■PRODUCT CLASSIFICATION

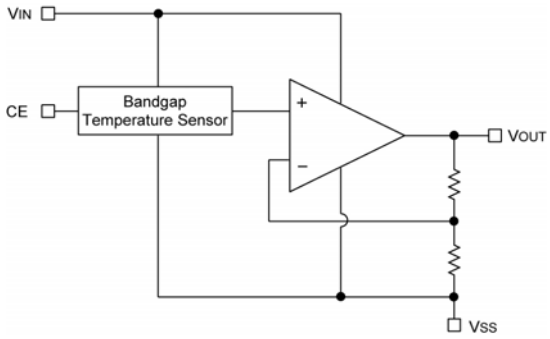
●Ordering Information

XC31B①②③④⑤⑥⑦-⑧ (*1)

DESIGNATOR	DESCRIPTION	SYMBOL	DESCRIPTION
①	Polarity of Output Voltage	P	+ (Positive)
②	Temperature Coefficient	N	- (Negative)
③④	Output Voltage (25℃)	20~60	e.g. 20=2.0V, 30=3.0V
⑤	Revision Character	A ~	-
⑥⑦-⑧	Packages Taping Type (*2)	MR	SOT-25
		MR-G	SOT-25
		DR	USP-6B

(*1) The "-G" suffix indicates that the products are Halogen and Antimony free as well as being fully RoHS compliant.
(*2) The device orientation is fixed in its embossed tape pocket. For reverse orientation, please contact your local Torex sales office or representative. (Standard orientation: ⑥R-⑧ Reverse orientation: ⑥L-⑧)

■BLOCK DIAGRAM



■ABSOLUTE MAXIMUM RATINGS

Ta=25℃, VSS=0V

PARAMETER		SYMBOL	RATINGS	UNIT
Input Voltage		VIN	−0.3 ～ 12	V
Output Voltage		VOUT	−0.3 ～ 12	V
CE Pin Voltage		VCE	−0.3 ～ VIN+0.3	V
Output Current		IOUT	20	mA
Power Dissipation	SOT-25	Pd	150	mW
	USP-6B		100	
Operating Temperature Range		Topr	−30 ～ +80	℃
Storage Temperature Range		Tstg	−40 ～ +125	℃

■ELECTRICAL CHARACTERISTICS

XC31BPN20A $V_{OUT(T)}$ (*1) =2.0V

PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNITS
Input Voltage	V_{IN}		—	—	10	V
Output Voltage	V_{OUT}	I_{OUT}=100μA (*2), V_{IN}=4.0V, Ta=25℃	1.94	2.0	2.06	V
Detectable Temperature Range			-30	—	+80	℃
Output Voltage Temperature Coefficient	T_D (*3)	I_{OUT}=100μA, V_{IN}=4.0V -30℃≦Ta≦80℃	-3400	-3900	-4400	ppm/℃
Temperature Sensitivity	T_{SE}	-30℃≦Ta≦80℃	-6.8	-7.8	-8.8	mV/℃
Linearity Margin Error	T_L (*4)	-30℃≦Ta≦80℃	—	1	3.5	%
Load Regulation	ΔVOUT	V_{IN}=4.0V 1μA≦I_{OUT}≦100μA	—	2.0	—	mV
Supply Current 1	I_{SS1}	V_{IN}=V_{CE}=4.0V, Ta=25℃	—	7	17	μA
Supply Current 2	I_{SS2}	V_{IN}=4.0V, V_{CE}=V_{SS}, Ta=25℃		—	0.1	μA
CE "High" Level Voltage	V_{CEH}		1.5	—	—	V
CE "Low" Level Voltage	V_{CEL}		—	—	0.3	V

XC31BPN40A $V_{OUT(T)}$ (*1) =4.0V

PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNITS
Input Voltage	V_{IN}		—	—	10	V
Output Voltage	V_{OUT}	I_{OUT}=100μA (*2), V_{IN}=6.0V,Ta=25℃	3.88	2.0	4.12	V
Detectable Temperature Range			-30	—	+80	℃
Output Voltage Temperature Coefficient	T_D (*3)	I_{OUT}=100μA, V_{IN}=6.0V -30℃≦Ta≦80℃	-3400	-3900	-4400	ppm/℃
Temperature Sensitivity	T_{SE}	-30℃≦Ta≦80℃	-13.6	-15.6	-17.6	mV/℃
Linearity Margin Error	T_L (*4)	-30℃≦Ta≦80℃	—	1	3.5	%
Load Regulation	ΔVOUT	V_{IN}=6.0V 1μA≦I_{OUT}≦100μA	—	3.0	—	mV
Supply Current 1	I_{SS1}	V_{IN}=V_{CE}=6.0V, Ta=25℃	—	8	18	μA
Supply Current 2	I_{SS2}	V_{IN}=6.0V, V_{CE}=V_{SS}, Ta=25℃	—	—	0.1	μA
CE "High" Level Voltage	V_{CEH}		1.5	—	—	V
CE "Low" Level Voltage	V_{CEL}		—	—	0.3	V

NOTE:

*1: $V_{OUT(T)}$ =Specified output voltage at 25℃.

*2: When output current exceed 100μA, output voltage drop will increase.
If this IC is to be used in applications where such currents are required, please use a buffer on the output

*3: Output voltage temperature coefficient (T_D) is defined as:

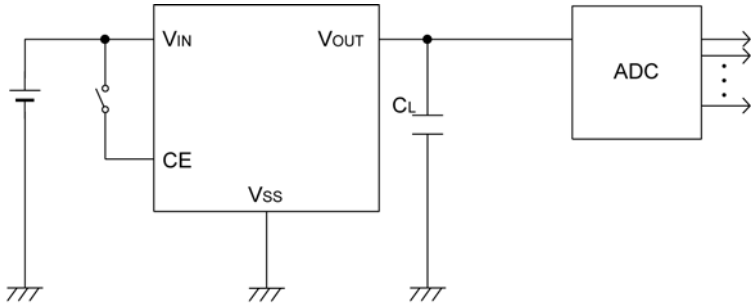
$$T_D = \frac{\Delta V_{OUT}}{Ta \cdot V_{OUT}}$$

*4: Linearity margin error (T_L) is calculated as follows:

$$T_L = \frac{emax}{Tse \cdot \Delta Ta}$$

where emax = maximum error.
The maximum error is the maximum difference between the actual measured value and the value on an approximated straight line.

■TYPICAL APPLICATION CIRCUIT



CL：0.01μF（ceramic capacitor）

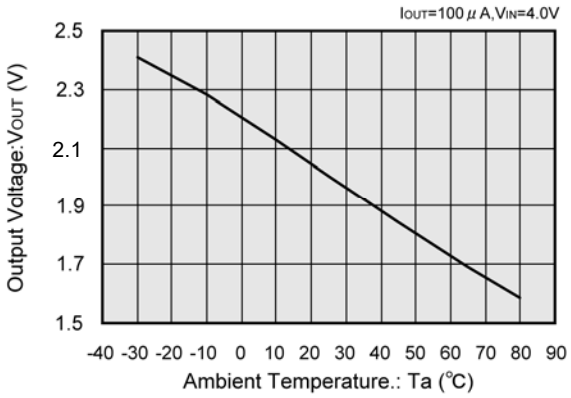
■NOTE ON USE

1. When the load capacitance C_L is too large, oscillation may occur on the output signal.
2. Output signal overshoot will occur when the power (V_{IN}) is switched on or when the power drastically fluctuates. The chip enable (CE) function is effective for helping to avoid overshoot and also in saving consumption current.

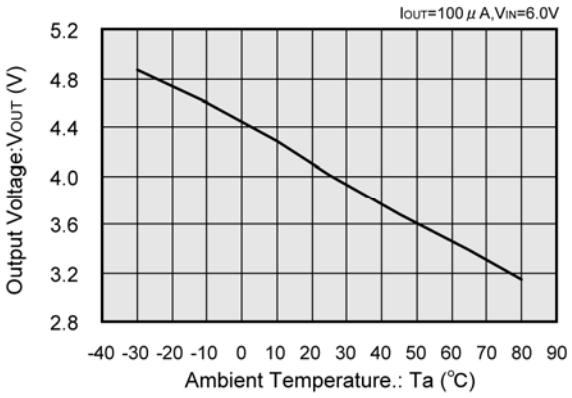
■TYPICAL PERFORMANCE CHARACTERISTICS

(1) Output Voltage vs. Ambient Temperature

XC31BPN20A（2.0V）

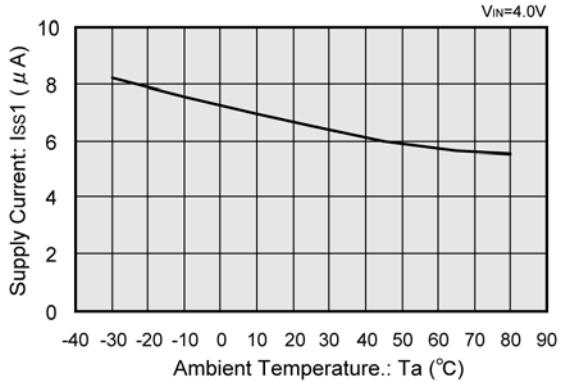


XC31BPN40A（4.0V）

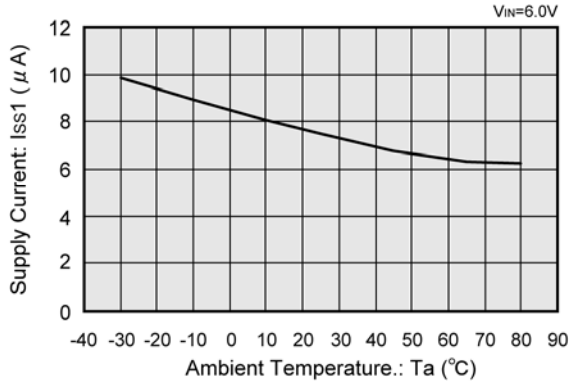


(2) Supply Current vs. Ambient Temperature

XC31BPN20A（2.0V）

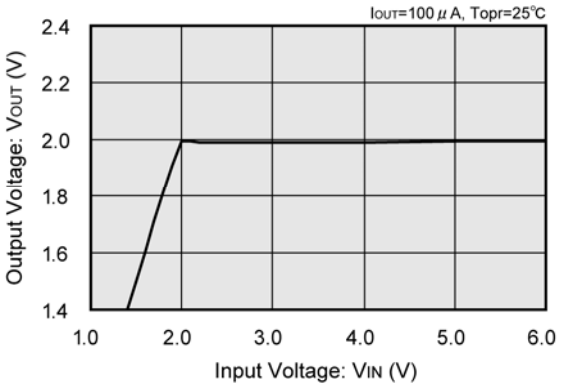


XC31BPN40A（4.0V）

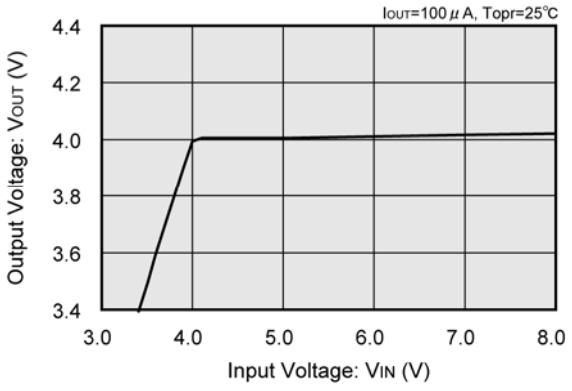


(3) Output Voltage vs. Input Voltage

XC31BPN20A（2.0V）



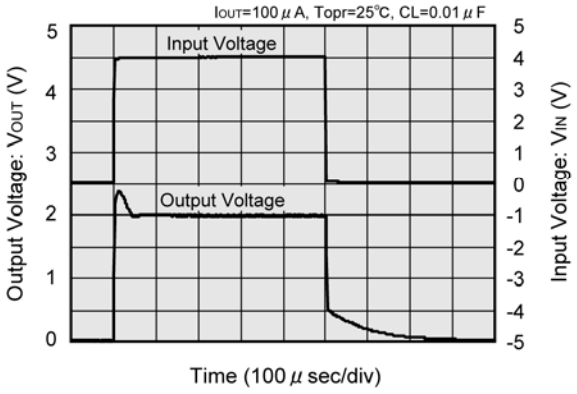
XC31BPN40A（4.0V）



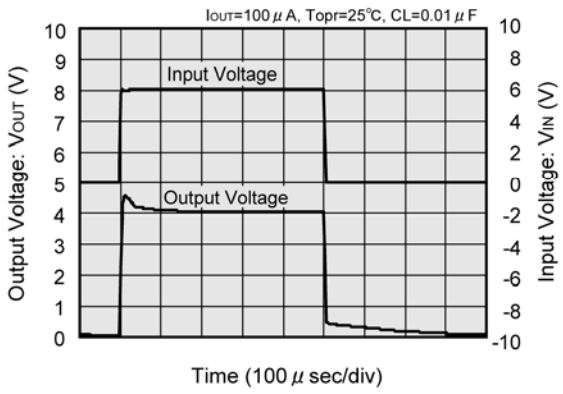
■TYPICAL PERFORMANCE CHARACTERISTICS(Continued)

(4) Input Transient Response 1

XC31BPN20A（2.0V）

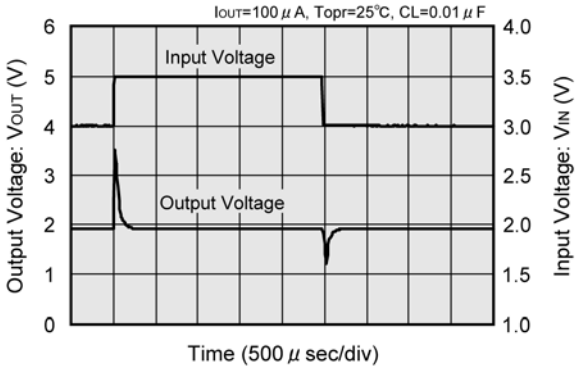


XC31BPN40A（4.0V）

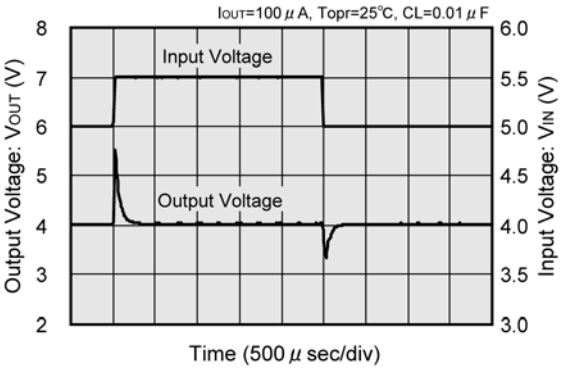


(5) Input Transient Response 2

XC31BPN20A（2.0V）

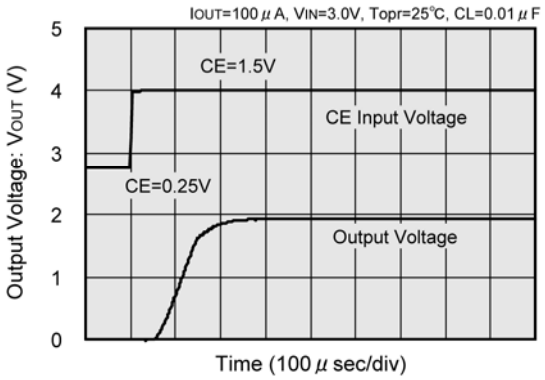


XC31BPN40A（4.0V）

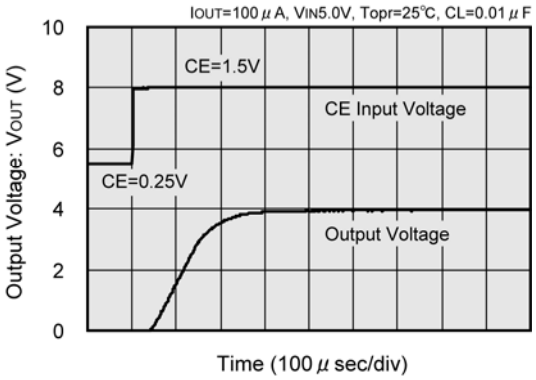


(6) CE Pin Transient Response

XC31BPN20A（2.0V）

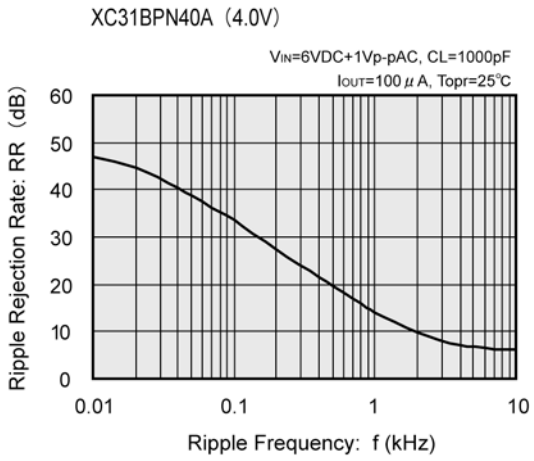


XC31BPN40A（4.0V）



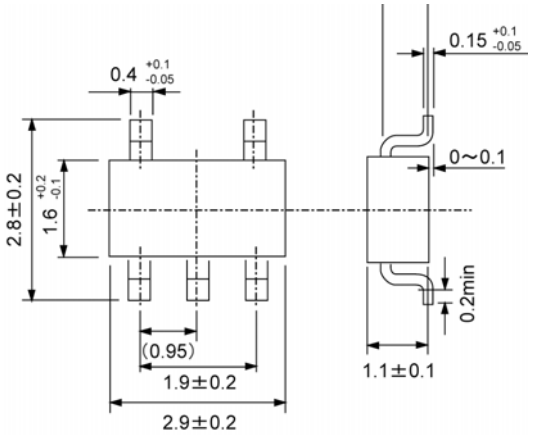
■TYPICAL PERFORMANCE CHARACTERISTICS(Continued)

(7) Ripple Rejection Rate

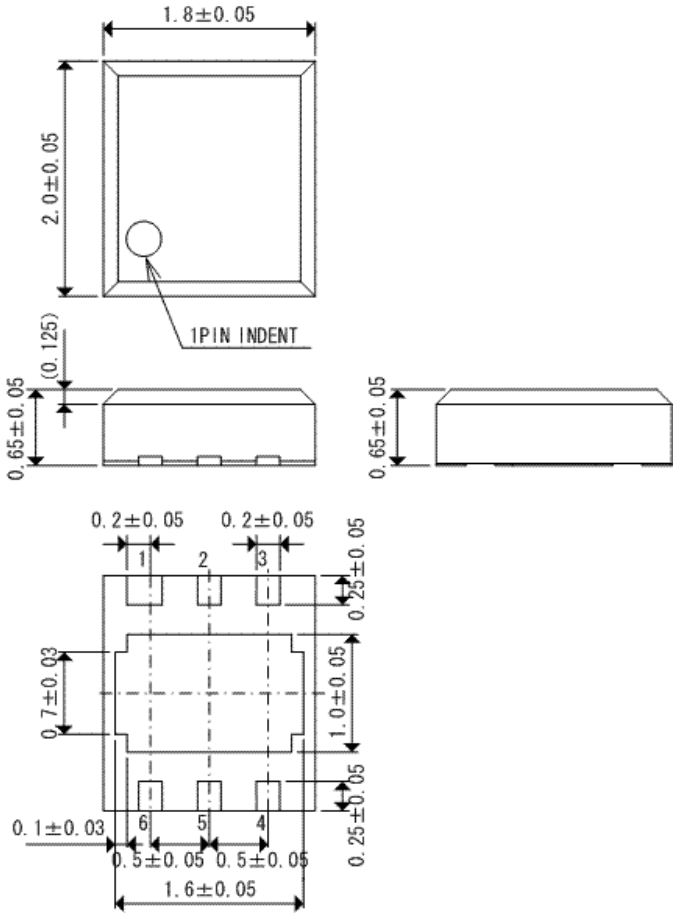


■PACKAGING INFORMATION

●SOT-25

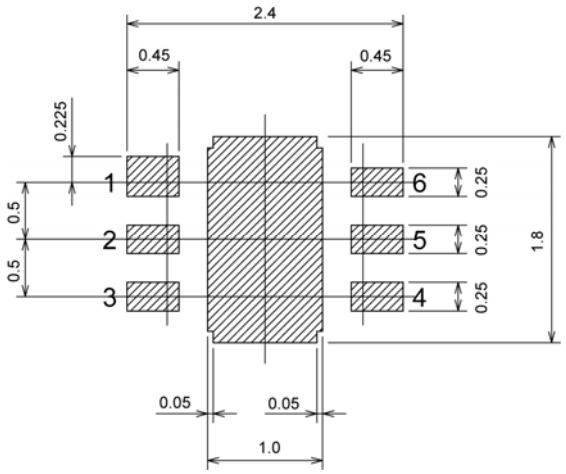


●USP-6B

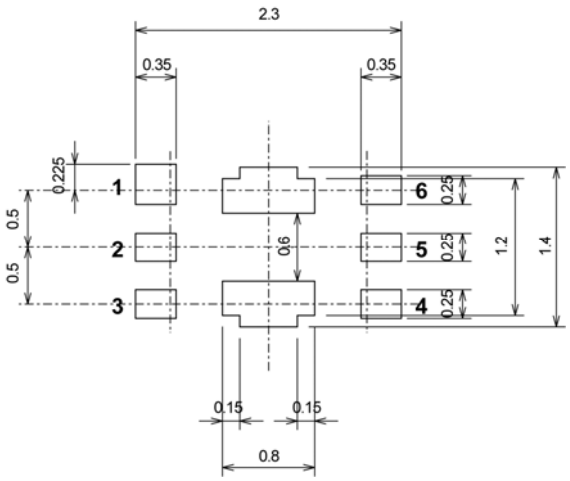


■PACKAGING INFORMATION (Continued)

●USP-6B Recommended Pattern Layout

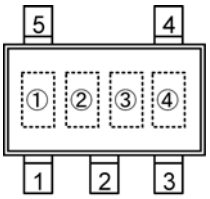


●USP-6B Recommended Metal Mask Design



■MARKING RULE

●SOT-25



SOT-25
(TOP VIEW)

① based on internal standards

② represents integer of output voltage

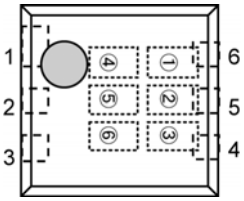
MARK	VOLTAGE (V)
2	2.x
3	3.x
4	4.x
5	5.x
6	6.x

③ represents decimal number point of output voltage

MARK	VOLTAGE (V)
0	x.0
1	x.1
2	x.2
3	x.3
4	x.4
5	x.5
6	x.6
7	x.7
8	x.8
9	x.9

④ represents assembly lot number
(Based on internal standards)

●USP-6B



USP-6B
(TOP VIEW)

① represents polarity of output voltage

MARK	POLARITY	PRODUCT SERIES
P	+	XC31BPN**AD*

② represents temperature coefficient

MARK	COEFFICIENT	PRODUCT SERIES
N	-	XC31BPN**AD*

③④ represents output voltage(25℃)
Ex)

MARK		VOLTAGE (V)	PRODUCT SERIES
③	④		
2	0	2.0	XC31BPN20AD*
3	0	3.0	XC31BPN30AD*

⑤ represents revision character
Ex)

MARK	PRODUCT SERIES
A	XC31BPN**AD*

⑥ represents production lot number
0~9, A~Z repeated. (G, I, J, O, Q, W excluded)
*No character inversion used.

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