

- ◆ **CMOS Low Power Consumption**
- ◆ **Dropout Voltage : 150mV @ 100mA**  
**300mV @ 200mA**
- ◆ **Maximum Output Current : more than 400mA (3.3V)**
- ◆ **Highly Accurate : ± 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

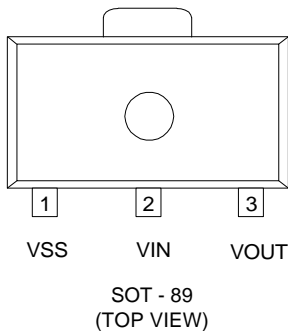
■ **General Description**

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** : ± 2%
- Low Power Consumption** : TYP 8.0 μA
- Output Voltage Temp. Characteristics** : TYP ±100ppm/°C
- Operational Temperature Range** : -40°C to 85°C
- Ultra Small Package** : SOT-89

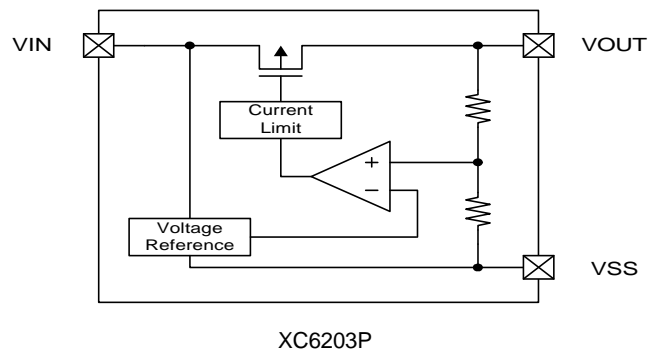
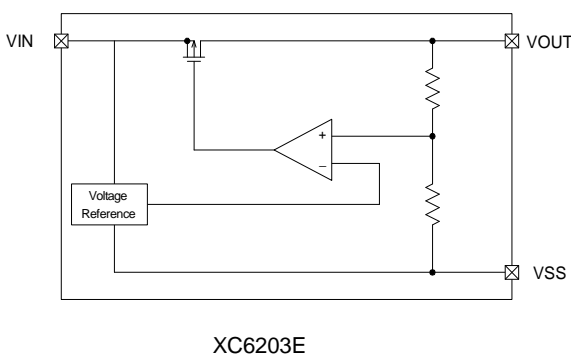
■ **Pin Configuration**



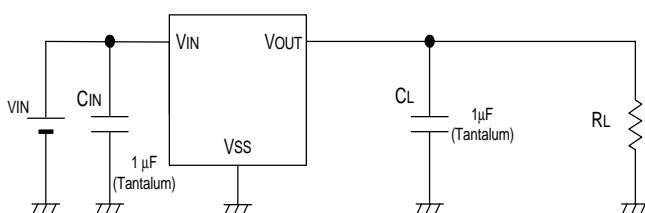
■ **Pin Assignment**

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	$\frac{\Delta VOUT}{\Delta Topr \cdot VOUT}$	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	$\frac{\Delta VOUT}{\Delta Topr \cdot VOUT}$	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	$\frac{\Delta VOUT}{\Delta Topr \cdot VOUT}$	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

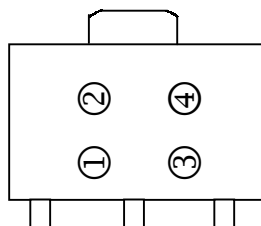
## ■ Ordering Information

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 Name	XC6203PXXXXPX
	2	3	4		XC6203EXXXXPX

③ Represents the Output Voltage

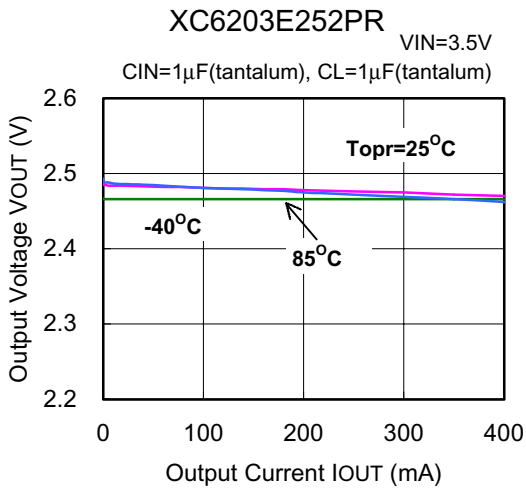
SYMBOL	OUTPUT VOLTAGE (V)			SYMBOL	OUTPUT VOLTAGE (V)		
	2, 5	3, 6	4, 7		2, 5	3, 6	4, 7
0	-	3.1	-	F	-	4.6	-
1	-	3.2	-	H	-	4.7	-
2	-	3.3	-	K	1.8	4.8	-
3	-	3.4	-	L	1.9	4.9	-
4	-	3.5	-	M	2.0	5.0	-
5	-	3.6	-	N	2.1	5.1	-
6	-	3.7	-	P	2.2	5.2	-
7	-	3.8	-	R	2.3	5.3	-
8	-	3.9	-	S	2.4	5.4	-
9	-	4.0	-	T	2.5	5.5	-
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.

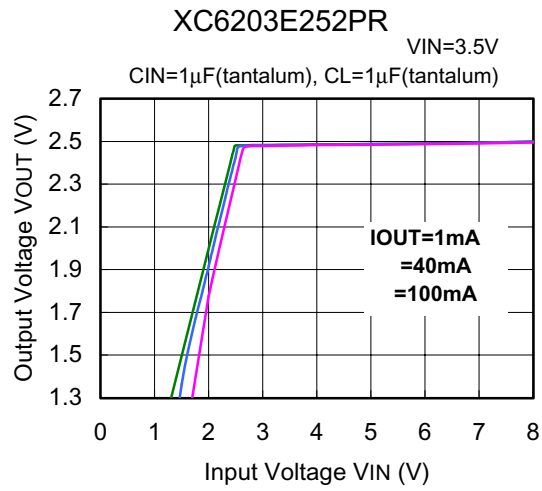
0~9, A~Z repeated (G, I, J, O, Q, W excepted)

# XC6203E Electrical Characteristics

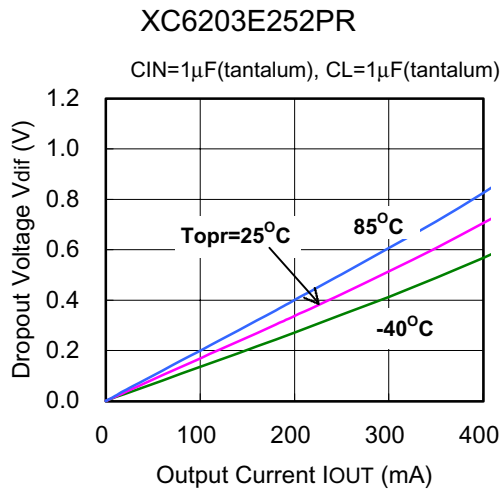
## (1) Output Voltage vs. Output Current



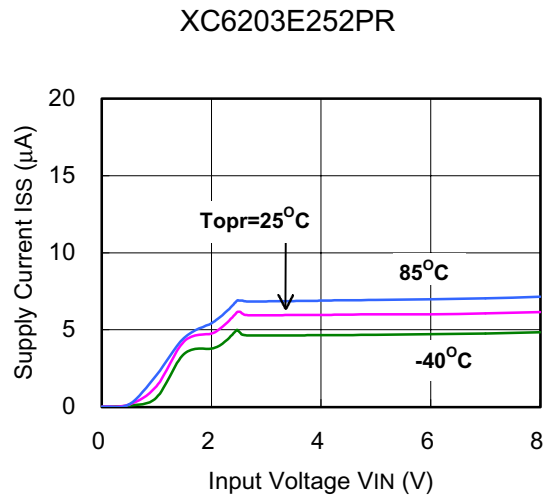
## (2) Output Voltage vs. Input Voltage



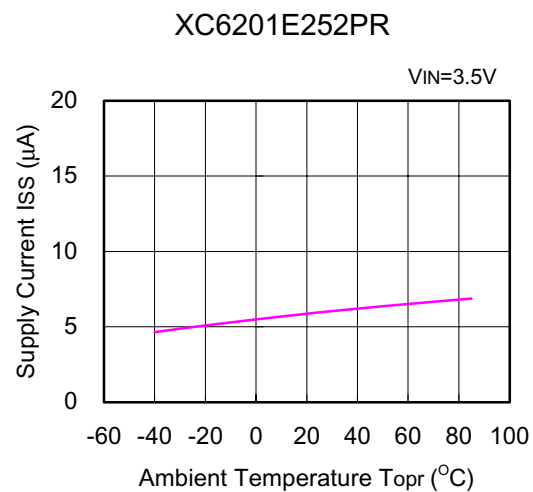
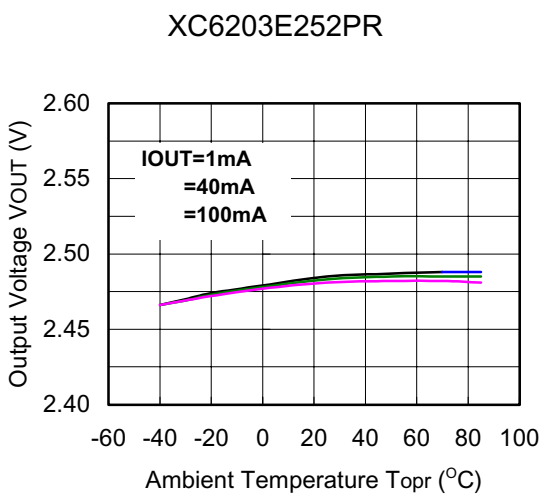
## (3) Dropout Voltage vs. Output Current



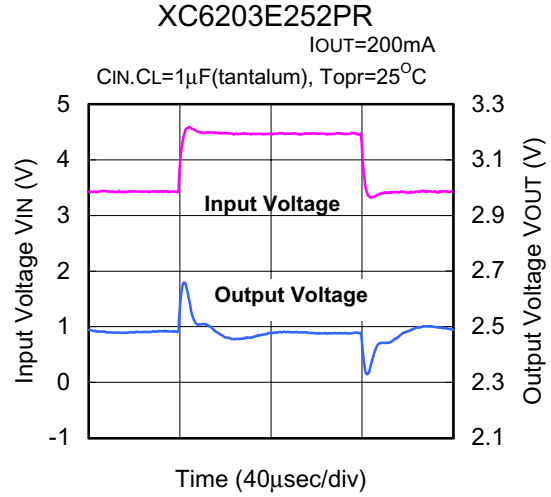
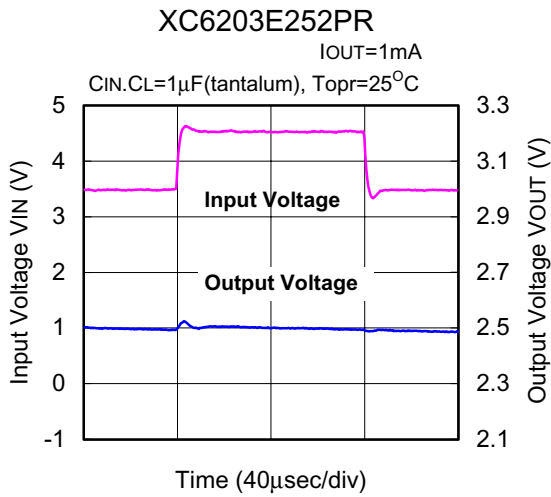
## (4) Supply Current vs. Input Voltage



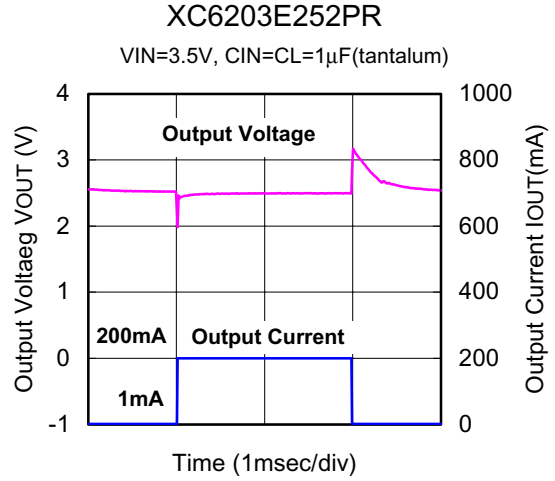
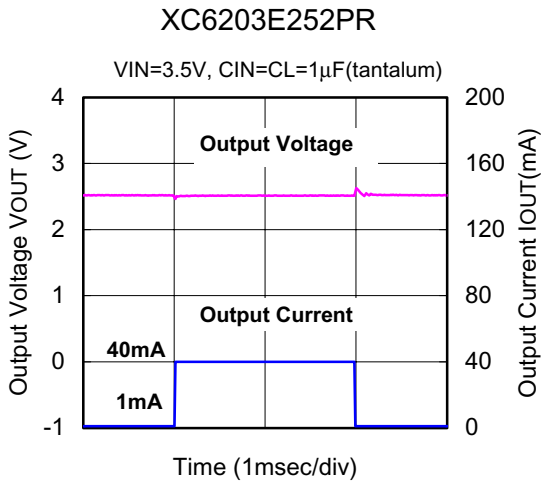
## (5) Output Voltage vs. Ambient Temperature (6) Supply Current vs. Ambient Temperature



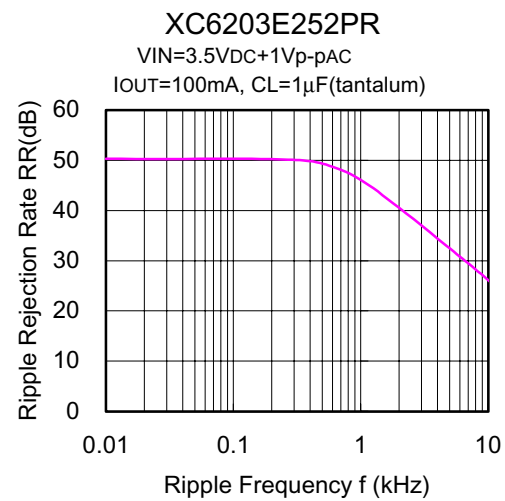
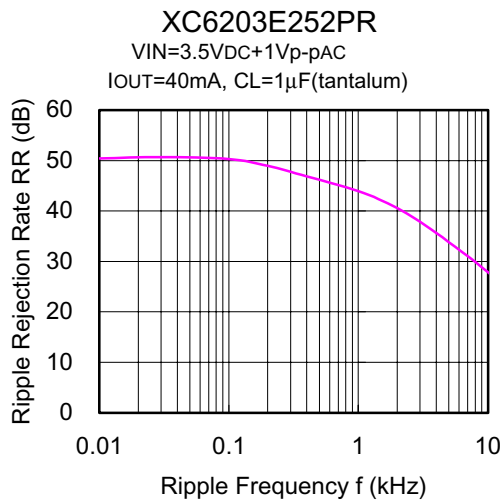
### (7) Input Transient Response



### (8) Load Transient Response

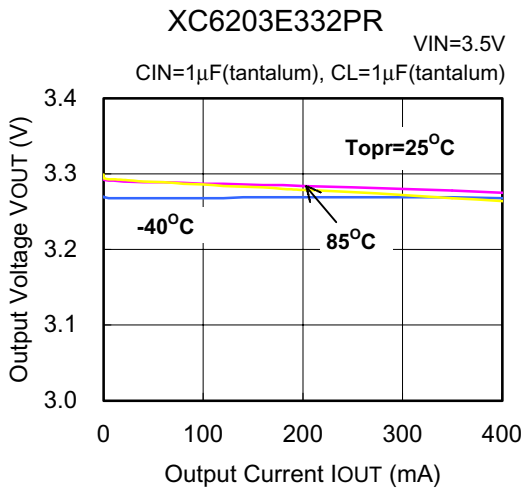


### (9) Ripple Rejection Rate

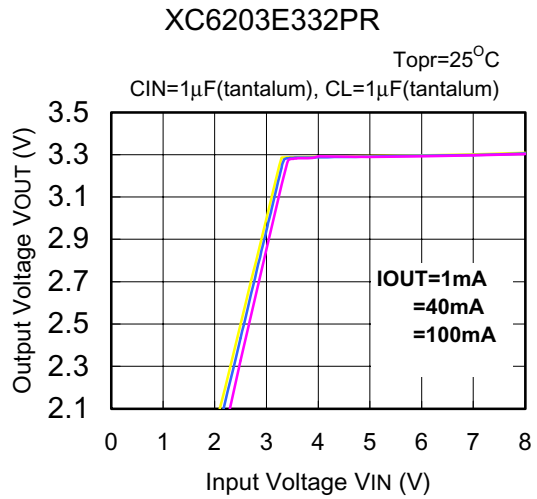


# XC6203E Electrical Characteristics

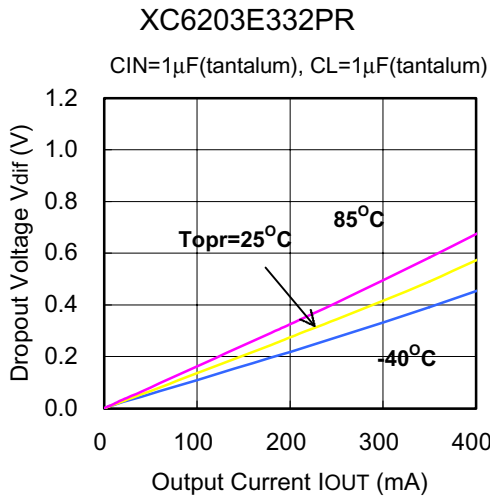
**(1) Output Voltage vs. Output Current**



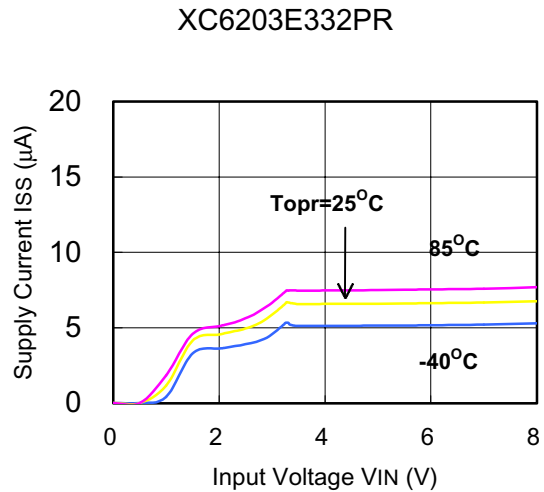
**(2) Output Voltage vs. Input Voltage**



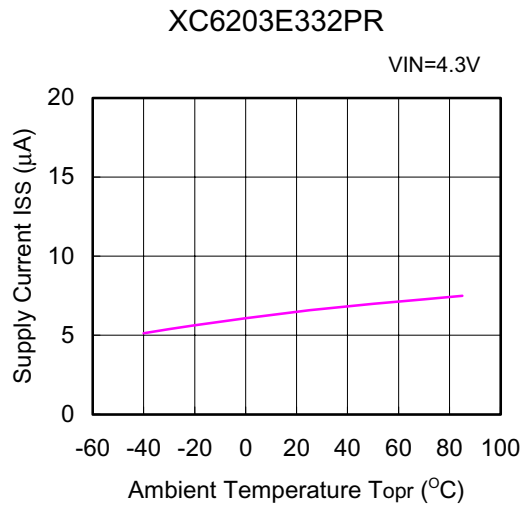
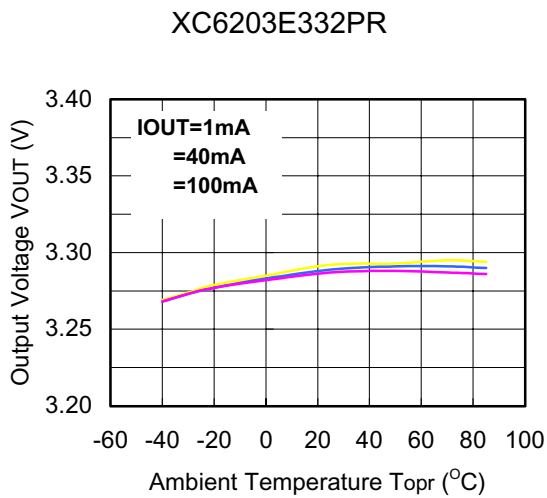
**(3) Dropout Voltage vs. Output Current**



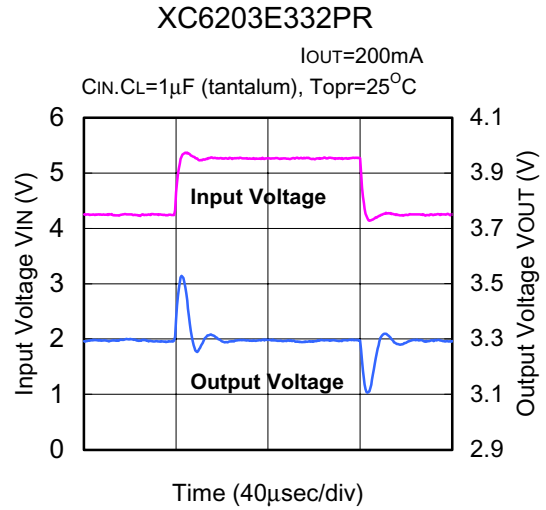
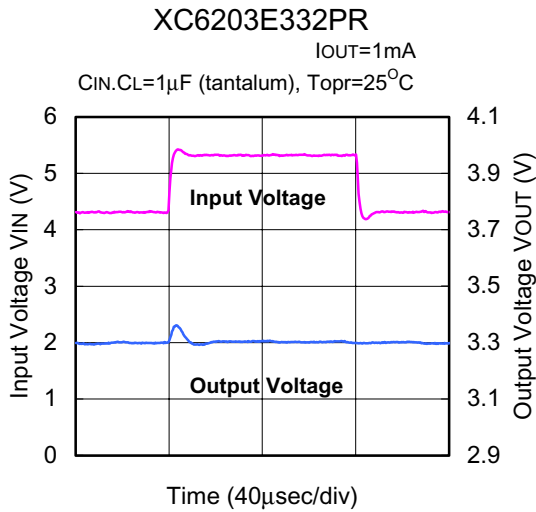
**(4) Supply Current vs. Input Voltage**



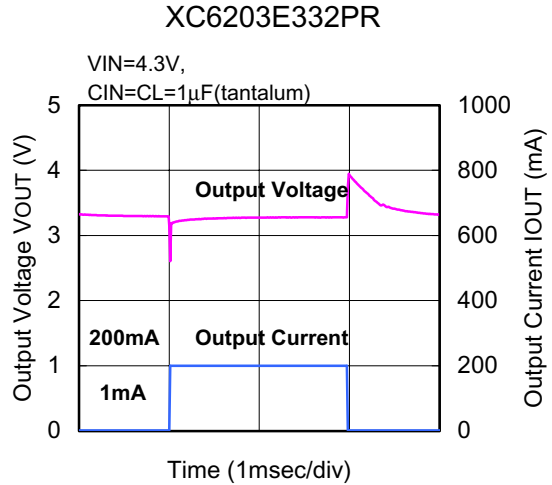
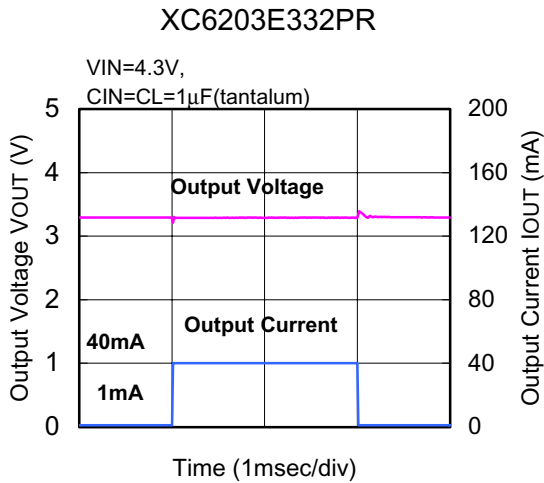
**(5) Output Voltage vs. Ambient Temperature (6) Supply Current vs. Ambient Temperature**



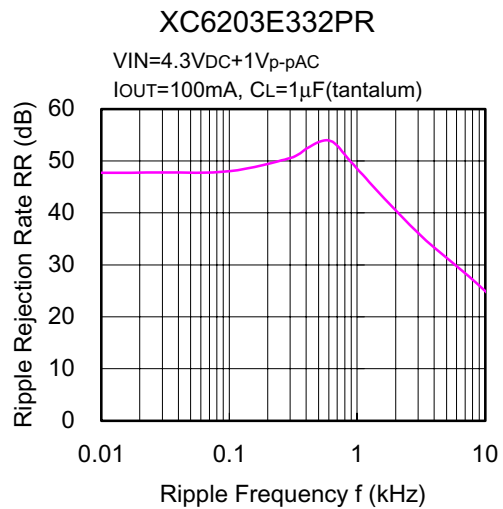
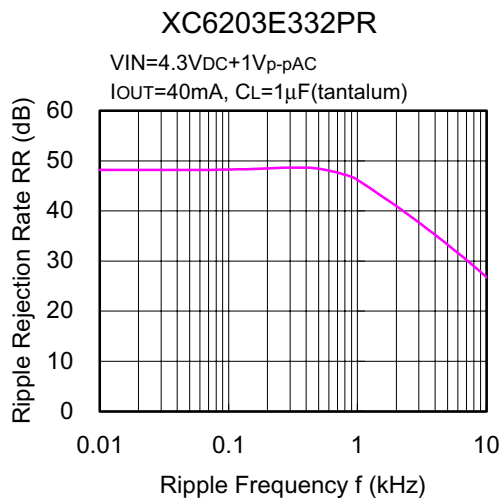
### (7) Input Transient Response



### (8) Load Transient Response



### (9) Ripple Rejection Rate



# XC6203P Electrical Characteristics

## (1) Output Voltage vs. Output Current

