

LOW DROPOUT VOLTAGE REGULATOR

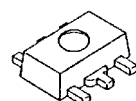
■ GENERAL DESCRIPTION

The NJM2830 is a 300mA output low dropout voltage regulator with ON/OFF control.

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

2.1V to 15.5V output voltage range, 1 μ F small decoupling capacitor, built-in noise bypass capacitor make the NJM2830 suitable for various applications.

■ PACKAGE OUTLINE

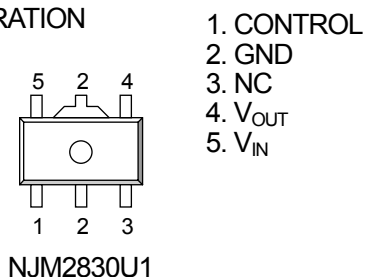


NJM2830U1

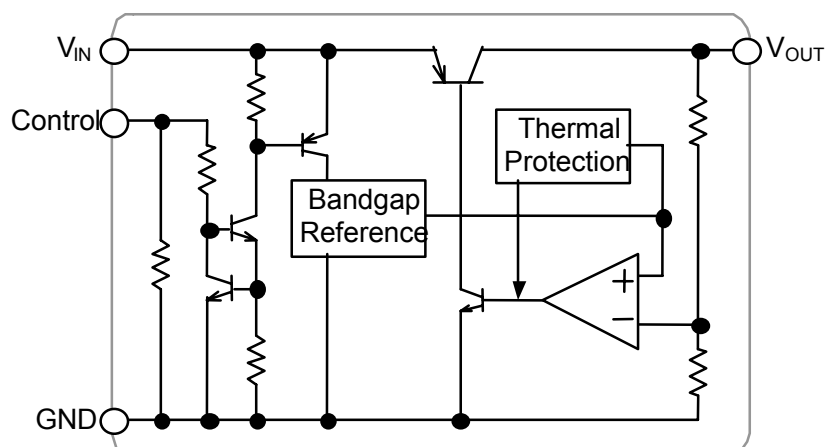
■ FEATURES

- | | |
|--|---|
| ● Output voltage options available | 2.1 ~ 15.5V (0.1V step) |
| ● High Ripple Rejection | 75dB typ. (f=1kHz Vo=3V Version) |
| ● Output Noise Voltage | V _{no} =50 μ Vrms typ. (Vo=3V Version) |
| ● Output capacitor with 1.0 μ F ceramic capacitor (Vo $\geq$ 5.1V) | |
| ● Output Current | I _o (max.)=300mA |
| ● High Precision Output | Vo $\pm$ 1.0% |
| ● Low Dropout Voltage | 0.10V typ. (I _o =100mA) |
| ● ON/OFF Control | (Active High) |
| ● Internal Thermal Overload Protection | |
| ● Internal Over Current Protection | |
| ● Bipolar Technology | |
| ● Package Outline | SOT-89-5 |

■ PIN CONFIGURATION



■ EQUIVALENT CIRCUIT



NJM2830

■ OUTPUT VOLTAGE

Device Name	Vout
NJM2830U1-21	2.1V
NJM2830U1-25	2.5V
NJM2830U1-03	3.0V
NJM2830U1-33	3.3V
NJM2830U1-05	5.0V
NJM2830U1-57	5.7V
NJM2830U1-58	5.8V
NJM2830U1-06	6.0V
NJM2830U1-08	8.0V
NJM2830U1-85	8.5V
NJM2830U1-86	8.6V
NJM2830U1-09	9.0V
NJM2830U1-12	12.0V
NJM2830U1-15	15.0V

The WHITE column shows applicable Voltage Rank(s)

■ ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage	V_{IN}	+20	V
Control Voltage	V_{CONT}	+20	V
Power Dissipation	P_D	440	mW
Operating Temperature	T_{opr}	-40~+85	°C
Storage Temperature	T_{stg}	-40~+150	°C

■ INPUT VOLTAGE RANGE

$V_{IN}=+2.3V\sim 18V$ (In case of $V_O < 2.2V$)

■ ELECTRICAL CHARACTERISTICS

($V_{IN}=V_O+1V$, $C_{IN}=0.1\mu F$, $C_O=1.0\mu F$ (4.9V< $V_O\leq 5.5V$: $C_O=2.2\mu F$, 2.9V< $V_O\leq 4.9V$: $C_O=4.7\mu F$, $V_O\leq 2.9V$: $C_O=10\mu F$), $T_a=25^\circ C$)

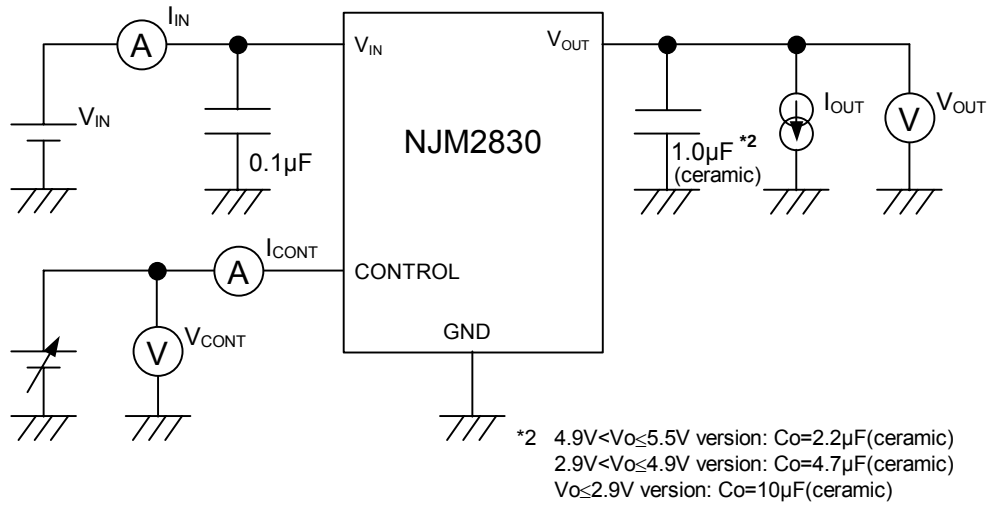
PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_O	$I_O=30mA$	-1.0%	—	+1.0%	V
Quiescent Current	I_Q	$I_O=0mA$, except I_{CONT}	$V_O\leq 5V$ Version		130	180 μA
			5V< $V_O\leq 10V$ Version		145	195 μA
			10V< $V_O\leq 15V$ Version		160	210 μA
Quiescent Current at Control OFF	$I_{Q(OFF)}$	$V_{CONT}=0V$	—	—	100	nA
Output Current	I_O	$V_O-0.3V$	300	400	—	mA
Line Regulation	$\Delta V_O/\Delta V_{IN}$	$V_{IN}=V_O+1V \sim V_O+6V$ ($V_O\leq 12V$ Version) $V_{IN}=V_O+1V \sim 18V$ ($V_O>12V$ Version), $I_O=30mA$	—	—	0.10	%/V
Load Regulation	$\Delta V_O/\Delta I_O$	$I_O=0 \sim 300mA$	—	—	0.009	%/mA
Dropout Voltage(*1)	ΔV_{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	—	75	—	dB
Average Temperature Coefficient of Output Voltage	$\Delta V_O/\Delta T_a$	$T_a=0 \sim 85^\circ C$, $I_O=10mA$	—	± 50	—	ppm/°C
Output Noise Voltage	V_{NO}	$f=10Hz \sim 80kHz$, $I_O=10mA$ $V_O=3V$ Version	—	50	—	μV_{rms}
Control Current	I_{CONT}	$V_{CONT}=1.6V$	—	3	12	μA
Control Voltage for ON-state	$V_{CONT(ON)}$		1.6	—	—	V
Control Voltage for OFF-state	$V_{CONT(OFF)}$		—	—	0.6	V

(*1): 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.

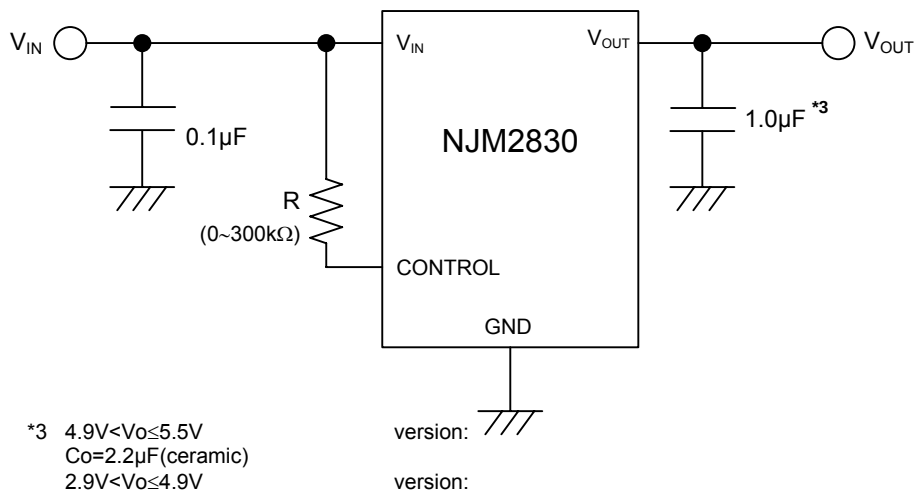
NJM2830

■ TEST CIRCUIT



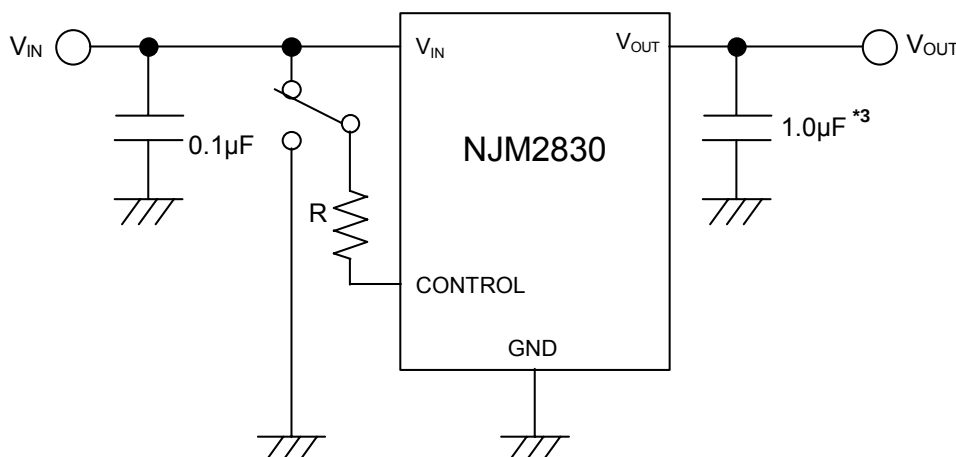
■ TYPICAL APPLICATIONS

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



Connect control terminal to V_{IN} terminal

② In use of ON/OFF CONTROL:



*3 4.9V<V_O≤5.5V version: C_O=2.2µF(ceramic)
 2.9V<V_O≤4.9V version: C_O=4.7µF(ceramic)
 V_O≤2.9V version: C_O=10µF(ceramic)

State of control terminal:

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

*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.

*Input Capacitance C_{IN}

Input capacitance C_{IN} is required to prevent oscillation and reduce power supply ripple for applications with high power supply impedance or a long power supply line.

Use the C_{IN} value of 0.1µF greater to avoid the problem.

C_{IN} should connect between GND and V_{IN} as short as possible.

*Output Capacitance C_O

Output capacitor (C_O) is required for a phase compensation of the internal error amplifier. The capacitance and the equivalent series resistance (ESR) influences stability of the regulator.

This product is designed to work with a low ESR capacitor for the C_O; however, use of recommended capacitance or greater value is essential for stable operation.

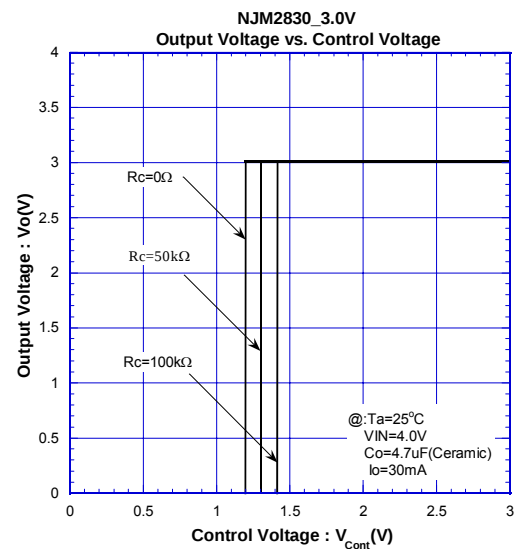
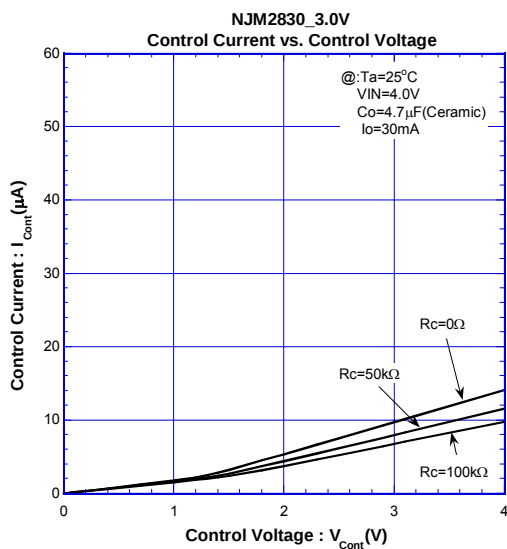
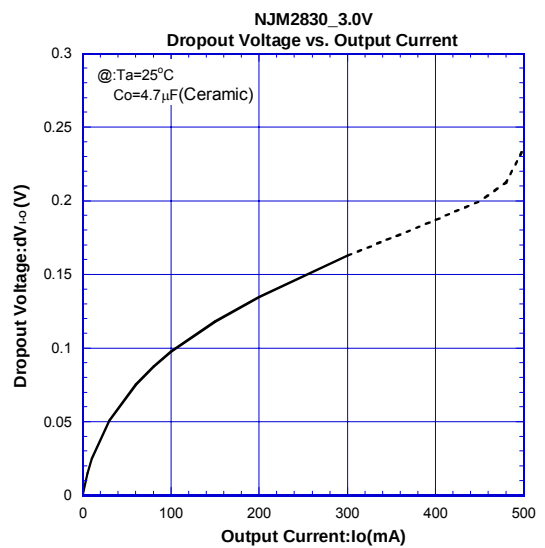
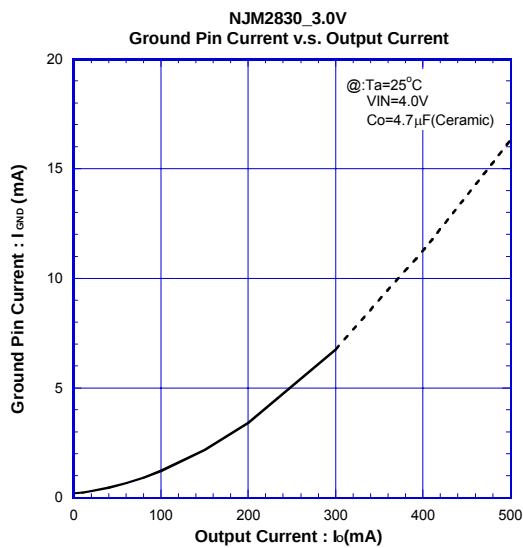
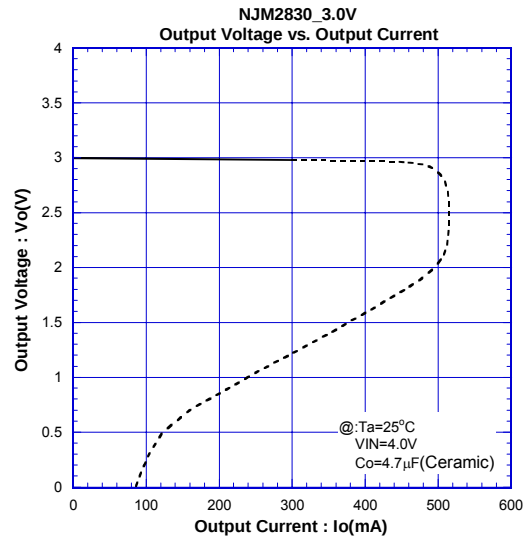
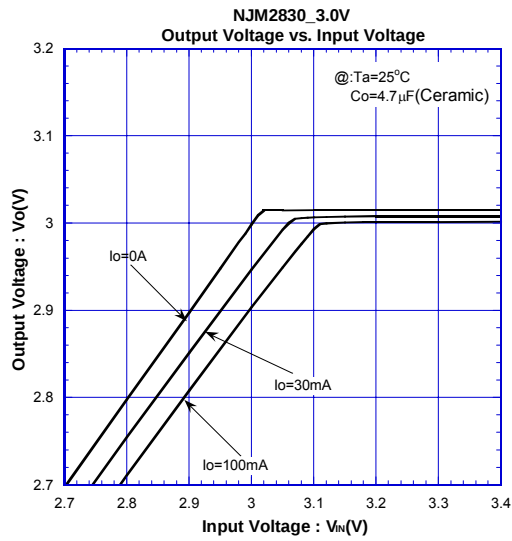
Use of a smaller C_O may cause excess output noise or oscillation of the regulator due to lack of the phase compensation.

Therefore, use C_O with the recommended capacitance or greater value and connect between V_O terminal and GND terminal with minimal wiring. The recommended capacitance depends on the output voltage. Low voltage regulator requires greater value of the C_O. Thus, check the recommended capacitance for each output voltage.

Use of a greater C_O reduces output noise and ripple output, and also improves transient response of the output voltage against rapid load change.

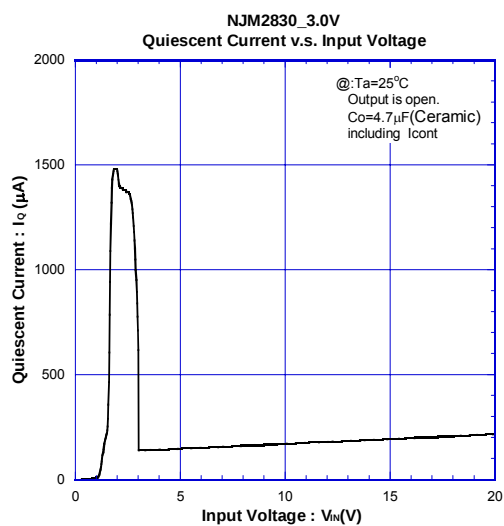
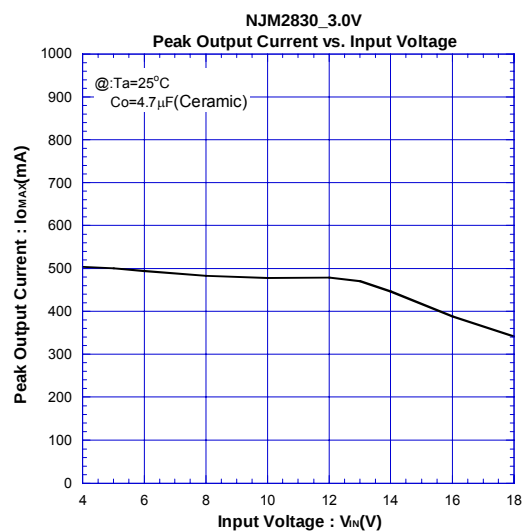
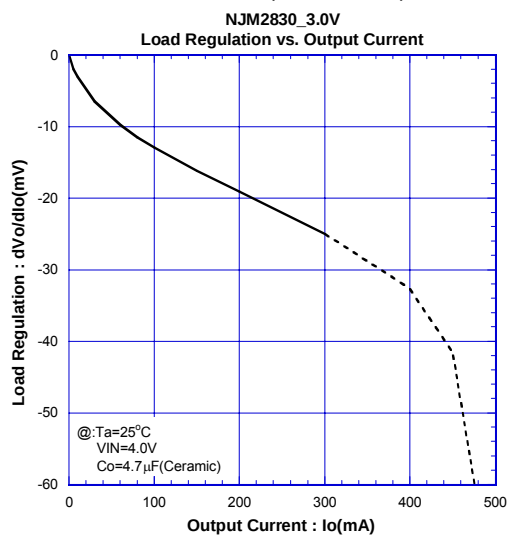
■ TYPICAL CHARACTERISTICS

● DC CHARACTERISTICS (3V Version)



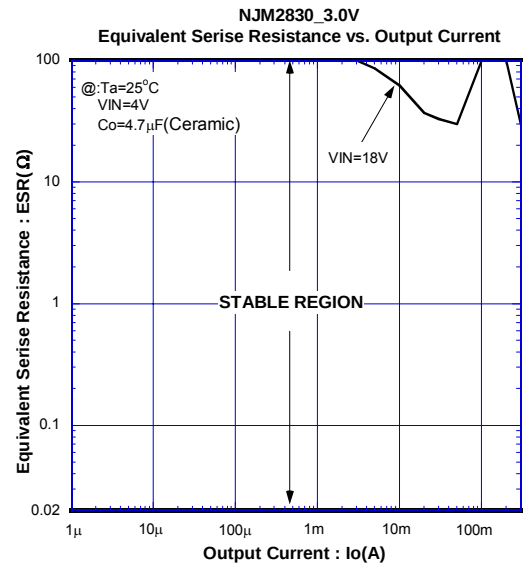
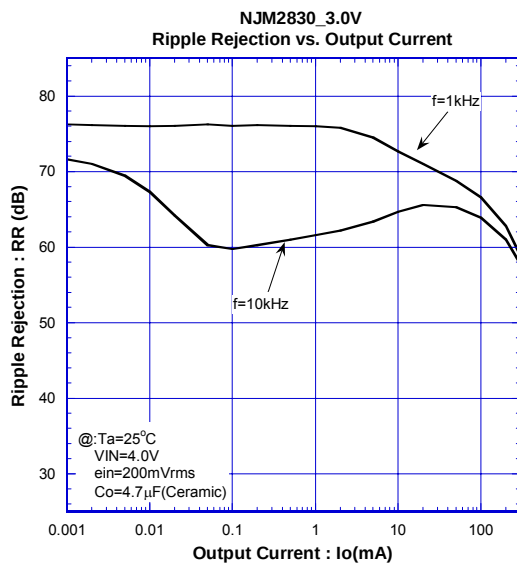
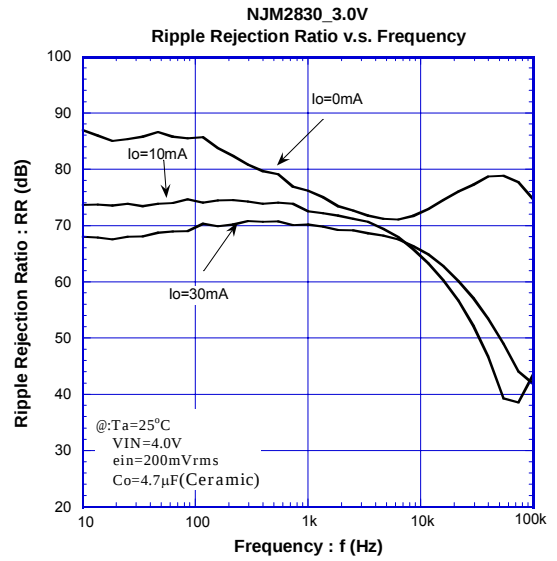
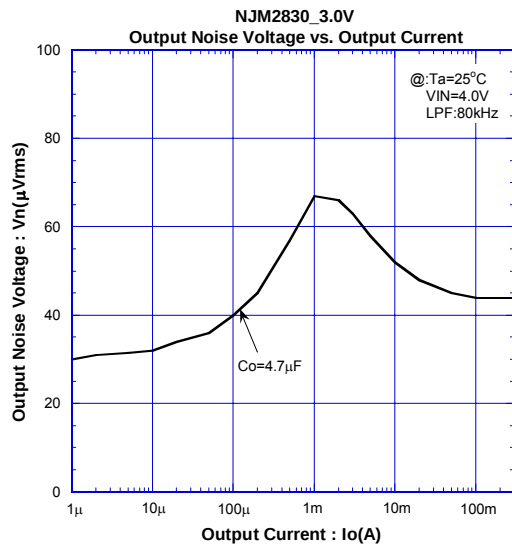
■ TYPICAL CHARACTERISTICS

● DC CHARACTERISTICS (3V Version)



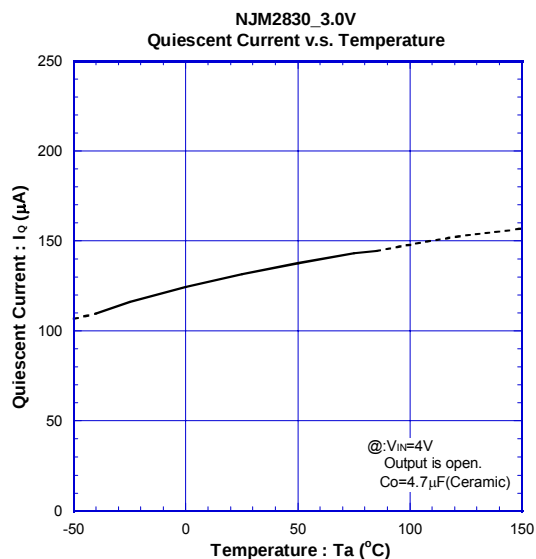
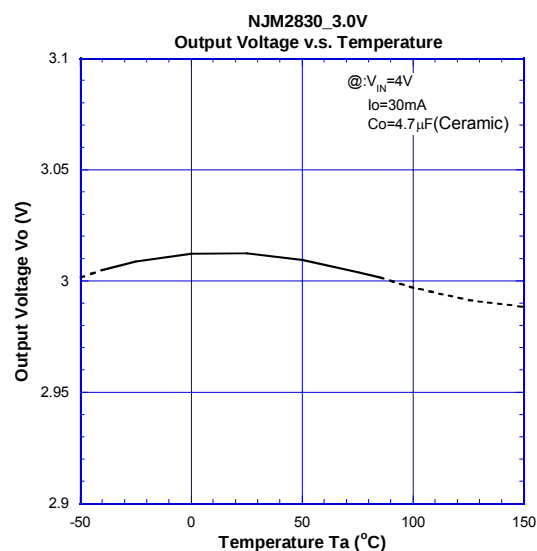
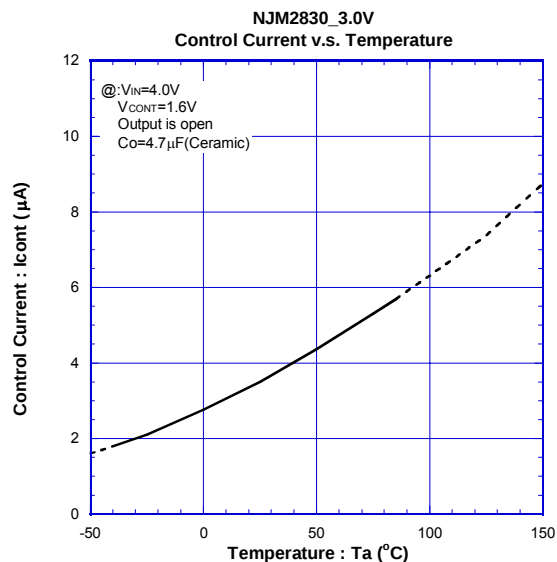
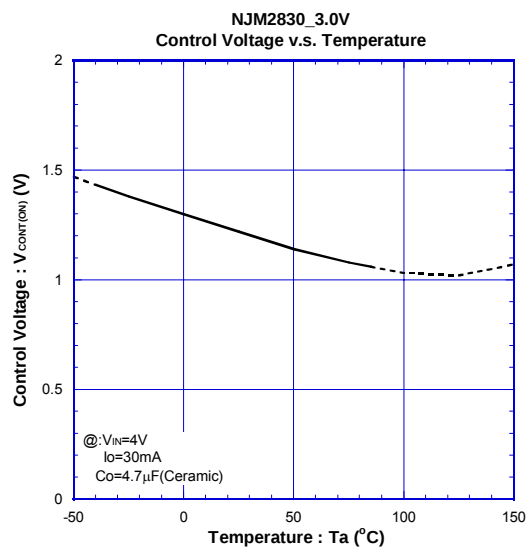
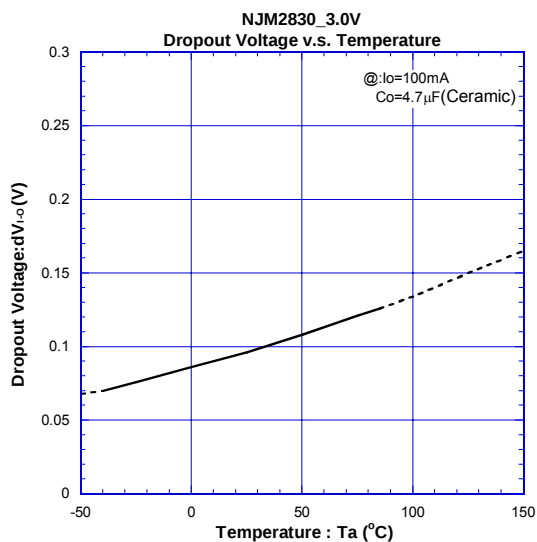
■ TYPICAL CHARACTERISTICS

● AC CHARACTERISTICS (3V Version)



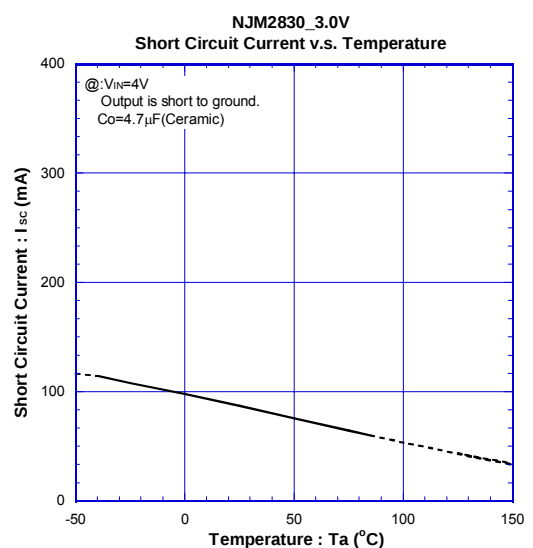
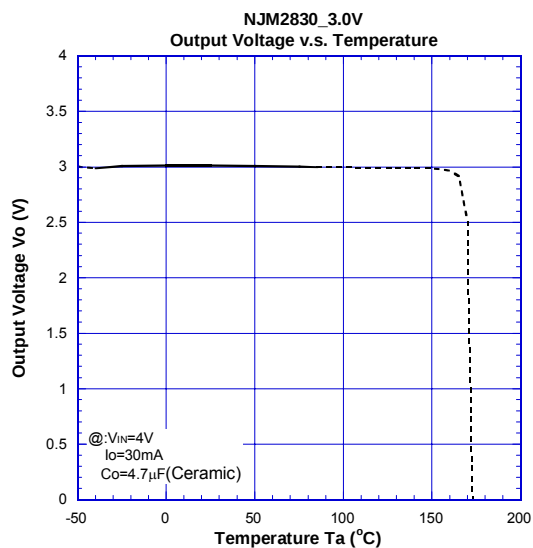
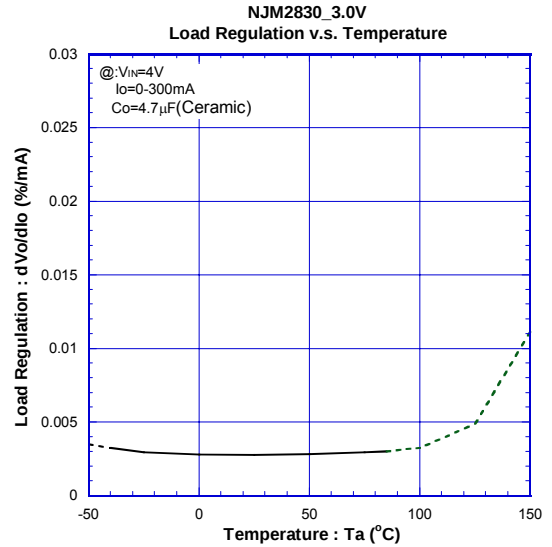
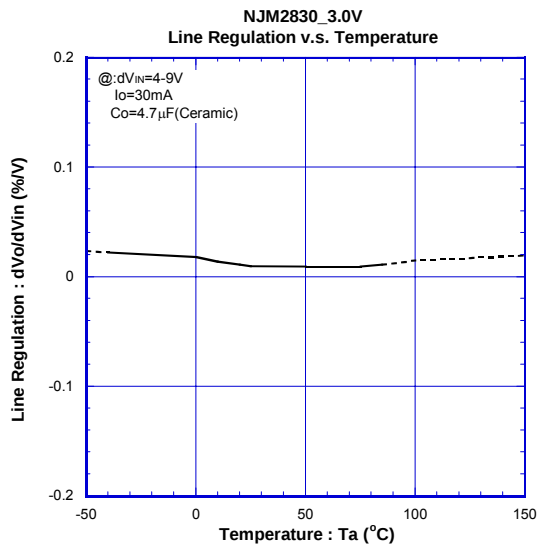
■ TYPICAL CHARACTERISTICS

● TEMPERATURE CHARACTERISTICS (3V Version)



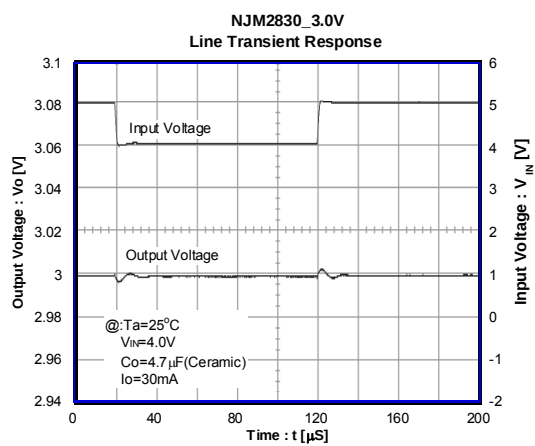
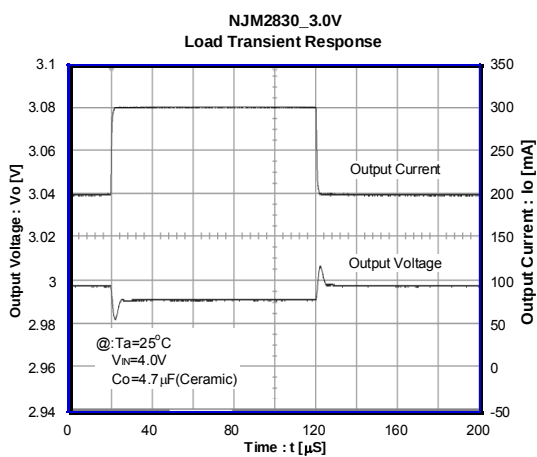
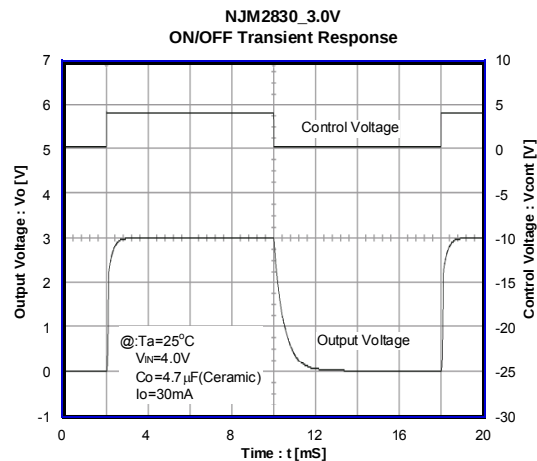
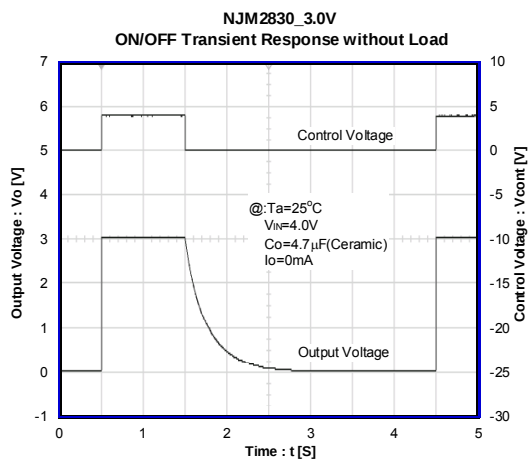
■ TYPICAL CHARACTERISTICS

● TEMPERATURE CHARACTERISTICS (3V Version)



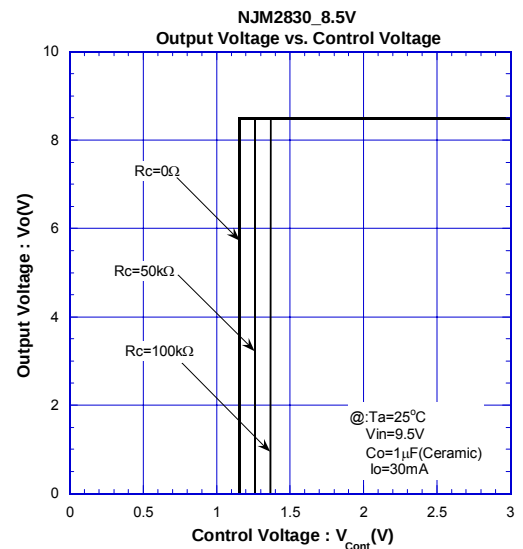
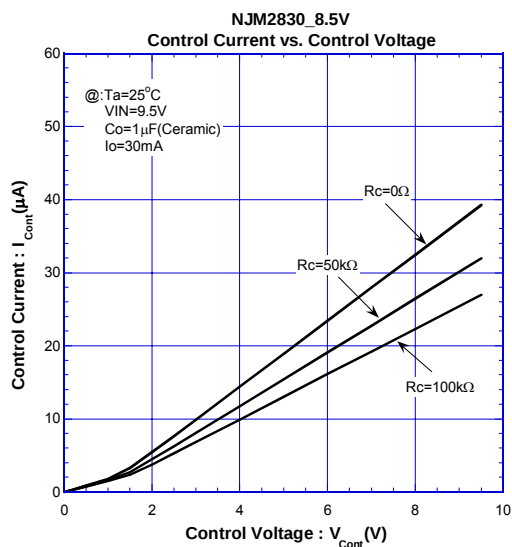
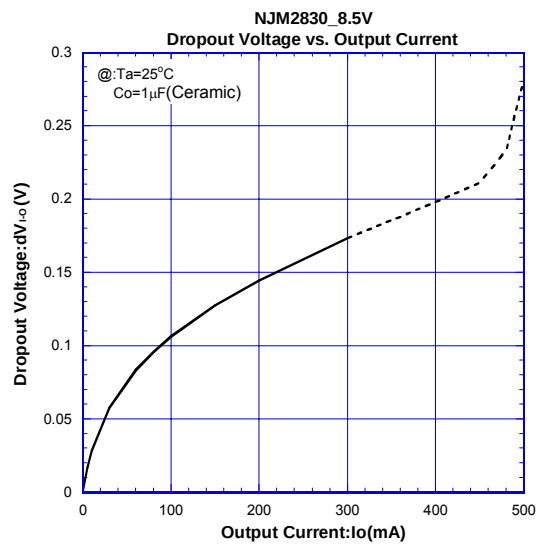
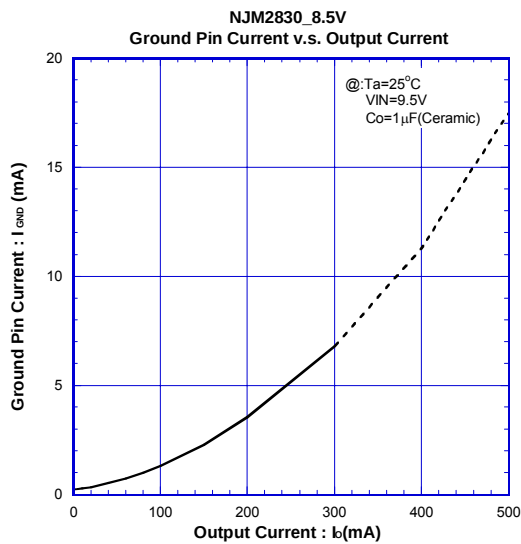
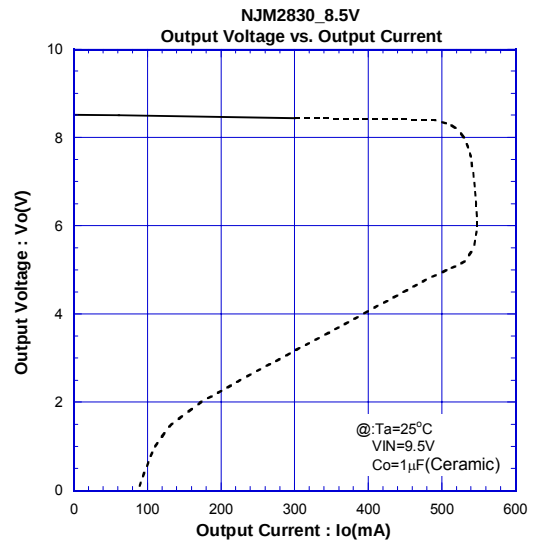
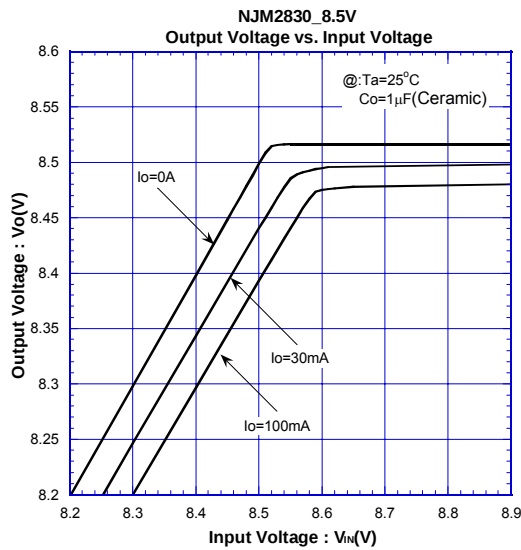
■ TYPICAL CHARACTERISTICS

● TRANSIENT RESPONSE (3V Version)



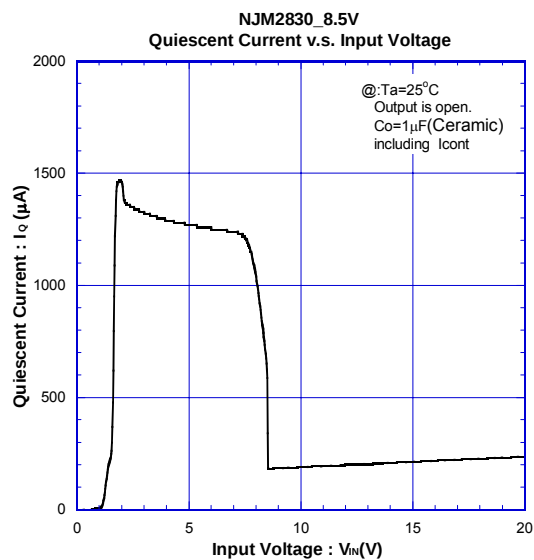
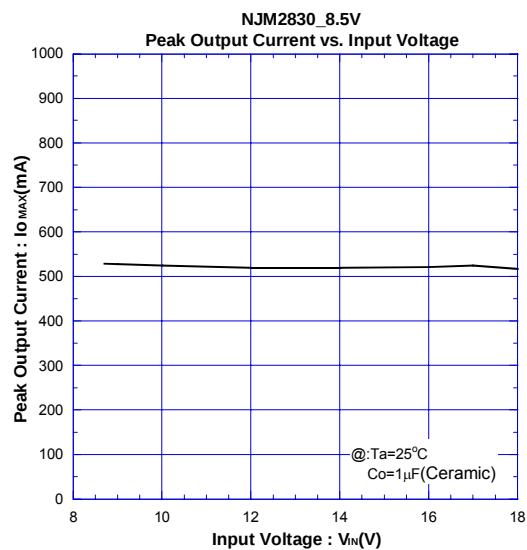
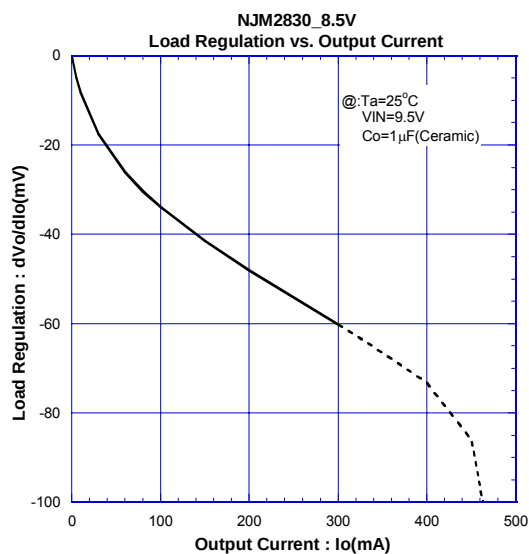
■ TYPICAL CHARACTERISTICS

● DC CHARACTERISTICS (8.5V Version)



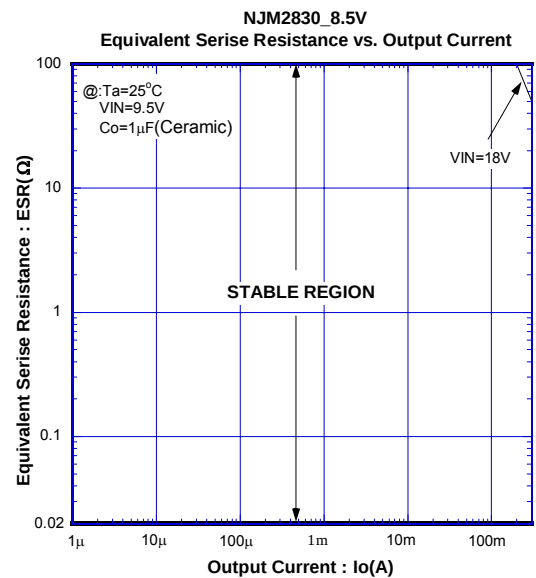
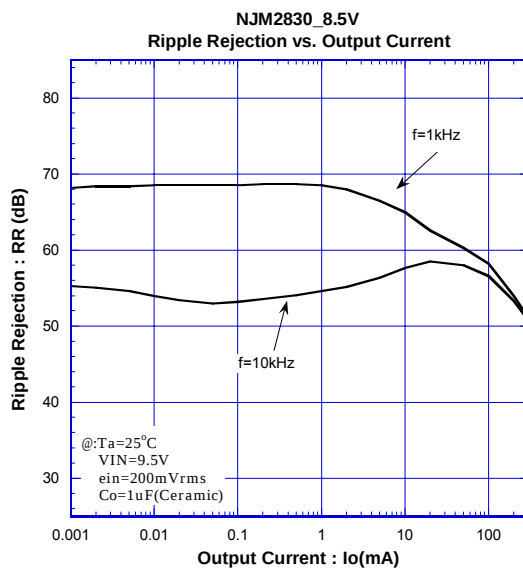
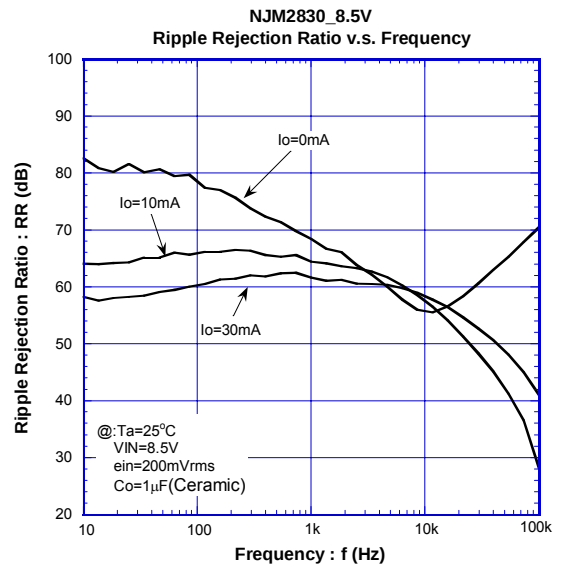
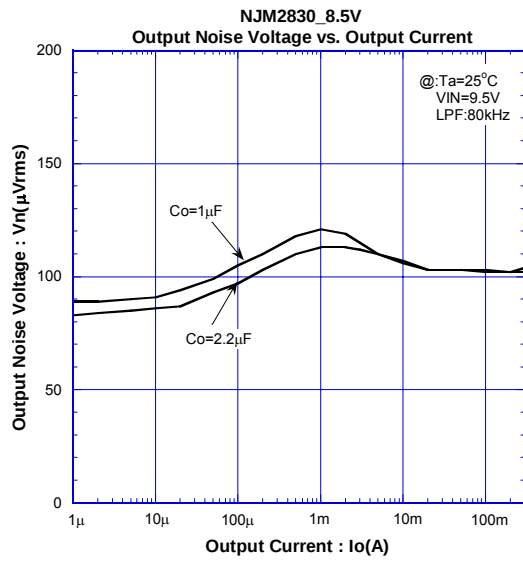
■ TYPICAL CHARACTERISTICS

● DC CHARACTERISTICS (8.5V Version)



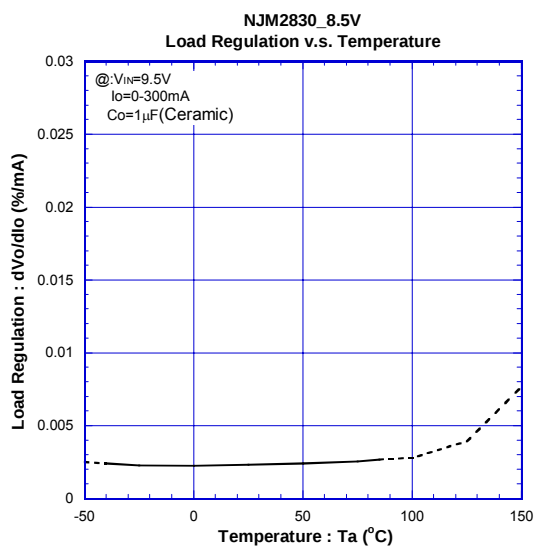
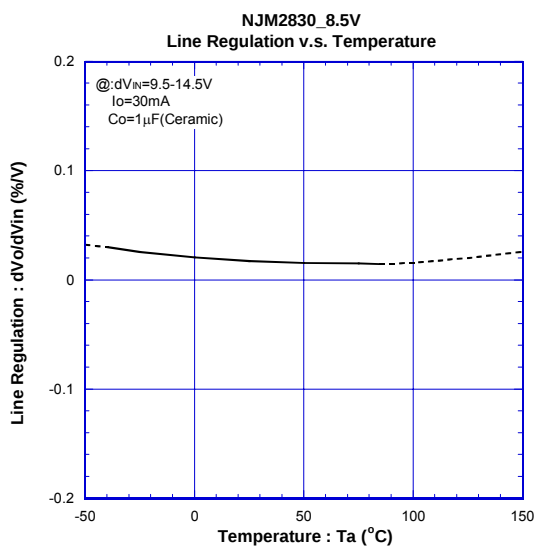
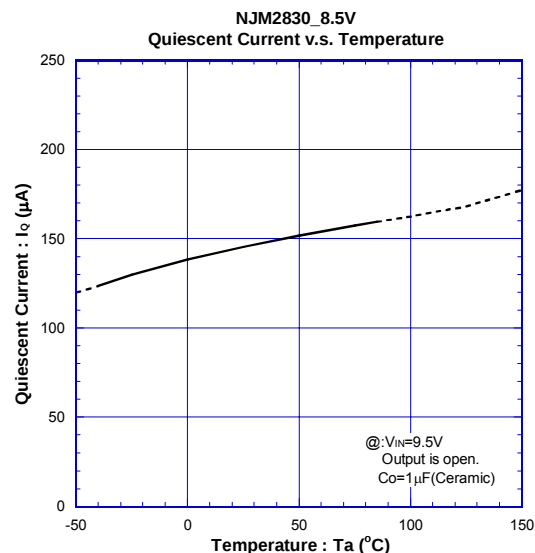
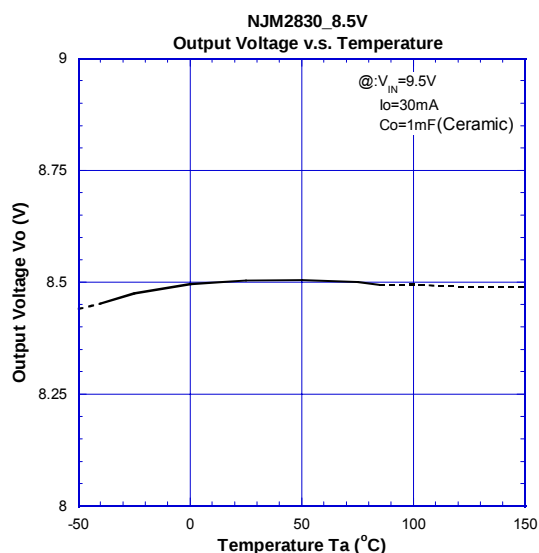
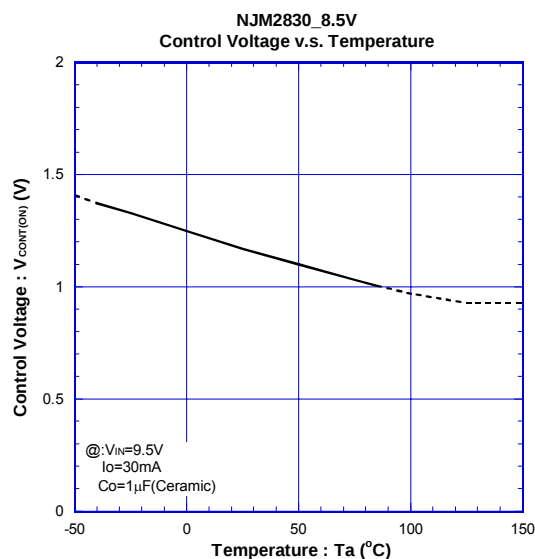
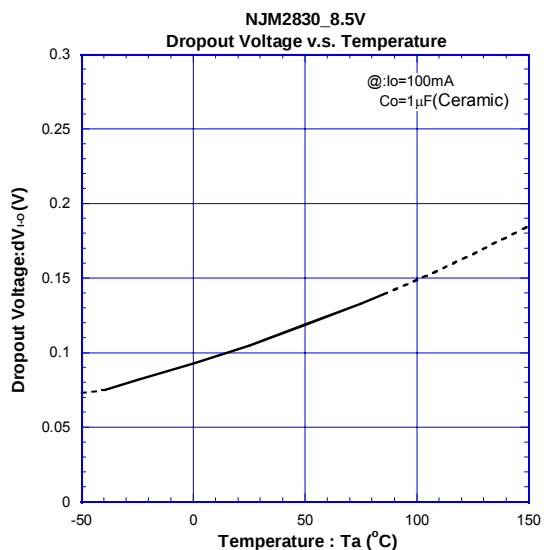
■ TYPICAL CHARACTERISTICS

● AC CHARACTERISTICS (8.5V Version)



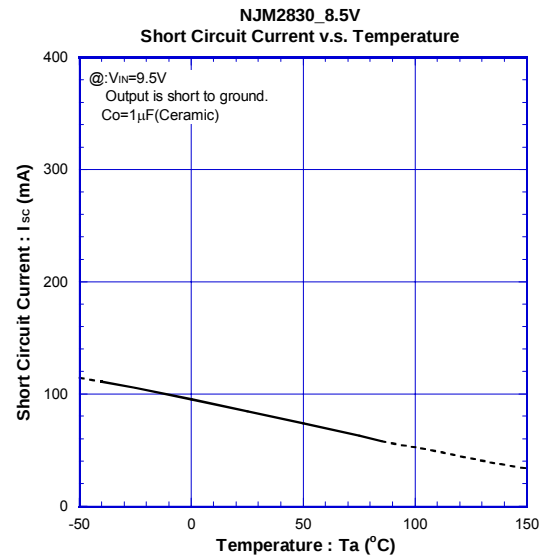
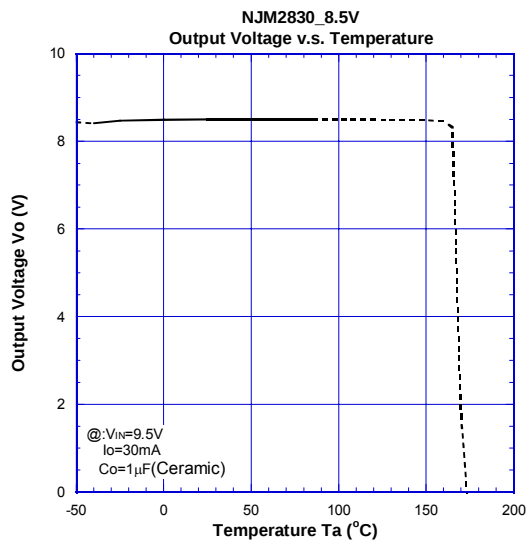
■ TYPICAL CHARACTERISTICS

● TEMPERATURE CHARACTERISTICS (8.5V Version)

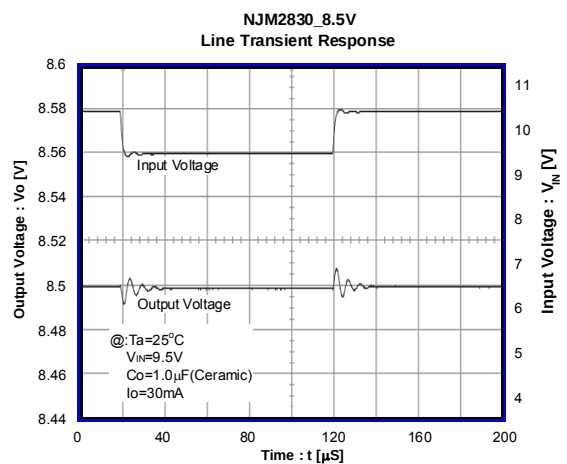
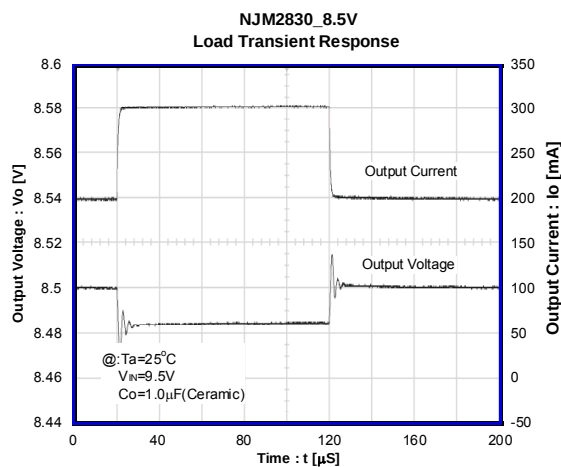
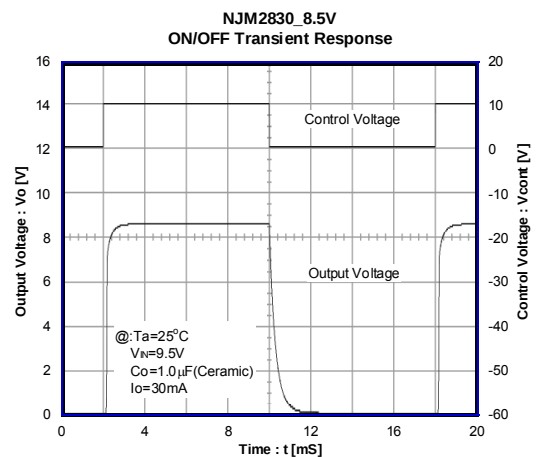
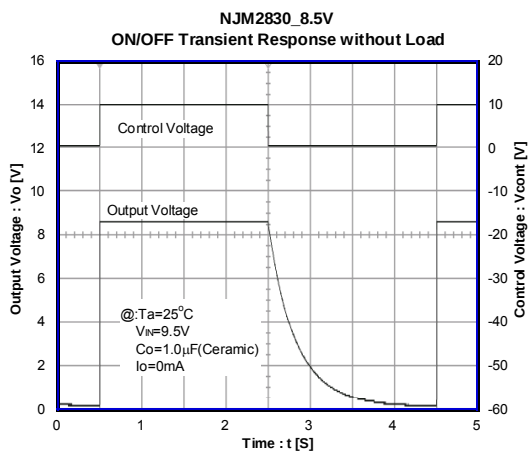


■ TYPICAL CHARACTERISTICS

● TEMPERATURE CHARACTERISTICS (8.5V Version)

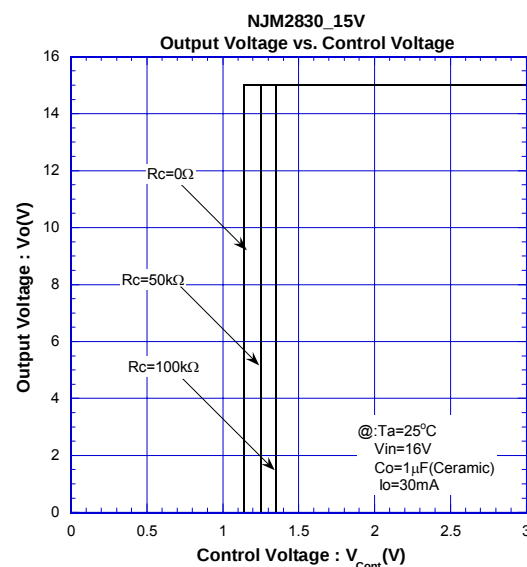
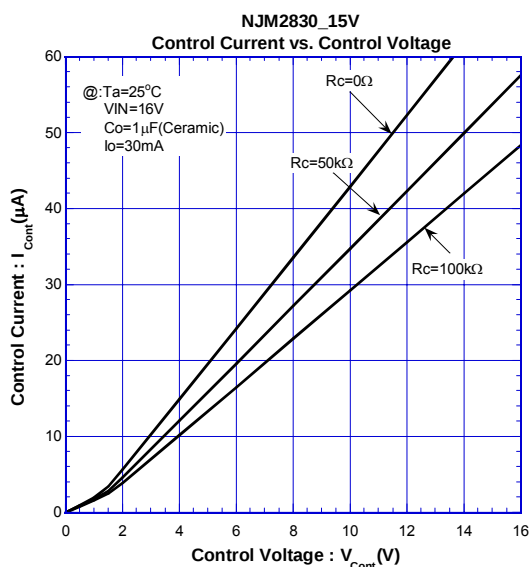
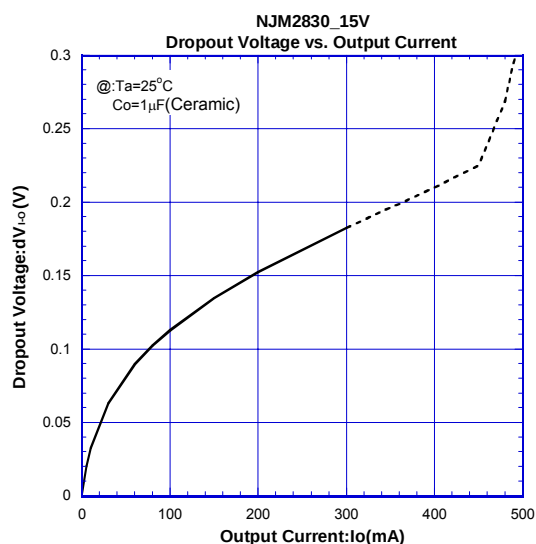
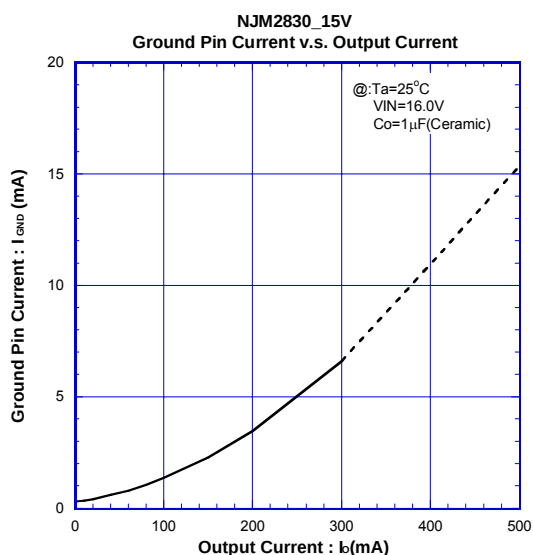
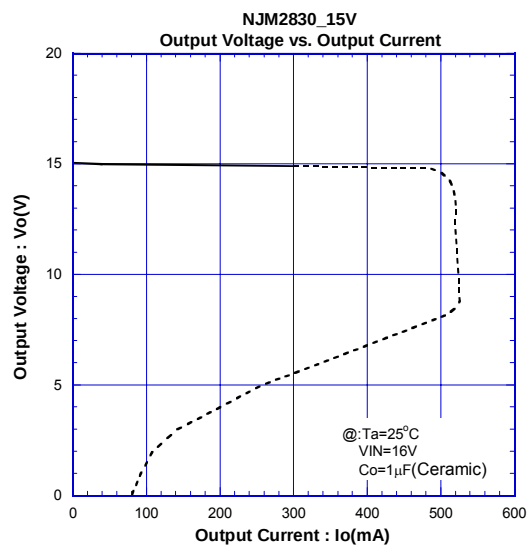
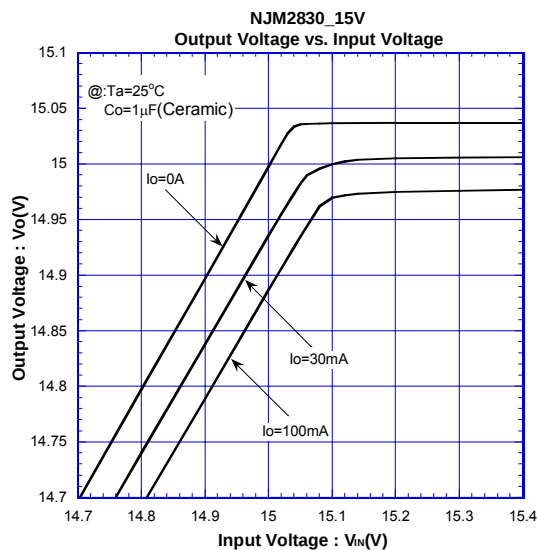


● TRANSIENT RESPONSE (8.5V Version)



■ TYPICAL CHARACTERISTICS

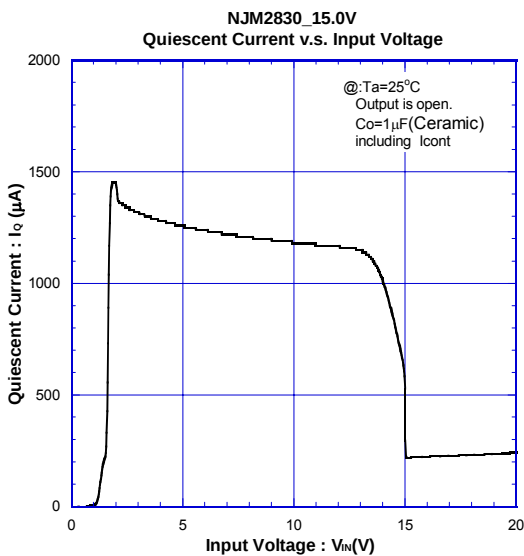
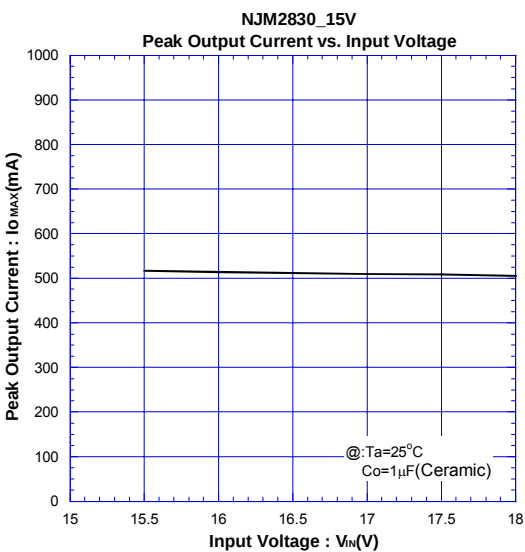
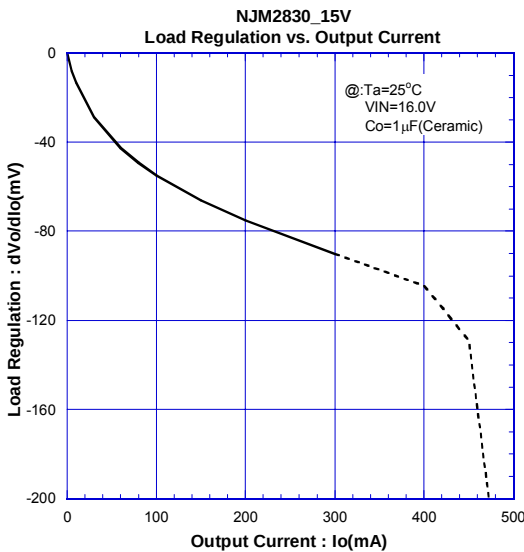
● DC CHARACTERISTICS (15V Version)



NJM2830

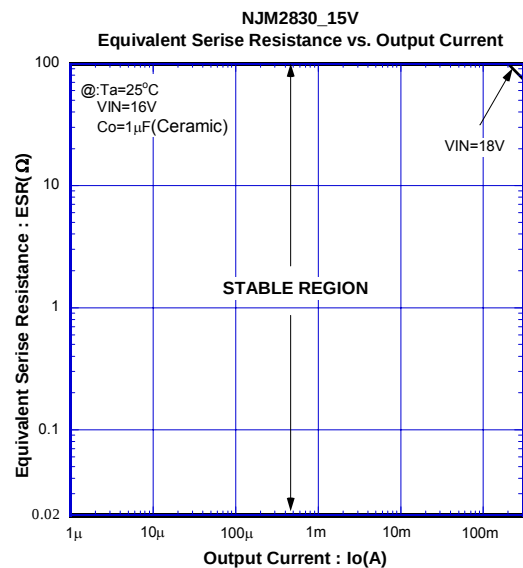
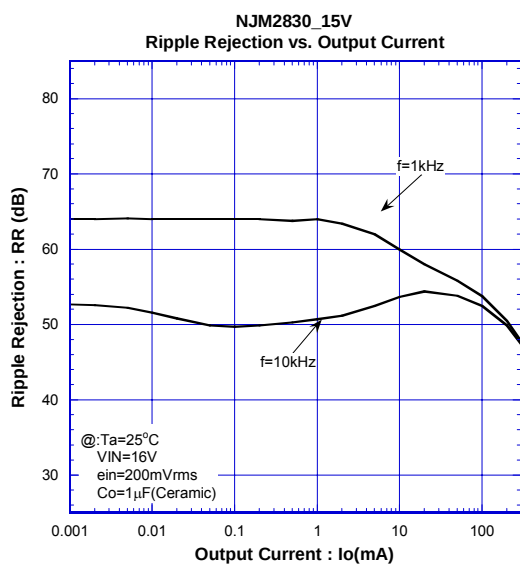
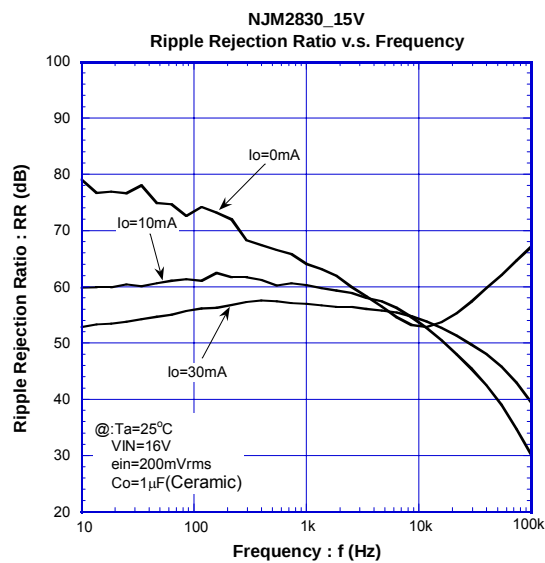
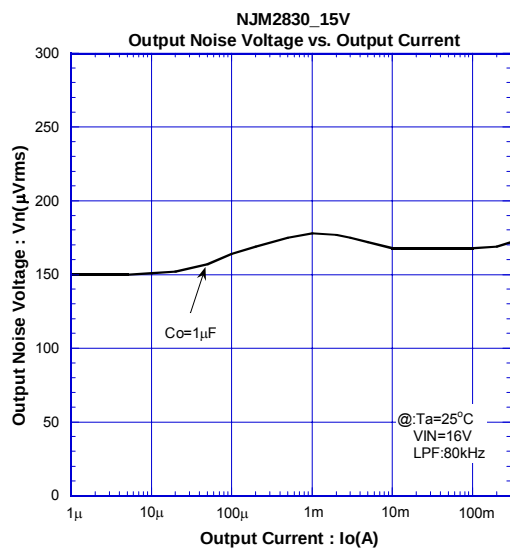
■ TYPICAL CHARACTERISTICS

● DC CHARACTERISTICS (15V Version)



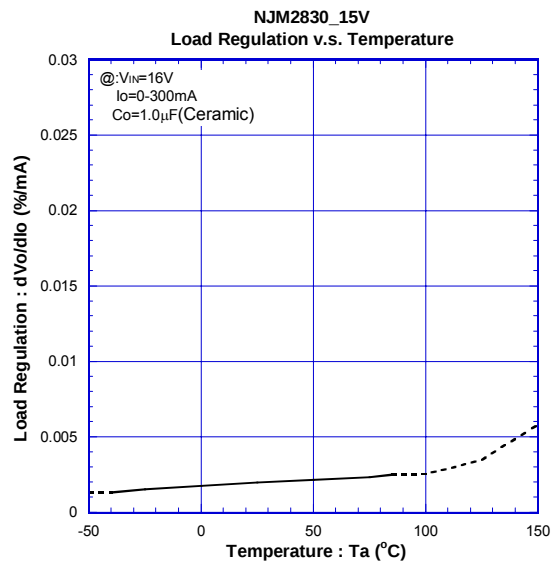
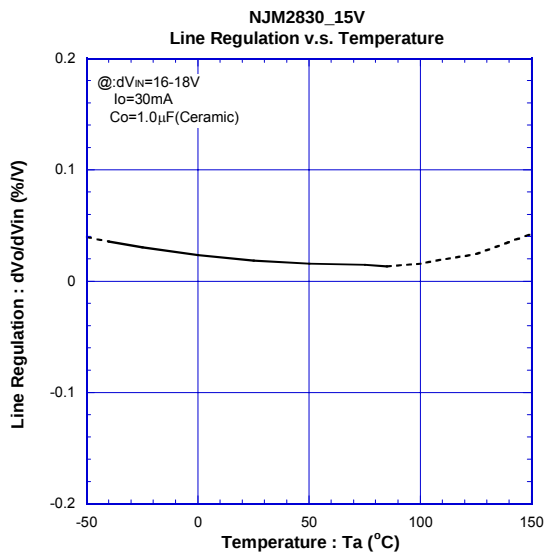
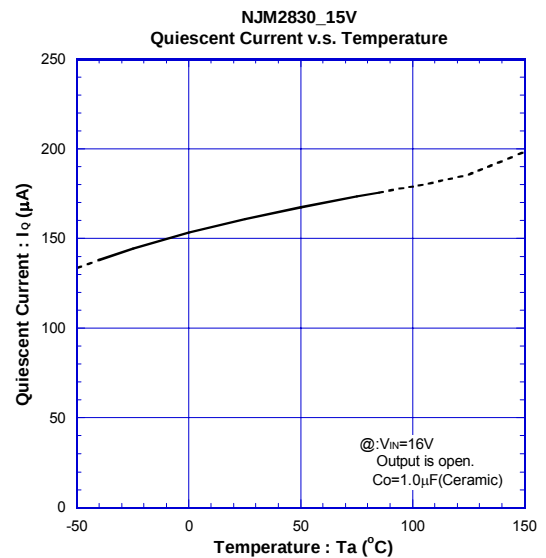
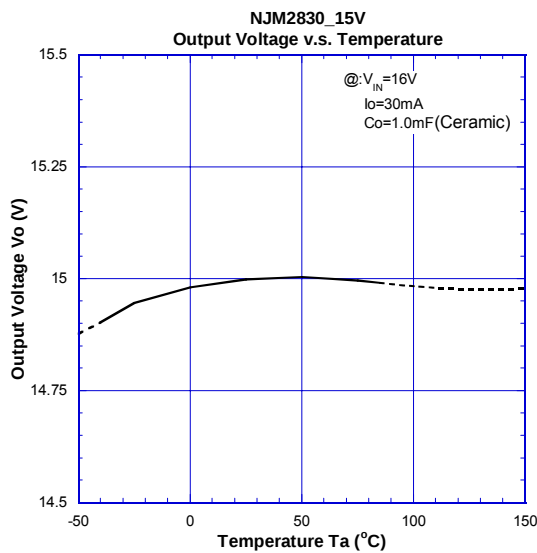
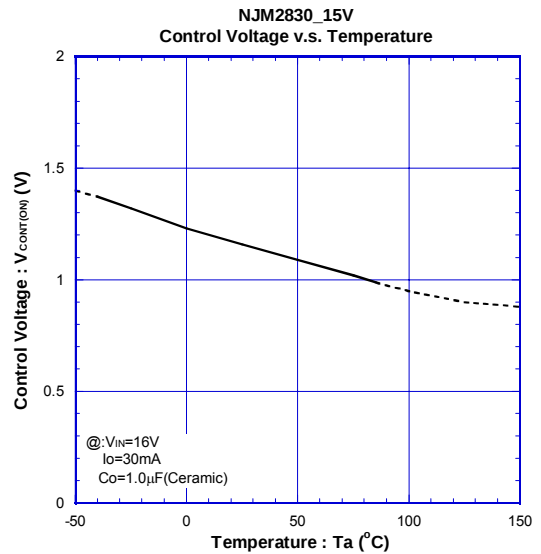
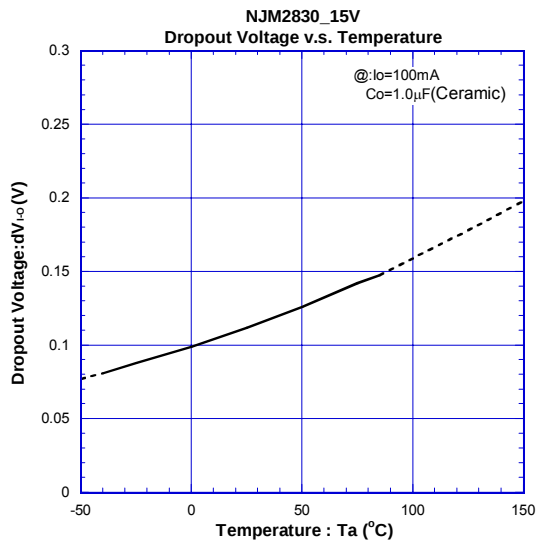
■ TYPICAL CHARACTERISTICS

● AC CHARACTERISTICS (15V Version)



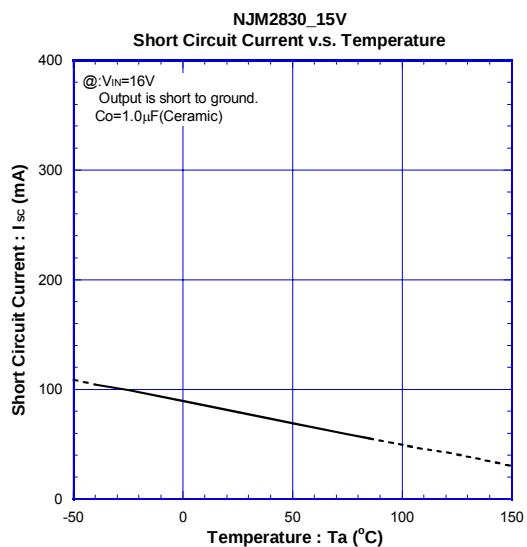
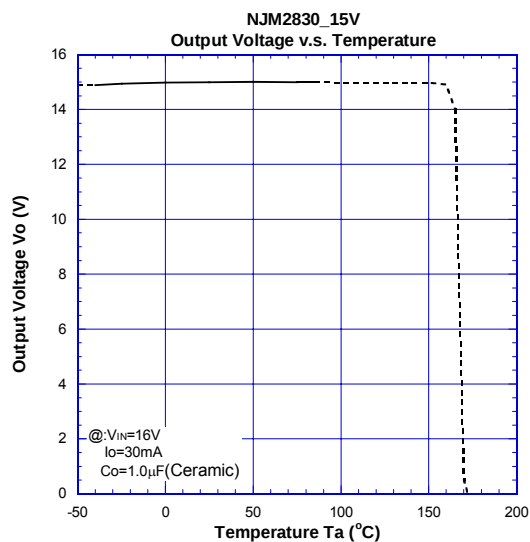
■ TYPICAL CHARACTERISTICS

● TEMPERATURE CHARACTERISTICS (15V Version)

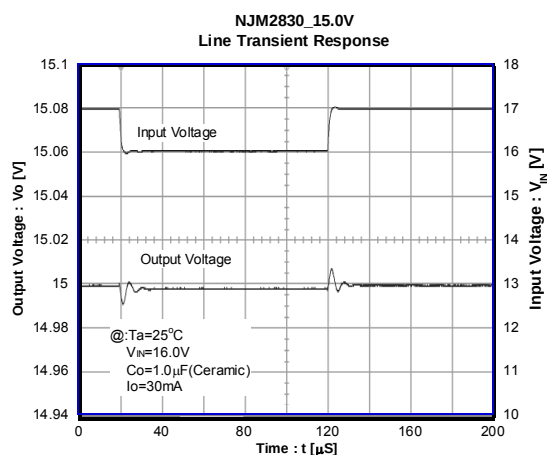
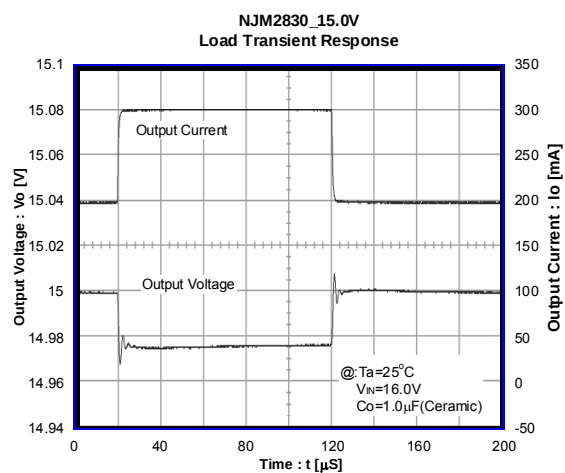
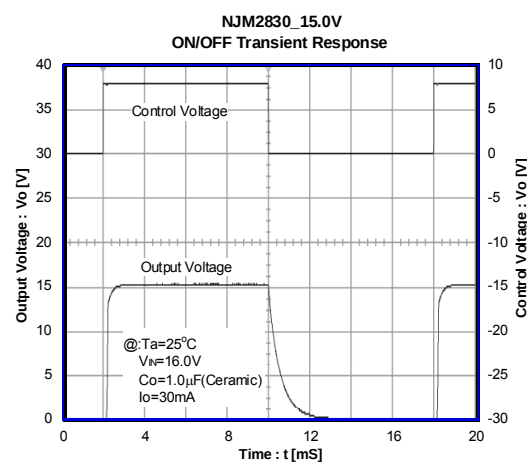
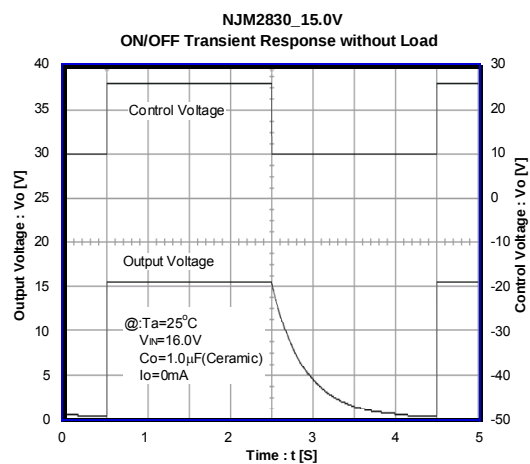


■ TYPICAL CHARACTERISTICS

● TEMPERATURE CHARACTERISTICS (15V Version)



● TRANSIENT RESPONSE (15V Version)



[CAUTION]

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- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

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- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



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