

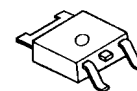
LOW DROPOUT VOLTAGE REGULATOR

■ GENERAL DESCRIPTION

The NJM2885 is low dropout voltage regulator designed for portable application.

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

■ PACKAGE OUTLINE

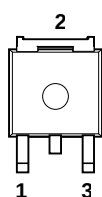


NJM2885DL1

■ FEATURES

- High Ripple Rejection 75dB typ. ($f=1\text{kHz}$, $V_o=3\text{V}$ Version)
- Output Noise Voltage $V_{no}=45\mu\text{V}_{rms}$ typ.
- Output capacitor with $2.2\mu\text{F}$ ceramic capacitor ($V_o\geq 2.7\text{V}$)
- Output Current $I_o(\text{max.})=500\text{mA}$
- High Precision Output $V_o\pm 1.0\%$
- Low Dropout Voltage 0.18V typ. ($I_o=300\text{mA}$)
- Internal Short Circuit Current Limit
- Internal Thermal Overload Protection
- Bipolar Technology
- Package Outline TO-252-3

■ PIN CONFIGURATION

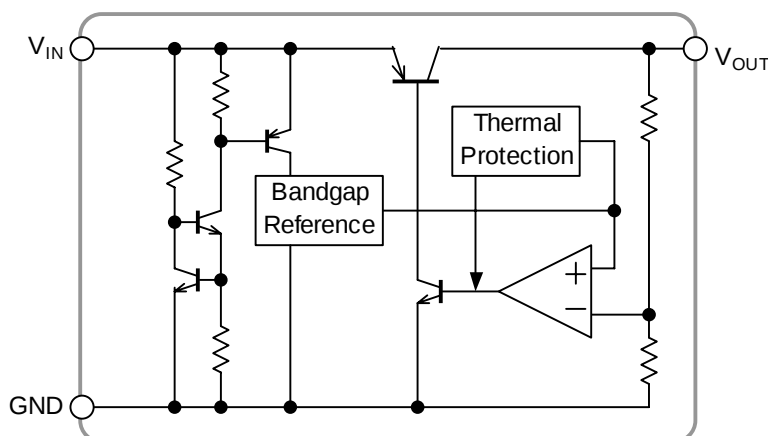


NJM2885DL1

PIN FUNCTION

1. V_{IN}
2. GND
3. V_{OUT}

■ BLOCK DIAGRAM



■ OUTPUT VOLTAGE RANK LIST

Device Name	V _{OUT}	Device Name	V _{OUT}
NJM2885DL1-15	1.5V	NJM2885DL1-28	2.8V
NJM2885DL1-18	1.8V	NJM2885DL1-03	3.0V
NJM2885DL1-19	1.9V	NJM2885DL1-33	3.3V
NJM2885DL1-21	2.1V	NJM2885DL1-35	3.5V
NJM2885DL1-25	2.5V	NJM2885DL1-38	3.8V
NJM2885DL1-26	2.6V	NJM2885DL1-05	5.0V

■ ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage	V _{IN}	+14	V
Power Dissipation	P _D	1190(*1) 3125(*2)	mW
Operating Temperature	T _{opr}	-40 ~ +85	°C
Storage Temperature	T _{stg}	-40 ~ +150	°C

(*1): Mounted on glass epoxy board. (76.2 × 114.3 × 1.6mm:based on EIA/JDEC standard size, 2Layers, Cu area 100mm²)

(*2): Mounted on glass epoxy board. (76.2 × 114.3 × 1.6mm:based on EIA/JDEC standard, 4Layers)

(For 4Layers: Applying 74.2 × 74.2mm inner Cu area and a thermal via hole to a board based on JEDEC standard JESD51-5)

■ Operating Voltage

V_{IN}=+2.3V ~ +14.0V (In case of V_O<2.1V)

■ ELECTRICAL CHARACTERISTICS

(V_{IN}=V_O+1V, C_{IN}=0.33μF, C_O=2.2μF, (1.7V<V_O≤2.6V: C_O=4.7μF, V_O≤1.7V:C_O=10μF), Ta=25°C)

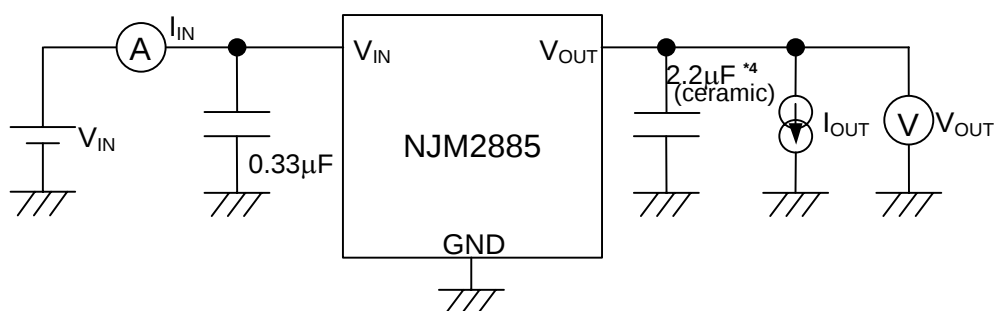
PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Voltage	V _O	I _O =30mA	-1.0%	—	+1.0%	V
Quiescent Current	I _Q	I _O =0mA	—	200	300	μA
Output Current	I _O	V _O -0.3V	500	650	—	mA
Line Regulation	ΔV _O /ΔV _{IN}	V _{IN} =V _O +1V ~ V _O +6.0V, I _O =30mA	—	—	0.10	%/V
Load Regulation	ΔV _O /ΔI _O	I _O =0 ~ 500mA	—	—	0.03	%/mA
Dropout Voltage(*3)	ΔV _{I-O}	I _O =300mA	—	0.18	0.28	V
Ripple Rejection	RR	e _{in} =200mVrms, f=1kHz, I _O =10mA V _O =3.0V Version	—	75	—	dB
Average Temperature Coefficient of Output Voltage	ΔV _O /ΔTa	Ta=0~85°C, I _O =10mA	—	±50	—	ppm/°C
Output Noise Voltage	V _{NO}	f=10Hz~80kHz, I _O =10mA, V _O =3.0V Version	—	45	—	μVrms

(*3): The output voltage excludes under 2.1V.

The above specification is a common specification for all output voltages.

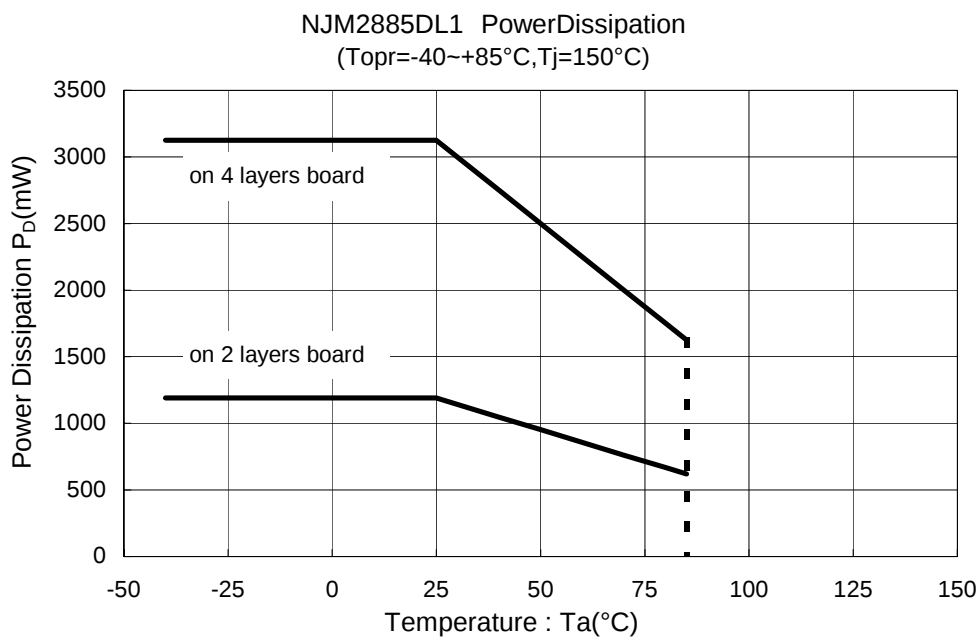
Therefore, it may be different from the individual specification for a specific output voltage.

■ TEST CIRCUIT



*4 1.7V<Vo≤2.6V version: Co=4.7μF(ceramic)
Vo≤1.7V version: 10μF(ceramic)

■ POWER DISSIPATION VS. AMBIENT TEMPERATURE



***Input Capacitor C_{IN}**

Input Capacitor C_{IN} is required to prevent oscillation and reduce power supply ripple for applications when high power supply impedance or a long power supply line.

Therefore, use the recommended C_{IN} value (refer to conditions of ELECTRIC CHARACTERISTIC) or larger and should connect between GND and V_{IN} as shortest path as possible to avoid the problem.

***Output Capacitor C_O**

Output capacitor (C_O) will be required for a phase compensation of the internal error amplifier.

The capacitance and the equivalent series resistance (ESR) influence to stable operation of the regulator.

Use of a smaller C_O may cause excess output noise or oscillation of the regulator due to lack of the phase compensation.

On the other hand, Use of a larger C_O reduces output noise and ripple output, and also improves output transient response when rapid load change.

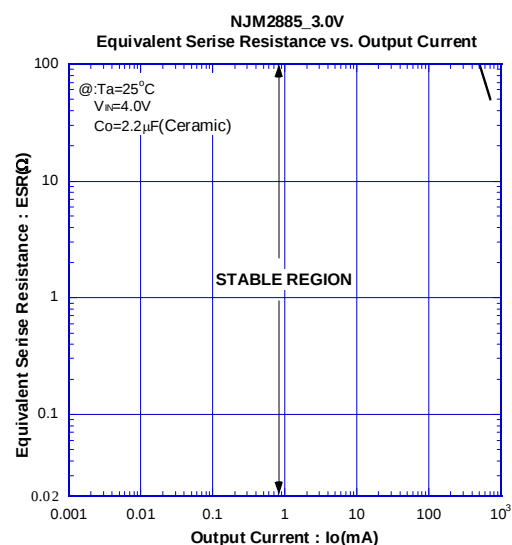
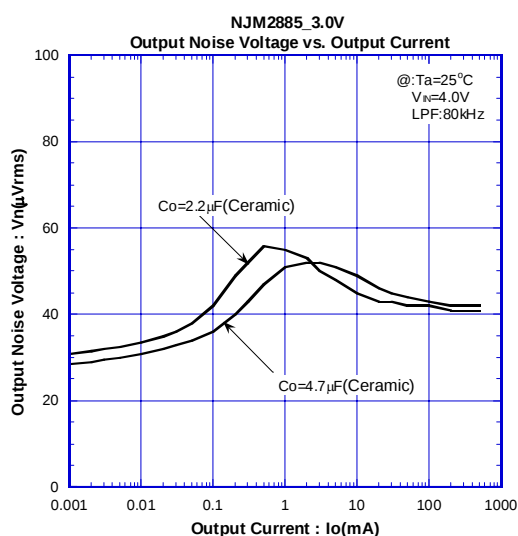
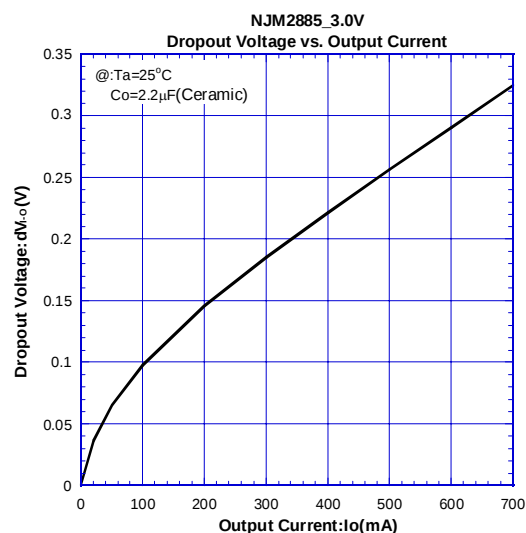
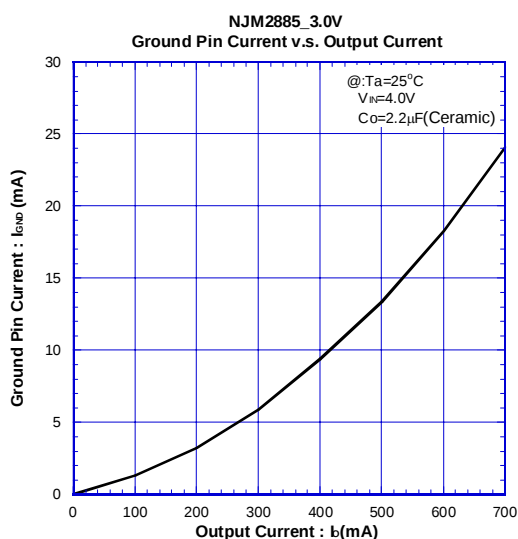
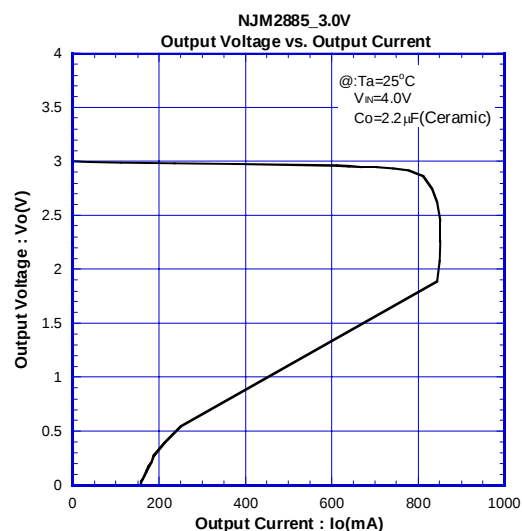
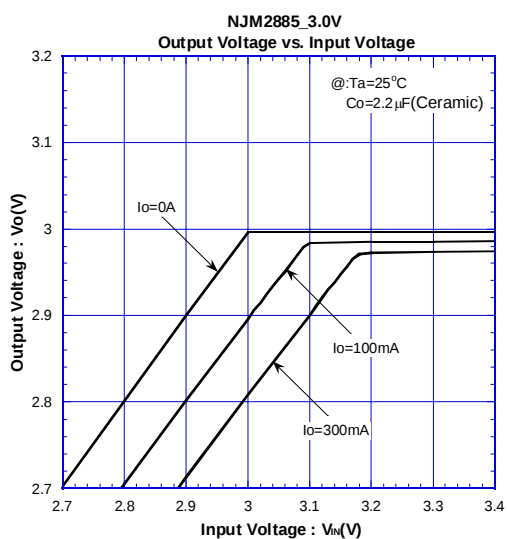
Therefore, use the recommended C_O value (refer to conditions of ELECTRIC CHARACTERISTIC) or larger and should connect between GND and V_{OUT} as shortest path as possible for stable operation

The recommended capacitance depends on the output voltage rank. Especially, low voltage regulator requires larger C_O value.

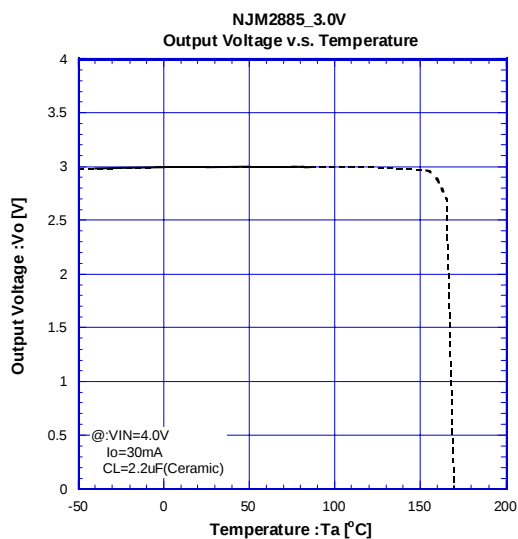
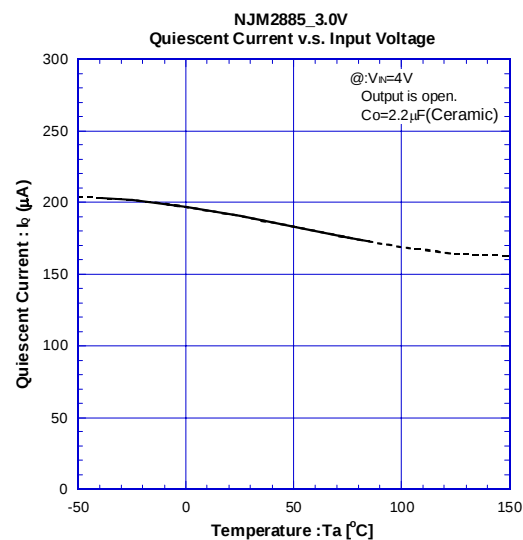
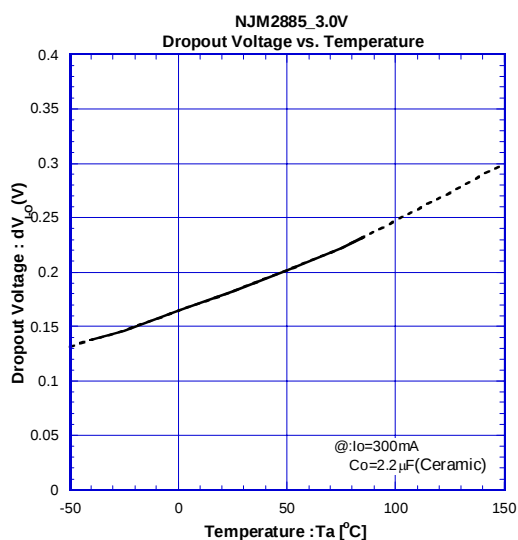
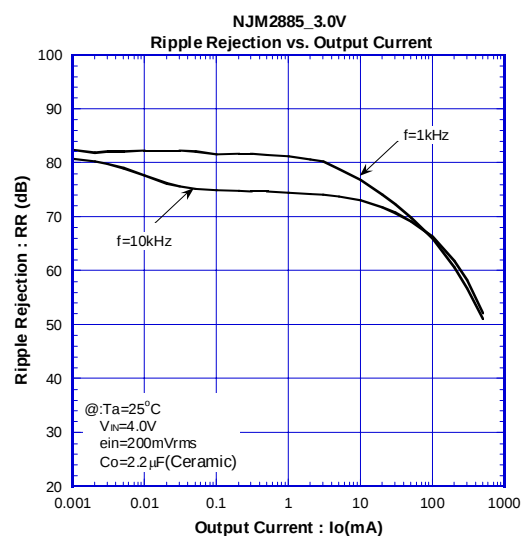
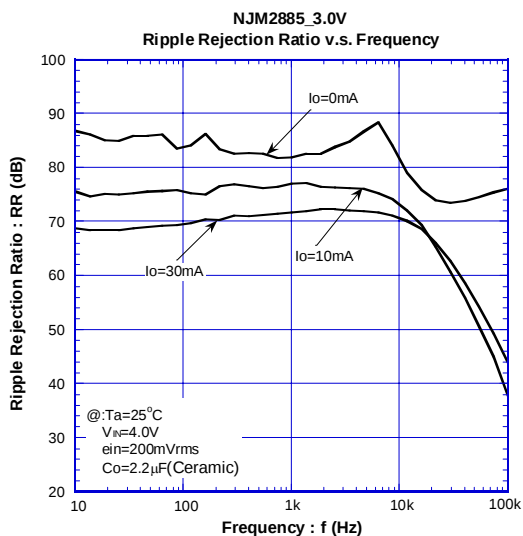
In addition, you should consider varied characteristics of capacitor (a frequency characteristic, a temperature characteristic, a DC bias characteristic and so on) and unevenness peculiar to a capacitor supplier enough.

When selecting C_O , recommend that have withstand voltage margin against output voltage and superior temperature characteristic though this product is designed stability works with wide range ESR of capacitor including low ESR products.

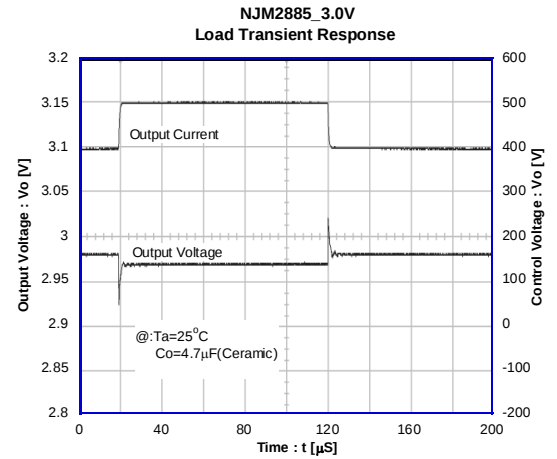
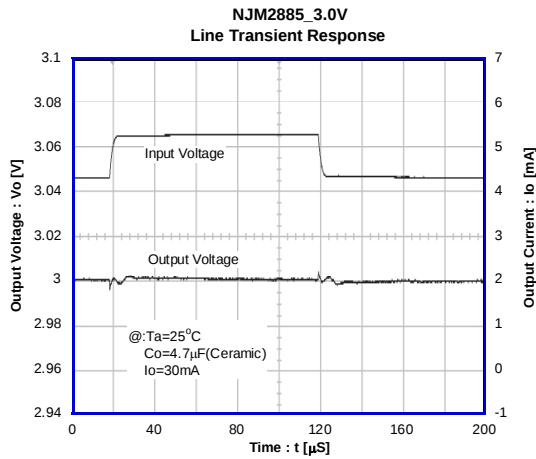
■ ELECTRICAL CHARACTERISTICS



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[CAUTION]

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