

**Features**

- Low Start-Up from below 1.0V
- Low Input Quiescent Current(Switching Off Current for 3.3V output) : 60 $\mu$ A (typ.)
- High Output Voltage Accuracy  $\pm$ 2.0%
- Small Number of External Components needed
- Output Voltage from 1.2V to 5.5V
- Space Saving MSOP-8 or TSSOP8 package

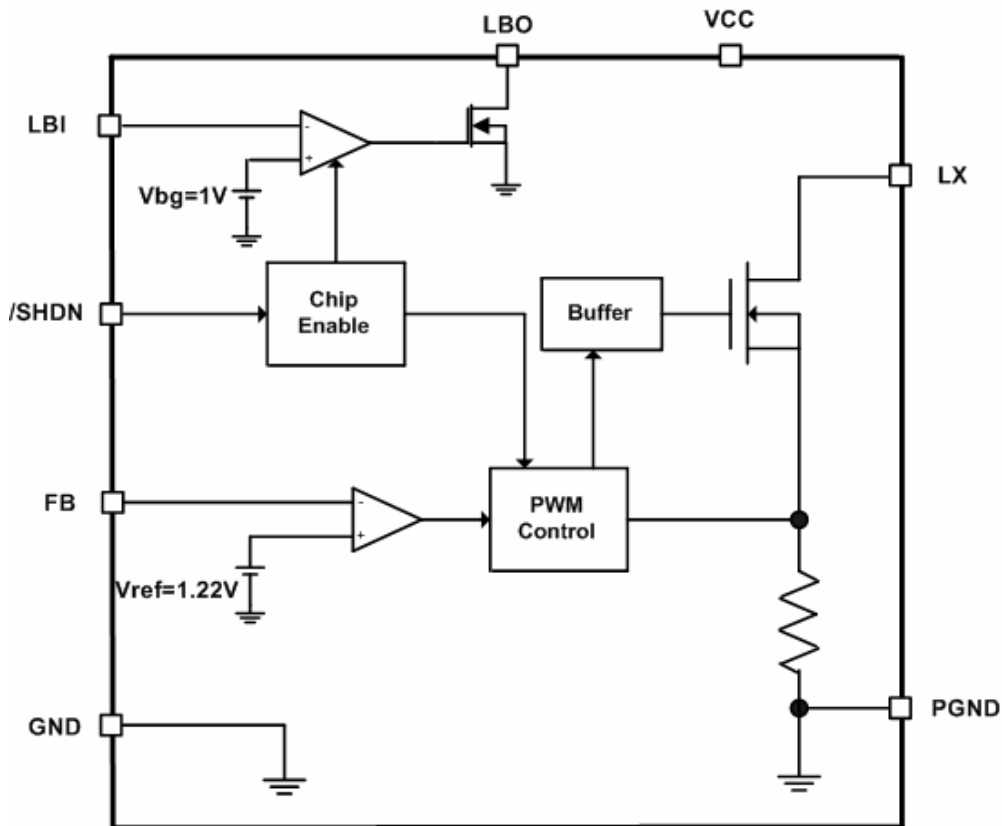
**Applications**

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

**General Description**

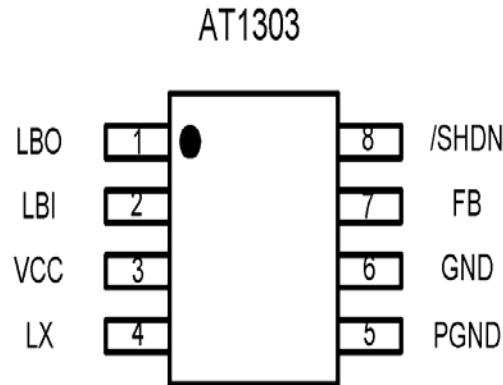
The AT1303 is a high efficiency current mode PWM step-up DC/DC converter with light load control for applications using battery-powered system. The device will automatically skip switching cycles under light load condition to maintain high efficiency at light load. The small MSOP-8 or TSSOP-8 packages 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	Marking
AT1303P	TSSOP8	AT1303P
AT1303P_PBF	TSSOP8, Pb-Free	AT1303P, Date Code with one bottom line
AT1303P_GRE	TSSOP8, Green	AT1303P, Date Code with two bottom line
AT1303M	MSOP8	AT1303
AT1303M_PBF	MSOP8, Pb-Free	AT1303, Date Code with one bottom line
AT1303M_GRE	MSOP8, Green	AT1303, Date Code with two bottom line

**Absolute Maximum Ratings**

 (T<sub>a</sub>=+25°C)

Parameter	Symbol	Condition	Rated Value		Unit
			Min.	Max.	
Power supply voltage	V <sub>CC</sub>	—	—	6.0	V
LX pin voltage	V <sub>LX</sub>	—	—	6.0	V
LX pin output current	I <sub>LX</sub>	—	—	1.7	A
Allowable dissipation	P <sub>D</sub>	TSSOP8	—	430	mW
		MSOP8	—	330	mW
Operating temperature	T <sub>OP</sub>	—	-30	+85	°C
Storage temperature	T <sub>stg</sub>	—	-55	+125	°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<sub>a</sub>=+25°C)

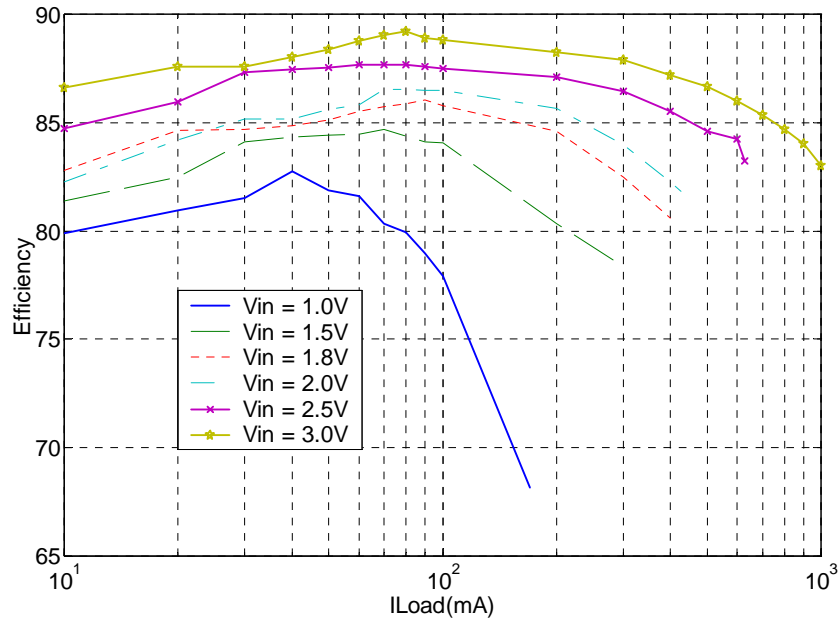
Parameter	Symbol	Condition	Values			Unit
			Min.	Typ.	Max.	
Power Supply Voltage	V <sub>CC</sub>		2.5	-	5.5	V
Input Voltage	V <sub>IN</sub>		1.5	-	5.5	V
Start-Up Voltage	V <sub>Start</sub>	I <sub>OUT</sub> =1mA V <sub>IN</sub> =0→2V	-	1.0	1.1	V
Switch off Current	I <sub>2</sub>	V <sub>IN</sub> = V <sub>OUT</sub> +0.5V(V <sub>OUT</sub> = 3.3V)	50	60	70	μA
	I <sub>2</sub>	V <sub>IN</sub> = V <sub>OUT</sub> +0.5V(V <sub>OUT</sub> = 5.0V)	90	100	110	μA
Shutdown Current	I <sub>3</sub>	/SHDN=0V, V <sub>IN</sub> =5.5V	-	1	5	μA
Feedback Reference	V <sub>REF</sub>	Close loop, V <sub>OUT</sub> =3.3V	1.200	1.220	1.244	V
Switching Frequency	F <sub>S</sub>	V <sub>OUT</sub> =3.3V	-	380	-	KHz
Maximum Duty	D <sub>max</sub>	V <sub>OUT</sub> =3.3V	85	90	95	%
LX ON Resistance		V <sub>OUT</sub> =3.3V	0.2	0.23	0.26	Ω
Current Limit	I <sub>Limit</sub>	V <sub>IN</sub> = 2.0V, V <sub>OUT</sub> =3.3V, Duty=55%	1.0	1.4	1.7	A
/SHDN Trip Level		V <sub>OUT</sub> =3.3V	0.4	0.8	1.2	V
LBI Trip Level		V <sub>CC</sub> Falling	0.98	1.0	1.02	V
Hysteresis Width (LBI Trip Level)		V <sub>CC</sub> Rising	50	70	90	mV
LBO/LD Sink current	I <sub>LBO</sub>	LBO/LD=0.4V	-	7.5	-	mA
Thermal shutdown			-	170	-	°C

Thermal shutdown Hysterises			-	20	-	°C
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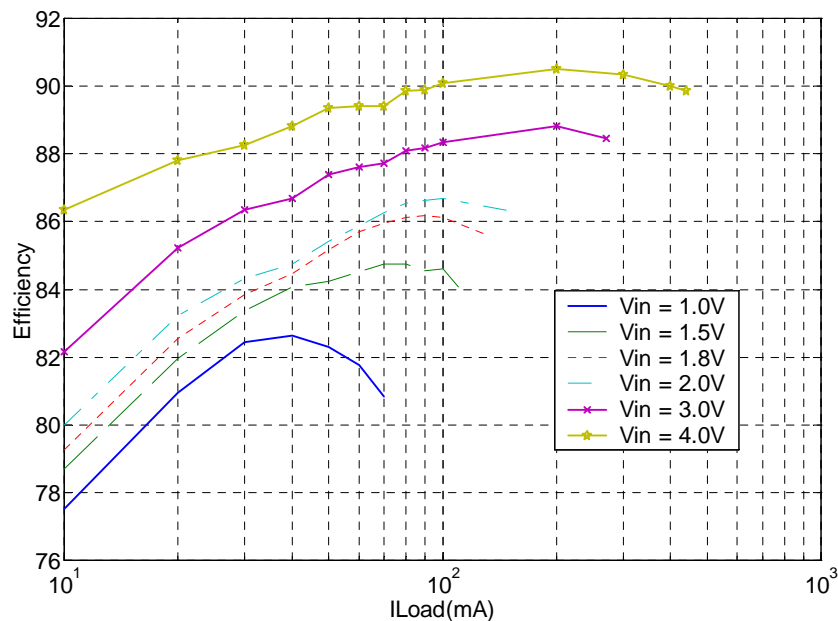
\*Unless otherwise provided,  $V_{IN} = 1.5V$  (when  $V_{OUT} = 3.3V$ ), and use External Circuit of Typical Application (Fig 1).

Typical Curve (as Fig.1, Fig. 2)  $L=10\mu H/ LYS6S28(LEE YU)$

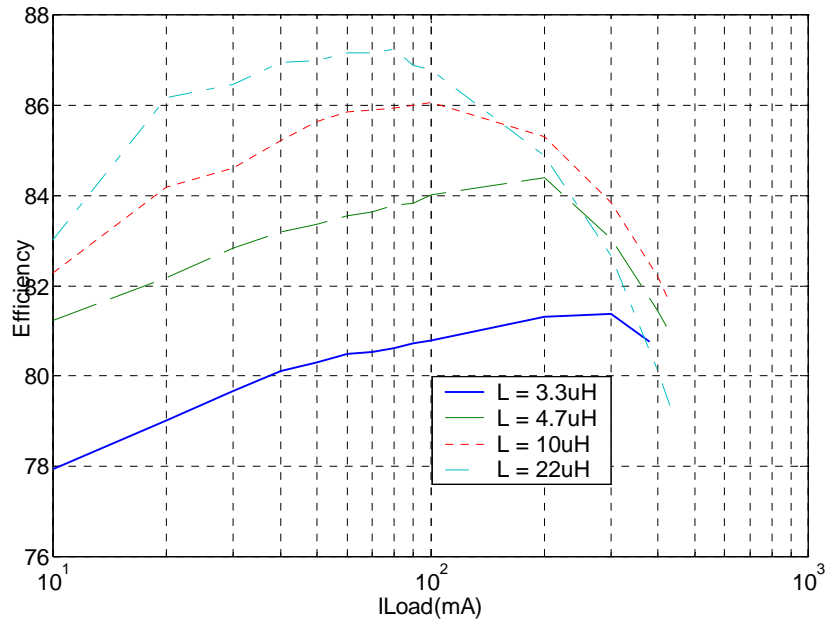
**Efficiency for 3.3V Output**



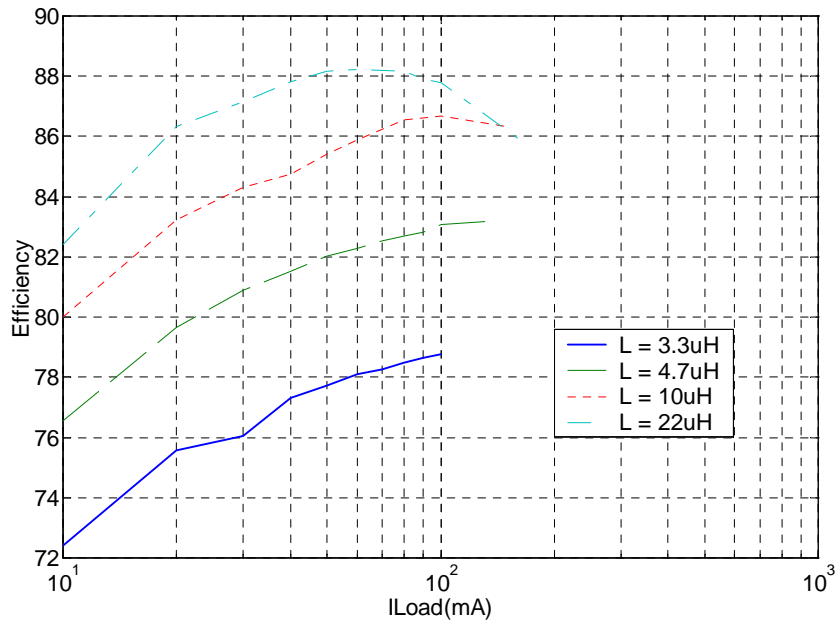
**Efficiency for 5.0V Output**

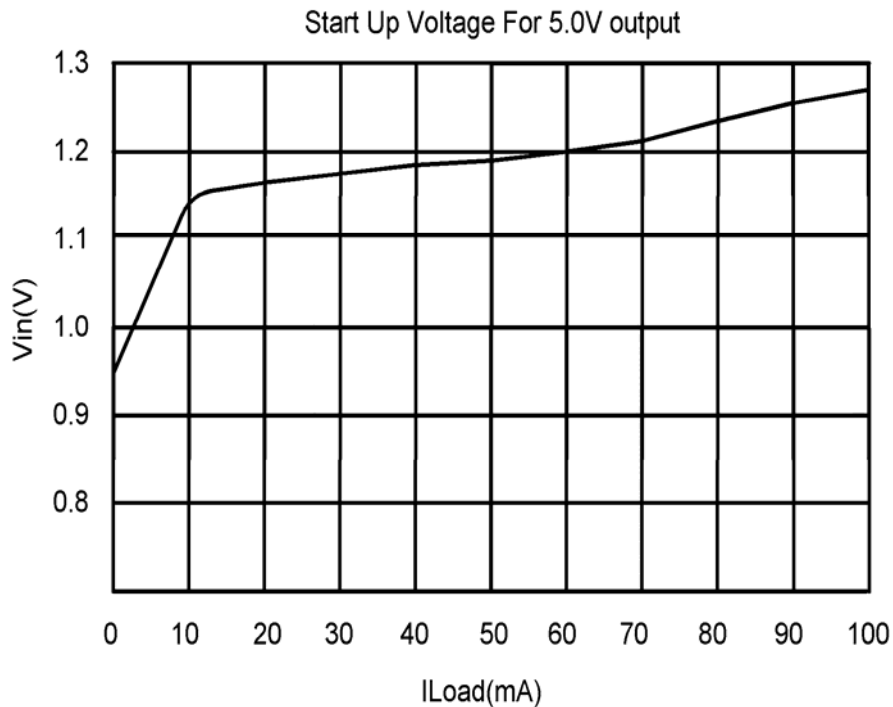
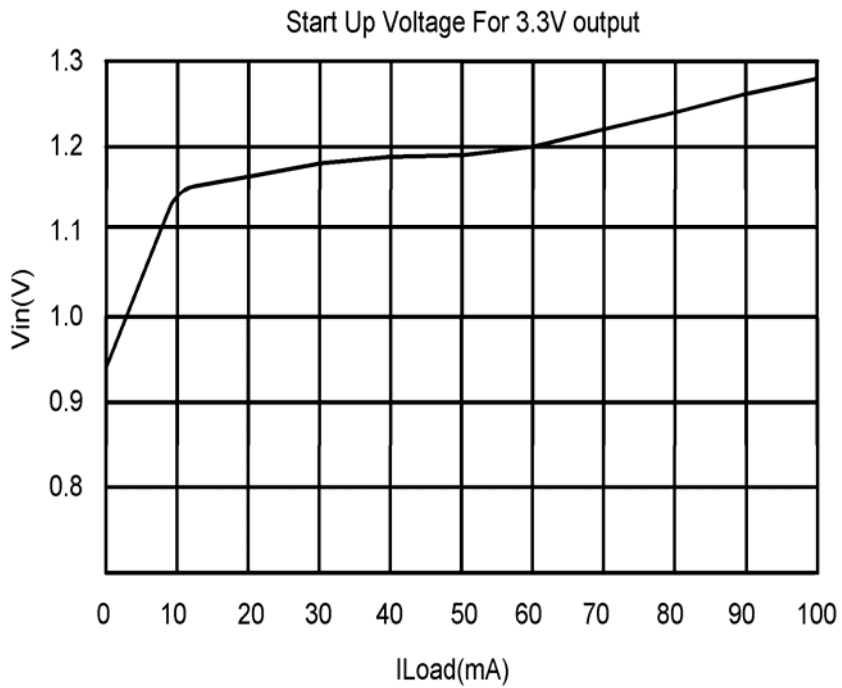


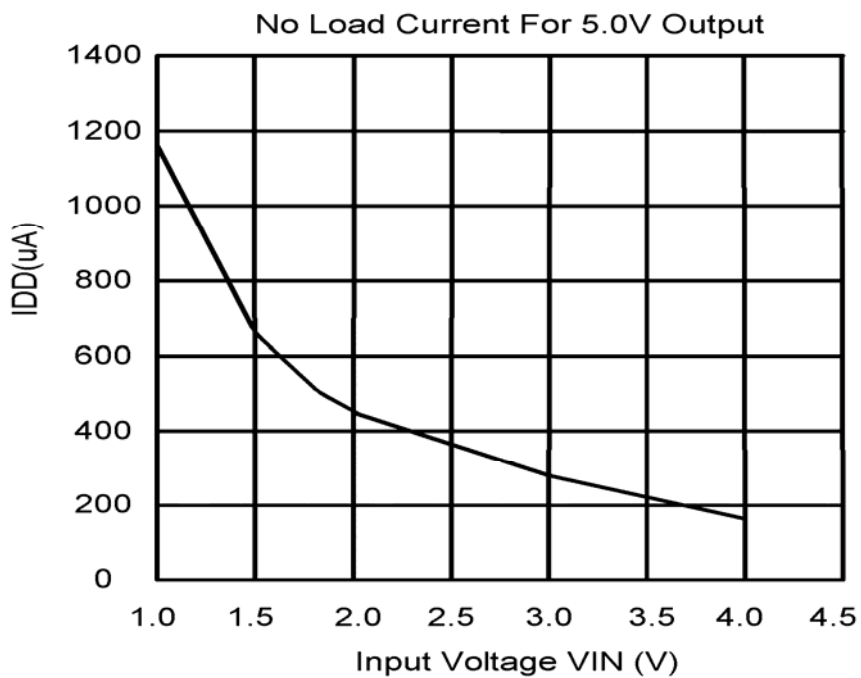
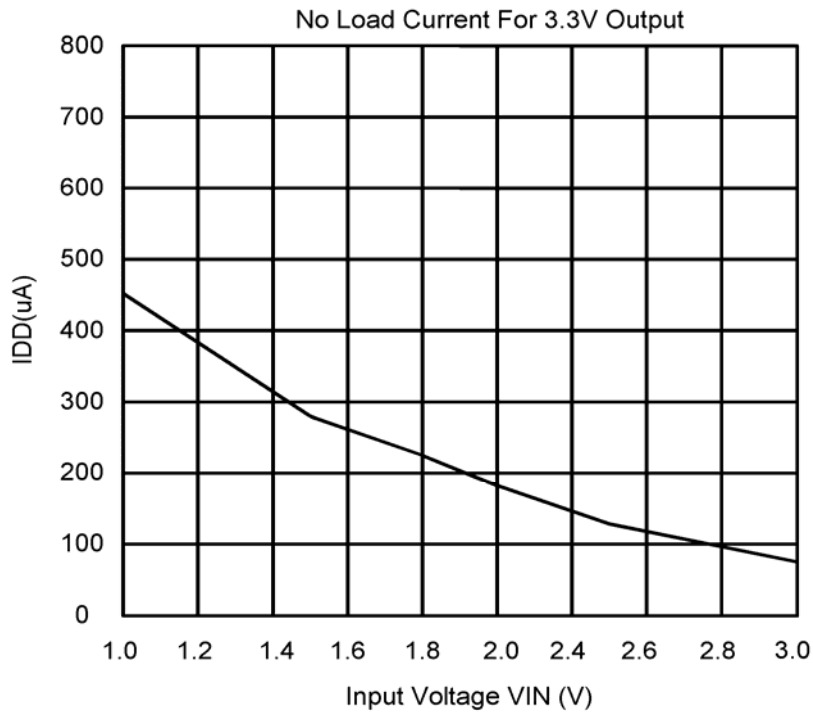
**Efficiency for 3.3V Output ( $V_{in}=2.0V$ )**



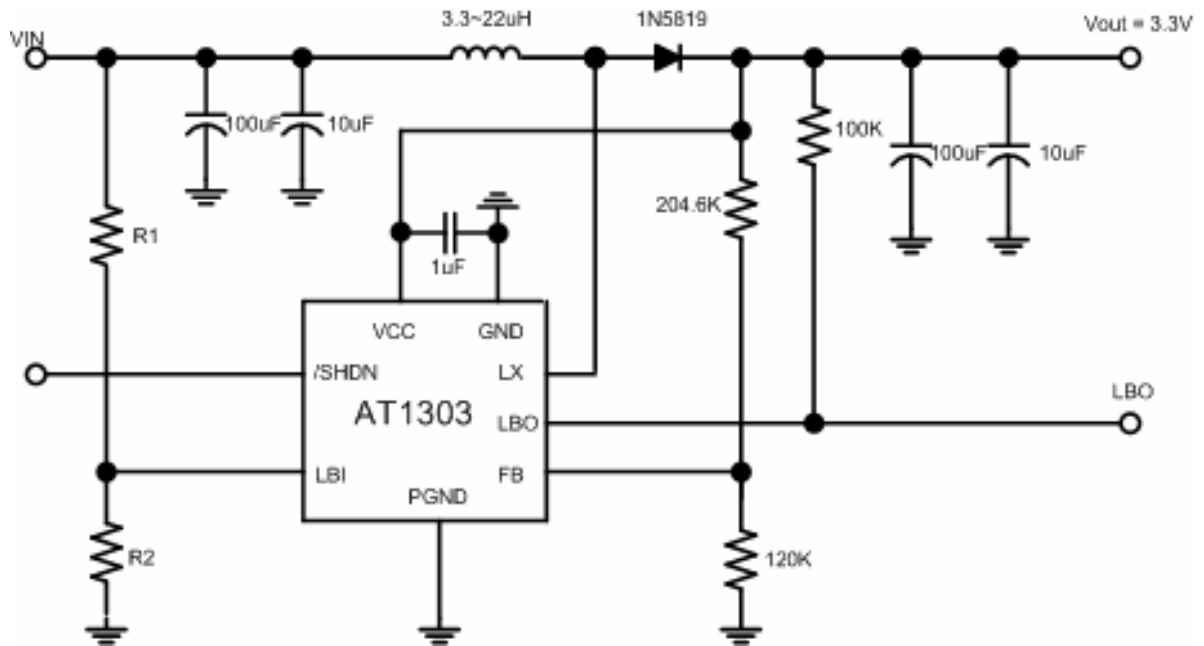
**Efficiency for 5.0V Output ( $V_{in}=2.0V$ )**



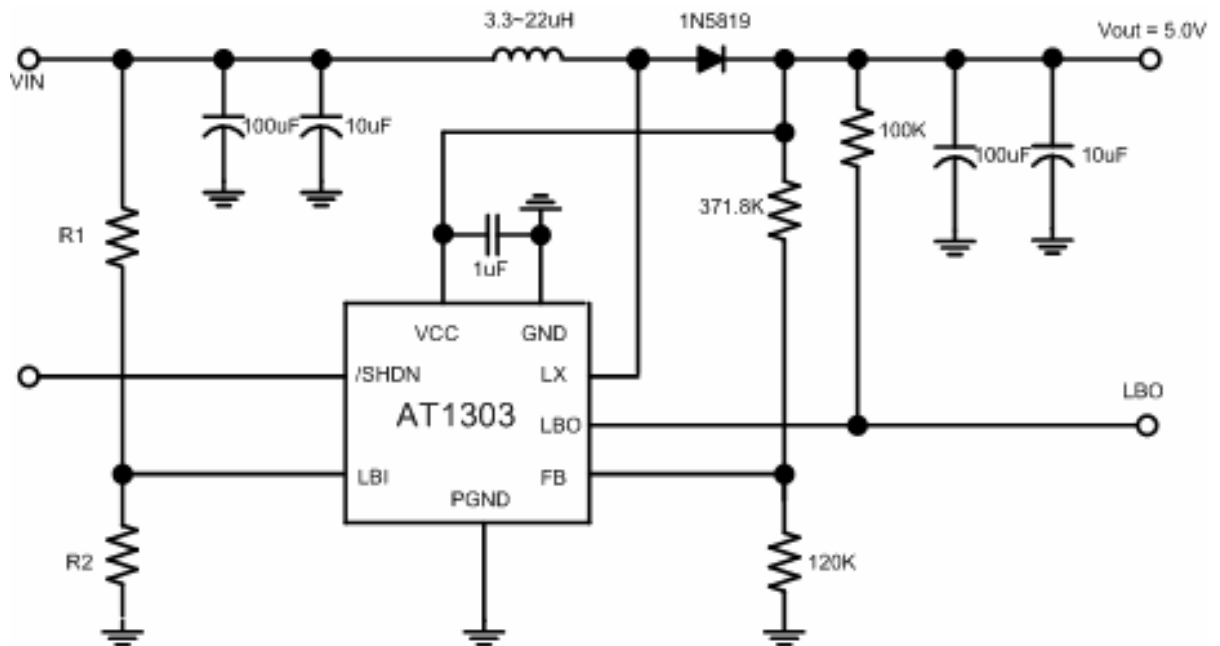




**Typical Application Circuit**



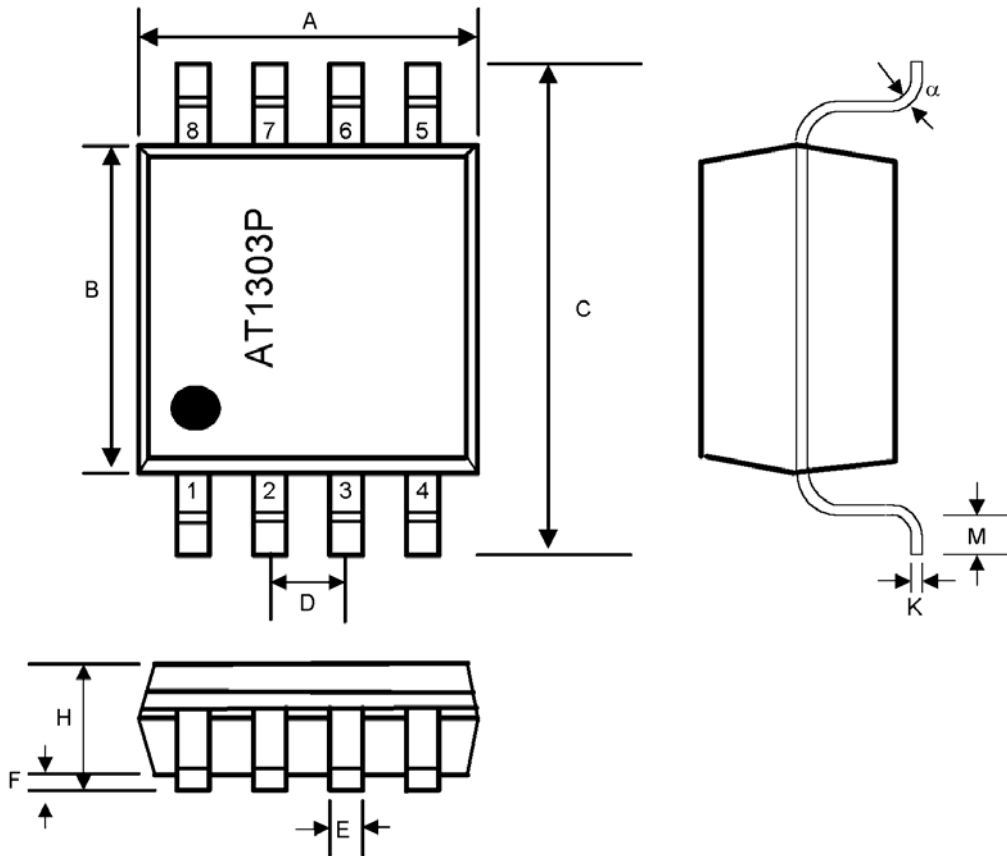
**Fig. 1**



**Fig. 2**

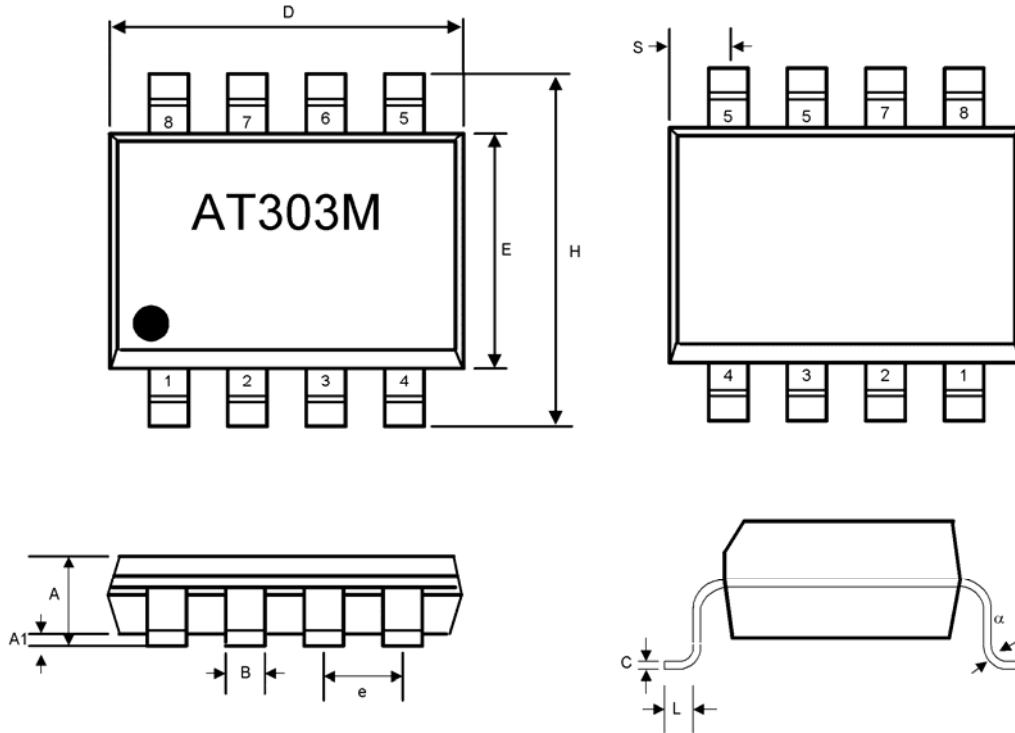


Small Outline 8-pin TSSOP



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	-
	0 <sup>0</sup>	8 <sup>0</sup>	0 <sup>0</sup>	8 <sup>0</sup>	-

**Small Outline 8-pin Plastic MSOP**



SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.037	0.043	0.94	1.10	-
A1	0.002	0.006	0.05	0.15	-
B	0.010	0.014	0.25	0.36	-
C	0.005	0.007	0.13	0.18	-
D	0.116	0.120	2.95	3.05	-
e	0.0256 BSC		0.65 BSC		-
E	0.116	0.120	2.95	3.05	-
H	0.188	0.198	4.78	5.03	-
L	0.016	0.026	0.41	0.66	-
	0°	6°	0°	6°	-
S	0.207 BSC		0.525 BSC		-