

## LOW DROPOUT VOLTAGE REGULATOR

### ■ GENERAL DESCRIPTION

The NJM2865 is a low dropout voltage regulator with ON/OFF control.

Advanced Bipolar technology achieves low noise, high ripple rejection and low quiescent current.

It is suitable for cellular phone, camcorder, IC decoder, camera, and other portable items.

It features small SC-88A package.

### ■ PACKAGE OUTLINE

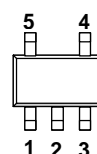


NJM2865F3

### ■ FEATURES

- High Ripple Rejection 75dB typ. (f=1kHz)
- Output Noise Voltage  $V_{no}=45\mu V_{rms}$
- Output capacitor with 1.0 $\mu F$  ceramic capacitor ( $V_o \geq 2.7V$ )
- Output Current  $I_o(max.)=100mA$
- High Precision Output  $V_o \pm 1.0\%$
- Low Dropout Voltage 0.10V typ. ( $I_o=60mA$ )
- Input Voltage Range +2.3V ~ +14V ( $V_o \leq 2.0$  Version)
- ON/OFF Control (Active High)
- Internal Short Circuit Current Limit
- Internal Thermal Overload Protection
- Bipolar Technology
- Package Outline SC88A

### ■ PIN CONFIGURATION

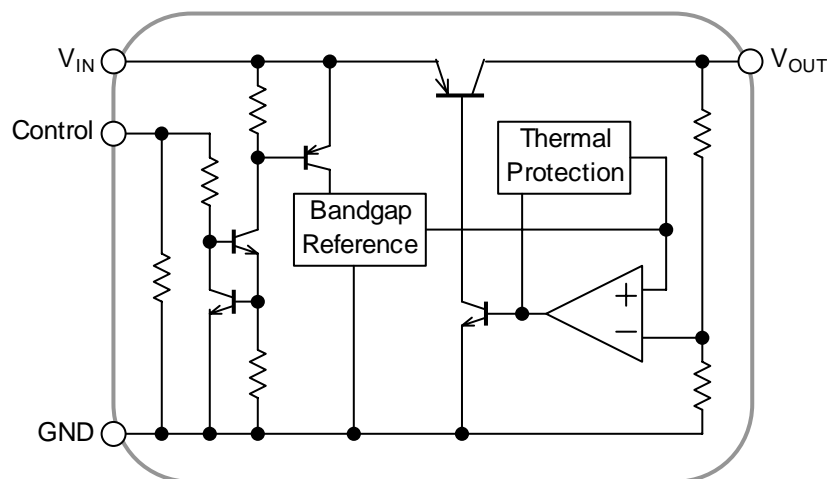


NJM2865F3

#### PIN FUNCTION

- 1.CONTROL (Active High)
- 2.GND
- 3.NC
- 4. $V_{OUT}$
- 5. $V_{IN}$

### ■ EQUIVALENT CIRCUIT



### ■ OUTPUT VOLTAGE RANK LIST

Device Name	$V_{OUT}$	Device Name	$V_{OUT}$
NJM2865F3-15	1.5V	NJM2865F3-03	3.0V
NJM2865F3-18	1.8V	NJM2865F3-33	3.3V
NJM2865F3-21	2.1V	NJM2865F3-05	5.0V
NJM2865F3-26	2.6V		
NJM2865F3-29	2.9V		

# ■ ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage	$V_{IN}$	+14	V
Control Voltage	$V_{CONT}$	+14(*note 1)	V
Power Dissipation	$P_D$	250(*note 2)	mW
Operating Temperature	$T_{opr}$	-40 ~ +85	°C
Storage Temperature	$T_{stg}$	-40 ~ +125	°C

(\*note 1): When input voltage is less than +14V, the absolute maximum control voltage is equal to the input voltage.

(\*note 2): On glass epoxy board. (50×50×1.6mm)

# ■ ELECTRICAL CHARACTERISTICS

(Vo≥2.0V version:  $V_{IN}=V_o+1V$ ,  $C_{IN}=0.1\mu F$ ,  $C_o=1.0\mu F$ : Vo≥2.7V ( $C_o=2.2\mu F$ : Vo≤2.6V), Ta=25°C)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Voltage	$V_o$	$I_o=30mA$	-1.0%	—	+1.0%	V
Quiescent Current	$I_Q$	$I_o=0mA$ , expect $I_{cont}$	—	120	180	$\mu A$
Quiescent Current at Control OFF	$I_{Q(OFF)}$	$V_{CONT}=0V$	—	—	100	nA
Output Current	$I_o$	$V_o-0.3V$	100	130	—	mA
Line Regulation	$\Delta V_o/\Delta V_{IN}$	$V_{IN}=V_o+1V \sim V_o+6V$ , $I_o=30mA$	—	—	0.10	%/V
Load Regulation	$\Delta V_o/\Delta I_o$	$I_o=0 \sim 60mA$	—	—	0.03	%/mA
Dropout Voltage	$\Delta V_{I-O}$	$I_o=60mA$	—	0.10	0.18	V
Ripple Rejection	RR	$e_{in}=200mV_{rms}$ , $f=1kHz$ , $I_o=10mA$ , Vo=3V Version	—	75	—	dB
Average Temperature Coefficient of Output Voltage	$\Delta V_o/\Delta T_a$	$T_a=0 \sim 85^\circ C$ , $I_o=10mA$	—	± 50	—	ppm/°C
Output Noise Voltage	$V_{NO}$	$f=10Hz \sim 80kHz$ , $I_o=10mA$ Vo=3V Version	—	45	—	$\mu V_{rms}$
Control Voltage for ON-state	$V_{CONT(ON)}$		1.6	—	—	V
Control Voltage for OFF-state	$V_{CONT(OFF)}$		—	—	0.6	V

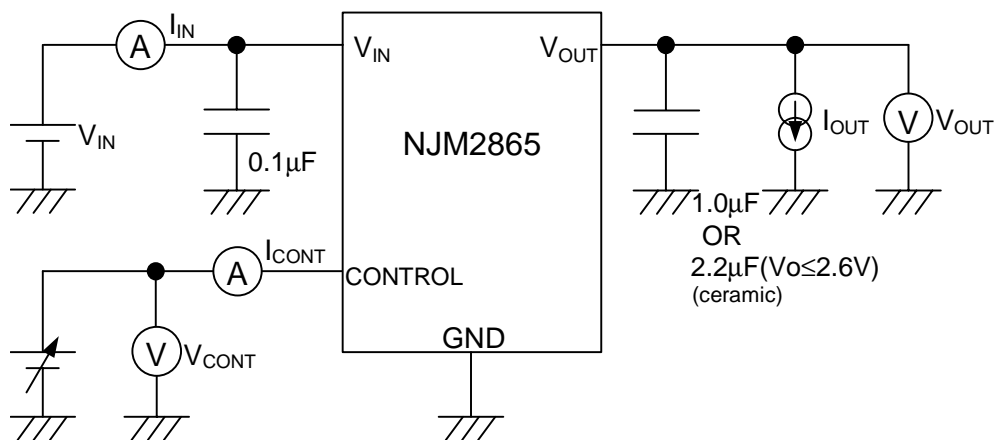
(Vo≤2.0V version:  $V_{IN}=V_o+1V$ ,  $C_{IN}=0.1\mu F$ ,  $C_o=2.2\mu F$ , Ta=25°C)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Voltage	$V_o$	$I_o=30mA$	-1.0%	—	+1.0%	V
Quiescent Current	$I_Q$	$I_o=0mA$ , expect $I_{cont}$	—	120	180	$\mu A$
Quiescent Current at Control OFF	$I_{Q(OFF)}$	$V_{CONT}=0V$	—	—	100	nA
Output Current	$I_o$	$V_o-0.3V$	100	130	—	mA
Line Regulation	$\Delta V_o/\Delta V_{IN}$	$V_{IN}=V_o+1V \sim V_o+6V$ , $I_o=30mA$	—	—	0.10	%/V
Load Regulation	$\Delta V_o/\Delta I_o$	$I_o=0 \sim 60mA$	—	—	0.03	%/mA
Ripple Rejection	RR	$e_{in}=200mV_{rms}$ , $f=1kHz$ , $I_o=10mA$ , Vo=1.8V Version	—	80	—	dB
Average Temperature Coefficient of Output Voltage	$\Delta V_o/\Delta T_a$	$T_a=0 \sim 85^\circ C$ , $I_o=10mA$	—	± 50	—	ppm/°C
Output Noise Voltage	$V_{NO}$	$f=10Hz \sim 80kHz$ , $I_o=10mA$ Vo=1.8V Version	—	70	—	$\mu V_{rms}$
Control Voltage for ON-state	$V_{CONT(ON)}$		1.6	—	—	V
Control Voltage for OFF-state	$V_{CONT(OFF)}$		—	—	0.6	V

(\*note 3): The above specification is a common specification for all output voltages.

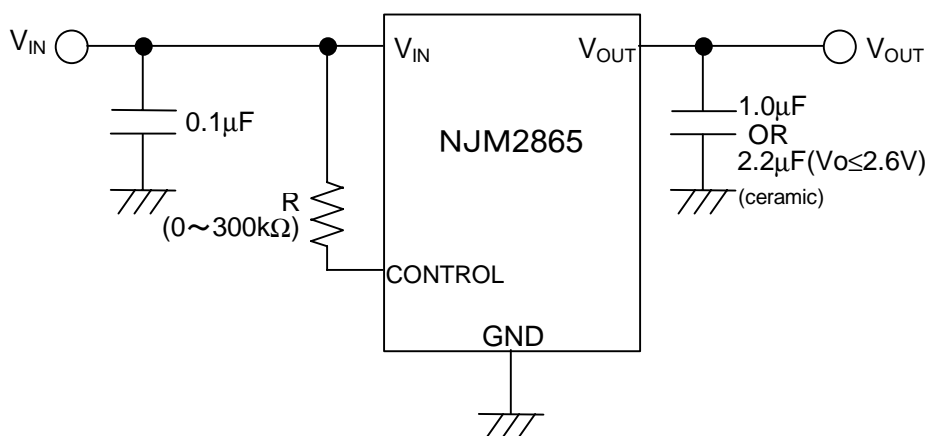
Therefore, it may be different from the individual specification for a specific output voltage.

## ■ TEST CIRCUIT



## ■ TYPICAL APPLICATION

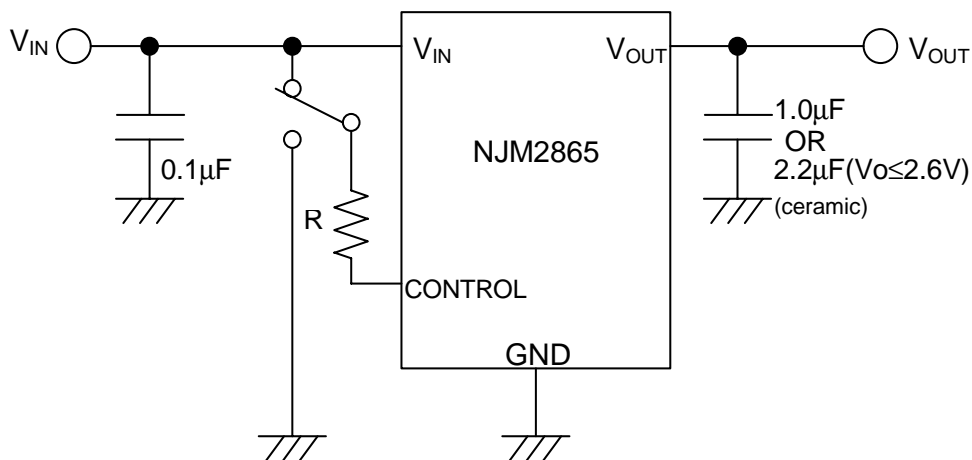
① In the case where ON/OFF Control is not required:



Connect control terminal to  $V_{IN}$  terminal

The quiescent current can be reduced by using a resistance “R”. Instead, it increases the minimum operating voltage. For further information, please refer to Figure “Output Voltage vs. Control Voltage”.

② In use of ON/OFF CONTROL:



State of control terminal:

- “H” → output is enabled.
- “L” or “open” → output is disabled.

**[CAUTION]**

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