

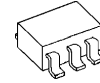
Ultra Low Noise Low Dropout Voltage Regulator

■ GENERAL DESCRIPTION

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

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

■ PACKAGE OUTLINE

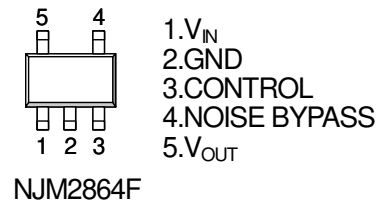
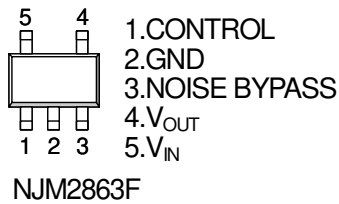


NJM2863F/64F

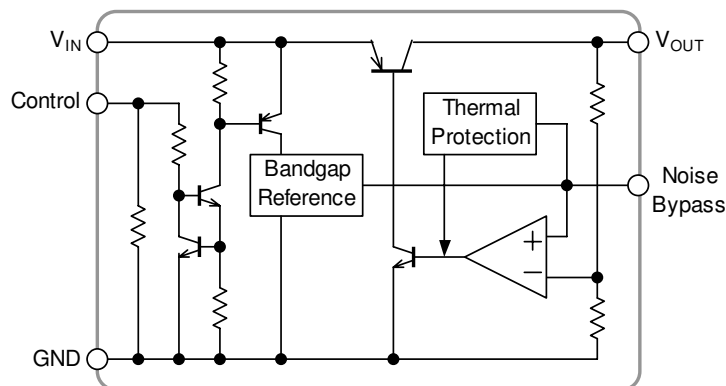
■ FEATURES

- High Ripple Rejection 75dB typ. (f=1kHz, Vo=3V Version)
- Output capacitor with 1.0μF ceramic capacitor
- Output Noise Voltage Vno=19μVrms typ. (Cp=0.01μF, Co=1.0μF(Ceramic))
Vno=12μVrms typ. (Cp=0.1μF, Co=10μF(Tantalum))
- Output Current Io(max.)=100mA
- High Precision Output Vo±1.0%
- Low Dropout Voltage 0.10V typ. (Io=60mA)
- ON/OFF Control (Active High)
- Internal Short Circuit Current Limit
- Internal Thermal Overload Protection
- Bipolar Technology
- Package Outline SOT-23-5

■ PIN CONFIGURATION



■ EQUIVALENT CIRCUIT



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■ 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		

■ ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage	V _{IN}	+14	V
Control Voltage	V _{CONT}	+14(*1)	V
Power Dissipation	P _D	SOT-23-5 350(*2) 200(*3)	mW
Operating Temperature	T _{opr}	-40 ~ +85	°C
Storage Temperature	T _{stg}	-40 ~ +125	°C

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

(*2): Mounted on glass epoxy board based on EIA/JEDEC. (114.3x76.2x1.6mm: 2Layers)

(*3): Device itself.

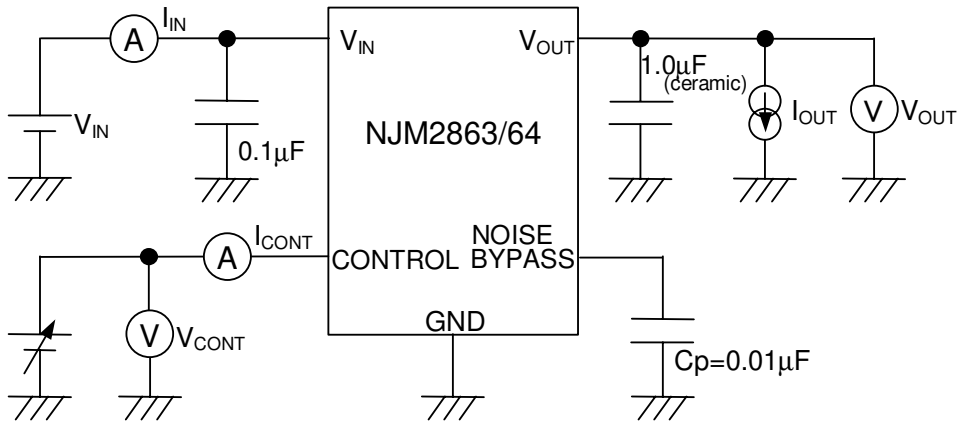
■ ELECTRICAL CHARACTERISTICS (V_{IN}=V_o+1V, C_{IN}=0.1μF, C_o=1.0μF, C_p=0.01μF, Ta=25°C)

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 _{I-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

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.

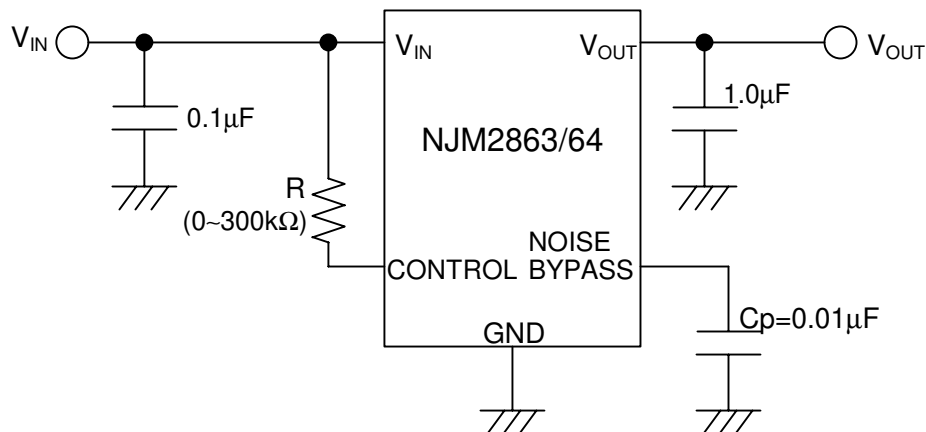
■ TEST CIRCUIT



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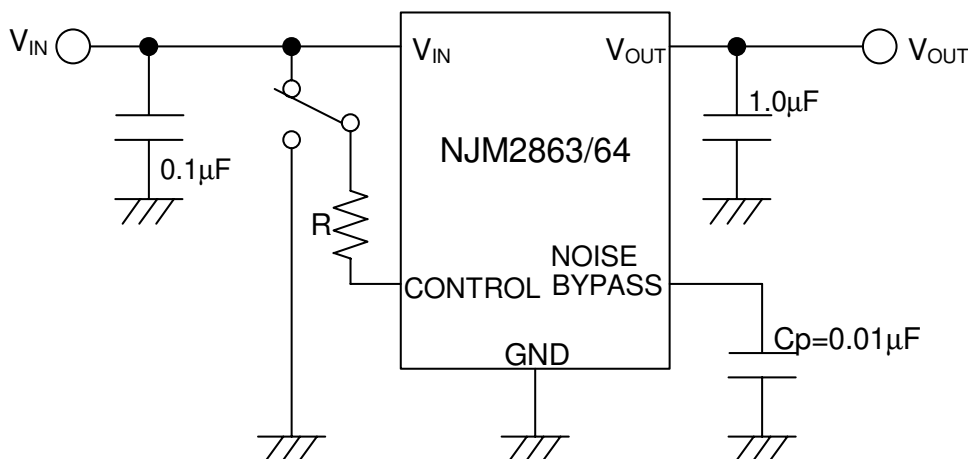
■ TYPICAL APPLICATION

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



Connect control terminal to V_{IN} terminal

② In use of ON/OFF CONTROL:



State of control terminal:

- "H" → output is enabled.
- "L" or "open" → output is disabled.

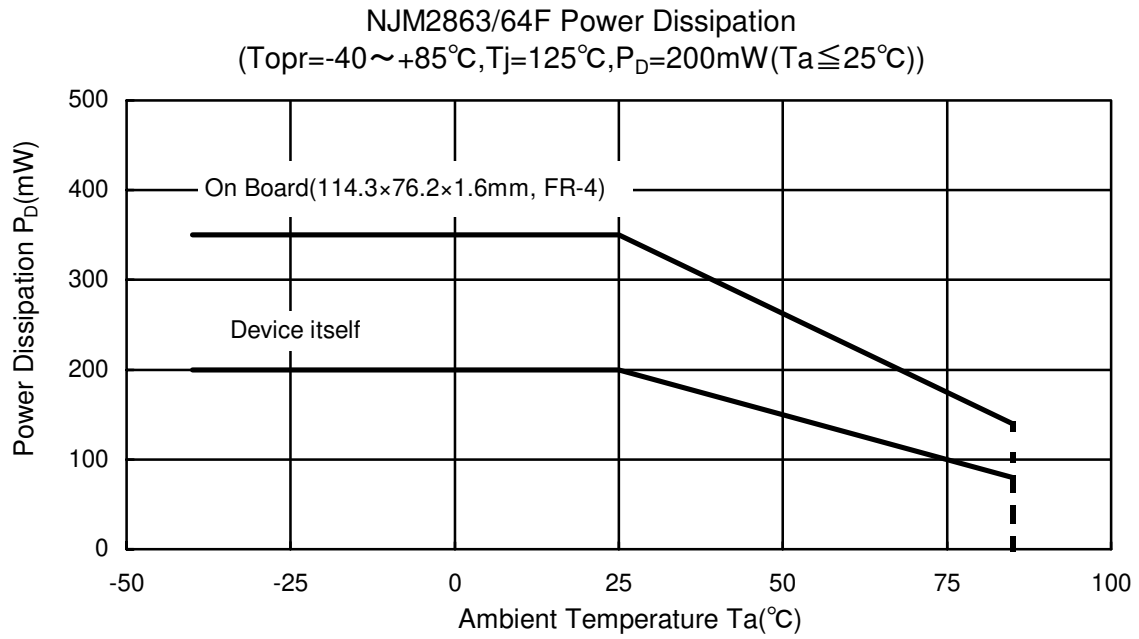
*Noise bypass Capacitance C_p

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.

*In the case of using a resistance "R" between V_{IN} and control.

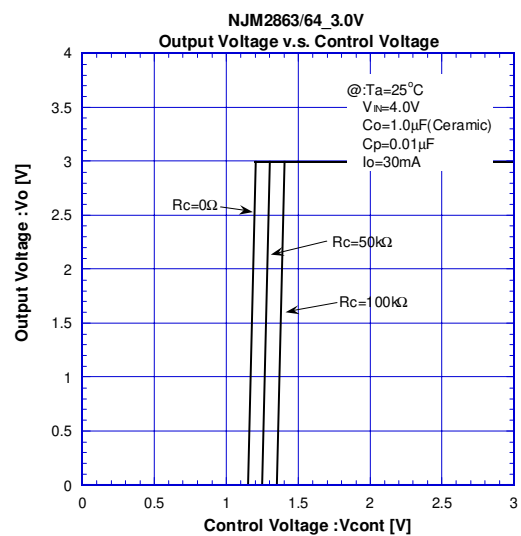
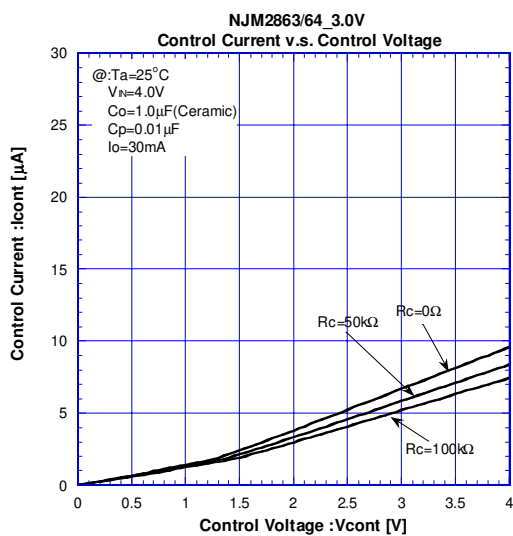
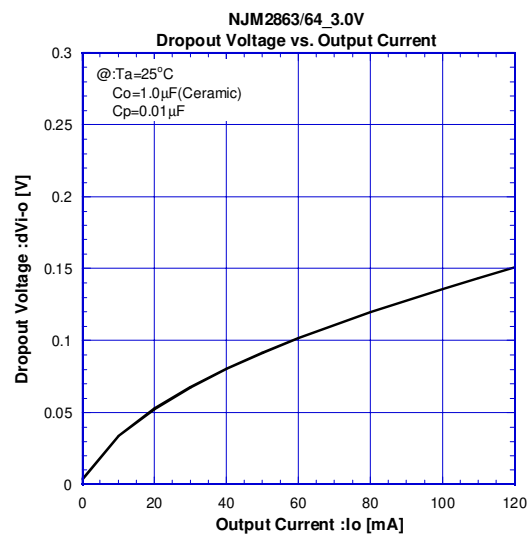
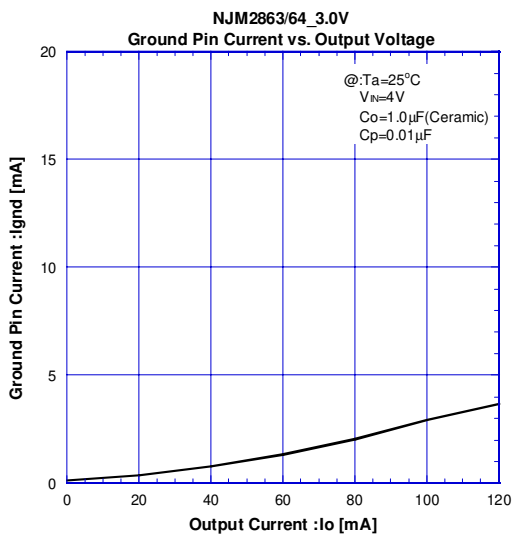
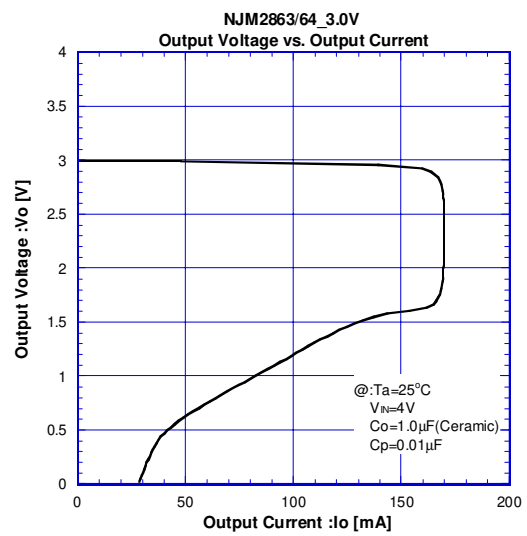
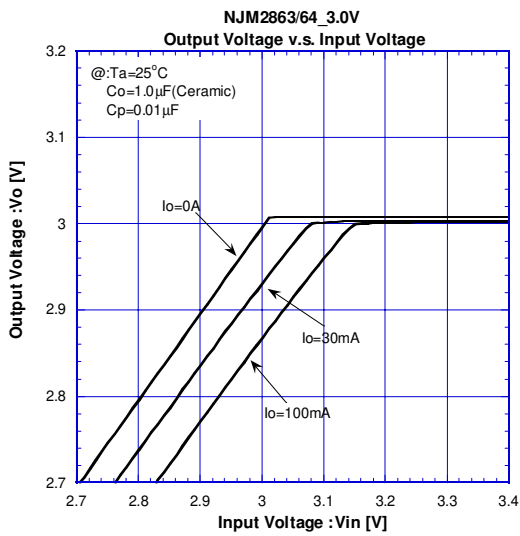
The current flow into the control terminal while the IC is ON state (I_{CONT}) can be reduced when a pull up resistance "R" is inserted between V_{IN} and the control terminal. The minimum control voltage for ON state ($V_{CONT(ON)}$) is increased due to the voltage drop caused by I_{CONT} and the resistance "R". The I_{CONT} is temperature dependence as shown in the "Control Current vs. Temperature" characteristics. Therefore, the resistance "R" should be carefully selected to ensure the control voltage exceeds the $V_{CONT(ON)}$ over the required temperature range.

POWER DISSIPATION vs. AMBIENT TEMPERATURE

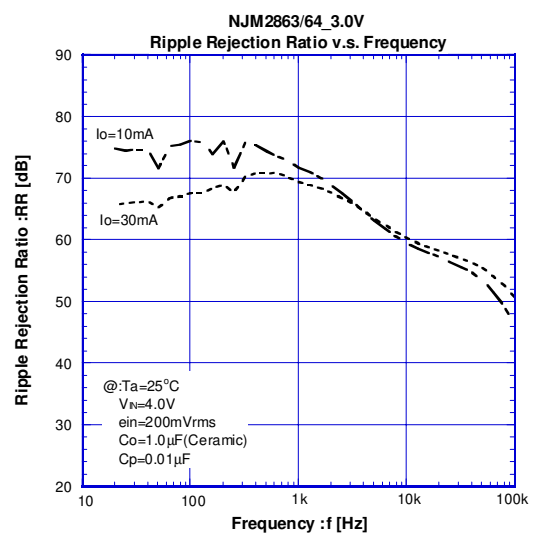
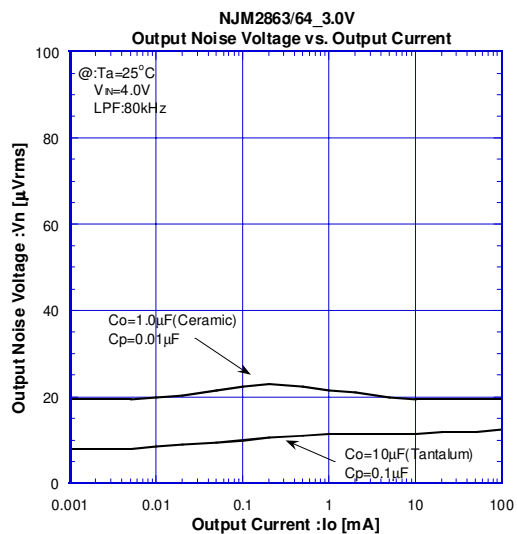
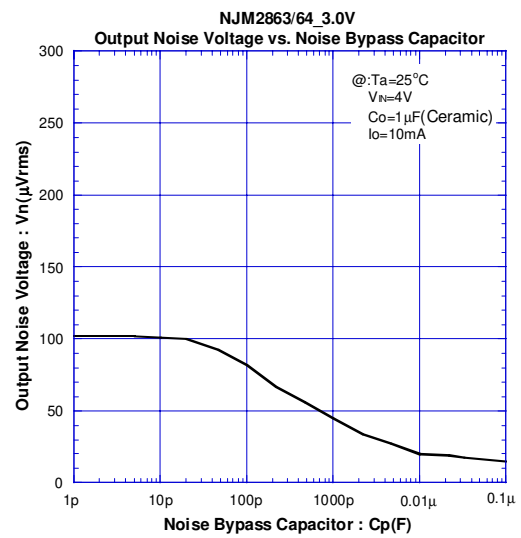
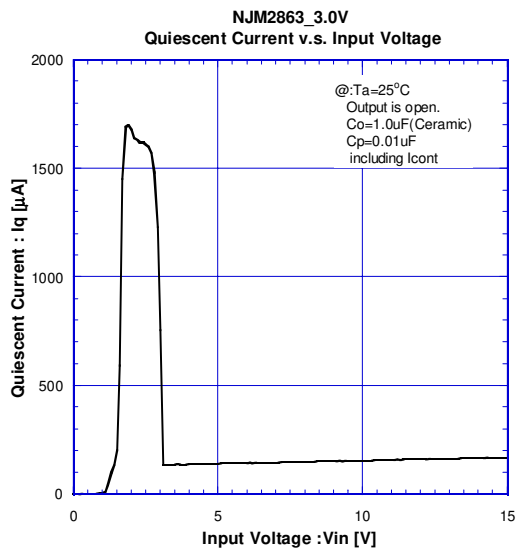
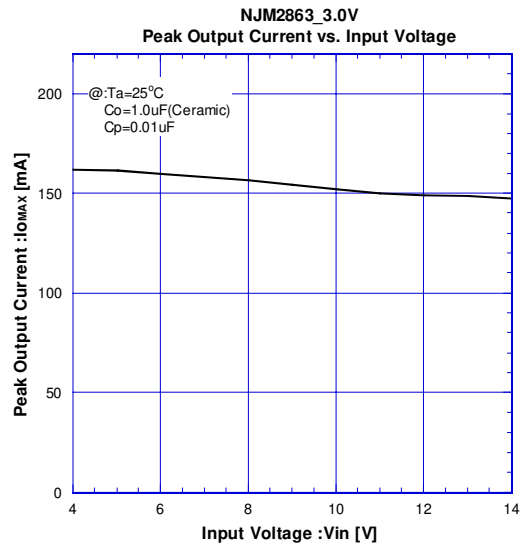
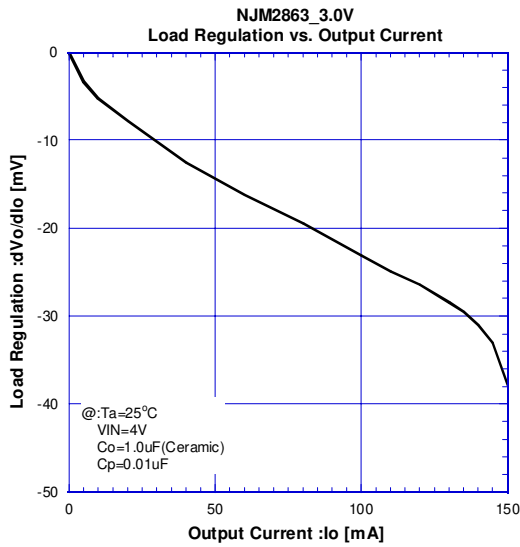


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■ ELECTRICAL CHARACTERISTICS

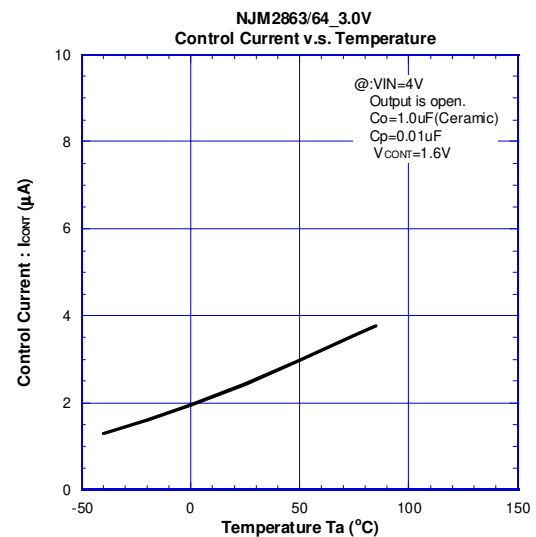
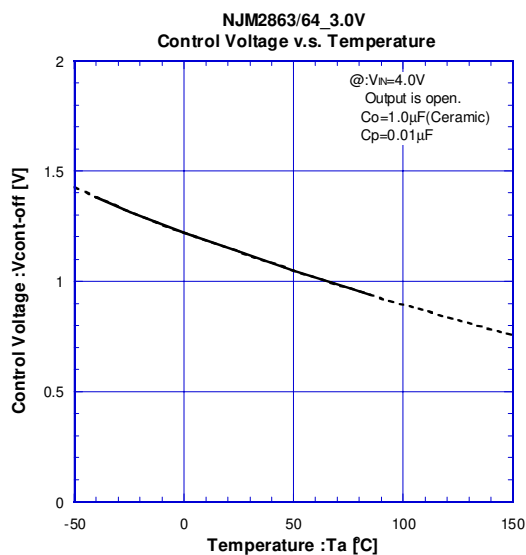
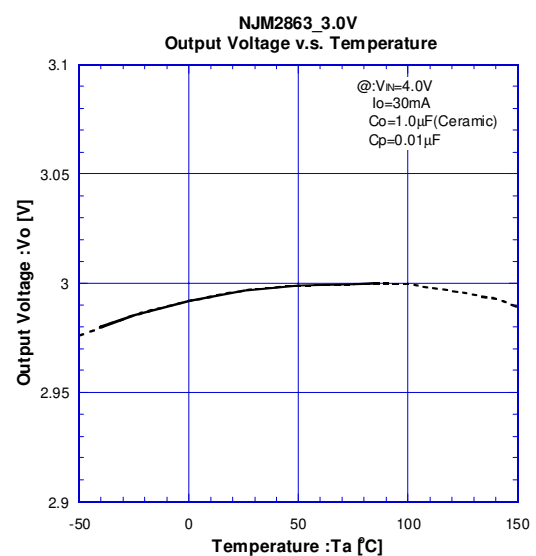
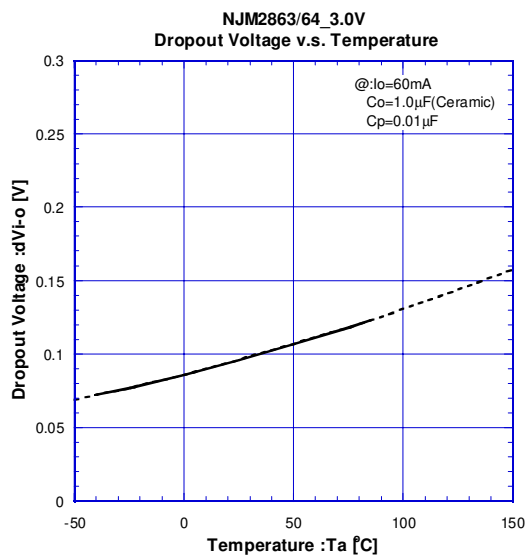
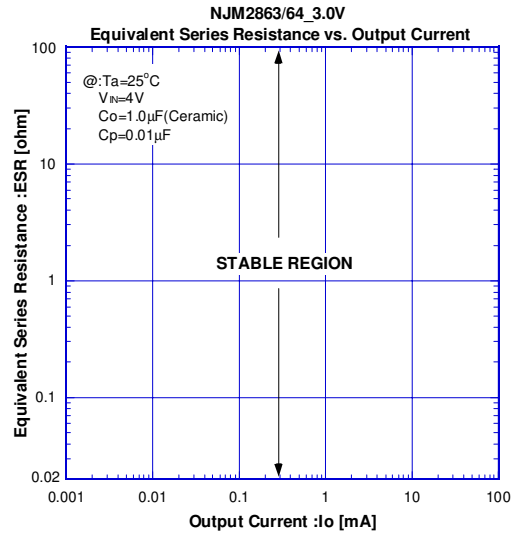
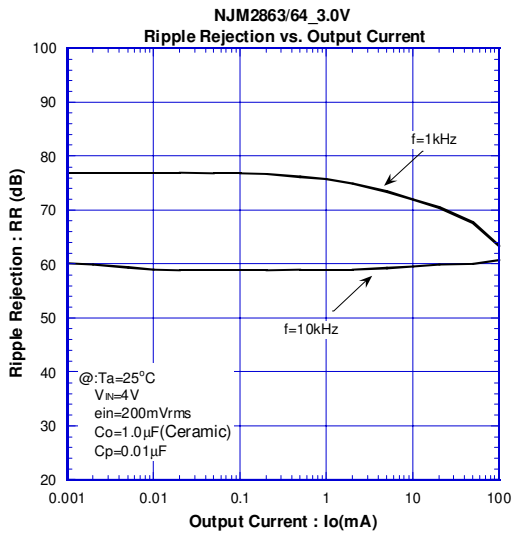


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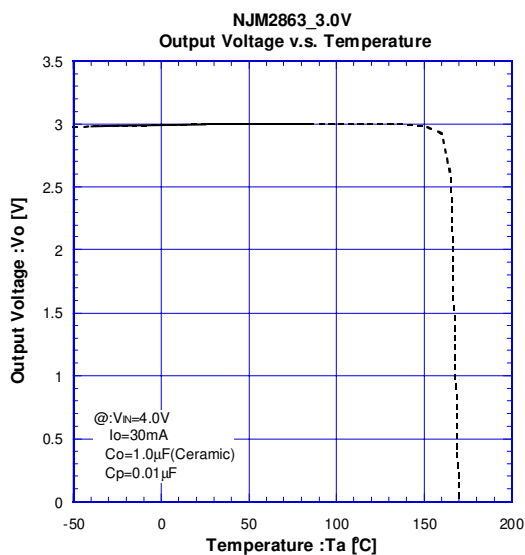
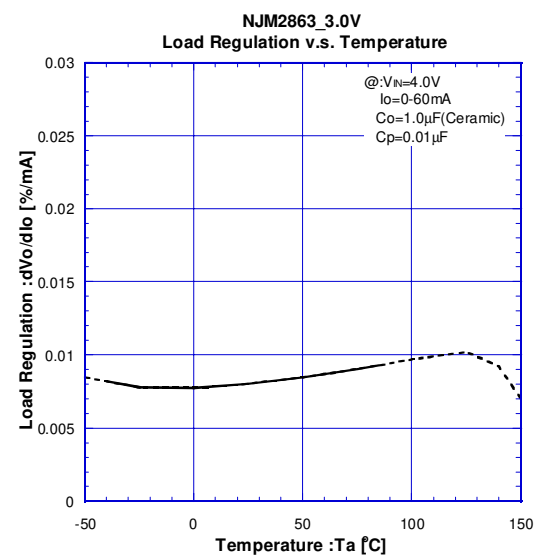
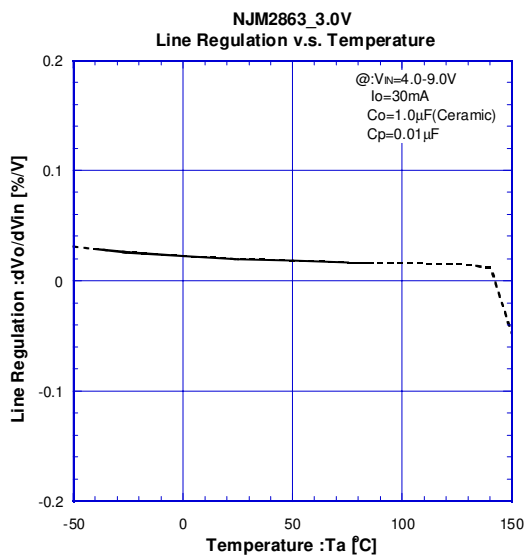
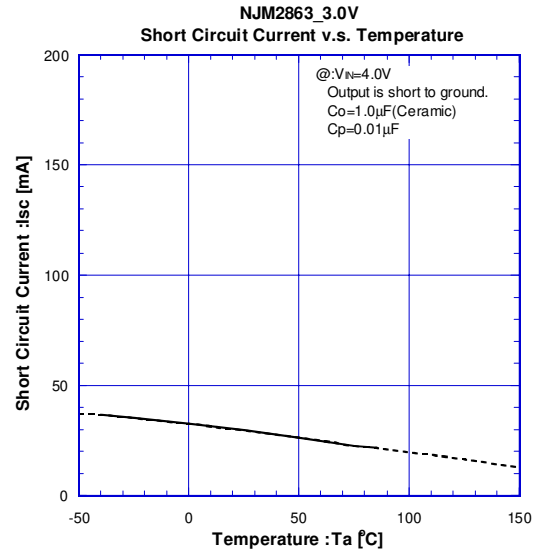
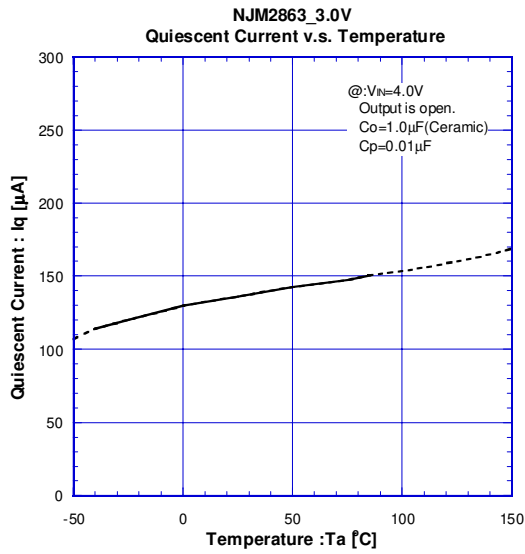


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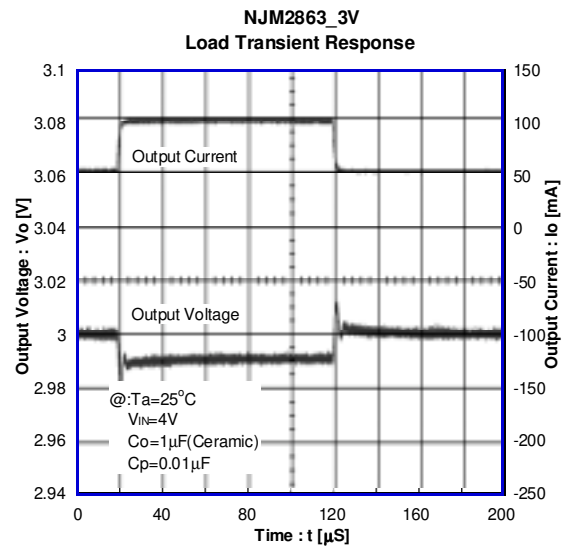
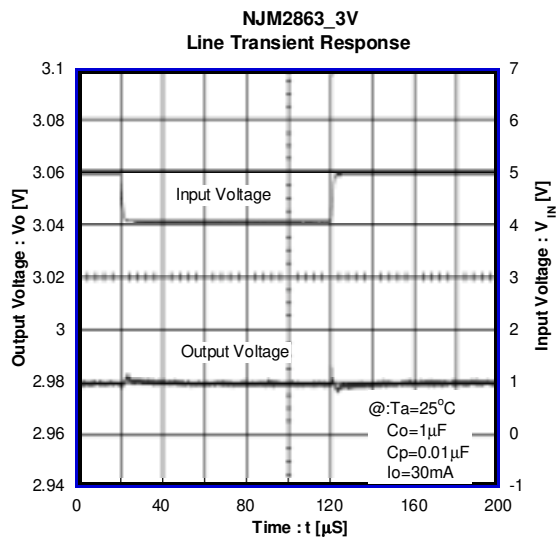
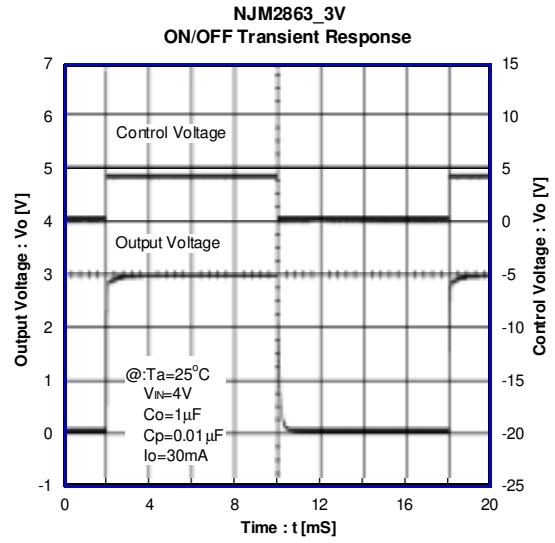
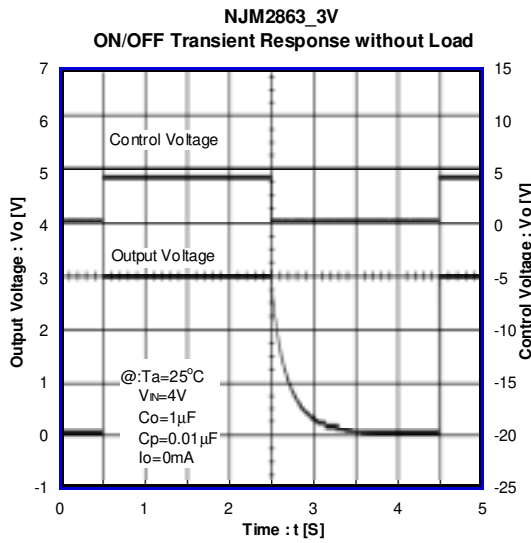


■ ELECTRICAL CHARACTERISTICS



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■ ELECTRICAL CHARACTERISTICS



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