

DP24H80/ μ A24H80 Winchester Disk Servo Preamplifier

General Description

The DP24H80/ μ A24H80 provides termination, gain, and impedance buffering for the servo read head in Winchester disk drives. It is a differential input, differential output design with fixed gain of approximately 100. The bandwidth is guaranteed greater than 30 MHz.

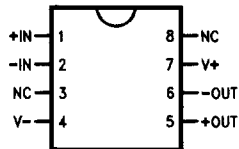
The internal design of the DP24H80/ μ A24H80 is optimized for low input noise voltage to allow its use in low input signal level applications. It is offered in 8-lead DIP, 10-lead flatpak, or SO-8 package suitable for surface mounting.

Features

- Low input noise voltage
- Wide power supply range (8V to 13V)
- Internal damping resistors (1.3 k Ω)
- Direct replacement for SSI 101A, with improved performance

Connection Diagrams

8-Lead DIP and SO-8 Package



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Top View

Ceramic DIP

† Order Number μ A24H80RC

‡ See NS Package Number J08A

Molded Surface Mount

† Order Number μ A24H80SC

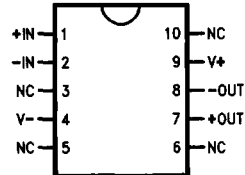
‡ See NS Package Number M08A

Molded DIP

† Order Number μ A24H80TC

‡ See NS Package Number N08E

10-Lead Ceramic Flatpak



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Top View

† Order Number μ A24H80FC

‡ See NS Package Number F10B

Pin Descriptions

Name	Description of Functions
V+	Positive Differential Supply with Respect to V-
V-	Negative Differential Supply with Respect to V+
+IN	Positive Differential Input
-IN	Negative Differential Input
+OUT	Positive Differential Output
-OUT	Negative Differential Output
NC	No Connection

† For most current order information, contact your local sales office.

‡ For current package information, contact product marketing.

Absolute Maximum Ratings

If Military/Aerospace specified devices are required, please contact the National Semiconductor Sales Office/Distributors for availability and specifications.

Storage Temperature Range	
Ceramic DIP and Flatpak	-65°C to +175°C
Molded DIP and SO-8	-65°C to +150°C
Operating Temperature Range	
	0°C to +70°C
Lead Temperature	
Ceramic DIP and Flatpak (Soldering, 60 seconds)	300°C
Molded DIP and SO-8 (Soldering, 10 seconds)	265°C

Internal Power Dissipation (Notes 1 & 2)	
8L-Ceramic DIP	1.30W
8L-Molded DIP	0.93W
SO-8	0.81W
10L-Flatpak	0.79W
Supply Voltage	15V
Output Voltage	15V
Differential Input Voltage	±10V

Note 1: $T_{J\text{ MAX}} = 150^\circ\text{C}$ for the Molded DIP and SO-8, and 175°C for the Ceramic DIP and Flatpak.

Note 2: Ratings apply to ambient temperature at 25°C . Above this temperature, derate the 8L-Ceramic DIP at $8.7\text{ mW}/^\circ\text{C}$, the 8L-Molded DIP at $7.5\text{ mW}/^\circ\text{C}$, the SO-8 at $6.5\text{ mW}/^\circ\text{C}$, and the Flatpak at $5.3\text{ mW}/^\circ\text{C}$.

Electrical Characteristics $T_A = 25^\circ\text{C}$, $V_{CC} = 8\text{V}$ to 13.2V , unless otherwise noted

Symbol	Parameter	Conditions	Min	Typ	Max	Units
G	Gain (Differential) (Note 4)	$R_p = 130\Omega$, $V_{CC} = 12\text{V}$	80	100	120	
		$R_p = 130\Omega$, $V_{CC} = 12\text{V}$ $T_A = 0^\circ\text{C}$ to $+70^\circ\text{C}$	70		130	
BW	Bandwidth (3.0 dB) (Note 2)	$V_i = 0.5\text{ mV}_{p-p}$	30	65		MHz
R_i	Input Resistance		1040	1300	1560	Ω
C_i	Input Capacitance			3		pF
V_i	Input Dynamic Range (Differential)	$R_p = 130\Omega$, $V_{CC} = 12\text{V}$	3			mV_{p-p}
I_S	Supply Current	$V_{CC} \approx 12\text{V}$		20	25	mA
ΔV_O	Output Offset (Differential)	$R_p = 130\Omega$, $R_s = 0\Omega$			200	mV
V_n	Equivalent Input Noise (Notes 2 & 3)	$R_s = 0\Omega$, BW = 4 MHz		1.5	2	μV
PSRR	Power Supply Rejection Ratio (Note 1)	$R_s = 0\Omega$, $f = 5\text{ MHz}$	55	70		dB
$\Delta G/\Delta V$	Gain Sensitivity (Supply)	$R_p = 130\Omega$, $\Delta V_{CC} = \pm 10\%$			±0.5	%/V
$\Delta G/\Delta T$	Gain Sensitivity (Temp)	$R_p = 130\Omega$, $T_A = 25^\circ\text{C}$ to $+70^\circ\text{C}$		-0.1		%/°C
CMR	Common Mode Rejection (Note 1) (Input)	$f = 5\text{ MHz}$	60	75		dB

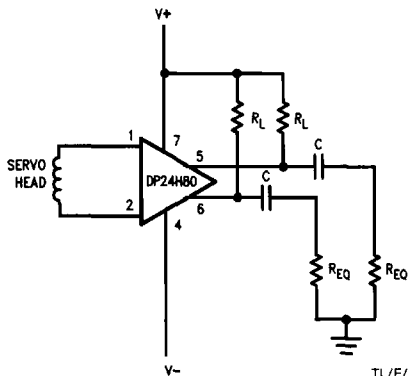
Note 1: Tested at DC, guaranteed at frequency.

Note 2: Guaranteed, but not tested in production.

Note 3: Equivalent input noise (additional specification):

Typ	Max	Unit	Condition
3	4	μV	BW = 15 MHz ²
0.85	1.0	$\text{nV}/\sqrt{\text{Hz}}$	BW = 15 MHz ²

Typical Applications



Note 1: Leads shown for 8-lead DIP.

Note 2: R_{eq} is equivalent load resistance.

Note 3: $R_p = \frac{R_L \cdot R_{eq}}{R_L + R_{eq}}$

Note 4: $G = 0.77 R_p$
Where $R_p =$ value from Note 3 (above) in ohms.

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