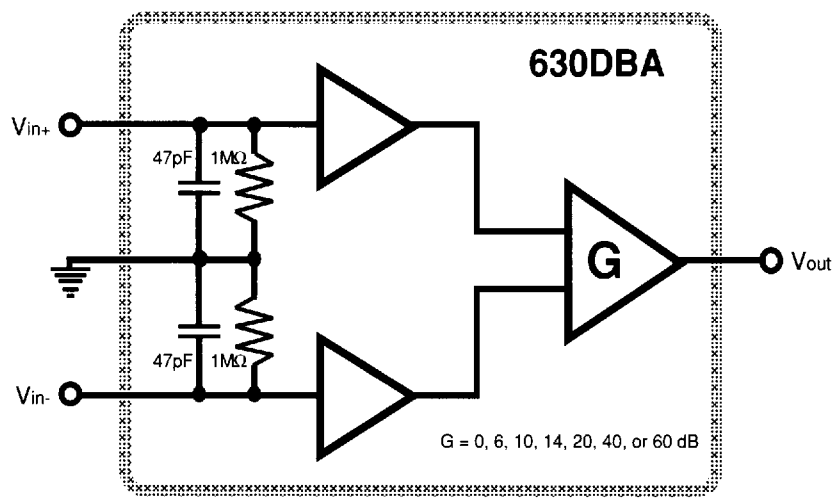




T-52-07

Differential Input Buffer Amplifiers




FEATURES

- Full Power Band Width > 100 kHz
- Fixed Gains from 0dB to 60dB
- DC Coupled Differential Input
- Channel to Channel Phase Match 0.5 ° from 1 Hz to 100 kHz
- THD .003% @ 1 kHz, .01% @ 100 kHz

APPLICATIONS

- Data Acquisition Systems
- Signal Conditioning
- Automatic Test Equipment
- Remote Instrumentation Systems
- Elimination of Ground Loops
- Pre-Filter Signal Scaling
- Sensor Output Amplification

General Description

The 630DBA Series are differential-input single-ended-output buffer amplifiers available in seven (0db, 6db, 10db, 14db, 20db, 40db & 60db) prefixed gain models. They are designed to accept differential inputs to reduce the effects of ground loops in multi channel data acquisition systems and similar applications.

Each input stage is a dc-coupled bipolar operational amplifier connected in a follower configuration to provide high input impedance and to drive a balanced differential gain stage.

Components are selected and configured to provide full signal bandwidth in excess of 100 kHz for all models in the series.

They are internally trimmed and compensated to provide high CMRR and minimum differential phase shift. To maintain CMRR, it is necessary to drive the inputs from low impedance sources (<50 ohms) or from equal impedance sources. Equal input impedance will also reduce differential input offset unbalances because input offset current is at least a factor of ten less than input bias currents.

The output is single-ended and is designed to provide full $\pm 10V$ swing at 10 mA for frequencies up to 100 kHz.

These devices are particularly useful to scale sensor outputs to signal levels that optimize signal-to-noise ratios prior to their input to FDI active filter modules.


**FREQUENCY
DEVICES™**
630DBA Series
General
Specifications
FREQUENCY DEVICES INC
Analog Input Characteristics

| | |
|-----------------------------|---|
| Configuration | DC Coupled Differential Input |
| Impedance | 1 Meg Ω 47 pF |
| Bias Current | 1 μ A max |
| Offset Current | 100 nA max |
| Voltage Range | \pm 10 V _{peak} |
| Maximum Safe Voltage | \pm 120 V _{peak} |
| Common Mode Rejection Ratio | Min. 80 dB min at 1 kHz Min. 60 db from 10 Hz to 100 kHz |
| Noise (Referred to input) | < 10 μ V RMS (100 kHz Bandwidth) typ 120 db down from 7 V _{RMS} |

Analog Output Characteristics

| | |
|--|---|
| Configuration | Single Ended DC Coupled |
| Impedance | <1 Ω |
| Gain | 0, 6, 10, 14, 20, 40, or 60 db @ 1 V _{RMS} |
| Gain Tolerance | \pm 0.1 db |
| Phase (Channel to Channel Match @ 0dB) | 0.5° from 1 Hz to 100 kHz |
| Current | \pm 10 mA Max. (for linear operation) |
| Distortion | .003% @ 1 kHz, .01% @ 90 kHz |
| Full Power Bandwidth | >100 kHz |

Power Requirement

| | |
|-------------------|---|
| Power Supply | \pm 15 Vdc |
| Quiescent Current | \pm 12 mA (no signal) \pm 15 mA (7 V _{RMS} In, Output open) |

Environmental

| | |
|-----------------------|---|
| Operating Temperature | -25 °C to +85 °C |
| Storage Temperature | -40 °C to +85 °C |
| Altitude | 10,000 Feet |
| Relative Humidity | 0 % to 95 % @ 60 °C (non-condensing) |

Notes

1. See functional schematic

| | | | |
|--------------|--------|---------------|--------------------|
| Frequency | 25 | Haverhill, | (508) 374-0761 |
| Devices | Locust | Massachusetts | TWX 710-347-0314 |
| Incorporated | Street | 01830 | FAX (508) 521-1839 |

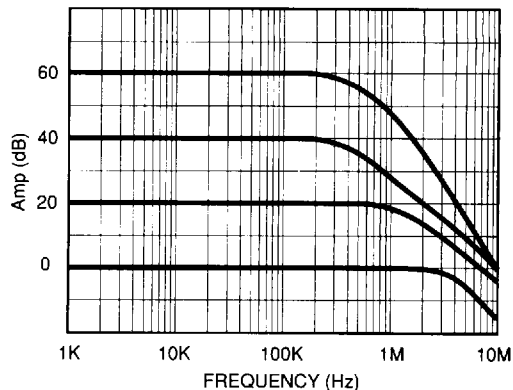


**FREQUENCY
DEVICES™**

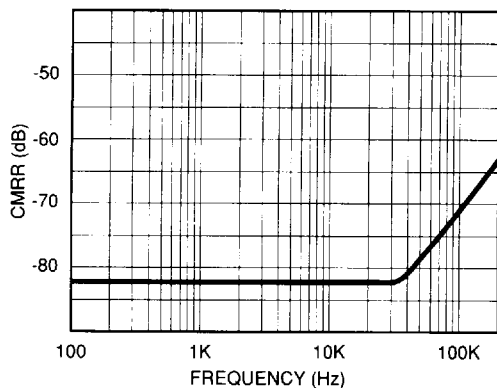
**630DBA Series
Typical
Performance
Curves**

FREQUENCY DEVICES INC

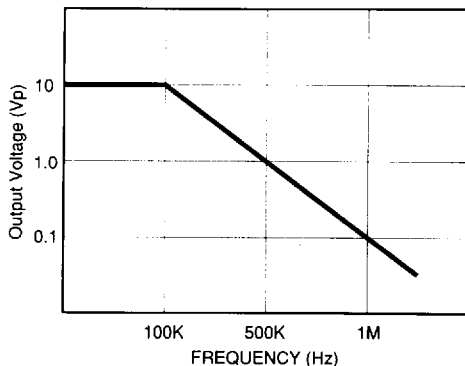
**Small Signal Gain
Bandwidth**



**Common Mode
Rejection Ratio**



Full Signal Bandwidth



Frequency Devices Incorporated
25 Locust Street

Haverhill, Massachusetts 01830

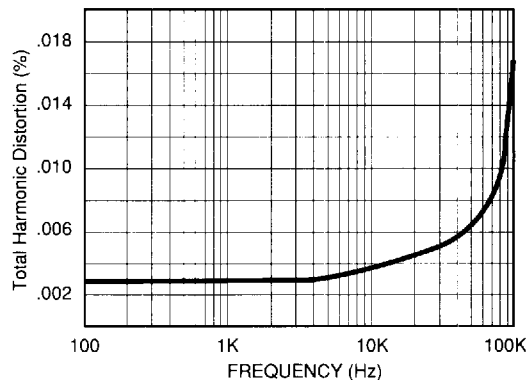
(508) 374-0761
TWX 710-347-0314
FAX (508) 521-1839



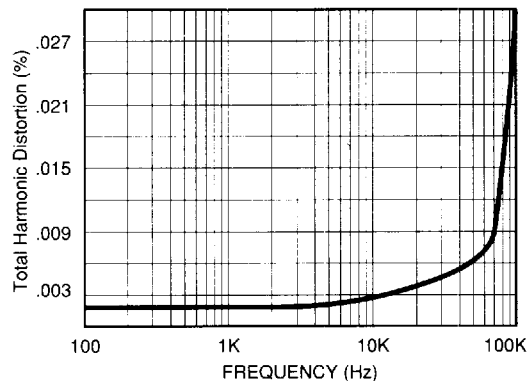
Typical Performance Curves

FREQUENCY DEVICES INC

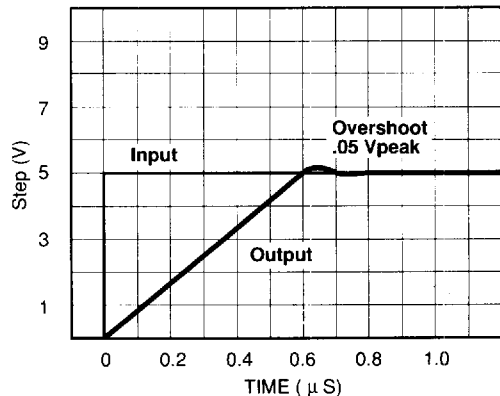
Total Harmonic Distortion
($V_{in} = 3.5 V_{RMS}$)



Total Harmonic Distortion
($V_{in} = 6.5 V_{RMS}$)



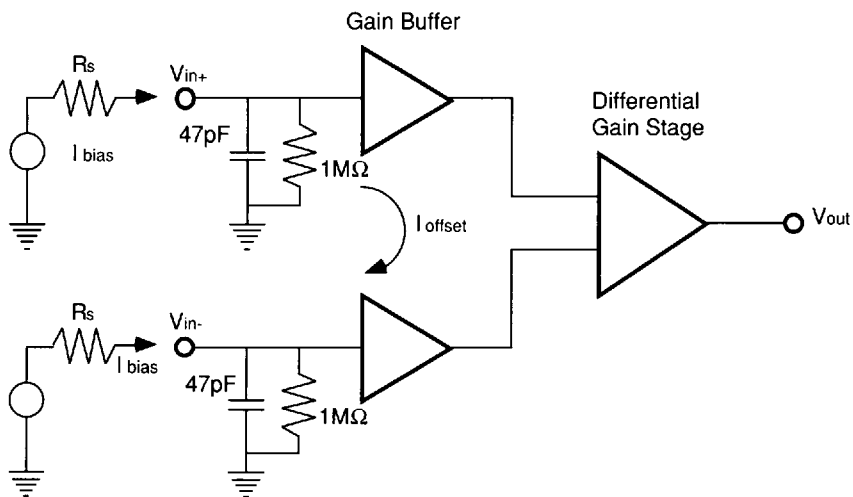
Step Response
($8V/\mu s$ Slew Rate)



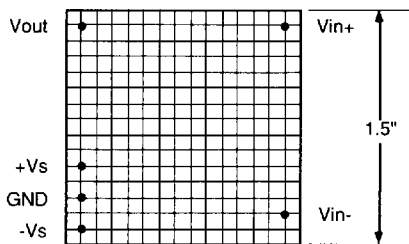
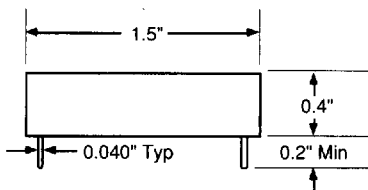


FREQUENCY DEVICES INC

Functional Schematic



**Package Data
and
Pin Designations**



0.1 Inch Grid

Bottom View

| | | | |
|--------------|--------|---------------|--------------------|
| Frequency | 25 | Haverhill, | (508) 374-0761 |
| Devices | Locust | Massachusetts | TWX 710-347-0314 |
| Incorporated | Street | 01830 | FAX (508) 521-1839 |



FREQUENCY DEVICES INC

Standard Models

| Model Number | Gain (dB) | Gain (Ratio) |
|--------------|-----------|--------------|
| 630DBA-0 | 0.0 | 1.00 |
| 630DBA-6 | 6.0 | 2.00 |
| 630DBA-10 | 10 | 3.16 |
| 630DBA-14 | 14 | 5.00 |
| 630DBA-20 | 20 | 10.0 |
| 630DBA-40 | 40 | 100 |
| 630DBA-60 | 60 | 1000 |

Custom Prefixed Gain Models

For custom prefixed gain models, please consult the factory for details.