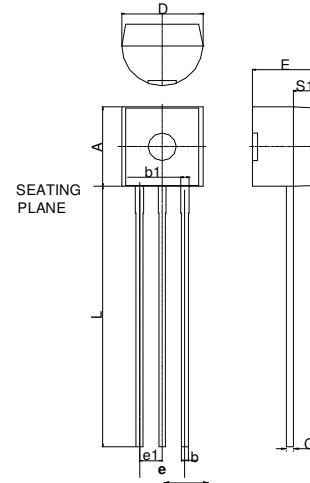


RoHS Compliant Product

TO-92

## Description

The S62FP series is a group of positive voltage output, three-pin regulators, that provide a high current even when the input/output voltage differential is small. Low power consumption and high accuracy is achieved through CMOS and laser trimming technologies. The S62FP consists of a high-precision voltage reference, an error amplification circuit, and a current limited output driver. Transient response to load variations have improved in comparison to the existing series.



## Features

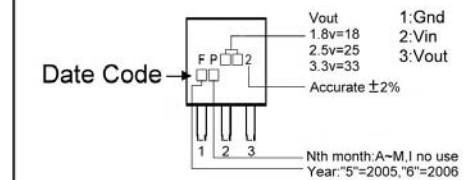
- \* Small Input-Output Differential:  $I_{OUT}=100mA @ V_{OUT}=5V$  with a 0.12V differential
- \* Highly Accurate: Output Voltage  $\pm 2\%$
- \* Low Power Consumption: Typ.  $2\mu A @ V_{OUT}=5V$
- \* Output Voltage Range: 1.5V~6V in 0.1V increments
- \* Input Stability: Typ. 0.2%/V
- \* Output Voltage Temperature Characteristics: Typ.  $\pm 100ppm/^{\circ}C$
- \* Max. Output Current: 250mA (Within Max. Power Dissipation,  $V_{OUT}=5V$ )

REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	4.45	4.7	D	4.44	4.7
S1	1.02	-	E	3.30	3.81
b	0.36	0.51	L	12.70	-
b1	0.36	0.76	e1	1.150	1.390
C	0.36	0.51	e	2.42	2.66

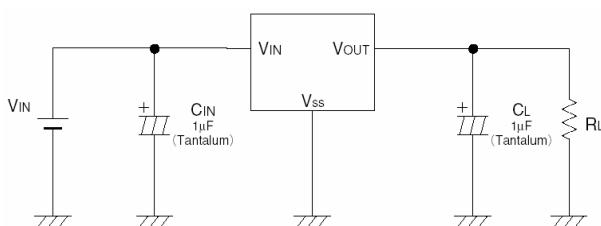
## Applications

- \* Reference Voltage Source
- \* Palmtops
- \* Battery Powered Equipment
- \* Portable Cameras And Video Recorders

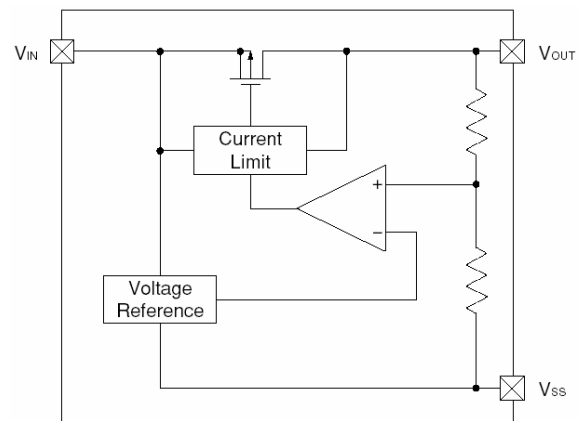
### Marking :



## Typical Application Circuit



## Block Diagram



## Absolute Maximum Ratings $T_a=25^\circ\text{C}$

Parameter	Symbol	Ratings	Unit
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
Operating Ambient Temperature	$T_{opr}$	-40~+85	$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-40~+125	$^\circ\text{C}$
Continuous Total Power Dissipation	$P_D$	500	mW

## Electrical Characteristics $T_a=25^\circ\text{C}$

### S62FP-50 $V_{OUT}(T) = 5.0V$ (Note1)

Parameter	Symbol	Condition	Min	TYP	Max	Unit
Output Voltage	$V_{OUT(E)}$ (Note2)	$V_{IN}=6.0V, I_{OUT}=40mA$	4.900	5.000	5.100	V
Max. Output Current	$I_{OUT\ max}$	$V_{IN}=6V, V_{OUT(E)} \geq 4.5V$	250	-	-	mA
Load Stability	$\Delta V_{OUT}$	$V_{IN}=6V, I_{OUT}=1mA$ to 100mA	-	40	80	mV
Input-Output Voltage Differential (Note3)	$V_{dif1}$	$I_{OUT}=100mA$	-	120	300	mV
	$V_{dif2}$	$I_{OUT}=200mA$	-	380	600	
Supply Current	$I_{SS}$	$V_{IN}=6V$	-	2.0	5.0	$\mu A$
Input Stability	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \cdot V_{OUT}}$	$I_{OUT}=40mA$ $V_{IN}=6V$ to 10V	-	0.2	0.3	%/V
Input Voltage	$V_{IN}$		-	-	10	V
Output Voltage Temperature Characteristics	$\frac{\Delta V_{OUT}}{\Delta T_{opr} \cdot V_{OUT}}$	$I_{OUT}=40mA$ $-40^\circ\text{C} \leq T_{opr} \leq 85^\circ\text{C}$	-	$\pm 100$	-	ppm/ $^\circ\text{C}$

Note 1:  $V_{OUT}(T)$  = Specified Output Voltage.

2:  $V_{OUT}(E)$  = Effective Output Voltage (i.e. the output voltage when " $V_{OUT}(T) + 1.0V$ " is provided at the  $V_{IN}$  pin while maintaining a certain  $I_{OUT}$  value).

3:  $V_{dif} = V_{IN}^{(Note4)} - V_{OUT}(E)$

4:  $V_{IN1}$  = The input voltage at the time 98% of  $V_{OUT}(E)$  is output (input voltage has been gradually reduced).

### S62FP-40 $V_{OUT}(T) = 4.0V$ (Note1)

Parameter	Symbol	Condition	Min	TYP	Max	Unit
Output Voltage	$V_{OUT(E)}$ (Note2)	$V_{IN}=5.0V, I_{OUT}=40mA$	3.920	4.000	4.080	V
Max. Output Current	$I_{OUT\ max}$	$V_{IN}=5V, V_{OUT(E)} \geq 3.6V$	200	-	-	mA
Load Stability	$\Delta V_{OUT}$	$V_{IN}=5V, I_{OUT}=1mA$ to 100mA	-	45	90	mV
Input-Output Voltage Differential (Note3)	$V_{dif1}$	$I_{OUT}=100mA$	-	170	330	mV
	$V_{dif2}$	$I_{OUT}=200mA$	-	400	630	
Supply Current	$I_{SS}$	$V_{IN}=5V$	-	2.0	4.5	$\mu A$
Input Stability	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \cdot V_{OUT}}$	$I_{OUT}=40mA$ $V_{IN}=5V$ to 10V	-	0.2	0.3	%/V
Input Voltage	$V_{IN}$		-	-	10	V
Output Voltage Temperature Characteristics	$\frac{\Delta V_{OUT}}{\Delta T_{opr} \cdot V_{OUT}}$	$I_{OUT}=40mA$ $-40^\circ\text{C} \leq T_{opr} \leq 85^\circ\text{C}$	-	$\pm 100$	-	ppm/ $^\circ\text{C}$

**S62FP-30 V<sub>OUT</sub> (T) =3.0V (Note1)**

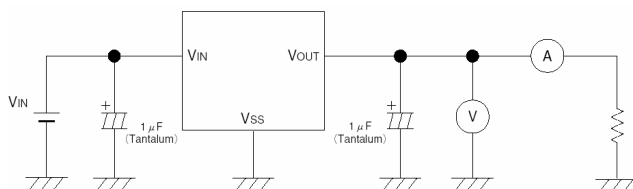
Parameter	Symbol	Condition	Min	TYP	Max	Unit
Output Voltage	V <sub>OUT</sub> (E) (Note2)	V <sub>IN</sub> =4.0V, I <sub>OUT</sub> =40mA	2.940	3.000	3.060	V
Max. Output Current	I <sub>OUT max</sub>	V <sub>IN</sub> =4V, V <sub>OUT</sub> (E)≥2.7V	150	-	-	mA
Load Stability	ΔV <sub>OUT</sub>	V <sub>IN</sub> =4V, I <sub>OUT</sub> =1mA to 80mA	-	45	90	mV
Input-Output Voltage Differential (Note3)	V <sub>dif1</sub>	I <sub>OUT</sub> =80mA	-	180	360	mV
	V <sub>dif2</sub>	I <sub>OUT</sub> =160mA	-	400	700	
Supply Current	I <sub>SS</sub>	V <sub>IN</sub> =4V	-	2.0	4.5	μA
Input Stability	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \cdot V_{OUT}}$	I <sub>OUT</sub> =40mA V <sub>IN</sub> =4V to 10V	-	0.2	0.3	%/V
Input Voltage	V <sub>IN</sub>		-	-	10	V
Output Voltage Temperature Characteristics	$\frac{\Delta V_{OUT}}{\Delta T_{opr} \cdot V_{OUT}}$	I <sub>OUT</sub> =40mA -40°C ≤ T <sub>opr</sub> ≤ 85°C	-	±100	-	ppm/°C

**S62FP-20 V<sub>OUT</sub> (T) =2.0V (Note1)**

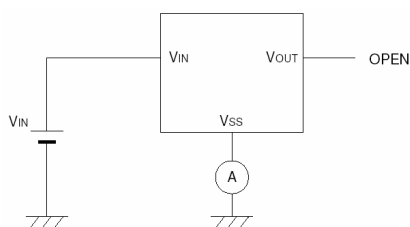
Parameter	Symbol	Condition	Min	TYP	Max	Unit
Output Voltage	V <sub>OUT</sub> (E) (Note2)	V <sub>IN</sub> =3.0V, I <sub>OUT</sub> =40mA	1.960	2.000	2.040	V
Max. Output Current	I <sub>OUT max</sub>	V <sub>IN</sub> =3V, V <sub>OUT</sub> (E)≥1.8V	100	-	-	mA
Load Stability	ΔV <sub>OUT</sub>	V <sub>IN</sub> =3V, I <sub>OUT</sub> =1mA to 60mA	-	45	90	mV
Input-Output Voltage Differential (Note3)	V <sub>dif1</sub>	I <sub>OUT</sub> =60mA	-	180	360	mV
	V <sub>dif2</sub>	I <sub>OUT</sub> =120mA	-	400	700	
Supply Current	I <sub>SS</sub>	V <sub>IN</sub> =3V	-	2.0	4.5	μA
Input Stability	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \cdot V_{OUT}}$	I <sub>OUT</sub> =40mA V <sub>IN</sub> =3V to 10V	-	0.2	0.3	%/V
Input Voltage	V <sub>IN</sub>		-	-	10	V
Output Voltage Temperature Characteristics	$\frac{\Delta V_{OUT}}{\Delta T_{opr} \cdot V_{OUT}}$	I <sub>OUT</sub> =40mA -40°C ≤ T <sub>opr</sub> ≤ 85°C	-	±100	-	ppm/°C

**Test Circuit**

Circuit1

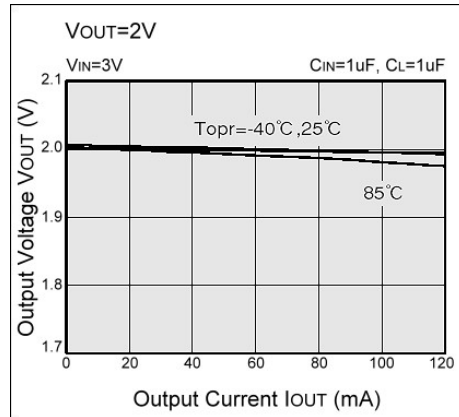
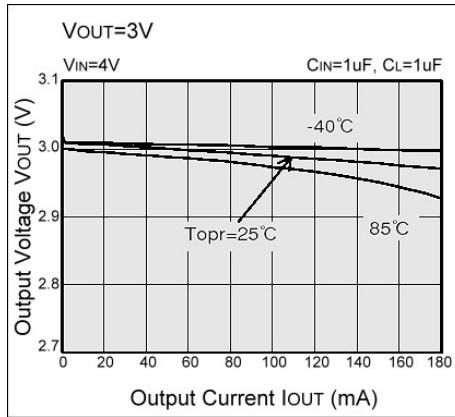
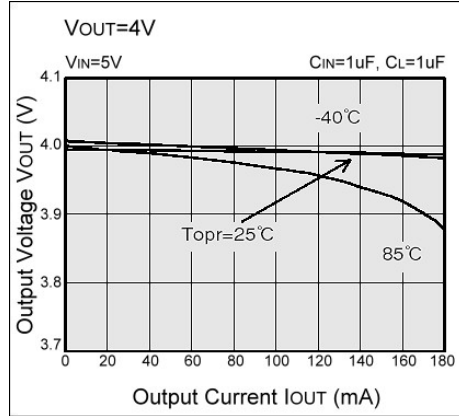
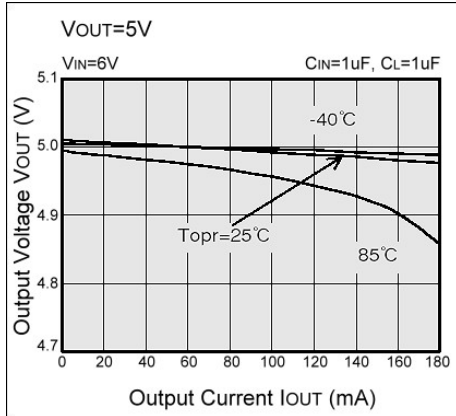


Circuit2

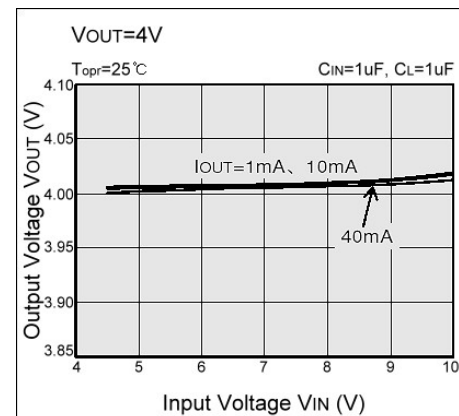
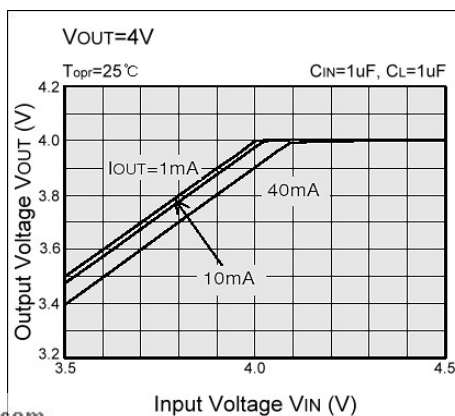
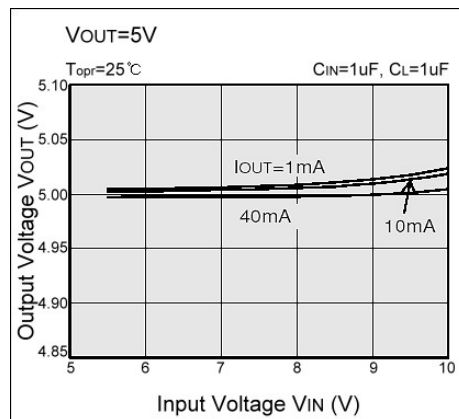
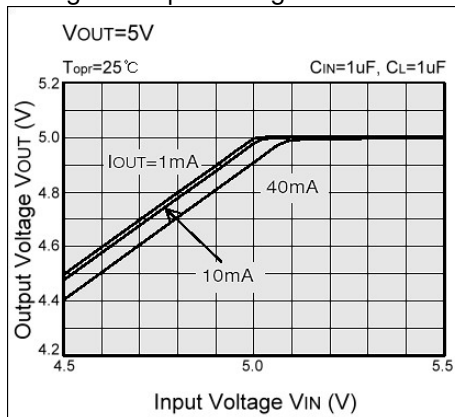


## Characteristics Curve

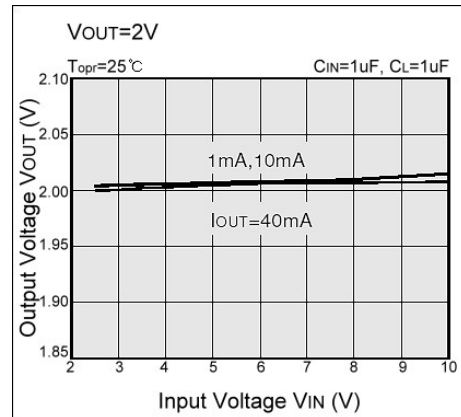
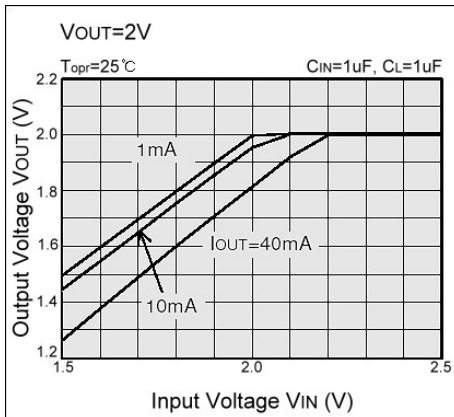
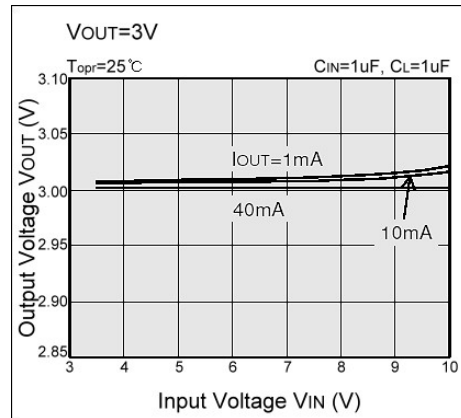
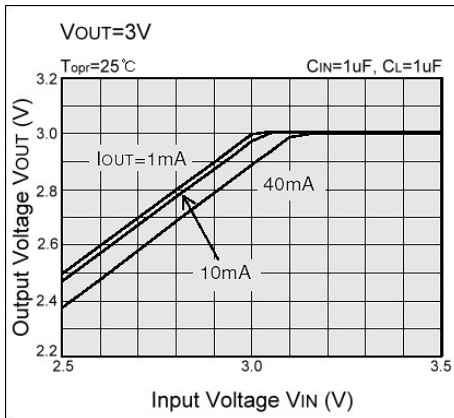
### (1) Output Voltage vs. Output Current



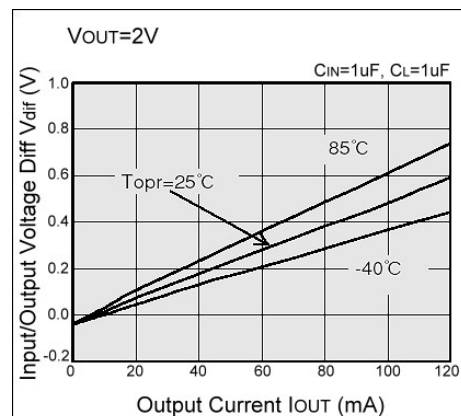
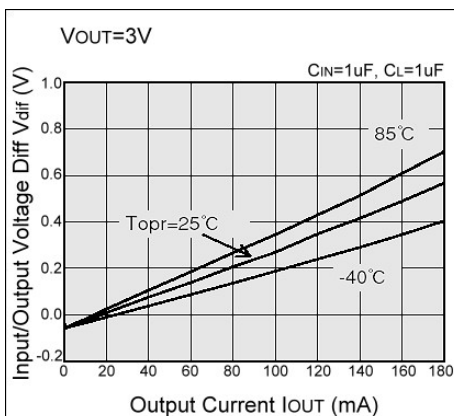
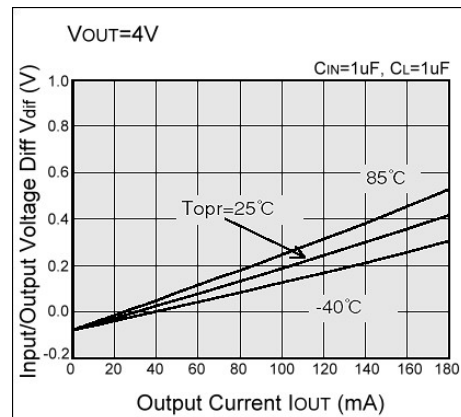
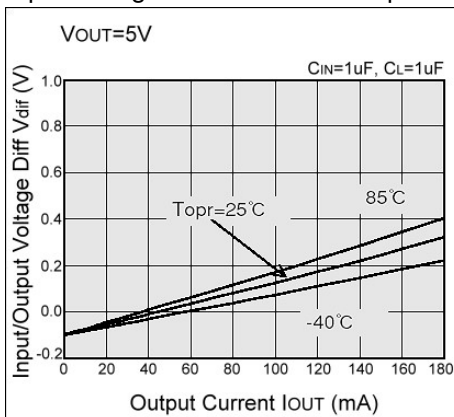
### (2) Output Voltage vs. Input Voltage



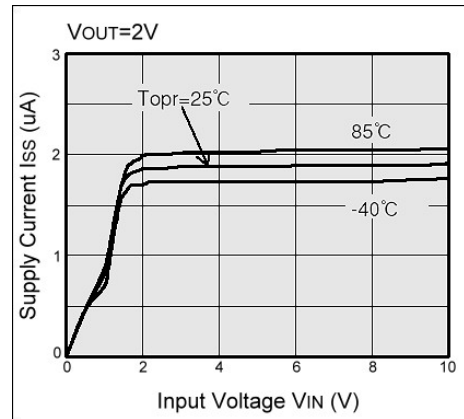
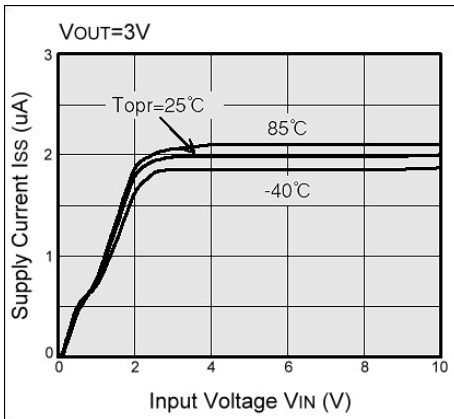
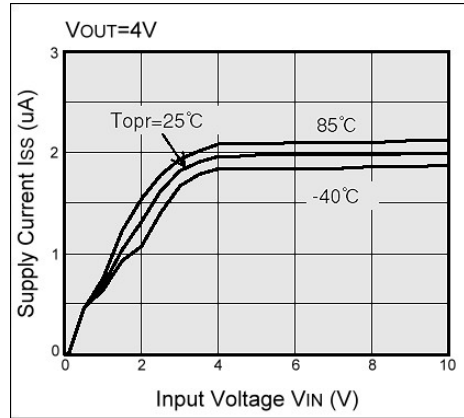
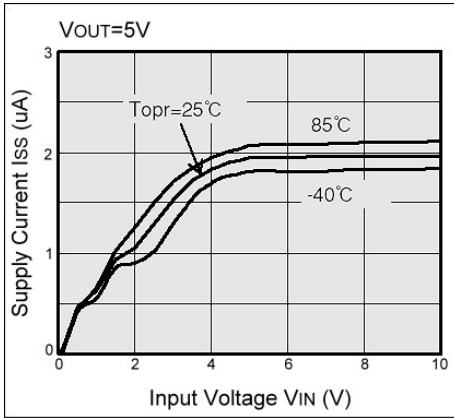
(2) Output Voltage vs. Input Voltage



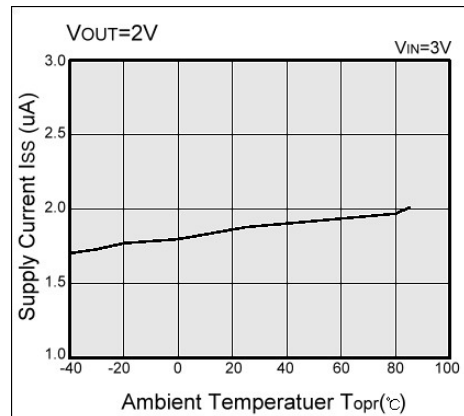
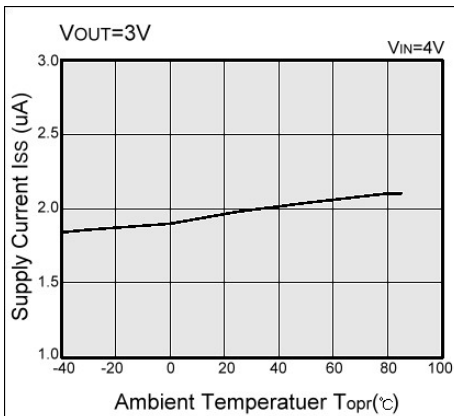
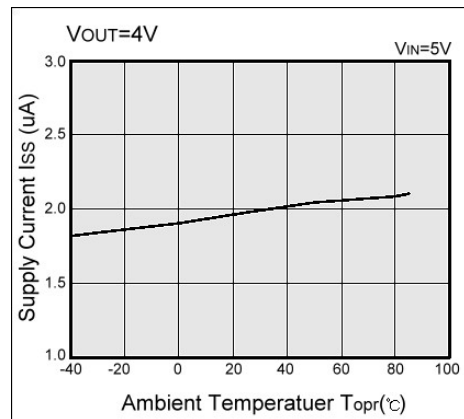
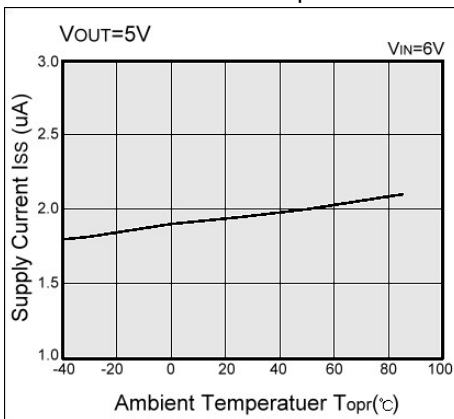
(3) Input/Output Voltage Differential vs. Output Current



(4) Supply Current vs. Input Voltage



(5) Supply Current vs. Ambient Temperature



(6) Output Voltage vs. Ambient Temperature

