

## LOW DROPOUT VOLTAGE REGULATOR

### ■ GENERAL DESCRIPTION

The NJM2880 is a low dropout voltage regulator. Advanced Bipolar technology achieves low noise, high ripple rejection and low quiescent current.

### ■ PACKAGE OUTLINE

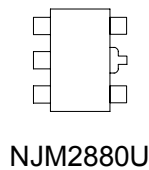


NJM2880U

### ■ FEATURES

- High Ripple Rejection      70dB typ. (f=1kHz)
- Output Noise Voltage       $V_{no}=30\mu V_{rms}$  ( $C_p=0.01\mu F$ )
- Output capacitor with 1.0 $\mu F$  ceramic capacitor
- Output Current               $I_o(max.)=300mA$
- High Precision Output       $V_o\pm 1.0\%$
- Low Dropout Voltage        0.10V typ. ( $I_o=100mA$ )
- ON/OFF Control            (Active High)
- Internal Short Circuit Current Limit
- Internal Thermal Overload Protection
- Bipolar Technology
- Package Outline              SOT-89(5pin)

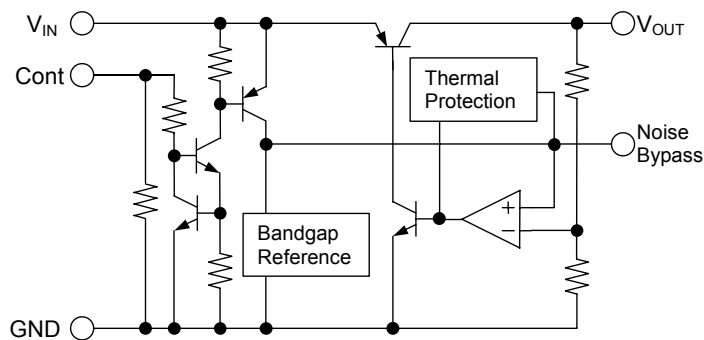
### ■ PIN CONFIGURATION



NJM2880U

- PIN FUNCTION**
1. CONTROL (Active High)
  2. GND
  3. NOISE BYPASS
  4.  $V_{OUT}$
  5.  $V_{IN}$

### ■ EQUIVALENT CIRCUIT



### ■ OUTPUT VOLTAGE RANK LIST

Device Name	Vout	Device Name	Vout
NJM2880U21	2.1V	NJM2880U33	3.3V
NJM2880U25	2.5V	NJM2880U38	3.8V
NJM2880U26	2.6V	NJM2880U05	5.0V
NJM2880U27	2.7V		
NJM2880U28	2.8V		
NJM2880U285	2.85V		
NJM2880U03	3.0V		

## ■ ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage	$V_{IN}$	+14	V
Control Voltage	$V_{CONT}$	+14(note 1)	V
Power Dissipation	$P_D$	350	mW
Operating Temperature	$T_{opr}$	-40 ~ +85	°C
Storage Temperature	$T_{stg}$	-40 ~ +125	°C

(note 1) When input voltage is less than +14V, the absolute maximum control voltage is equal to the input voltage.

## ■ ELECTRICAL CHARACTERISTICS

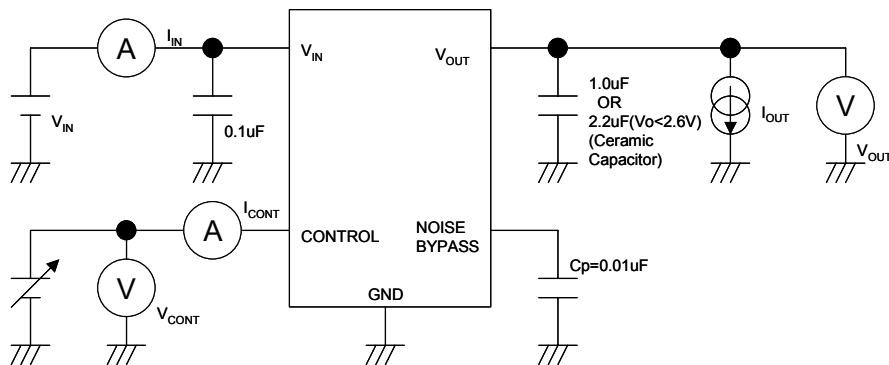
( $V_{IN}=V_o+1V$ ,  $C_o=1.0\mu F$ :  $V_o \geq 2.7V$  ( $C_o=2.2\mu F$ :  $V_o \leq 2.6V$ ),  $C_p=0.01\mu F$ ,  $T_a=25^\circ C$ )

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Voltage	$V_o$	$I_o=30mA$	-1.0%	-	+1.0%	V
Quiescent Current	$I_Q$	$I_o=0mA$ , expect $I_{cont}$	-	120	180	$\mu A$
Quiescent Current at Control OFF	$I_{Q(OFF)}$	$V_{CONT}=0V$	-	-	100	nA
Output Current	$I_o$	$V_o-0.3V$	300	400	-	mA
Line Regulation	$\Delta V_o/\Delta V_{IN}$	$V_{IN}=V_o+1V \sim V_o+6V$ , $I_o=30mA$	-	-	0.10	%/V
Load Regulation	$\Delta V_o/\Delta I_o$	$I_o=0 \sim 300mA$	-	-	0.03	%/mA
Dropout Voltage	$\Delta V_{I-O}$	$I_o=100mA$	-	0.10	0.18	V
Ripple Rejection	RR	$e_{in}=200mV_{rms}$ , $f=1kHz$ , $I_o=10mA$ $V_o=3V$ Version	-	70	-	dB
Average Temperature Coefficient of Output Voltage	$\Delta V_o/\Delta T_a$	$T_a=0 \sim 85^\circ C$ , $I_o=10mA$	-	$\pm 50$	-	ppm/°C
Output Noise Voltage	$V_{NO}$	$f=10Hz \sim 80kHz$ , $I_o=10mA$ , $V_o=3V$ Version	-	30	-	$\mu V_{rms}$
Control Voltage for ON-state	$V_{CONT(ON)}$		1.6	-	-	V
Control Voltage for OFF-state	$V_{CONT(OFF)}$		-	-	0.6	V

(note 2) The above specification is a common specification for all output voltages.

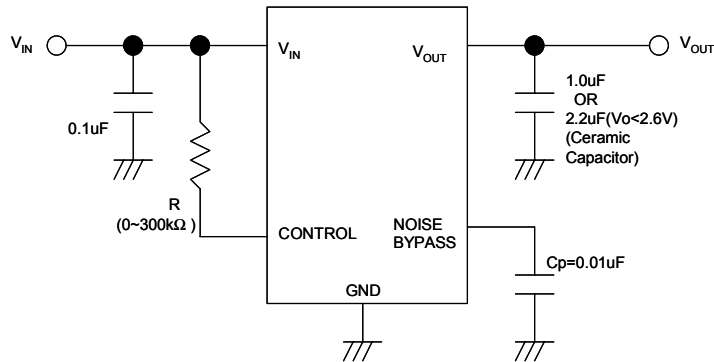
Therefore, it may be different from the individual specification for a specific output voltage.

## ■ TEST CIRCUIT



## ■ TYPICAL APPLICATION

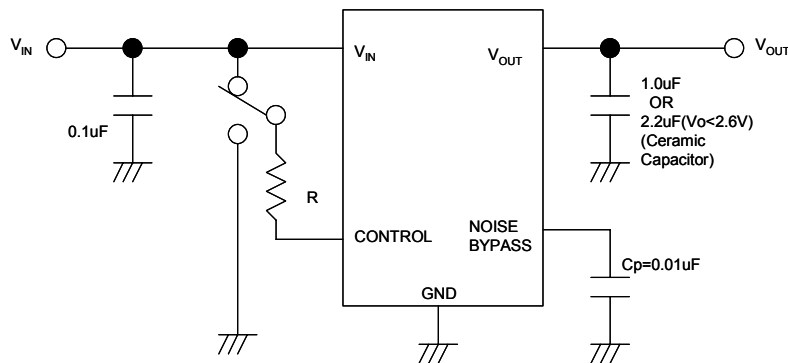
① In the case where ON/OFF Control is not required:



Connect control terminal to  $V_{IN}$  terminal

The quiescent current can be reduced by using a resistance “R”. Instead, it increases the minimum operating voltage. For further information, please refer to Figure “Output Voltage vs. Control Voltage”.

② In use of ON/OFF CONTROL:



State of control terminal:

- “H” → output is enabled.
- “L” or “open” → output is disabled.

### \*Noise bypass Capacitance $C_p$

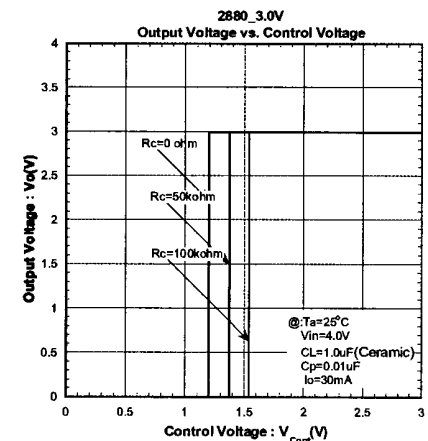
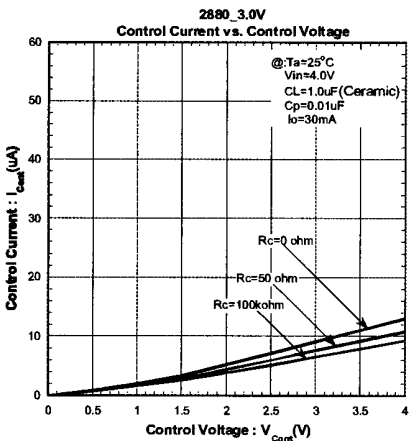
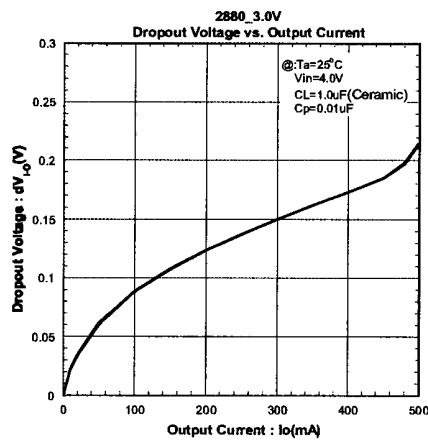
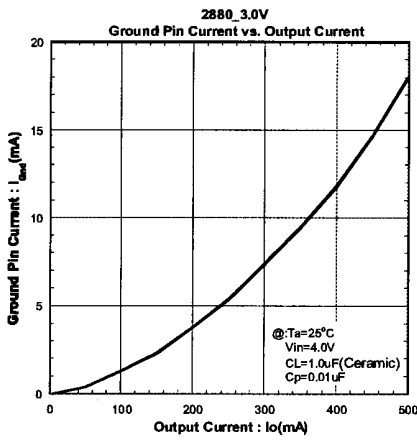
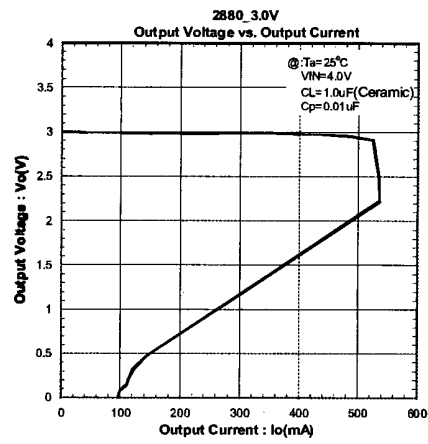
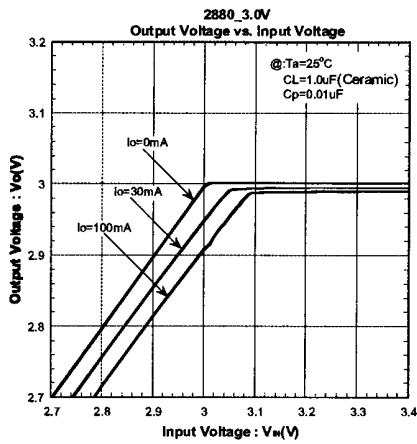
Noise bypass capacitance  $C_p$  reduces noise generated by band-gap reference circuit.

Noise level and ripple rejection will be improved when larger  $C_p$  is used.

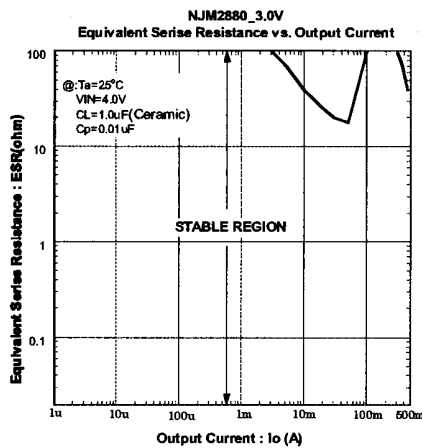
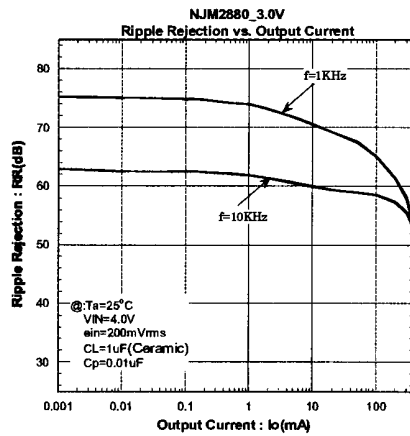
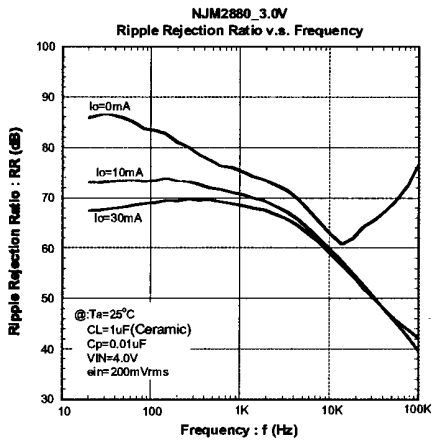
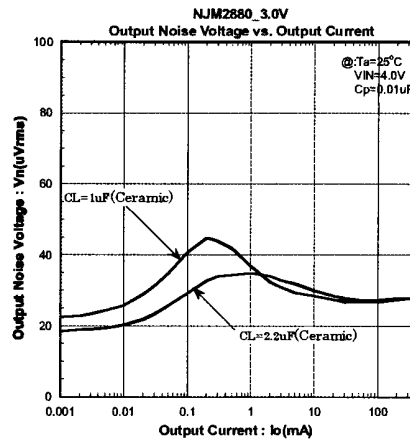
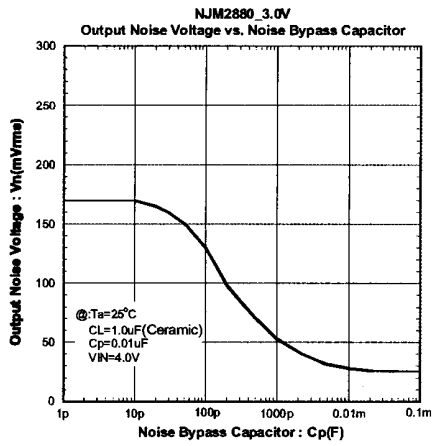
Use of smaller  $C_p$  value may cause oscillation.

Use the  $C_p$  value of 0.01μF greater to avoid the problem.

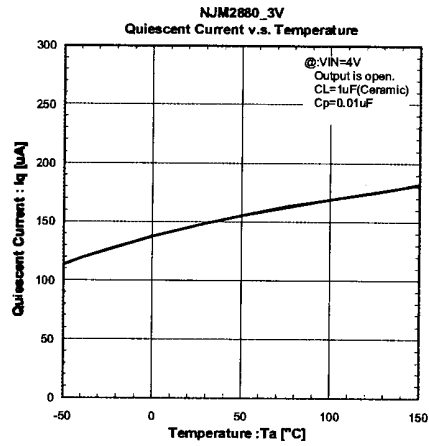
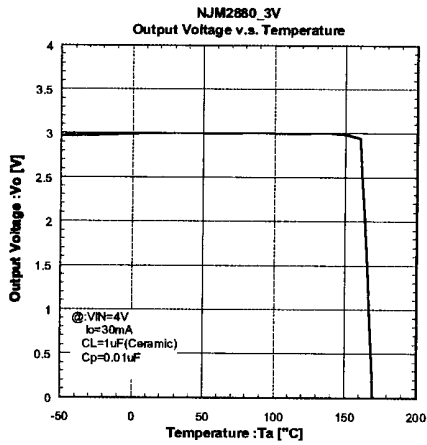
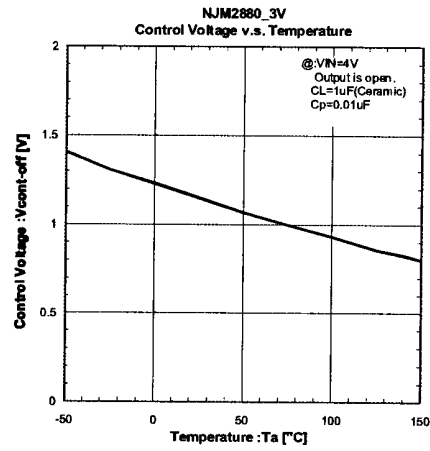
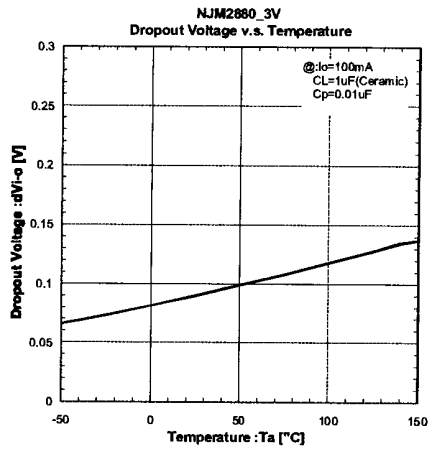
■ TYPICAL CHARACTERISTICS



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**[CAUTION]**

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