Dual Operational Amplifier

GENERAL DESCRIPTION

The XR-1458/4558 is a pair of independent internally compensated operational amplifiers on a single silicon chip, each similar to the popular 741, but with a power consumption less than one 741. Good thermal tracking and matched gain-bandwidth products make these Dual Op-amps useful for active filter applications.

FEATURES

Direct Pin-for-Pin Replacement for MC1458, RC4558, N5558
Low Power Consumption — 50 mW typ. and 120mW max.
Short-Circuit Protection
Internal Frequency Compensation
No Latch-Up
Wide Common-Mode and Differential Voltage Ranges
Matched Gain-Bandwidth

APPLICATIONS

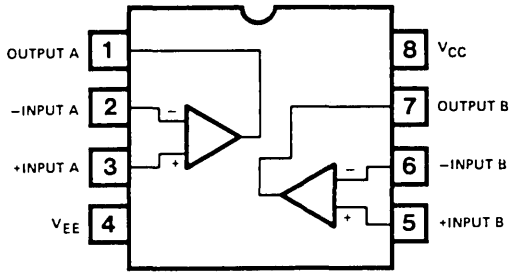
Buffer Amplifiers
Summing/Differencing Amplifiers
Instrumentation Amplifiers
Active Filters
Signal Processing
Sample and Differencing
I to V Converters
Integrators
Simulated Components
Analog Computers

ABSOLUTE MAXIMUM RATINGS

Supply Voltage	
XR-4558CP	±18V
Input Voltage (Note 1)	±15V
Common Mode Voltage Range	V_{EE} to V_{CC}
Output Short-Circuit Duration (Note 2)	indefinite
Differential Input Voltage	±30V
Internal Power Dissipation (Note 3)	
Plastic Package:	500 mW
Storage Temperature Range:	−65°C to +150°C
Operating Temperature Range:	0°C to +70°C

Note 1: For supply voltages less than ±15V, the absolute maximum input voltage is equal to the supply voltage.
Note 2: Short circuit may be to ground or either supply. Rating applies to +125°C case temperature of +75°C ambient temperature for XR1458/4558.
Note 3: Rating applies for case temperatures to 125°C; derate linearly at 6.5mW/°C for ambient temperatures above +75°C for XR1458/4558.

FUNCTIONAL BLOCK DIAGRAM



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ORDERING INFORMATION

Part Number	Package	Operating Temperature
XR-1458CN	Ceramic	0°C to +70°C
XR-1458CP	Plastic	0°C to +70°C
XR-4558CN	Ceramic	0°C to +70°C
XR-4558CP	Plastic	0°C to +70°C

SYSTEM DESCRIPTION

The XR-1458 and XR-4558 are dual general purpose op amps featuring better performance than industry standard devices such as the 741; bandwidth, slew rate, and input resistance are greatly improved. Internal protection circuitry includes latch-up elimination, short circuit current limiting, and internal compensation.

The two amplifiers are completely independent, sharing bias circuitry only.

XR-1458/4558

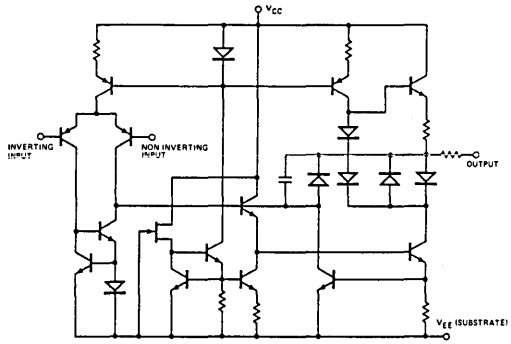
ELECTRICAL CHARACTERISTICS

Test Conditions: T_A = +25°C, ±15V, unless otherwise specified.

PARAMETERS	XR1458/4558CP MIN	TYP	MAX	UNITS	SYMBOLS	CONDITIONS
Input Offset Voltage		0.5	6.0	mV	$\|V_{io}\|$	$R_S \leq 10$ KΩ
Input Offset Current		5	200	nA	$\|I_{io}\|$	
Input Bias Current		40	500	nA	$\|I_b\|$	
Input Resistance	0.3	5		MΩ	R_{in}	
Large Signal Voltage Gain	20	300		V/mV	A_{VOL}	$R_L \geq 2$ KΩ V_{out} = ±10V
Output Voltage Swing	±12 ±10	±14 ±13		V V	V_{out} V_{out}	$R_L \geq 10$ KΩ $R_L \geq 2$ KΩ
Input Voltage Range	±12	±14		V	V_{iCM}	
Common Mode Rejection Ratio	70	90		dB	CMRR	$R_S \leq 10$ KΩ
Supply Voltage Rejection Ratio		30	150	μV/V	PSRR	$R_S \leq 10$ KΩ
Power Consumption		50	170	mW	P_i	
Transient Response (unity gain) Risetime Overshoot		 0.13 5		 μs %	 t_r t_o	V_{in} = 20 mV R_L = 2 KΩ $C_L \leq 100$ pF
Unity Gain Bandwidth		3.0		MHz	BW	
Slew Rate (unity gain)		1.0		V/μs	dV_{out}/dt	$R_L \geq 2$ KΩ
Channel Separation (open loop)		120		dB		f = 10 kHz R_S = 1 KΩ
(Gain of 100)		105		dB		f = 10 kHz R_S = 1 KΩ

The following specifications apply for 0°C ≤ T_A ≤ +70°C for XR4558CP

Input Offset Voltage			7.5	mV	$\|V_{io}\|$	$R_S \leq 10$ kΩ
Input Offset Current			300	nA	$\|I_{io}\|$	
Input Bias Current			800	nA	I_b	
Large-Signal Voltage Gain	15			V/mV	A_{VOL}	$R_S \geq 2$ KΩ V_{out} = ±10V
Output Voltage Swing	±10			mV	V_{out}	$R_L \geq 2$ KΩ
Power Consumption		 90 120	 150 200	 mW mW	 P_i P_i	V_S = ±15V T_A = High T_A = Low



EQUIVALENT SCHEMATIC DIAGRAM