

LOW DROPOUT VOLTAGE REGULATOR

■ GENERAL DISCRIPTION

NJU7747/48 is a low dropout voltage regulator with ON/OFF control.

Advanced CMOS technology achieves ultra low quiescent current.

SC-82AB package and 0.1 μ F small output capacitor make the NJU7747/48 suitable for space conscious applications.

NJU7748 features shunt switch which improves turn off response of output voltage when ON/OFF control is used.

■ PACKAGE OUTLINE

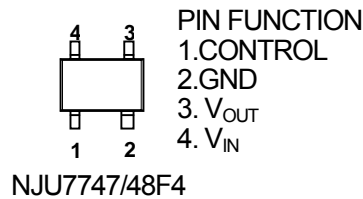


NJU7747/48F4

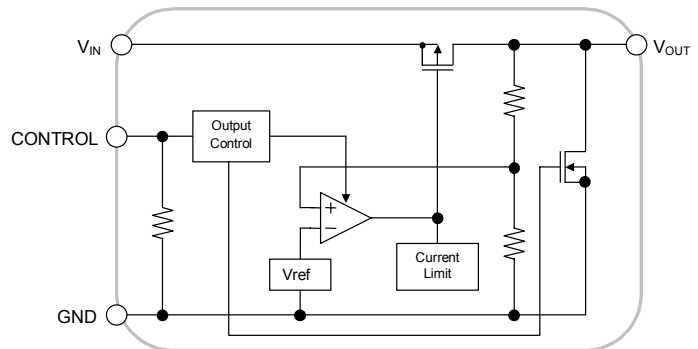
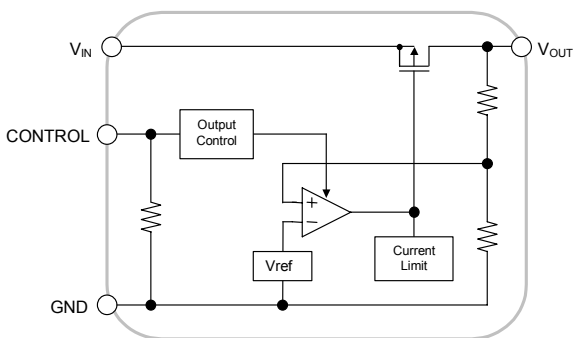
■ FEATURES

- Ultra Low quiescent Current $I_q=1.5\mu\text{A typ.}(I_o=0\text{mA})$
- Output capacitor with 0.1 μF ceramic capacitor
- Output Current $I_o(\text{max.})=100\text{mA}$
- High Precision Output $V_o\pm 1.0\%$
- Low Dropout Voltage 0.17V typ. ($I_o=40\text{mA}$, $V_o=3\text{V}$ version)
- With ON/OFF Control (Active High)
- With Output Shunt Switch Only NJU7748
- Internal Short Circuit Current Limit
- CMOS Technology
- Package Outline SC-82AB

■ PIN CONFIGURATION



■ EQUIVALENT CIRCUIT



NJU7747/48

■ OUTPUT VOLTAGE RANK LIST

DEVICE NAME	V _{OUT}	DEVICE NAME	V _{OUT}	DEVICE NAME	V _{OUT}
NJU774*F4-15	1.5V	NJU774*F4-28	2.8V	NJU774*F4-04	4.0V
NJU774*F4-18	1.8V	NJU774*F4-29	2.9V	NJU774*F4-45	4.5V
NJU774*F4-19	1.9V	NJU774*F4-03	3.0V	NJU774*F4-05	5.0V
NJU774*F4-02	2.0V	NJU774*F4-31	3.1V		
NJU774*F4-25	2.5V	NJU774*F4-33	3.3V		
NJU774*F4-27	2.7V	NJU774*F4-37	3.7V		

■ 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	250(*2)	mW
Operating Temperature	T _{opr}	-40 ~ +85	°C
Storage Temperature	T _{stg}	-40 ~ +125	°C
Output Sink Current at OFF-state(*3)	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): This maximum rating is applied to NJU7748.

■ ELECTRICAL CHARACTERISTICS (V_{IN}=V_O+1V, C_{IN}=0.1μF, C_O=0.1μF, Ta=25°C)

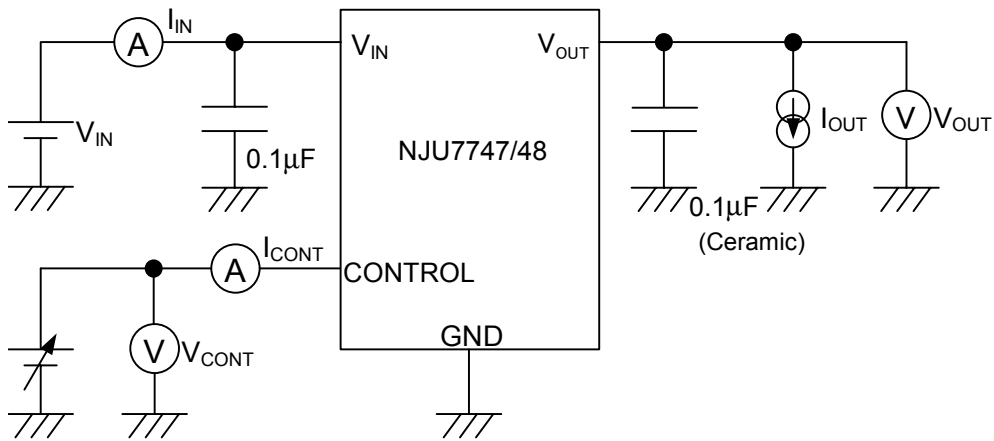
PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Output Voltage	V _O	I _o =30mA	-1.0%	-	+1.0%	V	
Input Voltage	V _{IN}		-	-	6	V	
Quiescent Current	I _q	I _o =0mA, V _{CONT} =V _{IN} , Except I _{CONT}	-	1.5	3.5	μA	
Quiescent Current at Control OFF	I _{q(OFF)}	V _{CONT} =0V	-	0.1	1	μA	
Output Current	I _o	V _O =0.3V	100	-	-	mA	
Short Circuit Limit	I _{LIM}	V _O =0V	-	25	-	mA	
Line Regulation	ΔV _O /ΔV _{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	-	-	0.30	%/V	
Load Regulation	ΔV _O /ΔV _O	I _o =0~100mA	-	-	0.15	%/mA	
Dropout Voltage	ΔV _{I-O}	I _o =40mA	1.5V≤V _O ≤2.0V	-	0.19	0.60	V
			2.0V≤V _O ≤2.4V	-	0.19	0.29	V
		I _o =60mA	2.5V≤V _O ≤2.7V	-	0.18	0.27	V
			2.8V≤V _O ≤3.3V	-	0.17	0.26	V
			3.4V≤V _O ≤5.0V	-	0.16	0.24	V
Average Temperature Coefficient of Output Voltage	ΔV _O /ΔTa	Ta=0~85°C, I _o =10mA	-	±100	-	ppm/°C	
Pull-down Resistance	R _{CONT}		2	5	10	MΩ	
Control Voltage for ON-State	V _{CONT(ON)}		1.6	-	V _{IN}	V	
Control Voltage for OFF-State	V _{CONT(OFF)}		0	-	0.3	V	
Pull-down Resistance at OFF-state(*4)	R _{O(OFF)}	V _{CONT} =0V (V _O =3.0V Version)	-	300	-	Ω	

(*4) This electrical characteristics is applied to NJU7748.

The above specification is a common specification for all voltages.

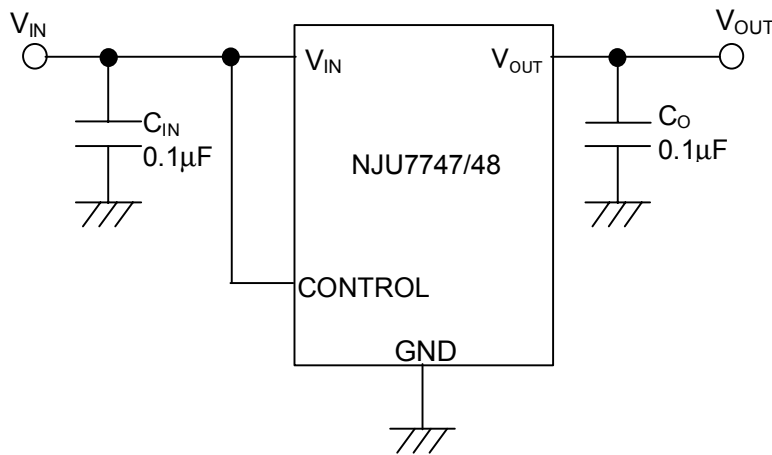
Therefore, it may be different from the individual specification for a specific output Voltage.

■ TEST CIRCUIT



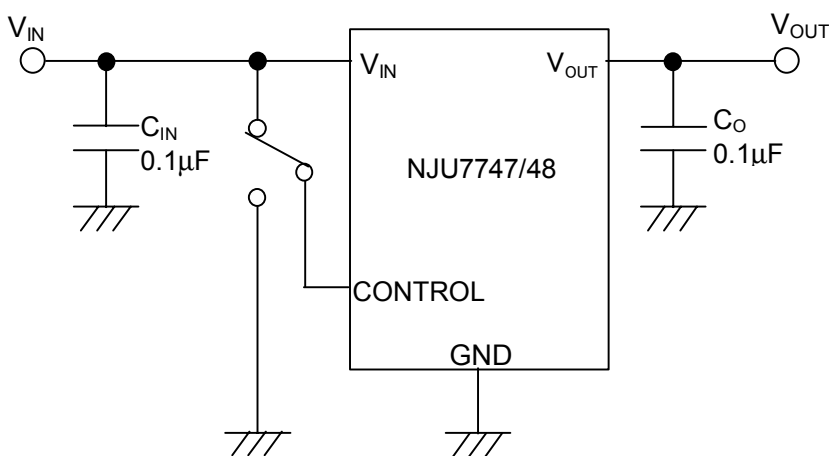
■ TYPICAL APPLICATION

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



Connect control terminal to V_{IN} terminal.

② In use of ON/OFF Control



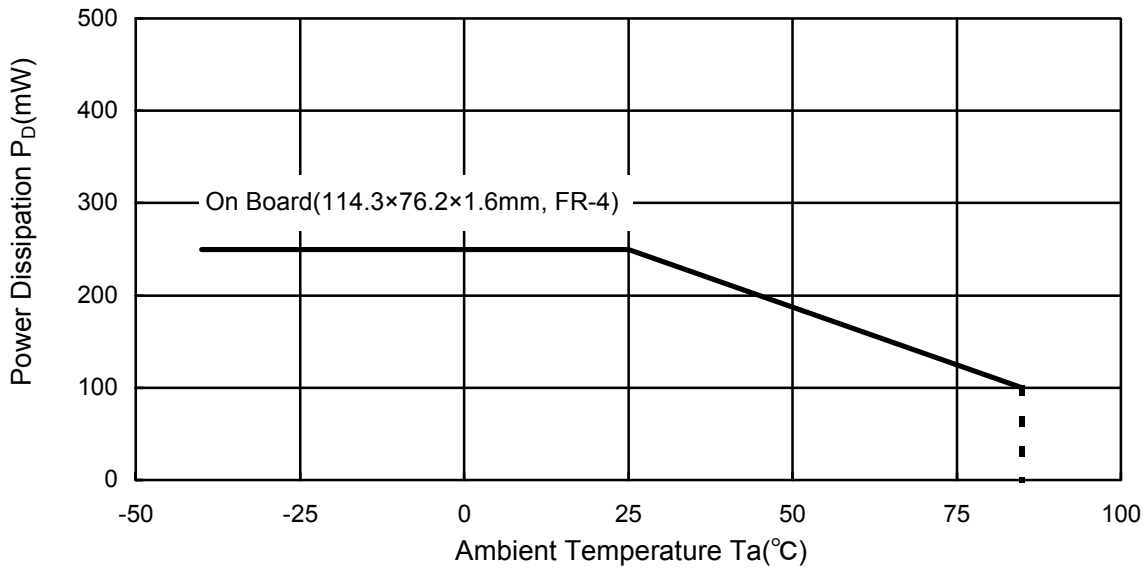
State of control terminal:

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

NJU7747/48

POWER DISSIPATION vs. AMBIENT TEMPERATURE

NJU7747/48F4 Power Dissipation
($T_{opr} = -40 \sim +85^{\circ}\text{C}$, $T_j = 125^{\circ}\text{C}$)



[CAUTION]

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