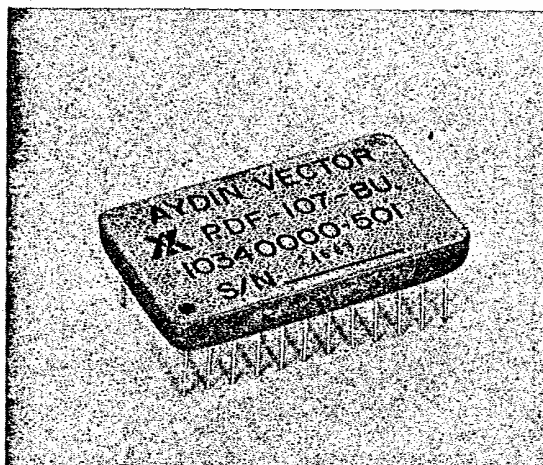


AYDIN



VECTOR

PDF-107 PROGRAMMABLE DATA FILTER



TYPE OF CIRCUITRY: Programmable gain and offset differential input instrumentation amplifier followed by programmable cutoff frequency low pass filter.

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.

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

COMMON MODE REJECTION RATIO, Dc TO 60 Hz:
At Gain = 1000, 110 dB Minimum. At Gain = 100, 100 dB Minimum. At Gain = 10, 90 dB Minimum.
At Gain = 1, 70 dB Minimum.

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

FIXED GAIN ACCURACY: @ 25°C

PDF-107-501 Gain = $1000 \pm 2\%$.
PDF-107-502 Gain = $100 \pm 0.5\%$.
PDF-107-503 Gain = $10 \pm 0.25\%$.
Gain of "1" and one of the above gains are supplied.

GAIN STABILITY: 0.15% @ G = 10.
0.35% @ G = 100
1% @ G = 1000.

OFFSET CORRECTION RANGE @ G=100: ± 50 mVdc programmable by external resistor/pot combination.

OFFSET DRIFT OVER TEMPERATURE RANGE:

$\pm 0.1\%$ of F.S. @ G ≤ 10
 $\pm 0.3\%$ of F.S. @ G = 100
 $\pm 2\%$ of F.S. @ G = 1000

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 Ω .

OUTPUT NOISE: .3 mV ptp @ G ≤ 10
2 mV ptp @ G = 100
20 mV ptp @ G = 1000

OUTPUT CURRENT: ± 25 mA typ.

OUTPUT IMPEDANCE: 0.1 Ω Maximum (Output shorted to load sense).

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

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

DISTORTION: $\pm 0.2\%$ Maximum @ f_{out} BW, $\leq V_{out} = 20$ V ptp.

FILTER TYPE: Low Pass.

CHARACTERISTICS: 6-pole Butterworth, with final roll-off of -36 dB/octave, to within ± 3 dB of theoretical response.

CUTOFF FREQUENCY RANGE: 5 Hz standard, programmable up to 10 kHz maximum by six equal resistors.

CUTOFF FREQUENCY POINT: -3.0 dB from reference mid band response.

CUTOFF FREQUENCY ACCURACY, INITIAL: $\pm 5\%$, exclusive of external programming resistor drift.

CUTOFF FREQUENCY, TEMPERATURE CO-EFFICIENT: $\pm 5\%$ over the stated operating temperature range.

TEMPERATURE RANGE, OPERATING: -25°C to $+85^{\circ}\text{C}$ (Consult factory for wider temperature range).

TEMPERATURE RANGE, STORAGE: -55°C to $+125^{\circ}\text{C}$

SIZE: 0.2" high, 0.77" wide, 1.27" long, 24 pins.

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

POWER SUPPLY CURRENT (Ea. Supply): 12 mA typ, 20 mA max.. exclusive of output load current.

RESISTOR TABLE FOR GAIN PROGRAMMING

GAIN	(RG) REQUIRED RESISTOR
1.0	OPEN
10.0	4440 Ω ±20%
100	404 Ω ±20%
1000	40 Ω ±20%

RESISTOR TABLE FOR CUTOFF FREQUENCY PROGRAMMING

Cutoff Frequency (-3 dB)	Required Resistors (R ₁ thru R ₆ , All Equal)
5 Hz	Factory Preset
50 Hz	755.6 kΩ
100 Hz	357.9 kΩ
500 Hz	68.69 kΩ
1000 Hz	34.17 kΩ
3000 Hz	11.35 kΩ
5000 Hz	6.8 kΩ
10000 Hz	3.4 kΩ

Recommended External Resistors For Gain:

Programming, Fixed; RN55C

Variable: Cermet, or Low T.C. Wirewound Type

Recommended External Resistors for Cutoff

Frequency Programming (All Six Resistors Equal).

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:

$$(R_1 \text{ through } R_6) R = \frac{3.4 \times 10}{FC-5}$$

Where: R=Resistor value for R₁ through R₆
FC=Desired cutoff frequency

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

FC=3400 Hz

$$R = \frac{3.4 \times 10}{3400.5} = \frac{10014.7 \text{ ohms}}{10.01 \text{ kohms}}$$

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

ENVIRONMENTAL SPECIFICATIONS

TEMPERATURE RANGE:

OPERATING: -25°C to +85°C (Consult factory for extended temperature range).

STORAGE: -45°C to +125°C.

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

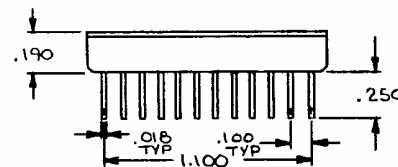
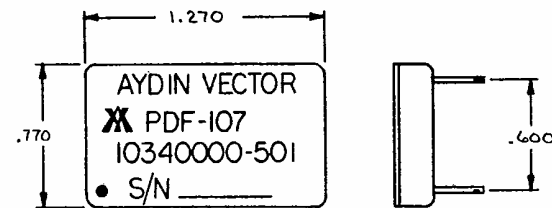
BURN-IN: 100% burn-in for 168 hours. Screened to MIL-STD-883B.

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.



Pin	FUNCTION	Pin	OUTPUT
1	X100 FIXED GAIN	13	OUTPUT
2	F.C. RES R1	14	+15V DC PWR
3	COMMON R1/R2	15	-15V DC PWR
4	F.C. RES R2	16	OFFSET TRIM
5	F.C. RES R3	17	OFFSET TRIM
6	COMMON R3/R4	18	BUFFER IN
7	F.C. RES R4	19	REF VOLTAGE
8	F.C. RES R5	20	BUFFER OUTPUT
9	COMMON R5/R6	21	GAIN RES 1
10	F.C. RES R6	22	GAIN RES 2
11	LOAD SENSE	23	DIFF INPUT (+)
12	PWR, SIGRET & CASE GND	24	DIFF INPUT (-)

Bulletin No.: 10340000-501/3-84-1M/Printed in USA.



AYDIN VECTOR DIVISION

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