

## 2ch LOW DROPOUT VOLTAGE REGULATOR

### ■ GENERAL DESCRIPTION

The NJM2891 is low dropout voltage regulator designed for cellular phone application.

Advanced Bipolar technology achieves low noise, high ripple rejection and low quiescent current.

### ■ PACKAGE OUTLINE

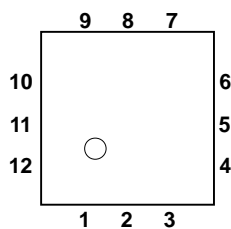


NJM2891PB1

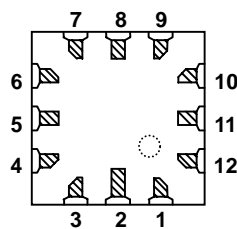
### ■ FEATURES

- High Ripple Rejection 70dB typ. (f=1kHz , Vo=3V Version)
- Output Noise Voltage Vno=30μVrms typ.(Cp=0.01μF)
- Output capacitor with 1.0μF ceramic capacitor (Vo≥2.7V)
- Output Current Io(max.)=150mA × 2ch
- High Precision Output Vo±1.0%
- Low Dropout Voltage 0.10V typ. (Io=60mA)
- ON/OFF Control (Active High)
- Internal Short Circuit Current Limit
- Internal Thermal Overload Protection
- Bipolar Technology
- Package Outline FFP12-B1 (2.0×2.0×0.85mm)

### ■ PIN CONFIGURATION



TOP



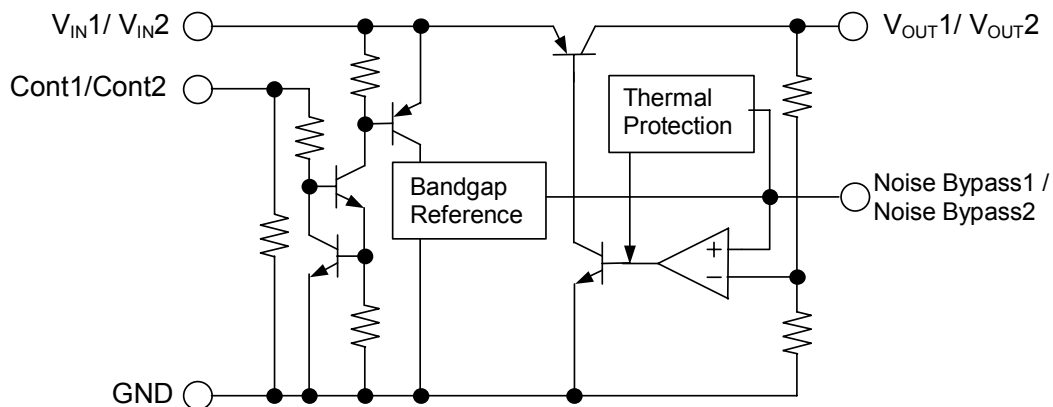
BOTTOM

NJM2891PB1

### PIN FUNCTION

- |                      |                      |
|----------------------|----------------------|
| 1. V <sub>OUT2</sub> | 7. CONTROL1          |
| 2. V <sub>OUT2</sub> | 8. V <sub>OUT1</sub> |
| 3. GND               | 9. V <sub>OUT1</sub> |
| 4. CONTROL2          | 10. NOISE BYPASS1    |
| 5. V <sub>IN2</sub>  | 11. NC               |
| 6. V <sub>IN1</sub>  | 12. NOISE BYPASS2    |

### ■ EQUIVALENT CIRCUIT



## ■ OUTPUT VOLTAGE RANK LIST

Device Name	Vout	
	CH1	CH2
NJM2891PB1-2121	2.1V	2.1V
NJM2891PB1-2725	2.7V	2.5V
NJM2891PB1-2727	2.7V	2.7V
NJM2891PB1-2825	2.8V	2.5V
NJM2891PB1-2828	2.8V	2.8V
NJM2891PB1-J18	2.85V	1.8V
NJM2891PB1-2929	2.9V	2.9V
NJM2891PB1-0328	3.0V	2.8V
NJM2891PB1-0303	3.0V	3.0V
NJM2891PB1-3332	3.3V	3.2V
NJM2891PB1-0521	5.0V	2.1V

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

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage	V <sub>IN</sub>	+14	V
Control Voltage	V <sub>CONT</sub>	+14(*1)	V
Power Dissipation	P <sub>D</sub>	300(*2)	mW
Operating Temperature	T <sub>opr</sub>	-40 ~ +85	°C
Storage Temperature	T <sub>stg</sub>	-40 ~ +125	°C

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

(\*2):On board. (25mm×25mm×0.2mm)

## ■ Operating Voltage

V<sub>IN</sub>=+2.5V ~ +14.0V (In case of Vo<2.1V)

## ■ ELECTRICAL CHARACTERISTICS

(1CH/2CH : V<sub>IN</sub>=Vo+1V, C<sub>IN</sub>=0.1μF, Co=1.0μF: Vo≥2.7V (Co=2.2μF: Vo≤2.6V), Cp=0.01μF, Ta=25°C)

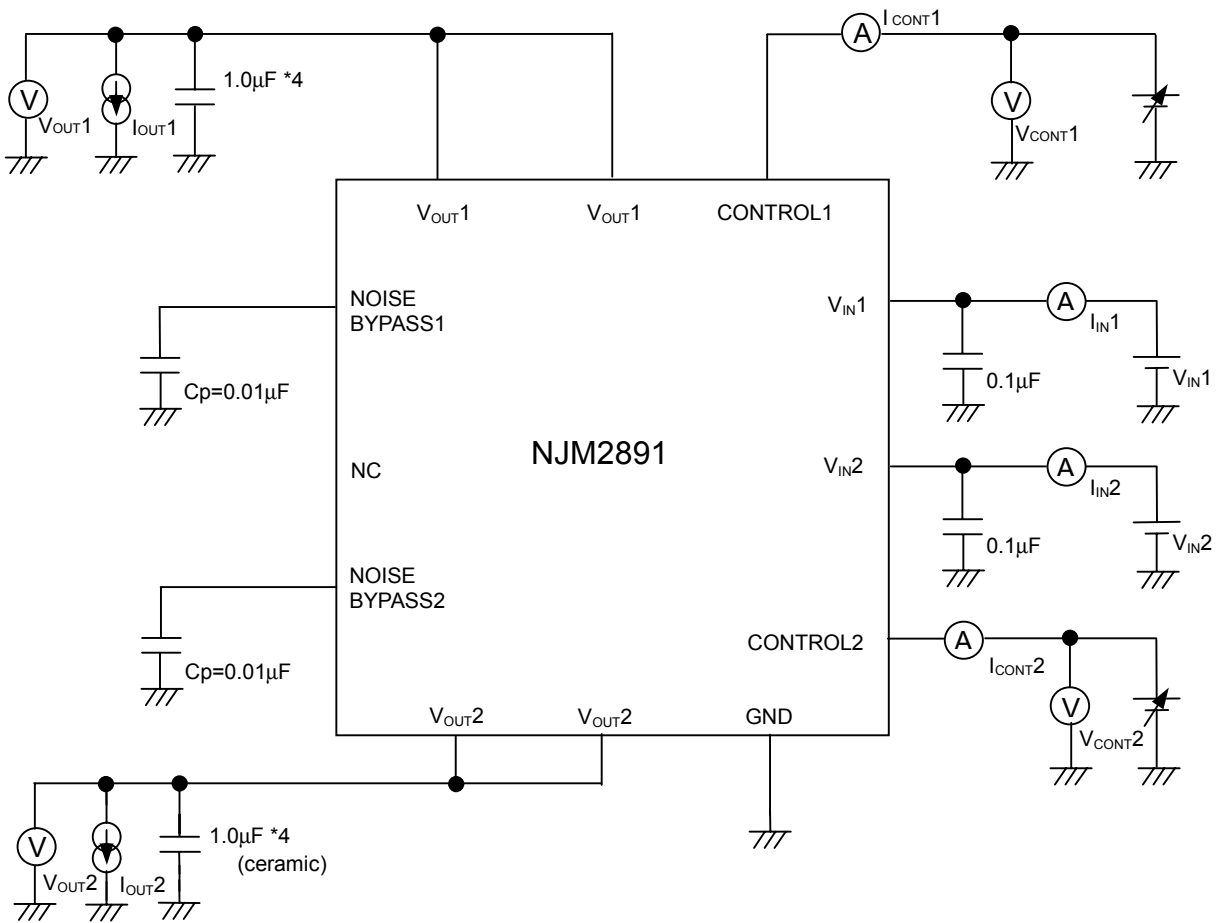
PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Voltage	Vo	I <sub>o</sub> =30mA	-1.0%	-	+1.0%	V
Quiescent Current	I <sub>Q</sub>	I <sub>o</sub> =0mA, expect I <sub>cont</sub>	-	120	180	μA
Quiescent Current at Control OFF	I <sub>Q(OFF)</sub>	V <sub>CONT</sub> =0V	-	-	100	nA
Output Current	I <sub>o</sub>	Vo-0.3V	150	200	-	mA
Line Regulation	ΔVo/ΔV <sub>IN</sub>	V <sub>IN</sub> =Vo+1V ~ Vo+6V, I <sub>o</sub> =30mA	-	-	0.10	%/V
Load Regulation	ΔVo/ΔI <sub>o</sub>	I <sub>o</sub> =0 ~ 100mA	-	-	0.03	%/mA
Dropout Voltage(*3)	ΔV <sub>I-O</sub>	I <sub>o</sub> =60mA	-	0.10	0.18	V
Ripple Rejection	RR	e <sub>in</sub> =200mVrms, f=1kHz, I <sub>o</sub> =10mA, Vo=3V Version	-	70	-	dB
Average Temperature Coefficient of Output Voltage	ΔVo/ΔTa	Ta=0~85°C, I <sub>o</sub> =10mA	-	±50	-	ppm/°C
Output Noise Voltage	V <sub>NO</sub>	f=10Hz~80kHz, I <sub>o</sub> =10mA, Vo=3V Version	-	30	-	μVrms
Control Voltage for ON-state	V <sub>CONT(ON)</sub>		1.6	-	-	V
Control Voltage for OFF-state	V <sub>CONT(OFF)</sub>		-	-	0.6	V

(\*3):The output voltage excludes under 2.1V.

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.

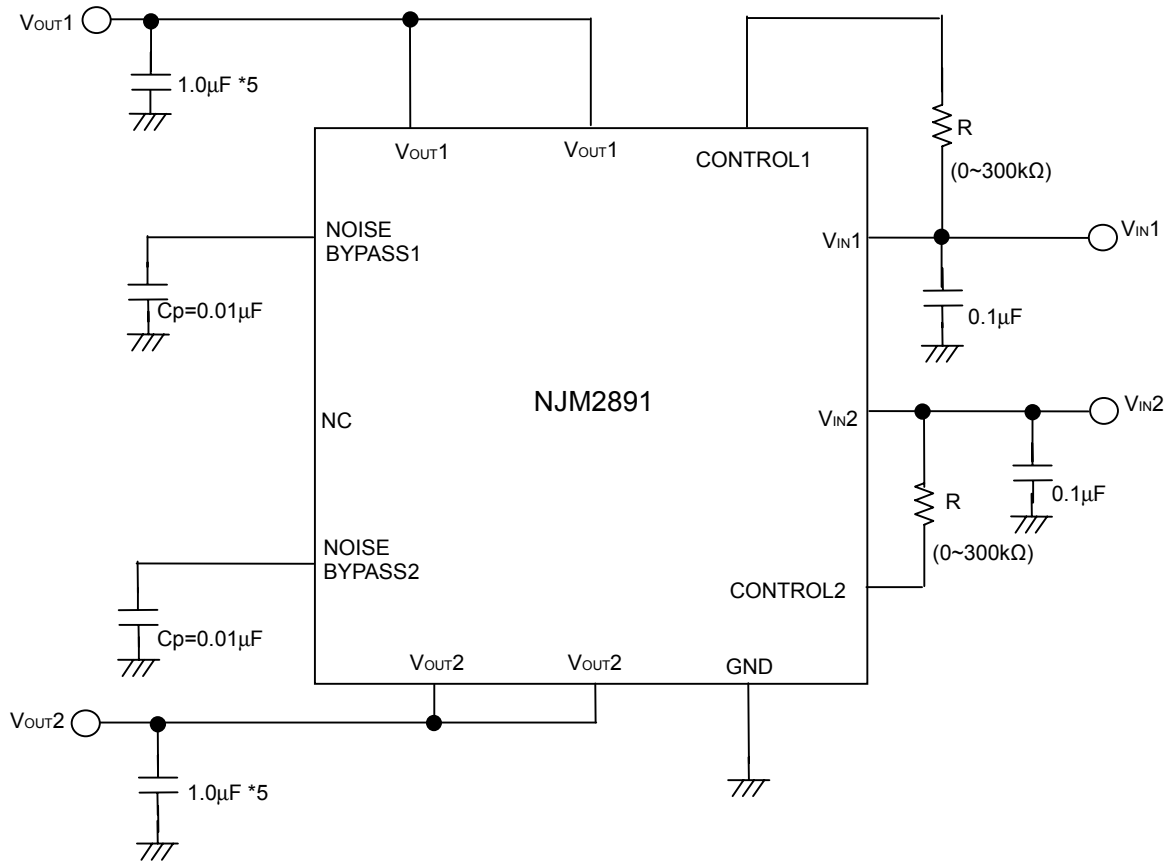
■ TEST CIRCUIT



\*4  $V_o \leq 2.6V$  version:  $C_o = 2.2\mu F$  (ceramic)

■ TYPICAL APPLICATION

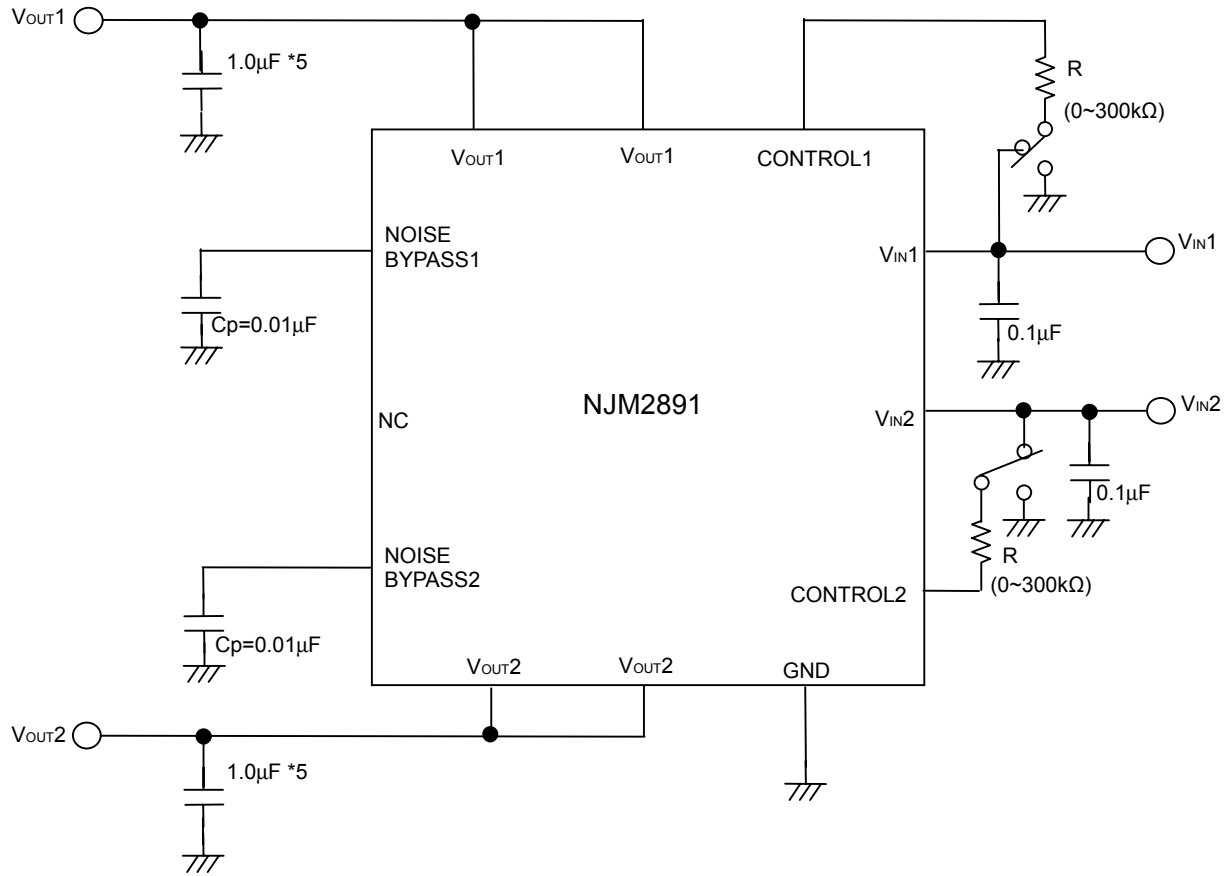
① In the case where ON/OFF Control is not required:



\*5  $V_o \leq 2.6V$  version:  $C_o = 2.2\mu F$

Connect control terminal to  $V_{IN}$  terminal

② In use of ON/OFF CONTROL:



\*5  $V_{o} \leq 2.6V$  version:  $C_o = 2.2\mu F$

State of control terminal:

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

\*Noise bypass Capacitance  $C_p$

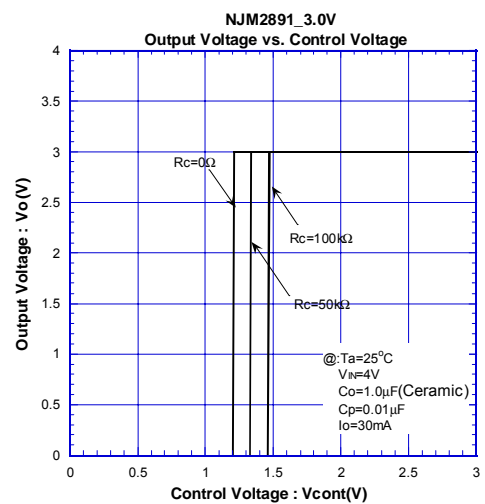
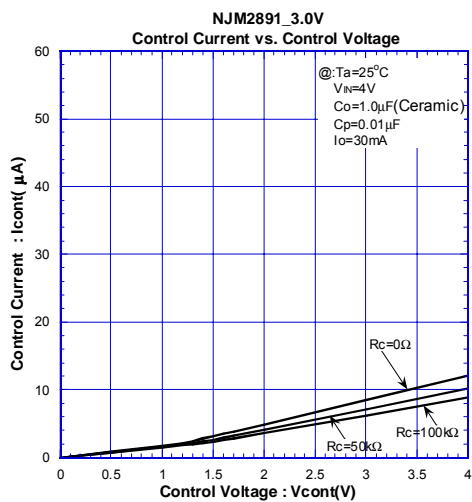
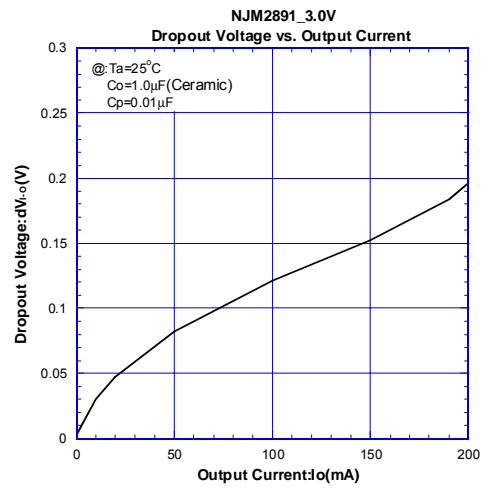
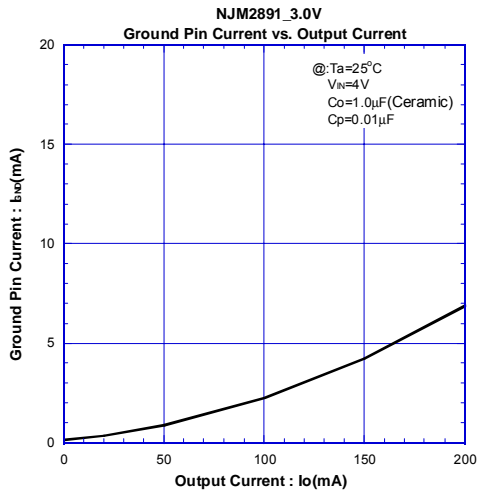
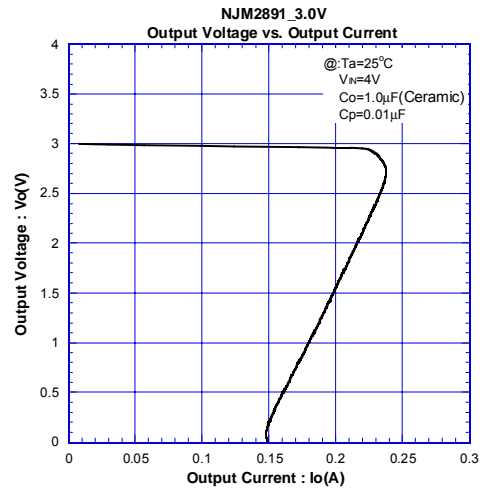
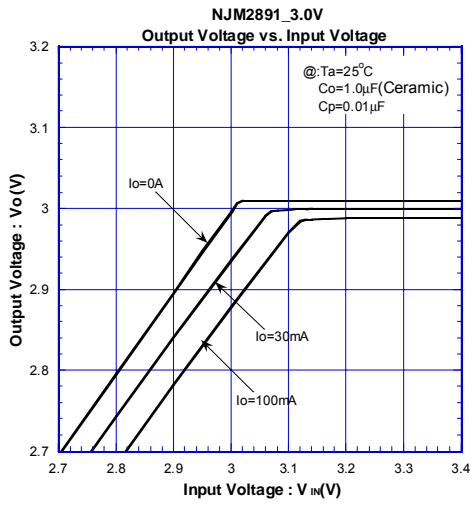
Noise bypass capacitance  $C_p$  reduces noise generated by band-gap reference circuit. Noise level and ripple rejection will be improved when larger  $C_p$  is used. Use of smaller  $C_p$  value may cause oscillation. Use the  $C_p$  value of  $0.01\mu F$  greater to avoid the problem.

\*In the case of using a resistance "R" between  $V_{IN}$  and control.

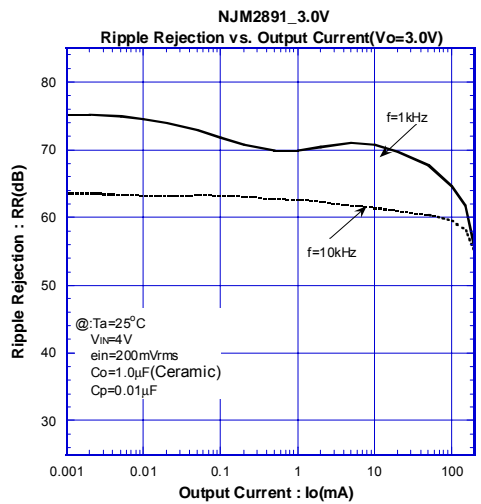
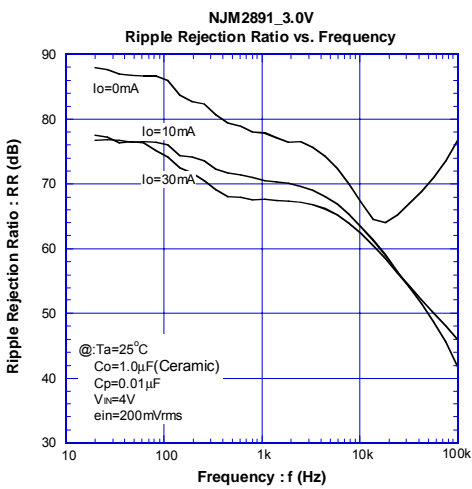
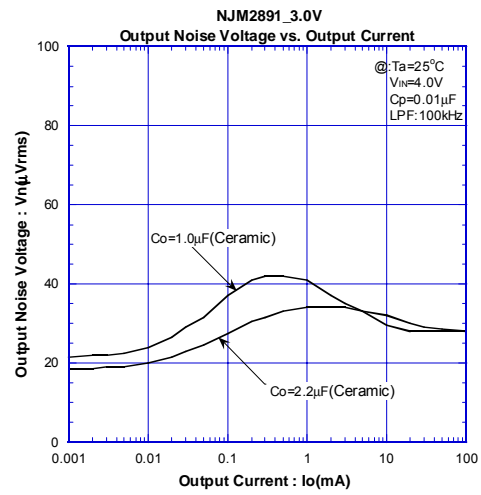
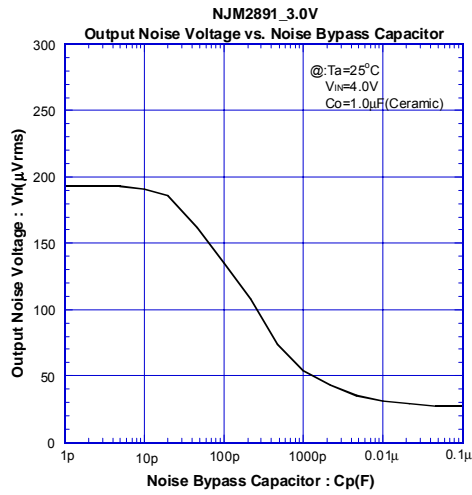
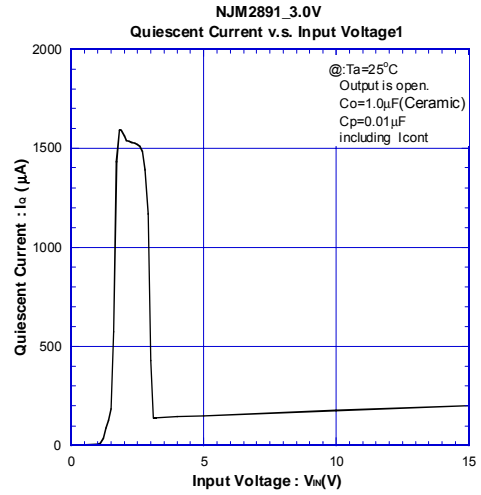
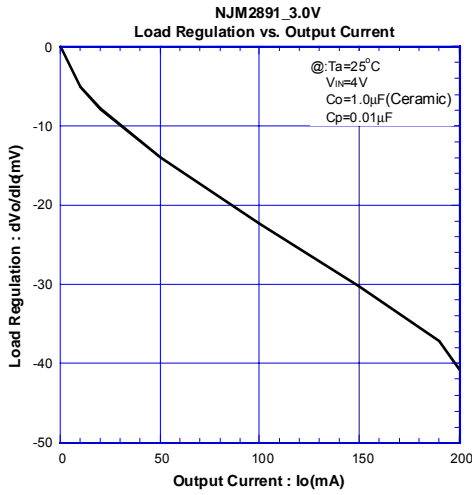
The current flow into the control terminal while the IC is ON state ( $I_{CONT}$ ) can be reduced when a pull up resistance "R" is inserted between  $V_{IN}$  and the control terminal.

The minimum control voltage for ON state ( $V_{CONT(ON)}$ ) is increased due to the voltage drop caused by  $I_{CONT}$  and the resistance "R". The  $I_{CONT}$  is temperature dependence as shown in the "Control Current vs. Temperature" characteristics. Therefore, the resistance "R" should be carefully selected to ensure the control voltage exceeds the  $V_{CONT(ON)}$  over the required temperature range.

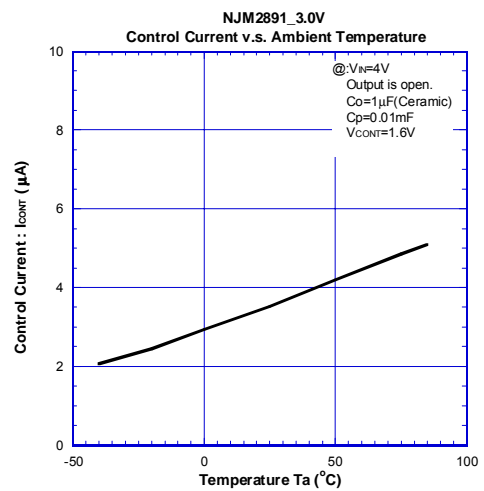
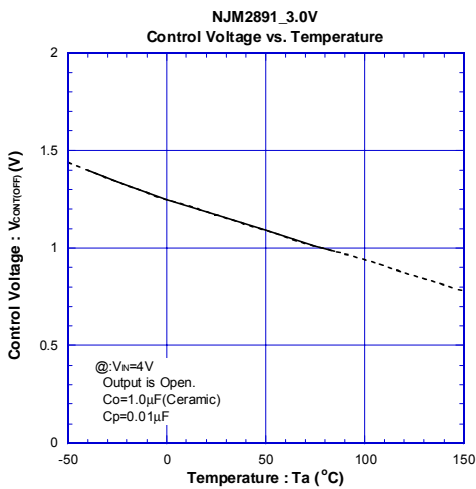
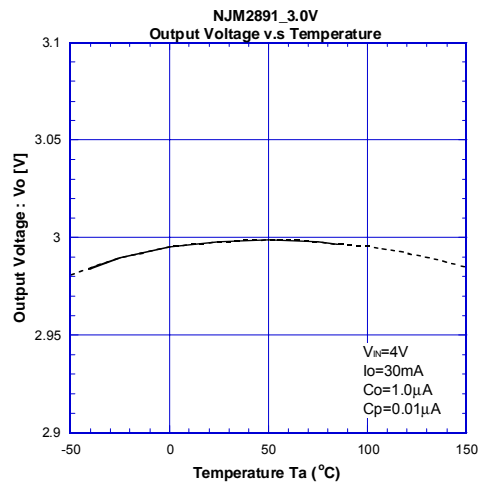
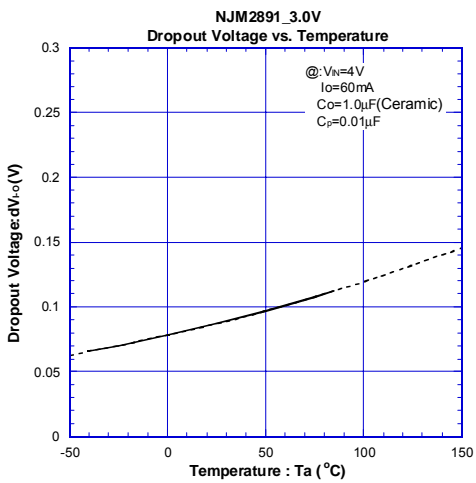
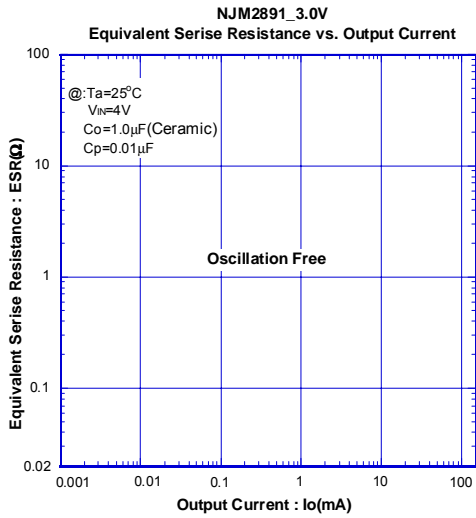
## ■ ELECTRICAL CHARACTERISTICS



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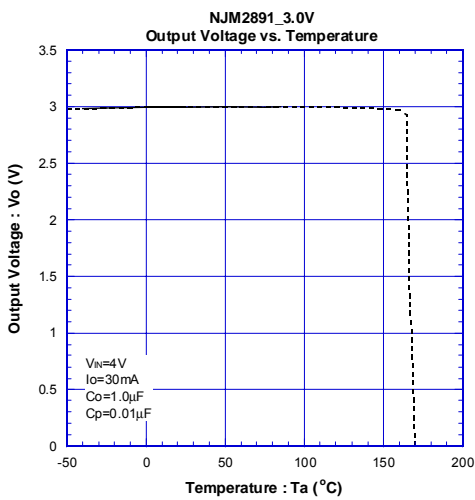
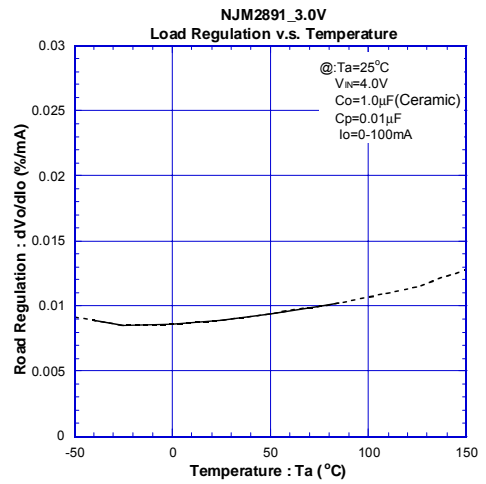
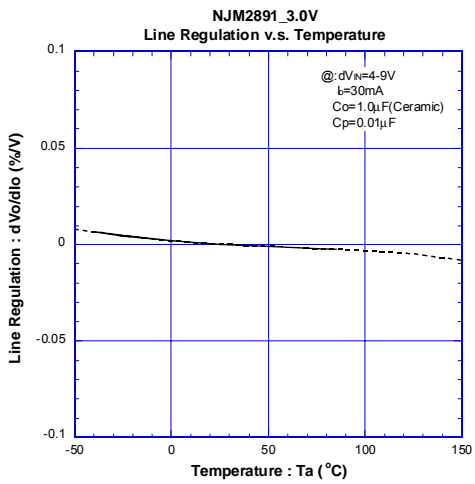
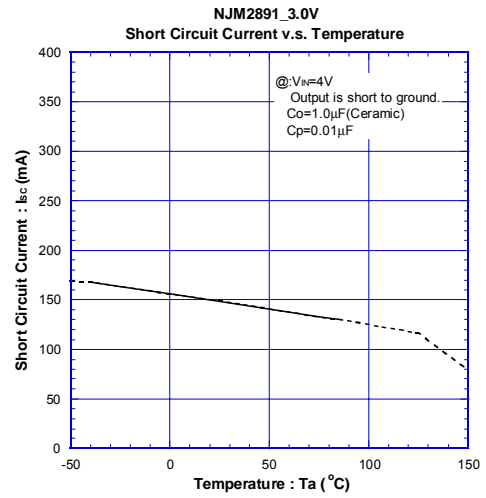
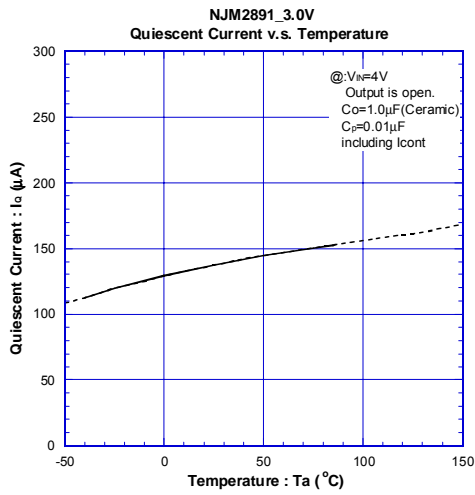


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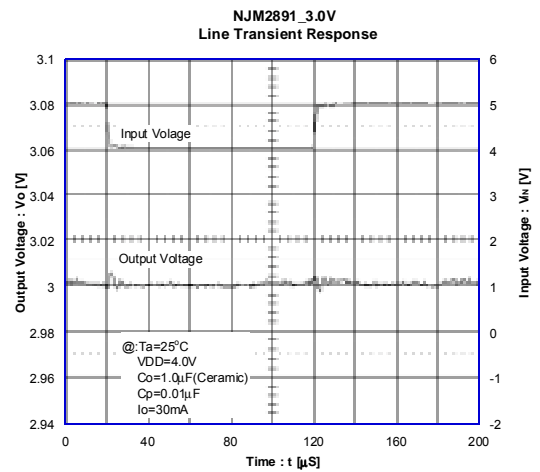
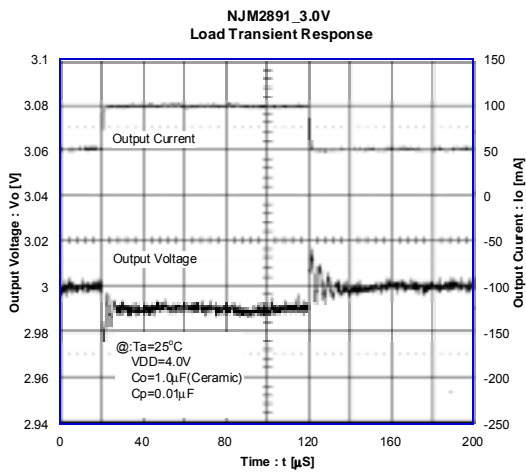
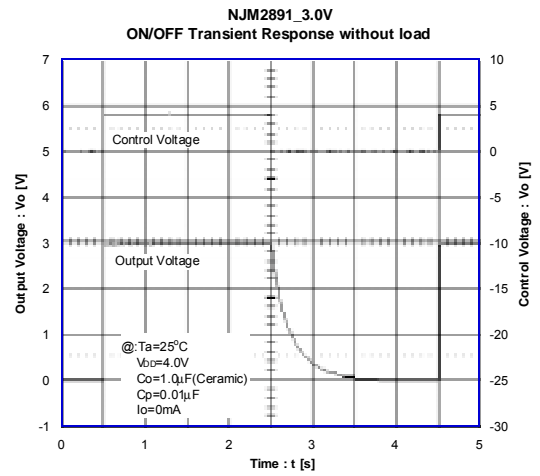
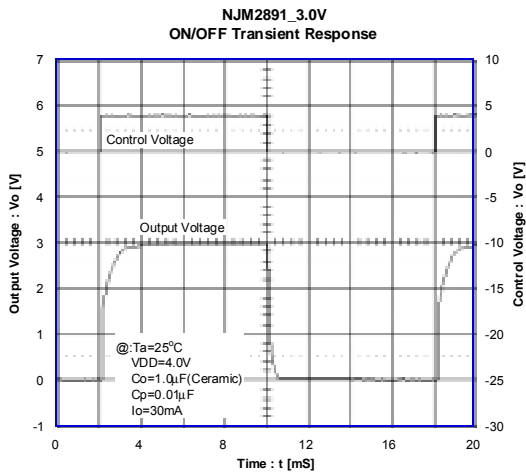




## ■ ELECTRICAL CHARACTERISTICS



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