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.

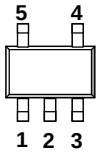
■ PACKAGE OUTLINE

NJU7751/54F

■ FEATURES

- Ultra Low quiescent Current Iq=20μA typ.(I_O=0mA)
- Output capacitor with 1.0uF ceramic capacitor
- Output Current I_O(max.)=100mA
- High Precision Output V_O±1.0%
- Low Dropout Voltage 0.15V typ. (I_O=60mA, V_O=3V)
- With ON/OFF Control (Active High)
- With Output Shunt Switch
- Internal Short Circuit Current Limit
- CMOS Technology
- Package Outline SOT-23-5

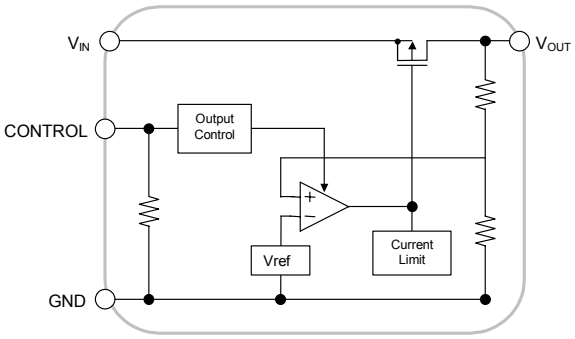
■ PIN CONFIGURATION



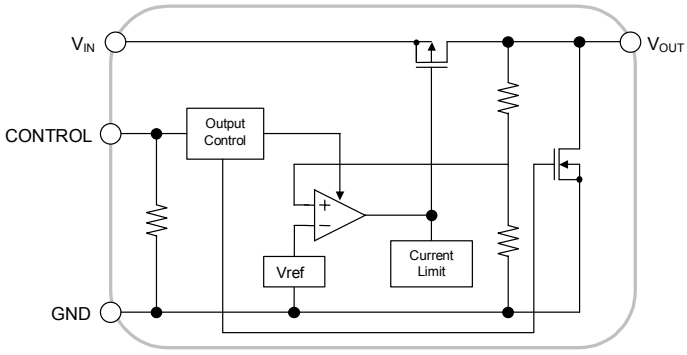
NJU7751/54F

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}	DEVICE NAME	V_{OUT}
NJU775*F15	1.5V	NJU775*F28	2.8V
NJU775*F18	1.8V	NJU775*F03	3.0V
NJU775*F21	2.1V	NJU775*F32	3.2V
NJU775*F22	2.2V	NJU775*F33	3.3V
NJU775*F24	2.4V	NJU775*F05	5.0V
NJU775*F25	2.5V		

■ ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

PARAMETER	SYMBOL	RATINGS		UNIT
Input Voltage	V_{IN}	+10		V
Control Voltage	V_{CONT}	+10(*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
Output Sink Current at OFF-state(*4)	I_O	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.

■ Operating voltage

V_{IN}=+2.3 ~ +9V (In case of Vo<2.1V version)

■ ELECTRICAL CHARACTERISTICS

(V_{IN}=V_O+1V, C_{IN}=0.1μ F, C_O=1.0μ F(Vo≤2.0V:Co=2.2μ F), Ta=25°C)

PARAMETER	SYMBOL	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Output Voltage	V_O	I_O=30mA		−1.0%	–	+1.0%	V
Input Voltage	V_{IN}			–	–	9	V
Quiescent Current	I_Q	I_O =0mA, V_{CONT}=V_{IN}, Include I_{CONT}		–	20	40	μA
Quiescent Current at Control OFF	$I_{Q(OFF)}$	V_{CONT}=0V		–	0.1	1	μA
Output Current	I_O	V_O−0.3V		100	–	–	mA
Short Circuit Limit	I_{LIM}	V_O=0V		–	40	–	mA
Line Regulation	$\Delta V_O / \Delta V_{IN}$	V_{IN}= V_O+1V~V_O+6.0V(V_O<3.0V) V_{IN}= V_O+1V~9.0V(V_O≥3.0V), I_O=30mA		–	–	0.20	%/V
Load Regulation	$\Delta V_O / \Delta V_O$	Io=0~100mA		–	–	0. 03	%/mA
Dropout Voltage(*5)	ΔV_{I-O}	Io=60mA	2.1V≤V_O≤2.4V	–	0.20	0.27	V
			2.5V≤V_O≤2.7V	–	0.18	0.25	V
			2.8V≤V_O≤3.3V	–	0.15	0.22	V
			3.4V≤V_O≤5.0V	–	0.12	0.19	V
Ripple Rejection	RR	ein=200mVrms,f=1kHz,Io=10mA, Vo=3.0V Version		–	65	–	dB
Average Temperature Coefficient of Output Voltage	$\Delta V_O / \Delta Ta$	Ta=0~85°C, I_O=10mA		–	±100	–	ppm/°C
Output Noise Voltage	V_{NO}	f=10Hz ~ 80kHz,Io=10mA,Vo=3.0V 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(*6)	$V_{CONT(OFF)}$			–	–	0.3	V
Pull-down Resistance at OFF-state	$R_{O(OFF)}$	V_{CONT}=0V (V_O=3.0V Version)		–	150	–	Ω

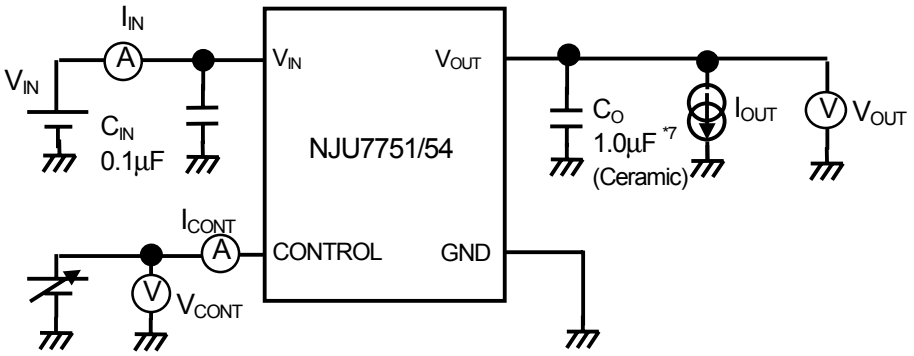
(*5): The output voltage excludes under 2.1V.

(*6): 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.

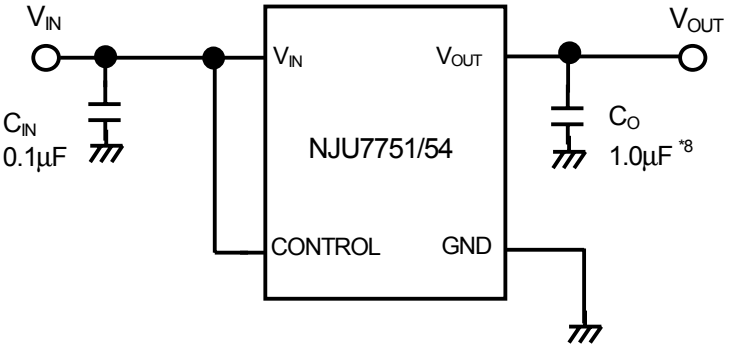
■ TEST CIRCUIT



*7 : Vo≤2.0V version, Co=2.2µF(Ceramic)

■ TYPICAL APPLICATION

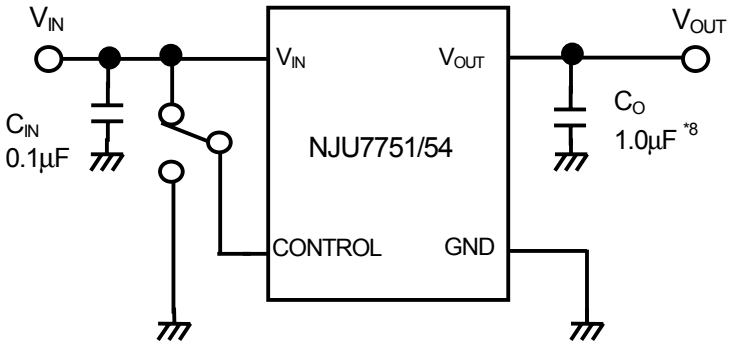
① In case that ON/OFF Control is not required:



*8 : Vo≤2.0V version, Co=2.2µF

Connect control terminal to V_{IN} terminal.

② In use of ON/OFF Control

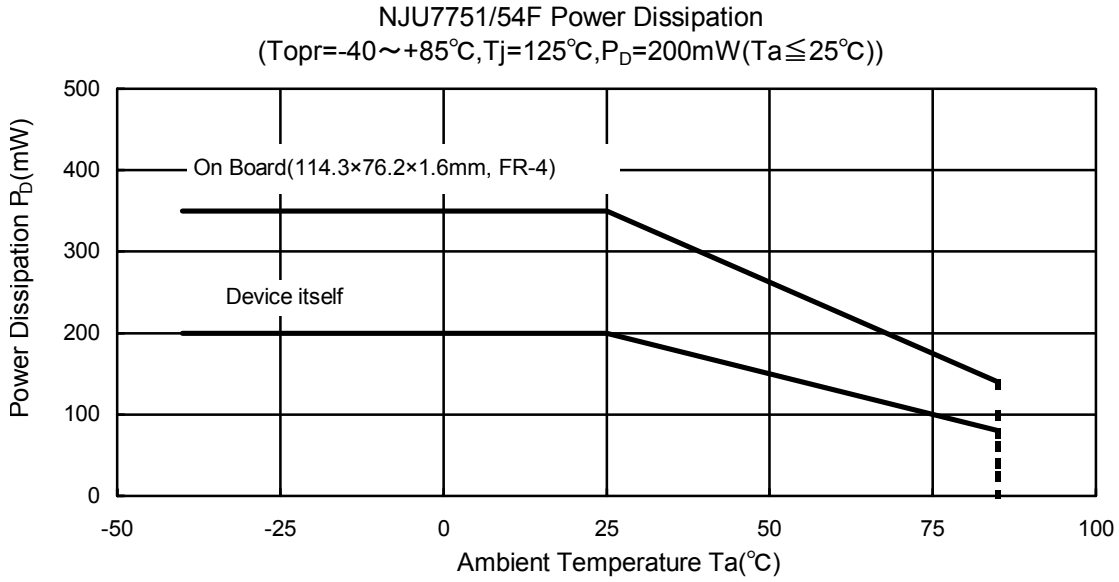


*8 : Vo≤2.0V version, Co=2.2µF

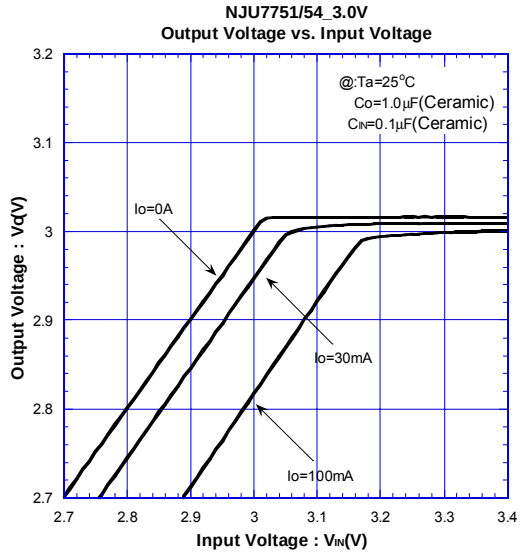
State of control terminal:

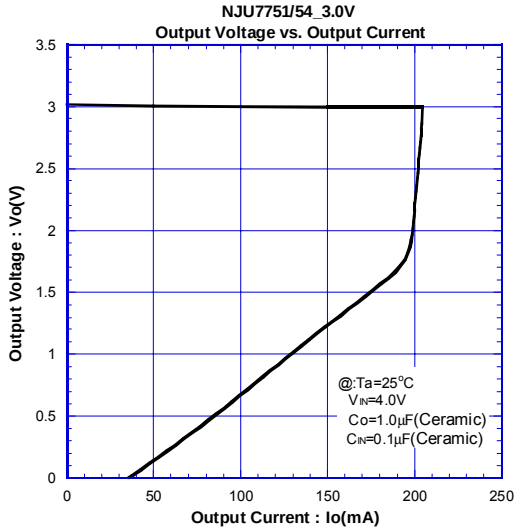
- "H" → output is enabled.
- "L" or "open" → output is disabled.

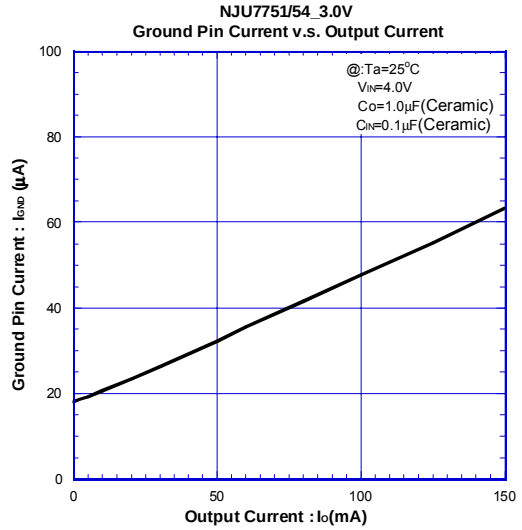
■ POWER DISSIPATION vs. AMBIENT TEMPERATURE

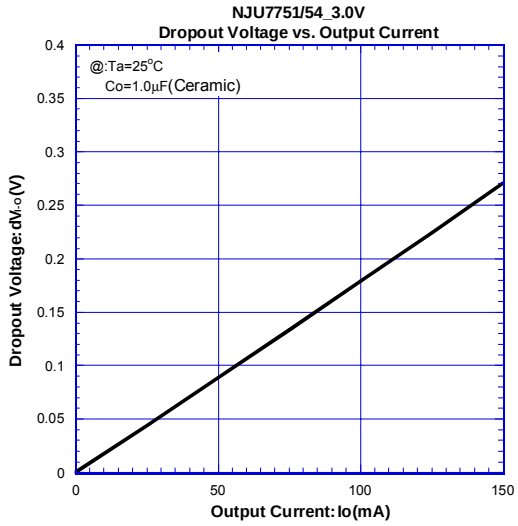


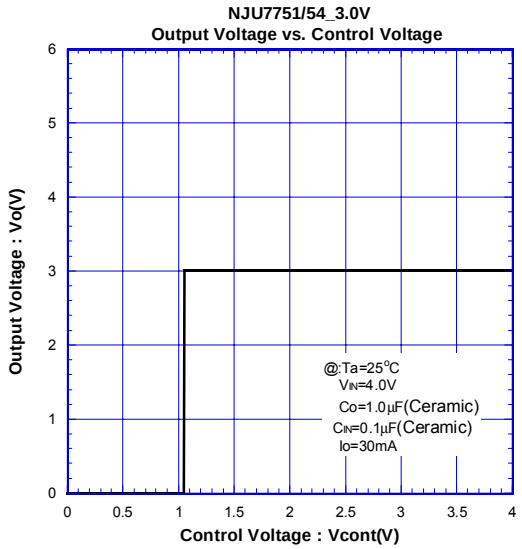
■ ELECTRICAL CHARACTERISTICS

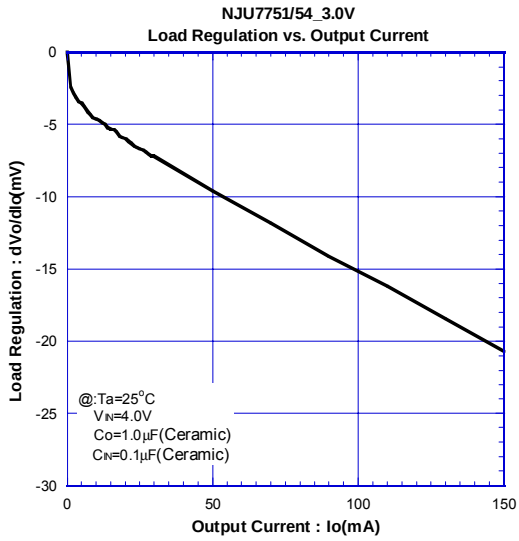






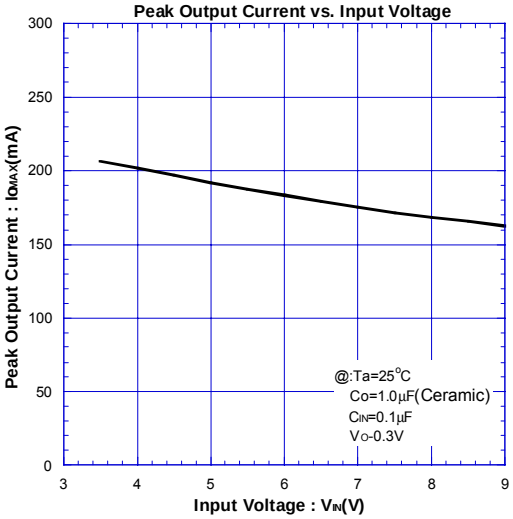




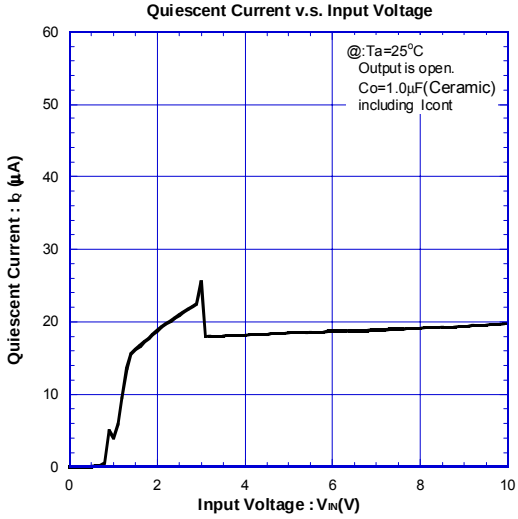


■ ELECTRICAL CHARACTERISTICS

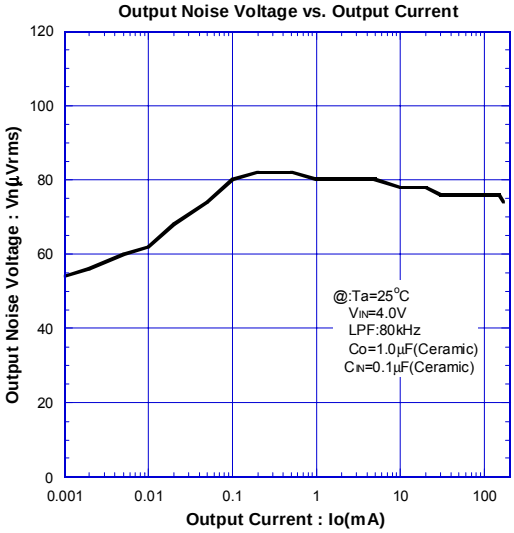
NJU7751/54_3.0V
Peak Output Current vs. Input Voltage



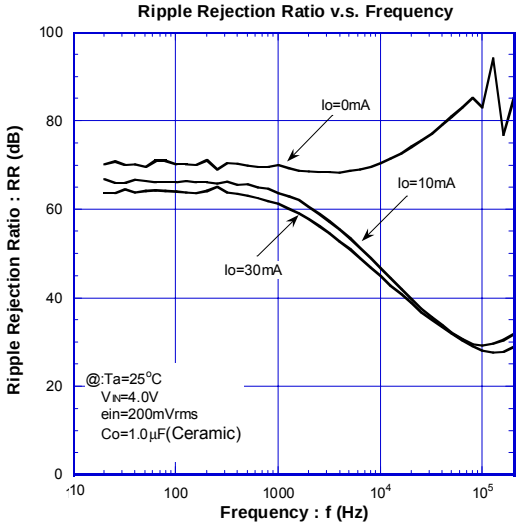
NJU7751/54_3.0V
Quiescent Current v.s. Input Voltage



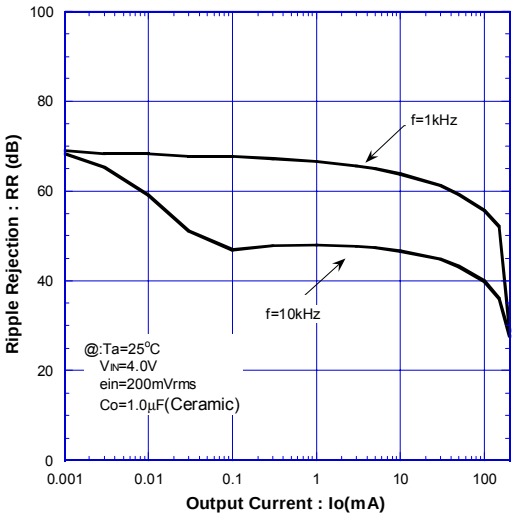
NJU7751/54_3.0V
Output Noise Voltage vs. Output Current



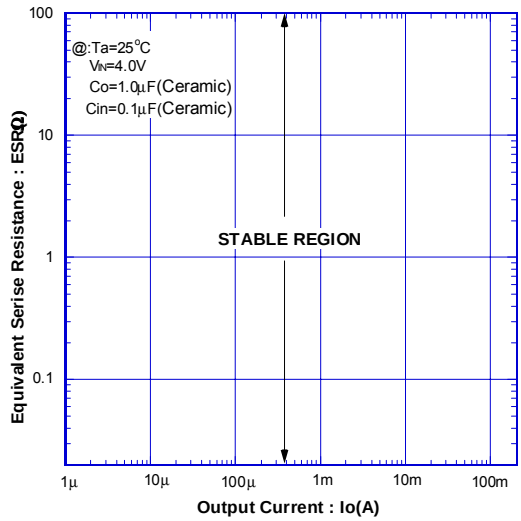
NJU7751/54_3.0V
Ripple Rejection Ratio v.s. Frequency



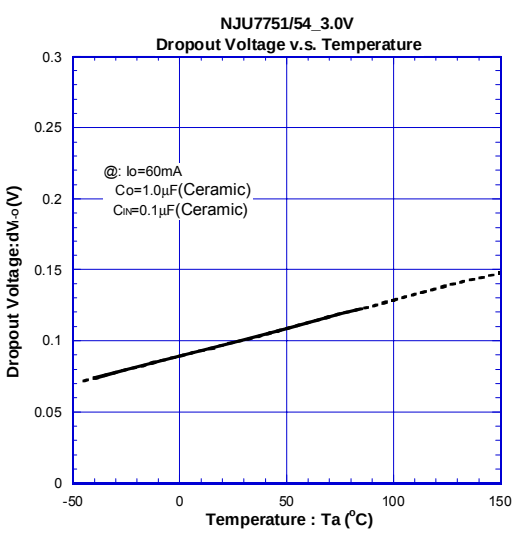
NJU7751/54_3.0V
Ripple Rejection vs. Output Current

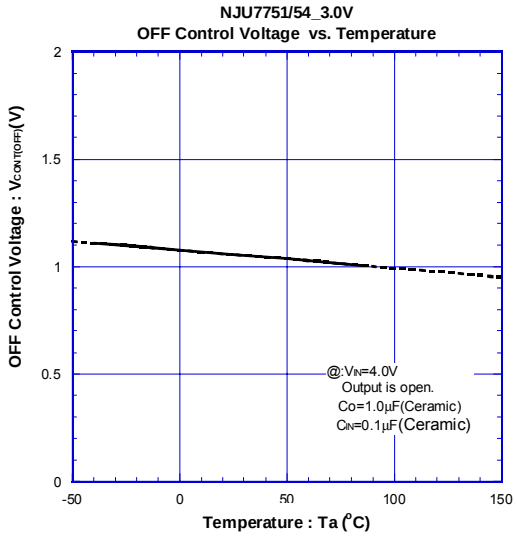


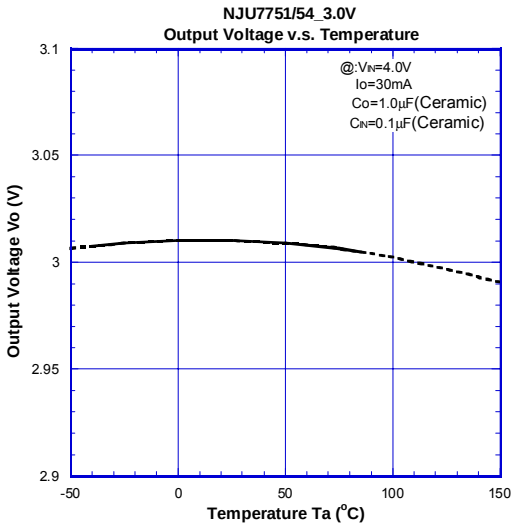
NJU7751/54_3.0V
Equivalent Serise Resistance vs. Output Current

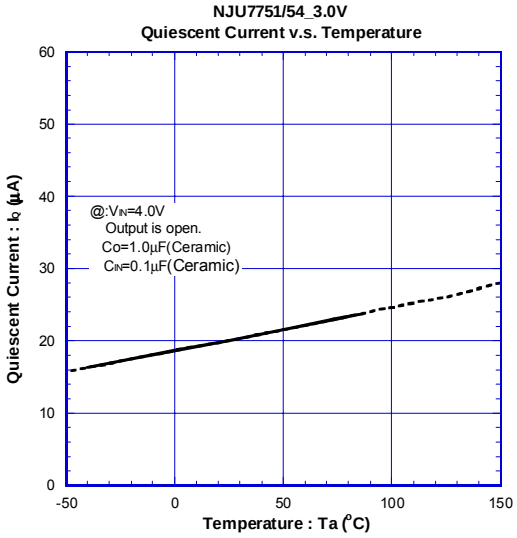


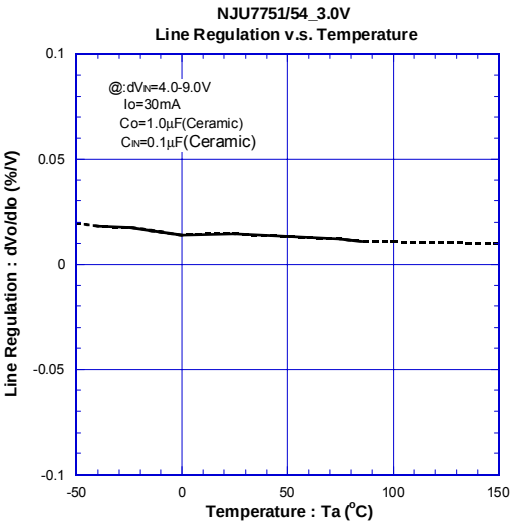
■ ELECTRICAL CHARACTERISTICS

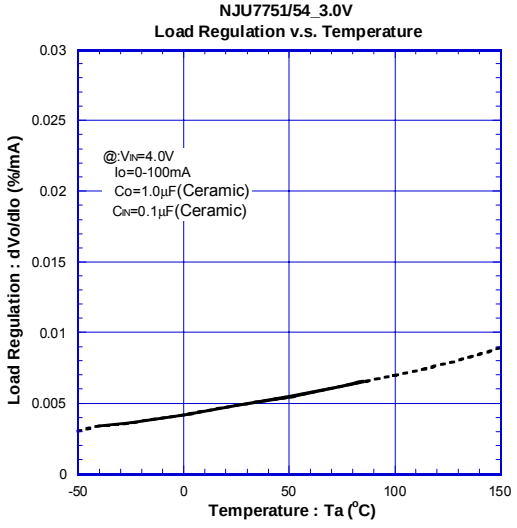












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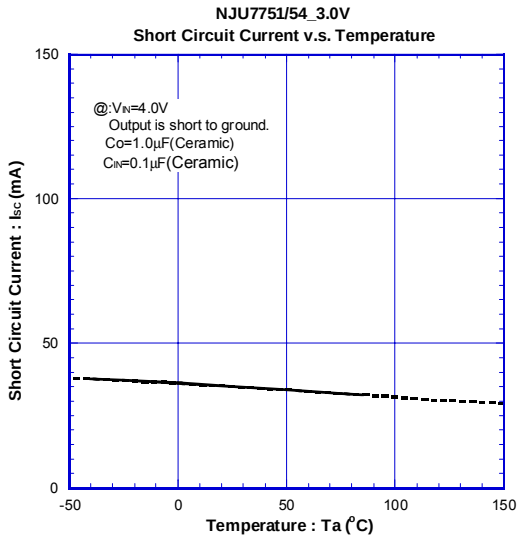
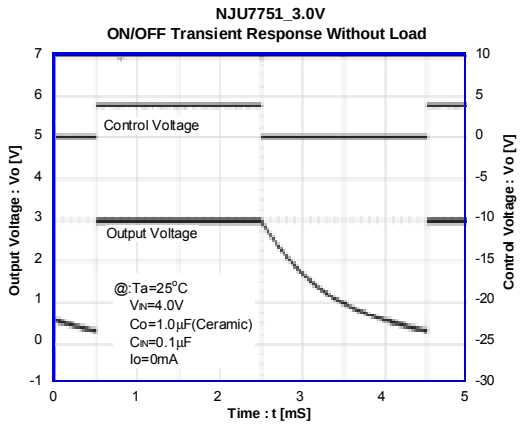
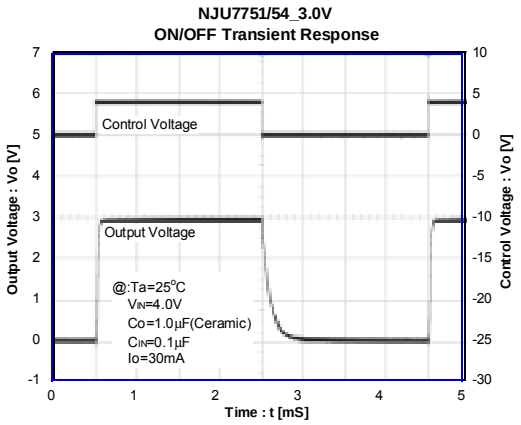
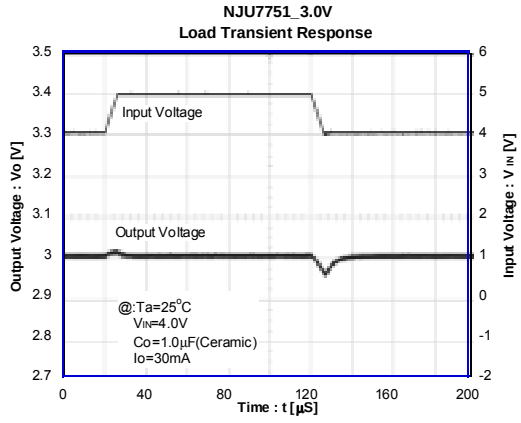
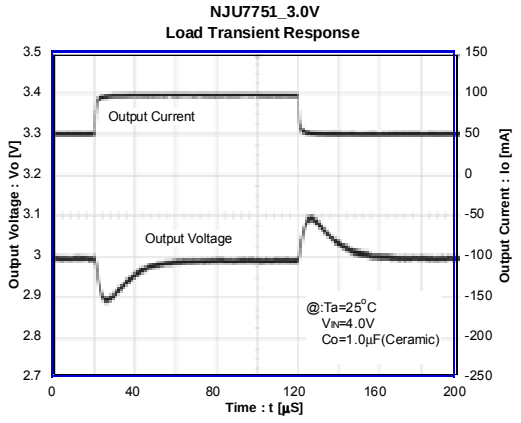


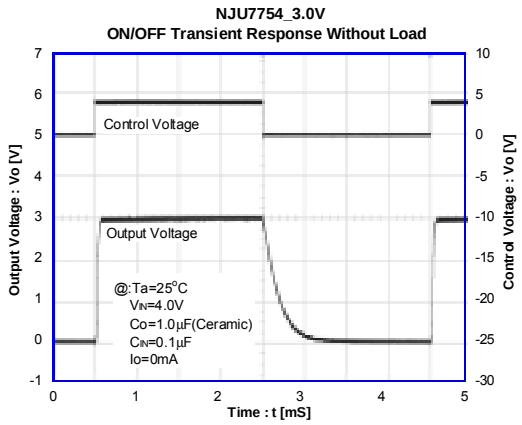


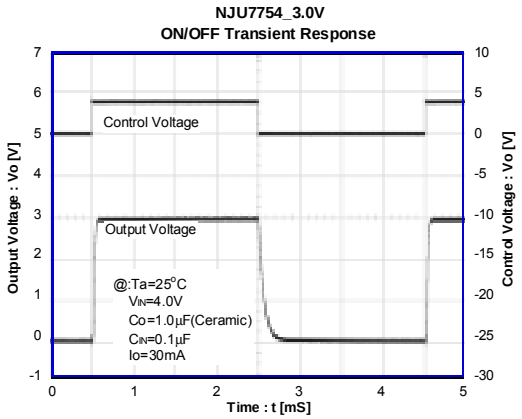


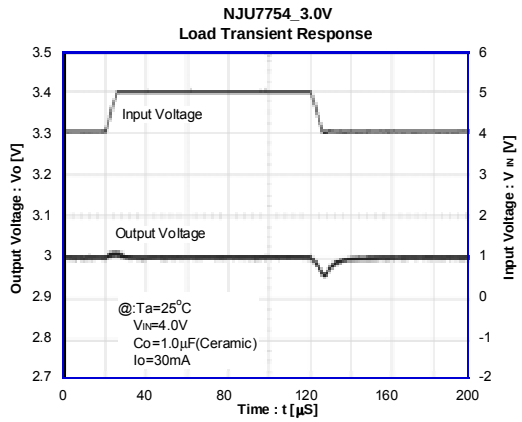


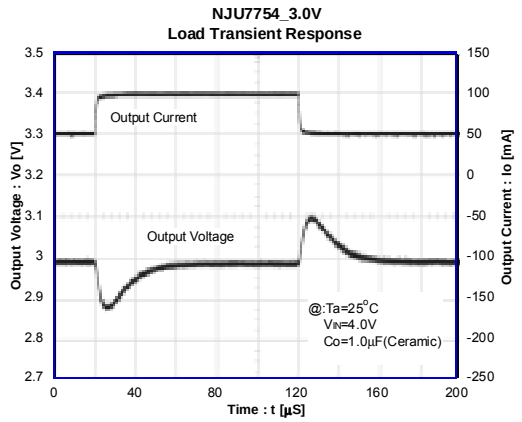


■ ELECTRICAL CHARACTERISTICS









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