



Integrated Device Technology, Inc.

## ULTRA HIGH-SPEED BiCMOS LOGIC

## ADVANCE INFORMATION FBT SERIES

### FEATURES:

- BiCEMOS™ FBT series 25% faster than FCTA speeds
- Equivalent to FCTA output drive over full temperature and voltage supply extremes
- $I_{OL}$  up to 64mA (Commercial) and 48mA (Military)
- CMOS power levels (1mW typical static)
- TTL compatible input and output levels
- High output impedance in power-off state
- JEDEC standard pinout for DIP, SOIC and LCC packages
- Military Product Compliant to Mil-Std-883, Class B

### DESCRIPTION:

The FBT series of BiCMOS devices are built using advanced BiCEMOS, a dual metal BiCMOS technology. This technology is designed to supply the highest device speeds while maintaining CMOS power levels.

These devices meet true bipolar TTL output levels. A combination of reduced bipolar output swing and unique BiCMOS output circuitry helps minimize simultaneous switching noise. The output buffers are designed to offer high output impedance in the power-off state. This feature makes these devices ideal for card edge interface.

### PRODUCTS TO BE OFFERED:

The following advanced information on our FBT series include the Absolute Maximum Ratings and DC Electrical Characteristics. For more detailed information on other specifications (Pin Descrip-

tion, Block Diagram, Truth Table, and Power Supply Characteristics), refer to data sheets in the 1989 Data Book Supplement. Switching Characteristics are not available at this time.

IDT54/74FBT240 refer to IDT54/74FCT240A specifications on page S10-82  
IDT54/74FBT241 refer to IDT54/74FCT241A specifications on page S10-86  
IDT54/74FBT244 refer to IDT54/74FCT244A specifications on page S10-86  
IDT54/74FBT245 refer to IDT54/74FCT245A specifications on page S10-92  
IDT54/74FBT373 refer to IDT54/74FCT373A specifications on page S10-105  
IDT54/74FBT374 refer to IDT54/74FCT374A specifications on page S10-109  
IDT54/74FBT540 refer to IDT54/74FCT540A specifications on page S10-122  
IDT54/74FBT541 refer to IDT54/74FCT541A specifications on page S10-122  
IDT54/74FBT821 refer to IDT54/74FCT821A specifications on page S10-152  
IDT54/74FBT823 refer to IDT54/74FCT823A specifications on page S10-152  
IDT54/74FBT827 refer to IDT54/74FCT827A specifications on page S10-158  
IDT54/74FBT841 refer to IDT54/74FCT841A specifications on page S10-171  
IDT54/74FBT843 refer to IDT54/74FCT843A specifications on page S10-171

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MILITARY AND COMMERCIAL TEMPERATURE RANGES

JANUARY 1989

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S10-1

DSC-4063/-

**ABSOLUTE MAXIMUM RATINGS <sup>(1)</sup>**

SYMBOL	RATING	COMMERCIAL	MILITARY	UNIT
V <sub>TERM</sub> <sup>(2)</sup>	Terminal Voltage with Respect to GND	-0.5 to +7.0	-0.5 to +7.0	V
V <sub>TERM</sub> <sup>(3)</sup>	Terminal Voltage with Respect to GND	-0.5 to +5.5	-0.5 to +5.5	V
T <sub>A</sub>	Operating Temperature	0 to +70	-55 to +125	°C
T <sub>BIAS</sub>	Temperature Under Bias	-55 to +125	-65 to +135	°C
T <sub>STG</sub>	Storage Temperature	-55 to +125	-65 to +150	°C
P <sub>T</sub>	Power Dissipation	0.5	0.5	W
I <sub>OUT</sub>	DC Output Current	120	120	mA

**NOTES:**

1. Stresses greater than those listed under ABSOLUTE MAXIMUM RATINGS may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect reliability.
2. Input and V<sub>CC</sub> terminals only.
3. Output and I/O terminals only.

**DC ELECTRICAL CHARACTERISTICS OVER OPERATING RANGE**

Following Conditions Apply Unless Otherwise Specified:

Commercial: T<sub>A</sub> = 0°C to +70°C; V<sub>CC</sub> = 5.0V±5%

Military: T<sub>A</sub> = -55°C to +125°C; V<sub>CC</sub> = 5.0V±10%

SYMBOL	PARAMETER	TEST CONDITIONS <sup>(1)</sup>	MIN.	TYP. <sup>(2)</sup>	MAX.	UNIT	
V <sub>IH</sub>	Input HIGH Level	Guaranteed Logic High Level	2.0	-	-	V	
V <sub>IL</sub>	Input LOW Level	Guaranteed Logic Low Level	-	-	0.8	V	
I <sub>IH</sub>	Input HIGH Current	V <sub>CC</sub> = Max. V <sub>I</sub> = 2.7V	Except I/O Pins I/O Pins	-	-	10 60	μA
I <sub>IL</sub>	Input LOW Current	V <sub>CC</sub> = Max. V <sub>I</sub> = .5V	Except I/O Pins I/O Pins	-	-	-10 -60	μA
I <sub>OZH</sub>	High Impedance Output Current	V <sub>CC</sub> = Max.	V <sub>O</sub> = 2.7V	-	-	50	μA
I <sub>OZL</sub>			V <sub>O</sub> = .5V	-	-	-50	μA
I <sub>I</sub>	Input HIGH Current	V <sub>CC</sub> = Max. V <sub>I</sub> = 5.5V	-	-	100	μA	
V <sub>IK</sub>	Clamp Diode Voltage	V <sub>CC</sub> = Min., I <sub>N</sub> = -18mA	-	-0.7	-1.2	V	
I <sub>OS</sub>	Short Circuit Current	V <sub>CC</sub> = Max. <sup>(3)</sup> , V <sub>O</sub> = GND	-60	-150	-225	mA	
V <sub>OH</sub>	Output HIGH Voltage	V <sub>CC</sub> = Min. V <sub>IN</sub> = V <sub>IH</sub> or V <sub>IL</sub>	I <sub>OH</sub> = -6mA MIL. I <sub>OH</sub> = -8mA COM'L.	2.4	3.3	-	V
V <sub>OL</sub>			For Non-800 Series Devices	I <sub>OH</sub> = -12mA MIL. I <sub>OH</sub> = -15mA COM'L.	2.0	3.0	-
V <sub>OH</sub>	Output HIGH Voltage	V <sub>CC</sub> = Min. V <sub>IN</sub> = V <sub>IH</sub> or V <sub>IL</sub>		I <sub>OL</sub> = 48mA MIL. I <sub>OL</sub> = 64mA COM'L.	-	0.3	0.55
V <sub>OL</sub>			For 800 Series Devices	I <sub>OH</sub> = -15mA I <sub>OH</sub> = -24mA	2.4 2.0	3.3	-
V <sub>OH</sub>	Output HIGH Voltage	V <sub>CC</sub> = Min. V <sub>IN</sub> = V <sub>IH</sub> or V <sub>IL</sub>		I <sub>OL</sub> = 32mA MIL. I <sub>OL</sub> = 48mA COM'L.	-	0.3	0.5
V <sub>OL</sub>			Output LOW Voltage	I <sub>OH</sub> = -15mA I <sub>OH</sub> = -24mA	2.4 2.0	3.3	-
V <sub>H</sub>	Input Hysteresis	V <sub>CC</sub> = 5V		-	200	-	mV
I <sub>OFF</sub>	Bus Leakage Current	V <sub>CC</sub> = 0V V <sub>O</sub> = 4.5V	-	-	100	μA	
I <sub>CC</sub>	Quiescent Power Supply Current	V <sub>CC</sub> = Max. V <sub>IN</sub> = GND or V <sub>CC</sub>	-	0.2	1.5	mA	

**NOTES:**

1. For conditions shown as max. or min., use appropriate value specified under Electrical Characteristics for the applicable device type.
2. Typical values are at V<sub>CC</sub> = 5.0V, +25°C ambient and maximum loading.
3. Not more than one output should be shorted at one time. Duration of the short circuit test should not exceed one second.

**CAPACITANCE (T<sub>A</sub> = +25°C, f = 1.0MHz)**

SYMBOL	PARAMETER <sup>(1)</sup>	CONDITIONS	TYP.	MAX.	UNIT
C <sub>IN</sub>	Input Capacitance	V <sub>IN</sub> = 0V	6	10	pF
C <sub>OUT</sub>	Output Capacitance	V <sub>OUT</sub> = 0V	8	12	pF
C <sub>I/O</sub>	I/O Capacitance	V <sub>OUT</sub> = 0V	8	12	pF

**NOTE:**

1. This parameter is measured at characterization but not tested.