



AM-430 Ultra-Low Drift, Monolithic Operational Amplifier

PRODUCT DATA SHEET

FEATURES

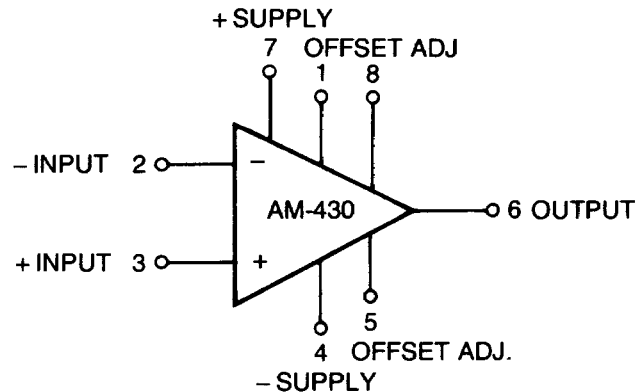
- 0.6 Microvolts/°C maximum drift
- 25 Microvolts maximum input offset voltage.
- 2.5 MHz Bandwidth
- 10^7 Open loop gain
- 9 nV/ $\sqrt{\text{Hz}}$ Voltage noise
- ± 4 nA Maximum bias

GENERAL DESCRIPTION

The AM-430 is a chopperless, ultra-low drift monolithic operational amplifier. Excellent input characteristics in conjunction with 2.5 MHz unity gain bandwidth make this amplifier extremely useful for precision integrator, biomedical, and low level signal amplification applications. This amplifier features 25 microvolts maximum input offset voltage, eliminating the need for external zeroing in most applications, and a maximum input offset voltage drift of only 0.6 microvolts/°C; specifications that rival those of more expensive chopper stabilized amplifiers.

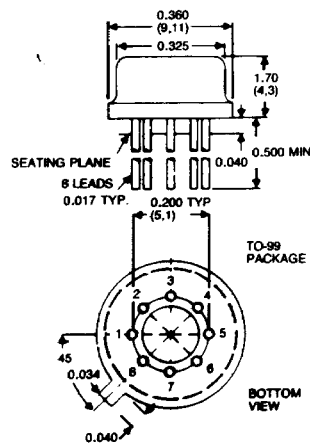
Other significant features include 10^7 open loop voltage gain, 100 dB minimum common mode rejection ratio, and ± 4 nA maximum bias current. The AM-430 also has low input noise characteristics of 9 nV/ $\sqrt{\text{Hz}}$ voltage noise density and 0.2 pA/ $\sqrt{\text{Hz}}$ current noise density. Output voltage range is ± 10 V minimum at ± 25 mA load current with a short circuit protected output.

Dynamic characteristics include a settling time of 11 microseconds to 0.1%, and a minimum slew rate of 0.5V/microsecond. Its unique combination of specifications make the AM-430 ideal for transducer amplification, threshold detector applications, low drift active filters and precision D/A converter output amplifiers.



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MECHANICAL DIMENSIONS INCHES (MM)



NOTE: ALL LEADS GOLD PLATED KOVAR

INPUT/OUTPUT CONNECTIONS

| PIN | FUNCTION |
|-----|------------------|
| 1 | OFFSET ADJ. |
| 2 | - INPUT |
| 3 | + INPUT |
| 4 | - SUPPLY VOLTAGE |
| 5 | OFFSET ADJ. * |
| 6 | OUTPUT |
| 7 | + SUPPLY VOLTAGE |
| 8 | OFFSET ADJ. * |

*PINS 5 AND 8 ARE INTERNALLY CONNECTED.

DataSheet

AM-430 ULTRA-LOW DRIFT MONOLITHIC OPERATIONAL AMPLIFIER

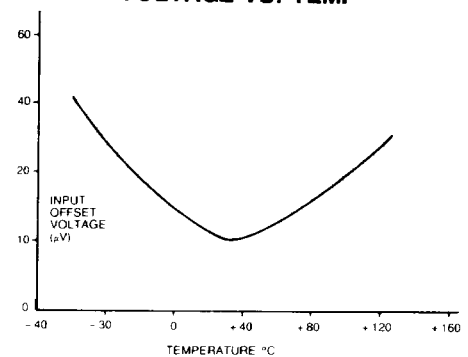
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AM-430



| ABSOLUTE MAXIMUM RATINGS ¹ | AM-430A | AM-430B |
|---------------------------------------|---------|---------|
| Power Supply Voltage | | ± 20V |
| Differential Input Voltage | | ± 15V |
| Power Dissipation ² | | 300 mW |

TYPICAL INPUT OFFSET VOLTAGE VS. TEMP

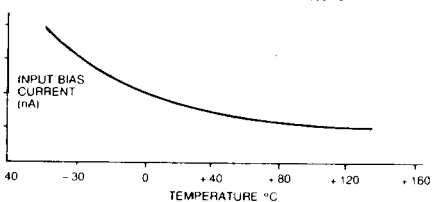


FUNCTIONAL SPECIFICATIONS

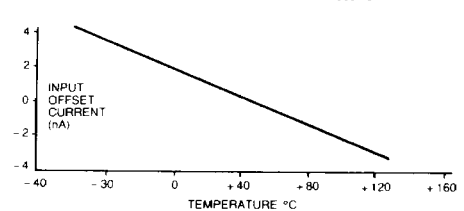
Typical at +25°C, ±15V dc supplies, unless otherwise noted.

| INPUT CHARACTERISTICS | | |
|--|-----------|-----------------|
| Common Mode Voltage Range, minimum ³ | | ± 12V |
| Input Resistance, diff. mode | | 30 MΩ |
| Input Offset Voltage, maximum | 75 µV | 25 µV |
| Input Bias Current, maximum | ± 4 nA | ± 2 nA |
| Input Offset Current, maximum | 4 nA | 2 nA |
| OUTPUT CHARACTERISTICS | | |
| Output Voltage, minimum ⁴ | | ± 10V |
| Output Current, S.C. protected, minimum | | ± 15 mA |
| Output Resistance, open loop ⁵ | | 45Ω |
| PERFORMANCE | | |
| DC Open Loop Gain, minimum ⁶ | | 120 dB |
| Input Offset Voltage Drift, maximum | 1.3 µV/°C | 0.6 µV/°C |
| Input Bias Current Drift, maximum | | 40 pA/°C |
| Input Offset Current Drift, maximum | | 40 pA/°C |
| Common Mode Rejection Ratio, minimum | | 100 dB |
| Input Noise Voltage Density, 1 kHz | | 9 nV/√Hz |
| Input Noise Current Density, 1 kHz | | 0.2 pA/√Hz |
| Power Supply Rejection Ratio, minimum ⁷ | | 94 dB |
| DYNAMIC CHARACTERISTICS | | |
| Unity Gain Bandwidth | | 2.5 MHz |
| Full Power Frequency | | 10 kHz |
| Slew Rate, minimum | | 0.5V/µsec. |
| Settling Time, 10V to 0.1% ⁸ | | 11 µsec. |
| Rise Time | | 340 nsec. |
| POWER REQUIREMENTS | | |
| Voltage, Rated Performance | | ± 15V dc |
| Quiescent Current, maximum ⁹ | | 1.3 mA |
| PHYSICAL/ENVIRONMENTAL | | |
| Operating Temperature Range: AM-430A,B | | 0°C to +70°C |
| Storage Temperature Range | | -65°C to +150°C |
| Package, Hermetically Sealed | | TO-99 |
| FOOTNOTES: | | |
| 1. Maximum ratings are limiting values, applied individually, beyond which the serviceability of the circuit may be impaired. Functional operation under any of these conditions is not necessarily implied. | | |
| 2. Derate at 6.8 mW/°C for operation at temperatures above +75°C. | | |
| 3. Specified at full operating temperature. | | |
| 4. R _L = 600Ω. | | |
| 5. Measured under open loop conditions, f = 100 Hz. | | |
| 6. V _{out} = ± 10V, R _L = 2 kΩ. | | |
| 7. V _{supp} = ± 5V dc to ± 20V dc. Specified at full operating temperature. | | |
| 8. G = -1. | | |
| 9. Specified at full operating temperature. | | |

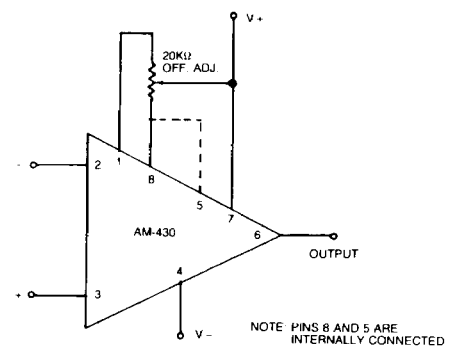
TYPICAL INPUT BIAS CURRENT VS. TEMP.



TYPICAL INPUT OFFSET CURRENT VS. TEMP.



CONNECTION DIAGRAM



ORDERING INFORMATION

| MODEL | INPUT OFFSET VOLTAGE DRIFT |
|---------|----------------------------|
| AM-430A | 1.3 µV/°C maximum |
| AM-430B | 0.6 µV/°C maximum |

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