

Dual Bipolar JFET Operational Amplifier

GENERAL DESCRIPTION

The XR-082/XR-083 family of dual bipolar JFET operational amplifiers are designed to offer higher performance than conventional bipolar op amps. Each amplifier features high slew rate, low input bias and offset currents, and low offset voltage drift with temperature. These operational amplifier circuits are fabricated using ion-implantation technology which combines well-matched junction JFETs and high-performance bipolar transistors on the same monolithic chip.

The XR-082 of family of dual bipolar JFET op amps are packaged in 8-pin dual-in-line packages. The XR-083 family of op amps offer independent offset adjustment for each of the individual op amps on the same chip, and are available in 14-pin dual-in-line packages.

FEATURES

Direct Replacement for TL082/TL083
 Low Power Consumption
 Wide Common-Mode and Differential Voltage Ranges
 Low Input Bias and Offset Currents
 Output Short Circuit Protection
 High Input Impedance . . . JFET Input Stage
 Internal Frequency Compensation
 Latch-Up-Free Operation
 High Slew Rate . . . 13 V/ μ s, Typical

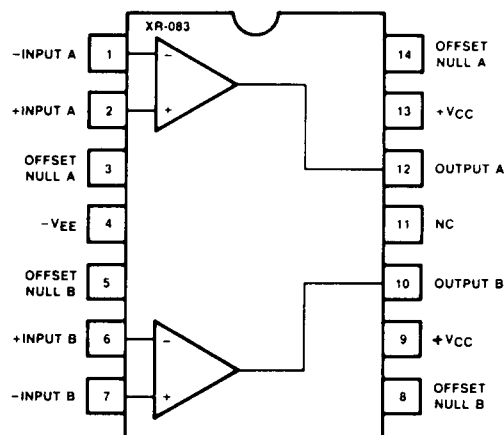
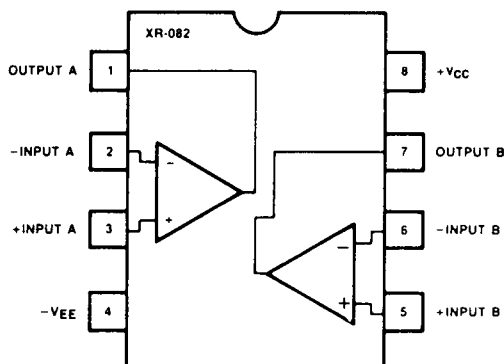
APPLICATIONS

Buffer Amplifiers
 Summing/Differencing Amplifiers
 Instrumentation Amplifiers
 Active Filters
 Signal Processing
 Sample and Differencing
 I to V Converters
 Integrators
 Simulated Components
 Analog Computers

ABSOLUTE MAXIMUM RATINGS

Supply Voltage	± 18 V
Differential Input Voltage	± 30 V
Input Voltage Range (Note 1)	± 15 V
Output Short Circuit Duration (Note 2)	Indefinite
Package Power Dissipation:	
Plastic Package	625 mW
Derate Above $T_A = +25^\circ\text{C}$	5.0 mW/ $^\circ\text{C}$
Ceramic Package	750 mW
Derate Above $T_A = +25^\circ\text{C}$	8 mW/ $^\circ\text{C}$
Storage Temperature Range	-65°C to $+150^\circ\text{C}$

FUNCTIONAL BLOCK DIAGRAMS



ORDERING INFORMATION

Part Number	Package	Operating Temperature
XR-082M/XR-083M	Ceramic	-55°C to $+125^\circ\text{C}$
XR-082N/XR-083N	Ceramic	-25°C to $+85^\circ\text{C}$
XR-082P/XR-083P	Plastic	-25°C to $+85^\circ\text{C}$
XR-082CN/XR-083CN	Ceramic	0°C to $+70^\circ\text{C}$
XR-082CP/XR-083CP	Plastic	0°C to $+70^\circ\text{C}$

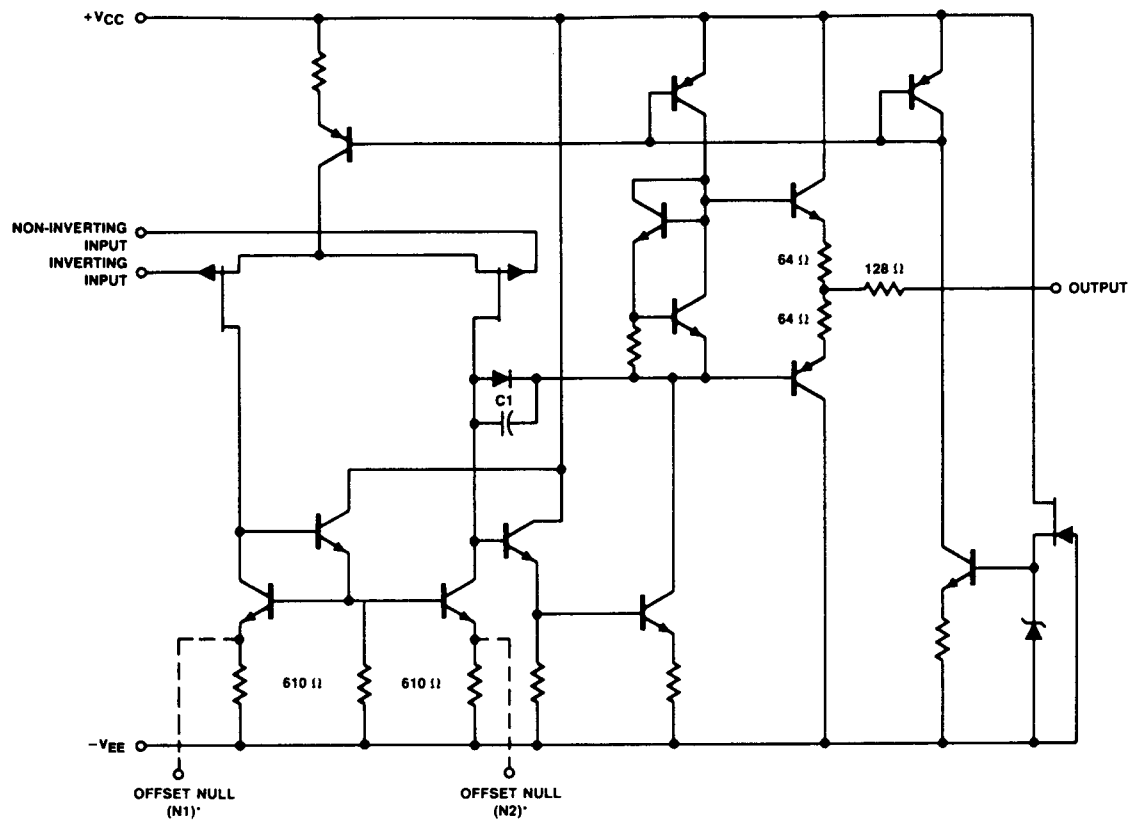
ELECTRICAL CHARACTERISTICS $T_A = 25^\circ\text{C}$, $V_{CC} = \pm 15\text{V}$, unless otherwise specified.

SYMBOL	PARAMETERS	XR-082M/ XR-083M			XR-082/ XR-083			XR-082C/ XR-083C			UNIT	CONDITIONS
		MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX		
V_{OS} V_{OS}	Input Offset Voltage		3	6 9		3	6 9		5	15 20	mV mV	$R_S = 50\Omega$ $R_S = 50\Omega$ $T_A = \text{Full Range}$
$\Delta V_{OS}/\Delta T$	Offset Voltage Temp. Coef.		10			10			10		$\mu\text{V}/^\circ\text{C}$	$R_S = 50\Omega$ $T_A = \text{Full Range}$
I_B	Input Bias Current		30	200		30	200		30	400	pA	
I_B	Input Bias Current Over Temp.			50			20			20	nA	$T_A = \text{Full Range}$
I_{OS}	Input Offset Current		5	100		5	100		5	200	pA	
	Input Offset Current Over Temp.			20			10			5	nA	$T_A = \text{Full Range}$
I_{CC}	Supply Current (per amplifier)		1.4	2.8		1.4	2.8		1.4	2.8	mA	No Load, No Input Signal
V_{ICM}	Input Common Mode Range	± 12			± 12			± 10			V	
A_{VOL}	Voltage Gain	50 25	200		50 25	200		25 15	200		V/mV	$R_L \geq 2\text{ k}\Omega$, $V_O = \pm 10\text{V}$ $T_A = \text{Full Range}$
V_{OPP}	Max. Output Swing (peak-to-peak)	24 24	27		24 24	27		24 24	27		V	$R_L \geq 10\text{ k}\Omega$ $T_A = \text{Full Range}$
R_{IN}	Input Resistance		10^{12}			10^{12}			10^{12}		Ω	
BW	Unity-Gain Bandwidth		3			3			3		MHz	
CMRR	Common-Mode Rejection	80	86		80	86		70	76		dB	$R_S \leq 10\text{ k}\Omega$
PSRR	Supply-Voltage Rejection	80	86		80	86		70	76		dB	
	Channel Separation		120			120			120		dB	$A_V = 100$, Freq. = 1 kHz
dV_{OUT}/dT	Slew Rate		13			13			13		V/ μS	$A_V = 1$, $R_L = 2\text{ k}\Omega$ $C_L = 100\text{ pF}$, $V_1 = 10\text{V}$
T_R	Rise Time		0.1			0.1			0.1		μsec	$A_V = 1$, $R_L = 2\text{ k}\Omega$
T_O	Overshoot		10			10			10		%	$C_L = 100\text{ pF}$, $V_1 = 20\text{ mV}$
E_N	Equivalent Input Noise Voltage		20			20			20		nV/ $\sqrt{\text{Hz}}$	$R_S = 100\Omega$ $f = 1\text{ kHz}$

Note 1: For Supply Voltage less than $\pm 15\text{ V}$, the absolute maximum input voltage is equal to the supply voltage.

Note 2: The output may be shorted to ground or to either supply. Temperature and/or supply voltages must be limited to ensure that the dissipation rating is not exceeded.

XR-082/083



* AVAILABLE IN XR-083 ONLY.

(ONE CHANNEL ONLY)

EQUIVALENT SCHEMATIC DIAGRAM

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EXAR

91D 04225

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XR-1488/1489A

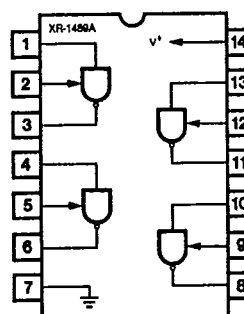
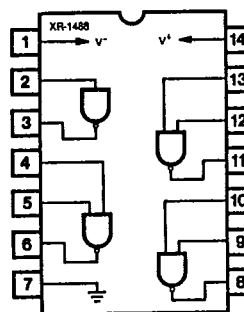
Quad Line Driver/Receiver

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.

FUNCTIONAL BLOCK DIAGRAMS



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

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/ μ S 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.