

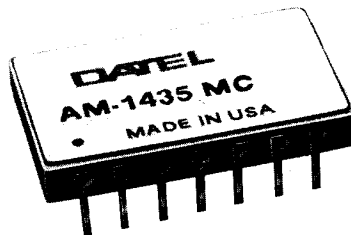
FEATURES

- 70 Nanoseconds settling to 0.01%
- 1 GHz Gain bandwidth product
- 100 dB Open loop gain
- 80 dB Minimum CMRR
- -55°C to +125°C Operation

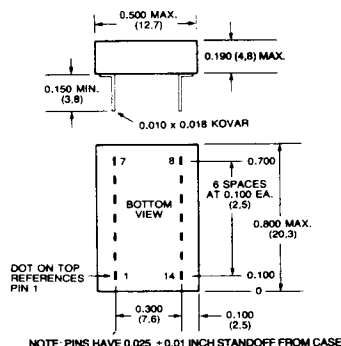
GENERAL DESCRIPTION

DATEL's AM-1435 is an ultrafast settling, wide-band operational amplifier. Utilizing precision thin-film hybrid construction and differential input operational amplifier design techniques, the AM-1435 achieves a settling time of only 70 nanoseconds for a 10 volt step to 0.01% accuracy. High speed performance is optimized with high open-loop gain, flat frequency response beyond 10 KHz and a roll-off of 6 dB/octave to beyond 100 MHz. Typically, gain bandwidth product is 1 GHz and slew rate is 300 V/microsecond.

AM-1435 dc characteristics include a dc open loop gain of 100 db, 1 M Ω input impedance, and an initial input offset voltage of only ± 2 mV. Input offset voltage drift is typically ± 5 μ V/°C. Also featured is a minimum common mode rejection ratio of 80 dB and full power frequency of 8 MHz.

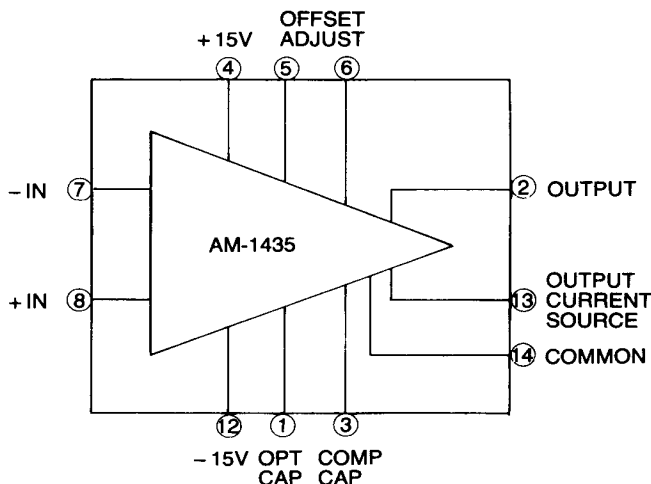


MECHANICAL DIMENSIONS INCHES (MM)



INPUT/OUTPUT CONNECTIONS

PIN	FUNCTION
1	OPTIONAL CAP
2	OUTPUT
3	COMPENSATION CAP
4	+ 15V SUPPLY (+ V _S)
5	OFFSET ADJUST
6	OFFSET ADJUST
7	- INPUT
8	+ INPUT
9	N.C.
10	N.C.
11	N.C.
12	- 15V SUPPLY (- V _S)
13	OUTPUT CURRENT SOURCE
14	COMMON



FUNCTIONAL SPECIFICATIONS

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

INPUT CHARACTERISTICS	MINIMUM	TYPICAL	MAXIMUM
Differential between inputs	—	—	±4V
Common Mode Voltage Range	±7V	±8.5V	—
Common Mode Rejection Ratio;			
dc	80 dB	—	—
1 MHz	70 dB	—	—
Input Impedance;			
common mode	1 MΩ 2 pF	—	—
differential mode	2.5 kΩ 2 pF	—	—
Input Offset Voltage ²	—	±2 mV	±5 mV
Input Bias Current	—	10 μA	20 μA
Input Offset Current	—	0.3 μA	—
OUTPUT CHARACTERISTICS			
Output Voltage ³	±5V	±7V	—
Output Current ³	±10 mA	±14 mA	—
Stable Capacitive Load ⁴	—	1000 pF	—
PERFORMANCE			
dc Open Loop Gain ³	90 dB	100 dB	—
Input Offset Voltage Drift	—	±5 μV/°C	±25 μV/°C
Input Bias Current Drift	—	50 nA/°C	100 nA/°C
Input Offset Current Drift	—	2 nA/°C	—
Input Voltage Noise,			
0.01 Hz to 10 Hz	—	15 μV P-P	—
100 Hz to 10 kHz	—	1.6 μV RMS	—
10 Hz to 1 MHz	—	5.2 μV RMS	—
Input Current Noise ⁵ ,			
0.01 Hz to 10 Hz	—	2.5 nA P-P	—
100 Hz to 10 kHz	—	2.5 nA RMS	—
10 Hz to 1 MHz	—	3.5 nA RMS	—
Power Supply Rejection Ratio	—	0.15 mV/V ΔV _S	—
DYNAMIC CHARACTERISTICS			
Gain Bandwidth Product	700 MHz	1000 MHz	—
Unity Gain Bandwidth	—	150 MHz	—
Full Power Frequency ⁴	8 MHz	10 MHz	—
Settling Time, 10V to 0.025% ⁷	—	60 nsec.	75 nsec.
10V to 0.01% ⁷	—	70 nsec. ⁸	—
5V to 1.0% ⁷	—	25 nsec.	—
5V to 0.1% ⁷	—	40 nsec.	60 nsec.
1V to 1.0% ⁷	—	10 nsec.	—
1V to 0.1% ⁷	—	20 nsec.	—
Slew Rate	250 V/μsec. ⁶	300 V/μsec.	—
Overshoot	—	5 nsec.	1%
Propagation Delay	—	40 nsec.	—
Rise Time, 10V Step	—	40 nsec.	—
Overload Recovery Time	—	50 nsec.	—
POWER REQUIREMENTS			
Rated Supply Voltage	±12V	±15V	±16V
Quiescent Current ⁸	—	—	±30 mA

PHYSICAL/ENVIRONMENTAL

Oper. Temp. Range

AM-1435MC 0 to +70 °C

AM-1435MM⁹/MM-QL -55 to +125 °C

Storage Temp. Range -65 to +125 °C

Package 14-pin hermetically sealed ceramic DIP

FOOTNOTES:

- Specified for dc linear operation. Common mode voltage range prior to fault condition is ±10V dc maximum.
- Adjustable to zero.
- R₁ = 500Ω.
- C₁ = 3 pF.
- Referred to input.
- C₁ = 0.5 pF.
- C₂ = 1 pF.
- ±V_S = ±15V dc.
- With 18°C/watt heat sink.

ORDERING INFORMATION

Model No. Operating Temp. Range

AM-1435MC 0 to +70 °C
 AM-1435MM -55 to +125 °C
 AM-1435MM-QL -55 to +125 °C

TECHNICAL NOTES

- The extensive use of a ground plane for all common connections is recommended. Keep lead length to a minimum with point-to-point connections wired directly to the amplifier pins. Use 1 μF tantalum bypass capacitors the +Vs and -Vs pins.
- When using the AM-1435MM over the +85 to +125°C temperature range, use an 18°C/W heat sink.
- Apply negative supply voltage before the positive supply. Power-up prior to applying power to either input. If frequency response is not critical, use an external input protection circuit.

COMPENSATION - The typical connection diagram shows the AM-1435 in a unity gain inverting configuration. Use in any conventional amp circuit, the AM-1435, as a noninverting amplifier, requires a noise gain of at least two (NOISE GAIN = 1 + R₄/R₁).

The 2 pF compensation capacitor at C₁ is required for stable operation when the noise gain is less than 10. Compensation for bias current is provided by R₂ and its value determined by the formula

$$R_2 = \frac{(R_1) \times (R_4)}{R_1 + R_4}$$

R₃ and C₄ are optional. Use C₄ when driving capacitive loads to prevent oscillation of the output stage.

When using the AM-1435 at low impedances, include the feedback resistor as a part of the total output load.

TYPICAL CONNECTION DIAGRAM

