

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

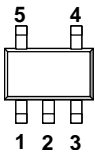


NJM2863F/64F

■ FEATURES

- High Ripple Rejection 75dB typ. (f=1kHz)
- Output capacitor with 1.0 μ 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

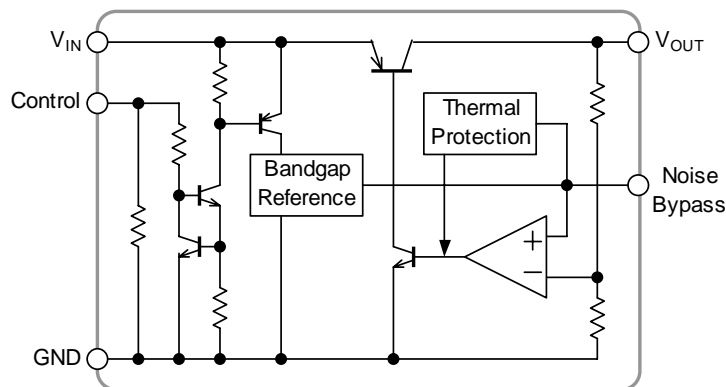
- 1.CONTROL
- 2.GND
- 3.NOISE BYPASS
- 4.V_{OUT}
- 5.V_{IN}

NJM2863F

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

NJM2864F

■ EQUIVALENT CIRCUIT



■ OUTPUT VOLTAGE RANK LIST

| Device Name | V _{OUT} | Device Name | V _{OUT} |
|-------------|------------------|-------------|------------------|
| 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 _{IN} | +14 | V |
| Control Voltage | V _{CONT} | +14(*note 1) | V |
| Power Dissipation | P _D | 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

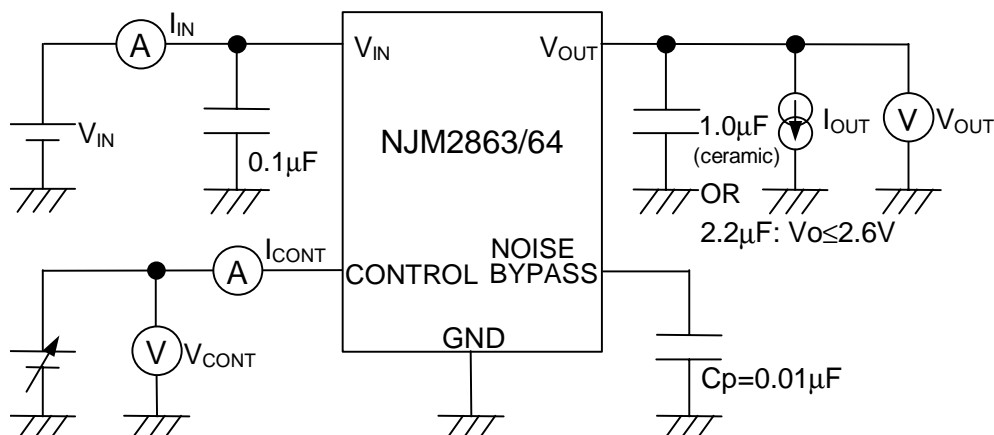
(V_{IN}=V_o+1V, C_{IN}=0.1μF, C_o=1.0μF: V_o≥2.7V (C_o=2.2μF: V_o≤2.6V), C_p=0.01μF, Ta=25°C)

| 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, except 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 | ΔV _o /ΔV _{IN} | V _{IN} =V _o +1V ~ V _o +6V, I _o =30mA | — | — | 0.10 | %/V |
| Load Regulation | ΔV _o /ΔI _o | I _o =0 ~ 100mA | — | — | 0.03 | %/mA |
| Dropout Voltage | ΔV _{L-O} | I _o =60mA | — | 0.10 | 0.18 | V |
| Ripple Rejection | RR | e _{in} =200mVrms, f=1kHz, I _o =10mA, V _o =3V Version | — | 75 | — | dB |
| Average Temperature Coefficient of Output Voltage | ΔV _o /ΔTa | Ta=0-85°C, I _o =10mA | — | ± 50 | — | ppm/°C |
| Output Noise Voltage1 | V _{NO1} | f=10Hz-80kHz, I _o =10mA, C _p =0.01μF, C _o =1.0μF (Ceramic), V _o =3V Version | — | 19 | — | μVrms |
| Output Noise Voltage2 | V _{NO2} | f=10Hz-80kHz, I _o =10mA, C _p =0.1μF, C _o =10μF (Tantalum), V _o =3V Version | — | 12 | — | μVrms |
| 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.

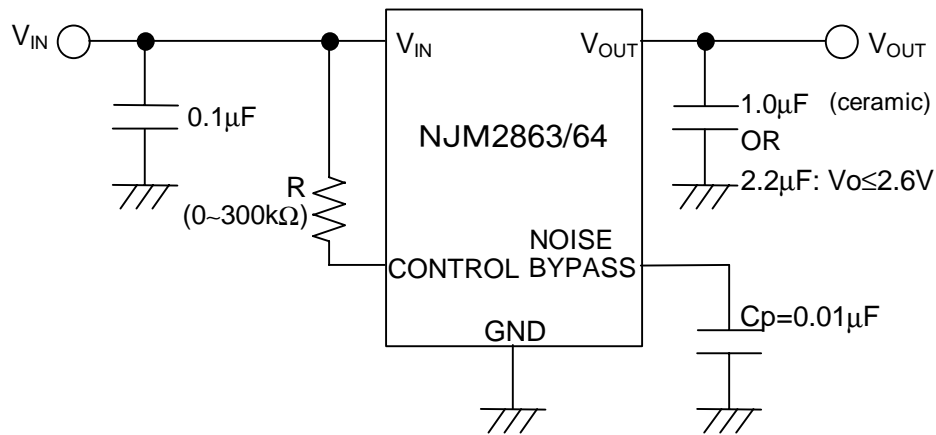
Therefore, it may be different from the individual specification for a specific output voltage.

■ TEST CIRCUIT



■ TYPICAL APPLICATION

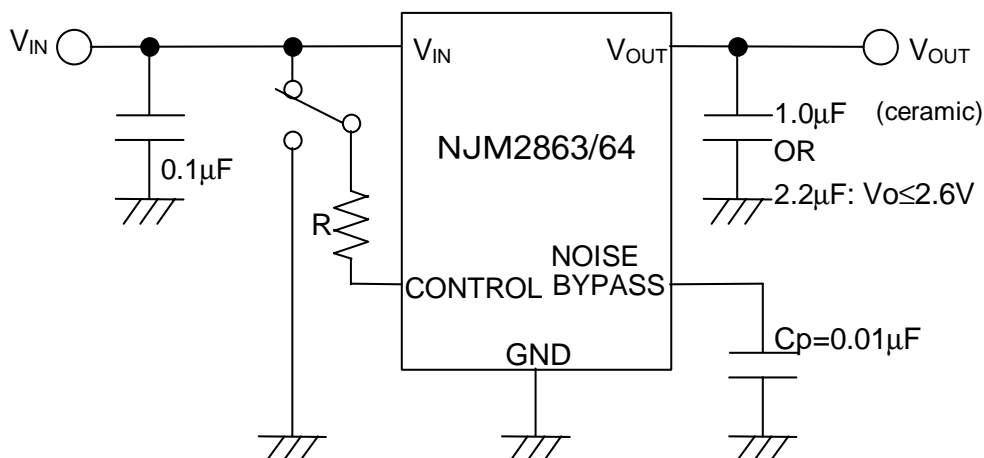
① In the case where ON/OFF Control is not required:



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.

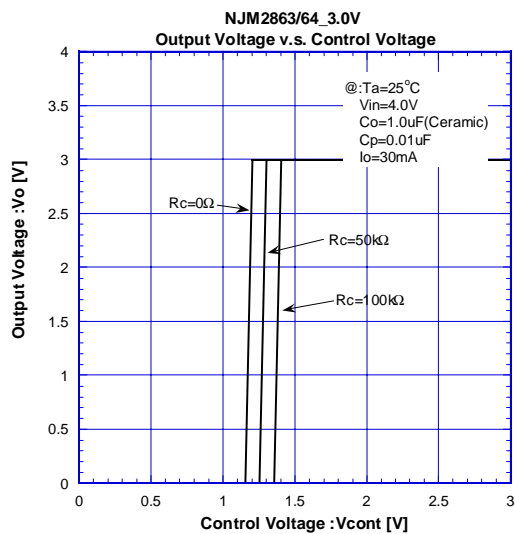
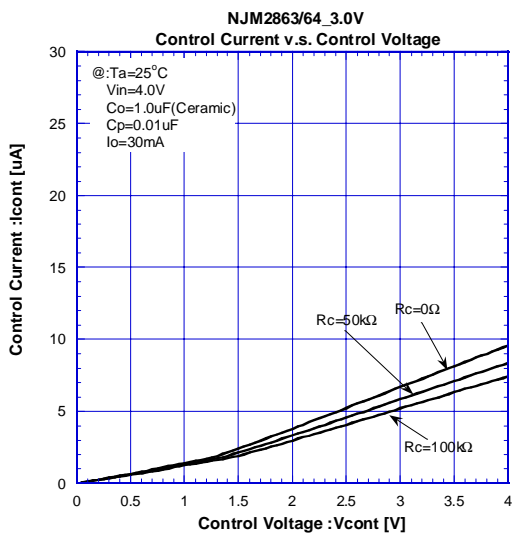
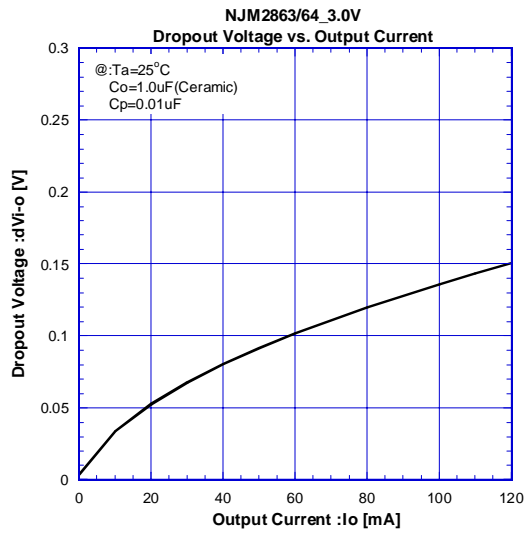
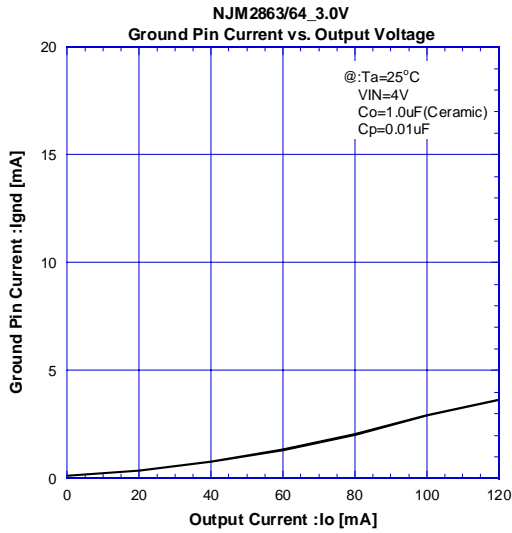
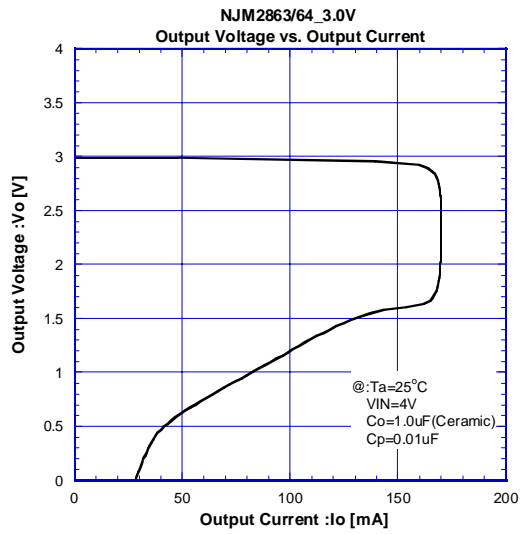
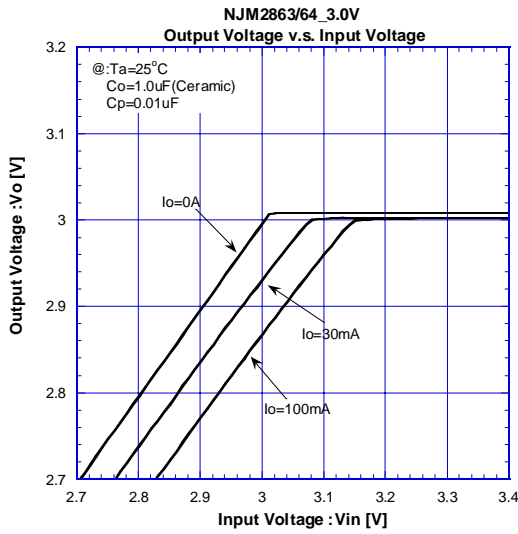
Noise level and ripple rejection will be improved when larger C_p is used.

Use of smaller C_p value may cause oscillation.

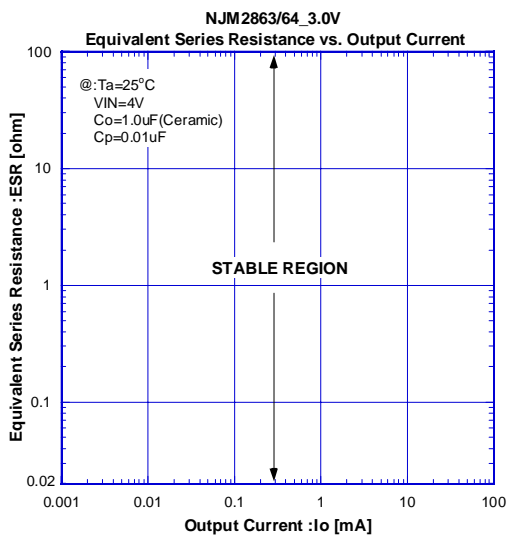
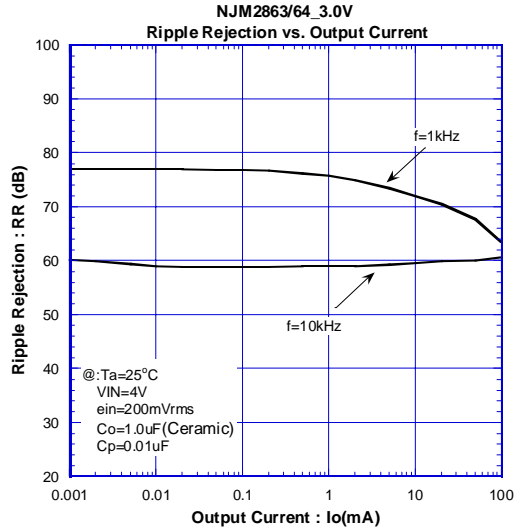
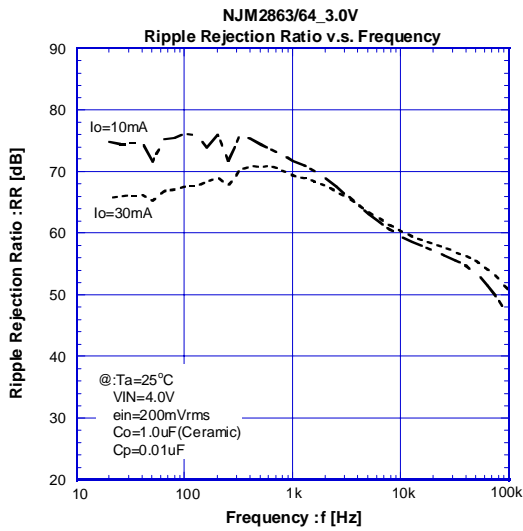
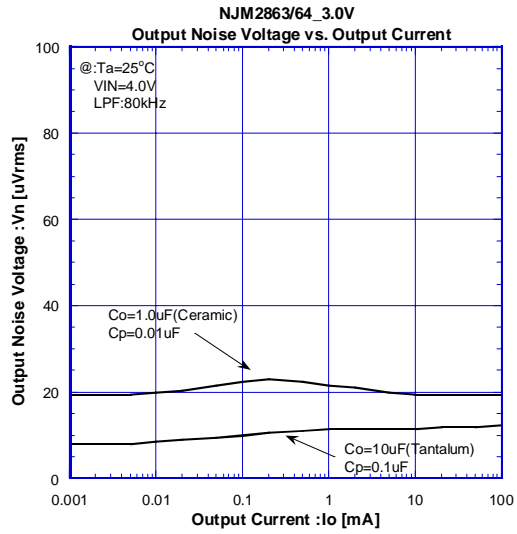
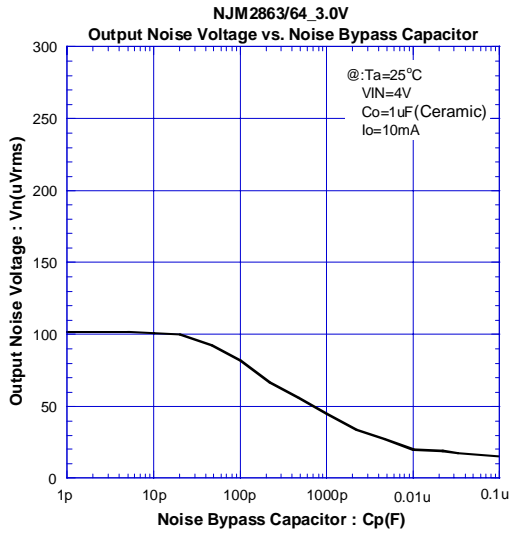
Use the C_p value of $0.01\mu\text{F}$ greater to avoid the problem.

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ELECTRICAL CHARACTERISTICS

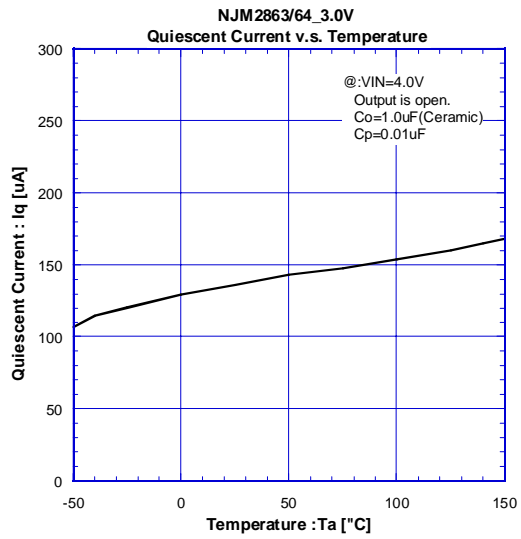
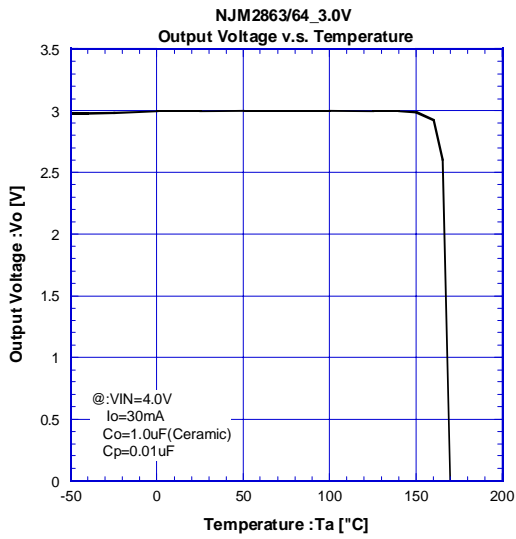
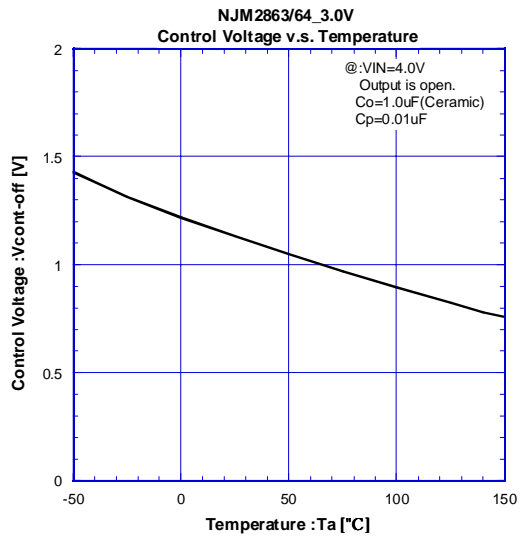
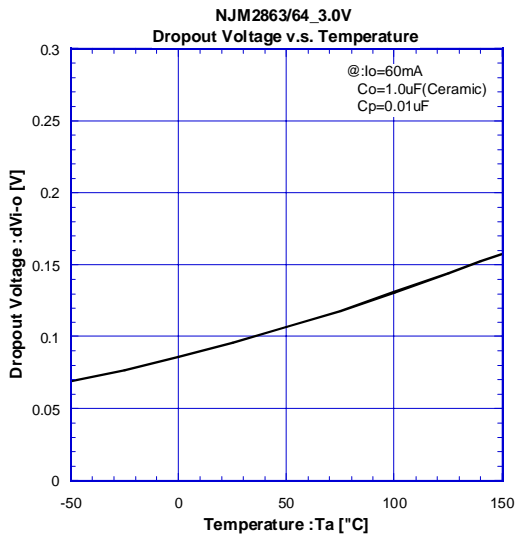


■ ELECTRICAL CHARACTERISTICS



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■ ELECTRICAL CHARACTERISTICS



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