

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

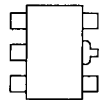


NJM2880U

■ 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 μF 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

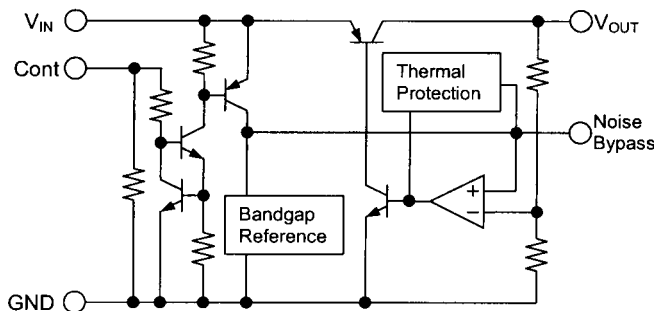


NJM2880U

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	V_{OUT}	Device Name	V_{OUT}
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		

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■ 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 to +85	°C
Storage Temperature	T _{stg}	-40 to +125	°C

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

■ ELECTRICAL CHARACTERISTICS

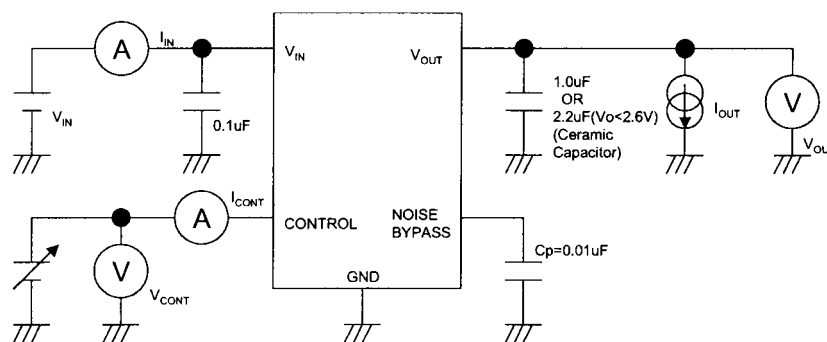
(V_{IN}=V_O+1V, C_O=1.0uF : V_O≥2.7V(C_O=2.2uF : V_O≤2.6V), C_P=0.01uF, T_a=25°C)

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	uA
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	ΔV _O / ΔV _{IN}	V _{IN} =V _O +1V to V _O +6V, I _O =30mA	-	-	0.10	% / V
Load Regulation	ΔV _O / ΔI _O	I _O =0 to 300mA	-	-	0.03	% / mA
Dropout Voltage	ΔV _{LO}	I _O =100mA	-	0.10	0.18	V
Ripple Rejection	RR	e _{in} =200mVrms, f=1kHz, I _O =10mA V _O =3V Version	-	70	-	dB
Average Temperature Coefficient of Output Voltage	ΔV _O / ΔT _a	T _a =0 to 85°C, I _O =10mA	-	±50	-	ppm / °C
Output Noise Voltage	V _{NO}	f=10Hz to 80kHz, I _O =10mA V _O =3V Version	-	30	-	uVrms
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.

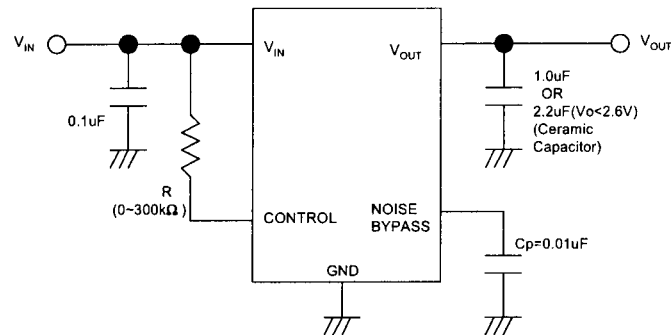
Therefore, it may be different from the individual specification for a specific output voltage.

■ TEST CIRCUIT



■ TYPICAL APPLICATION

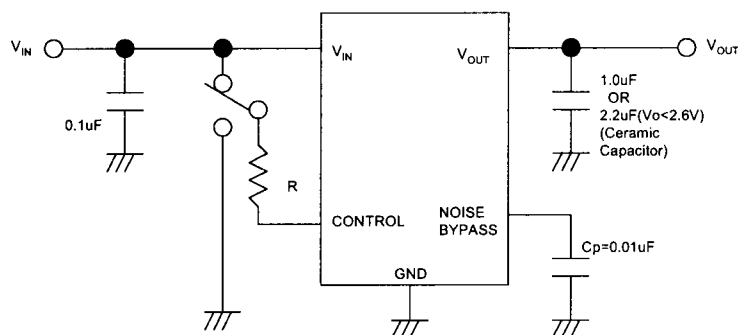
① In the case where ON / OFF Control is not required :



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.

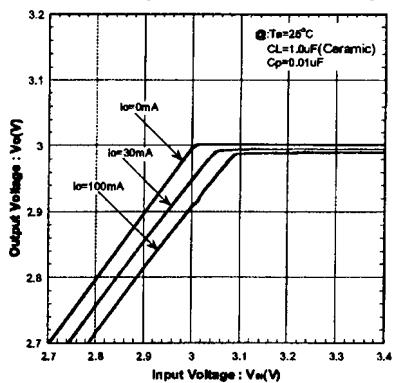
Use of smaller C_p value may cause oscillation.

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

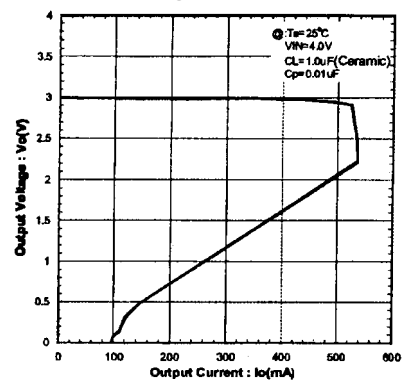
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■ TYPICAL CHARACTERISTICS

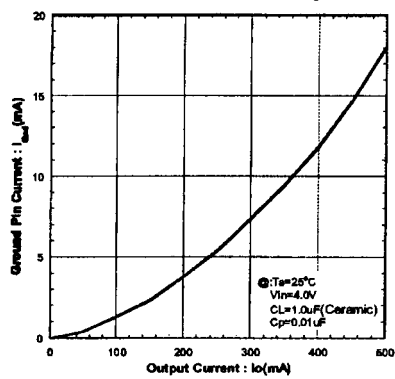
NJM2880_3.0V
Output Voltage vs. Input Voltage



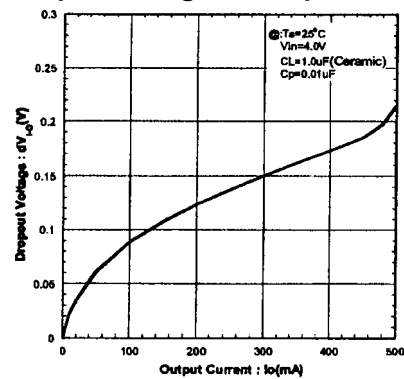
NJM2880_3.0V
Output Voltage vs. Output Current



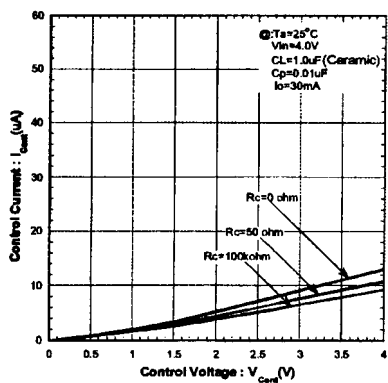
NJM2880_3.0V
Ground Pin Current vs. Output Current



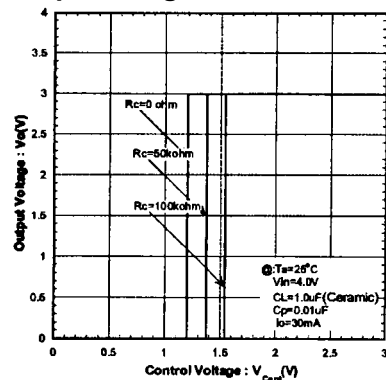
NJM2880_3.0V
Dropout Voltage vs. Output Current



NJM2880_3.0V
Control Current vs. Control Voltage

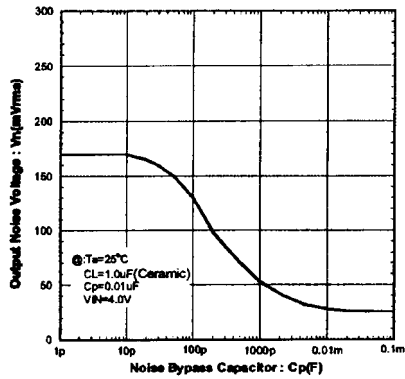


NJM2880_3.0V
Output Voltage vs. Control Voltage

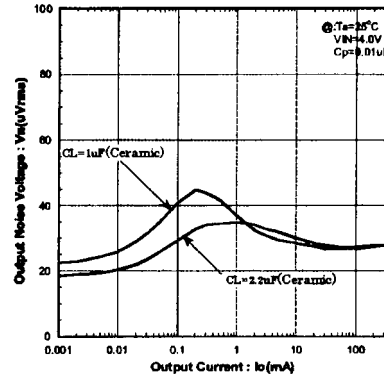


■ TYPICAL CHARACTERISTICS

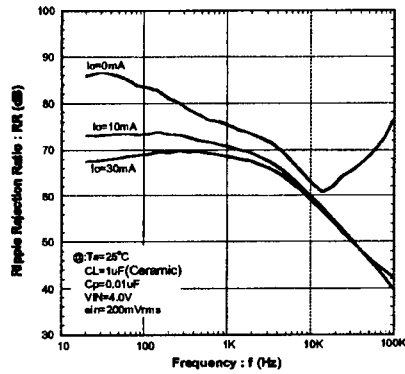
NJM2880_3.0V
Output Noise Voltage vs. Noise bypass Capacitor



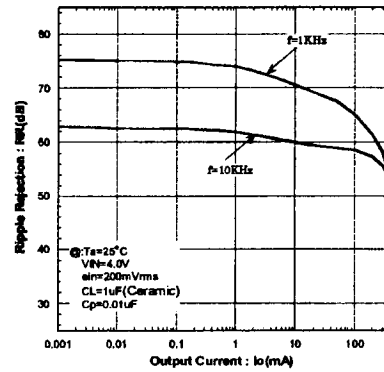
NJM2880_3.0V
Output Noise Voltage vs. Output Current



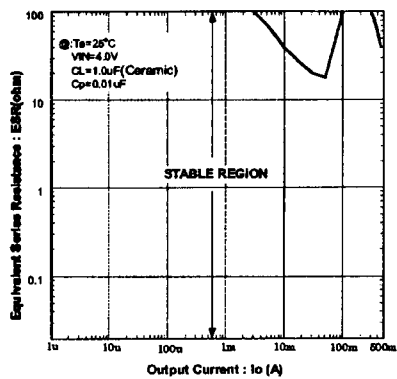
NJM2880_3.0V
Ripple Rejection vs. Frequency



NJM2880_3.0V
Ripple Rejection vs. Output Current



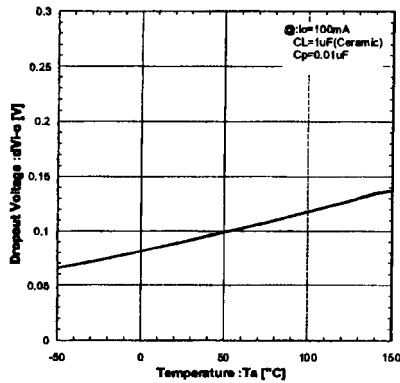
NJM2880_3.0V
Equivalent Series Resistance vs. Output Current



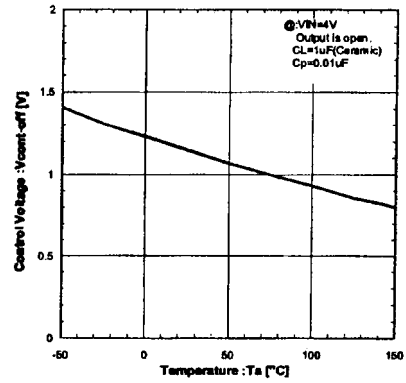
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■ TYPICAL CHARACTERISTICS

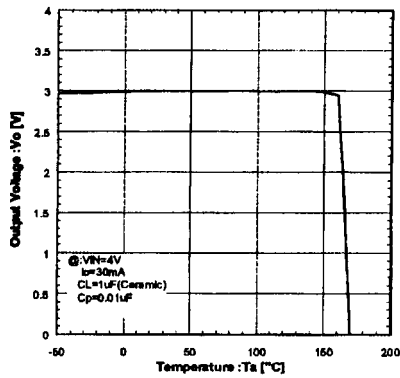
NJM2880_3.0V
Dropout Voltage vs. Temperature



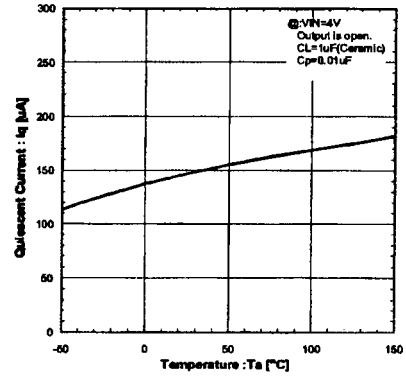
NJM2880_3.0V
Control Voltage vs. Temperature



NJM2880_3.0V
Output Voltage vs. Temperature



NJM2880_3.0V
Quiescent Current vs. Temperature



[CAUTION]

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