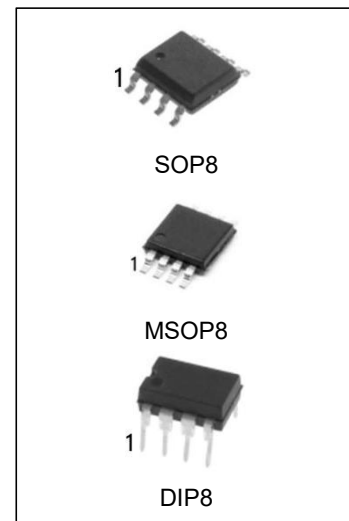


## Very low offset single bipolar operational amplifier

### Features

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



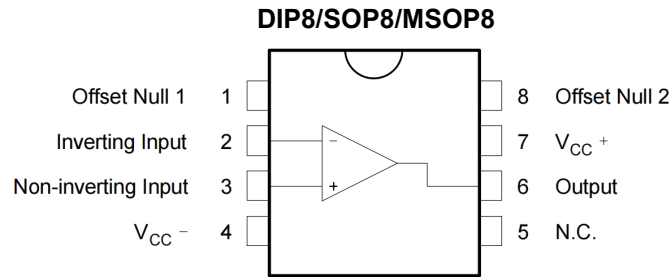
### Ordering Information

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 $\mu$ 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

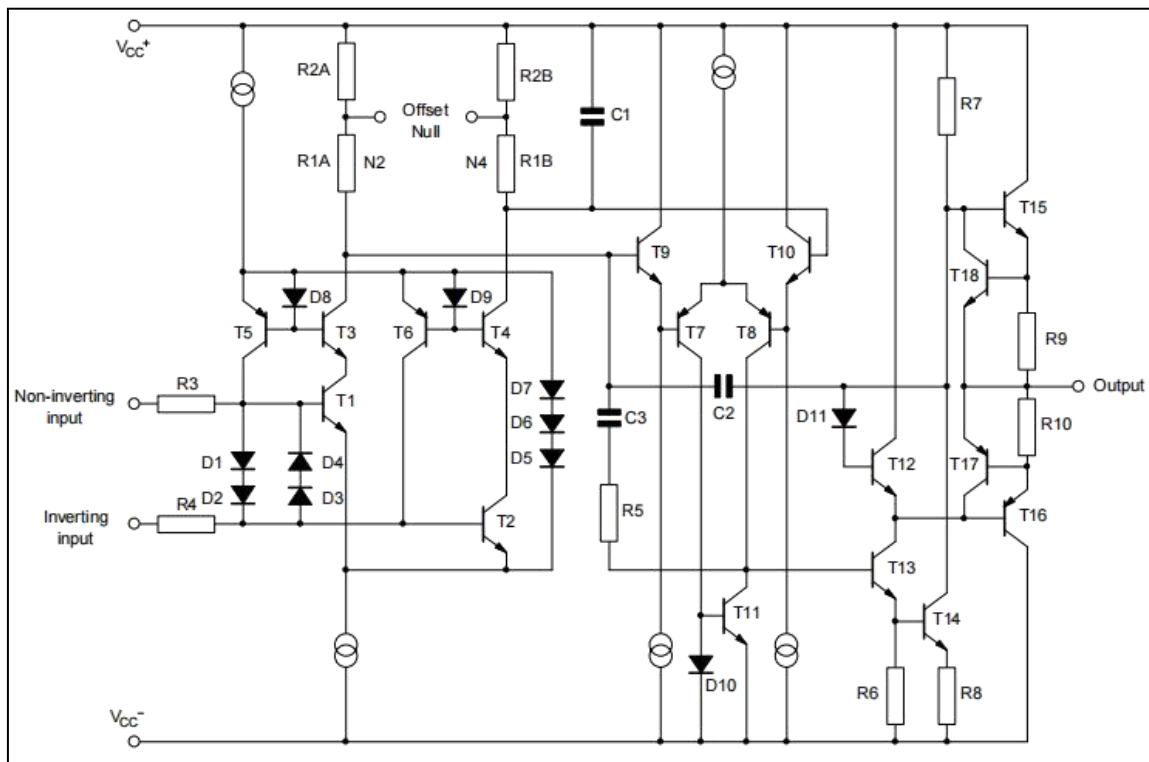
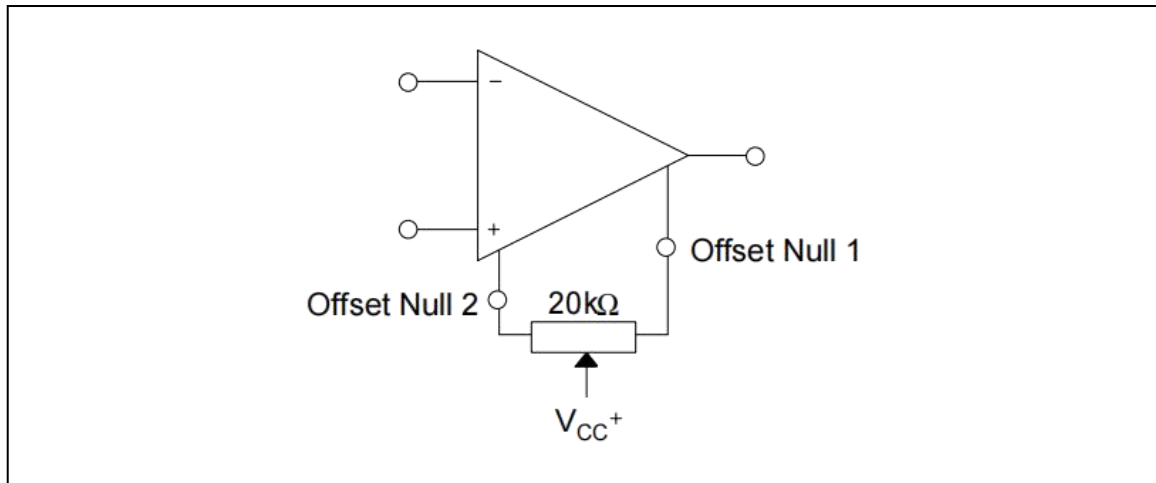


Figure 2. Input offset voltage nulling circuit



## Absolute maximum ratings

Table 1. Absolute maximum ratings

Symbol	Parameter	Value	Unit
$V_{CC}$	Supply voltage	$\pm 22$	V
$V_{id}$	Differential input voltage	$\pm 30$	V
$V_i$	Input voltage	$\pm 22$	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

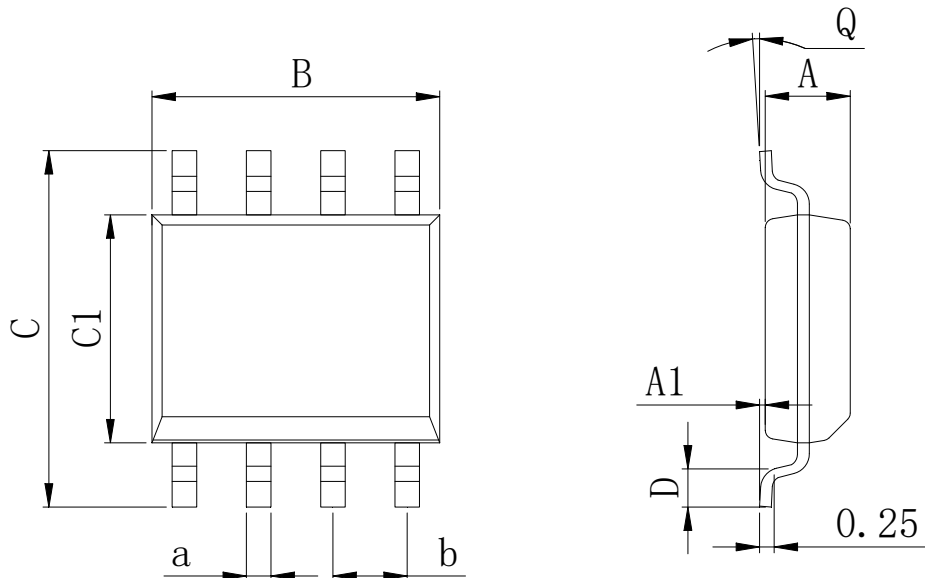
- Short-circuits can cause excessive heating and destructive dissipation.
- $R_{th}$  are typical values.
- Human body model: 100pF discharged through a 1.5k $\Omega$  resistor between two pins of the device, done for all couples of pin combinations with other pins floating.
- Machine model: a 200pF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

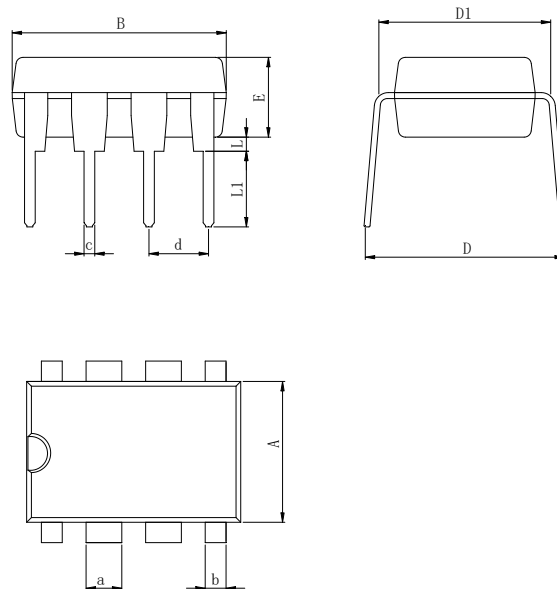
Table 2. VCC+ = 15 V, VCC- = Ground, Tamb = 25° C (unless otherwise specified)

Symbol	Parameter	OP07C			OP07D			Unit
		Min.	Typ.	Max.	Min.	Typ.	Max.	
V <sub>io</sub>	Input offset voltage 0°C ≤ T <sub>amb</sub> ≤ +70°C		60				150	μV
			85				250	
	Long term input offset - voltage stability <sup>(1)</sup>		0.4					uV/Mo
DV <sub>io</sub>	Input offset voltage drift		0.5				2.5	uV/°C
I <sub>io</sub>	Input offset current (V <sub>ic</sub> = 0V) 0°C ≤ T <sub>amb</sub> ≤ +70°C		0.8	6		0.8	6	nA
				7			7	
DI <sub>io</sub>	Input offset current drift		15	50		15	50	pA/°C
DI <sub>ib</sub>	Input bias current drift		15	50		15	50	pA/°C
R <sub>o</sub>	Open loop output resistance		60			60		
R <sub>id</sub>	Differential input resistance		33			33		MΩ
R <sub>ic</sub>	Common mode input resistance		120			120		GΩ
V <sub>icm</sub>	Input common mode voltage range 0°C ≤ T <sub>amb</sub> ≤ +70°C	±13 ±13	±13.5		±13 ±13	±13.5		V
CMR	Common-mode rejection ratio (V <sub>ic</sub> = V <sub>icm</sub> - min) 0°C ≤ T <sub>amb</sub> ≤ +70°C	100	120		94	110		dB
		97			94	106		
SVR	Supply voltage rejection ratio (VCC = ±3 to ±18V) 0°C ≤ T <sub>amb</sub> ≤ +70°C	90	104		90	104		dB
		86			86			
A <sub>vd</sub>	Large signal voltage gain VCC = ±15, R <sub>L</sub> = 2k , V <sub>o</sub> = ±10V 0°C ≤ T <sub>amb</sub> ≤ +105°C VCC = ±3, R <sub>L</sub> = 500 , V <sub>o</sub> = ±0.5V	120	40		120	400		V/mV
		100			100			
		100	400		100	400		
V <sub>opp</sub>	Output voltage swing R <sub>L</sub> = 10k R <sub>L</sub> = 2k R <sub>L</sub> = 1k 0°C ≤ T <sub>amb</sub> ≤ +105°C R <sub>L</sub> = 2k	±12	±13		±12	±13		V
		±11.5	±12.8		±11.5	±12.8		
			±12			±12		
		±11			±11			
SR	Slew rate (R <sub>L</sub> = 2k , C <sub>L</sub> = 100pF)		0.17			0.17		V/us
GBP	Gain bandwidth product (R <sub>L</sub> = 2kΩ, C <sub>L</sub> = 100pF, f = 100kHz)		0.5			0.5		MHz
I <sub>CC</sub>	Supply current - no load 0°C ≤ T <sub>amb</sub> ≤ +70°C VCC = ±3V		2.7	5		2.7	5	mA
				6			6	
		0.67	1.3		0.67	1.3		
e <sub>n</sub>	Equivalent input noise voltage f = 10Hz f = 100Hz f = 1kHz		11	20		11	20	nV/√Hz
			10.5	13.5		10.5	13.5	
			10	11.5		10	11.5	
i <sub>n</sub>	Equivalent input noise current f = 10Hz f = 100Hz f = 1kHz		0.3	0.9		0.3	0.9	pA/√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<sub>io</sub> vs time over extended periods after the first 30 days of operation.

**Physical Dimensions**
**SOP8**

**Dimensions In Millimeters(SOP8)**

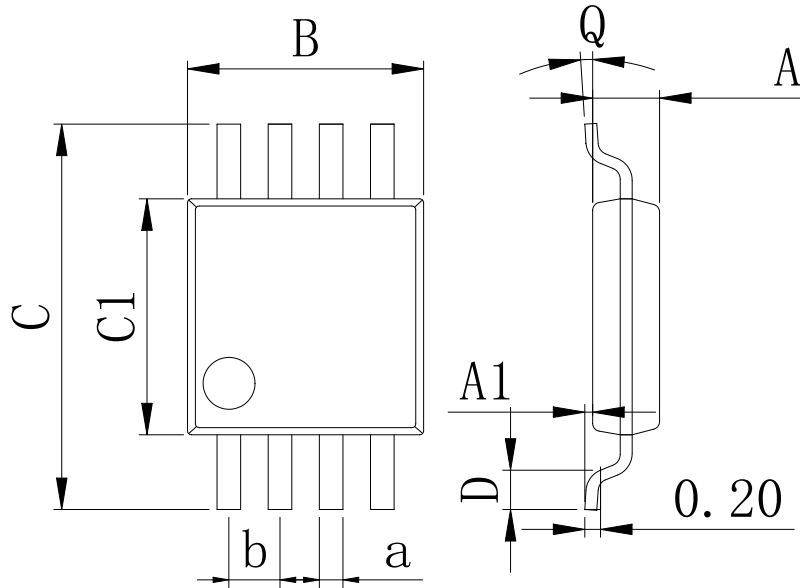
Symbol:	A	A1	B	C	C1	D	Q	a	b
Min:	1.35	0.05	4.90	5.80	3.80	0.40	0°	0.35	1.27 BSC
Max:	1.55	0.20	5.10	6.20	4.00	0.80	8°	0.45	

**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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