

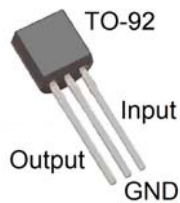
## Features

- 3-terminal regulators
- Output current up to 100mA
- No external components
- Internal thermal overload protection

## Applications

- TFT flat panel backlighting
- AC/DC LED lamp
- LED traffic light
- T5, T8 LED line bar
- MR-16 lamp
- Signage or decorative LED lamp

## Package Pin Out



## General Description


This series of fixed voltage monolithic integrated circuit voltage regulators is designed for a wide range of applications. These applications include on-card regulation for elimination of noise and distribution problems associated with single-point regulation. In addition, they can be used with power-pass elements to make high-current voltage regulators. Each of these regulators can deliver up to 100mA of output current. The internal limiting and thermal shutdown features of these regulators make them essentially immune to overload. When used as a replacement for a Zener diode-resistor combination, an effective improvement in output impedance can be obtained together with lower-bias current.

## Ordering Information

Part No.	Output	Package	Packing Options	
			Bag (BG)	Tape & Reel (TR)
LD6805	5V	TO-92	LD6805T1-TU	LD6805T1-TR
LD6806	6V		LD6806T1-TU	LD6806T1-TR
LD6808	8V		LD6808T1-TU	LD6808T1-TR
LD6809	9V		LD6809T1-TU	LD6809T1-TR
LD6810	10V		LD6810T1-TU	LD6810T1-TR
LD6812	12V		LD6812T1-TU	LD6812T1-TR
LD6815	15V		LD6815T1-TU	LD6815T1-TR
LD6818	18V		LD6818T1-TU	LD6818T1-TR
LD6824	24V		LD6824T1-TU	LD6824T1-TR

- Package material default is "Green" package.

## Product Marking

LD8888 SSSSS... 	◇ Line 1 – "LD" is a fixed character 8888: product name ◇ Line 2 – SSSSS...: lot number
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## Absolute Maximum Ratings

Parameter	LD6805 ~ LD6810	LD6812 ~ LD6818	LD6824	Units
Input voltage	30	35	40	V
Operating free-air, case, or virtual junction temperature range	0~150			°C
Storage temperature range	-65~150			°C
Operating Temperature Range (T <sub>A</sub> )	-40~85			°C
Lead temperature (1.6mm aside from the case, 10 seconds)	260			°C

The values beyond the boundaries of absolute maximum rating may cause the damage to the device. Functional operation in this context is not implied. Continuous use of the device at the absolute rating level might influence device reliability. All voltages have their reference to device ground.

## Recommended operating conditions

Parameter	Symbol	Device Name	Min	Max	Unit
Input Voltage	V <sub>IN</sub>	LD6805	7	20	V
		LD6806	8	20	V
		LD6808	10.5	23	V
		LD6809	11.5	24	V
		LD6810	12.5	25	V
		LD6812	14.5	27	V
		LD6815	17.5	30	V
		LD6818	20.5	33	V
LD6824	26.5	39	V		
Output Current	I <sub>OUT</sub>	–	–	100	mA
Operating virtual junction temperature	T <sub>J</sub>	–	0	125	°C

## Electrical Characteristics

LD6805 is working under V<sub>IN</sub>=10V, I<sub>OUT</sub>=40mA, at specified virtual junction temperature, unless specified.

Parameter	Symbol	Conditions <sup>*1</sup>	T <sub>J</sub>	Min	Typ.	Max	Unit
Output voltage <sup>*2</sup>	V <sub>OUT</sub>	–	25°C	4.8	5	5.2	V
		I <sub>OUT</sub> =1~40mA, V <sub>IN</sub> =7~20V	0~+125°C	4.75	5	5.25	
		I <sub>OUT</sub> =1~70mA	4.75	5	5.25		
Input line regulation	V <sub>LINEREG</sub>	V <sub>IN</sub> =7~20V	25°C	–	32	150	mV
		V <sub>IN</sub> =8~20V	–	26	100		
Ripple rejection	G <sub>RIPPLE</sub>	V <sub>IN</sub> =8~18V, f=120Hz	25°C	41	49	–	dB
Output load regulation	V <sub>LOADREG</sub>	I <sub>OUT</sub> =1~100mA	25°C	–	15	60	mV
		I <sub>OUT</sub> =1~40mA	–	8	30		
Output noise voltage	V <sub>NOISE</sub>	f=10~100Hz	25°C	–	42	–	µV
Dropout voltage	V <sub>DROP</sub>	–	25°C	–	1.7	–	V
Bias current	I <sub>BIAS</sub>	–	25°C	–	3.8	6	mA
		–	125°C	–	–	5.5	
Bias current change	ΔI <sub>BIAS</sub>	V <sub>IN</sub> =8~20V	0~+125°C	–	–	1.5	mA
		I <sub>OUT</sub> =1~40mA	–	–	0.1		

Notes:

\*1. Pulse testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into account separately. All characteristics are measured with a 0.33µF capacitor across the input and a 0.1µF capacitor across the output.

\*2. This specification applies only for dc power dissipation permitted by absolute maximum ratings.

## Electrical Characteristics (Cont')

LD6806 is working under  $V_{IN}=11V$ ,  $I_{OUT}=40mA$ , at specified virtual junction temperature, unless specified.

Parameter	Symbol	Conditions <sup>*1</sup>	T <sub>J</sub>	Min	Typ.	Max	Unit
Output voltage <sup>*2</sup>	V <sub>OUT</sub>	–	25°C	5.75	6	6.25	V
		I <sub>OUT</sub> =1~40mA, V <sub>IN</sub> =8~20V	0~+125°C	5.7	6	6.3	
		I <sub>OUT</sub> =1~70mA		5.7	6	6.3	
Input line regulation	V <sub>LINEREG</sub>	V <sub>IN</sub> =8~20V	25°C	–	35	175	mV
		V <sub>IN</sub> =9~20V		–	29	125	
Ripple rejection	G <sub>RIPPLE</sub>	V <sub>IN</sub> =9~19V, f=120Hz	25°C	40	48	–	dB
Output load regulation	V <sub>LOADREG</sub>	I <sub>OUT</sub> =1~100mA	25°C	–	16	80	mV
		I <sub>OUT</sub> =1~40mA		–	9	40	
Output noise voltage	V <sub>NOISE</sub>	f=10~100Hz	25°C	–	46	–	μV
Dropout voltage	V <sub>DROP</sub>	–	25°C	–	1.7	–	V
Bias current	I <sub>BIAS</sub>	–	25°C	–	3.9	6	mA
			125°C	–	–	5.5	
Bias current change	ΔI <sub>BIAS</sub>	V <sub>IN</sub> =9~20V	0~+125°C	–	–	1.5	mA
		I <sub>OUT</sub> =1~40mA		–	–	0.1	

Notes:

- \*1. Pulse testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into account separately. All characteristics are measured with a 0.33μF capacitor across the input and a 0.1μF capacitor across the output.
- \*2. This specification applies only for dc power dissipation permitted by absolute maximum ratings.

LD6808 is working under  $V_{IN}=14V$ ,  $I_{OUT}=40mA$ , at specified virtual junction temperature, unless specified.

Parameter	Symbol	Conditions <sup>*1</sup>	T <sub>J</sub>	Min	Typ.	Max	Unit
Output voltage <sup>*2</sup>	V <sub>OUT</sub>	–	25°C	7.7	8	8.3	V
		I <sub>OUT</sub> =1~40mA, V <sub>IN</sub> =10.5~23V	0~+125°C	7.6	8	8.4	
		I <sub>OUT</sub> =1~70mA		7.6	8	8.4	
Input line regulation	V <sub>LINEREG</sub>	V <sub>IN</sub> =10.5~23V	25°C	–	42	175	mV
		V <sub>IN</sub> =11~23V		–	36	125	
Ripple rejection	G <sub>RIPPLE</sub>	V <sub>IN</sub> =13~23V, f=120Hz	25°C	37	46	–	dB
Output load regulation	V <sub>LOADREG</sub>	I <sub>OUT</sub> =1~100mA	25°C	–	18	80	mV
		I <sub>OUT</sub> =1~40mA		–	10	40	
Output noise voltage	V <sub>NOISE</sub>	f=10~100Hz	25°C	–	54	–	μV
Dropout voltage	V <sub>DROP</sub>	–	25°C	–	1.7	–	V
Bias current	I <sub>BIAS</sub>	–	25°C	–	4	6	mA
			125°C	–	–	5.5	
Bias current change	ΔI <sub>BIAS</sub>	V <sub>IN</sub> =11~23V	0~+125°C	–	–	1.5	mA
		I <sub>OUT</sub> =1~40mA		–	–	0.1	

Notes:

- \*1. Pulse testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into account separately. All characteristics are measured with a 0.33μF capacitor across the input and a 0.1μF capacitor across the output.
- \*2. This specification applies only for dc power dissipation permitted by absolute maximum ratings.

## Electrical Characteristics (Cont')

LD6809 is working under  $V_{IN}=16V$ ,  $I_{OUT}=40mA$ , at specified virtual junction temperature, unless specified.

Parameter	Symbol	Conditions <sup>*1</sup>	T <sub>J</sub>	Min	Typ.	Max	Unit
Output voltage <sup>*2</sup>	V <sub>OUT</sub>	–	25°C	8.6	9	9.4	V
		I <sub>OUT</sub> =1~40mA, V <sub>IN</sub> =12~24V	0~+125°C	8.55	9	9.45	
		I <sub>OUT</sub> =1~70mA		8.55	9	9.45	
Input line regulation	V <sub>LINEREG</sub>	V <sub>IN</sub> =12~24V	25°C	–	45	175	mV
		V <sub>IN</sub> =13~24V		–	40	125	
Ripple rejection	G <sub>RIPPLE</sub>	V <sub>IN</sub> =15~25V, f=120Hz	25°C	38	45	–	dB
Output load regulation	V <sub>LOADREG</sub>	I <sub>OUT</sub> =1~100mA	25°C	–	19	90	mV
		I <sub>OUT</sub> =1~40mA		–	11	40	
Output noise voltage	V <sub>NOISE</sub>	f=10~100Hz	25°C	–	58	–	μV
Dropout voltage	V <sub>DROP</sub>	–	25°C	–	1.7	–	V
Bias current	I <sub>BIAS</sub>	–	25°C	–	4.1	6	mA
			125°C	–	–	5.5	
Bias current change	ΔI <sub>BIAS</sub>	V <sub>IN</sub> =13~24V	0~+125°C	–	–	1.5	mA
		I <sub>OUT</sub> =1~40mA		–	–	0.1	

Notes:

- \*1. Pulse testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into account separately. All characteristics are measured with a 0.33μF capacitor across the input and a 0.1μF capacitor across the output.
- \*2. This specification applies only for dc power dissipation permitted by absolute maximum ratings.

LD6810 is working under  $V_{IN}=17V$ ,  $I_{OUT}=40mA$ , at specified virtual junction temperature, unless specified.

Parameter	Symbol	Conditions <sup>*1</sup>	T <sub>J</sub>	Min	Typ.	Max	Unit
Output voltage <sup>*2</sup>	V <sub>OUT</sub>	–	25°C	9.6	10	10.4	V
		I <sub>OUT</sub> =1~40mA, V <sub>IN</sub> =13~25V	0~+125°C	9.5	10	10.5	
		I <sub>OUT</sub> =1~70mA		9.5	10	10.5	
Input line regulation	V <sub>LINEREG</sub>	V <sub>IN</sub> =13~25V	25°C	–	51	175	mV
		V <sub>IN</sub> =14~25V		–	42	125	
Ripple rejection	G <sub>RIPPLE</sub>	V <sub>IN</sub> =15~25V, f=120Hz	25°C	37	44	–	dB
Output load regulation	V <sub>LOADREG</sub>	I <sub>OUT</sub> =1~100mA	25°C	–	20	90	mV
		I <sub>OUT</sub> =1~40mA		–	11	40	
Output noise voltage	V <sub>NOISE</sub>	f=10~100Hz	25°C	–	62	–	μV
Dropout voltage	V <sub>DROP</sub>	–	25°C	–	1.7	–	V
Bias current	I <sub>BIAS</sub>	–	25°C	–	4.2	6	mA
			125°C	–	–	5.5	
Bias current change	ΔI <sub>BIAS</sub>	V <sub>IN</sub> =14~25V	0~+125°C	–	–	1.5	mA
		I <sub>OUT</sub> =1~40mA		–	–	0.1	

Notes:

- \*1. Pulse testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into account separately. All characteristics are measured with a 0.33μF capacitor across the input and a 0.1μF capacitor across the output.
- \*2. This specification applies only for dc power dissipation permitted by absolute maximum ratings.

## Electrical Characteristics (Cont')

LD6812 is working under  $V_{IN}=19V$ ,  $I_{OUT}=40mA$ , at specified virtual junction temperature, unless specified.

Parameter	Symbol	Conditions <sup>*1</sup>	T <sub>J</sub>	Min	Typ.	Max	Unit
Output voltage <sup>*2</sup>	V <sub>OUT</sub>	–	25°C	11.5	12	12.5	V
		I <sub>OUT</sub> =1~40mA, V <sub>IN</sub> =14~27V	0~+125°C	11.4	12	12.6	
		I <sub>OUT</sub> =1~70mA		11.4	12	12.6	
Input line regulation	V <sub>LINEREG</sub>	V <sub>IN</sub> =14~27V	25°C	–	55	250	mV
		V <sub>IN</sub> =16~27V		–	49	200	
Ripple rejection	G <sub>RIPPLE</sub>	V <sub>IN</sub> =15~25V, f=120Hz	25°C	37	42	–	dB
Output load regulation	V <sub>LOADREG</sub>	I <sub>OUT</sub> =1~100mA	25°C	–	22	100	mV
		I <sub>OUT</sub> =1~40mA		–	13	50	
Output noise voltage	V <sub>NOISE</sub>	f=10~100Hz	25°C	–	70	–	μV
Dropout voltage	V <sub>DROP</sub>	–	25°C	–	1.7	–	V
Bias current	I <sub>BIAS</sub>	–	25°C	–	4.3	6.5	mA
			125°C	–	–	6	
Bias current change	ΔI <sub>BIAS</sub>	V <sub>IN</sub> =16~27V	0~+125°C	–	–	1.5	mA
		I <sub>OUT</sub> =1~40mA		–	–	0.1	

Notes:

- \*1. Pulse testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into account separately. All characteristics are measured with a 0.33μF capacitor across the input and a 0.1μF capacitor across the output.
- \*2. This specification applies only for dc power dissipation permitted by absolute maximum ratings.

LD6815 is working under  $V_{IN}=23V$ ,  $I_{OUT}=40mA$ , at specified virtual junction temperature, unless specified.

Parameter	Symbol	Conditions <sup>*1</sup>	T <sub>J</sub>	Min	Typ.	Max	Unit
Output voltage <sup>*2</sup>	V <sub>OUT</sub>	–	25°C	14.4	15	15.6	V
		I <sub>OUT</sub> =1~40mA, V <sub>IN</sub> =17.5~30V	0~+125°C	14.25	15	15.75	
		I <sub>OUT</sub> =1~70mA		14.25	15	15.75	
Input line regulation	V <sub>LINEREG</sub>	V <sub>IN</sub> =17.5~30V	25°C	–	65	300	mV
		V <sub>IN</sub> =19~30V		–	58	250	
Ripple rejection	G <sub>RIPPLE</sub>	V <sub>IN</sub> =18.5~28.5V, f=120Hz	25°C	34	39	–	dB
Output load regulation	V <sub>LOADREG</sub>	I <sub>OUT</sub> =1~100mA	25°C	–	25	150	mV
		I <sub>OUT</sub> =1~40mA		–	15	75	
Output noise voltage	V <sub>NOISE</sub>	f=10~100Hz	25°C	–	82	–	μV
Dropout voltage	V <sub>DROP</sub>	–	25°C	–	1.7	–	V
Bias current	I <sub>BIAS</sub>	–	25°C	–	4.6	6.5	mA
			125°C	–	–	6	
Bias current change	ΔI <sub>BIAS</sub>	V <sub>IN</sub> =19~30V	0~+125°C	–	–	1.5	mA
		I <sub>OUT</sub> =1~40mA		–	–	0.1	

Notes:

- \*1. Pulse testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into account separately. All characteristics are measured with a 0.33μF capacitor across the input and a 0.1μF capacitor across the output.
- \*2. This specification applies only for dc power dissipation permitted by absolute maximum ratings.

## Electrical Characteristics (Cont')

LD6818 is working under  $V_{IN}=26V$ ,  $I_{OUT}=40mA$ , at specified virtual junction temperature, unless specified.

Parameter	Symbol	Conditions <sup>*1</sup>	T <sub>J</sub>	Min	Typ.	Max	Unit
Output voltage <sup>*2</sup>	V <sub>OUT</sub>	–	25°C	17.3	18	18.7	V
		I <sub>OUT</sub> =1~40mA, V <sub>IN</sub> =20.5~33V	0~+125°C	17.1	18	18.9	
		I <sub>OUT</sub> =1~70mA		17.1	18	18.9	
Input line regulation	V <sub>LINEREG</sub>	V <sub>IN</sub> =20.5~33V	25°C	–	70	360	mV
		V <sub>IN</sub> =22~33V		–	64	300	
Ripple rejection	G <sub>RIPPLE</sub>	V <sub>IN</sub> =21.5~31.5V, f=120Hz	25°C	32	36	–	dB
Output load regulation	V <sub>LOADREG</sub>	I <sub>OUT</sub> =1~100mA	25°C	–	27	180	mV
		I <sub>OUT</sub> =1~40mA		–	19	90	
Output noise voltage	V <sub>NOISE</sub>	f=10~100Hz	25°C	–	89	–	μV
Dropout voltage	V <sub>DROP</sub>	–	25°C	–	1.7	–	V
Bias current	I <sub>BIAS</sub>	–	25°C	–	4.7	6.5	mA
			125°C	–	–	6	
Bias current change	ΔI <sub>BIAS</sub>	V <sub>IN</sub> =22~33V	0~+125°C	–	–	1.5	mA
		I <sub>OUT</sub> =1~40mA		–	–	0.1	

Notes:

- \*1. Pulse testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into account separately. All characteristics are measured with a 0.33μF capacitor across the input and a 0.1μF capacitor across the output.
- \*2. This specification applies only for dc power dissipation permitted by absolute maximum ratings.

LD6824 is working under  $V_{IN}=32V$ ,  $I_{OUT}=40mA$ , at specified virtual junction temperature, unless specified.

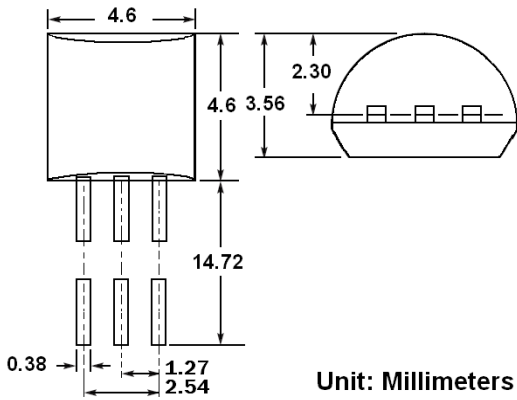
Parameter	Symbol	Conditions <sup>*1</sup>	T <sub>J</sub>	Min	Typ.	Max	Unit
Output voltage <sup>*2</sup>	V <sub>OUT</sub>	–	25°C	23	24	25	V
		I <sub>OUT</sub> =1~40mA, V <sub>IN</sub> =26.5~39V	0~+125°C	22.8	24	25.2	
		I <sub>OUT</sub> =1~70mA		22.8	24	25.2	
Input line regulation	V <sub>LINEREG</sub>	V <sub>IN</sub> =26.5~39V	25°C	–	95	480	mV
		V <sub>IN</sub> =29~39V		–	78	400	
Ripple rejection	G <sub>RIPPLE</sub>	V <sub>IN</sub> =27.5~37.5V, f=120Hz	25°C	30	33	–	dB
Output load regulation	V <sub>LOADREG</sub>	I <sub>OUT</sub> =1~100mA	25°C	–	41	240	mV
		I <sub>OUT</sub> =1~40mA		–	28	120	
Output noise voltage	V <sub>NOISE</sub>	f=10~100Hz	25°C	–	97	–	μV
Dropout voltage	V <sub>DROP</sub>	–	25°C	–	1.7	–	V
Bias current	I <sub>BIAS</sub>	–	25°C	–	4.8	6.5	mA
			125°C	–	–	6	
Bias current change	ΔI <sub>BIAS</sub>	V <sub>IN</sub> =28~39V	0~+125°C	–	–	1.5	mA
		I <sub>OUT</sub> =1~40mA		–	–	0.1	

Notes:

- \*1. Pulse testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into account separately. All characteristics are measured with a 0.33μF capacitor across the input and a 0.1μF capacitor across the output.
- \*2. This specification applies only for dc power dissipation permitted by absolute maximum ratings.

## Package Outline

### TO-92:



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