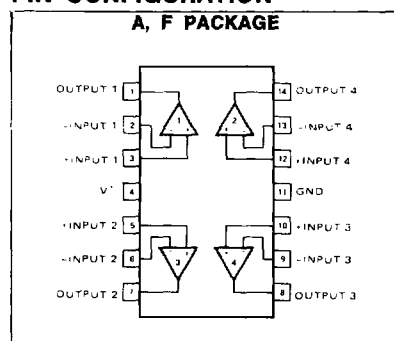


FEATURES

- INTERNALLY FREQUENCY COMPENSATED FOR UNITY GAIN
- LARGE DC VOLTAGE GAIN — 100dB
- WIDE BANDWIDTH (UNITY GAIN) — 1MHz (TEMPERATURE COMPENSATED)
- WIDE POWER SUPPLY RANGE: SINGLE SUPPLY 3V DC to 30V DC OR DUAL SUPPLIES ±1.5V DC to ±15V DC
- VERY LOW SUPPLY CURRENT DRAIN (800µA) — ESSENTIALLY INDEPENDENT OF SUPPLY VOLTAGE (1mW/op amp at +5V DC)
- LOW INPUT BIASING CURRENT — 45nA DC (TEMPERATURE COMPENSATED)
- LOW INPUT OFFSET VOLTAGE — 2mV DC AND OFFSET CURRENT — 5nA DC
- DIFFERENTIAL INPUT VOLTAGE RANGE EQUAL TO THE POWER SUPPLY VOLTAGE
- LARGE OUTPUT VOLTAGE — 0V DC to V+ —1.5V DC SWING

PIN CONFIGURATION



UNIQUE FEATURES

IN THE LINEAR MODE THE INPUT COMMON-MODE VOLTAGE RANGE INCLUDES GROUND AND THE OUTPUT VOLTAGE CAN ALSO SWING TO GROUND, EVEN THOUGH OPERATED FROM ONLY A SINGLE POWER SUPPLY VOLTAGE. THE UNITY GAIN CROSS FREQUENCY IS TEMPERATURE COMPENSATED. THE INPUT BIAS CURRENT IS ALSO TEMPERATURE COMPENSATED.

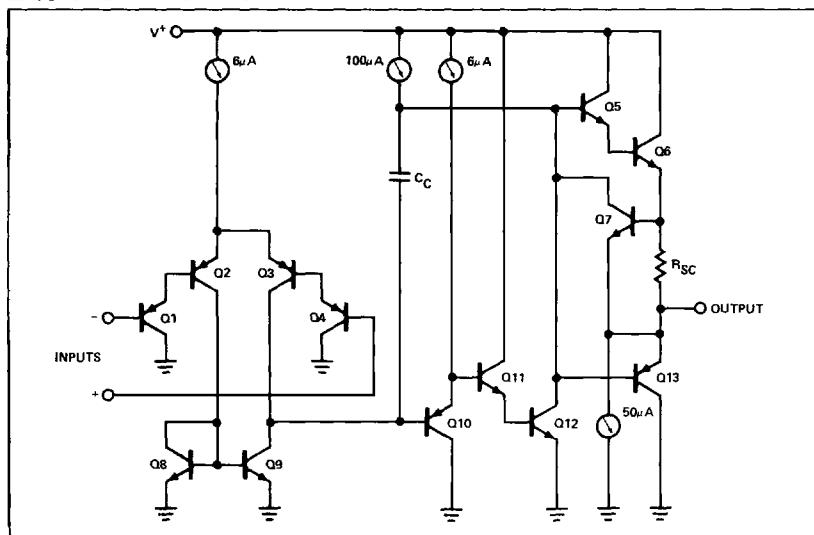
ABSOLUTE MAXIMUM RATINGS

- Supply Voltage, V+ 32V DC or ±16V DC
- Differential Input Voltage 32V DC
- Input Voltage -0.3V DC to +32V DC
- Power Dissipation (Note 1)
 - Molded DIP (LM224A, LM324A) 570mW
 - Cavity DIP (LM124F, LM224F, and LM324F) 900mW
- Output Short-Circuit to GND
 - 1 Amplifier (Note 2) Continuous
 - V+ < 15V DC and TA = 25°C
- Input Current (VIN < -0.3V) (Note 3) 50mA
- Operating Temperature Range
 - LM324 0°C to +70°C
 - LM224 -25°C to +85°C
 - LM124 -55°C to +125°C
- Storage Temperature Range -65°C to +150°C
- Lead Temperature (Soldering, 10 sec.) 300°C

NOTES:

1. For operating at high temperatures, the LM324 must be derated based on a +125°C maximum junction temperature and a thermal resistance of 175°C/W which applies for the device soldered in a printed circuit board, operating in a still air ambient. The LM224 and LM124 can be derated based on a +150°C maximum junction temperature.
2. Short circuits from the output to V+ can cause excessive heating and eventual destruction. The maximum output current is approximately 40 mA independent of the magnitude of V+. At values of supply voltage in excess of +15V DC, continuous short-circuits can exceed the power dissipation ratings and cause eventual destruction.
3. The direction of the input current is out of the IC due to the PNP input stage. This current is essentially constant, independent of the state of the output so no loading change exists on the input lines.

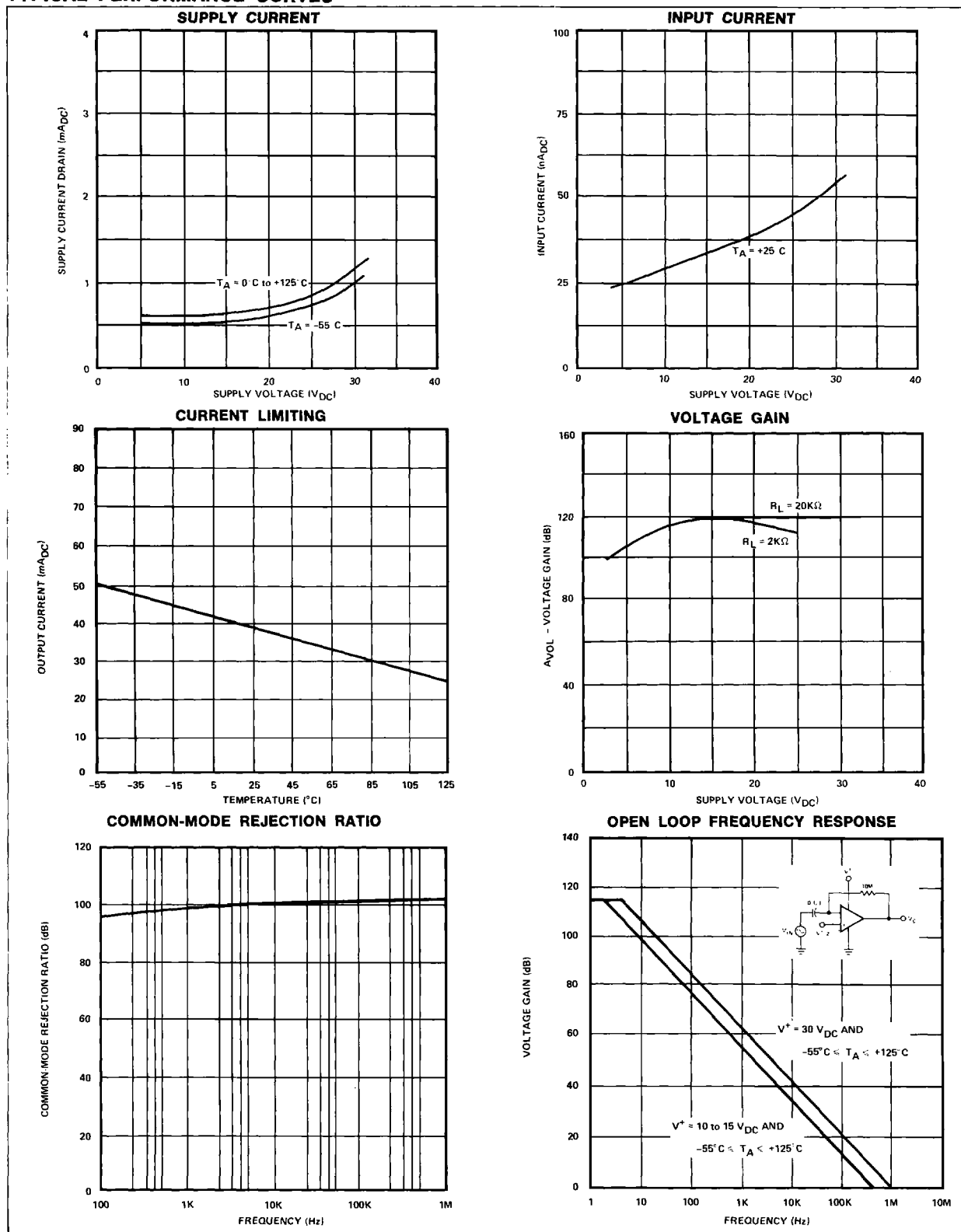
EQUIVALENT CIRCUIT



ELECTRICAL CHARACTERISTICS

Parameter	Test Conditions	LIMITS			Units
		Min	Typ	Max	
Amplifier-to-Amplifier Coupling	f = 1kHz to 20kHz, TA = +25°C (input Referred)		-120		dB
Output Current Source	VIN+ = +1VDC, VIN- = 0VDC, V+ = 15VDC, TA = +25°C	20	40		mADC
	VIN+ = +1VDC, VIN- = 0VDC, V+ = 15VDC	10	20		mA
Output Current Sink	VIN- = +1VDC, VIN+ = 0VDC, V+ = 15VDC, TA = +25°C	10	20		mADC
	VIN- = +1VDC, VIN+ = 0VDC, TA = +25°C, VO = 200mVDC	12	50		µADC
	VIN- = +1VDC, VIN+ = 0VDC, V+ = 15VDC	5	8		mA
Differential Input Voltage	See Note 5				

TYPICAL PERFORMANCE CURVES



ANALOG

TYPICAL PERFORMANCE CURVES (Cont'd)

