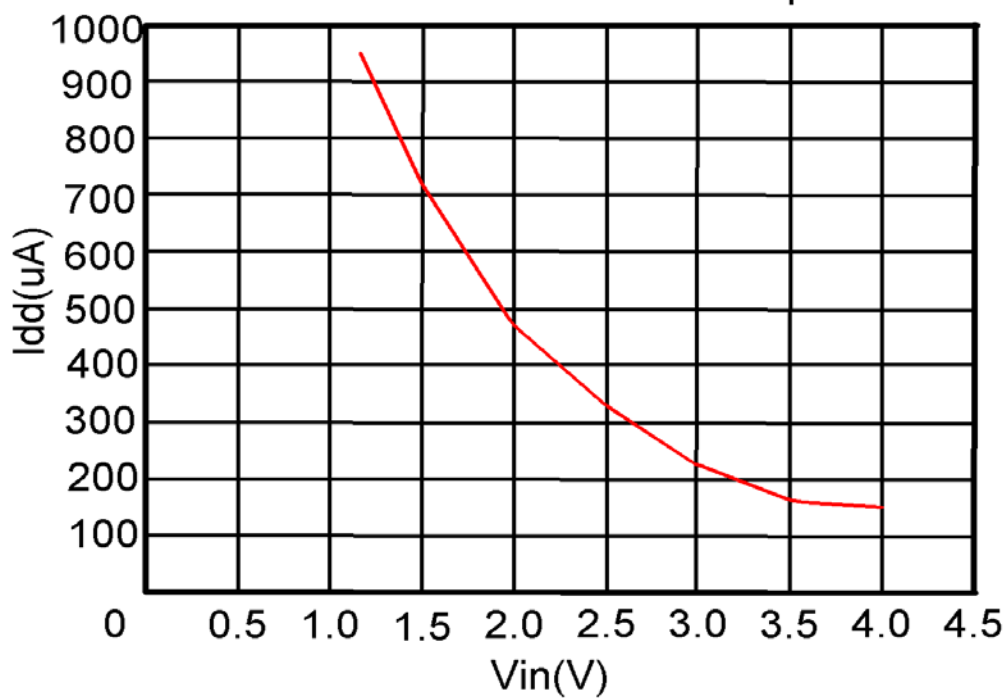
Typical Curve (as Fig.1, Fig. 2)



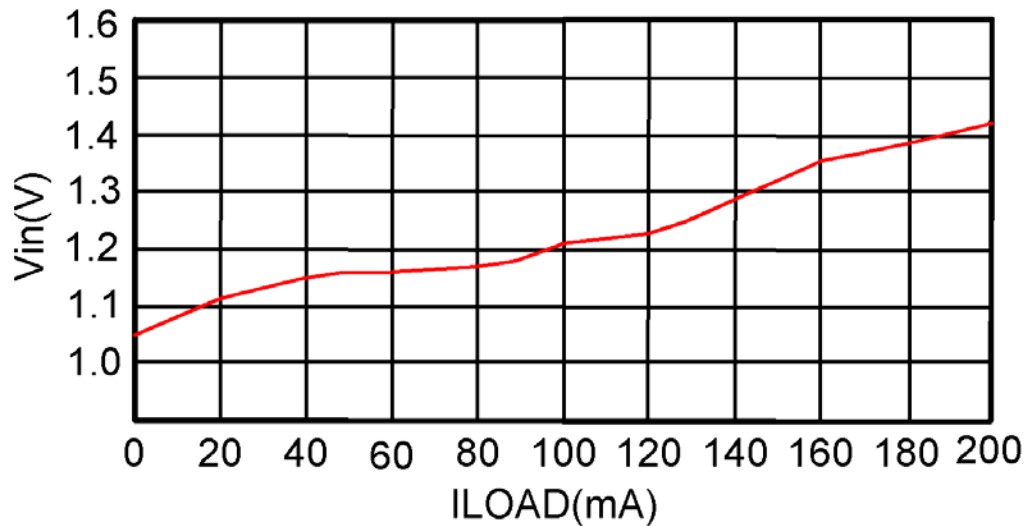
No Load Current For 3.3V Output



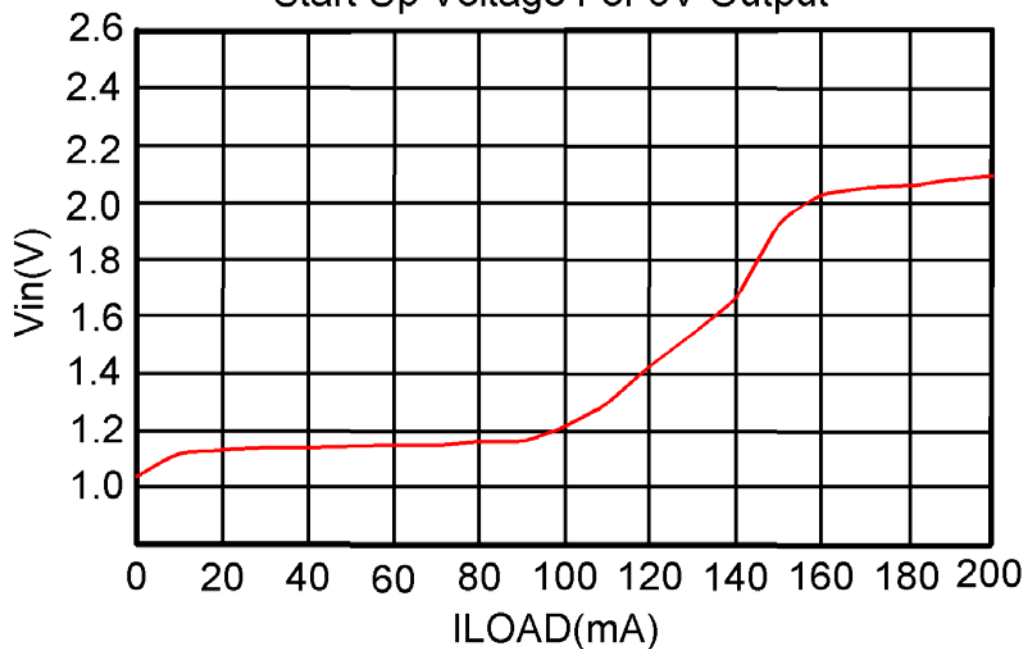
No Load Current For 5V Output



Start Up Voltage For 3.3V Output



Start Up Voltage For 5V Output



Typical Application Circuit

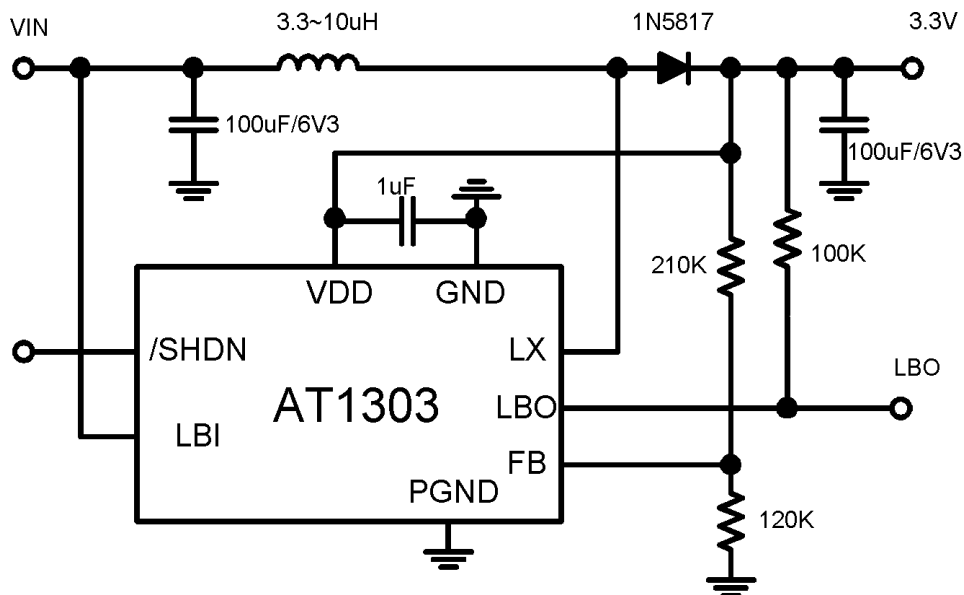


Fig. 1

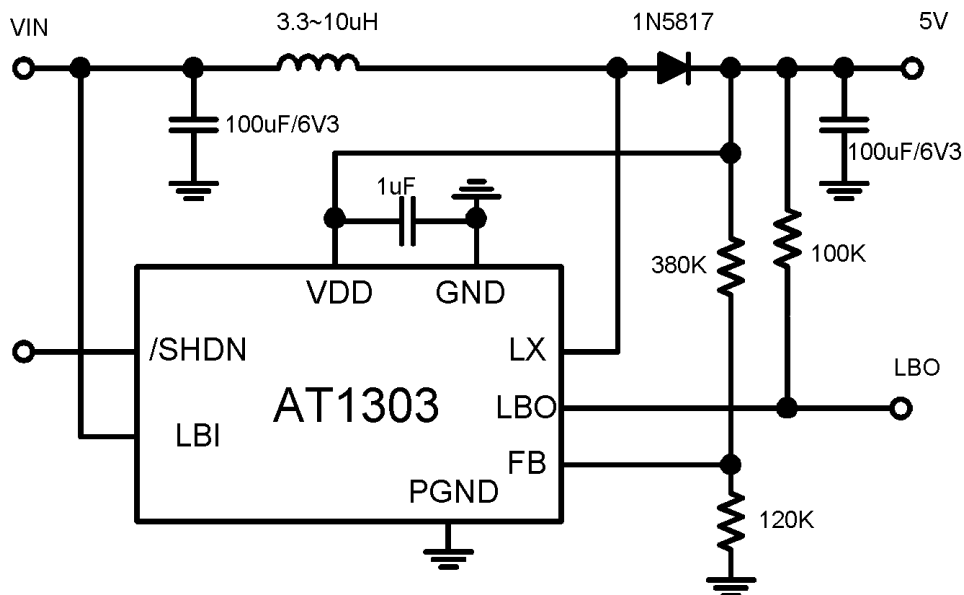


Fig. 2

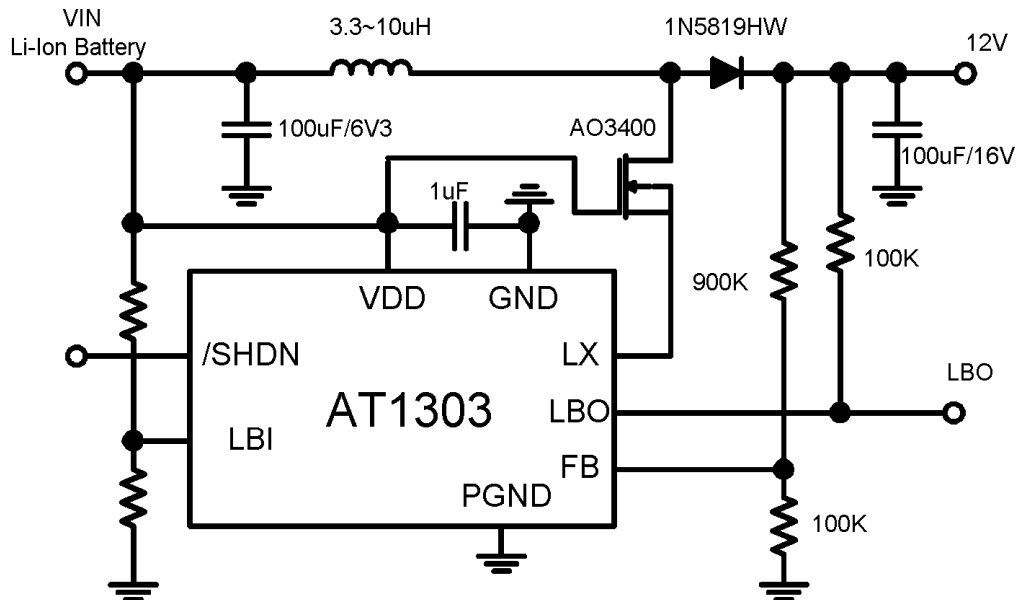


Fig. 3

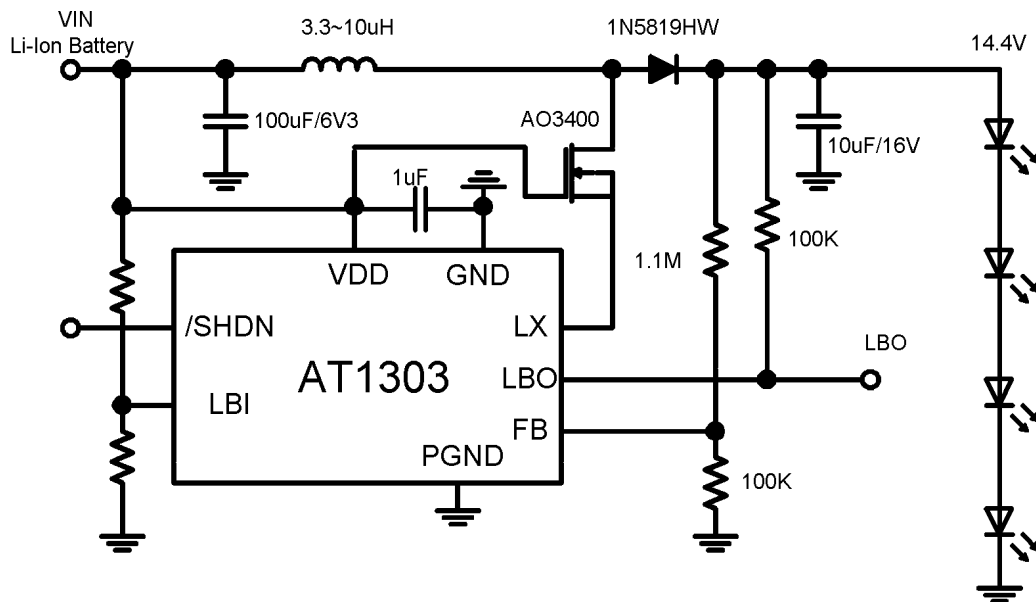
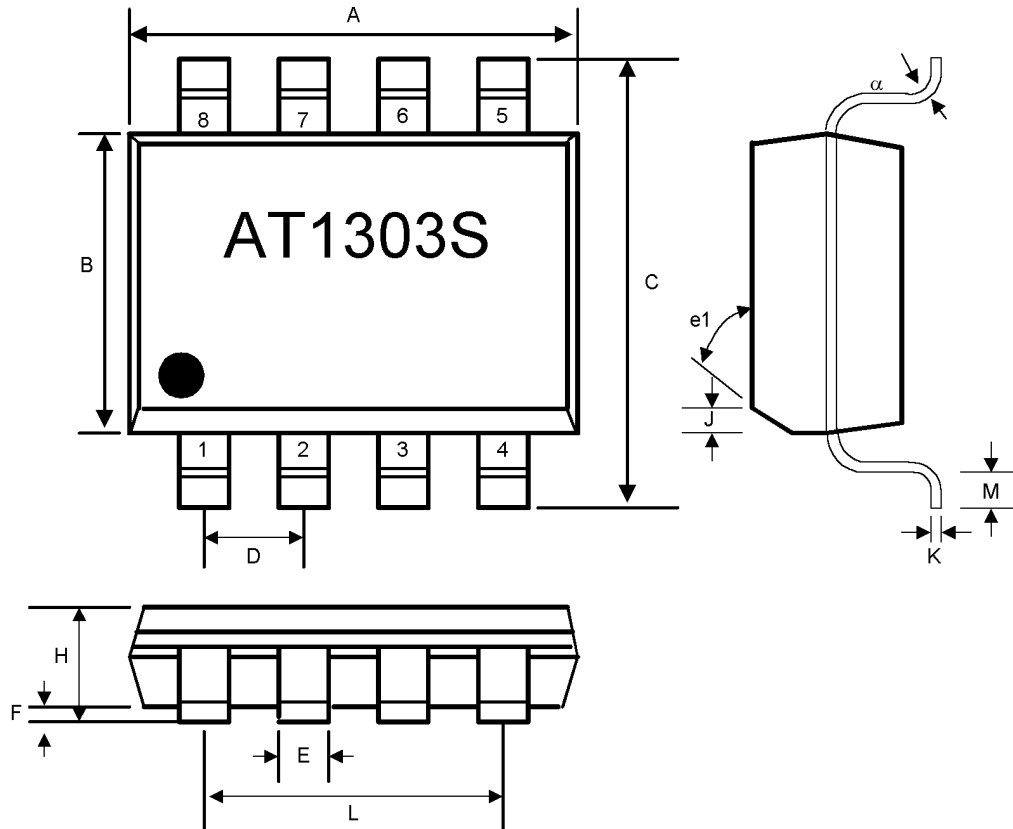


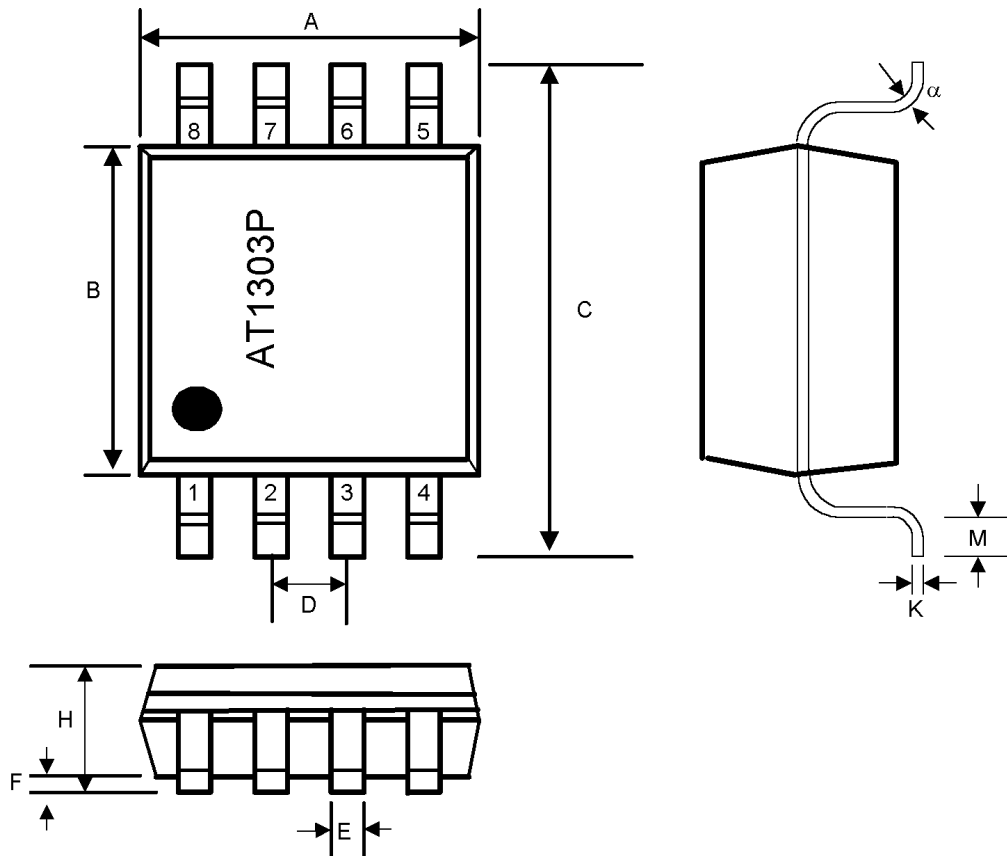
Fig. 4

Small Outline 8-pin Plastic SOL



SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.188	0.197	4.80	5.00	-
B	0.149	0.158	3.80	4.00	-
C	0.228	0.244	5.80	6.20	-
D	0.050 BSC		1.27 BSC		-
E	0.013	0.020	0.33	0.51	-
F	0.004	0.010	0.10	0.25	-
H	0.053	0.069	1.35	1.75	-
J	0.011	0.019	0.28	0.48	-
K	0.007	0.010	0.19	0.25	-
M	0.016	0.050	0.40	1.27	-
L	0.150 REF		3.81 REF		-
e1	45°		45°		-
α	0°	8°	0°	8°	-

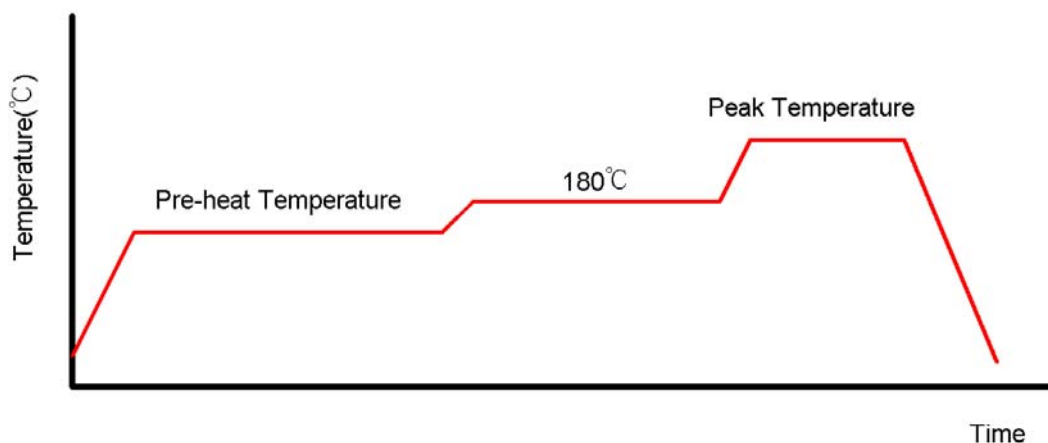
Small Outline 8-pin TSSOP



SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.114	0.122	2.90	3.10	-
B	0.169	0.177	4.30	4.50	-
C	0.244	0.260	6.20	6.60	-
D	0.026	BSC	0.65	BSC	-
E	0.010	0.012	0.25	0.30	-
F	0.002	0.006	0.05	0.15	-
H	0.041	0.047	1.05	1.20	-
K	0.005	BSC	0.127	BSC	-
M	0.020	0.028	0.50	0.70	-
α	0°	8°	0°	8°	-

Reflow Condition (IR/Convection or VPR Reflow)

Reference JEDEC Standard J-STD-020A



Classification Reflow Profiles

	Convection or IR/Convction	VPR
Average Heating Rate(180°C to peak)	5°C/second max.	10°C/second max.
Preheat Temperature(125±20°C)	120 seconds max.	
Temperature maintained above 180°C	10~150 seconds	
Time within 5°C of actual Peak Temperature	10~20 seconds	60 seconds
Peak Temperature Range(Note 1)	219~225°C or 235~240°C	219~225°C or 235~240°C
Cooling Rate	6°C /second max.	10°C/second max.
Time 25°C to Peak Temperature	6 minutes max.	

*1 The maximum peak temperatures for IR and VP reflow are depending on package dimensions.

Package Reflow Conditions

Pkg. Thickness ≥2.5mm and all bags	Pkg. Thickness <2.5mm and Pkg. Volume ≥350 mm ³	Pkg. Thickness <2.5mm and Pkg. Volume <350 mm ³
Convection 219~225°C		Convection 235~240°C
VPR 219~225°C		VPR 235~240°C
IR/Convection 219~225°C		IR/Convection 235~240°C