## 1.0 SCOPE

**1.1 Scope.** This specification covers the detail requirements for a high-speed, low noise dual operational amplifier.

It is highly recommended that this datasheet be used as a baseline for new military or aerospace specification control drawings.

**1.2 Part Number.** The complete part numbers per Table 1 of this specification follow:

| Device | Part Number | Package |
|---|---|---|
| A | OP-270AZ/883 | Z |
| A | OP-270ARC/883 | RC |

**1.2.3 Case Outline.** The case outline is designated as follows:

| Letter | Case Outline (Lead Finish per MIL-STD-38510) |
|---|---|
| Z | 8-lead ceramic dual-in-line package |
| RC | 20-pin leadless chip carrier |

**1.3 Absolute Maximum Ratings.** ($T_A$ = +25°C, unless otherwise noted)

| | |
|---|---|
| Supply Voltage | ±18V |
| Differential Input Voltage (Note 1) | ±1V |
| Differential Input Current (Note 1) | ±25mA |
| Input Voltage | Supply Voltage |
| Output Short-Circuit Duration | Continuous |
| Storage Temperature Range | -65°C to +150°C |
| Operating Temperature Range | -55°C ≤$T_A$≤ +125°C |
| Lead Temperature Range (Soldering, 60 sec) | 300°C |
| Maximum Junction Temperature ($T_J$) | 150°C |

NOTE:
1. The OP-270's inputs are protected by back-to-back diodes. Current limiting resistors are not used in order to achieve low noise performance. If the differential input voltage exceeds ±1.0V, the input current should be limited to ±25mA.

**1.5 Thermal Characteristics:**

Thermal Resistance, CERDIP (Z) package: Junction-to-Case ($\Theta_{JC}$) = 45°C/W MAX
Junction-to-Ambient ($\Theta_{JC}$) = 150°C/W MAX

Thermal Resistance, LCC (RC) package: Junction-to-Case ($\Theta_{JC}$) = 35°C/W MAX
Junction-to-Ambient ($\Theta_{JC}$) = 110°C/W MAX

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## TABLE 1

**$V_S$ = ±15V; $R_S$ = 50Ω ; $T_J$ = $T_A$ = +25°C unless otherwise specified.**

| Characteristic | Symbol | Special Conditions | OP-270/883 LIMITS A MIN | MAX | Units |
|---|---|---|---|---|---|
| Input Offset Voltage | $V_{OS}$ | | -- | 75 | µV |
| | | -55° ≤ $T_A$ ≤ +125°C | -- | 175 | µV |
| Input Offset Current | $I_{OS}$ | $V_{CM}$ = 0V | -- | 10 | nA |
| | | $V_{CM}$ = 0V<br>-55° ≤ $T_A$ ≤ +125°C | -- | 30 | nA |
| Input Bias Current | $I_B$ | $V_{CM}$ = 0V | -- | 20 | nA |
| | | $V_{CM}$ = 0V<br>-55° ≤ $T_A$ ≤ +125°C | -- | 60 | nA |
| Input Noise Voltage | $E_{nt}$ | $f_O$ = 1Hz to 100Hz<br>see test circuit | -- | 80 | $nV_{RMS}$ |
| Large-Signal Voltage Gain | $Av_O$ | $V_O$ = ±10V $R_L$ = 10kΩ | 1500 | -- | V/mV |
| | | $V_O$ = ±10V $R_L$ = 10kΩ<br>-55° ≤ $T_A$ ≤ +125°C | 750 | -- | V/mV |
| | | $V_O$ = ±10V $R_L$ = 2kΩ | 750 | -- | V/mV |
| | | $V_O$ = ±10V $R_L$ = 2kΩ<br>-55° ≤ $T_A$ ≤ +125°C | 400 | -- | V/mV |
| Output Voltage Swing | $V_O$ | $R_L$ = 2kΩ | ±12 | -- | V |
| | | $R_L$ = 2kΩ<br>-55° ≤ $T_A$ ≤ +125°c | ±12 | -- | V |
| Common-Mode Rejection (Note 1) | CMR | $V_{CM}$ = ±12V | 106 | -- | dB |
| | | $V_{CM}$ = ±12V<br>-55° ≤ $T_A$ ≤ +125°C | 100 | -- | dB |

## TABLE 1

**$V_S$ = ±15V; $R_S$ = 50Ω ; $T_J$ = $T_A$ = +25°C unless otherwise specified.**

| Characteristic | Symbol | Special Conditions | OP-270/883 LIMITS A MIN | MAX | Units |
|---|---|---|---|---|---|
| **Power-Supply Rejection Ratio** | PSRR | $V_S$ = ±4.5V to ±18V | -- | 3.2 | µV/V |
| | | $V_S$ = ±4.5V to ±18V<br>-55° ≤ $T_A$ ≤ +125°C | -- | 5.6 | µV/V |
| **Supply Current** (Note 2) | $I_{SY}$ | No Load | -- | 6.5 | mA |
| | | No Load<br>-55° ≤ $T_A$ ≤ +125°C | -- | 7.5 | mA |
| **Slew Rate** | SR | $A_{VCL}$ = +20, $R_L$ = 10kΩ | ±1.7 | -- | V/µs |
| **Input Offset Voltage Temperature Coefficient** | $TCV_{OS}$ | -55° ≤ $T_A$ ≤ +125°C | -- | 1.0 | µV/°C |

Note 1. IVR is defined as the $V_{CM}$ range used for the CMR test.
Note 2. $I_{SY}$ limit = total for both amplifiers.

## TABLE 2

**OP-270/883**

**Electrical Test Requirements**
**For Class B Devices**

| MIL-STD-883 Test Requirement | Subgroups (see Table.3) |
|---|---|
| Interim Electrical Parameters (pre Burn-In) | 1 |
| Final Electrical Test Parameters | 1*, 2, 3,4,5,6 |
| Group A Test Requirements | 1,2,3,4,5,6,7,8 |

* PDA applies to Subgroup 1 only.
No other Subgroups are included in PDA.

## TABLE 3
### Group A Inspection

$V_S$ = ±15V; $R_S$ = 50Ω; $T_J$ = $T_A$ unless otherwise specified.

| | Symbol | Special Conditions | OP-270/883 LIMITS A MIN | MAX | Units |
|---|---|---|---|---|---|
| **Subgroup 1.** $T_A$ = +25°C | $V_{OS}$ | | -- | 75 | µV |
| | $I_{OS}$ | $V_{CM}$ = 0V | -- | 10 | nA |
| | $I_B$ | $V_{CM}$= 0V | -- | 20 | nA |
| | CMR | $V_{CM}$ = ±12V | 106 | -- | dB |
| | PSRR | $V_S$ = ±4.5V to ±18V | -- | 3.2 | µV/V |
| | $I_{SY}$ | No Load (Note 1) | -- | 6.5 | mA |
| **Subgroup 2.** $T_A$ = +125°C | $V_{OS}$ | | -- | 175 | µV |
| | $I_{OS}$ | $V_{CM}$ = 0V | -- | 30 | nA |
| | $I_B$ | $V_{CM}$ = 0V | -- | 60 | nA |
| | CMR | $V_{CM}$ = ±12V | 100 | -- | dB |
| | PSRR | $V_S$ = ±4.5V to ±18V | -- | 5.6 | µV/V |
| | $I_{SY}$ | No Load (Note 1) | -- | 7.5 | mA |

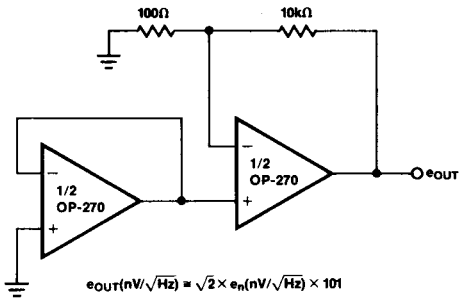
## TABLE 3
### Group A Inspection

**$V_S$ = ±15V; $R_S$ = 50Ω; $T_J$ = $T_A$ unless otherwise specified.**

| | Symbol | Special Conditions | OP-270/883 LIMITS A MIN | MAX | Units |
|---|---|---|---|---|---|
| **Subgroup 3.** $T_A$ = -55°C | | All Tests, Limits and Conditions are the same as for Subgroup 2. | | | |
| **Subgroup 4.** $T_A$ = +25°C | $AV_O$ | $V_O$ = ±10V, $R_L$ = 10kΩ | 1500 | -- | V/mV |
| | | $V_O$ = ±10V, $R_L$ = 2kΩ | 750 | -- | V/mV |
| | $V_O$ | $R_L$ = 2kΩ | ±12 | -- | V |
| **Subgroup 5.** $T_A$ = +125°C | $AV_O$ | $V_O$ = ±10V, $R_L$ = 10kΩ | 750 | -- | V/mV |
| | | $V_O$ = ±10V, $R_L$ = 2kΩ | 400 | -- | V/mV |
| | $V_O$ | $R_L$ = 2kΩ | ±12 | -- | V |
| **Subgroup 6.** $T_A$ = +55°C | | All Tests, Limits and Conditions are the same as for Subgroup 5. | | | |
| **Subgroup 7.** $T_A$ = +25°C | SR | $A_{VCL}$ = +20, $R_L$ = 10kΩ | ±1.7 | -- | V/μs |
| | $E_{nt}$ | $f_O$ = 1Hz to 100Hz | -- | 80 | $nV_{RMS}$ |
| **Subgroup 8.** $T_A$ = -55°C, +125°C | $TCV_{OS}$ | | -- | 1.0 | μV/°C |

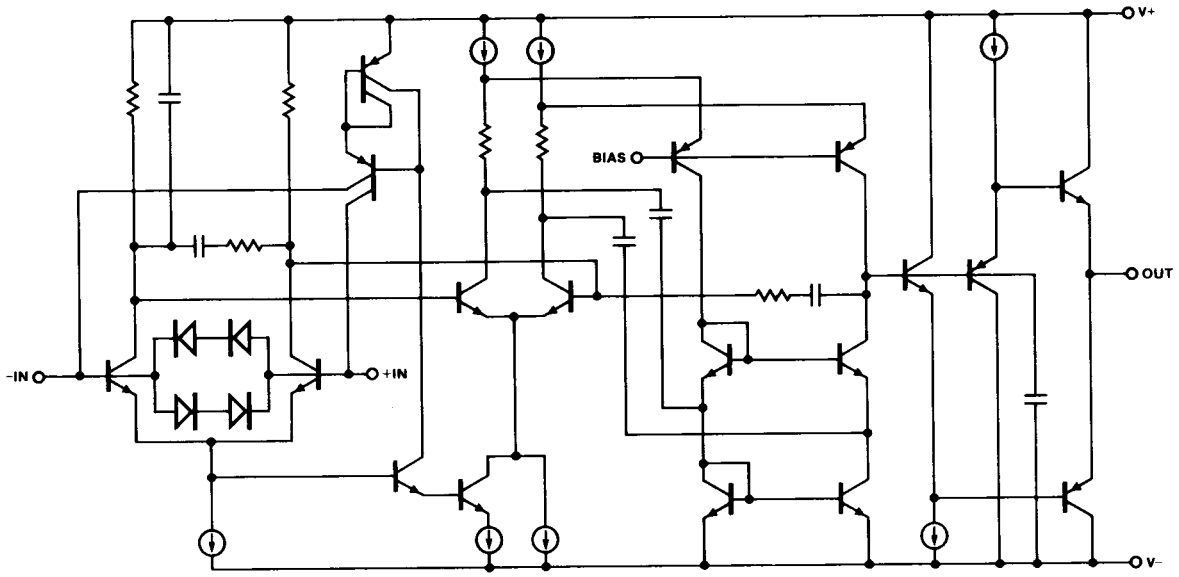
Note 1. $I_{SY}$ limit = total of both amplifiers.

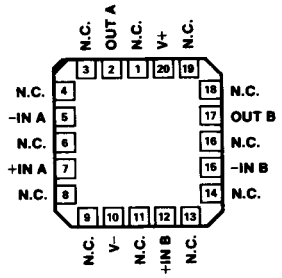
### Noise Test Circuit Schematic



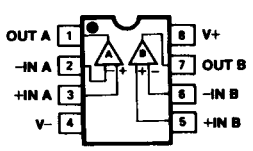



## 3.2.1 Simplified Schematic and Pin Connections




**LCC**
**(RC-Suffix)**




**8-PIN HERMETIC DIP**
**(Z-Suffix)**

**3.2.4 Microcircuit Group Assignment.** This microcircuit is covered by microcircuit group 49.

**4.2 Life Test/Burn-In Circuit.**

Burn-in performed per 883/1005 condition A, B, C, or D.