

LOW DROPOUT VOLTAGE REGULATOR

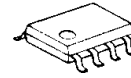
■ GENERAL DESCRIPTION

The NJM2883 is a low dropout voltage regulator in EMP8 package

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

It is suitable for portable applications.

■ PACKAGE OUTLINE

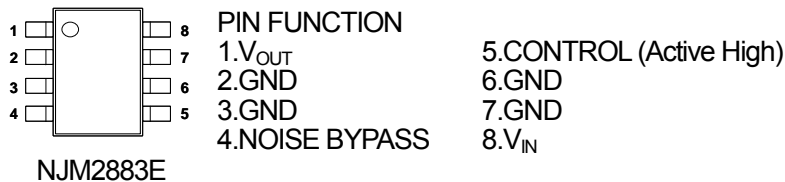


NJM2883E

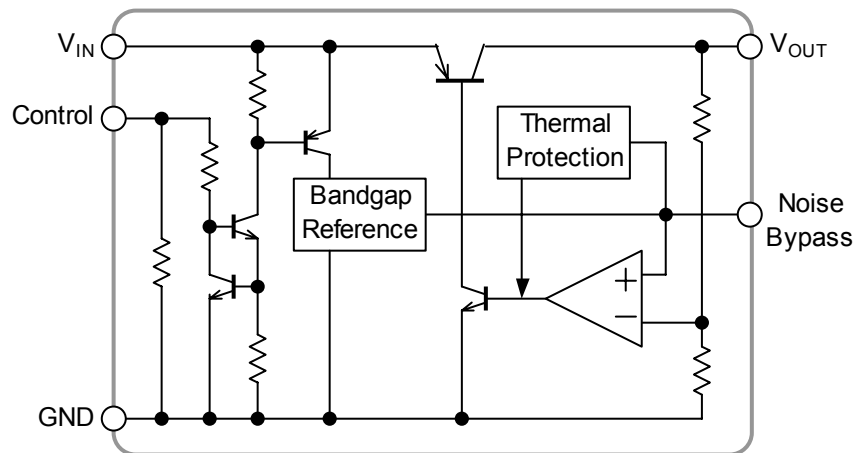
■ FEATURES

- High Ripple Rejection 75dB 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.)=300mA
- High Precision Output Vo±1%
- Low Dropout Voltage 0.10V typ. (Io=100mA)
- ON/OFF Control (Active High)
- Operating Voltage Range +2.3V~+14V (Vo≤2.0V version)
- Internal Short Circuit Current Limit
- Internal Thermal Overload Protection
- Bipolar Technology
- Package Outline EMP8 (5.0×6.0×1.5mm)

■ PIN CONFIGURATION



■ EQUIVALENT CIRCUIT



NJM2883

■ OUTPUT VOLTAGE RANK LIST (* : Under development)

Device Name	V _{OUT}	Device Name	V _{OUT}
*NJM2883E15	1.5V	*NJM2883E31	3.1V
*NJM2883E17	1.7V	NJM2883E33	3.3V
NJM2883E18	1.8V	NJM2883E345	3.45V
*NJM2883E21	2.1V	*NJM2883E35	3.5V
NJM2883E25	2.5V	*NJM2883E38	3.8V
NJM2883E28	2.8V	*NJM2883E04	4.0V
*NJM2883E285	2.85V	*NJM2883E43	4.3V
NJM2883E29	2.9V	*NJM2883E47	4.7V
NJM2883E03	3.0V	NJM2883E05	5.0V

■ ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage	V _{IN}	+14	V
Control Voltage	V _{CONT}	+14(*1)	V
Power Dissipation	P _D	650(*2)	mW
Operating Temperature	Topr	-40 ~ +85	°C
Storage Temperature	Tstg	-40 ~ +125	°C

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

(*2): Mounted on glass epoxy board based on EIA/JEDEC. (114.3x76.2x1.6mm: 2Layers)

■ Operating voltage

V_{IN}=+2.3V ~ +14.0V (In case of Vo<2.1V)

■ ELECTRICAL CHARACTERISTICS

(Vo>2.0V version : V_{IN}=Vo+1V, C_{IN}=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	Io=30mA	-1.0%	-	+1.0%	V
Quiescent Current	I _Q	Io=0mA, expect Icont	-	120	180	μA
Quiescent Current at Control OFF	I _{Q(OFF)}	V _{CONT} =0V	-	-	100	nA
Output Current	Io	Vo - 0.3V	300	400	-	mA
Line Regulation	ΔVo/ΔV _{IN}	V _{IN} =Vo+1V~Vo+6V, Io=30mA	-	-	0.10	%/V
Load Regulation	ΔVo/ΔIo	Io=0~300mA	-	-	0.03	%/mA
Dropout Voltage	ΔV _{L-O}	Io=100mA	-	0.10	0.18	V
Ripple Rejection	RR	ein=200mVrms, f=1kHz, Io=10mA, Vo=3V Version	-	75	-	dB
Average Temperature Coefficient of Output Voltage	ΔVo/ΔTa	Ta=0~+85°C, Io=10mA	-	±50	-	ppm/°C
Output Noise Voltage	V _{NO}	f=10Hz~80kHz, Io=10mA, Vo=3V Version	-	30	-	μVrms
Control Voltage for ON-state	V _{CONT(ON)}		1.6	-	-	V
Control Voltage for OFF-state	V _{CONT(OFF)}		-	-	0.6	V

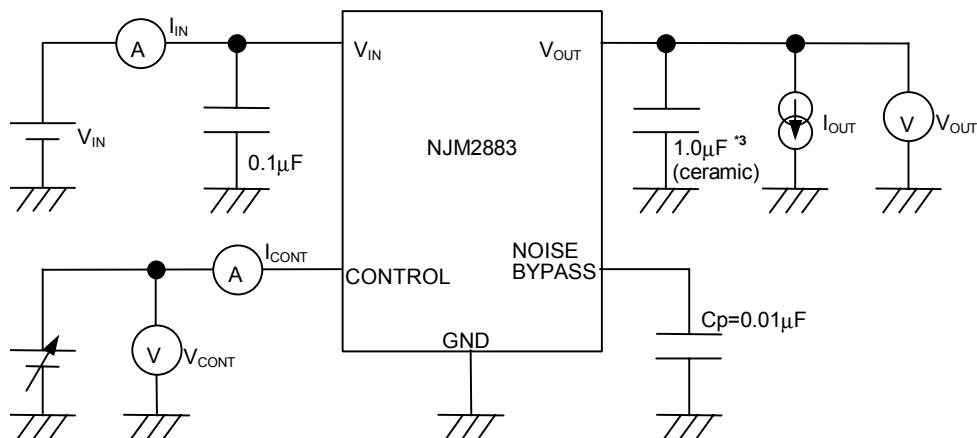
($V_o \leq 2.0V$ version: $V_{IN} = V_o + 1V$, $C_{IN} = 0.1\mu F$, $C_o = 2.2\mu F$; $V_o \geq 1.9V$ ($C_o = 4.7\mu F$; $V_o \leq 1.8V$), $C_p = 0.01\mu F$, $T_a = 25^\circ C$)

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	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	$\Delta V_o / \Delta V_{IN}$	$V_{IN} = V_o + 1V \sim V_o + 6V$, $I_o = 30mA$	-	-	0.10	%/V
Load Regulation	$\Delta V_o / \Delta I_o$	$I_o = 0 \sim 300mA$	-	-	0.03	%/mA
Ripple Rejection	RR	$e_{in} = 200mV_{rms}$, $f = 1kHz$, $I_o = 10mA$, $V_o = 1.8V$ Version	-	80	-	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/ $^\circ C$
Output Noise Voltage	V_{NO}	$f = 10Hz \sim 80kHz$, $I_o = 10mA$, $V_o = 1.8V$ Version	-	20	-	μV_{rms}
Control Voltage for ON-state	$V_{CONT(ON)}$		1.6	-	-	V
Control Voltage for OFF-state	$V_{CONT(OFF)}$		-	-	0.6	V

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

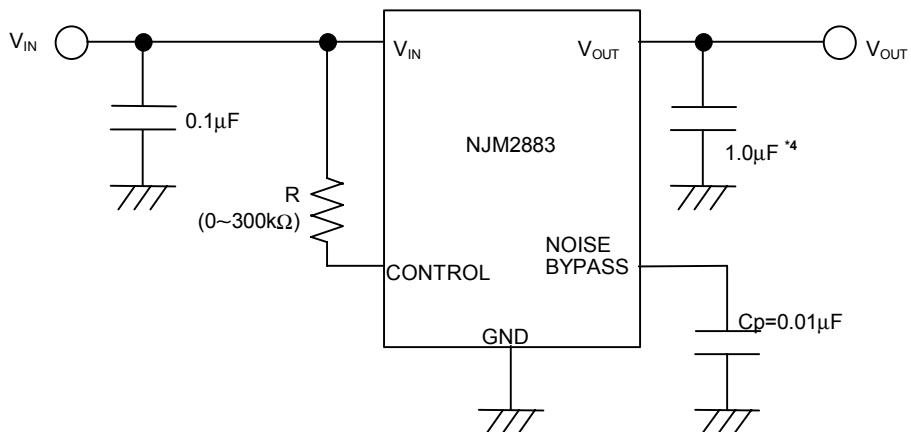


*3 $1.9V \leq V_o \leq 2.6V$ version: $C_o = 2.2\mu F$ (ceramic)
 $V_o \leq 1.8V$ version: $C_o = 4.7\mu F$ (ceramic)

NJM2883

■ TYPICAL APPLICATION

① In case that ON/OFF Control is not required:

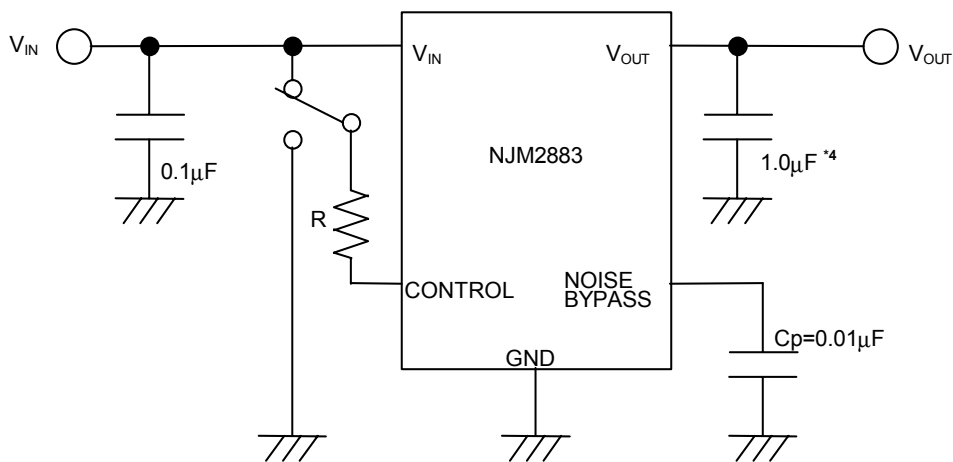


*4 1.9V ≤ V_o ≤ 2.6V version: C_o=2.2µF
V_o ≤ 1.8V version: C_o=4.7µF

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:



*4 1.9V ≤ V_o ≤ 2.6V version : C_o=2.2uF
V_o ≤ 1.8V version : C_o=4.7uF

State of control terminal:

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

*Noise bypass Capacitance C_p

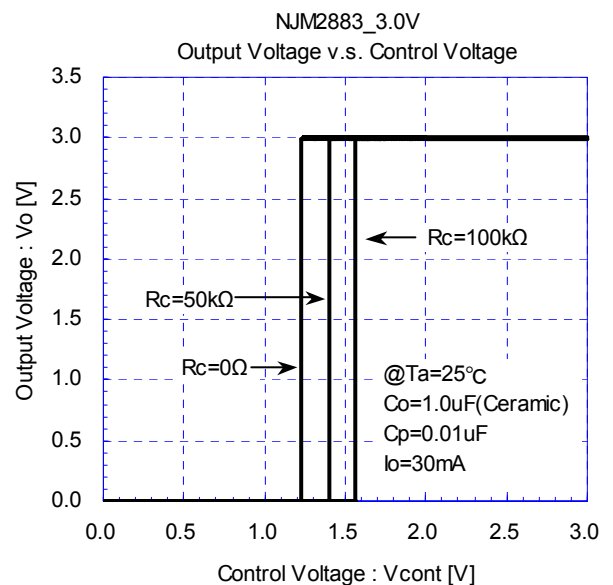
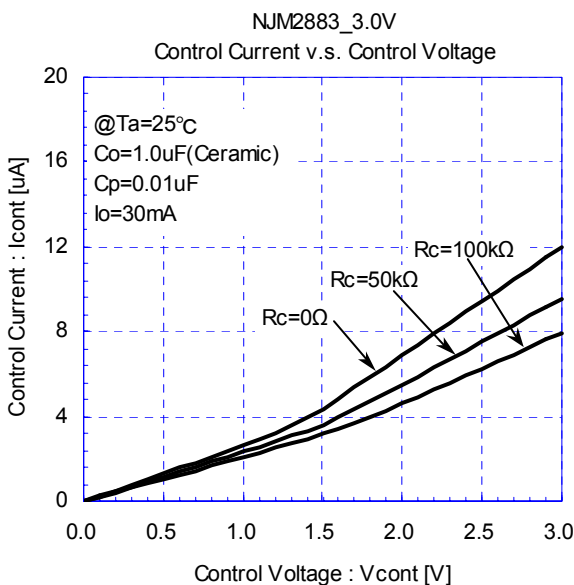
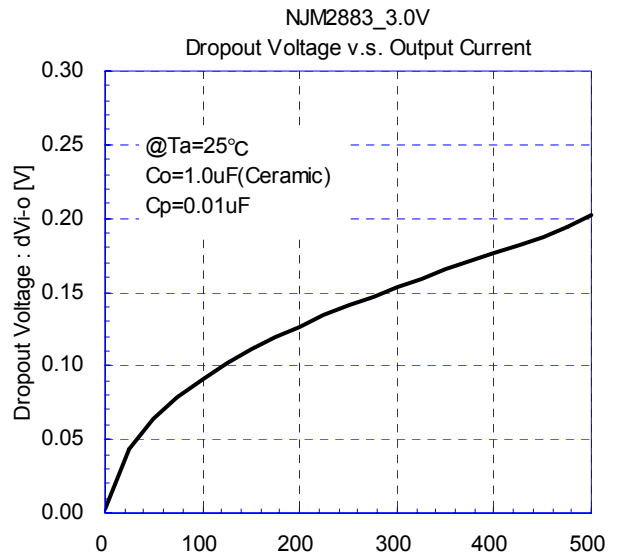
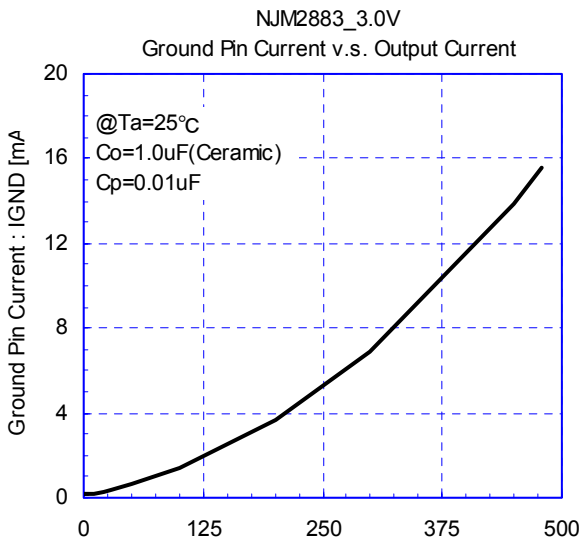
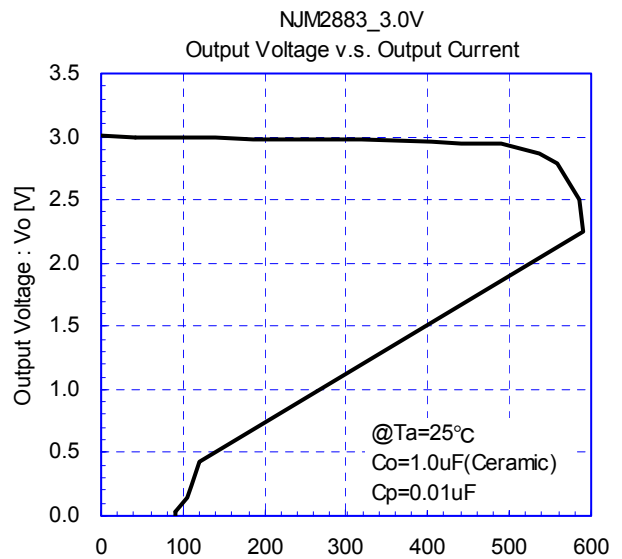
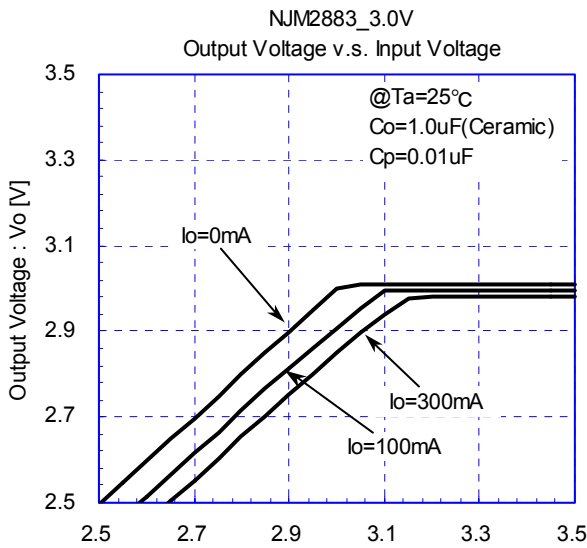
Noise bypass capacitance C_p reduces noise generated by band-gap reference circuit.

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

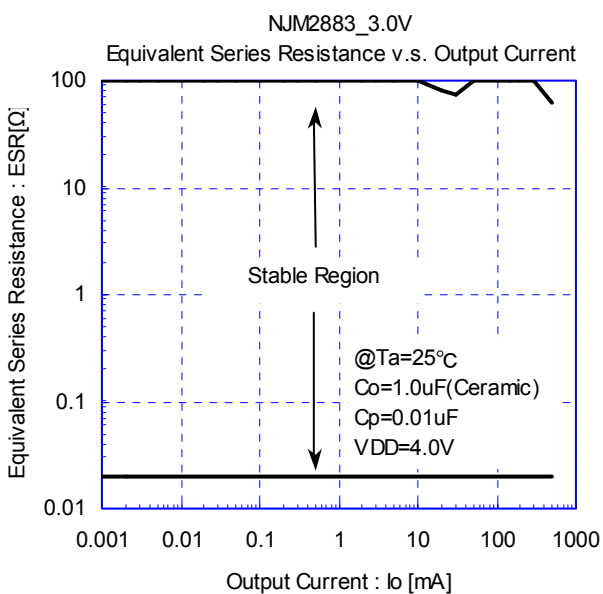
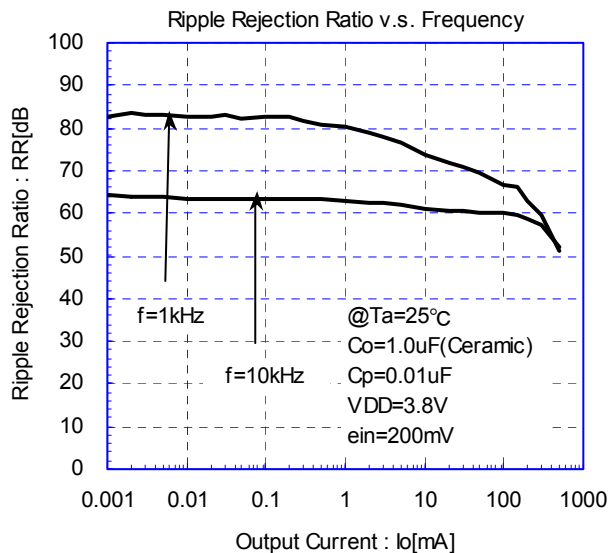
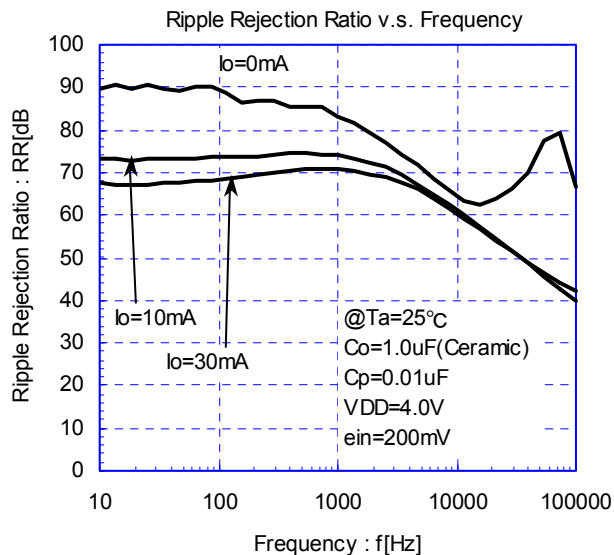
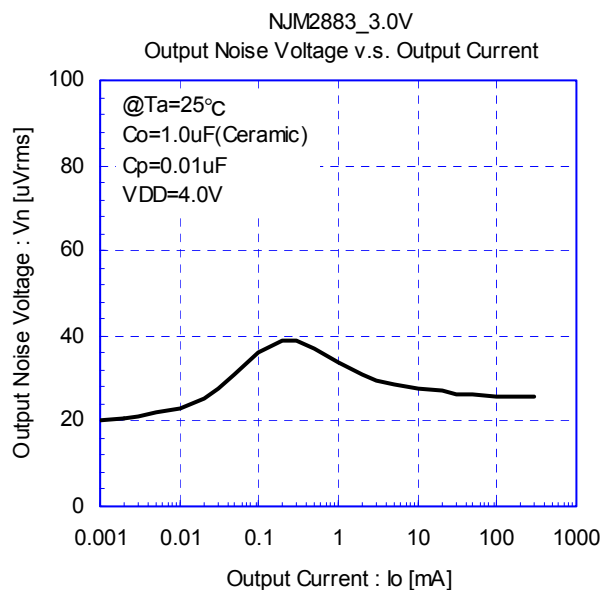
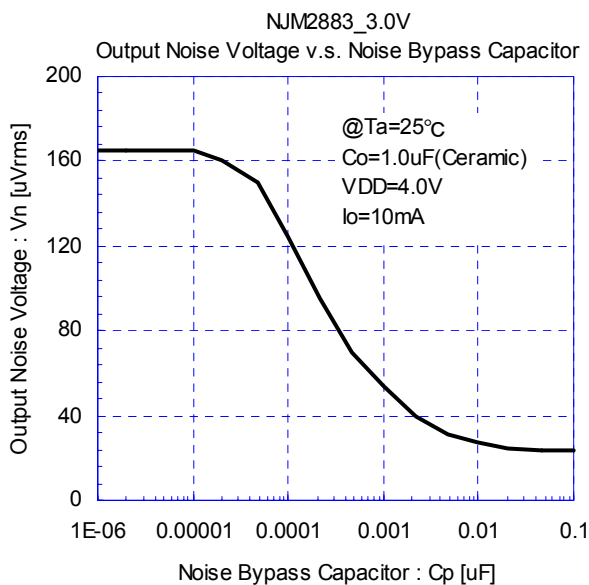
Use of smaller C_p value may cause oscillation.

Use the C_p value of 0.01uF greater to avoid the problem.

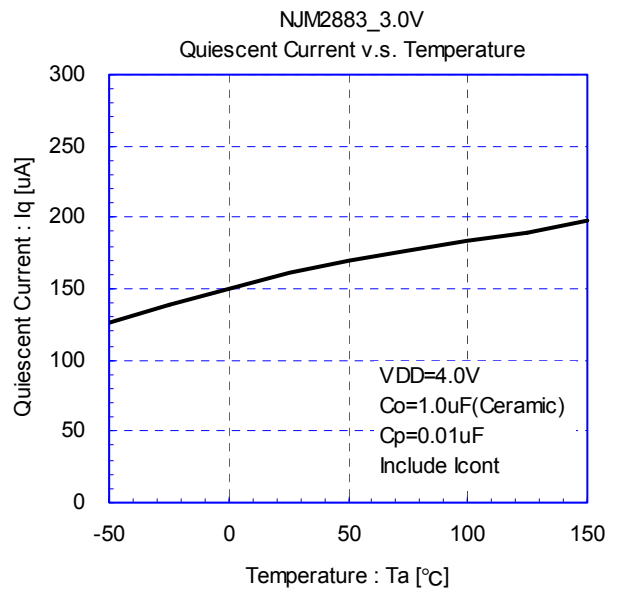
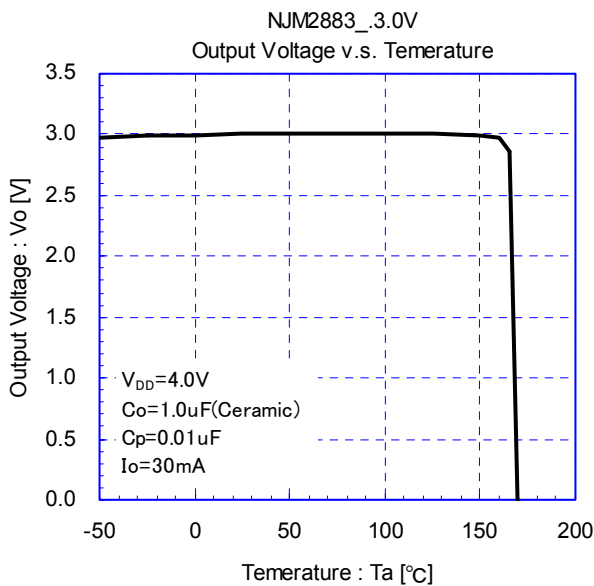
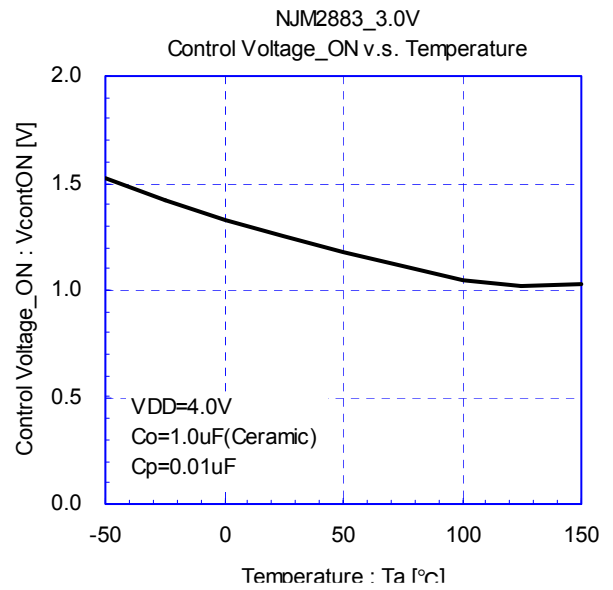
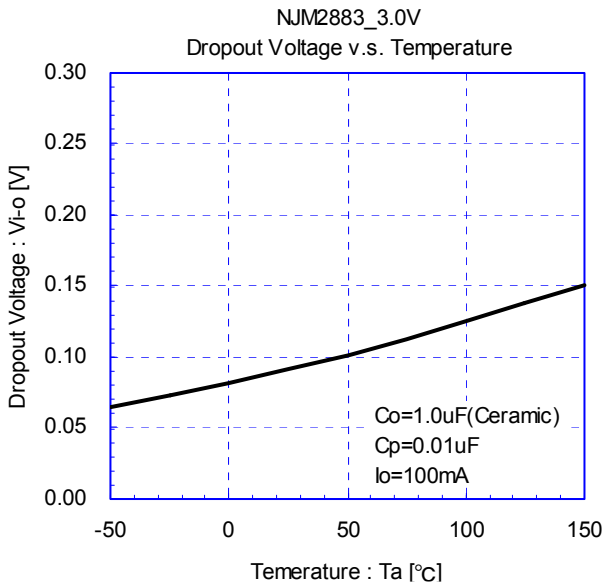
■ ELECTRICAL CHARACTERISTICS



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[CAUTION]

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