

## LOW DROPOUT VOLTAGE REGULATOR

### ■ GENERAL DISCRIPTION

NJU7751/54 is a low dropout voltage regulator with ON/OFF control and Output shunt switch.

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

It is suitable for reset small micro controller and other logic chips.

### ■ PACKAGE OUTLINE

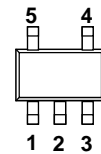


NJU7751/54F

### ■ FEATURES

- Ultra Low quiescent Current  $I_q=20\mu\text{A typ.}(I_o=0\text{mA})$
- Output capacitor with 1.0uF ceramic capacitor
- Output Current  $I_o(\text{max.})=100\text{mA}$
- High Precision Output  $V_o\pm 1.0\%$
- Low Dropout Voltage 0.15V typ. ( $I_o=60\text{mA}, V_o=3\text{V}$ )
- With ON/OFF Control (Active High)
- With Output Shunt Switch
- Internal Short Circuit Current Limit
- CMOS Technology
- Package Outline SOT-23-5

### ■ PIN CONFIGURATION

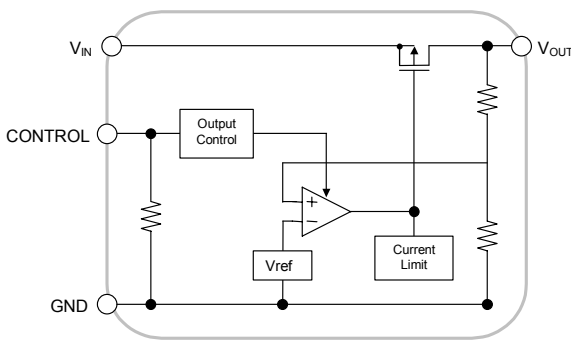


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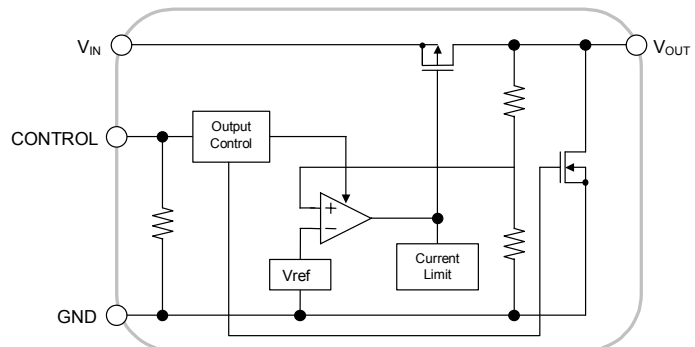
### PIN FUNCTION

- 1.CONTROL
- 2.GND
- 3.N.C.
4. $V_{OUT}$
5. $V_{IN}$

### ■ EQUIVALENT CIRCUIT



NJU7751



NJU7754

### ■ OUTPUT VOLTAGE RANK LIST

DEVICE NAME	$V_{OUT}$
NJU775*F21	2.1V
NJU775*F25	2.5V
NJU775*F03	3.0V
NJU775*F33	3.3V
NJU775*F05	5.0V

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## ■ 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(*1)	V	
Power Dissipation	P <sub>D</sub>	SOT-23-5	350(*2)	mW
			200(*3)	
Operating Temperature	Topr	-40 ~ +85	°C	
Storage Temperature	Tstg	-40 ~ +125	°C	
Output Sink Current at OFF-state(*4)	I <sub>o</sub>	10	mA	

(\*1) When input voltage is less than +10V, 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.

(\*4): This maximum rating is applied to NJU7754.

## ■ ELECTRICAL CHARACTERISTICS

(V<sub>IN</sub>=V<sub>O</sub>+1V, C<sub>IN</sub>=0.1μF, C<sub>O</sub>=1.0μF, Ta=25°C)

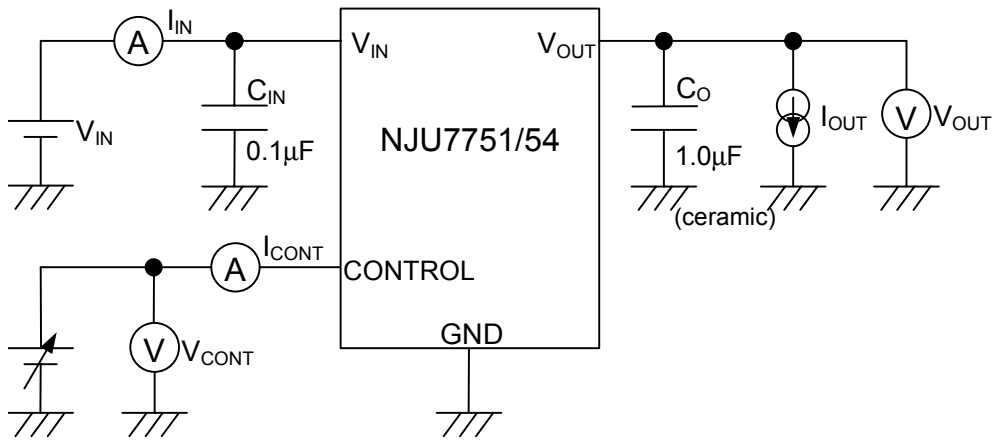
PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Output Voltage	V <sub>O</sub>	I <sub>o</sub> =30mA	-1.0%	-	+1.0%	V	
Input Voltage	V <sub>IN</sub>		-	-	9	V	
Quiescent Current	I <sub>Q</sub>	I <sub>o</sub> =0mA, V <sub>CONT</sub> =V <sub>IN</sub> , Include I <sub>CONT</sub>	-	20	40	μA	
Quiescent Current at Control OFF	I <sub>Q(OFF)</sub>	V <sub>CONT</sub> =0V	-	0.1	1	μA	
Output Current	I <sub>o</sub>	V <sub>O</sub> -0.3V	100	-	-	mA	
Short Circuit Limit	I <sub>LIM</sub>	V <sub>O</sub> =0V	-	40	-	mA	
Line Regulation	ΔV <sub>O</sub> /ΔV <sub>IN</sub>	V <sub>IN</sub> =V <sub>O</sub> +1V~V <sub>O</sub> +6.0V(V <sub>O</sub> <3.0V) V <sub>IN</sub> =V <sub>O</sub> +1V~9.0V(V <sub>O</sub> ≥3.0V), I <sub>o</sub> =30mA	-	-	0.20	%/V	
Load Regulation	ΔV <sub>O</sub> /ΔV <sub>O</sub>	I <sub>o</sub> =0~100mA	-	-	0.03	%/mA	
Dropout Voltage	ΔV <sub>I-O</sub>	I <sub>o</sub> =60mA	2.1V≤V <sub>O</sub> ≤2.4V	-	0.20	0.27	V
			2.5V≤V <sub>O</sub> ≤2.7V	-	0.18	0.25	V
			2.8V≤V <sub>O</sub> ≤3.3V	-	0.15	0.22	V
			3.4V≤V <sub>O</sub> ≤5.0V	-	0.12	0.19	V
Ripple Rejection	RR	e <sub>in</sub> =200mVrms, f=1kHz, I <sub>o</sub> =10mA, V <sub>O</sub> =3.0V Version	-	65	-	dB	
Average Temperature Coefficient of Output Voltage	ΔV <sub>O</sub> /ΔTa	Ta=0~85°C, I <sub>o</sub> =10mA	-	±100	-	ppm/°C	
Output Noise Voltage	V <sub>NO</sub>	f=10Hz ~ 80kHz, I <sub>o</sub> =10mA, V <sub>O</sub> =3.0V Version	-	75	-	μVrms	
Pull-down Resistance	R <sub>CONT</sub>		2	5	10	MΩ	
Control Voltage for ON-State	V <sub>CONT(ON)</sub>		1.6	-	-	V	
Control Voltage for OFF-State(*5)	V <sub>CONT(OFF)</sub>		-	-	0.3	V	
Pull-down Resistance at OFF-state	R <sub>O(OFF)</sub>	V <sub>CONT</sub> =0V (V <sub>O</sub> =3.0V Version)	-	150	-	Ω	

(\*5) This electrical characteristics is applied to NJU7754.

The above specification is a common specification for all voltages.

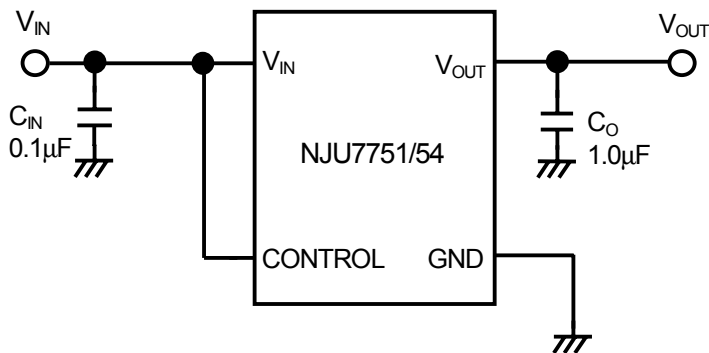
Therefore, it may be different from the individual specification for a specific output Voltage.

## ■ TEST CIRCUIT



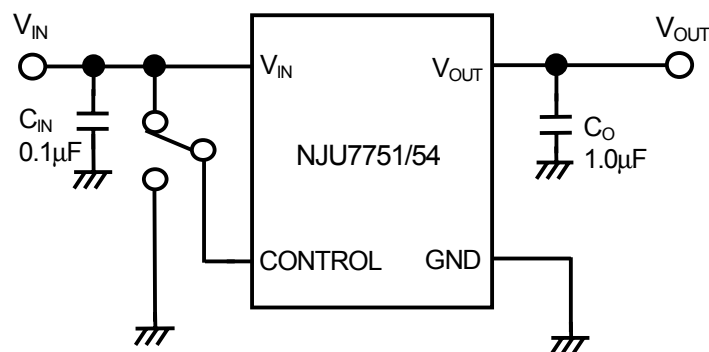
## ■ TYPICAL APPLICATION

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



Connect control terminal to VIN terminal.

② In use of ON/OFF Control

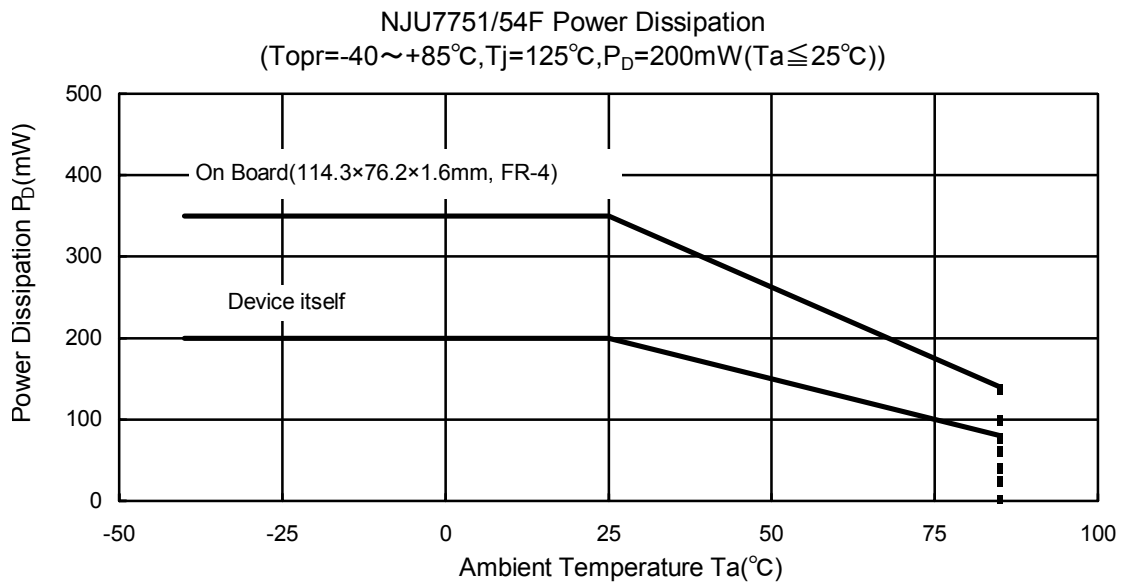


State of control terminal:

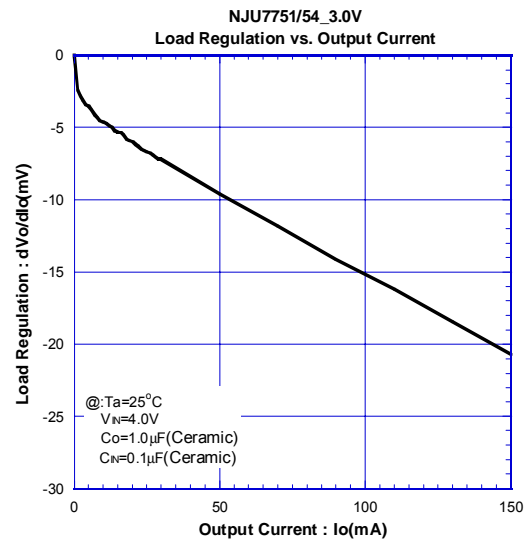
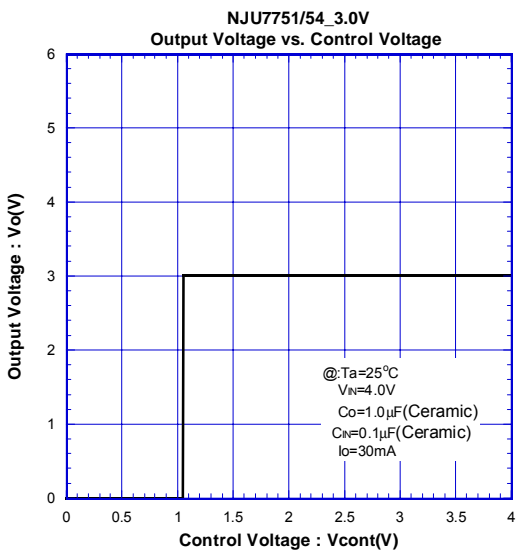
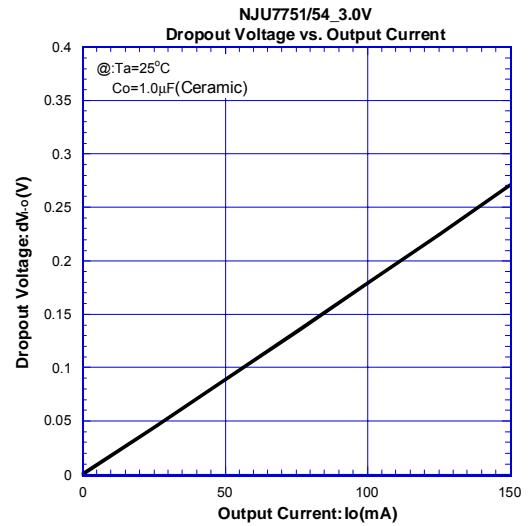
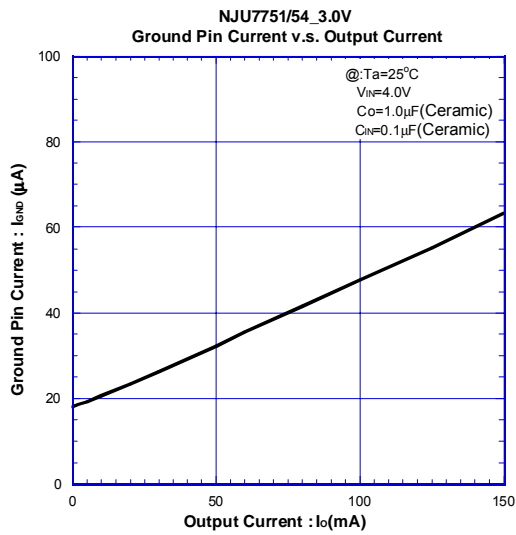
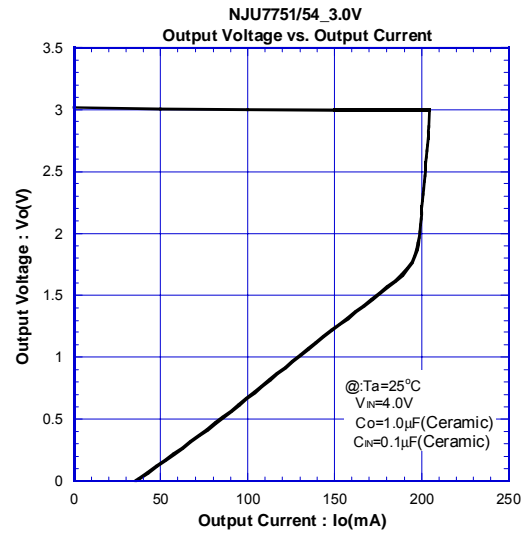
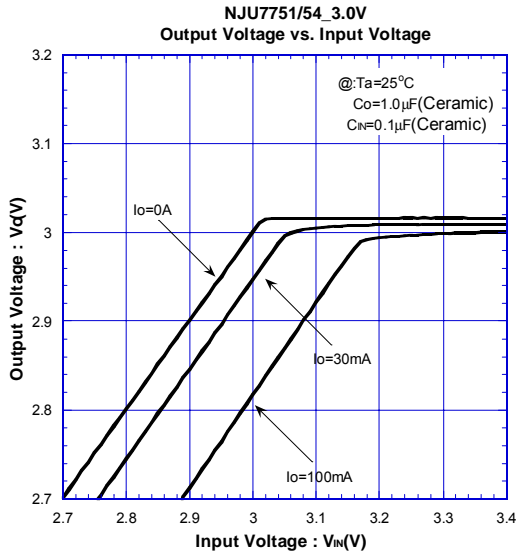
- "H" → output is enabled.
- "L" or "open" → output is disabled.

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## POWER DISSIPATION vs. AMBIENT TEMPERATURE

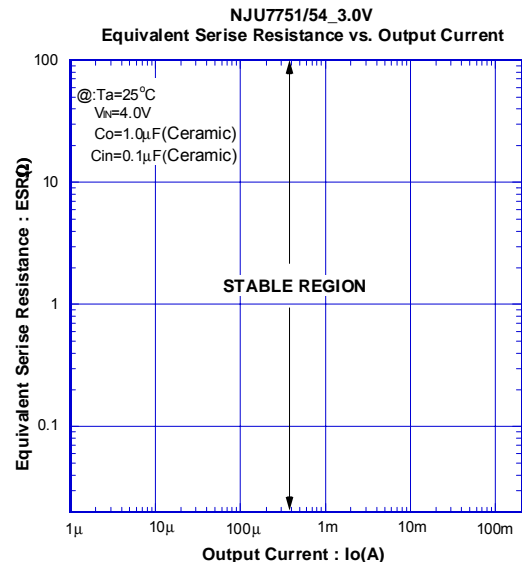
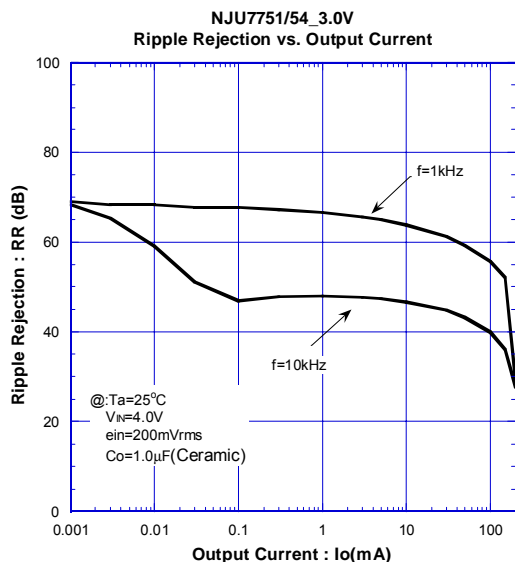
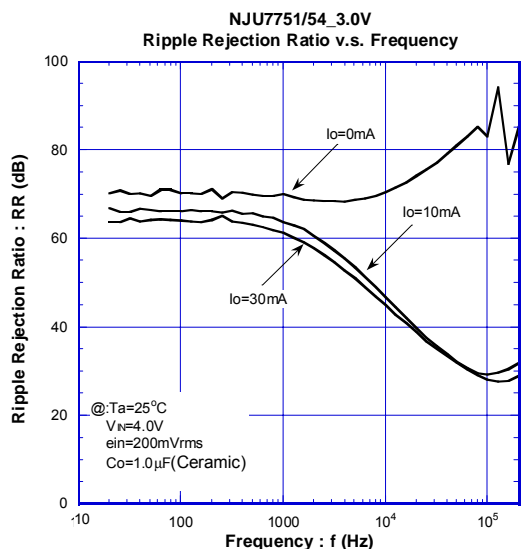
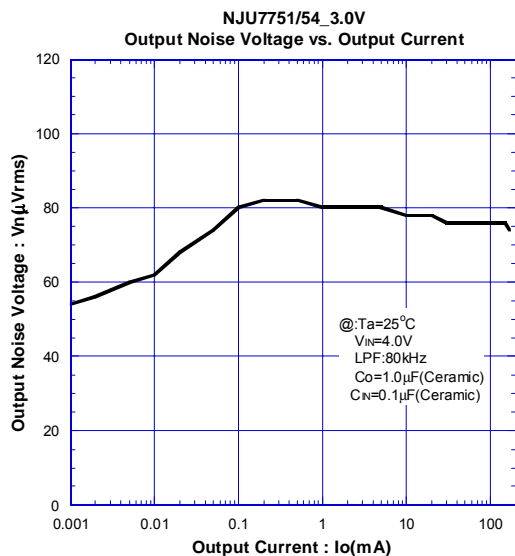
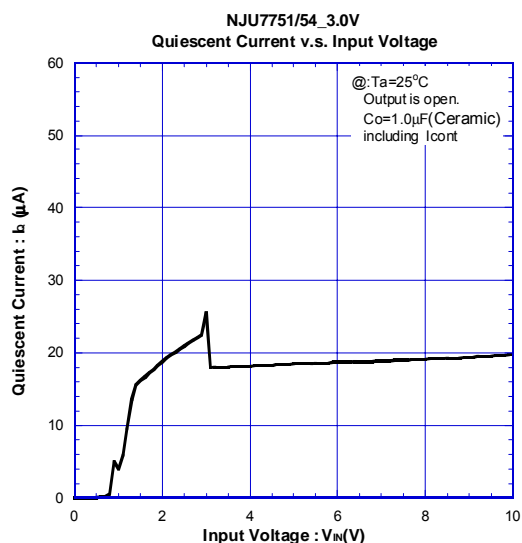
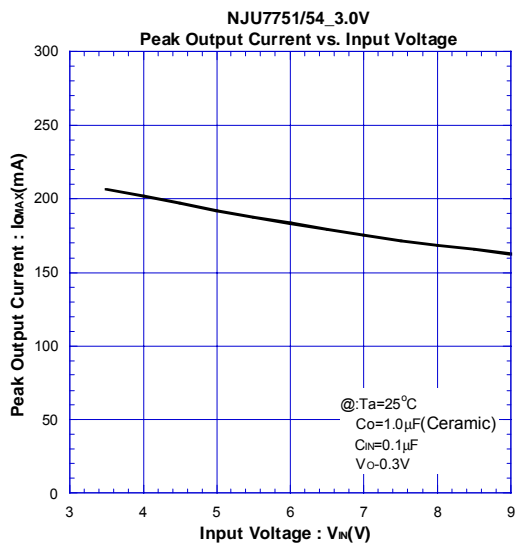


## ■ ELECTRICAL CHARACTERISTICS

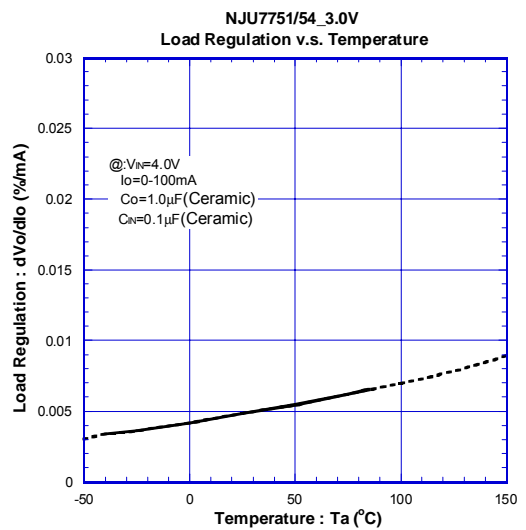
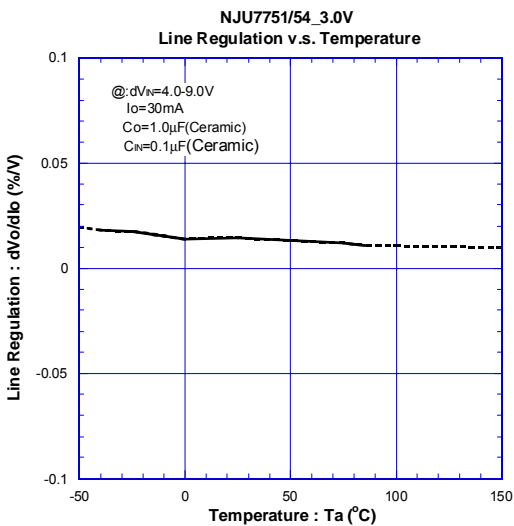
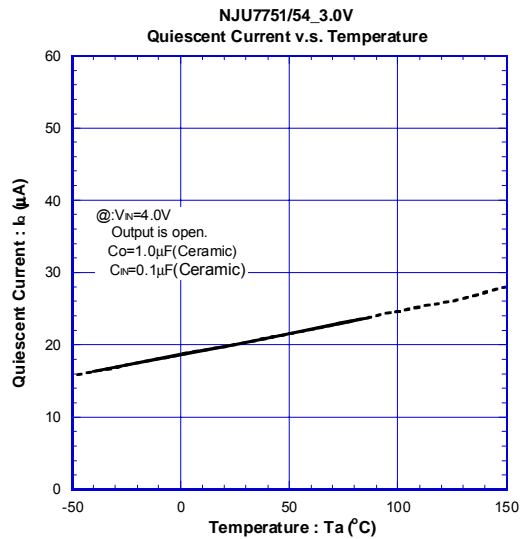
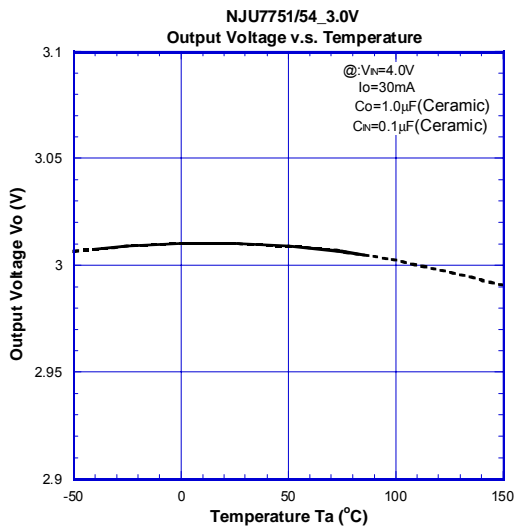
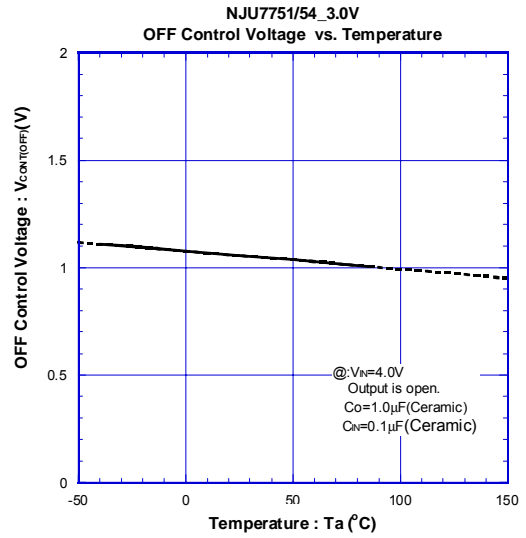
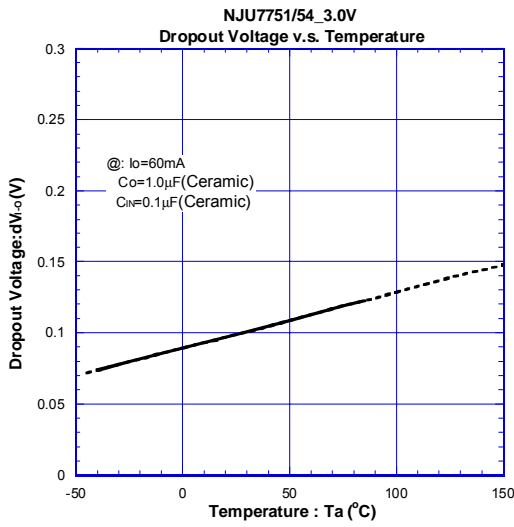


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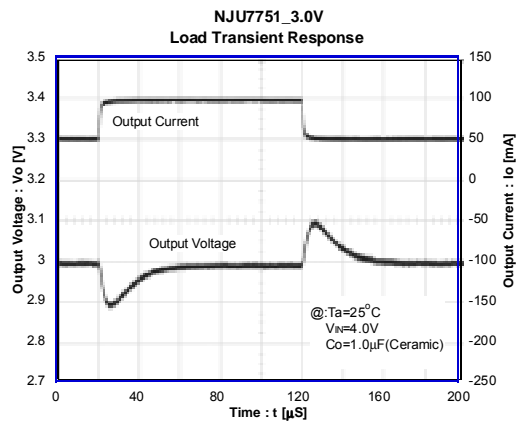
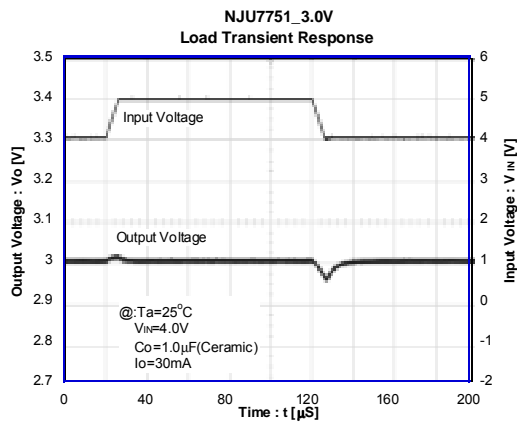
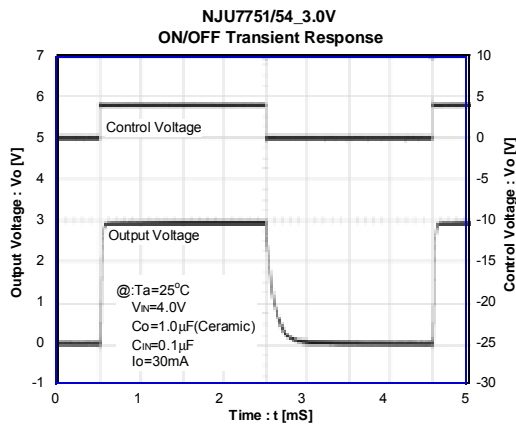
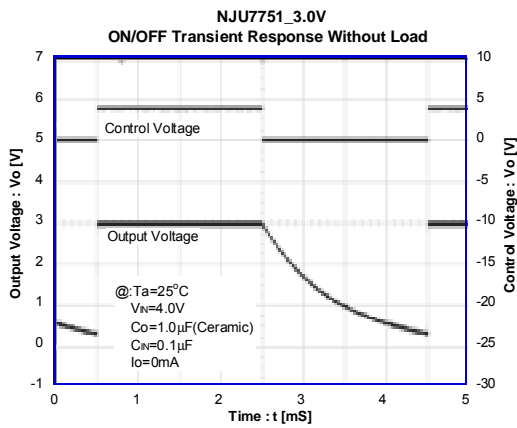
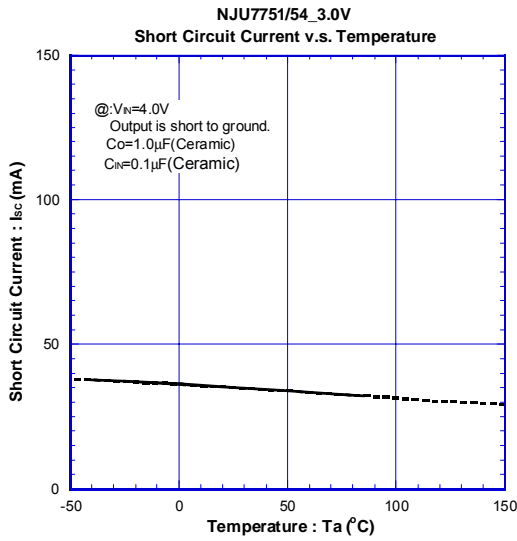
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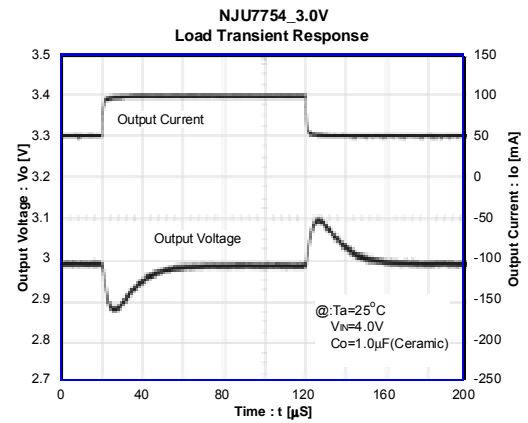
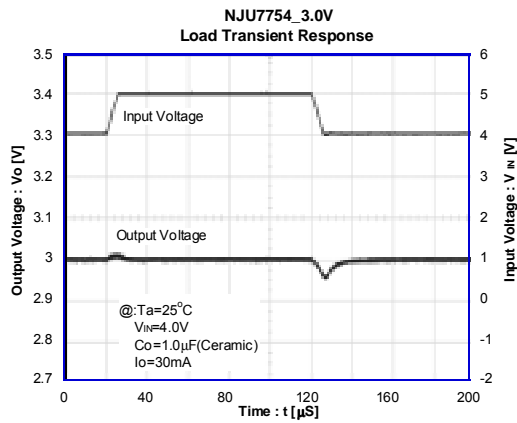
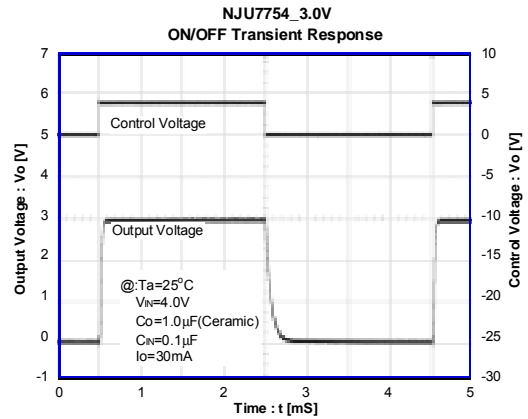
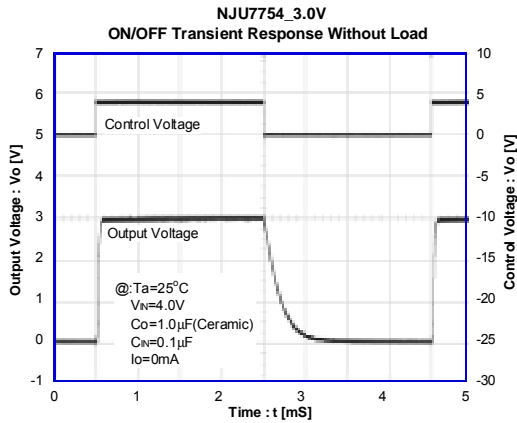


## ■ ELECTRICAL CHARACTERISTICS





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