



# CY54/74FCT2245T

## 8-Bit Transceiver

### Features

- Function and pinout compatible with FCT and F logic
- 25Ω output series resistors to reduce transmission line reflection noise
- FCT-C speed at 4.1 ns max. (Com'I)
- FCT-A speed at 4.6 ns max. (Com'I)
- Edge-rate control circuitry for significantly improved noise characteristics
- Power-off disable feature
- Fully compatible with TTL input and output logic levels
- ESD > 2000V

- Sink current 12 mA (Com'I), 12 mA (Mil)
- Source current 15 mA (Com'I), 12 mA (Mil)
- Three-state outputs

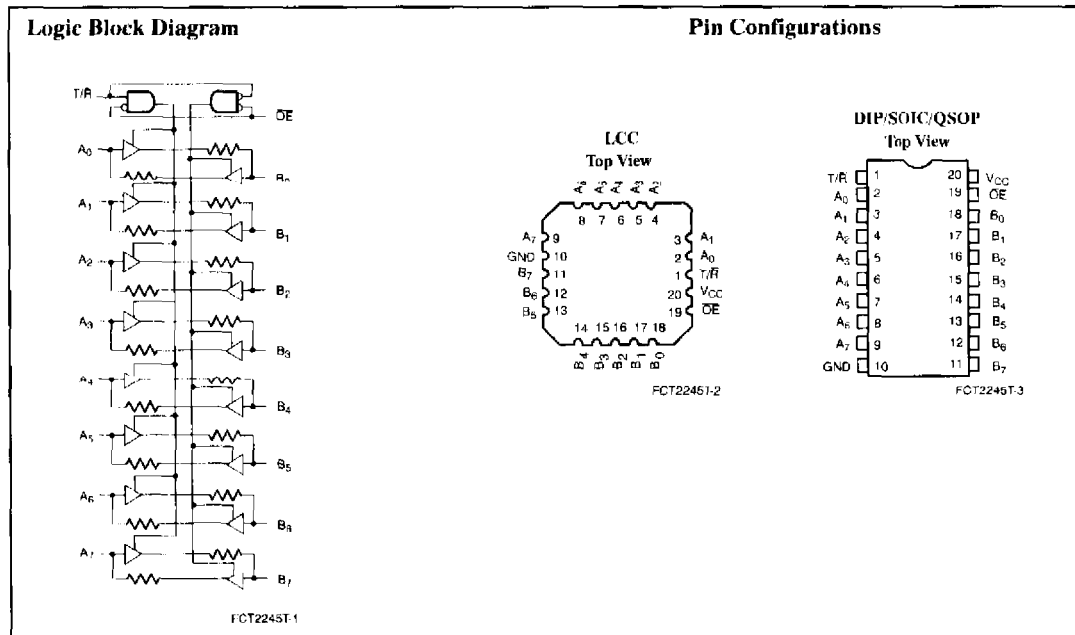
### Functional Description

The FCT2245T contains eight non-inverting, bidirectional buffers with three-state outputs intended for bus oriented applications. On-chip termination resistors have been added to the outputs to reduce system noise caused by reflections. For this reason, the FCT2245T can be used in an existing design to replace the FCT245T. The FCT2245T current sink-

ing capability is 12 mA at the A and B ports.

The Transmit/Receive (T/R) input determines the direction of data flow through the bidirectional transceiver. Transmit (Active HIGH) enables data from A ports to B ports; receive (Active LOW) enables data from B ports to A ports. The output enable (OE) input, when HIGH, disables both the A and B ports by putting them in a High Z condition.

The outputs are designed with a power-off disable feature to allow for live insertion of boards.



### Function Table III

Inputs		Output
OE	T/R	
1	1	Bus B Data to Bus A
L	H	Bus A Data to Bus B
H	X	High Z State

Note:  
1. H = HIGH Voltage Level, L = LOW Voltage Level, X = Don't Care.

**Power Supply Characteristics**

Parameter	Description	Test Conditions	Typ. <sup>[8]</sup>	Max.	Unit
$I_{CC}$	Quiescent Power Supply Current	$V_{CC} = \text{Max.}, V_{IN} \leq 0.2V,$ $V_{IN} \geq V_{CC} - 0.2V$	0.1	0.2	mA
$\Delta I_{CC}$	Quiescent Power Supply Current (TTL inputs)	$V_{CC} = \text{Max.}, V_{IN} = 3.4V^{[8]}$ $f_I = 0, \text{Outputs Open}$	0.5	2.0	mA
$I_{CCD}$	Dynamic Power Supply Current <sup>[10]</sup>	$V_{CC} = \text{Max.}, \text{One Input Toggling},$ 50% Duty Cycle, Outputs Open, $T/R = OE = GND,$ $V_{IN} \leq 0.2V \text{ or } V_{IN} \geq V_{CC} - 0.2V$	0.06	0.12	mA/ MHz
$I_C$	Total Power Supply Current <sup>[10]</sup>	$V_{CC} = \text{Max.}, 50\% \text{ Duty Cycle},$ Outputs Open, One Bit Toggling at $f_I = 10 \text{ MHz},$ $T/R = OE = GND,$ $V_{IN} \leq 0.2V \text{ or } V_{IN} \geq V_{CC} - 0.2V$	0.7	1.4	mA
		$V_{CC} = \text{Max.},$ 50% Duty Cycle, Outputs Open, One Bit Toggling at $f_I = 10 \text{ MHz},$ $T/R = OE = GND,$ $V_{IN} = 3.4V \text{ or } V_{IN} = GND$	1.0	2.4	mA
		$V_{CC} = \text{Max.},$ 50% Duty Cycle, Outputs Open, Eight Bits Toggling at $f_I = 2.5 \text{ MHz},$ $T/R = OE = GND,$ $V_{IN} \leq 0.2V \text{ or } V_{IN} \geq V_{CC} - 0.2V$	1.3	2.6 <sup>[11]</sup>	mA
		$V_{CC} = \text{Max.},$ 50% Duty Cycle, Outputs Open, Eight Bits Toggling at $f_I = 2.5 \text{ MHz},$ $T/R = OE = GND,$ $V_{IN} = 3.4V \text{ or } V_{IN} = GND$	3.3	10.6 <sup>[11]</sup>	mA

**Notes:**

8. For TTL driven input ( $V_{IN} = 3.4V$ ); all other inputs at  $V_{CC}$  or GND.
9. This parameter is not directly testable, but is derived for use in Total Power Supply calculations.
10.  $I_C = I_{CC} + \Delta I_{CC} D_{H1} N_T + I_{CCD} (f_0/2 + f_I N_T)$   
 $I_{CC}$  = Quiescent Current with CMOS input levels  
 $\Delta I_{CC}$  = Power Supply Current for a TTL HIGH input ( $V_{IN} = 3.4V$ )  
 $D_{H1}$  = Duty Cycle for TTL inputs HIGH  
 $N_T$  = Number of TTL inputs at  $D_{H1}$   
 $I_{CCD}$  = Dynamic Current caused by an input transition pair (H.L or L.H.)  
 $f_0$  = Clock frequency for registered devices, otherwise zero  
 $f_I$  = Input signal frequency  
 $N_T$  = Number of inputs changing at  $f_I$   
 All currents are in milliamps and all frequencies are in megahertz.
11. Values for these conditions are examples of the  $I_{CC}$  formula. These limits are guaranteed but not tested.



Switching Characteristics Over the Operating Range

Parameter	Description	FCT2245T				FCT2245AT				Unit	Fig. No. <sup>[13]</sup>
		Military		Commercial		Military		Commercial			
		Min. <sup>[12]</sup>	Max.	Min. <sup>[12]</sup>	Max.	Min. <sup>[12]</sup>	Max.	Min. <sup>[12]</sup>	Max.		
t <sub>PLH</sub> t <sub>PHL</sub>	Propagation Delay A <sub>n</sub> to B <sub>n</sub> or B <sub>n</sub> to A <sub>n</sub>	1.5	7.5	1.5	7.0	1.5	4.9	1.5	4.6	ns	1, 3
t <sub>PZH</sub> t <sub>PZL</sub>	Output Enable Time	1.5	10.0	1.5	9.5	1.5	6.5	1.5	6.2	ns	1, 7, 8
t <sub>PLZ</sub> t <sub>PLZ</sub>	Output Disable Time	1.5	10.0	1.5	7.5	1.5	6.0	1.5	5.0	ns	1, 7, 8

Switching Characteristics Over the Operating Range (continued)

Parameter	Description	FCT2245CT		FCT2245DT		Unit	Fig. No. <sup>[13]</sup>
		Commercial		Commercial			
		Min. <sup>[12]</sup>	Max.	Min. <sup>[12]</sup>	Max.		
t <sub>PLH</sub> t <sub>PHL</sub>	Propagation Delay A <sub>n</sub> to B <sub>n</sub> or B <sub>n</sub> to A <sub>n</sub>	1.5	4.1	1.5	3.8	ns	1, 3
t <sub>PZH</sub> t <sub>PZL</sub>	Output Enable Time	1.5	5.8	1.5	5.0	ns	1, 7, 8
t <sub>PLZ</sub> t <sub>PLZ</sub>	Output Disable Time	1.5	4.5	1.5	4.3	ns	1, 7, 8

Ordering Information—FCT2245T

Speed (ns)	Ordering Code	Package Name	Package Type	Operating Range
3.8	CY74FCT2245DTQC	Q5	20-Lead (150-Mil) QSOP	Commercial
	CY74FCT2245DTSOC	S5	20-Lead (300-Mil) Molded SOIC	
4.1	CY74FCT2245CTPC	P5	20-Lead (300-Mil) Molded DIP	Commercial
	CY74FCT2245CTQC	Q5	20-Lead (150-Mil) QSOP	
	CY74FCT2245CTSOC	S5	20-Lead (300-Mil) Molded SOIC	
4.6	CY74FCT2245ATPC	P5	20-Lead (300-Mil) Molded DIP	Commercial
	CY74FCT2245ATQC	Q5	20-Lead (150-Mil) QSOP	
	CY74FCT2245ATSOC	S5	20-Lead (300-Mil) Molded SOIC	
4.9	CY54FCT2245ATDMB	D6	20-Lead (300-Mil) CerDIP	Military
	CY54FCT2245ATLMB	L61	20-Pin Square Leadless Chip Carrier	
7.0	CY54FCT2245TDMB	D6	20-Lead (300-Mil) CerDIP	Military
	CY54FCT2245TLMB	L61	20-Pin Square Leadless Chip Carrier	
7.5	CY74FCT2245TPC	P5	20-Lead (300-Mil) Molded DIP	Commercial
	CY74FCT2245TQC	Q5	20-Lead (150-Mil) QSOP	
	CY74FCT2245TSOC	S5	20-Lead (300-Mil) Molded SOIC	

Shaded areas contain preliminary information.

Notes:

- 12. Minimum limits are guaranteed but not tested on Propagation Delays.
- 13. See "Parameter Measurement Information" in the General Information section.

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