

## LOW DROPOUT VOLTAGE REGULATOR

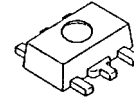
### ■ GENERAL DESCRIPTION

The NJU7780/81 is a low dropout voltage regulator with ON/OFF Control.

Advanced CMOS technology achieves low quiescent current. It is suitable for cellular phone and other portable items.

When the ON/OFF control is used, NJU7781 has high transition response characteristics for shunt switch.

### ■ PACKAGE OUTLINE

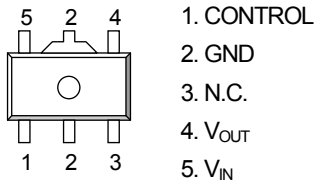


NJU7780/81U1 ( SOT-89-5 )

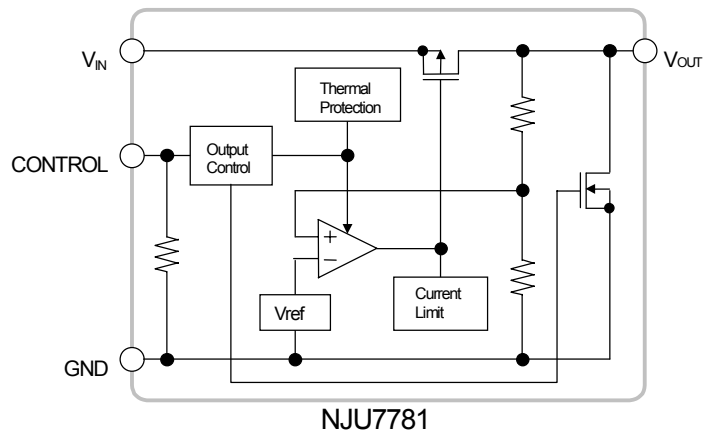
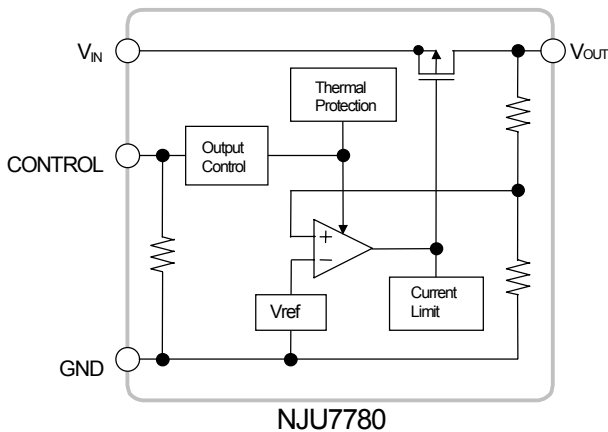
### ■ FEATURES

- High Ripple Rejection      65dB typ. (f=400Hz, Vo=3V)
- Low quiescent Current      Iq=20μA (Io=0mA, VCONT=VIN)
- Output capacitor with 1.0μF ceramic capacitor
- Output Current              Io(max)=300mA
- High Precision Output      Vo±1.0%
- Low Dropout Voltage        0.15V typ. (Io=150mA, Vo=3.0V)
- ON/OFF Control              (Active High)
- Shunt Switch                Only NJU7781
- Internal Short Circuit Current Limit
- Internal Thermal Overload Protection
- CMOS technology
- Package outline              SOT-89-5

### ■ PIN CONFIGURATION



### ■ EQUIVALENT CIRCUIT



# NJU7780/81

## ■ OUTPUT VOLTAGE RANK LIST (1.5V~5.0V : 0.1V step)

Device Name	V <sub>OUT</sub>
NJU778xU1-21	2.1V
NJU778xU1-25	2.5V
NJU778xU1-03	3.0V
NJU778xU1-33	3.3V
NJU778xU1-05	5.0V

## ■ ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage	V <sub>IN</sub>	+10	V
Control Voltage	V <sub>CONT</sub>	+10(note 1)	V
Power Dissipation	P <sub>D</sub>	350(note 2)	mW
Operating Temperature	Topr	-40 ~ +85	°C
Storage Temperature	Tstg	-40 ~ +125	°C
OFF-state Output Sink Current (note 3)	I <sub>o</sub>	10	mA

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

(note 2): Device itself.

(note 3): This maximum rating is applied to NJU7781.

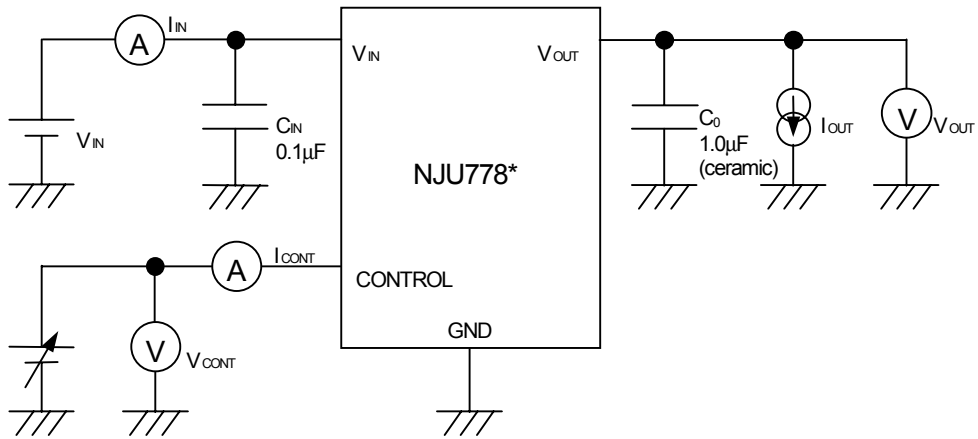
## ■ ELECTRICAL CHARACTERISTICS

(V<sub>IN</sub>=V<sub>o</sub>+1V, C<sub>IN</sub>=0.1μF, C<sub>o</sub>=0.1μF, Ta=25°C)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Output Voltage	V <sub>o</sub>	I <sub>o</sub> =30mA	-1.0%	-	+1.0%	V	
Input Voltage	V <sub>IN</sub>		-	-	9	V	
Quiescent Current	I <sub>Q</sub>	I <sub>o</sub> =0mA, V <sub>CONT</sub> =V <sub>IN</sub>	-	20	40	μA	
Quiescent Current at Control OFF	I <sub>Q(OFF)</sub>	V <sub>CONT</sub> =0V	-	-	1	μA	
Output Current	I <sub>o</sub>	V <sub>o</sub> =0.3V	300	-	-	mA	
Short Current Limit	I <sub>LIM</sub>	V <sub>o</sub> =0V	-	120	-	mA	
Line Regulation	ΔV <sub>o</sub> /ΔV <sub>IN</sub>	V <sub>IN</sub> =V <sub>o</sub> +1V~V <sub>o</sub> +6V(3.0>V <sub>o</sub> ), V <sub>IN</sub> =V <sub>o</sub> +1V~V <sub>o</sub> +9V(3.0≤V <sub>o</sub> ), I <sub>o</sub> =30mA	-	-	0.10	%/V	
Load Regulation	ΔV <sub>o</sub> /ΔI <sub>o</sub>	I <sub>o</sub> =0~300mA	-	-	0.015	%/mA	
Dropout Voltage	ΔV <sub>I-O</sub>	I <sub>o</sub> =150mA	2.1 ≤ V <sub>o</sub> ≤ 2.6V	-	0.18	0.25	V
			2.7 ≤ V <sub>o</sub> ≤ 3.3V	-	0.15	0.22	
			3.4 ≤ V <sub>o</sub> ≤ 5.0V	-	0.12	0.2	
Ripple Rejection	RR	e <sub>in</sub> =200mVrms, f=400Hz, I <sub>o</sub> =10mA, V <sub>o</sub> =3.0V	-	65	-	dB	
Average Temperature Coefficient of Output Voltage	ΔV <sub>o</sub> /ΔTa	Ta=0~85°C, I <sub>o</sub> =10mA	-	±100	-	ppm/ <sup>o</sup> C	
Output Noise Voltage	V <sub>NO</sub>	F=10Hz~80kHz, I <sub>o</sub> =10mA, V <sub>o</sub> =3.0V	-	80	-	μVrms	
Pull-Down Resistance	R <sub>CONT</sub>		1.5	5	10	MΩ	
Control Voltage for ON-state	V <sub>CONT(ON)</sub>		1.6	-	-	V	
Control Voltage for OFF-state	V <sub>CONT(OFF)</sub>		-	-	0.3	V	

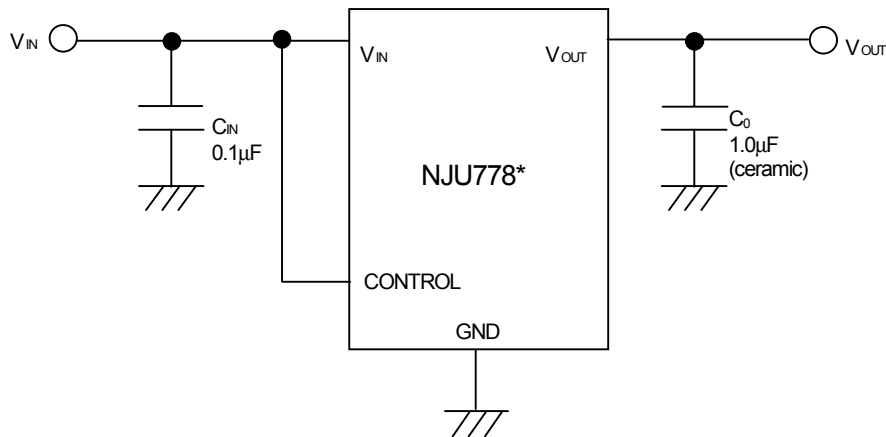
(note 4) Please confirm the specification separately because some parameters depend on output voltage.

## ■ TEST CIRCUIT



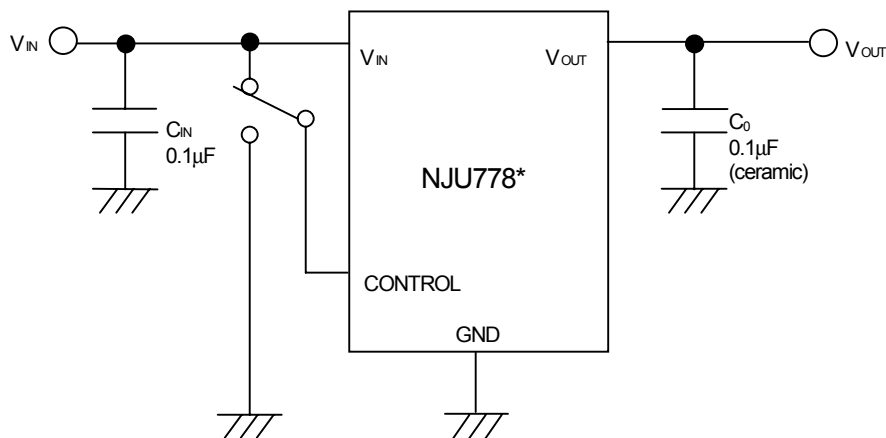
## ■ TYPICAL APPLICATION

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:

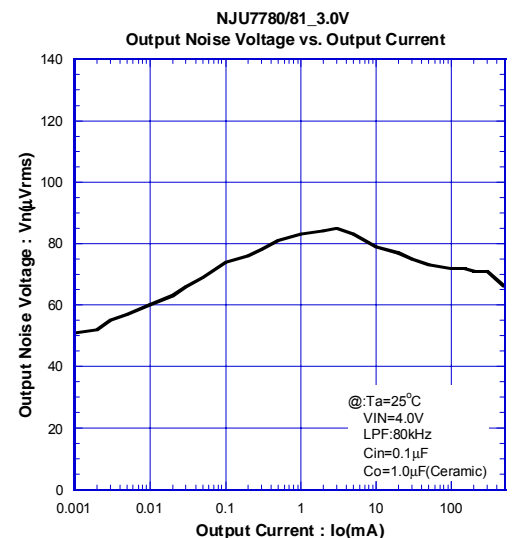
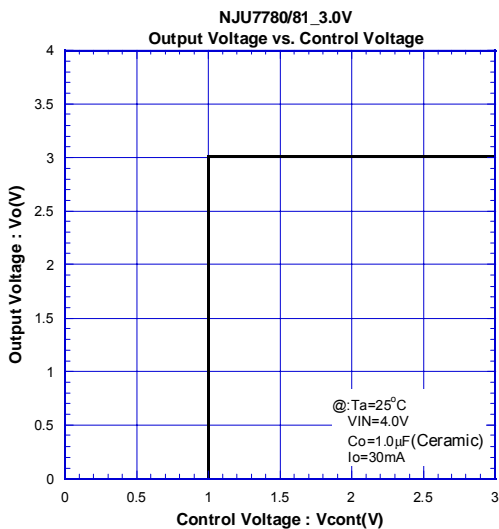
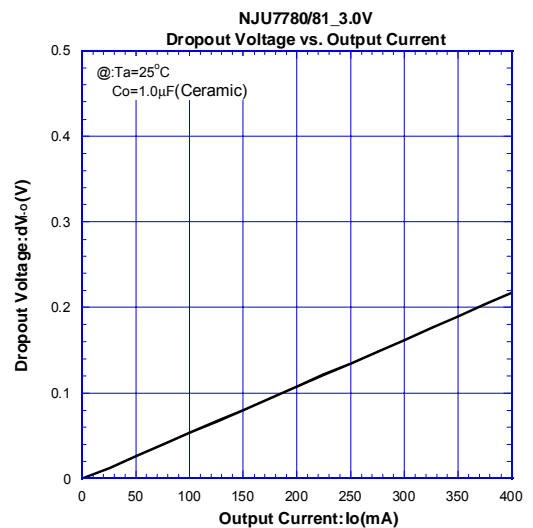
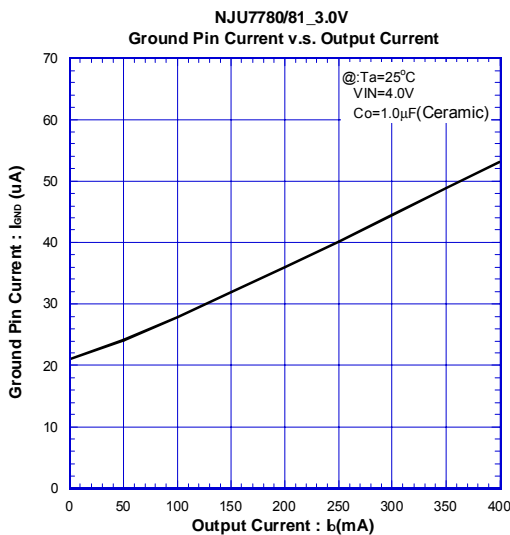
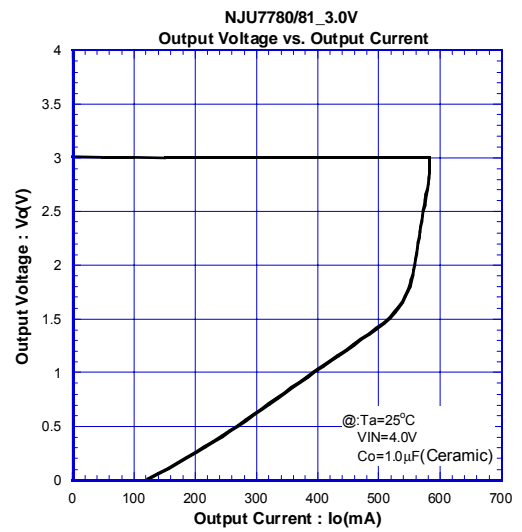
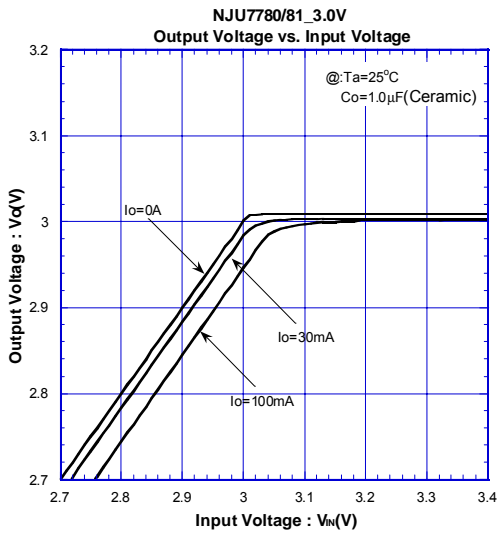


State of control terminal:

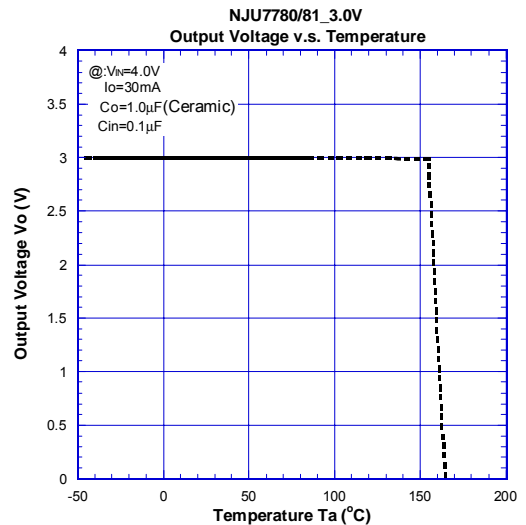
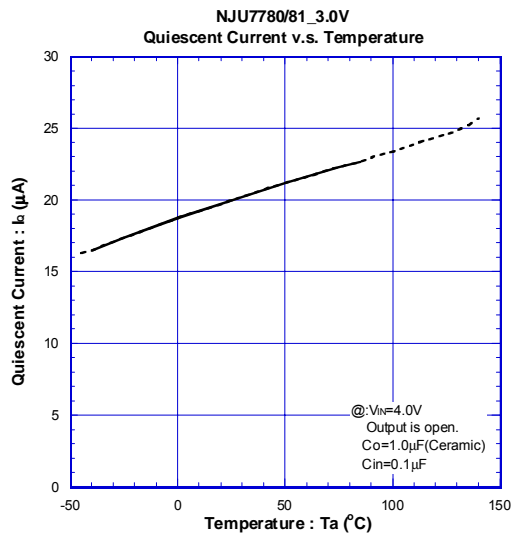
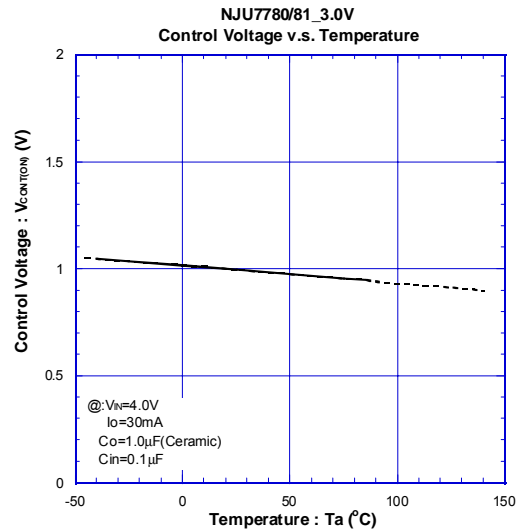
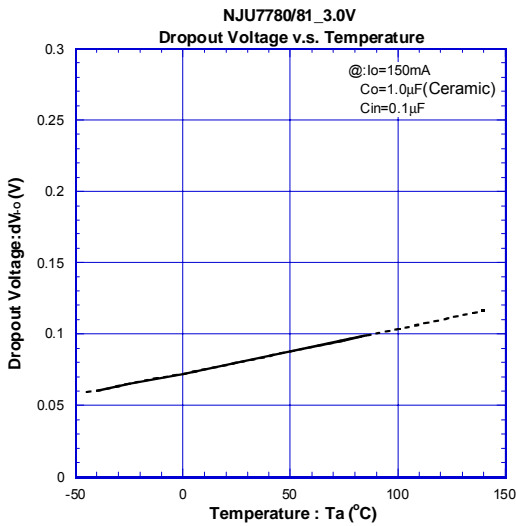
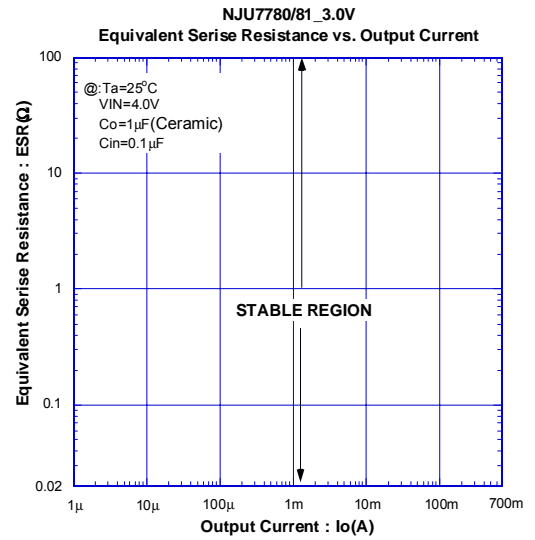
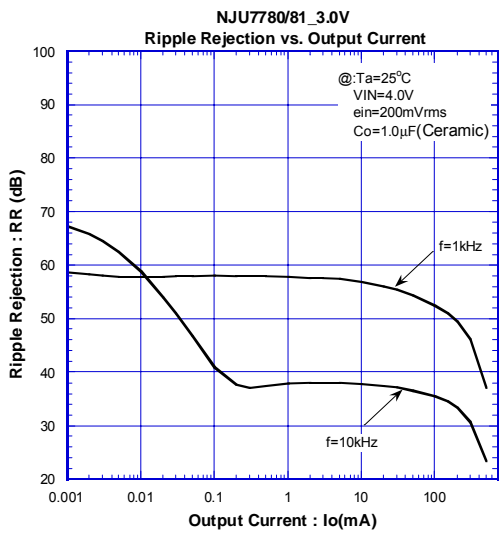
- “H” → output is enabled.
- “L” or “open” → output is disabled.

# NJU7780/81

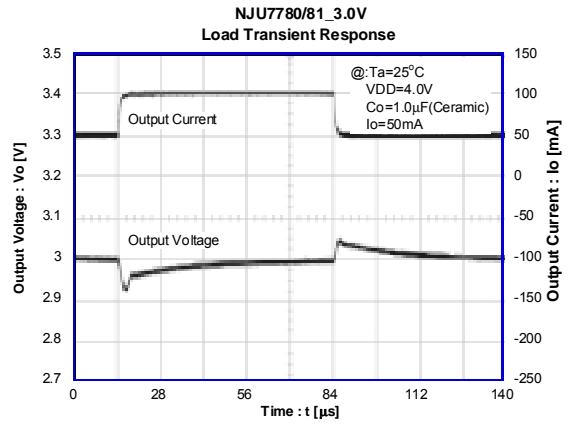
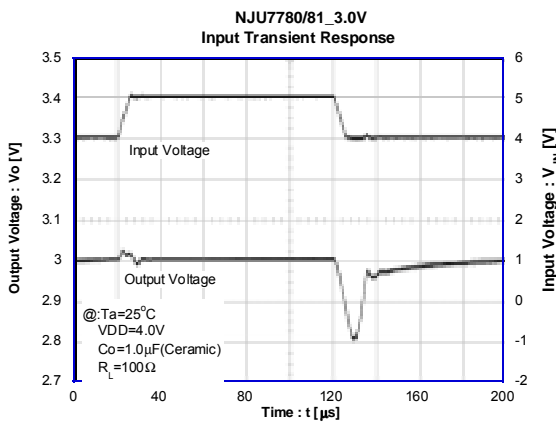
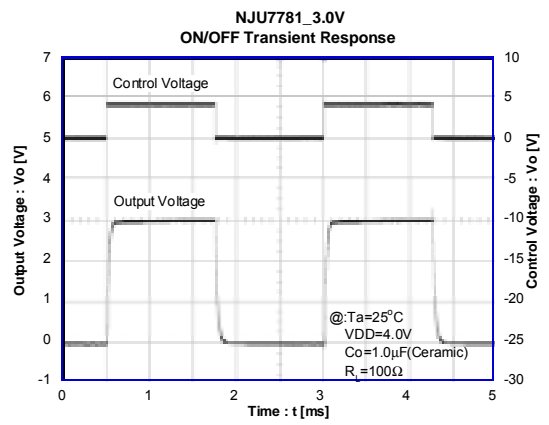
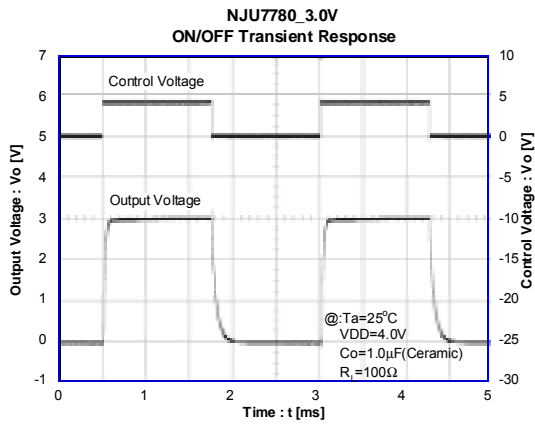
## ■ ELECTRICAL CHARACTERISTICS



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