LOW DROPOUT VOLTAGE REGULATOR WITH ON/OFF CONTROL

■GENERALE DESCRIPTION

The NJM2370 is a low dropout voltage regulator with ON/OFF control.

Its dropout voltage is 0.1V at Io=30mA, also it actualizes low output noise and high ripple rejection in connecting an external capaciter to noise bypass terminal.

It's suitable for portable items such as cellular phone, video camera and others.

■PACKAGE OUTLINE

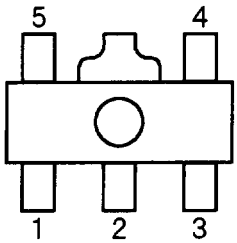
NJM2370U

NJM2370R

■FEATURES

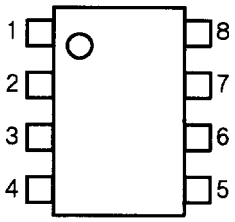
- ●Output Current (150mA min. (Vo-0.3V))
- ●Low Dropout Voltage (0.1V typ. (Io=30mA))
- ●External Capaciter for Noise Bypass
- ●ON/OFF Control Function
- ●High Ripple Rejection
- ●Over Current Protection
- ●Thermal Shutdown
- ●Bipolar Technology
- ●Package Outline SOT-89(5Pin), VSP8

■PIN CONFIGURATION



NJM2370U

PIN FUNCTION
1. CONTROL
2. GND
3. NOISE BYPASS
4. V_{OUT}
5. V_{IN}



NJM2370R

PIN FUNCTION
1. CONTROL
2. GND
3. NC
4. NOISE BYPASS
5. V_{OUT}
6. NC
7. NC
8. V_{IN}

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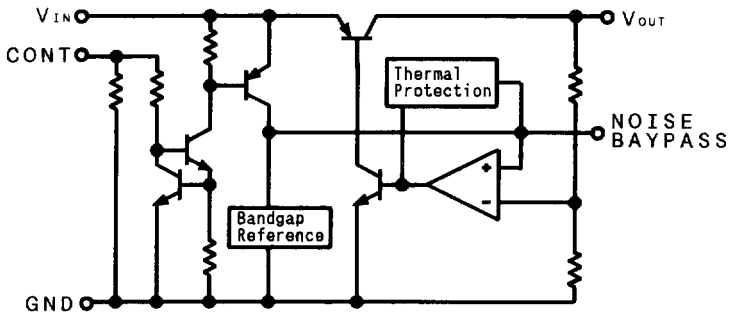
■EQUIVALENT CIRCUIT



■ABSOLUTE MAXIMUM RATINGS (Ta＝25℃)

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage	V_{IN}	20	V
Control Voltage	V_{CONT}	20※	V
Power Dissipation	P_D	(SOT-89) 350 (VSP8) 320	mW
Operating Temperature Range	T_{opr}	−40～+85	℃
Storage Temperature Range	T_{stg}	−50～+125	℃

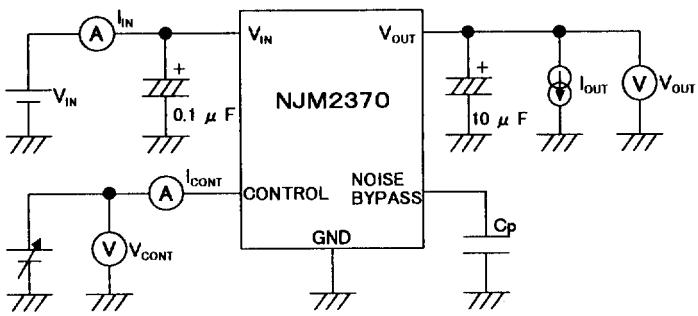
※When input voltage is less than +20V, the absolute maximum control voltage is equal to the input voltage.

■RECOMMENDED OPERATING CONDITION (Ta＝25℃)

PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_O	V_{IN}=V_O+1V, I_O=30mA	-3	—	+3	%
Quiescent Current 1	I_Q1	I_O=0mA, expect I_{CONT}	—	180	—	μA
Quiescent Current 2	I_Q2	CONTROL-GND short	—	—	100	nA
Output Current	I_O	V_O−0.3V	150	180	—	mA
Line Regulation	$\Delta V_O/\Delta V_{IN}$	V_{IN}=(V_O+1V)～(V_O+6V) V_O=2V～14V	—	—	0.12	%/V
		V_{IN}=(V_O+1V)～(V_O+5V) V_O=15V	—	—	0.12	%/V
Load Regulation	$\Delta V_O/\Delta I_O$	I_O=0～60mA	—	—	0.03	%/mA
Dropout Voltage	ΔV_{I-O}	I_O=30mA	—	0.1	0.3	V
Ripple Rejection	R・R	f=400Hz, ein=100mV_{P-P} V_{IN}=V_O+1.5V, I_O=10mA	—	60	—	dB
Average Temperature Coefficient of Output Voltage	$\Delta V_O/\Delta Ta$	Ta=−20～75℃, I_O=10mA V_{IN}=V_O+1.5V	—	0.2	—	mV/℃
Output Noise Voltage	V_{NO}	10Hz<f<80kHz, I_O=10mA V_O=3V	—	30	—	μVrms

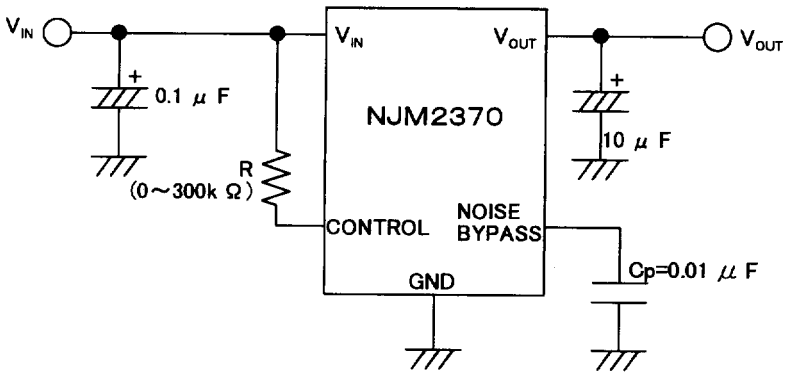
※Please confirm the specification separately because some parameters depend on output voltage.

■TEST CIRCUIT



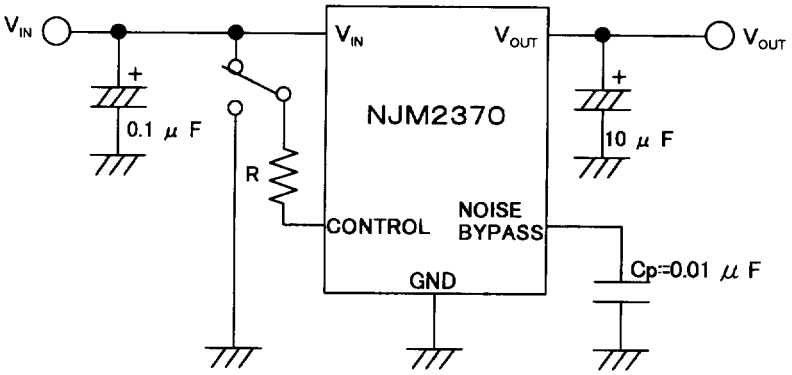
■TYPICAL APPLICATION

①In Nonuse of ON/OFF Control



Connect control terminal(1pin) to V_{IN} terminal(5pin).
When a resistance "R" is connected, the quiescent current decreases, but minimum operating voltage increases. Please refer to a figure of Output Voltage vs. Control Voltage.

②In Use of ON/OFF Control



When the control terminal is "H", it is on .
When the control terminal "L"or"open", it is OFF.

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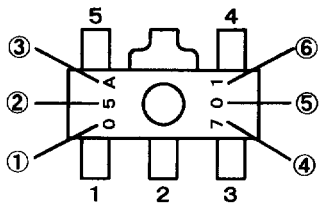
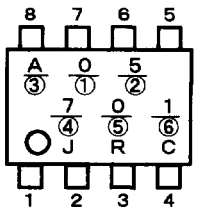
■PACKAGE MAKING



NJM2370U



NJM2370R

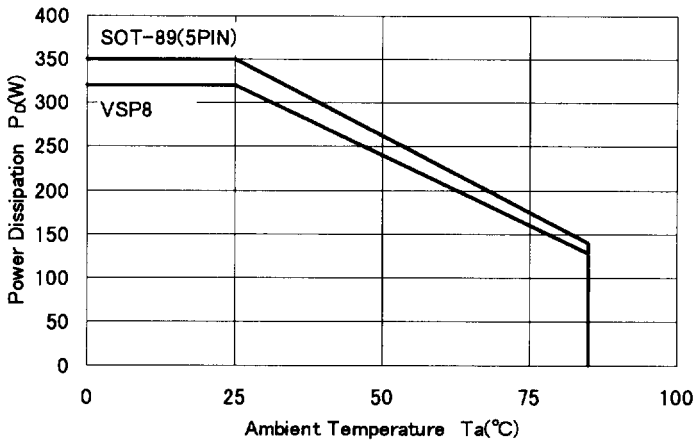
①、② Output voltage
※Please refer to output voltage rank list.
③ Product number. (NJM2370 is"A")
④ Western calendar Sueo.
⑤、⑥ Lot number.

■OUTPUT VOLTAGE RANK LIST

Output Voltage	Order Number	Package ①	Marking ②
2.0V	NJM2370X02	0	2
2.1V	NJM2370X21	2	1
2.2V	NJM2370X22	2	2
2.3V	NJM2370X23	2	3
2.4V	NJM2370X24	2	4
2.5V	NJM2370X25	2	5
2.6V	NJM2370X26	2	6
2.7V	NJM2370X27	2	7
2.8V	NJM2370X28	2	8
2.9V	NJM2370X29	2	9
3.0V	NJM2370X03	0	3
3.1V	NJM2370X31	3	1
3.2V	NJM2370X32	3	2

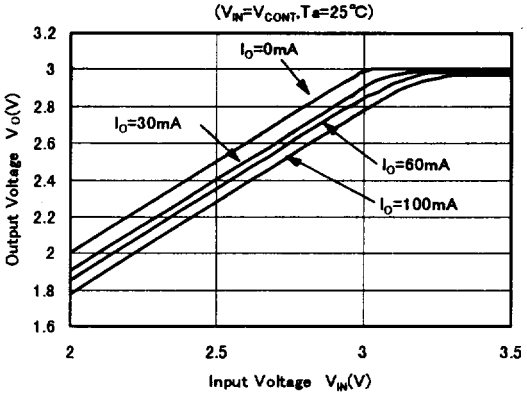
Output Voltage	Order Number	Package ①	Marking ②
3.3V	NJM2370X33	3	3
3.5V	NJM2370X35	3	5
3.6V	NJM2370X36	3	6
3.7V	NJM2370X37	3	7
4.0V	NJM2370X04	0	4
5.0V	NJM2370X05	0	5
6.0V	NJM2370X06	0	6
8.0V	NJM2370X08	0	8
9.0V	NJM2370X09	0	9
10.0V	NJM2370X10	1	0
12.0V	NJM2370X12	1	2
15.0V	NJM2370X15	1	5

■POWER DISSIPATION VS. AMBIENT TEMPERATURE

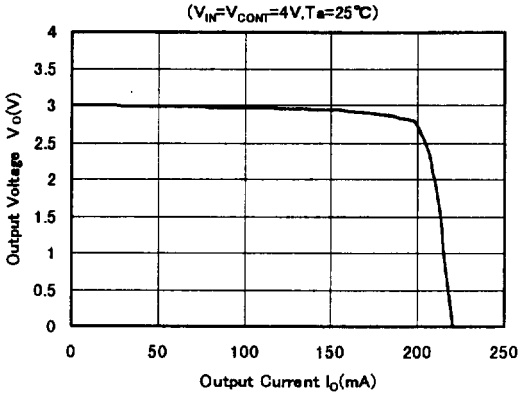


■TYPICAL CHARACTERISTICS

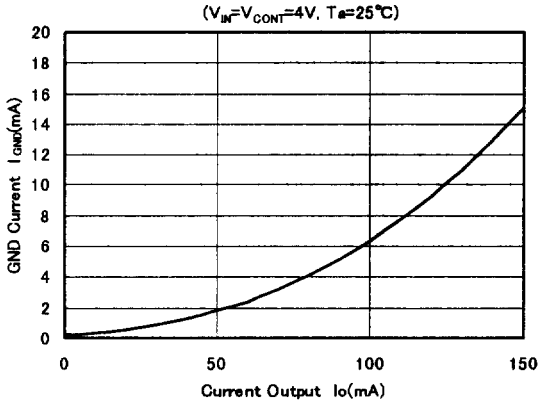
NJM2370U03/R03 Dropout Voltage
(V_{IN}=V_{CONT},Ta=25℃)



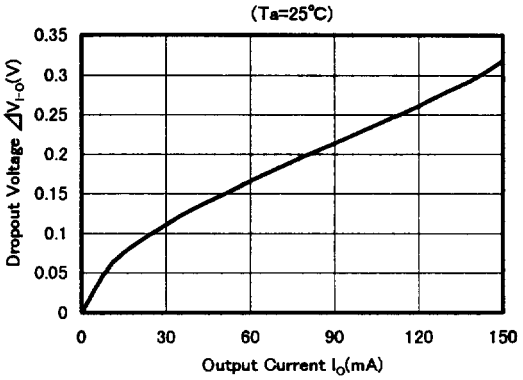
NJM2370U03/R03 Load Regulation
(V_{IN}=V_{CONT}=4V,Ta=25℃)



NJM2370U03/R03 GND Current vs. Output Current
(V_{IN}=V_{CONT}=4V, Ta=25℃)



NJM2370U03/R03 Dropout Voltage vs. Output Current
(Ta=25℃)



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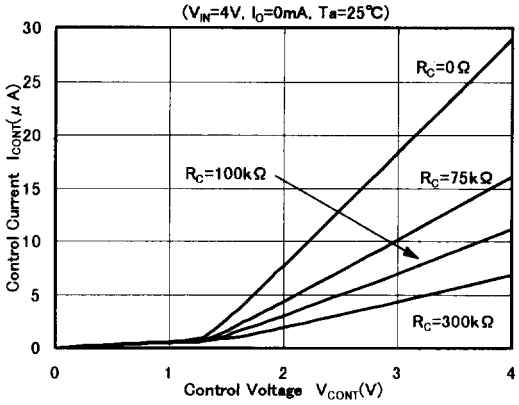
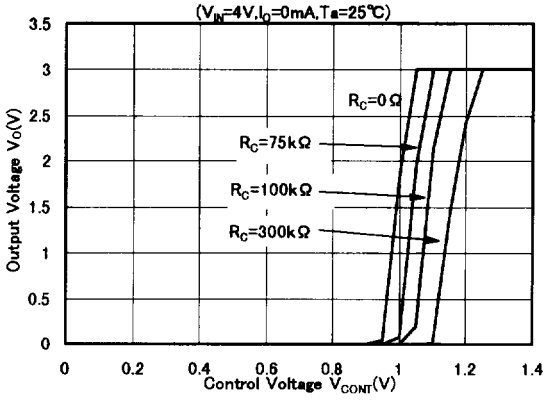
■TYPICAL CHARACTERISTICS

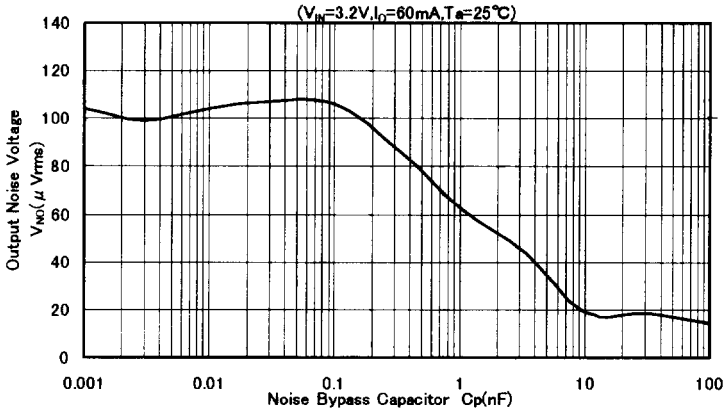
NJM2370U03/R03 Control Current vs. Control Voltage
(V_{IN}=4V, I_O=0mA, Ta=25℃)



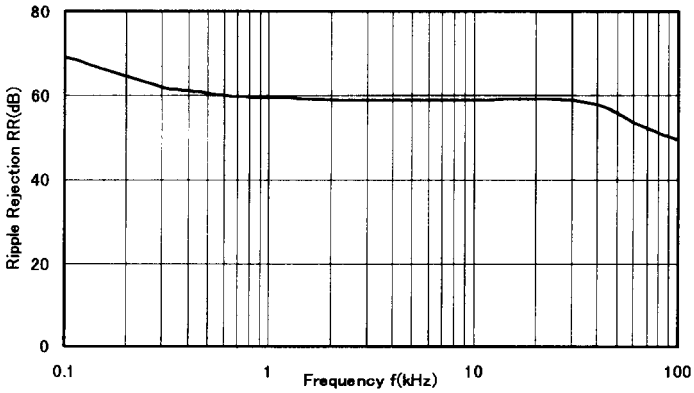
NJM2370U03/R03 Output Voltage vs. Control Voltage
(V_{IN}=4V, I_O=0mA, Ta=25℃)



NJM2370U03/R03 Output Noise Voltage vs. Noise Bypass Capacitor
(V_{IN}=3.2V, I_O=60mA, Ta=25℃)

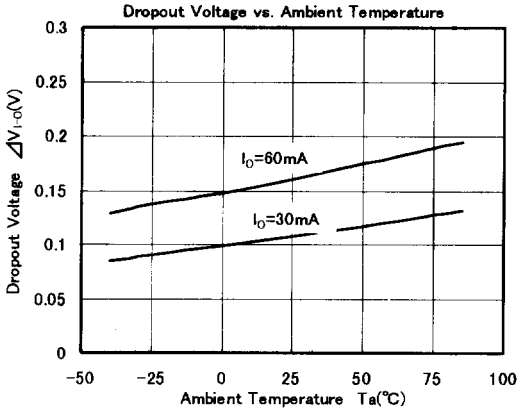


NJM2370U03/R03 Ripple Rejection vs. Frequency
(V_{IN}=V_O+1.5V, ein=100mVrms, Io=10mA, Ta=25℃)

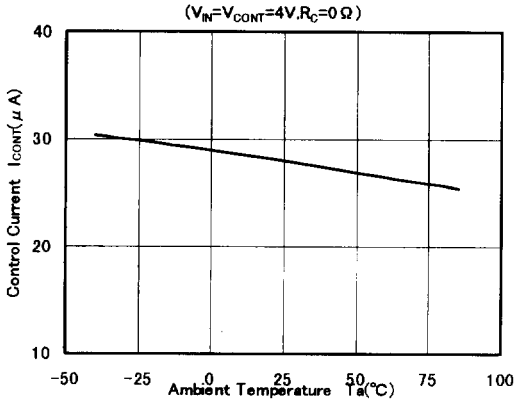


■TYPICAL CHARACTERISTICS

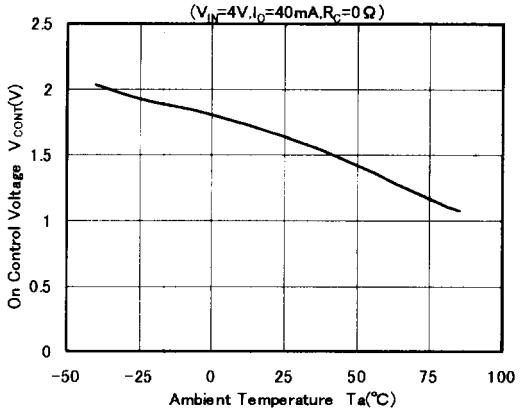
Dropout Voltage vs. Ambient Temperature



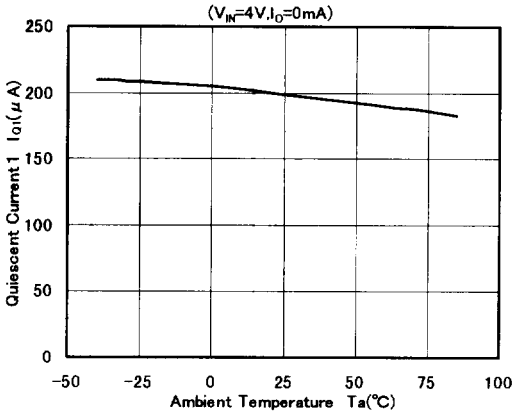
NJM2370U03/R03 Control Current vs. Ambient Temperature
(V_{IN}=V_{CONT}=4V,R_C=0Ω)



On Control Voltage vs. Temperature
(V_{IN}=4V,I_O=40mA,R_C=0Ω)



NJM2370U03/R03 Quiescent Current1 vs. Ambient Temperature
(V_{IN}=4V,I_O=0mA)



Thermal Shutdown
(V_{IN}=V_{CONT}=4V,I_O=10mA)