General Description

These devices offer low offset and long-term stability by means of alow-noise,chopperless,bipolar-input-transistor amplifier circuit.Formost applications,external components are not required for offset nulling and frequency compensation.The true differential input, with a wide input-voltage range and out standing common-oderejection,provides maximum flexibility and performance in high-noise environments and in noninverting applications.Low bias currents and extremely high input impedances are maintained over the entire temperature range.

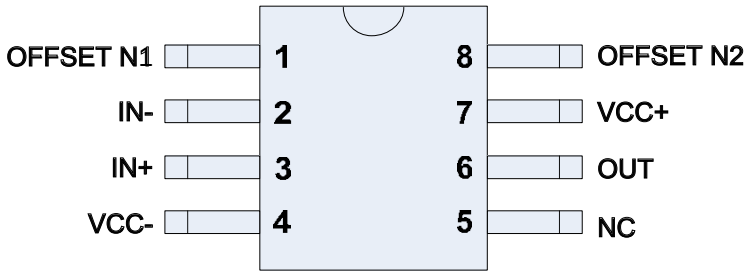
Features

- Low Noise
- No External Components Required
- Replace Chopper Amplifiers at a Lower Cost
- Wide Input-Voltage Range: 0 to ±14 V (Typ)
- Wide Supply-Voltage Range: ±3 V to ±18 V

Ordering Information

Product Model	Package Type	Packing	Packing Qty
OP07CP	SOP-8	Tube	50Pcs/Box

Pin Configurations



Function Block

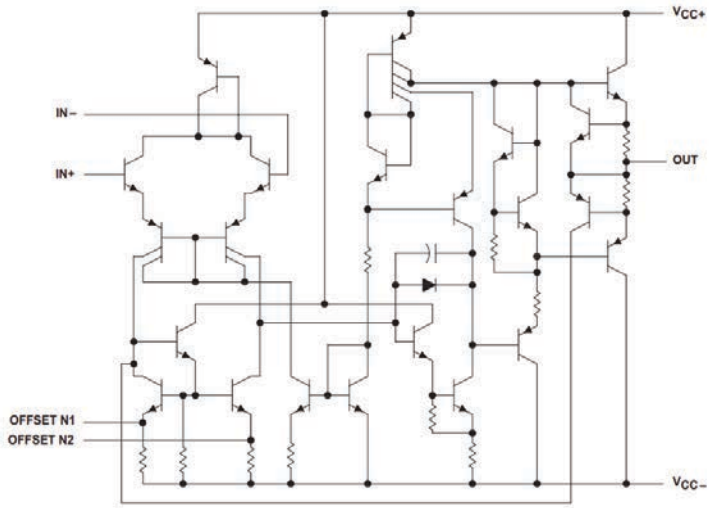


Figure 1 Function Block Diagram of OP07CP

Absolute Maximum Ratings

Symbol	Parameter	Value	Unit
VCC	Supply voltage	±22	V
V_{id}	Differential input voltage	±30	
V_i	Input voltage	±22	
	Output short-circuit duration	Infinite	
R_{thja}	Thermal resistance junction to ambient	85	°C/W
R_{thjc}	Thermal resistance junction to case	41	
ESD	HBM: human body model(1) DIP package SO package	500 400	V
	MM: machine model(2)	100	
	CDM: charged device model(3)	1.5	kV
Tstg	Storage temperature range	-65 to +150	°C

1. Human body model: a 100 pF capacitor is charged to the specified voltage, then discharged through a 1.5kΩ resistor between two pins of the device. This is done for all couples of connected pin combinations while the other pins are floating.
2. Machine model: a 200 pF capacitor is charged to the specified voltage, then discharged directly between two pins of the device with no external series resistor (internal resistor <5Ω). This is done for all couples of connected pin combinations while the other pins are floating.
3. Charged device model: all pins and the package are charged together to the specified voltage and then discharged directly to the ground through only one pin. This is done for all pins.

Operating Conditions

Symbol	Parameter	Value	Unit
VCC	Supply voltage	6 to 36	V
Vicm	Common mode input voltage range	±13	
Toper	Operating free air temperature range	-40 to +125	°C

Electrical Characteristics

TA = 25°C, unless otherwise noted, VCC = ±15 V, Tamb = 25 °C

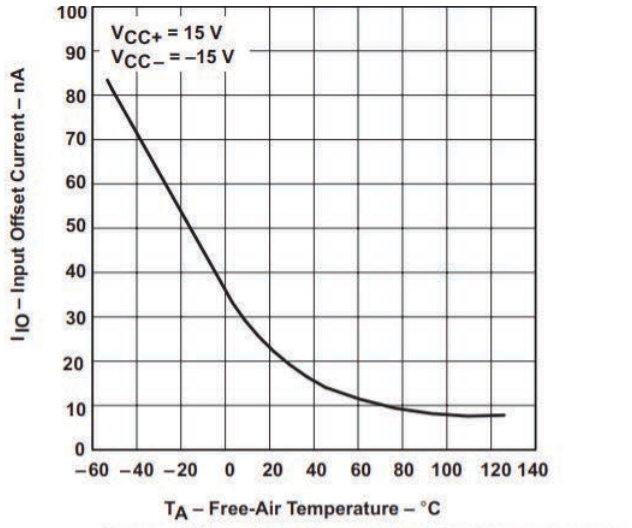
Symbol	Parameter		Min.	Typ.	Max.	Unit
V_{io}	Input offset voltage (R_S ≤10 kΩ) T_{amb} = +25 °C T_{min} ≤T_{amb} ≤T_{max}			260	300 350	uV
I_{io}	Input offset current Tamb = +25 °C T_{min} ≤T_{amb} ≤T_{max}			2	6 8	nA
I_{ib}	Input bias current Tamb = +25 °C T_{min} ≤T_{amb} ≤T_{max}				±12 ±14	
A_{vd}	Large signal voltage gain (Vo = ±10 V, R_L = 2 kΩ) T_{am} = +25 °C T_{min} ≤T_{amb} ≤T_{max}		120 100	400		V/mV
SVR	Supply voltage rejection ratio ((R_S ≤10 kΩ) T_{amb} = +25 °C T_{min} ≤T_{amb} ≤T_{max}		77 77	90		dB
I_{CC}	Supply current, no load Tamb = +25 °C T_{min} ≤T_{amb} ≤T_{max}			1.7	2.8 3.3	mA
V_{icm}	Input common mode voltage range T_{amb} = +25 °C T_{min} ≤T_{amb} ≤T_{max}		±13 ±13			V
CMR	Common mode rejection ratio (R_S ≤10 kΩ) T_{amb} = +25 °C T_{min} ≤T_{amb} ≤T_{max}		70 70	90		dB
I_{OS}	Output short circuit current		10	25	40	mA
±V_{opp}	Output voltage swing Tamb = +25 °C Tmin ≤Tamb ≤Tmax	R_L = 10 kΩ R_L = 2 kΩ R_L= 10 kΩ R_L = 2 kΩ	12 10 12 10	14 13		V
SR	Slew rate V_i = ±10 V, R_L = 2 kΩ, C_L = 100 pF, unity gai		0.25	0.5		V/μs
t_r	Rise time V_i = ±20 mV, R_L = 2 kΩ, C_L = 100 pF, unity gain			0.3		μs
K_{ov}	Overshoot V_i = 20 mV, R_L = 2 kΩ, C_L = 100 pF, unity gain			5		%
R_i	Input resistance		7	31		MΩ

Electrical Characteristics

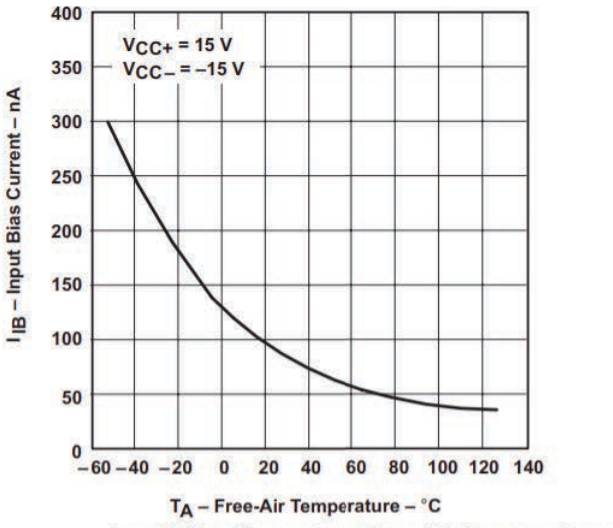
TA = 25°C, unless otherwise noted, VCC = ±15 V, Tamb = 25 °C

Symbol	Parameter	Min.	Typ.	Max.	Unit
GBP	Gain bandwidth product V_i = 10 mV, R_L = 2 kΩ, C_L = 100 pF, f = 100 kHz	0.4	0.6		MHz
THD	Total harmonic distortion f = 1 kHz, A_V = 20 dB, R_L = 2 kΩ, V_O= 2 Vpp, C_L= 100 pF, T_{amb} = +25° C		0.06		%
e_n	Equivalent input noise voltage f = 1 kHz, R_S = 100 Ω		23		$\frac{nV}{\sqrt{Hz}}$
⌀ m	Phase margin		50		Degree

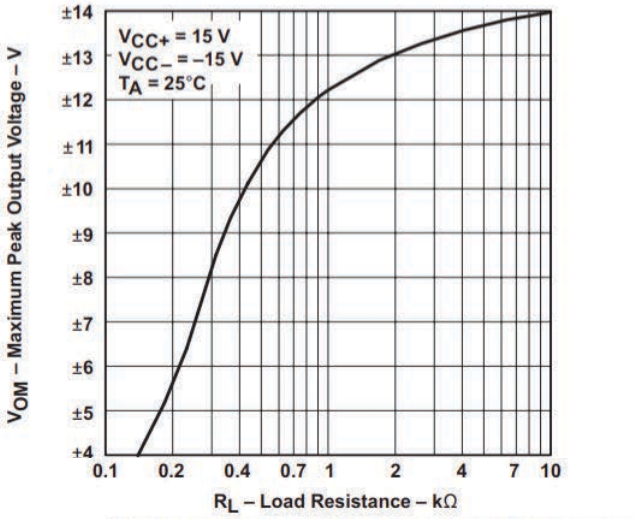
Typical Characteristics



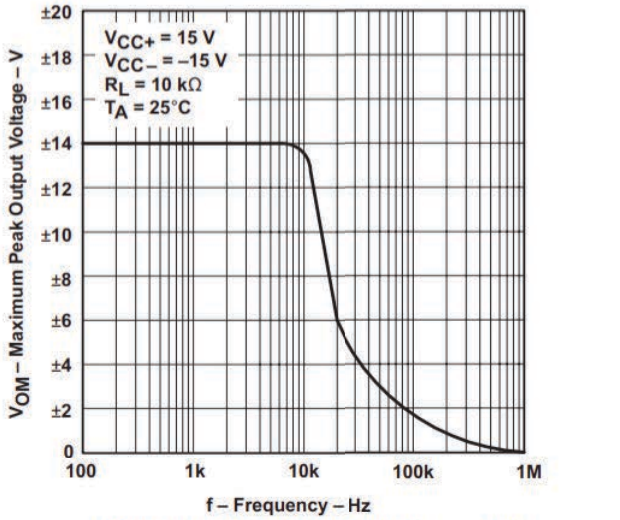
Input Offset Current vs Free-Air Temperature



Input Bias Current vs Free-Air Temperature

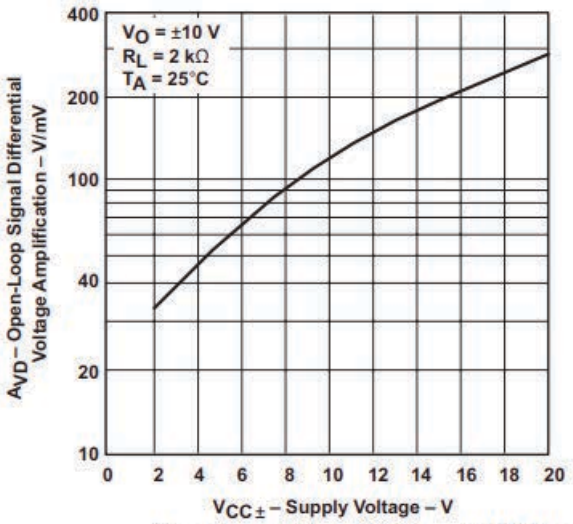


Maximum Output Voltage vs Load Resistance

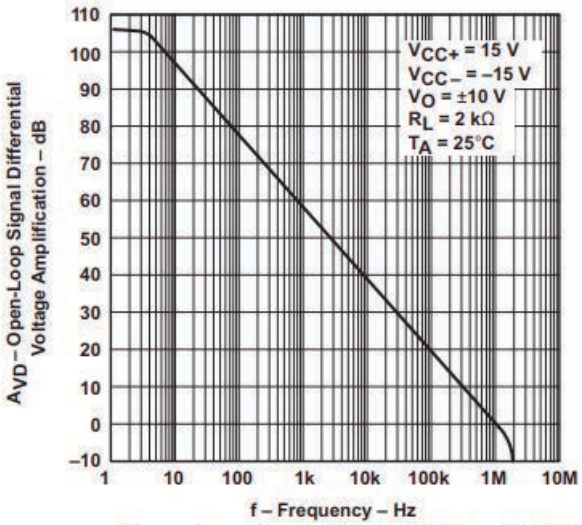


Maximum Peak Output Voltage vs Frequency

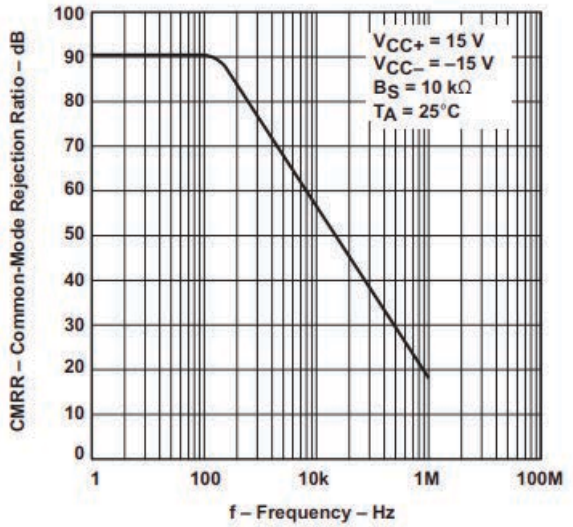
Typical Characteristics



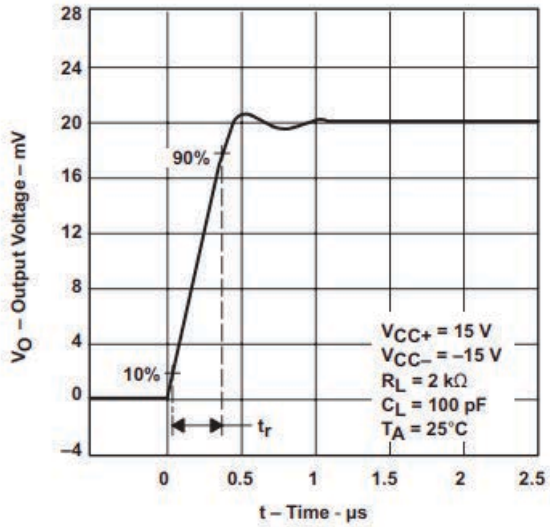
Open-Loop Signal Differential Voltage Amplification vs Supply Voltage



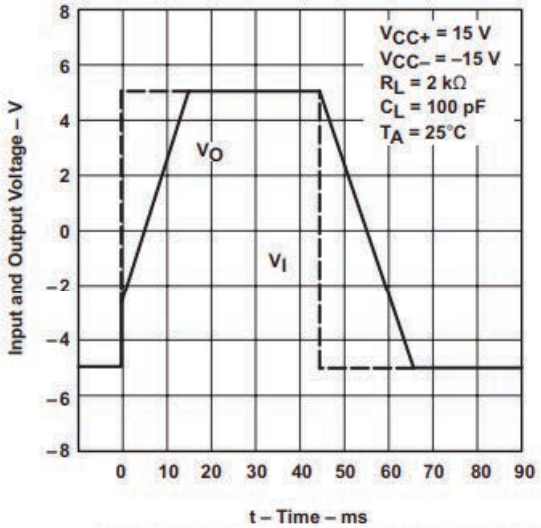
Open-Loop Large-Signal Differential Voltage Amplification vs Frequency



Common-Mode Rejection Ratio vs Frequency



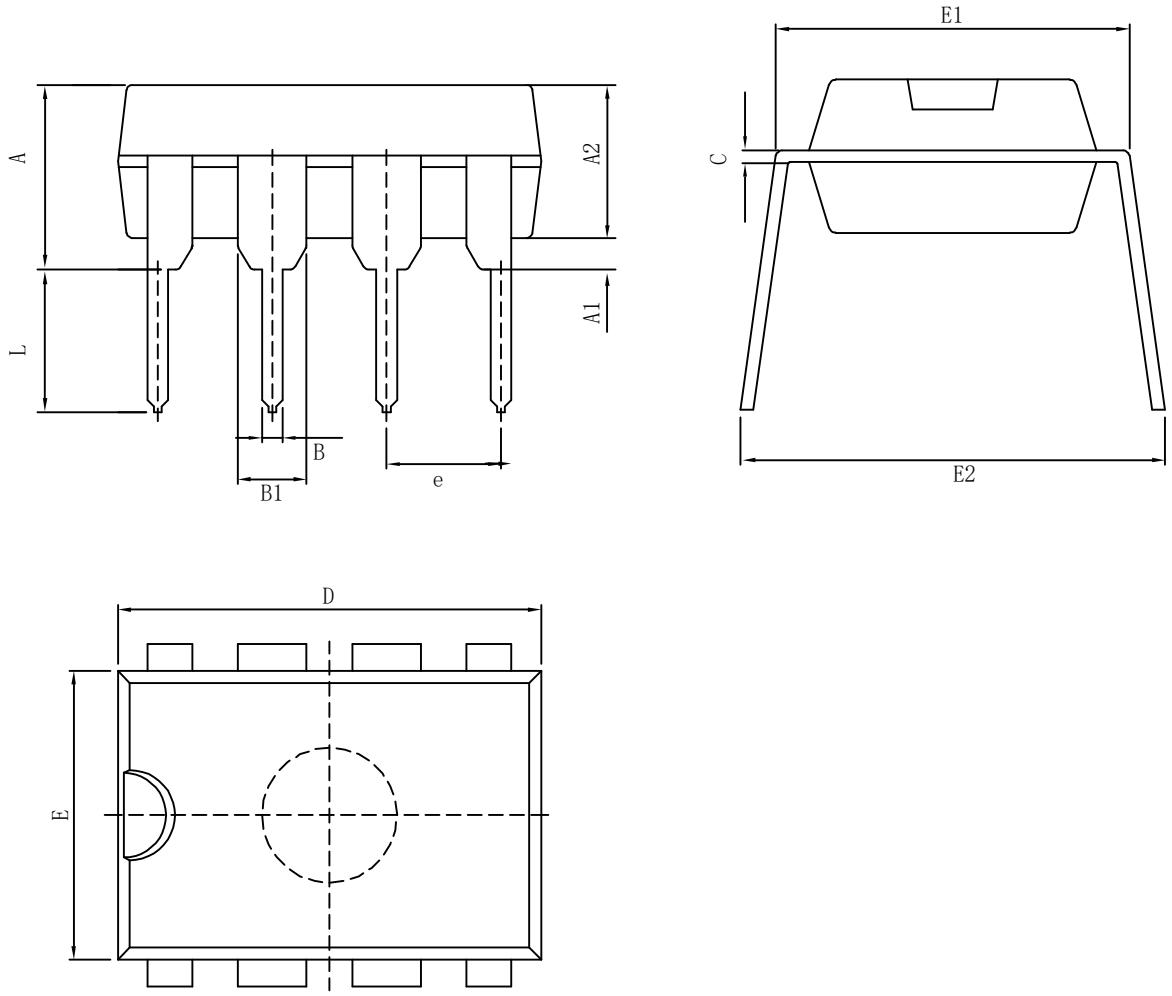
Output Voltage vs Elapsed Time



Voltage-Follower Large-Signal Pulse Response

Package Information

DIP-8



Size / Symbol	Dimensions In Millimeters		Size / Symbol	Dimensions In Inches	
	Min(mm)	Max(mm)		Min(in)	Max(in)
A	3.710	4.310	A	0.146	0.170
A1	0.510		A1	0.020	
A2	3.200	3.600	A2	0.126	0.142
B	0.380	0.570	B	0.015	0.022
B1	1.524(BSC)		B1	0.060(BSC)	
C	0.204	0.360	C	0.008	0.014
D	9.000	9.400	D	0.354	0.370
E	6.200	6.600	E	0.244	0.260
E1	7.320	7.920	E1	0.288	0.312
e	2.540(BSC)		e	0.100(BSC)	
L	3.000	3.600	L	0.118	0.142
E2	8.400	9.000	E2	0.331	0.354

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