XC62RP series is Discontinued.

XC62RP Series

TOIREX

ETR0314_001a

Positive Voltage Regulators for Voltage Reference Source

■GENERAL DESCRIPTION

The XC62RP series are highly precise, low power consumption, positive voltage regulators, for voltage reference source, manufactured using CMOS and laser trimming technologies.
SOT-23 (150mW), SOT-89 (500mW) and TO-92 (300mW) packages are available.

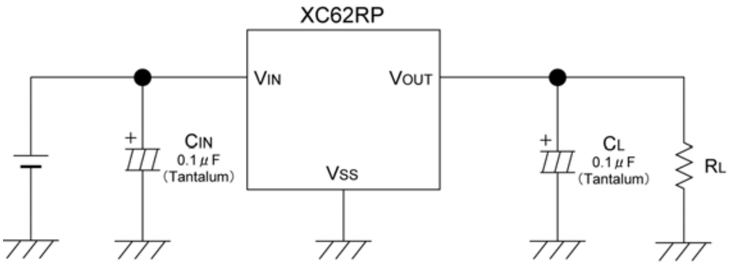
■APPLICATIONS

- ●Battery powered equipment
- ●Reference voltage sources
- ●Cameras and video recorders
- ●Palmtops

■FEATURES

Maximum Output Current : 6.0mA (within max. power dissipation, V_{OUT}=2.0V)
Output Voltage Range : 1.5V ~ 3.5V in 0.1V increments
Highly Accurate : Setting Voltage accuracy±2% (±1%for semi-custom products)
Low Power Consumption : 3.2μA (V_{OUT}=2.0) (TYP.)
Output Voltage Temperature Characteristics : ±100ppm/℃(TYP.)
Line Regulation : 0.2%/V (TYP.)
CMOS Low Power Consumption
Dropout Voltage : 140mV @ 300μA
Ultra Small Packages : SOT-23 (150mW) mini-mold
SOT-89 (500mW) mini-power mold
TO-92 (300mW)

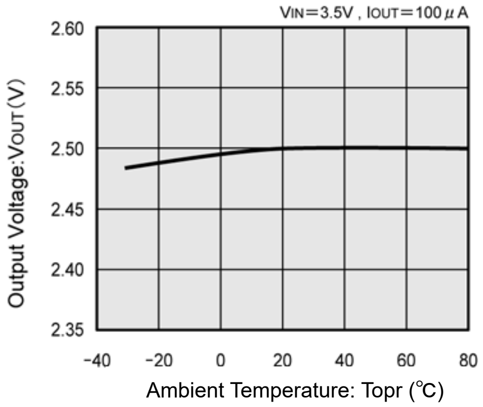
■TYPICAL APPLICATION CIRCUIT



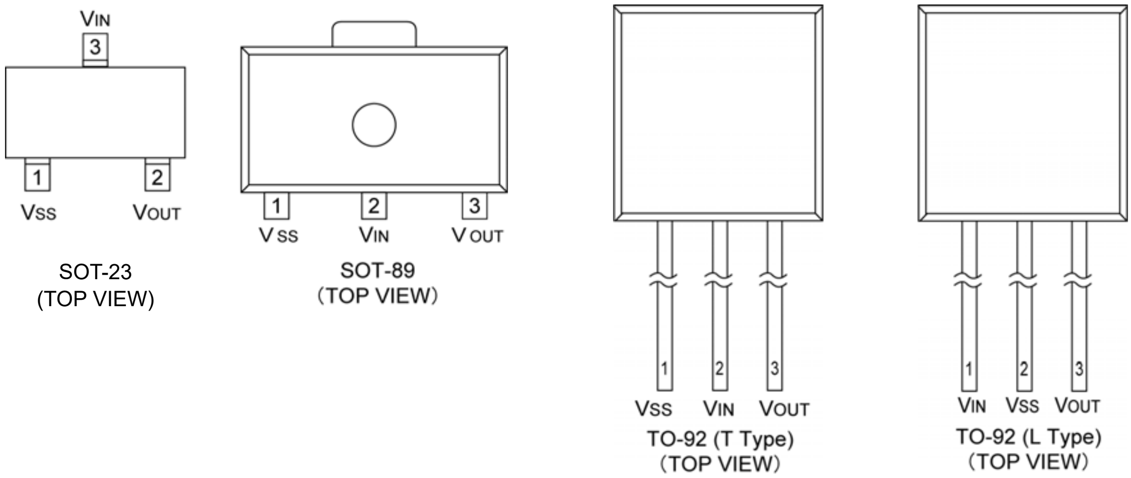
Please use with a load capacitance (C_L) of less than 0.1μF.

■TYPICAL PERFORMANCE CHARACTERISTICS

XC62RP2502(2.5V)



■PIN CONFIGURATION



■PIN ASSIGNMENT

PIN NUMBER				PIN NAME	FUNCTION
SOT-23	SOT-89	TO-92 (T)	TO-92 (L)		
1	1	1	2	VSS	Ground
3	2	2	1	VIN	Supply Voltage Input
2	3	3	3	VOUT	Output

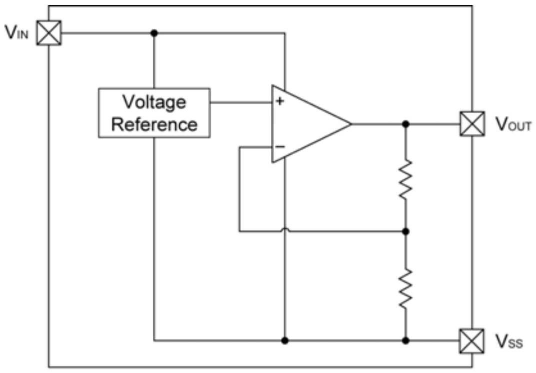
■PRODUCT CLASSIFICATION

●Ordering Information

XC62R ①②③④⑤⑥⑦

DESIGNATOR	DESCRIPTION	SYMBOL	DESCRIPTION
①	Polarity of Output Voltage	P	: Positive
② ③	Output Voltage	15 ~ 35	: e.g. VOUT1.5V→②=1, ③=5 VOUT3.0V→②=3, ③=0
④	Temperature Coefficients	0	:±100ppm (TYP.)
⑤	Output Voltage Accuracy	1	:±1% (Semi-custom)
		2	:±2%
⑥	Package	M	: SOT-23
		P	: SOT-89
		T	: TO-92 (standard)
		L	: TO-92 (Custom pin configuration) (Discontinued Product)
⑦	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°C

PARAMETER		SYMBOL	RATINGS	UNITS
Input Voltage		VIN	12.0	V
Output Current		IOUT	50*	mA
Output Voltage		VOUT	VSS-0.3~VIN+0.3	V
Power Dissipation	SOT-23	Pd	150	mW
	SOT-89		500	
	TO-92		300	
Operating Temperature Range		Topr	-30 ~ +80	℃
Storage Temperature Range		Tstg	-40 ~ +125	℃

Note: Please ensure that IOUT is less than Pd / (VIN-VOUT).

■ELECTRICAL CHARACTERISTICS

XC62RP1602 $V_{OUT(T)}$=1.6V (*1) Ta=25℃

PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNITS	CIRCUIT
Output Voltage	$V_{OUT(E)}$ (*2)	I_{OUT}=100μA V_{IN}=2.6V	1.568	1.600	1.632	V	1
Maximum Output Current	I_{OUT} max	V_{IN}=2.6V, $V_{OUT(E)}$≧$V_{OUT(T)}$ x 0.95	4.0	-	-	mA	1
Load Regulation	ΔV_{OUT}	V_{IN}=2.6 V 100μA≦I_{OUT}≦ 300μA	-	20	40	mV	1
Dropout Voltage (*3)	Vdif1	I_{OUT}=100μA	-	30	80	mV	1
	Vdif2	I_{OUT}=300μA	-	50	140	mV	1
Supply Current	I_{SS}	V_{IN}=2.6V	-	3.0	5.8	μA	2
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \cdot V_{OUT}}$	I_{OUT}=100μA 2.6V≦V_{IN}≦6.0V	-	0.2	0.3	%/V	1
Input Voltage	V_{IN}		-	-	6.0	V	-
Output Voltage Temperature Characteristics	$\frac{\Delta V_{OUT}}{\Delta Topr \cdot V_{OUT}}$	I_{OUT}=100μA -30℃≦Topr≦80℃	-	±100	-	ppm/℃	1

XC62RP2002 $V_{OUT(T)}$=2.0V (*1) Ta=25℃

PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNITS	CIRCUIT
Output Voltage	$V_{OUT(E)}$ (*2)	I_{OUT}=100μA V_{IN}=3.0V	1.960	2.000	2.040	V	1
Maximum Output Current	I_{OUT} max	V_{IN}=3.0V, $V_{OUT(E)}$≧$V_{OUT(T)}$ x 0.95	6.0	-	-	mA	1
Load Regulation	ΔV_{OUT}	V_{IN}=3.0 V 100μA≦I_{OUT}≦300μA	-	20	40	mV	1
Dropout Voltage (*3)	Vdif1	I_{OUT}=100μA	-	30	80	mV	1
	Vdif2	I_{OUT}=300μA	-	50	140	mV	1
Supply Current	I_{SS}	V_{IN}=3.0V	-	3.2	6.2	μA	2
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \cdot V_{OUT}}$	I_{OUT}=100μA 3.0V≦V_{IN}≦6.0V	-	0.2	0.3	%/V	1
Input Voltage	V_{IN}		-	-	6.0	V	-
Output Voltage Temperature Characteristics	$\frac{\Delta V_{OUT}}{\Delta Topr \cdot V_{OUT}}$	I_{OUT}=100μA -30℃≦Topr≦80℃	-	±100	-	ppm/℃	1

■ELECTRICAL CHARACTERISTICS (Continued)

XC62RP2502 VOUT(T)=2.5V (*1) Ta=25℃

PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNITS	CIRCUIT
Output Voltage	VOUT(E) (*2)	IOUT=100μA VIN=3.5V	2.450	2.500	2.550	V	1
Maximum Output Current	IOUT max	VIN=3.5V, VOUT(E)≧VOUT(T) x 0.95	8.0	-	-	mA	1
Load Regulation	ΔVOUT	VIN=3.5 V 100μA≦IOUT≦300μA	-	20	40	mV	1
Dropout Voltage (*3)	Vdif1	IOUT=100μA	-	30	80	mV	1
	Vdif2	IOUT=300μA	-	50	140	mV	1
Supply Current	ISS	VIN=3.5V	-	3.5	6.8	μA	2
Line Regulation	ΔVOUT / ΔVIN・VOUT	IOUT=100μA 3.5V≦VIN≦6.0V	-	0.2	0.3	%/V	1
Input Voltage	VIN		-	-	6.0	V	-
Output Voltage Temperature Characteristics	ΔVOUT / ΔTopr・VOUT	IOUT=100μA -30℃≦Topr≦80℃	-	±100	-	ppm/℃	1

XC62RP3002 VOUT(T)=3.0V (*1) Ta=25℃

PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNITS	CIRCUIT
Output Voltage	VOUT(E) (*2)	IOUT=100μA VIN=4.0V	2.940	3.000	3.060	V	1
Maximum Output Current	IOUT max	VIN=4.0V, VOUT(E)≧VOUT(T) x 0.95	10.0	-	-	mA	1
Load Regulation	ΔVOUT	VIN=4.0 V 100μA≦IOUT≦300μA	-	20	40	mV	1
Dropout Voltage (*3)	Vdif1	IOUT=100μA	-	30	80	mV	1
	Vdif2	IOUT=300μA	-	50	140	mV	1
Supply Current	ISS	VIN=4.0V	-	3.8	7.3	μA	2
Line Regulation	ΔVOUT / ΔVIN・VOUT	IOUT=100μA 4.0V≦VIN≦6.0V	-	0.2	0.3	%/V	1
Input Voltage	VIN		-	-	6.0	V	-
Output Voltage Temperature Characteristics	ΔVOUT / ΔTopr・VOUT	IOUT=100μA -30℃≦Topr≦ 80℃	-	±100	-	ppm/℃	1

NOTE:

*1: VOUT(T)=Specified output voltage .

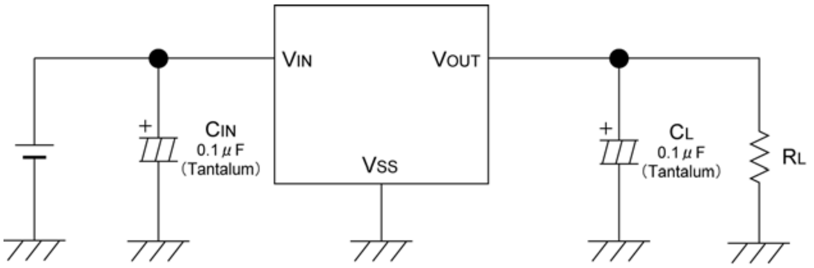
*2: VOUT(E)=Effective output voltage (i.e. the output voltage when "VOUT(T)+1.0V" is provided at the VIN pin while maintaining a certain IOUT value).

*3: Vdif= {VIN1 (*5)-VOUT1 (*4)}

*4: VOUT1= A voltage equal to 98% of the output voltage whenever an amply stabilized IOUT {VOUT(T)+1.0V} is input.

*5: VIN1= The input voltage when VOUT1 appears as input voltage is gradually decreased.

■TYPICAL APPLICATION CIRCUIT



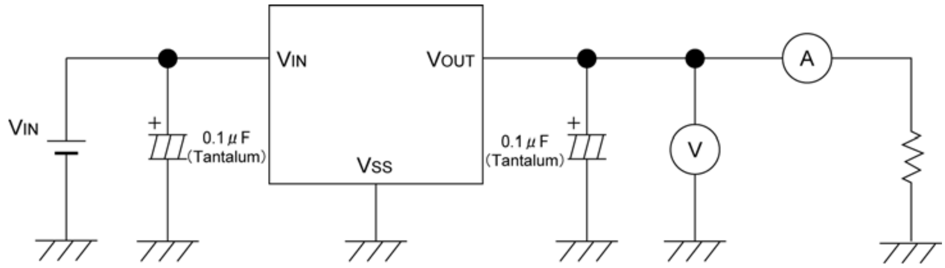
Please use with a load capacitance (CL) of less than 0.1μF.

■NOTES ON USE

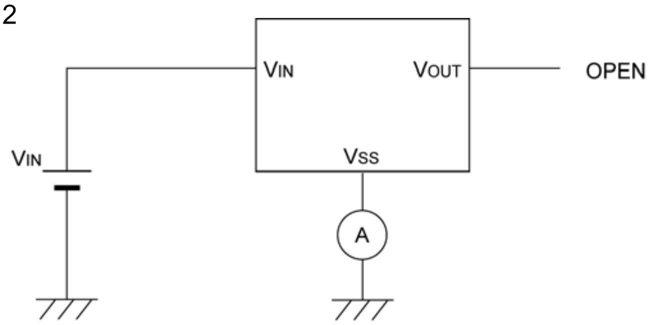
1. Please use with a load capacitance, CL, of less than 0.1μF and in 0.01μF steps.
2. Since short-circuit protection is not built-in, the IC may be damaged by rush current should the output pin be connected to the Ground pin.
3. When the load capacitance, CL, is small, overshoot will be produced when the power is switched on.
4. As the output pin's current is only a few μA, output voltage will increase should output be pulled-up by means of a resistor.

■TEST CIRCUITS

Circuit 1

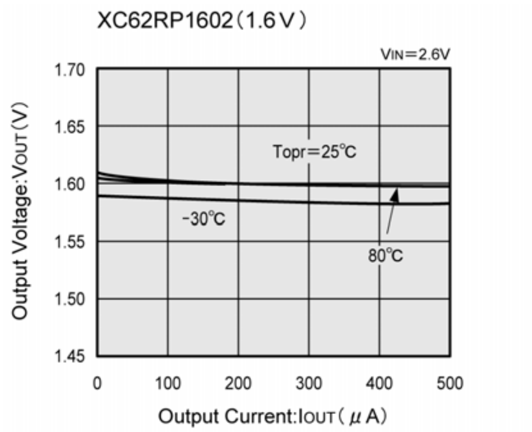


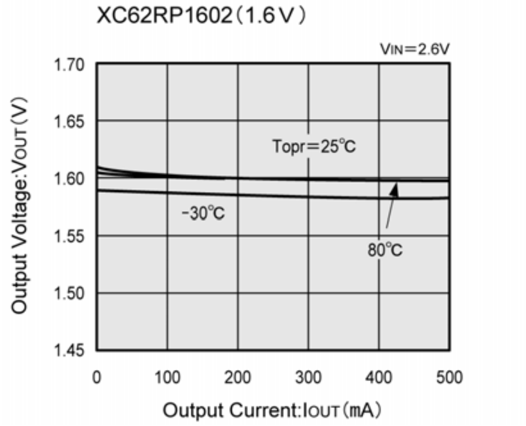
Circuit 2

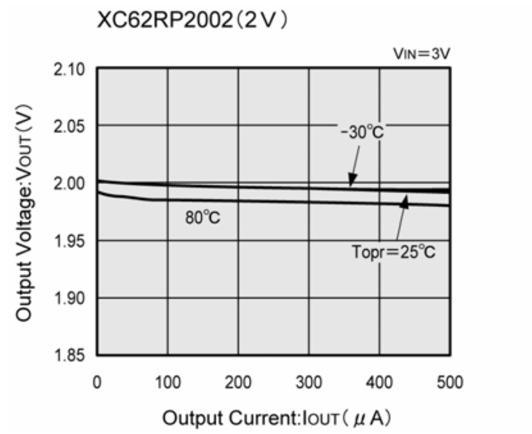


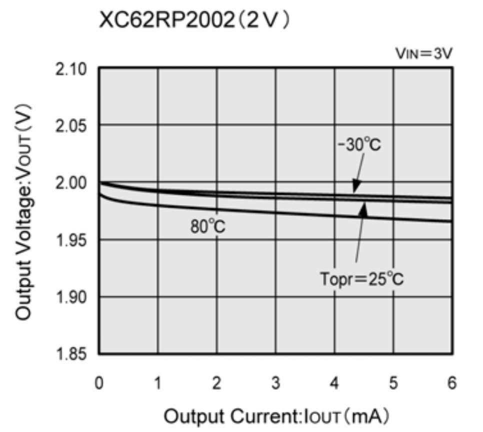
■TYPICAL PERFORMANCE CHARACTERISTICS

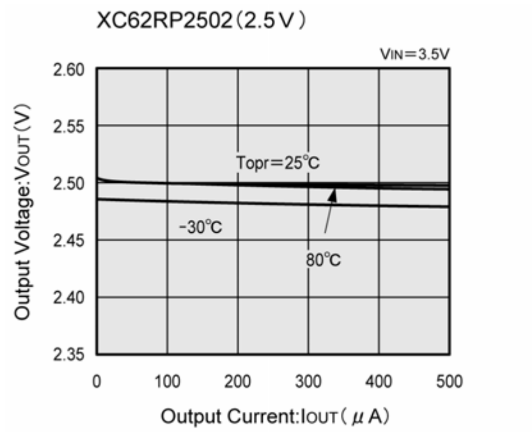
(1) Output Voltage vs. Output Current

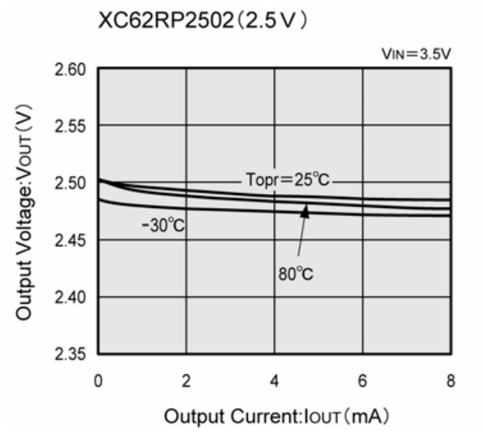


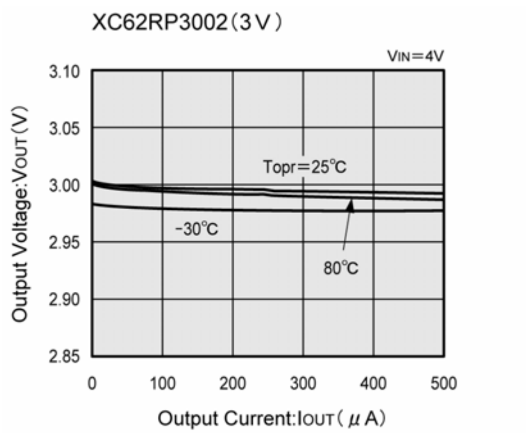


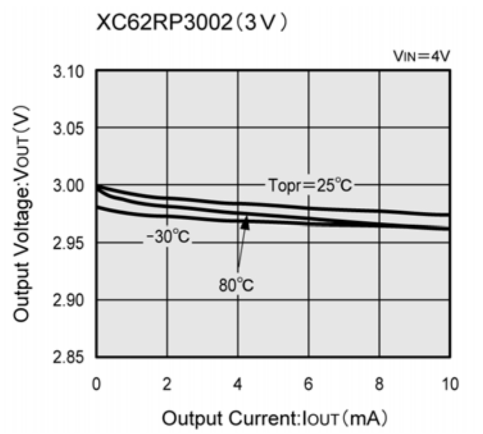






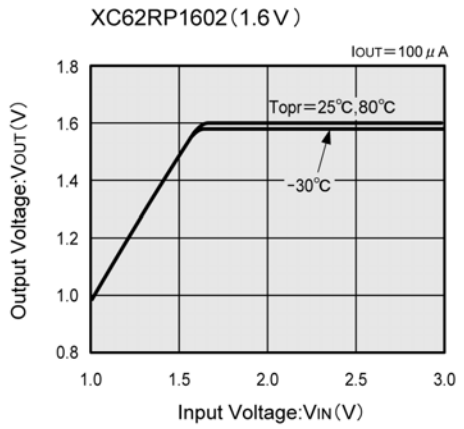


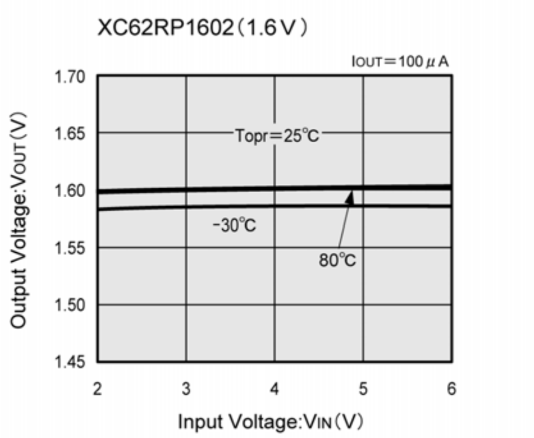


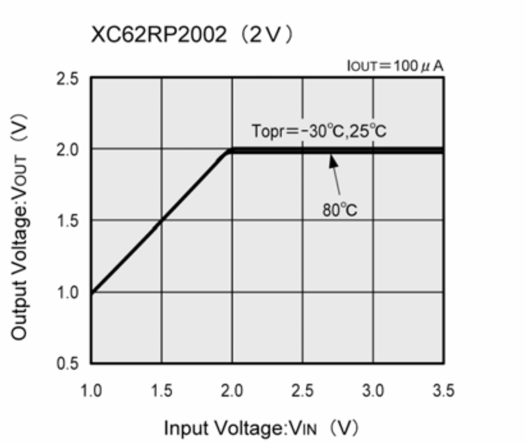


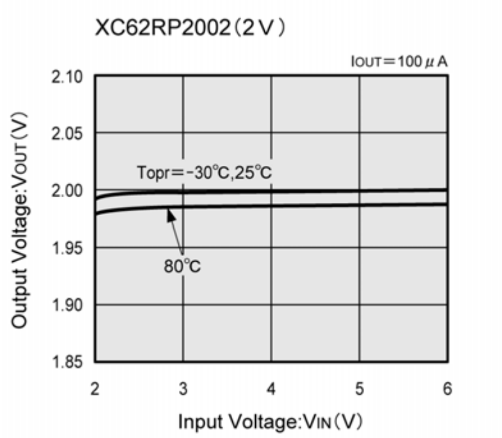
■TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

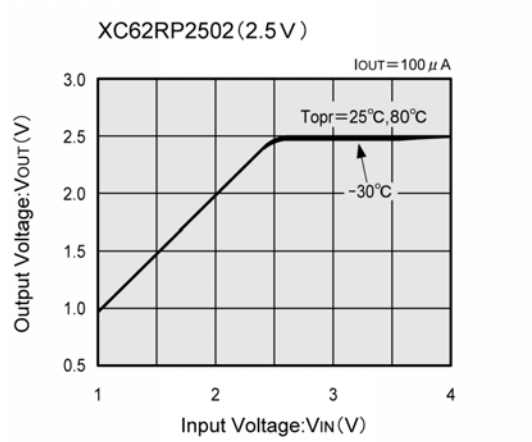
(2) Output Voltage vs. Input Voltage

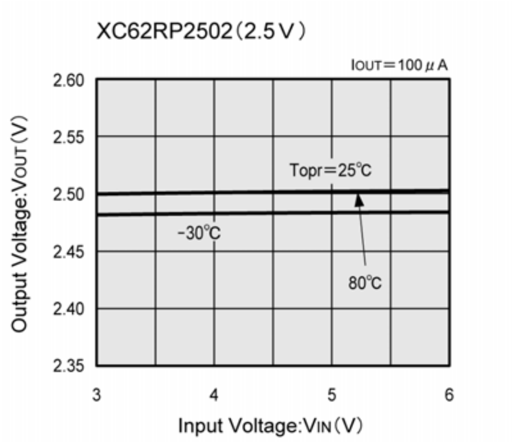


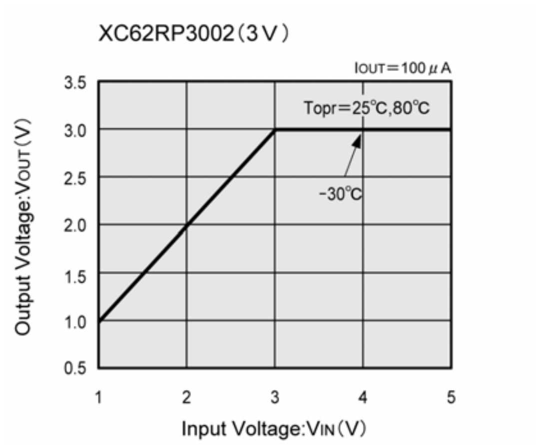


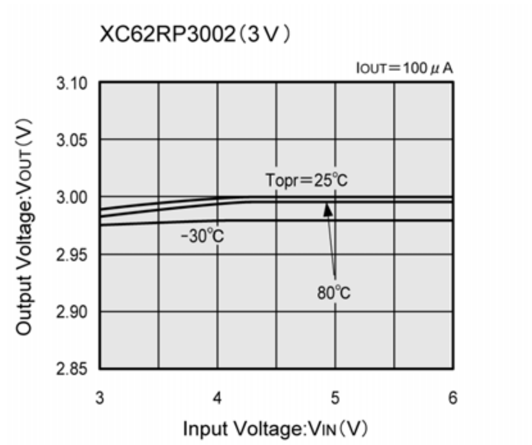








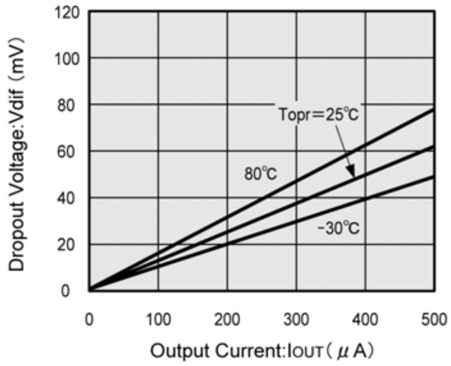




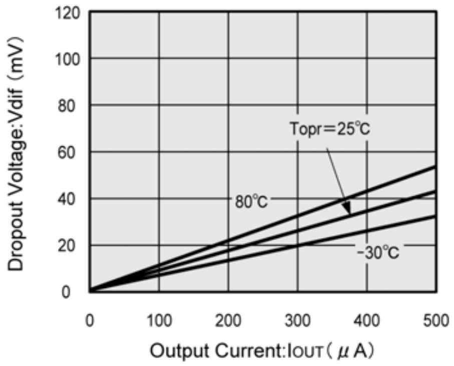
■TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

(3) Dropout Voltage vs. Output Current

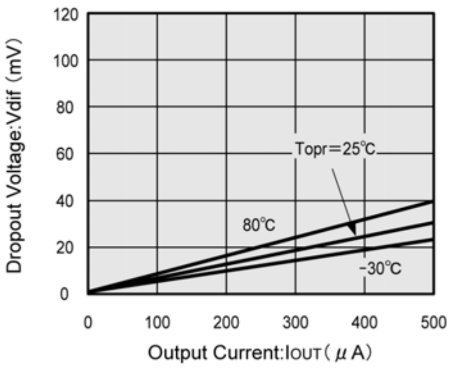
XC62RP1602(1.6V)



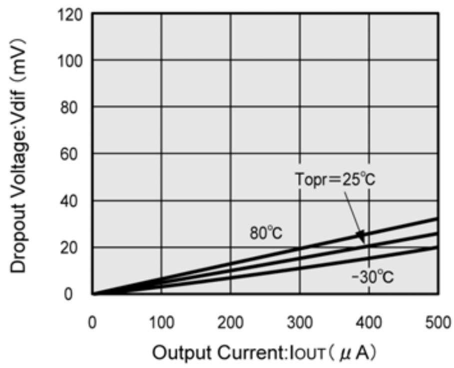
XC62RP2002(2V)



XC62RP2502(2.5V)

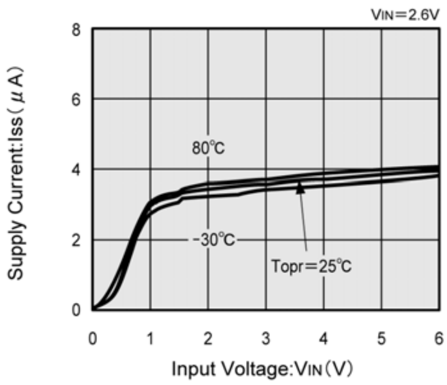


XC62RP3002(3V)



(4) Supply Current vs. Input Voltage

XC62RP1602(1.6V)



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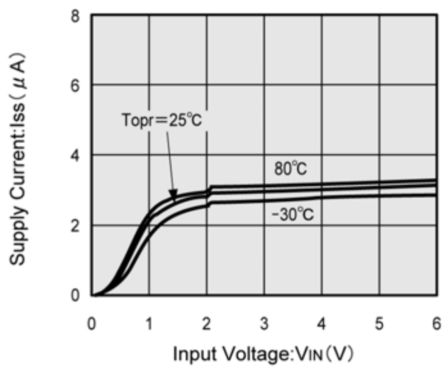

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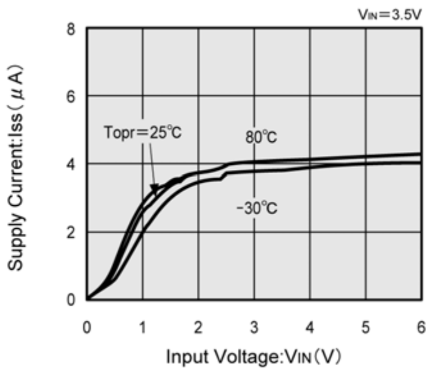

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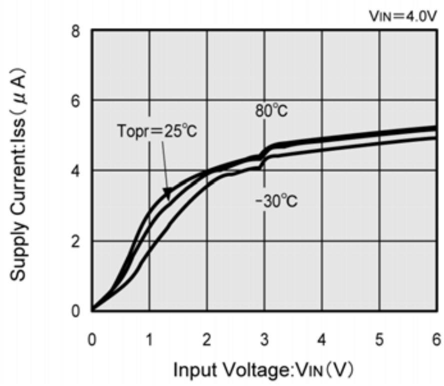
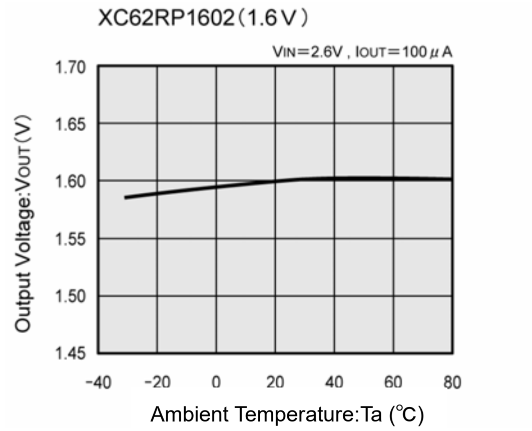
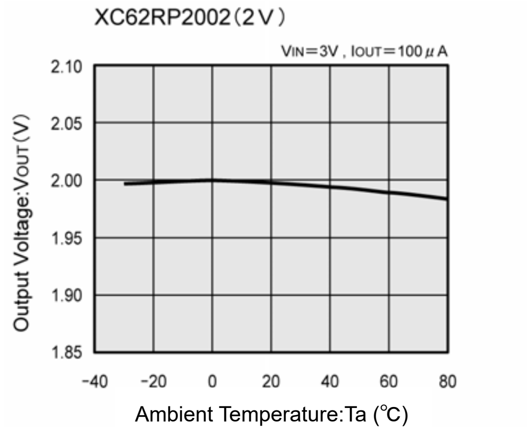
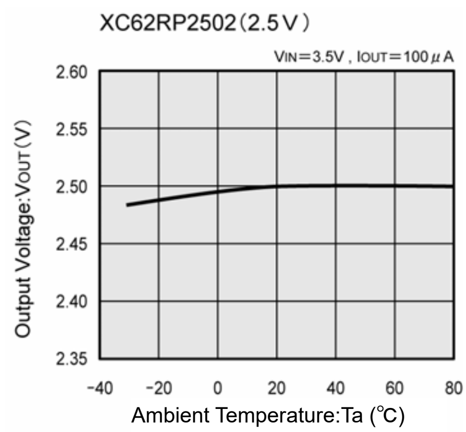


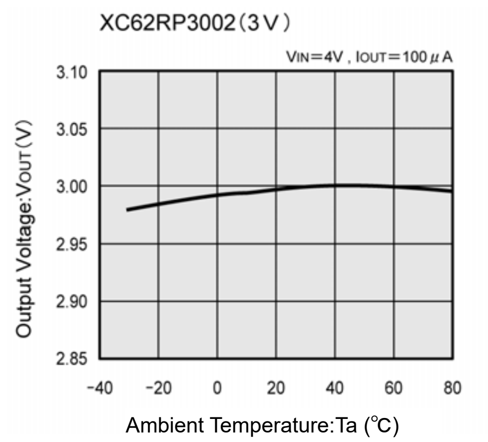
■TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

(5) Output Voltage vs. Ambient Temperature

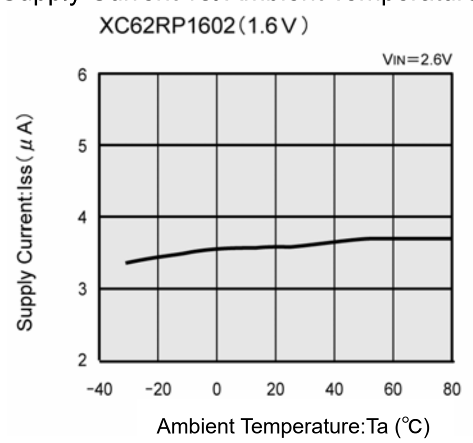


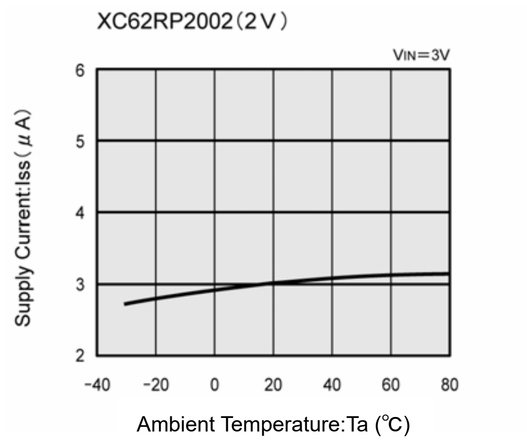


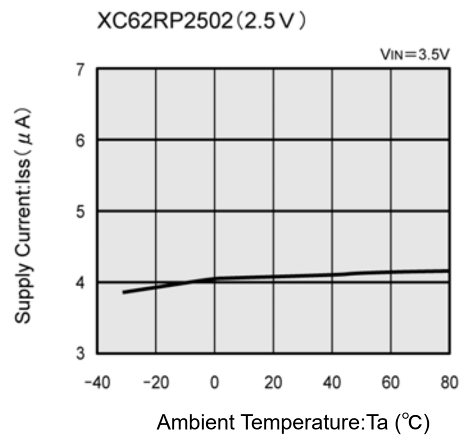


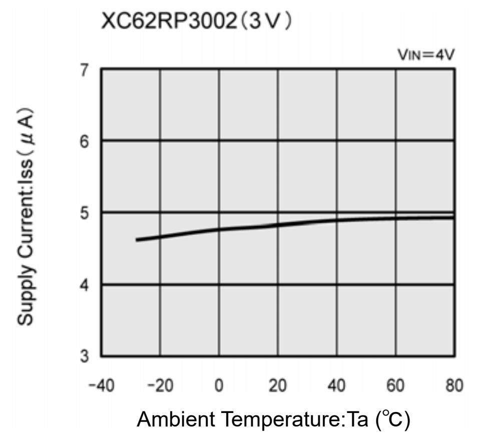


(6) Supply Current vs. Ambient Temperature





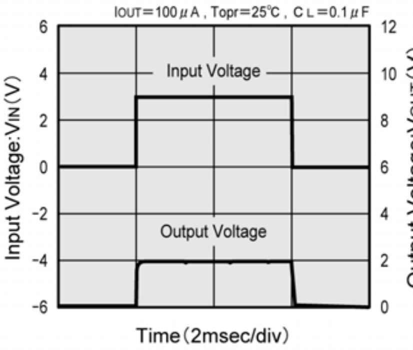




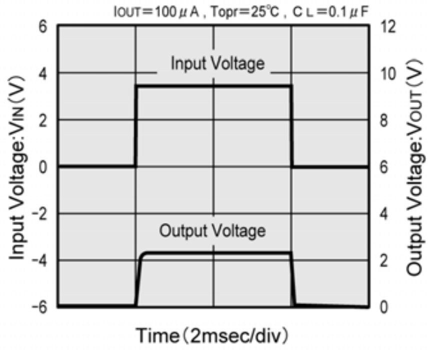
■TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

(7) Input Transient Response

XC62RP2002(2V)

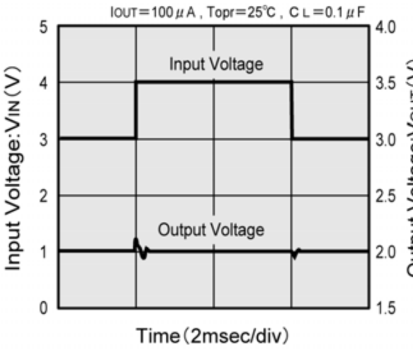


XC62RP2502(2.5V)

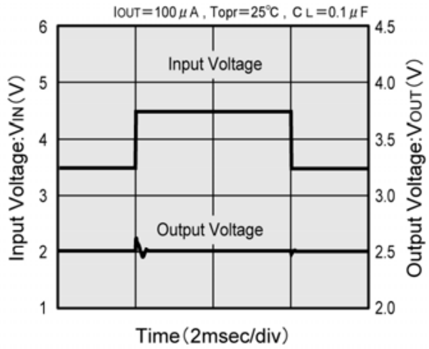


(8) Input Transient Response 2

XC62RP2002(2V)

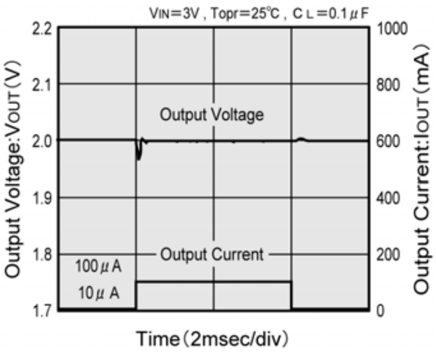


XC62RP2502(2.5V)

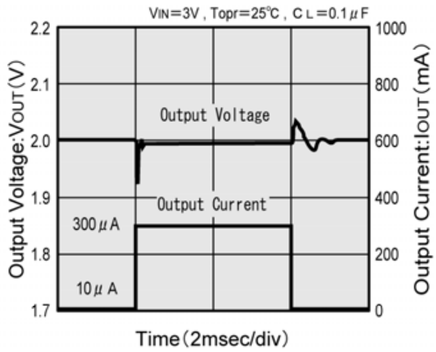


(9) Load Transient Response

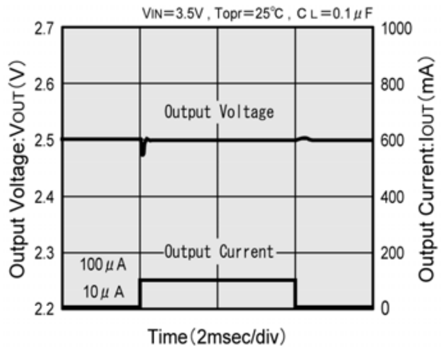
XC62RP2002(2V)



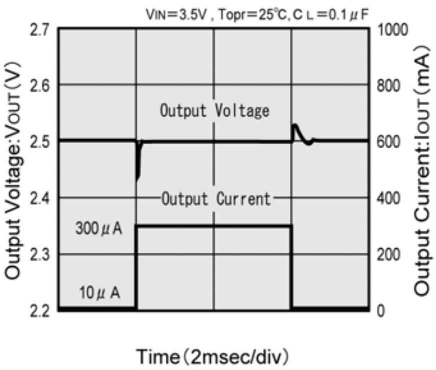
XC62RP2002(2V)



XC62RP2502(2.5V)

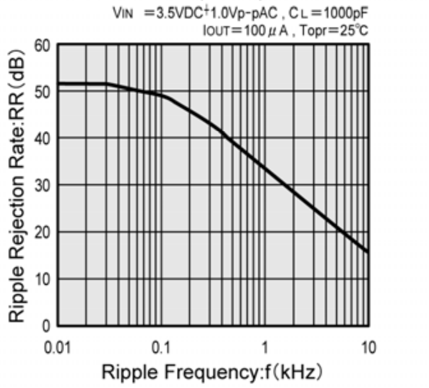


XC62RP2502(2.5V)



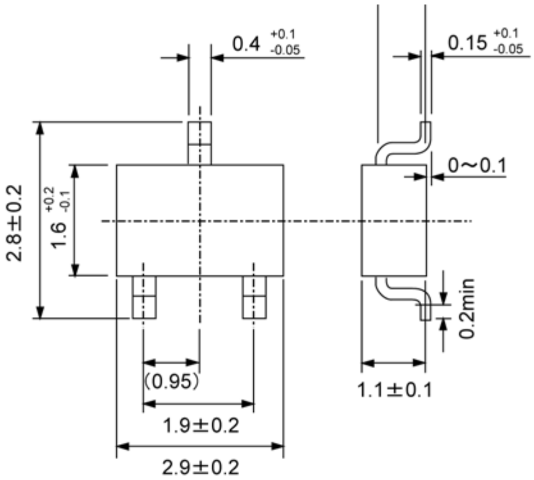
(10) Ripple Rejection Rate

XC62RP2502(2.5V)

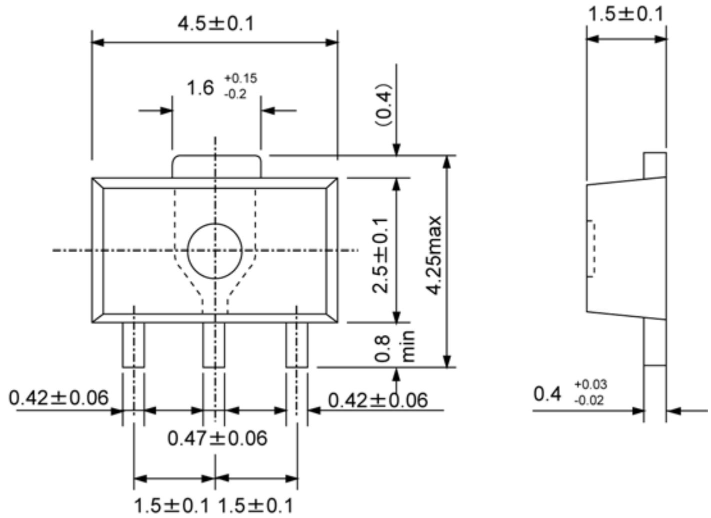


■PACKAGING INFORMATION

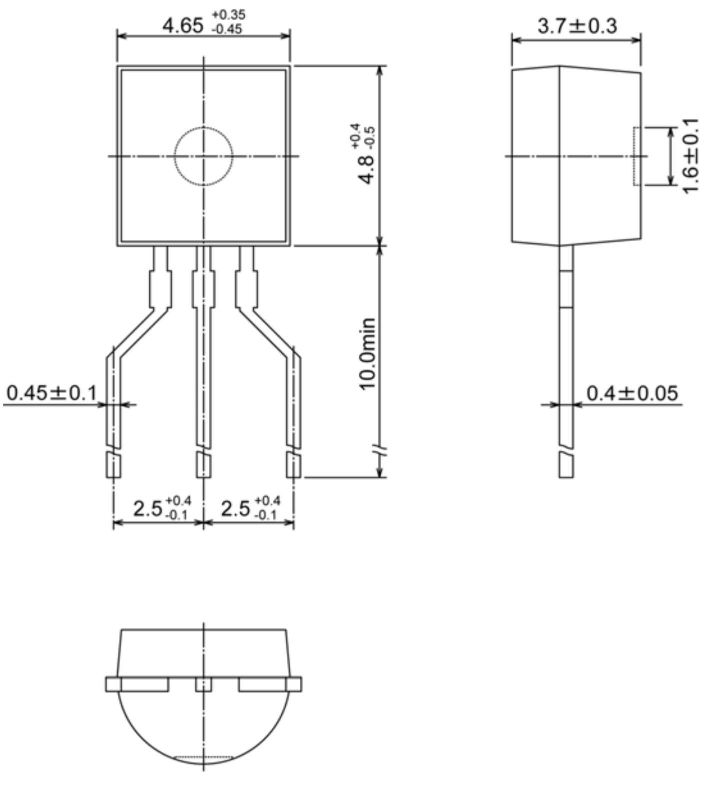
●SOT-23



●SOT-89

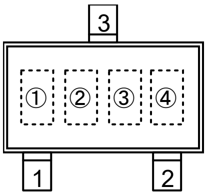


●TO-92

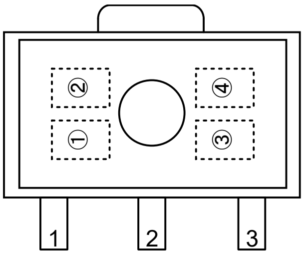


■MARKING RULE

●SOT-23, SOT-89



SOT-23
(TOP VIEW)



SOT-89
(TOP VIEW)

①Not used

②Represents integer of output voltage

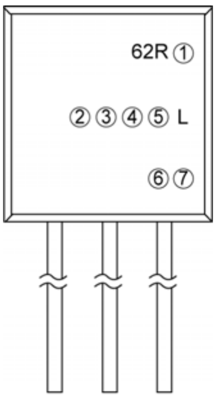
MARK	VOLTAGE (V)
A	0.x
B	1.x
C	2.x
D	3.x

③Represents decimal number of output voltage

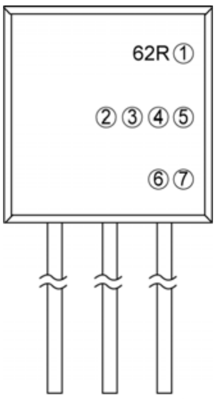
MARK	VOLTAGE (V)	MARK	VOLTAGE (V)
A	x.0	F	x.5
B	x.1	H	x.6
C	x.2	K	x.7
D	x.3	L	x.8
E	x.4	M	x.9

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

●TO-92



TO-92 (L Type)
(TOP VIEW)



TO-92 (T Type)
(TOP VIEW)

①Represents polarity of output voltage

MARK	POLARITY
P	+ (Positive)

②③Represents output voltage

MARK		OUTPUT VOLTAGE (V)
②	③	
3	3	3.3
5	0	5.0

④Represents temperature characteristics

MARK	TEMPERATURE CHARACTERISTICS
0	±100 ppm (TYP.)

⑤Represents output voltage accuracy

MARK	OUTPUT VOLTAGE ACCURACY
1	Within ±1% (semi-custom)
2	Within ±2%

⑥Represents a least significant digit of production year

MARK	PRODUCTION YEAR
3	2003
4	2004

⑦Represents production lot number
0 to 9, A to Z repeated (G, I, J, O, Q, W excepted)

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   (e.g. Atomic energy; aerospace; transport; combustion and associated safety equipment thereof.)
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