

AYDIN VECTOR

PDF-202 DUAL PROGRAMMABLE DATA FILTER

TYPE OF CIRCUITRY: The PDF-202 is a dual amplifying, 2 pole low pass filter. It is comprised of two individual channels each containing a programmable gain instrumentation amplifier followed by a 2 pole, resistor programmable low pass filter. The following specifications are given for a single channel but they apply to both.

CHANNEL ISOLATION: ≥ 60 dB

SIGNAL INPUT VOLTAGE RANGE: ± 10 Vdc maximum.

DIFFERENTIAL INPUT IMPEDANCE: ≥ 100 megohms in parallel with 12 pF.

COMMON MODE INPUT IMPEDANCE: ≥ 100 megohms in parallel with 12 pF.

INITIAL OFFSET: Less than 10 mV

INPUT BIAS CURRENT (either input): 60 nanoamperes maximum from -25°C to $+85^{\circ}\text{C}$.

COMMON MODE REJECTION RATIO, DC TO 60 Hz:
At Gain = 100, 100 dB Minimum.
At Gain = 1, 70 dB Minimum.

GAIN RANGE: 1 to 1000, programmable by external resistor/pot combination.

FIXED GAIN:
Gain = 100 $\leq \pm 0.5\%$, Factory Preset Jumper Selectable
Gain = 1 $\leq \pm 0.1\%$.

GAIN STABILITY: 0.03% @ G = 1.
0.35% @ G = 100

OFFSET CORRECTION RANGE ± 50 mVdc
programmable by external resistor/pot combination.

OFFSET DRIFT OVER TEMPERATURE RANGE:
 $\leq \pm 0.1\%$ F.S. for G ≤ 100

OFFSET CORRECTION TERMINAL:

- Input Resistance: 40 k Ω 20%.*
- Input Range: ± 10 Vdc Maximum.
- Voltage Gain To Output: Unity, with positive sense.

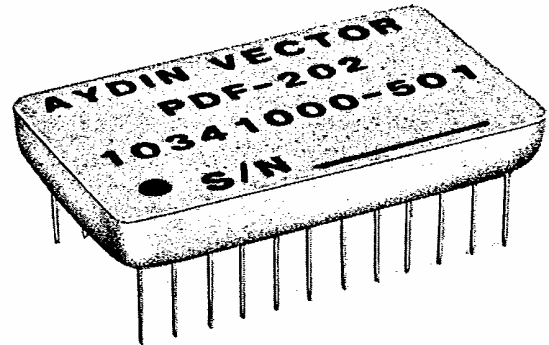
*If used, driver's source impedance must be less than 100 ohms.

OUTPUT NOISE:
2 mV P-P

OUTPUT CURRENT: ± 25 mA typ.

OUTPUT IMPEDANCE: 0.1 Ω Maximum

OUTPUT VOLTAGE SWING, 1 k Ω LOAD: ± 10 Vdc.



OUTPUT NON-LINERITY: $\pm 0.2\%$ Maximum.

DISTORTION: 0.2% Maximum @ $f_{out} \geq BW, V_{out} \leq 20$ V P-P.

FILTER TYPE: Butterworth low pass.

CHARACTERISTICS: 2 Pole Butterworth with an output rolloff of -12 dB/octave to within 2dB of the theoretical response.

CUTOFF FREQUENCY RANGE: 5Hz standard, programmable up to 5 kHz maximum by two equal valued resistors.

CUTOFF FREQUENCY POINT: -3.0 dB ± 1 dB from the referenced mid-band response.

CUTOFF FREQUENCY ACCURACY: Initial, $\pm 5\%$ exclusive of external programming resistor drift. Over Operating Temperature, $\pm 5\%$ over the given range.

TEMPERATURE RANGE: Operating, -25°C to $+85^{\circ}\text{C}$
(For extended temperature range consult factory)
Storage, -55°C to $+125^{\circ}\text{C}$

POWER SUPPLY INPUT VOLTAGE: $+15$ V and -15 Vdc with 0.5% regulation recommended.

POWER SUPPLY CURRENT (Ea. Supply): 18 mA typ, 25 mA max., exclusive of output load current.

RESISTOR TABLE FOR GAIN PROGRAMMING

GAIN	(RG) REQUIRED RESISTOR
1.0	OPEN
10.0	4440 Ω $\pm 20\%$
100	FACTORY PRESET JUMPER SELECTABLE
1000	40 Ω $\pm 20\%$

ENVIRONMENTAL

VIBRATION: Capable of withstanding greater than 30g from 55 to 200 Hz in each major axis.

BURN-IN: 100% burn-in for 168 hours. Screened to MIL-STD-883B.

SHOCK: Capable of withstanding at least 20g shock in each major axis.

ACCELERATION: Capable of withstanding at least 100g acceleration in each major axis.

ALTITUDE: Unlimited.

HUMIDITY: 95% RH non-condensing.

WEIGHT: 13 grams

Recommended External Resistors For Gain:
Programming, Fixed; RN55C
Variable: Cermet, or Low T.C. Wirewound Type

Recommended External Resistors for Cutoff Frequency Programming (Resistors Equal Each Channel)
 Type RN55C for values to 301 kΩ
 Type CC (Cermet) Allen-Bradley for values to 22 megohms.

To calculate resistor values for cutoff frequencies other than those shown in the resistor table, use the following formula:

$$R_{1, R_2} - \text{Channel 1} \quad R = 1.875 \times 10^7$$

$$R_{3, R_4} - \text{Channel 2}$$

FC-5

(Each channel may be set to a different cutoff frequency independent of the other channel)

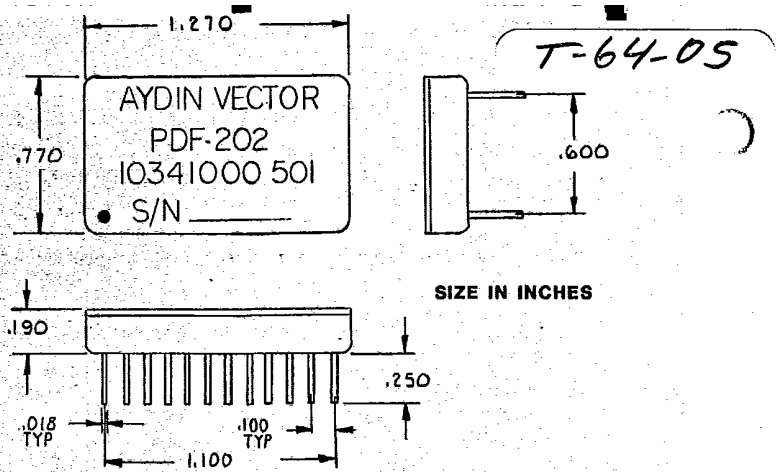
Where: R = Resistor value for R₁ and R₂ or R₃ and R₄
 FC = Desired cutoff frequency

For example, to calculate -3 dB point at 3400 Hz

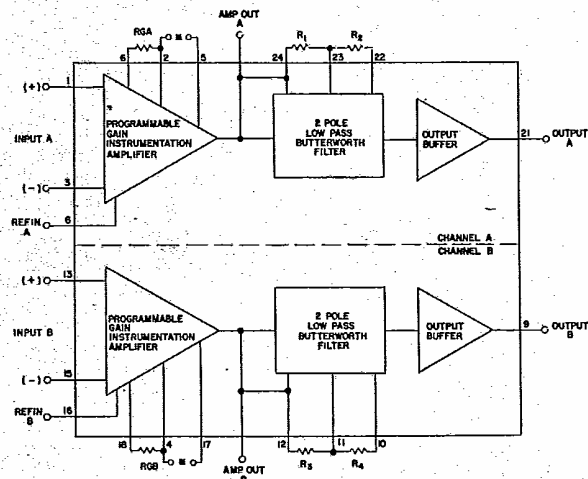
$$FC = 3400 \text{ Hz}$$

$$R = \frac{1.875 \times 10^7}{3400.5} = \frac{5522.8 \text{ ohms}}{5.52 \text{ kohms}}$$

Since the exact values are not always available you must round off to the nearest available value.



PIN	FUNCTION	PIN	FUNCTION
1	+INPUT A	13	+INPUT B
2	RG2A	14	RG2B
3	-INPUT A	15	-INPUT B
4	REF IN A	16	REF IN B
5	X100 A	17	X100 B
6	RG1A	18	RG1 B
7	GND	19	+VS
8	CHASSIS GND	20	-VS
9	OUTPUT B	21	OUTPUT A
10	PROG RB ₂	22	PROG RA ₂
11	COMM B	23	COMM A
12	PROG RB ₁	24	PROG RA ₁



NOTE 1) RGA, RGB out and * Jumper in place GAIN = 100
 2) RGA, RGB out and * Jumper out GAIN = 1

PDF-202 Block Diagram



AYDIN VECTOR DIVISION

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