

## 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.

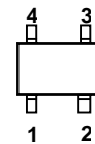
NJU7758 features shunt switch which improves turn off response of output voltage when ON/OFF control is used.

### ■ PACKAGE OUTLINE



NJU7757/58F4

### ■ PIN CONFIGURATION



#### PIN FUNCTION

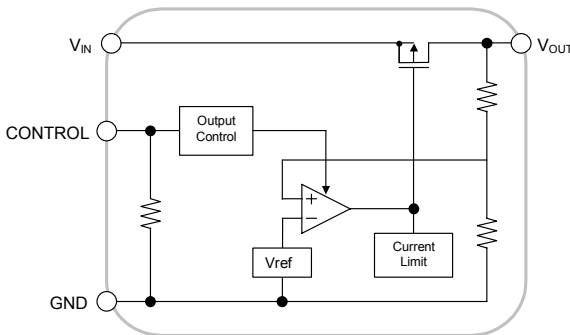
1. CONTROL
2. GND
3.  $V_{OUT}$
4.  $V_{IN}$

NJU7757/58F4

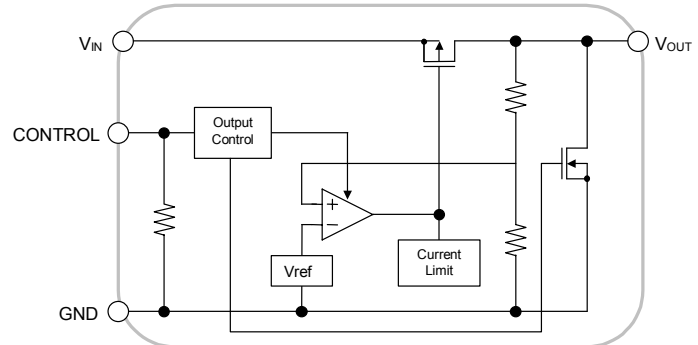
### ■ FEATURES

- 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

## ■ 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>	250(*2)	mW
Operating Temperature	T <sub>opr</sub>	-40 ~ +85	°C
Storage Temperature	T <sub>stg</sub>	-40 ~ +125	°C
Output Sink Current at OFF-state(*3)	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): This maximum rating is applied to NJU7758.

## ■ Operating voltage

V<sub>IN</sub>=+2.3 ~ +9V (In case of Vo<2.1V version)

## ■ ELECTRICAL CHARACTERISTICS (V<sub>IN</sub>=V<sub>O</sub>+1V, C<sub>IN</sub>=0.1μ F, C<sub>O</sub>=1.0μ F (Vo≤2.0V:Co=2.2μ F), 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>		-	-	6	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> +6V (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> /ΔI <sub>o</sub>	I <sub>o</sub> =0 ~ 100mA	-	-	0.03	%/mA	
Dropout Voltage(*5)	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> =3V 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	V <sub>CONT(OFF)</sub>		-	-	0.3	V	
Pull-down Resistance at OFF-state(*4)	R <sub>O(OFF)</sub>	V <sub>CONT</sub> =0V, V <sub>o</sub> =3.0V Version	-	150	-	Ω	

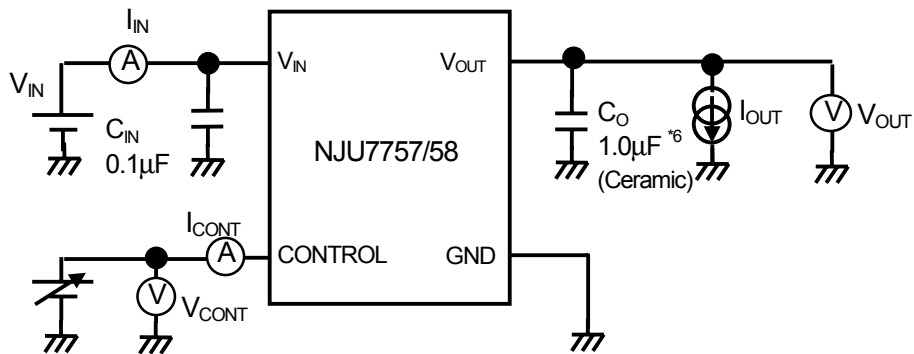
(\*4) This electrical characteristics is applied to NJU7758.

(\*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.

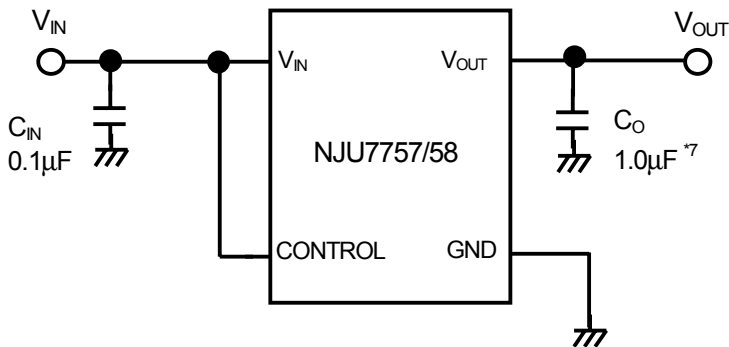
## ■ TEST CIRCUIT



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

## ■ TYPICAL APPLICATION

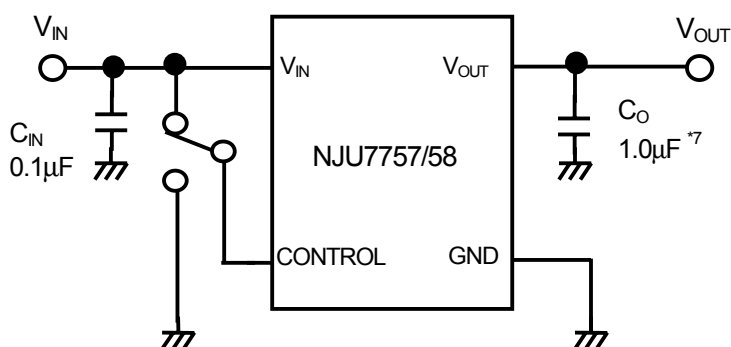
① In case that ON/OFF Control is not required:



\*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

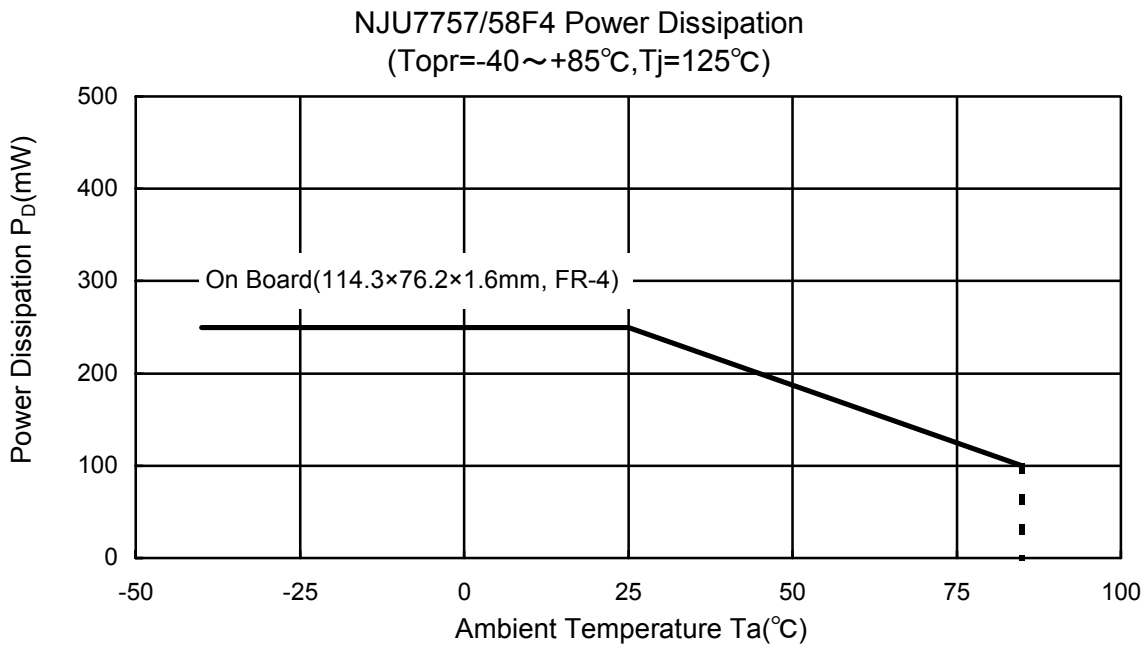


\*7 :  $V_O \leq 2.0V$  version,  $C_O = 2.2\mu F$

State of control terminal:

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

## POWER DISSIPATION vs. AMBIENT TEMPERATURE



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