LOW DROPOUT VOLTAGE REGULATOR

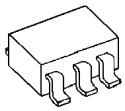
■ GENERAL DESCRIPTION

NJM2881/82 is a low dropout voltage regulator with ON/OFF control.

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

It is mounted on SOT-23-5 as small package and 1.0μF ceramic capacitor is available. Therefore it is suitable for cellular phone, camcorder, IC decoder, camera, and other portable items.

■ PACKAGE OUTLINE

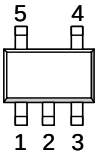


NJM2881/82F

■ FEATURES

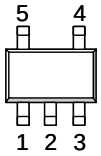
- High Ripple Rejection 75dB typ. (f=1kHz ,Vo=3V version)
- Low Output Noise Voltage Vno=30μVrms (Cp=0.01μF)
- Output capacitor with 1.0μF ceramic capacitor (Vo≥2.7V)
- Output Current Io(max.)=300mA
- High Precision Output Vo±1.0%
- Low Dropout Voltage 0.10V typ. (Io=100mA)
- ON/OFF Control (Active High)
- Internal Short Circuit Current Limit
- Internal Thermal Overload Protection
- Bipolar Technology
- Package Outline SOT-23-5

■ PIN CONFIGURATION



1. CONTROL (Active High)
2. GND
3. NOISE BYPASS
4. V_{OUT}
5. V_{IN}

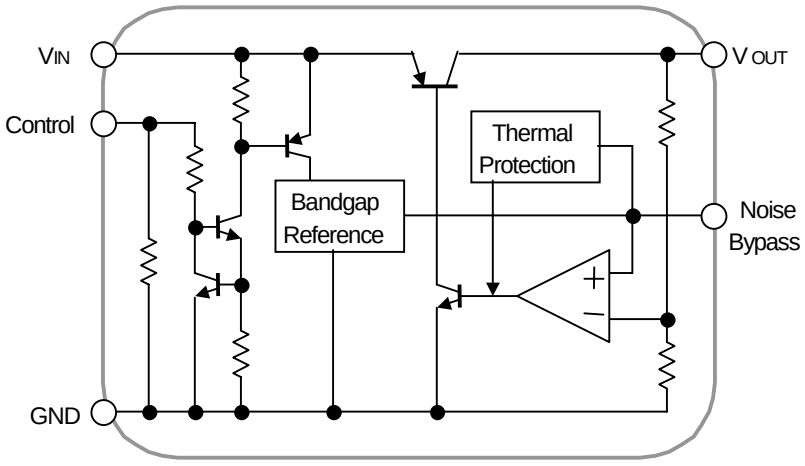
NJM2881F



1. V_{IN}
2. GND
3. CONTROL (Active High)
4. NOISE BYPASS
5. V_{OUT}

NJM2882F

■ EQUIVALENT CIRCUIT



■ OUTPUT VOLTAGE RANK LIST

Device Name	V_{OUT}	Device Name	V_{OUT}	Device Name	V_{OUT}
NJM288*F15	1.5V	NJM288*F29	2.9V	NJM288*F38	3.8V
NJM288*F17	1.7V	NJM288*F03	3.0V	NJM288*F04	4.0V
NJM288*F18	1.8V	NJM288*F31	3.1V	NJM288*F43	4.3V
NJM288*F21	2.1V	NJM288*F32	3.2V	NJM288*F47	4.7V
NJM288*F25	2.5V	NJM288*F33	3.3V	NJM288*F05	5.0V
NJM288*F28	2.8V	NJM288*F345	3.45V		
NJM288*F285	2.85V	NJM288*F35	3.5V		

■ 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)	mW
			200(*3)	
Operating Temperature	Topr	-40 ~ +85		°C
Storage Temperature	Tstg	-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.

■ Operating voltage

V_{IN}=+2.3 ~ +6V (In case of Vo<2.1V)

■ ELECTRICAL CHARACTERISTICS

(Vo>2.0V version: V_{IN}=Vo+1V, C_{IN}=0.1µF, Co=1.0µF: Vo≥2.7V (Co=2.2µF: Vo≤2.6V), Cp=0.01µF, Ta=25°C)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Voltage	Vo	Io=30mA	-1.0%	-	+1.0%	V
Quiescent Current	I_Q	Io=0mA, except Icont	-	120	180	µA
Quiescent Current at Control OFF	$I_{Q(OFF)}$	V_{CONT}=0V	-	-	100	nA
Output Current	Io	Vo-0.3V	300	400	-	mA
Line Regulation	$\Delta Vo/\Delta V_{IN}$	V_{IN}=Vo+1V ~ Vo+6V, Io=30mA	-	-	0.10	%/V
Load Regulation	$\Delta Vo/\Delta Io$	Io=0 ~ 300mA	-	-	0.03	%/mA
Dropout Voltage	ΔV_{I-O}	Io=100mA	-	0.10	0.18	V
Ripple Rejection	RR	ein=200mVrms,f=1kHz,Io=10mA, Vo=3V version	-	75	-	dB
Average Temperature Coefficient of Output Voltage	$\Delta Vo/\Delta Ta$	Ta=0 ~ 85°C, Io=10mA	-	±50	-	ppm/°C
Output Noise Voltage	V_{NO}	f=10Hz ~ 80kHz, Io=10mA, Vo=3V version	-	30	-	µVrms
Control Voltage for ON-state	$V_{CONT(ON)}$		1.6	-	-	V
Control Voltage for OFF-state	$V_{CONT(OFF)}$		-	-	0.6	V

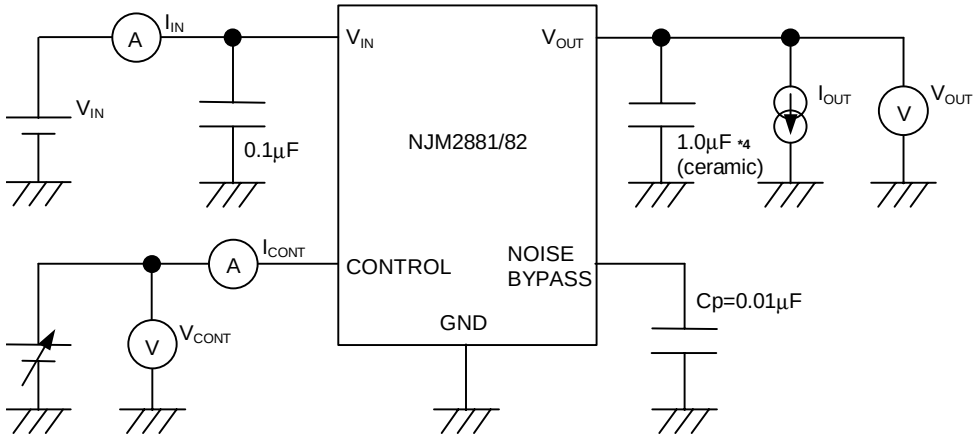
■ ELECTRICAL CHARACTERISTICS

(Vo≤2.0V version: V_{IN}=Vo+1V, C_{IN}=0.1µF, Co=2.2µF: Vo≥1.9V (Co=4.7µF: Vo≤1.8V), Cp=0.01µF, Ta=25°C)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Voltage	Vo	Io=30mA	-1.0%	-	+1.0%	V
Quiescent Current	I_Q	Io=0mA, except I_{CONT}	-	120	180	µA
Quiescent Current at Control OFF	$I_{Q(OFF)}$	V_{CONT}=0V	-	-	100	nA
Output Current	Io	Vo-0.3V	300	400	-	mA
Line Regulation	$\Delta Vo/\Delta V_{IN}$	V_{IN}=Vo+1V ~ Vo+6V, Io=30mA	-	-	0.10	%/V
Load Regulation	$\Delta Vo/\Delta Io$	Io=0 ~ 300mA	-	-	0.03	%/mA
Ripple Rejection	RR	ein=200mVrms,f=1kHz,Io=10mA, Vo=1.8V version	-	80	-	dB
Average Temperature Coefficient of Output Voltage	$\Delta Vo/\Delta Ta$	Ta=0 ~ 85°C, Io=10mA	-	±50	-	ppm/°C
Output Noise Voltage	V_{NO}	f=10Hz ~ 80kHz, Io=10mA, Vo=1.8V version	-	20	-	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.

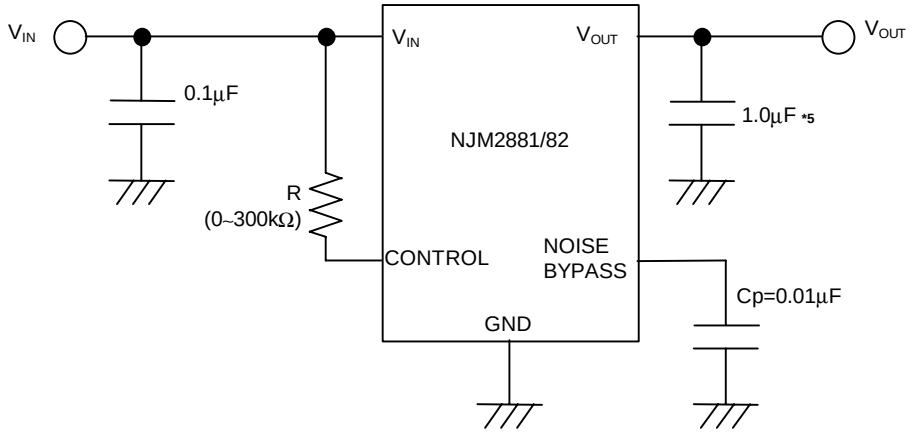
■ TEST CIRCUIT



*4 1.9V ≤ Vo ≤ 2.6V version: Co=2.2µF(ceramic)
Vo ≤ 1.8V version: Co=4.7µF(ceramic)

■ TYPICAL APPLICATION

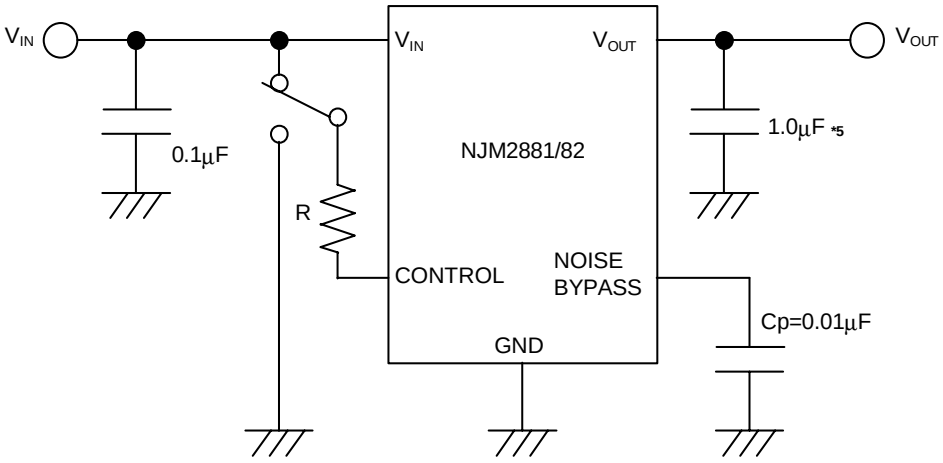
① In the case where ON/OFF Control is not required:



*5 1.9V ≤ Vo ≤ 2.6V version: Co=2.2μF
Vo ≤ 1.8V version: Co=4.7μF

Connect control terminal to V_{IN} terminal

② In use of ON/OFF CONTROL:



*5 1.9V ≤ Vo ≤ 2.6V version: Co=2.2μF
Vo ≤ 1.8V version: Co=4.7μF

State of control terminal:

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

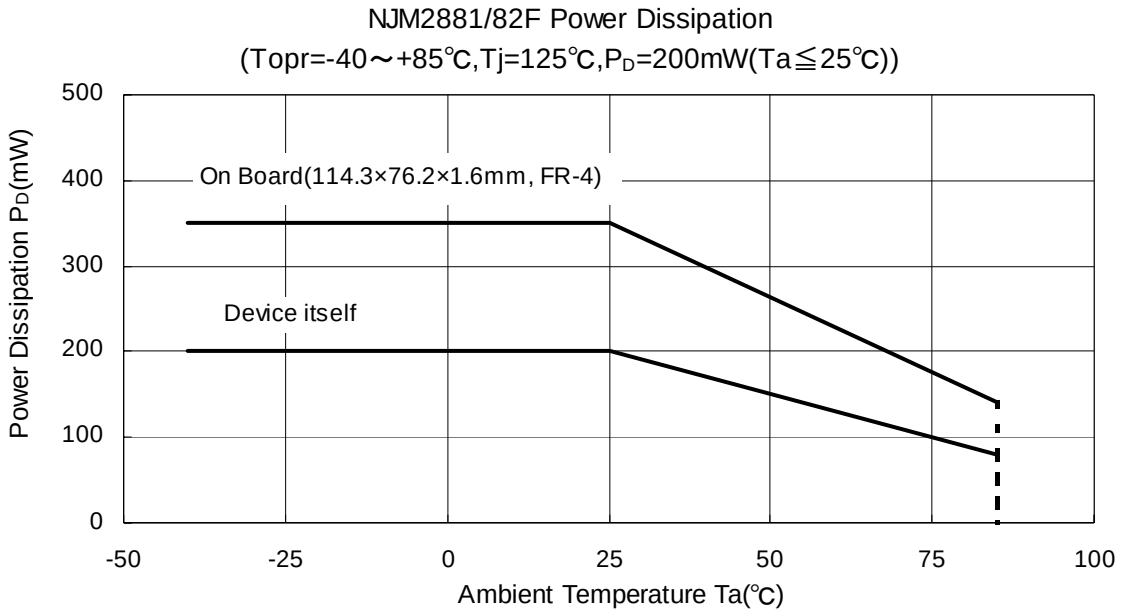
∗Noise bypass Capacitance Cp

Noise bypass capacitance Cp reduces noise generated by band-gap reference circuit. Noise level and ripple rejection will be improved when larger Cp is used. Use of smaller Cp value may cause oscillation.
Use the Cp value of 0.01μF greater to avoid the problem.

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

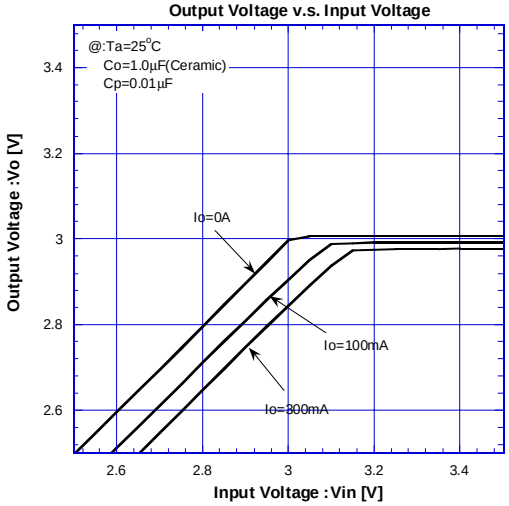
The current flow into the control terminal while the IC is ON state (I_{CONT}) can be reduced when a pull up resistance "R" is inserted between V_{IN} and the control terminal.
The minimum control voltage for ON state ($V_{CONT\,(ON)}$) is increased due to the voltage drop caused by I_{CONT} and the 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

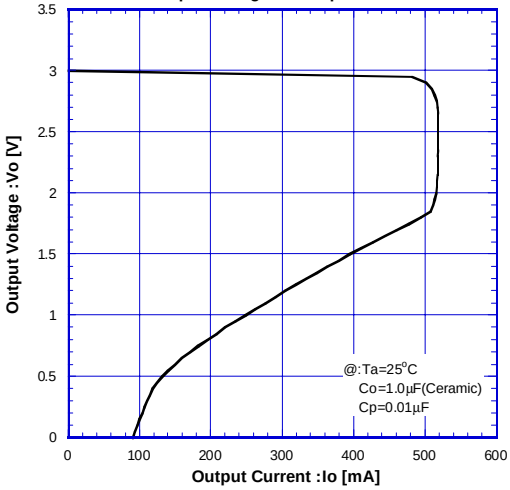


■ ELECTRICAL CHARACTERISTICS

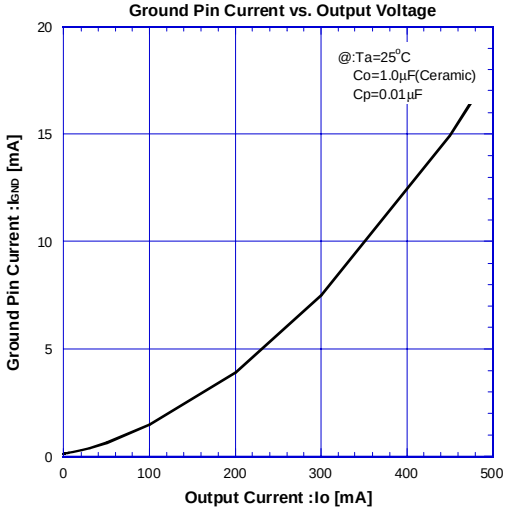
NJM2881/82_3.0V
Output Voltage v.s. Input Voltage



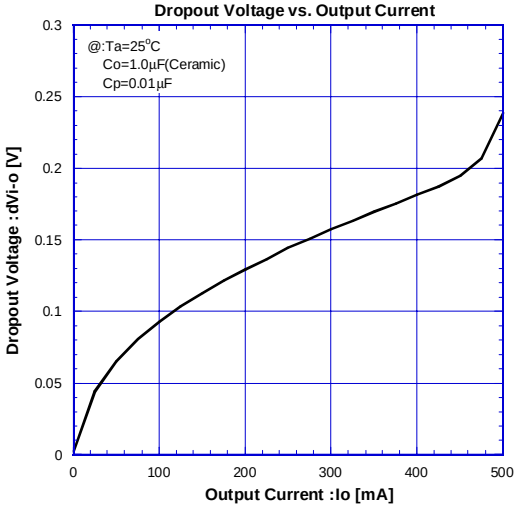
NJM2881/82_3.0V
Output Voltage vs. Output Current



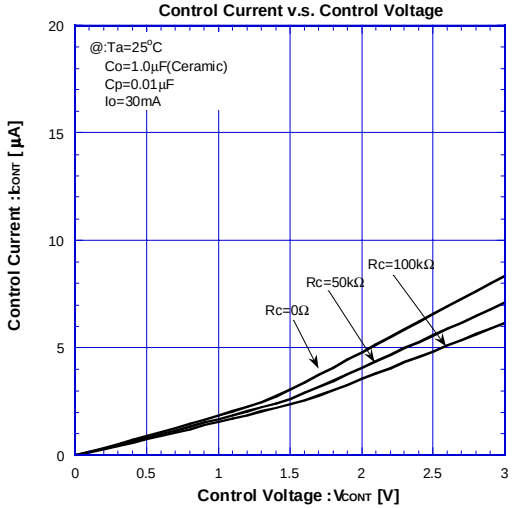
NJM2881/82_3.0V
Ground Pin Current vs. Output Voltage



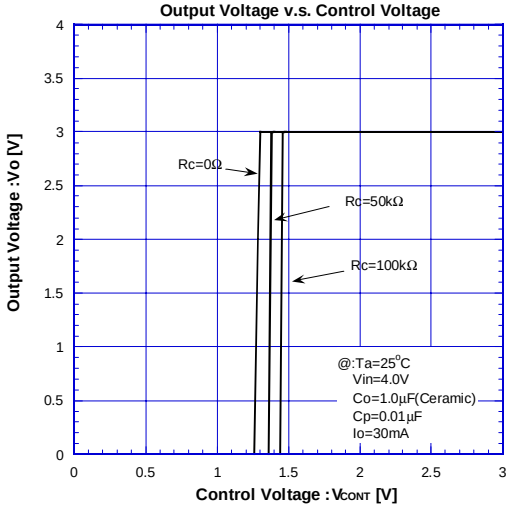
NJM2881/82_3.0V
Dropout Voltage vs. Output Current



NJM2881/82_3.0V
Control Current v.s. Control Voltage

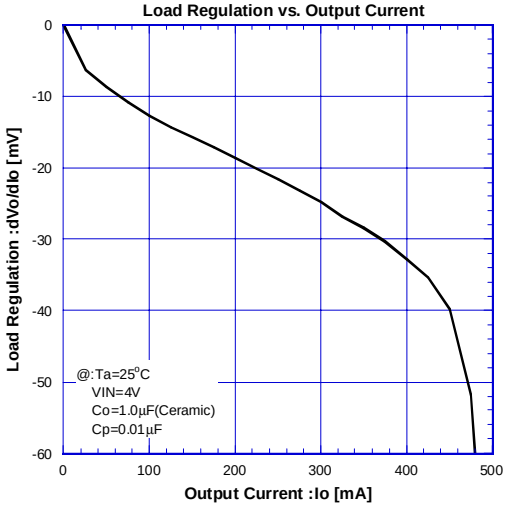


NJM2881/82_3.0V
Output Voltage v.s. Control Voltage

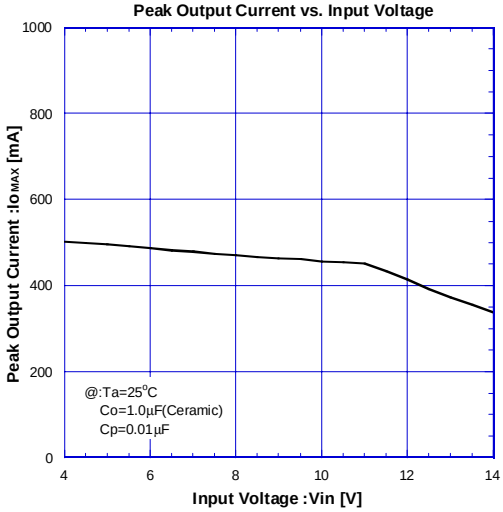


■ ELECTRICAL CHARACTERISTICS

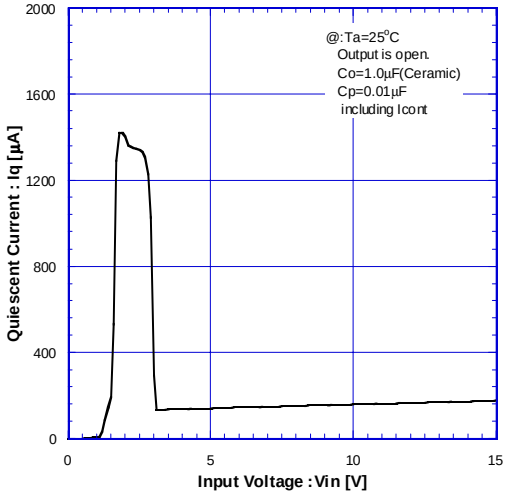
NJM2881/82_3.0V
Load Regulation vs. Output Current



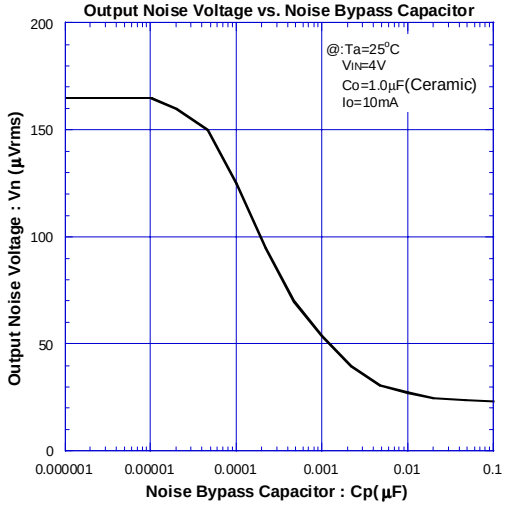
NJM2881/82_3.0V
Peak Output Current vs. Input Voltage



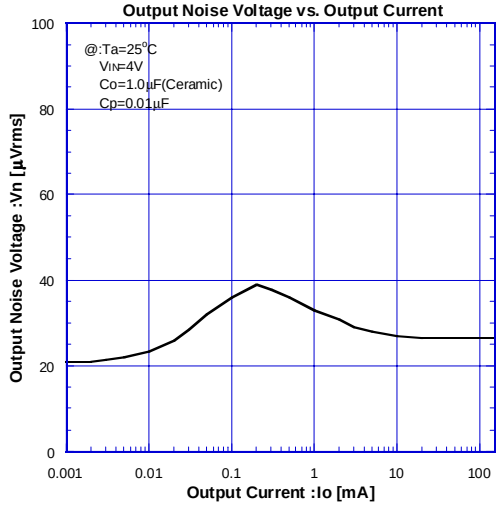
NJM2881/82_3.0V
Quiescent Current v.s. Input Voltage



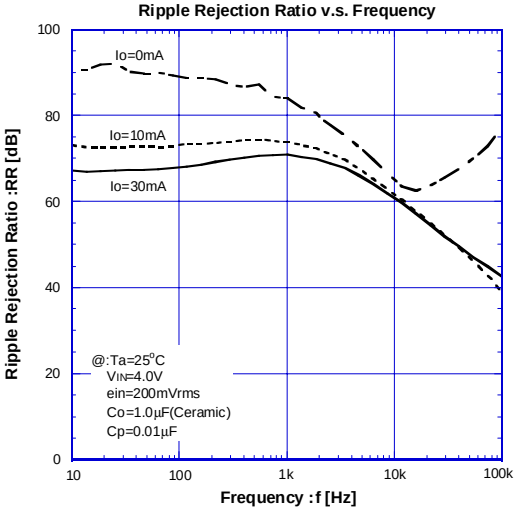
NJM2881/82_3.0V
Output Noise Voltage vs. Noise Bypass Capacitor



NJM2881/82_3.0V
Output Noise Voltage vs. Output Current

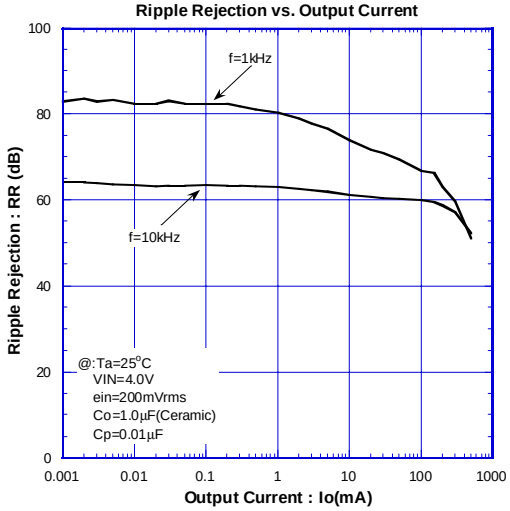


NJM2881/82_3.0V
Ripple Rejection Ratio v.s. Frequency

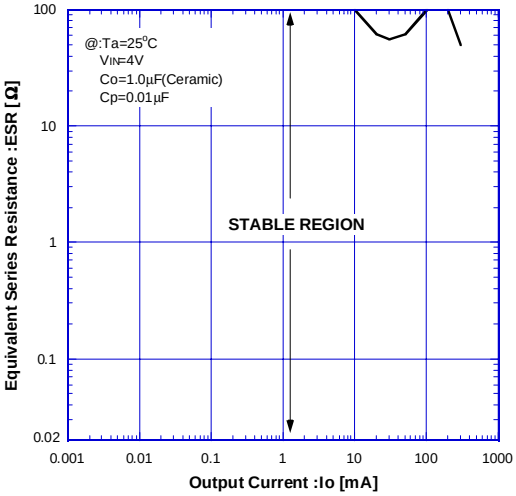


■ ELECTRICAL CHARACTERISTICS

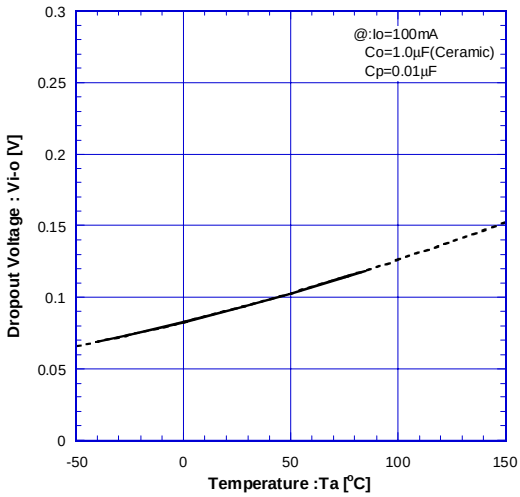
NJM2881/82_3.0V
Ripple Rejection vs. Output Current



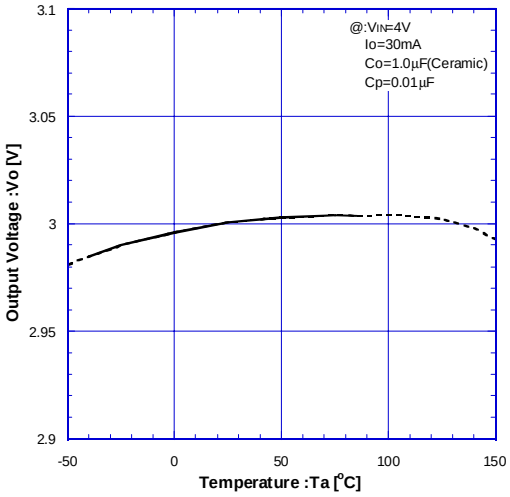
NJM2881/82_3.0V
Equivalent Series Resistance vs. Output Current



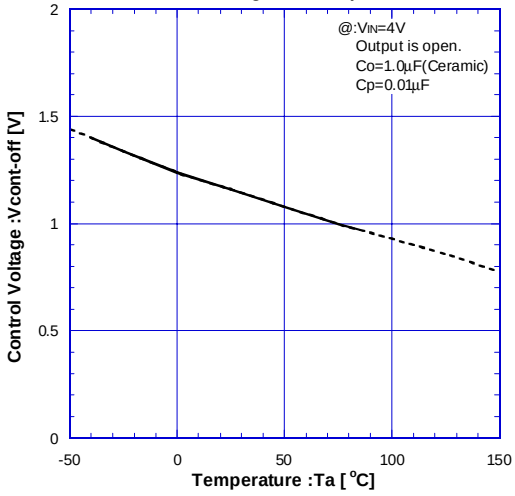
NJM2881/82_3.0V
Dropout Voltage v.s. Temperature



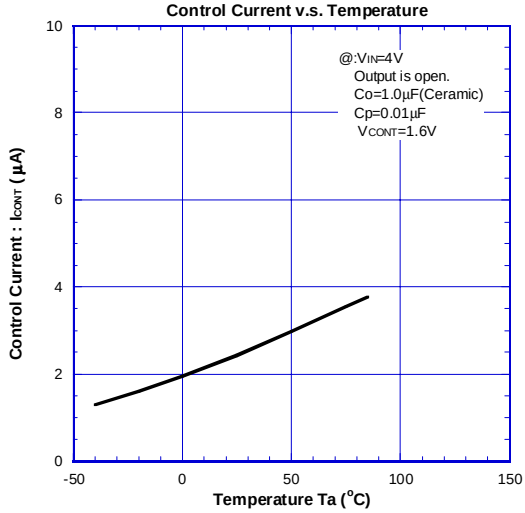
NJM2881/82_3.0V
Output Voltage v.s. Temperature



NJM2881/82_3.0V
Control Voltage v.s. Temperature

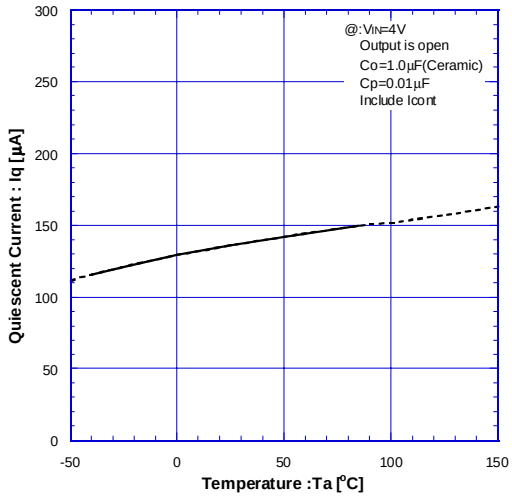


NJM2881/82_3.0V
Control Current v.s. Temperature

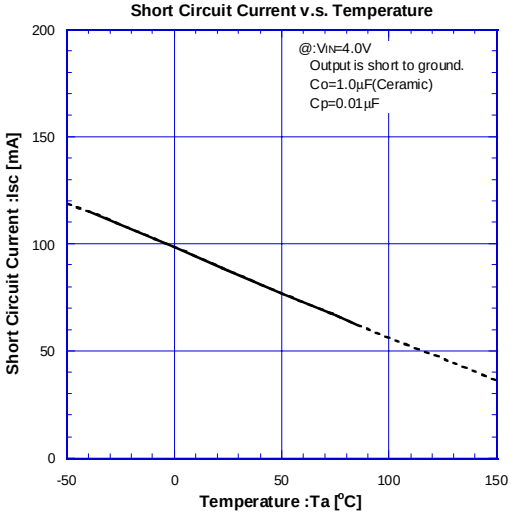


■ ELECTRICAL CHARACTERISTICS

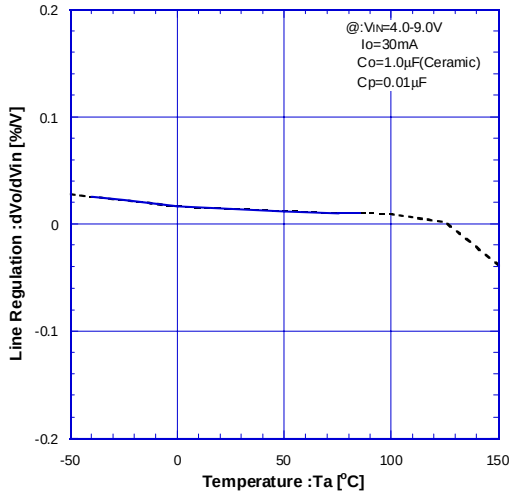
NJM2881/82_3.0V
Quiescent Current v.s. Temperature



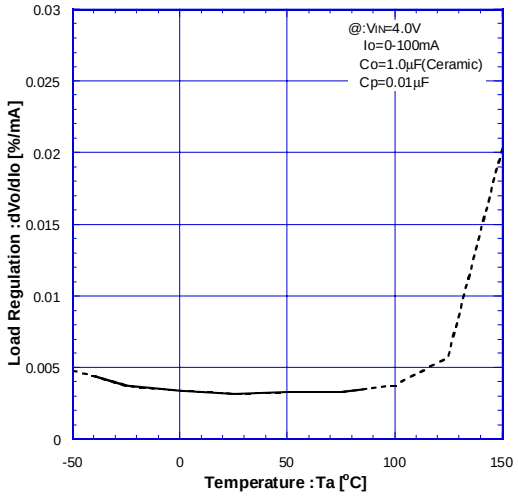
NJM2881/82_3.0V
Short Circuit Current v.s. Temperature



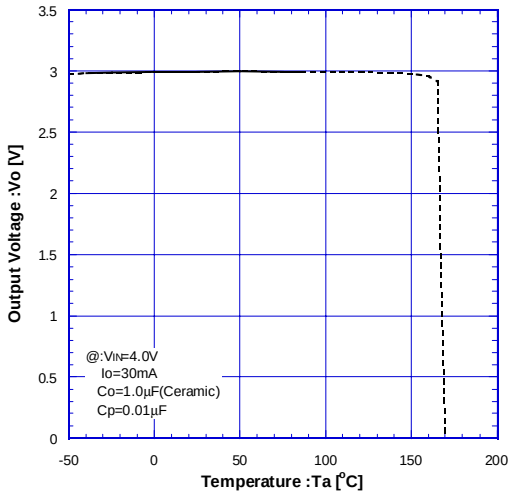
NJM2881/82_3.0V
Line Regulation v.s. Temperature



NJM2881/82_3.0V
Load Regulation v.s. Temperature

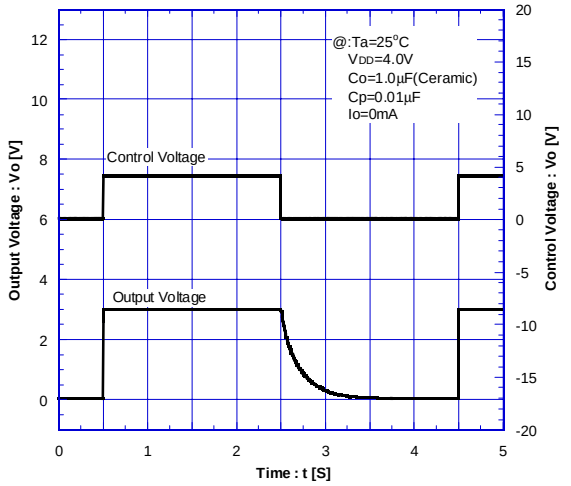


NJM2881/82_3.0V
Output Voltage v.s. Temperature

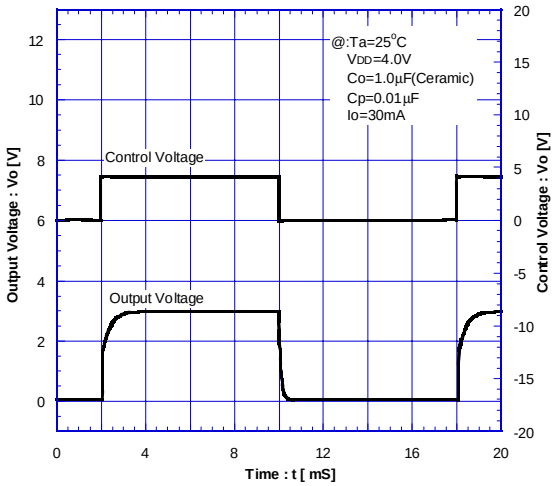


■ ELECTRICAL CHARACTERISTICS

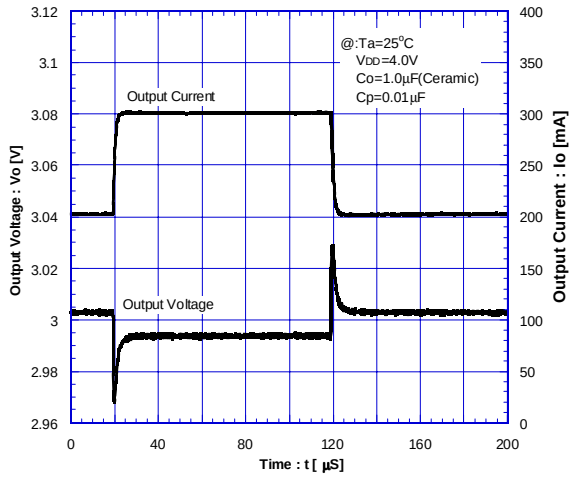
NJM2881_3.0V
ON/OFF Transient Response without Load



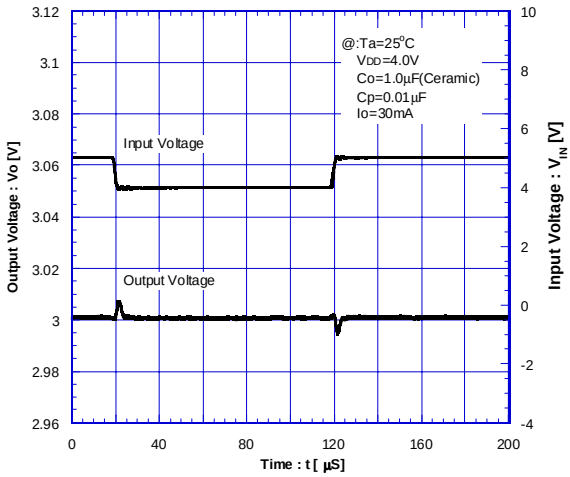
NJM2881_3.0V
ON/OFF Transient Response



NJM2881/82_3.0V
Load Transient Response



NJM2881/82_3.0V
Input Transient Response



[CAUTION]
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NJR:

NJM2881F25-TE1 NJM2882F25-TE1 NJM2881F28-TE1 NJM2882F28-TE1 NJM2881F345-TE1 NJM2882F18-TE1 NJM2881F18-TE1 NJM2881F29-TE1 NJM2882F33-TE1 NJM2881F33-TE1 NJM2881DL2 NJM2882F03-TE1 NJM2881F03-TE1 NJM2882F05-TE1 NJM2882F04-TE1 NJM2882F35-TE1 NJM2881F17-TE1 NJM2881F21-TE1 NJM2881F05-TE1 NJM2881F43-TE1 NJM2882F31-TE1 NJM2882F15-TE1 NJM2881F15-TE1 NJM2881F31-TE1 NJM2882F47-TE1 NJM2882F29-TE1 NJM2882F345-TE1 NJM2881F285-TE1 NJM2881F35-TE1 NJM2882F38-TE1 NJM2882F43-TE1 NJM2882F17-TE1 NJM2881F47-TE1 NJM2881F04-TE1 NJM2882F21-TE1 NJM2881F32-TE1 NJM2882F285-TE1 NJM2881F38-TE1

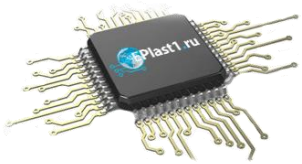
Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits,General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

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