CYPRESS

CY74FCT16823T
CY74FCT162823T

18-Bit Registers

Features

- Low power, pin compatible replacement for ABT functions
- FCT-C speed at 6.0 ns
- Power-off disable outputs permits live insertion
- Edge-rate control circuitry for significantly improved noise characteristics
- Typical output skew < 250 ps
- ESD > 2000 V
- TSSOP (19.6-mil pitch) and SSOP (25-mil pitch) packages
- Extended commercial range of −40°C to +85°C
- V_{CC} = 5V ± 10%

CY74FCT16823T Features:

- 64 mA sink current (Com'l), 32 mA source current (Com'l)
- Typical V_{OLP} (ground bounce) <1.0V at V_{CC} = 5V, T_A = 25°C

CY74FCT162823T Features:

- Balanced output drivers: 24 mA
- Reduced system switching noise
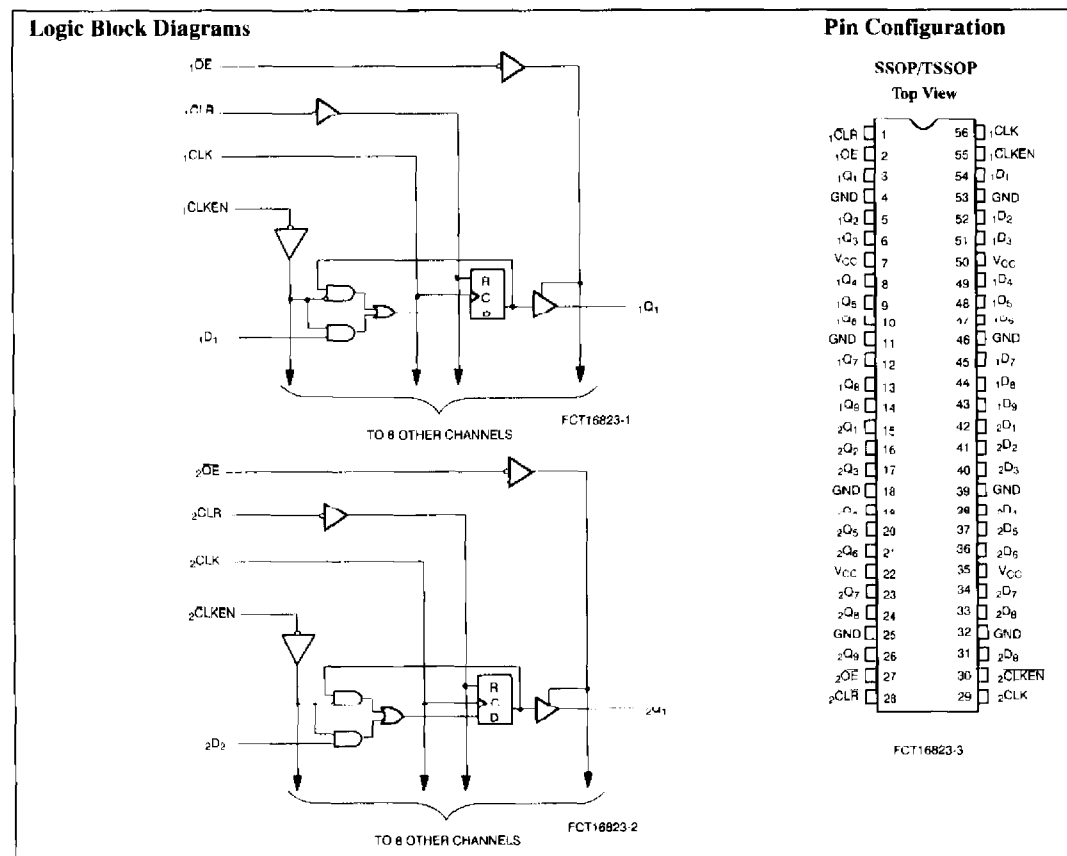- Typical V_{OLP} (ground bounce) <0.6V at V_{CC} = 5V, T_A = 25°C

Functional Description

The CY74FCT16823T and the CY74FCT162823T 18-bit bus interface register are designed for use in high-speed, low-power systems needing wide registers and parity. 18-bit operation is achieved by connecting the control lines of the two 9-bit registers. Flow-through pinout and small shrink packaging aids in simplifying board layout. The outputs are designed with a power-off disable feature to allow live insertion of boards.

The CY74FCT16823T is ideally suited for driving high-capacitance loads and low-impedance backplanes.

The CY74FCT162823T has 24-mA balanced output drivers with current limiting resistors in the outputs. This reduces the need for external terminating resistors and provides for minimal undershoot and reduced ground bounce. The CY74FCT162823T is ideal for driving transmission lines.

Logic Block Diagrams

FCT16823-1

TO 8 OTHER CHANNELS

FCT16823-2

TO 8 OTHER CHANNELS

Pin Configuration

SSOP/TSSOP
Top View

FCT16823-3

1CLR	1	56 1CLK
1OE	2	55 1CLKEN
1Q1	3	54 1D1
GND	4	53 GND
1Q2	5	52 1D2
1Q3	6	51 1D3
VCC	7	50 VCC
1Q4	8	49 1D4
1Q5	9	48 1D5
1Q6	10	47 1D6
GND	11	46 GND
1Q7	12	45 1D7
1Q8	13	44 1D8
1Q9	14	43 1D9
2Q1	15	42 2D1
2Q2	16	41 2D2
2Q3	17	40 2D3
GND	18	39 GND
2Q4	19	38 2D4
2Q5	20	37 2D5
2Q6	21	36 2D6
VCC	22	35 VCC
2Q7	23	34 2D7
2Q8	24	33 2D8
GND	25	32 GND
2Q9	26	31 2D9
2OE	27	30 2CLKEN
2CLR	28	29 2CLK

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Pin Description

Name	Description
D	Data Inputs
CLK	Clock Inputs
CLKEN	Clock Enable Inputs (Active LOW)
CLR	Asynchronous Clear Inputs (Active LOW)
OE	Output Enable Inputs (Active LOW)
Q	Three-State Outputs

Function Table[1]

Inputs						Outputs
OE	CLR	CLKEN	CLK	D	Q	Function
H	X	X	X	X	Z	High Z
L	L	X	X	X	L	Clear
L	H	H	X	X	Q[2]	Hold
H	H	L	$\int$	L	Z	Load
H	H	L	$\int$	H	Z	
L	H	L	$\int$	L	L	
L	H	L	$\int$	H	H	

Maximum Ratings[3, 4]

(Above which the useful life may be impaired. For user guidelines, not tested.)

Storage Temperature .... Com'l −55°C to +125°C

Ambient Temperature with
Power Applied .... Com'l −55°C to +125°C

DC Input Voltage .... −0.5V to +7.0V

DC Output Voltage .... −0.5V to +7.0V

DC Output Current
(Maximum Sink Current/Pin) .... −60 to +120 mA

Notes:
1. H = HIGH Voltage Level.
   L = LOW Voltage Level.
   X = Don't Care.
   Z = HIGH Impedance.
   $\int$ = LOW-to-HIGH transition.
2. Output level before indicated steady-state input conditions were established.

Power Dissipation 1.0W

Static Discharge Voltage .... >2001 V
(per MIL-STD-883, Method 3015)

Operating Range

Range	Ambient Temperature	V_{CC}
Commercial	−40°C to +85°C	5V ± 10%

3. Operation beyond the limits set forth may impair the useful life of the device. Unless otherwise noted, these limits are over the operating free-air temperature range.
4. Unused inputs must always be connected to an appropriate logic voltage level, preferably either V_{CC} or ground.

Electrical Characteristics Over the Operating Range

Parameter	Description	Test Conditions	Min.	Typ.[8]	Max.	Unit
V_{IH}	Input HIGH Voltage		2.0			V
V_{IL}	Input LOW Voltage				0.8	V
V_H	Input Hysteresis[5]			100		mV
V_{IK}	Input Clamp Diode Voltage	V_{CC}=Min., I_{IN}=−18 mA		−0.7	−1.2	V
I_{IH}	Input HIGH Current	V_{CC}=Max., V_I=V_{CC}			±1	µA
I_{IL}	Input LOW Current	V_{CC}=Max., V_I=GND			±1	µA
I_{OZH}	High Impedance Output Current (Three-State Output pins)	V_{CC}=Max., V_{OUT}=2.7V			±1	µA
I_{OZL}	High Impedance Output Current (Three-State Output pins)	V_{CC}=Max., V_{OUT}=0.5V			±1	µA
I_{OS}	Short Circuit Current[6]	V_{CC}=Max., V_{OUT}=GND	−80	−140	−200	mA
I_O	Output Drive Current[6]	V_{CC}=Max., V_{OUT}=2.5V	−50		−180	mA
I_{OFF}	Power-Off Disable	V_{CC}=0V, V_{OUT}≤4.5V			1	µA

Output Drive Characteristics for CY74FCT16823T

Parameter	Description	Test Conditions	Min.	Typ.[8]	Max.	Unit
V_{OH}	Output HIGH Voltage	V_{CC}=Min., I_{OH}=−3 mA	2.5	3.5		V
		V_{CC}=Min., I_{OH}=−15 mA	2.4	3.5		V
		V_{CC}=Min., I_{OH}=−32 mA	2.0	3.0		V
V_{OL}	Output LOW Voltage	V_{CC}=Min., I_{OL}=64 mA		0.2	0.55	V

Output Drive Characteristics for CY74FCT162823T

Parameter	Description	Test Conditions	Min.	Typ.[8]	Max.	Unit
I_{OLD}	Output LOW Voltage[6]	V_{CC}=5V, V_{IN}=V_{IH} or V_{IL}, V_{OUT}=1.5V	60	115	150	mA
I_{ODH}	Output HIGH Voltage[6]	V_{CC}=5V, V_{IN}=V_{IH} or V_{IL}, V_{OUT}=1.5V	−60	−115	−150	mA
V_{OH}	Output HIGH Voltage	V_{CC}=Min., I_{OH}=−24 mA	2.4	3.3		V
V_{OL}	Output LOW Voltage	V_{CC}=Min., I_{OL}=24 mA		0.3	0.55	V

Capacitance[7] (T_A = +25°C, f = 1.0 MHz)

Parameter	Description	Test Conditions	Typ.[8]	Max.	Unit
C_{IN}	Input Capacitance	V_{IN} = 0V	4.5	6.0	pF
C_{OUT}	Output Capacitance	V_{OUT} = 0V	5.5	8.0	pF

Notes:
5. This input is guaranteed but not tested.
6. Not more than one output should be shorted at a time. Duration of short should not exceed one second. The use of high-speed test apparatus and/or sample and hold techniques are preferable in order to minimize internal chip heating and more accurately reflect operational values. Otherwise prolonged shorting of a high output may raise the chip temperature well above normal and thereby cause invalid readings in other parametric tests. In any sequence of parameter tests, I_{OS} tests should be performed last.
7. This parameter is guaranteed but not tested.
8. Typical values are at V_{CC} = 5.0V, T_A = +25°C ambient.

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Ordering Information CY74FCT16823

Speed (ns)	Ordering Code	Package Name	Package Type	Operating Range
6.0	CY74FCT16823CTPAC	Z56	56-Lead (240-Mil) TSSOP	Commercial
	CY74FCT16823CTPVC	O56	56-Lead (300-Mil) SSOP	
7.5	CY74FCT16823BTPAC	Z56	56-Lead (240-Mil) TSSOP	Commercial
	CY74FCT16823BTPVC	O56	56-Lead (300-Mil) SSOP	
10.0	CY74FCT16823ATPAC	Z56	56-Lead (240-Mil) TSSOP	Commercial
	CY74FCT16823ATPVC	O56	56-Lead (300-Mil) SSOP	

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	CY74FCT162823CTPVC	O56	56-Lead (300-Mil) SSOP	
7.5	CY74FCT162823ATPAC	Z56	56-Lead (240-Mil) TSSOP	Commercial
	CY74FCT162823ATPVC	O56	56-Lead (300-Mil) SSOP	
10.0	CY74FCT162823TPAC	Z56	56-Lead (240-Mil) TSSOP	Commercial
	CY74FCT162823TPVC	O56	56-Lead (300-Mil) SSOP	

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