

LOW DROPOUT VOLTAGE REGULATOR WITH ON/OFF CONTROL

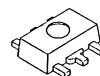
■ GENERAL DESCRIPTION

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

It features dropout voltage of 0.1V at $I_o=30\text{mA}$, low output noise and high ripple rejection by connecting an external capacitor to noise bypass terminal.

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

■ PACKAGE OUTLINE



NJM2370U

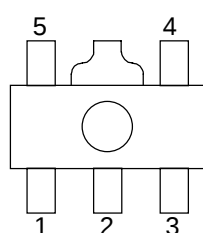


NJM2370R

■ FEATURES

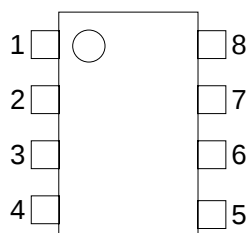
- Output Current (150mA min. ($V_o=0.3\text{V}$))
- Low Dropout Voltage (0.1V typ. ($I_o=30\text{mA}$))
- External Capacitor for Noise Bypass
- ON/OFF Control Function
- Over Current Limit
- Thermal Shutdown
- Bipolar Technology
- Package Outline SOT-89(5pin), VSP8

■ PIN CONFIGURATION



NJM2370U

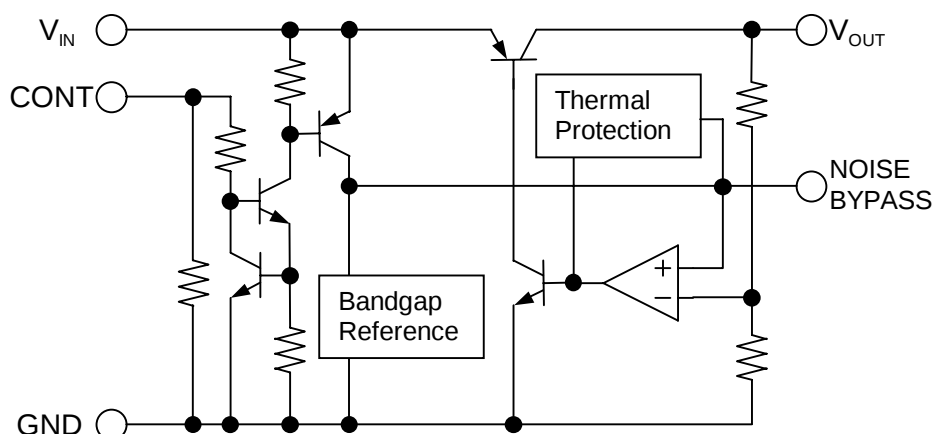
PIN FUNCTION
 1. CONTROL
 2. GND
 3. NOISE BYPASS
 4. V_{OUT}
 5. V_{IN}



NJM2370R

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

■ EQUIVALENT CIRCUIT



■ ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage	V_{IN}	20	V
Control Voltage	V_{CONT}	20(note 1)	V
Power Dissipation	P_D	(SOT-89) 350 (VSP8) 320	mW
Operating Temperature Range	T_{opr}	-40 ~ +85	°C
Storage Temperature Range	T_{stg}	-40 ~ +125	°C

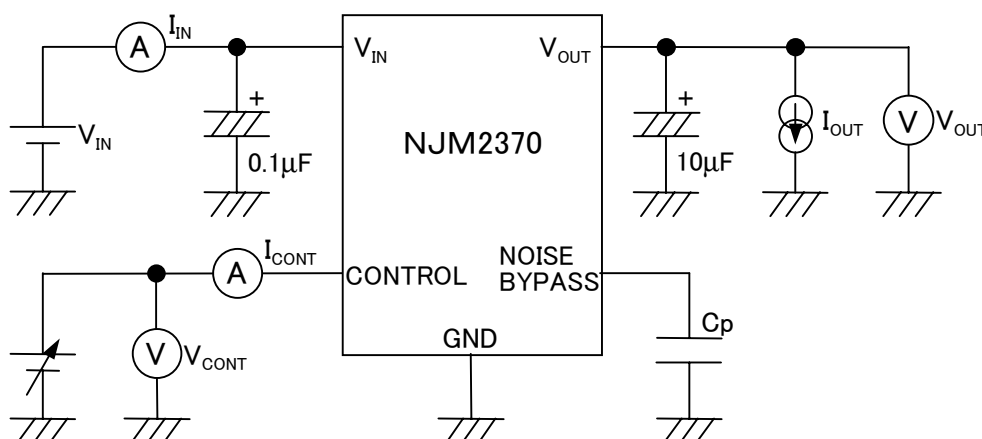
(note 1)When input voltage is less than +20V, the absolute maximum control voltage is equal to the input voltage.

■ ELECTRICAL CHARACTERISTICS (Ta=25°C)

PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_O	$V_{IN}=V_O+1V$, $I_O=30mA$	-3%	-	+3%	V
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	$\Delta V_O/\Delta V_{IN}$	$V_{IN}=(V_O+1V) \sim (V_O+6V)$ $V_O=2V$ to $14V$	-	-	0.12	%/V
		$V_{IN}=(V_O+1V) \sim (V_O+5V)$ $V_O=15V$	-	-	0.12	%/V
Load Regulation	$\Delta V_O/\Delta I_O$	$I_O=0 \sim 60mA$	-	-	0.03	%/mA
Dropout Voltage	ΔV_{I-O}	$I_O=30mA$	-	0.1	0.3	V
Ripple Rejection	$R \bullet R$	$f=400Hz$, $e_{in}=100mVp-p$ $V_{IN}=V_O+1.5V$, $I_O=10mA$	-	60	-	dB
Average Temperature Coefficient of Output Voltage	$\Delta V_O/\Delta T_a$	$T_a=-20 \sim 75^\circ C$, $I_O=10mA$ $V_{IN}=V_O+1.5V$	-	0.2	-	mV/°C
Output Noise Voltage	V_{NO}	$10Hz < f < 80kHz$, $I_O=10mA$, $V_O=3V$	-	30	-	μV_{rms}

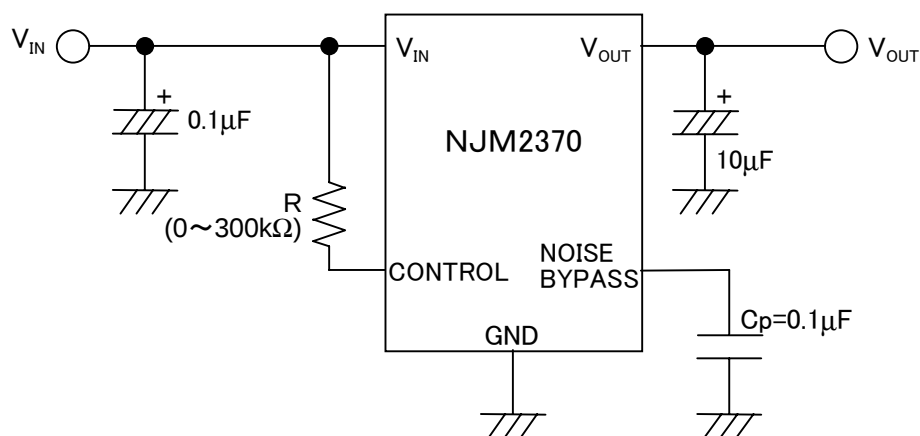
(note 2)Please confirm the specification separately because some parameters depend on output voltage.

■ TEST CIRCUIT



■ TYPICAL APPLICATION

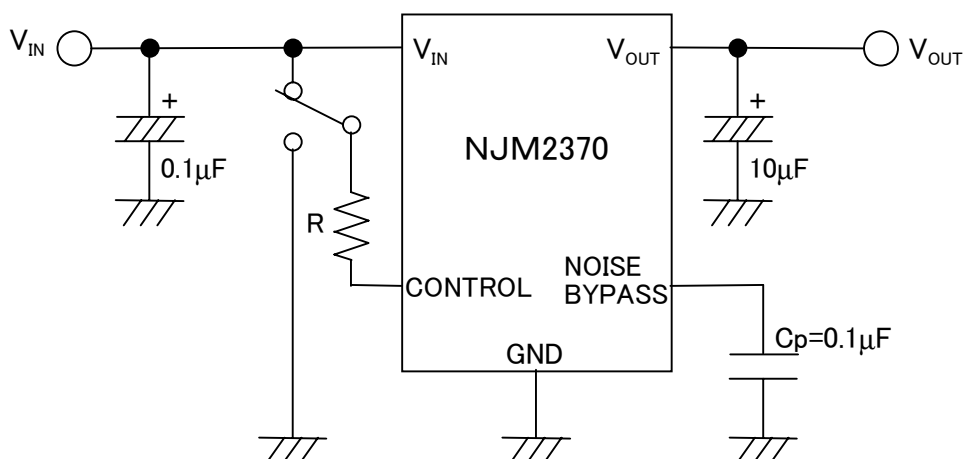
① In Nonuse of ON/OFF Control



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.

② In Use of ON/OFF CONTROL



When the control terminal is “H”, it is ON.

When the control terminal is “L” or “open”, it is OFF.

★Noise bypass Capacitance C_p

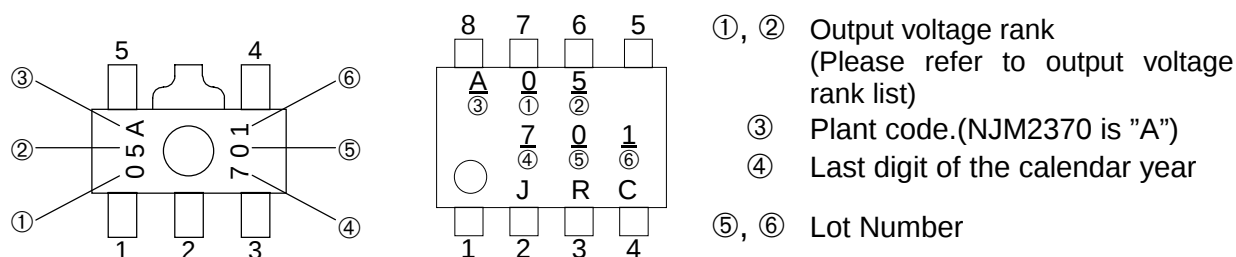
Noise bypass capacitance C_p reduces noise generated by band-gap reference circuit.

Noise level and ripple rejection will be improved when larger C_p is used. Please refer to the typical characteristics to determine the value.

Use of smaller C_p value may induce oscillation.

Please make sure to use C_p value of greater than 0.1μF to avoid the problem.

■ PACKAGE MARKING



■ OUTPUT VOLTAGE RANK LIST

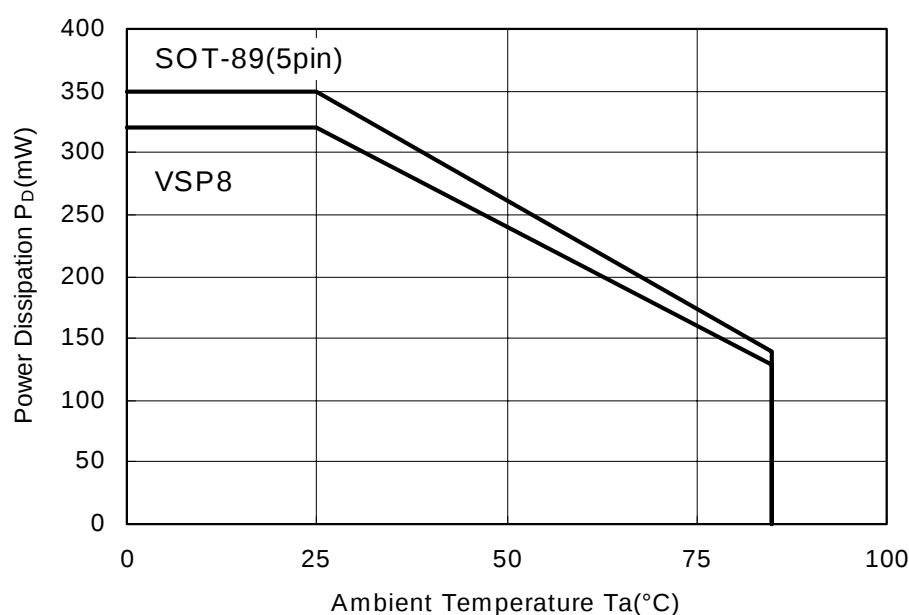
Output Voltage	Part Number	Marking	
		①	②
2.0V	NJM2370X02	0	2
2.1V	NJM2370X21	2	1
2.2V	NJM2370X22	2	2
2.3V	NJM2370X23	2	3
2.4V	NJM2370X24	2	4
2.5V	NJM2370X25	2	5
2.6V	NJM2370X26	2	6
2.7V	NJM2370X27	2	7
2.8V	NJM2370X28	2	8
2.9V	NJM2370X29	2	9
3.0V	NJM2370X03	0	3
3.1V	NJM2370X31	3	1
3.2V	NJM2370X32	3	2
3.3V	NJM2370X33	3	3
3.5V	NJM2370X35	3	5

Output Voltage	Part Number	Marking	
		①	②
3.6V	NJM2370X36	3	6
3.7V	NJM2370X37	3	7
3.8V	NJM2370X38	3	8
3.9V	NJM2370X39	3	9
4.0V	NJM2370X04	0	4
4.7V	NJM2370X47	4	7
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
13.0V	NJM2370X13	1	3
15.0V	NJM2370X15	1	5

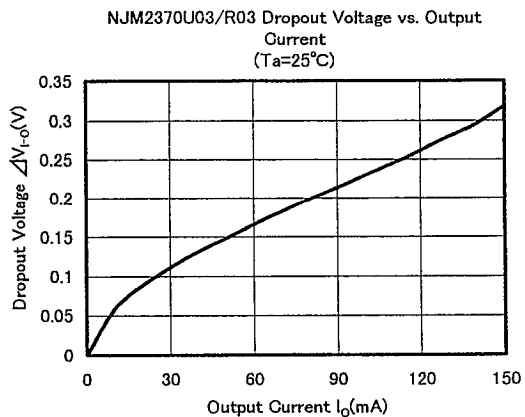
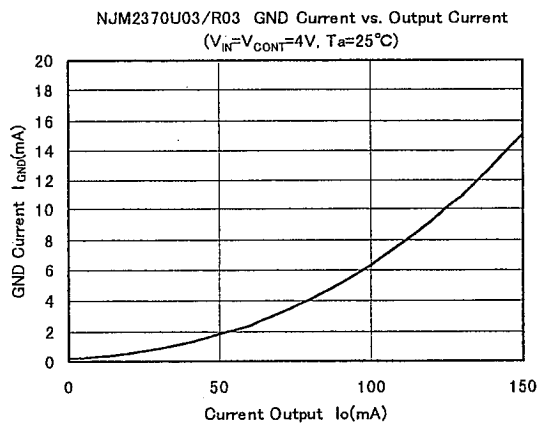
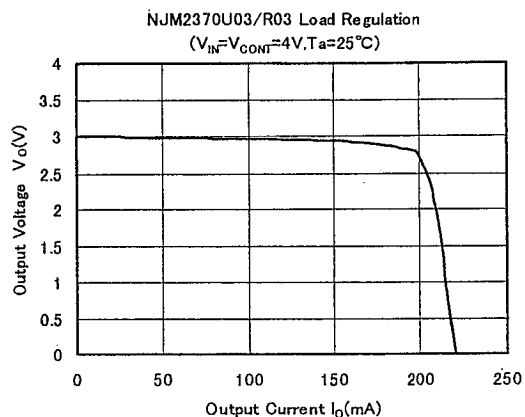
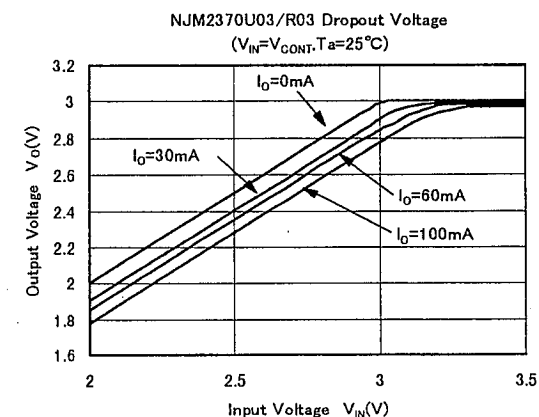
(★1):SOT-89(5pin) ONLY

(★2):VSP8 ONLY

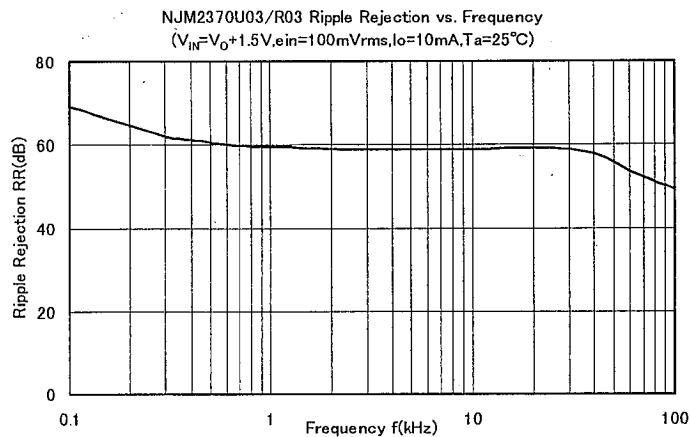
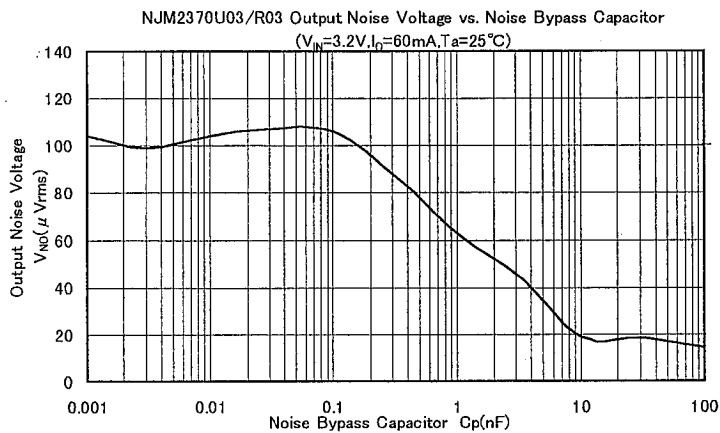
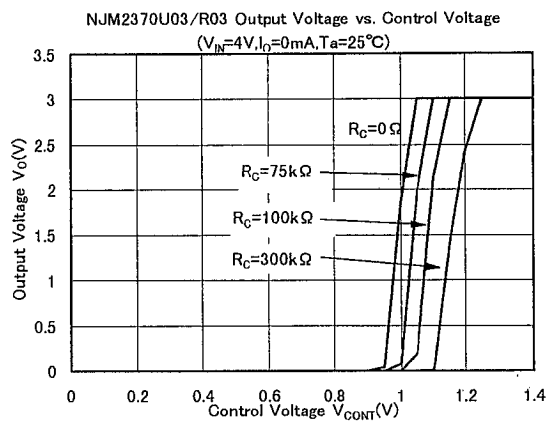
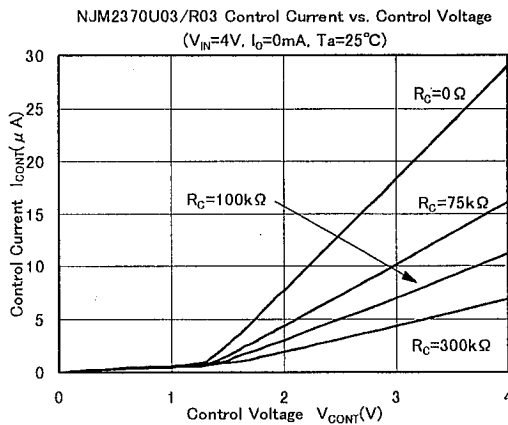
■ POWER DISSIPATION VS. AMBIENT TEMPERATURE



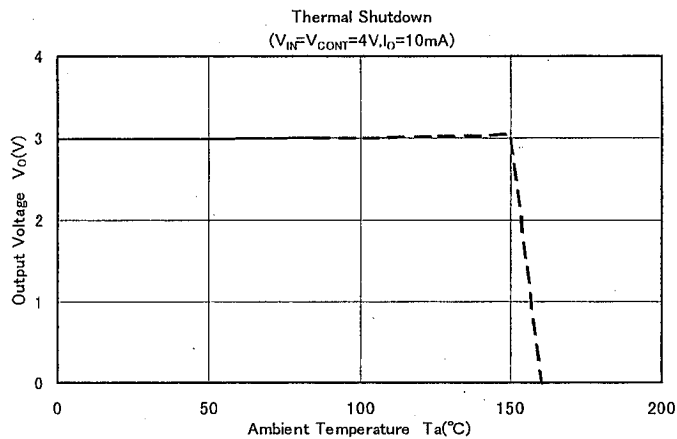
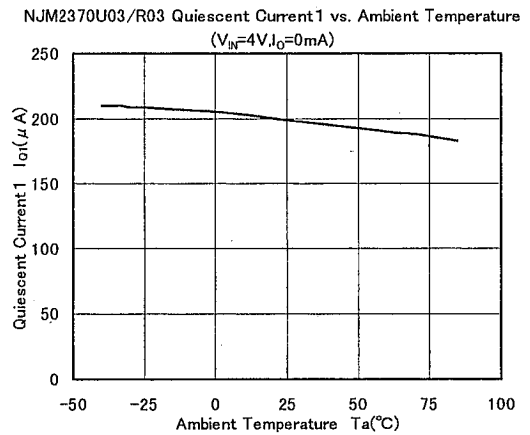
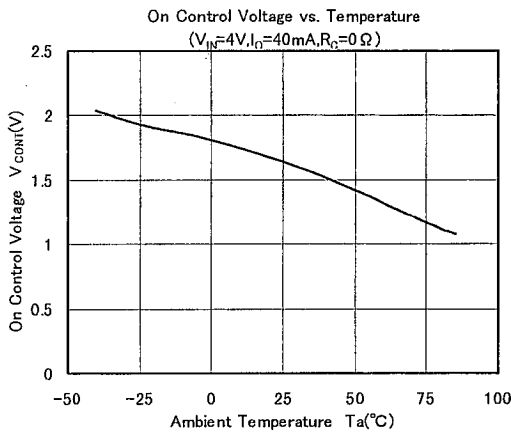
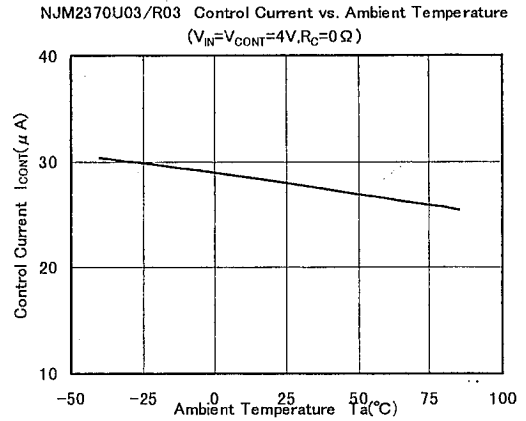
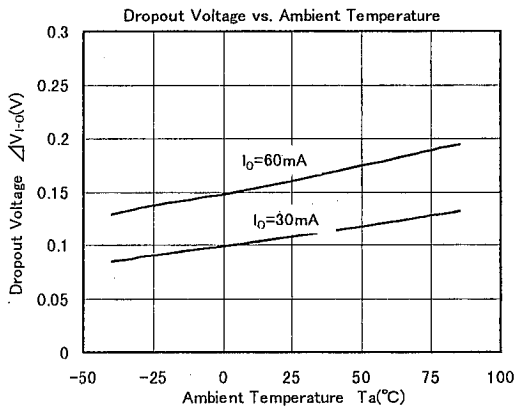
TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS



MEMO

[CAUTION]

The specifications on this databook are only given for information , without any guarantee as regards either mistakes or omissions. The application circuits in this databook are described only to show representative usages of the product and not intended for the guarantee or permission of any right including the industrial rights.