

## General Description

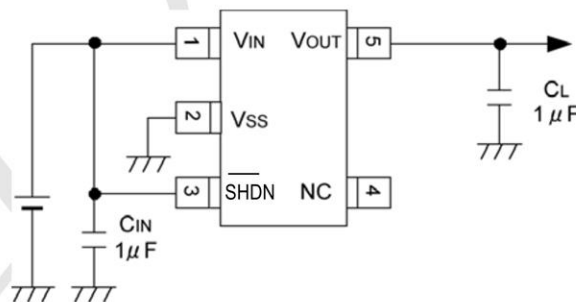
The MCP1801 is a family of CMOS low dropout (LDO) voltage regulators that can deliver up to 150 mA of current while consuming only 25  $\mu$ A of quiescent current (typical). The input operating range is specified from 2.0V to 10.0V, making it an ideal choice for two to six primary cell battery-powered applications, 9V alkaline and one or two cell Li-Ion-powered applications.

The MCP1801 is capable of delivering 100 mA with only 200 mV (typical) of input to output voltage differential ( $V_{OUT} = 3.3V$ ). The output voltage tolerance of the MCP1801 at +25°C is typically  $\pm 0.4\%$  with a maximum of  $\pm 2\%$ . Line regulation is  $\pm 0.01\%$  typical at +25°C.

## Features

- **CMOS Low Power Consumption**
- **Dropout Voltage: 60mV @ 30mA,**
- **200mV @ 100mA**
- **Maximum Output Current:**
- **150mA**
- **Highly Accurate: 1.2V ~ 1.95V  $\pm 3\%$**
- **2.0V ~ 6.00V  $\pm 2\%$**
- **Output Voltage Range: 1.5V ~ 6.0V**
- **Low ESR capacitor compatible**
- **Output Voltage Options: 1.2V, 1.8V, 2.5V**
- **3.3V, 5.0V**
- **Package: SOT23-5**

## Typical Application Circuit



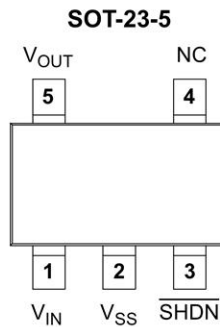
The LDO output is stable with a minimum of 1  $\mu$ F of output capacitance. Ceramic, tantalum, or aluminum electrolytic capacitors can all be used for input and output. Overcurrent limit with current foldback provides short-circuit protection. A shutdown ( $\overline{SHDN}$ ) function allows the output to be enabled or disabled. When disabled, the MCP1801 draws only 0.01  $\mu$ A of current (typical).

The MCP1801 is available in a SOT-23-5 package.

## Applications

- **Mobile phones**
- **Cordless phones**
- **Cameras, video recorders**
- **Portable games**
- **Portable AV equipment**
- **Reference voltage**
- **Battery-powered equipment**

## PIN CONFIGURATION



Pin No. SOT-23-5	Name	Function
1	V <sub>IN</sub>	Unregulated Supply Voltage
2	GND	Ground Terminal
3	SHDN	Shutdown Input
4	NC	No Connection
5	V <sub>OUT</sub>	Regulated Voltage Output

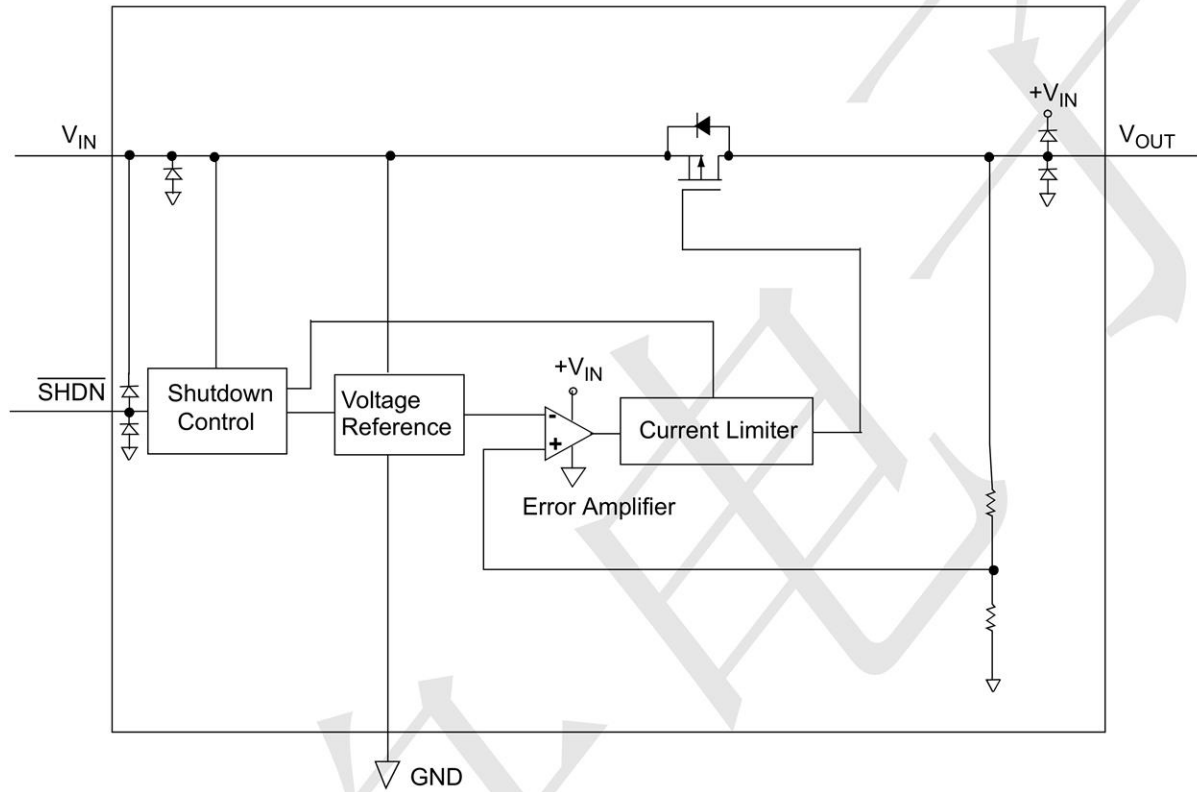
## ABSOLUTE MAXIMUM RATINGS (T = 25°C unless otherwise noted)

Parameter	Symbol	Ratings	Units
Input Voltage	V <sub>IN</sub>	12	V
Output Current	I <sub>OUT</sub>	500	mA
Output Voltage	V <sub>OUT</sub>	V <sub>SS</sub> -0.3 ~ V <sub>IN</sub> +0.3	V
Power Dissipation SOT25	P <sub>d</sub>	250	mW
Operation Ambient Temperature	T <sub>opr</sub>	-40 ~ +85	°C
Storage Temperature	T <sub>stg</sub>	-55 ~ +85	°C

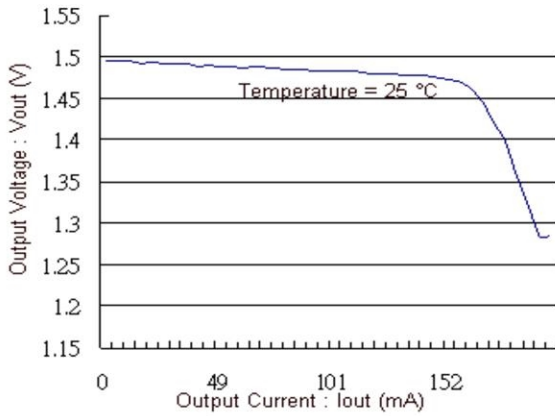
**Electrical Characteristics** (T =25°C unless otherwise noted)

PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNITS
Output Voltage (2%) <sup>(5)</sup>	V <sub>OUT(E)</sub> <sup>(3)</sup>	I <sub>OUT</sub> =30mA	V <sub>OUT(T)</sub> <sup>(2)</sup> ×0.98	V <sub>OUT(T)</sub> <sup>(2)</sup>	V <sub>OUT(T)</sub> <sup>(2)</sup> ×1.02	V
Output Voltage (1%) <sup>(6)</sup>			V <sub>OUT(T)</sub> <sup>(2)</sup> ×0.99		V <sub>OUT(T)</sub> <sup>(2)</sup> ×1.01	
Maximum Output Current	I <sub>OUTMAX</sub>	-	150	-	-	mA
Load Regulation	ΔV <sub>OUT</sub>	1mA ≤ I <sub>OUT</sub> ≤ 100mA	-	15	50	mV
Dropout Voltage <sup>(4)</sup>	V <sub>dif1</sub>	I <sub>OUT</sub> =30mA	E-1			mV
	V <sub>dif2</sub>	I <sub>OUT</sub> =100mA	E-2			mV
Supply Current (Type A)	I <sub>DD</sub>	V <sub>CE</sub> =V <sub>IN</sub> =V <sub>OUT(T)</sub> +1.0V	-	28	55	μA
Supply Current (Type B)		When V <sub>OUT</sub> ≤ 0.95V, V <sub>IN</sub> =V <sub>CE</sub> =2.0V	-	25	50	
Stand-by Current	I <sub>STB</sub>	V <sub>IN</sub> =V <sub>OUT(T)</sub> +1.0V, V <sub>CE</sub> =V <sub>SS</sub> When V <sub>OUT</sub> ≤ 0.95V, V <sub>IN</sub> =2.0V	-	0.01	0.10	μA
Line Regulation	ΔV <sub>OUT</sub> / (ΔV <sub>IN</sub> ·V <sub>OUT</sub> )	V <sub>OUT(T)</sub> +1.0V ≤ V <sub>IN</sub> ≤ 10V When V <sub>OUT</sub> ≤ 0.95, 2.0V ≤ V <sub>IN</sub> ≤ 10V I <sub>OUT</sub> =30mA When V <sub>OUT</sub> ≤ 1.75V, I <sub>OUT</sub> =10mA	-	0.01	0.20	%/V
Input Voltage	V <sub>IN</sub>		2	-	10	V
Output Voltage Temperature Characteristics	ΔV <sub>OUT</sub> / (ΔT <sub>opr</sub> ·V <sub>OUT</sub> )	I <sub>OUT</sub> =30mA -40°C ≤ T <sub>opr</sub> ≤ 85°C	-	100	-	ppm/°C
Power Supply Rejection Ratio	PSRR	V <sub>IN</sub> =[V <sub>OUT(T)</sub> +1.0]V+1.0V <sub>p-pAC</sub> When V <sub>OUT</sub> ≤ 1.5V, V <sub>IN</sub> =2.5V+1.0V <sub>p-pAC</sub> I <sub>OUT</sub> =50mA, f=10kHz	-	70	-	dB
Current Limit	I <sub>lim</sub>	V <sub>IN</sub> =V <sub>OUT(T)</sub> +1.0V, V <sub>CE</sub> =V <sub>SS</sub> When V <sub>OUT</sub> ≤ 1.75, V <sub>IN</sub> =V <sub>OUT(T)</sub> +2.0V	-	300	-	mA
Short Current	I <sub>SHORT</sub>	V <sub>IN</sub> =V <sub>OUT(T)</sub> +1.0V, V <sub>CE</sub> =V <sub>SS</sub> When V <sub>OUT</sub> ≤ 1.75, V <sub>IN</sub> =V <sub>OUT(T)</sub> +2.0V	-	50	-	mA
Logic High Input	V <sub>SHDN-HIGH</sub>	-	1.6	-	V <sub>IN</sub>	V
Logic Low Input	V <sub>SHDN-LOW</sub>	-	-	-	0.25	V

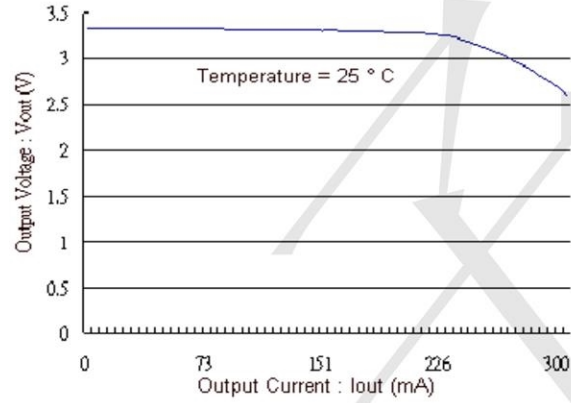
**BLOCK DIAGRAM**



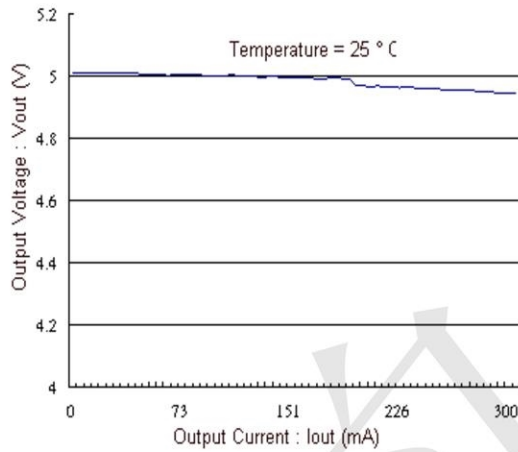
**MCP1801T-1502I/OT**



**MCP1801T-3302I/OT**



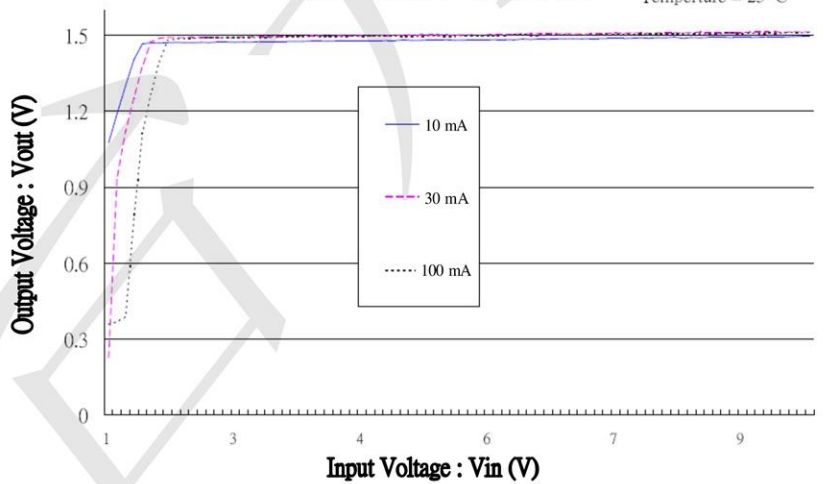
**MCP1801T-5002I/OT**



**(2) Output Voltage VS Input Voltage**

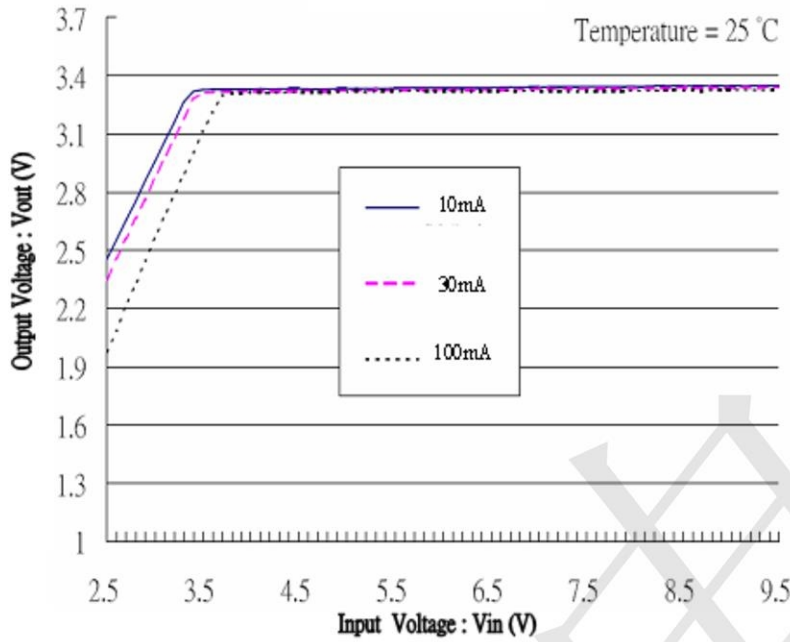
**MCP1801T-1502I/OT**

Temperature = 25 °C

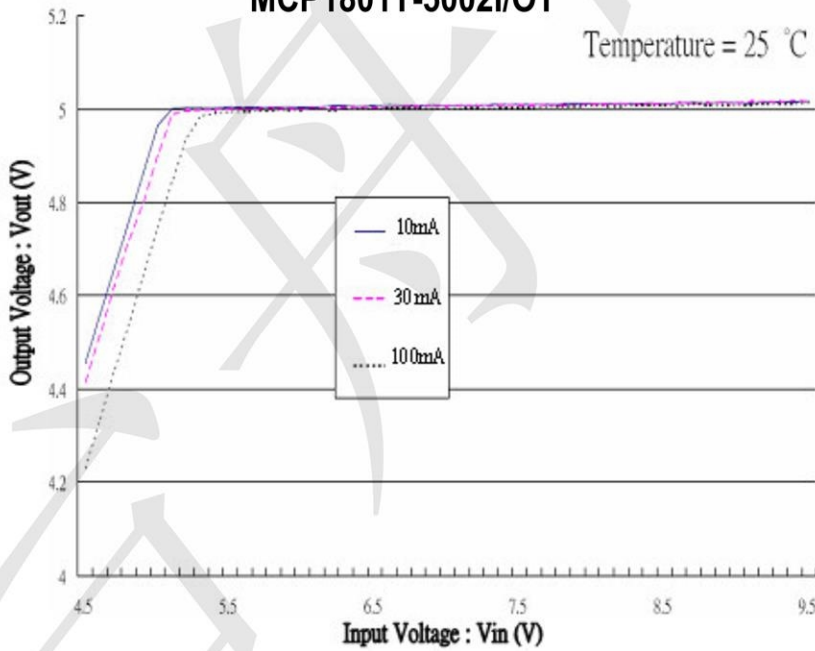




MCP1801T-3302I/OT

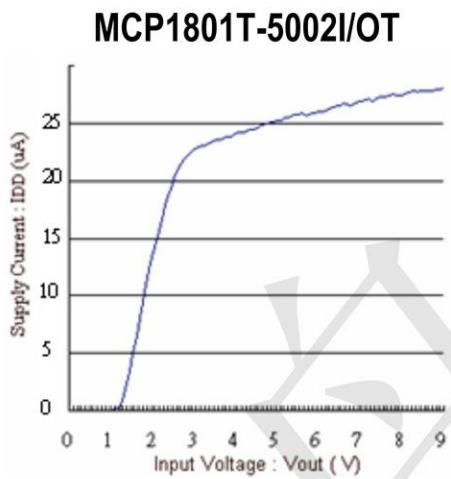
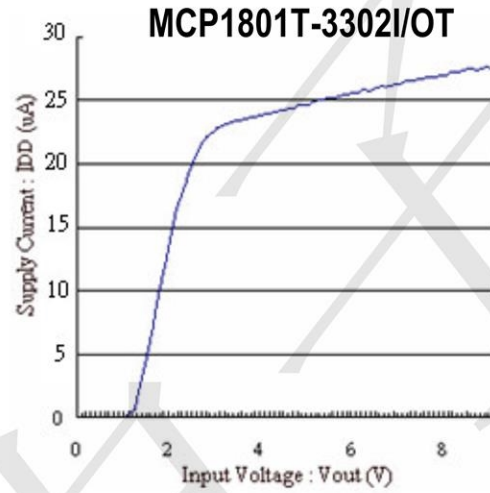
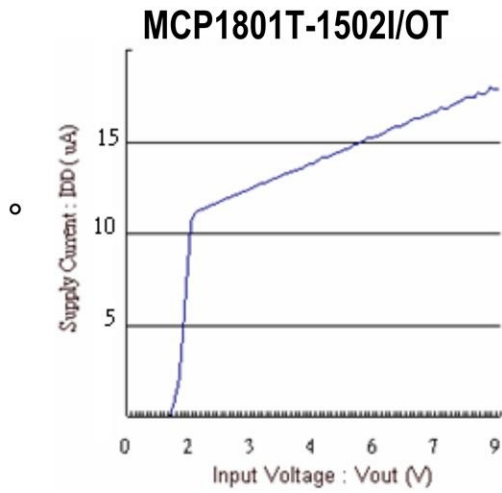


MCP1801T-5002I/OT





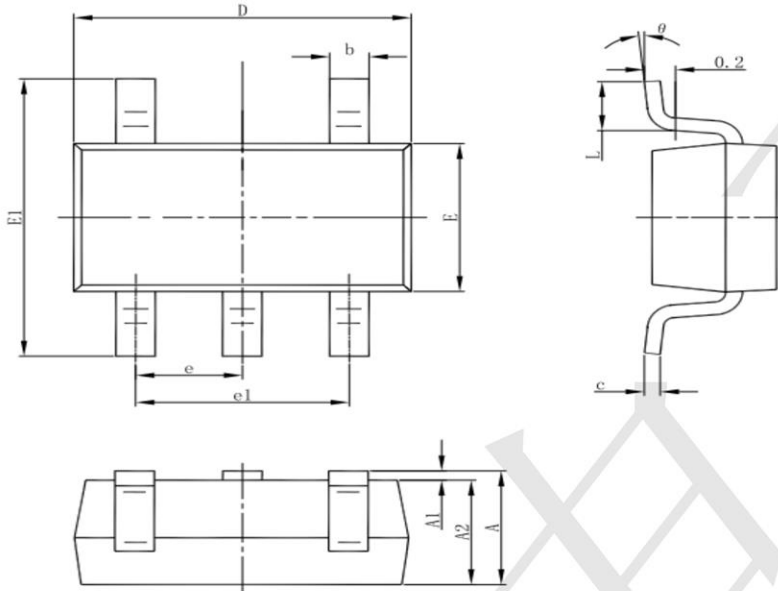
**(3) Supply Current VS Input Voltage**



## Package information

[www.sot23.com.tw](http://www.sot23.com.tw)

### 3-pin SOT23-5 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°

## Ordering information

Order code	Package	Baseqty	Delivery mode
TP MCP1801T-3302I/OT	SOT23-5	3000	Tape and reel

Order code	Package	Baseqty	Delivery mode
TP MCP1801T-5002I/OT	SOT23-5	3000	Tape and reel

Order code	Package	Baseqty	Delivery mode
TP MCP1801T-XX02I/OT	SOT23-5	3000	Tape and reel

XX=iout voltage



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