Elektronische Bauelemente

SM62FP

CMOS Positive

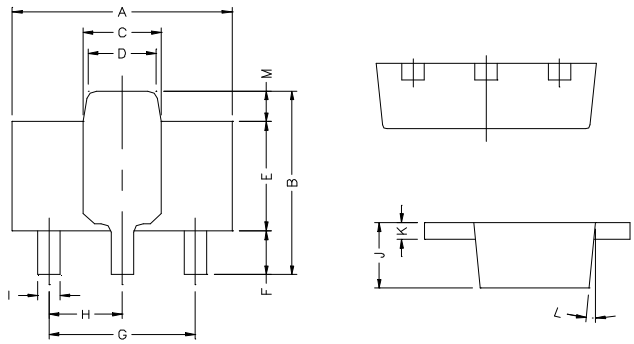
Voltage Regulator

RoHS Compliant Product

Description

The SM62FP 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 SM62FP 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.

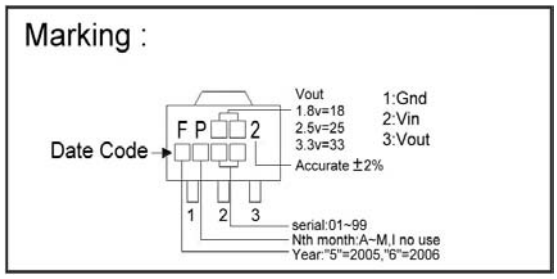
SOT-89



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	4.4	4.6	G	3.00 REF.	
B	4.05	4.25	H	1.50 REF.	
C	1.50	1.70	I	0.40	0.52
D	1.30	1.50	J	1.40	1.60
E	2.40	2.60	K	0.35	0.41
F	0.89	1.20	L	5° TYP.	
			M	0.70 REF.	

Features

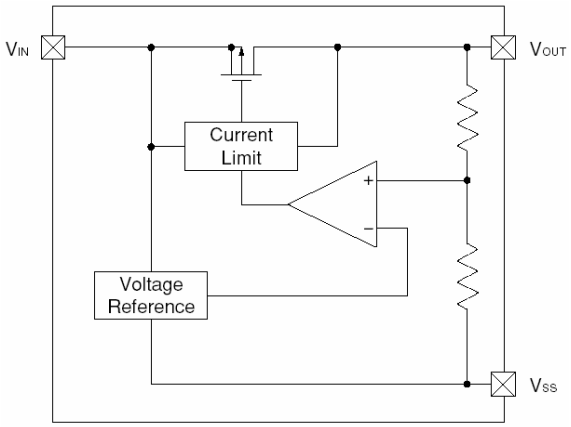
* Small Input-Output Differential:I_{OUT}=100mA@V_{OUT}=5V with a 0.12V differential
* Highly Accruate: Output Voltage ± 2%
* Low Power Consumption: Typ. 2uA@V_{OUT}=5V
* Output Voltage Range: 1.5V~6V in 0.1V increments
* Input Stability: Typ. 0.2%/V
* Output Voltage Temperature Characteristics: Typ.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



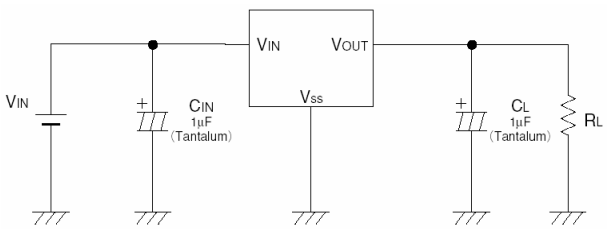
Applications

* Reference Voltage Souce
* Palmtops
* Battery Powered Equipment
* Portable Cameras And Video Recorders

Block Diagram



Typical Application Circuit



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	℃
Storage Temperature	Tstg	-40~+125	℃
Continuous Total Power Dissipation	P_D	500	mW

Electrical Characteristics Ta=25℃

SM62FP-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	$\triangle V_{OUT}$	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	μA
Input Stability	$\frac{\triangle V_{OUT}}{\triangle V_{IN} \cdot V_{OUT}}$	I_{OUT}=40mA V_{IN}=6V to 10V	-	0.2	0.3	%/V
Input Voltage	V_{IN}		-	-	10	V
Output Voltage Temperature Characteristics	$\frac{\triangle V_{OUT}}{\triangle Topr \cdot V_{OUT}}$	I_{OUT}=40mA -40℃≤ Topr ≤ 85℃	-	±100	-	ppm/℃

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: Vdif=V_{IN} (Note4)-V_{OUT} (E)

4: V_{IN}1=The input voltage at the time 98% of V_{OUT} (E) is output (input voltage has been gradually reduced).

SM62FP-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	$\triangle V_{OUT}$	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	μA
Input Stability	$\frac{\triangle V_{OUT}}{\triangle V_{IN} \cdot V_{OUT}}$	I_{OUT}=40mA V_{IN}=5V to 10V	-	0.2	0.3	%/V
Input Voltage	V_{IN}		-	-	10	V
Output Voltage Temperature Characteristics	$\frac{\triangle V_{OUT}}{\triangle Topr \cdot V_{OUT}}$	I_{OUT}=40mA -40℃≤ Topr ≤ 85℃	-	±100	-	ppm/℃

SM62FP-30 V_{OUT} (T) =3.0V (Note1)

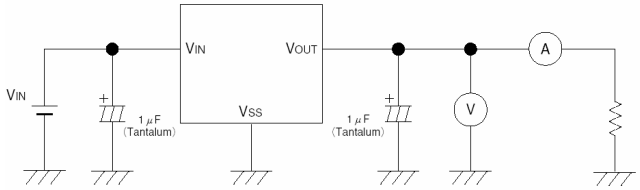
Parameter	Symbol	Condition	Min	TYP	Max	Unit
Output Voltage	$V_{OUT}(E)$ (Note2)	V_{IN}=4.0V, I_{OUT}=40mA	2.940	3.000	3.060	V
Max. Output Current	$I_{OUT\ max}$	V_{IN}=4V, $V_{OUT}(E)$≥2.7V	150	-	-	mA
Load Stability	$\triangle V_{OUT}$	V_{IN}=4V, I_{OUT}=1mA to 80mA	-	45	90	mV
Input-Output Voltage Differential (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	$\frac{\triangle V_{OUT}}{\triangle V_{IN} \cdot V_{OUT}}$	I_{OUT}=40mA V_{IN}=4V to 10V	-	0.2	0.3	%/V
Input Voltage	V_{IN}		-	-	10	V
Output Voltage Temperature Characteristics	$\frac{\triangle V_{OUT}}{\triangle Topr \cdot V_{OUT}}$	I_{OUT}=40mA -40℃≤ Topr ≤ 85℃	-	±100	-	ppm/℃

SM62FP-20 V_{OUT} (T) =2.0V (Note1)

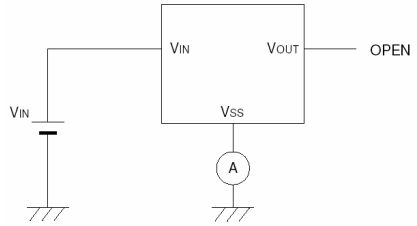
Parameter	Symbol	Condition	Min	TYP	Max	Unit
Output Voltage	$V_{OUT}(E)$ (Note2)	V_{IN}=3.0V, I_{OUT}=40mA	1.960	2.000	2.040	V
Max. Output Current	$I_{OUT\ max}$	V_{IN}=3V, $V_{OUT}(E)$≥1.8V	100	-	-	mA
Load Stability	$\triangle V_{OUT}$	V_{IN}=3V, I_{OUT}=1mA to 60mA	-	45	90	mV
Input-Output Voltage Differential (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	$\frac{\triangle V_{OUT}}{\triangle V_{IN} \cdot V_{OUT}}$	I_{OUT}=40mA V_{IN}=3V to 10V	-	0.2	0.3	%/V
Input Voltage	V_{IN}		-	-	10	V
Output Voltage Temperature Characteristics	$\frac{\triangle V_{OUT}}{\triangle Topr \cdot V_{OUT}}$	I_{OUT}=40mA -40℃≤ Topr ≤ 85℃	-	±100	-	ppm/℃

Test Circuit

Circuit1



Circuit2



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Elektronische Bauelemente

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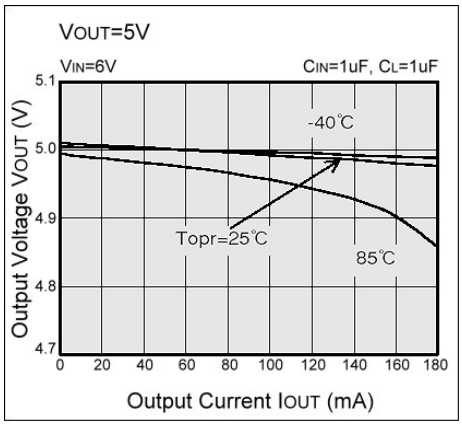
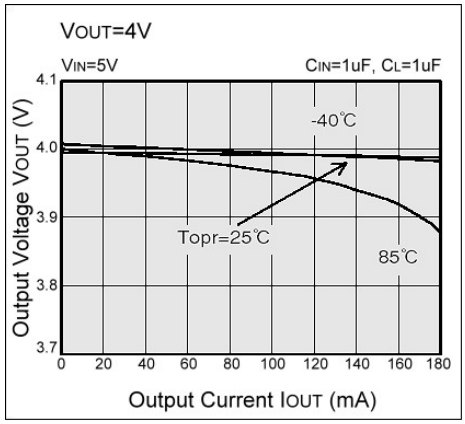
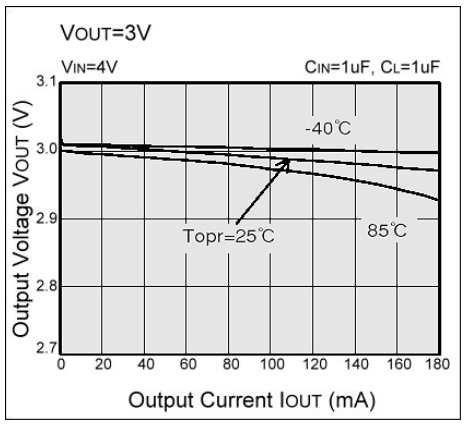
Voltage Regulator

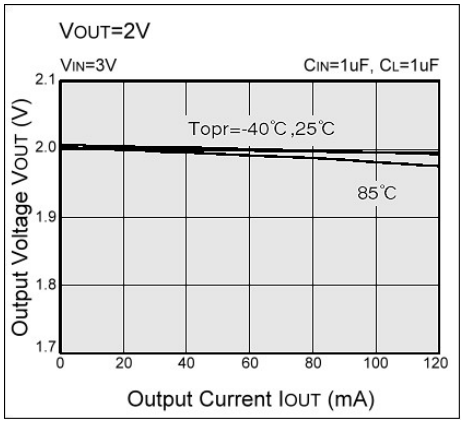
Characteristics Curve

(1) Output Voltage vs. Output Current

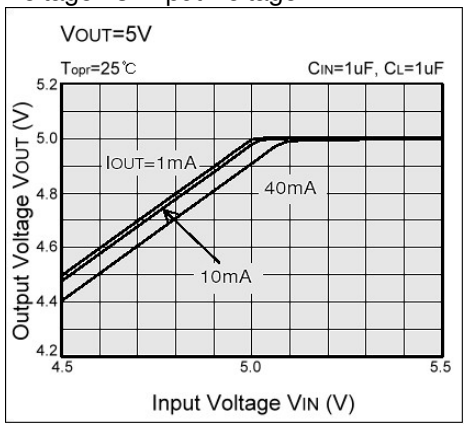


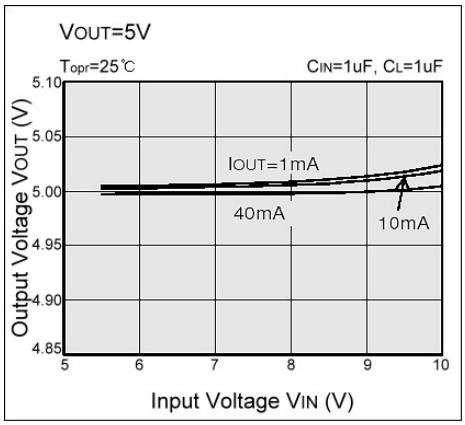


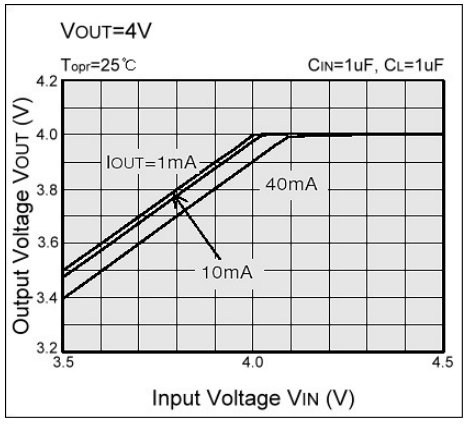


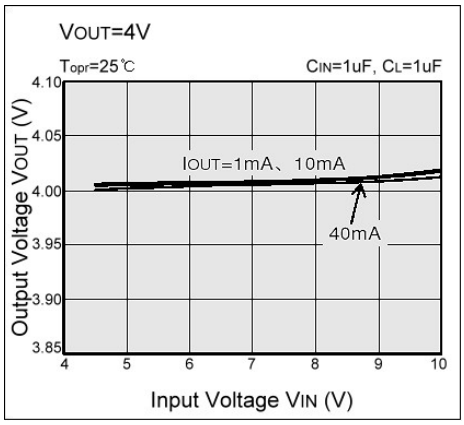


(2) Output Voltage vs. Input Voltage

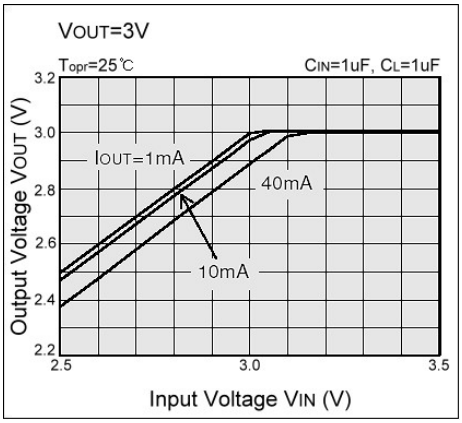


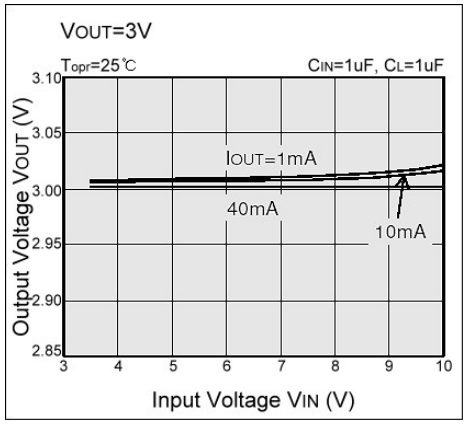


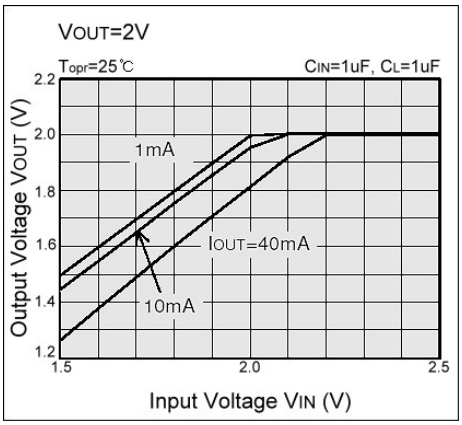


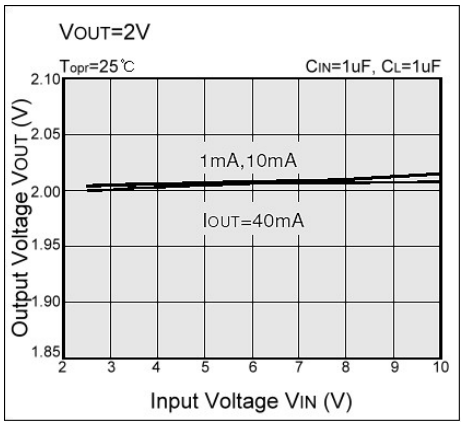


(2) Output Voltage vs. Input Voltage

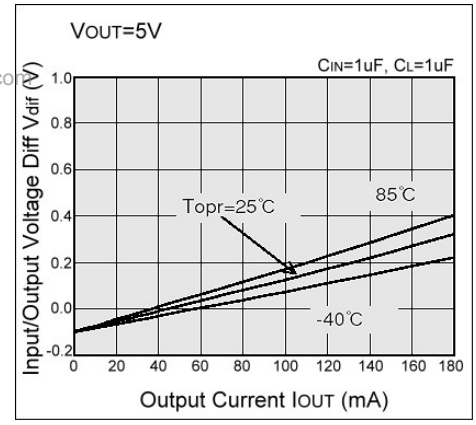


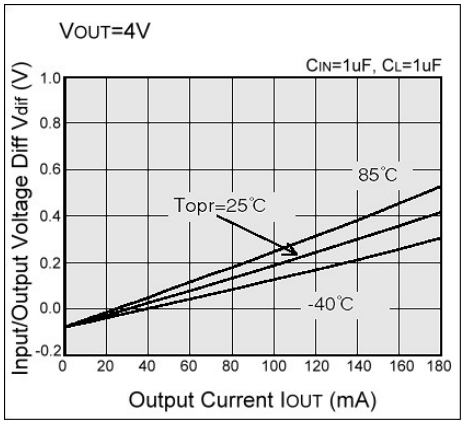


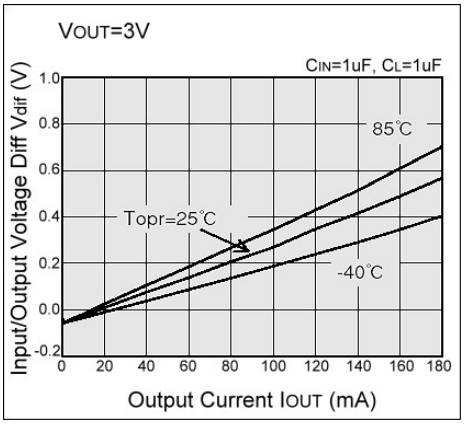


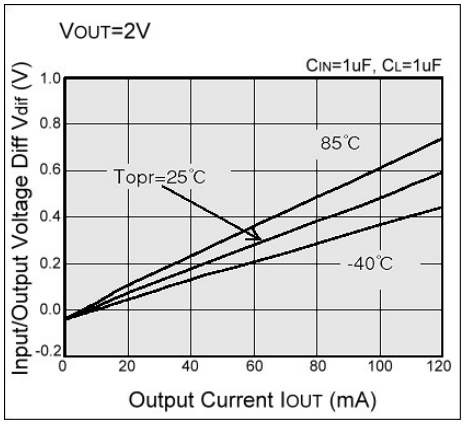


(3) Input/Output Voltage Differential vs. Output Current

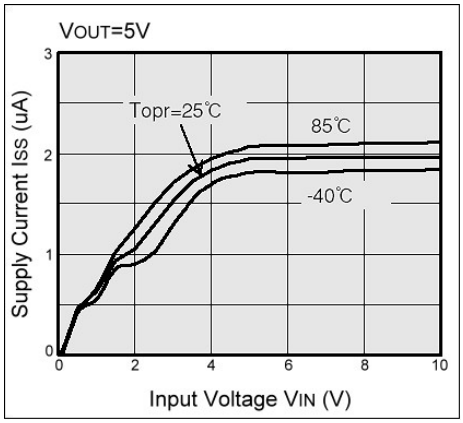


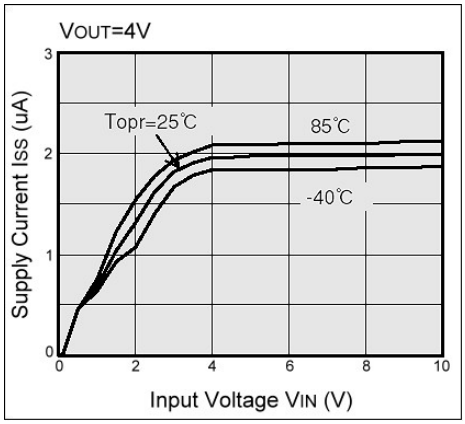


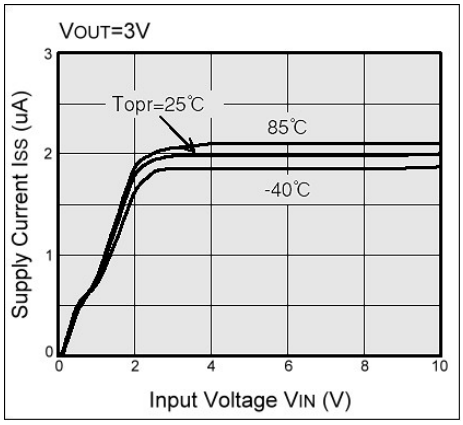


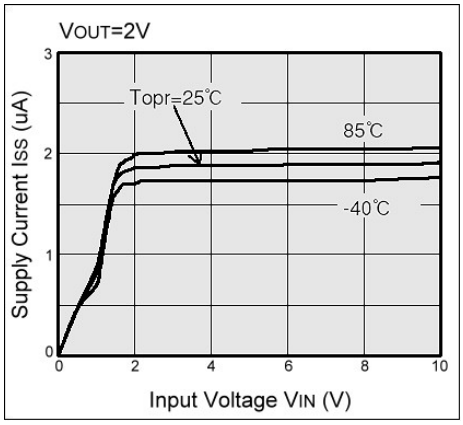


(4) Supply Current vs. Input Voltage

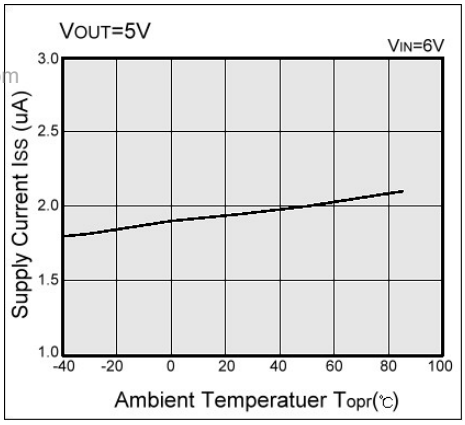


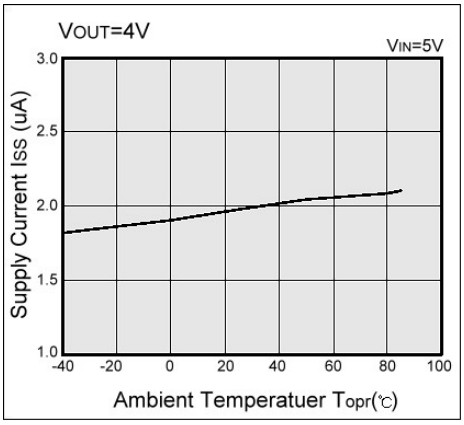


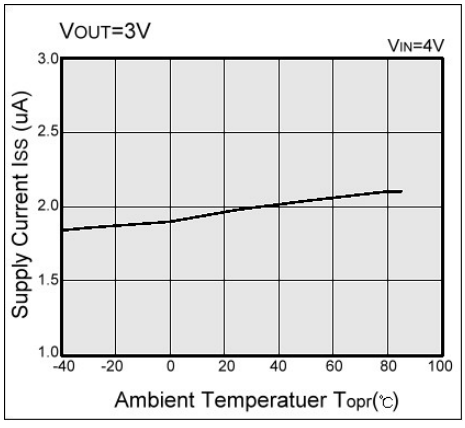


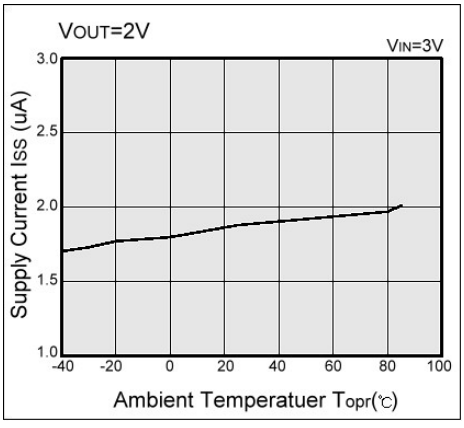


(5) Supply Current vs. Ambient Temperature









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(6) Output Voltage vs. Ambient Temperature