μPC159

High Speed Operational Amplifier

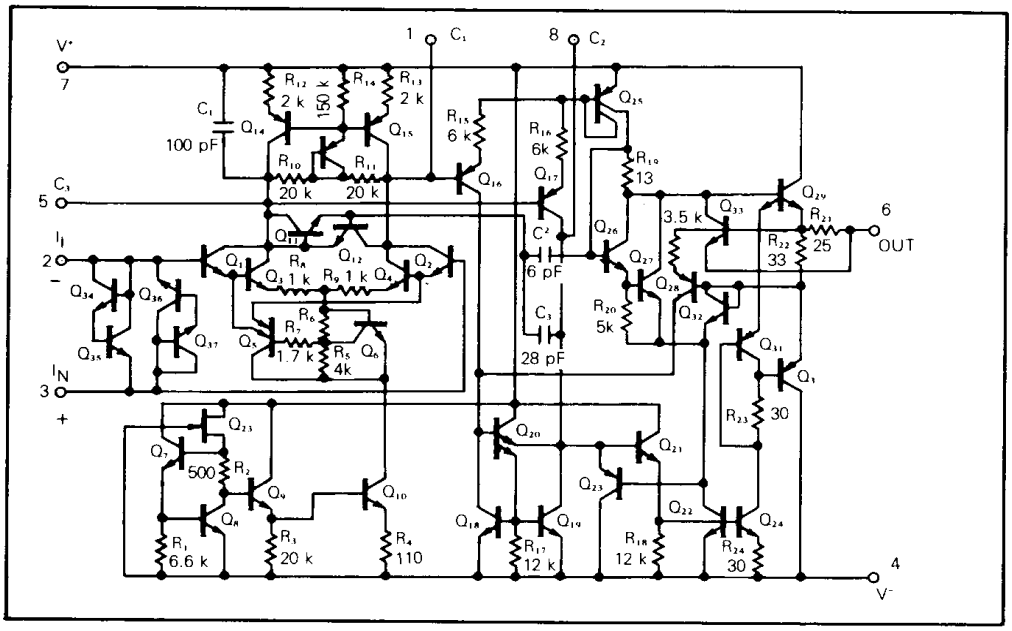
GENERAL DESCRIPTION

The μPC159 is a precision high-speed operational amplifier designed for applications requiring wide bandwidth and high slew rate. It features a factor of ten increase in speed over general purpose devices without sacrificing DC performance. The μPC159 has internal unity gain frequency compensation. This simplifies its application since no external components are necessary for operation. The high speed and fast setting time of this device make it useful in D/A converters, oscillators and hold circuits.

FEATURES

- Very High Slew Rate
- Maximum Bias Current of 500 nA
- Operates from Supplies of ±5 V to ±20 V
- Internal Frequency Compensation
- Input and Output Overload Protected
- LM318 Direct Replacement

EQUIVALENT CIRCUIT



ORDERING INFORMATION

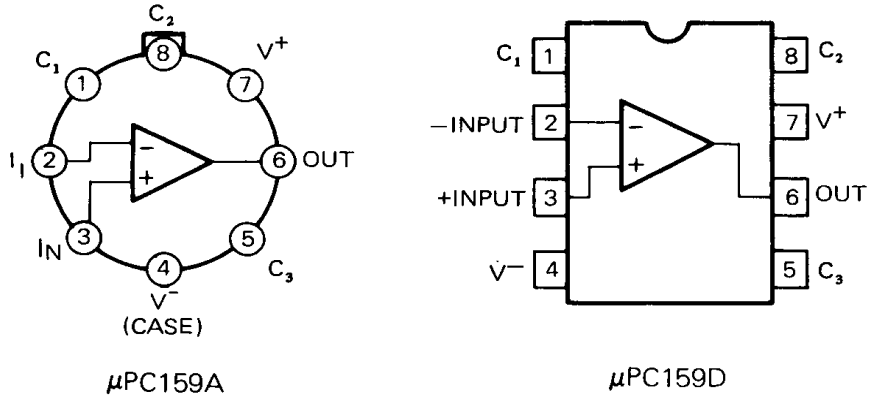
μPC159A

8 pin Metal Can Package

μPC159D

8 pin Ceramic DIP
(Dual In-Line Package)

CONNECTION DIAGRAM (Top View)



μPC159A μPC159D

ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

PARAMETER		μPC159	UNIT
Voltage between V^+ and V^-		40	V
Power Dissipation*	A or D Package	500	mW
Differential Input Current (Note 1)		±10	mA
Input Voltage (Note 2)		±15	V
Output Short Circuit Duration		Indefinite	s
Operating Temperature Range	A or D Package	−20 to +80	°C
Strage Temperature Range	A Package	−65 to +175	°C
	D Package	−55 to +150	

Note 1: The Inputs are shunted with back-to-back diodes for overvoltage protection. Therefore, excessive current will flow if a differential input voltage in excess of 1 V is applied between the inputs unless some limiting resistance is used.

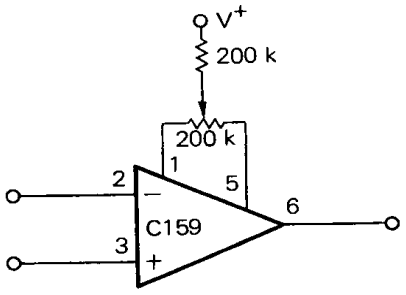
2: For supply voltages less than ±15 V, the maximum input voltage is equal to the supply voltage.

* See thermal information in chapter 11.

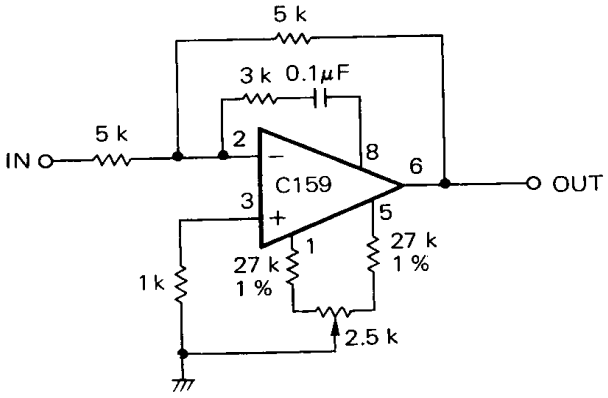
ELECTRICAL CHARACTERISTICS (Ta = 25°C, $V^{\pm}$ = ±15 V)

CHARACTERISTIC	MIN.	TYP.	MAX.	UNIT	CONDITIONS
Input Offset Voltage		4	10	mV	R_S = 100 Ω
Input Offset Current		30	200	nA	
Input Bias Current		150	500	nA	
Input Impedance	0.5	3		MΩ	
Large Signal Voltage Gain	25,000	200,000			V_O = ±10 V, $R_L \geqslant$ 2 kΩ
Slew Rate	50	70		V/μs	A_V = 1
Output Voltage Swing	±12	±13		V	$R_L \geqslant$ 2 kΩ
Common Mode Input Voltage Range	±11.5			V	
Common Mode Rejection Ratio	70	100		dB	
Supply Voltage Rejection Ratio	65	80		dB	
Supply Current		5	10	mA	R_L = ∞, V_O = 0 V

Offset Balancing Circuit



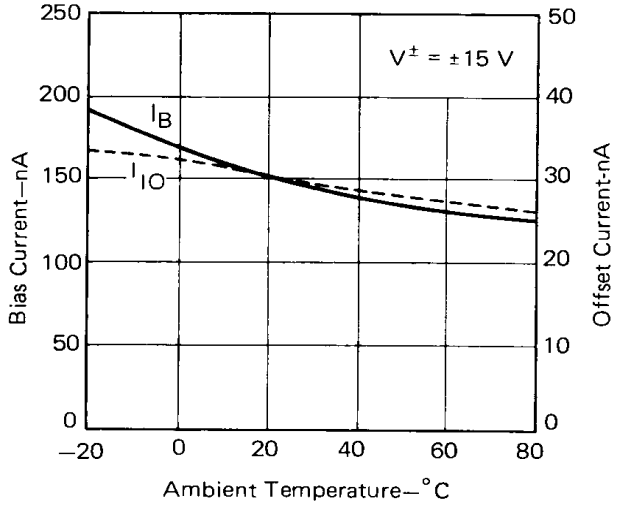
Feedforward Compensation for Greater Inverting Slew Rate



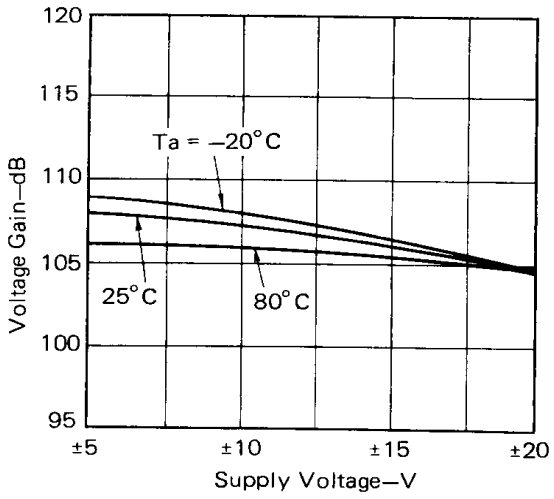
*Slew rate typically 150 V/μs
*Balance circuit necessary for increased slew

TYPICAL PERFORMANCE CHARACTERISTICS (Ta = 25°C)

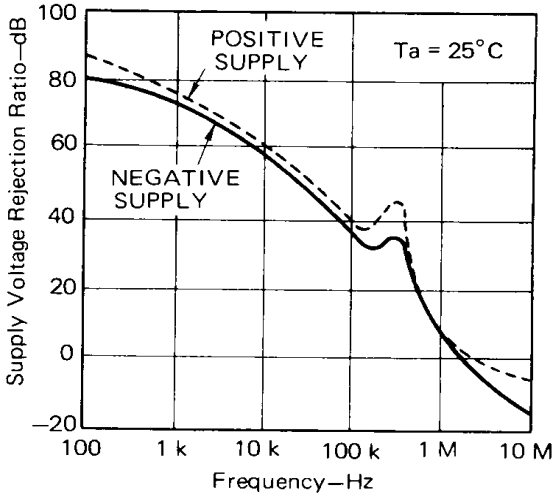
INPUT CURRENT



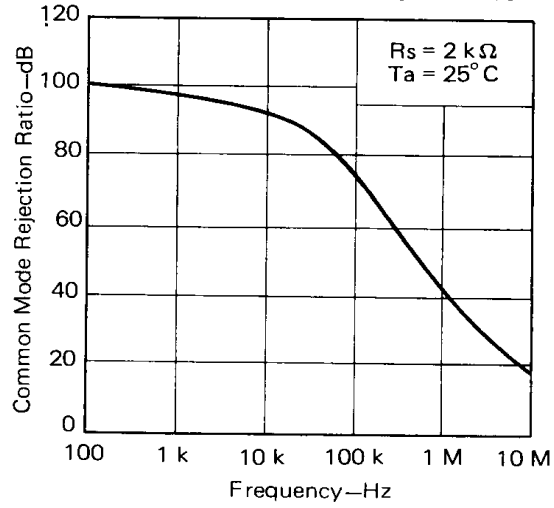
VOLTAGE GAIN



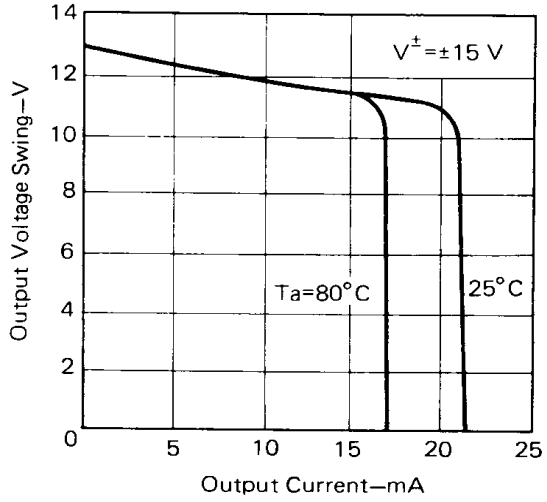
SUPPLY VOLTAGE REJECTION RATIO



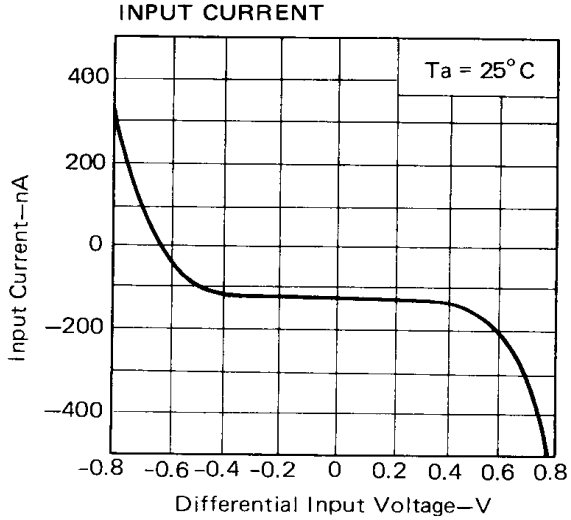
COMMON MODE REJECTION RATIO



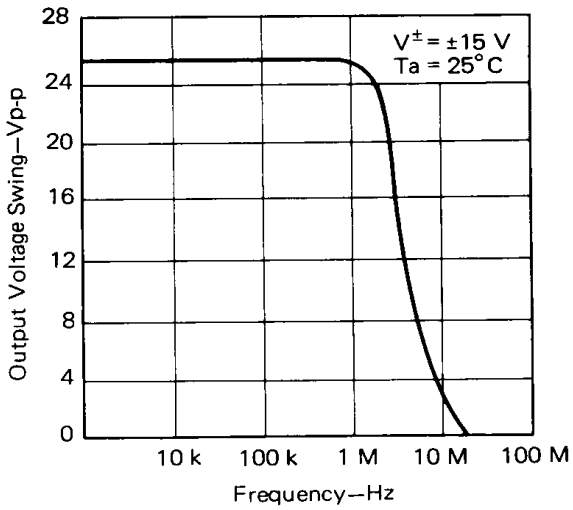
CURRENT LIMITING



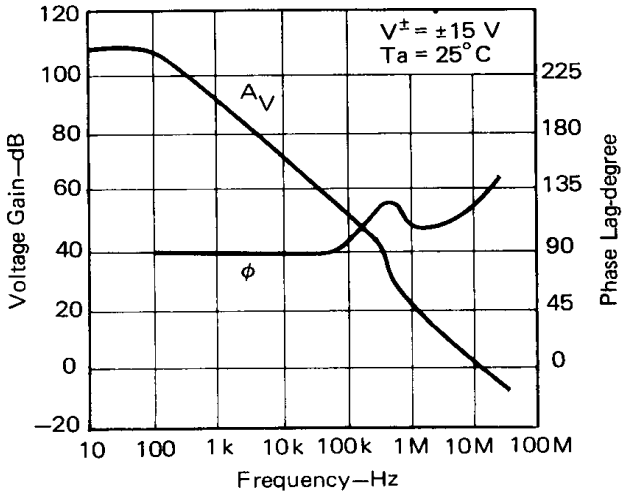
INPUT CURRENT



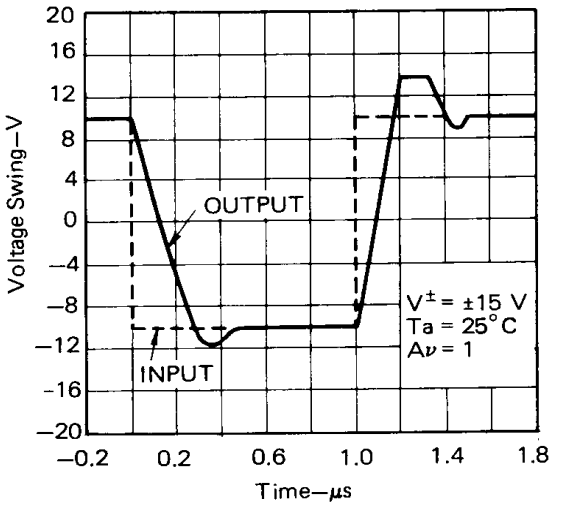
LARGE SIGNAL FREQUENCY RESPONSE



OPEN LOOP FREQUENCY RESPONSE



VOLTAGE FOLLOWER PULSE RESPONSE



INVERTER PULSE RESPONSE