

FIFOs

Product Selection Guide



Key Features/Benefits:

- **Optimizes system performance**
- **Eliminates data bottlenecks** between: DSPs, high-speed processors, industry-standard buses, memory devices and Analog Front Ends
- **Designed for variety of systems** including: real-time DSP applications, telecommunications, internetworking, instrumentation and high-bandwidth computing.
- **DSP-Sync**
Glueless interface with C6x and newer C5x DSPs
- **Output Edge Control (OEC)**
Reduces simultaneous switching noise and package inductance
- **Distributed Vcc & GND**
Reduces package inductance
- **Programmable Flags**
Provides design flexibility and control
- **Parity Generate & Check**
Ensures data integrity in fault-control systems
- **Synchronous Retransmit Feature**
Provides a user-defined point to transmit data
- **Mailbox-Bypass Registers**
Permits the user to bypass the internal SRAM
- **Bus Mapping Feature**
Sizes data from 36-bits to either 9, 18 or 16
- **Byte Swapping Feature**
Converts data from Big Endian (Motorola) to Little Endian (Intel). Ideal for mixed systems.

FIFO

A FIFO is a dual-port memory with built-in read and write addressing that unloads data in the same order as it is written in. Data reads and writes can be synchronous or asynchronous to one another. The FIFO provides status flags to indicate the amount of valid data residing in memory. The most common uses of FIFOs involves transferring data between system elements running asynchronously to each other, and/or operating with different data rates.

Synchronous FIFO

The term synchronous refers to a port-control method and does not imply that data writes and reads must be synchronous to one another. Data is written by a low-to-high transition of a write clock when write-enable inputs are asserted and the full flag is not asserted. Likewise, data is read by a low-to-high transition of a read clock when read-enable inputs are asserted and the empty flag is not asserted. The empty flag is synchronized to the read clock and the full flag is synchronized to the write clock.

Asynchronous FIFO

Data transmission is not synchronized with any type of clock. A low-level pulse on the write-enable input initiates data writes when the full flag is not asserted. Likewise, a low-level pulse on the read-enable input initiates data reads when the empty flag is not asserted. The empty and full flags are not synchronized to a particular clock and reflect the instantaneous comparison of the read and write pointers.

TI DSP-Sync™ FIFOs																		
Part Number	I/O Width			Max Density	Max Frequency	Max Data Rate	Supply Voltage	Port Selectable Bus Width	Depth Expansion	Width Expansion	First Word Fall Through	Empty/ Full Flag	Half Full Flag	Almost Empty / Almost Full Flag	Preset Flag Default Values	Flag Programming	Partial Reset	Retransmit
	9	18	36															
SN74V215		x		72K bit	133 MHz	2.4 Gb/s	3.3 V		x	x	x	x	x	x	1	Parallel		
SN74V225		x		36K bit	133 MHz	2.4 Gb/s	3.3 V		x	x	x	x	x	x	1	Parallel		
SN74V235		x		18K bit	133 MHz	2.4 Gb/s	3.3 V		x	x	x	x	x	x	1	Parallel		
SN74V245		x		9K bit	133 MHz	2.4 Gb/s	3.3 V		x	x	x	x	x	x	1	Parallel		
SN74V263	x	x		144K bit	166 MHz	2.9 Gb/s	3.3 V	x	x	x	x	x	x	x	8	Serial/Parallel	x	x
SN74V273	x	x		288K bit	166 MHz	2.9 Gb/s	3.3 V	x	x	x	x	x	x	x	8	Serial/Parallel	x	x
SN74V283	x	x		576K bit	166 MHz	2.9 Gb/s	3.3 V	x	x	x	x	x	x	x	8	Serial/Parallel	x	x
SN74V293	x	x		1M bit	166 MHz	2.9 Gb/s	3.3 V	x	x	x	x	x	x	x	8	Serial/Parallel	x	x
SN74V3640	x	x	x	36K bit	166 MHz	5.8 Gb/s	3.3 V	x	x	x	x	x	x	x	8	Serial/Parallel	x	x
SN74V3650	x	x	x	72K bit	166 MHz	5.8 Gb/s	3.3 V	x	x	x	x	x	x	x	8	Serial/Parallel	x	x
SN74V3660	x	x	x	144K bit	166 MHz	5.8 Gb/s	3.3 V	x	x	x	x	x	x	x	8	Serial/Parallel	x	x
SN74V3670	x	x	x	288K bit	166 MHz	5.8 Gb/s	3.3 V	x	x	x	x	x	x	x	8	Serial/Parallel	x	x
SN74V3680	x	x	x	576K bit	166 MHz	5.8 Gb/s	3.3 V	x	x	x	x	x	x	x	8	Serial/Parallel	x	x
SN74V3690	x	x	x	1M bit	166 MHz	5.8 Gb/s	3.3 V	x	x	x	x	x	x	x	8	Serial/Parallel	x	x

Pin-for-Pin Functional Equivalents *

Organization	Vcc (V)	IDT Part #	TI Part #
8192 X 18/16384 X 9	3.3	IDT 72V263XXPF	SN74V263-XXPZA
16384 X 18/32768 X 9	3.3	IDT 72V273XXPF	SN74V273-XXPZA
32768 X 18/65536 X 9	3.3	IDT 72V283XXPF	SN74V283-XXPZA
65536 X 18/131072 X 9	3.3	IDT 72V293XXPF	SN74V293-XXPZA
1024 X 36	3.3	IDT 72V3640XXPF	SN74V3640-XXPEU
2048 X 36	3.3	IDT 72V3650XXPF	SN74V3650-XXPEU
4096 X 36	3.3	IDT 72V3660XXPF	SN74V3660-XXPEU
8192 X 36	3.3	IDT 72V3670XXPF	SN74V3670-XXPEU
16384 X 36	3.3	IDT 72V3680XXPF	SN74V3680-XXPEU
32768 X 36	3.3	IDT 72V3690XXPF	SN74V3690-XXPEU

* Pin-for-Pin Functional Equivalents:

Devices are functionally identical and have identical pinouts.

** Functional Equivalents:

Devices are functionally equivalent or similar, but have different pinouts.

Functional Equivalents **

Organization	Vcc (V)	Cypress Part #	IDT Part #	TI Part #
512 X 18	3.3	CY7C4215V		SN74V215
1024 X 18	3.3	CY7C4225V		SN74V225
2048 X 18	3.3	CY7C4235V		SN74V235
4096 X 18	3.3	CY7C4245V		SN74V245
8192 X 16	3.3		IDT7216160	SN74V263
16384 X 16	3.3		IDT7217160	SN74V273
32768 X 16	3.3		IDT7218160	SN74V283
65536 X 16	3.3		IDT7219160	SN74V293
1024 X 32	3.3		IDT72/14320	SN74V3640
2048 X 32	3.3		IDT72V15320	SN74V3650
4096 X 32	3.3		IDT72/16320	SN74V3660
8192 X 32	3.3		IDT72/17320	SN74V3670
16384 X 32	3.3		IDT72V18320	SN74V3680
32768 X 32	3.3		IDT72V19320	SN74V3690



36-bit Synchronous FIFOs							
Part Number	Organization	Technology	Vcc (V)	Fmax (MHz)	Max Data Rate	Package	Comments
SN74V3640	1024 X 36	CMOS	3.3	166	5.8 Gb/s	PEU	PF, BMA, BSW, SRR
SN74V3650	2048 X 36	CMOS	3.3	166	5.8 Gb/s	PEU	PF, BMA, BSW, SRR
SN74V3660	4096 X 36	CMOS	3.3	166	5.8 Gb/s	PEU	PF, BMA, BSW, SRR
SN74V3670	8192 X 36	CMOS	3.3	166	5.8 Gb/s	PEU	PF, BMA, BSW, SRR
SN74V3680	16384 X 36	CMOS	3.3	166	5.8 Gb/s	PEU	PF, BMA, BSW, SRR
SN74V3690	32768 X 36	CMOS	3.3	166	5.8 Gb/s	PEU	PF, BMA, BSW, SRR
SN74ACT3651	2048 X 36	CMOS	5.0	100	2.4 Gb/s	PCB, PQ	PF, SRR, MBR
SN74ACT3631	512 X 36	CMOS	5.0	67	2.4 Gb/s	PCB, PQ	PF, SRR, MBR
SN74ACT3641	1024 X 36	CMOS	5.0	67	2.4 Gb/s	PCB, PQ	PF, SRR, MBR
SN74ACT3622	256 X 36 X 2	CMOS	5.0	67	2.4 Gb/s	PCB, PQ	BID, PF, MBR
SN74ACT3632	512 X 36 X 2	BiCMOS	5.0	67	2.4 Gb/s	PCB, PQ	BID, PF, MBR
SN74ABT3612	64 X 36 X 2	BiCMOS	5.0	67	2.4 Gb/s	PCB, PQ	BID, PF, PGC, MBR
SN74ABT3614	64 X 36 X 2	BiCMOS	5.0	67	2.4 Gb/s	PCB, PQ	BID, PF, PGC, BMA, BSW, MBR

18-bit Synchronous FIFOs							
Part Number	Organization	Technology	Vcc (V)	Fmax (MHz)	Max Data Rate	Package	Comments
SN74V263	8192 X 18/16384 X 9	CMOS	3.3	166	2.9 Gb/s	PZA, GGM	PF, BMA, BSW, SRR
SN74V273	16384 X 18/32768 X 9	CMOS	3.3	166	2.9 Gb/s	PZA, GGM	PF, BMA, BSW, SRR
SN74V283	32768 X 18/65536 X 9	CMOS	3.3	166	2.9 Gb/s	PZA, GGM	PF, BMA, BSW, SRR
SN74V293	65536 X 18/131072 X 9	CMOS	3.3	166	2.9 Gb/s	PZA, GGM	PF, BMA, BSW, SRR
SN74V215	512 X 18	CMOS	3.3	133	2.4 Gb/s	PAG	PF
SN74V225	1024 X 18	CMOS	3.3	133	2.4 Gb/s	PAG	PF
SN74V235	2048 X 18	CMOS	3.3	133	2.4 Gb/s	PAG	PF
SN74V245	4096 X 18	CMOS	3.3	133	2.4 Gb/s	PAG	PF
SN74ALVC7813	64 X 18	CMOS	3.3	50	0.9 Gb/s	DL	PF
SN74ALVC7805	256 X 18	CMOS	3.3	50	0.9 Gb/s	DL	PF
SN74ALVC7803	512 X 18	CMOS	3.3	50	0.9 Gb/s	DL	PF
SN74ACT7811	1024 X 18	CMOS	5.0	40	0.7 Gb/s	68-FN, PN	PF
SN74ACT7881	1024 X 18	CMOS	5.0	67	0.7 Gb/s	68-FN, PN	PF
SN74ACT7882	2048 X 18	CMOS	5.0	67	0.7 Gb/s	68-FN, PN	PF
SN74ABT7819A	512 X 18 X 2	BiCMOS	5.0	100	1.8 Gb/s	PH, PN	BID, PF
SN74ACT7813	64 X 18	CMOS	5.0	67	0.7 Gb/s	DL	PF
SN74ACT7805	256 X 18	CMOS	5.0	67	0.7 Gb/s	DL	PF
SN74ACT7803	512 X 18	CMOS	5.0	67	0.7 Gb/s	DL	PF

18-bit Asynchronous FIFOs							
Part Number	Organization	Technology	Vcc (V)	Fmax (MHz)	Max Data Rate	Package	Comments
SN74ACT7814	64 X 18	CMOS	5.0	50	.966 Gb/s	DL	PF
SN74ACT7806	256 X 18	CMOS	5.0	50	.966 Gb/s	DL	PF
SN74ACT7804	512 X 18	CMOS	5.0	50	.966 Gb/s	DL	PF
SN74ABT7820	512 X 18 X 2	BiCMOS	5.0	67	1.2 Gb/s	PH, PN	BID, PF
SN74ACT7802	1024 X 18	CMOS	5.0	40	.7 Gb/s	68-FN, PN	PF
SN74ALVC7814	64 X 18	CMOS	3.3	40	.7 Gb/s	DL	PF
SN74ALVC7806	256 X 18	CMOS	3.3	40	.7 Gb/s	DL	PF
SN74ALVC7804	512 X 18	CMOS	3.3	40	.7 Gb/s	DL	PF

9-bit FIFOs							
Part Number	Organization	Technology	Vcc (V)	Fmax (MHz)	Max Data Rate	Package	Comments
SN74ACT2235	1024 X 9 X 2	CMOS	5.0	50	.9 Gb/s	44-FN, PAG	BID, PF
SN74ACT7807	2048 X 9	CMOS	5.0	67	1.2 Gb/s	44-FN, PAG	PF
SN74ACT7808	2048 X 9	CMOS	5.0	50	.9 Gb/s	44-FN, PAG	PF

1-bit Telecommunication FIFOs							
Part Number	Organization	Technology	Vcc (V)	Fmax (MHz)	Package	Comments	
SN74ACT2226	64 X 1	CMOS	5.0	22	24-DW	DUAL	
SN74ACT2227	64 X 1	CMOS	5.0	60	28-DW	DUAL	
SN74ACT2228	256 X 1	CMOS	5.0	22	24-DW	DUAL	
SN74ACT2229	256 X 1	CMOS	5.0	60	28-DW	DUAL	

Package Suffix:

PAG = 64-pin TQFP

FN = PLCC

PZA = 80-pin TQFP

PCB = 120-pin TQFP

PH = 80-pin QFP

GGM = 100-pin BGA

PQ = 132-pin QFP

PM = 64-pin TQFP

PEU = 128-pin TQFP

DL = 56-pin SSOP

DW = SOIC

PN = 80-pin TQFP

N = DIP

Comments:

BID = Bidirectional

BMA = Bus Matching

BSW = Byte Swapping

PF = Programmable Flags

DUAL = Dual Independent FIFOs

SRR = Synchronous Read/Retransmit

PGC = Parity Generate/Check

MBR = Mail-box Bypass Register

Pin-for-Pin Functional Equivalents*			
Organization	Vcc (V)	IDT Part #	TI Part #
64 X 36 X 2	5.0	IDT723612LXXPF	SN74ABT3612-XXPCB
		IDT723612LXXPQF	SN74ABT3612-XXPQ
64 X 36 X 2	5.0	IDT723614LXXPF	SN74ABT3614-XXPCB
		IDT723614LXXPQF	SN74ABT3614-XXPQ
256 X 36 X 2	5.0	IDT723622LXXPF	SN74ACT3622-XXPCB
		IDT723622LXXPQF	SN74ACT3622-XXPQ
512 X 36	5.0	IDT723631LXXPF	SN74ACT3631-XXPCB
		IDT723631LXXPQF	SN74ACT3631-XXPQ
512 X 36 X 2	5.0	IDT723632LXXPF	SN74ACT3632-XXPCB
		IDT723632LXXPQF	SN74ACT3632-XXPQ
1024 X 36	5.0	IDT723641LXXPF	SN74ACT3641-XXPCB
		IDT723641LXXPQF	SN74ACT3641-XXPQ
2048 X 36	5.0	IDT723651LXXPF	SN74ACT3651-XXPCB
		IDT723651LXXPQF	SN74ACT3651-XXPQ
512 X 18	3.3	IDT72V215LXTF	SN74215-XXPAG
1024 X 18	3.3	IDT72V225LXTF	SN74225-XXPAG
2048 X 18	3.3	IDT72V235LXTF	SN74235-XXPAG
4096 X 18	3.3	IDT72V245LXTF	SN74245-XXPAG
8192 X 18/16384 X 9	3.3	IDT 72V283XXPF	SN74V283-XXPZA
65536 X 18/131072 X 9	3.3	IDT 72V293XXPF	SN74V293-XXPZA
1024 X 36	3.3	IDT 72V3640XXPF	SN74V3640-XXPEU
2048 X 36	3.3	IDT 72V3650XXPF	SN74V3650-XXPEU
4096 X 36	3.3	IDT 72V3660XXPF	SN74V3660-XXPEU
8192 X 36	3.3	IDT 72V3670XXPF	SN74V3670-XXPEU
16384 X 36	3.3	IDT 72V3680XXPF	SN74V3680-XXPEU
32768 X 36	3.3	IDT 72V3690XXPF	SN74V3690-XXPEU

Suggested FIFOs for DSP Applications	
C6x DSP Port Size: 32-bits System Supply Voltage: 3.3 V	
Asynchronous FIFO	Synchronous FIFO
ALVC7804 ALVC7806 ALVC7814	ALVC3631 ALVC3641 ALVC3651 ALVC7803 ALVC7805 ALVC7813 SN74V215 SN74V225 SN74V235 SN74V245 SN74V263 SN74V273 SN74V283 SN74V293 SN74V3640 SN74V3650 SN74V3660 SN74V3670 SN74V3680 SN74V3690

Suggested FIFOs for DSP Applications	
C54x DSP Port Size: 16-bits System Supply Voltage: 3.3 V	
Asynchronous FIFO	Synchronous FIFO
ALVC7804 ALVC7806 ALVC7814	ALVC7803 ALVC7805 ALVC7813 SN74V215 SN74V225 SN74V235 SN74V245 SN74V263 SN74V273 SN74V283 SN74V293 SN74V3640 SN74V3650 SN74V3660 SN74V3670 SN74V3680 SN74V3690

Functional Equivalents**				
Organization	Vcc (V)	Cypress Part #	IDT Part #	TI Part #
256 x 36 x 2	5.0	CY7C43622		SN74ACT3622
512 x 36	5.0	CY7C43633		SN74ACT3631
512 x 36 x 2	5.0	CY7C43632		SN74ACT3632
1024 x 36	5.0	CY7C43643		SN74ACT3641
2048 x 36	5.0	CY7C43663		SN74ACT3651
64 x 18	5.0	CY7C4425		SN74ACT7813
256 x 18	5.0	CY7C4405	IDT72205	SN74ACT7805
512 x 18 x 2	5.0	CY7C4215	IDT72815	SN74ABT7819
512 x 18 x 2	5.0		IDT72511	SN74ABT7820
512 x 18	5.0	CY7C455	IDT72215	SN74ABT7803
1024 x 18	5.0	CY7C4225	IDT72225	SN74ABT7811
2048 x 18	5.0	CY7C4235	IDT72235	SN74ABT7881
2048 x 9	5.0		IDT72231	SN74ABT7807
2048 x 9	5.0	CY7C4231	IDT7203	SN74ABT7808
64 x 18	3.3	CY7C4425V		SN74ALVC7813
256 x 18	3.3	CY7C4201V		SN74ALVC7805
512 x 18	3.3		IDT72V215LA	SN74ALVC7805
512 X 18	3.3	CY7C4215V		SN74V215
1024 X 18	3.3	CY7C4225V		SN74V225
2048 X 18	3.3	CY7C4235V		SN74V235
4096 X 18	3.3	CY7C4245V		SN74V245
8192 X 16	3.3		IDT7216160	SN74V263
16384 X 16	3.3		IDT7217160	SN74V273
32768 X 16	3.3		IDT7218160	SN74V283
65536 X 16	3.3		IDT7219160	SN74V293
1024 X 32	3.3		IDT72V14320	SN74V3640
2048 X 32	3.3		IDT72V15320	SN74V3650
4096 X 32	3.3		IDT72V16320	SN74V3660
8192 X 32	3.3		IDT72V17320	SN74V3670
16384 X 32	3.3		IDT72V18320	SN74V3680
32768 X 32	3.3		IDT72V19320	SN74V3690

Suggested FIFOs for DSP Applications	
C3x, C4x DSP Port Size: 32-bits System Supply Voltage: 5 V	
Asynchronous FIFO	Synchronous FIFO
ABT7820 ACT 2235 ACT7802 ACT7804 ACT7806 ACT7808 ACT7814	ABT3612 ABT3614 ABT7819 ACT3622 ACT3631 ACT3632 ACT3641 ACT3651 ACT7803 ACT7805 ACT7807 ACT7813 ACT7881 ACT7882

Suggested FIFOs for DSP Applications	
VC3x, LC3x DSP Port Size: 32-bits System Supply Voltage: 3.3 V	
Asynchronous FIFO	Synchronous FIFO
ALVC7804 ALVC7806 ALVC7814	ALVC7803 ALVC7805 ALVC7813 SN74V215 SN74V225 SN74V235 SN74V245 SN74V263 SN74V273 SN74V283 SN74V293 SN74V3640 SN74V3650 SN74V3660 SN74V3670 SN74V3680 SN74V3690

* Pin-for-Pin Functional Equivalents:

Devices are functionally identical and have identical pinouts.

** Functional Equivalents:

Devices are functionally equivalent or similar, but have different pinouts.

TI Worldwide Technical Support

Internet

TI Semiconductor Home Page

<http://www.ti.com/sc>

TI Distributors

<http://www.ti.com/sc/docs/distmenu.htm>

Product Information Centers

Americas

Phone +1(972) 644-5580
Fax +1(972) 480-7800
Email sc-infomaster@ti.com

Europe, Middle East, and Africa

Phone
Deutsch +49-(0) 8161 80 3311
English +44-(0) 1604 66 3399
Español +34-(0) 90 23 54 0 28
Français +33-(0) 1-30 70 11 64
Italiano +33-(0) 1-30 70 11 67
Fax +44-(0) 1604 66 33 34
Email epic@ti.com

Japan

Phone
International +81-3-3457-0972
Domestic 0120-81-0026
Fax
International +81-3-3457-1259
Domestic 0120-81-0036
Email pic-japan@ti.com

Asia

Phone
International +886-2-23786800
Domestic Local Access Code TI Number
Australia 1-800-881-011 -800-800-1450
China 10810 -800-800-1450
Hong Kong 800-96-1111 -800-800-1450
India 000-117 -800-800-1450
Indonesia 001-801-10 -800-800-1450
Korea 080-551-2804 -
Malaysia 1-800-800-011 -800-800-1450
New Zealand 000-911 -800-800-1450
Philippines 105-11 -800-800-1450
Singapore 800-0111-111 -800-800-1450
Taiwan 080-006800 -
Thailand 0019-991-1111 -800-800-1450
Fax 886-2-2378-6808
Email tiasia@ti.com

Important Notice: The products and services of Texas Instruments and its subsidiaries described herein are sold subject to TI's standard terms and conditions of sale. Customers are advised to obtain the most current and complete information about TI products and services before placing orders. TI assumes no liability for applications assistance, customer's applications or product designs, software performance, or infringement of patents. The publication of information regarding any other company's products or services does not constitute TI's approval, warranty or endorsement thereof.

DSP-Sync FIFOs and Real World Signal Processing and DSPSync are trademarks of Texas Instruments.

A042799



SCAB005D