MCP1802T Series

300mA,High PSRR,LowQuiescent Current LDO

General Description

The MCP1802 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 MCP1802 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 MCP1802 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 ($\overline{SHDN}$) function allows the output to be enabled or disabled. When disabled, the MCP1802 draws only 0.01 µA of current (typical).

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

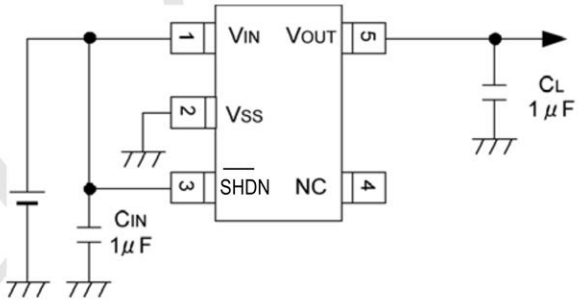
Features

- **CMOS Low Power Consumption**
- **Dropout Voltage: 60mV @ 30mA,**
- **200mV @ 100mA**
- **Maximum Output Current: 300mA**
- **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**

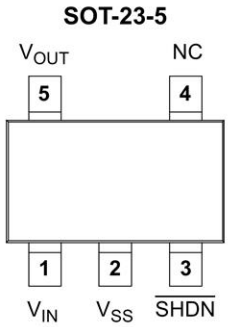
Applications

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

Typical Application Circuit



PIN CONFIGURATION



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

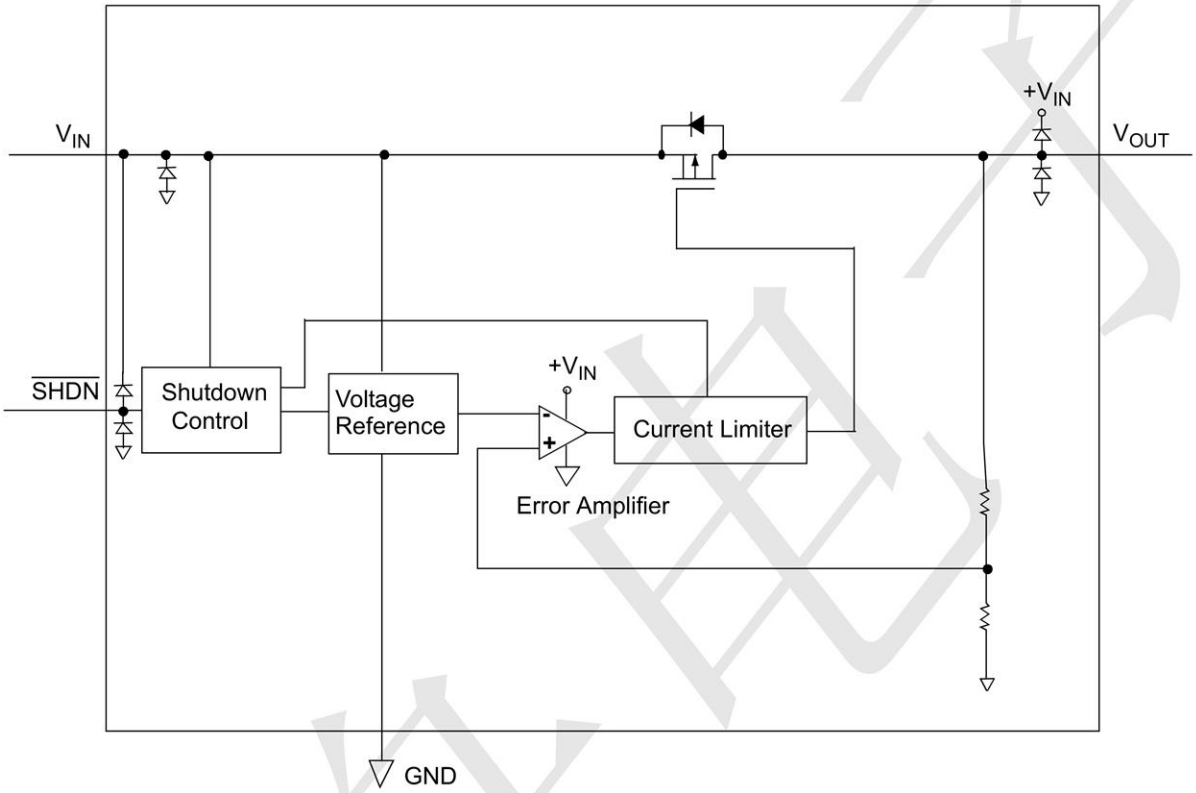
ABSOLUTE MAXIMUM RATINGS (T =25°C unless otherwise noted)

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

Electrical Characteristics (T =25 C unless otherwise noted)

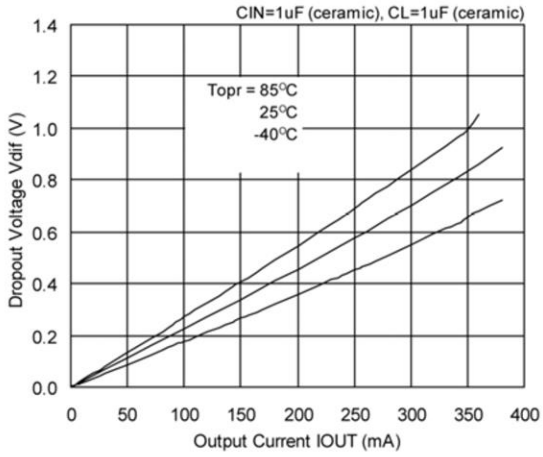
PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNITS
Output Voltage (2%)(*5)	$V_{OUT(E)}$(*3)	I_{OUT}=30mA	$V_{OUT(T)}$(*2)x0.98	$V_{OUT(T)}$(*2)	$V_{OUT(T)}$(*2)x1.02	V
Output Voltage (1%)(*6)			$V_{OUT(T)}$(*2)x0.99		$V_{OUT(T)}$(*2)x1.01	
Maximum Output Current	I_{OUTMAX}	V_{IN}=E-3(*7)	E-4	-	-	mA
Load Regulation	ΔV_{OUT}	1mA≦ I_{OUT} ≦100mA	-	15	50	mV
Load Regulation 2	ΔV_{OUT2}	1mA≦ I_{OUT} ≦300mA	-	-	100	mV
Dropout Voltage (*4)	Vdif1	I_{OUT}=30mA	E-1			mV
	Vdif2	I_{OUT}=100mA	E-2			mV
Supply Current (Type E)	I_{DD}	V_{CE}=V_{IN}=$V_{OUT(T)}$+1.0V When V_{OUT}≦0.95V, V_{CE}=V_{IN}=2.0V	-	28	55	μA
Supply Current (Type F)				25	50	
Stand-by Current	I_{STB}	V_{IN}=$V_{OUT(T)}$+1.0V, V_{CE}=V_{SS} When V_{OUT}≦0.95V, V_{CE}=V_{IN}=2.0V	-	0.01	0.10	μA
Line Regulation	ΔV_{OUT}/ (ΔV_{IN}·V_{OUT})	$V_{OUT(T)}$+1.0V≦V_{IN}≦10 V When V_{OUT}≦0.95V, 2.0V≦V_{IN}≦10V I_{OUT}=30mA V_{OUT}≦1.75V, I_{OUT}=10mA	-	0.01	0.20	%/V
Input Voltage	V_{IN}	-	2	-	10	V -
Output Voltage Temperature Characteristics	ΔV_{OUT}/ (ΔTopr·V_{OUT})	I_{OUT}=30mA -40℃≦Topr≦85℃	-	100	-	ppm/℃
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_{IN}, When V_{OUT}≦1.75V, V_{IN}=$V_{OUT(T)}$+2.0V	-	380	-	mA
Short Current	I_{SHORT}	V_{IN}= $V_{OUT(T)}$+1.0V, V_{CE}=V_{IN}, When V_{OUT}<1.75V, V_{IN}=$V_{OUT(T)}$+2.0V	-	50	-	mA
Logic High Input	$V_{SHDN-HIGH}$	- 1.6 -				V
Logic Low Input	$V_{SHDN-LOW}$	-	-	-	0.25	V

BLOCK DIAGRAM

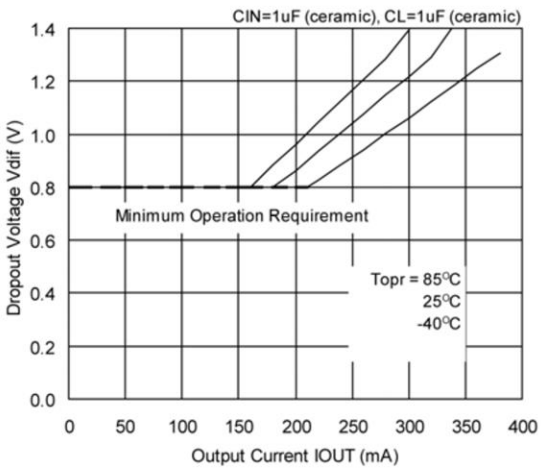


Dropout Voltage vs. Output Current

MCP1802T-3002I/OT

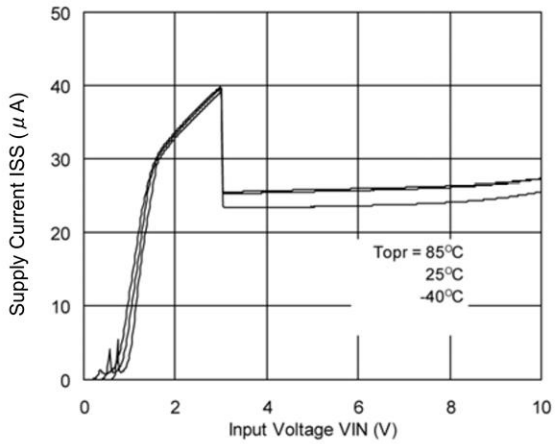


MCP1802T-1202I/OT

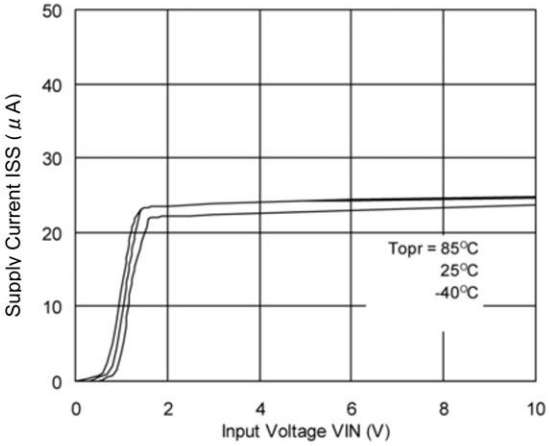


(4) Supply Current vs. Input Voltage

MCP1802T-3002I/OT

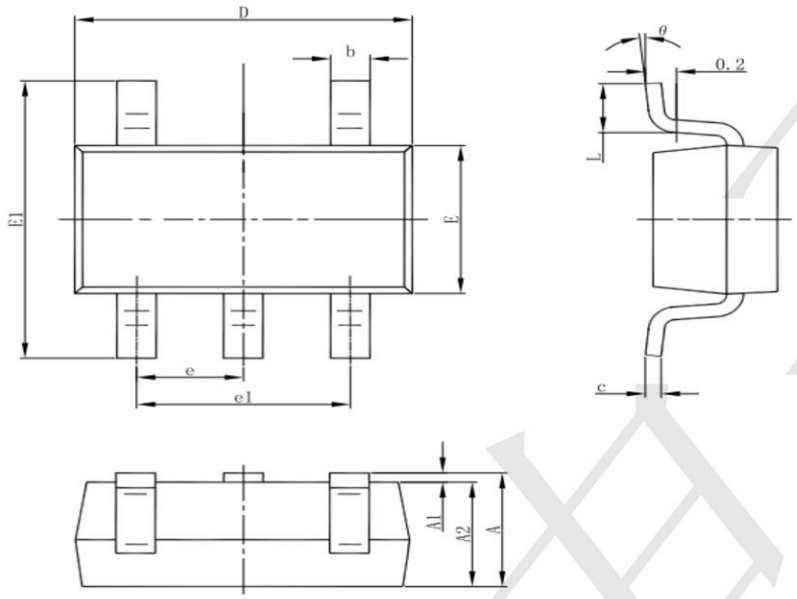


MCP1802T-1202I/OT



Package information

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 MCP1802T-3302I/OT	SOT23-5	3000	Tape and reel

Order code	Package	Baseqty	Delivery mode
TP MCP1802T-5002I/OT	SOT23-5	3000	Tape and reel

Order code	Package	Baseqty	Delivery mode
TP MCP1802T-XX02I/OT	SOT23-5	3000	Tape and reel

XX=iout voltage

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