FAIRCHILD

A Schlumberger Company

MIL-STD-883
July 1986—Rev 2[5]

μA108AQB Super Beta Operational Amplifier

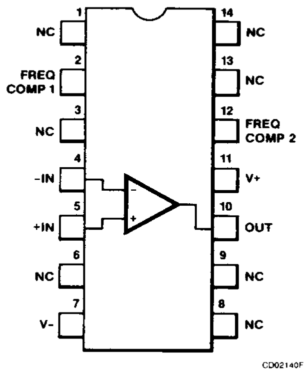
Aerospace and Defense Data Sheet
Linear Products

Description

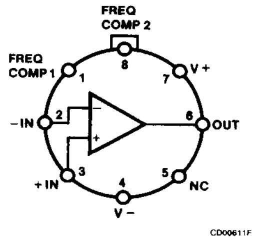
The μA108AQB Super Beta Operational Amplifier is constructed using the Fairchild Planar Epitaxial process. High input impedance, low noise, low input offsets, and low temperature drifts are made possible through use of super beta processing, making the device suitable for applications requiring high accuracy and low drift performance. The μA108AQB is specially selected for extremely low offset voltage and drift, and high common mode rejection, giving superior performance in applications where offset nulling is undesirable. Increased slew rate without performance compromise is available through use of feedforward compensation techniques, maximizing performance in high speed sample-and-hold circuits and precision high speed summing amplifiers. The wide supply range and excellent supply voltage rejection assure maximum flexibility in voltage follower, summing, and general feedback applications.[6]

- **Guaranteed Low Input Offset Characteristics**
- **High Input Impedance**
- **Low Offset Current**
- **Low Bias Current**
- **Operation Over Wide Supply Range**

Connection Diagram
14-Lead DIP
(Top View)

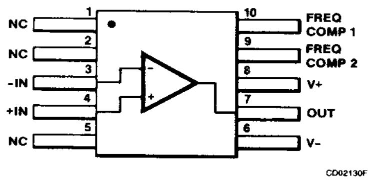


Connection Diagram
8-Lead Can
(Top View)



Lead 4 connected to case.

Connection Diagram
10-Lead Flatpak
(Top View)



Order Information

Part No.	Case/ Finish	Package Code Mil-M-38510, Appendix C
μA108ADMQB	CA	D-1 14-Lead DIP
μA108AHMQB	GC	A-1 8-Lead Can
μA108AFMQB	HA	F-4 10-Lead Flatpak

JAN Product Available

10104	BCA	D-1 14-Lead DIP
10104	BCC	D-1 14-Lead DIP
10104	BGA	A-1 8-Lead Can
10104	BGC	A-1 8-Lead Can
10104	BHA	F-4 10-Lead Flatpak
10104	BHB	F-4 10-Lead Flatpak

14

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[9]	
Can and Flatpak	330 mW
DIP	400 mW
Supply Voltage	±22 V
Differential Input Voltage	±5.0 V
Input Voltage[10]	±20 V
Short Circuit Duration[11]	Indefinite
Differential Input Current[12]	±10 mA

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}: $Z_I = 2[(V_T/I_{IB}) + 1001R_E(10^{-6})]$, $V_T = 26$ mV at 25°C, $R_E = 1700\ \Omega$.
8. V_{IR} is guaranteed by the CMR test.
9. 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.
10. For supply voltages less than ±20 V, the absolute maximum input voltage is equal to the supply voltage.
11. Short circuit may be to ground or either supply. Rating applies to 125°C case temperature or 75°C ambient temperature.
12. The inputs are shunted with back-to-back diodes for overvoltage protection. Therefore, excessive current will flow if a differential input voltage in excess of 1.0 V is applied between the inputs unless adequate limiting resistance is used.

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:

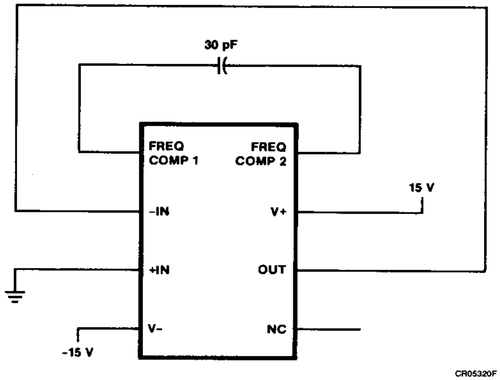
1. Static tests at 25°C
2. Static tests at 125°C
3. Static tests at −55°C
4. Dynamic tests at 25°C
5. Dynamic tests at 125°C
6. Dynamic tests at −55°C
9. AC tests at 25°C
10. AC tests at 125°C
11. AC tests at −55°C

Group C and D Endpoints: Group A, Subgroup 1

μA108AQB
Electrical Characteristics $\pm 5.0\ V \leq V_{CC} \leq \pm 20V$, unless otherwise specified.

Symbol	Characteristic		Condition	Min	Max	Unit	Note	Subgrp
V_{IO}	Input Offset Voltage		$R_S = 50\ \Omega$, $V_{CM} = 0\ V$		0.5	mV	1	1
					1.0	mV	1	2,3
$\Delta V_{IO}/\Delta T$	Input Offset Voltage Temperature Sensitivity		$25°C \leq T_A \leq 125°C$		5.0	μV/°C	4	2
			$-55°C \leq T_A \leq +25°C$		5.0	μV/°C	4	3
I_{IO}	Input Offset Current		$V_{CM} = 0\ V$		0.2	nA	1	1
					0.4	nA	1	2,3
$\Delta I_{IO}/\Delta T$	Input Offset Current Temperature Sensitivity		$25°C \leq T_A \leq 125°C$		2.5	pA/°C	4	2
			$-55°C \leq T_A \leq +25°C$		5.0	pA/°C	4	3
I_{IB}	Input Bias Current		$V_{CM} = 0\ V$		1.9	nA	1	1
					3.0	nA	1	2,3
Z_I	Input Impedance[7]			30		MΩ	1	1
I_{CC}	Supply Current		$V_{CC} = \pm 20\ V$		0.6	mA	1	1,2
					0.8	mA	1	3
CMR	Common Mode Rejection		$V_{CC} = \pm 15\ V$, $V_{CM} = \pm 13.5\ V$, $R_S = 50\ \Omega$	96		dB	1	1,2,3
V_{IR}	Input Voltage Range[8]		$V_{CC} = \pm 15\ V$	±13.5		V	1	1,2,3
PSRR	Power Supply Rejection Ratio		$\pm 5.0\ V \leq V_{CC} \leq \pm 20\ V$, $R_S = 50\ \Omega$		16	μV/V	1	1,2,3
I_{OS}	Output Short Circuit Current		$V_{CC} = \pm 15\ V$		15	mA	3	1,2,3
A_{VS}	Large Signal Voltage Gain		$V_{CC} = \pm 15\ V$, $V_O = \pm 10\ V$, $R_L = 10\ k\Omega$	80		V/mV	1	4
				40		V/mV	1	5,6
V_{OP}	Output Voltage Swing		$V_{CC} = \pm 15\ V$, $R_L = 10\ k\Omega$	±13		V	1	4,5,6
$TR(t_r)$	Transient Response	Rise Time	$V_{CC} = \pm 20\ V$, $V_I = 50\ mV$, $R_L = 2.0\ k\Omega$, $C_L = 100\ pF$, $A_V = 1.0$		1000	ns	3	9, 10, 11
$TR(o_s)$		Overshoot			50	%	3	9, 10, 11
SR	Slew Rate		$V_{CC} = \pm 20\ V$, $R_L = 2.0\ k\Omega$, $A_V = 1.0$	0.05		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

Primary Burn-In Circuit
(38510/10104 may be used by FSC as an alternate)



Equivalent Circuit