# XC6202 Series

ETR0302_001

High Voltage Positive Voltage Regulators

## ■GENERAL DESCRIPTION

The XC6202 series are highly precise, low power consumption, high voltage input, positive voltage regulators manufactured using CMOS and laser trimming technologies. The XC6202 consists of a current limiter circuit, a driver transistor, a precision reference voltage and an error correction circuit.

Output voltage is selectable in 100mV steps from 1.8V ~ 18V. The series are also compatible with low ESR ceramic capacitors which give added output stability.

Since the current limiter circuit is built-in, the IC is protected against overshoot currents at such times of output shorts etc.

SOT-23 (150mW), SOT-89 (500mW), TO-92 (300mW), SOT-223 (1200mW) and USP-6B (100mW) packages are available.

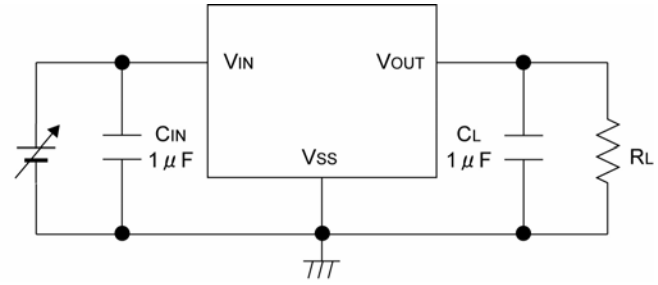
## ■APPLICATIONS

- ●Battery powered equipment
- ●Reference voltage
- ●Cameras, video cameras
- ●Palmtops

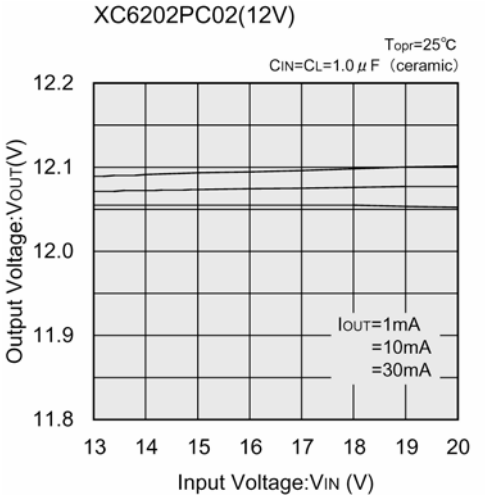
## ■FEATURES

| | |
|---|---|
| **Maximum Output Current** | : 150mA (within Pd) |
| **Maximum Operational Voltage** | : 20V |
| **Output Voltage Range** | : 1.8V ~ 18V (0.1V increments) |
| **Highly Accurate** | : ±2% |
| **Low Power Consumption** | : 10μA (TYP.) |
| **Line Regulation** | : 0.01% / V (TYP.) |
| **Dropout Voltage** | : 200mV @ 30mA<br>670mV@100mA |
| **Operational Temperature Range** | : -40℃ ~ 85℃ |
| **Low ESR Capacitor Compatible** | : Ceramic capacitor |
| **Current Limiter Circuit Built-In** | |
| **Small Packages** | : SOT-23 (150mW),<br>SOT-89 (500mW),<br>TO-92 (300mW),<br>SOT-223 (1200mW),<br>USP-6B (100mW) |

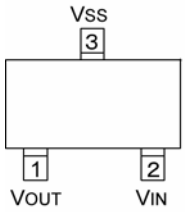
## ■TYPICAL APPLICATION CIRCUIT



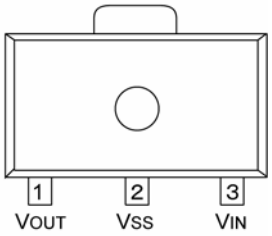

## ■TYPICAL PERFORMANCE CHARACTERISTICS



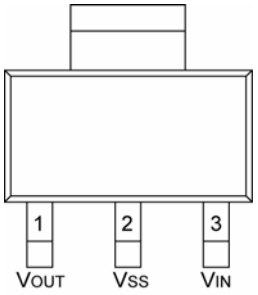
## ■PIN CONFIGURATION



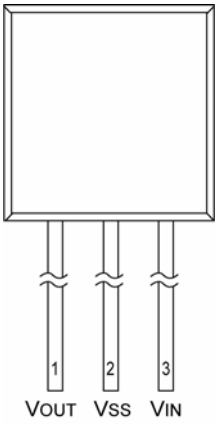

SOT-23
(TOP VIEW)



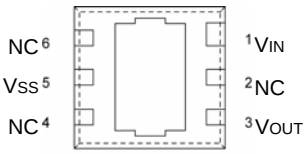

SOT-89
(TOP VIEW)




SOT-223
(TOP VIEW)




TO-92
(TOP VIEW)




USP-6B
(BOTTOM VIEW)

*The dissipation pad for the USP-6B package should be solder-plated in recommended mount pattern and metal masking so as to enhance mounting strength and heat release.
If the pad needs to be connected to other pins, it should be connected to the VSS (No.5) pin.

## ■PIN ASSIGNMENT

| PIN NUMBER | | | PIN NAME | FUNCTION |
|---|---|---|---|---|
| SOT-23 | SOT-89/TO-92/ SOT-223 | USP-6B | | |
| 1 | 1 | 3 | VOUT | Output |
| 3 | 2 | 5 | VSS | Ground |
| 2 | 3 | 1 | VIN | Power Input |
| – | – | 2, 4, 6 | NC | No connection |

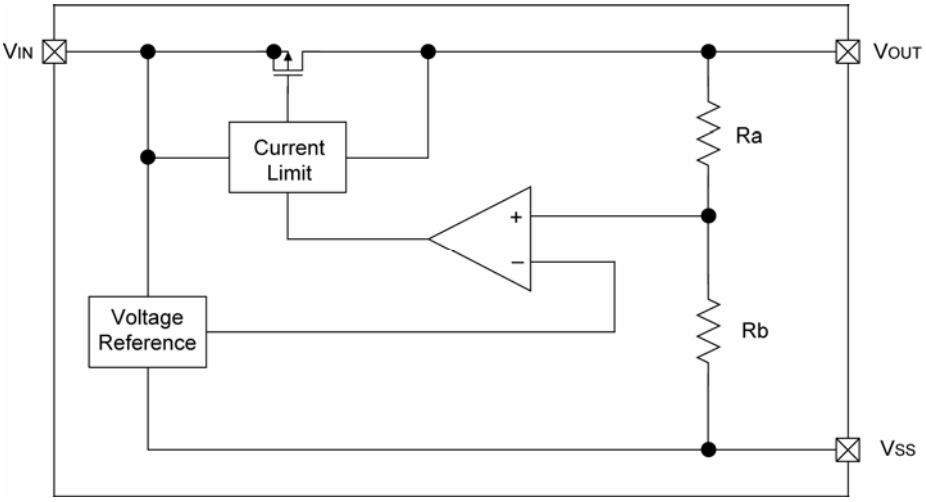
## ■PRODUCT CLASSIFICATION

●Ordering Information

XC6202P①②③④⑤

| DESIGNATOR | DESCRIPTION | SYMBOL | DESCRIPTION |
|---|---|---|---|
| ①② | Output Voltage | 18 ～ J0 | : For the voltage above 10V, see the example<br>10=A, 11=B 12=C, 13=D, 14=E, 15=F, 16=G, 17=H, 18=J<br>e.g. VOUT= 3.0V → ①:3, ②:0<br>VOUT= 12V → ①:C, ②:0<br>VOUT= 15V → ①:F, ②:0 |
| ③ | Accuracy | 2 | : ±2% |
| ④ | Packages | M | : SOT-23 |
| | | P | : SOT-89 |
| | | T | : TO-92 |
| | | F | : SOT-223 |
| | | D | : USP-6B |
| ⑤ | Device Orientation | R | : Embossed tape, standard feed |
| | | L | : Embossed tape, reverse feed |
| | | H | : Paper Tape (TO-92) |
| | | B | : Bag (TO-92) |

## ■BLOCK DIAGRAM




## ■ABSOLUTE MAXIMUM RATINGS

Ta = 25℃

| PARAMETER | | SYMBOL | RATINGS | UNITS |
|---|---|---|---|---|
| Input Voltage | | VIN | 22.0 | V |
| Output Current | | IOUT | 500 | mA |
| Output Voltage | | VOUT | VSS-0.3 ~ VIN+0.3 | V |
| Power Dissipation | SOT-25 | Pd | 150 | mW |
| | SOT-89 | | 500 | |
| | TO-92 | | 300 | |
| | USP-6B | | 100 | |
| | SOT-223 | | 1,200* | |
| Operating Temperature Range | | Topr | -40～+85 | ℃ |
| Storage Temperature Range | | Tstg | -55～+125 | ℃ |

* Circuits board mounting: Double-sided board

## ■ELECTRICAL CHARACTERISTICS

XC6202P182 $V_{OUT(T)}$=1.8V (*1) Topr=25℃

| PARAMETER | SYMBOL | CONDITIONS | MIN. | TYP. | MAX. | UNITS | CIRCUIT |
|---|---|---|---|---|---|---|---|
| Output Voltage | $V_{OUT(E)}$ (*2) | $V_{IN}$=2.8V<br>$I_{OUT}$=30mA | 1.764 | 1.800 | 1.836 | V | ② |
| Maximum Output Current | $I_{OUTmax}$ | $V_{IN}$=2.8V<br>$V_{OUT} \geqq V_{OUT(E)} \times 0.9$ | 60 | - | - | mA | ② |
| Load Regulation | $\triangle V_{OUT}$ | $V_{IN}$=2.8V<br>1mA≦$I_{OUT}$≦60mA | - | 10 | 80 | mV | ② |
| Dropout Voltage(*3) | Vdif1 | $I_{OUT}$=30mA | - | 340 | 470 | mV | ② |
| | Vdif2 | $I_{OUT}$=100mA | - | 1000 | 1500 | | |
| Supply Current | $I_{SS}$ | $V_{IN}$=2.8V | - | 10 | 24 | μA | ① |
| Line Regulation | $\frac{\triangle V_{OUT}}{\triangle V_{IN} \cdot \triangle V_{OUT}}$ | $I_{OUT}$=1mA<br>2.8V≦$V_{IN}$≦20V | - | 0.01 | 0.20 | %/V | ② |
| Input Voltage | $V_{IN}$ | | - | - | 20 | V | - |
| Output Voltage Temperature Characteristics | $\frac{\triangle V_{OUT}}{\triangle Topr \cdot \triangle V_{OUT}}$ | $I_{OUT}$=30mA<br>-40℃≦Topr≦85℃ | - | ±100 | - | ppm/℃ | ② |
| Short-circuit Current | Ishort | $V_{IN}$=3.8V | - | 40 | - | mA | ② |

XC6202P332 $V_{OUT(T)}$=3.3V (*1) Topr=25℃

| PARAMETER | SYMBOL | CONDITIONS | MIN. | TYP. | MAX. | UNITS | CIRCUIT |
|---|---|---|---|---|---|---|---|
| Output Voltage | $V_{OUT(E)}$ (*2) | $V_{IN}$=4.3V<br>$I_{OUT}$=30mA | 3.234 | 3.300 | 3.366 | V | ② |
| Maximum Output Current | $I_{OUTmax}$ | $V_{IN}$=4.3V<br>$V_{OUT} \geqq V_{OUT(E)} \times 0.9$ | 150 | - | - | mA | ② |
| Load Regulation | $\triangle V_{OUT}$ | $V_{IN}$=4.3V<br>1mA≦$I_{OUT}$≦100mA | - | 25 | 90 | mV | ② |
| Dropout Voltage(*3) | Vdif1 | $I_{OUT}$=30mA | - | 200 | 280 | mV | ② |
| | Vdif2 | $I_{OUT}$=100mA | - | 670 | 900 | | |
| Supply Current | $I_{SS}$ | $V_{IN}$=4.3V | - | 10 | 24 | μA | ① |
| Line Regulation | $\frac{\triangle V_{OUT}}{\triangle V_{IN} \cdot \triangle V_{OUT}}$ | $I_{OUT}$=1mA<br>4.3V≦$V_{IN}$≦20V | - | 0.01 | 0.20 | %/V | ② |
| Input Voltage | $V_{IN}$ | | - | - | 20 | V | - |
| Output Voltage Temperature Characteristics | $\frac{\triangle V_{OUT}}{\triangle Topr \cdot \triangle V_{OUT}}$ | $I_{OUT}$=30mA<br>-40℃≦Topr≦85℃ | - | ±100 | - | ppm/℃ | ② |
| Short-circuit Current | Ishort | $V_{IN}$=5.3V | - | 40 | - | mA | ② |

# ■ELECTRICAL CHARACTERISTICS (Continued)

XC6202P502 $V_{OUT(T)}$=5.0V (*1)

Topr=25℃

| PARAMETER | SYMBOL | CONDITIONS | MIN. | TYP. | MAX. | UNITS | CIRCUIT |
|---|---|---|---|---|---|---|---|
| Output Voltage | $V_{OUT(E)}$ (*2) | $V_{IN}$=6V<br>$I_{OUT}$=30mA | 4.900 | 5.000 | 5100 | V | ② |
| Maximum Output Current | $I_{OUTmax}$ | $V_{IN}$=6V<br>$V_{OUT} \geqq V_{OUT(E)} \times 0.9$ | 200 | - | - | mA | ② |
| Load Regulation | $\triangle V_{OUT}$ | $V_{IN}$=6V<br>1mA≦$I_{OUT}$≦100mA | - | 30 | 100 | mV | ② |
| Dropout Voltage(*3) | Vdif1 | $I_{OUT}$=30mA | - | 130 | 190 | mV | ② |
| | Vdif2 | $I_{OUT}$=100mA | - | 440 | 550 | | |
| Supply Current | $I_{SS}$ | $V_{IN}$=6V | - | 10 | 24 | μA | ① |
| Line Regulation | $\frac{\triangle V_{OUT}}{\triangle V_{IN} \cdot \triangle V_{OUT}}$ | $I_{OUT}$=1mA<br>6V≦$V_{IN}$≦20V | - | 0.01 | 0.20 | %/V | ② |
| Input Voltage | $V_{IN}$ | | - | - | 20 | V | - |
| Output Voltage Temperature Characteristics | $\frac{\triangle V_{OUT}}{\triangle Topr \cdot \triangle V_{OUT}}$ | $I_{OUT}$=30mA<br>-40℃≦Topr≦85℃ | - | ±100 | - | ppm/℃ | ② |
| Short-circuit Current | Ishort | $V_{IN}$=7V | - | 40 | - | mA | ② |

XC6202PC02 $V_{OUT(T)}$=12V (*1)

Topr=25℃

| PARAMETER | SYMBOL | CONDITIONS | MIN. | TYP. | MAX. | UNITS | CIRCUIT |
|---|---|---|---|---|---|---|---|
| Output Voltage | $V_{OUT(E)}$ (*2) | $V_{IN}$=13V<br>$I_{OUT}$=30mA | 11.760 | 12.000 | 12.240 | V | ② |
| Maximum Output Current | $I_{OUTmax}$ | $V_{IN}$=13V<br>$V_{OUT} \geqq V_{OUT(E)} \times 0.9$ | 200 | - | - | mA | ② |
| Load Regulation | $\triangle V_{OUT}$ | $V_{IN}$=13V<br>1mA≦$I_{OUT}$≦100mA | - | 60 | 230 | mV | ② |
| Dropout Voltage(*3) | Vdif1 | $I_{OUT}$=30mA | - | 90 | 150 | mV | ② |
| | Vdif2 | $I_{OUT}$=100mA | - | 290 | 380 | | |
| Supply Current | $I_{SS}$ | $V_{IN}$=13V | - | 12 | 28 | μA | ① |
| Line Regulation | $\frac{\triangle V_{OUT}}{\triangle V_{IN} \cdot \triangle V_{OUT}}$ | $I_{OUT}$=1mA<br>13V≦$V_{IN}$≦20V | - | 0.01 | 0.20 | %/V | ② |
| Input Voltage | $V_{IN}$ | | - | - | 20 | V | - |
| Output Voltage Temperature Characteristics | $\frac{\triangle V_{OUT}}{\triangle Topr \cdot \triangle V_{OUT}}$ | $I_{OUT}$=30mA<br>-40℃≦Topr≦85℃ | - | ±100 | - | ppm/℃ | ② |
| Short-circuit Current | Ishort | $V_{IN}$=14V | - | 40 | - | mA | ② |

## ■ELECTRICAL CHARACTERISTICS (Continued)

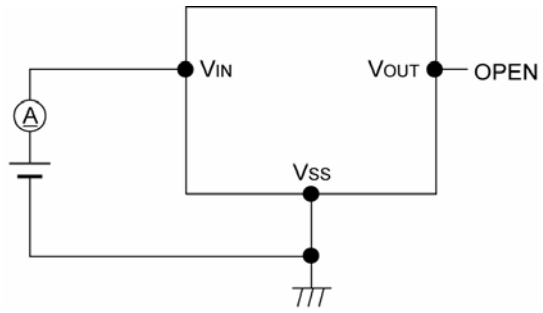
XC6202PJ02 $V_{OUT(T)}$=18V (*1) Topr=25℃

| PARAMETER | SYMBOL | CONDITIONS | MIN. | TYP. | MAX. | UNITS | CIRCUIT |
|---|---|---|---|---|---|---|---|
| Output Voltage | $V_{OUT(E)}$ (*2) | $V_{IN}$=19V<br>$I_{OUT}$=30mA | 17.640 | 18.000 | 18.360 | V | ② |
| Maximum Output Current | $I_{OUTmax}$ | $V_{IN}$=19V<br>$V_{OUT} \geqq V_{OUT(E)} \times 0.9$ | 200 | - | - | mA | ② |
| Load Regulation | $\triangle V_{OUT}$ | $V_{IN}$=19V<br>1mA≦$I_{OUT}$≦100mA | - | 120 | 380 | mV | ② |
| Dropout Voltage(*3) | Vdif1 | $I_{OUT}$=30mA | - | 80 | 150 | mV | ② |
| | Vdif2 | $I_{OUT}$=100mA | - | 280 | 380 | | |
| Supply Current | $I_{SS}$ | $V_{IN}$=19V | - | 15 | 30 | μA | ① |
| Line Regulation | $\frac{\triangle V_{OUT}}{\triangle V_{IN} \cdot \triangle V_{OUT}}$ | $I_{OUT}$=1mA<br>19V≦$V_{IN}$≦20V | - | 0.01 | 0.20 | %/V | ② |
| Input Voltage | $V_{IN}$ | | - | - | 20 | V | - |
| Output Voltage Temperature Characteristics | $\frac{\triangle V_{OUT}}{\triangle Topr \cdot \triangle V_{OUT}}$ | $I_{OUT}$=30mA<br>-40℃≦Topr≦85℃ | - | ±100 | - | ppm/℃ | ② |
| Short-circuit Current | Ishort | $V_{IN}$=20V | - | 40 | - | mA | ② |

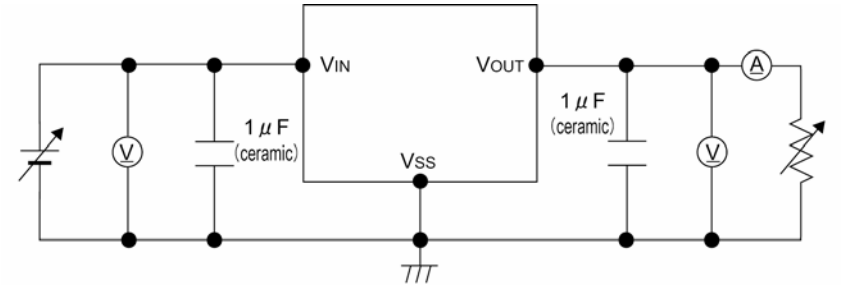
*1. $V_{OUT(T)}$ = Specified output voltage.
*2. $V_{OUT(E)}$ = Effective output voltage (i.e. the output voltage when "$V_{OUT(T)}$+1.0V" is provided at the $V_{IN}$ pin while maintaining certain $I_{OUT}$ value).
*3. Vdif = {$V_{IN1}$(*5)-$V_{OUT1}$(*4)}
*4. $V_{OUT1}$ = A voltage equal to 98% of the output voltage when "$V_{OUT(T)}$ + 1.0V" is input.
*5. $V_{IN1}$ = The input voltage when $V_{OUT1}$ is output following a gradual decrease in the input voltage.

## ■TEST CIRCUITS

CIRCUIT ①



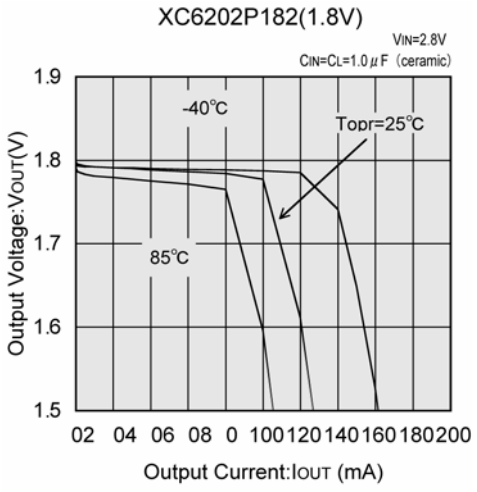

CIRCUIT ②



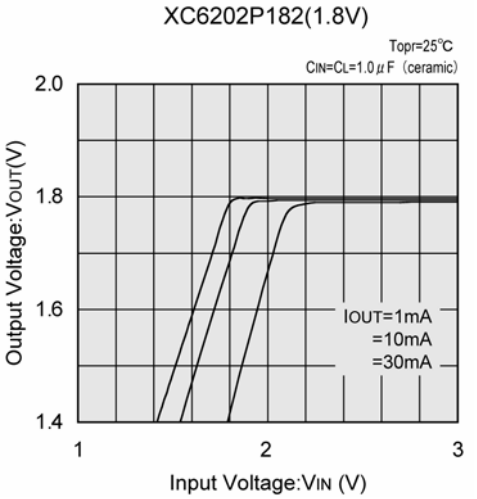
# ■TYPICAL PERFORMANCE CHARACTERISTICS

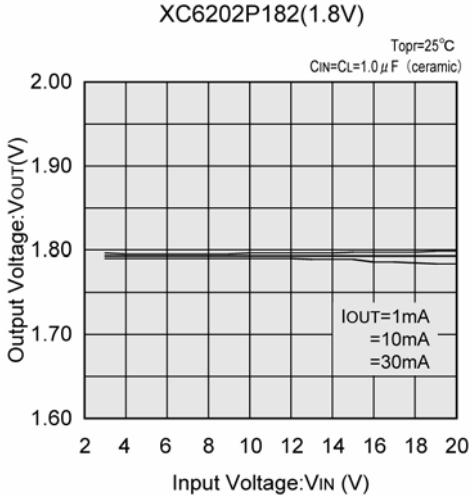
●XC6202P182

(1) Output Voltage vs. Output Current

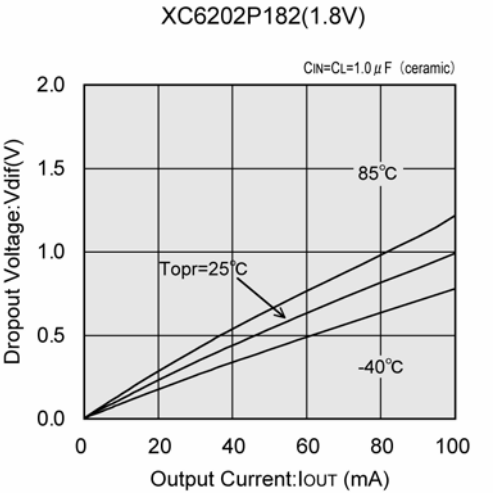



(2) Output Voltage vs. Input Voltage



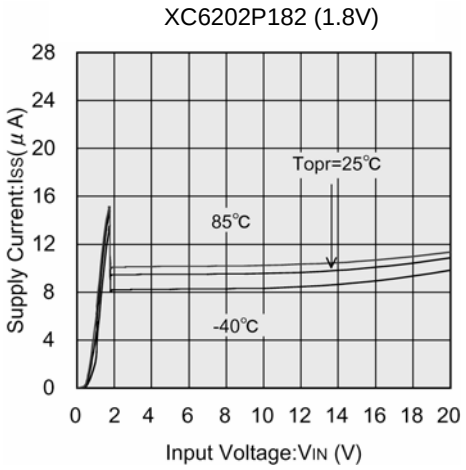

(3) Dropout Voltage vs. Output Current

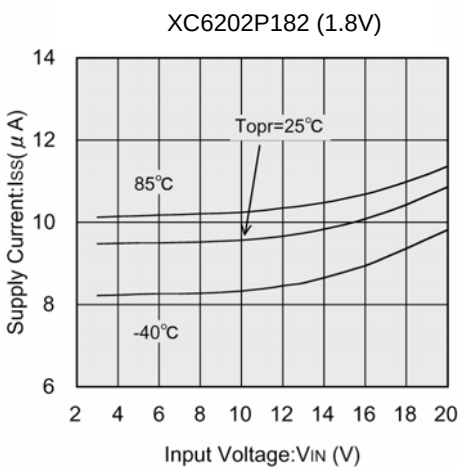


## ■TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

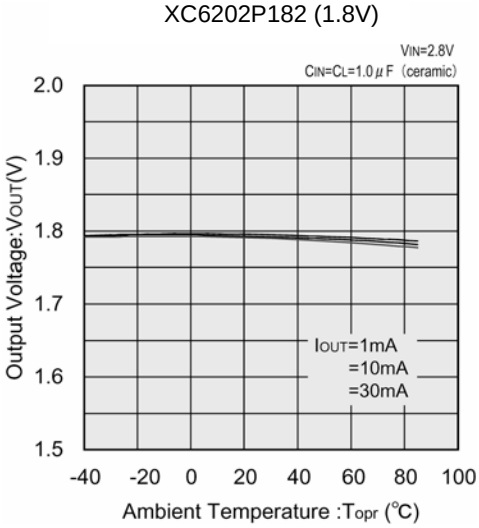
●XC6202P182 (Continued)

(4) Supply Current vs. Input Voltage

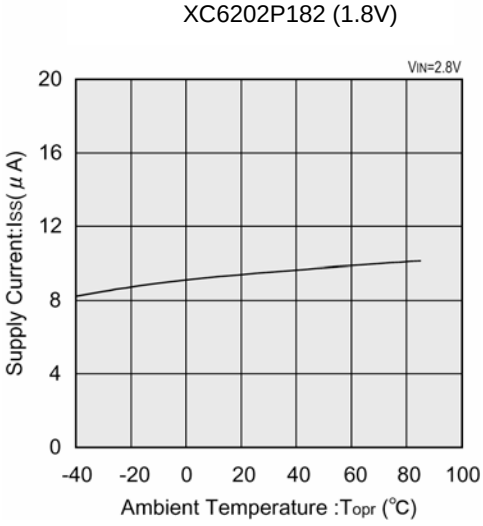


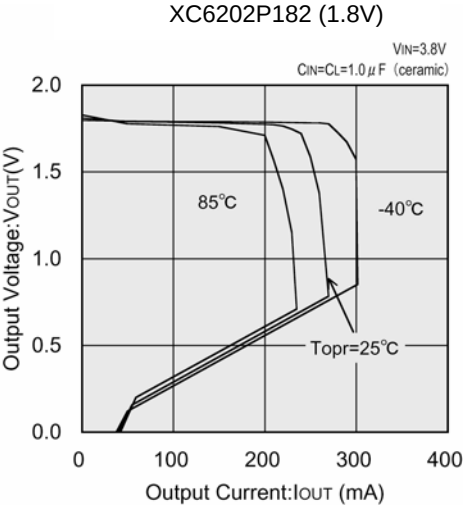

(5) Output Voltage vs. Ambient Temperature




(6) Supply Current vs. Ambient Temperature




(7) Current Limiter Circuit

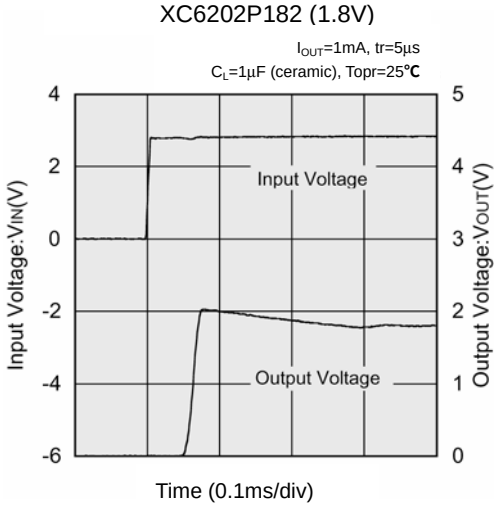


# ■TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

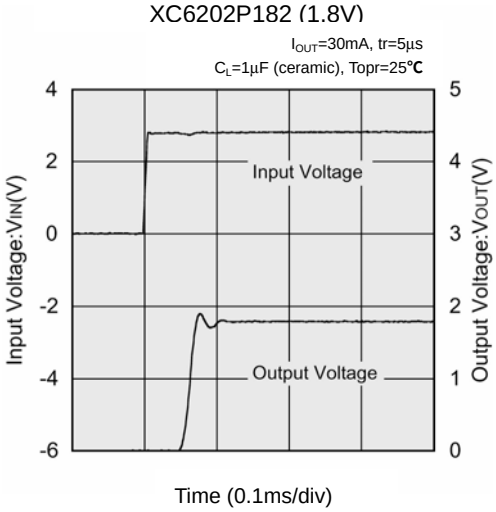
●XC6202P182 (Continued)

(8) Input Transient Response 1

XC6202P182 (1.8V)

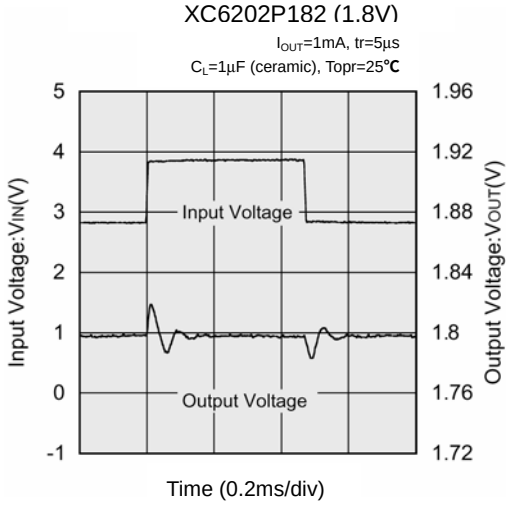



XC6202P182 (1.8V)

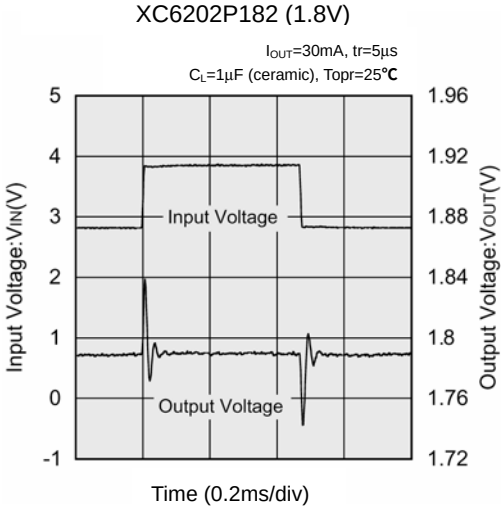



(9) Input Transient Response 2

XC6202P182 (1.8V)

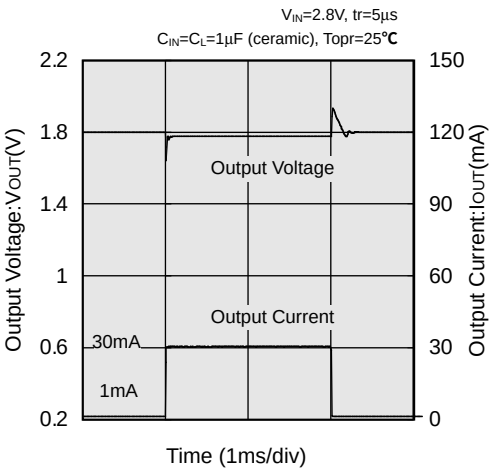



XC6202P182 (1.8V)




(10) Load Transient Response

XC6202P182 (1.8V)

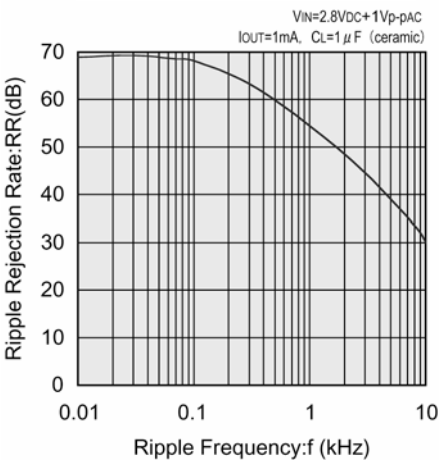


## ■TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

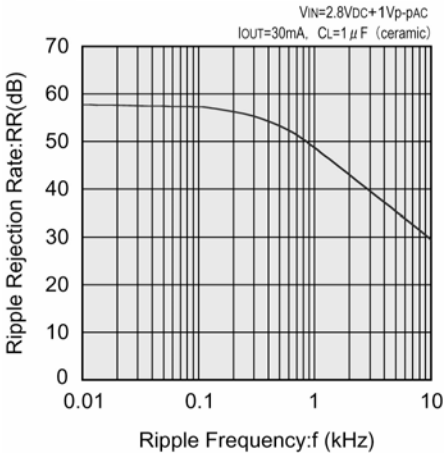
●XC6202P182 (Continued)

(11) Ripple Rejection Rate

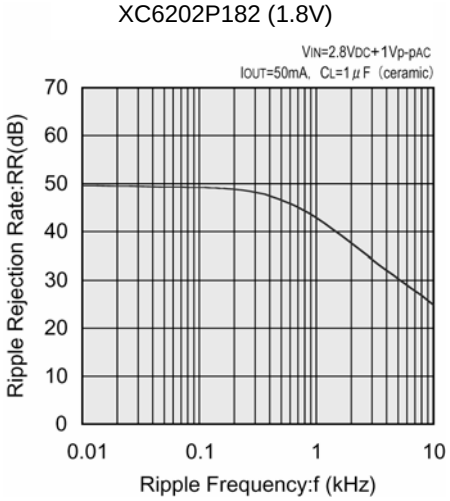
XC6202P182 (1.8V)




XC6202P182 (1.8V)




XC6202P182 (1.8V)

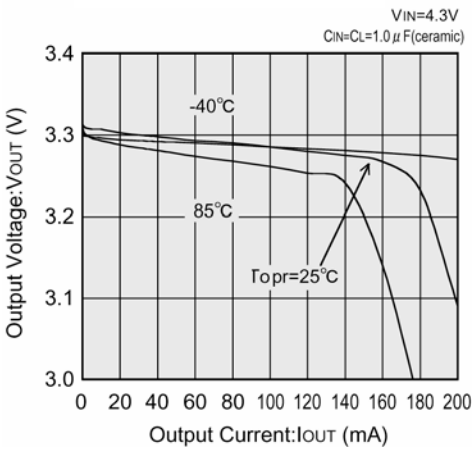


# ■TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

●XC6202P332

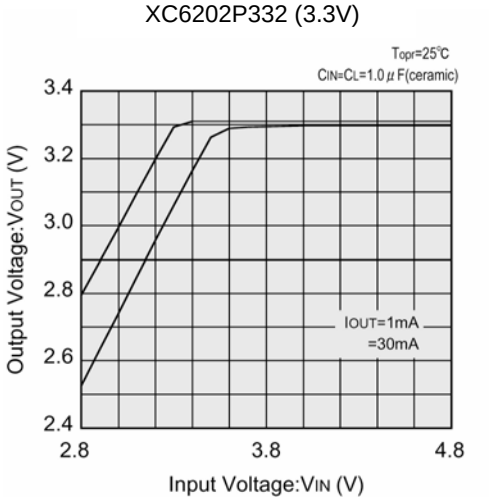
(1) Output Voltage vs. Output Current

XC6202P332 (3.3V)

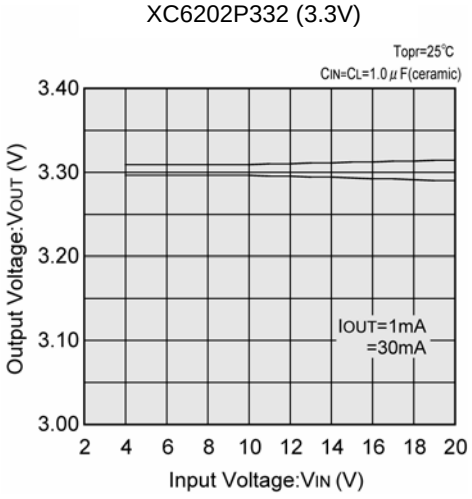



(2) Output Voltage vs. Input Voltage

XC6202P332 (3.3V)

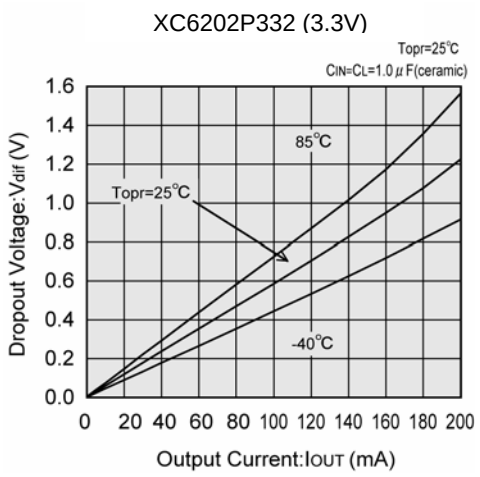



XC6202P332 (3.3V)




(3) Dropout Voltage vs. Output Current

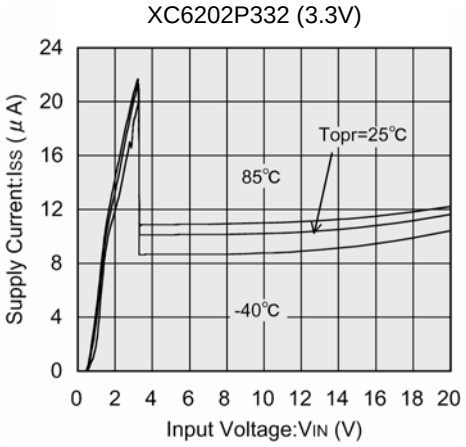
XC6202P332 (3.3V)

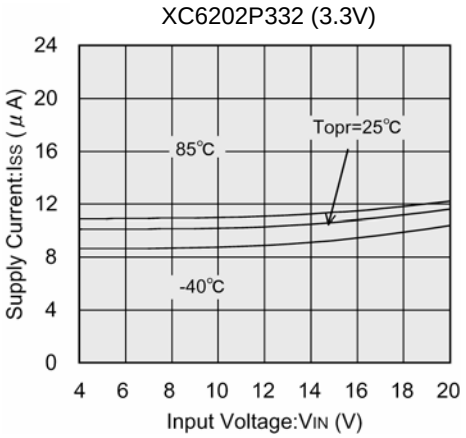


## ■TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

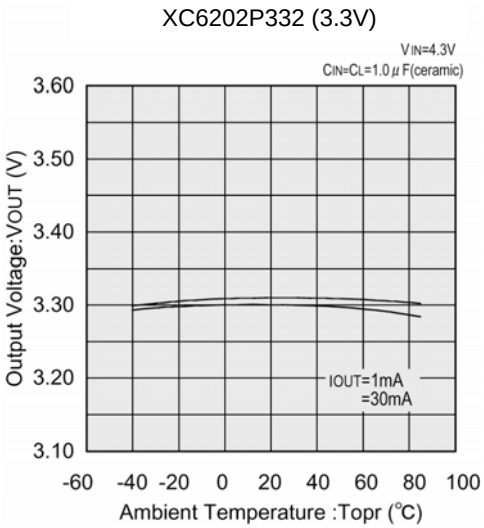
●XC6202P332 (Continued)

(4) Supply Current vs. Input Voltage

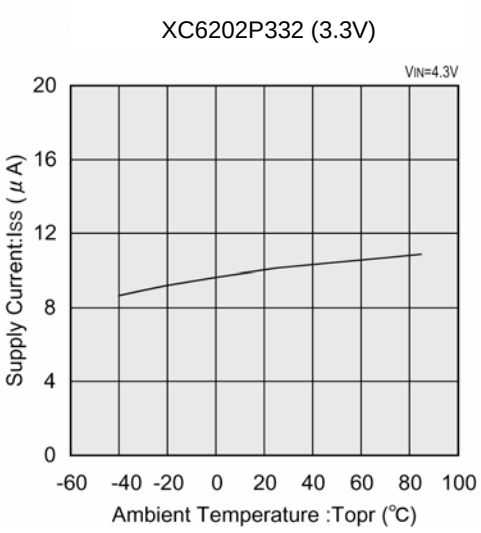


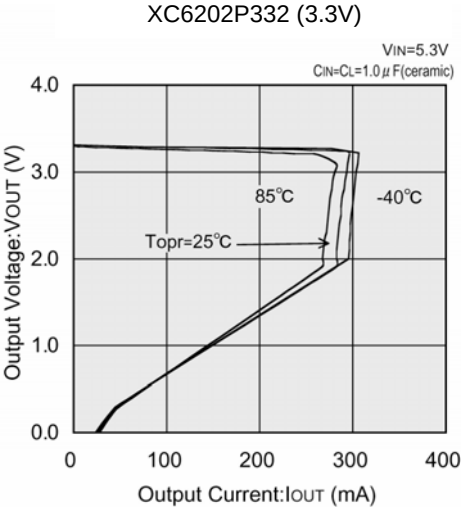

(5) Output Voltage vs. Ambient Temperature




(6) Supply Current vs. Ambient Temperature




(7) Current Limiter Circuit

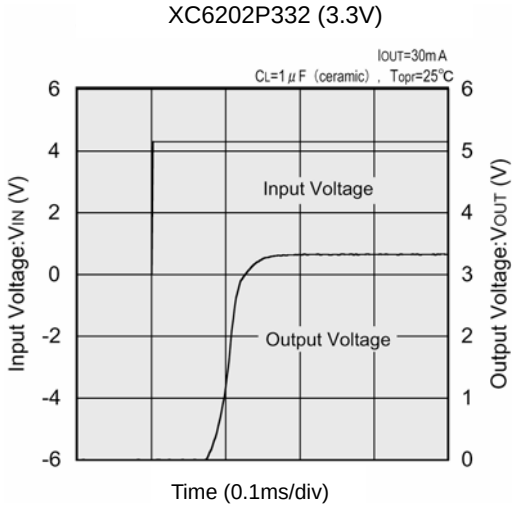


# ■TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

●XC6202P332 (Continued)

(8) Input Transient Response 1

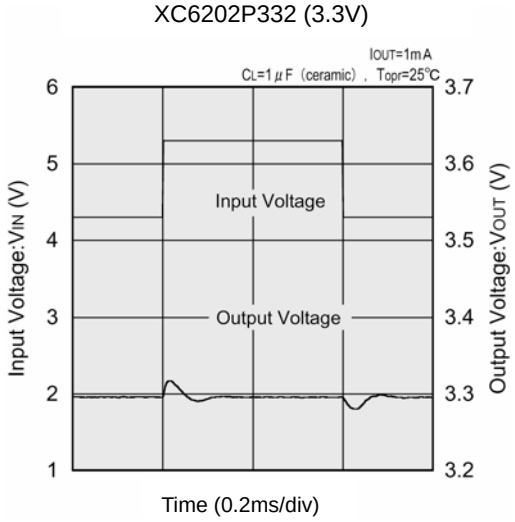
XC6202P332 (3.3V)




Time (0.1ms/div)

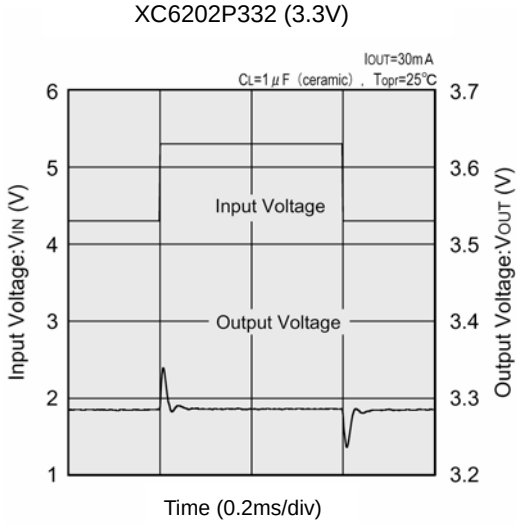
(9) Input Transient Response 2

XC6202P332 (3.3V)




Time (0.2ms/div)

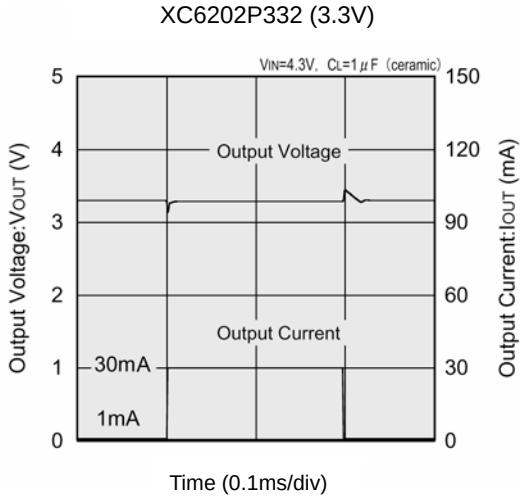
XC6202P332 (3.3V)




Time (0.2ms/div)

(10) Load Transient Response

XC6202P332 (3.3V)



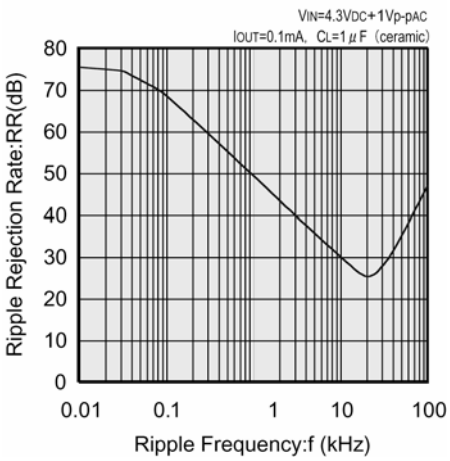

Time (0.1ms/div)

## ■TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

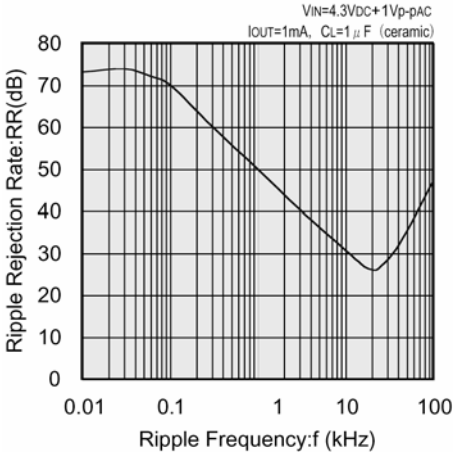
●XC6202P332 (Continued)

(11) Ripple Rejection Rate

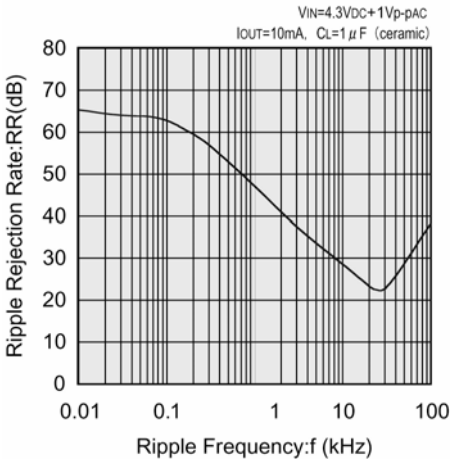
XC6202P332 (3.3V)



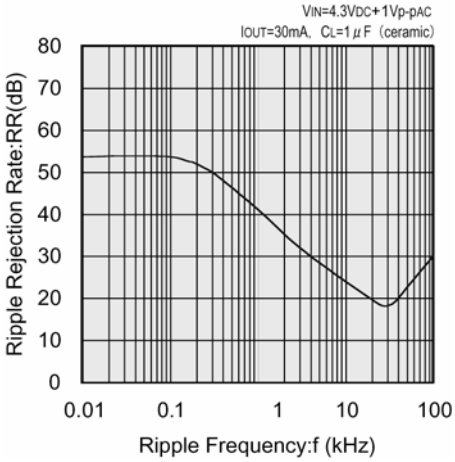

XC6202P332 (3.3V)



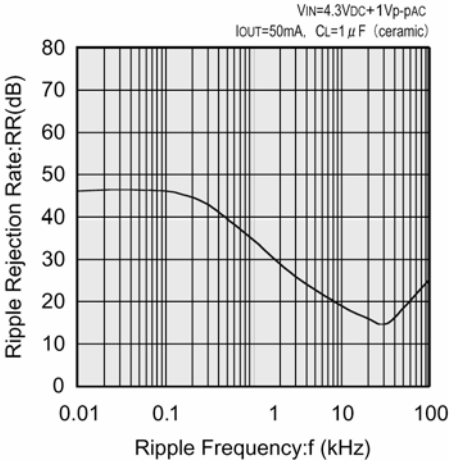

XC6202P332 (3.3V)




XC6202P332 (3.3V)




XC6202P332 (3.3V)

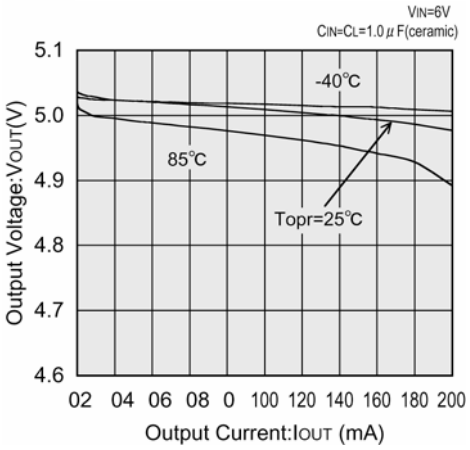


# ■TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

●XC6202P502

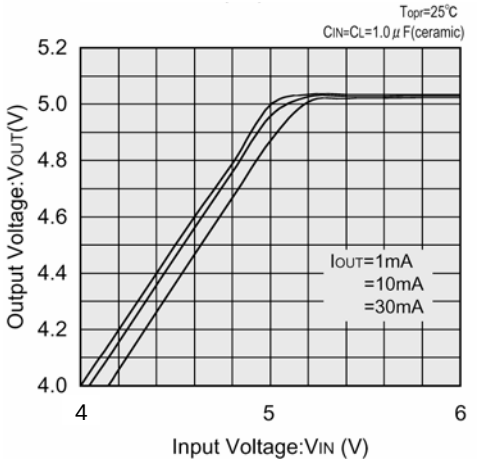
(1) Output Voltage vs. Output Current

XC6202P502 (5.0V)

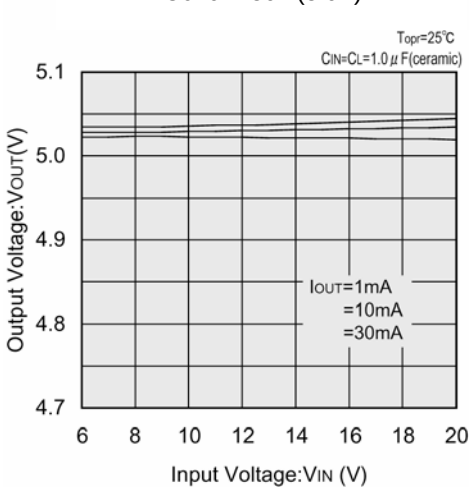



(2) Output Voltage vs. Input Voltage

XC6202P502 (5.0V)

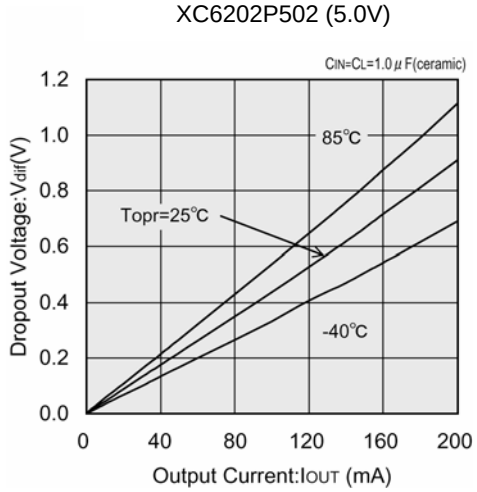



XC6202P502 (5.0V)




(3) Dropout Voltage vs. Output Current

XC6202P502 (5.0V)

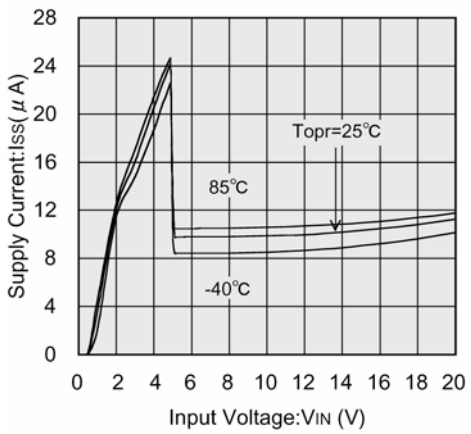


## ■TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

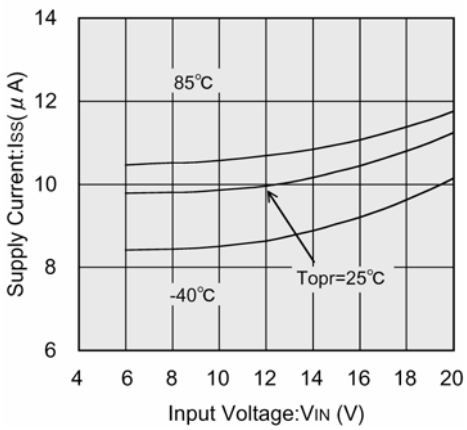
●XC6202P502 (Continued)

(4) Supply Current vs. Input Voltage

XC6202P502 (5.0V)

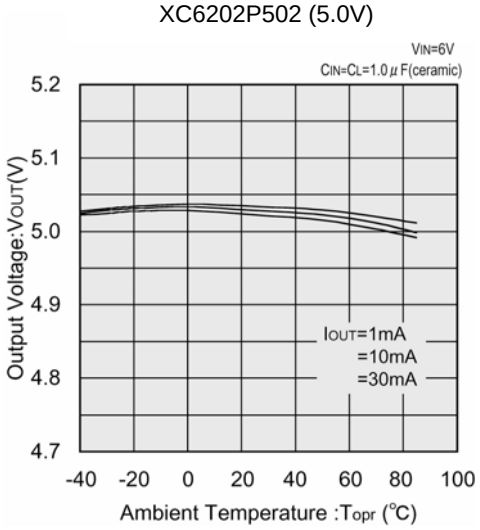



XC6202P502 (5.0V)



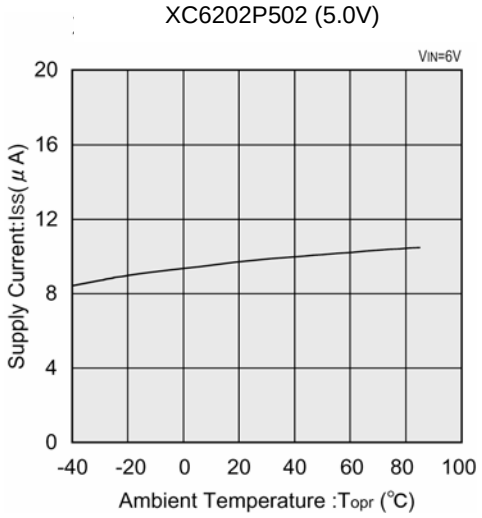

(5) Output Voltage vs. Ambient Temperature

XC6202P502 (5.0V)



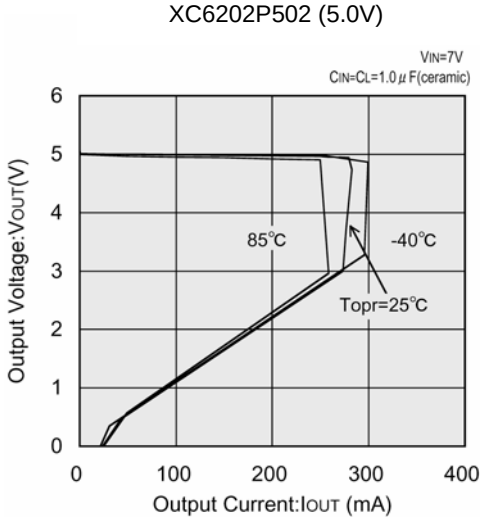

(6) Supply Current vs. Ambient Temperature

XC6202P502 (5.0V)




(7) Current Limiter Circuit

XC6202P502 (5.0V)

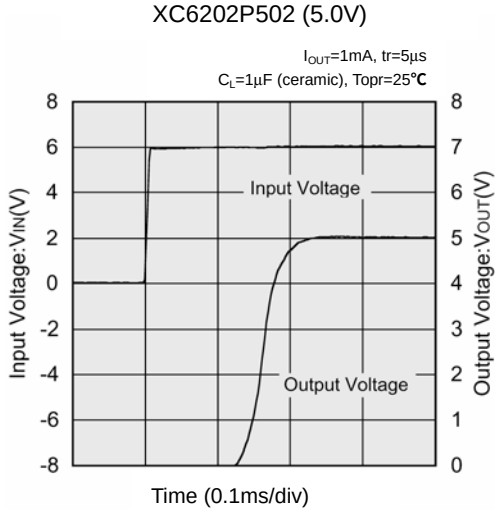


# ■TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

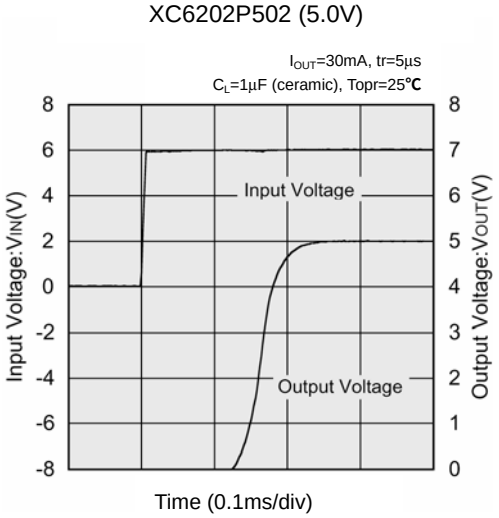
●XC6202P502 (Continued)

(8) Input Transient Response 1

XC6202P502 (5.0V)

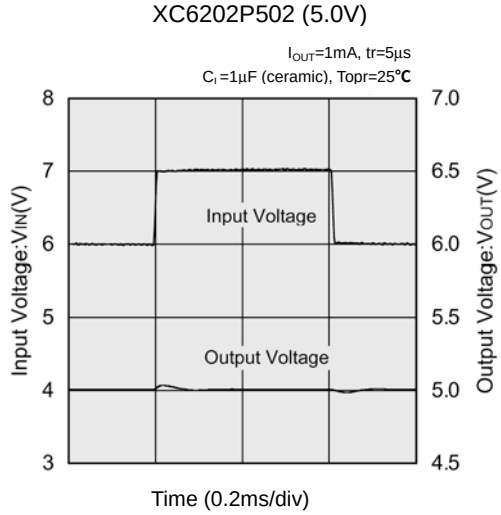



XC6202P502 (5.0V)

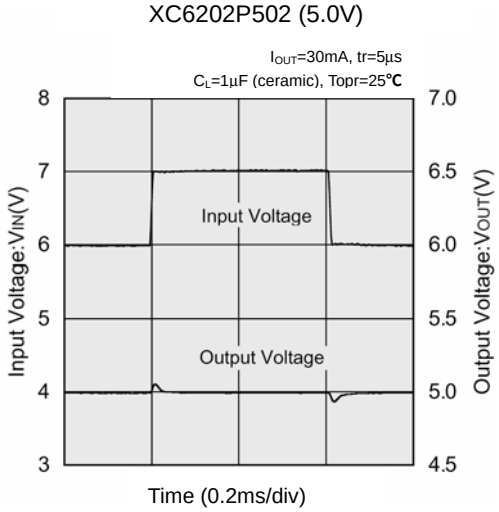



(9) Input Transient Response 2

XC6202P502 (5.0V)

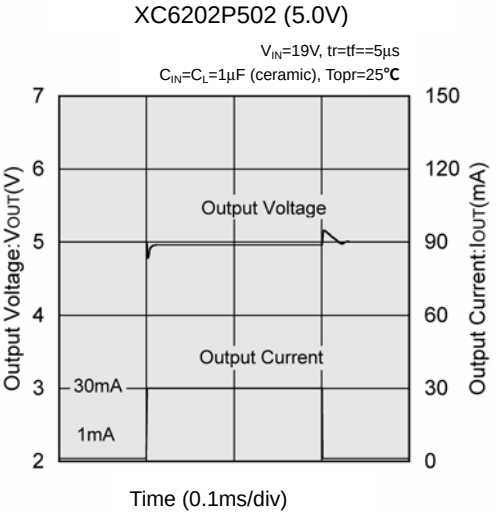



XC6202P502 (5.0V)




(10) Load Transient Response

XC6202P502 (5.0V)

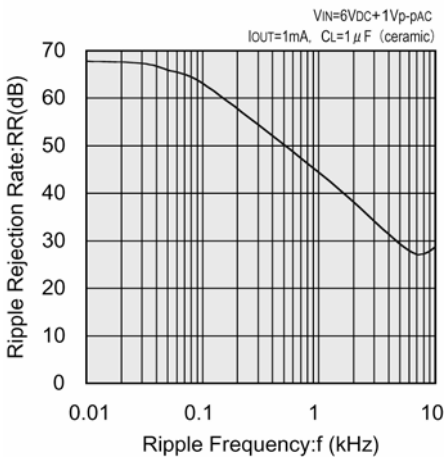


## ■TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

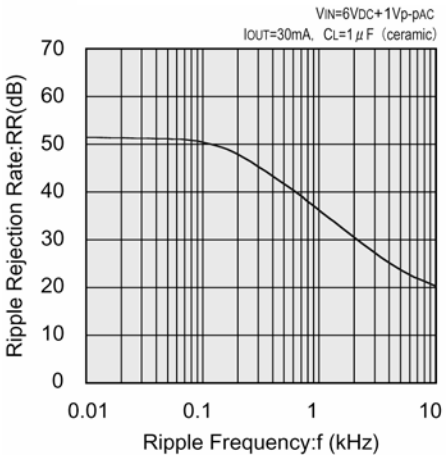
●XC6202P502 (Continued)

(11) Ripple Rejection Rate

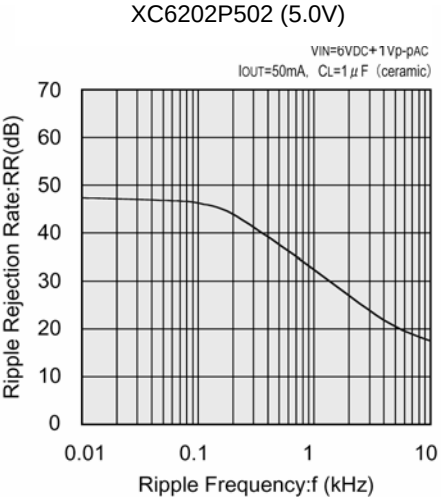
XC6202P502 (5.0V)




XC6202P502 (5.0V)




XC6202P502 (5.0V)

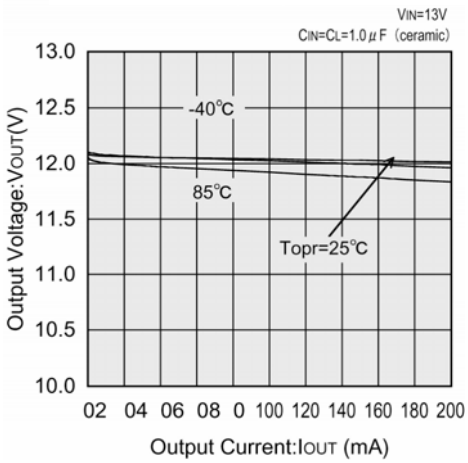


# ■TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

●XC6202PC02

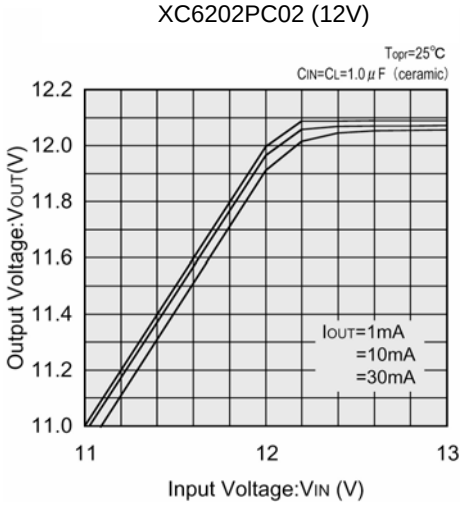
(1) Output Voltage vs. Output Current

XC6202PC02 (12V)

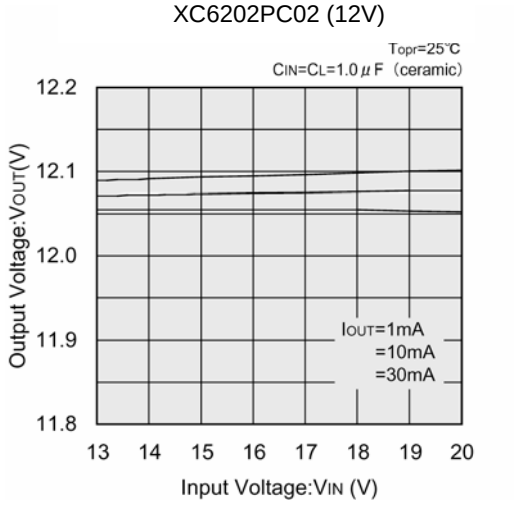



(2) Output Voltage vs. Input Voltage

XC6202PC02 (12V)

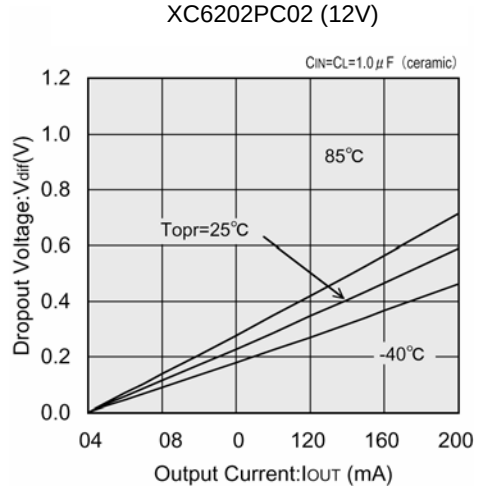



XC6202PC02 (12V)




(3) Dropout Voltage vs. Output Current

XC6202PC02 (12V)

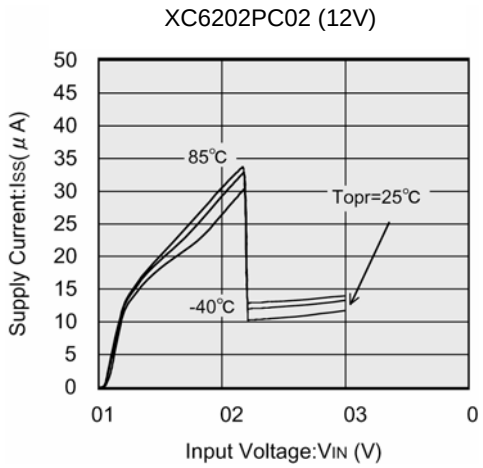


## ■TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

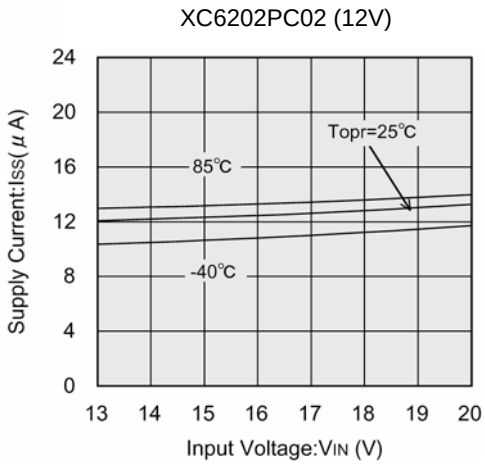
●XC6202PC02 (Continued)

(4) Supply Current vs. Input Voltage

XC6202PC02 (12V)

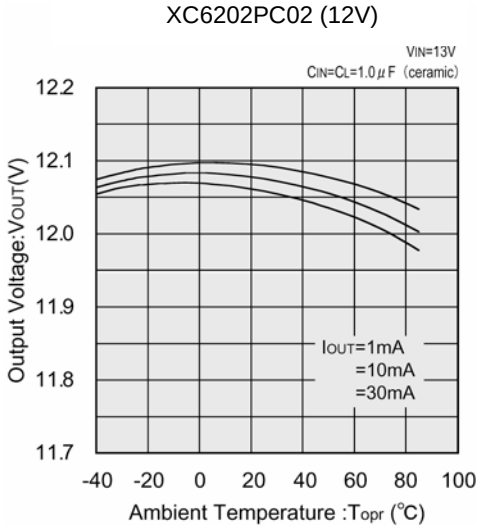



XC6202PC02 (12V)



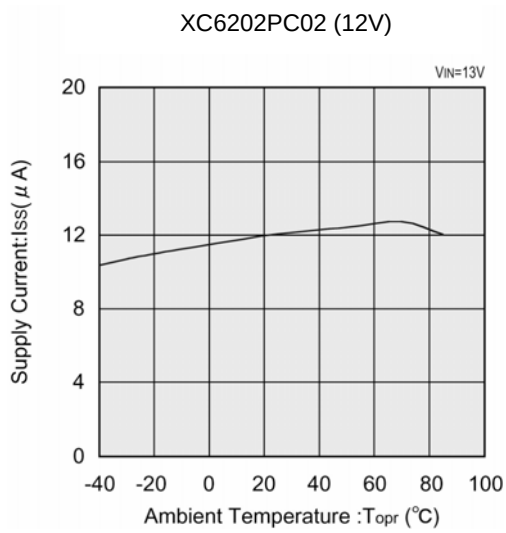

(5) Output Voltage vs. Ambient Temperature

XC6202PC02 (12V)



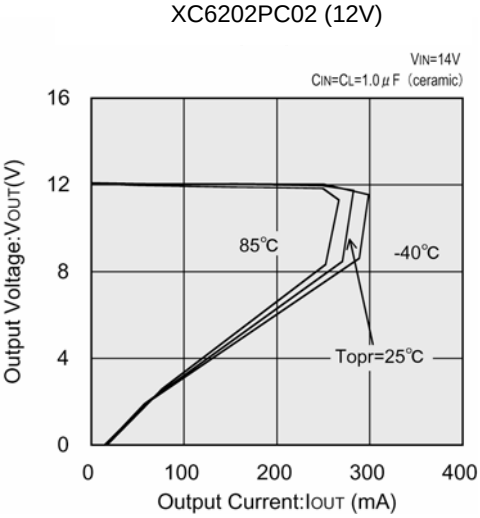

(6) Supply Current vs. Ambient Temperature

XC6202PC02 (12V)




(7) Current Limiter Circuit

XC6202PC02 (12V)



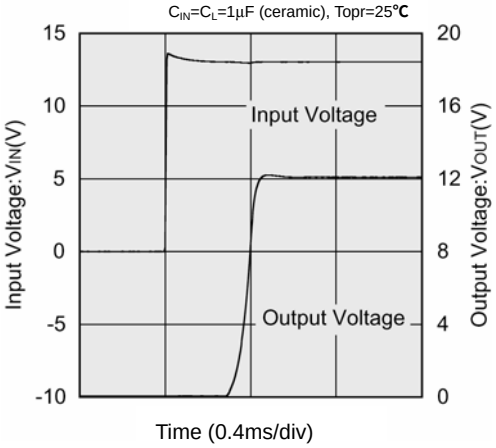
# ■TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

●XC6202PC02 (Continued)

(8) Input Transient Response 1

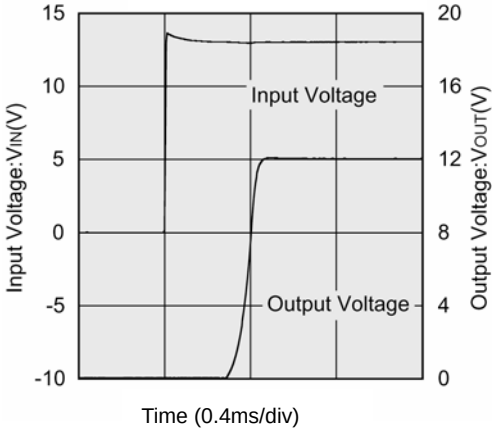
XC6202PC02 (12V)

$I_{OUT}$=1mA, tr=5µs
$C_{IN}$=$C_L$=1µF (ceramic), Topr=25℃




XC6202PC02 (12V)

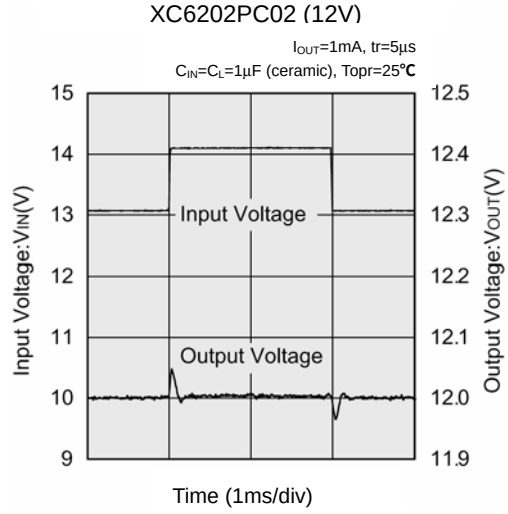
$I_{OUT}$=30mA, tr=5µs
$C_{IN}$=$C_L$=1µF (ceramic), Topr=25℃




(9) Input Transient Response 2

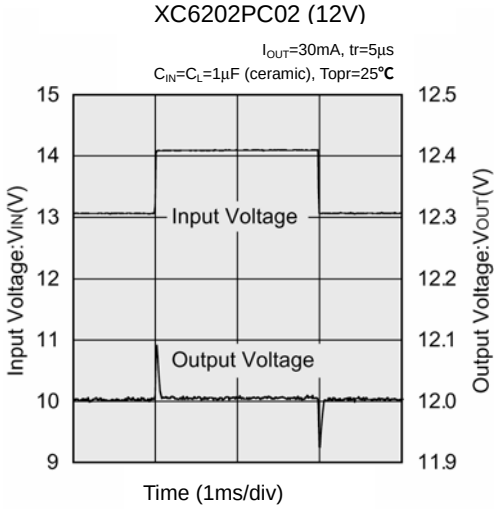
XC6202PC02 (12V)

$I_{OUT}$=1mA, tr=5µs
$C_{IN}$=$C_L$=1µF (ceramic), Topr=25℃




XC6202PC02 (12V)

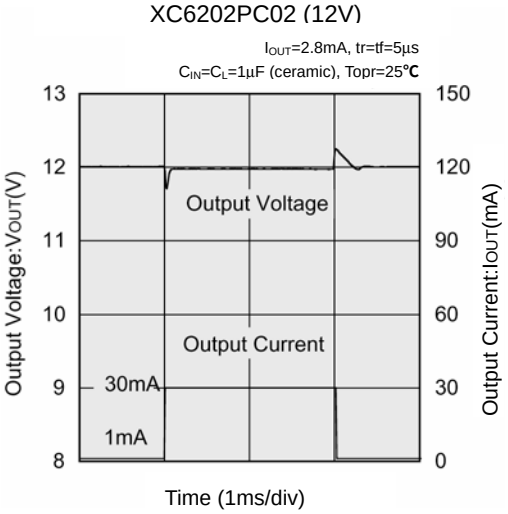
$I_{OUT}$=30mA, tr=5µs
$C_{IN}$=$C_L$=1µF (ceramic), Topr=25℃




(10) Load Transient Response

XC6202PC02 (12V)

$I_{OUT}$=2.8mA, tr=tf=5µs
$C_{IN}$=$C_L$=1µF (ceramic), Topr=25℃

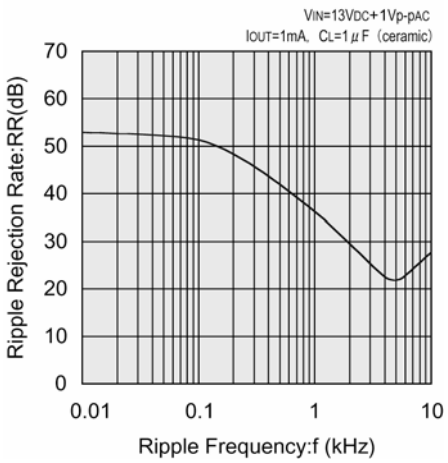


## ■TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

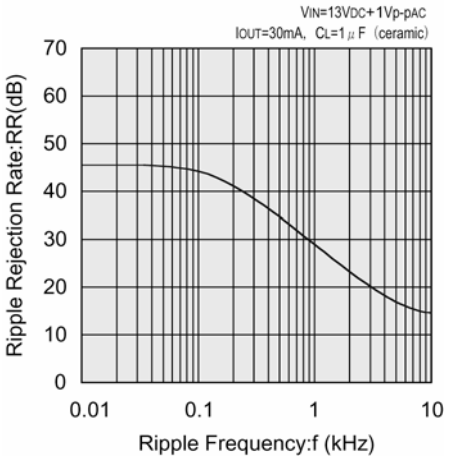
●XC6202PC02 (Continued)

(11) Ripple Rejection Rate

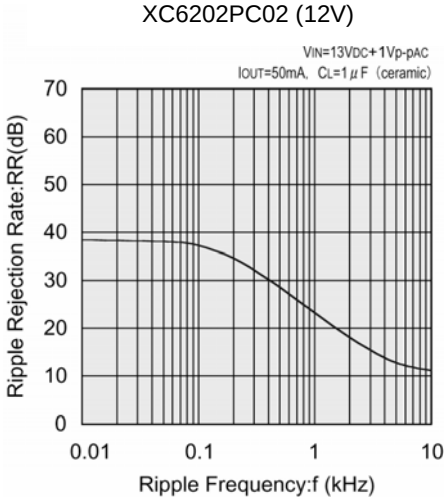
XC6202PC02 (12V)




XC6202PC02 (12V)



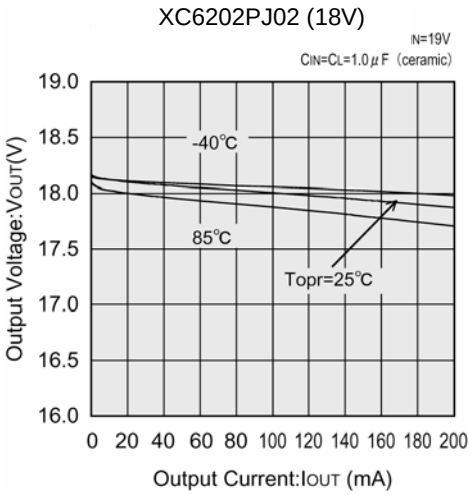

XC6202PC02 (12V)



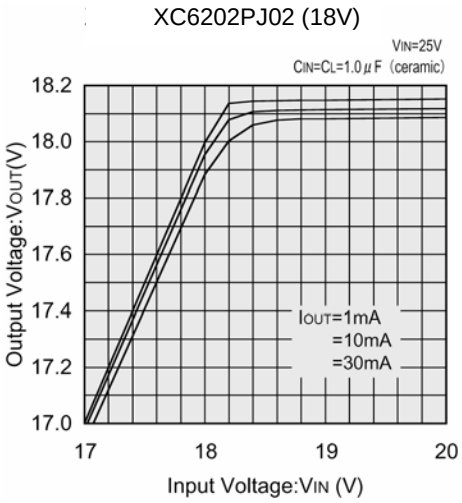
# ■TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

●XC6202PJ02

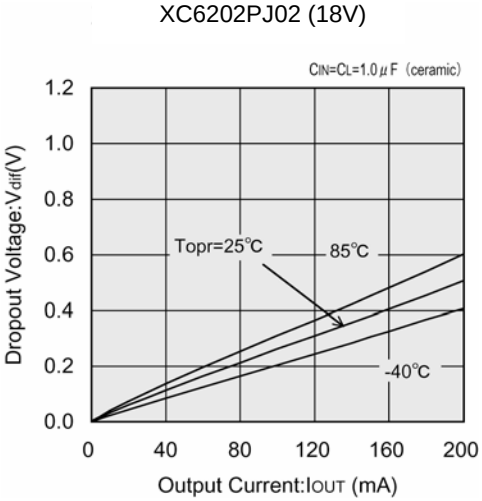
(1) Output Voltage vs. Output Current



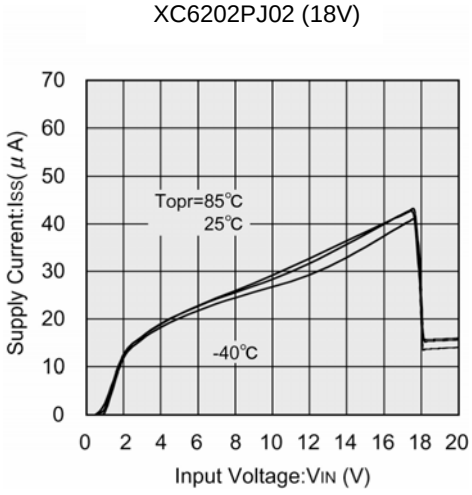

(2) Output Voltage vs. Input Voltage



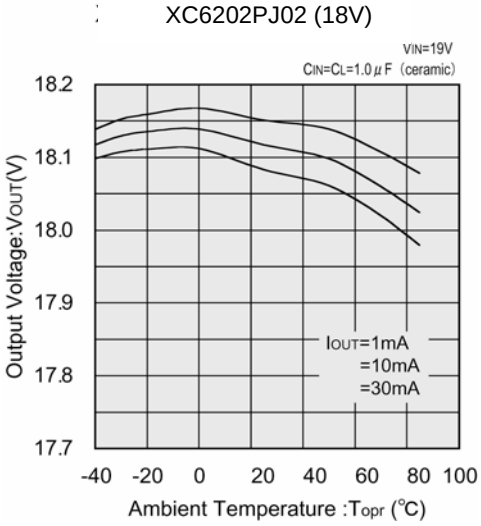

(3) Dropout Voltage vs. Output Current



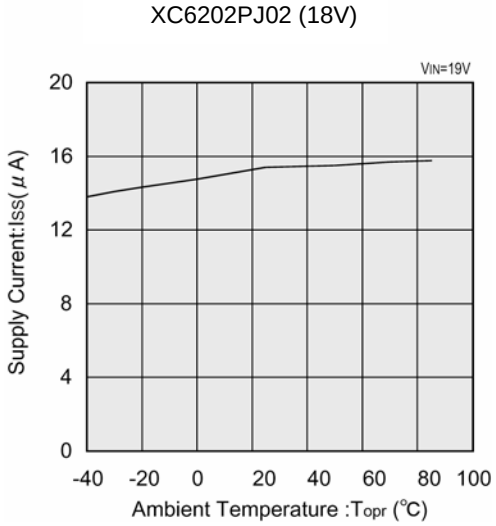

(4) Supply Current vs. Input Voltage




(5) Output Voltage vs. Ambient Temperature




(6) Supply Current vs. Ambient Temperature

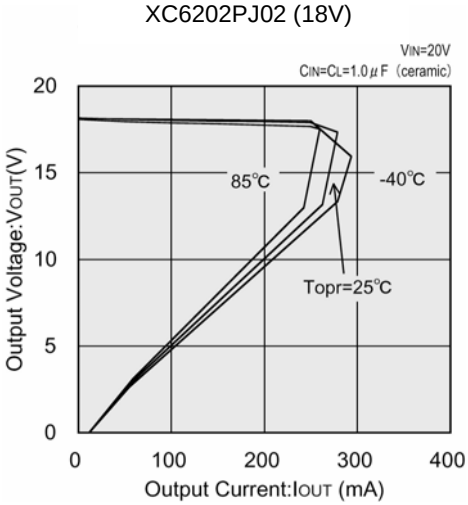


## ■TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

●XC6202PJ02 (Continued)

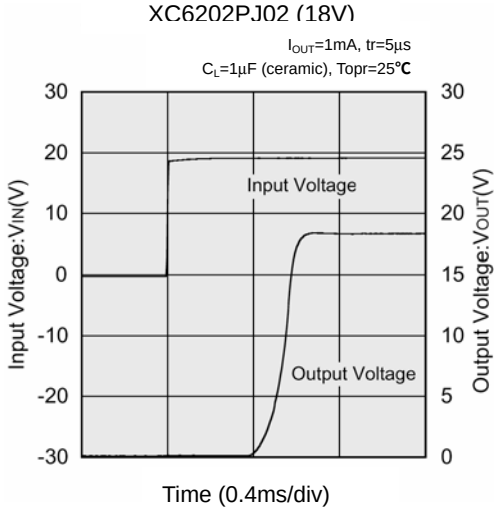
(7) Current Limiter Circuit

XC6202PJ02 (18V)

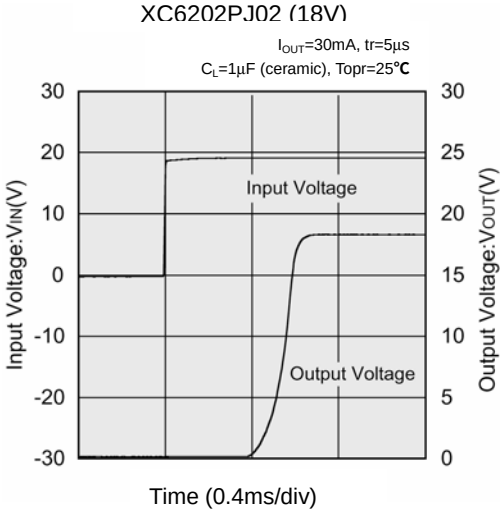



(8) Input Transient Response 1

XC6202PJ02 (18V)

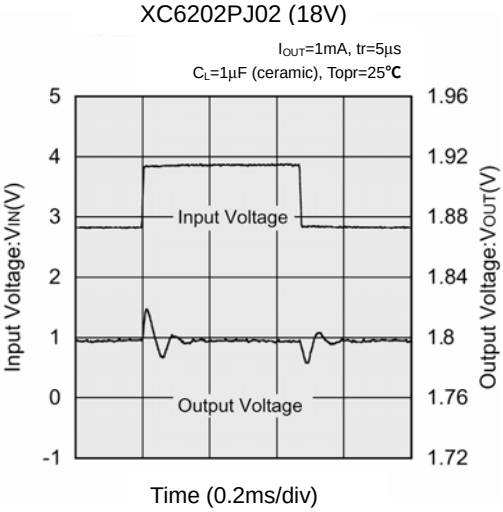



XC6202PJ02 (18V)

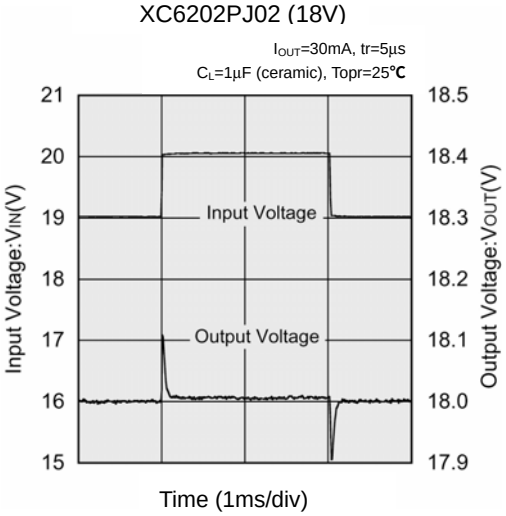



(9) Input Transient Response 2

XC6202PJ02 (18V)




XC6202PJ02 (18V)

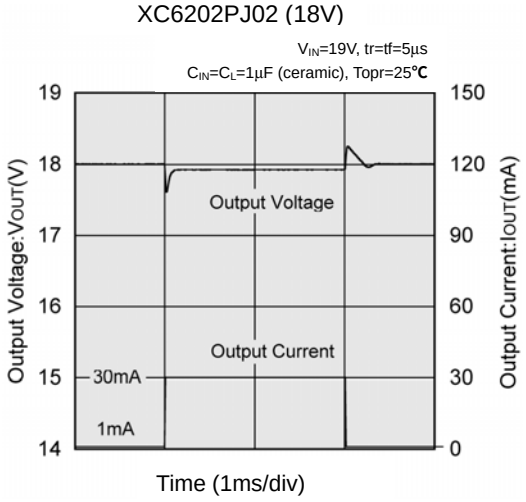


# ■TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

●XC6202PJ02 (Continued)

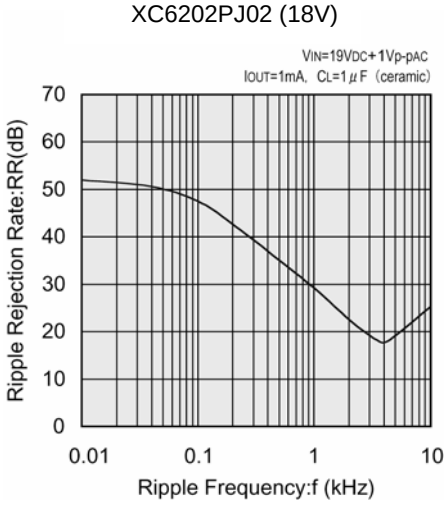
(10) Load Transient Response

XC6202PJ02 (18V)

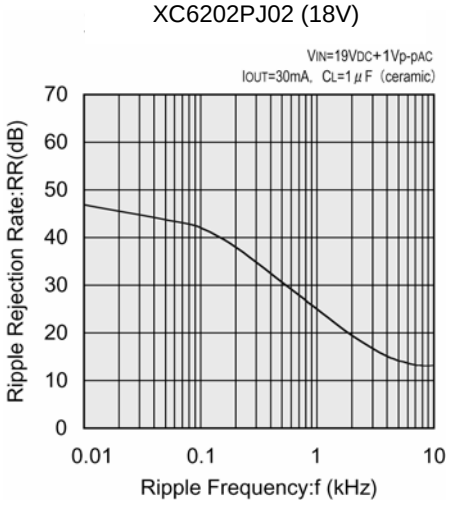



(11) Ripple Rejection Rate

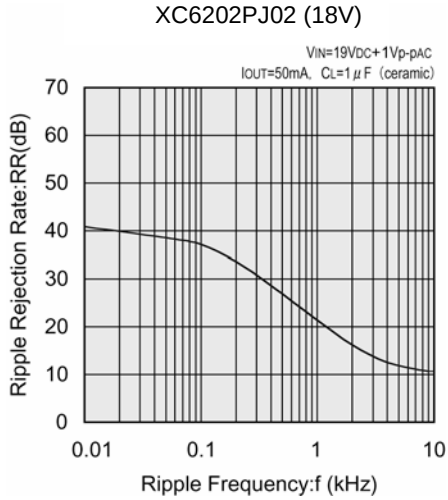
XC6202PJ02 (18V)




XC6202PJ02 (18V)

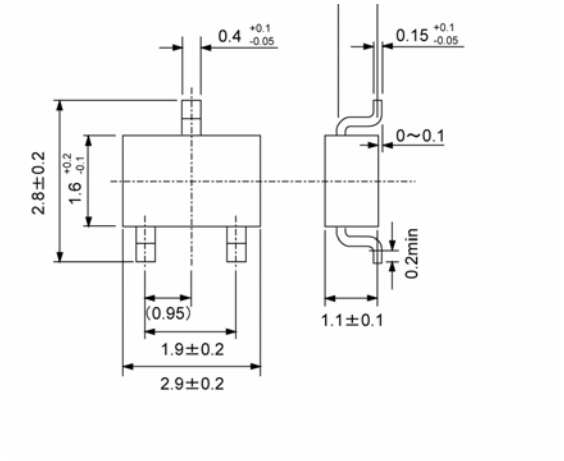



XC6202PJ02 (18V)

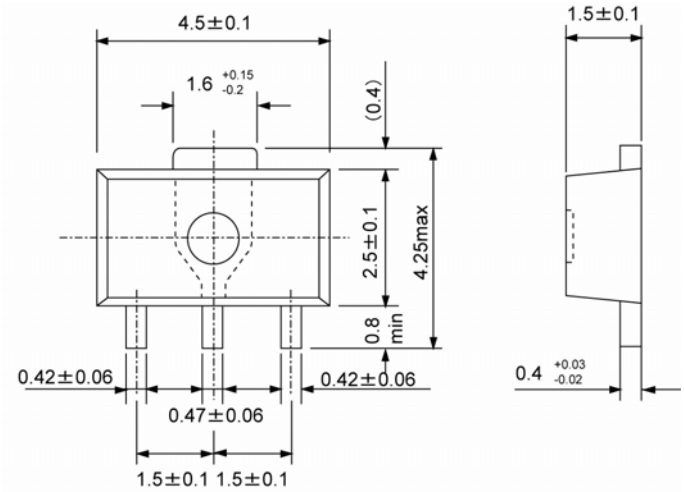


## ■PACKAGING INFORMATION

●SOT-23

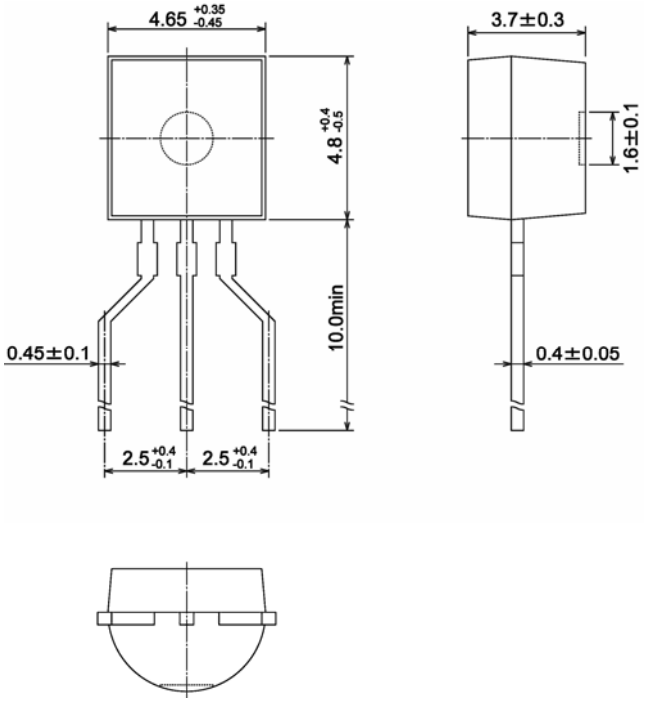



●SOT-89

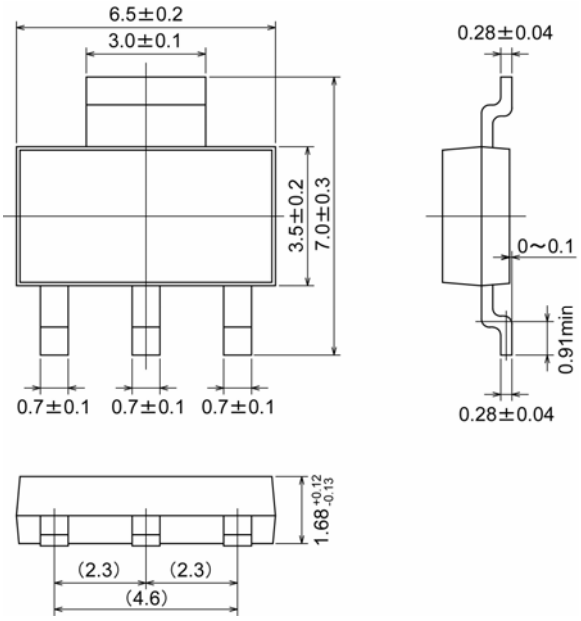


# ■PACKAGING INFORMATION (Continued)

●TO-92

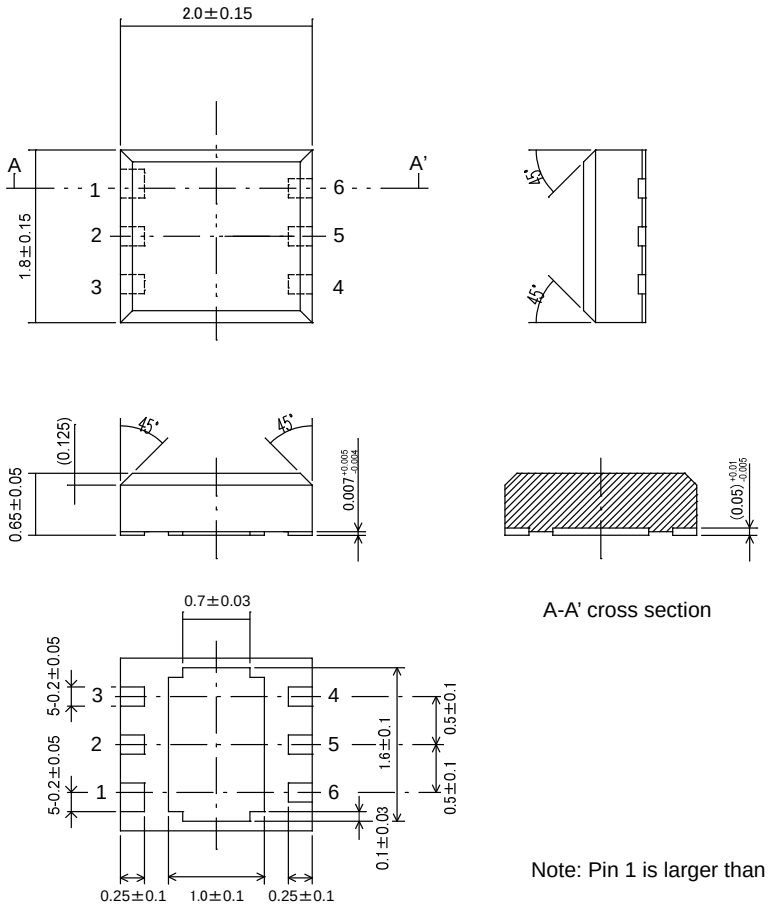



●SOT-223



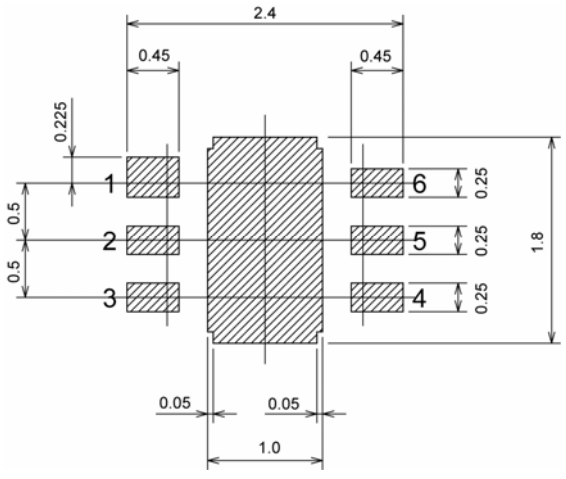
## ■PACKAGING INFORMATION (Continued)

●USP-6B

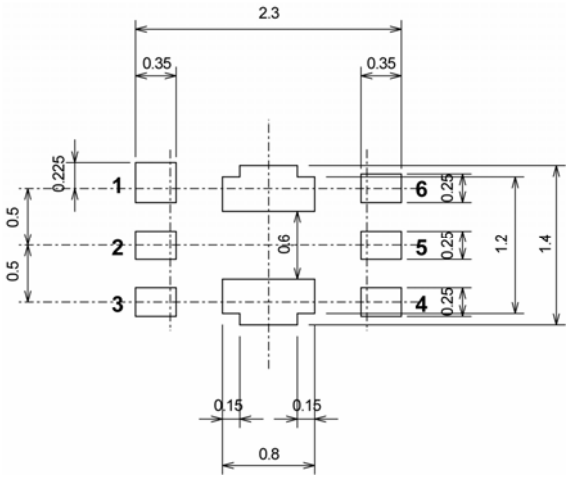



Note: Pin 1 is larger than the other pins

●USP-6B Recommended Pattern Layout

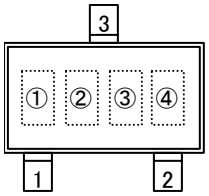



●USP-6B Recommended Metal Mask Design

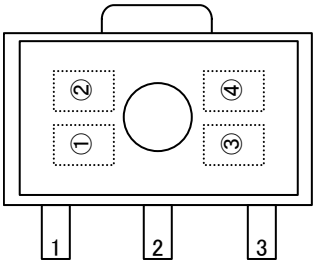


# ■MARKING RULE

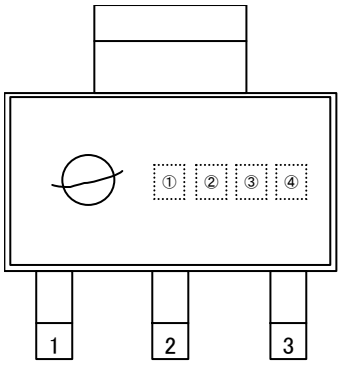
●SOT-23, SOT-89, SOT-223




SOT-23
(TOP VIEW)




SOT-89
(TOP VIEW)




SOT-223
(TOP VIEW)

①Represents product series

| MARK | PRODUCT SERIES |
|---|---|
| 2 | XC6202Pxxxxx |

②Represents output voltage range

| MARK | VOLTAGE (V) | PRODUCT SERIES |
|---|---|---|
| 4 | 0.1 ~ 3.0 | XC6202Pxxxxx |
| 5 | 3.1 ~ 6.0 | |
| 6 | 6.1 ~ 9.0 | |
| 7 | 9.1 ~ 12.0 | |
| 8 | 12.1 ~ 15.0 | |
| 9 | 15.1 ~ 18.0 | |

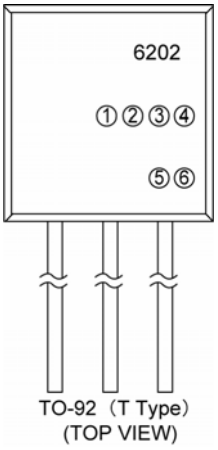
③Represents output voltage

| MARK | VOLTAGE (V) | | | | | | MARK | VOLTAGE (V) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | – | 3.1 | 6.1 | 9.1 | 12.1 | 15.1 | F | – | 4.6 | 7.6 | 10.6 | 13.6 | 16.6 |
| 1 | – | 3.2 | 6.2 | 9.2 | 12.2 | 15.2 | H | – | 4.7 | 7.7 | 10.7 | 13.7 | 16.7 |
| 2 | – | 3.3 | 6.3 | 9.3 | 12.3 | 15.3 | K | 1.8 | 4.8 | 7.8 | 10.8 | 13.8 | 16.8 |
| 3 | – | 3.4 | 6.4 | 9.4 | 12.4 | 15.4 | L | 1.9 | 4.9 | 7.9 | 10.9 | 13.9 | 16.9 |
| 4 | – | 3.5 | 6.5 | 9.5 | 12.5 | 15.5 | M | 2.0 | 5.0 | 8.0 | 11.0 | 14.0 | 17.0 |
| 5 | – | 3.6 | 6.6 | 9.6 | 12.6 | 15.6 | N | 2.1 | 5.1 | 8.1 | 11.1 | 14.1 | 17.1 |
| 6 | – | 3.7 | 6.7 | 9.7 | 12.7 | 15.7 | P | 2.2 | 5.2 | 8.2 | 11.2 | 14.2 | 17.2 |
| 7 | – | 3.8 | 6.8 | 9.8 | 12.8 | 15.8 | R | 2.3 | 5.3 | 8.3 | 11.3 | 14.3 | 17.3 |
| 8 | – | 3.9 | 6.9 | 9.9 | 12.9 | 15.9 | S | 2.4 | 5.4 | 8.4 | 11.4 | 14.4 | 17.4 |
| 9 | – | 4.0 | 7.0 | 10.0 | 13.0 | 16.0 | T | 2.5 | 5.5 | 8.5 | 11.5 | 14.5 | 17.5 |
| A | – | 4.1 | 7.1 | 10.1 | 13.1 | 16.1 | U | 2.6 | 5.6 | 8.6 | 11.6 | 14.6 | 17.6 |
| B | – | 4.2 | 7.2 | 10.2 | 13.2 | 16.2 | V | 2.7 | 5.7 | 8.7 | 11.7 | 14.7 | 17.7 |
| C | – | 4.3 | 7.3 | 10.3 | 13.3 | 16.3 | X | 2.8 | 5.8 | 8.8 | 11.8 | 14.8 | 17.8 |
| D | – | 4.4 | 7.4 | 10.4 | 13.4 | 16.4 | Y | 2.9 | 5.9 | 8.9 | 11.9 | 14.9 | 17.9 |
| E | – | 4.5 | 7.5 | 10.5 | 13.5 | 16.5 | Z | 3.0 | 6.0 | 9.0 | 12.0 | 15.0 | 18.0 |

④Represents production lot number
0 to 9, A to Z reversed character 0 to 9, A to Z repeated. (G, I, J, O, Q, W excepted)

## ■MARKING RULE(Continued)

●TO-92 (T TYPE)




①Represents type of regulator

| MARK | PRODUCT SERIES |
|---|---|
| P | XC6202Pxxxxx |

②Represents integer of the output voltage

| MARK | VOLTAGE (V) | PRODUCT SERIES | MARK | VOLTAGE (V) | PRODUCT SERIES |
|---|---|---|---|---|---|
| 1 | 1.x | XC6202P1xxxx | A | 10.x | XC6202PAxxxx |
| 2 | 2.x | XC6202P2xxxx | B | 11.x | XC6202PBxxxx |
| 3 | 3.x | XC6202P3xxxx | C | 12.x | XC6202PCxxxx |
| 4 | 4.x | XC6202P4xxxx | D | 13.x | XC6202PDxxxx |
| 5 | 5.x | XC6202P5xxxx | E | 14.x | XC6202PExxxx |
| 6 | 6.x | XC6202P6xxxx | F | 15.x | XC6202PFxxxx |
| 7 | 7.x | XC6202P7xxxx | G | 16.x | XC6202PGxxxx |
| 8 | 8.x | XC6202P8xxxx | H | 17.x | XC6202PHxxxx |
| 9 | 9.x | XC6202P9xxxx | J | 18.x | XC6202PJxxxx |

③Represents decimal number of output voltage

| MARK | VOLTAGE (V) | PRODUCT SERIES |
|---|---|---|
| 3 | x.3 | XC6202Px3xxx |
| 0 | x.0 | XC6202Px0xxx |

④Represents detect voltage accuracy

| MARK | DETECT VOLTAGE ACCURACY | PRODUCT SERIES |
|---|---|---|
| 2 | Within ±2% | XC6202Pxx2xx |
| 1 | Within ±1% | XC6202Pxx1xx |

⑤Represents a least significant digit of production year

| MARK | PRODUCTION YEAR |
|---|---|
| 3 | 2003 |
| 4 | 2004 |

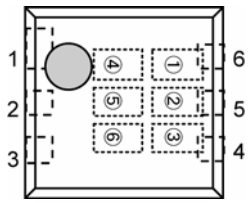
⑥Represents production lot number

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

Note: No character inversion used.

# ■MARKING RULE (Continued)

●USP-6B




USP-6B
(TOP VIEW)

①②Represents product series

| MARK | | PRODUCT SERIES |
|---|---|---|
| ① | ② | |
| 0 | 2 | XC6202PxxxDx |

③Represents type of regulator

| MARK | PRODUCT SERIES |
|---|---|
| P | XC6202Pxxxxx |

④Represents integer of the output voltage

| MARK | VOLTAGE (V) | PRODUCT SERIES | MARK | VOLTAGE (V) | PRODUCT SERIES |
|---|---|---|---|---|---|
| 1 | 1.x | XC6202P1xxDx | A | 10.x | XC6202PAxxDx |
| 2 | 2.x | XC6202P2xxDx | B | 11.x | XC6202PBxxDx |
| 3 | 3.x | XC6202P3xxDx | C | 12.x | XC6202PCxxDx |
| 4 | 4.x | XC6202P4xxDx | D | 13.x | XC6202PDxxDx |
| 5 | 5.x | XC6202P5xxDx | E | 14.x | XC6202PExxDx |
| 6 | 6.x | XC6202P6xxDx | F | 15.x | XC6202PFxxDx |
| 7 | 7.x | XC6202P7xxDx | G | 16.x | XC6202PGxxDx |
| 8 | 8.x | XC6202P8xxDx | H | 17.x | XC6202PHxxDx |
| 9 | 9.x | XC6202P9xxDx | J | 18.x | XC6202PJxxDx |

⑤Represents decimal number of output voltage

| MARK | VOLTAGE (V) | PRODUCT SERIES |
|---|---|---|
| 3 | X.3 | XC6202Px3xDx |
| 0 | X.0 | XC6202Px0xDx |

⑥Represents production lot number
0 to 9, A to Z repeated (G, I, J, O, Q, W excepted)
Note: No character inversion used.

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