

## Ultra Low Noise Low Dropout Voltage Regulator

### ■ GENERAL DESCRIPTION

The NJM2863/64 is a 2ch low dropout voltage regulator designed for VCO Applications.

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

### ■ PACKAGE OUTLINE

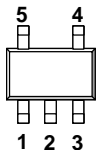


NJM2863F/64F

### ■ FEATURES

- High Ripple Rejection      75dB typ. (f=1kHz)
- Output capacitor with 1.0 $\mu$ F ceramic capacitor
- Output Noise Voltage       $V_{no}=19\mu V_{rms}$  typ. ( $C_p=0.01\mu F$ ,  $C_o=1.0\mu F$ (Ceramic))  
 $V_{no}=12\mu V_{rms}$  typ. ( $C_p=0.1\mu F$ ,  $C_o=10\mu F$ (Tantalum))
- 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              MTP5

### ■ PIN CONFIGURATION



#### PIN FUNCTION

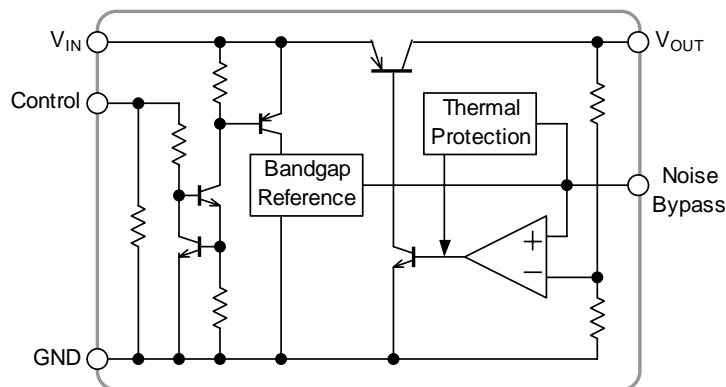
- 1.CONTROL
- 2.GND
- 3.NOISE BYPASS
- 4.V<sub>OUT</sub>
- 5.V<sub>IN</sub>

NJM2863F

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- 5.V<sub>OUT</sub>

NJM2864F

### ■ EQUIVALENT CIRCUIT



### ■ OUTPUT VOLTAGE RANK LIST

Device Name	V <sub>OUT</sub>	Device Name	V <sub>OUT</sub>
NJM286×F21	2.1V	NJM286×F29	2.9V
NJM286×F25	2.5V	NJM286×F03	3.0V
NJM286×F27	2.7V	NJM286×F33	3.3V
NJM286×F28	2.8V	NJM286×F05	5.0V
NJM286×F285	2.85V		

# NJM2863/64

## ■ ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage	V <sub>IN</sub>	+14	V
Control Voltage	V <sub>CONT</sub>	+14(*note 1)	V
Power Dissipation	P <sub>D</sub>	200	mW
Operating Temperature	Topr	-40 ~ +85	°C
Storage Temperature	Tstg	-40 ~ +125	°C

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

## ■ ELECTRICAL CHARACTERISTICS

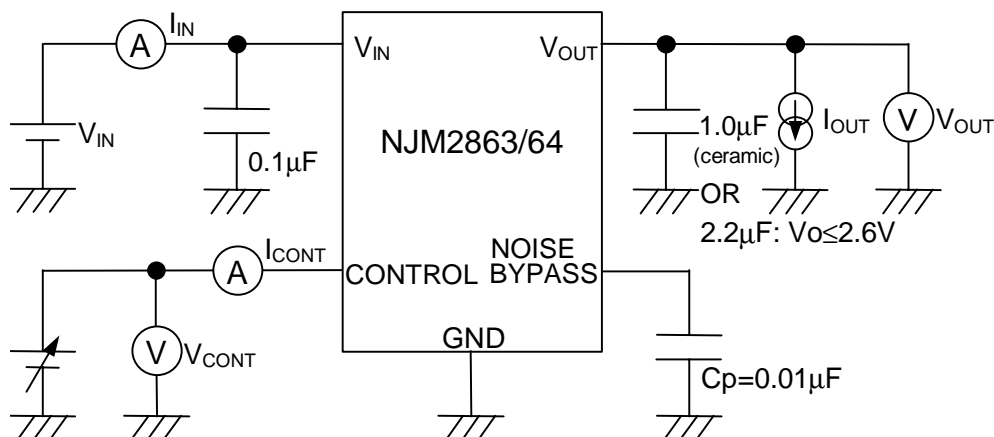
(V<sub>IN</sub>=V<sub>o</sub>+1V, C<sub>IN</sub>=0.1μF, C<sub>o</sub>=1.0μF: V<sub>o</sub>≥2.7V (C<sub>o</sub>=2.2μF: V<sub>o</sub>≤2.6V), C<sub>p</sub>=0.01μF, Ta=25°C)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Voltage	V <sub>o</sub>	I <sub>o</sub> =30mA	-1.0%	—	+1.0%	V
Quiescent Current	I <sub>Q</sub>	I <sub>o</sub> =0mA, except I <sub>cont</sub>	—	120	180	μA
Quiescent Current at Control OFF	I <sub>Q(OFF)</sub>	V <sub>CONT</sub> =0V	—	—	100	nA
Output Current	I <sub>o</sub>	V <sub>o</sub> =0.3V	100	130	—	mA
Line Regulation	ΔV <sub>o</sub> /ΔV <sub>IN</sub>	V <sub>IN</sub> =V <sub>o</sub> +1V ~ V <sub>o</sub> +6V, I <sub>o</sub> =30mA	—	—	0.10	%/V
Load Regulation	ΔV <sub>o</sub> /ΔI <sub>o</sub>	I <sub>o</sub> =0 ~ 100mA	—	—	0.03	%/mA
Dropout Voltage	ΔV <sub>L-O</sub>	I <sub>o</sub> =60mA	—	0.10	0.18	V
Ripple Rejection	RR	e <sub>in</sub> =200mVrms, f=1kHz, I <sub>o</sub> =10mA, V <sub>o</sub> =3V Version	—	75	—	dB
Average Temperature Coefficient of Output Voltage	ΔV <sub>o</sub> /ΔTa	Ta=0-85°C, I <sub>o</sub> =10mA	—	± 50	—	ppm/°C
Output Noise Voltage1	V <sub>NO1</sub>	f=10Hz-80kHz, I <sub>o</sub> =10mA, C <sub>p</sub> =0.01μF, C <sub>o</sub> =1.0μF (Ceramic), V <sub>o</sub> =3V Version	—	19	—	μVrms
Output Noise Voltage2	V <sub>NO2</sub>	f=10Hz-80kHz, I <sub>o</sub> =10mA, C <sub>p</sub> =0.1μF, C <sub>o</sub> =10μF (Tantalum), V <sub>o</sub> =3V Version	—	12	—	μVrms
Control Voltage for ON-state	V <sub>CONT(ON)</sub>		1.6	—	—	V
Control Voltage for OFF-state	V <sub>CONT(OFF)</sub>		—	—	0.6	V

(\*note 2): The above specification is a common specification for all output voltages.

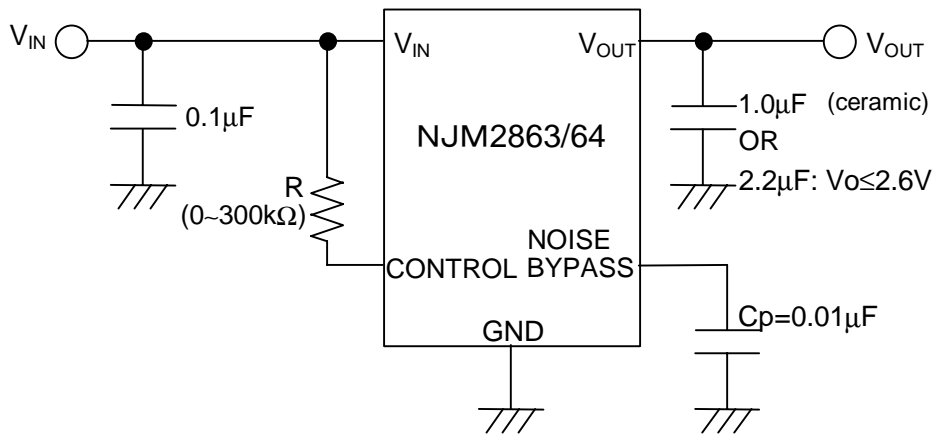
Therefore, it may be different from the individual specification for a specific output voltage.

## ■ TEST CIRCUIT



## ■ TYPICAL APPLICATION

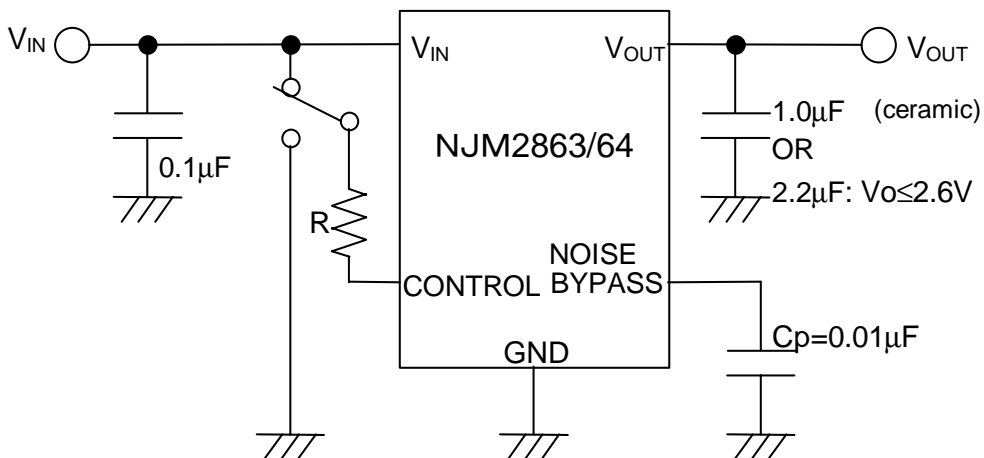
① In the case where ON/OFF Control is not required:



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.

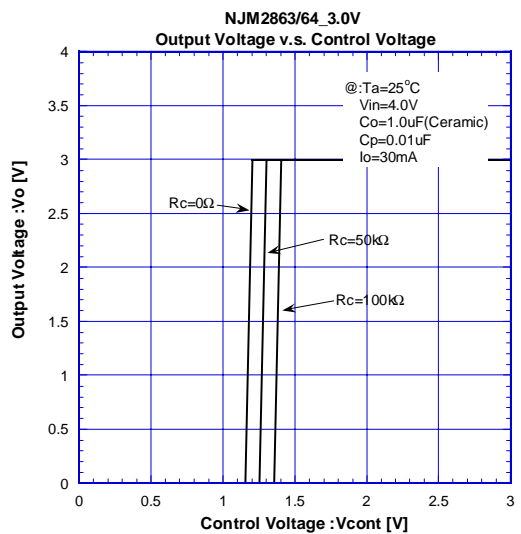
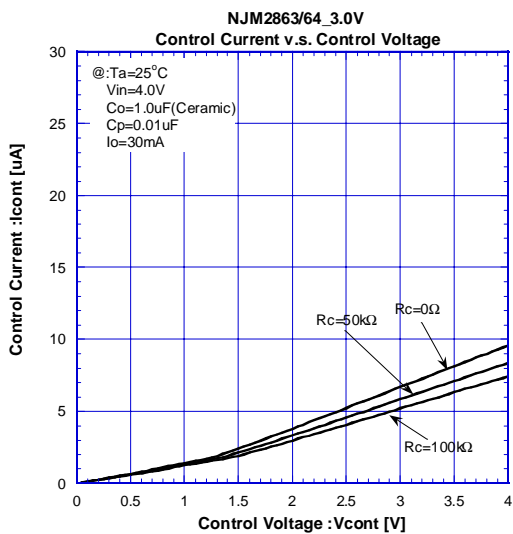
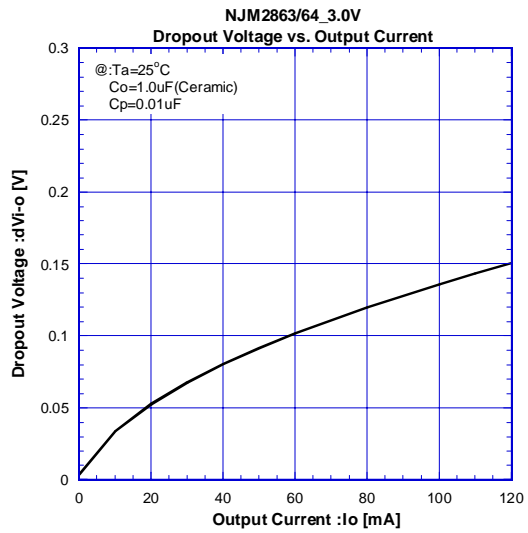
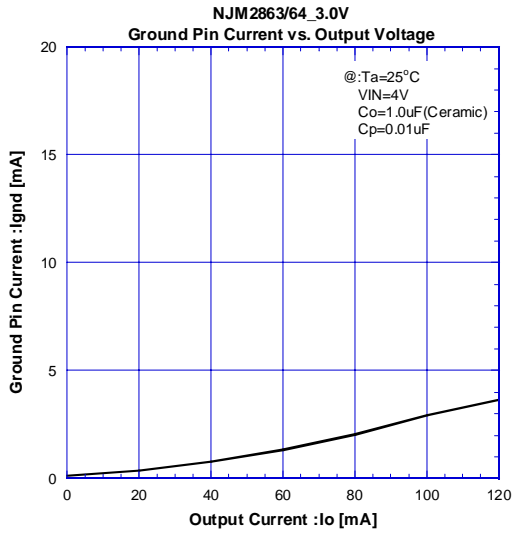
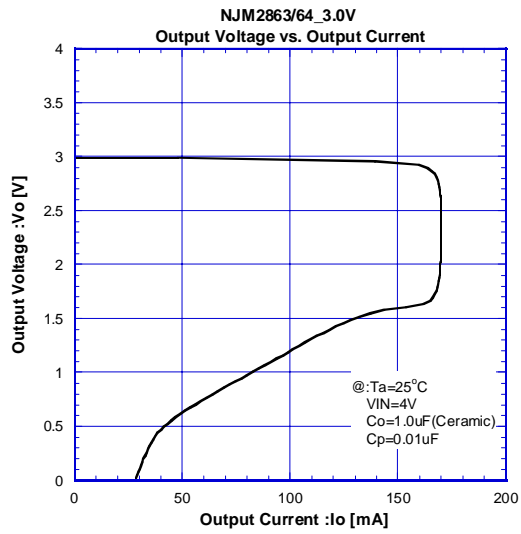
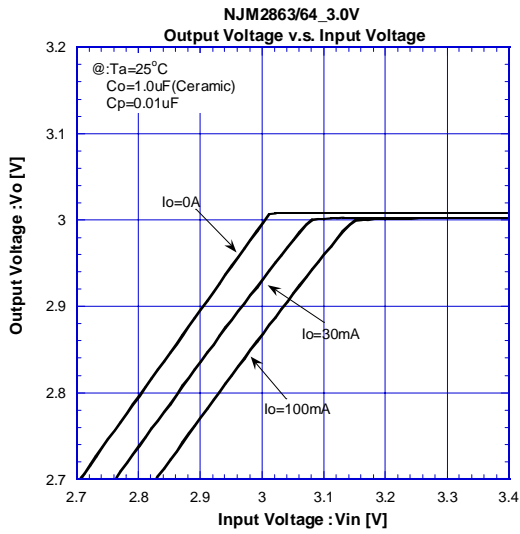
Noise level and ripple rejection will be improved when larger  $C_p$  is used.

Use of smaller  $C_p$  value may cause oscillation.

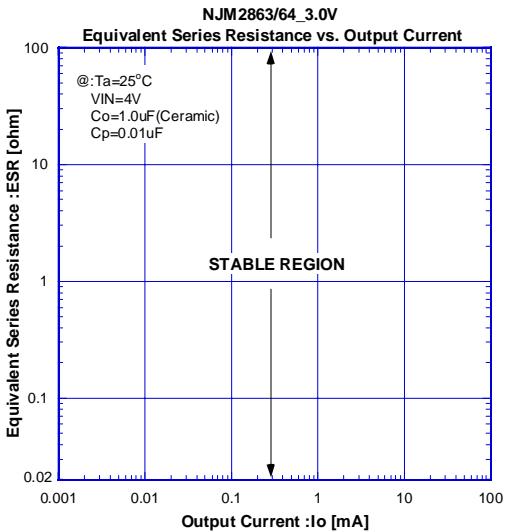
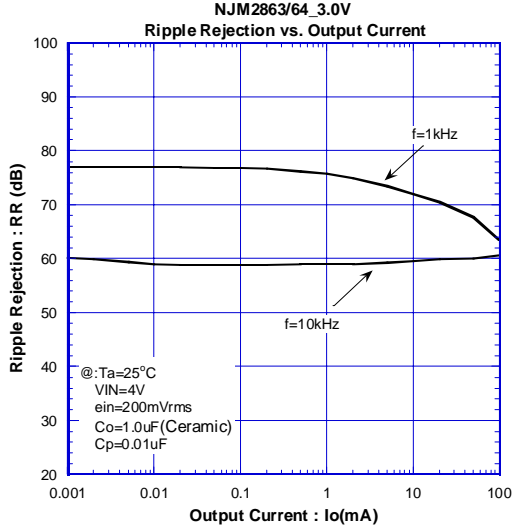
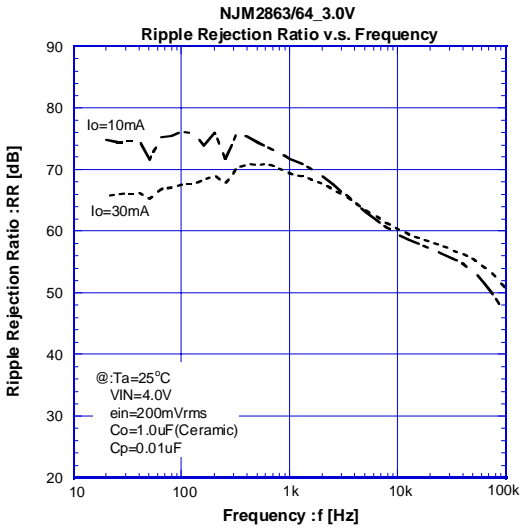
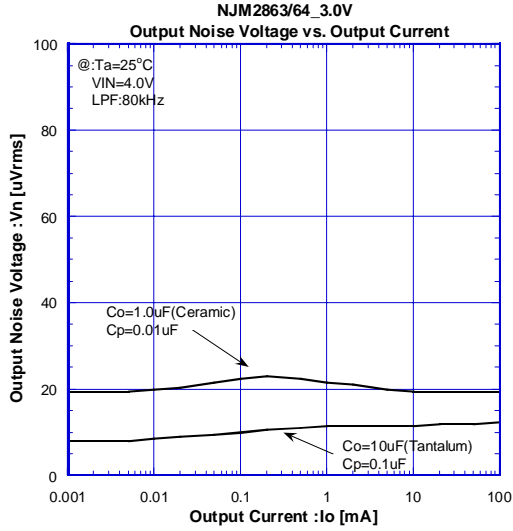
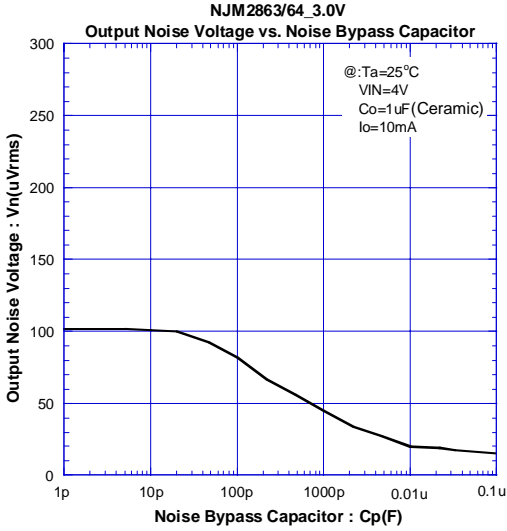
Use the  $C_p$  value of  $0.01\mu\text{F}$  greater to avoid the problem.

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## ELECTRICAL CHARACTERISTICS

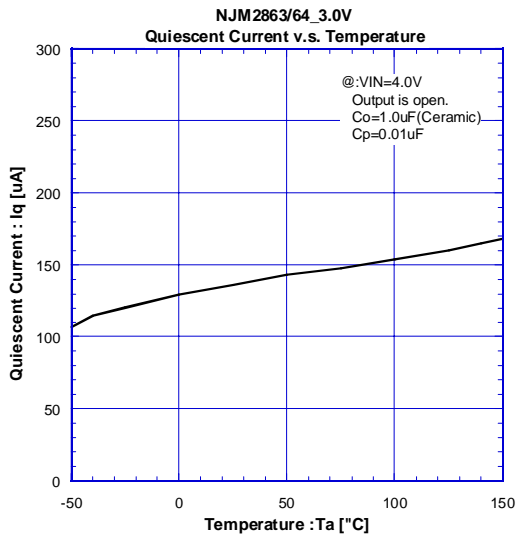
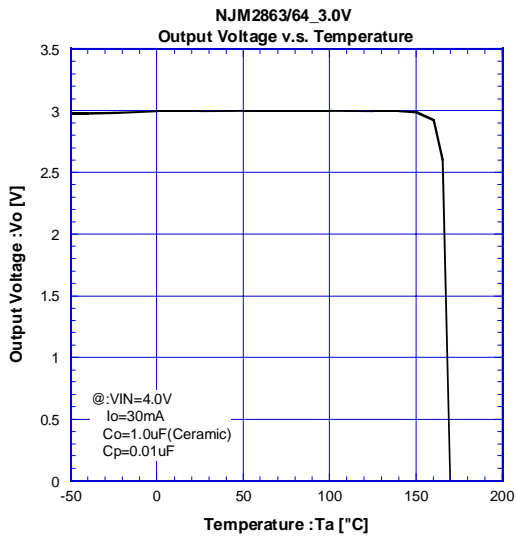
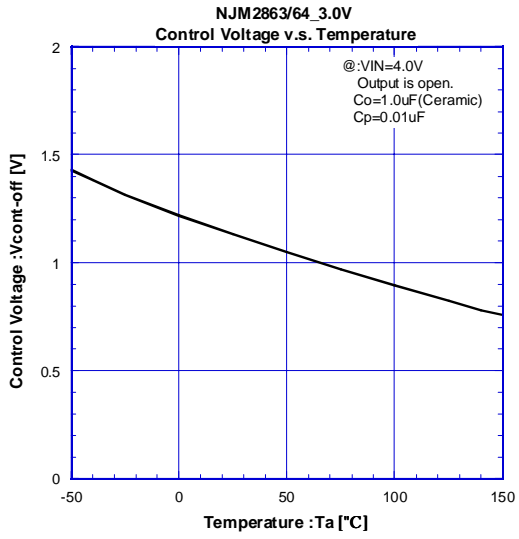
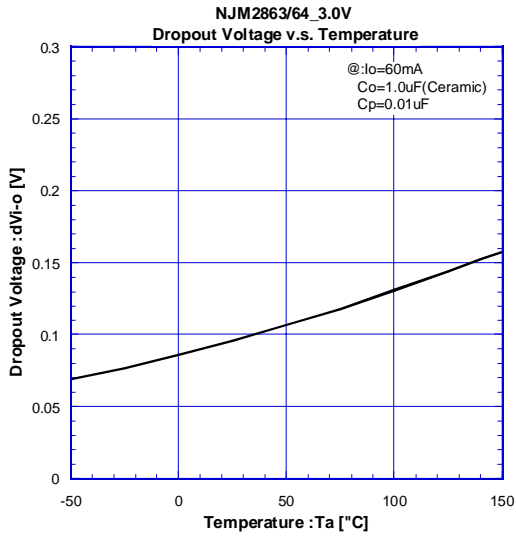


## ■ ELECTRICAL CHARACTERISTICS



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## ■ ELECTRICAL CHARACTERISTICS



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