General Description
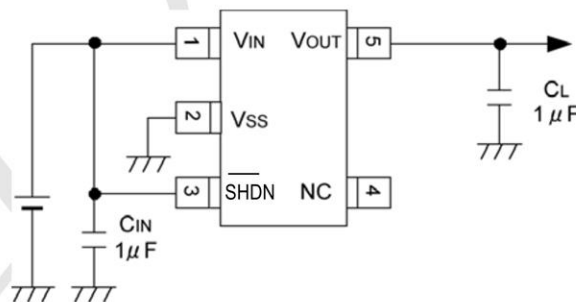
The MCP1801 is a family of CMOS low dropout (LDO) voltage regulators that can deliver up to 150 mA of current while consuming only 25 μA of quiescent current (typical). The input operating range is specified from 2.0V to 10.0V, making it an ideal choice for two to six primary cell battery-powered applications, 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 ±0.4% with a maximum of ±2%. Line regulation is ±0.01% typical at +25°C.

The LDO output is stable with a minimum of 1 μF 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 (SHDN) function allows the output to be enabled or disabled. When disabled, the MCP1801 draws only 0.01 μA of current (typical).

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

Features

- **CMOS Low Power Consumption**
- **Dropout Voltage:** 60mV @ 30mA,
  - 200mV @ 100mA
- **Maximum Output Current:**
  - 150mA
- **Highly Accurate:** 1.2V ~ 1.95V ± 3%
  - 2.0V ~ 6.00V ± 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**

Applications

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

Typical Application Circuit

PIN CONFIGURATION
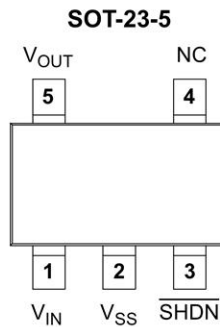
SOT-23-5

Pin No. SOT-23-5	Name	Function
1	V_{IN}	Unregulated Supply Voltage
2	GND	Ground Terminal
3	$\overline{SHDN}$	Shutdown Input
4	NC	No Connection
5	V_{OUT}	Regulated Voltage Output

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

Parameter	Symbol	Ratings	Units
Input Voltage	VIN	12	V
Output Current	IOUT	500	mA
Output Voltage	VOUT	VSS-0.3 ~ VIN+0.3	V
Power Dissipation SOT25	Pd	250	mW
Operation Ambient Temperature	Topr	-40 ~ +85	°C
Storage Temperature	Tstg	-55 ~ +85	°C

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

| PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNITS
Output Voltage (2%)[*5]	$V_{OUT(E)}$ [*3]	I_{OUT}=30mA	$V_{OUT(T)}$[*2]×0.98	$V_{OUT(T)}$[*2]	$V_{OUT(T)}$[*2]×1.02	V
Output Voltage (1%)[*6]			$V_{OUT(T)}$[*2]×0.99		$V_{OUT(T)}$[*2]×1.01	
Maximum Output Current	I_{OUTMAX}	-	150	-	-	mA
Load Regulation	$\triangle V_{OUT}$	1mA≦I_{OUT}≦100mA	-	15	50	mV
Dropout Voltage [*4]	Vdif1	I_{OUT}=30mA		E-1		mV
	Vdif2	I_{OUT}=100mA		E-2		mV
Supply Current (Type A)	I_{DD}	V_{CE}=V_{IN}=$V_{OUT(T)}$+1.0V	-	28	55	μA
Supply Current (Type B)		When V_{OUT}≦0.95V, V_{IN}=V_{CE}=2.0V	-	25	50	
Stand-by Current	I_{STB}	V_{IN}=$V_{OUT(T)}$+1.0V,V_{CE}=V_{SS} When V_{OUT}≦0.95V, V_{IN}=2.0V	-	0.01	0.10	μA
Line Regulation	$\triangle V_{OUT}$/ ($\triangle V_{IN}\cdot V_{OUT}$)	$V_{OUT(T)}$+1.0V≦V_{IN}≦10V When V_{OUT}≦0.95,2.0V=V_{IN}≦10V I_{OUT}=30mA When V_{OUT}≦1.75V, I_{OUT}=10mA	-	0.01	0.20	%/V
Input Voltage	V_{IN}		2	-	10	V
Output Voltage Temperature Characteristics	$\triangle V_{OUT}$/ ($\triangle Topr\cdot V_{OUT}$)	I_{OUT}=30mA -40°C≦Topr≦85°C	-	100	-	ppm/°C
Power Supply Rejection Ratio	PSRR	V_{IN}=[$V_{OUT(T)}$+1.0]V+1.0Vp-p$_{AC}$ When V_{OUT}≦1.5V, V_{IN}=2.5V+1.0Vp-p$_{AC}$ I_{OUT}=50mA, f=10kHz	-	70	-	dB
Current Limit	Ilim	V_{IN}=$V_{OUT(T)}$+1.0V, V_{CE}=V_{SS} When V_{OUT}≦1.75, V_{IN}=$V_{OUT(T)}$+2.0V	-	300	-	mA
Short Current	I_{SHORT}	V_{IN}=$V_{OUT(T)}$+1.0V, V_{CE}=V_{SS} When V_{OUT}≦1.75, V_{IN}=$V_{OUT(T)}$+2.0V	-	50	-	mA
Logic High Input	$V_{SHDN-HIGH}$	-	1.6	-	V_{IN}	V
Logic Low Input	$V_{SHDN-LOW}$	-	-	-	0.25	V

BLOCK DIAGRAM
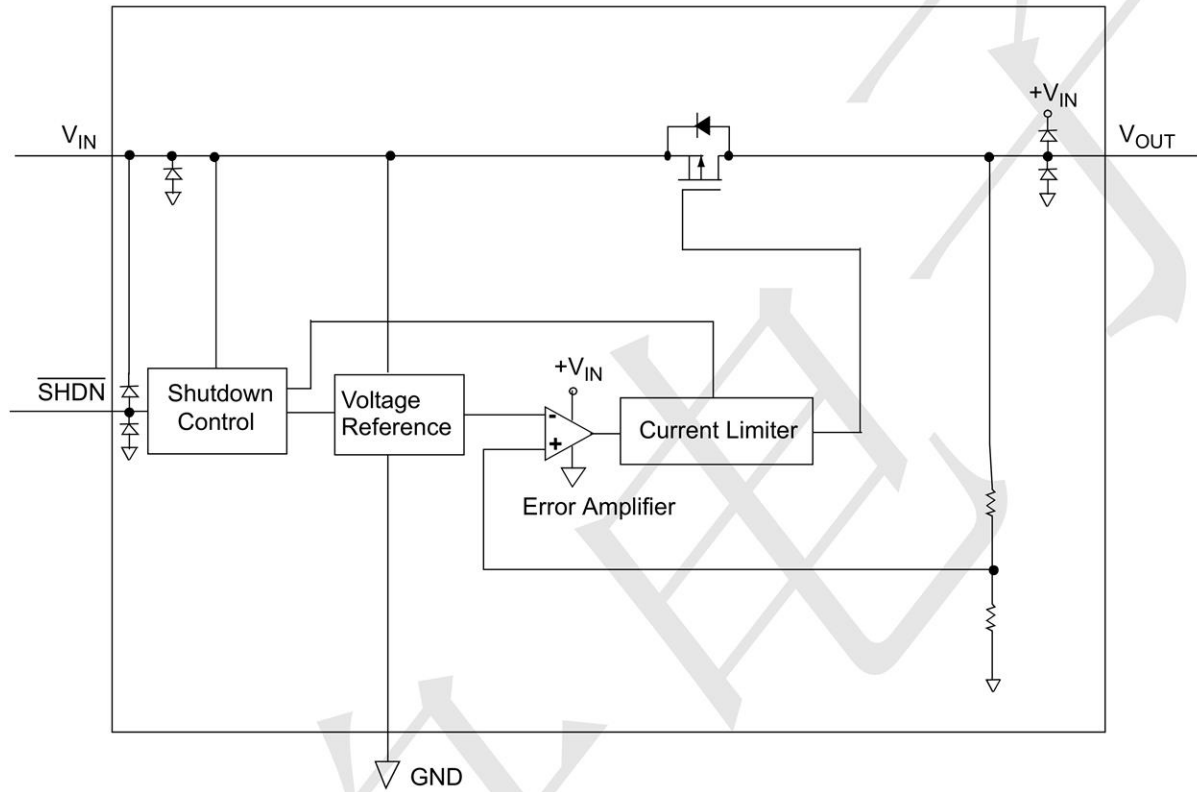
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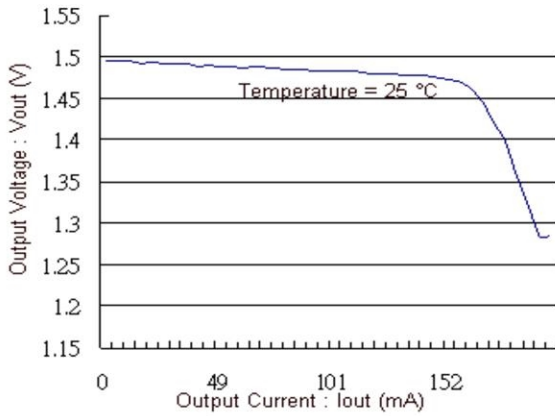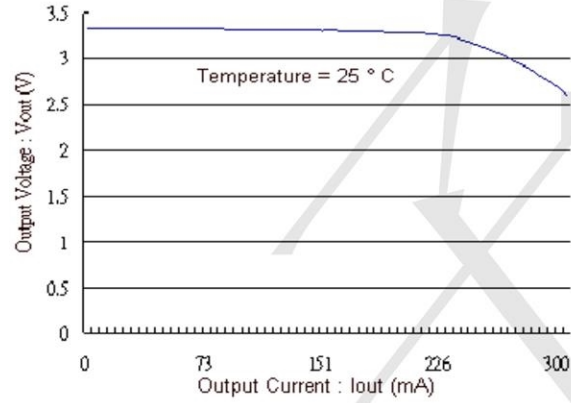
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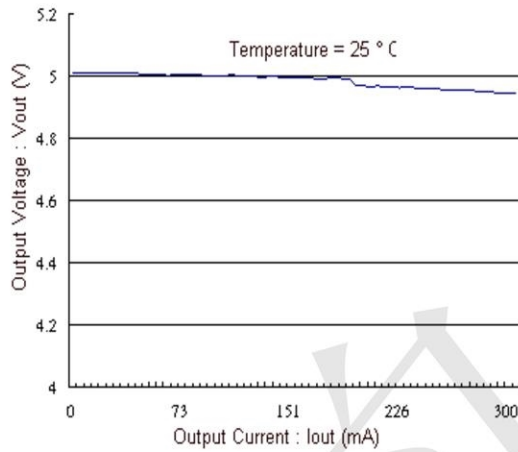
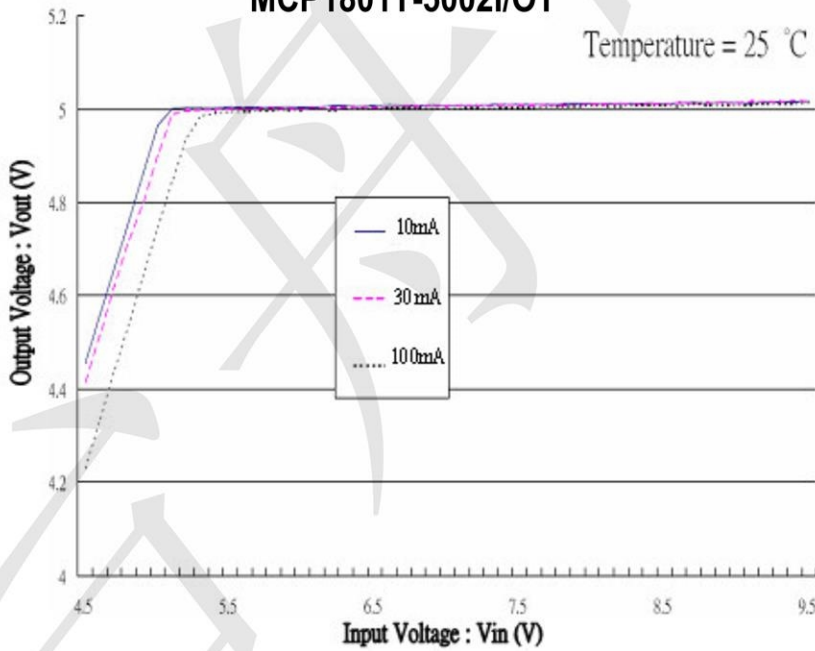### MCP1801T-5002I/OT

(2) Output Voltage VS Input Voltage
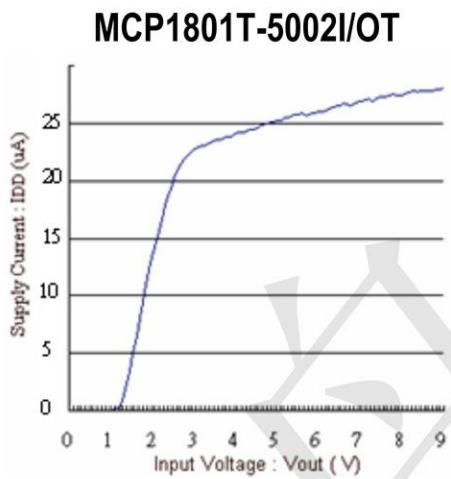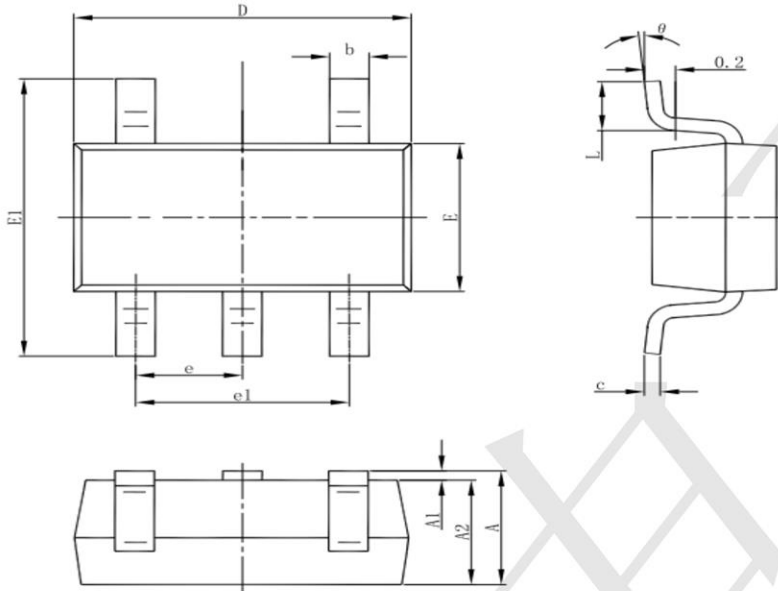
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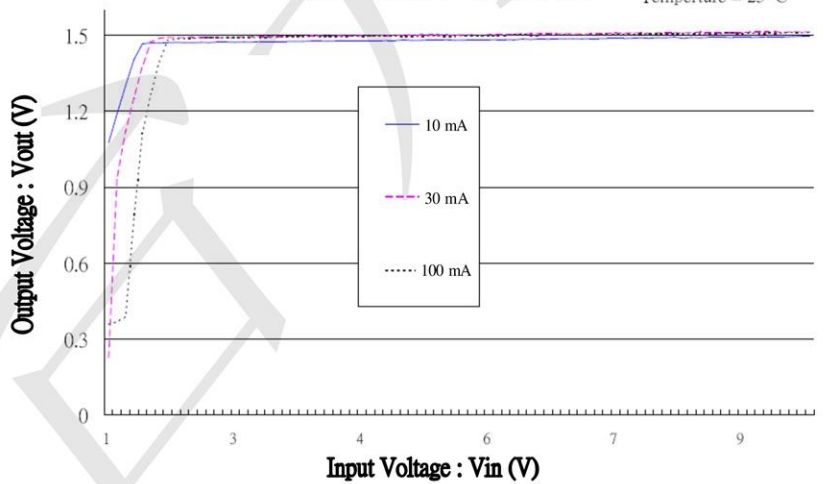
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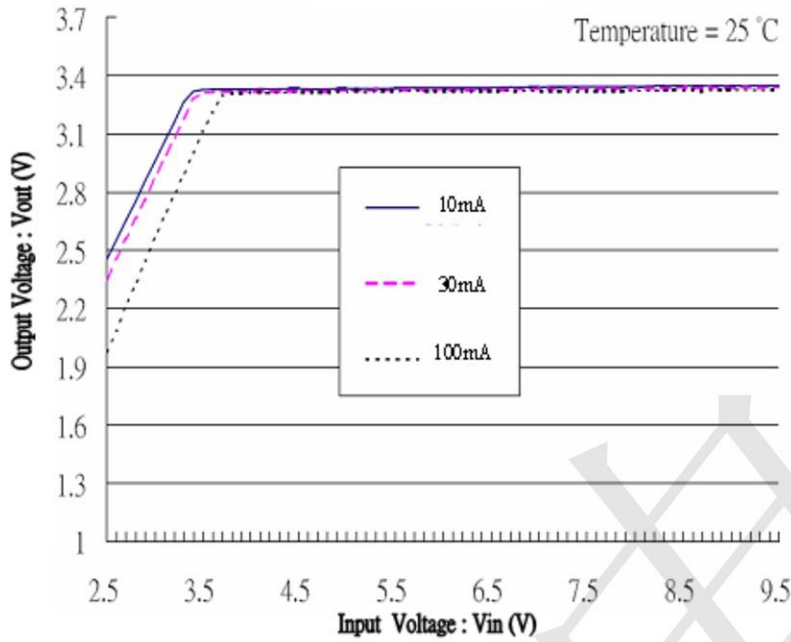
MCP1801T-5002I/OT

(3) Supply Current VS Input Voltage

MCP1801T-1502I/OT

MCP1801T-3302I/OT

MCP1801T-5002I/OT

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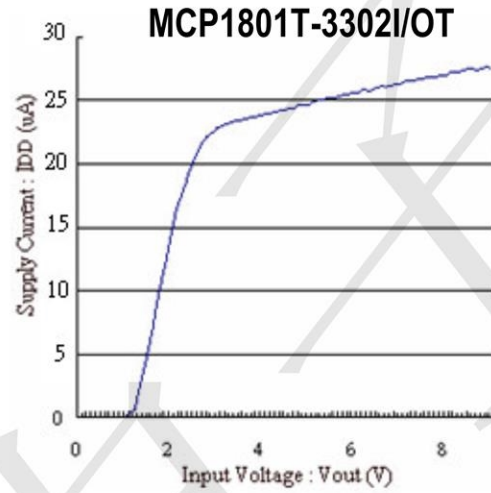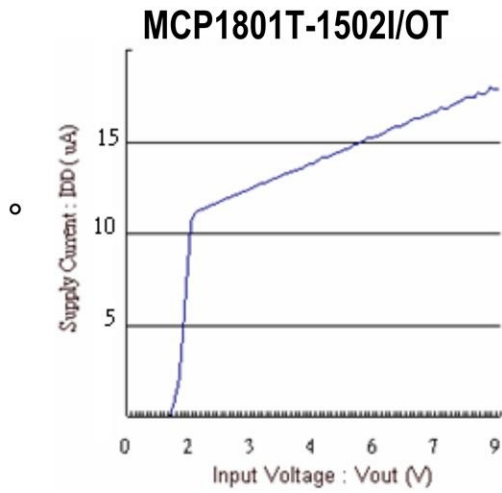
Package informantion

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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