



UA741

GENERAL PURPOSE SINGLE OPERATIONAL AMPLIFIER

- LARGE INPUT VOLTAGE RANGE
- NO LATCH-UP
- HIGH GAIN
- SHORT-CIRCUIT PROTECTION
- NO FREQUENCY COMPENSATION REQUIRED
- SAME PIN CONFIGURATION AS THE UA709

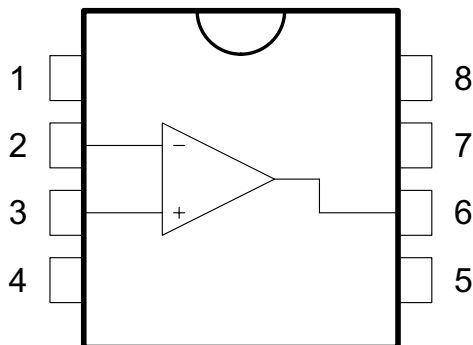
DESCRIPTION

The UA741 is a high performance monolithic operational amplifier constructed on a single silicon chip. It is intended for a wide range of analog applications.

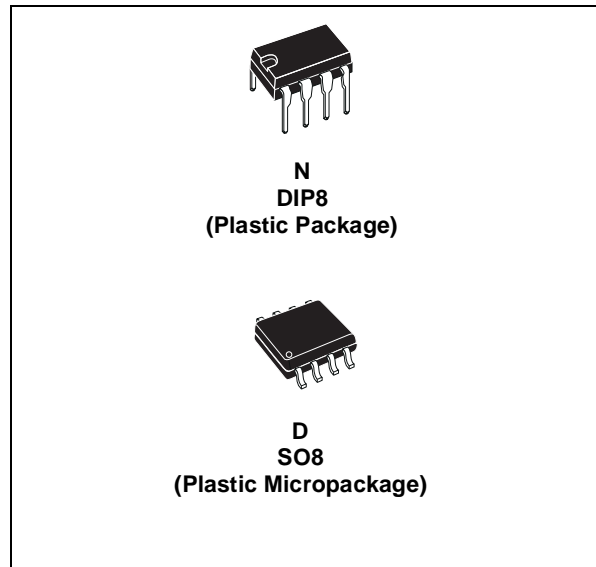
- Summing amplifier
- Voltage follower
- Integrator
- Active filter
- Function generator

The high gain and wide range of operating voltages provide superior performances in integrator, summing amplifier and general feedback applications. The internal compensation network (6dB/octave) insures stability in closed loop circuits.

PIN CONNECTIONS (top view)



- 1 - Offset null 1
- 2 - Inverting input
- 3 - Non-inverting input
- 4 - V_{CC}^-
- 5 - Offset null 2
- 6 - Output
- 7 - V_{CC}^+
- 8 - N.C.



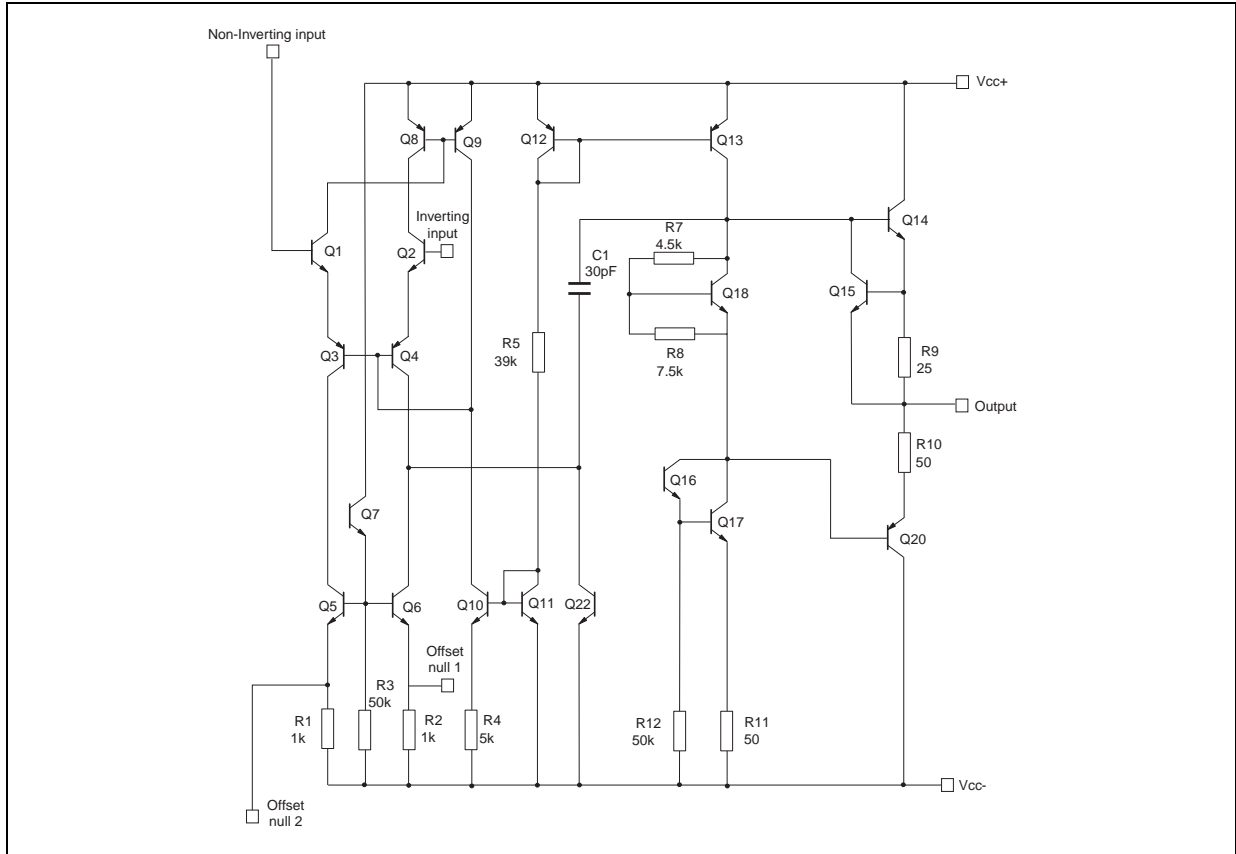
ORDER CODE

| Part Number | Temperature Range | Package | |
|-------------|-------------------|---------|---|
| | | N | D |
| UA741C | 0°C, +70°C | • | • |
| UA741I | -40°C, +105°C | • | • |
| UA741M | -55°C, +125°C | • | • |

Example : UA741CN

N = Dual in Line Package (DIP)
D = Small Outline Package (SO) - also available in Tape & Reel (DT)

SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

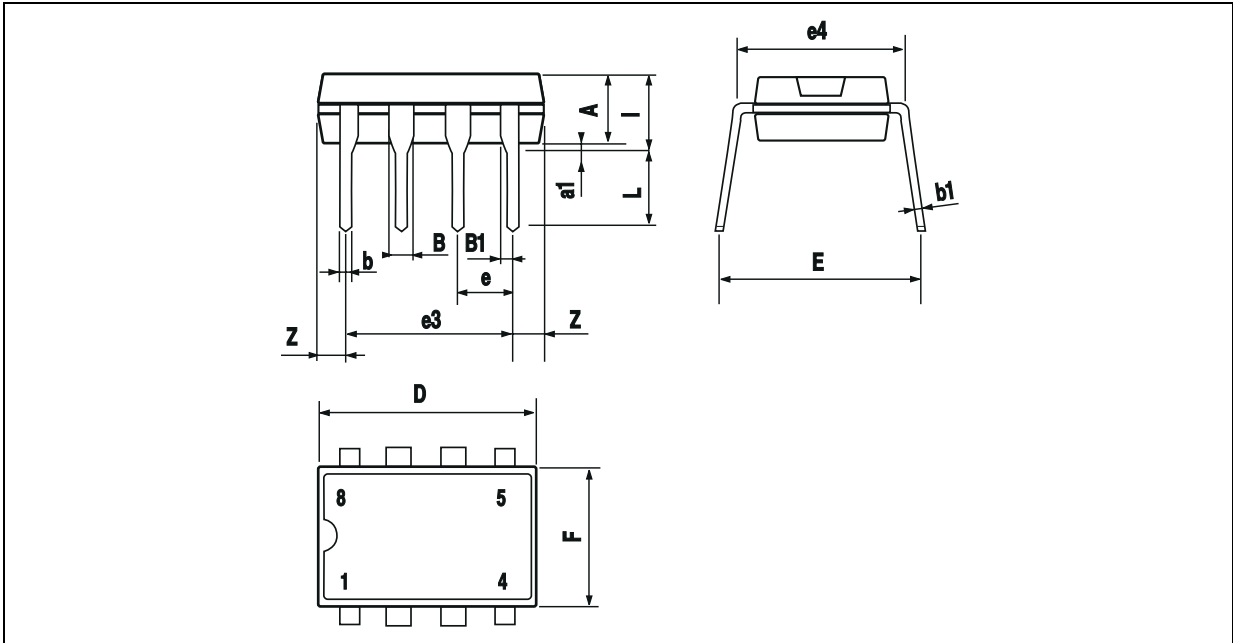
| Symbol | Parameter | UA741M | UA741I | UA741C | Unit |
|------------|--------------------------------------|-------------|-------------|----------|------|
| V_{CC} | Supply voltage | ±22 | | | V |
| V_{id} | Differential Input Voltage | ±30 | | | V |
| V_i | Input Voltage | ±15 | | | V |
| P_{tot} | Power Dissipation ¹⁾ | 500 | | | mW |
| | Output Short-circuit Duration | Infinite | | | |
| T_{oper} | Operating Free-air Temperature Range | -55 to +125 | -40 to +105 | 0 to +70 | °C |
| T_{stg} | Storage Temperature Range | -65 to +150 | | | °C |

1. Power dissipation must be considered to ensure maximum junction temperature (T_j) is not exceeded.

ELECTRICAL CHARACTERISTICS $V_{CC} = \pm 15V$, $T_{amb} = +25^{\circ}C$ (unless otherwise specified)

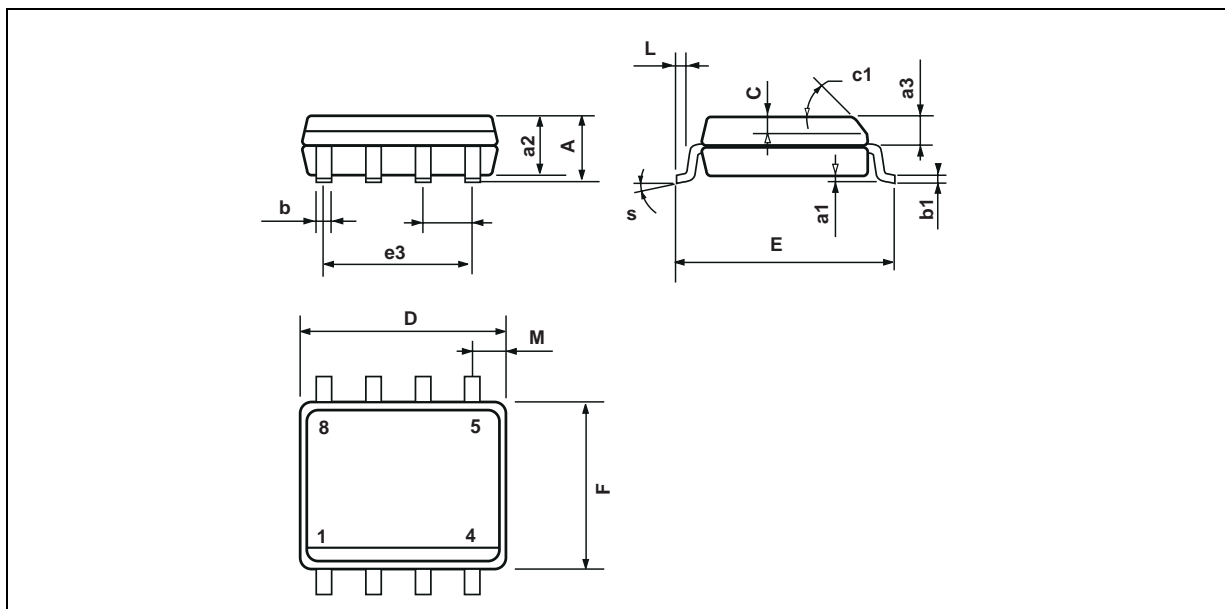
| Symbol | Parameter | Min. | Typ. | Max. | Unit |
|---------------|--|----------------------|------|------------|------------------------|
| V_{io} | Input Offset Voltage ($R_s \leq 10k\Omega$) $T_{amb} = +25^{\circ}C$ $T_{min} \leq T_{amb} \leq T_{max}$ | | 1 | 5 6 | mV |
| I_{io} | Input Offset Current $T_{amb} = +25^{\circ}C$ $T_{min} \leq T_{amb} \leq T_{max}$ | | 2 | 30 70 | nA |
| I_{ib} | Input Bias Current $T_{amb} = +25^{\circ}C$ $T_{min} \leq T_{amb} \leq T_{max}$ | | 10 | 100 200 | nA |
| A_{vd} | Large Signal Voltage Gain ($V_o = \pm 10V$, $R_L = 2k\Omega$) $T_{amb} = +25^{\circ}C$ $T_{min} \leq T_{amb} \leq T_{max}$ | 50 25 | 200 | | V/mV |
| SVR | Supply Voltage Rejection Ratio ($R_s \leq 10k\Omega$) $T_{amb} = +25^{\circ}C$ $T_{min} \leq T_{amb} \leq T_{max}$ | 77 77 | 90 | | dB |
| I_{CC} | Supply Current, no load $T_{amb} = +25^{\circ}C$ $T_{min} \leq T_{amb} \leq T_{max}$ | | 1.7 | 2.8 3.3 | mA |
| V_{icm} | Input Common Mode Voltage Range $T_{amb} = +25^{\circ}C$ $T_{min} \leq T_{amb} \leq T_{max}$ | ± 12 ± 12 | | | V |
| CMR | Common Mode Rejection Ratio ($R_s \leq 10k\Omega$) $T_{amb} = +25^{\circ}C$ $T_{min} \leq T_{amb} \leq T_{max}$ | 70 70 | 90 | | dB |
| I_{OS} | Output short Circuit Current | 10 | 25 | 40 | mA |
| $\pm V_{opp}$ | Output Voltage Swing $T_{amb} = +25^{\circ}C$ $T_{min} \leq T_{amb} \leq T_{max}$ | | | | V |
| | $R_L = 10k\Omega$ | 12 | 14 | | |
| | $R_L = 2k\Omega$ | 10 | 13 | | |
| | $R_L = 10k\Omega$ | 12 | | | |
| | $R_L = 2k\Omega$ | 10 | | | |
| SR | Slew Rate $V_i = \pm 10V$, $R_L = 2k\Omega$, $C_L = 100pF$, unity Gain | 0.25 | 0.5 | | V/ μs |
| t_r | Rise Time $V_i = \pm 20mV$, $R_L = 2k\Omega$, $C_L = 100pF$, unity Gain | | 0.3 | | μs |
| K_{ov} | Overshoot $V_i = 20mV$, $R_L = 2k\Omega$, $C_L = 100pF$, unity Gain | | 5 | | % |
| R_i | Input Resistance | 0.3 | 2 | | M Ω |
| GBP | Gain Bandwidth Product $V_i = 10mV$, $R_L = 2k\Omega$, $C_L = 100pF$, $f = 100kHz$ | 0.7 | 1 | | MHz |
| THD | Total Harmonic Distortion $f = 1kHz$, $A_v = 20dB$, $R_L = 2k\Omega$, $V_o = 2V_{pp}$, $C_L = 100pF$, $T_{amb} = +25^{\circ}C$ | | 0.06 | | % |
| e_n | Equivalent Input Noise Voltage $f = 1kHz$, $R_s = 100\Omega$ | | 23 | | $\frac{nV}{\sqrt{Hz}}$ |
| ϕ_m | Phase Margin | | 50 | | Degrees |

PACKAGE MECHANICAL DATA
8 PINS - PLASTIC DIP



| Dim. | Millimeters | | | Inches | | |
|------|-------------|------|-------|--------|-------|-------|
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | | 3.32 | | | 0.131 | |
| a1 | 0.51 | | | 0.020 | | |
| B | 1.15 | | 1.65 | 0.045 | | 0.065 |
| b | 0.356 | | 0.55 | 0.014 | | 0.022 |
| b1 | 0.204 | | 0.304 | 0.008 | | 0.012 |
| D | | | 10.92 | | | 0.430 |
| E | 7.95 | | 9.75 | 0.313 | | 0.384 |
| e | | 2.54 | | | 0.100 | |
| e3 | | 7.62 | | | 0.300 | |
| e4 | | 7.62 | | | 0.300 | |
| F | | | 6.6 | | | 0.260 |
| i | | | 5.08 | | | 0.200 |
| L | 3.18 | | 3.81 | 0.125 | | 0.150 |
| Z | | | 1.52 | | | 0.060 |

PACKAGE MECHANICAL DATA
8 PINS - PLASTIC MICROPACKAGE (SO)



| Dim. | Millimeters | | | Inches | | |
|------|-------------|------|------|--------|-------|-------|
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | | | 1.75 | | | 0.069 |
| a1 | 0.1 | | 0.25 | 0.004 | | 0.010 |
| a2 | | | 1.65 | | | 0.065 |
| a3 | 0.65 | | 0.85 | 0.026 | | 0.033 |
| b | 0.35 | | 0.48 | 0.014 | | 0.019 |
| b1 | 0.19 | | 0.25 | 0.007 | | 0.010 |
| C | 0.25 | | 0.5 | 0.010 | | 0.020 |
| c1 | 45° (typ.) | | | | | |
| D | 4.8 | | 5.0 | 0.189 | | 0.197 |
| E | 5.8 | | 6.2 | 0.228 | | 0.244 |
| e | | 1.27 | | | 0.050 | |
| e3 | | 3.81 | | | 0.150 | |
| F | 3.8 | | 4.0 | 0.150 | | 0.157 |
| L | 0.4 | | 1.27 | 0.016 | | 0.050 |
| M | | | 0.6 | | | 0.024 |
| S | 8° (max.) | | | | | |

Information furnished is believed to be accurate and reliable. However, STMicroelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of STMicroelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. STMicroelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of STMicroelectronics.

© The ST logo is a registered trademark of STMicroelectronics

© 2001 STMicroelectronics - Printed in Italy - All Rights Reserved
 STMicroelectronics GROUP OF COMPANIES

Australia - Brazil - Canada - China - Finland - France - Germany - Hong Kong - India - Israel - Italy - Japan - Malaysia
 Malta - Morocco - Singapore - Spain - Sweden - Switzerland - United Kingdom - United States

© <http://www.st.com>

