µA740

FET INPUT OPERATIONAL AMPLIFIER

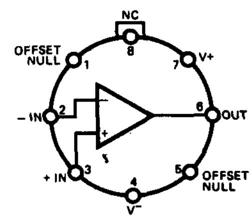
FAIRCHILD LINEAR INTEGRATED CIRCUITS

GENERAL DESCRIPTION – The µA740 is a high performance monolithic FET Input Operational Amplifier constructed using the Fairchild Planar* epitaxial process. It is intended for a wide range of analog applications where very high input impedance is required and features very low input offset current and very low input bias current. High slew rate, high common mode voltage range and absence of latch-up make the µA740 ideal for use as a voltage follower. The high gain and wide range of operating voltages provide superior performance in active filters, integrators, summing amplifiers, sample-and-hold circuits, transducer amplifiers, and other general feedback applications. The µA740 is short circuit protected and has the same pin configuration as the popular µA741 operational amplifier. No external components for frequency compensation are required as the internal 6 dB/octave roll-off insures stability in closed loop applications.

- **HIGH INPUT IMPEDANCE . . . 1,000,000 MΩ**
- **NO FREQUENCY COMPENSATION REQUIRED**
- **SHORT-CIRCUIT PROTECTION**
- **OFFSET VOLTAGE NULL CAPABILITY**
- **LARGE COMMON-MODE AND DIFFERENTIAL VOLTAGE RANGES**
- **NO LATCH UP**

CONNECTION DIAGRAM

8-LEAD METAL CAN
(TOP VIEW)
PACKAGE OUTLINE 5S
PACKAGE CODE H



NOTE: Pin 4 Connected to Case.

12

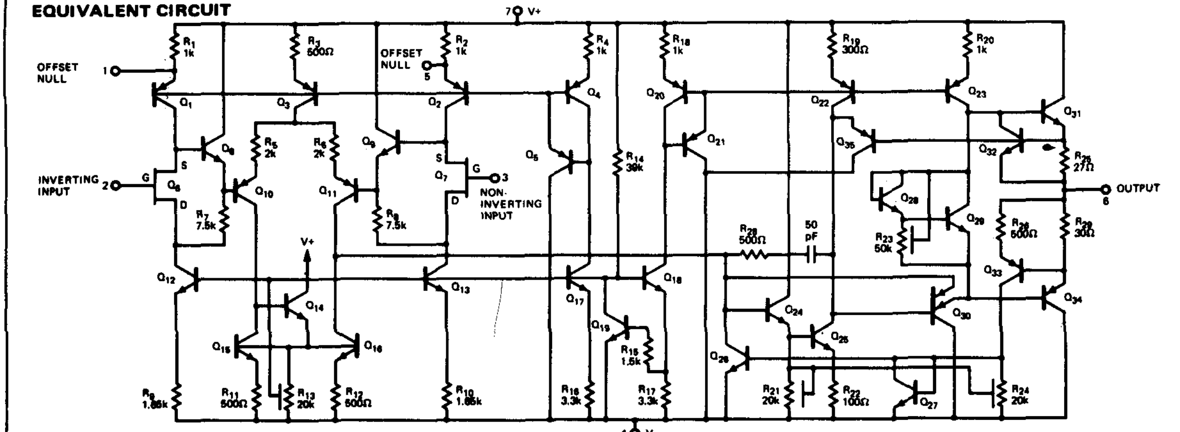
ORDER INFORMATION

TYPE	PART NO.
µA740	µA740HM
µA740C	µA740HC

ABSOLUTE MAXIMUM RATINGS

Supply Voltage	±22V
Internal Power Dissipation (Note 1)	500 mW
Differential Input Voltage	±30V
Input Voltage (Note 2)	±15V
Voltage between Offset Null and V+	±0.5V
Storage Temperature Range	–65°C to +150°C
Operating Temperature Range	
Military (µA740)	–55°C to +125°C
Commercial (µA740C)	0°C to +70°C
Lead Temperature (Soldering, 60 seconds)	300°C
Output Short-Circuit Duration (Note 3)	Indefinite

EQUIVALENT CIRCUIT



Notes on following pages.

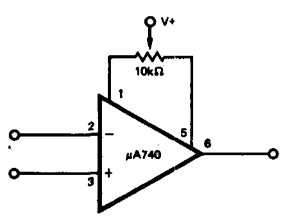
*Planar is a patented Fairchild process.

μA740

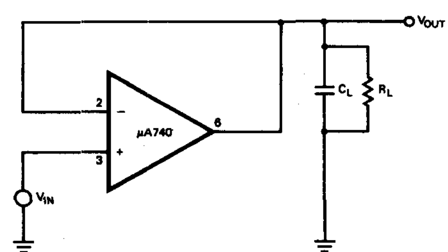
ELECTRICAL CHARACTERISTICS ($V_S = \pm 15V$, $T_C = 25^oC$ unless otherwise specified)

PARAMETER		CONDITIONS	MIN	TYP	MAX	UNITS
Input Offset Voltage		$R_S \leqslant 100\ k\Omega$		10	20	mV
Input Offset Current [Note 4]				40	150	pA
Input Current (either input) [Note 4]				100	200	pA
Input Resistance				1,000,000		MΩ
Large Signal Voltage Gain		$R_L \geqslant 2k\Omega$, $V_{OUT} = \pm 10V$	50,000	1,000,000		V/V
Output Resistance				75		Ω
Output Short Circuit Current				20		mA
Common Mode Rejection Ratio			64	80		dB
Supply Voltage Rejection Ratio				70	300	μV/V
Supply Current				4.2	5.2	mA
Power Consumption				126	156	mW
Slew Rate				6.0		V/μs
Unity Gain Bandwidth				3.0		MHz
Transient Response (Unity Gain)	Rise Time	$C_L \leqslant 100pF$, $R_L = 2k\Omega$, $V_{IN} = 100mV$		110		ns
	Overshoot			10	20	%
The following specifications apply for $T_C = -55^oC$ to $+85^oC$:						
Input Voltage Range			±10		±12	V
Large Signal Voltage Gain		$R_L > 2\ k\Omega$, $V_{OUT} = \pm 10\ V$	25,000			V/V
Output Voltage Swing		$R_L \geqslant 10k\Omega$	±12	±14		V
		$R_L \geqslant 2k\Omega$	±10	±13		V
Input Offset Voltage		$R_S \leqslant 100k\Omega$		15	30	mV
Input Offset Current		$T_A = -55^oC$		30		pA
		$T_A = +85^oC$		185		pA
Input Current (either input)		$T_A = -55^oC$			200	pA
		$T_A = +85^oC$		2.5	4.0	nA

VOLTAGE OFFSET NULL CIRCUIT

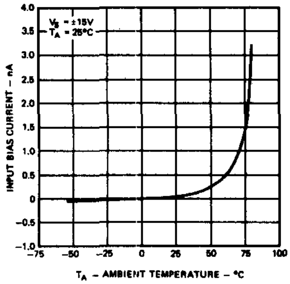


TRANSIENT RESPONSE TEST CIRCUIT

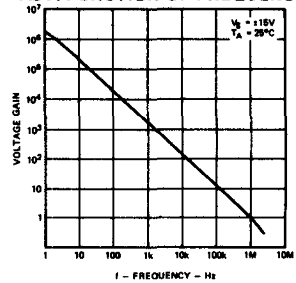


TYPICAL PERFORMANCE CURVES FOR μA740 AND μA740C

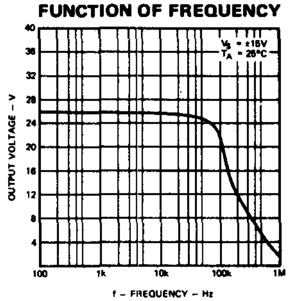
INPUT BIAS CURRENT AS A FUNCTION OF AMBIENT TEMPERATURE



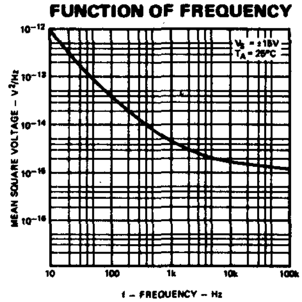
OPEN LOOP VOLTAGE GAIN AS A FUNCTION OF FREQUENCY



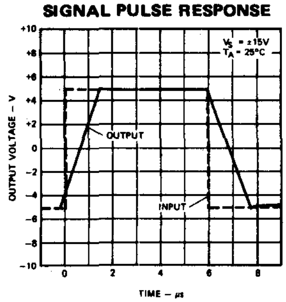
OUTPUT VOLTAGE SWING AS A FUNCTION OF FREQUENCY



INPUT NOISE VOLTAGE AS A FUNCTION OF FREQUENCY



VOLTAGE FOLLOWER LARGE SIGNAL PULSE RESPONSE



OPEN LOOP PHASE RESPONSE AS A FUNCTION OF FREQUENCY