

### 贴片三端稳压器 NSP-78L系列

#### ※ 概述

NSP-78LXX 系列三端稳压器有效利用几个固定电压得到较宽的应用范围，可替代混合的齐纳二极管和电阻，并比其拥有更低的静态电流。适合 100mA 的各种稳压要求。NSP-78LXX 这些电压可以用在逻辑系统，检测仪器，HIFI，和其他电子设备。可以替代过热保护 IC。

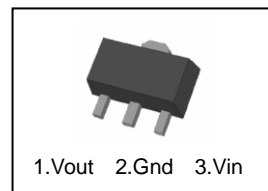
封装：SOT-89

输出电压精度±5%

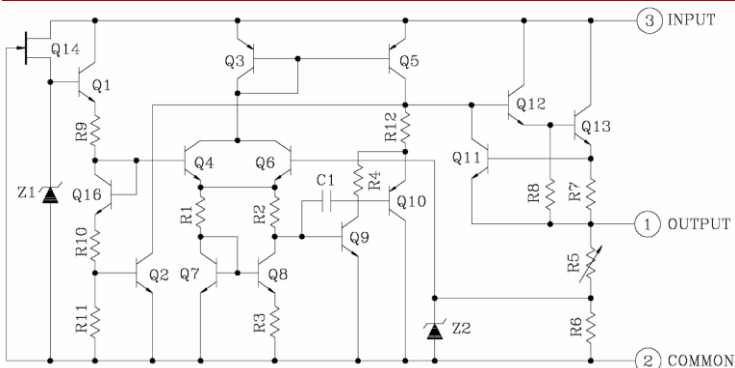
输出电流 100mA

内置过流保护功能

输出电压 5.0V, 6.0V, 7V, 8.0V, 9.0V, 10V, 12V, 15V



#### ※ 功能框图

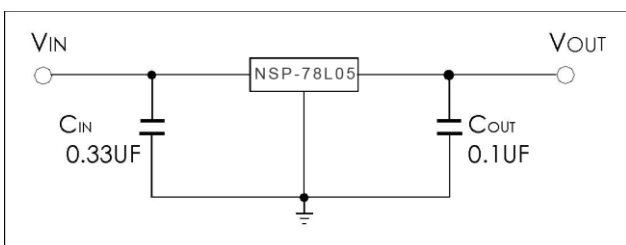


#### ※ 最大额定值 (Ta=25°C)

特性参数	符合	额定值		单位
		最小值	最大值	
功耗	PD		0.5	W
输入电压	VIN		35	V
工作温度	Topt	-0	125	°C
存储温度	Tstg	-55	150	°C

注意：绝对最大值是一个极限值，在任何情况下即使极短的时间亦不能被超过。而且，任何两项的绝对值都不能同时达到极限。任何超越最大值操作，将会引起器件永久损坏。这仅仅是重要的范围值，但并不意味著所有的功能操作必须在此极限值下去做。

#### ※ 典型应用图例



※ NSP-78L05

Unless otherwise specified,  $V_{in}=10V$ ,  $I_{out}=40mA$ ,  $C_{in}=0.33\mu F$ ,  $C_{out}=0.1\mu F$ ,  $T_j=0^{\circ}C$  to  $125^{\circ}C$

CHARACTERISTIC	SYMBOL	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Output Voltage	$V_{out}$	$T_j=25^{\circ}C$		4.75	5.0	5.25	V
Input Regulation	Reg line	$T_j=25^{\circ}C$	$7.0V \leq V_{in} \leq 20V$	-	55	150	mV
			$8.0V \leq V_{in} \leq 20V$	-	45	100	
Load Regulation	Reg load	$T_j=25^{\circ}C$	$1.0mA \leq I_{out} \leq 100mA$	-	11	60	mV
			$1.0mA \leq I_{out} \leq 40mA$	-	5.0	30	
Output Voltage	$V_{out}$	$7.0V \leq V_{in} \leq 20V$ $1.0mA \leq I_{out} \leq 40mA$		4.65	-	5.3	V
		$V_{in}=10V$ , $1.0mA \leq I_{out} \leq 70mA$		4.65	-	5.3	
Quiescent Current	$I_Q$	$T_j=25^{\circ}C$		-	3.1	6.0	mA
		$T_j=125^{\circ}C$		-	-	5.5	
Quiescent Current	$\Delta I_Q$	$8.0V \leq V_{in} \leq 20V$		-	-	1.5	mA
Change		$1.0mA \leq I_{out} \leq 40mA$		-	-	0.1	
Output Noise Voltage	$V_{NO}$	$T_a=25^{\circ}C$ , $10Hz \leq f \leq 100kHz$		-	40	-	$\mu V_{rms}$
Long Term Stability	$\Delta V_{out}/\Delta t$			-	12	-	mV/1.0kHrs
Ripple Rejection Ratio	RR	$f=120Hz$ , $8.0V \leq V_{in} \leq 18V$ , $T_j=25^{\circ}C$		41	49	-	dB
Dropout Voltage	$ V_{in}-V_{out} $	$T_j=25^{\circ}C$			1.7		V
Average Temperature Coefficient of Output Voltage	TCvo	$I_{out}=5mA$		-	-0.6	-	mV/ $^{\circ}C$

※ NSP-78L06

less otherwise specified,  $V_{in}=11V$ ,  $I_{out}=40mA$ ,  $C_{in}=0.33\mu F$ ,  $C_{out}=0.1\mu F$ ,  $T_j=0^{\circ}C$  to  $125^{\circ}C$

CHARACTERISTIC	SYMBOL	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Output Voltage	$V_{out}$	$T_j=25^{\circ}C$		5.7	6.0	6.3	V
Input Regulation	Reg line	$T_j=25^{\circ}C$	$8.1V \leq V_{in} \leq 21V$	-	50	150	mV
			$9.0V \leq V_{in} \leq 21V$ ,	-	45	110	
Load Regulation	Reg load	$T_j=25^{\circ}C$	$1.0mA \leq I_{out} \leq 100mA$	-	12	70	mV
			$1.0mA \leq I_{out} \leq 40mA$	-	5.5	35	
Output Voltage	$V_{out}$	$8.1V \leq V_{in} \leq 21V$ $1.0mA \leq I_{out} \leq 40mA$		5.58	-	6.42	V
		$V_{in}=11V$ , $1.0mA \leq I_{out} \leq 70mA$		5.58	-	6.42	
Quiescent Current	$I_Q$	$T_j=25^{\circ}C$		-	3.1	6.0	mA
		$T_j=125^{\circ}C$		-	-	5.5	
Quiescent Current	$\Delta I_Q$	$9.0V \leq V_{in} \leq 19V$ ,		-	-	1.5	mA
Change		$1.0mA \leq I_{out} \leq 40mA$		-	-	0.1	
Output Noise Voltage	$V_{NO}$	$T_a=25^{\circ}C$ , $10Hz \leq f \leq 100kHz$		-	40	-	$\mu V_{rms}$
Long Term Stability	$\Delta V_{out}/\Delta t$			-	14	-	mV/1.0kHrs
Ripple Rejection Ratio	RR	$F=120Hz$ , $9.0V \leq V_{in} \leq 19V$ , $T_j=25^{\circ}C$		39	47	-	dB
Dropout Voltage	$ V_{in}-V_{out} $	$T_j=25^{\circ}C$			1.7		V
Average Temperature Coefficient of Output Voltage	TCvo	$I_{out}=5mA$		-	-0.7	-	mV/ $^{\circ}C$

※ NSP-78L07

Unless otherwise specified,  $V_{in}=12V$ ,  $I_{out}=40mA$ ,  $C_{in}=0.33\mu F$ ,  $C_{out}=0.1\mu F$ ,  $T_j=0^{\circ}C$  to  $125^{\circ}C$

CHARACTERISTIC	SYMBOL	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Output Voltage	$V_{out}$	$T_j=25^{\circ}C$		6.72	7.0	7.28	V
Input Regulation	Reg line	$T_j=25^{\circ}C$	$9.2V \leq V_{in} \leq 22V$ ,	-	50	160	mV
			$10V \leq V_{in} \leq 22V$ ,	-	45	115	
Load Regulation	Reg load	$T_j=25^{\circ}C$	$1.0mA \leq I_{out} \leq 100mA$	-	13	75	mV
			$1.0mA \leq I_{out} \leq 40mA$	-	6.0	40	
Output Voltage	$V_{out}$	$9.2V \leq V_{in} \leq 22V$ , $1.0mA \leq I_{out} \leq 40mA$		6.65	-	7.35	V
		$V_{in}=12V$ , $1.0mA \leq I_{out} \leq 70mA$		6.65	-	7.35	
Quiescent Current	$I_Q$	$T_j=25^{\circ}C$		-	3.1	6.5	mA
		$T_j=125^{\circ}C$		-	-	6.0	
Quiescent Current	$\Delta I_Q$	$10V \leq V_{in} \leq 22V$ ,		-	-	1.5	mA
Change		$1.0mA \leq I_{out} \leq 40mA$		-	-	0.1	
Output Noise Voltage	$V_{NO}$	$T_a=25^{\circ}C$ , $10Hz \leq f \leq 100kHz$		-	50	-	$\mu V_{rms}$
Long Term Stability	$\Delta V_{out}/\Delta t$			-	17	-	mV/1.0kHrs
Ripple Rejection Ratio	RR	$F=120Hz$ , $10V \leq V_{in} \leq 20V$ , $T_j=25^{\circ}C$		37	46	-	dB
Dropout Voltage	$ V_{in}-V_{out} $	$T_j=25^{\circ}C$			1.7		V
Average Temperature Coefficient of Output Voltage	TCvo	$I_{out}=5mA$			-0.75	-	mV/ $^{\circ}C$

※ NSP-78L08

Unless otherwise specified,  $V_{in}=14V$ ,  $I_{out}=40mA$ ,  $C_{in}=0.33\mu F$ ,  $C_{out}=0.1\mu F$ ,  $T_j=0^{\circ}C$  to  $125^{\circ}C$

CHARACTERISTIC	SYMBOL	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Output Voltage	$V_{out}$	$T_j=25^{\circ}C$		7.6	8.0	8.4	V
Input Regulation	Reg line	$T_j=25^{\circ}C$	$10.5V \leq V_{in} \leq 23V$ ,	-	20	175	mV
			$11V \leq V_{in} \leq 23V$ ,	-	12	125	
Load Regulation	Reg load	$T_j=25^{\circ}C$	$1.0mA \leq I_{out} \leq 100mA$	-	15	80	mV
			$1.0mA \leq I_{out} \leq 40mA$	-	7.0	40	
Output Voltage	$V_{out}$	$10.5V \leq V_{in} \leq 23V$ , $1.0mA \leq I_{out} \leq 40mA$		7.44	-	8.56	V
		$V_{in}=14V$ , $1.0mA \leq I_{out} \leq 70mA$		7.44	-	8.56	
Quiescent Current	$I_Q$	$T_j=25^{\circ}C$		-	3.1	6.5	mA
		$T_j=125^{\circ}C$		-	-	6.0	
Quiescent Current	$\Delta I_Q$	$11V \leq V_{in} \leq 23V$ ,		-	-	1.5	mA
Change		$1.0mA \leq I_{out} \leq 40mA$		-	-	0.1	
Output Noise Voltage	$V_{NO}$	$T_a=25^{\circ}C$ , $10Hz \leq f \leq 100kHz$		-	60	-	$\mu V_{rms}$
Long Term Stability	$\Delta V_{out}/\Delta t$			-	20	-	mV/1.0kHrs
Ripple Rejection Ratio	RR	$F=120Hz$ , $12V \leq V_{in} \leq 23V$ , $T_j=25^{\circ}C$		37	45	-	dB
Dropout Voltage	$ V_{in}-V_{out} $	$T_j=25^{\circ}C$			1.7		V
Average Temperature Coefficient of Output Voltage	TCvo	$I_{out}=5mA$		-	-0.8	-	mV/ $^{\circ}C$

※ NSP-78L09

Unless otherwise specified,  $V_{in}=15V$ ,  $I_{out}=40mA$ ,  $C_{in}=0.33\mu F$ ,  $C_{out}=0.1\mu F$ ,  $T_j=0^{\circ}C$  to  $125^{\circ}C$

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Output Voltage	$V_{out}$	$T_j=25^{\circ}C$	8.55	9.0	9.45	V	
Input Regulation	Reg line	$T_j=25^{\circ}C$	$11.4V \leq V_{in} \leq 24V$ ,	-	80	200	mV
			$12V \leq V_{in} \leq 24V$ ,	-	20	160	
Load Regulation	Reg load	$T_j=25^{\circ}C$	$1.0mA \leq I_{out} \leq 100mA$	-	17	90	mV
			$1.0mA \leq I_{out} \leq 40mA$	-	8.0	45	
Output Voltage	$V_{out}$	$11.4V \leq V_{in} \leq 24V$ , $1.0mA \leq I_{out} \leq 40mA$	8.37	-	9.63	V	
		$V_{in}=15V$ , $1.0mA \leq I_{out} \leq 70mA$	8.37	-	9.63		
Quiescent Current	$I_Q$	$T_j=25^{\circ}C$	-	3.2	6.5	mA	
		$T_j=125^{\circ}C$	-	-	6.0		
Quiescent Current Change	$\Delta I_Q$	$12V \leq V_{in} \leq 24V$ ,	-	-	1.5	mA	
		$1.0mA \leq I_{out} \leq 40mA$	-	-	0.1		
Output Noise Voltage	$V_{NO}$	$T_a=25^{\circ}C$ , $10Hz \leq f \leq 100kHz$	-	65	-	$\mu V_{rms}$	
Long Term Stability	$\Delta V_{out}/\Delta t$		-	21	-	mV/1.0kHrs	
Ripple Rejection Ratio	RR	$F=120Hz$ , $12V \leq V_{in} \leq 24V$ , $T_j=25^{\circ}C$	36	44	-	dB	
Dropout Voltage	$ V_{in}-V_{out} $	$T_j=25^{\circ}C$		1.7		V	
Average Temperature Coefficient of Output Voltage	TCvo	$I_{out}=5mA$		0.85	-	mV/ $^{\circ}C$	

※ NSP-78L10

Unless otherwise specified,  $V_{in}=16V$ ,  $I_{out}=40mA$ ,  $C_{in}=0.33\mu F$ ,  $C_{out}=0.1\mu F$ ,  $T_j=0^{\circ}C$  to  $125^{\circ}C$

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Output Voltage	$V_{out}$	$T_j=25^{\circ}C$	9.5	10	10.5	V	
Input Regulation	Reg line	$T_j=25^{\circ}C$	$12.5V \leq V_{in} \leq 25V$ ,	-	80	230	mV
			$13V \leq V_{in} \leq 25V$ ,	-	30	170	
Load Regulation	Reg load	$T_j=25^{\circ}C$	$1.0mA \leq I_{out} \leq 100mA$	-	18	90	mV
			$1.0mA \leq I_{out} \leq 40mA$	-	8.5	45	
Output Voltage	$V_{out}$	$12.5V \leq V_{in} \leq 25V$ , $1.0mA \leq I_{out} \leq 40mA$	9.3	-	10.7	V	
		$V_{in}=16V$ , $1.0mA \leq I_{out} \leq 70mA$	9.3	-	10.7		
Quiescent Current	$I_Q$	$T_j=25^{\circ}C$	-	3.2	6.5	mA	
		$T_j=125^{\circ}C$	-	-	6.0		
Quiescent Current Change	$\Delta I_Q$	$13V \leq V_{in} \leq 25V$ ,	-	-	1.5	mA	
		$1.0mA \leq I_{out} \leq 40mA$	-	-	0.1		
Output Noise Voltage	$V_{NO}$	$T_a=25^{\circ}C$ , $10Hz \leq f \leq 100kHz$	-	70	-	$\mu V_{rms}$	
Long Term Stability	$\Delta V_{out}/\Delta t$		-	22	-	mV/1.0kHrs	
Ripple Rejection Ratio	RR	$F=120Hz$ , $13V \leq V_{in} \leq 24V$ , $T_j=25^{\circ}C$	37	43	-	dB	
Dropout Voltage	$ V_{in}-V_{out} $	$T_j=25^{\circ}C$		1.7		V	
Average Temperature Coefficient of Output Voltage	TCvo	$I_{out}=5mA$	-	-0.9	-	mV/ $^{\circ}C$	

※ NSP-78L12

Unless otherwise specified,  $V_{in}=19V$ ,  $I_{out}=40mA$ ,  $C_{in}=0.33\mu F$ ,  $C_{out}=0.1\mu F$ ,  $T_j=0^{\circ}C$  to  $125^{\circ}C$

CHARACTERISTIC	SYMBOL	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Output Voltage	$V_{out}$	$T_j=25^{\circ}C$		11.4	12	12.6	V
Input Regulation	Reg line	$T_j=25^{\circ}C$	$14.5V \leq V_{in} \leq 27V$ ,	-	120	250	mV
			$16V \leq V_{in} \leq 27V$ ,	-	100	200	
Load Regulation	Reg load	$T_j=25^{\circ}C$	$1.0mA \leq I_{out} \leq 100mA$	-	20	100	mV
			$1.0mA \leq I_{out} \leq 40mA$	-	10	50	
Output Voltage	$V_{out}$	$14.5V \leq V_{in} \leq 27V$ , $1.0mA \leq I_{out} \leq 40mA$		11.16	-	12.84	V
		$V_{in}=19V$ , $1.0mA \leq I_{out} \leq 70mA$		11.16	-	12.84	
Quiescent Current	$I_q$	$T_j=25^{\circ}C$		-	3.2	6.5	mA
		$T_j=125^{\circ}C$		-	-	6.0	
Quiescent Current Change	$\Delta I_q$	$16V \leq V_{in} \leq 27V$ ,		-	-	1.5	mA
		$1.0mA \leq I_{out} \leq 40mA$		-	-	0.1	
Output Noise Voltage	$V_{NO}$	$T_a=25^{\circ}C$ , $10Hz \leq f \leq 100kHz$		-	80	-	$\mu V_{rms}$
Long Term Stability	$\Delta V_{out}/\Delta t$			-	24	-	mV/1.0kHrs
Ripple Rejection Ratio	RR	$F=120Hz$ , $15V \leq V_{in} \leq 25V$ , $T_j=25^{\circ}C$		36	41	-	dB
Dropout Voltage	$ V_{in}-V_{out} $	$T_j=25^{\circ}C$			1.7		V
Average Temperature Coefficient of Output Voltage	TCvo	$I_{out}=5mA$		-	-1.0	-	mV/ $^{\circ}C$

※ NSP-78L15

Unless otherwise specified,  $V_{in}=23V$ ,  $I_{out}=40mA$ ,  $C_{in}=0.33\mu F$ ,  $C_{out}=0.1\mu F$ ,  $T_j=0^{\circ}C$  to  $125^{\circ}C$

CHARACTERISTIC	SYMBOL	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Output Voltage	$V_{out}$	$T_j=25^{\circ}C$		14.25	15	15.75	V
Input Regulation	Reg line	$T_j=25^{\circ}C$	$17.5V \leq V_{in} \leq 30V$ ,	-	130	300	mV
			$20V \leq V_{in} \leq 30V$ ,	-	110	250	
Load Regulation	Reg load	$T_j=25^{\circ}C$	$1.0mA \leq I_{out} \leq 100mA$	-	25	150	mV
			$1.0mA \leq I_{out} \leq 40mA$	-	12	75	
Output Voltage	$V_{out}$	$17.5V \leq V_{in} \leq 30V$ , $1.0mA \leq I_{out} \leq 40mA$		13.95	-	16.05	V
		$V_{in}=23V$ , $1.0mA \leq I_{out} \leq 70mA$		13.95	-	16.05	
Quiescent Current	$I_q$	$T_j=25^{\circ}C$		-	3.3	6.5	mA
		$T_j=125^{\circ}C$		-	-	6.0	
Quiescent Current Change	$\Delta I_q$	$20V \leq V_{in} \leq 30V$ ,		-	-	1.5	mA
		$1.0mA \leq I_{out} \leq 40mA$		-	-	0.1	
Output Noise Voltage	$V_{NO}$	$T_a=25^{\circ}C$ , $10Hz \leq f \leq 100kHz$		-	90	-	$\mu V_{rms}$
Long Term Stability	$\Delta V_{out}/\Delta t$			-	30	-	mV/1.0kHrs
Ripple Rejection Ratio	RR	$F=120Hz$ , $18.5V \leq V_{in} \leq 28.5V$ , $T_j=25^{\circ}C$		34	40	-	dB
Dropout Voltage	$ V_{in}-V_{out} $	$T_j=25^{\circ}C$			1.7		V
Average Temperature Coefficient of Output Voltage	TCvo	$I_{out}=5mA$		-	-1.3	-	mV/ $^{\circ}C$