



General Description

These devices offer low offset and long-term stability by means of a low-noise, chopperless, bipolar-input-transistor amplifier circuit. For most applications, external components are not required for offset nulling and frequency compensation. The true differential input, with a wide input-voltage range and outstanding common-mode rejection, 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.

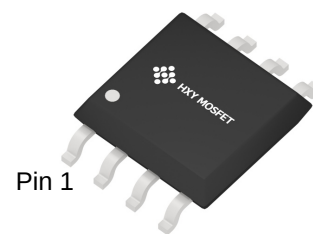
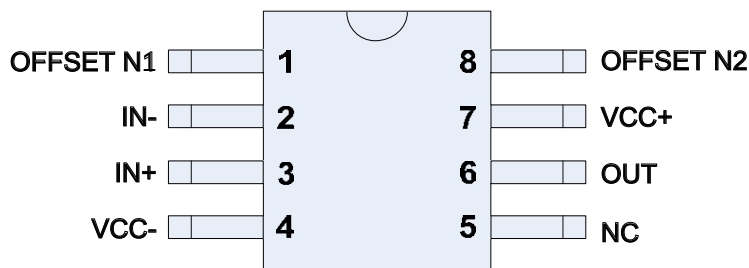
Features

- 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
OP07CDR	SOP-8	Tape	2500Pcs/Reel

Pin Configurations



Function Block

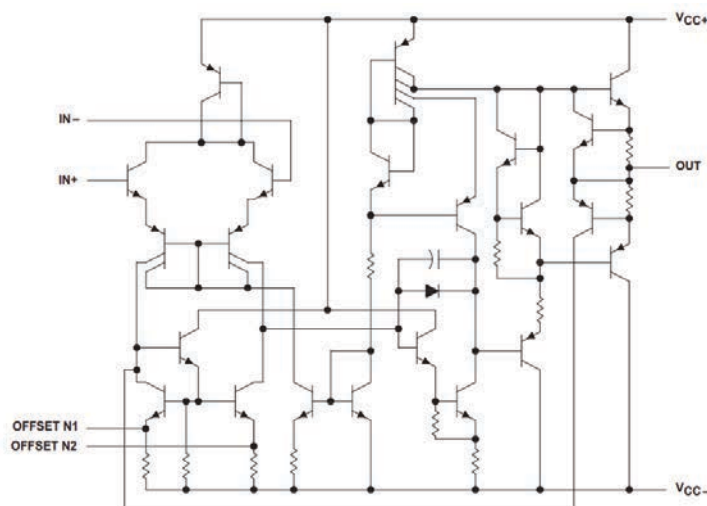


Figure 1 Function Block Diagram of OP07CDR



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	125	°C/W
R _{thjc}	Thermal resistance junction to case	40	
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
V _{icm}	Common mode input voltage range	±13	
T _{oper}	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	μV
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

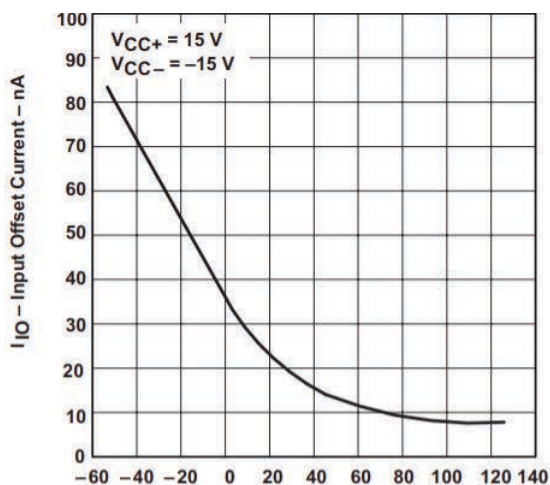


Electrical Characteristics

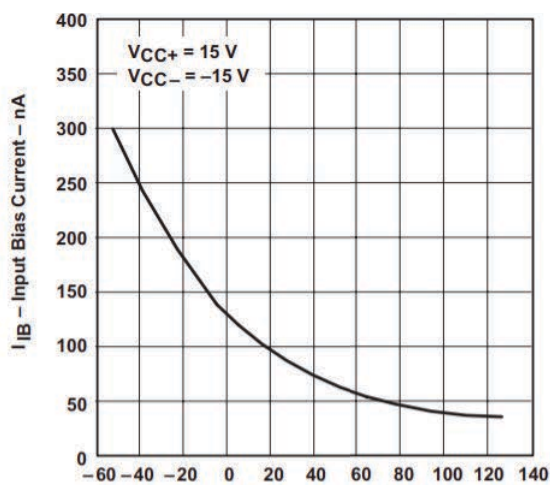
$T_A = 25^\circ\text{C}$, unless otherwise noted, $V_{CC} = \pm 15\text{ V}$, $T_{\text{amb}} = 25^\circ\text{C}$

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

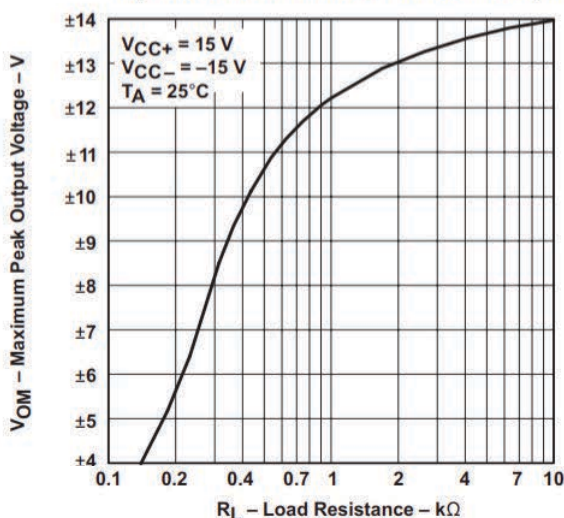
Typical Characteristics



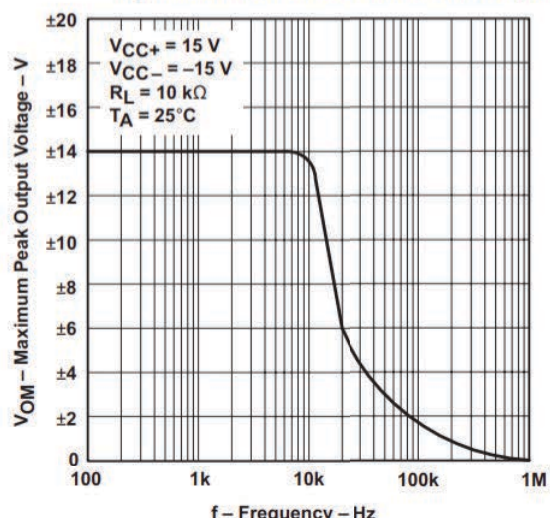
Input Offset Current vs Free-Air Temperature



Input Bias Current vs Free-Air Temperature



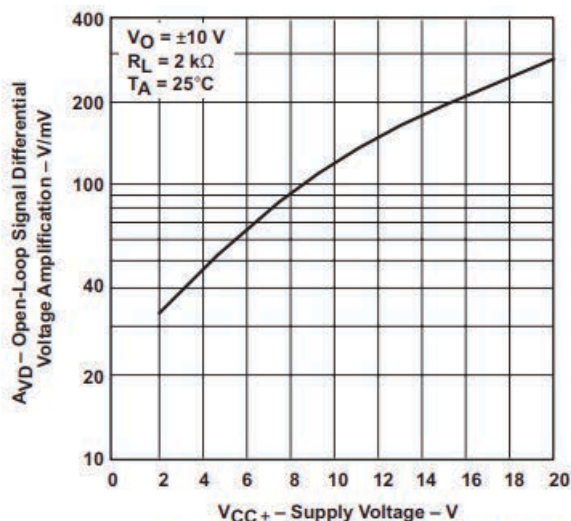
Maximum Output Voltage vs Load Resistance



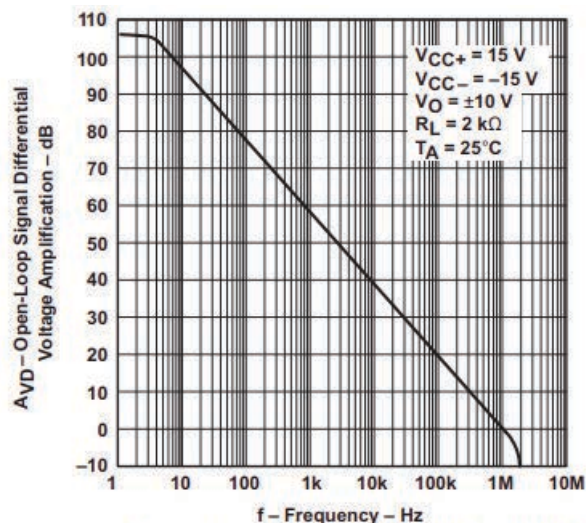
Maximum Peak Output Voltage vs Frequency



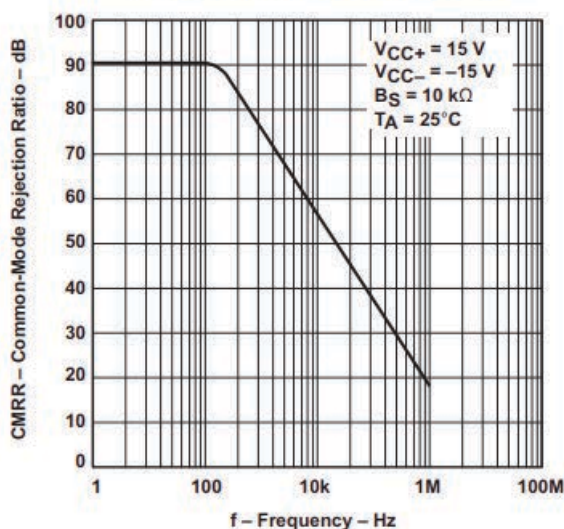
Typical Characteristics



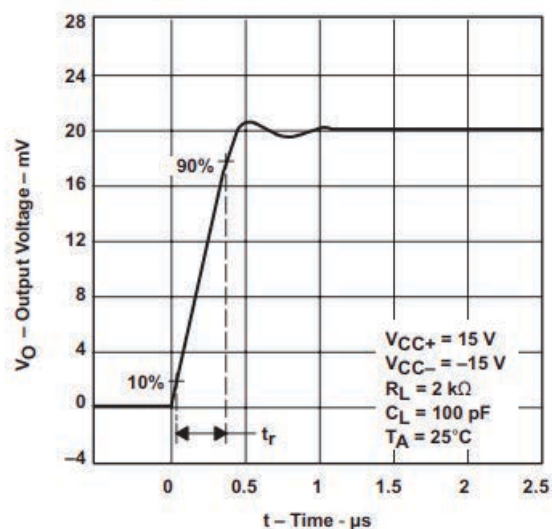
Open-Loop Signal Differential Voltage Amplification vs Supply Voltage



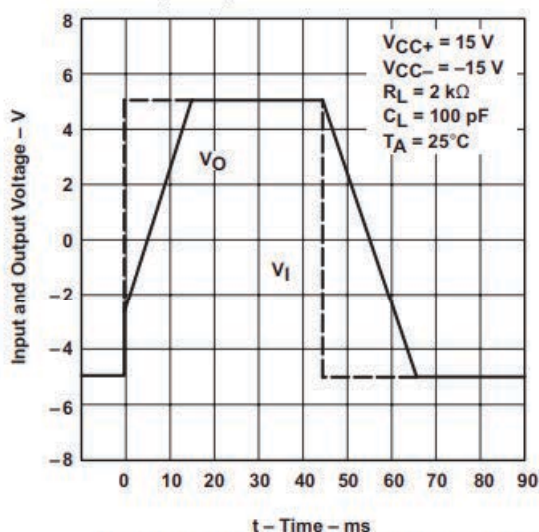
Open-Loop Large-Signal Differential Voltage Amplification vs Frequency



Common-Mode Rejection Ratio vs Frequency



Output Voltage vs Elapsed Time

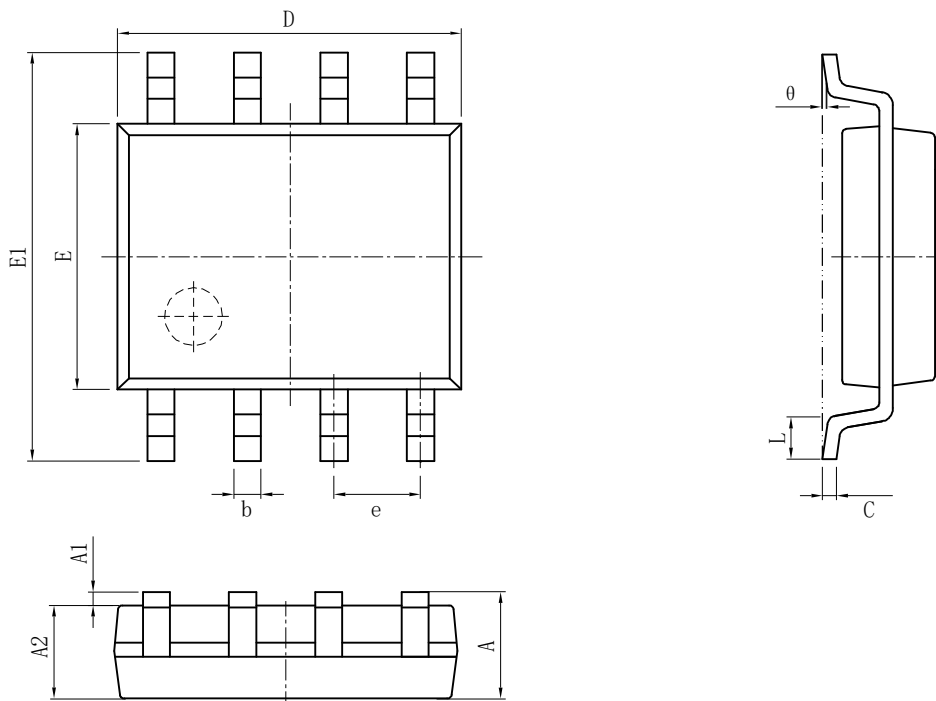


Voltage-Follower Large-Signal Pulse Response



Package Information

SOP-8(SOIC-8)



Size Symbol	Dimensions In Millimeters		Size Symbol	Dimensions In Inches	
	Min(mm)	Max(mm)		Min(in)	Max(in)
A	1.350	1.750	A	0.053	0.069
A1	0.100	0.250	A1	0.004	0.010
A2	1.350	1.550	A2	0.053	0.061
b	0.330	0.510	b	0.013	0.020
c	0.170	0.250	c	0.006	0.010
D	4.700	5.100	D	0.185	0.200
E	3.800	4.000	E	0.150	0.157
E1	5.800	6.200	E1	0.228	0.224
e	1.270(BSC)		e	0.050(BSC)	
L	0.400	1.270	L	0.016	0.050
θ	0°	8°	θ	0°	8°



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