Operational Amplifiers

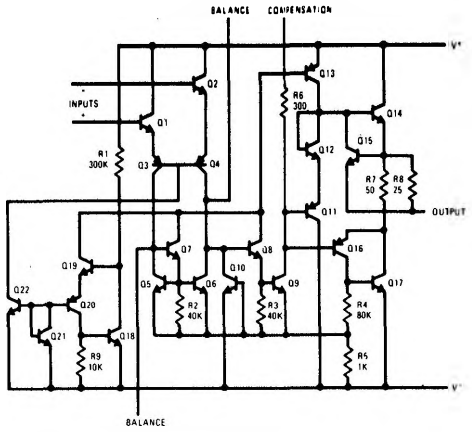
LM201 operational amplifier general description

The LM201 is a general-purpose operational amplifier built on a single silicon chip. It is identical to the LM101 except that operation is specified over a 0 to 70°C temperature range. The device features:

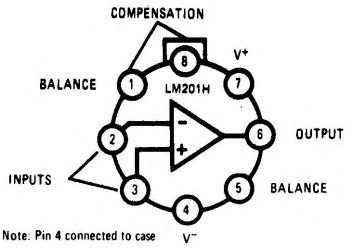
- Frequency compensation with a single 30 pF capacitor
- Operation from ±5V to ±20V
- Low current drain: 1.8 mA at ±20V
- Continuous short-circuit protection
- Operation as a comparator with differential inputs as high as ±30V
- No latch-up when common mode range is exceeded
- LM709 lead configuration in metal cans and flat-packages.

The unity-gain compensation specified makes the circuit stable for all feedback configurations, even with capacitive loads. However, it is possible to optimize compensation for best high frequency performance at any gain. As a comparator, the output can be clamped at any desired level to make it compatible with logic circuits. Further, the low power dissipation permits high-voltage operation and simplifies packaging.

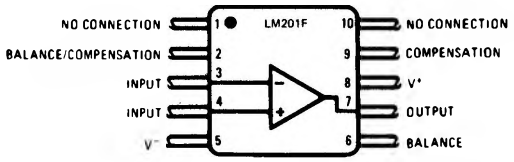
schematic and connection diagrams



Metal Can

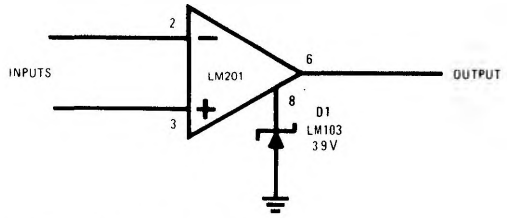


Flat Pack

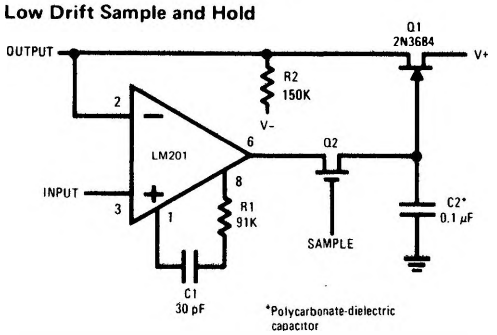


typical applications**

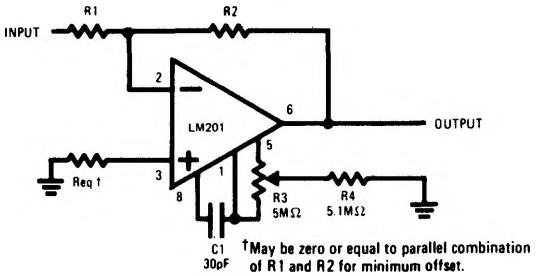
Voltage Comparator for Driving DTL or TTL Integrated Circuits



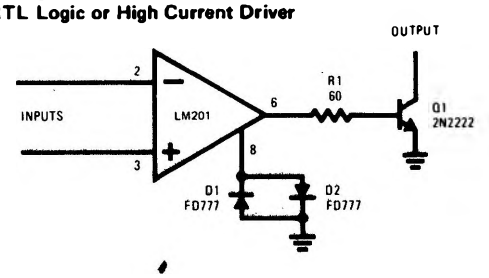
Low Drift Sample and Hold



Inverting Amplifier with Balancing Circuit



Voltage Comparator for Driving RTL Logic or High Current Driver



**Pin connections shown are for metal can package.

absolute maximum ratings

Supply Voltage	±22V
Power Dissipation (Note 1)	250 mW
Differential Input Voltage	±30V
Input Voltage (Note 2)	±15V
Output Short-Circuit Duration (Note 3)	Indefinite
Operating Temperature Range	0°C to +70°C
Storage Temperature Range	−65°C to +150°C
Lead Temperature (Soldering, 10 sec)	300°C

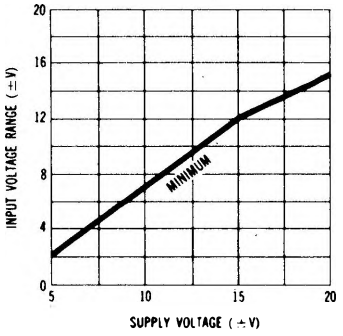
electrical characteristics (note 4)

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
Input Offset Voltage	$T_A = 25°C$, $R_S \leq 10k\Omega$		2.0	7.5	mV
Input Offset Current	$T_A = 25°C$		100	500	nA
Input Bias Current	$T_A = 25°C$		0.25	1.5	μA
Input Resistance	$T_A = 25°C$	100	400		kΩ
Supply Current	$T_A = 25°C$, $V_S = \pm 20V$		1.8	3.0	mA
Large Signal Voltage Gain	$T_A = 25°C$, $V_S = \pm 15V$ $V_{OUT} = \pm 10V$, $R_L \geq 2k\Omega$	20	150		V/mV
Input Offset Voltage	$R_S \leq 10k\Omega$			10	mV
Average Temperature Coefficient of Input Offset Voltage	$R_S \leq 50\Omega$		6		μV/°C
	$R_S \leq 10k\Omega$		10		μV/°C
Input Offset Current	$T_A = +70°C$		50	400	nA
	$T_A = 0°C$		150	750	nA
Input Bias Current	$T_A = 0°C$		0.32	2.0	μA
Large Signal Voltage Gain	$V_S = \pm 15V$, $V_{OUT} = \pm 10V$ $R_L \geq 2k\Omega$	15			V/mV
Output Voltage Swing	$V_S = \pm 15V$, $R_L = 10k\Omega$	±12	±14		V
	$R_L = 2k\Omega$	±10	±13		V
Input Voltage Range	$V_S = \pm 15V$	±12			V
Common Mode Rejection Ratio	$R_S \leq 10k\Omega$	65	90		dB
Supply Voltage Rejection Ratio	$R_S \leq 10k\Omega$	70	90		dB

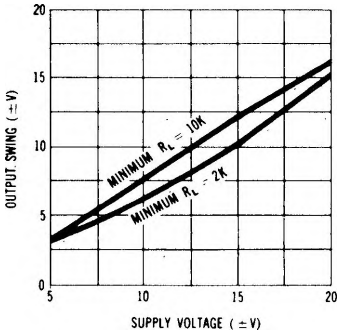
Note 1: For operating at elevated temperatures, the device must be derated based on a 100°C maximum junction temperature and a thermal resistance of 150°C/W junction to ambient or 45°C/W junction to case for the metal-can package. For the flat package, the derating is based on a thermal resistance of 185°C/W when mounted on a 1/16-inch-thick, epoxy-glass board with ten, 0.03-inch-wide, 2-ounce copper conductors (see curve).
Note 2: For supply voltages less than ±15V, the absolute maximum input voltage is equal to the supply voltage.
Note 3: Continuous short circuit is allowed for case temperatures to 70°C and ambient temperatures to 55°C.
Note 4: These specifications apply for $0°C \leq T_A \leq 70°C$, $\pm 5V \leq V_S \leq \pm 20V$ and C1 = 30 pF unless otherwise specified.

guaranteed performance

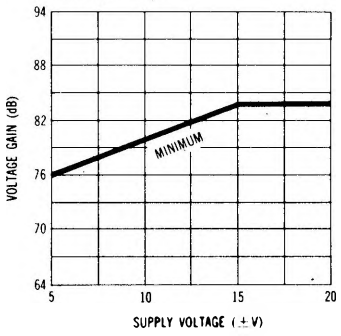
Input Voltage Range



Output Swing

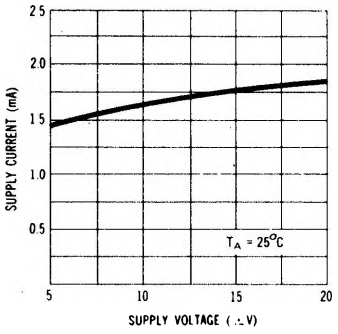


Voltage Gain

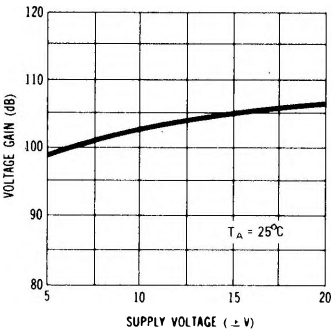


typical performance

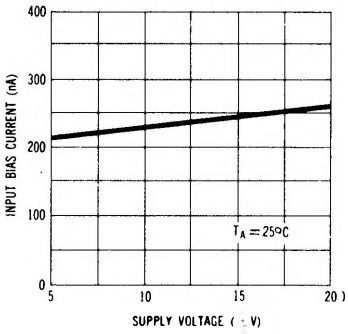
Supply Current



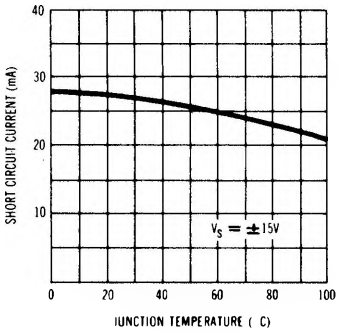
Voltage Gain



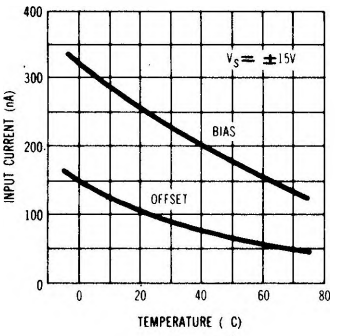
Input Bias Current



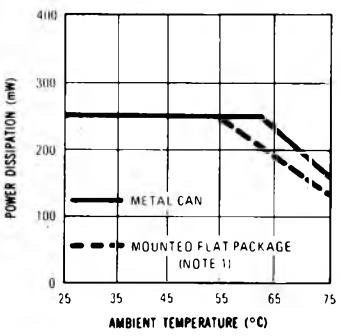
Short Circuit Current



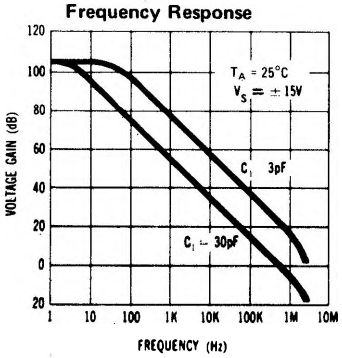
Input Current



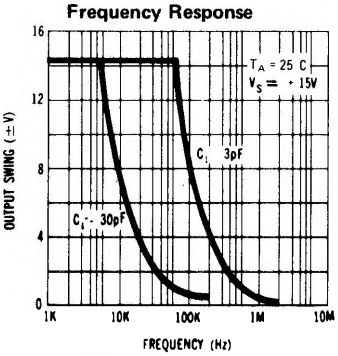
Maximum Power Dissipation



Open Loop Frequency Response



Large Signal Frequency Response



Voltage Follower Pulse Response