

LOW DROPOUT VOLTAGE REGULATOR

■ GENERAL DISCRIPTION

NJU7757/58 is a low dropout voltage regulator with ON/OFF control.

Advanced CMOS technology achieves low quiescent current.

SC-82AB package and 0.1uF small output capacitor make the NJU7757/58 suitable for space conscious applications.

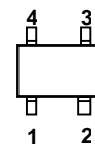
NJU7758 features shunt switch which improves turn off response of output voltage when ON/OFF control is used.

■ PACKAGE OUTLINE



NJU7757/58F4

■ PIN CONFIGURATION



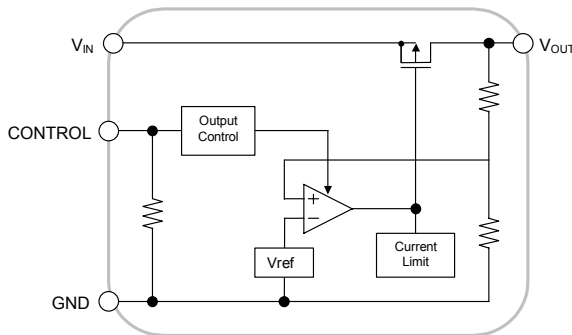
- PIN FUNCTION**
1. CONTROL
 2. GND
 3. V_{OUT}
 4. V_{IN}

NJU7757/58F4

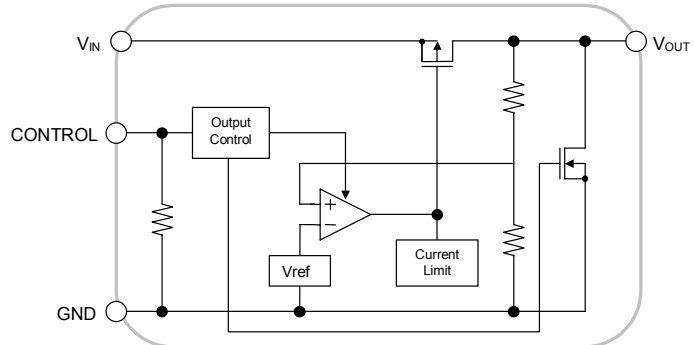
■ FEATURES

- Low Quiescent Current $I_q=20\mu A$ typ. ($I_o=0mA$)
- Output capacitor with 0.1uF ceramic capacitor
- Output Current $I_o(max.)=100mA$
- High Precision Output $V_o\pm 1.0\%$
- Low Dropout Voltage 0.15V typ. ($I_o=60mA$, $V_o=3V$ version)
- With ON/OFF Control (Active High)
- With Output Shunt Switch Only NJU7758
- Internal Short Circuit Current Limit
- CMOS Technology
- Package Outline SC-82AB

■ EQUIVALENT CIRCUIT



NJU7757



NJU7758

■ OUTPUT VOLTAGE RANK LIST

DEVICE NAME	V _{OUT}	DEVICE NAME	V _{OUT}
NJU775*F4-15	1.5V	NJU775*F4-28	2.8V
NJU775*F4-18	1.8V	NJU775*F4-03	3.0V
NJU775*F4-21	2.1V	NJU775*F4-32	3.2V
NJU775*F4-22	2.2V	NJU775*F4-33	3.3V
NJU775*F4-24	2.4V	NJU775*F4-05	5.0V
NJU775*F4-25	2.5V		

NJU7757/58

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■ 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 NJU7758.

■ 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}		-	-	6	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	ΔV _o /ΔV _{IN}	V _{IN} =V _o +1V ~ V _o +6V (V _o <3.0V) V _{IN} =V _o +1V ~ 9.0V (V _o ≥3.0V), I _o =30mA	-	-	0.20	%/V	
Load Regulation	ΔV _o /ΔI _o	I _o =0 ~ 100mA	-	-	0.03	%/mA	
Dropout Voltage(*5)	ΔV _{I-O}	I _o =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	e _{in} =200mVrms, f=1kHz, I _o =10mA, V _o =3V Version	-	65	-	dB	
Average Temperature Coefficient of Output Voltage	ΔV _o /ΔTa	Ta=0 ~ 85°C, I _o =10mA	-	±100	-	ppm/°C	
Output Noise Voltage	V _{NO}	f=10Hz ~ 80kHz, I _o =10mA, V _o =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	V _{CONT(OFF)}		-	-	0.3	V	
Pull-down Resistance at OFF-state(*4)	R _{O(OFF)}	V _{CONT} =0V, V _o =3.0V Version	-	150	-	Ω	

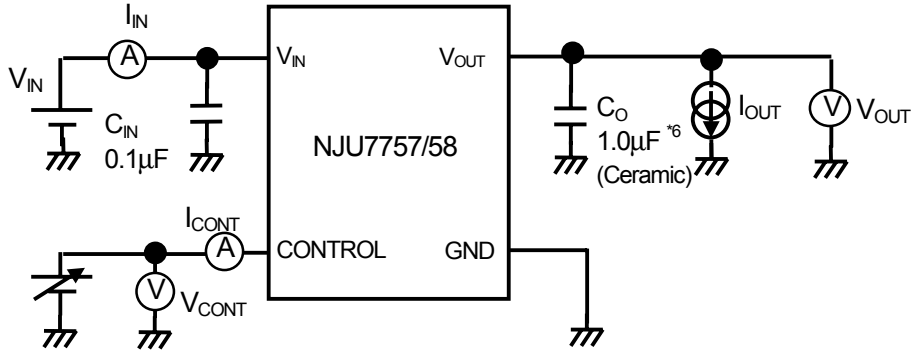
(*4) This electrical characteristics is applied to NJU7758.

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

The above specification is a common specification for all voltages.

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

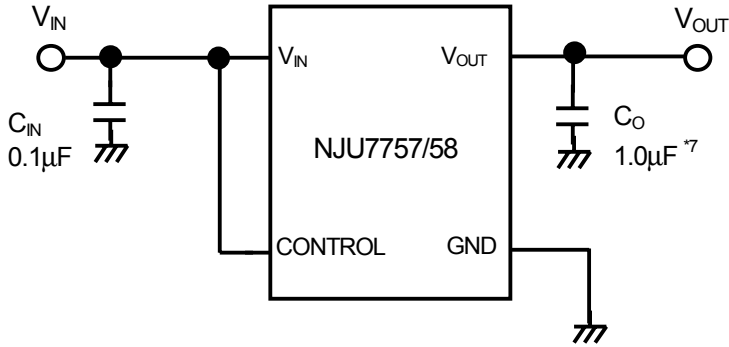
■ TEST CIRCUIT



*6 : $V_O \leq 2.0V$ version, $C_O = 2.2\mu F$ (Ceramic)

■ TYPICAL APPLICATION

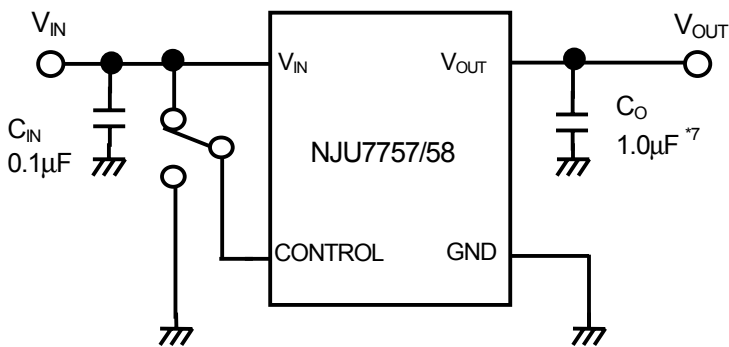
① In case that ON/OFF Control is not required:



*7 : $V_O \leq 2.0V$ version, $C_O = 2.2\mu F$

Connect control terminal to V_{IN} terminal.

② In use of ON/OFF Control



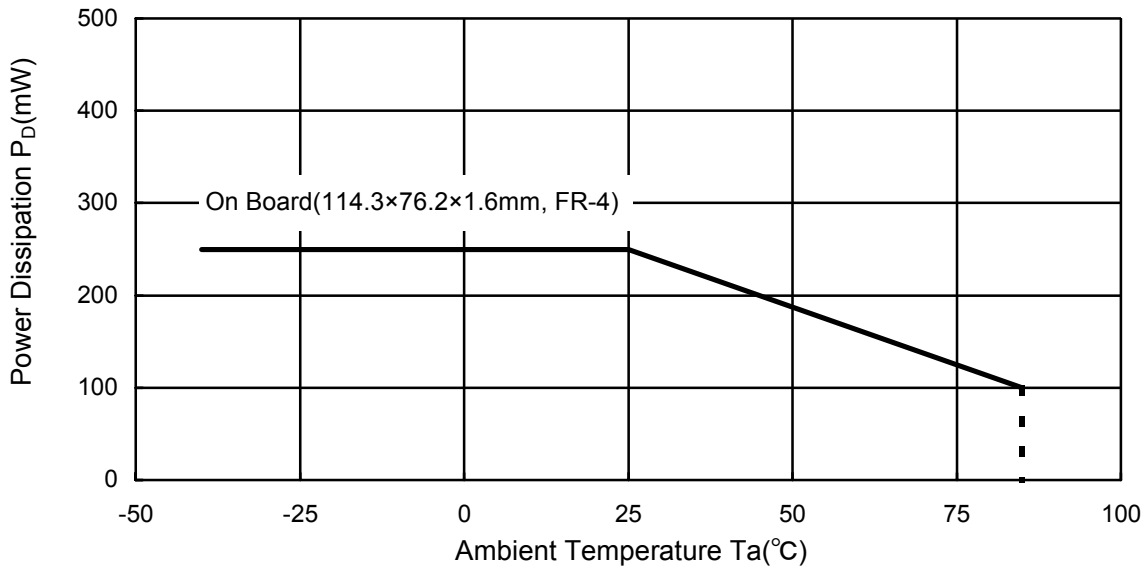
*7 : $V_O \leq 2.0V$ version, $C_O = 2.2\mu F$

State of control terminal:

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

POWER DISSIPATION vs. AMBIENT TEMPERATURE

NJU7757/58F4 Power Dissipation
($T_{opr} = -40 \sim +85^{\circ}\text{C}$, $T_j = 125^{\circ}\text{C}$)



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