# Stereo Demodulator

## GENERAL DESCRIPTION

The XR-1310 is a unique FM stereo demodulator which uses phase-locked techniques to derive the right and left audio channels from the composite signal. Using a phase-locked loop to regenerate the 38 kHz subcarrier, it requires no external L-C tanks for tuning. Alignment is accomplished with a single potentiometer.

## FEATURES

Requires No Inductors
Low External Part Count
Simple, Noncritical Tuning by Single Potentiometer Adjustment
Internal Stereo/Monaural Switch with 100 mA Lamp Driving Capability
Wide Dynamic Range: 600 mV (RMS) Maximum Composite Input Signal
Wide Supply Voltage Range: 8 to 14 Volts
Excellent Channel Separation
Low Distortion
Excellent SCA Rejection

## APPLICATIONS

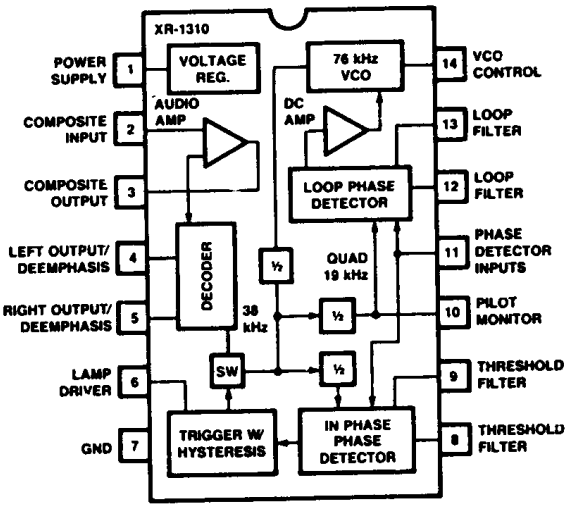
FM Stereo Demodulation
Stereo Indicator

## ABSOLUTE MAXIMUM RATINGS

($T_A$ = +25°C unless otherwise noted)

| | |
|---|---|
| Power Supply Voltage | 14V |
| Lamp Current (nominal rating, 12 V lamp) | 75 mA |
| Power Dissipation (package limitation) | 625 mW |
| Derate above $T_A$ = +25°C | 5.0 mW/°C |
| Operating Temperature Range (Ambient) | −40 to +85°C |
| Storage Temperature Range | −65 to +150°C |

## FUNCTIONAL BLOCK DIAGRAM




## ORDERING INFORMATION

| Part Number | Package | Operating Temperature |
|---|---|---|
| XR-1310CP | Plastic | −40°C to +85°C |

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## SYSTEM DESCRIPTION

The XR-1310 is a complete stereo demodulator specifically designed for transforming a composite FM stereo signal into its left and right channel components.

The composite FM stereo input signal, from the receiver detector, is applied to the buffer amplifier, Pin 2. Buffered output (gain = 1) is applied to the L+R, L−R decoder.

The VCO of the PLL runs at 76 kHz, four times the 19 kHz pilot frequency. Free-running frequency is set by the parallel RC circuit on Pin 14. The VCO output drives a controlled switch which allows demodulation. When the PLL is locked, the lamp driver open collector output (Pin 6) can sink up to 100 mA.

Left and right channel outputs are taken from Pins 4 and 5 respectively. De-emphasis is performed by the RC circuit here; slightly higher gain is possible by increasing the resistor size, but the RC product should remain constant.

# XR-1310

## ELECTRICAL CHARACTERISTICS

**Test Conditions:** Unless otherwise noted; $V_{CC}$* = +12 Vdc, $T_A$ = +25°C, 560 mV (RMS) (2.8 Vp-p) standard multiplex composite signal with L or R channel only modulated at 1.0 kHz and with 100 mV (RMS) (10% pilot level), using circuit of Figure 1.

| PARAMETERS | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|
| Maximum Standard Composite Input Signal (0.5% THD) | 2.8 | | | Vp-p |
| Maximum Monaural Input Signal (1.0% THD) | 2.8 | | | Vp-p |
| Input Impedance | | 50 | | kΩ |
| Stereo Channel Separation (50 Hz — 15 KHz) | 30 | 40 | | dB |
| Audio Output Voltage (desired channel) | | 485 | | mV (RMS) |
| Monaural Channel Balance (pilot tone "off") | | | 1.5 | dB |
| Total Harmonic Distortion | | 0.3 | | % |
| Ultrasonic Frequency Rejection 19 kHz<br>38 kHz | | 34.4<br>45 | | dB |
| Inherent SCA Rejection<br>(f = 67 kHz; 9.0 kHz beat note measured with 1.0 kHz modulation "off") | | 80 | | dB |
| Stereo Switch Level<br>(19 kHz input for lamp "on")<br>Hysteresis | 13 | <br><br>6 | 20 | mV (RMS)<br>dB |
| Capture Range (permissable tuning error of internal oscillator, reference circuit values of Figure 1) | | ±3.5 | | % |
| Operating Supply Voltage (loads reduced to 2.7 kΩ for 8.0-volt operation) | 8.0 | | 14 | Vdc |
| Current Drain (lamp "off") | | 13 | | mAdc |

*Symbols conform to JEDEC Engineering Bulletin No. 1 where applicable.

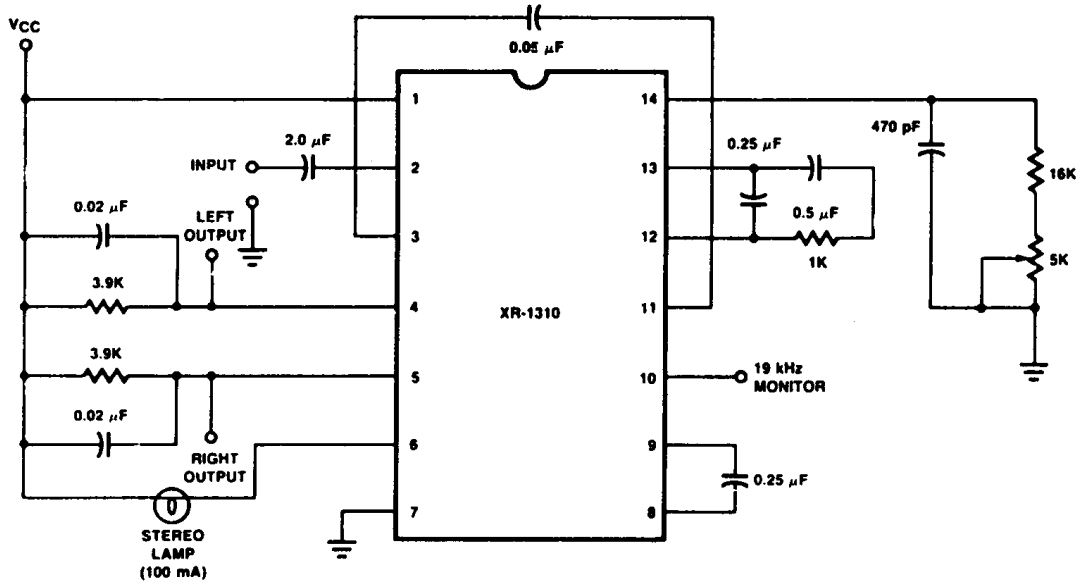



**Figure 1. Typical Application**

# Quad Line Driver/Receiver

## GENERAL DESCRIPTION

The XR-1488 is a monolithic quad line driver designed to interface data terminal equipment with data communications equipment in conformance with the specifications of EIA Standard No. RS232C. This extremely versatile integrated circuit can be used to perform a wide range of applications. Features such as output current limiting, independent positive and negative power supply driving elements, and compatibility with all DTL and TTL logic families greatly enhance the versatility of the circuit.

The XR-1489A is a monolithic quad line receiver designed to interface data terminal equipment with data communications equipment. the XR-1489A quad receiver along with its companion circuit, the XR-1488 quad driver, provide a complete interface system between DTL or TTL logic levels and the RS232C defined voltage and impedance levels.

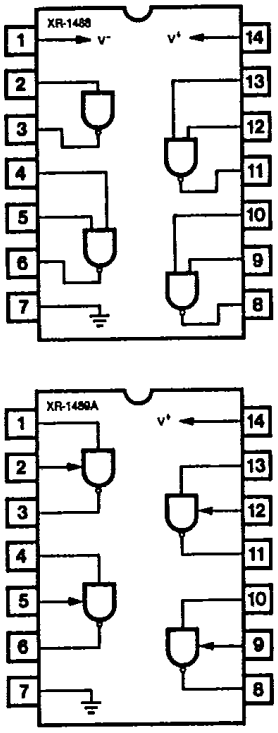
## ABSOLUTE MAXIMUM RATINGS

| | |
|---|---|
| Power Supply | |
| XR-1488 | ±15 Vdc |
| XR-1489A | +10 Vdc |
| Power Dissipation | |
| Ceramic Package | 1000 mW |
| Derate above +25°C | 6.7 mW/°C |
| Plastic Package | 650 mW/°C |
| Derate above +25°C | 5 mW/°C |

## ORDERING INFORMATION

| Part Number | Package | Operating Temperature |
|---|---|---|
| XR-1488N | Ceramic | 0°C to +70°C |
| XR-1488P | Plastic | 0°C to +70°C |
| XR-1489AN | Ceramic | 0°C to +70°C |
| XR-1489AP | Plastic | 0°C to +70°C |

## FUNCTIONAL BLOCK DIAGRAMS



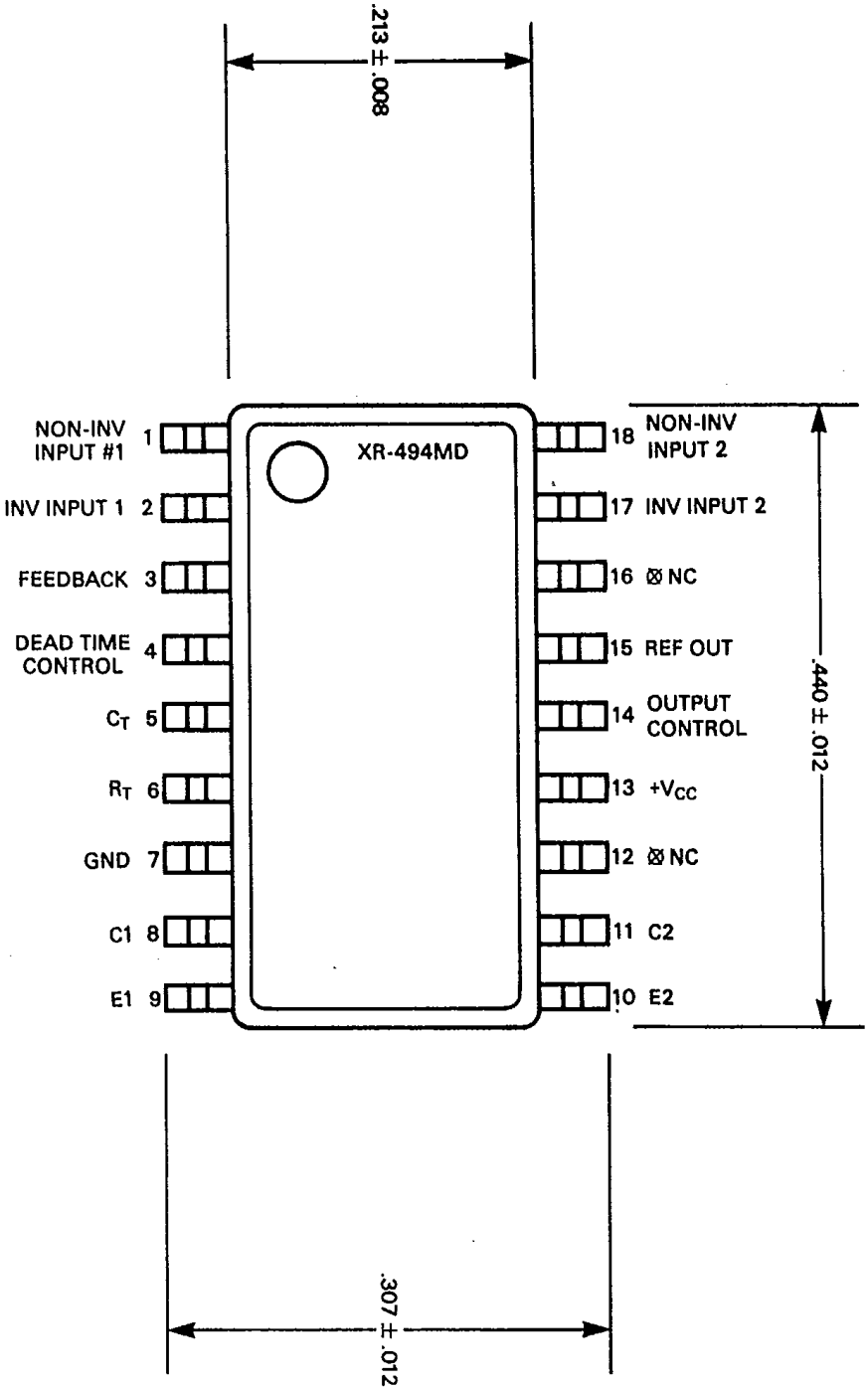




## SYSTEM DESCRIPTION

The XR-1488 and XR-1489A are a matched set of quad line drivers and line receivers designed for interfacing between TTL/DTL and RS232C data communication lines.

The XR-1488 contains four independent split supply line drivers, each with a ±10 mA current limited output. For RS232C applications, the slew rate can be reduced to the 30 V/μS limit by shunting the output to ground with a 410 pF capacitor. The XR-1489A contains four independent line receivers, designed for interfacing RS232C to TTL/DTL. Each receiver features independently programmable switching thresholds with hysteresis, and input protection to ±30 V. The output can typically source 3 mA and sink 20 mA.



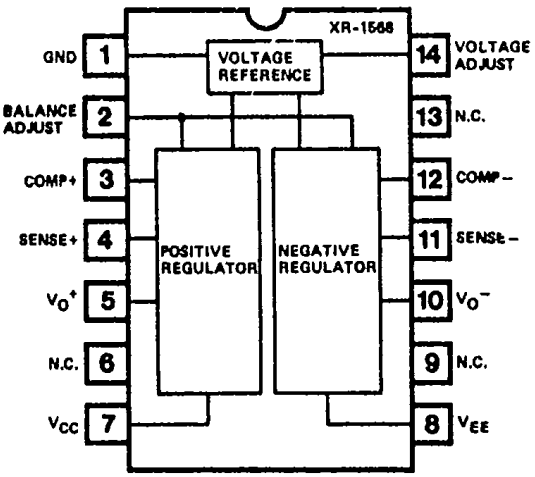
# Dual-Polarity Tracking Voltage Regulator

## GENERAL DESCRIPTION

The XR-1468/1568 is a dual polarity tracking voltage regulator, internally trimmed for symmetrical positive and negative 15V outputs. Current output capability is 100 mA, and may be increased by adding external pass transistors. The device is intended for local "on-card" regulation, which eliminates the distribution problems associated with single point regulation.

The XR-1468CN and XR-1568N are guaranteed over the 0°C to 70°C commercial temperature range. The XR-1568M is rated over the full military temperature range of −55°C to +125°C.

## FUNCTIONAL BLOCK DIAGRAM




## FEATURES

Internally Set for ±15V Outputs
±100 mA Peak Output Current
Output Voltages Balanced Within 1% (XR-1568)
0.06% Line and Load Regulation
Low Stand-By Current
Output Externally Adjustable from ±8 to ±20 Volts
Externally Adjustable Current Limiting
Remote Sensing

## APPLICATIONS

Main Regulation in Small Instruments
On-Card Regulation in Analog and Digital Systems
Point-of-Load Precision Regulation

## ORDERING INFORMATION

| Part Number | Temperature | Output Offset | Package |
|---|---|---|---|
| XR-1568M | −55°C to +125°C | ±150 mV max | Ceramic |
| XR-1568N | 0°C to +70°C | ±150 mV max | Ceramic |
| XR-1468CN | 0°C to +70°C | ±300 mV max | Ceramic |

## ABSOLUTE MAXIMUM RATINGS

| | |
|---|---|
| Power Supply | ±30 Volts |
| Minimum Short-Circuit Resistance | 4.0 Ohms |
| Load Current, Peak | ±100 mA |
| Power Dissipation | |
| Ceramic (N) Package | 1.0 Watt |
| Derate Above +25°C | 6.7 mW/°C |
| Operating Temperature | |
| XR-1568M | −55°C to +125°C |
| XR-1568/XR-1468C | 0°C to +70°C |
| Storage Temperature | −65°C to +150°C |

## SYSTEM DESCRIPTION

The XR-1468/1568 is a dual polarity tracking voltage regulator combining two separate regulators with a common reference element in a single monolithic circuit, thus providing a very close balance between the positive and negative output voltages. Outputs are internally set to ±15 Volts but can be externally adjusted between ±8.0 to ±20 Volts with a single control. The circuit features ±100 mA output current, with externally adjustable current limiting, and provision for remote voltage sensing.