



## -12 dB to +60 dB

## Programmable Amplifier

### Description

The D83P Series programmable amplifiers are digitally controlled gain modules that were designed for conditioning DC-coupled wide-band signals (AC coupled optional). They are programmable from -12 dB to +60 dB in 6 dB steps with an 4-bit parallel word.

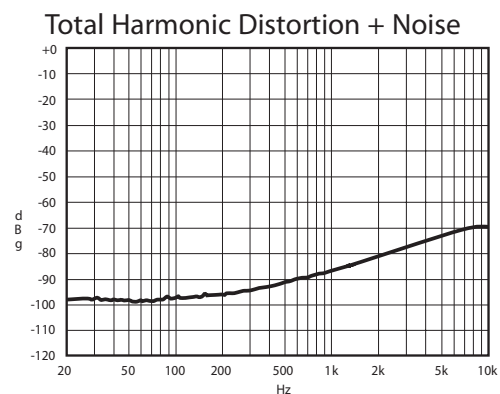
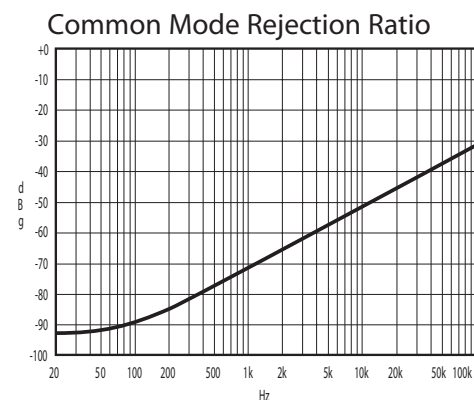
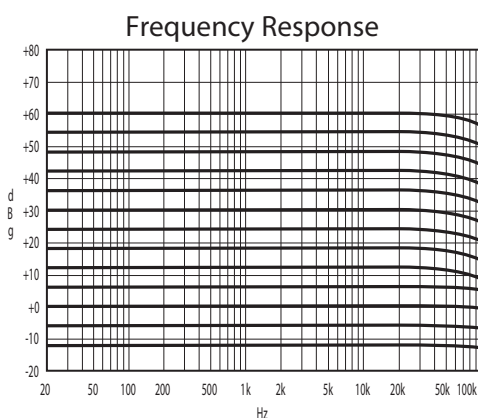
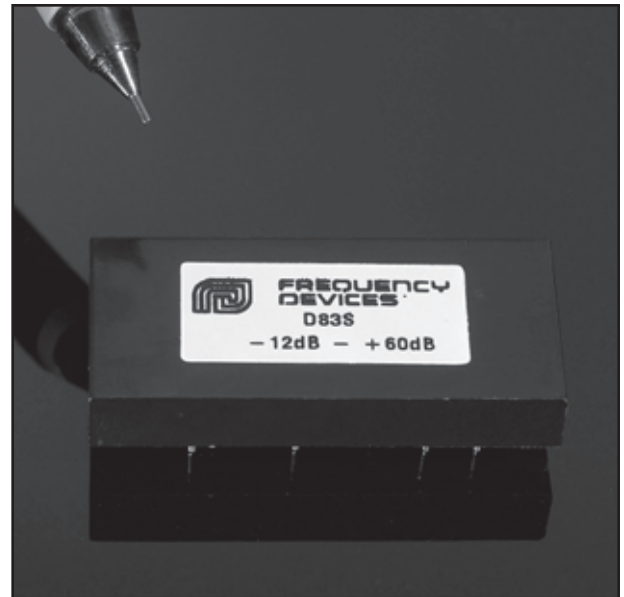
Other standard performance features include differential input, single ended output, 5V interface logic, and low noise and distortion, making this plug-in ready-to-use amplifier ideal for many signal conditioning applications. Available options include AC coupled input and/or differential output.

### Features/Benefits:

- Full power bandwidth to 100 kHz for wide dynamic range applications
- Compact 1.8" x 0.8" x 0.3" (32 pin DIP) size minimizes board space requirements
- Parallel 4-bit word for easy gain control.
- Data out line allows data verification and cascading of multiple amplifiers over the same serial interface.
- Plug-in ready-to-use, reducing engineering design and manufacturing time.

### Applications

- Data acquisition
- Test equipment
- Remote instrumentation systems
- Ground loop elimination in remote measurements
- Improvements in system dynamic range and resolution
- Telemetry
- Process control
- Digitally controlled auto ranging systems
- Medical, Scientific & engineering research





## Gain Amplifier

## Digital Programming & Control

The D83P programs via a four terminal parallel data interface over a gain range from 0.25 (~-12dB) to 1024 (~+60dB).

Two stages of programmable gain/attenuation are used to optimize the D-C offset and gain bandwidth performance.

Recommended Programming Table

Gain ( V/V )	Gain (~dB)	D0	D1	D2	D3
1/4	-12.04	0	0	0	0
1/2	-6.02	1	0	0	0
1	0.00	0	1	0	0
2	+6.02	1	1	0	0
4	+12.04	0	0	1	0
8	+18.06	1	0	1	0
16	+24.08	0	1	1	0
32	+30.10	1	1	1	0
64	+36.12	0	0	0	1
128	+42.14	1	0	0	1
256	+48.16	0	1	0	1
512	+54.19	1	1	0	1
1024	+60.21	0	0	1	1

**Specifications  
(25°C and  $V_s \pm 15$  Vdc)**
**Pin-Out and Package Data  
Ordering Information**
**Analog Input Characteristics**

Configuration:	DC coupled, differential Input
AC Coupled (Optional):	Fixed @ 10 Hz
Impedance:	1 M $\Omega$    22pF
Bias Current:	20 pA max.
Offset Current:	10 pA max.
Voltage Range:	$\pm 10$ Vpeak
Max. Safe Voltage:	$\pm V_s$
Common Mode Rejection Ratio:	Typ. 80 dB @ 1 kHz Min. 60 dB @ 1 kHz
Noise Voltage Density, RTI:	20 nV/ $\sqrt{\text{Hz}}$ @ 1 kHz, G=1,024

**Analog Output Characteristics**

Configuration:	Single ended, DC coupled
Differential Output (Optional):	
Impedance:	<1 $\Omega$ typ., 10 $\Omega$ max.
Current (linear operation):	$\pm 5$ mA max.
Offset Voltage:	2 mV RTI, NTE 40 mV max.
Offset Temp. Coeff.:	$\pm(5 + 100/G)$ $\mu\text{V}/^\circ\text{C}$

**General Analog Characteristics**

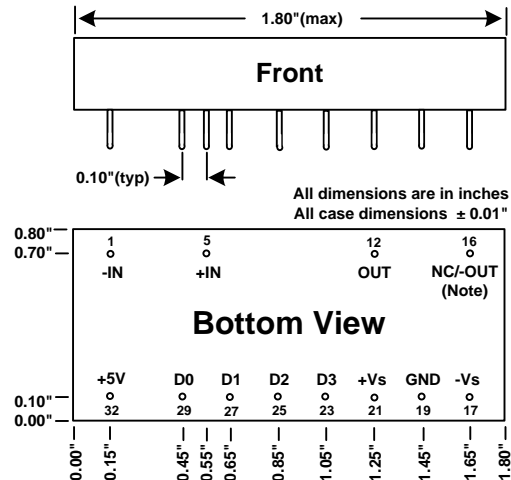
Gain (programmable):	0.25X to 1,024X in factors of 2
Gain Tolerance:	$\pm 0.10$ dB
Distortion (0 dB gain @ 3.5 Vrms):	-86 dB @ 1 kHz typ.
Full Power Bandwidth (0 dB gain):	100 kHz

**Power Supplies ( $\pm V_s$ ), +Vd**

Rated Voltage:	$\pm 15$ Vdc, +5 Vdc
Operating Range:	$\pm 5$ to $\pm 18$ Vdc, 5 $\pm$ 0.5 Vdc
Maximum Safe Voltage:	$\pm 18$ Vdc, +5.5 Vdc
Quiescent Current:	$\pm 15$ V $\pm 12$ mA +5 V +0.2 mA

**Temperature**

Operating:	0 to +70°C
Storage:	-25 to +85°C



Note: NC pin is used as "-OUT" for differential input option.

**ORDERING INFORMATION**
**D83P-D**
**Options**

A – AC Coupled Input  
D – Differential Output