芯 伯 乐 ®
XINBOLE

Product Specification

XBLW UA741

General-purpose Operational Amplifiers

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RoHS

Description

The UA741 is a general-purpose operational amplifiers.
The amplifiers offer many features which make their application nearly foolproof: overload protection on the input and output, no latch-up when the common-mode range is exceeded, as well as freedom from oscillations.

Features

➢ Overload Protection on the Input and Output
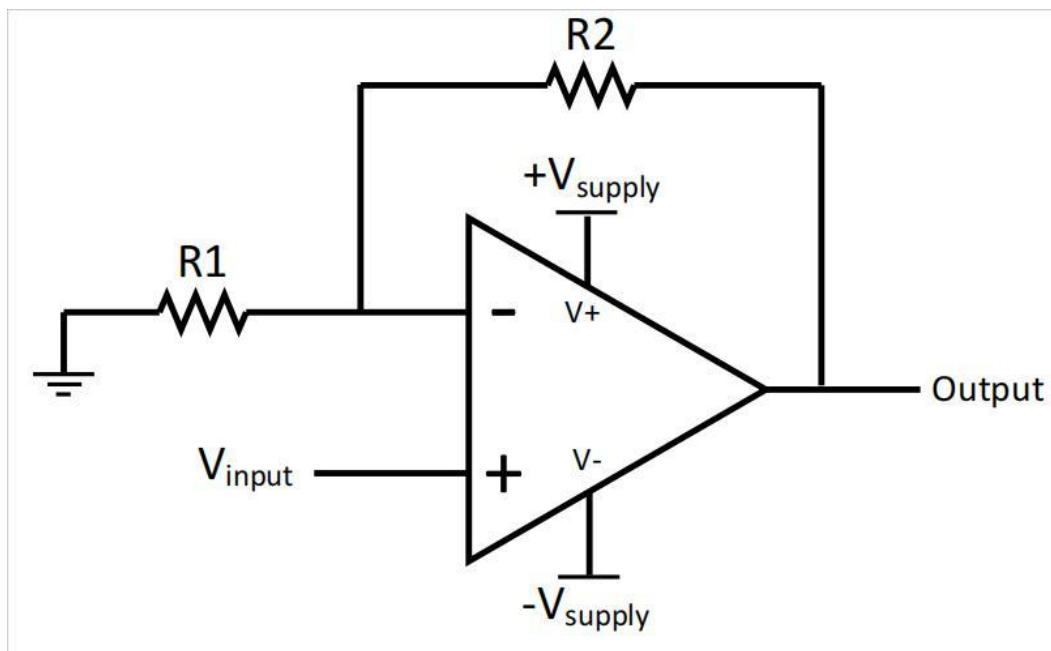➢ No Latch-Up When the Common-Mode Range is Exceeded

Apply

➢ Comparators
➢ Multivibrators
➢ DC Amplifiers
➢ Summing Amplifiers
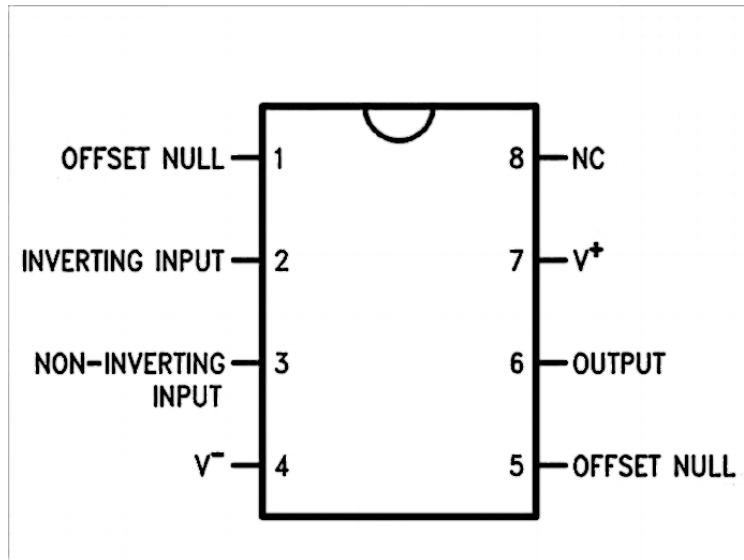➢ Integrator or Differentiators
➢ Active Filters

Ordering Information

Product Model	Package Type	Marking	Packing	Packing Qty
UA741CP	DIP-8	UA741CP	Tube	2000Pcs/Box
UA741CDTR	SOP-8	UA741C	Tape	2500Pcs/Reel

Typical Applications

Pin Configuration and Functions

Pin		I/O	Description
Name	No.		
INVERTING INPUT	2	I	Inverting signal input
NC	8	N/A	No Connect, should be left floating
NONINVERTING INPUT	3	I	Noninverting signal input
OFFSET NULL	1,5	I	Offset null pin used to eliminate the offset voltage and balance the input voltages.
OFFSET NULL			
OUTPUT	6	O	Amplified signal output
V+	7	I	Positive supply voltage
V-	4	I	Negative supply voltage

Absolute Maximum rating

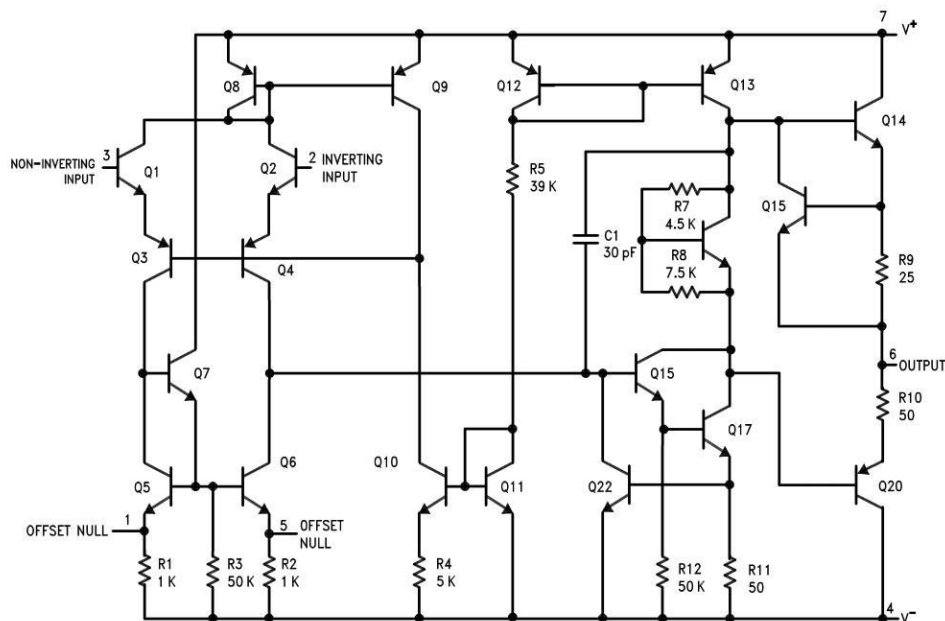over operating free-air temperature range (unless otherwise noted)[1][2][3]

		Min	Max	Unit
Supply voltage			±22	V
Power dissipation			500	mW
Differential input voltage			±30	V
Input voltage			±15	V
Output short circuit duration		Continuous		
Operating temperature		0	70	℃
Junction temperature			150	℃
Soldering information	DIP package (10 seconds)		260	℃
Storage temperature, Tstg		-65	150	℃

Electrical characteristics

Unless otherwise specified, these specifications apply for VS = ±15 V

Parameter	Test Conditions		Min	Typ	Max	Unit
Input offset voltage	RS≤10KΩ	TA=25℃		2	6	mV
		TAMIN≤TA≤TAMAX			7.5	mV
Input offset voltage adjustment range	TA=25℃,Vs=±20V			±15		mV
Input offset current	TA=25℃			20	200	nA
	TAMIN≤TA≤Tamax				300	
Input bias current	TA=25℃			80	500	nA
	TAMIN≤TA≤Tamax				0.8	µA
Input resistance	TA=25℃,Vs=±20V		0.3	2		MΩ
Input voltage range	TA=25℃		±12	±13		V
Large signal voltage gain	VS=±15V,VO=±10V, RL≥2KΩ	TA=25℃	20	200		V/mV
		TAMIN≤TA≤TAMAX	15			
Output voltage swing	VS=±15V	RL≥10KΩ	±12	±14		V
		RL≥2KΩ	±10	±13		
Output short circuit current	TA=25℃			25		mA
Common-mode rejection ratio	RS≤10KΩ ,VCM= ±12V,TAMIN≤TA≤Tamax		70	90		dB
Supply voltage rejection ratio	VS=±20V to VS=±5V,RS≤10Ω , TAMIN≤TA≤tamax		77	96		dB
Trans ient respo nse	Rise time	TA=25℃,unity gain		0.3		µs
	Overshoot			5%		
Slew rate	TA=25℃,unity gain			0.5		V/ µs
Supply current	TA=25℃			1.7	2.8	mA
Power consumption	VS=±15V,TA=25℃			50	85	mW

Functional Block Diagram

Feature Description

Overload Protection

The UA741 features overload protection circuitry on the input and output. This prevents possible circuit damage to the device.

Latch-up Prevention

The UA741 is designed so that there is no latch-up occurrence when the common-mode range isexceeded. This allows the device to function properly without having to power cycle the device.
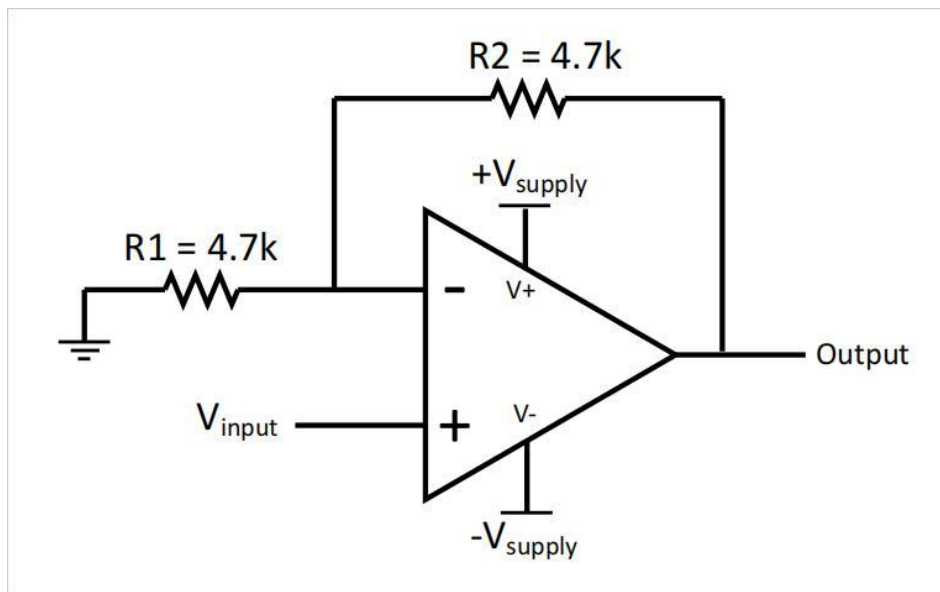
Typical Application

Figure 1. UA741 Noninverting Amplifier Circuit

Design Requirements

As shown in Figure 1, the signal is applied to the noninverting input of the UA741. The gain of the system is determined by the feedback resistor and input resistor connected to the inverting input. The gain can be calculated by Equation 1:

Gain = 1 + (R2/R1)

(1) The gain is set to 2 for this application. R1 and R2 are 4.7-k resistors with 5% tolerance.

Detailed Design Procedure

The UA741 can be operated in either single supply or dual supply. This application is configured for dual supply with the supply rails at ±15 V. The input signal is connected to a function generator. A 1-Vpp, 10-kHz sine wave was used as the signal input. 5% tolerance resistors were used, but if the application requires an accurate gain response, use 1% tolerance resistors.

Package Outline Dimensions

SOP-8
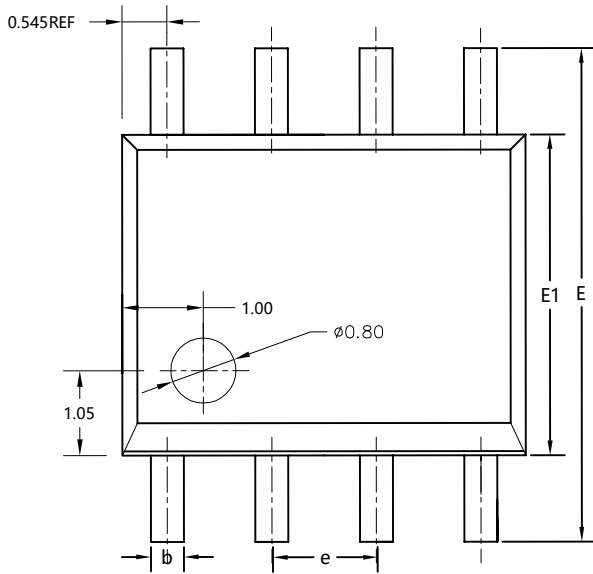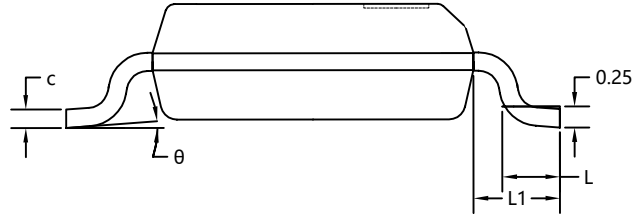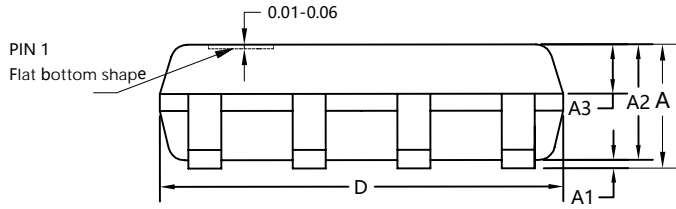
SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	1.55	1.65	1.75
A1	0.10	0.15	0.20
A2	1.35	1.45	1.55
A3	0.60	0.70	0.80
b	0.30	0.40	0.50
c	0.17	0.20	0.25
D	4.80	4.90	5.00
E	5.80	6.00	6.20
E1	3.80	3.90	4.00
e	1.27BSC		
L	0.50	0.60	0.70
L1	1.05REF		
θ	0°	4°	8°

DIP-8
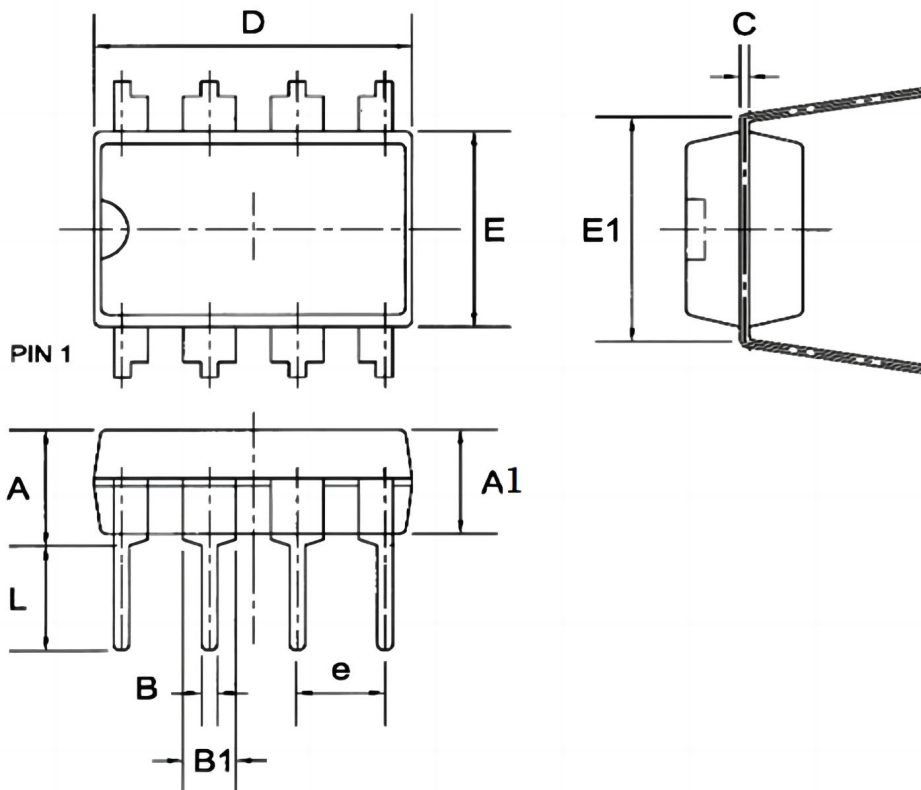
Symbol	Dimensions in Millimeters		
	Min	Nom	Max
A	--	--	4.31
A1	3.15	3.30	3.65
B	0.38	0.46	0.51
B1	1.27	1.55	1.77
C	0.20	0.25	0.30
D	8.95	9.40	9.45
E	6.15	6.20	6.65
E1	--	7.60	--
e	--	2.54	--
L	3.00	3.30	3.60

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