National Semiconductor

DP24H80/μA24H80 Winchester Disk Servo Preamplifier

General Description

The DP24H80/μA24H80 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.

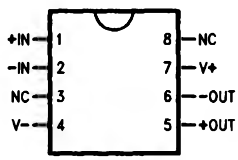
The internal design of the DP24H80/μA24H80 is optimized for low input noise voltage to allow its use in low input signal level applications. It is offered in 8-lead DIP, 10-lead flatpak, or SO-8 package suitable for surface mounting.

Features

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

Connection Diagrams

8-Lead DIP and SO-8 Package



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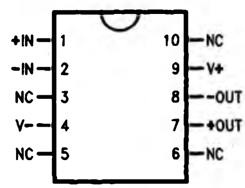
Top View

Ceramic DIP
† Order Number μA24H80RC
‡ See NS Package Number J08A

Molded Surface Mount
† Order Number μA24H80SC
‡ See NS Package Number M08A

Molded DIP
† Order Number μA24H80TC
‡ See NS Package Number N08E

10-Lead Ceramic Flatpak



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Top View

† Order Number μA24H80FC
‡ 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: $T_{J\ MAX}$ = 150°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 mW/°C, the 8L-Molded DIP at 7.5 mW/°C, the SO-8 at 6.5 mW/°C, and the Flatpak at 5.3 mW/°C.

Electrical Characteristics T_A = 25°C, V_{CC} = 8V to 13.2V, unless otherwise noted

Symbol	Parameter	Conditions	Min	Typ	Max	Units
G	Gain (Differential) (Note 4)	R_p = 130Ω, V_{CC} = 12V	80	100	120	
		R_p = 130Ω, V_{CC} = 12V T_A = 0°C to +70°C	70		130	
BW	Bandwidth (3.0 dB) (Note 2)	V_I = 0.5 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 = 130Ω, V_{CC} = 12V	3			mV_{p-p}
I_S	Supply Current	V_{CC} = 12V		20	25	mA
ΔV_O	Output Offset (Differential)	R_p = 130Ω, R_s = 0Ω			200	mW
V_n	Equivalent Input Noise (Notes 2 & 3)	R_s = 0Ω, BW = 4 MHz		1.5	2	μV
PSRR	Power Supply Rejection Ratio (Note 1)	R_s = 0Ω, f = 5 MHz	55	70		dB
ΔG/ΔV	Gain Sensitivity (Supply)	R_p = 130Ω, ΔV_{CC} = ±10%			±0.5	%/V
ΔG/ΔT	Gain Sensitivity (Temp)	R_p = 130Ω, T_A = 25°C to +70°C		−0.1		%/°C
CMR	Common Mode Rejection (Note 1) (Input)	f = 5 MHz	60	75		dB

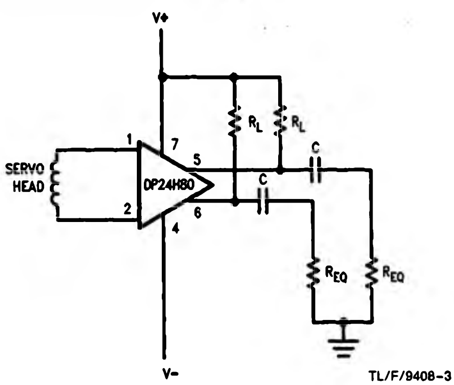
Note 1: Tested at DC, guaranteed at frequency.

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	nV/√Hz	BW = 15 MHz[2]

Typical Applications



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Note 1: Leads shown for 8-lead DIP.

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

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

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