

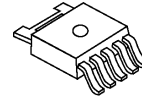
2ch LOW DROPOUT VOLTAGE REGULATOR

■ GENERAL DESCRIPTION

The NJM2895/96 is a 2ch low dropout voltage regulator with ON/OFF control.

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

■ PACKAGE OUTLINE

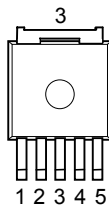


NJM2895/96DL3

■ FEATURES

- High Ripple Rejection 75dB typ. (f=1kHz $V_o=3V$ version)
- Output Noise Voltage $V_{no}=40\mu V_{rms}$ typ.
- Output capacitor with 1.0 μF ceramic capacitor ($V_o\geq 2.5V$)
- Output Current $I_o(max.)=500mA \times 2ch$
- High Precision Output $V_o\pm 1.0\%$
- Low Dropout Voltage 0.18V typ. ($I_o=300mA$)
- ON/OFF Control (NJM2895 : ch1/ch2 common, NJM2896 ch2 only)
- Internal Short Circuit Current Limit
- Internal Thermal Overload Protection
- Bipolar Technology
- Package Outline TO-252-5

■ PIN CONFIGURATION



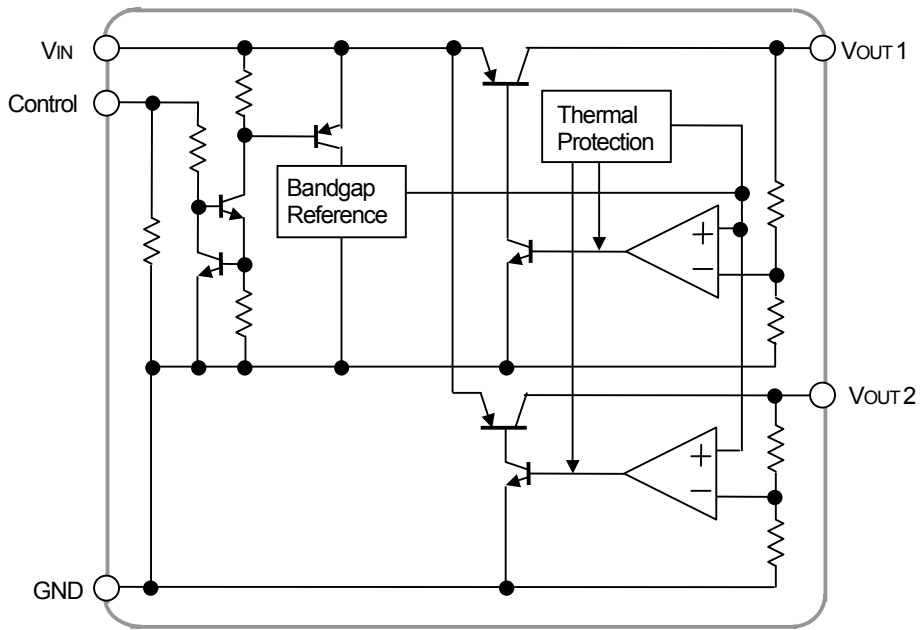
1. V_{OUT1}
2. V_{IN}
3. GND
4. V_{OUT2}
5. CONTROL (Active High)

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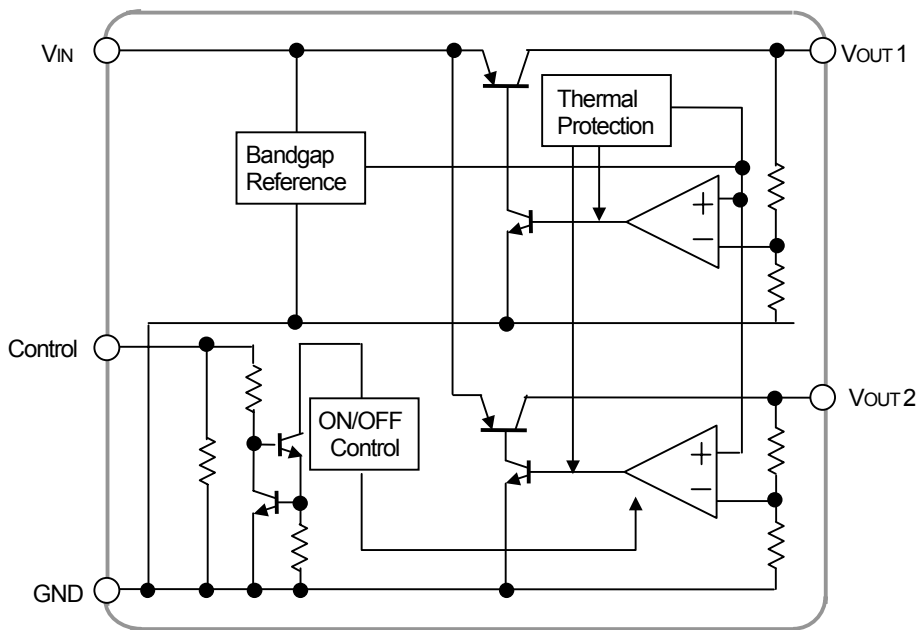
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■ EQUIVALENT CIRCUIT



NJM2895



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■ OUTPUT VOLTAGE RANK LIST

Device Name	V _{OUT}	
	Ch 1	Ch 2
NJM289*DL3-2121	2.1V	2.1V
NJM289*DL3-0303	3.0V	3.0V
NJM289*DL3-0533	5.0V	3.3V
NJM289*DL3-0505	5.0V	5.0V

■ 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	8(Tc=25°C) 0.8(Ta≤25°C)	W
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.

■ NJM2895

■ ELECTRICAL CHARACTERISTICS (V_{IN}=Vo+1V, C_{IN}=0.33μF, Co=1.0μF (Vo≤2.4V : Co=2.2μF), Ta=25°C)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Voltage	Vo	Io=30mA	-1.0%	-	+1.0%	V
Quiescent Current	I _{Q1}	Io=0mA	-	400	600	μA
Quiescent Current at Control OFF	I _{Q(OFF)}	V _{CONT} =0V	-	-	100	nA
Output Current	Io	Vo-0.3V	500	650	-	mA
Line Regulation	ΔVo/ΔV _{IN}	V _{IN} =Vo+1V ~ Vo+6V, Io=30mA	-	-	0.10	%/V
Load Regulation	ΔVo/ΔIo	Io=0 ~ 500mA	-	-	0.03	%/mA
Dropout Voltage	ΔV _{LO}	Io=300mA	-	0.18	0.28	V
Ripple Rejection	RR	ein=200mVrms, f=1kHz, Io=10mA, Vo=3V version	-	75	-	dB
Average Temperature Coefficient of Output Voltage	ΔVo/ΔTa	Ta=0 ~ 85°C, Io=10mA	-	± 50	-	ppm/°C
Output Noise Voltage	V _{NO}	f=10Hz ~ 80kHz, Io=10mA, Vo=3V version	-	40	-	μVrms
Control Voltage for ON-state	V _{CONT(ON)}		1.6	-	-	V
Control Voltage for OFF-state	V _{CONT(OFF)}		-	-	0.6	V

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■ NJM2896

■ ELECTRICAL CHARACTERISTICS ($V_{IN}=V_o+1V$, $C_{IN}=0.33\mu F$, $C_o=1.0\mu F$ ($V_o\leq 2.4V$: $C_o=2.2\mu F$), $T_a=25^\circ C$)

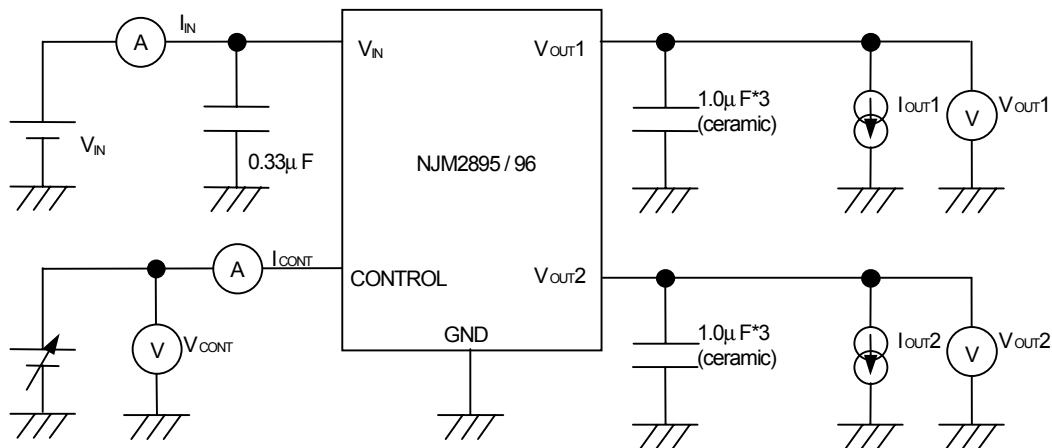
PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_o	$I_o=30mA$	-1.0%	-	+1.0%	V
Quiescent Current 2	I_{Q1}	$I_o=0mA$, $V_{CONT}=0V$, expect I_{CONT}	-	200	300	μA
Quiescent Current 2	I_{Q2}	$I_o=0mA$, $V_{CONT}=0V$, expect I_{CONT}	-	400	600	μA
Output Current	I_o	$V_o=0.3V$	500	650	-	mA
Line Regulation	$\Delta V_o/\Delta V_{IN}$	$V_{IN}=V_o+1V \sim V_o+6V$, $I_o=30mA$	-	-	0.10	%/V
Load Regulation	$\Delta V_o/\Delta I_o$	$I_o=0 \sim 500mA$	-	-	0.03	%/mA
Dropout Voltage	ΔV_{LO}	$I_o=300mA$	-	0.18	0.28	V
Ripple Rejection	RR	$e_{in}=200mV_{rms}$, $f=1kHz$, $I_o=10mA$, $V_o=3V$ version	-	75	-	dB
Average Temperature Coefficient of Output Voltage	$\Delta V_o/\Delta T_a$	$T_a=0 \sim 85^\circ C$, $I_o=10mA$	-	± 50	-	ppm/ $^\circ C$
Output Noise Voltage	V_{NO}	$f=10Hz \sim 80kHz$, $I_o=10mA$, $V_o=3V$ version	-	40	-	μV_{rms}
Control Voltage for ON-state	$V_{CONT(ON)}$		1.6	-	-	V
Control Voltage for OFF-state	$V_{CONT(OFF)}$		-	-	0.6	V

(*2): $V_{IN}=V_o+1V$ means add 1V to higher output voltage.

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.

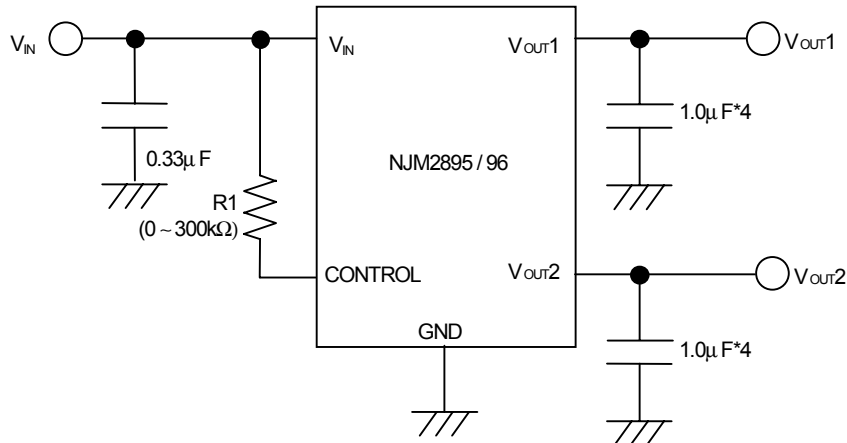
■ TEST CIRCUIT



*3 $V_o\leq 2.4V$ version: $C_o=2.2\mu F$ (ceramic)

■ TYPICAL APPLICATION

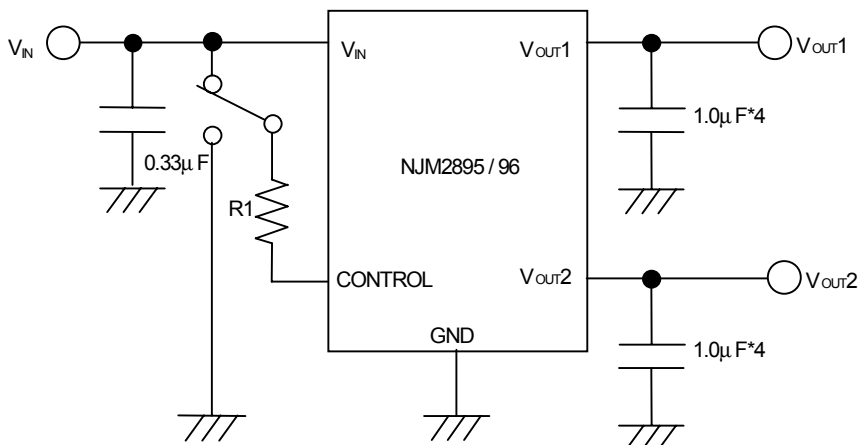
① In the case where ON/OFF Control is not required:



*4 $V_{O} \leq 2.4V$ version: $C_o = 2.2\mu F$

Connect control terminal to V_{IN} terminal

② In use of ON/OFF CONTROL:



*4 $V_{O} \leq 2.4V$ version: $C_o = 2.2\mu F$

State of control terminal:

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

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

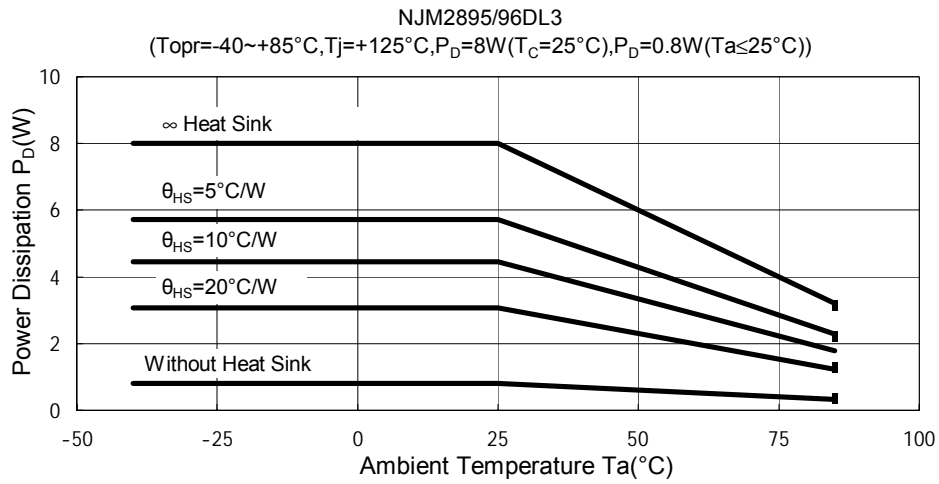
The current flow into the control terminal while the IC is ON state (I_{CONT}) can be reduced when a pull up resistance "R" is inserted between V_{IN} and the control terminal.

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.

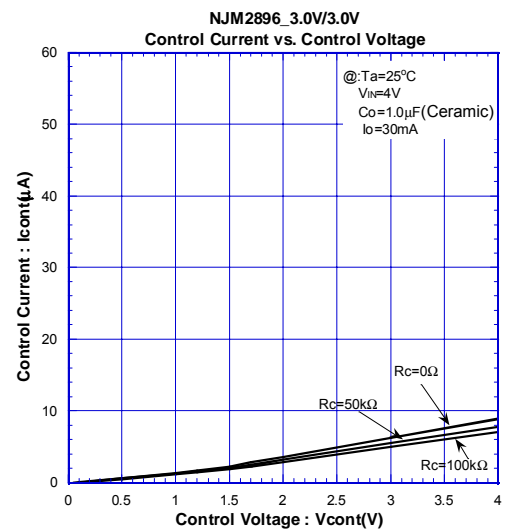
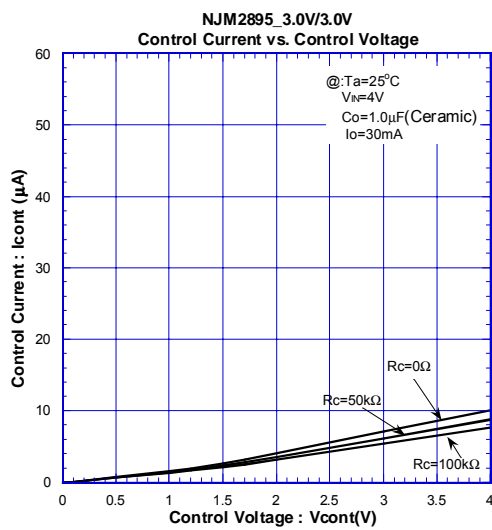
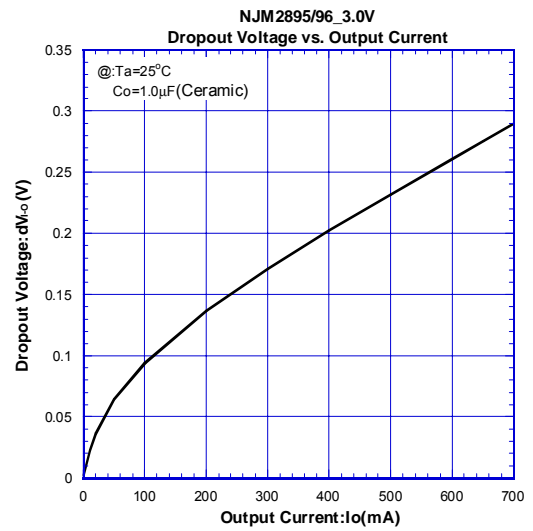
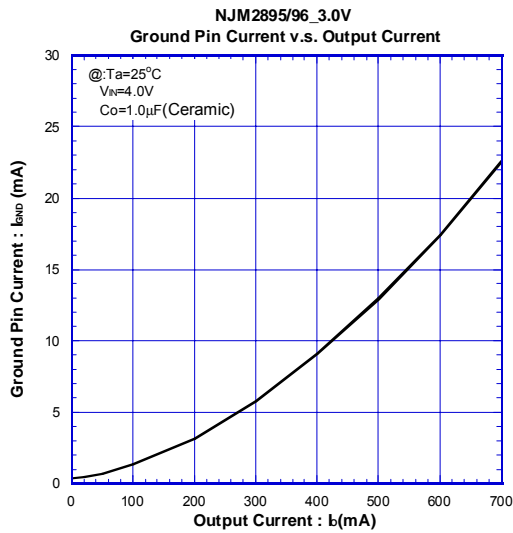
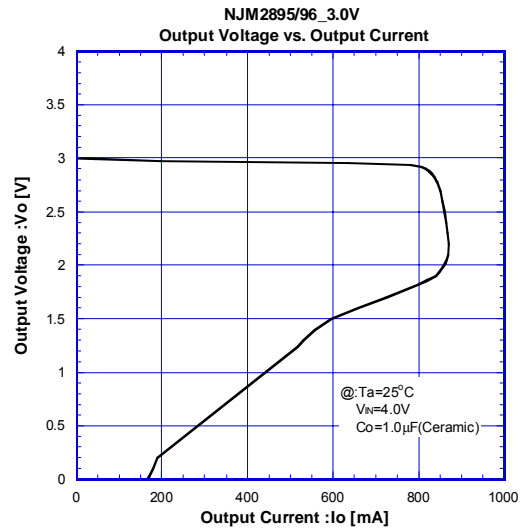
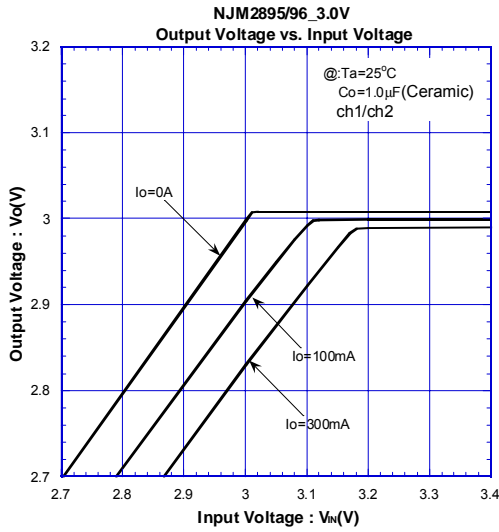
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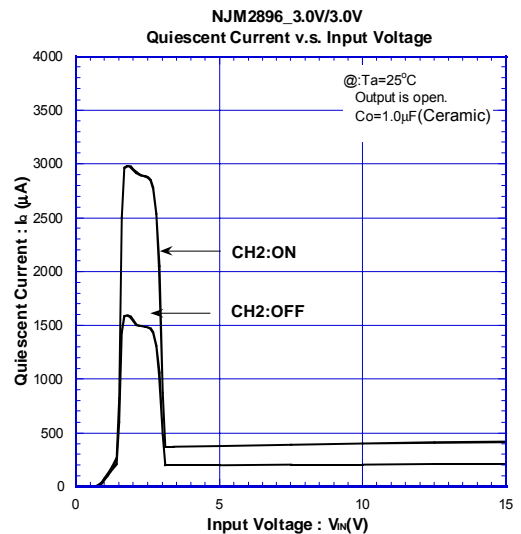
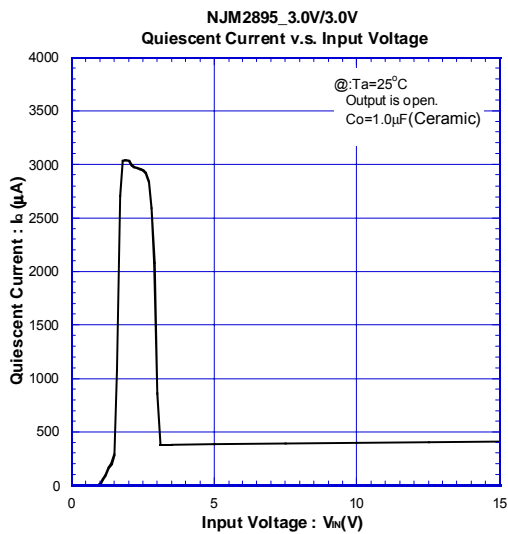
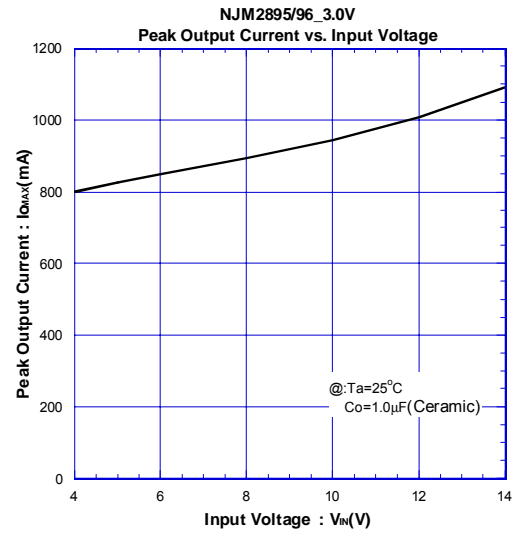
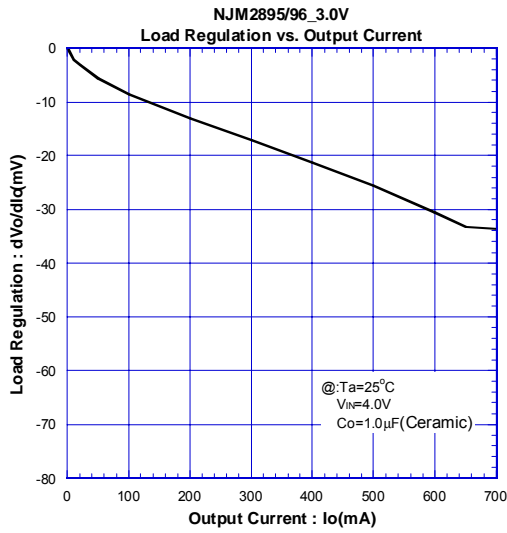
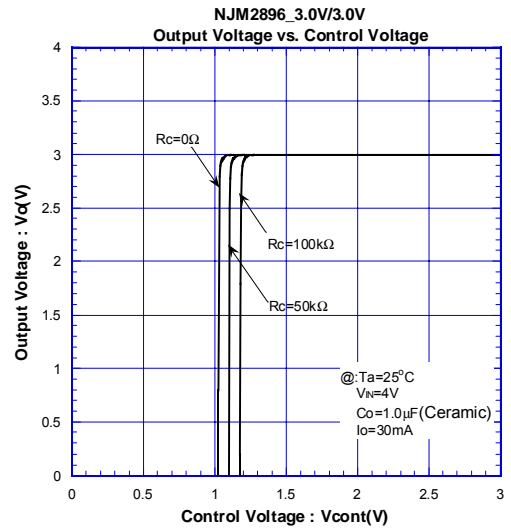
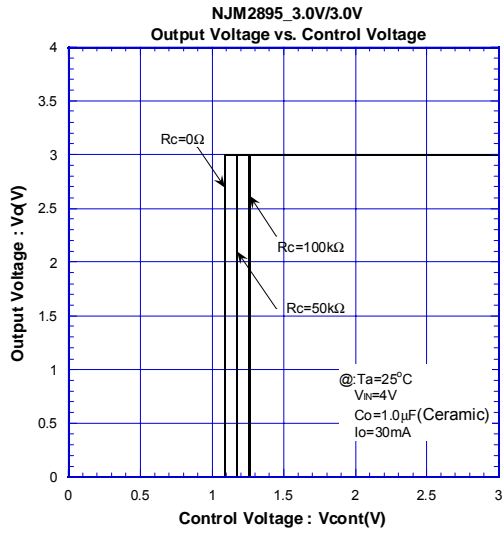
POWER DISSIPATION VS. AMBIENT TEMPERATURE



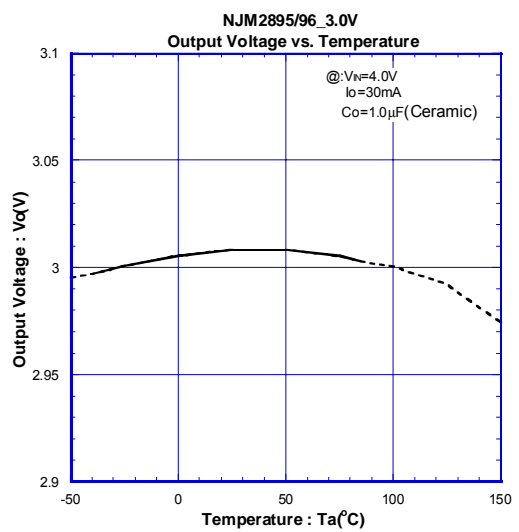
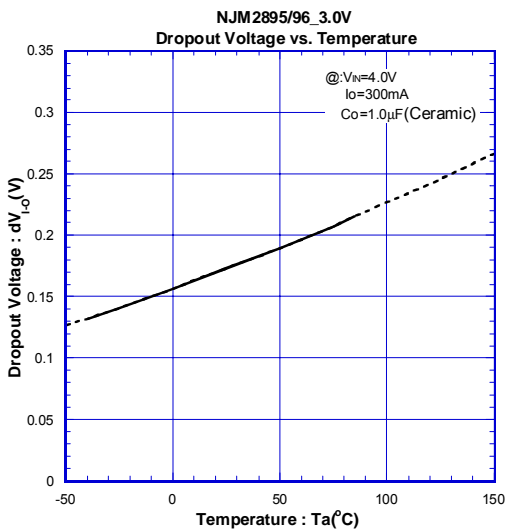
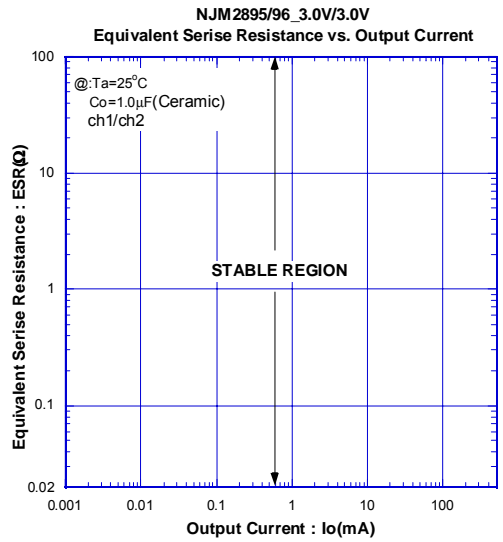
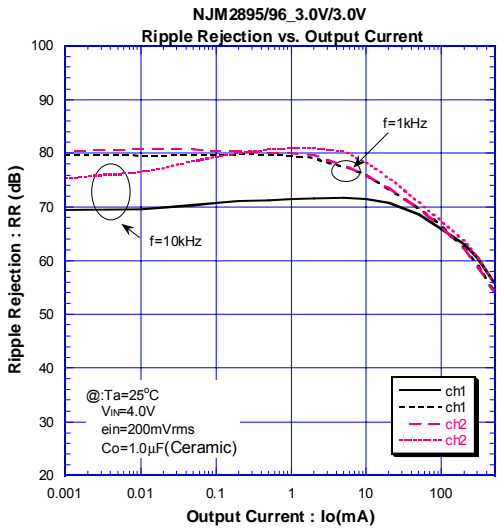
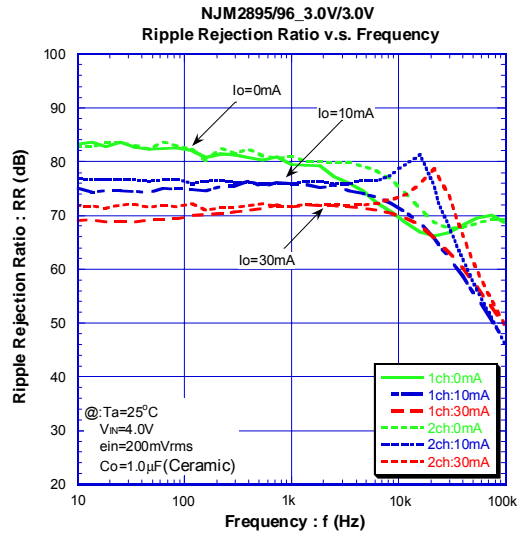
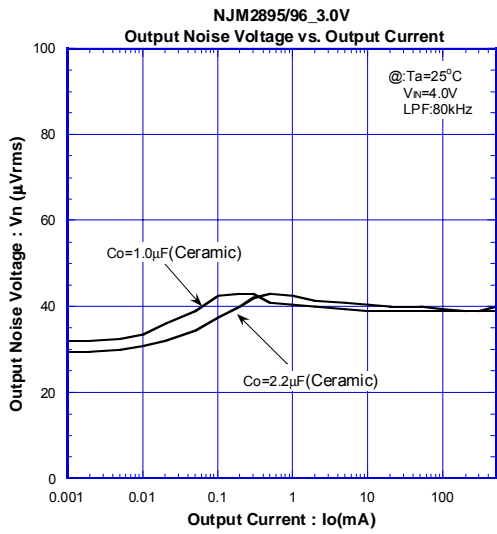
ELECTRICAL CHARACTERISTICS



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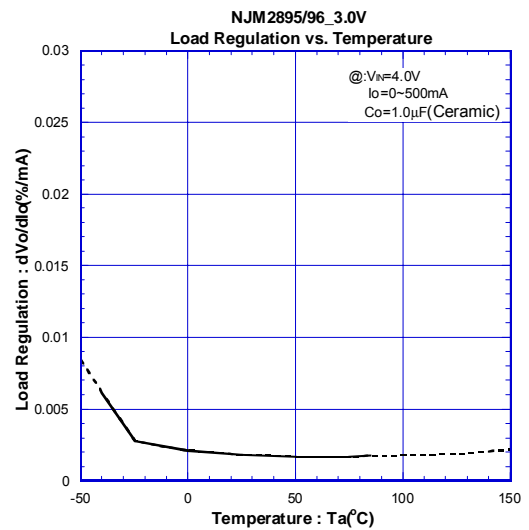
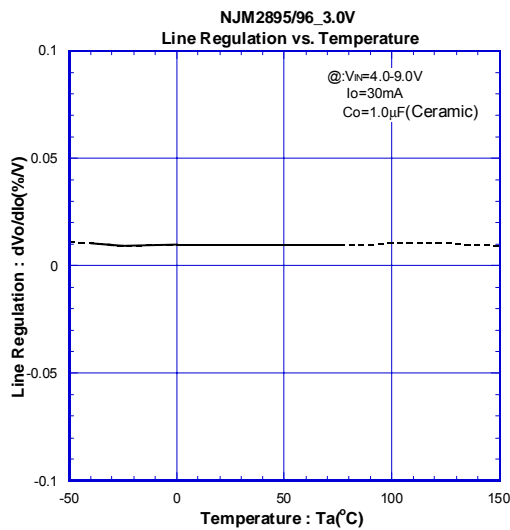
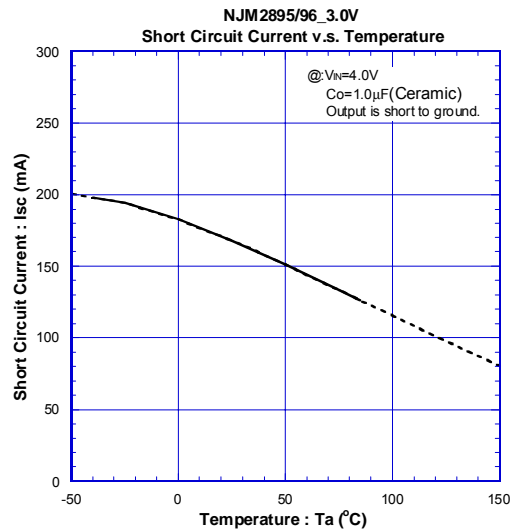
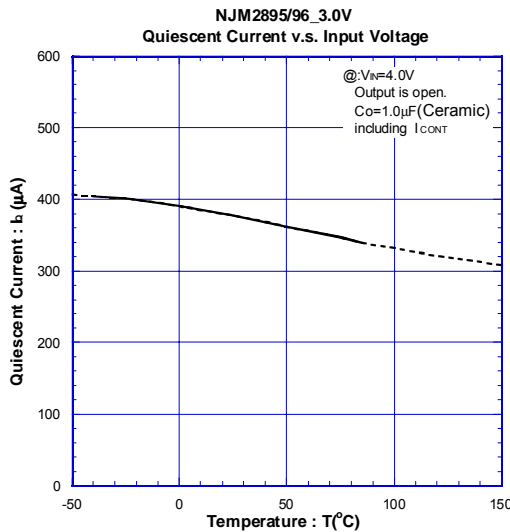
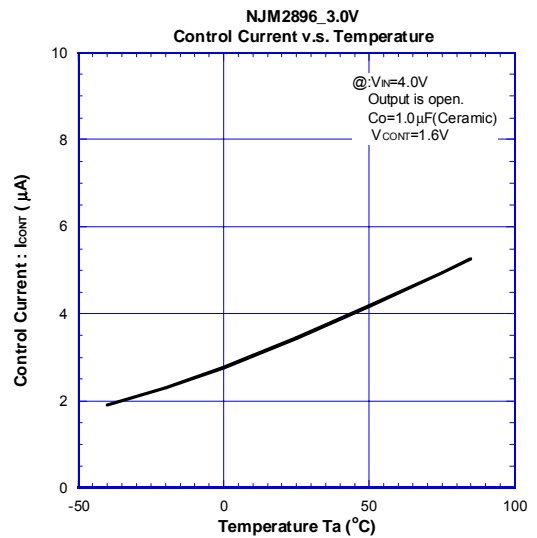
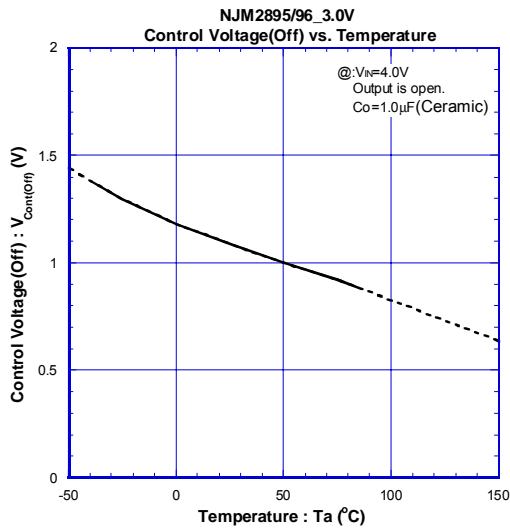
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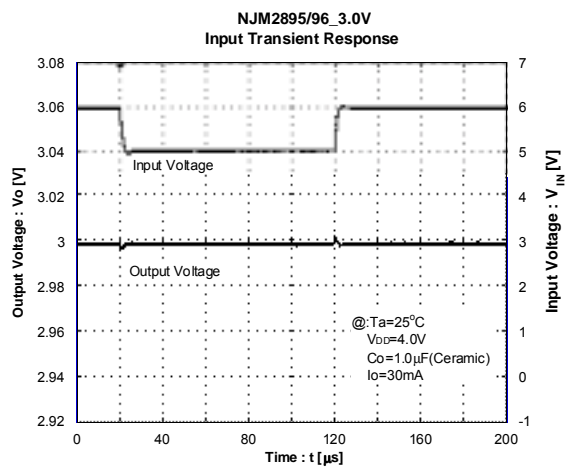
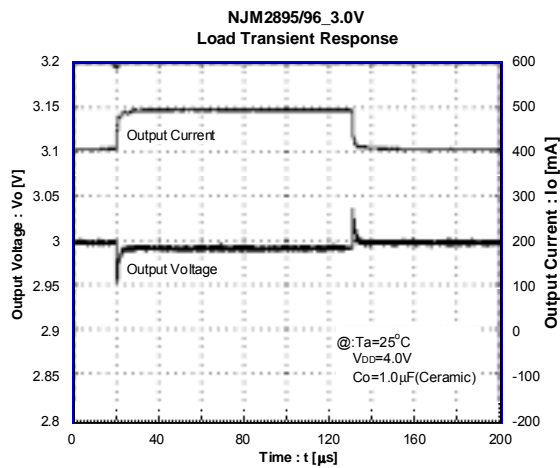
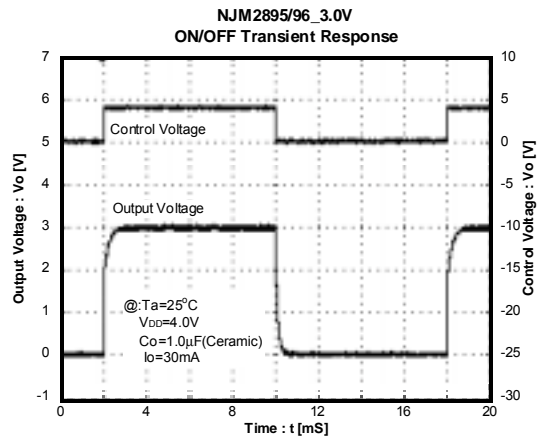
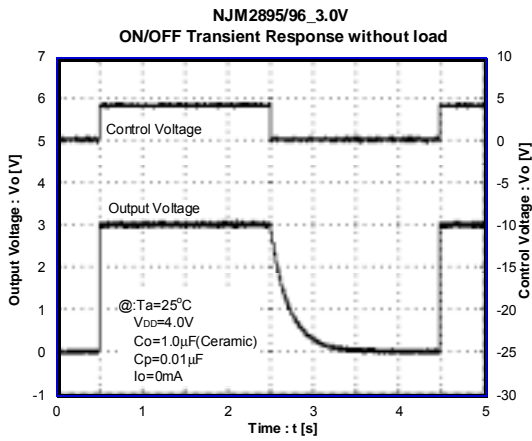
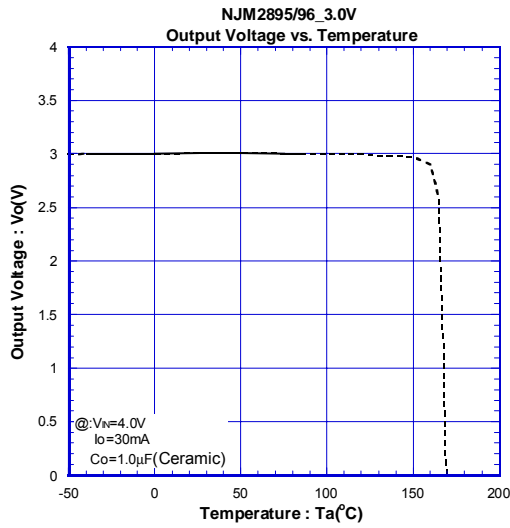
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