

FEATURES

AC PERFORMANCE

Unity Gain Bandwidth: 34 MHz
Fast Settling: 135 ns to 0.01%
Slew Rate: 250 V/ μ s
Stable at Gains of 1 or Greater
Full Power Bandwidth: 3.9 MHz

DC PERFORMANCE

Input Offset Voltage: 1 mV max (AD843K/B)
Input Bias Current: 0.6 nA typ
Input Voltage Noise: 19 nV/ $\sqrt{\text{Hz}}$
Open Loop Gain: 30 V/mV into a 500 Ω Load
Output Current: 50 mA min
Supply Current: 13 mA max

Available in 8-Pin Plastic Mini-DIP & Cerdip, 16-Pin SOIC,
20-Pin LCC and 12-Pin Hermetic Metal Can Packages
Available in Tape and Reel in Accordance with
EIA-481A Standard

Chips and MIL-STD-883B Parts Also Available

APPLICATIONS

High Speed Sample-and-Hold Amplifiers
High Bandwidth Active Filters
High Speed Integrators
High Frequency Signal Conditioning

PRODUCT DESCRIPTION

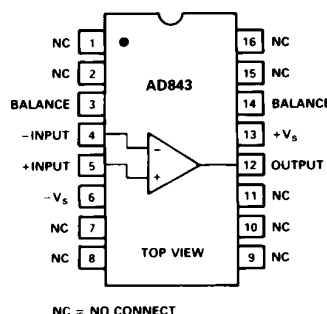
The AD843 is a fast settling, 34 MHz, CBFET input op amp. The AD843 combines the low (0.6 nA) input bias currents characteristic of a FET input amplifier while still providing a 34 MHz bandwidth and a 135 ns settling time (to within 0.01% of final value for a 10 volt step). The AD843 is a member of the Analog Devices' family of wide bandwidth operational amplifiers. These devices are fabricated using Analog Devices' junction isolated complementary bipolar (CB) process. This process permits a combination of dc precision and wideband ac performance previously unobtainable in a monolithic op amp.

The 250 V/ μ s slew rate and 0.6 nA input bias current of the AD843 ensure excellent performance in high speed sample-and-hold applications and in high speed integrators. This amplifier is also ideally suited for high bandwidth active filters and high frequency signal conditioning circuits.

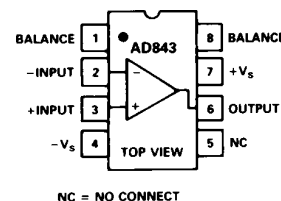
Unlike many high frequency amplifiers, the AD843 requires no external compensation and it remains stable over its full operating temperature range. It is available in five performance grades: the AD843J and AD843K are rated over the commercial temperature range of 0°C to +70°C. The AD843A and AD843B are rated over the industrial temperature range of -40°C to +85°C. The AD843S is rated over the military temperature range of -55°C to +125°C and is available processed to MIL-STD-883B, Rev. C.

CONNECTION DIAGRAMS

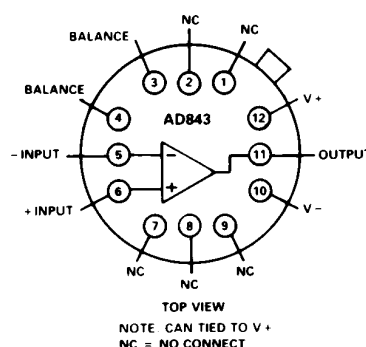
16-Pin SOIC (R-16) Package



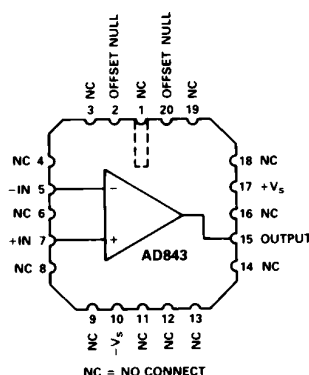
Plastic (N-8) and Cerdip (Q-8) Package



TO-8 (H-12A) Package



LCC (E-20A) Package



The AD843 is offered in either 8-pin plastic DIP or hermetic cerdip packages, in 16-pin SOIC, 20-Pin LCC, or in a 12-pin metal can. Chips are also available.

PRODUCT HIGHLIGHTS

1. The high slew rate, fast settling time and low input bias current of the AD843 make it the ideal amplifier for 12-bit D/A and A/D buffers, for high speed sample-and-hold amplifiers and for high speed integrator circuits. The AD843 can replace many FET input hybrid amplifiers such as the LH0032, LH4104 and OPA600.
2. Fully differential inputs provide outstanding performance in all standard high frequency op amp applications such as signal conditioning and active filters.
3. Laser wafer trimming reduces the input offset voltage to 1 mV max (AD843K and AD843B).
4. Although external offset nulling is unnecessary in many applications, offset null pins are provided.
5. The AD843 does not require external compensation at closed loop gains of 1 or greater.

AD843—SPECIFICATIONS (@ T_A = +25°C and ±15 V dc, unless otherwise noted)

Model	Conditions	AD843J/A			AD843K/B			AD843S ¹			Units
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
INPUT OFFSET VOLTAGE ¹											
Offset Drift	T _{MIN} –T _{MAX}		1.0 1.7 12	2.0 4.0		0.5 1.2 12	1.0 2.0 35		1.0 3.0 12	2.0 4.5	mV mV μV/°C
INPUT BIAS CURRENT	Initial (T _J = +25°C) Warmed-Up ² T _{MIN} –T _{MAX}		50 0.8	2.5 60/160		40 0.6	1.0 23/65		50 0.8	2.5 2600	pA nA nA
INPUT OFFSET CURRENT	Initial (T _J = +25°C) Warmed-Up ² T _{MIN} –T _{MAX}		30 0.25	1.0 23/64		20 0.2	0.4 9/26		30 0.25	1.0 1025	pA nA nA
INPUT CHARACTERISTICS											
Input Resistance			10 ¹⁰			10 ¹⁰			10 ¹⁰		Ω
Input Capacitance			6			6			6		pF
INPUT VOLTAGE RANGE											
Common Mode		±10	+12, –13		±10	+12, –13		±10	+12, –13		V
COMMON-MODE REJECTION	V _{CM} = ±10 V T _{MIN} –T _{MAX}	60 60	72 72		70 68	76 76		60 60	72 72		dB dB
INPUT VOLTAGE NOISE	f = 10 kHz Wideband Noise 10 Hz to 10 MHz		19 60			19 60			19 60		nV/√Hz μV rms
OPEN LOOP GAIN	V _O = ±10 V R _{LOAD} ≥ 500 Ω T _{MIN} –T _{MAX}	15 10	25 20		20 10	30 25		15 10	30 25		V/mV V/mV
OUTPUT CHARACTERISTICS											
Voltage	R _{LOAD} ≥ 500 Ω	±10	+11.5, –12.6		±10	+11.5, –12.6		±10	+11.5, –12.6		V
Current	V _{OUT} = ±10 V	50			50			50			mA
Output Resistance	Open Loop		12			12			12		Ω
FREQUENCY RESPONSE											
Unity Gain Bandwidth	V _{OUT} = 90 mV p-p V _O = 20 V p-p R _I ≥ 500 Ω		34			34			34		MHz
Full Power Bandwidth ³		2.5	3.9		2.5	3.9		2.5	3.9		MHz
Rise Time	A _{VCL} = –1		10			10			10		ns
Overshoot	A _{VCL} = –1		15			15			15		%
Slew Rate	A _{VCL} = –1	160	250		160	250		160	250		V/μs
Settling Time	10 V Step A _{VCL} = –1 to 0.1% to 0.01%		95 135			95 135			95 135		ns ns
Overdrive Recovery	–Overdrive +Overdrive		200 700			200 700			200 700		ns ns
Differential Gain	f = 4.4 MHz		0.025			0.025			0.025		%
Differential Phase	f = 4.4 MHz		0.025			0.025			0.025		Degree
POWER SUPPLY											
Rated Performance			±15			±15			±15		V
Operating Range		±4.5		±18	±4.5		±18	±4.5		±18	V
Quiescent Current			12 12.3	13 14		12 12.3	13 14		12 12.5	13 16	mA mA
Rejection Ratio	T _{MIN} –T _{MAX} ±5 V to ±18 V	65	76		70	80		65	76		dB
Rejection Ratio	T _{MIN} –T _{MAX}	62	76		68	80		62	76		dB
TEMPERATURE RANGE											
Operating, Rated Performance											
Commercial (0°C to +70°C)											
Industrial (–40°C to +85°C)											
Military (–55°C to +125°C) ⁴											
PACKAGE OPTIONS											
Plastic (N-8)			AD843JN			AD843KN			AD843SQ, AD843SQ/883B		
Cerdip (Q-8)			AD843AQ			AD843BQ			AD843SH, AD843SH/883B		
Metal Can (H-12A)						AD843BH			AD843SE/883B		
LCC (E-20A)											
SOIC (R-16)											
Tape & Reel											
Chips			AD843JR-16 AD843JR-16-REEL AD843JR-16-REEL7 AD843JCHIPS						AD843SCHIPS		

NOTES

¹Standard Military Drawings Available: 5962-9098001M2A (SE/883B), 5962-9098001MXA (SH/883B), 5962-9098001MPA (SQ/883B).

²Specifications are guaranteed after 5 minutes at $T_A = +25^\circ\text{C}$.

³Full power bandwidth = Slew Rate/2 π V peak.

⁴All "S" grade $T_{\text{MIN}}-T_{\text{MAX}}$ specifications are tested with automatic test equipment at $T_A = -55^\circ\text{C}$ and $T_A = +125^\circ\text{C}$.

Specifications subject to change without notice.

Specifications in **boldface** are tested on all production units at final electrical test. Results from those tests are used to calculate outgoing quality levels. All min and max specifications are guaranteed although only those shown in **boldface** are tested on all production units.

ABSOLUTE MAXIMUM RATINGS¹

Supply Voltage $\pm 18\text{ V}$

Internal Power Dissipation²

Plastic Package 1.50 Watts

Cerdip Package 1.35 Watts

12-Pin Header Package 1.80 Watts

16-Pin SOIC Package 1.50 Watts

20-Pin LCC Package 1.00 Watt

Input Voltage $\pm V_S$

Output Short Circuit Duration Indefinite

Differential Input Voltage $+V_S$ and $-V_S$

Storage Temperature Range (N, R) -65°C to $+125^\circ\text{C}$

Storage Temperature Range (Q, H, E) -65°C to $+150^\circ\text{C}$

Operating Temperature Range

AD843J/R 0°C to $+70^\circ\text{C}$

AD843A/B -40°C to $+85^\circ\text{C}$

AD843S -55°C to $+125^\circ\text{C}$

Lead Temperature Range (Soldering 60 sec) $+300^\circ\text{C}$

ESD Rating 500 V

NOTES

¹Stresses above those listed under "Absolute Maximum Ratings" may cause permanent damage to the device at these or any other conditions above those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

²8-Pin Plastic Package: $\theta_{JA} = 100^\circ\text{C/Watt}$

8-Pin Cerdip Package: $\theta_{JA} = 110^\circ\text{C/Watt}$

12-Pin Header Package: $\theta_{JA} = 80^\circ\text{C/Watt}$

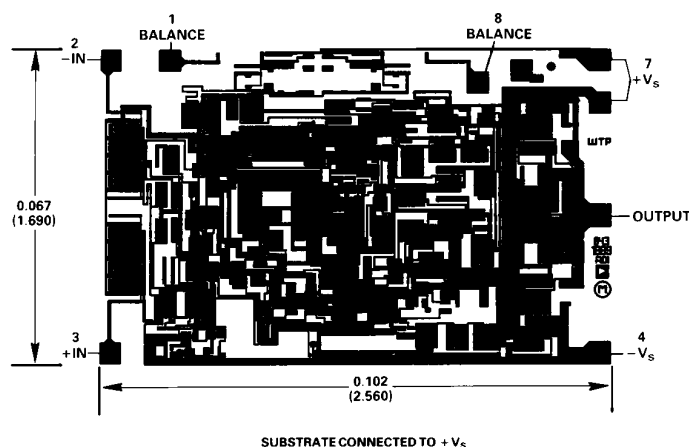
16-Pin SOIC Package: $\theta_{JA} = 100^\circ\text{C/Watt}$

20-Pin LCC Package: $\theta_{JA} = 150^\circ\text{C/Watt}$

METALIZATION PHOTOGRAPH

Contact factory for latest dimensions.

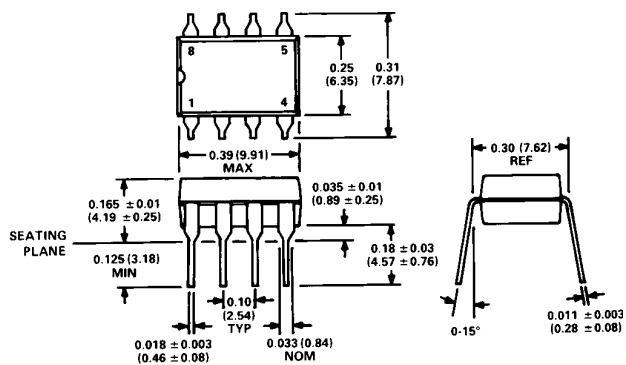
Dimensions shown in inches and (mm).



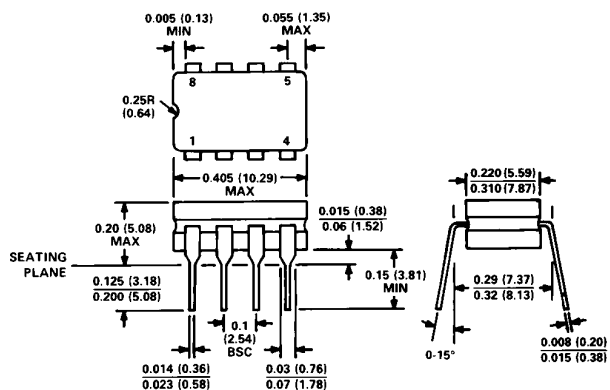
OUTLINE DIMENSIONS

Dimensions shown in inches and (mm).

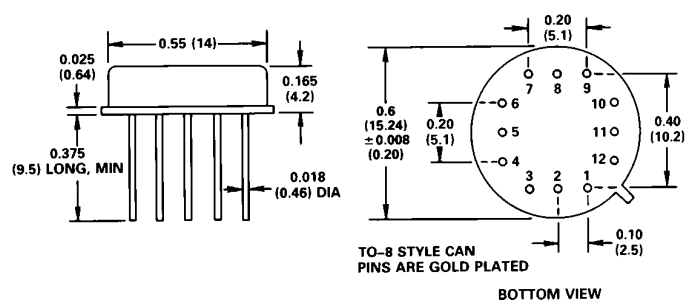
**Mini-DIP Package
(N-8)**



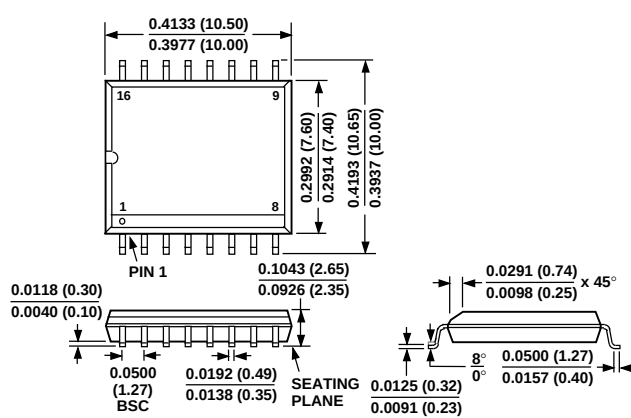
**Cerdip Package
(Q-8)**



**TO-8 Package
(H-12A)**



**16-Pin SOIC Package
(R-16)**



**LCC Package
(E-20A)**

