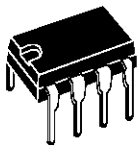
SGS-THOMSON MICROELECTRONICS

# OP07C

## VERY LOW OFFSET SINGLE BIPOLAR OPERATIONAL AMPLIFIERS

- EXTREMELY LOW OFFSET : 150µV MAX
- LOW INPUT BIAS CURRENT : 1.8nA
- LOW $V_{io}$ DRIFT : 0.5µV/°C
- ULTRA STABLE WITH TIME : 2µV/month max.
- WIDE SUPPLY VOLTAGE RANGE : ± 3V to ± 22V



**N**
**DIP8**
(Plastic Package)

### DESCRIPTION

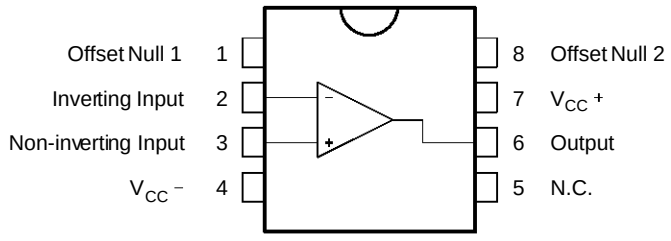
The OP07C is a very high precision op amp with an offset voltage maximum of 150µV.

Offering also low input current (1.8nA) and high gain (400V/mV), the OP07C is particularly suitable for instrumentation applications.

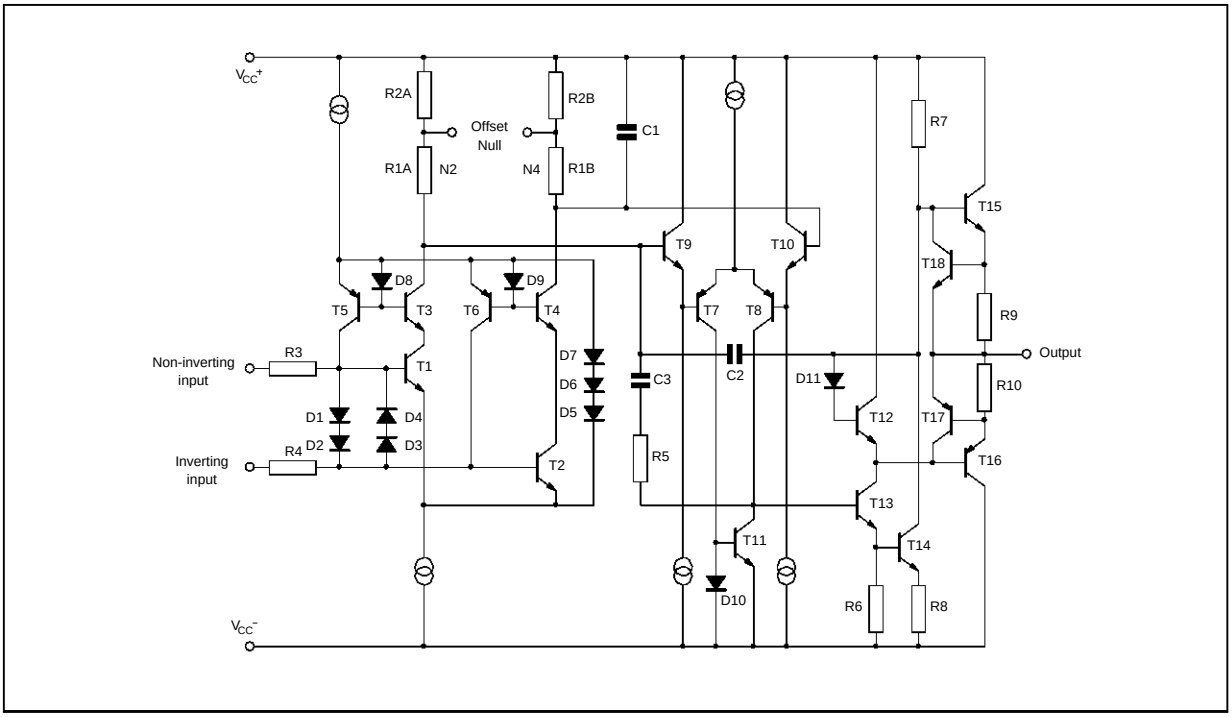
### ORDER CODES

| Part Number | Temperature Range | Package |
|---|---|---|
| | | N |
| OP07C | -40°C, +105°C | • |

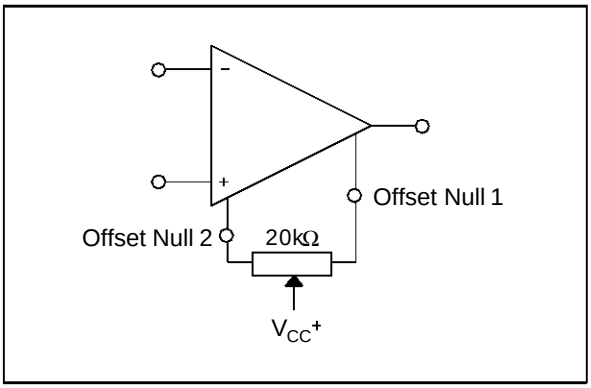
### PIN CONNECTIONS (top view)



## SCHEMATIC DIAGRAM




## INPUT OFFSET VOLTAGE NULLING CIRCUIT




## 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 | -40 to +105 | $^oC$ |
| $T_{stg}$ | Storage Temperature | -65 to +150 | $^oC$ |

## ELECTRICAL CHARACTERISTICS

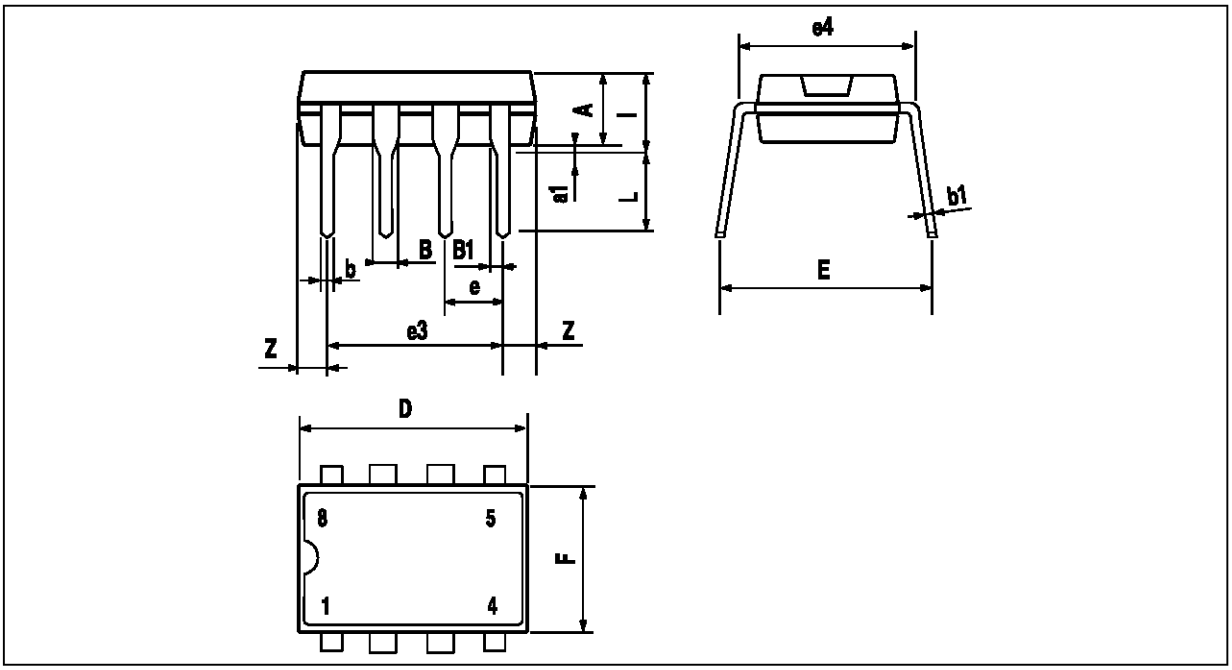
$V_{CC}$ = ±15V, $T_{amb}$ = +25°C (unless otherwise specified)

| Symbol | Parameter | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|
| $V_{io}$ | Input Offset Voltage<br>0°C ≤ $T_{amb}$ ≤ +70°C | | 60 | 150<br>250 | µV |
| | Long Term Input Offset Voltage Stability - (note 1) | | 0.4 | 2 | µV/Mo |
| $DV_{io}$ | Input Offset Voltage Drift | | 0.5 | 1.8 | µV/°C |
| $I_{io}$ | Input Offset Current<br>0°C ≤ $T_{amb}$ ≤ +70°C | | 0.8 | 6<br>8 | nA |
| $DI_{io}$ | Input Offset Current Drift | | 15 | 50 | pA/°C |
| $I_{ib}$ | Input Bias Current<br>0°C ≤ $T_{amb}$ ≤ +70°C | | 1.8 | 7<br>9 | nA |
| $DI_{ib}$ | Input Bias Current Drift | | 15 | 50 | pA/°C |
| $R_o$ | Open Loop Output Resistance | | 60 | | Ω |
| $R_{id}$ | Differential Input Resistance | | 33 | | MΩ |
| $R_{ic}$ | Common Mode Input Resistance | | 120 | | GΩ |
| $V_{icm}$ | Input Common Mode Voltage Range<br>0°C ≤ $T_{amb}$ ≤ +70°C | ±13<br>±13 | ±13.5 | | V |
| CMR | Common Mode Rejection Ratio<br>($V_i$ = $V_{icm}$ min)<br>0°C ≤ $T_{amb}$ ≤ +70°C | 100<br>97 | 120 | | dB |
| SVR | Supply Voltage Rejection Ratio<br>($V_{CC}$ = ±3 to ±18V)<br>0°C ≤ $T_{amb}$ ≤ +70°C | 90<br>86 | 104 | | dB |
| $A_{vd}$ | Large Signal Voltage Gain<br>$V_{CC}$ = ±15, $R_L$ = 2kΩ, $V_O$ = ±10V,<br>0°C ≤ $T_{amb}$ ≤ +105°C<br>$V_{CC}$ = ±3V, $R_L$ = 500Ω, $V_O$ = ±0.5V | 120<br>100<br>100 | 400<br><br>400 | | V/mV |
| $V_{opp}$ | Output Voltage Swing<br>$R_L$ = 10kΩ<br>$R_L$ = 2kΩ<br>$R_L$ = 1kΩ<br>0°C ≤ $T_{amb}$ ≤ +70°C $R_L$ = 2kΩ | <br>±12<br>±11.5<br><br>±11 | <br>±13<br>±12.8<br>±12<br> | | V |
| SR | Slew Rate ($R_L$ = 2kΩ, $C_L$ = 100pF) | | 0.17 | | V/µS |
| GBP | Gain Bandwidth Product<br>($R_L$ = 2kΩ, $C_L$ = 100pF, f = 100kHz) | | 0.5 | | MHz |
| $I_{CC}$ | Supply Current - (no load)<br>0°C ≤ $T_{amb}$ ≤ +70°C<br>$V_{CC}$ = ±3V | | 2.7<br><br>0.67 | 5<br>6<br>1.3 | mA |
| $e_n$ | Equivalent Input Noise Voltage<br>f = 10Hz<br>f = 100Hz<br>f = 1kHz | | <br>11<br>10.5<br>10 | <br>20<br>13.5<br>11.5 | $\frac{nV}{\sqrt{Hz}}$ |
| $i_n$ | Equivalent Input Noise Current<br>f = 10Hz<br>f = 100Hz<br>f = 1kHz | | <br>0.3<br>0.2<br>0.1 | <br>0.9<br>0.3<br>0.2 | $\frac{pA}{\sqrt{Hz}}$ |

**Note 1 :** 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.

## PACKAGE MECHANICAL DATA

8 PINS - PLASTIC DIP




PM-DIP8.EPS

| Dimensions | Millimeters | | | Inches | | |
|---|---|---|---|---|---|---|
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | | 3.32 | | | 0.131 | |
| a1 | 0.51 | | | 0.020 | | |
| B | 1.15 | | 1.65 | 0.045 | | 0.065 |
| b | 0.356 | | 0.55 | 0.014 | | 0.022 |
| b1 | 0.204 | | 0.304 | 0.008 | | 0.012 |
| D | | | 10.92 | | | 0.430 |
| E | 7.95 | | 9.75 | 0.313 | | 0.384 |
| e | | 2.54 | | | 0.100 | |
| e3 | | 7.62 | | | 0.300 | |
| e4 | | 7.62 | | | 0.300 | |
| F | | | 6.6 | | | 0260 |
| i | | | 5.08 | | | 0.200 |
| L | 3.18 | | 3.81 | 0.125 | | 0.150 |
| Z | | | 1.52 | | | 0.060 |

DIP8.TBL



ORDER CODE :