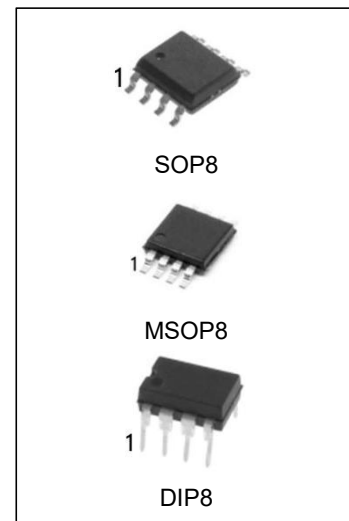


Very low offset single bipolar operational amplifier

Features

- Extremely low offset: 150 μ V/ max.
- Low input bias current: 1.8nA
- LOW Vio drift: 0.5 μ V/ $^{\circ}$ C
- Ultra stable with time: 2 μ V/month max.
- Wide supply voltage range: \pm 3V to \pm 22V
- Temperature range: 0 $^{\circ}$ C to -70 $^{\circ}$ C



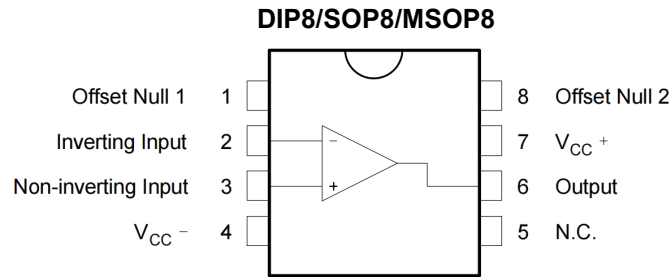
Ordering Information

DEVICE	Package Type	MARKING	Packing	Packing Qty
OP07CN	DIP8	OP07C	TUBE	2000/box
OP07DN	DIP8	OP07D	TUBE	2000/box
OP07CM/TR	SOP8	OP07C	REEL	2500/reel
OP07DM/TR	SOP8	OP07D	REEL	2500/reel
OP07CMM/TR	MSOP8	OP07C	REEL	3000/reel
OP07DMM/TR	MSOP8	OP07D	REEL	3000/reel

Description

The OP07 is a very high precision op-amp with an offset voltage maximum of 150 μ V. Offering also low input current (1.8nA) and high gain (400V/mV), the OP07 is particularly suitable for instrumentation applications.

Pin Configuration



Schematic diagram

Figure 1. Schematic diagram

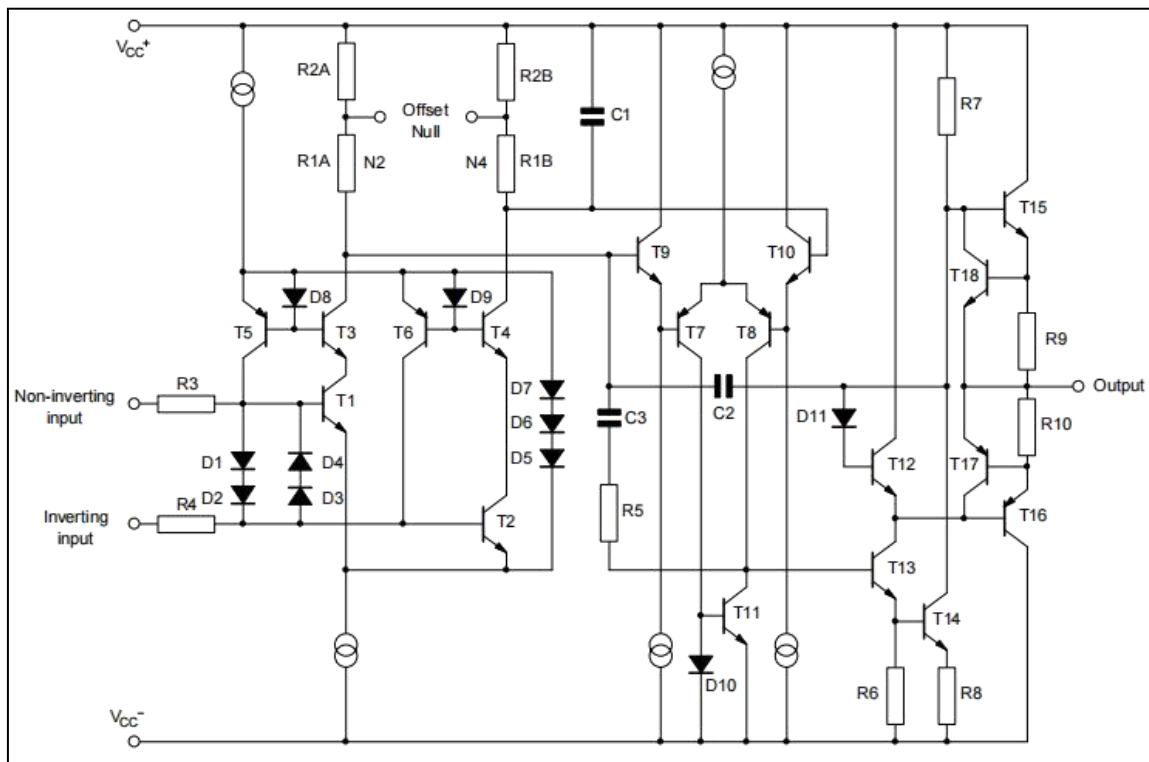
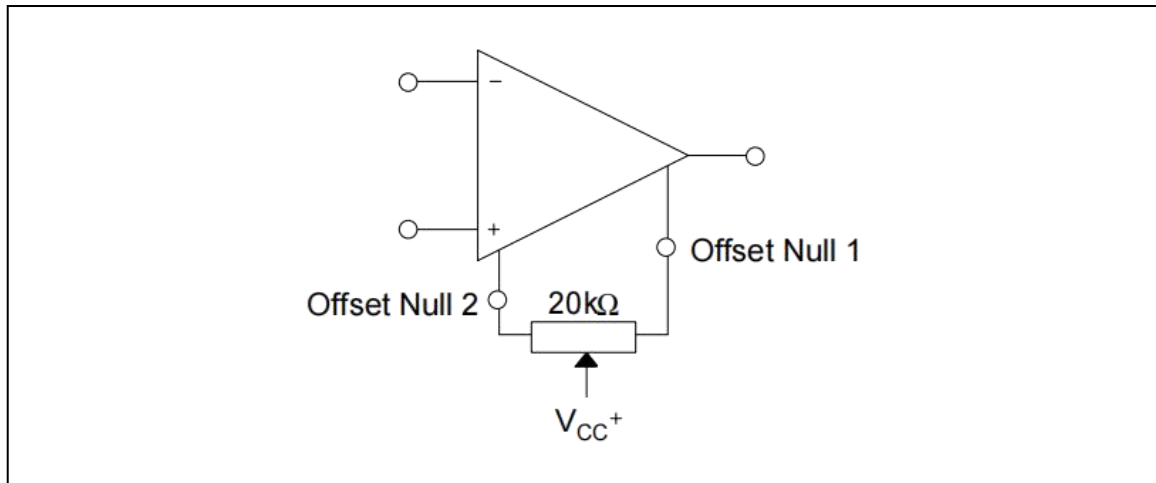


Figure 2. Input offset voltage nulling circuit



Absolute maximum ratings

Table 1. Absolute maximum ratings

Symbol	Parameter	Value	Unit
V_{CC}	Supply voltage	± 22	V
V_{id}	Differential input voltage	± 30	V
V_i	Input voltage	± 22	V
T_{oper}	Operating temperature	0 to 70	$^{\circ}\text{C}$
T_{stg}	Storage temperature	-65 to 150	$^{\circ}\text{C}$
R_{thja}	Thermal resistance junction to ambient DIP8	85	$^{\circ}\text{C}/\text{W}$
R_{thjc}	Thermal resistance junction to case DIP8	41	$^{\circ}\text{C}/\text{W}$
ESD	HBM: human body model	1.5	kV
	MM: machine model	200	V
	CDM: charged device model	1.5	kV

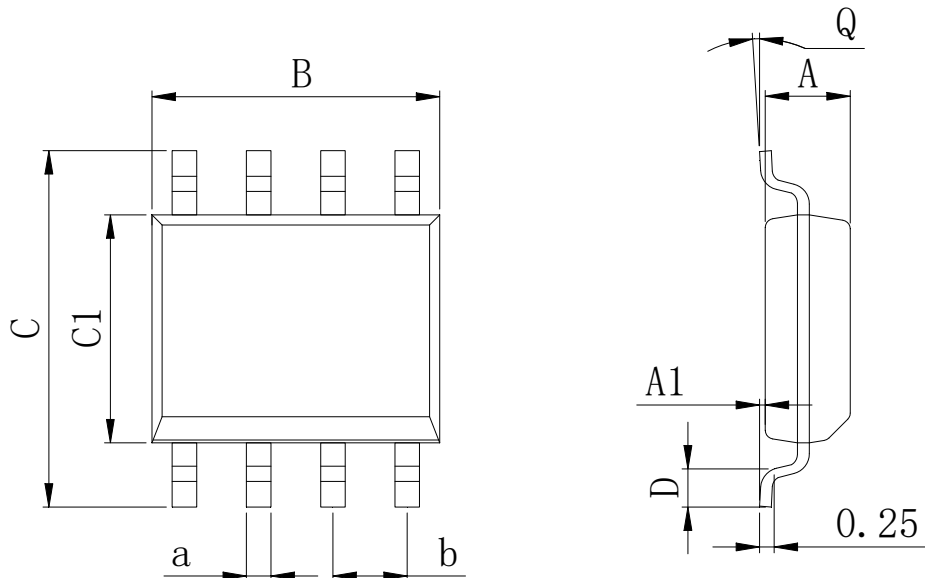
- Short-circuits can cause excessive heating and destructive dissipation.
- R_{th} are typical values.
- Human body model: 100pF discharged through a 1.5k Ω resistor between two pins of the device, done for all couples of pin combinations with other pins floating.
- Machine model: a 200pF cap is charged to the specified voltage, then discharged directly between two pins of the device with no external series resistor (internal resistor < 5 Ω). Done for all couples of pin combinations with other pins floating.
- Charged device model: all pins plus package are charged together to the specified voltage and then discharged directly to the ground.

Electrical characteristics

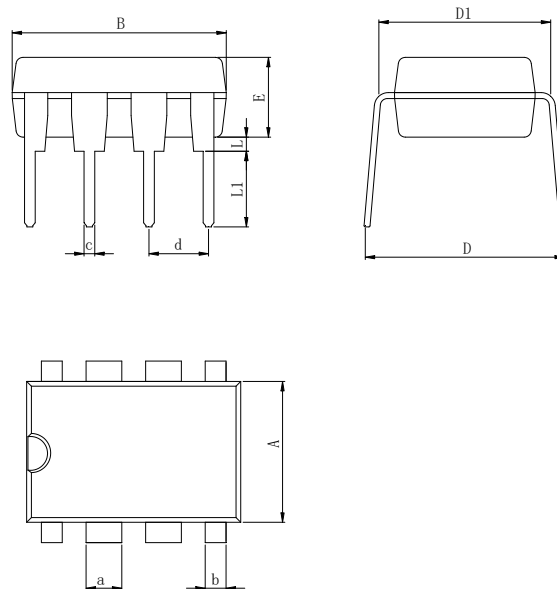
Table 2. VCC+ = 15 V, VCC- = Ground, Tamb = 25° C (unless otherwise specified)

Symbol	Parameter	OP07C			OP07D			Unit
		Min.	Typ.	Max.	Min.	Typ.	Max.	
V _{io}	Input offset voltage 0°C ≤ T _{amb} ≤ +70°C		60				150	μV
			85				250	
	Long term input offset - voltage stability ⁽¹⁾		0.4					uV/Mo
DV _{io}	Input offset voltage drift		0.5				2.5	uV/°C
I _{io}	Input offset current (V _{ic} = 0V) 0°C ≤ T _{amb} ≤ +70°C		0.8	6		0.8	6	nA
				7			7	
DI _{io}	Input offset current drift		15	50		15	50	pA/°C
DI _{ib}	Input bias current drift		15	50		15	50	pA/°C
R _o	Open loop output resistance		60			60		
R _{id}	Differential input resistance		33			33		MΩ
R _{ic}	Common mode input resistance		120			120		GΩ
V _{icm}	Input common mode voltage range 0°C ≤ T _{amb} ≤ +70°C	±13 ±13	±13.5		±13 ±13	±13.5		V
CMR	Common-mode rejection ratio (V _{ic} = V _{icm} - min) 0°C ≤ T _{amb} ≤ +70°C	100	120		94	110		dB
		97			94	106		
SVR	Supply voltage rejection ratio (VCC = ±3 to ±18V) 0°C ≤ T _{amb} ≤ +70°C	90	104		90	104		dB
		86			86			
A _{vd}	Large signal voltage gain VCC = ±15, R _L = 2k , V _o = ±10V 0°C ≤ T _{amb} ≤ +105°C VCC = ±3, R _L = 500 , V _o = ±0.5V	120	40		120	400		V/mV
		100			100			
		100	400		100	400		
V _{opp}	Output voltage swing R _L = 10k R _L = 2k R _L = 1k 0°C ≤ T _{amb} ≤ +105°C R _L = 2k	±12	±13		±12	±13		V
		±11.5	±12.8		±11.5	±12.8		
			±12			±12		
		±11			±11			
SR	Slew rate (R _L = 2k , C _L = 100pF)		0.17			0.17		V/us
GBP	Gain bandwidth product (R _L = 2kΩ, C _L = 100pF, f = 100kHz)		0.5			0.5		MHz
I _{CC}	Supply current - no load 0°C ≤ T _{amb} ≤ +70°C VCC = ±3V		2.7	5		2.7	5	mA
				6			6	
		0.67	1.3		0.67	1.3		
e _n	Equivalent input noise voltage f = 10Hz f = 100Hz f = 1kHz		11	20		11	20	$\frac{nV}{\sqrt{Hz}}$
			10.5	13.5		10.5	13.5	
			10	11.5		10	11.5	
i _n	Equivalent input noise current f = 10Hz f = 100Hz f = 1kHz		0.3	0.9		0.3	0.9	$\frac{pA}{\sqrt{Hz}}$
			0.2	0.3		0.2	0.3	
			0.1	0.2		0.1	0.2	

1. Long term input offset voltage stability refers to the average trend line of V_{io} vs time over extended periods after the first 30 days of operation.

Physical Dimensions
SOP8

Dimensions In Millimeters(SOP8)

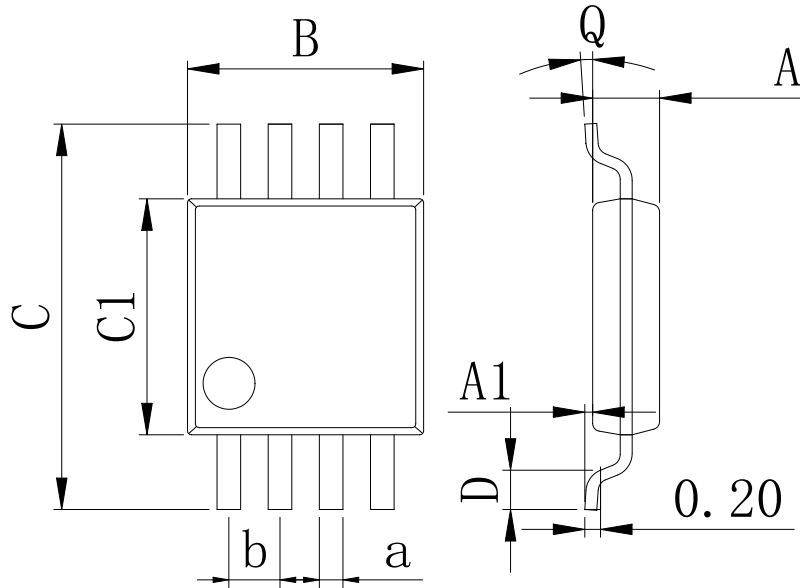
Symbol:	A	A1	B	C	C1	D	Q	a	b
Min:	1.35	0.05	4.90	5.80	3.80	0.40	0°	0.35	1.27 BSC
Max:	1.55	0.20	5.10	6.20	4.00	0.80	8°	0.45	

DIP8

Dimensions In Millimeters(DIP8)

Symbol:	A	B	D	D1	E	L	L1	a	b	c	d
Min:	6.10	9.00	8.40	7.42	3.10	0.50	3.00	1.50	0.85	0.40	2.54 BSC
Max:	6.68	9.50	9.00	7.82	3.55	0.70	3.60	1.55	0.90	0.50	

Physical Dimensions

MSOP8



Dimensions In Millimeters(MSOP8)									
Symbol:	A	A1	B	C	C1	D	Q	a	b
Min:	0.80	0.05	2.90	4.75	2.90	0.35	0°	0.25	0.65 BSC
Max:	0.90	0.20	3.10	5.05	3.10	0.75	8°	0.35	

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