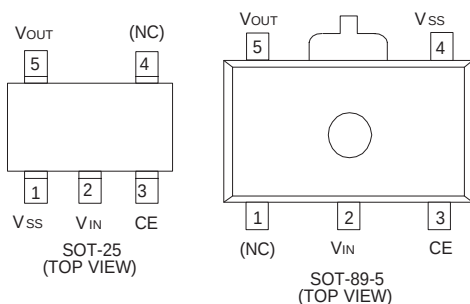


- ◆ CMOS Low Power Consumption
- ◆ Small Input-Output Voltage Differential:
0.2V at 80mA, 0.38V at 160mA
- ◆ Maximum Output Current : 150mA
($V_{OUT} = 3.0V$)
- ◆ Highly Accurate: $\pm 2\%$ ($\pm 1\%$)
- ◆ Output Voltage Range: 2.1V - 5.0V
- ◆ Stand-by Supply Current: 0.1 μA
($V_{OUT} = 3.0V$)
- ◆ SOT-25 / SOT-89-5 Package

General Description

The XC62G series are highly precise, low power consumption positive voltage regulators, manufactured using CMOS and laser trimming technologies. The series achieves high output currents, 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 responses, output remains stable even during load changes. 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. SOT-25 (150mW) and SOT-89-5 (500mW) packages are available. With regards to the CE function, as well as the positive logic XC62GR series, a negative logic XC62GP series (custom) is also available.

Pin Configuration



Function

SERIES	CE	VOLTAGE OUTPUT
XC62GR	H	ON
	L	OFF
XC62GP	H	OFF
	L	ON

H=High, L=Low

Applications

- Battery-powered Equipment
- Voltage supplies for cellular phones
- Cameras, Video Recorders
- Palmtops

Features

Max. output current: 150mA (within max. power dissipation, $V_{OUT}=3.0V$)

Output voltage range: 2.1V~5.0V in 0.1V increments

Highly accurate: Set-up voltage $\pm 2\%$ ($\pm 1\%$ for semi-custom products)

Low power consumption: TYP. 13 μA ($V_{OUT}=3.0V$),
TYP 23 μA ($V_{OUT}=3.0V$ semi-custom, high-speed versions),
TYP 0.1 μA (Stand-by mode)

Output voltage temperature characteristics: TYP $\pm 100ppm/^{\circ}C$

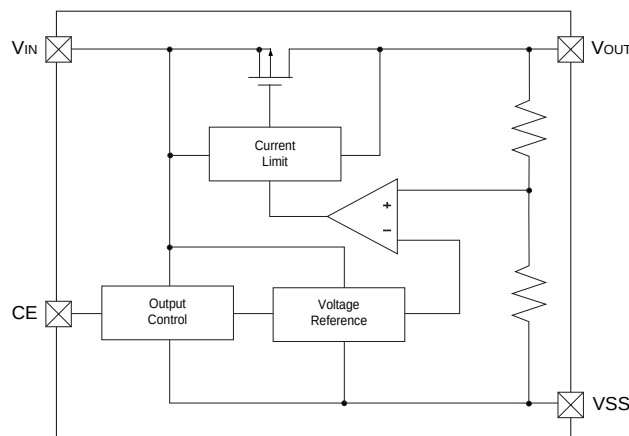
Input stability: TYP 0.2%/V

Ultra small package: SOT-25 (150mW) mini-mold
SOT-89-5 (500mW) mini-power mold

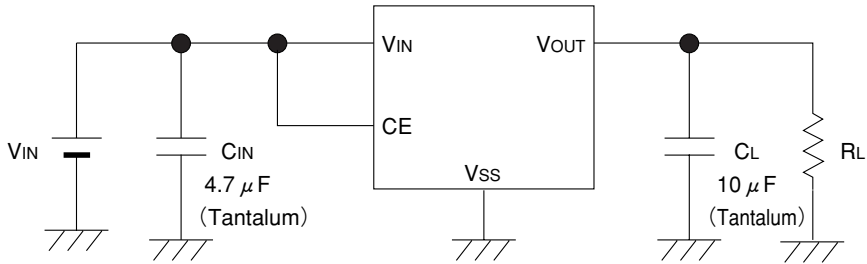
Pin Assignment

PIN NUMBER		PIN NAME	FUNCTION
SOT-25	SOT-89-5		
1	4	VSS	Ground
2	2	VIN	Supply Voltage input
3	3	CE	Chip Enable
4	1	(NC)	No Connection
5	5	VOUT	Regulated Output Voltage

Block Diagram

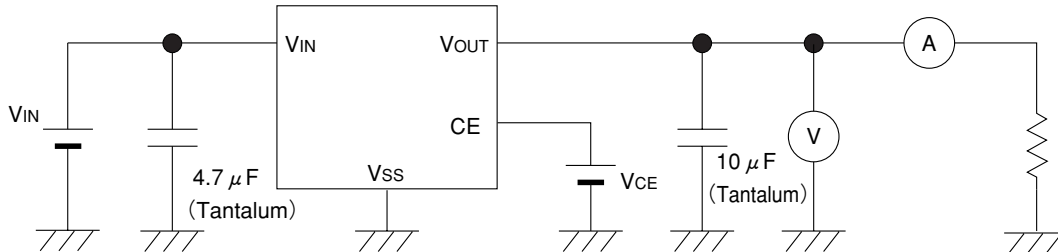


Standard Circuit

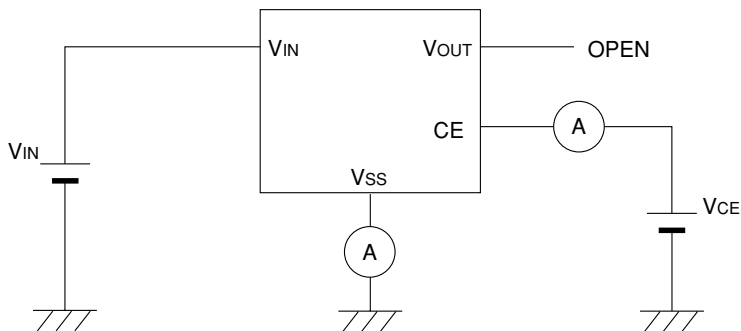


Typical Application Circuit

Circuit1



Circuit2



Absolute Maximum Ratings

Ta=25°C

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
CE Input Voltage		V _{CE}	V _{SS} -0.3~V _{IN} +0.3	V
Continuous Total Power Dissipation	SOT-25	P _d	150	mW
	SOT-89-5	P _d	500	
Operating Ambient Temperature		T _{opr}	-30~+80	°C
Storage Temperature		T _{stg}	-40~+125	°C

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

Electrical Characteristics

XC62GR30 V_{OUT}(T)=3.0V(Note1)

Ta=25°C

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS	CIRCUIT
Output Voltage	V _{OUT} (E) (Note2)	I _{OUT} =40mA V _{IN} =4.0V	2.940	3.000	3.060	V	1
Maximum Output Current	I _{OUT} max.	V _{IN} =4.0 V _{OUT} (E)≥2.7V	150			mA	1
Load Stability	ΔV _{OUT}	V _{IN} =4.0V 1mA≤I _{OUT} ≤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	mV	1
Supply Current1	I _{SS1}	V _{IN} =V _{CE} =4.0V (Note6)	Standard	11	19	μA	2
			High Speed	23	31	μA	2
Supply Current2	I _{SS2}	V _{IN} =4.0V, V _{CE} =V _{SS}			0.1	μA	2
Input Stability	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \cdot V_{OUT}}$	I _{OUT} =40mA 4.0V≤V _{IN} ≤10.0V		0.2	0.3	%/V	1
Input Voltage	V _{IN}				10.0	V	-
Output Voltage Temperature Characteristics	$\frac{\Delta V_{OUT}}{\Delta T_{opr} \cdot V_{OUT}}$	I _{OUT} =10mA -30°C≤T _{opr} ≤80°C		±100		ppm/°C	
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. V_{dif}= {V_{IN1} (Note5)-V_{OUT1} (Note4)}
 4. V_{OUT1}= A voltage equal to 98% of the Output Voltage whenever an amply stabilised 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.
 6. High Speed is Semi-custom.

Electrical Characteristics

XC62GR50 $V_{OUT}(T)=5.0V$ (Note1)

$T_a=25^{\circ}C$

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS	CIRCUIT
Output Voltage	$V_{OUT}(E)$ (Note2)	$I_{OUT}=40mA$ $V_{IN}=6.0V$	4.900	5.000	5.100	V	1
Maximum Output Current	$I_{OUT\ max.}$	$V_{IN}=6.0\ V_{OUT}(E)\geq 4.5V$	180			mA	1
Load Stability	ΔV_{OUT}	$V_{IN}=6.0V$ $1mA\leq I_{OUT}\leq 100mA$		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	mV	1
Supply Current1	I_{SS1}	$V_{IN}=V_{CE}=6.0V$ (Note6)	Standard	13	21	μA	2
			High Speed	27	35	μA	2
Supply Current2	I_{SS2}	$V_{IN}=6.0V, V_{CE}=V_{SS}$			0.1	μA	2
Input Stability	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \cdot V_{OUT}}$	$I_{OUT}=40mA$ $6.0V\leq V_{IN}\leq 10.0V$		0.2	0.3	%/V	1
Input Voltage	V_{IN}				10.0	V	-
Output Voltage Temperature Characteristics	$\frac{\Delta V_{OUT}}{\Delta T_{opr} \cdot V_{OUT}}$	$I_{OUT}=40mA$ $-30^{\circ}C\leq T_{opr}\leq 80^{\circ}C$		± 100		ppm/ $^{\circ}C$	
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

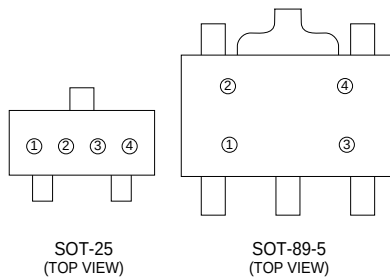
- Note:
1. $V_{OUT}(T)$ =Specified Output Voltage .
 2. $V_{OUT}(E)$ =Effective Output Voltage (i.e. the output voltage when " $V_{OUT}(T)+1.0V$ " is provided at the V_{IN} pin while maintaining a certain I_{OUT} value).
 3. V_{dif} = { V_{IN1} (Note5)- V_{OUT1} (Note4)}
 4. V_{OUT1} = A voltage equal to 98% of the Output Voltage whenever an amply stabilised 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.
 6. High Speed is Semi-custom.

Ordering Information

XC62Gxxxxxx
 ↑ ↑ ↑ ↑ ↑
 a b c d e f

DESIGNATOR	DESCRIPTION	DESIGNATOR	DESCRIPTION
a	True Logic Level at CE Pin: R=Positive P=Negative(Custom)	e	Package Type M=SOT-25 P=SOT-89-5
b	Output Voltage 30=3.0V 50=5.0V		
c	Response: 1=Standard 2=High Speed (Semi-Custom)	f	Device Orientation R=Embossed Tape (Orientation of Device:Right) L=Embossed Tape (Orientation of Device:Left)
d	Output Voltage Accuracy: 1=±1.0%(Semi-custom) 2=±2.0%		

Marking



① Represents the integer of the Output Voltage

R TYPE POSITIVE VOLTAGE LOGIC SYMBOL	VOLTAGE(V)	P TYPE NEGATIVE VOLTAGE LOGIC SYMBOL	VOLTAGE(V)
A	0.②	$\bar{A}$	0.②
B	1.②	$\bar{B}$	1.②
C	2.②	$\bar{C}$	2.②
D	3.②	$\bar{D}$	3.②
E	4.②	$\bar{E}$	4.②
F	5.②	$\bar{F}$	5.②
H	6.②	$\bar{H}$	6.②

② Represents the decimal point of the Output Voltage

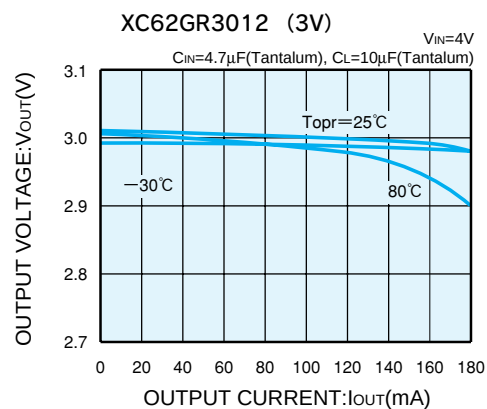
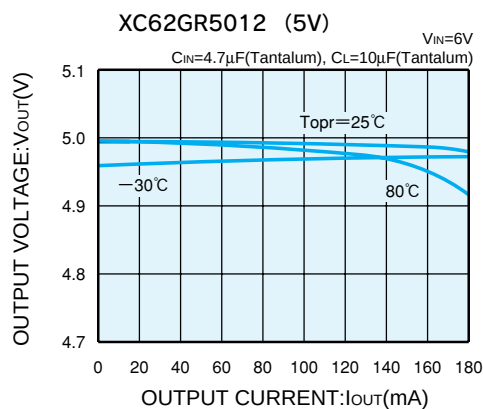
SYMBOL	VOLTAGE(V)	SYMBOL	VOLTAGE(V)
A	①.0	F	①.5
B	①.1	H	①.6
C	①.2	K	①.7
D	①.3	L	①.8
E	①.4	M	①.9

③ Represents the transition response

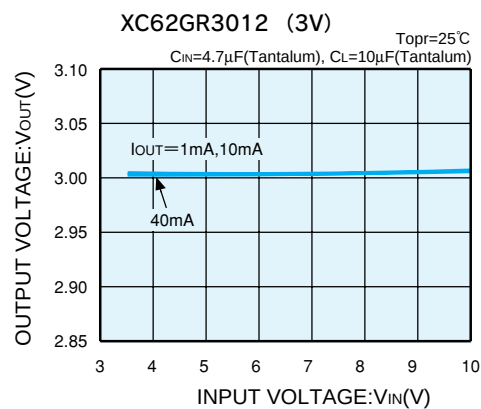
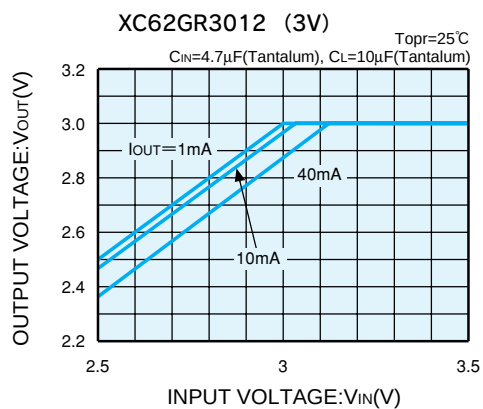
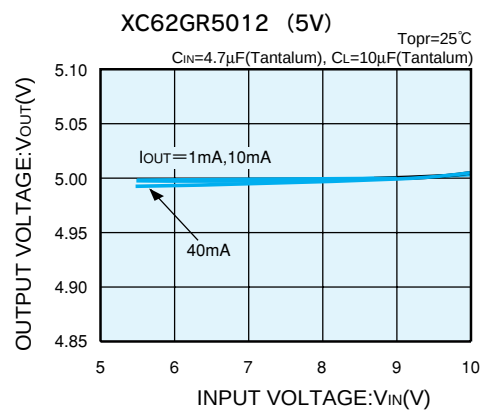
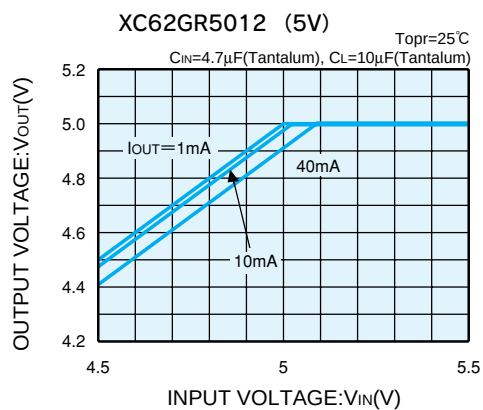
SYMBOL	TRANSITION RESPONSE
-	REGULAR
+	HIGH SPEED

④ Represents the assembly lot no. 0-9,A-Z repeated (G, I, J, O, Q, W excepted)

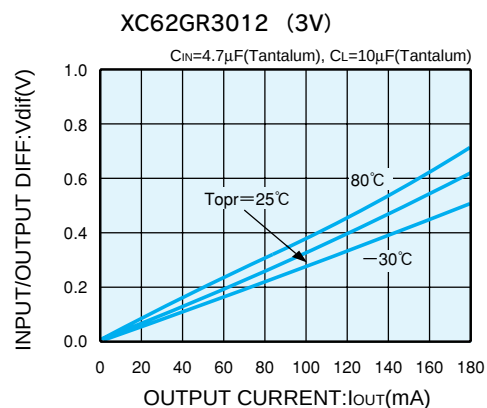
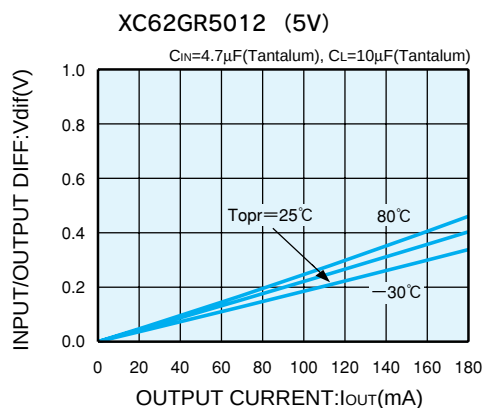
(1) OUTPUT VOLTAGE vs. OUTPUT CURRENT



(2) OUTPUT VOLTAGE vs. INPUT VOLTAGE

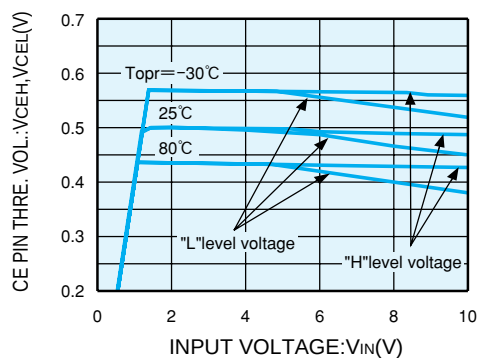


(3) INPUT/OUTPUT VOLTAGE DIFFERENTIAL vs. OUTPUT CURRENT

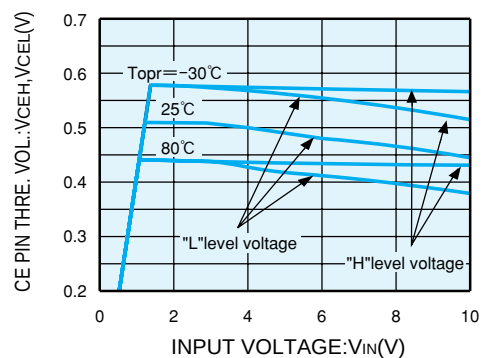


(4) CE PIN THRESHOLD VOLTAGE vs. INPUT VOLTAGE

XC62GR5012(5V)

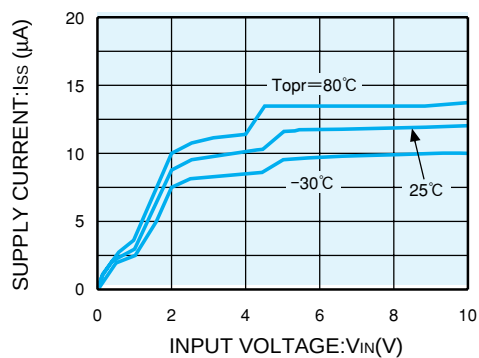


XC62GR3012(3V)

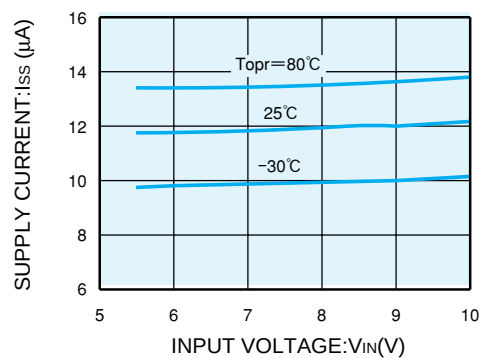


(5) SUPPLY CURRENT vs. INPUT VOLTAGE

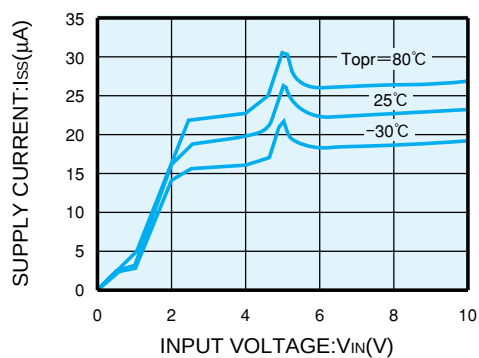
XC62GR5012(5V)



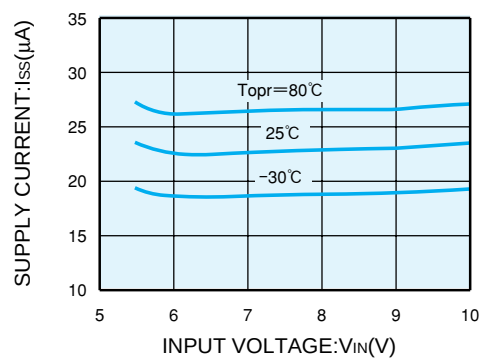
XC62GR5012(5V)



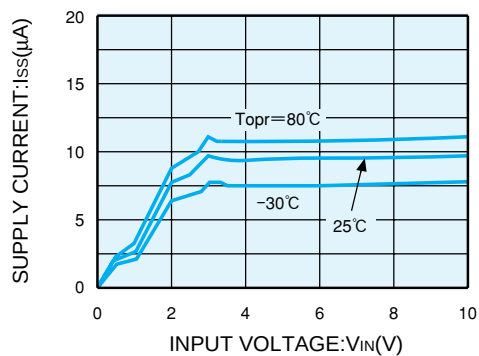
XC62GR5022(5V HIGH SPEED)



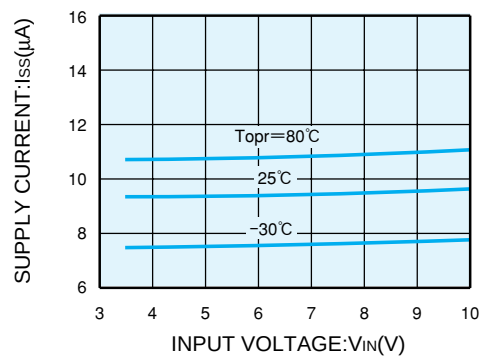
XC62GR5022(5V HIGH SPEED)



XC62GR3012(3V)

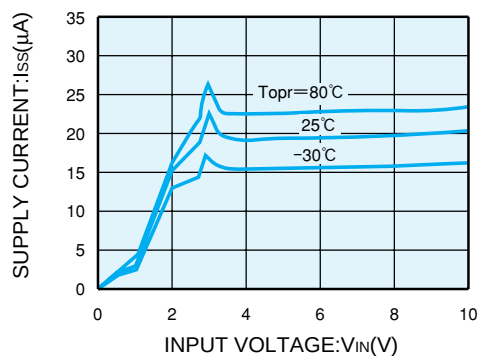


XC62GR3012(3V)

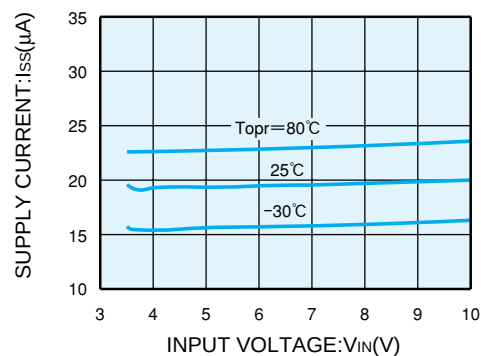


(5) SUPPLY CURRENT vs. INPUT VOLTAGE (CONTINUED)

XC62GR3022 (3V HIGH SPEED)

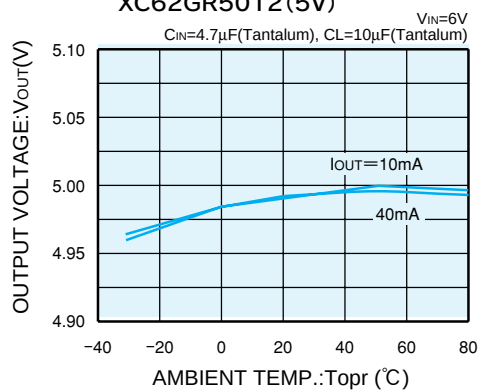


XC62GR3022 (3V HIGH SPEED)

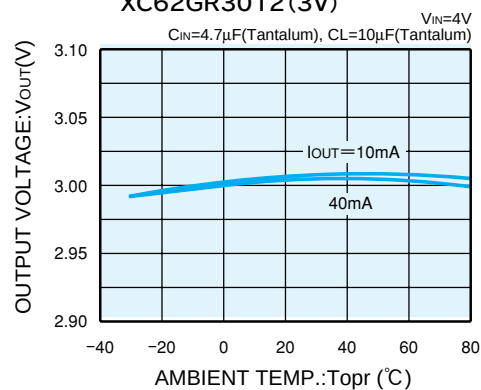


(6) OUTPUT VOLTAGE vs. AMBIENT TEMPERATURE

XC62GR5012 (5V)

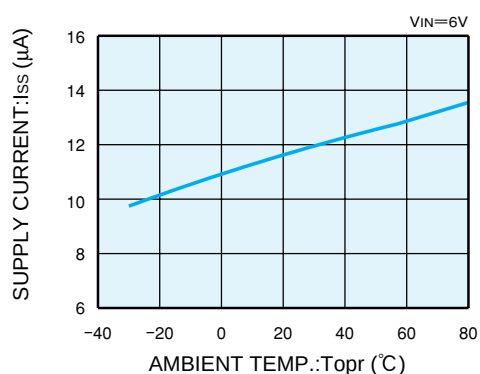


XC62GR3012 (3V)

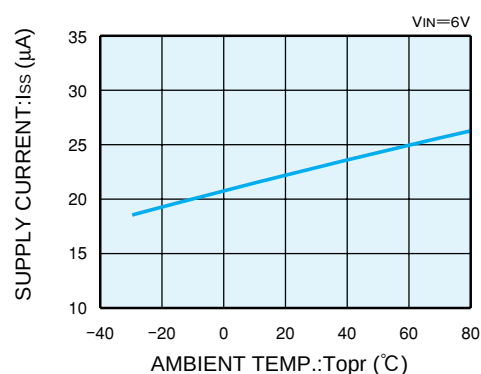


(7) SUPPLY CURRENT vs. AMBIENT TEMPERATURE

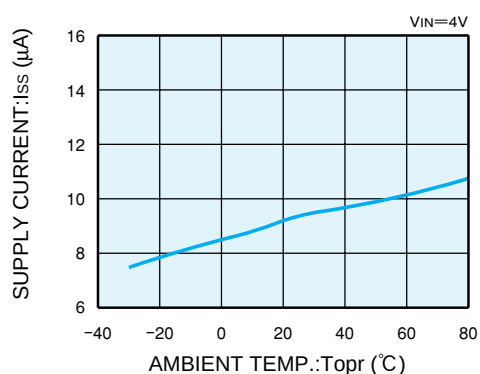
XC62GR5012 (5V)



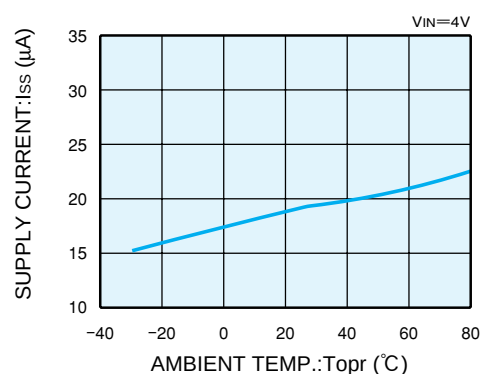
XC62GR5022 (5V HIGH SPEED)



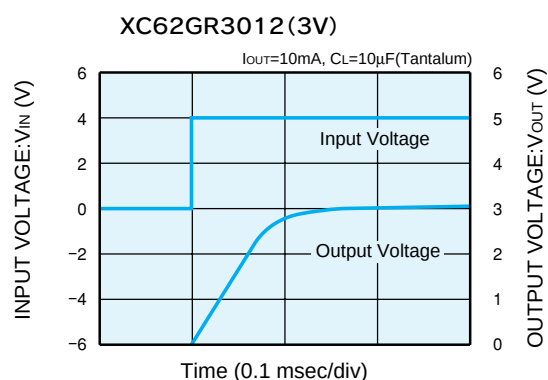
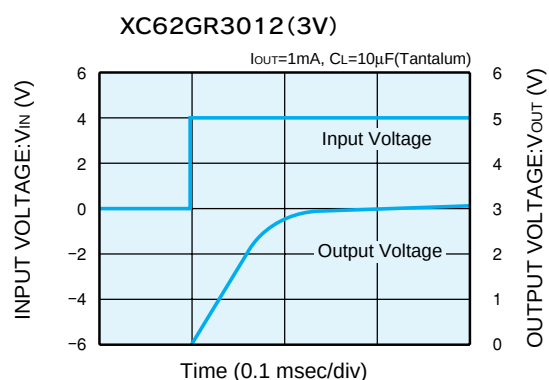
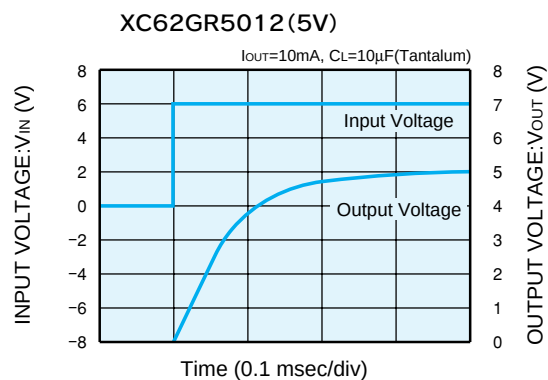
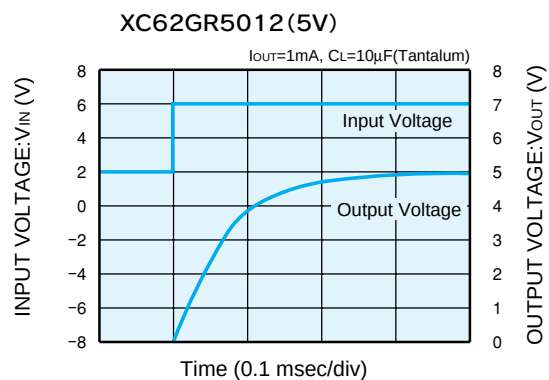
XC62GR3012 (3V)



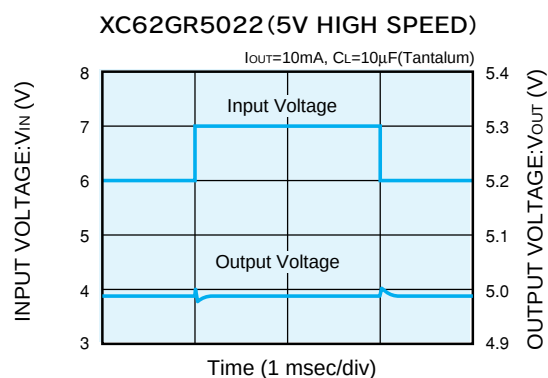
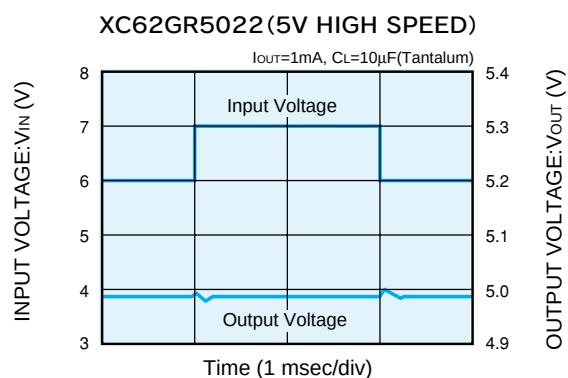
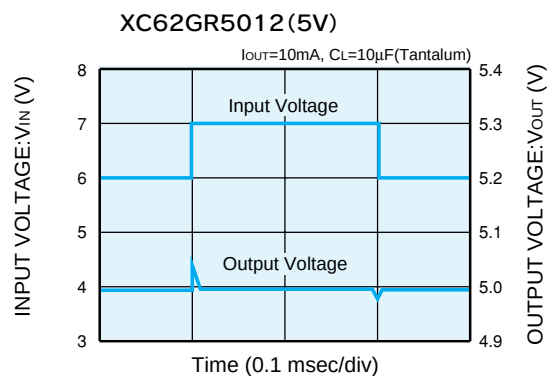
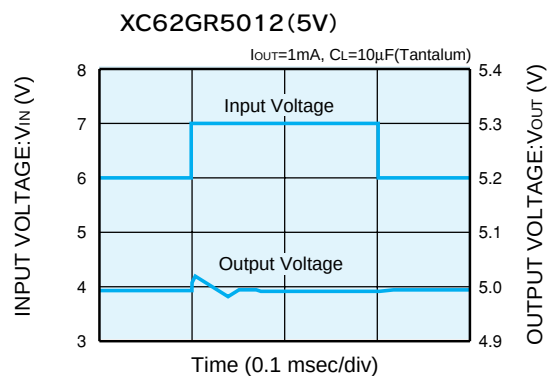
XC62GR3022 (3V HIGH SPEED)



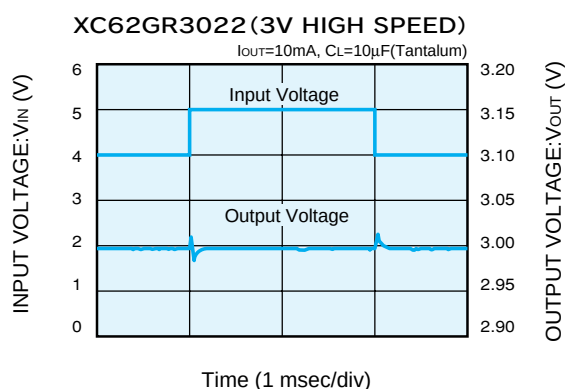
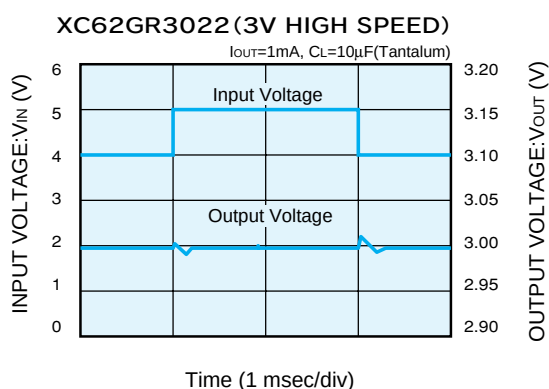
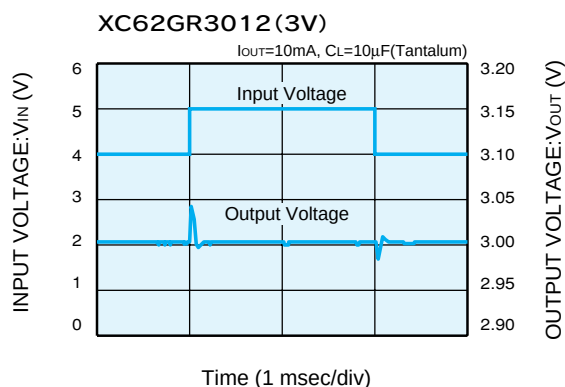
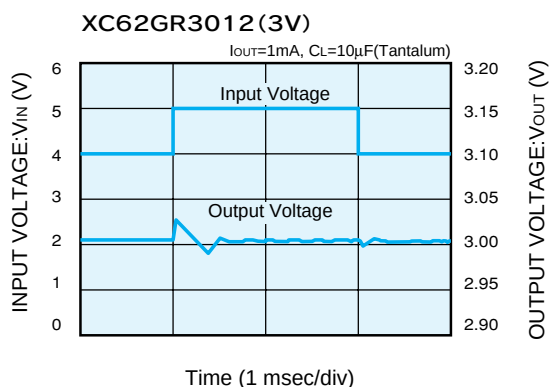
(8) INPUT TRANSIENT RESPONSE 1



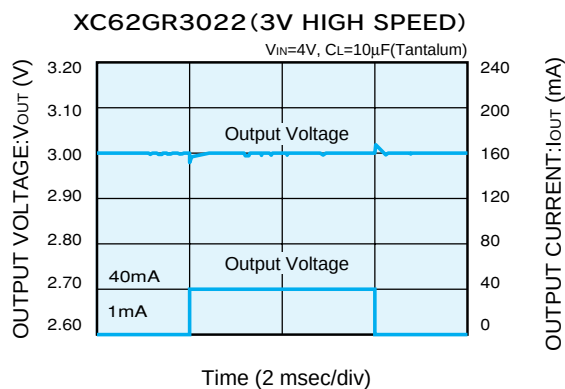
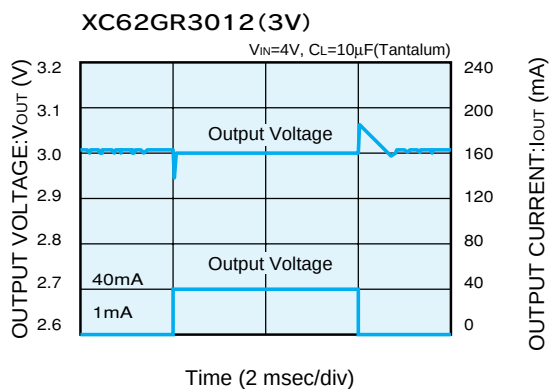
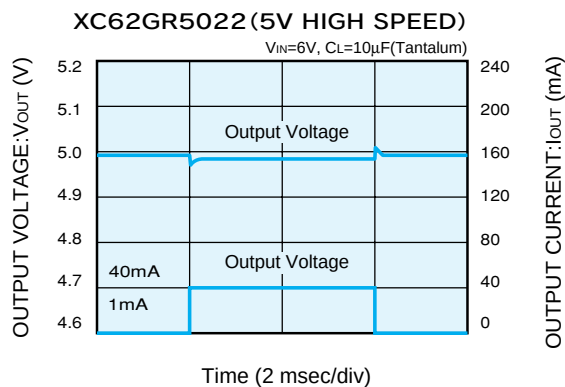
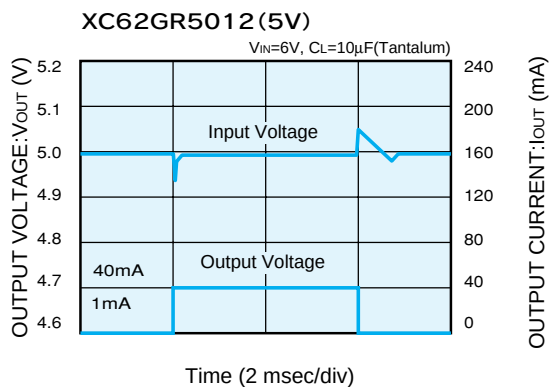
(9) INPUT TRANSIENT RESPONSE 2



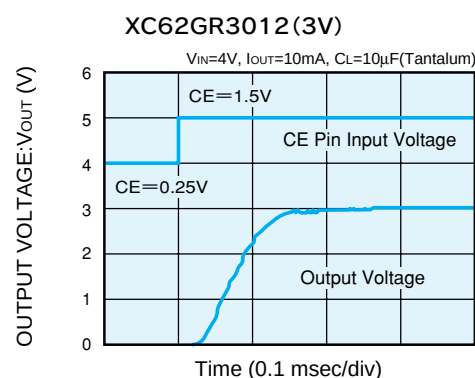
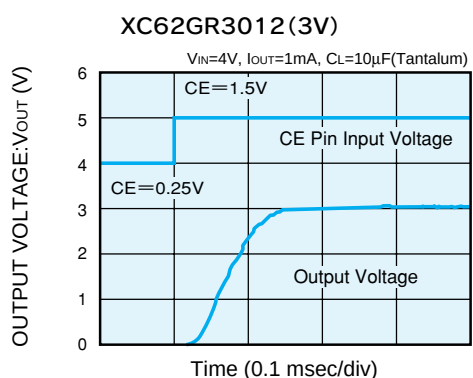
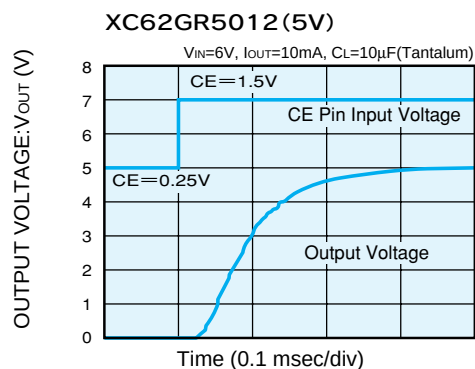
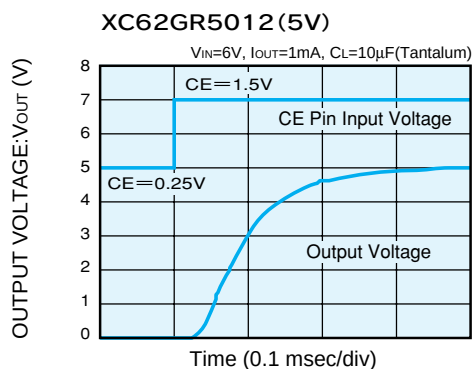
(9) INPUT TRANSIENT RESPONSE 2 (CONTINUED)



(10) LOAD TRANSIENT RESPONSE



(11) CE PIN TRANSIENT RESPONSE



(12) RIPPLE REJECTION RATE

