

General Description

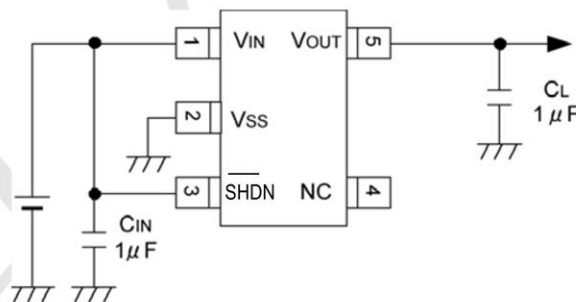
The MCP1802 is a family of CMOS low dropout (LDO) voltage regulators that can deliver up to 150 mA of current while consuming only 25 μ A of quiescent current (typical). The input operating range is specified from 2.0V to 10.0V, making it an ideal choice for two to six primary cell battery-powered applications, 9V alkaline and one or two cell Li-Ion-powered applications.

The 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 $\pm 0.4\%$ 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: 300mA**
- **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



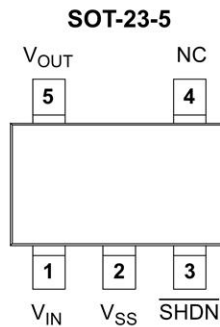
The LDO output is stable with a minimum of 1 μ F of output capacitance. Ceramic, tantalum, or aluminum electrolytic capacitors can all be used for input and output. Overcurrent limit with current foldback provides short-circuit protection. A shutdown (\overline{SHDN}) function allows the output to be enabled or disabled. When disabled, the MCP1802 draws only 0.01 μ 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 _{IN}	Unregulated Supply Voltage
2	GND	Ground Terminal
3	$\overline{\text{SHDN}}$	Shutdown Input
4	NC	No Connection
5	V _{OUT}	Regulated Voltage Output

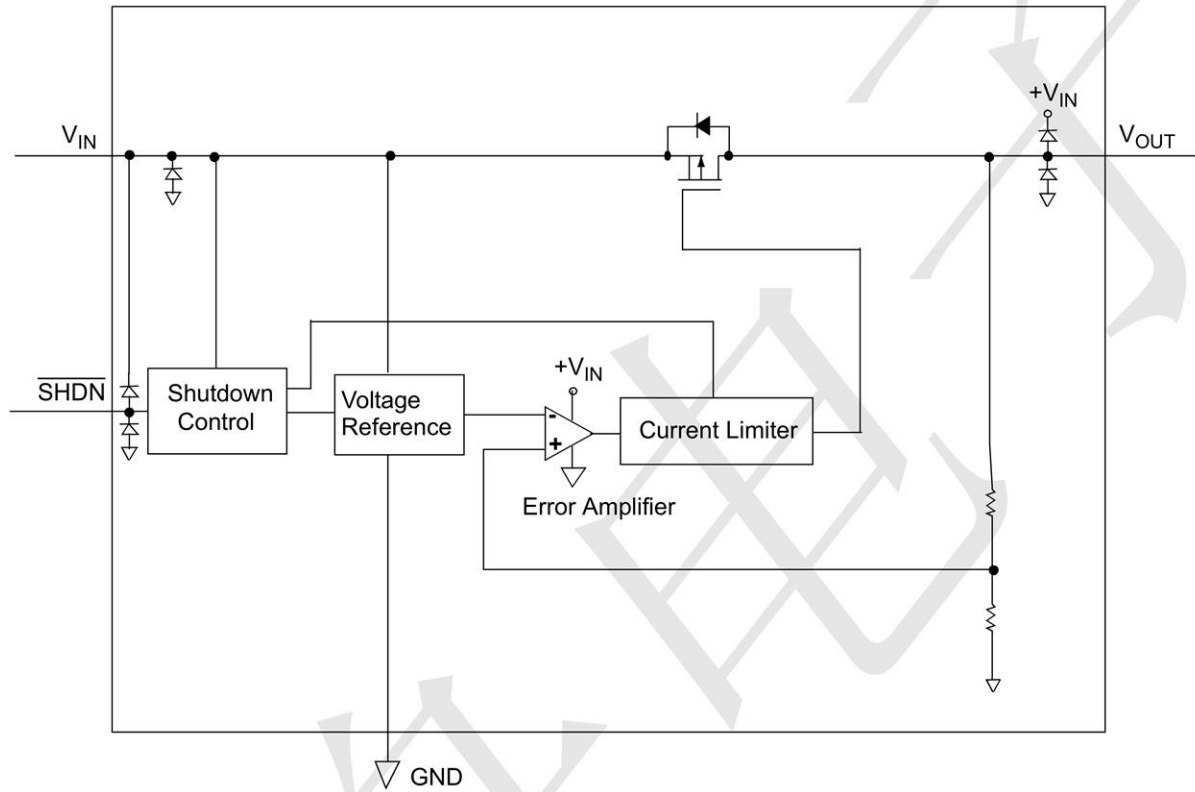
ABSOLUTE MAXIMUM RATINGS (T = 25°C unless otherwise noted)

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

Electrical Characteristics (T =25 C unless otherwise noted)

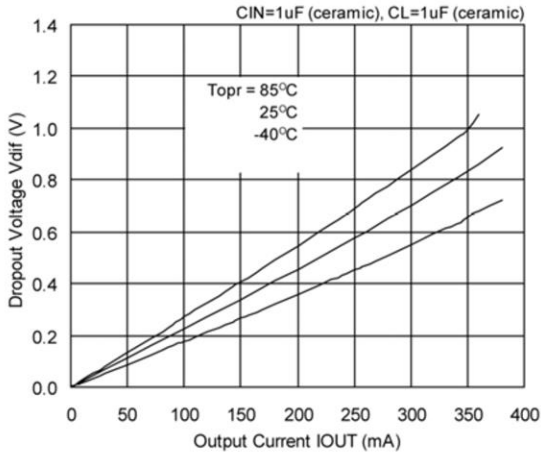
PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNITS
Output Voltage (2%) ⁽⁵⁾	V _{OUT(E)} ⁽³⁾	I _{OUT} =30mA	V _{OUT(T)} ⁽²⁾ ×0.98	V _{OUT(T)} ⁽²⁾	V _{OUT(T)} ⁽²⁾ ×1.02	V
Output Voltage (1%) ⁽⁶⁾			V _{OUT(T)} ⁽²⁾ ×0.99		V _{OUT(T)} ⁽²⁾ ×1.01	
Maximum Output Current	I _{OUTMAX}	V _{IN} =E-3 ⁽⁷⁾	E-4	-	-	mA
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⁾	V _{dif1}	I _{OUT} =30mA	E-1			mV
	V _{dif2}	I _{OUT} =100mA	E-2			mV
Supply Current (Type E)	I _{DD}	V _{CE} =V _{IN} =V _{OUT(T)} +1.0V	-	28	55	μA
Supply Current (Type F)		When V _{OUT} ≤ 0.95V, V _{CE} =V _{IN} =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 _{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} ≤ 10V 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} / (ΔT _{opr} · V _{OUT})	I _{OUT} =30mA -40°C ≤ T _{opr} ≤ 85°C	-	100	-	ppm/°C
Power Supply Rejection Ratio	PSRR	V _{IN} ={V _{OUT(T)} +1.0}V+1.0V _{p-pAC} , When V _{OUT} ≤ 1.5V, V _{IN} =2.5V+1.0V _{p-pAC} , I _{OUT} =50mA, f=10kHz	-	70	-	dB
Current Limit	I _{lim}	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

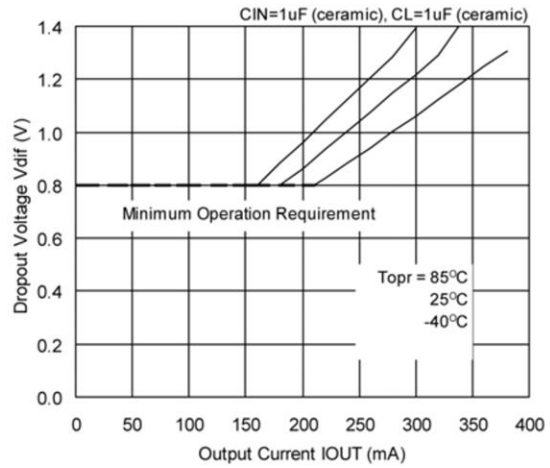


Dropout Voltage vs. Output Current

MCP1802T-3002I/OT

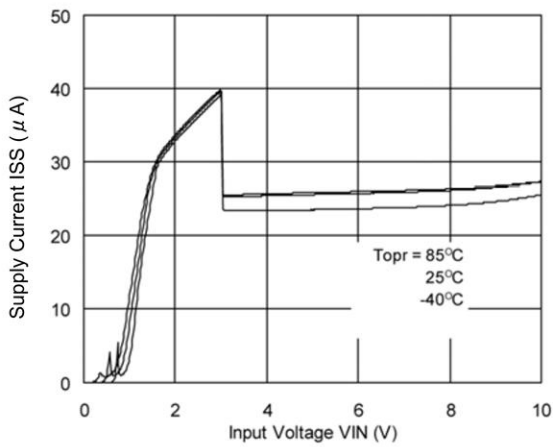


MCP1802T-1202I/OT

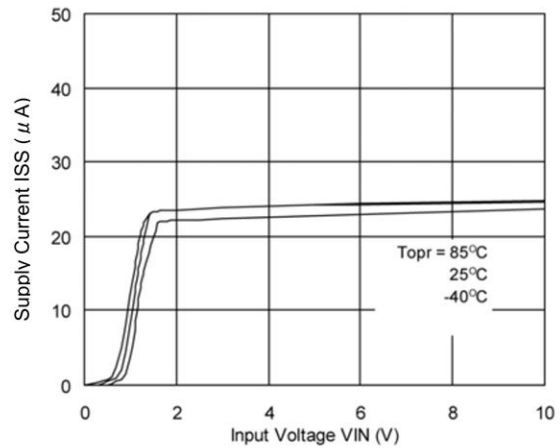


(4) Supply Current vs. Input Voltage

MCP1802T-3002I/OT

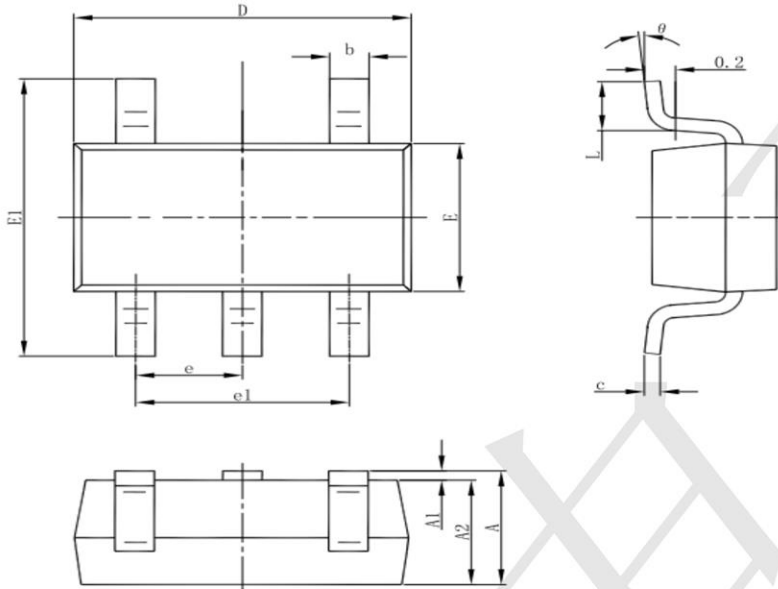


MCP1802T-1202I/OT



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