

LOW DROPOUT VOLTAGE REGULATOR

■ GENERAL DESCRIPTION

The NJM2860 is a low dropout voltage regulator. Advanced Bipolar technology achieves low noise, high ripple rejection and low quiescent current. It features small SC-88A package.

■ PACKAGE OUTLINE

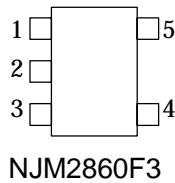


NJM2860F3

■ FEATURES

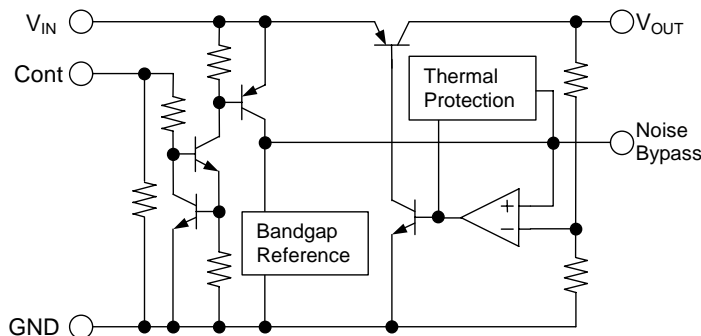
- High Ripple Rejection 70dB typ. (f=1kHz)
- Output Noise Voltage $V_{no}=30\mu V_{rms}$ ($C_p=0.01\mu F$)
- Output capacitor with 1.0uF ceramic capacitor ($V_o \geq 2.7V$)
- Output Current $I_o(max.)=100mA$
- High Precision Output $V_o \pm 1.0\%$
- Low Dropout Voltage 0.10V typ. ($I_o=60mA$)
- ON/OFF Control (Active High)
- Internal Short Circuit Current Limit
- Internal Thermal Overload Protection
- Bipolar Technology
- Package Outline SC88A

■ PIN CONFIGURATION



- 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	V_{OUT}
NJM2860F3-21	2.1V
NJM2860F3-25	2.5V
NJM2860F3-26	2.6V
NJM2860F3-27	2.7V
NJM2860F3-28	2.8V
NJM2860F3-285	2.85V
NJM2860F3-03	3.0V

Device Name	V_{OUT}
NJM2860F3-31	3.1V
NJM2860F3-33	3.3V
NJM2860F3-35	3.5V
NJM2860F3-38	3.8V
NJM2860F3-04	4.0V
NJM2860F3-46	4.6V
NJM2860F3-47	4.7V

Device Name	V_{OUT}
NJM2860F3-05	5.0V

■ 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	250(note 2)	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.

(note 2) On glass epoxy board. (50×50×1.6mm)

■ ELECTRICAL CHARACTERISTICS

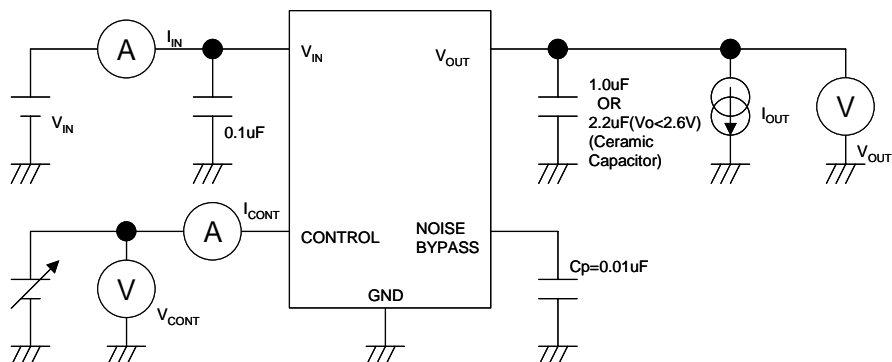
($V_{IN}=V_o+1V$, $C_{IN}=0.1\mu F$, $C_o=1.0\mu F$: $V_o \geq 2.7V$ ($C_o=2.2\mu F$: $V_o \leq 2.6V$), $C_p=0.01\mu F$, $T_a=25^\circ C$)

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	μA
Quiescent Current at Control OFF	$I_{Q(OFF)}$	$V_{CONT}=0V$	-	-	100	nA
Output Current	I_o	$V_o-0.3V$	100	130	-	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	$\Delta V_o/\Delta I_o$	$I_o=0 \sim 60mA$	-	-	0.03	%/mA
Dropout Voltage	ΔV_{I-O}	$I_o=60mA$	-	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	$\Delta V_o/\Delta T_a$	$T_a=0 \sim 85^\circ C$, $I_o=10mA$	-	± 50	-	ppm/°C
Output Noise Voltage	V_{NO}	$f=10Hz \sim 80kHz$, $I_o=10mA$, $V_o=3V$ Version	-	30	-	μV_{rms}
Control Voltage for ON-state	$V_{CONT(ON)}$		1.6	-	-	V
Control Voltage for OFF-state	$V_{CONT(OFF)}$		-	-	0.6	V

(note 3) The above specification is a common specification for all output voltages.

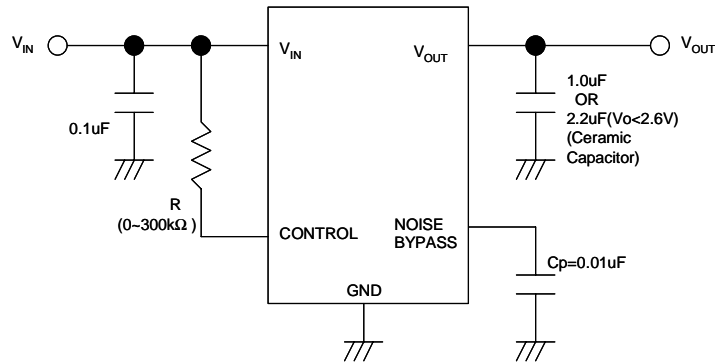
Therefore, it may be different from the individual specification for a specific output voltage.

■ TEST CIRCUIT



■ TYPICAL APPLICATION

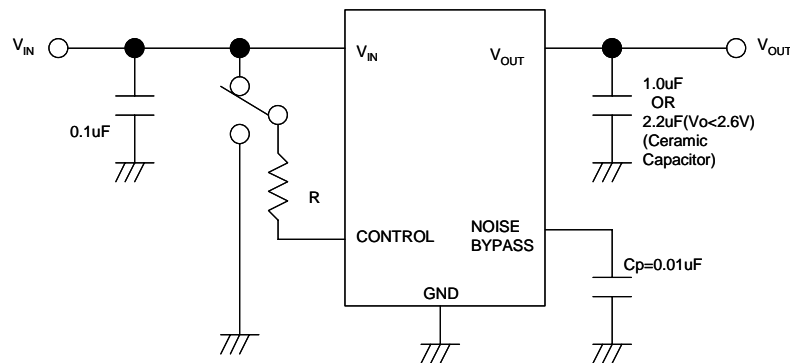
① In the case where ON/OFF Control is not required:



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

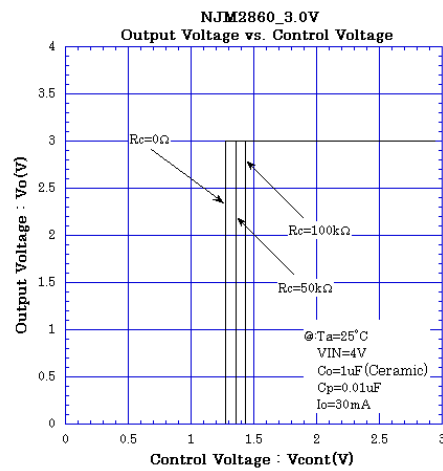
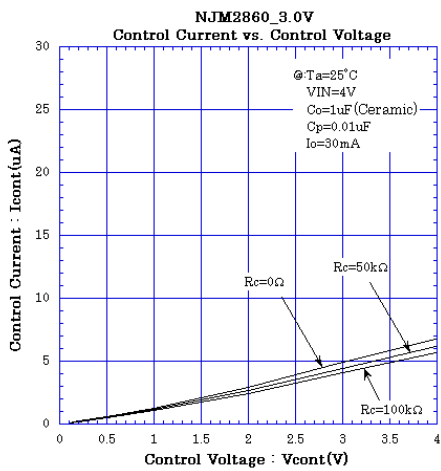
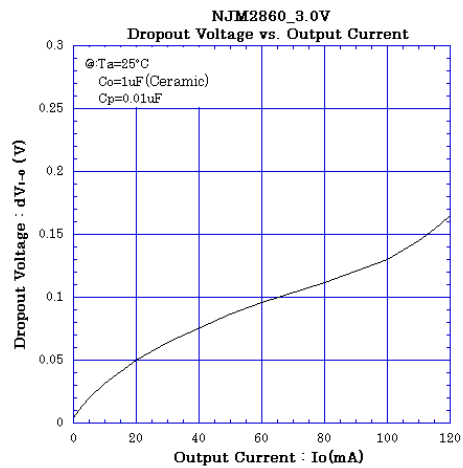
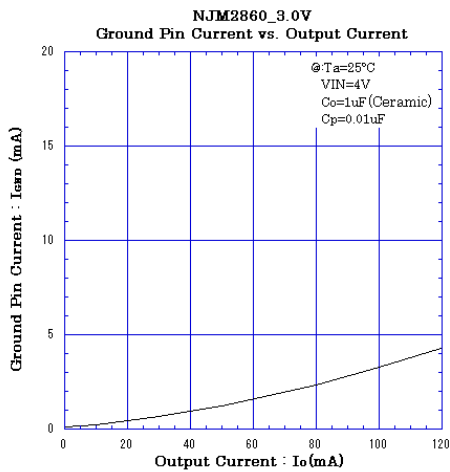
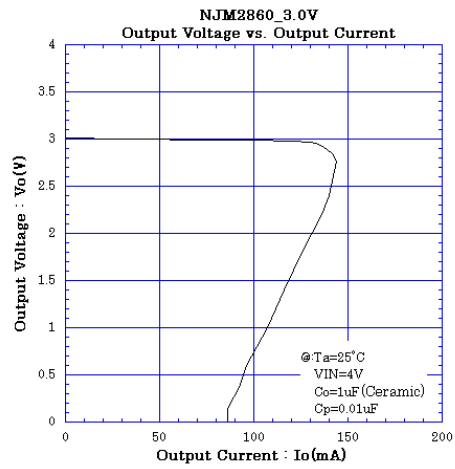
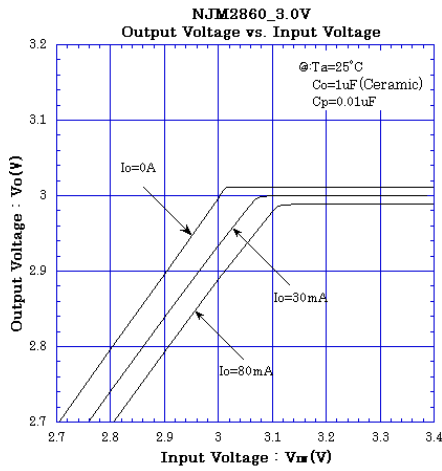
Noise bypass capacitance C_p reduces noise generated by band-gap reference circuit.

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

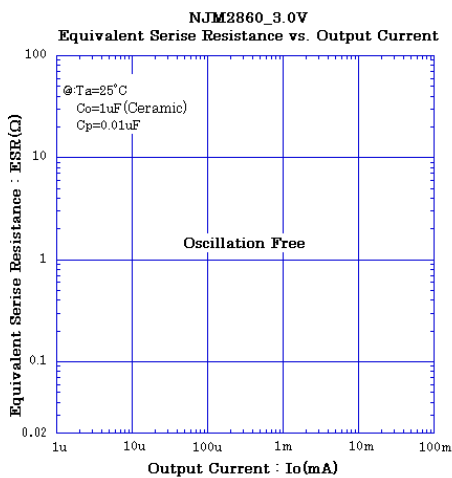
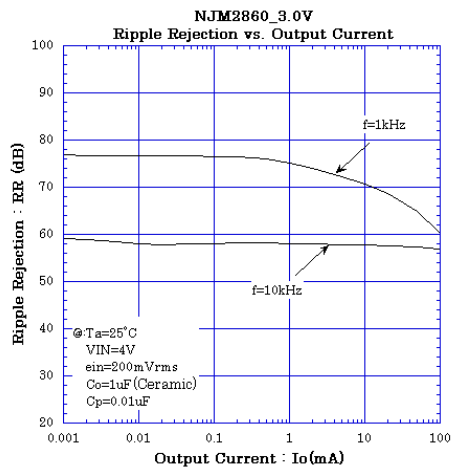
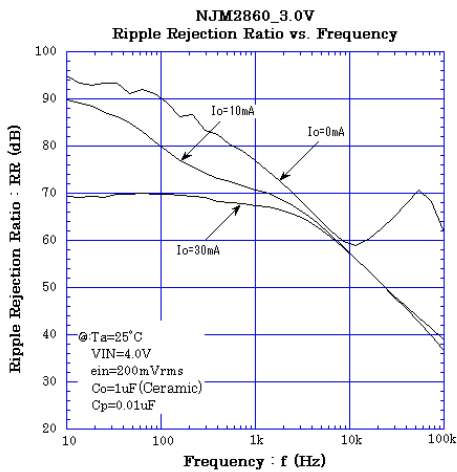
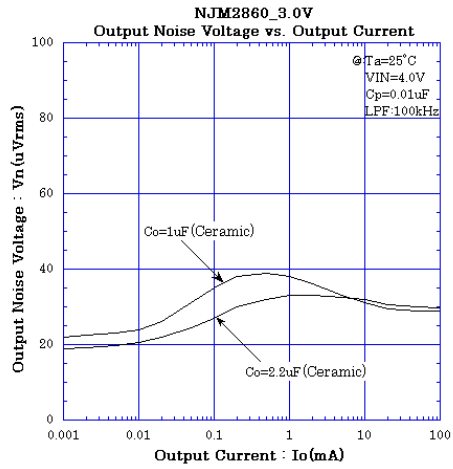
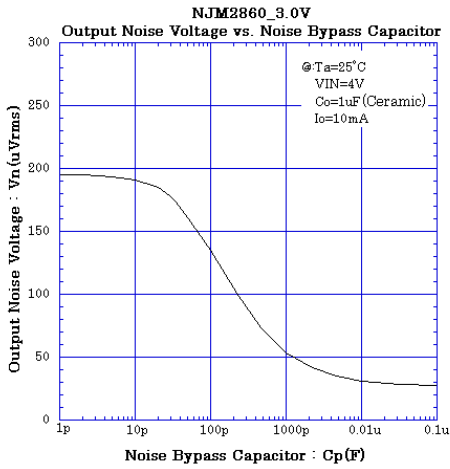
Use of smaller C_p value may cause oscillation.

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

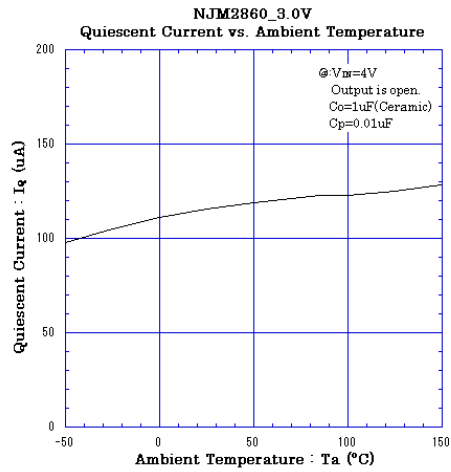
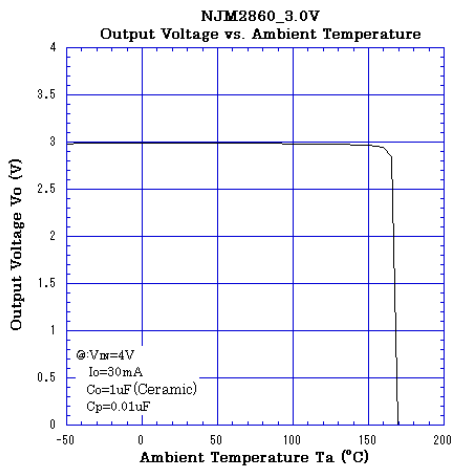
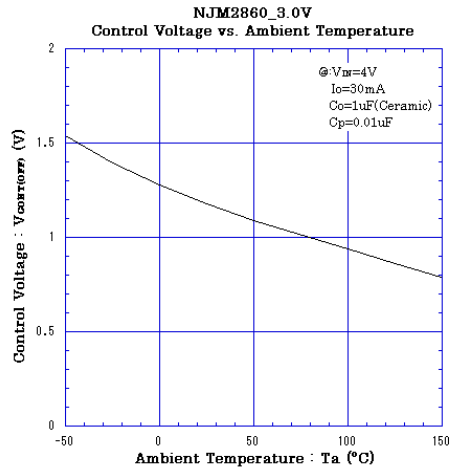
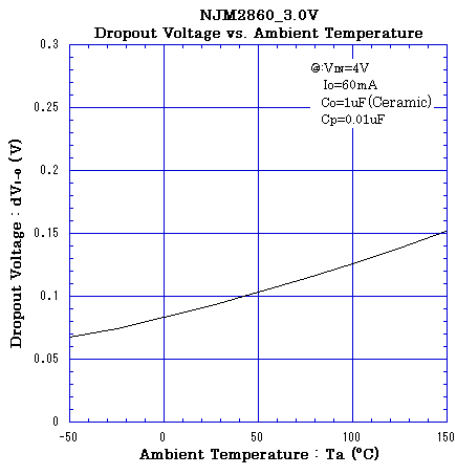
TYPICAL CHARACTERISTICS



TYPICAL CHARACTERISTICS



TYPICAL CHARACTERISTICS



[CAUTION]

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