

Positive Voltage Regulator with (Output ON/OFF)

■ GENERAL DESCRIPTION

The XC62H series are highly precise, low power consumption, positive voltage regulators, manufactured using CMOS and laser trimming technologies. The series consists of a high precision voltage reference, an error correction circuit, and an output driver with current limitation.

By way of the CE function, with output turned off, the series enters standby. In the stand-by mode, power consumption is greatly reduced.

SOT-25 (150mW), SOT-89-5 (500mW) and USP-6B (120mW) packages are available.

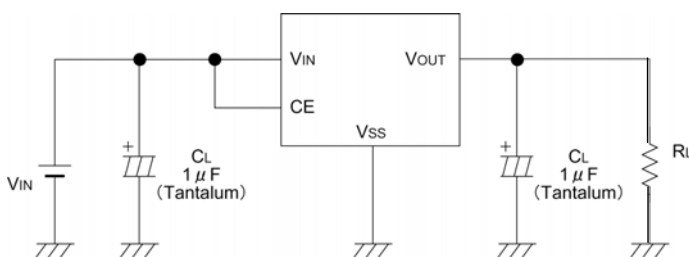
■ APPLICATIONS

- Multi-function power supplies
- Voltage supplies for cellular phones
- Digital still cameras / Camcorders
- Note PC / Tablet PC

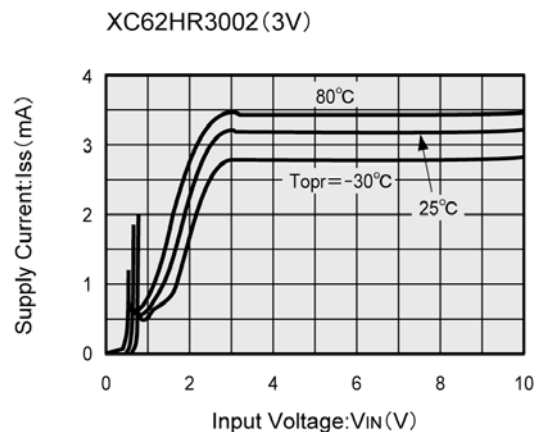
■ FEATURES

- Maximum Output Current** : 165mA (within max Pd, $V_{OUT}=3.0V$)
- Output Voltage Range** : 2.0V ~ 6.0V (0.1V increments)
(1.5V ~ 1.9V semi-custom)
- Highly Accurate** : $\pm 2\%$
($\pm 1\%$ for semi-custom products)
- Low Power Consumption** : 3 μA (TYP.) ($V_{OUT}=3V$, Output enabled)
: 0.1 μA (TYP.) (Output disabled)
- Output Voltage Temperature Characteristics** : $\pm 100ppm/^\circ C$ (TYP.)
- Line Regulation** : 0.2% / V (TYP.)
- CMOS Low Power Consumption**
- Dropout Voltage** : 0.18V @ 60mA
: 0.58V @ 160mA
- Packages** : SOT-25
SOT-89-5
USP-6B
- Environmentally Friendly** : EU RoHS Compliant, Pb Free

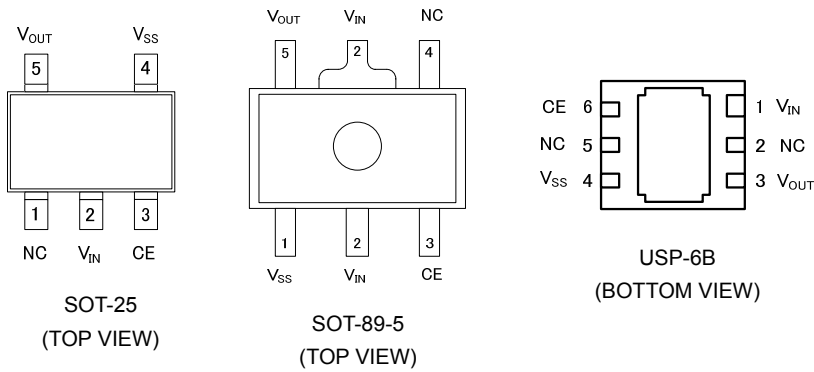
■ TYPICAL APPLICATION CIRCUIT



■ TYPICAL PERFORMANCE CHARACTERISTICS



PIN CONFIGURATION



*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 VIN (No.1) pin.

PIN ASSIGNMENT

| PIN NUMBER | | | PIN NAME | FUNCTIONS |
|------------|----------|--------|------------------|--------------------------|
| SOT-25 | SOT-89-5 | USP-6B | | |
| 1 | 4 | 2, 5 | NC | No Connection |
| 2 | 2 | 1 | V _{IN} | Supply Voltage Input |
| 3 | 3 | 6 | CE | ON/OFF Chip Enable |
| 4 | 1 | 4 | V _{SS} | Ground |
| 5 | 5 | 3 | V _{OUT} | Regulated Output Voltage |

FUNCTIONS

| CE | OPERATION |
|------|-----------------|
| L | OFF |
| H | ON |
| OPEN | Undefined state |

PRODUCT CLASSIFICATION

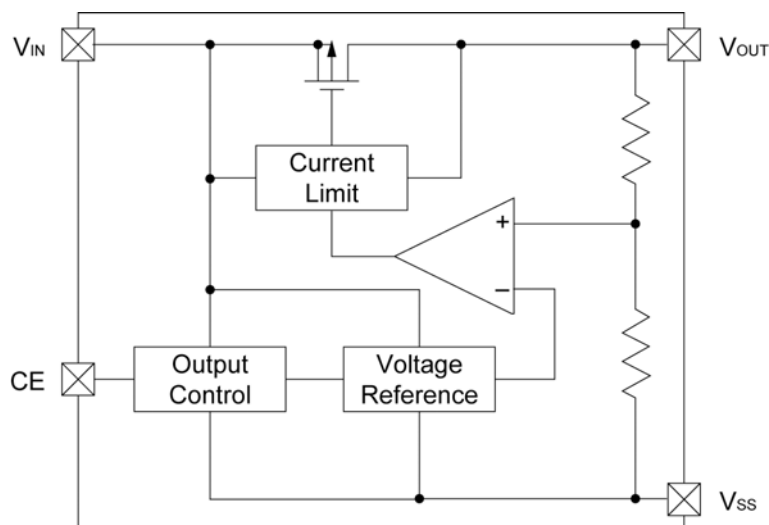
Ordering Information

XC62H①②③④⑤⑥⑦-⑧^(*)

| DESIGNATOR | ITEM | SYMBOL | DESCRIPTION |
|------------|-----------------------------|--------|---|
| ① | CE Pin Logic | R | Positive |
| ②③ | Output Voltage | 20~60 | e.g. V _{OUT} 3.0V → ②=3, ③=0 V _{OUT} 5.0V → ②=5, ③=0 |
| ④ | Temperature Characteristics | 0 | ± 100ppm (TYP.) |
| ⑤ | Output Voltage Accuracy | 1 | ± 1% (semi-custom) |
| | | 2 | ± 2% |
| ⑥⑦-⑧ | Packages (Order Unit) | MR | SOT-25 (3,000/Reel) |
| | | MR-G | SOT-25 (3,000/Reel) |
| | | PR | SOT-89-5 (1,000/Reel) |
| | | PR-G | SOT-89-5 (1,000/Reel) |
| | | DR | USP-6B (3,000/Reel) |
| | | DR-G | USP-6B (3,000/Reel) |

^(*) The "-G" suffix denotes Halogen and Antimony free as well as being fully EU RoHS compliant.

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATINGS

Ta=25°C

| PARAMETER | SYMBOL | RATINGS | UNITS |
|-------------------------------|------------------|---|-------|
| Input Voltage | V _{IN} | 12.0 | V |
| Output Current | I _{OUT} | 500 ^(*) | mA |
| Output Voltage | V _{OUT} | V _{SS} -0.3 ~ V _{IN} +1.3 | V |
| CE Input Voltage | V _{CE} | V _{SS} -0.3 ~ V _{IN} +1.3 | V |
| Power Dissipation | SOT-25 | 150 | mW |
| | SOT-89-5 | 500 | |
| | USP-6B | 120 | |
| Operating Ambient Temperature | T _{opr} | -30 ~ +80 | °C |
| Storage Temperature | T _{stg} | -40 ~ +125 | °C |

(*) Please use within the range of $I_{OUT} \leq P_d / (V_{IN} - V_{OUT})$

ELECTRICAL CHARACTERISTICS

● Low Voltage

Ta=25°C

| PARAMETER | SYMBOL | CONDITIONS | MIN | TYP | MAX | UNITS | CIRCUIT |
|--|---|---|--------------------------------|--------------|--------------------------------|---------|---------|
| Output Voltage | $V_{OUT(E)}^{(*2)}$ | $V_{IN}=V_{OUT(T)}^{(*1)}+1.0V$ $I_{OUT}=0.5mA$ | $\times 0.98$ $E1-1^{(*7)}$ | $V_{OUT(T)}$ | $\times 1.02$ $E1-2^{(*7)}$ | V | 1 |
| Maximum Output Current | I_{OUTmax} | $V_{IN}=V_{OUT(T)}+1.0V$ $V_{OUT(E)} \geq V_{OUT(T)} \times 0.9$ | $E2^{(*7)}$ | | | mA | 1 |
| Load Regulation | ΔV_{OUT} | $V_{IN}=V_{OUT(T)}+1.0V$ $1mA \leq I_{OUT} \leq 30mA$ | | 15 | 40 | mV | 1 |
| Dropout Voltage ^(*3) | Vdif | Output Voltage: 1.5 ~ 1.7V $I_{OUT}=10mA, V_{CE}=V_{IN}$ | 1.0 | | 500 | mV | 1 |
| | | Output Voltage: 1.8 ~ 1.9V $I_{OUT}=20mA, V_{CE}=V_{IN}$ | 1.0 | | 300 | | |
| Supply Current 1 | I_{SS1} | $V_{IN}=V_{CE}=V_{OUT(T)}+1.0V$ | 2.0 | | 6.8 | μA | 2 |
| Supply Current 2 | I_{SS2} | $V_{IN}=V_{OUT(T)}+1.0V, V_{CE}=V_{SS}$ | | | 0.1 | μA | 2 |
| Line Regulation | $\frac{\Delta V_{OUT}}{(\Delta V_{IN} \cdot V_{OUT})}$ | $I_{OUT}=0.5mA$ $V_{OUT(T)}+1.0V \leq V_{IN} \leq 10V$ | | 0.15 | 0.25 | %/V | 1 |
| Input Voltage | V_{IN} | | 2 | | 10 | V | - |
| Output Voltage Temperature Characteristics | $\frac{\Delta V_{OUT}}{(\Delta T_{opr} \cdot V_{OUT})}$ | $I_{OUT}=0.5mA$ $-30^{\circ}C \leq T_{opr} \leq 80^{\circ}C$ | | ± 100 | | ppm/°C | 1 |
| CE "High" Voltage | V_{CEH} | | 1.5 | | | V | 1 |
| CE "Low" Voltage | V_{CEL} | | | | 0.25 | V | 1 |
| CE "High" Current | I_{CEH} | $V_{CE}=V_{IN}$ | | | 0.1 | μA | 2 |
| CE "Low" Current | 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: $Vdif = \{V_{IN1}^{(*5)} - V_{OUT1}^{(*4)}\}$

*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.

*6: Over $V_{IN}=2.0V$ of input voltage is necessary.

*7: Refer to the "Voltage chart"

■ ELECTRICAL CHARACTERISTICS (Continued)

● Low Voltage Chart

| SYMBOL | E1-1 | E1-2 | E2 |
|------------------------------|--------------------|-------|-----------------------------|
| PARAMETER | OUTPUT VOLTAGE (V) | | MAXIMUM OUTPUT CURRENT (mA) |
| SETTING OUTPUT VOLTAGE(V) | $V_{OUT(E)}$ | | I_{OUTmax} |
| $V_{OUT(T)}$ | MIN | MAX | MIN |
| 1.5 | 1.470 | 1.530 | 60 |
| 1.6 | 1.568 | 1.632 | 70 |
| 1.7 | 1.666 | 1.734 | 80 |
| 1.8 | 1.764 | 1.836 | 90 |
| 1.9 | 1.862 | 1.938 | 100 |

Note) The symbol is as same as that in the chart of electrical characteristics.

ELECTRICAL CHARACTERISTICS (Continued)

● Standard Voltage

Ta=25°C

| PARAMETER | SYMBOL | CONDITIONS | MIN | TYP | MAX | UNITS | CIRCUIT |
|--|---|---|--------------------|----------------------|----------------------|--------|---------|
| Output Voltage (2%) | $V_{OUT(E)}^{(*2)}$ | $V_{IN}=V_{OUT(T)}^{(*1)}+1.0V$ | ×0.98 | $V_{OUT(T)}$ | ×1.02 | V | 1 |
| Output Voltage (1%) | | $I_{OUT}=40mA$ | ×0.99 | E1 ^(*6) | ×1.01 | | |
| Maximum Output Current | I_{OUTmax} | $V_{IN}=V_{OUT(T)}+1.0V$ $V_{OUT(E)} \geq V_{OUT(T)} \times 0.9$ | E2 ^(*6) | | | mA | 1 |
| Load Regulation | ΔV_{OUT} | $V_{IN}=V_{OUT(T)}+1.0V$ $1mA \leq I_{OUT} \leq \{C1^{(*7)}\}mA$ | | E3-1 ^(*6) | E3-2 ^(*6) | mV | 1 |
| Dropout Voltage ^(*3) | Vdif | $I_{OUT}=\{C2^{(*7)}\}mA$ | | E4-1 ^(*6) | E4-2 ^(*6) | mV | 1 |
| | Vdif | $I_{OUT}=\{C3^{(*7)}\}mA$ | | E5-1 ^(*6) | E5-2 ^(*6) | mV | 1 |
| Supply Current 1 | I_{SS1} | $V_{IN}=V_{CE}=V_{OUT(T)}+1.0V$ | | E6-1 ^(*6) | E6-2 ^(*6) | μA | 2 |
| Supply Current 2 | I_{SS2} | $V_{IN}=V_{OUT(T)}+1.0V, V_{CE}=V_{SS}$ | | | 0.1 | μA | 2 |
| Line Regulation | $\frac{\Delta V_{OUT}}{(\Delta V_{IN} \cdot V_{OUT})}$ | $I_{OUT}=40mA$ $V_{OUT(T)}+1.0V \leq V_{IN} \leq 10.0V$ | | 0.2 | 0.3 | %/V | 1 |
| Input Voltage | V_{IN} | | | | 10 | 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/°C | 1 |
| CE "High" Voltage | V_{CEH} | | 1.5 | | | V | 1 |
| CE "Low" Voltage | V_{CEL} | | | | 0.25 | V | 1 |
| CE "High" Current | I_{CEH} | $V_{CE}=V_{IN}$ | | | 0.1 | μA | 2 |
| CE "Low" Current | 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: $V_{dif} = \{V_{IN1}^{(*5)} - V_{OUT1}^{(*4)}\}$

*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.

*6: Refer to the "Standard Voltage, Voltage chart"

*7: Refer to the "Voltage chart "

■ ELECTRICAL CHARACTERISTICS (Continued)

● Standard Voltage, Voltage chart

| SYMBOL | E1-1 | E1-2 | | | E2 | E3-1 | E3-2 | E4-1 | E4-2 | E5-1 | E5-2 | E6-1 | E6-2 |
|--|--|-------|--|-------|--------------------------------------|----------------------------|------|-------------------------|------|------------|------|----------------------------------|------|
| PARAMETER SETTING OUTPUT VOLTAGE(V) | OUTPUT VOLTAGE (V) (2% products) | | OUTPUT VOLTAGE (V) (1% products) | | MAXIMUM OUTPUT CURRENT (mA) | LOAD REGULATION (mV) | | DROPOUT VOLTAGE (mV) | | | | SUPPLY CURRENT1 (μ A) | |
| $V_{OUT(T)}$ | $V_{OUT(E)}$ | | $V_{OUT(E)}$ | | I_{OUTmax} | ΔV_{OUT} | | V_{dif1} | | V_{dif2} | | I_{SS1} | |
| | MIN | MAX | MIN | MAX | MIN | TYP | MAX | TYP | MAX | TYP | MAX | TYP | MAX |
| 2.0 | 1.960 | 2.040 | 1.980 | 2.020 | 115 | 45 | 90 | 180 | 360 | 580 | 880 | 2.9 | 7.9 |
| 2.1 | 2.058 | 2.142 | 2.079 | 2.121 | 115 | 45 | 90 | 180 | 360 | 580 | 880 | 2.9 | 7.9 |
| 2.2 | 2.156 | 2.244 | 2.178 | 2.222 | 115 | 45 | 90 | 180 | 360 | 580 | 880 | 2.9 | 7.9 |
| 2.3 | 2.254 | 2.346 | 2.277 | 2.323 | 115 | 45 | 90 | 180 | 360 | 580 | 880 | 2.9 | 7.9 |
| 2.4 | 2.352 | 2.448 | 2.376 | 2.424 | 115 | 45 | 90 | 180 | 360 | 580 | 880 | 2.9 | 7.9 |
| 2.5 | 2.450 | 2.550 | 2.475 | 2.525 | 115 | 45 | 90 | 180 | 360 | 580 | 880 | 2.9 | 7.9 |
| 2.6 | 2.548 | 2.652 | 2.574 | 2.626 | 115 | 45 | 90 | 180 | 360 | 580 | 880 | 2.9 | 7.9 |
| 2.7 | 2.646 | 2.754 | 2.673 | 2.727 | 115 | 45 | 90 | 180 | 360 | 580 | 880 | 2.9 | 7.9 |
| 2.8 | 2.744 | 2.856 | 2.772 | 2.828 | 115 | 45 | 90 | 180 | 360 | 580 | 880 | 2.9 | 7.9 |
| 2.9 | 2.842 | 2.958 | 2.871 | 2.929 | 115 | 45 | 90 | 180 | 360 | 580 | 880 | 2.9 | 7.9 |
| 3.0 | 2.940 | 3.060 | 2.970 | 3.030 | 165 | 45 | 90 | 180 | 360 | 580 | 880 | 2.9 | 7.9 |
| 3.1 | 3.038 | 3.162 | 3.069 | 3.131 | 165 | 45 | 90 | 180 | 360 | 580 | 880 | 3.0 | 8.0 |
| 3.2 | 3.136 | 3.264 | 3.168 | 3.232 | 165 | 45 | 90 | 180 | 360 | 580 | 880 | 3.0 | 8.0 |
| 3.3 | 3.234 | 3.366 | 3.267 | 3.333 | 165 | 45 | 90 | 180 | 360 | 580 | 880 | 3.0 | 8.0 |
| 3.4 | 3.332 | 3.468 | 3.366 | 3.434 | 165 | 45 | 90 | 180 | 360 | 580 | 880 | 3.0 | 8.0 |
| 3.5 | 3.430 | 3.570 | 3.465 | 3.535 | 165 | 45 | 90 | 180 | 360 | 580 | 880 | 3.0 | 8.0 |
| 3.6 | 3.528 | 3.672 | 3.564 | 3.636 | 165 | 45 | 90 | 180 | 360 | 580 | 880 | 3.0 | 8.0 |
| 3.7 | 3.626 | 3.774 | 3.663 | 3.737 | 165 | 45 | 90 | 180 | 360 | 580 | 880 | 3.0 | 8.0 |
| 3.8 | 3.724 | 3.876 | 3.762 | 3.838 | 165 | 45 | 90 | 180 | 360 | 580 | 880 | 3.0 | 8.0 |
| 3.9 | 3.822 | 3.978 | 3.861 | 3.939 | 165 | 45 | 90 | 180 | 360 | 580 | 880 | 3.0 | 8.0 |
| 4.0 | 3.920 | 4.080 | 3.960 | 4.040 | 200 | 45 | 90 | 170 | 340 | 560 | 840 | 3.1 | 8.1 |
| 4.1 | 4.018 | 4.182 | 4.059 | 4.141 | 200 | 45 | 90 | 170 | 340 | 560 | 840 | 3.1 | 8.1 |
| 4.2 | 4.116 | 4.284 | 4.158 | 4.242 | 200 | 45 | 90 | 170 | 340 | 560 | 840 | 3.1 | 8.1 |
| 4.3 | 4.214 | 4.386 | 4.257 | 4.343 | 200 | 45 | 90 | 170 | 340 | 560 | 840 | 3.1 | 8.1 |
| 4.4 | 4.312 | 4.488 | 4.356 | 4.444 | 200 | 45 | 90 | 170 | 340 | 560 | 840 | 3.1 | 8.1 |
| 4.5 | 4.410 | 4.590 | 4.455 | 4.545 | 200 | 45 | 90 | 170 | 340 | 560 | 840 | 3.1 | 8.1 |
| 4.6 | 4.508 | 4.692 | 4.554 | 4.646 | 200 | 45 | 90 | 170 | 340 | 560 | 840 | 3.1 | 8.1 |
| 4.7 | 4.606 | 4.794 | 4.653 | 4.747 | 200 | 45 | 90 | 170 | 340 | 560 | 840 | 3.1 | 8.1 |
| 4.8 | 4.704 | 4.896 | 4.752 | 4.848 | 200 | 45 | 90 | 170 | 340 | 560 | 840 | 3.1 | 8.1 |
| 4.9 | 4.802 | 4.998 | 4.851 | 4.949 | 200 | 45 | 90 | 170 | 340 | 560 | 840 | 3.1 | 8.1 |
| 5.0 | 4.900 | 5.100 | 4.950 | 5.050 | 220 | 40 | 80 | 165 | 320 | 540 | 820 | 3.1 | 8.1 |
| 5.1 | 4.998 | 5.202 | 5.049 | 5.151 | 220 | 40 | 80 | 165 | 320 | 540 | 820 | 3.1 | 8.1 |
| 5.2 | 5.096 | 5.304 | 5.148 | 5.252 | 220 | 40 | 80 | 165 | 320 | 540 | 820 | 3.1 | 8.1 |
| 5.3 | 5.194 | 5.406 | 5.247 | 5.353 | 220 | 40 | 80 | 165 | 320 | 540 | 820 | 3.1 | 8.1 |
| 5.4 | 5.292 | 5.508 | 5.346 | 5.454 | 220 | 40 | 80 | 165 | 320 | 540 | 820 | 3.1 | 8.1 |
| 5.5 | 5.390 | 5.610 | 5.445 | 5.555 | 220 | 40 | 80 | 165 | 320 | 540 | 820 | 3.1 | 8.1 |
| 5.6 | 5.488 | 5.712 | 5.544 | 5.656 | 220 | 40 | 80 | 165 | 320 | 540 | 820 | 3.1 | 8.1 |
| 5.7 | 5.586 | 5.814 | 5.643 | 5.757 | 220 | 40 | 80 | 165 | 320 | 540 | 820 | 3.1 | 8.1 |
| 5.8 | 5.684 | 5.916 | 5.742 | 5.858 | 220 | 40 | 80 | 165 | 320 | 540 | 820 | 3.1 | 8.1 |
| 5.9 | 5.782 | 6.018 | 5.841 | 5.959 | 220 | 40 | 80 | 165 | 320 | 540 | 820 | 3.1 | 8.1 |
| 6.0 | 5.880 | 6.120 | 5.940 | 6.060 | 220 | 40 | 80 | 165 | 320 | 540 | 820 | 3.1 | 8.1 |

Note) The symbol is as same as that in the chart of electrical characteristics.

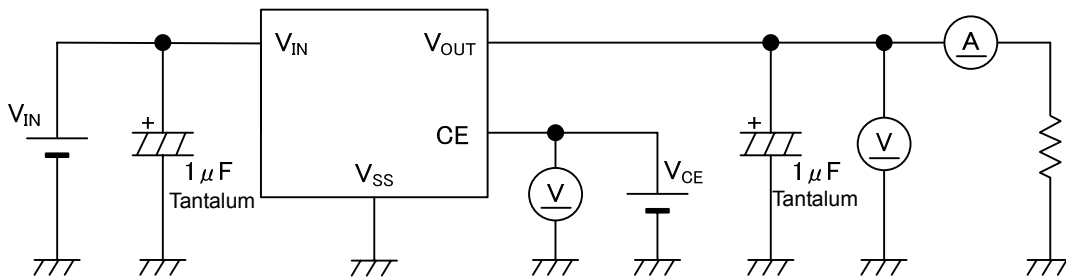
■ ELECTRICAL CHARACTERISTICS (Continued)

● Voltage Chart

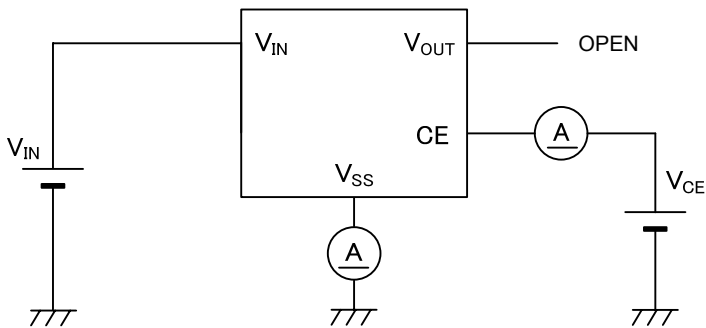
| SYMBOL | C1 | C2 | C3 |
|-------------------|------------------|------------|------------|
| PARAMETER | ΔV_{OUT} | Vdif1 | Vdif2 |
| | CONDITIONS | CONDITIONS | CONDITIONS |
| SETTING | (mA) | (mA) | (mA) |
| OUTPUT VOLTAGE(V) | I_{OUT} | I_{OUT} | I_{OUT} |
| $V_{OUT(T)}$ | CONDITIONS | CONDITIONS | CONDITIONS |
| 2.0 | 60 | 40 | 100 |
| 2.1 | 60 | 40 | 100 |
| 2.2 | 60 | 40 | 100 |
| 2.3 | 60 | 40 | 100 |
| 2.4 | 60 | 40 | 100 |
| 2.5 | 60 | 40 | 100 |
| 2.6 | 60 | 40 | 100 |
| 2.7 | 60 | 40 | 100 |
| 2.8 | 60 | 40 | 100 |
| 2.9 | 60 | 40 | 100 |
| 3.0 | 80 | 60 | 160 |
| 3.1 | 80 | 60 | 160 |
| 3.2 | 80 | 60 | 160 |
| 3.3 | 80 | 60 | 160 |
| 3.4 | 80 | 60 | 160 |
| 3.5 | 80 | 60 | 160 |
| 3.6 | 80 | 60 | 160 |
| 3.7 | 80 | 60 | 160 |
| 3.8 | 80 | 60 | 160 |
| 3.9 | 80 | 60 | 160 |
| 4.0 | 100 | 80 | 180 |
| 4.1 | 100 | 80 | 180 |
| 4.2 | 100 | 80 | 180 |
| 4.3 | 100 | 80 | 180 |
| 4.4 | 100 | 80 | 180 |
| 4.5 | 100 | 80 | 180 |
| 4.6 | 100 | 80 | 180 |
| 4.7 | 100 | 80 | 180 |
| 4.8 | 100 | 80 | 180 |
| 4.9 | 100 | 80 | 180 |
| 5.0 | 100 | 100 | 200 |
| 5.1 | 100 | 100 | 200 |
| 5.2 | 100 | 100 | 200 |
| 5.3 | 100 | 100 | 200 |
| 5.4 | 100 | 100 | 200 |
| 5.5 | 100 | 100 | 200 |
| 5.6 | 100 | 100 | 200 |
| 5.7 | 100 | 100 | 200 |
| 5.8 | 100 | 100 | 200 |
| 5.9 | 100 | 100 | 200 |
| 6.0 | 100 | 100 | 200 |

■ **TEST CIRCUITS**

Circuit 1



Circuit 2



OPERATIONAL EXPLANATION

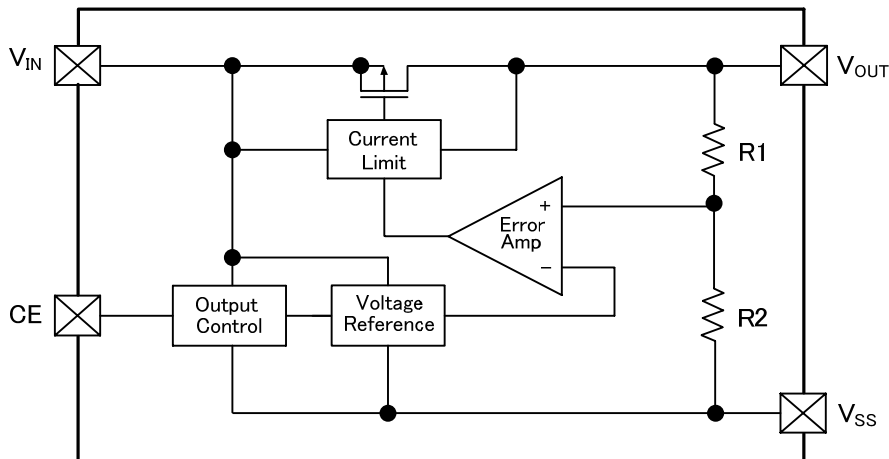
Output voltage control with the XC62H series:

The voltage divided by resistors R1 & R2 is compared with the internal reference voltage by the error amplifier.

The P-channel MOSFET, which is connected to the V_{OUT} pin, is then driven by the subsequent output signal.

The output voltage at the V_{OUT} pin is controlled & stabilized by a system of negative feedback.

The current limit circuit operate in relation to the level of output current.



< Current Limiter >

The XC62H series has output current limiter of fixed current limiter circuit. When the output current reaches the current limit, the fixed current limiter circuit operates and the output voltage drops with keeping the output current.

<CE Pin>

The IC's internal circuitry can be operated or shutdown via the signal from the CE pin with the XC62H series. In shutdown mode, output at the V_{OUT} pin will be pulled down to the V_{SS} level via R1 & R2. Note that the XC62H series' regulator is "High Active/No Pull-Down", operations will become unstable with the CE pin open. We suggest that you use this IC with either a CE High level voltage or a CE Low level voltage input at the CE pin. If this IC is used with the correct specifications for the CE pin, the operational logic is fixed and the IC will operate normally. However, supply current may increase as a result of through current in the IC's internal circuitry.

<Input and Output Capacitors>

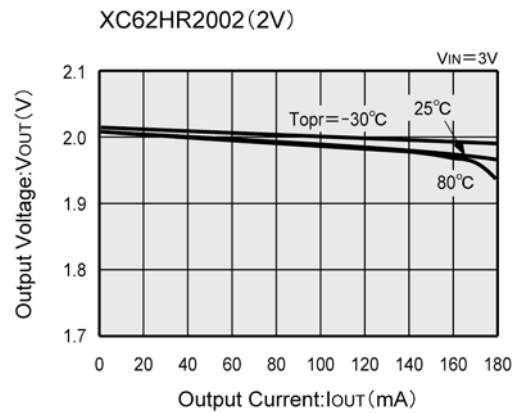
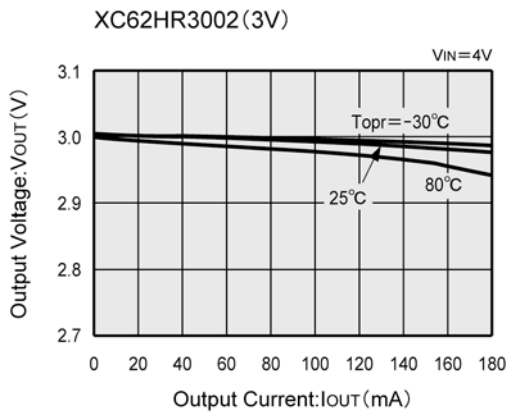
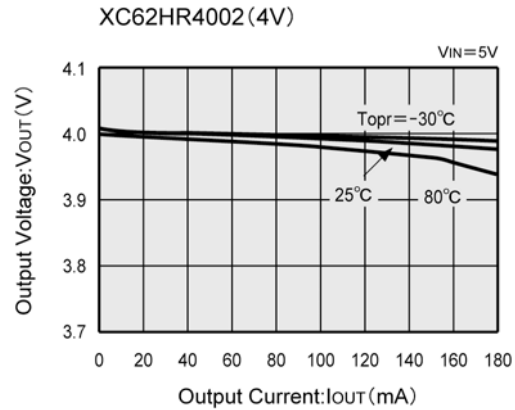
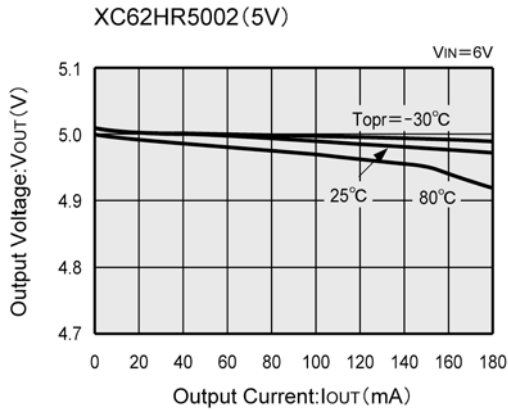
The XC62H series needs an output capacitor (C_L) for phase compensation. In order to ensure the stable phase compensation, please place an output capacitor of 1.0 μF at the V_{OUT} pin and V_{SS} pin as close as possible. For a stable power input, please connect an input capacitor (C_{IN}) of 1.0 μF between the input pin (V_{IN}) and the ground pin (V_{SS}).

NOTES ON USE

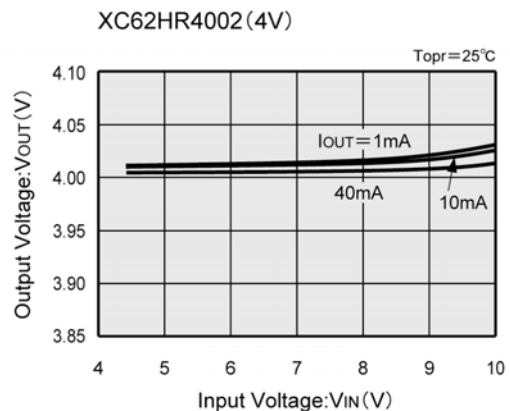
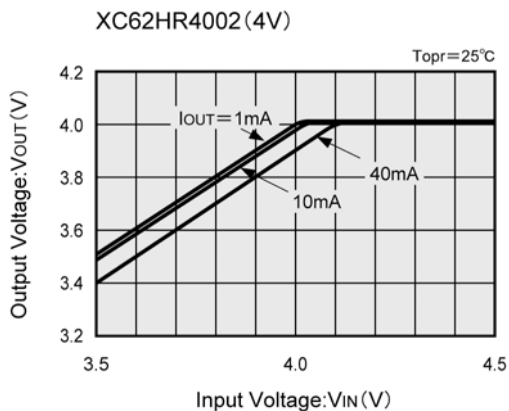
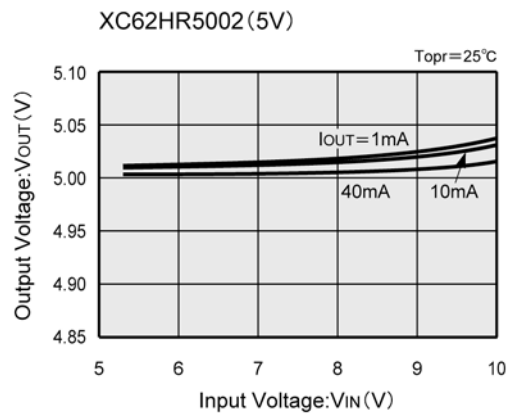
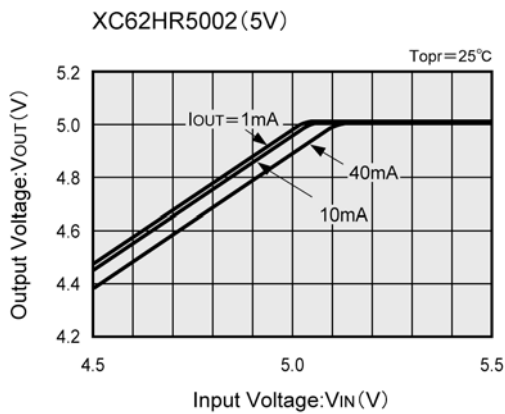
1. Please use this IC within the stated maximum ratings. For temporary, transitional voltage drop or voltage rising phenomenon, the IC is liable to malfunction should the ratings be exceeded.
2. Where wiring impedance is high, operations may become unstable due to noise and/or phase lag depending on output current. Please strengthen V_{IN} and V_{SS} wiring in particular.
3. Please wire the input capacitor (C_{IN}) and the output capacitor (C_L) as close to the IC as possible. Should rapid input fluctuation or load fluctuation occur, please increase the capacitor value such as C_{IN} or C_L to stabilize the operation.
4. Torex places an importance on improving our products and their reliability. We request that users incorporate fail-safe designs and post-aging protection treatment when using Torex products in their systems.

TYPICAL PERFORMANCE CHARACTERISTICS

(1) Output Voltage vs. Output Current

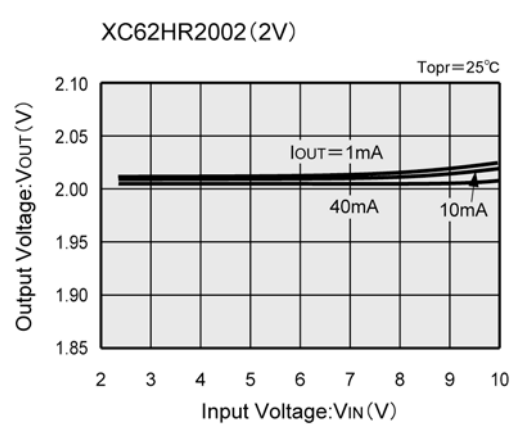
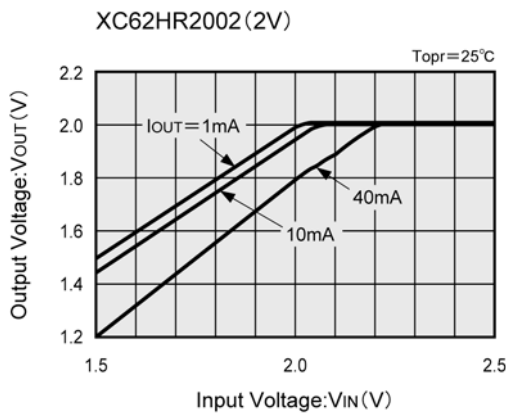
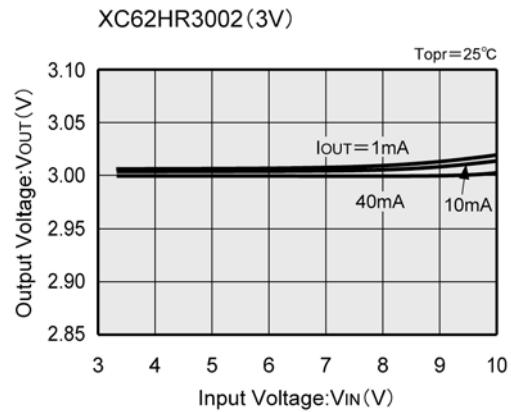
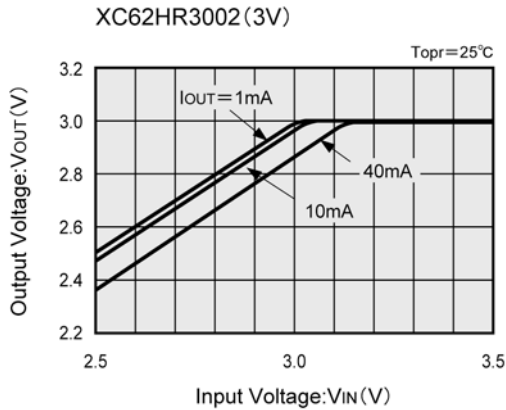


(2) Output Voltage vs. Input Voltage

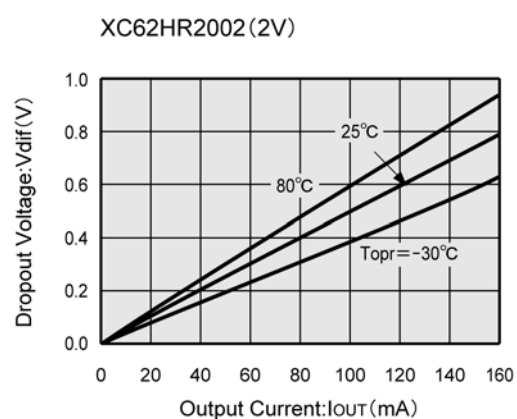
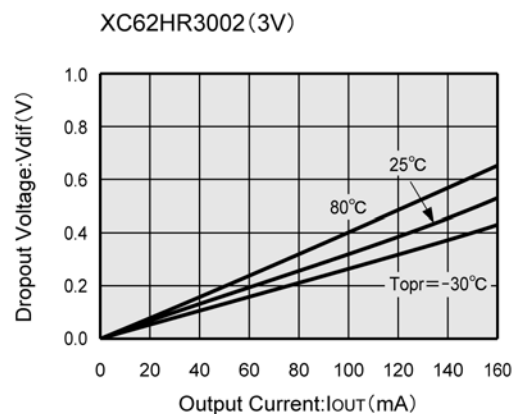
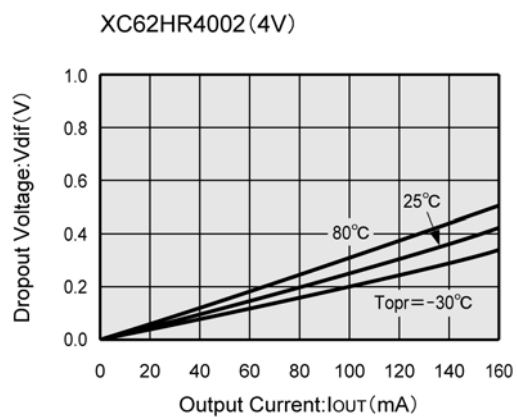
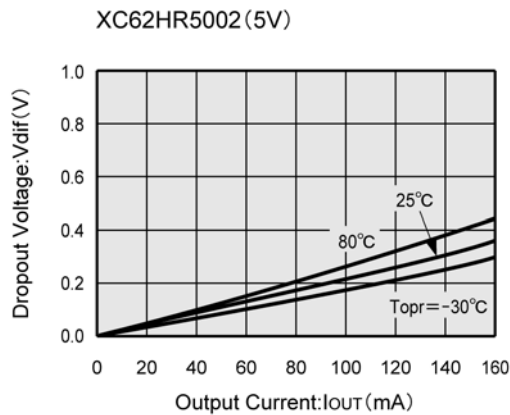


TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

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

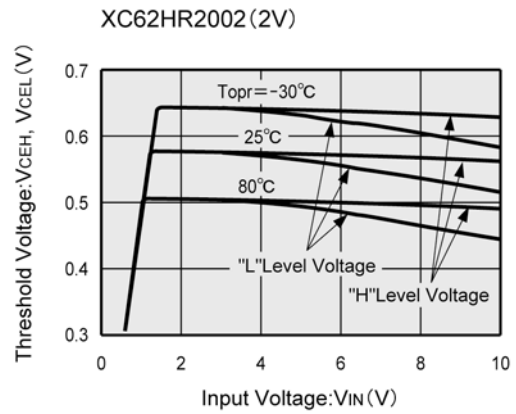
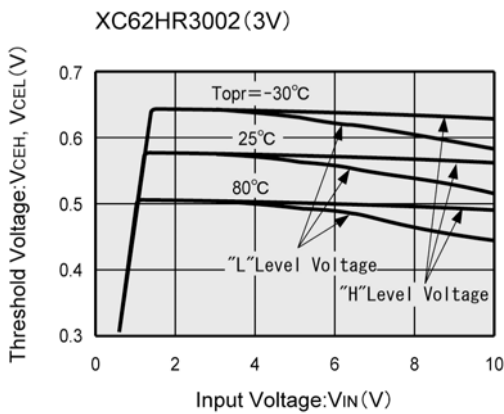
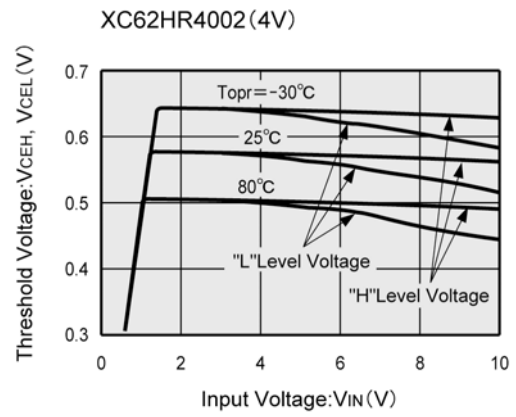
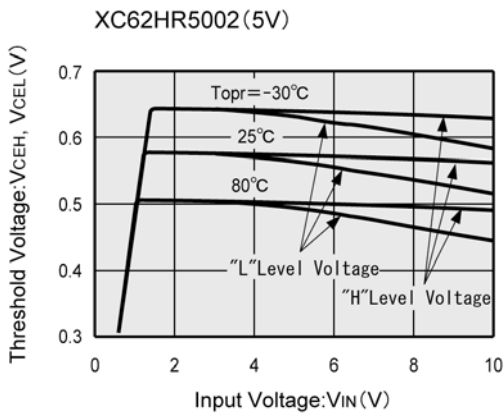


(3) Dropout Voltage vs. Output Current

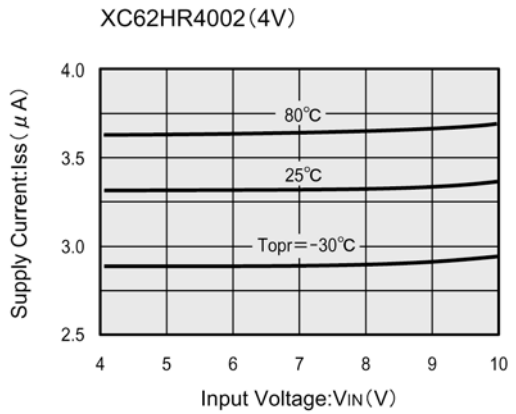
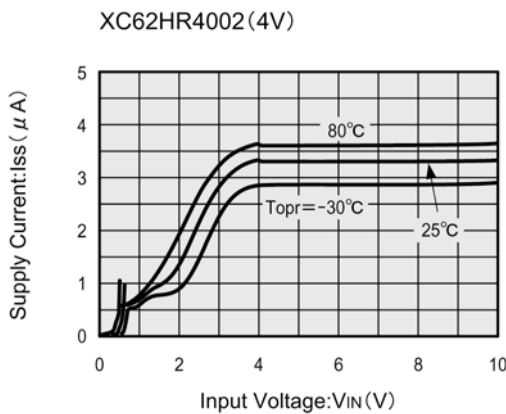
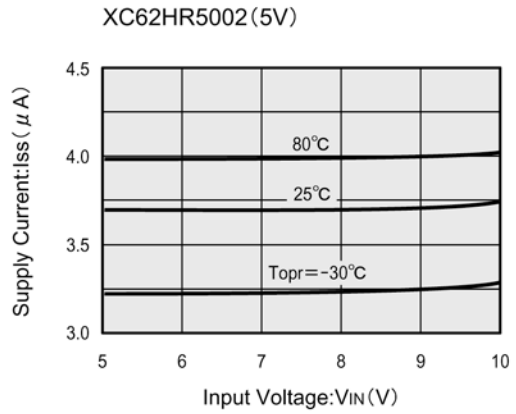
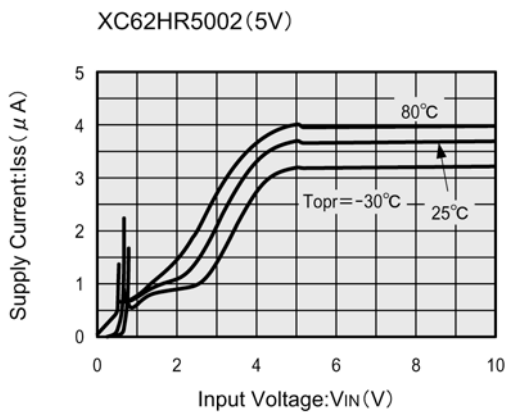


■ TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

(4) CE Pin Threshold Voltage vs. Input Voltage

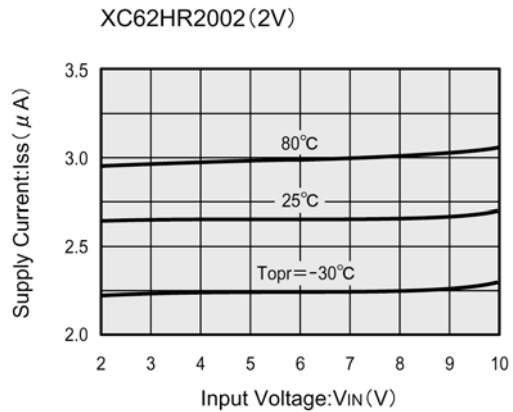
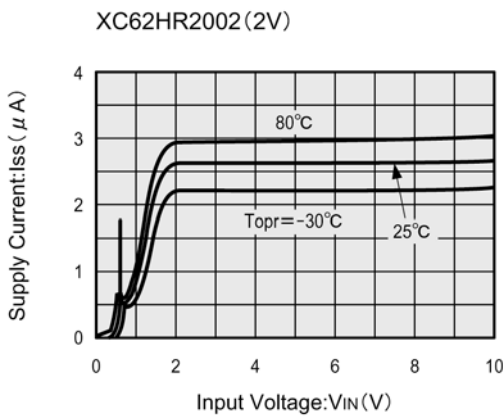
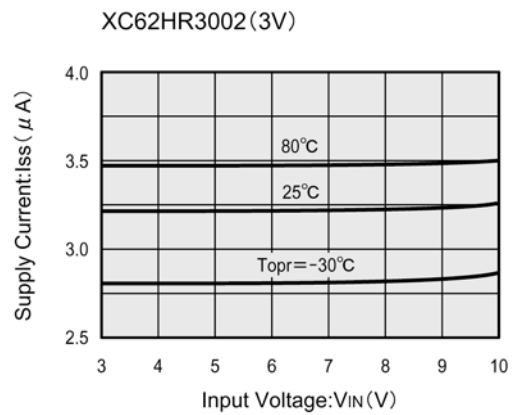
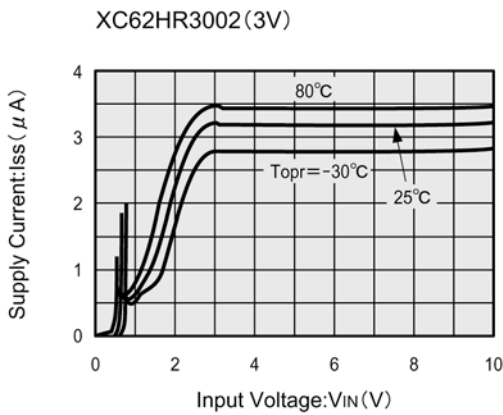


(5) Supply Current vs. Input Voltage

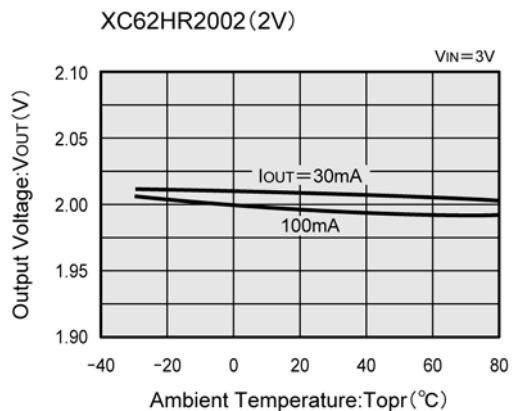
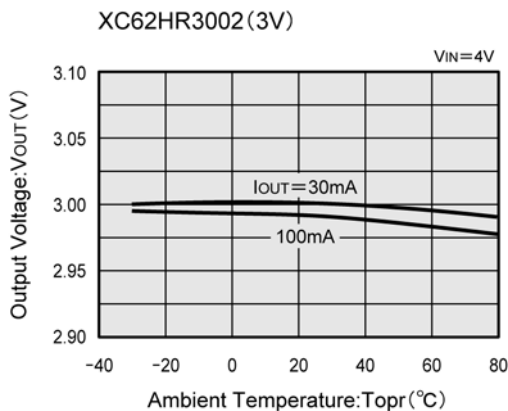
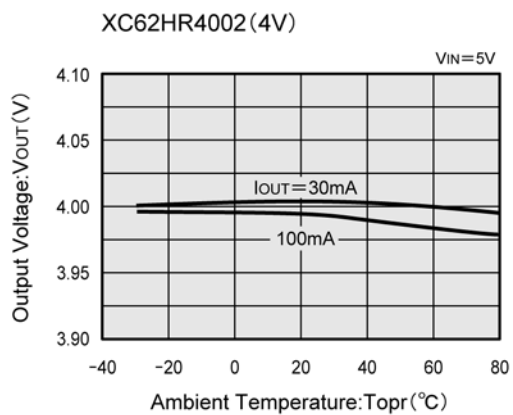
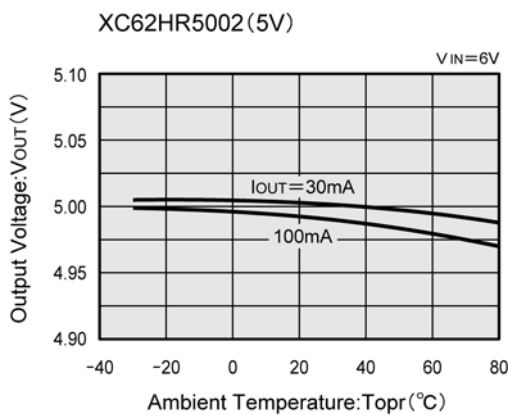


TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

(5) Supply Current vs. Input Voltage (Continued)

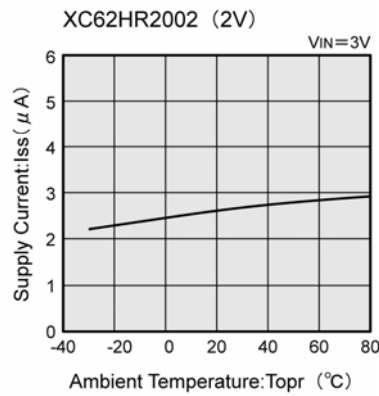
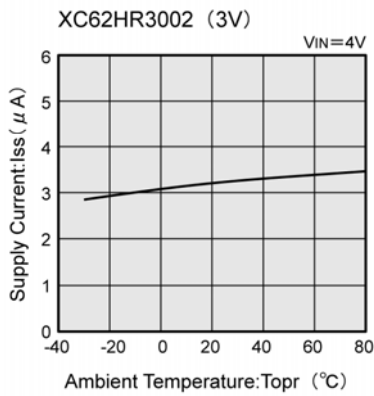
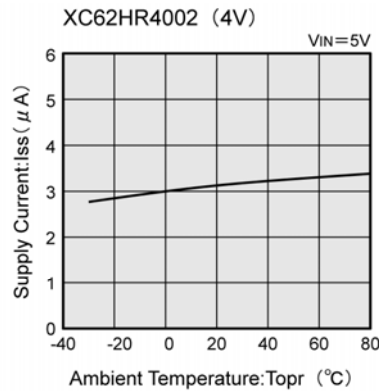
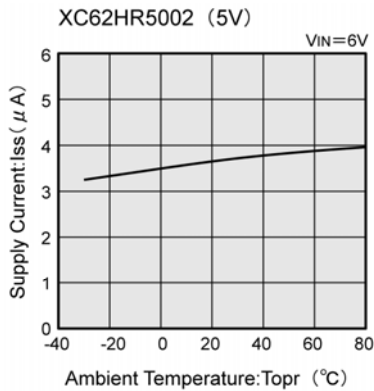


(6) Output Voltage vs. Ambient Temperature

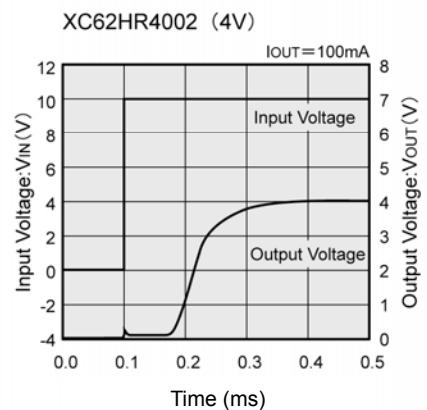
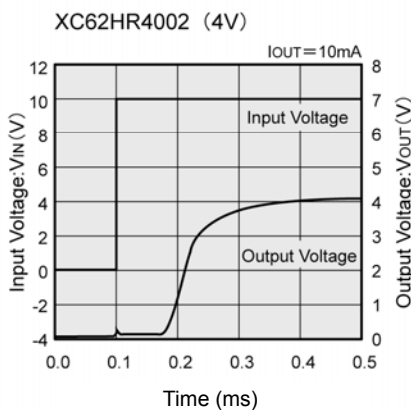
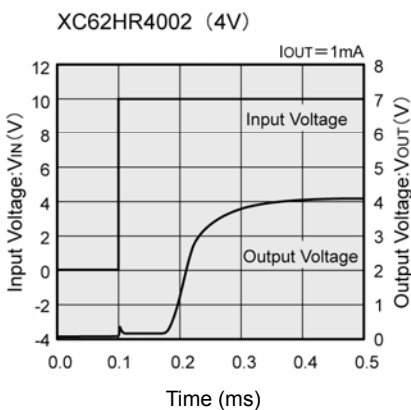
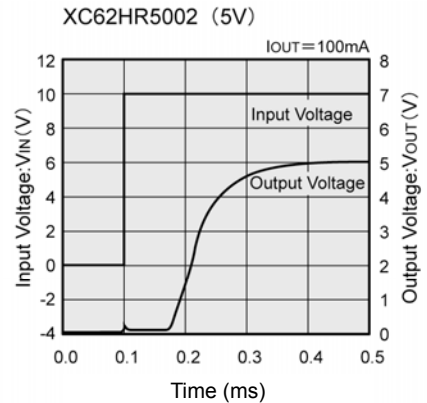
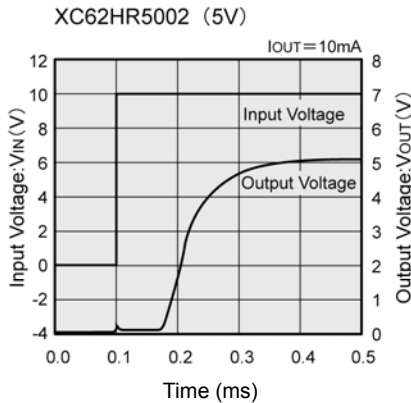
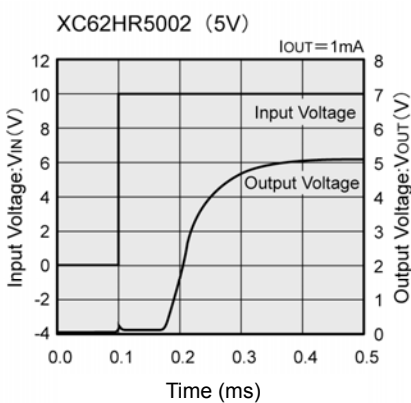


TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

(7) Supply Current vs. Ambient Temperature

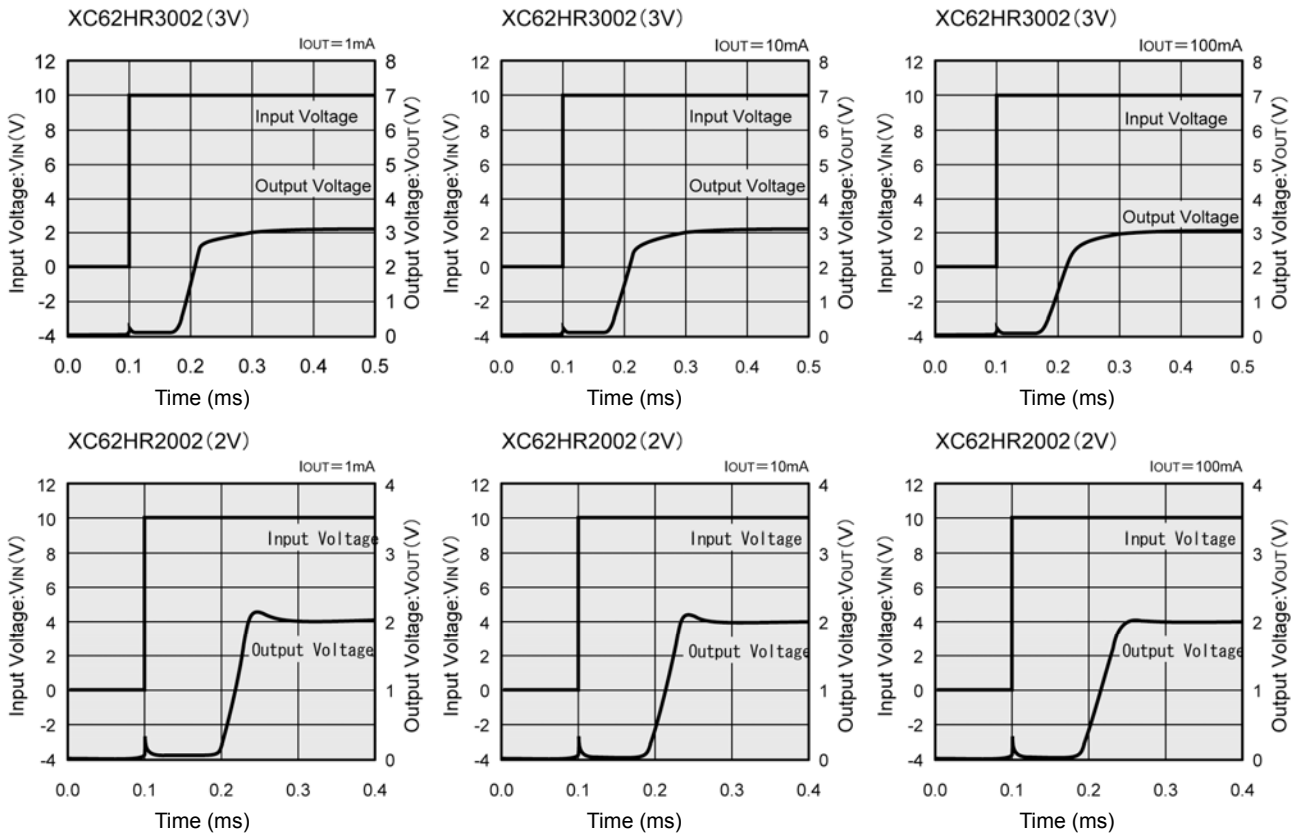


(8) Input Transient Response 1

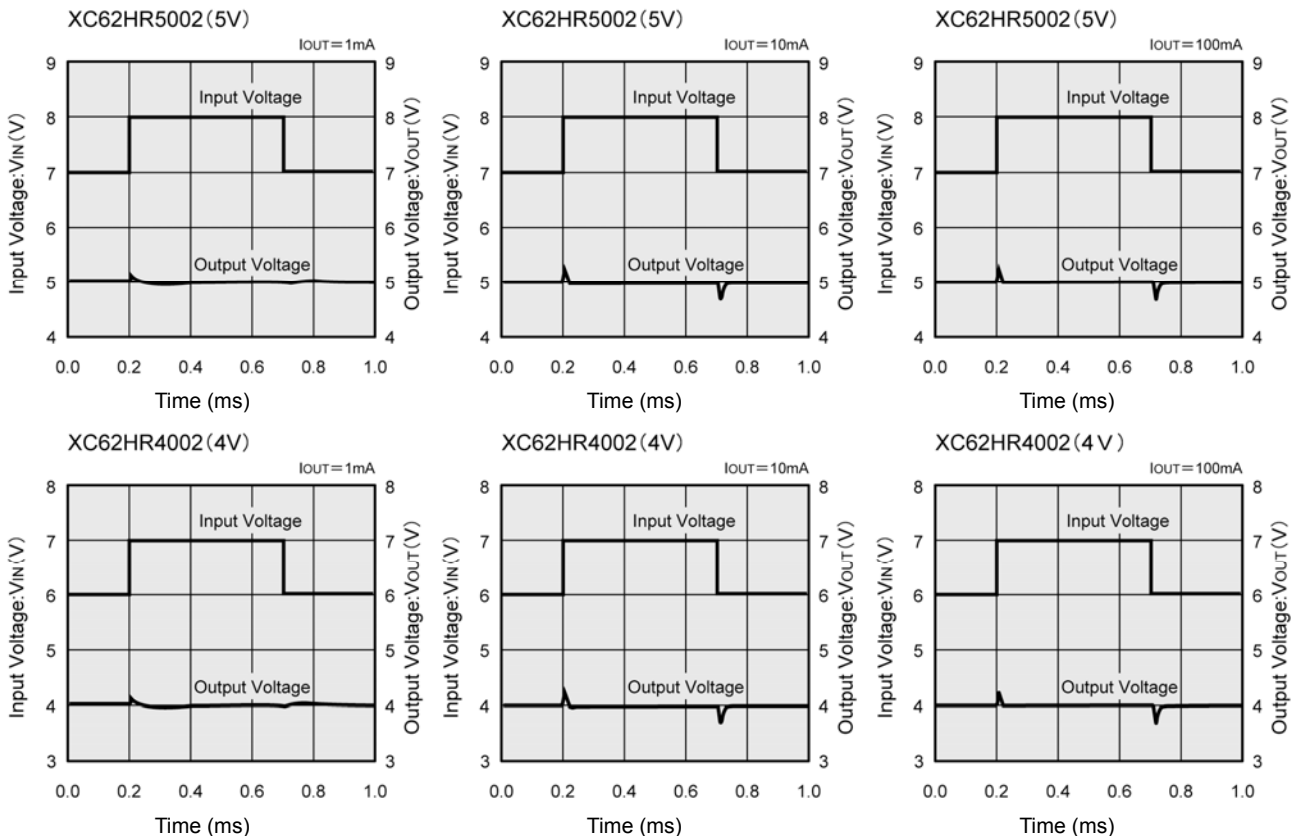


TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

(8) Input Transient Response 1 (Continued)

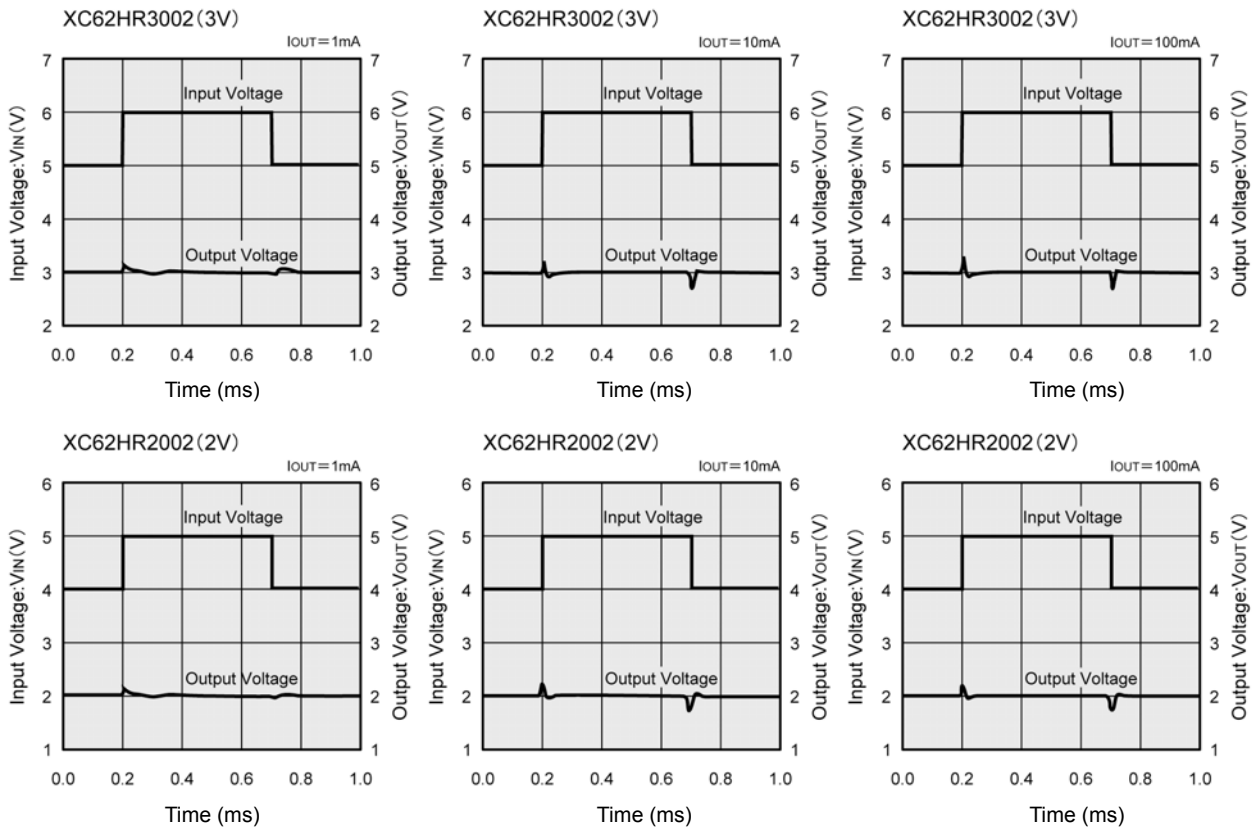


(9) Input Transient Response 2

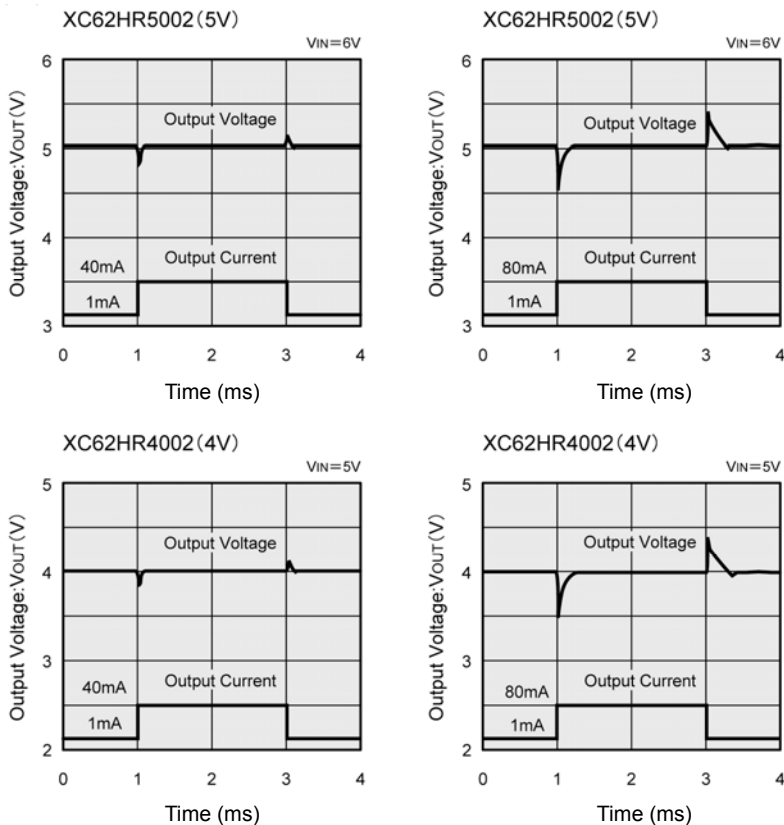


■ TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

(9) Input Transient Response 2 (Continued)

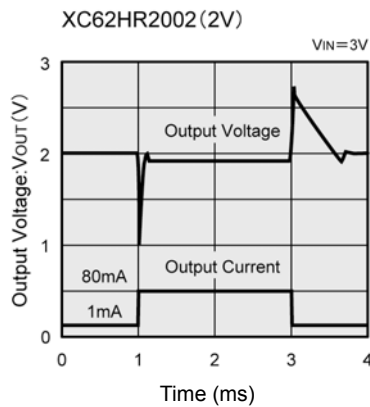
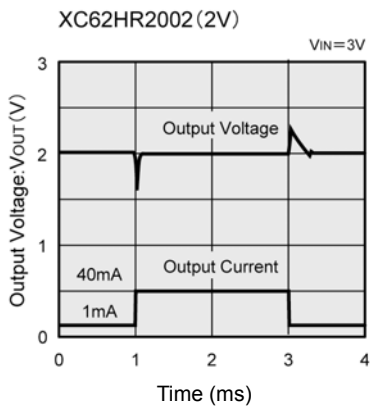
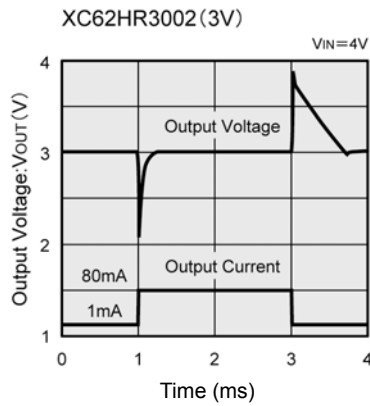
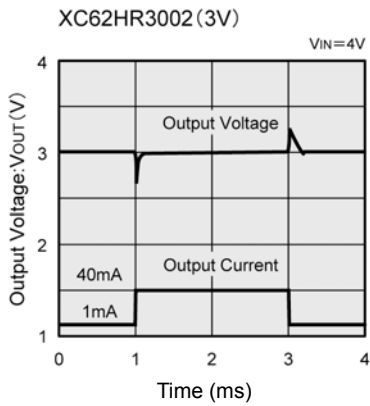


(10) Load Transient Response

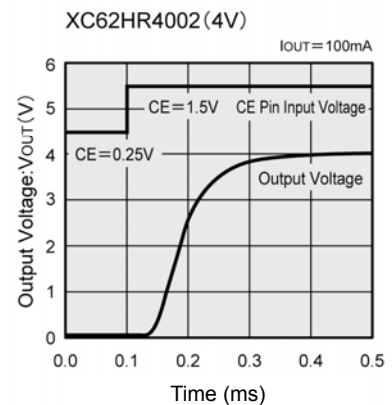
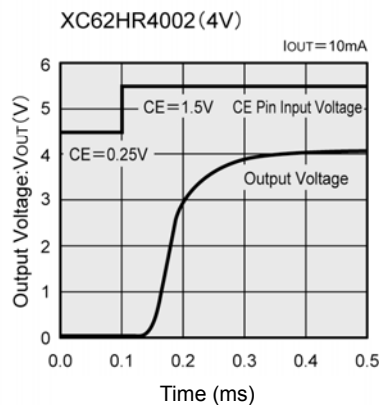
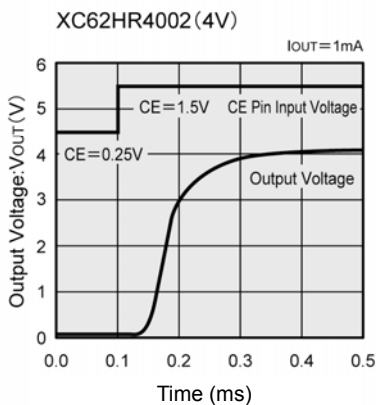
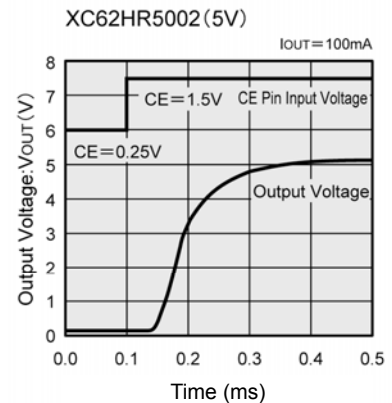
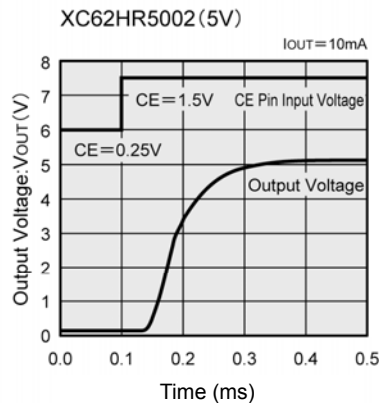
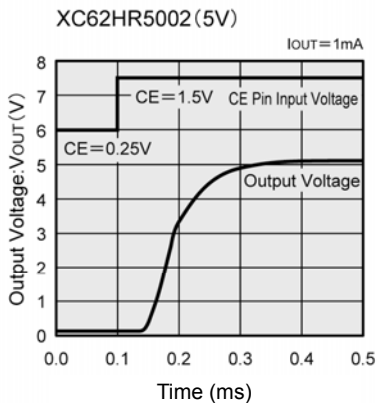


TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

(10) Load Transient Response (Continued)

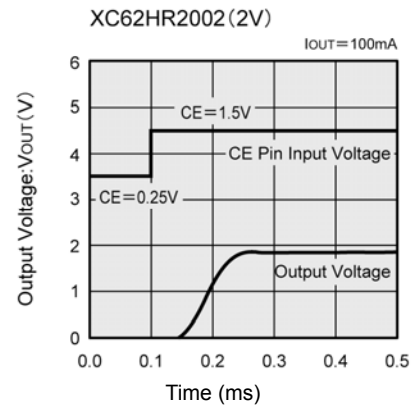
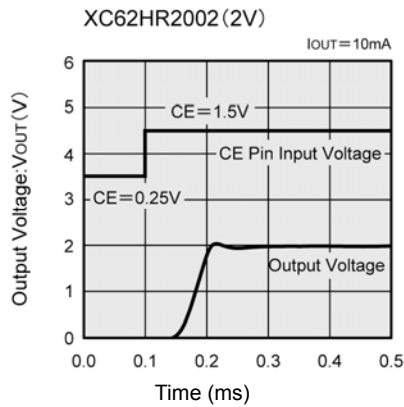
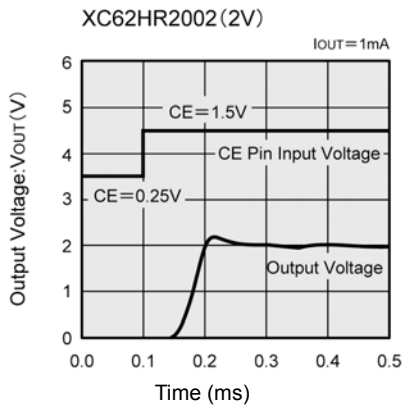
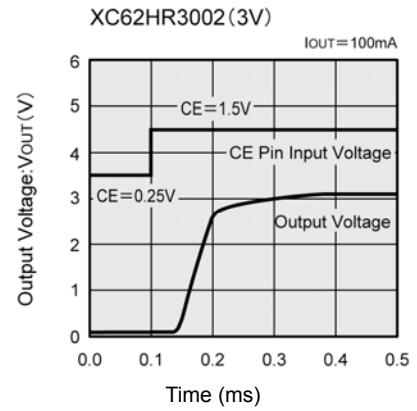
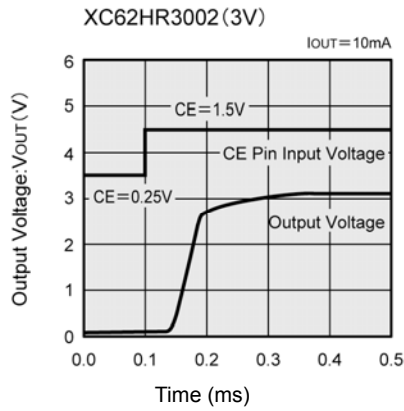
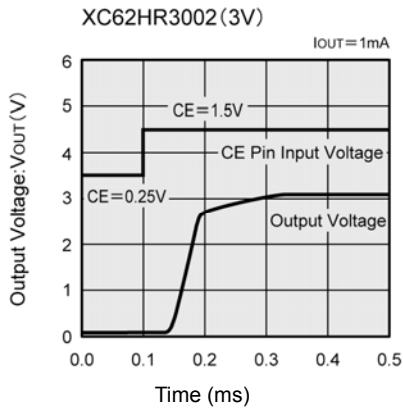


(11) CE Pin Transient Response

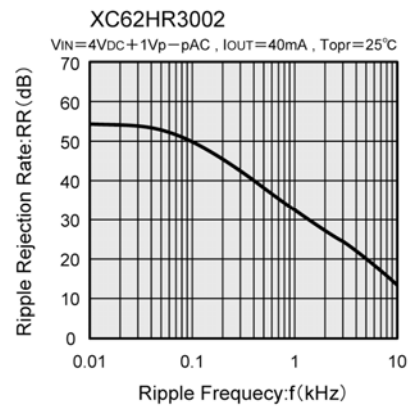
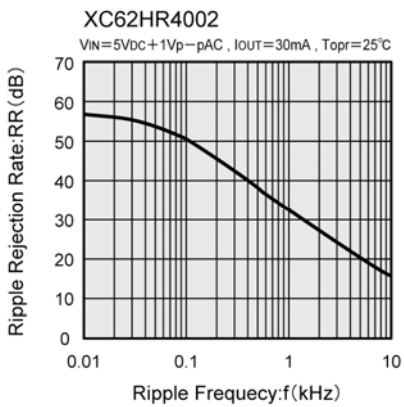
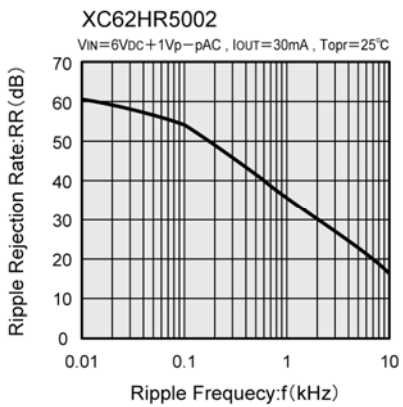


■ TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

(11) CE Pin Transient Response (Continued)



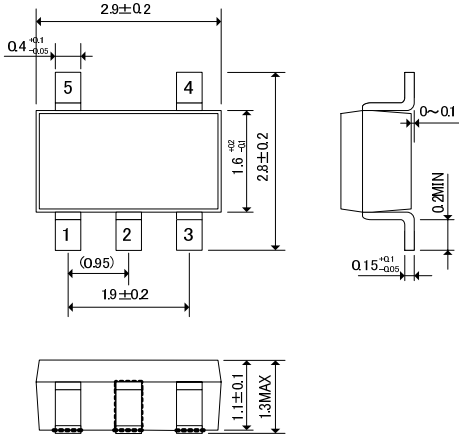
(12) Ripple Rejection Rate



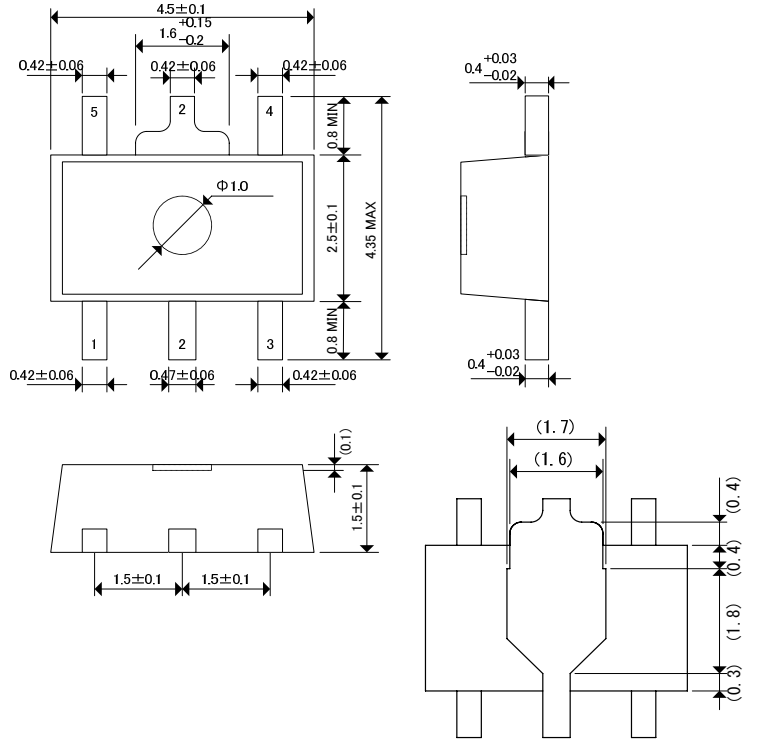
PACKAGING INFORMATION

● SOT-25

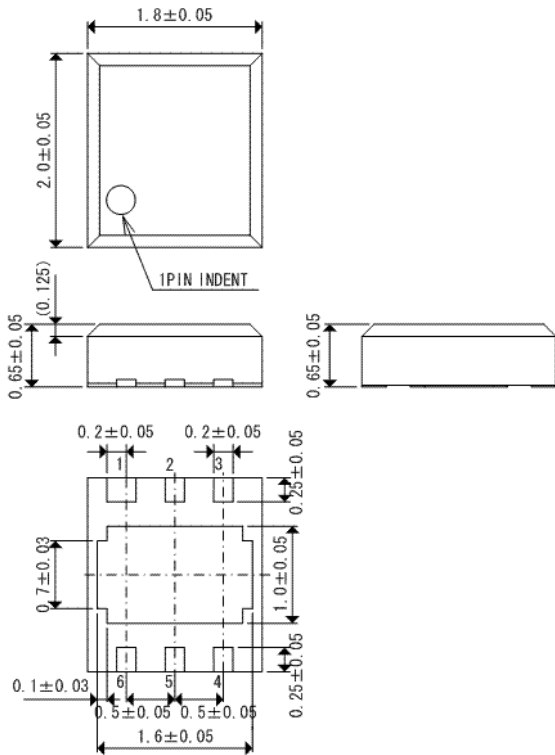
(unit : mm)



● SOT-89-5

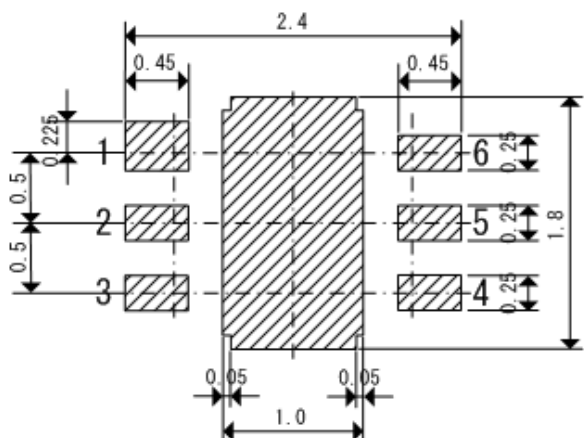


● USP-6B

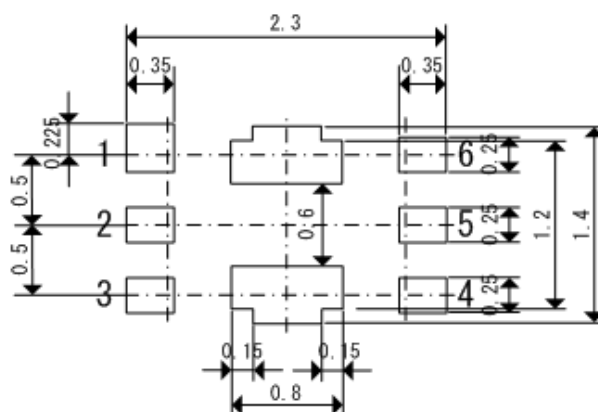


PACKAGING INFORMATION (Continued)

● USP-6B Reference Pattern Layout

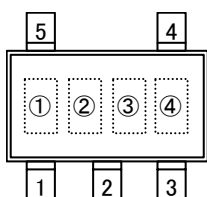


● USP-6B Reference metal mask design

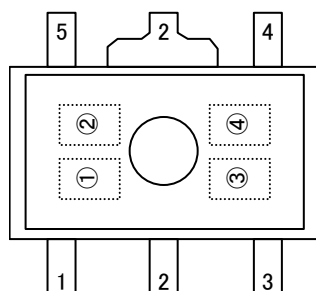


MARKING RULE

● SOT-25, SOT-89-5



SOT-25
(TOP VIEW)



SOT-89-5
(TOP VIEW)

① represents integer of the output voltage

| MARK | VOLTAGE (V) |
|------|-------------|
| 0 | 0.② |
| 1 | 1.② |
| 2 | 2.② |
| 3 | 3.② |
| 4 | 4.② |
| 5 | 5.② |
| 6 | 6.② |

② represents decimal number of the output voltage

| MARK | VOLTAGE (V) |
|------|-------------|
| 0 | ①.0 |
| 1 | ①.1 |
| 2 | ①.2 |
| 3 | ①.3 |
| 4 | ①.4 |
| 5 | ①.5 |
| 6 | ①.6 |
| 7 | ①.7 |
| 8 | ①.8 |
| 9 | ①.9 |

③ represents temperature characteristics

| MARK |
|------|
| - |

④ represents production lot number

0 to 9, A to Z repeated, reverse character 0 to 9, A to Z repeated
(G, I, J, O, Q, W excluded)

MARKING RULE

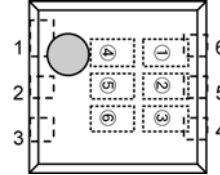
● USP-6B

① represents product series

| MARK | PRODUCT SERIES |
|------|----------------|
| H | XC62HR**0*D* |

② represents CE pin logic

| MARK | LOGIC | PRODUCT SERIES |
|------|----------|----------------|
| R | Positive | XC62HR**0*D* |



USP-6B
(TOP VIEW)

③④ represents output voltage

ex:

| MARK | | VOLTAGE(V) | PRODUCT SERIES |
|------|---|------------|----------------|
| ③ | ④ | | |
| 3 | 3 | 3.3 | XC62HR330*D* |
| 5 | 0 | 5.0 | XC62HR500*D* |

⑤ represents temperature characteristics

| MARK | TEMPERATURE CHARACTERISTICS | PRODUCT SERIES |
|------|-----------------------------|----------------|
| 0 | TYP±100ppm | XC62HR**0*** |

⑥ represents production lot number

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

Note: No character inversion used.