LM741
LM741A
LM741C

FREQUENCY COMPENSATED OPERATIONAL AMPLIFIERS

- NO FREQUENCY COMPENSATION REQUIRED
- SHORT CIRCUIT PROTECTION
- OFFSET VOLTAGE NULL CAPABILITY
- LARGE COMMON MODE AND DIFFERENTIAL VOLTAGE RANGE
- NO LATCH-UP

The LM741 series consists of general purpose operational amplifiers, intended for a wide range of analog applications. High common mode voltage range and absence of "latch-up" tendencies make the LM741 series ideal for use as a voltage follower. The high gain and wide range of operating voltage provide superior performance in integrators, summing amplifiers, and general feedback applications.

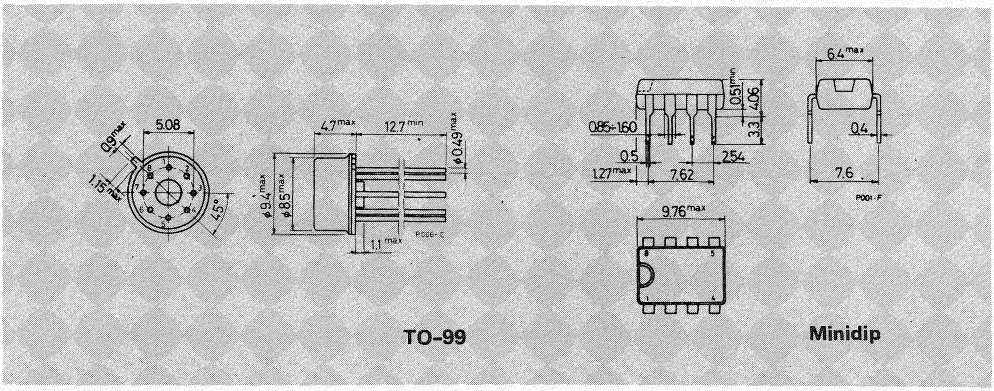
ABSOLUTE MAXIMUM RATINGS

		LM741/741A	LM741C
V_s	Supply voltage	± 22V	± 18V
V_i (1)	Input voltage	± 15V	± 15V
ΔV_i	Differential input voltage	± 30V	± 30V
T_{op}	Operating temperature	-55 to 125°C	0 to 70°C
	Output short circuit duration (2)	indefinite	indefinite
P_{tot}	Power dissipation at T_{amb}= 70°C	520 mW	665 mW
T_{stg}	Storage temperature	-65 to 150°C	-55 to 150°C

1) For supply voltage less than ± 15V, input voltage is equal to the supply voltage.
2) The short circuit duration is limited by thermal dissipation.

MECHANICAL DATA

Dimensions in mm

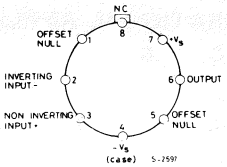


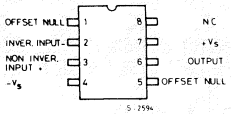
TO-99

Minidip

LM741
LM741A
LM741C

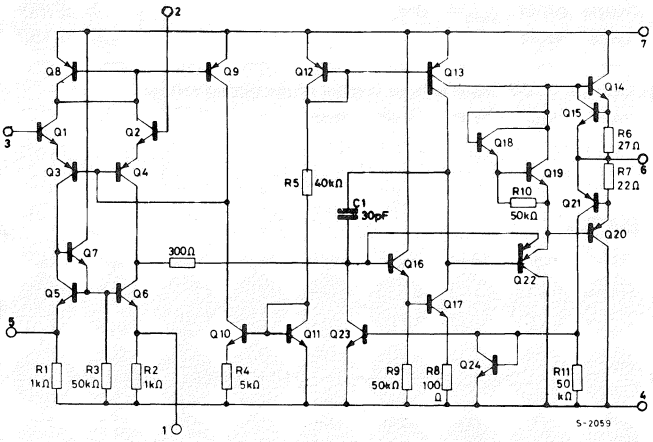
CONNECTION DIAGRAMS AND ORDERING NUMBERS





Type	TO-99	Minidip
LM 741	LM 741 H	—
LM 741A	LM 741 AH	—
LM 741C	LM 741 CH	LM 741 CN

SCHEMATIC DIAGRAM



THERMAL DATA

			TO-99	Minidip
$R_{th\ j\text{-}amb}$	Thermal resistance junction ambient	max	155 °C/W	120 °C/W

ELECTRICAL CHARACTERISTICS (see note)

Parameter		Test conditions	LM 741			LM 741A			LM 741C			Unit
			Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
V_{os}	Input offset voltage	T_{amb}= 25°C $R_g \leq 10\ k\Omega$ $R_g \leq 50\ \Omega$		1	5		0.8	3		2	6	mV mV
		$T_{amb}= T_{min}$ to T_{max} $R_g \leq 10\ k\Omega$ $R_g \leq 50\ \Omega$			6			4			7.5	mV mV
ΔV_{os}	Input offset voltage adjust. range	V_s= ± 20V V_s= ± 15V T_{amb}= 25°C		±15		±10				±15		mV
$\frac{\Delta V_{os}}{\Delta T}$	Average input offset voltage drift							15				$\frac{\mu V}{°C}$
I_{os}	Input offset current	T_{amb}= 25°C $T_{amb}= T_{min}$ to T_{max}		20 85	200 500		3	30 70		20	200 300	nA nA
$\frac{\Delta I_{os}}{\Delta T}$	Average input offset current drift							0.5				$\frac{nA}{°C}$
I_b	Input bias current	T_{amb}= 25°C $T_{amb}= T_{min}$ to T_{max}		80	500 1.5		30	80 0.21		80	500 0.8	nA μA
R_i	Input resistance	T_{amb}= 25°C $T_{amb}= T_{min}$ to T_{max}	0.3	2		1 0.5	6		0.3	2		MΩ MΩ
V_i	Input voltage range	$T_{amb}= T_{min}$ to T_{max}	±12	±13		±12	±13		±12	±13		V
G_v	Large signal voltage gain	T_{amb}= 25°C $R_L \geq 2\ k\Omega$ V_s= ±15V V_o= ±10V	94	106		94			86	106		dB
		$T_{amb}= T_{min}$ to T_{max} $R_L \geq 2\ k\Omega$ V_s= ±15V V_o= ±10V V_s= ±5V V_o= ±2V	88			90 80			84			dB
V_o	Output voltage swing	V_s= ±15V $R_L \geq 10\ k\Omega$ $R_L \geq 2\ k\Omega$	±12 ±10	±14 ±13		±12 ±10	±14 ±13		±12 ±10	±14 ±13		V V
I_{sc}	Output short circuit current	T_{amb}= 25°C $T_{amb}= T_{min}$ to T_{max}		25		10 10	25	35 40		25		mA mA
CMR	Common mode rejection	V_s = ±20V $R_g \leq 10\ k\Omega$ V_{CM}=±12V	70	90		80	95		70	90		dB
SVR	Supply voltage rejection	$R_g \leq 50\Omega$ V_s=±5to±20V $R_g \leq 10k\Omega$ V_s=±5to±15V	77	96		86	96		77	96		dB dB

ELECTRICAL CHARACTERISTICS (continued)

Parameter		Test conditions	LM 741			LM 741A			LM 741C			Unit
			Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
	Transient respon. (unity gain) Rise time Overshoot	T_{amb}= 25°C		 0.3 5			 0.25 6	 0.8 20		 0.3 5		 µs %
B	Bandwidth	T_{amb}= 25°C				0.437	1.5					MHz
SR	Slew rate	T_{amb}= 25°C		0.5		0.3	0.7			0.5		V/µs
I_s	Supply current	T_{amb}= 25°C		1.7	2.8					1.7	2.8	mA
P_{tot}	Power consumption	T_{amb}= 25°C V_s= ±20V V_s= ±15V		 50	 85		 80	 150		 50	 85	 mW mW
		V_s= ±20V T_{amb}= T_{min} T_{amb}= T_{max}						 165 135				 mW mW
		V_s= ±15V T_{amb}= T_{min} T_{amb}= T_{max}		 60 45	 100 75							 mW mW

Note: These specifications, unless otherwise specified, apply for V_s= ±15V and T_{amb}= -55 to 125°C for LM 741 and LM741A. For the LM 741C these specifications apply for T_{amb}= 0 to 70°C.

Fig. 1 - Open loop voltage gain vs. frequency

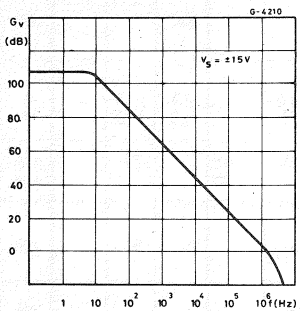


Fig. 2 - Open loop phase response vs. frequency

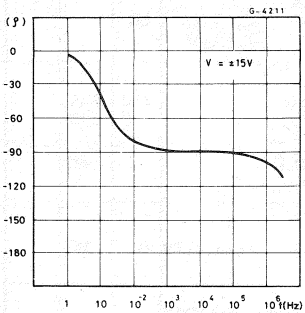


Fig. 3 - Output voltage swing vs. load resistance