Preliminary – **LD6307**

Dual OPAmp and Voltage Reference

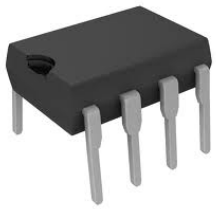
Features

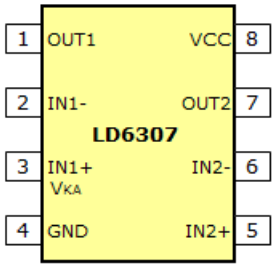
- Input offset voltage: 0.5mV
- Supply current: 250μA each at 5.0-volt supply voltage
- Unity gain bandwidth: 1MHz
- Output voltage swing: 0 to (VCC-1.5)V
- Power supply range: 3V to 18V
- Fixed output reference voltage: 2.5V, 2.6V
- Voltage tolerance: 1%
- Sink current capability 0.2 to 80mA

Applications

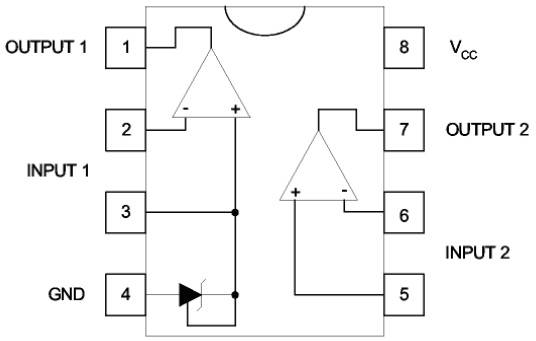
- Battery Chargers
- Switching mode power supplies

Package Pin Out





Block Diagram



General Description

The LD6307 is a monolithic IC specifically designed to control the output current and voltage levels of battery chargers and switching mode power supplies.
The device contains two operational amplifiers and a precision shunt regulator. OPAmp1 is designed for the voltage control and its non-inverting input is internally connected to the output of the shunt regulator. OPAmp2 is intended for the current control with both inputs uncommitted. The IC offers the power converter designer a control solution that features an increased precision with a corresponding reduction in the system complexity and cost.

The LD6307 is available in 2 packages: DIP-8 and SOP-8.

Ordering Information

		Packing Options	
Part No.	Package	Tube (TU)	Tape & Reel (TR)
LD6307	DIP-8	LD6307D1-TU	LD6307D1-TR
	SOP-8	LD6307S1-TU	LD6307S1-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

Absolute Maximum Ratings*1

Parameter		Maximum	Unit
V_{CC} power supply voltage		20	V
V_{IN} Input voltage range (pin 2,5,6)		-0.3 to V_{CC}+0.3	V
V_{ID}, Input differential voltage (pin 5,6)		20	V
I_K voltage reference cathode current (pin 3)		1.2	A
P_D Power Dissipation T_A=25°C	DIP-8	800	mW
	SOP-8	500	
V_{CC} Operating supply voltage range		3~18	V
T_A Operating ambient temperature range		-40 to +105	°C
T_{STG} Storage temperature range		-65 to +150	°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.

Electrical Characteristics

V_{CC}=+5.0V, T_A=25°C, unless specified

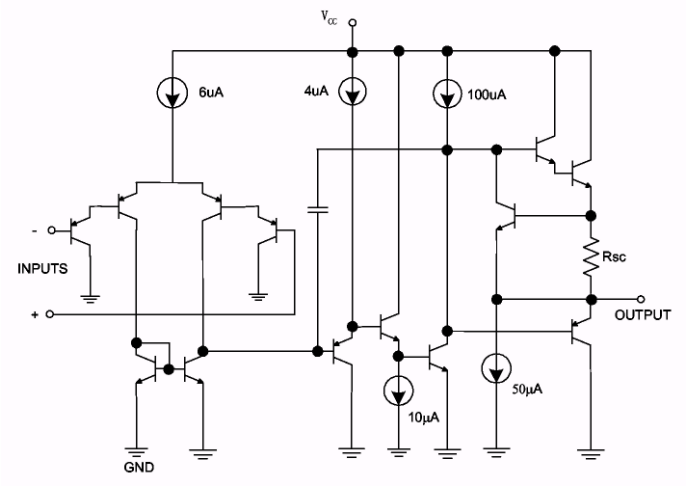
Parameter	Symbol	Condition	Min	Typ.	Max	Unit
General						
Total supply current, excluding the current in the Voltage Reference	I_{SPLY}	V_{CC} = 5V, no load, -40°C≦T_A≦85°C	–	0.5	0.8	mA
		V_{CC} = 18V, no load, -40°C≦T_A≦85°C	–	0.6	1.2	
Voltage Reference						
Reference voltage	V_{REF}	I_{KA} = 10mA, T_A = 25°C	2.475	2.500	2.525	V
Reference voltage deviation	ΔV_{REF}	I_{KA} = 10mA, -40°C≦T_A≦85°C	–	5	24	mV
Minimum cathode current for regulation	I_{CAT}	–	–	–	10	mA
Dynamic impedance	R_{DYN}	I_{KA} = 1~80mA, f≦1KHz	–	0.3	0.5	Ω
OPAmp1						
Input offset voltage	V_{OFST}	T_A = 25°C	–	0.5	3	mV
		-40°C≦T_A≦85°C	–	–	5	
Input offset voltage temperature drift	ΔV_{OFST}	-40°C≦T_A≦85°C	–	7	–	μV/°C
Input bias current (inverting input only)	I_{BIAS}	T_A = 25°C	–	20	150	nA
Large signal voltage gain	Gain	V_{CC} = 18V,R_L=2KΩ, V_O=1.4~11.4V	85	100	–	dB
Power supply rejection ratio	Ratio	V_{CC} = 5~18V	70	90	–	dB
Output current source	I_{OSRC}	V_{CC} = 15V,V_{ID}=1V, V_O=2V	20	40	–	mA
Output current sink	I_{OSINK}	V_{CC} = 15V,V_{ID}=-1V, V_O=2V	10	20	–	mA
Output voltage swing (High)	V_{OSWH}	V_{CC} = 18V,R_L=10KΩ, V_{ID}=1V	16	16.5	–	V
Output voltage swing (Low)	V_{OSWL}	V_{CC} = 18V,R_L=10KΩ, V_{ID}=-1V	–	17	100	mV
Slew rate	ΔV_{SLEW}	V_{CC} = 18V,R_L=2KΩ, A_V=1, V_{IN}=0.5~2V	0.2	0.5	–	V/μS
Gain-bandwidth product	BW	V_{CC} = 18V,R_L=2KΩ, f=100KHz, V_{IN}=10mV	0.5	1	–	MHz
OPAmp2						
Input offset voltage	V_{OFST}	T_A = 25°C	–	0.5	3	mV
		-40°C≦T_A≦85°C	–	–	5	
Input offset voltage temperature drift	ΔV_{OFST}	-40°C≦T_A≦85°C	–	7	–	μV/°C
Input offset current	I_{OFST}	T_A = 25°C	–	2	30	nA
Input bias current	I_{BIAS}	T_A = 25°C	–	20	150	nA
Input voltage range	V_{IN}	V_{CC} = 0~18V	0	–	V_{CC}-1.5	V
Large signal voltage gain	Gain	V_{CC} = 18V,R_L=2KΩ, V_O=1.4~11.4V	85	100	–	dB
Power supply rejection ratio	Ratio	V_{CC} = 5~18V	70	90	–	dB
Output current source	I_{OSRC}	V_{CC} = 15V,V_{ID}=1V, V_O=2V	20	40	–	mA
Output current sink	I_{OSINK}	V_{CC} = 15V,V_{ID}=-1V, V_O=2V	10	20	–	mA
Output voltage swing (High)	V_{OSWH}	V_{CC} = 18V,R_L=10KΩ, V_{ID}=1V	16	16.5	–	V
Output voltage swing (Low)	V_{OSWL}	V_{CC} = 18V,R_L=10KΩ, V_{ID}=-1V	–	17	100	mV
Slew rate*2	ΔV_{SLEW}	V_{CC} = 18V,R_L=2KΩ, A_V=1, V_{IN}=0.5~2V	0.2	0.5	–	V/μS
Gain-bandwidth product*2	BW	V_{CC} = 18V,R_L=2KΩ, f=100KHz, V_{IN}=10mV	0.5	1	–	MHz

Notes:

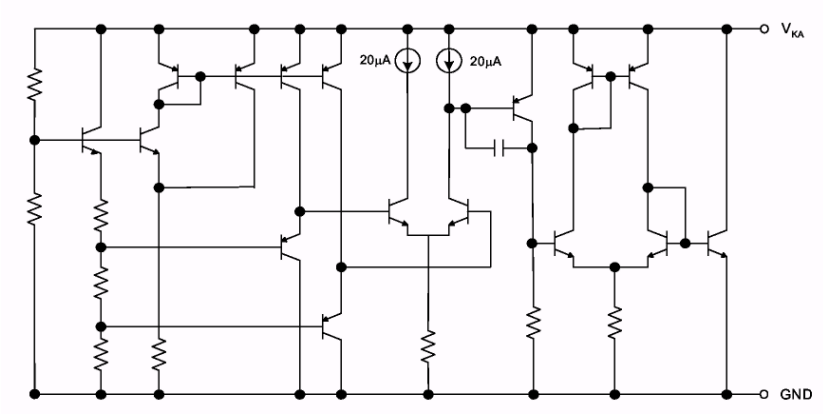
1. Stresses greater than those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions beyond those indicated under “Recommended Operating Conditions” are not implied. Exposure to “Absolute Maximum Ratings” for extended periods may affect device reliability.
2. Load capacitor C_L=100pF

Functional Block Diagram

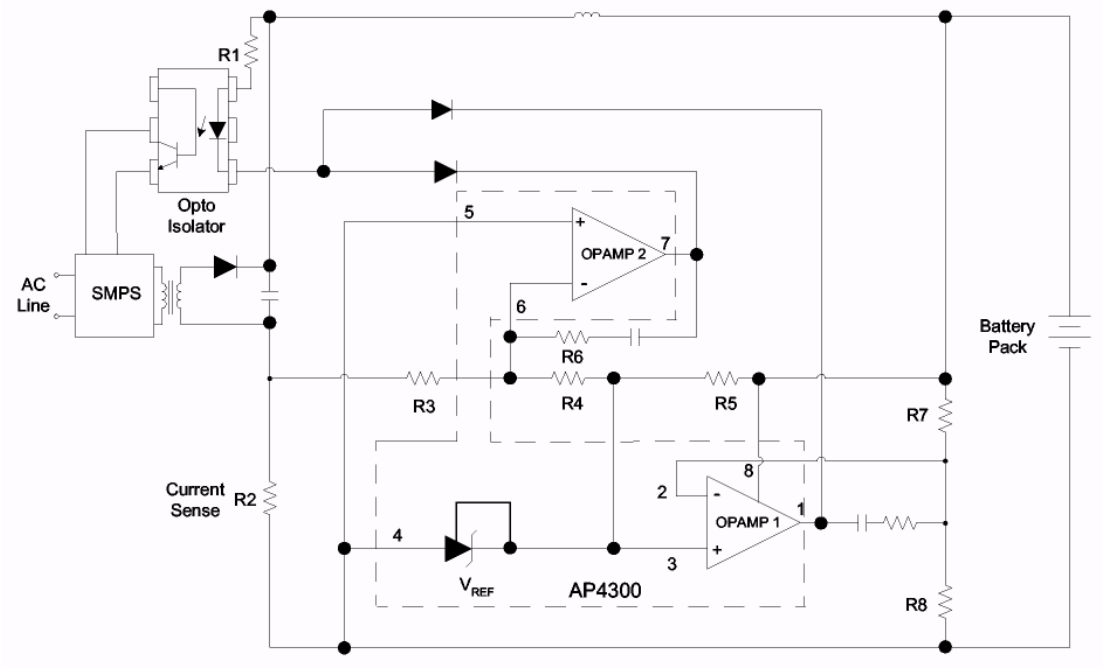
OPAmp



Voltage Reference

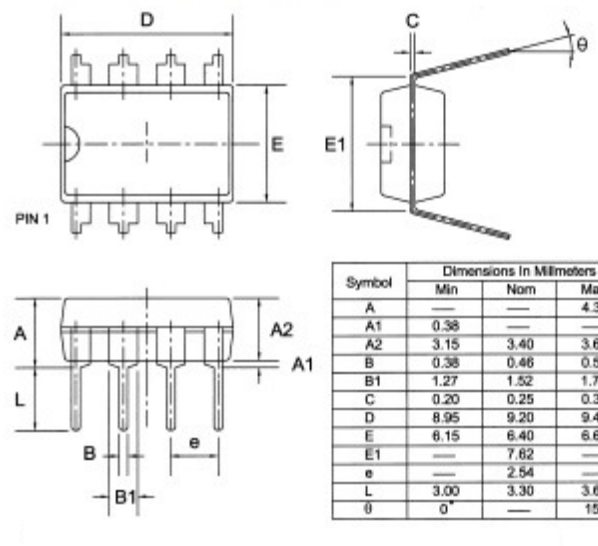


Typical Application



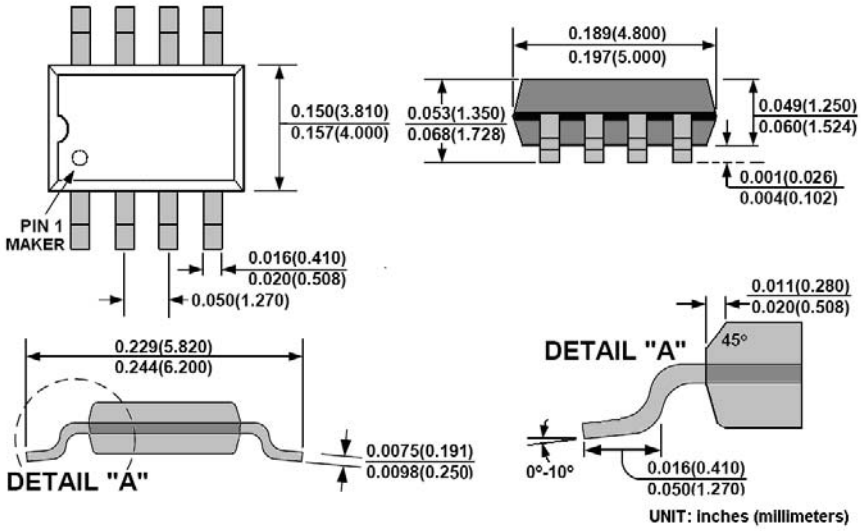
Package Outline

DIP8:



Symbol	Dimensions In Millimeters			Dimensions In Inches		
	Min	Nom	Max	Min	Nom	Max
A	—	—	4.31	—	—	0.170
A1	0.38	—	—	0.015	—	—
A2	3.15	3.40	3.65	0.124	0.134	0.144
B	0.38	0.46	0.51	0.015	0.018	0.020
B1	1.27	1.52	1.77	0.050	0.060	0.070
C	0.20	0.25	0.30	0.008	0.010	0.012
D	8.95	9.20	9.45	0.352	0.362	0.372
E	6.15	6.40	6.65	0.242	0.252	0.262
E1	—	7.62	—	—	0.300	—
e	—	2.54	—	—	0.100	—
L	3.00	3.30	3.60	0.118	0.130	0.142
θ	0°	—	15°	0°	—	15°

SOP8:



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