FAIRCHILD

A Schlumberger Company

μA741AQB Operational Amplifier

MIL-STD-883
July 1986 — Rev 2[5]

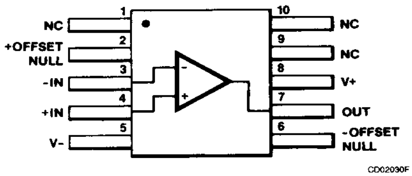
Aerospace and Defense Data Sheet
Linear Products

Description

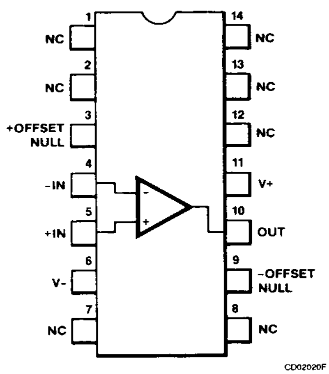
The μA741AQB is a high performance monolithic operational amplifier constructed using the Fairchild Planar Epitaxial process. It is intended for a wide range of analog applications. High common mode voltage range and absence of latch-up tendencies make the μA741AQB ideal for use as a voltage follower. The high gain and wide range of operating voltage provide superior performance in integrator, summing amplifier, and general feedback applications.[6]

- **No Frequency Compensation Required**
- **Short Circuit Protection**
- **Offset Voltage Null Capability**
- **Large Common Mode And Differential Voltage Ranges**
- **Low Power Consumption**
- **No Latch-Up**

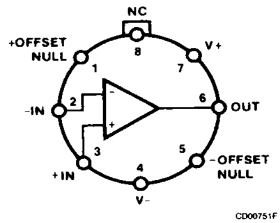
Connection Diagram
10-Lead Flatpak
(Top View)



Connection Diagram
14-Lead DIP
(Top View)

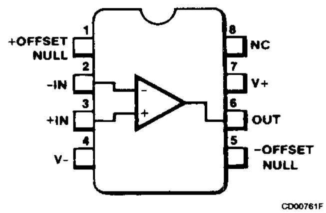


Connection Diagram
8-Lead Can
(Top View)



Lead 4 connected to case.

Connection Diagram
8-Lead DIP
(Top View)



Order Information

Part No.	Case/ Finish	Package Code Mil-M-38510, Appendix C
μA741ADMQB	CA	D-1 14-Lead DIP
μA741AHMQB	GC	A-1 8-Lead Can
μA741AFMQB	HA	F-4 10-Lead Flatpak
μA741ARMQB	PA	D-4 8-Lead DIP

JAN Product Available

10101	BCA	D-1 14-Lead DIP
10101	BCB	D-1 14-Lead DIP
10101	BGA	A-1 8-Lead Can
10101	BGC	A-1 8-Lead Can
10101	BHA	F-4 10-Lead Flatpak
10101	BHB	F-4 10-Lead Flatpak
10101	BPA	D-4 8-Lead DIP
10101	BPB	D-4 8-Lead DIP

Absolute Maximum Ratings

Storage Temperature Range	−65°C to +175°C
Operating Temperature Range	−55°C to +125°C
Lead Temperature (soldering, 60 s)	300°C
Internal Power Dissipation[11]	
Can and Flatpak	330 mW
DIP	400 mW
Supply Voltage	±22 V
Differential Input Voltage	±30 V
Input Voltage[12]	±20 V
Short Circuit Duration[13]	Indefinite

Notes

1. 100% Test and Group A
2. Group A
3. Periodic tests, Group C
4. Guaranteed but not tested
5. When changes occur, FSC will make data sheet revisions available. Contact local sales representative for the latest revision.
6. For more information on device function, refer to the Fairchild Linear Data Book Commercial Section.
7. Z_I is guaranteed by I_{IB}: $Z_I = 4.0\ V_T/I_{IB}$, $V_T = 26$ mV at 25°C, 34 mV at 125°C and 19 mV at −55°C.
8. P_c is guaranteed by I_{CC}: $P_c = 40\ I_{CC}$.
9. V_{IR} is guaranteed by the CMR test.
10. BW is guaranteed by t_r: $BW = 0.35/t_r$.
11. Rating applies to ambient temperatures up to 125°C. Above 125°C ambient, derate linearly at 150°C/W for the Can and Flatpak and 120°C/W for the DIP.
12. For supply voltages less than ±20 V, the absolute maximum input voltage is equal to the supply voltage.
13. Short circuit may be to ground or either supply. Rating applies to 125°C case temperature or 75°C ambient temperature.

Processing: MIL-STD-883, Method 5004

Burn-In: Method 1015, Condition A, PDA calculated using Method 5005, Subgroup 1

Quality Conformance Inspection: MIL-STD-883, Method 5005

Group A Electrical Tests Subgroups:

1. Static tests at 25°C
2. Static tests at 125°C
3. Static tests at −55°C
4. Dynamic tests at 25°C
5. Dynamic tests at 125°C
6. Dynamic tests at −55°C
9. AC tests at 25°C
10. AC tests at 125°C
11. AC tests at −55°C

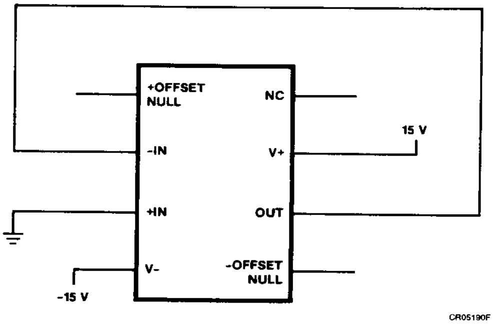
Group C and D Endpoints: Group A, Subgroup 1

μA741AQB
Electrical Characteristics $V_{CC} = \pm 15$ V, unless otherwise specified.

Symbol	Characteristic	Condition	Min	Max	Unit	Note	Subgrp
V_{IO}	Input Offset Voltage	$R_S = 50\ \Omega$, $V_{CM} = 0$ V		3.0	mV	1	1
				4.0	mV	1	2,3
$\Delta V_{IO}/\Delta T$	Input Offset Voltage Temperature Sensitivity	$25°C \leq T_A \leq 125°C$		15	μV/°C	4	2
		$-55°C \leq T_A \leq +25°C$		15	μV/°C	4	3
$V_{IO\ adj}$	Input Offset Voltage Adjustment Range	$V_{CC} = \pm 20$ V	5.0		mV	1	1,2,3
I_{IO}	Input Offset Current	$V_{CM} = 0$ V		30	nA	1	1
				70	nA	1	2,3
$\Delta I_{IO}/\Delta T$	Input Offset Current Temperature Sensitivity	$25°C \leq T_A \leq 125°C$		0.5	nA/°C	4	2
		$-55°C \leq T_A \leq +25°C$		0.5	nA/°C	4	3
I_{IB}	Input Bias Current	$V_{CM} = 0$ V		80	nA	1	1
				210	nA	1	2,3
Z_I	Input Impedance[7]		1.0		MΩ	1	1
			0.5		MΩ	1	2
I_{CC}	Supply Current	$V_{CC} = \pm 20$ V		3.750	mA	1	1
				3.375	mA	1	2
				4.125	mA	1	3
P_c	Power Consumption[8]	$V_{CC} = \pm 20$ V		150	mW	1	1
				135	mW	1	2
				165	mW	1	3
CMR	Common Mode Rejection	$V_{CC} = \pm 20$ V, $V_{CM} = \pm 15$ V, $R_S = 50\ \Omega$	80		dB	1	1,2,3
V_{IR}	Input Voltage Range[9]	$V_{CC} = \pm 20$ V	±15		V	1	1,2,3
PSRR	Power Supply Rejection Ratio	V+ = 10 V, V− = −20 V to V+ = 20 V, V− = −10 V, $R_S = 50\ \Omega$		50	μV/V	1	1
				100	μV/V	1	2,3
I_{OS}	Output Short Circuit Current			60	mA	1	1,2,3
A_{VS}	Large Signal Voltage Gain	$V_{CC} = \pm 20$ V, $V_O = \pm 15$ V, $R_L = 2.0$ kΩ	50		V/mV	1	4
			32		V/mV	1	5,6
		$V_{CC} = \pm 5.0$ V, $V_O = \pm 2.0$ V, $R_L = 2.0$ kΩ	10		V/mV	1	4,5,6
V_{OP}	Output Voltage Swing	$V_{CC} = \pm 20$ V, $R_L = 10$ kΩ	±16		V	1	4,5,6
		$V_{CC} = \pm 20$ V, $R_L = 2.0$ kΩ	±15		V	1	4,5,6
$TR(t_r)$	Transient Response: Rise Time	$V_{CC} = \pm 20$ V, $V_I = 50$ mV, $R_L = 2.0$ kΩ, $C_L = 100$ pF, $A_V = 1.0$		800	ns	3	9, 10, 11
$TR(o_s)$	Transient Response: Overshoot			25	%	3	9, 10, 11
BW	Bandwidth[10]		0.437		MHz	3	9, 10, 11
SR	Slew Rate	$V_{CC} = \pm 20$ V, $R_L = 2.0$ kΩ, $A_V = 1.0$	0.3		V/μs	3	9, 10, 11
N_I (BB)	Noise Broadband	$V_{CC} = \pm 20$ V, BW = 5.0 kHz		15	μV_{rms}	4	9
N_I (PC)	Noise Popcorn	$V_{CC} = \pm 20$ V, BW = 5.0 kHz		40	μV_{pk}	4	9

14

Primary Burn-In Circuit
(38510/10101 may be used by FSC as an alternate)



Equivalent Circuit