

- ◆ CMOS Low Power Consumption
- ◆ Dropout Voltage : 150mV @ 100mA
300mV @ 200mA
- ◆ Maximum Output Current : more than 400mA (3.3V)
- ◆ Highly Accurate : $\pm 2\%$
- ◆ SOT-89 Package

Applications

- Battery Powered Equipment
- Reference Voltage Sources
- Cameras, Video Cameras
- CD-ROMs, DVDs
- Palmtops
- Portable Audio Video Equipment
- USB connection Products

General Description

The XC6203 series are highly precise, low power consumption, positive voltage regulators manufactured using CMOS and laser trimming technologies. The series provides large currents with a significantly small dropout voltage. The XC6203P consists of a driver transistor, a current limiter, a precision reference voltage and an error amplifier. The XC6203E is also available but without the current limiter function. Output voltage is selectable in 0.1V steps between a voltage of 1.8V and 6.0V. SOT-89 (500mW) package.

Features

Maximum Output Current : 400mA

Maximum Operating Voltage : 8V

Output Voltage Range : 1.8V to 6.0V (selectable in 0.1V steps)

Highly Accurate : $\pm 2\%$

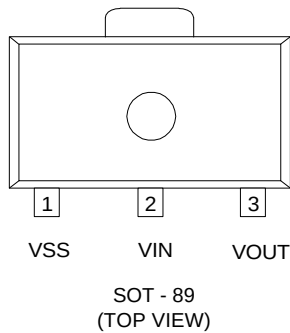
Low Power Consumption : TYP 8.0 μ A

Output Voltage Temp. Characteristics : TYP ± 100 ppm/ $^{\circ}$ C

Operational Temperature Range : -40° C to 85° C

Ultra Small Package : SOT-89

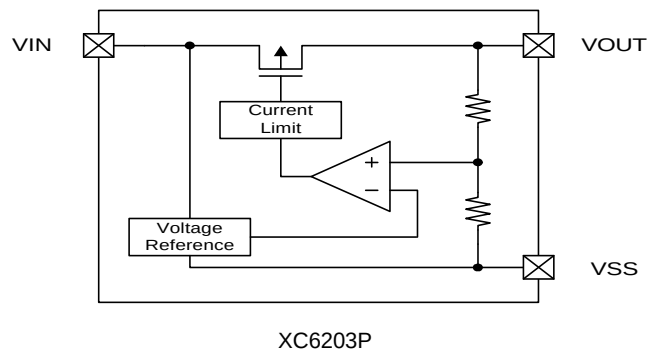
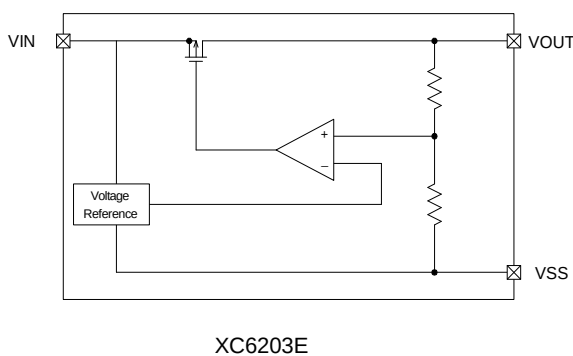
Pin Configuration



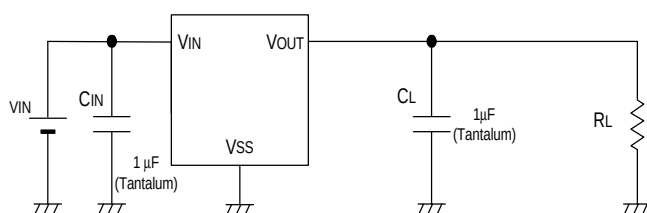
Pin Assignment

PIN NUMBER	PIN NAME	FUNCTION
1	VSS	Ground
2	VIN	Power Input
3	VOUT	Output

Block Diagram



Typical Application



■ Electrical Characteristics

XC6203X252

VOUT(T)=2.5V (Note1)

Ta=25°C

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Output Voltage	VOUT(E) (Note2)	VIN=3.5V IOUT=40mA	2.450	2.500	2.550	V
Maximum Output Current	IOUT max	VIN=3.5V VOUT ≥ VOUT(E) × 0.96	400			mA
Load Regulation	ΔVOUT	VIN=3.5V 1mA ≤ IOUT ≤ 200mA		40	100	mV
Dropout Voltage(Note3)	Vdif1	IOUT=100mA		170	250	mV
	Vdif2	IOUT=200mA		320	500	
Supply Current	ISS	VIN=3.5V		8.0	16.0	μA
Line Regulation	$\frac{\Delta VOUT}{\Delta VIN \cdot VOUT}$	IOUT=40mA 3.5V ≤ VIN ≤ 8.0V		0.2	0.3	%/V
Input Voltage	VIN				8	V
Output Voltage Temperature Characteristics	$\frac{\Delta VOUT}{\Delta T_{opr} \cdot VOUT}$	IOUT=40mA -40°C ≤ Topr ≤ 85°C		±100		ppm/°C

XC6203X302

VOUT(T)=3.0V (Note1)

Ta=25°C

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Output Voltage	VOUT(E) (Note2)	VIN=4V IOUT=40mA	2.940	3.000	3.060	V
Maximum Output Current	IOUT max	VIN=4V VOUT ≥ VOUT(E) × 0.96	400			mA
Load Regulation	ΔVOUT	VIN=4V 1mA ≤ IOUT ≤ 200mA		40	100	mV
Dropout Voltage(Note3)	Vdif1	IOUT=100mA		150	220	mV
	Vdif2	IOUT=200mA		300	420	
Supply Current	ISS	VIN=4V		8.0	16.0	μA
Line Regulation	$\frac{\Delta VOUT}{\Delta VIN \cdot VOUT}$	IOUT=40mA 4V ≤ VIN ≤ 8.0V		0.2	0.3	%/V
Input Voltage	VIN				8	V
Output Voltage Temperature Characteristics	$\frac{\Delta VOUT}{\Delta T_{opr} \cdot VOUT}$	IOUT=40mA -40°C ≤ Topr ≤ 85°C		±100		ppm/°C

XC6203X332

VOUT(T)=3.3V (Note1)

Ta=25°C

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Output Voltage	VOUT(E) (Note2)	VIN=4.3V IOUT=40mA	3.234	3.300	3.366	V
Maximum Output Current	IOUT max	VIN=4.3V VOUT ≥ VOUT(E) × 0.96	400			mA
Load Regulation	ΔVOUT	VIN=4.3V 1mA ≤ IOUT ≤ 200mA		40	100	mV
Dropout Voltage(Note3)	Vdif1	IOUT=100mA		150	220	mV
	Vdif2	IOUT=200mA		300	420	
Supply Current	ISS	VIN=4.3V		8.0	16.0	μA
Line Regulation	$\frac{\Delta VOUT}{\Delta VIN \cdot VOUT}$	IOUT=40mA 4.3V ≤ VIN ≤ 8.0V		0.2	0.3	%/V
Input Voltage	VIN				8	V
Output Voltage Temperature Characteristics	$\frac{\Delta VOUT}{\Delta T_{opr} \cdot VOUT}$	IOUT=40mA -40°C ≤ Topr ≤ 85°C		±100		ppm/°C

Note: 1. Vout(T)=Specified Output Voltage.

2. Vout(E)=Effective Output Voltage(I.e.the output voltage when "V out(T)+1.0V" is provided at the VIN pin while maintaining a certain IOUT value).

3. Vdif=VIN1 - VOUT1

■ Absolute Maximum Ratings

PARAMETER	SYMBOL	RATINGS	UNITS
Input Voltage	VIN	12	V
Output Current	IOUT	500	mA
Output Voltage	VOUT	VSS-0.3 ~ VIN+0.3	V
Power Dissipation / SOT-89	Pd	500	mW
Operating Ambient Temperature	Topr	-40 ~ +85	°C
Storage Temperature	Tstg	-40 ~ +125	°C

■ Ordering Information

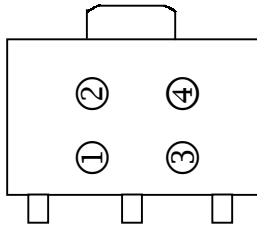
XC6203XXXXX

↑ ↑ ↑ ↑ ↑ ↑

a b c d e f

DESIGNATOR	DESCRIPTION	DESIGNATOR	DESCRIPTION
a	Product Series Number 3	d	Output Voltage Accuracy 1=±1.0% 2=±2.0%
b	Type of Regulator E = No current limiter circuit built-in P = Current limiter circuit built-in	e	Package Type P=SOT-89
c	Output Voltage 30:3.0V 50:5.0V	f	Device Orientation R=Orientation of Device:Right L=Orientation of Device:Left

■ Marking Rule



① Represents the product name

SYMBOL	PRODUCT NAME
3	XC6203XXXXPX

② Represents the type of regulator

VOLTAGE(V)	0.1~3.0	3.1~6.0	6.1~9.0		
SYMBOL	5	6	7	Product	XC6203PXXXXPX
	2	3	4	Name	XC6203EXXXPX

③ Represents the Output Voltage

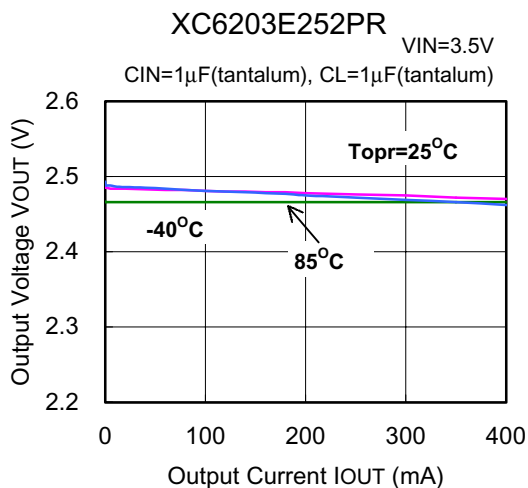
SYMBOL	OUTPUT VOLTAGE (V)			SYMBOL	OUTPUT VOLTAGE (V)		
	2, 5	3, 6	4, 7		2, 5	3, 6	4, 7
0	-	3.1	-	F	-	4.6	-
1	-	3.2	-	H	-	4.7	-
2	-	3.3	-	K	1.8	4.8	-
3	-	3.4	-	L	1.9	4.9	-
4	-	3.5	-	M	2.0	5.0	-
5	-	3.6	-	N	2.1	5.1	-
6	-	3.7	-	P	2.2	5.2	-
7	-	3.8	-	R	2.3	5.3	-
8	-	3.9	-	S	2.4	5.4	-
9	-	4.0	-	T	2.5	5.5	-
A	-	4.1	-	Y	2.6	5.6	-
B	-	4.2	-	V	2.7	5.7	-
C	-	4.3	-	X	2.8	5.8	-
D	-	4.4	-	Y	2.9	5.9	-
E	-	4.5	-	Z	3.0	6.0	-

④ Represents the assembly lot no.

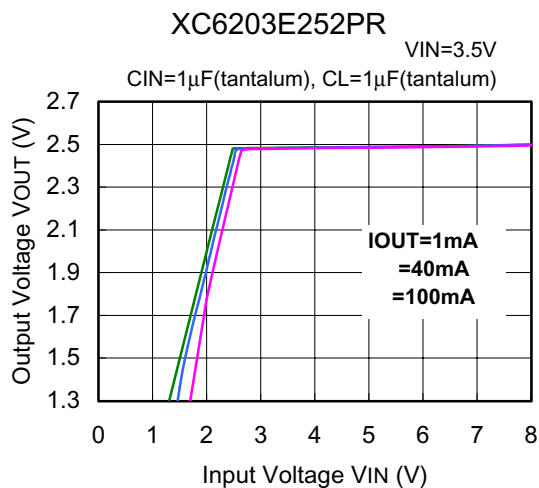
0~9, A~Z repeated (G, I, J, O, Q, W excepted)

■XC6203E Electrical Characteristics

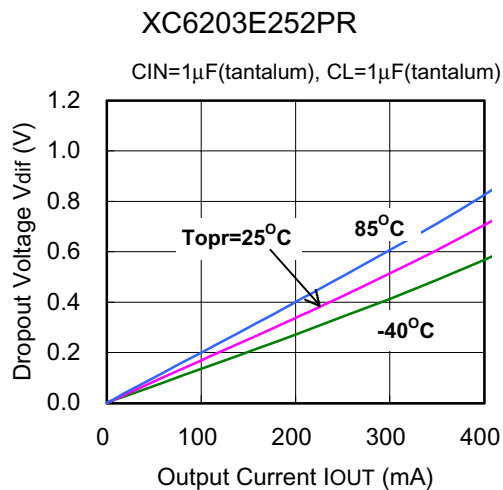
(1) Output Voltage vs. Output Current



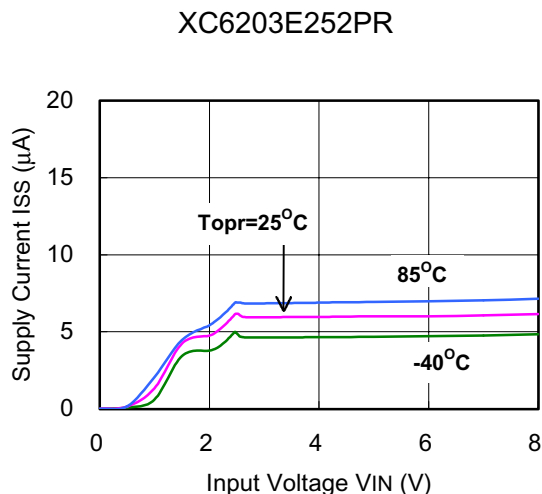
(2) Output Voltage vs. Input Voltage



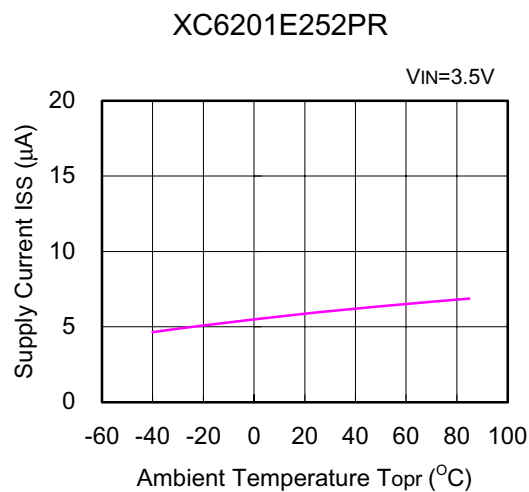
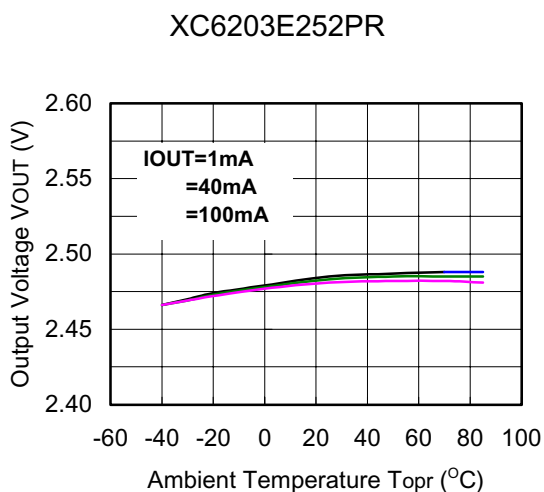
(3) Dropout Voltage vs. Output Current



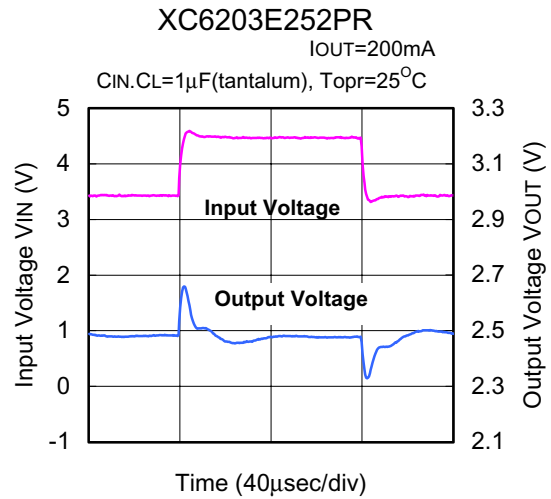
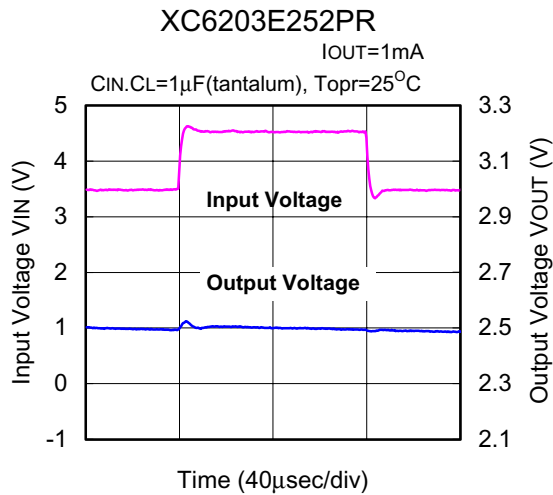
(4) Supply Current vs. Input Voltage



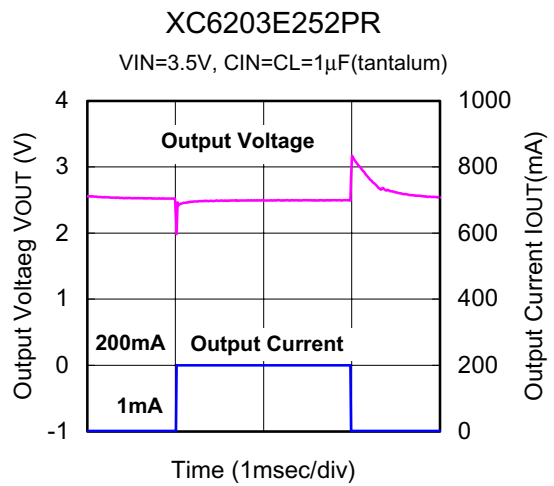
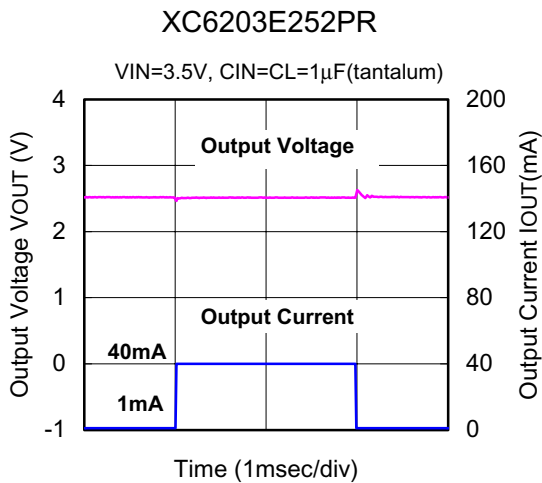
(5) Output Voltage vs. Ambient Temperature (6) Supply Current vs. Ambient Temperature



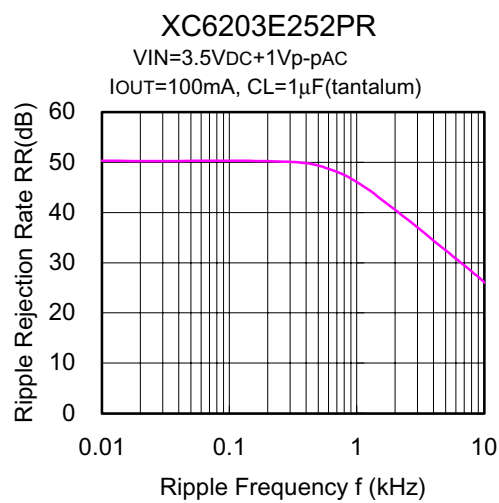
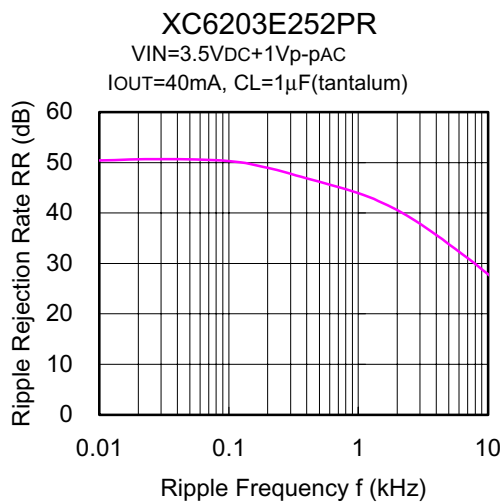
(7) Input Transient Response



(8) Load Transient Response

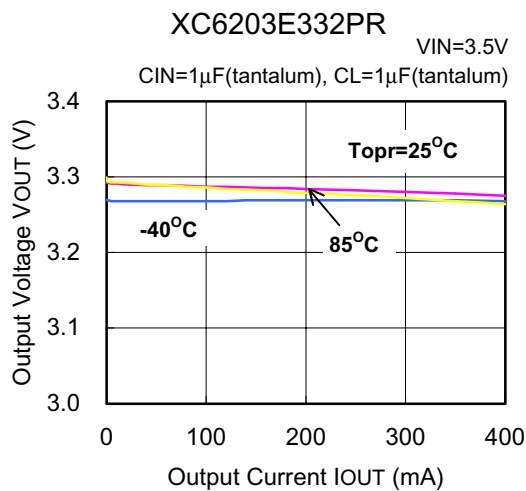


(9) Ripple Rejection Rate

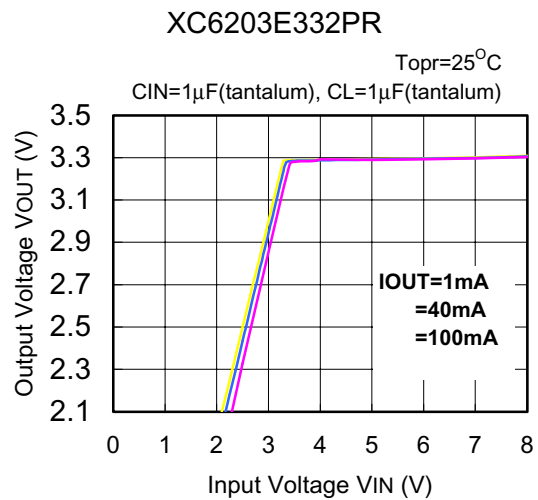


■XC6203E Electrical Characteristics

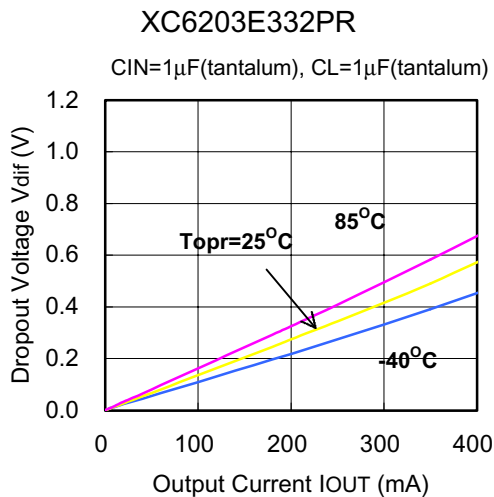
(1) Output Voltage vs. Output Current



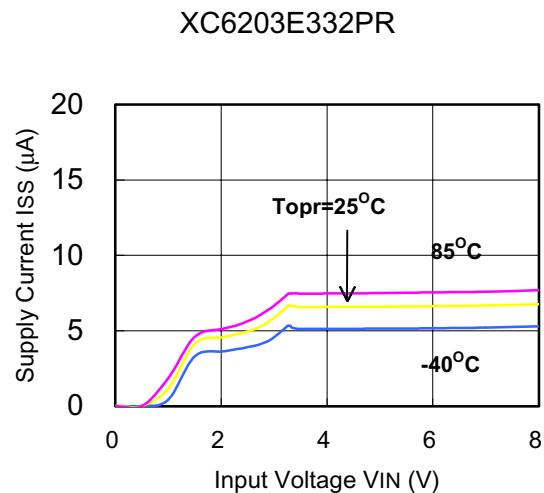
(2) Output Voltage vs. Input Voltage



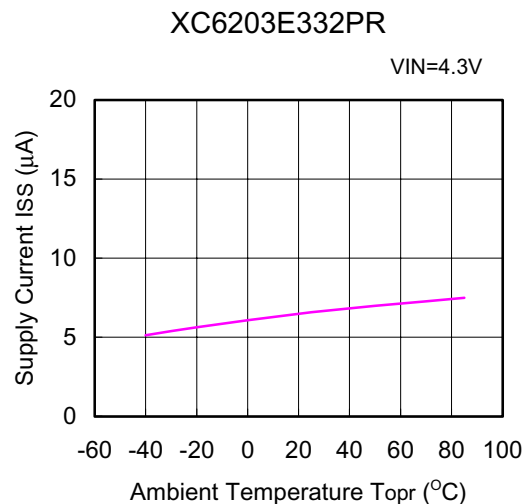
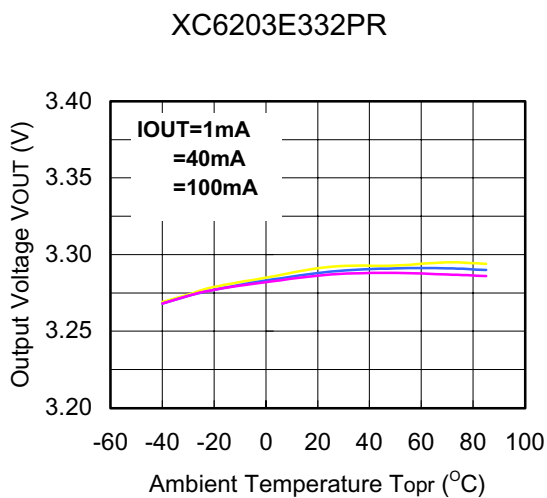
(3) Dropout Voltage vs. Output Current



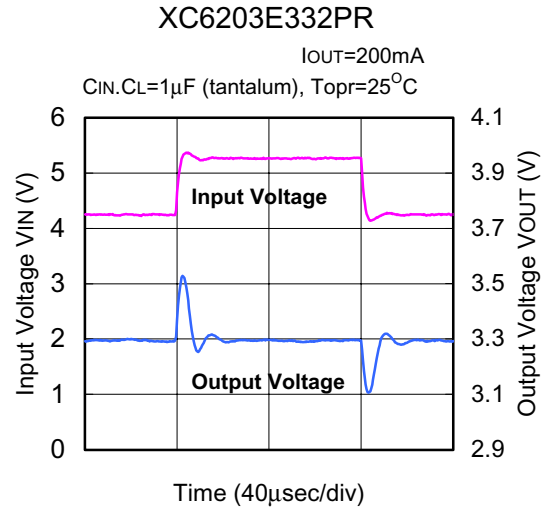
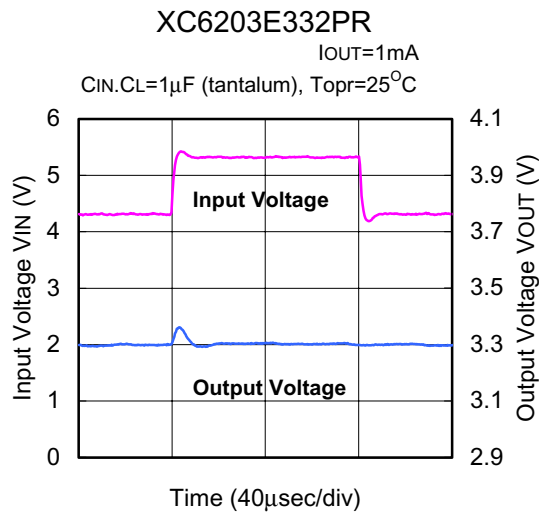
(4) Supply Current vs. Input Voltage



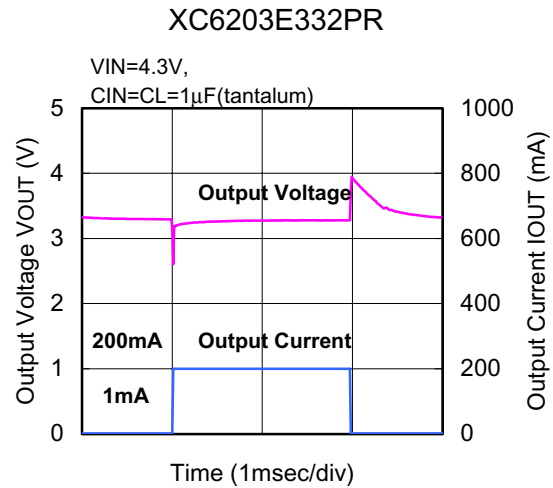
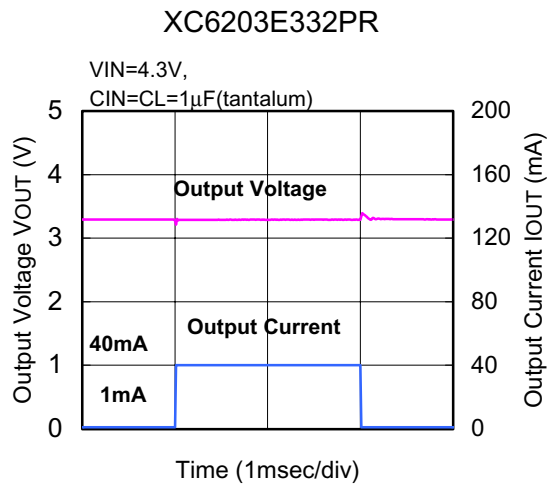
(5) Output Voltage vs. Ambient Temperature (6) Supply Current vs. Ambient Temperature



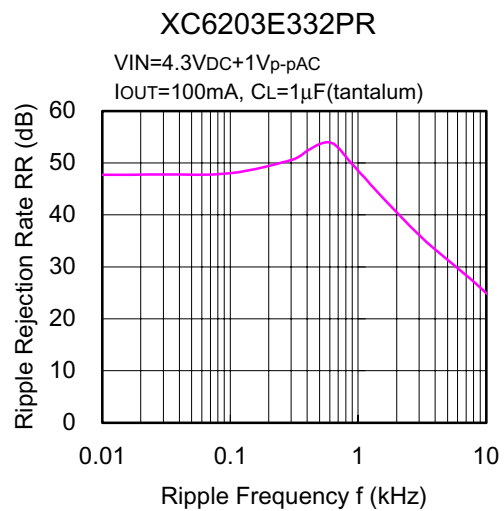
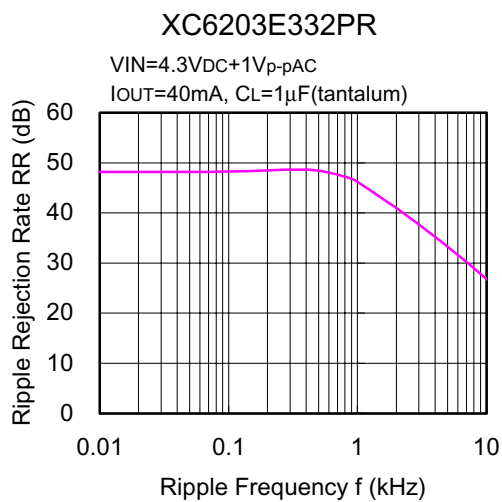
(7) Input Transient Response



(8) Load Transient Response



(9) Ripple Rejection Rate



■XC6203P Electrical Characteristics

(1) Output Voltage vs. Output Current

