FAIRCHILD
A Schlumberger Company

MIL-STD-883
July 1986—Rev 2[5]

μA710QB High Speed Differential Comparator

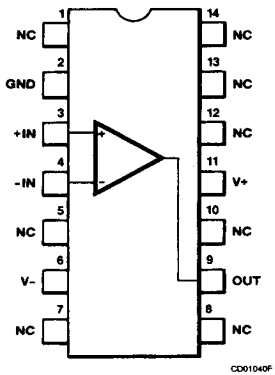
Aerospace and Defense Data Sheet
Linear Products

Description

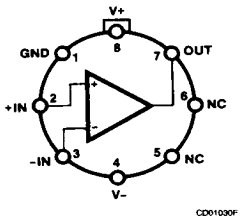
The μA710QB is a differential voltage comparator intended for applications requiring high accuracy and fast response times. It is constructed on a single silicon chip using the Fairchild Planar Epitaxial process. The device is useful as a variable threshold Schmitt trigger, a pulse-height discriminator, a voltage comparator in high speed A/D converters, a memory sense amplifier or a high noise immunity line receiver. The output of the comparator is compatible with all integrated logic forms.[6]

- **Low Offset Voltage**
- **Low Offset Current**
- **High Voltage Gain**
- **Low Offset Voltage Drift**

Connection Diagram 14-Lead DIP (Top View)

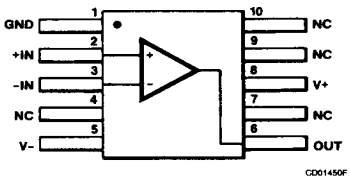


Connection Diagram 8-Lead Can (Top View)



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
μA710DMQB	CA	D-1 (14-Lead DIP)
μA710HMQB	GC	A-1 (8-Lead Can)
μA710FMQB	HA	F-4 (10-Lead Flatpak)
JAN Product Available		
10301	BCA	D-1 (14-Lead DIP)
10301	BCB	D-1 (14-Lead DIP)
10301	BGA	A-1 (8-Lead Can)
10301	BGC	A-1 (8-Lead Can)
10301	BHA	F-4 (10-Lead Flatpak)
10301	BHB	F-4 (10-Lead Flatpak)

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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[9]	
Can and Flatpak	330 mW
DIP	400 mW
Positive Supply Voltage	14 V
Negative Supply Voltage	−7 V
Peak Output Current	10 mA
Differential Input Voltage	±5 V
Input Voltage	±7 V
Short Circuit Duration	10 s

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. P_C is guaranteed by I+, I−: P_C=(12) (I+) + (6) (I−).
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.

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

Group C and D Endpoints: Group A, Subgroup 1

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μA710QB
Electrical Characteristics V+ = 12 V, V− = −6 V, unless otherwise specified.

Symbol	Characteristic	Condition		Min	Max	Unit	Note	Subgrp
V_{IO}	Input Offset Voltage	50 Ω ≤ R_S ≤ 200 Ω, V_{CM} = 0 V	V_O = 1.4 V		2.0	mV	1	1
			V_O = 1.0 V		3.0	mV	1	2
			V_O = 1.8 V		3.0	mV	1	3
$\Delta V_{IO}/\Delta T$	Input Offset Voltage Temperature Coefficient	25°C ≤ T_A ≤ 125°C			10	μV/°C	4	2
		−55°C ≤ T_A ≤ 25°C			10	μV/°C	4	3
I_{IO}	Input Offset Current	V_{CM} = 0 V	V_O = 1.4 V		3.0	μA	1	1
			V_O = 1.0 V		3.0	μA	1	2
			V_O = 1.8 V		7.0	μA	1	3
$\Delta I_{IO}/\Delta T$	Input Offset Current Temperature Coefficient	25°C ≤ T_A ≤ 125°C			25	nA/°C	4	2
		−55°C ≤ T_A ≤ 25°C			75	nA/°C	4	3
I_{IB}	Input Bias Current	V_{CM} = 0 V			20	μA	1	1
					45	μA	1	2,3
I+	Positive Supply Current	V_O = 0 V, V_{I-} = 10 mV			9.0	mA	1	1,2,3
I−	Negative Supply Current	V_O = 0 V, V_{I-} = 10 mV		−7.0		mA	1	1,2,3
P_C	Power Consumption	V_O = 0 V, V_{I-} = 10 mV			150	mW	7	1,2,3
CMR	Common Mode Rejection	V− = −7.0 V, V_{CM} = ±5.0 V, R_S = 200 Ω		80		dB	1	1,2,3
V_{IR}	Input Voltage Range	V− = −7.0 V		±5.0		V	8	1,2,3
V_{OH}	Output Voltage HIGH	V_{I+} = 5.0 mV, 0 mA ≤ I_{OH} ≤ 5.0 mA		2.5	4.0	V	1	1,2,3
V_{OL}	Output Voltage LOW	V_{I-} = 5.0 mV, I_{OL} = 0 mA		−1.0	0	V	1	1,2,3
I_{OL}	Output Sink Current	V_{I-} = 5.0 mV, V_O = 0 V		2.0		mA	1	1
				0.5		mA	1	2
				1.0		mA	1	3
A_{VS}	Large Signal Voltage Gain			1250		V/V	1	4
				1000		V/V	1	5,6
t_{PLH}	Propagation Delay to High Level	C_L = 5.0 pF, 100 mV step, V_{OD} = 5.0 mV			60	ns	4	9
t_{PHL}	Propagation Delay to Low Level				60	ns	4	9

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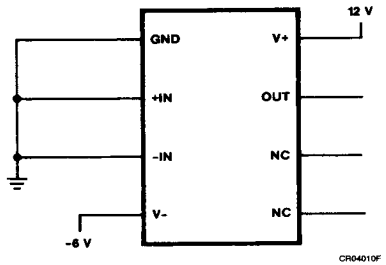
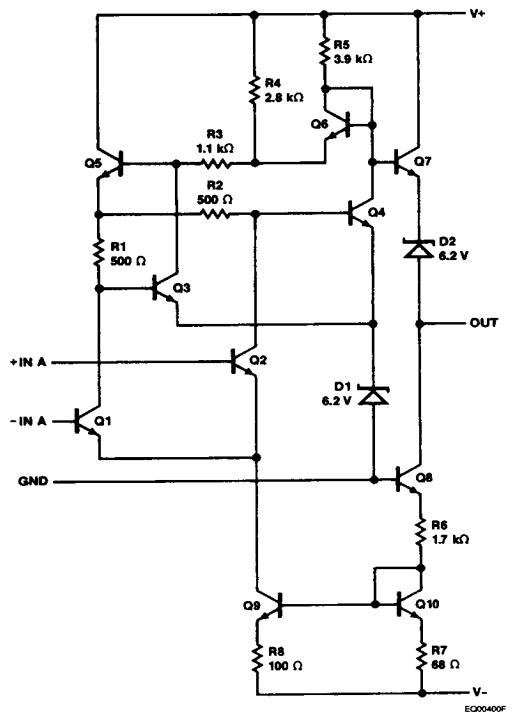
Primary Burn-In Circuit
(38510/10301 may be used by FSC as an alternate)



Equivalent Circuit



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