Elektronische Bauelemente

S5M62GR

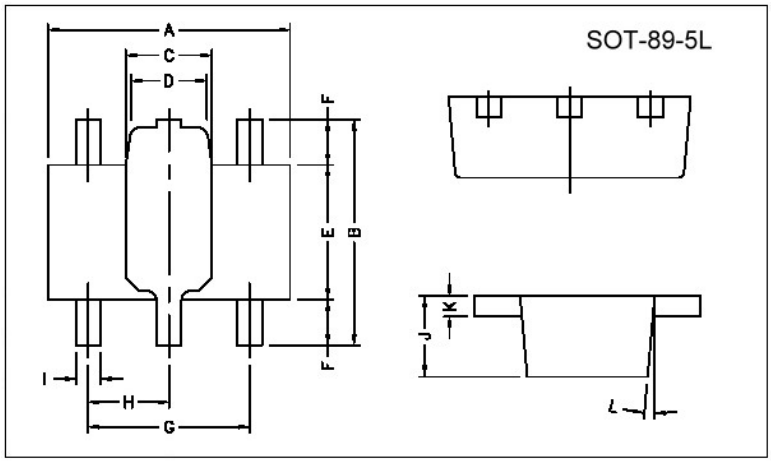
CMOS Positive

Voltage Regulator

RoHS Compliant Product

Description

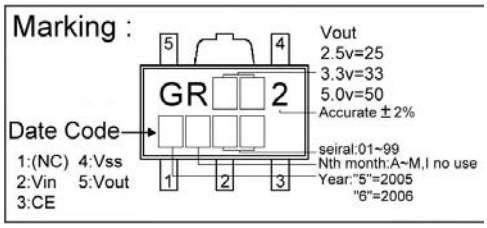
The S5M62GR series are highly precise, low consumption positive voltage regulators, manufactured using CMOS and laser trimming technologies. The series achieves high output current, with low input-output voltage differentials, and consists of a high precision voltage reference, an error correction circuit, and an output driver with current limitation. With good transient response, output remains stable even during load changed. Also, having high ripple rejection ratios, the series can be used with low power supply noise. The CE input enables the output to be turned off, resulting in reduced power consumption. With regards to the CE function, as well as the positive logic S5M62GR series is also available.



REF.	Millimeter		REF.	Dimensions	
	Min.	Max.		Millimeter	
A	4.40	4.60	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	0.80	-	L	5 ° TYP.	

Features

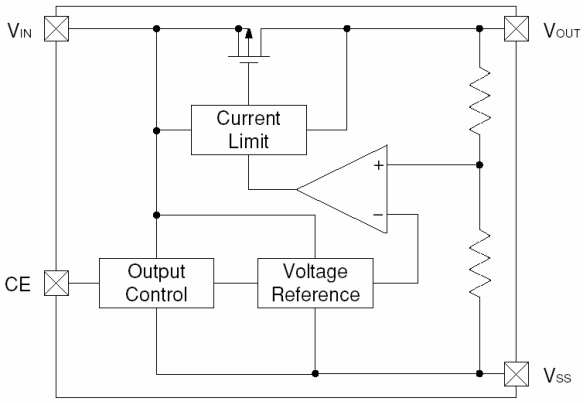
* Small Input-Output Differential:I_{OUT}=160mA@V_{OUT}=3V with a 0.38V differential
* Highly Accruate: Output Voltage ± 2%
* Low Power Consumption: Typ. 13uA@V_{OUT}=5V
* Output Voltage Range: 2.1V~5V in 0.1V increments
* Input Stability: Typ. 0.2%/V
* Output Voltage Temperature Characteristics: Typ. ±100ppm/ºC
* Max. Output Current: 150mA (Within Max. Power Dissipation, V_{OUT}=3V)



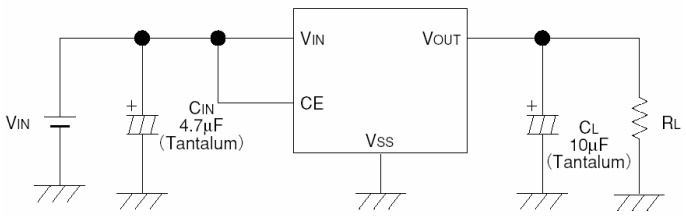
Applications

* Voltage Supplies For Cellular Phones
* Palmtops
* Battery Powered Equipment
* Cameras, Viedo Recorders

Block Diagram



Typical Application Circuit



Function List

Sereis	CE	Voltage Output
S5M62GR	High	ON
	Low	OFF
S5M62GP	High	ON
	Low	OFF

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
CE Input Voltage	V_{CE}	V_{SS}-0.3~V_{IN}+0.3	V
Operating Ambient Temperature	Topr	-30~+80	℃
Storage Temperature	Tstg	-40~+125	℃
Continuous Total Power Dissipation	P_D	500	mW

Note: I_{OUT} must be less than Pd/(V_{IN}-V_{OUT})

Electrical Characteristics Ta=25℃

S5M62GR-50 V_{OUT} (T) =5.0V (Note1)

Parameter	Symbol	Condition	Min	TYP	Max	Unit	Circuit
Output Voltage	V_{OUT}(E) (Note2)	V_{IN}=6.0V, I_{OUT}=40mA	4.900	5.000	5.100	V	1
Max. Output Current	$I_{OUT\ max}$	V_{IN}=6V, V_{OUT}(E)≥4.5V	180	-	-	mA	1
Load Stability	△V_{OUT}	V_{IN}=6V, I_{OUT}=1mA to 100mA	-	40	80	mV	1
Input-Output Voltage Differential (Note3)	V_{dif1}	I_{OUT}=100mA	-	165	330	mV	1
	V_{dif2}	I_{OUT}=200mA	-	330	660		1
Supply Current1	I_{SS}1	V_{IN}=V_{CE}=6V	-	13	21	μA	2
Supply Current2	I_{SS}2	V_{IN}=6V, V_{CE}=V_{SS}	-	-	0.1	μA	2
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	1
Input Voltage	V_{IN}		-	-	10	V	-
Output Voltage Temperature Characteristics	$\frac{\triangle V_{OUT}}{\triangle Topr \cdot V_{OUT}}$	I_{OUT}=40mA -30℃≤ Topr ≤ 85℃	-	±100	-	ppm/℃	
CE Input Voltage "High"	V_{CEH}		1.5	-	-	V	1
CE Input Voltage "Low"	V_{CEL}		-	-	0.25	V	1
CE Input Current "High"	I_{CEH}	V_{CE}=V_{IN}	-	-	5.0	μA	2
CE Input Current "Low"	I_{CEL}	V_{CE}=V_{SS}	-0.2	-0.05	0	μA	2

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_{IN1} (Note5) -V_{OUT1} (Note4)}

4: V_{OUT1}=A voltage equal to 98% of the Output Voltage whenever an amply stabilized I_{OUT}{V_{OUT} (T)+1.0V} is input.

5: V_{IN1}=The input voltage when V_{OUT1}appears as input voltage is gradually decreased.

S5M62GR-30 V_{OUT} (T) =3.0V (Note1)

Parameter	Symbol	Condition	Min	TYP	Max	Unit	Circuit
Output Voltage	$V_{OUT}(E)$ (Note2)	V_{IN}=4.0V, I_{OUT}=40mA	2.940	3.000	3.060	V	1
Max. Output Current	$I_{OUT\ max}$	V_{IN}=4V, $V_{OUT}(E)$≥2.7V	150	-	-	mA	1
Load Stability	$\triangle V_{OUT}$	V_{IN}=4V, I_{OUT}=1mA to 80mA	-	45	90	mV	1
Input-Output Voltage Differential (Note3)	V_{dif1}	I_{OUT}=80mA	-	200	395	mV	1
	V_{dif2}	I_{OUT}=160mA	-	380	770		1
Supply Current1	$I_{SS}1$	V_{IN}=V_{CE}=4V	-	11	19	μA	2
Supply Current2	$I_{SS}2$	V_{IN}=4V, V_{CE}=V_{SS}	-	-	0.1	μA	2
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	1
Input Voltage	V_{IN}		-	-	10	V	-
Output Voltage Temperature Characteristics	$\frac{\triangle V_{OUT}}{\triangle Topr \cdot V_{OUT}}$	I_{OUT}=10mA -30℃≤ Topr ≤ 85℃	-	±100	-	ppm/℃	
CE Input Voltage "High"	V_{CEH}		1.5	-	-	V	1
CE Input Voltage "Low"	V_{CEL}		-	-	0.25	V	1
CE Input Current "High"	I_{CEH}	V_{CE}=V_{IN}	-	-	5.0	μA	2
CE Input Current "Low"	I_{CEL}	V_{CE}=V_{SS}	-0.2	-0.05	0	μA	2

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).

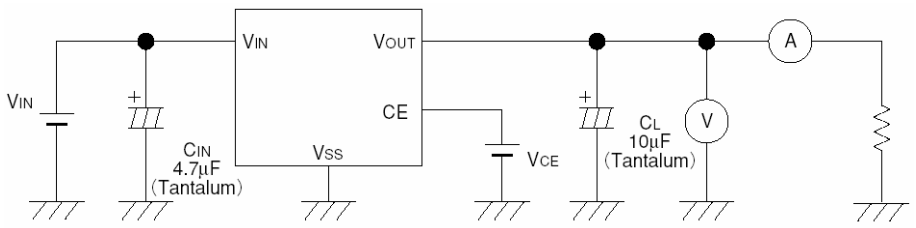
3: Vdif={V_{IN1} (Note5) -V_{OUT1} (Note4)}

4: V_{OUT1}=A voltage equal to 98% of the Output Voltage whenever an amply stabilized I_{OUT} {V_{OUT} (T)+1.0V} is input.

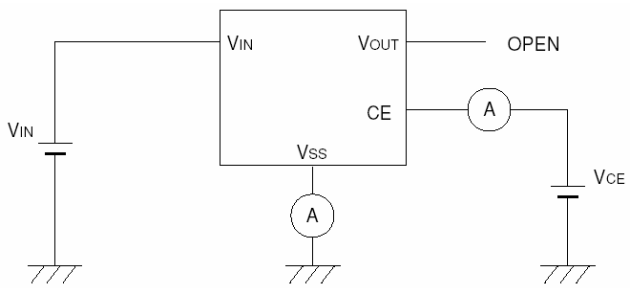
5: V_{IN1}=The input voltage when V_{OUT1} appears as input voltage is gradually decreased.

Test Circuit

Circuit1

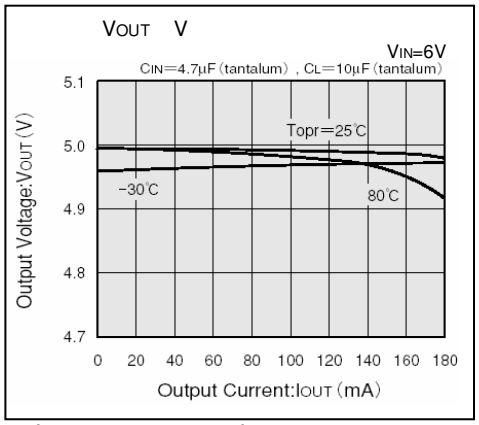


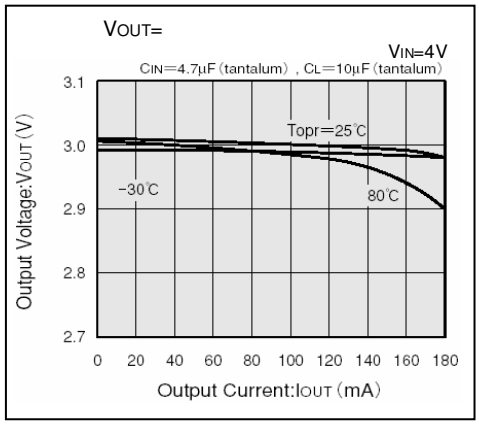
Circuit2



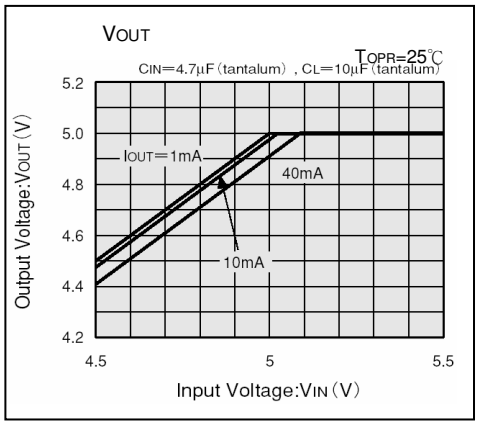
Characteristics Curve

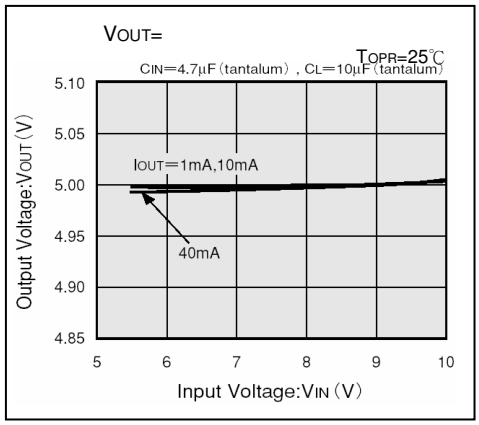
(1) Output Voltage vs. Output Current

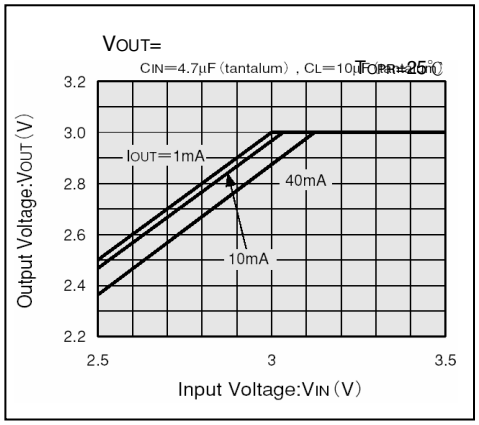


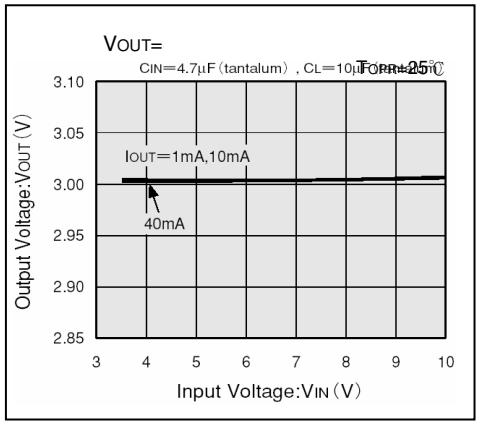


(2) Output Voltage vs. Input Voltage

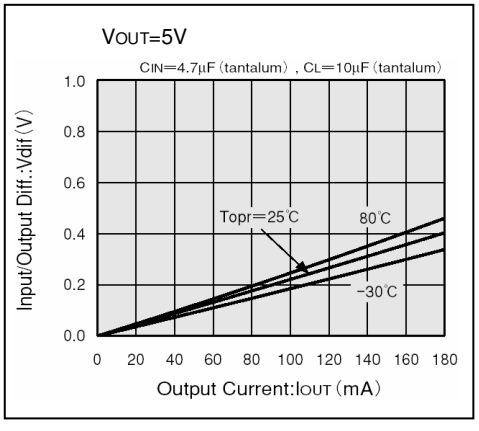


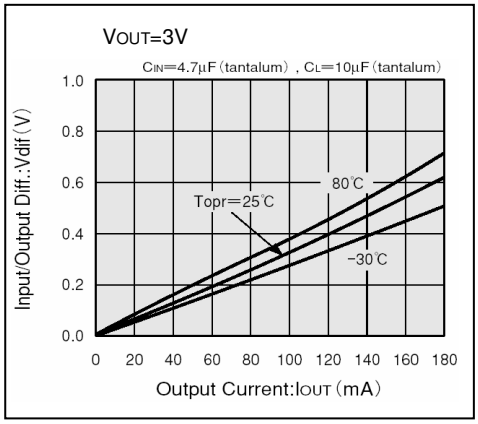




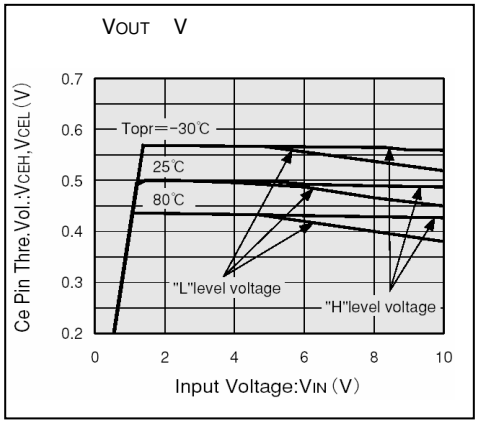


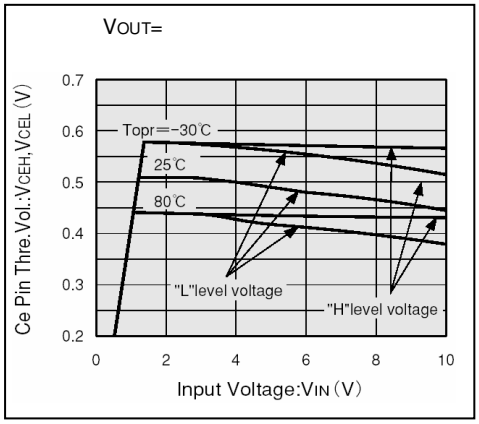
(3) Input/Output Voltage Differential vs. Output Current



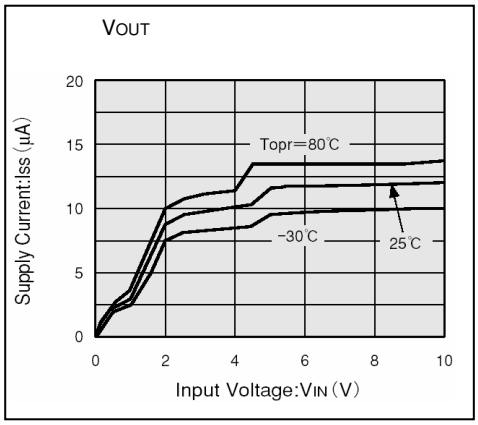


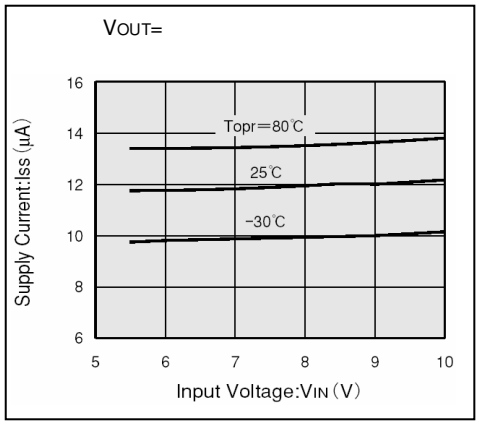
(4) CE Pin Threshold Voltage vs. Input Voltage

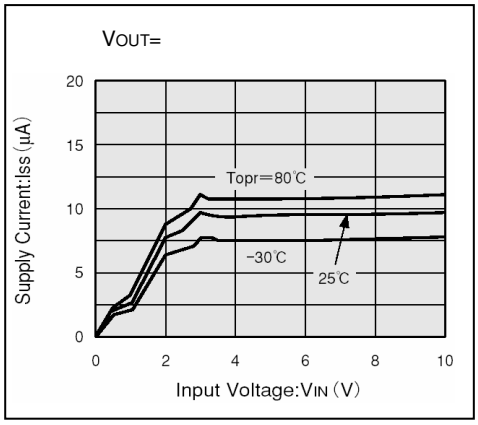


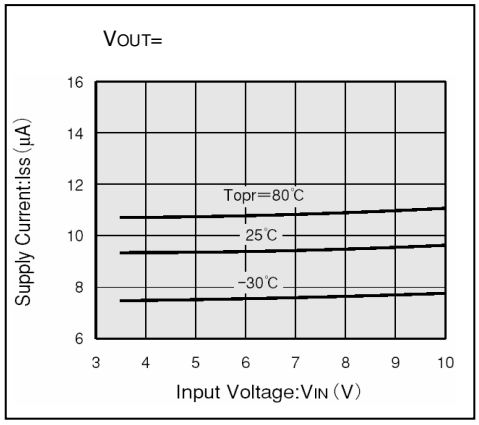


(5) Supply Current vs. Input Voltage

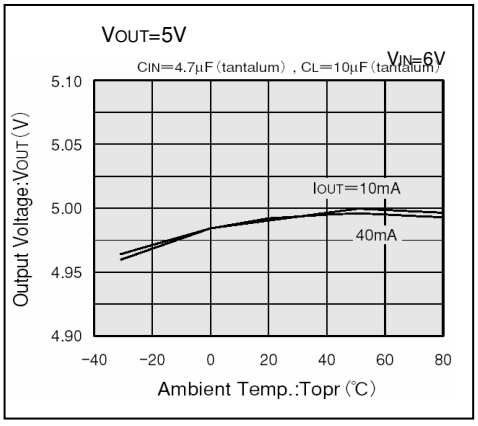


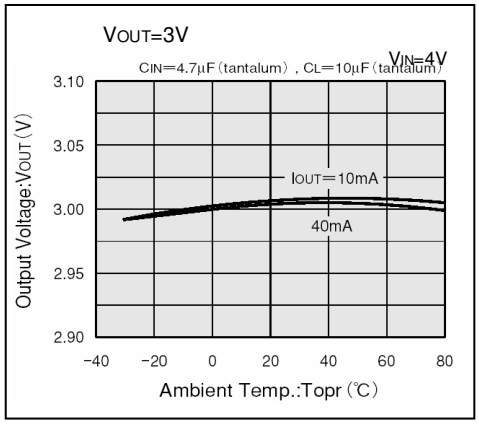




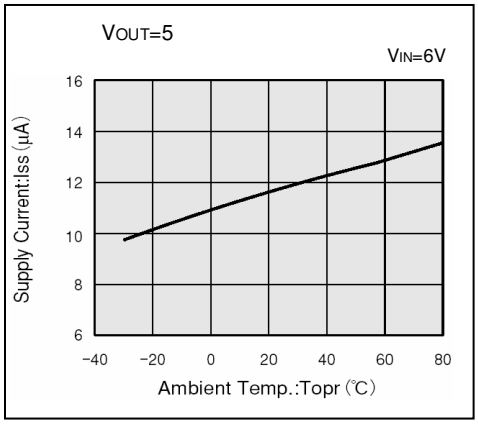


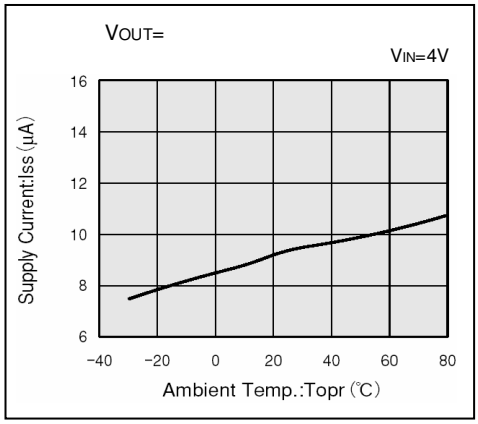
(6) Output Voltage vs. Ambient Temperature



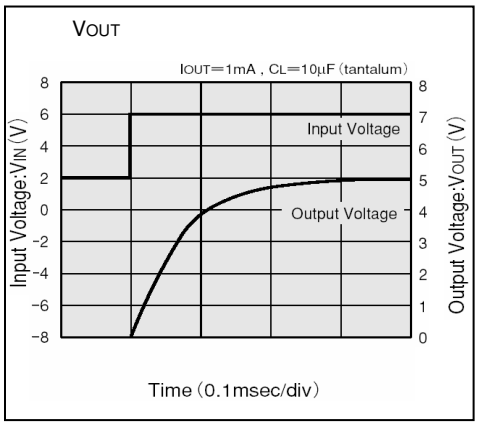


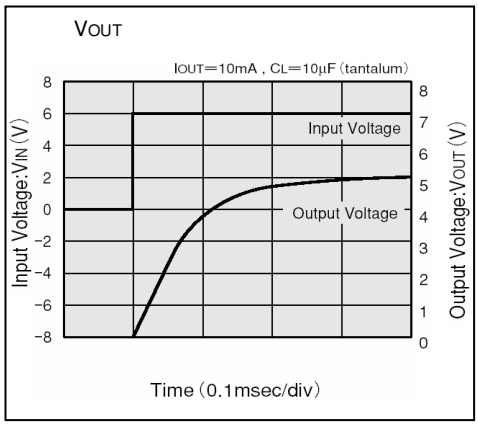
(7) Supply Current vs. Ambient Temperature

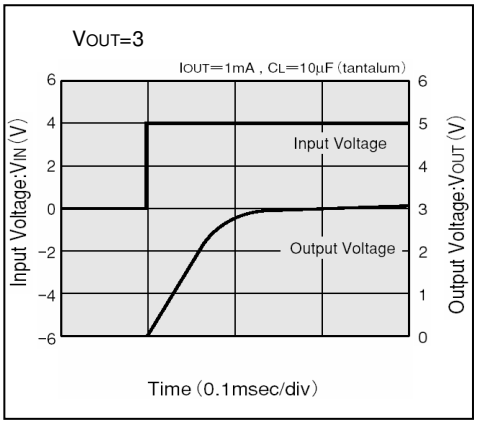


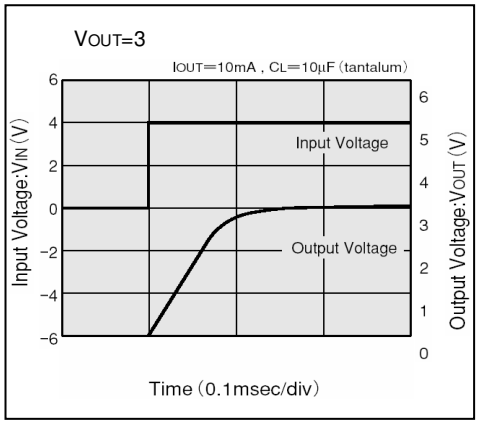


(8) Input Transient Response 1

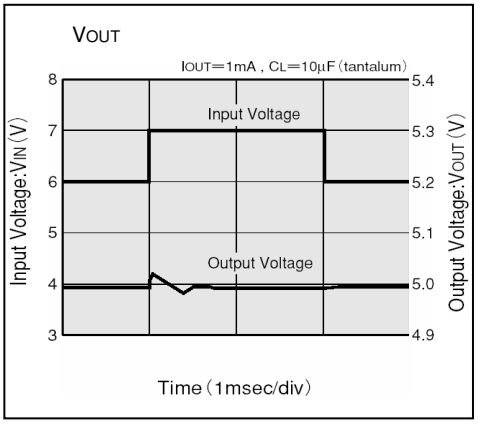


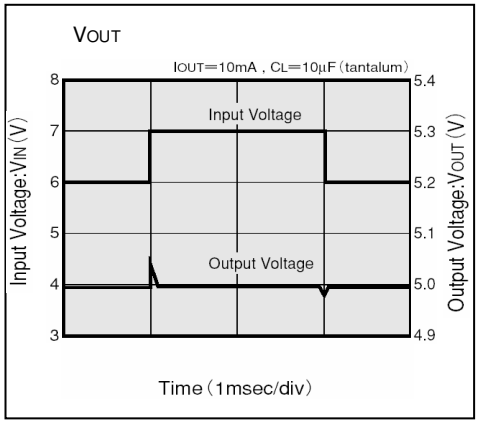




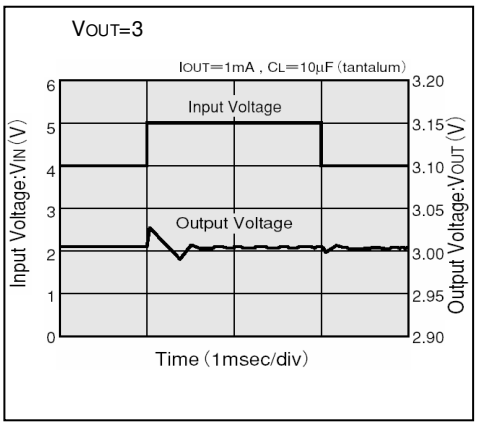


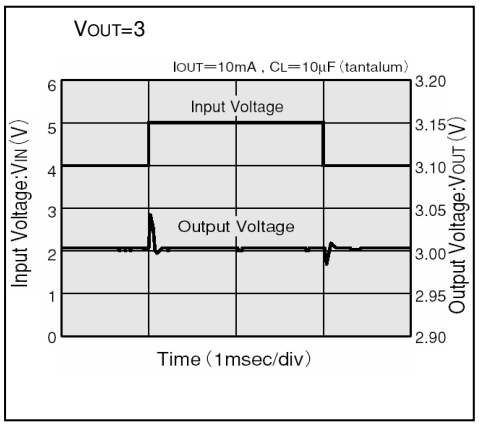
(9) Input Transient Response 2



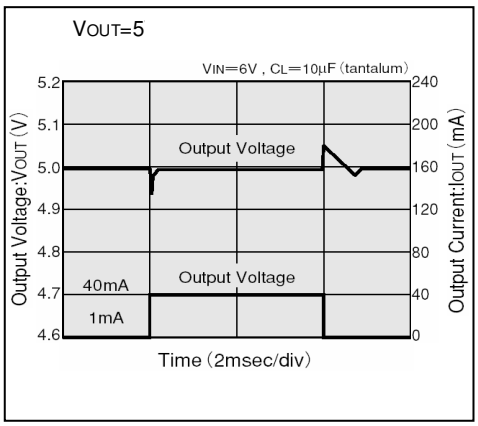


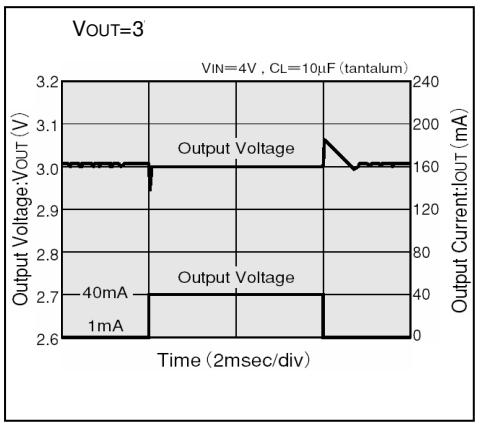
(9) Input Transient Response 2



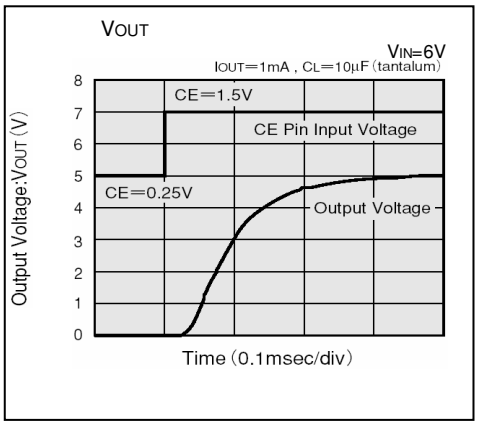


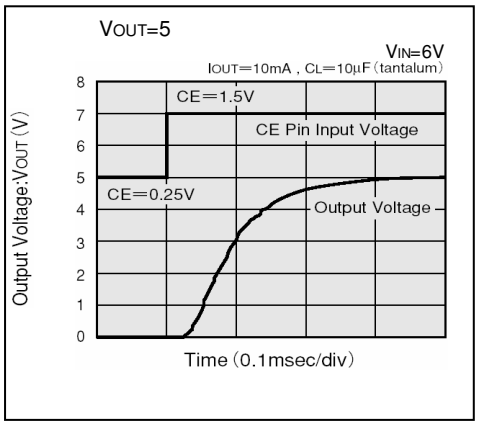
(10) Load Transient Response

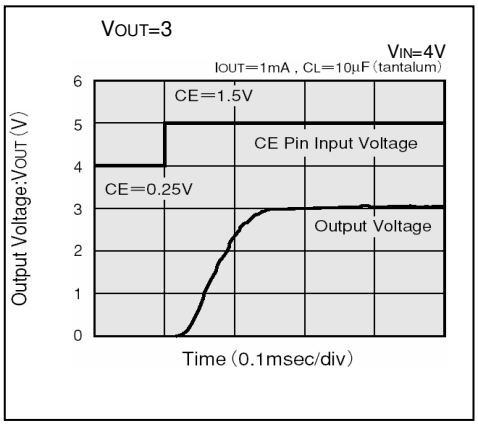


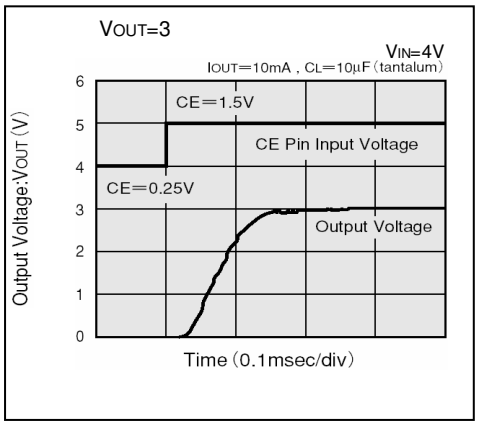


(11) CE Pin Transient Response









(12) Ripple Rejection Rate