

LOW DROPOUT VOLTAGE REGULATOR

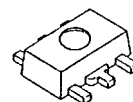
■ GENERAL DESCRIPTION

The NJU7790 is a 500mA output low dropout voltage regulator with ON/OFF control.

Advanced CMOS technology achieves high ripple rejection and low quiescent current.

Small packaging and 2.2 μ F small decoupling capacitor make the NJU7790 suitable for space conscious applications.

■ PACKAGE OUTLINE

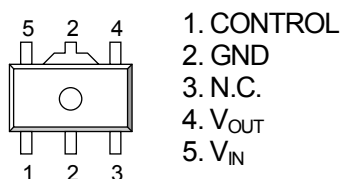


NJU7790U1

■ FEATURES

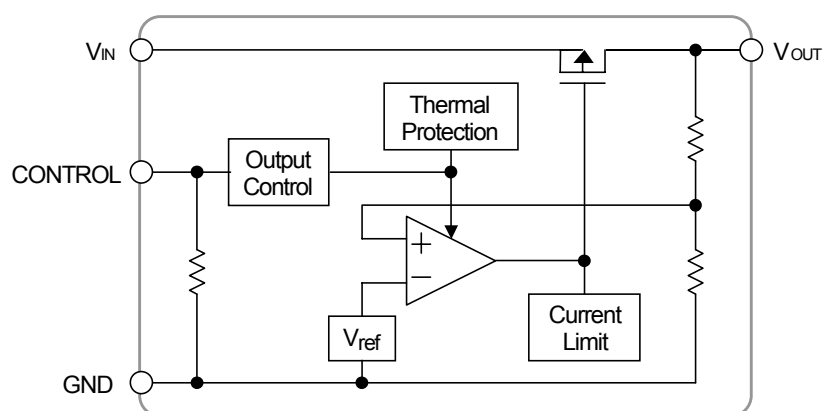
- High Ripple Rejection 65dB typ. (f=400Hz, Vo=3.0V Version)
- Low quiescent Current Iq=30 μ A typ. (Io=0mA)
- Output Current Io(max.)=500mA
- High Precision Output Vo $\pm$ 1.0%
- Output capacitor with 2.2 μ F ceramic capacitor (Vo $\geq$ 2.1V version)
- Low Dropout Voltage 0.14V typ. (Io=300mA, Vo=3.0V Version)
- ON/OFF Control
- Internal Thermal Overload Protection
- Internal Over Current Protection
- CMOS Technology
- Package Outline SOT-89-5

■ PIN CONFIGURATION



NJU7790U1

■ EQUIVALENT CIRCUIT



■ OUTPUT VOLTAGE RANK LIST

Device Name	V _{OUT}
NJU7790U1-15	1.5V
NJU7790U1-21	2.1V
NJU7790U1-03	3.0V
NJU7790U1-33	3.3V
NJU7790U1-05	5.0V

■ ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage	V _{IN}	+9	V
Control Voltage	V _{CONT}	+9(*1)	V
Power Dissipation	P _D	350(*2)	mW
Operating Temperature	Topr	-40~+85	°C
Storage Temperature	Tstg	-40~+125	°C

(*1) : When input voltage is less than +10V, the absolute maximum control voltage is equal to the input voltage.

(*2) : Device itself.

■ Operating voltage

V_{IN}=+2.3 ~ +8V (In case of Vo<2.1V version)

■ ELECTRICAL CHARACTERISTICS (V_{IN}=Vo+1V, C_{IN}=1.0μF, Co=2.2μF(Co=4.7μF: Vo≤2.0V), Ta=25°C)

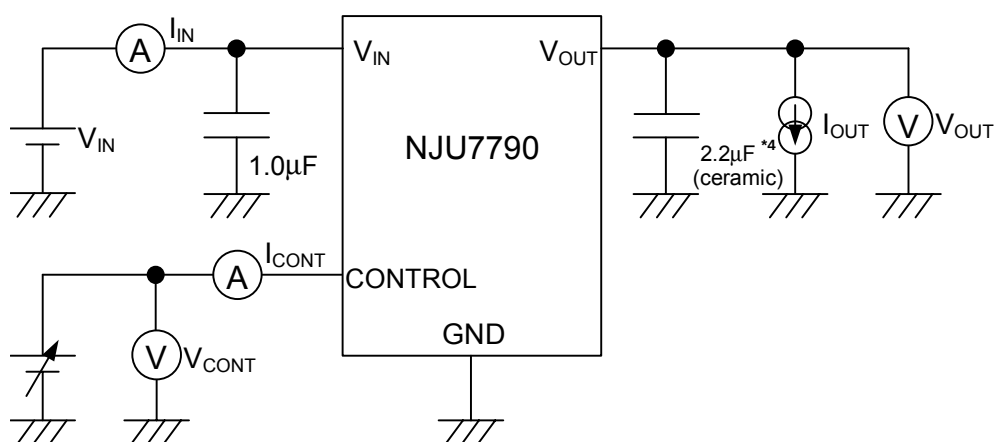
PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Voltage	Vo	Io=30mA	-1.0%	—	+1.0%	V
Input Voltage	V _{IN}		—	—	8	V
Quiescent Current	I _Q	Io=0mA, V _{CONT} =V _{IN} , Include I _{CONT}	—	30	60	μA
Quiescent Current at Control OFF	I _{Q(OFF)}	V _{CONT} =0V	—	0.1	1.0	μA
Output Current	Io	Vo - 0.1V (Vo≤2.0V Version) Vo - 0.3V (Vo≥2.1V Version)	500	—	—	mA
Short Current Limit	I _{LIM}	Vo=0V	—	180	—	mA
Line Regulation	ΔVo/ΔV _{IN}	V _{IN} =Vo+1V ~ Vo+6.0V (Vo<2V Version) V _{IN} =Vo+1V ~ 8.0V (Vo≥2V Version), Io=30mA	—	—	0.15	%/V
Load Regulation	ΔVo/ΔIo	Io=0 ~ 500mA	—	—	0.005	%/mA
Dropout Voltage(*3)	ΔV _{LO}	Io=300mA	2.1V≤Vo<2.5V	—	0.17	0.22 V
			2.5V≤Vo<2.9V	—	0.15	0.19 V
			2.9V≤Vo<3.5V	—	0.14	0.18 V
			3.5V≤Vo≤5.0V	—	0.12	0.16 V
Ripple Rejection	RR	ein=200mVrms, f=400Hz, Io=10mA, Vo=3V Version	—	65	—	dB
Average Temperature Coefficient of Output Voltage	ΔVo/ΔTa	Ta=0 ~ +85°C, Io=10mA	—	±100	—	ppm/°C
Output Noise Voltage	V _{NO}	f=10Hz ~ 80kHz, Io=10mA, Vo=3V Version	—	75	—	μVrms
Pull-down Resistance	R _{CONT}		2	5	10	MΩ
Control Voltage for ON-state	V _{CONT(ON)}		1.6	—	—	V
Control Voltage for OFF-state	V _{CONT(OFF)}		—	—	0.3	V

(*3): Except output voltage less than 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.

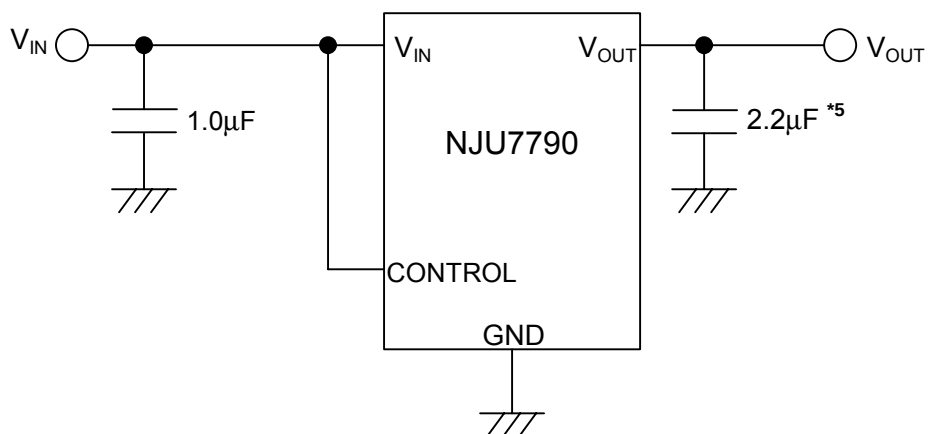
■ TEST CIRCUIT



*4 $V_O \leq 2.0V$ version: $C_O = 4.7\mu F$ (ceramic)

■ TYPICAL APPLICATION

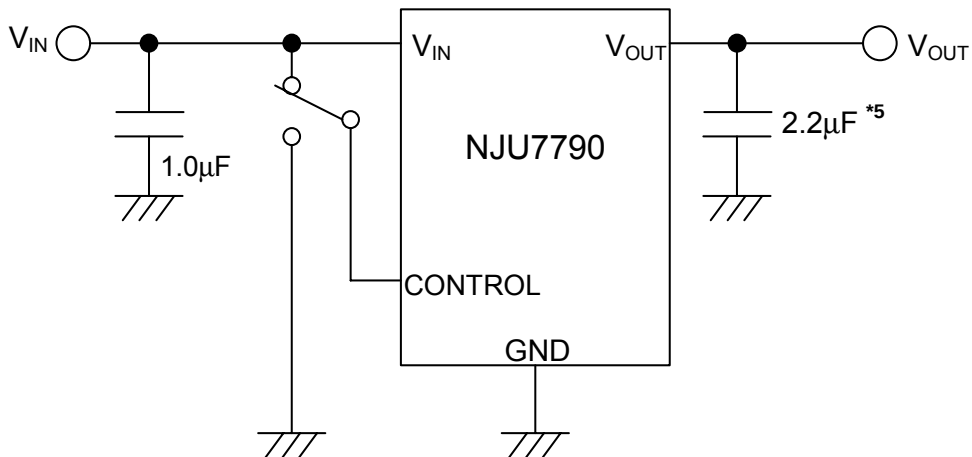
① In case that ON/OFF Control is not required:



*5: $V_O \leq 2.0V$ version: $C_O = 4.7\mu F$

Connect control terminal to V_{IN} terminal.

② In use of ON/OFF Control



*5: $V_O \leq 2.0V$ version: $C_O = 4.7\mu F$

State of control terminal:

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

*Input Capacitance C_{IN}

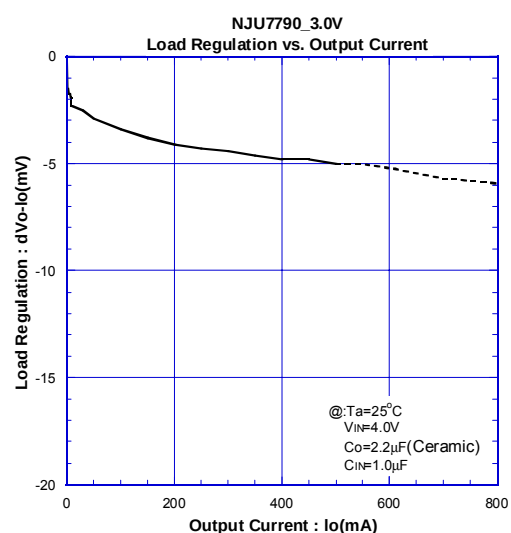
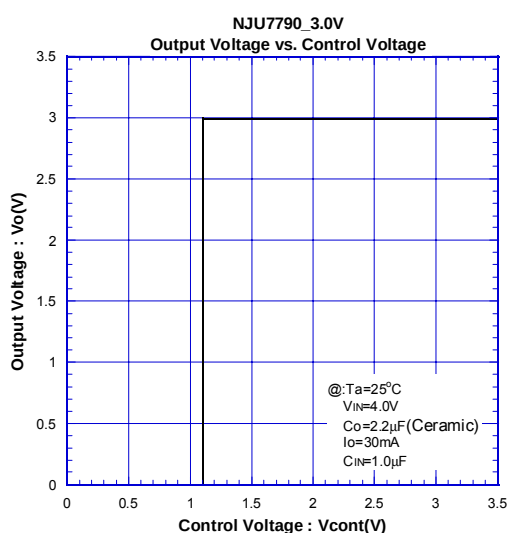
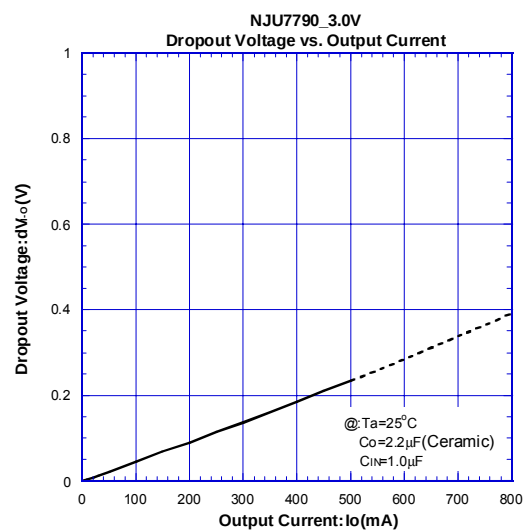
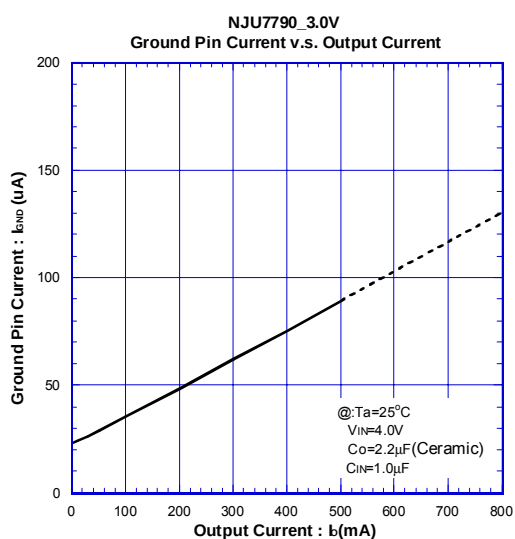
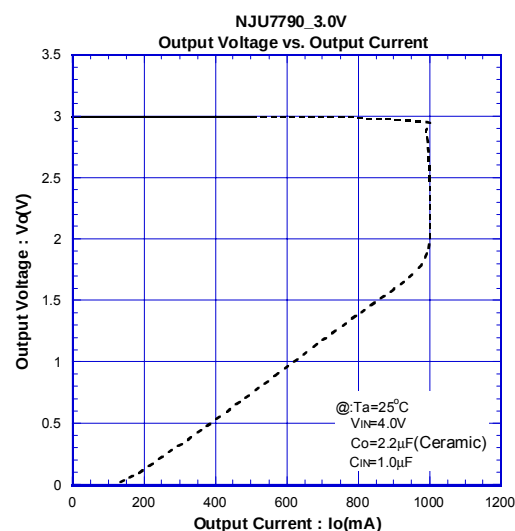
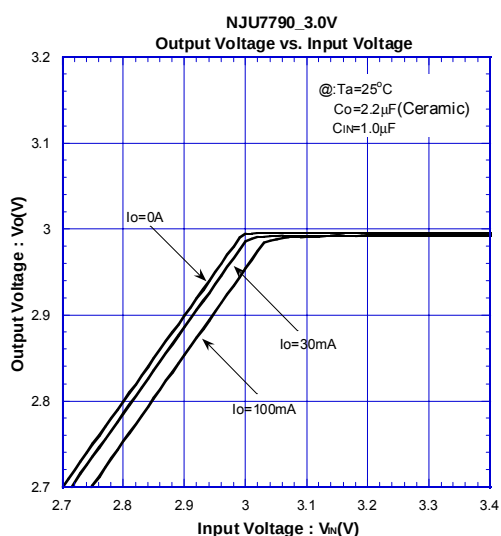
Input Capacitance C_{IN} is required to prevent oscillation and reduce power supply ripple for applications with high power supply impedance or a long power supply line.

Use the C_{IN} value of $1.0\mu F$ greater to avoid the problem.

C_{IN} should connect between GND and V_{IN} as short as possible.

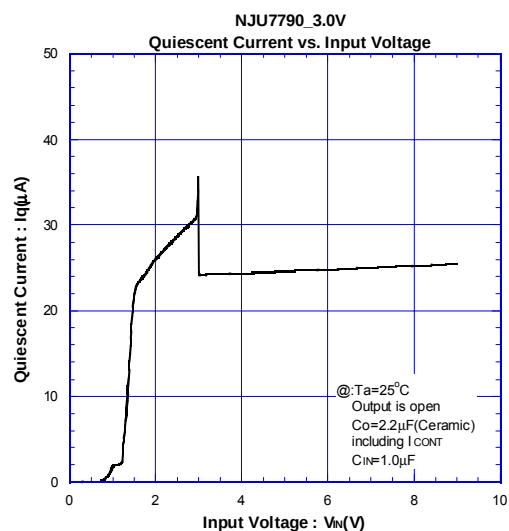
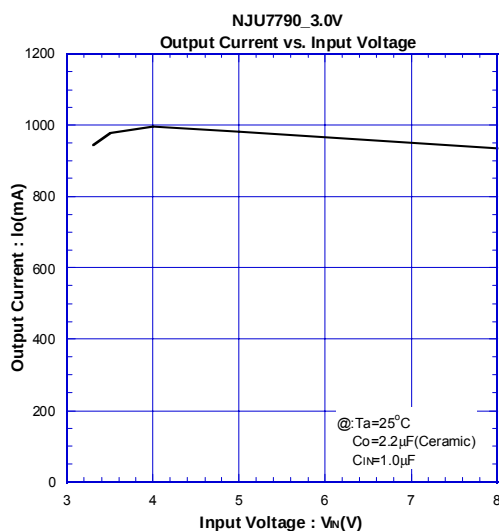
■ TYPICAL CHARACTERISTICS

● DC CHARACTERISTICS

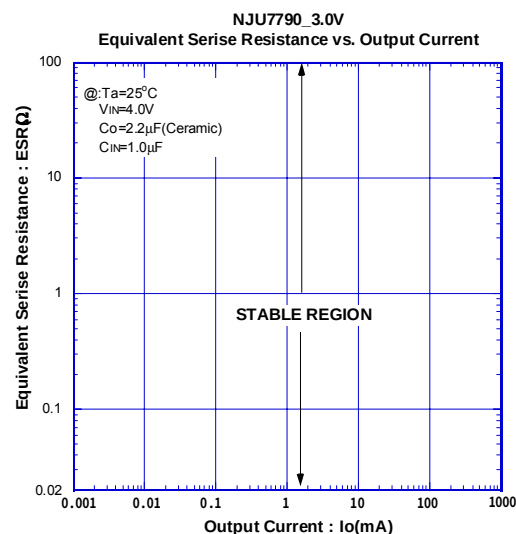
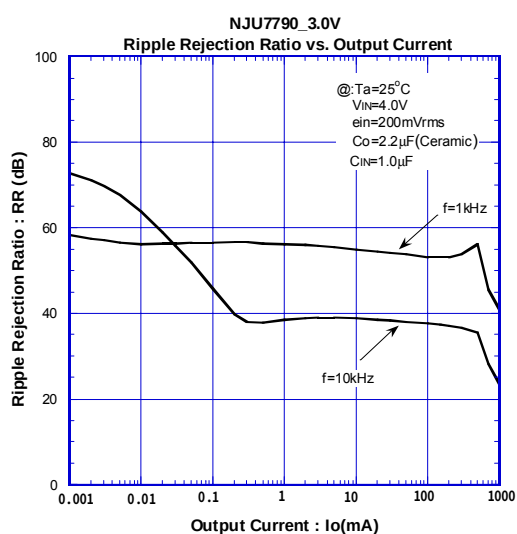
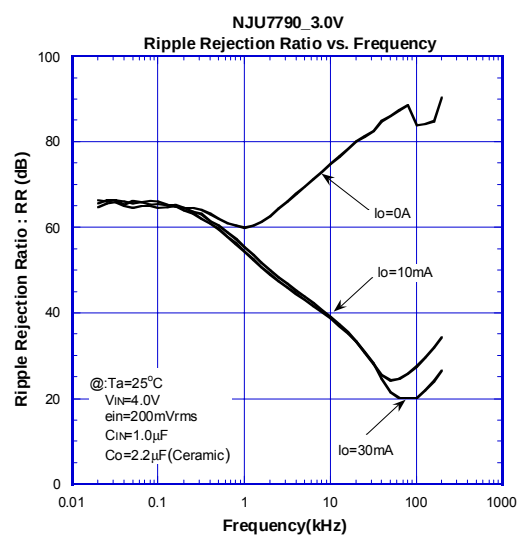
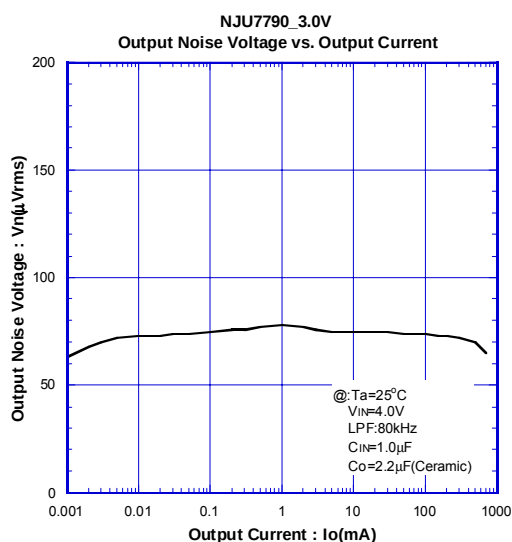


■ TYPICAL CHARACTERISTICS

● DC CHARACTERISTICS

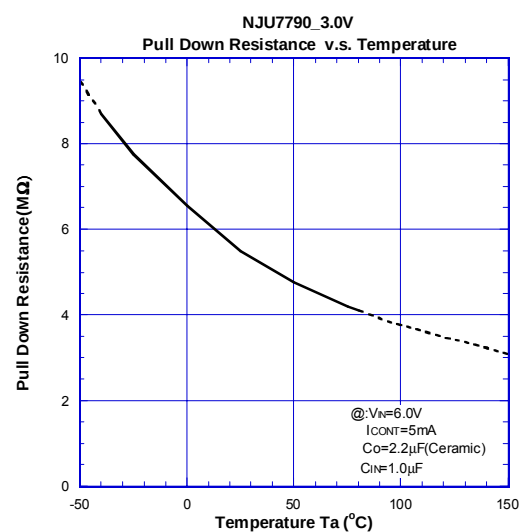
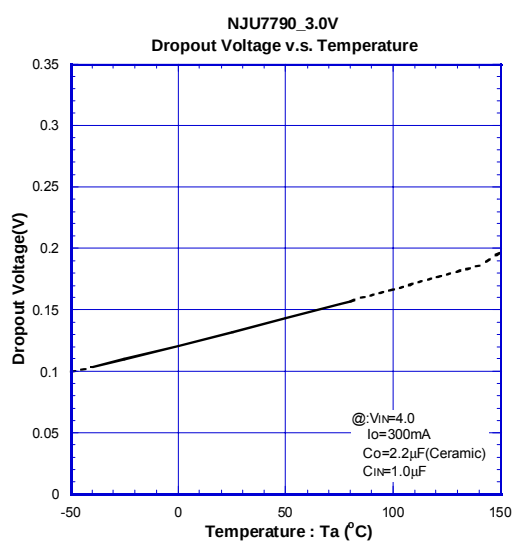
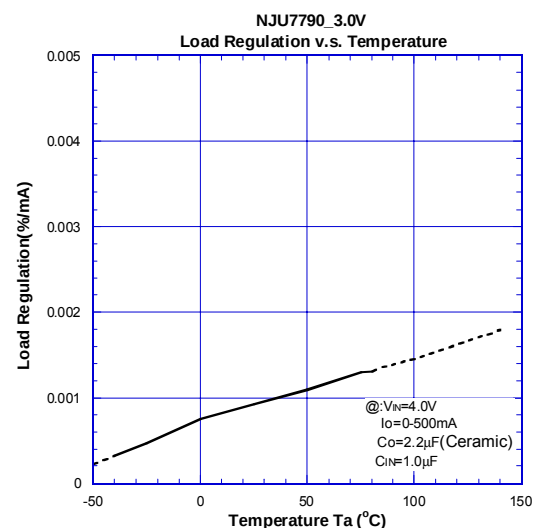
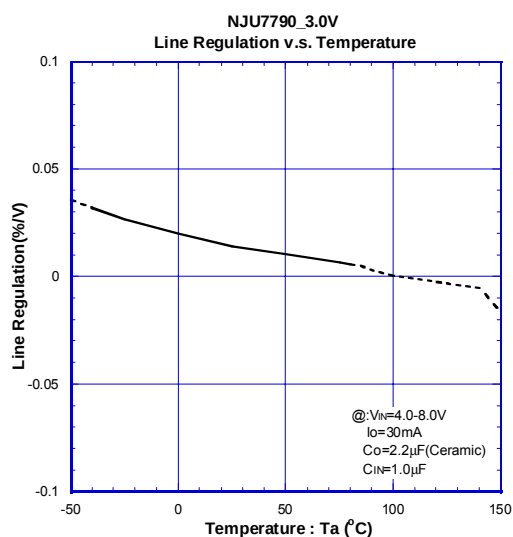
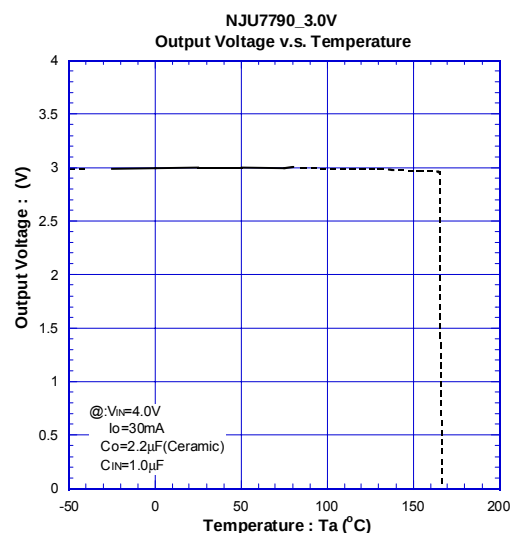
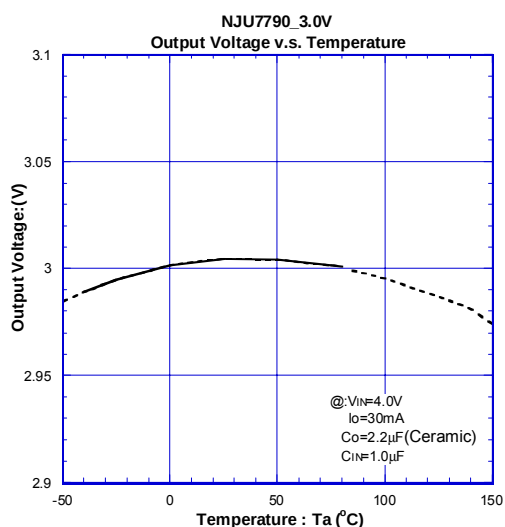


● AC CHARACTERISTICS



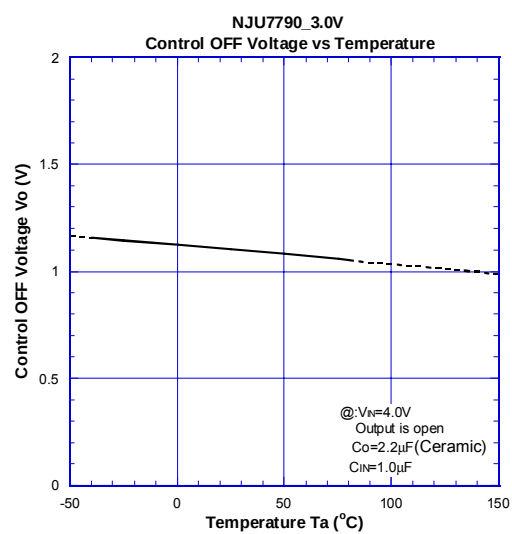
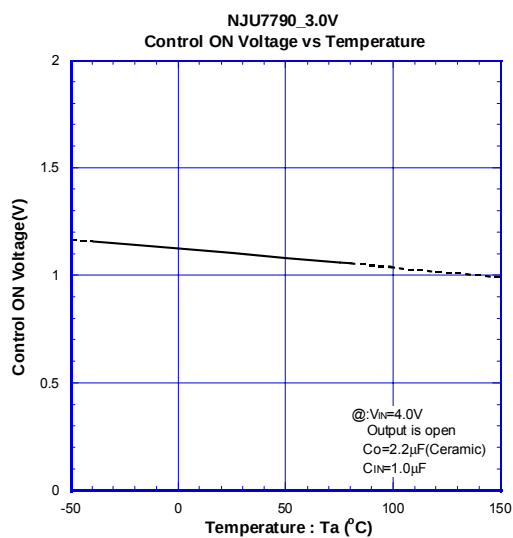
■ TYPICAL CHARACTERISTICS

● TEMPERATURE CHARACTERISTICS



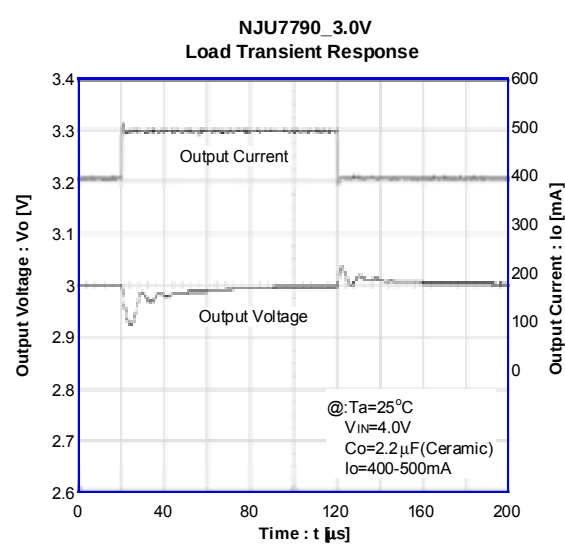
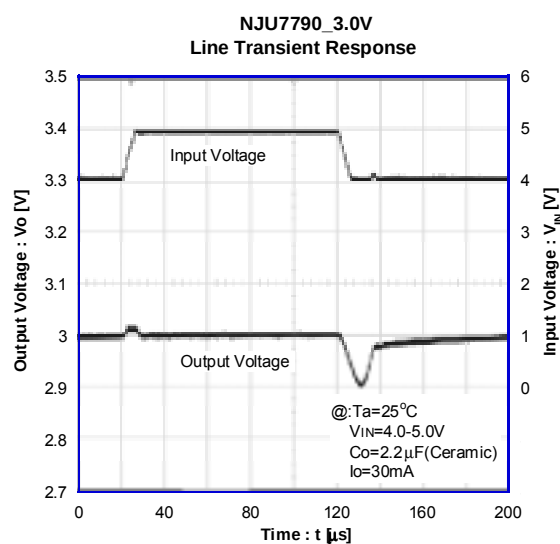
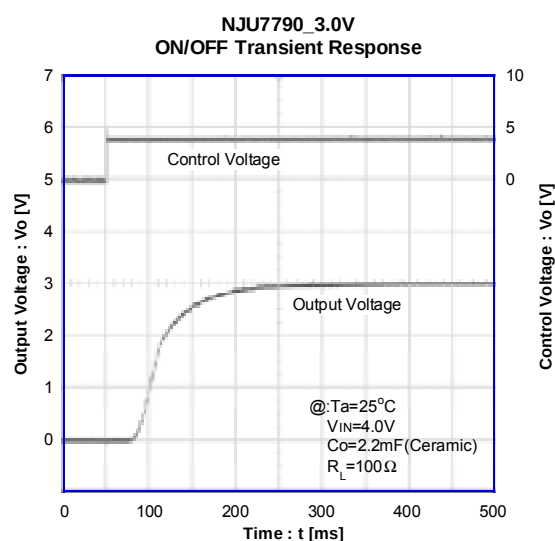
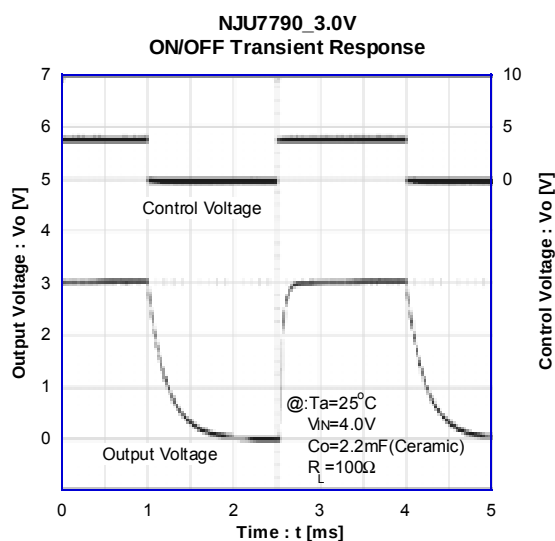
■ TYPICAL CHARACTERISTICS

● TEMPERATURE CHARACTERISTICS



■ TYPICAL CHARACTERISTICS

● TRANSIENT RESPONSE



[CAUTION]

The specifications on this databook are only given for information, without any guarantee as regards either mistakes or omissions. The application circuits in this databook are described only to show representative usages of the product and not intended for the guarantee or permission of any right including the industrial rights.

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[NJR:](#)

[NJU7790U1-TE1](#)