FAIRCHILD

A Schlumberger Company

MIL-STD-883
July 1986—Rev 1[5]

μA4136QB Quad Operational Amplifier

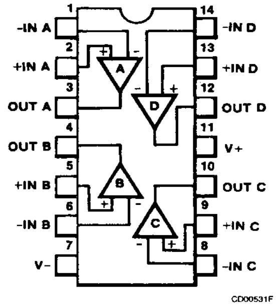
Aerospace and Defense Data Sheet
Linear Products

Description

The μA4136QB Monolithic Quad Operational Amplifier consists of four independent high gain, internal frequency-compensated operational amplifiers. It is constructed using the Fairchild Planar Epitaxial process. The specifically designed low noise input transistors allow the μA4136QB to be used in low noise signal processing applications such as audio preamplifiers and signal conditioners. The simplified output stage completely eliminates crossover distortion under any load conditions, has large source and sink capacity, and is short circuit protected. A novel current source stabilizes output parameters over a wide power supply voltage range.[6]

- **High Unity Gain Bandwidth**
- **Continuous Short Circuit Protection**
- **No Frequency Compensation Required**
- **No Latch-Up**
- **Large Common Mode And Differential Voltage Ranges**
- **μA741QB Operational Amplifier Type Performance**
- **Parameter Tracking Over Temperature Range**
- **Gain And Phase Match Between Amplifiers**

Connection Diagram
14-Lead DIP
(Top View)



Order Information

Part No.	Case/ Finish	Package Code Mil-M-38510, Appendix C
μA4136DMQB	CA	D-1 14-Lead DIP

JAN Product Available

11004	BCA	D-1 14-Lead DIP
11004	BCB	D-1 14-Lead DIP

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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[10]	
DIP	400 mW
Supply Voltage	±22 V
Differential Input Voltage[11]	±30 V
Input Voltage[12]	±20 V
Input Current	10 mA
Short Circuit Duration[13]	Indefinite

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

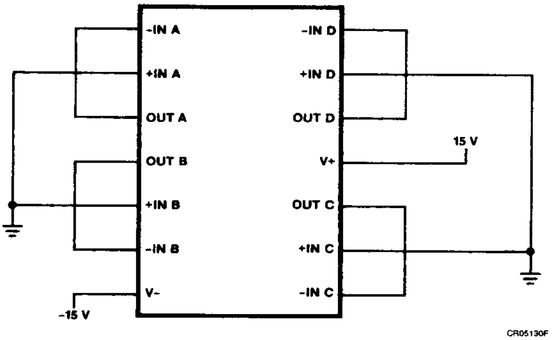
Notes

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}: $Z_I = 2.0\ V_T/I_{IB}$, $V_T = 26$ mV at 25°C, 34 mV at 125°C, and 19 mV at −55°C.
8. P_c is guaranteed by I_{CC}: $P_c = 30\ I_{CC}$.
9. V_{IR} is guaranteed by the CMR test.
10. Rating applies to ambient temperatures up to 125°C. Above 125°C ambient, derate linearly at 120°C/W.
11. The differential input voltage shall not exceed the supply voltage.
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. No more than one amplifier should be shorted simultaneously as the maximum junction temperature will be exceeded.

μA4136QB
Electrical Characteristics $V_{CC} = \pm 15$ V, unless otherwise specified.

Symbol	Characteristic		Condition	Min	Max	Unit	Note	Subgrp
V_{IO}	Input Offset Voltage		$R_S = 10$ kΩ, $V_{CM} = 0$ V		5.0	mV	1	1
					6.0	mV	1	2,3
$\Delta V_{IO}/\Delta T$	Input Offset Voltage Temperature Sensitivity		$25°C \leq T_A \leq 125°C$		25	μV/°C	4	2
			$-55°C \leq T_A \leq +25°C$		25	μV/°C	4	3
I_{IO}	Input Offset Current		$V_{CM} = 0$ V		200	nA	1	1
					500	nA	1	2,3
$\Delta I_{IO}/\Delta T$	Input Offset Current Temperature Sensitivity		$25°C \leq T_A \leq 125°C$		500	pA/°C	4	2
			$-55°C \leq T_A \leq +25°C$		1000	pA/°C	4	3
I_{IB}	Input Bias Current		$V_{CM} = 0$ V		340	nA	1	1
					1500	nA	1	2,3
Z_I	Input Impedance[7]			0.15		MΩ	1	1
I_{CC}	Supply Current (Total)				11.3	mA	1	1
					10	mA	1	2
					13.3	mA	1	3
P_c	Power Consumption (Total)[8]				340	mW	1	1
					300	mW	1	2
					400	mW	1	3
CMR	Common Mode Rejection		$V_{CM} = \pm 12$ V, $R_S = 10$ kΩ	70		dB	1	1,2,3
V_{IR}	Input Voltage Range[9]			±12		V	1	1,2,3
PSRR	Power Supply Rejection Ratio		$\pm 5.0\ V \leq V_{CC} \leq \pm 22$ V, $R_S = 10$ kΩ		150	μV/V	1	1,2,3
I_{OS}	Output Short Circuit Current				80	mA	1	1,2,3
A_{VS}	Large Signal Voltage Gain		$V_O = \pm 10$ V, $R_L = 2.0$ kΩ	50		V/mV	1	4
				25		V/mV	1	5,6
V_{OP}	Output Voltage Swing		$R_L = 10$ kΩ	±12		V	1	4,5,6
			$R_L = 2.0$ kΩ	±10		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, $A_V = 1.0$		0.3	μs	3	9, 10, 11
$TR(o_s)$		Overshoot			50	%	3	9, 10, 11
SR	Slew Rate		$V_{CC} = \pm 20$ V, $R_L = 2.0$ kΩ, $A_V = 1.0$	0.6		V/μs	3	9, 10, 11
CS	Channel Separation		$V_{CC} = \pm 20$ V	80		dB	4	9
N_I (BB)	Noise Broadband		$V_{CC} = \pm 20$ V		5.0	μV_{rms}	4	9
N_I (PC)	Noise Popcorn		$V_{CC} = \pm 20$ V		50	μV_{pk}	4	9

Primary Burn-In Circuit
(38510/11004 may be used by FSC as an alternate)



Equivalent Circuit (1/4 of circuit)