

G62FP

CMOS Positive Voltage Regulator

Description

The G62FP 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 G62FP 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.

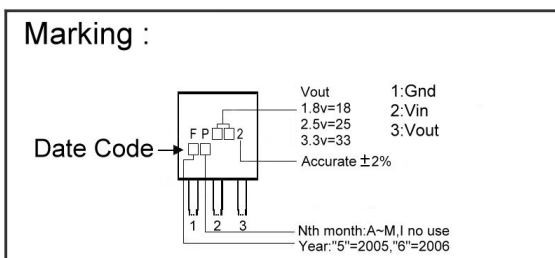
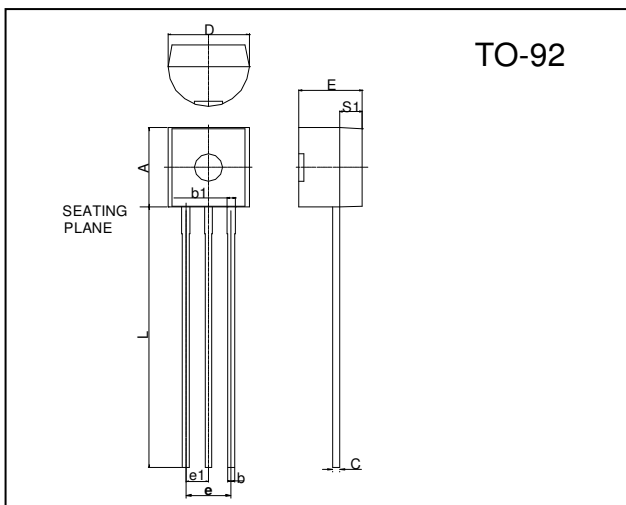
Features

- Maximum Output Current: 250mA (within max. power dissipation, $V_{out}=5.0V$)
- Output Voltage Range: 1.5V ~ 6V in 0.1V increments
- Low Power Consumption: Typ. 2.0uA @ $V_{OUT}=5.0V$
- Output Voltage Temperature Characteristics: Typ. $\pm 100ppm/^{\circ}C$
- Input Stability: Typ. 0.2%/V
- Small Input-Output Differential: $I_{OUT}=100mA$ @ $V_{OUT}=5.0V$ with a 0.12V differential
- Highly Accurate: Output voltage $\pm 2\%$

Applications

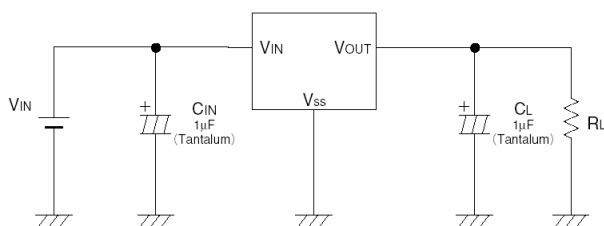
- Battery Powered Equipment
- Palmtops
- Portable Cameras and Video Recorders
- Reference Voltage Source

Package Dimensions

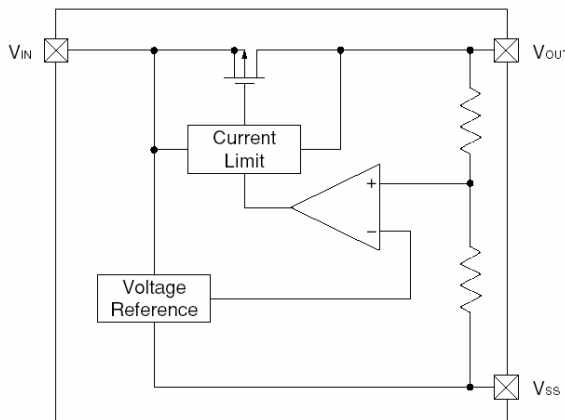


| REF. | Millimeter | | REF. | Millimeter | |
|------|------------|------|------|------------|-------|
| | Min. | Max. | | Min. | Max. |
| A | 4.45 | 4.7 | D | 4.44 | 4.7 |
| S1 | 1.02 | - | E | 3.30 | 3.81 |
| b | 0.36 | 0.51 | L | 12.70 | - |
| b1 | 0.36 | 0.76 | e1 | 1.150 | 1.390 |
| C | 0.36 | 0.51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

Typical Application Circuit



Block Diagram



Absolute Maximum Ratings Ta=25°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 | Topr | -40 ~ +85 | °C |
| Storage Temperature | Tstg | -40 ~ +125 | °C |
| Continuous Total Power Dissipation | PD | 300 | mW |

Electrical Characteristics Ta=25°C**G62FP-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)≥4.5V | 250 | - | - | mA |
| Load Stability | ΔV _{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 | μA |
| 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°C ≤ Topr ≤ 85°C | - | ±100 | - | ppm/°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).

G62FP-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)≥3.6V | 200 | - | - | mA |
| Load Stability | ΔV _{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 | μA |
| 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°C ≤ Topr ≤ 85°C | - | ±100 | - | ppm/°C |

G62FP-30 $V_{OUT}(T) = 3.0V$ (Note1)

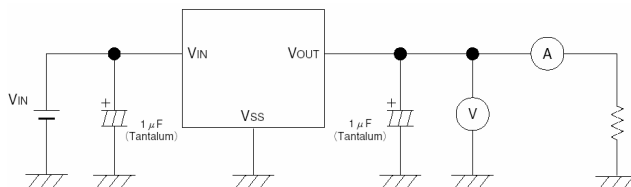
| Parameter | Symbol | Condition | Min | TYP | Max | Unit |
|--|---|--|-------|-----------|-------|------------------|
| Output Voltage | $V_{OUT(E)}$ (Note2) | $V_{IN}=4.0V, I_{OUT}=40mA$ | 2.940 | 3.000 | 3.060 | V |
| Max. Output Current | $I_{OUT\ max}$ | $V_{IN}=4V, V_{OUT(E)} \geq 2.7V$ | 150 |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

G62FP-20 $V_{OUT}(T) = 2.0V$ (Note1)

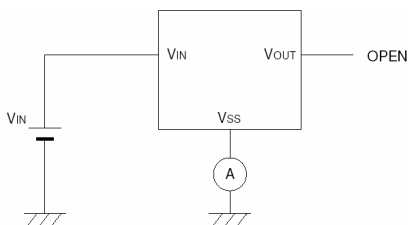
| Parameter | Symbol | Condition | Min | TYP | Max | Unit |
|--|---|--|-------|-----------|-------|------------------|
| Output Voltage | $V_{OUT(E)}$ (Note2) | $V_{IN}=3.0V, I_{OUT}=40mA$ | 1.960 | 2.000 | 2.040 | V |
| Max. Output Current | $I_{OUT\ max}$ | $V_{IN}=3V, V_{OUT(E)} \geq 1.8V$ | 100 |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

Test Circuit

Circuit1

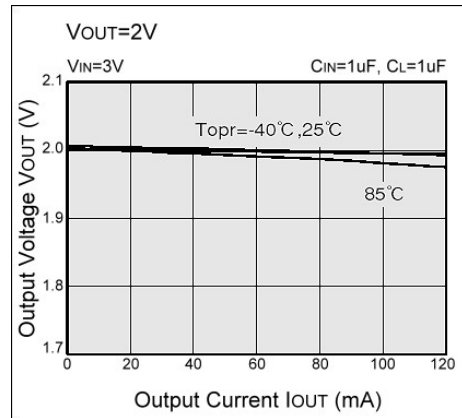
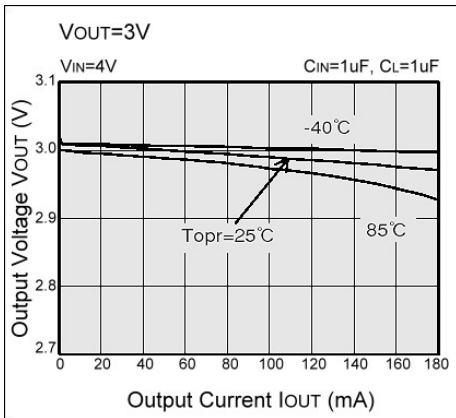
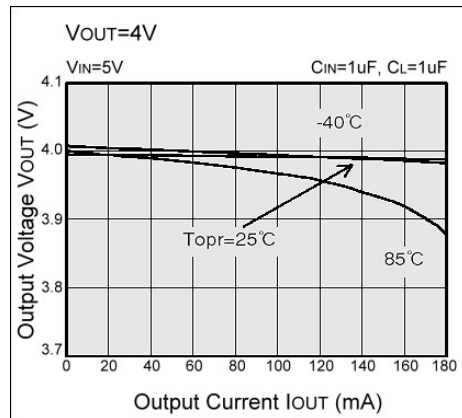
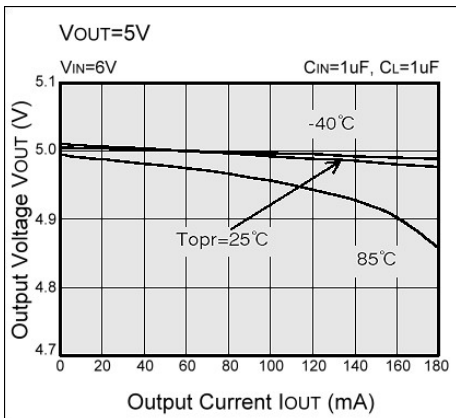


Circuit2

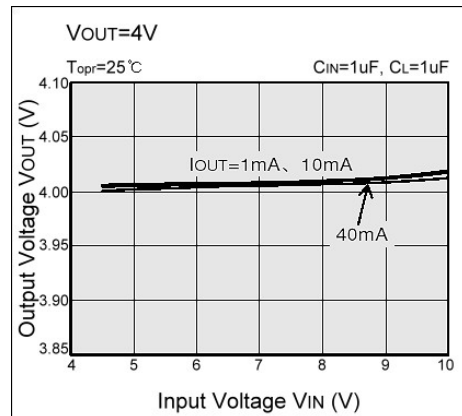
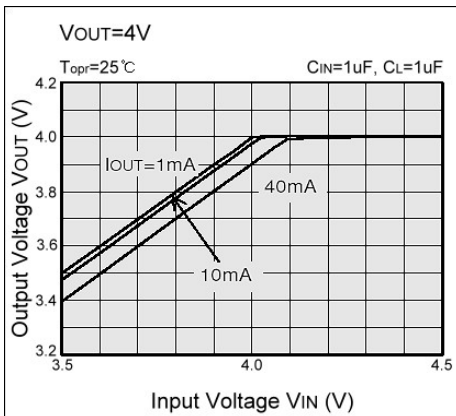
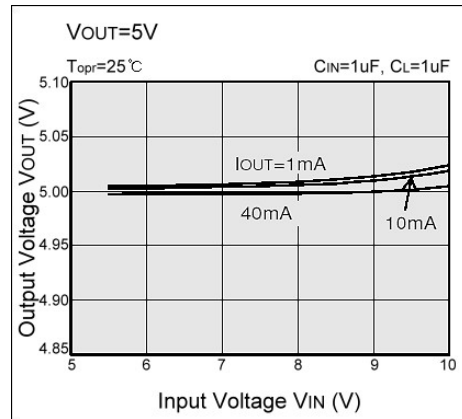
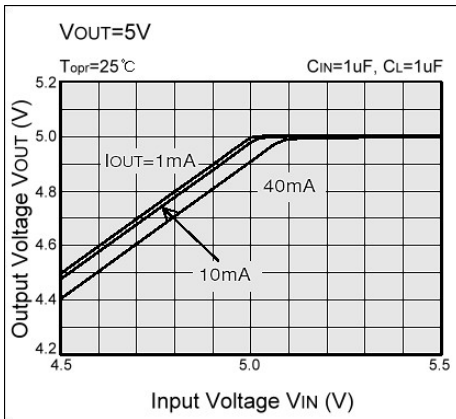


Characteristics Curve

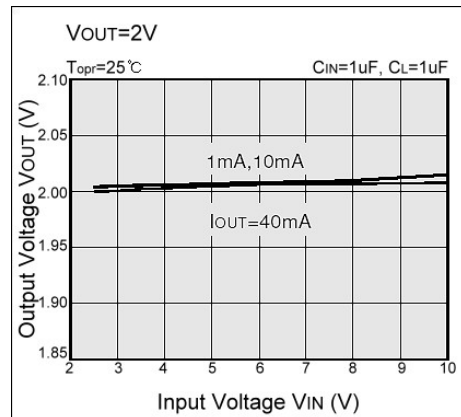
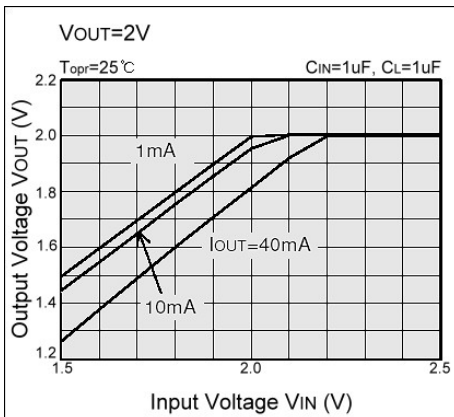
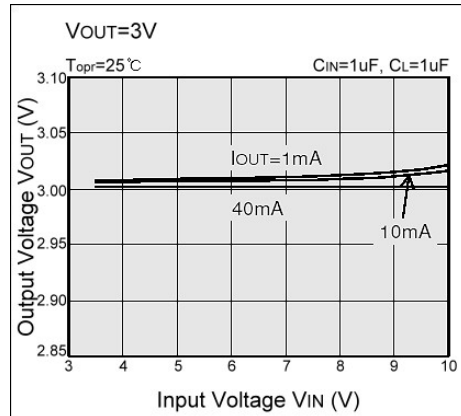
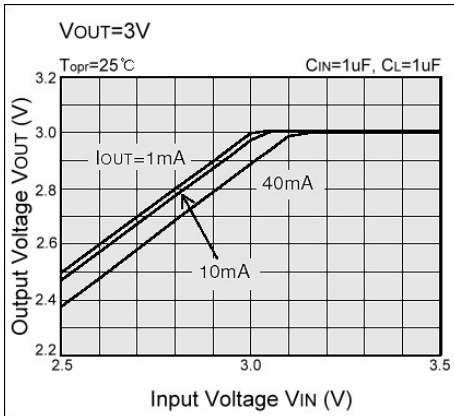
(1) Output Voltage vs. Output Current



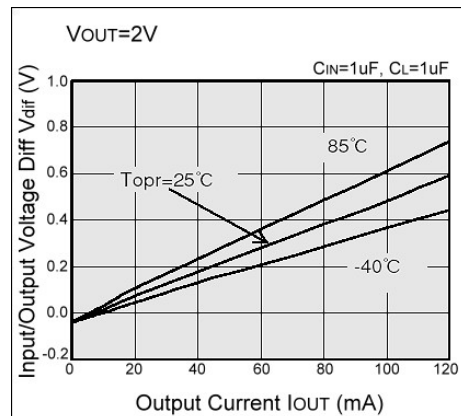
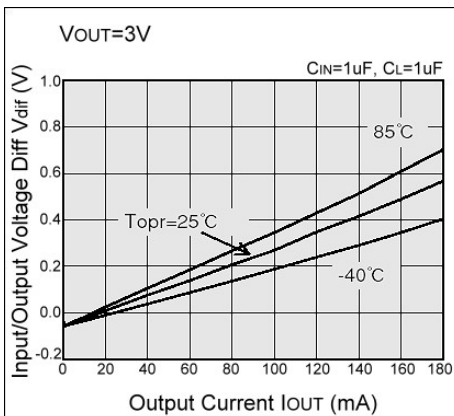
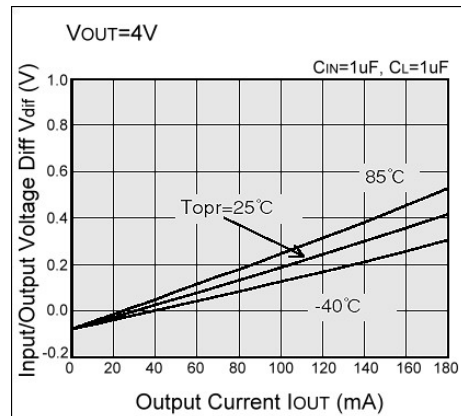
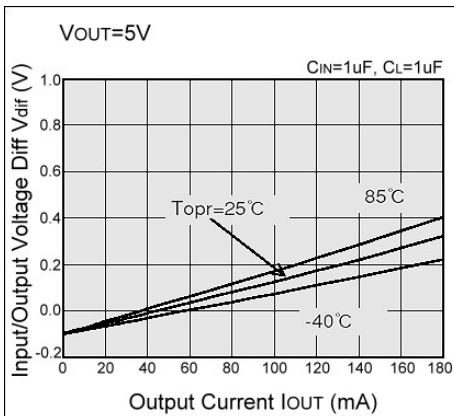
(2) Output Voltage vs. Input Voltage



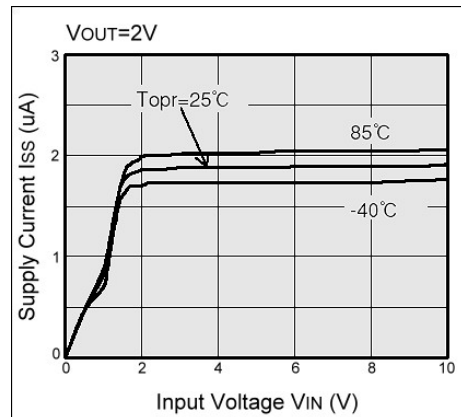
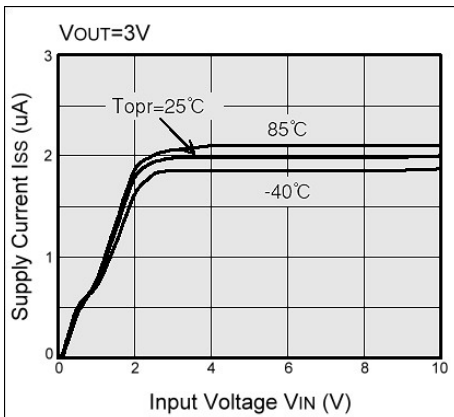
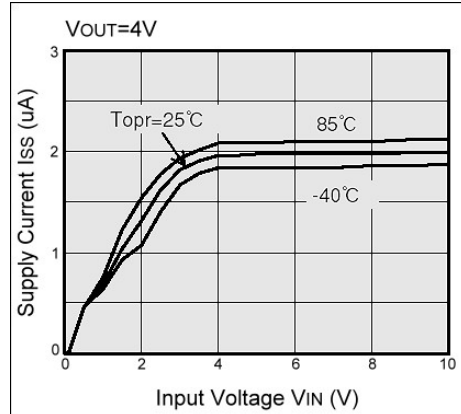
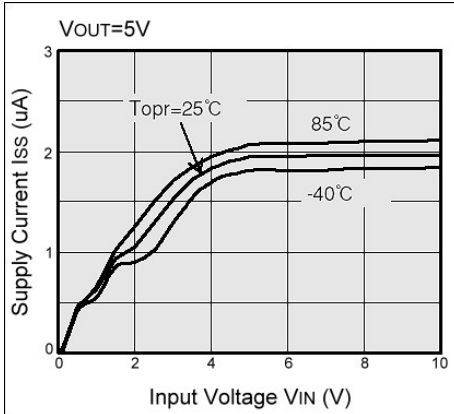
(2) Output Voltage vs. Input Voltage



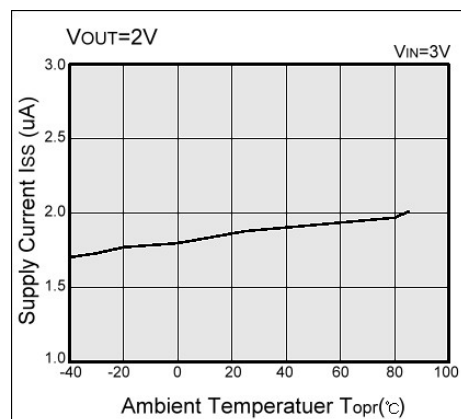
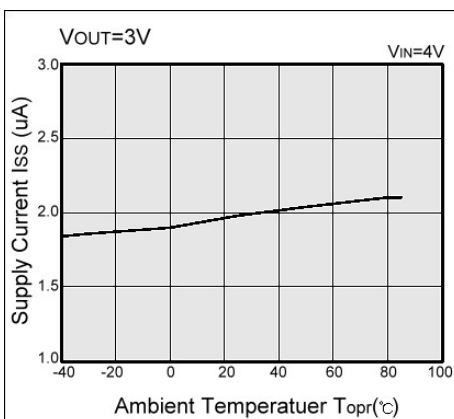
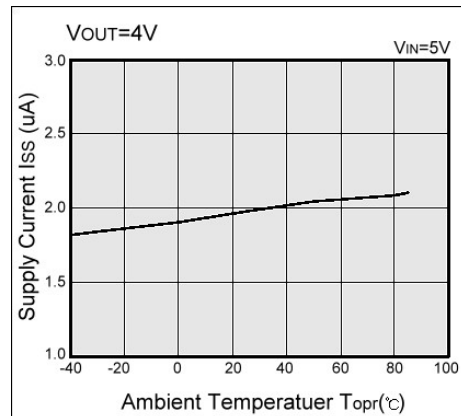
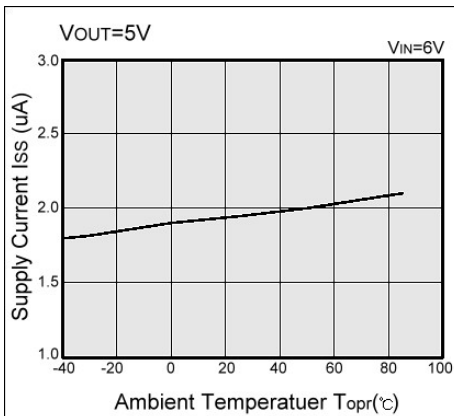
(3) Input/Output Voltage Differential vs. Output Current



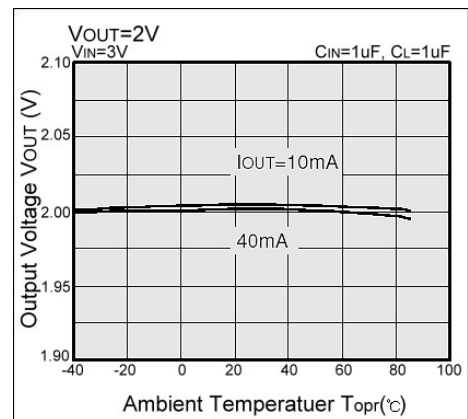
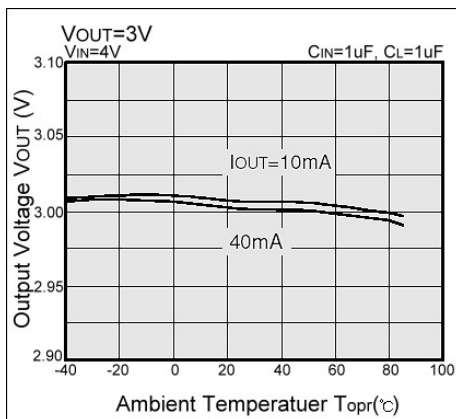
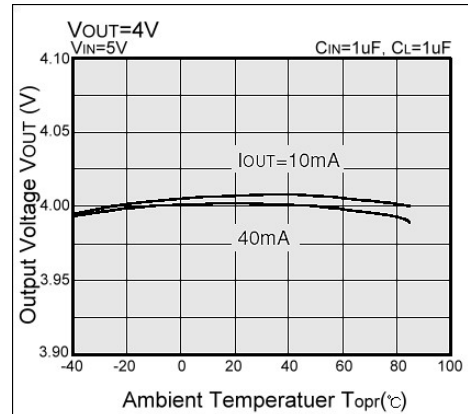
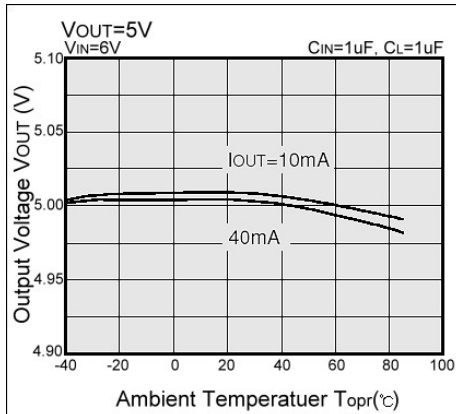
(4) Supply Current vs. Input Voltage



(5) Supply Current vs. Ambient Temperature



(6) Output Voltage vs. Ambient Temperature



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