



Am7202-40/50/65/80

High Density First-in First-out (FIFO) 1024x9 CMOS Memory

DISTINCTIVE CHARACTERISTICS

- RAM based FIFO
- 1024x9 organization
- Cycle times of 50/65/80/100 nanoseconds
- Asynchronous and simultaneous writes and reads
- Low power consumption
 - 90 mA max, –50/65/80
 - 100 mA max, –40
- Status flags – full, half-full, empty
- Retransmit capability
- Expandable in both width and depth
- Increased noise immunity for $\overline{X1}$ - CMOS threshold
- Functional and pin compatible with industry standard devices

GENERAL DESCRIPTION

The Am7202 is a RAM-based CMOS FIFO that is 1024 words deep with 9-bit wide words. It is expandable to any width and/or depth to create much larger FIFOs.

This FIFO can accept data and output data asynchronously and simultaneously at data rates from 0 to 20 MHz. Status flags are provided to signify empty, full, and half-full conditions. The capability also exists to retransmit data from the FIFO.

High-density FIFOs such as the Am7202 are useful in a wide range of applications. The ability to buffer large transfers of data and the rate adaption capabilities make the Am7202 useful in communication, image processing, mass storage, DSP, and printing systems.

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BLOCK DIAGRAM

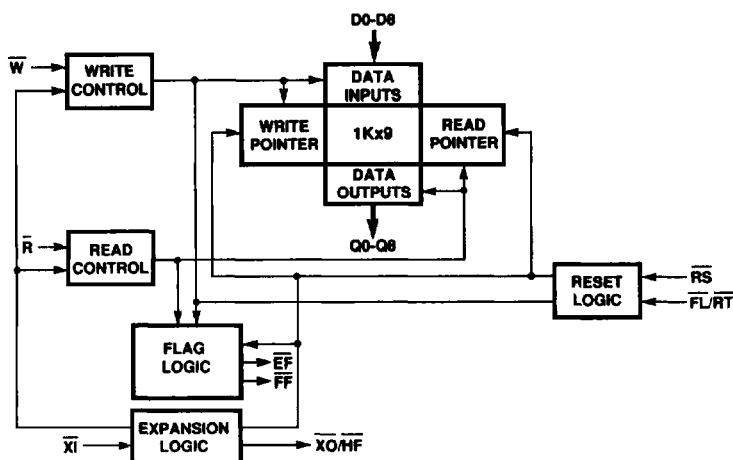
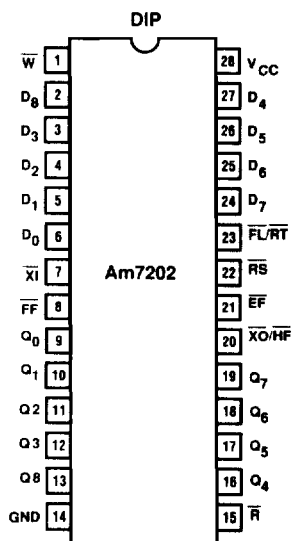


Figure 1.

This document contains information on a product under development at Advanced Micro Devices, Inc. The information is intended to help you to evaluate this product. AMD reserves the right to change or discontinue work on this proposed product without notice.

Publication #	Rev.	Amendment
10909	B	70
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CONNECTION DIAGRAMS



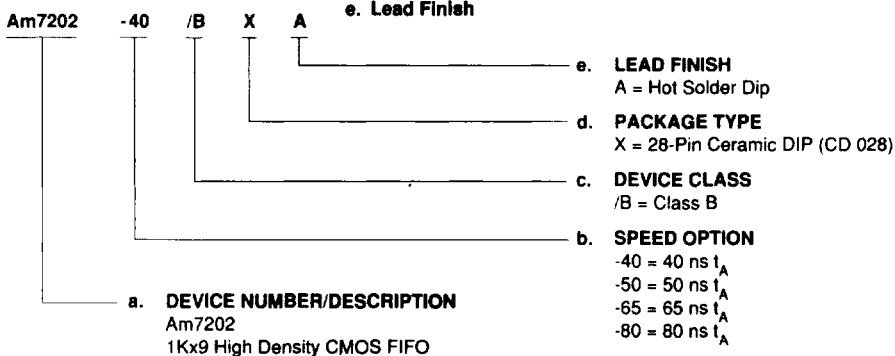
Pin Designations: \overline{W} = Write
 \overline{R} = Read
 \overline{RS} = Reset
 $\overline{FL/RT}$ = First Load/Retransmit
 D_x = Data In
 \overline{Q}_x = Data Out
 \overline{XI} = Expansion In
 $\overline{XO/HF}$ = Expansion Out/Half-Full Flag
 \overline{FF} = Full Flag
 \overline{EF} = Empty Flag
 V_{CC} = Supply Voltage
 GND = Ground

MILITARY ORDERING INFORMATION

APL Products

AMD products for Aerospace and Defense applications are available in several packages and operating ranges. APL (Approved Products List) products are fully compliant with MIL-STD-883C requirements. The order number (Valid Combination) for APL products is formed by a combination of:

- Device Number
- Speed Option (if applicable)
- Device Class
- Package Type
- Lead Finish



Valid Combinations	
Am7202-40	/BXA
Am7202-50	
Am7202-65	
Am7202-80	

Valid Combinations

Valid Combinations list configurations planned to be supported in volume for this device. Consult the local AMD sales office to confirm availability of specific valid combinations or to check for newly released valid combinations.

Group A Tests

Group A Tests consist of subgroups 1, 2, 3, 7, 8, 9, 10, 11.

MILITARY BURN-IN

Military burn-in is in accordance with the current revision of MIL-STD-883, Test Method 1015, Conditions A through E. Test conditions are selected at AMD's option.

ABSOLUTE MAXIMUM RATINGS

Supply voltage, V_{CC}	-0.5 V to + 7.0 V
Input voltage	-0.5 V to $V_{CC} + 0.5$ V
Operating temperature	-55°C to +125°C
Storage temperature	-65°C to + 150°C
Power dissipation	2.0 W
DC output current	50 mA

Stresses above those listed under ABSOLUTE MAXIMUM RATINGS may cause permanent device failure. Functionality at or above these limits is not implied. Exposure to absolute maximum ratings for extended periods may affect device reliability. Absolute maximum ratings are for system design reference; parameters given are not tested.

DC CHARACTERISTICS Military: $V_{CC} = 5 \text{ V} \pm 10\%$, $T_A^\dagger = -55^\circ\text{C to } +125^\circ\text{C}$

Parameter Symbol	Parameter Description	Am7202-40 $t_A = 40 \text{ ns}$		Am7202-50 $t_A = 50 \text{ ns}$		Am7202-65 $t_A = 65 \text{ ns}$		Am7202-80 $t_A = 80 \text{ ns}$		Unit
		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
I_{IL}	Input Leakage Current (any input) (Note 1)	-10	10	-10	10	-10	10	-10	10	μA
I_{IO}	Output Leakage Current (data outputs) (Note 2)	-10	10	-10	10	-10	10	-10	10	μA
V_{IH}	Input High Voltage (all inputs except \overline{XI}) (Note 3)	2.2	—	2.2	—	2.2	—	2.2	—	V
V_{IL}	Input Low Voltage (all inputs except \overline{XI}) (Note 3)	—	0.8	—	0.8	—	0.8	—	0.8	V
$V_{IH(XI)}$	Input High Voltage, \overline{XI} (Note 3)	3.5	—	3.5	—	3.5	—	3.5	—	V
$V_{IL(XI)}$	Input Low Voltage, \overline{XI} (Note 3)	—	1.5	—	1.5	—	1.5	—	1.5	V
V_{OH}	Output Logic "1" Voltage $I_{OH} = -2 \text{ mA}$	2.4	—	2.4	—	2.4	—	2.4	—	V
V_{OL}	Output Logic "0" voltage $I_{OL} = 8 \text{ mA}$	—	0.4	—	0.4	—	0.4	—	0.4	V
I_{CC1}	Average V_{CC} Power Supply Current (Note 4)	—	100	—	90	—	90	—	90	mA
I_{CC2}	Average Standby Current ($\overline{R} = \overline{W} = \overline{RS} = \overline{FL/RT} = V_{IH}$) (Note 4)	—	25	—	25	—	25	—	25	mA
I_{CC3}	Power Down Current (all inputs = $V_{CC} - 0.2 \text{ V}$) (Note 4)	—	5	—	5	—	5	—	5	mA

- Notes: 1. Measurements with $GND \leq V_{IN} \leq V_{CC}$.
2. $R \geq V_{IH}$, $GND \leq V_{OUT} \leq V_{CC}$.
3. V_{IL} and V_{IH} are input conditions of output tests and are not themselves directly tested. V_{IL} and V_{IH} are absolute voltages with respect to device ground and include all overshoots due to system and/or tester noise. Do not attempt to test these values without suitable equipment.
4. I_{CC} measurements are made with outputs open.
† Instant-On Case Temperature.

AC CHARACTERISTICS $V_{CC} = 5\text{ V} \pm 10\%$, $T_A^\dagger = -55^\circ\text{C to } +125^\circ\text{C}$

Parameter Symbol	Parameter Description	Am7202-40 Min. Max.	Am7202-50 Min. Max.	Am7202-65 Min. Max.	Am7202-80 Min. Max.	Unit
Write and Flag Timing						
t_{WC}	Write Cycle Time	50	65	80	100	ns
t_{WPW}	Write Pulse Width	40	50	65	80	ns
t_{WR}	Write Recovery Time	10	15	15	20	ns
t_{DS}	Data Setup Time	20	30	30	40	ns
t_{DH}	Data Hold Time	0	5	10	10	ns
t_{WFF}	Write LOW to Full Flag LOW	35	45	60	60	ns
t_{WHF}	Write LOW to Half-Full Flag LOW	50	65	80	100	ns
t_{WEF}	Write HIGH to Empty Flag HIGH	35	45	60	60	ns
t_{WLZ}	Write pulse HIGH to data bus at LOW Z (Note 1)	10	15	15	15	ns
Read and Flag Timing						
t_{RC}	Read Cycle Time	50	65	80	100	ns
t_A	Access Time	40	50	65	80	ns
t_{RR}	Read Recovery Time	10	15	15	20	ns
t_{RPW}	Read Pulse Width	40	50	65	80	ns
t_{RLZ}	Read pulse LOW to data bus at LOW Z (Note 1)	5	10	10	10	ns
t_{DV}	Data Valid from read pulse HIGH	5	5	5	5	ns
t_{RHZ}	Read pulse HIGH to data bus at HIGH Z (Note 1)	25	30	30	30	ns
t_{RFF}	Read HIGH to Full Flag HIGH	35	45	60	60	ns
t_{RHF}	Read HIGH to Half-Full-Flag HIGH	50	65	80	100	ns
t_{REF}	Read LOW to Empty Flag LOW	30	45	60	60	ns
Reset Timing						
t_{RSC}	Reset Cycle Time	50	65	80	100	ns
t_{RS}	Reset Pulse Width	40	50	65	80	ns
t_{RSS}	Reset Setup Time	40	50	65	80	ns
t_{RSR}	Reset Recovery Time	10	15	15	20	ns
t_{EFL}	Reset to Empty Flag LOW	50	65	80	100	ns
t_{HFL}	Reset to Half-Full Flag High	50	65	80	100	ns
t_{FFH}	Reset to Full Flag HIGH	50	65	80	100	ns
Retransmit Timing						
t_{RTC}	Retransmit Cycle Time	50	65	80	100	ns
t_{RT}	Retransmit Pulse Width	40	50	65	80	ns
t_{RTR}	Retransmit Recovery Time	10	15	15	20	ns

Note: 1. Characterized parameters.

† Instant-On Case Temperature.