

### 1.1 Scope.

This specification covers the device requirements for a high speed, low drift FET input operational amplifier.

### 1.2 Part Number.

The complete part number per Table 1 of this specification is as follows:

| Device | Part Number  |
|--------|--------------|
| - 1    | AD380SH/883B |
| - 2    | AD381SH/883B |
| - 3    | AD382SH/883B |

### 1.2.3 Case Outline.

See Appendix 1 of General Specification ADI-H-1000: package outline:

| Device | Package |
|--------|---------|
| - 1    | H-12A   |
| - 2    | H-08B   |
| - 3    | H-12A   |

### 1.3 Absolute Maximum Ratings. ( $T_A = +25^\circ\text{C}$ unless otherwise noted)

|                                                        |                    |
|--------------------------------------------------------|--------------------|
| Positive Supply Voltage                                | +18V               |
| Negative Supply Voltage                                | -18V               |
| Input Signal                                           | $\pm V_S$          |
| Differential Input Signal                              | $\pm 2 \times V_S$ |
| Output Short Circuit Current to Ground (Device - 1, 3) | 80mA Continuous    |
| Output Short Circuit Current to Ground (Device - 2)    | 20mA Continuous    |
| Junction Temperature                                   | +175°C             |
| Storage Temperature Range                              | -65°C to +150°C    |
| Lead Temperature (Soldering 10sec)                     | +300°C             |

### 1.5 Thermal Characteristics.

|                                  |                     |
|----------------------------------|---------------------|
| Thermal Resistance $\theta_{JC}$ | = 70°C/W for H-12A  |
| $\theta_{JA}$                    | = 100°C/W for H-12A |
| $\theta_{JC}$                    | = 40°C/W for H-08B  |
| $\theta_{JA}$                    | = 150°C/W for H-08B |

# AD380/AD381/AD382 — SPECIFICATIONS

| Test                                    | Symbol            | Device    | Design Limit<br>@ +25°C | Sub Group<br>1 | Sub Group<br>2, 3 | Sub Group<br>4 | Test Condition <sup>1</sup>                       | Units       |
|-----------------------------------------|-------------------|-----------|-------------------------|----------------|-------------------|----------------|---------------------------------------------------|-------------|
| Open Loop Gain                          | A <sub>OL</sub>   | – 1       | 40,000                  |                |                   | 40,000         | No Load                                           | V/V min     |
|                                         |                   | – 1       | 25,000                  |                |                   | 25,000         | Note 2                                            | V/V min     |
|                                         |                   | – 2       | 100,000                 |                |                   | 100,000        | Note 3                                            | V/V min     |
|                                         |                   | – 3       | 35,000                  |                |                   | 35,000         | Note 2                                            | V/V min     |
|                                         |                   | – 3       | 150,000                 |                |                   | 150,000        | Note 4                                            | V/V min     |
| Gain Bandwidth Product                  | GBP               | – 1       | 200                     |                |                   | 200            | f = 60kHz, C <sub>C</sub> = 1pF                   | MHz min     |
|                                         |                   |           | 20                      |                |                   | 20             | f = 60kHz, C <sub>C</sub> = 10pF                  |             |
| Slew Rate                               | SR                | – 1       | 200                     |                |                   | 200            | C <sub>C</sub> = 1pF, 20V Swing                   | V/μs        |
|                                         |                   | – 2, 3    | 20                      |                |                   | 20             |                                                   |             |
| Output Voltage Swing                    | OVS               | – 1       | 12                      |                |                   | 10             | R <sub>L</sub> = 200Ω                             | ± V min     |
|                                         |                   | – 2       |                         |                |                   |                | R <sub>L</sub> = 1kΩ                              |             |
|                                         |                   | – 3       |                         |                |                   |                | R <sub>L</sub> = 200Ω                             |             |
| Input Offset Voltage                    | V <sub>OS</sub>   | – 1       | 2.0                     | 2.0            |                   |                |                                                   | mV max      |
|                                         |                   | – 2, 3    | 1.0                     | 1.0            |                   |                |                                                   |             |
| Input Offset Voltage<br>vs. Temperature | V <sub>OSTC</sub> | – 1       | 50                      |                | 50                |                |                                                   | ± μV/°C max |
|                                         |                   | – 2, 3    | 10                      |                | 10                |                |                                                   |             |
| Output Short Circuit Current            | I <sub>SC</sub>   | – 1       | 90                      |                |                   | 90             | Short Circuit<br>Current to<br>Ground, Continuous | mA min      |
|                                         |                   |           | 220                     |                |                   | 220            |                                                   | mA max      |
|                                         |                   | – 2       | 20                      |                |                   | 20             |                                                   | mA min      |
|                                         |                   |           | 220                     |                |                   | 220            |                                                   | mA max      |
|                                         |                   | – 3       | 80                      |                |                   | 80             |                                                   | mA min      |
|                                         |                   |           | 220                     |                |                   | 220            |                                                   | mA max      |
| Input Bias Current                      | I <sub>BIAS</sub> | – 1       | 100                     |                |                   | 100            | Either Input                                      | pA max      |
|                                         |                   | – 2       | 100                     |                |                   | 100            |                                                   |             |
|                                         |                   | – 3       | 100                     |                |                   | 100            |                                                   |             |
| Input Offset Current                    | I <sub>OS</sub>   | – 1, 2, 3 | 5                       |                |                   |                |                                                   | pA typ      |
| Common-Mode Range                       | V <sub>DIF</sub>  | – 1, 2, 3 | 10                      |                |                   |                |                                                   | ± V max     |
| Common-Mode Rejection<br>Ratio          | CMRR              | – 1       | 60                      |                |                   | 60             | V <sub>INPUT</sub> = ± 10V                        | dB min      |
|                                         |                   | – 2, 3    | 80                      |                |                   | 80             |                                                   |             |
| Operating Power Supply                  | V <sub>SS</sub>   | – 1       | 6                       |                |                   |                |                                                   | ± V min     |
|                                         |                   |           | 20                      |                |                   |                |                                                   | ± V max     |
|                                         |                   | – 2, 3    | 5                       |                |                   |                |                                                   | ± V min     |
|                                         |                   |           | 18                      |                |                   |                |                                                   | ± V max     |
| Quiescent Current                       | I <sub>SS</sub>   | – 1       | 17                      |                |                   | 17             |                                                   | ± mA max    |
|                                         |                   | – 2, 3    | 6                       |                |                   | 6              |                                                   |             |

## NOTES

<sup>1</sup>T<sub>A</sub> = +25°C, V<sub>S</sub> = ±15V, unless otherwise specified.

<sup>2</sup>V<sub>OUT</sub> = +10V to 0V 200Ω load, V<sub>OUT</sub> = 0V to –10V 200Ω load.

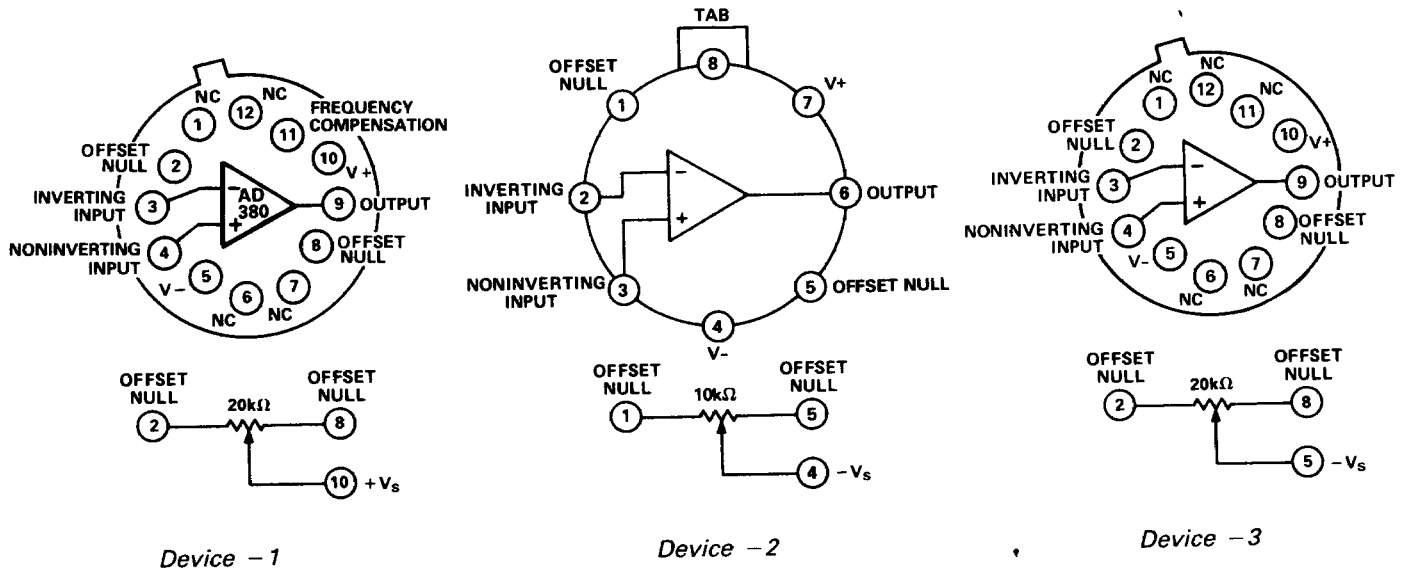
<sup>3</sup>V<sub>OUT</sub> = +10V to 0V 2k load, V<sub>OUT</sub> = 0V to –10V 2k load.

<sup>4</sup>V<sub>OUT</sub> = +10V to 0V 10kΩ load, V<sub>OUT</sub> = 0V to –10V 10kΩ load.

Table 1.

## 3.2.1 Functional Block Diagram and Terminal Assignments.

Top View

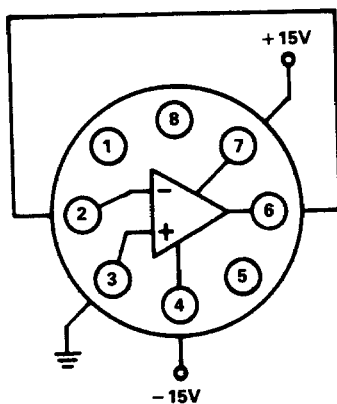


## 3.2.4 Microcircuit Technology Group.

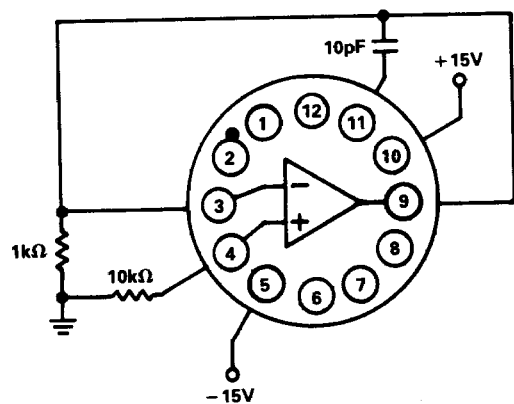
This microcircuit is covered by technology group (I).

## 4.2.1 Life Test/Burn-In Circuit.

Steady state life test is per MIL-STD-883 Method 1005. Burn-in is per MIL-STD-883 Method 1015 test condition (B).



Device -2



Device -1 or -3