FEATURES:

- IDT54/74FBT2244 equivalent to the 54/74BCT2244
- **IDT54/74FBT2244A 25% faster than the 2244**
- 25Ω output resistors reduce overshoot and undershoot when driving MOS RAMs
- Significant reduction in ground bounce from standard CMOS devices
- TTL compatible input and output levels
- Higher static V_{OH} for improved noise immunity and reduced system power dissipation.
- ±10% power supply for both military and commercial grades
- JEDEC standard pinout for DIP, SOIC and LCC packages
- Military product compliant to MIL-STD-883, Class B

DESCRIPTION:

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

The IDT54/74FBT2244 series are octal buffers/line drivers where each output is terminated with a 25Ω series resistor.

The FBT series of bus interface devices are ideal for use in designs needing to drive large capacitive loads with low static (DC) current loading. All data inputs have a 200mV typical input hysteresis for improved noise rejection. The output buffers are designed to guarantee a static V_{OH} of 2.7V. This higher output level in the high state results in a significant reduction in overall system power dissipation and in improved noise immunity when driving DRAMS and SRAMS.
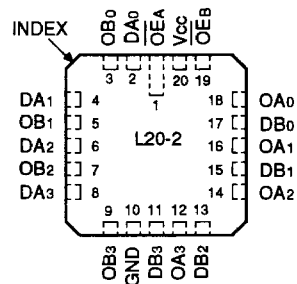
FUNCTIONAL BLOCK DIAGRAM

2641 drw 01
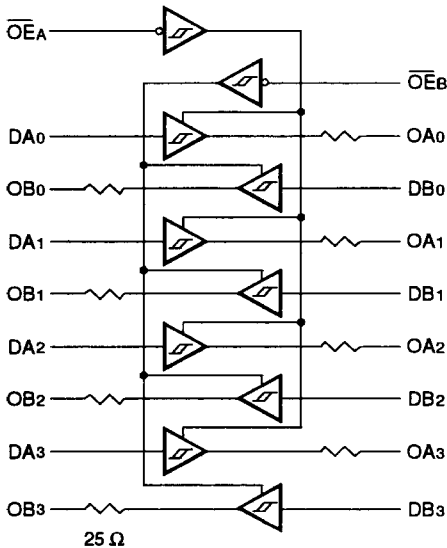
PIN CONFIGURATIONS
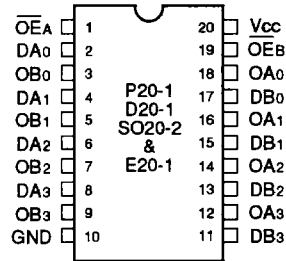
DIP/SOIC/CERPACK
TOP VIEW

2641 drw 02

LCC
TOP VIEW

MILITARY AND COMMERCIAL TEMPERATURE RANGES　　　　　　　　　　　**APRIL 1992**

PIN DESCRIPTION

Pin Names	Description
$\overline{OE}_A$, $\overline{OE}_B$	3-State Output Enable Inputs
Dxx	Inputs
Oxx	Outputs

2641 tbl 01

FUNCTION TABLE[1]

Inputs		Outputs
$\overline{OE}_A$, $\overline{OE}_B$	Dxx	Oxx
L	L	L
L	H	H
H	X	Z

NOTE:
2641 tbl 02

1. H = HIGH Voltage Level
   L = LOW Voltage Level
   X = Don't Care
   Z = High Impedance

ABSOLUTE MAXIMUM RATINGS[1]

Symbol	Rating	Commercial	Military	Unit
V_{TERM}[2]	Terminal Voltage with Respect to GND	−0.5 to +7.0	−0.5 to +7.0	V
V_{TERM}[3]	Terminal Voltage with Respect to GND	−0.5 to Vcc	−0.5 to Vcc	V
T_A	Operating Temperature	0 to +70	−55 to +125	°C
T_{BIAS}	Temperature Under Bias	−55 to +125	−65 to +135	°C
T_{STG}	Storage Temperature	−55 to +125	−65 to +150	°C
P_T	Power Dissipation	0.5	0.5	W
I_{OUT}	DC Output Current	120	120	mA

NOTES:
2641 tbl 03

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. No terminal voltage may exceed Vcc by +0.5V unless otherwise noted.
2. Input and Vcc terminals only.
3. Outputs and I/O terminals only.

CAPACITANCE (T_A = +25°C, f = 1.0MHz)

Symbol	Parameter[1]	Conditions	Type	Max.	Unit
C_{IN}	Input Capacitance	V_{IN} = 0V	6	10	pF
C_{OUT}	Output Capacitance	V_{OUT} = 0V	8	12	pF

NOTE:
2641 tbl 04

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

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DC ELECTRICAL CHARACTERISTICS OVER OPERATING RANGE

Following Conditions Apply Unless Otherwise Specified: V_{LC} = 0.2V; V_{HC} = V_{CC} − 0.2V
Commercial: T_A = 0°C to +70°C, V_{CC} = 5.0V ± 10%; Military: T_A = −55°C to +125°C, V_{CC} = 5.0V ± 10%

Symbol	Parameter	Test Conditions[1]		Min.	Typ.[2]	Max.	Unit
V_{IH}	Input HIGH Level	Guaranteed Logic HIGH Level		2.0	—	—	V
V_{IL}	Input LOW Level	Guaranteed Logic LOW Level		—	—	0.8	V
I_{IH}	Input HIGH Current	V_{CC} = Max., V_I = 2.7V		—	—	10	μA
I_{IL}	Input LOW Current	V_{CC} = Max., V_I = 0.5V		—	—	−10	μA
I_{OZH}	High Impedance	V_{CC} = Max.	V_O = 2.7V	—	—	50	μA
I_{OZL}	Output Current		V_O = 0.5V	—	—	−50	
I_I	Input HIGH Current	V_{CC} = Max., V_{CC} (Max.)		—	—	100	μA
V_{IK}	Clamp Diode Voltage	V_{CC} = Min., I_N = −18mA		—	−0.7	−1.2	V
I_{ODH}	Output Drive Current	V_{CC} = Min., V_O = 2.25V		−35	—	—	mA
I_{ODL}	Output Drive Current	V_{CC} = Min., V_O = 2.25V		50	—	—	mA
I_{OS}	Short Circuit Current	V_{CC} = Max., V_O = GND[3]		−75	—	−225	mA
V_{OH}	Output HIGH Voltage	V_{CC} = Min.	I_{OH} = −300μA[4]	V_{HC}	V_{CC}	—	V
		V_{IN} = V_{IH} or V_{IL}	I_{OH} = −1mA	2.7	3.8	—	
			I_{OH} = −8mA	2.4	3.3	—	
			I_{OH} = −12mA	2.0	3.2	—	
V_{OL}	Output LOW Voltage	V_{CC} = Min.	I_{OL} = 300μA[4]	—	GND	V_{LC}	V
		V_{IN} = V_{IH} or V_{IL}	I_{OL} = 1mA	—	0.1	0.5	
			I_{OL} = 12mA	—	0.35	0.8	
V_H	Input Hysteresis	—		—	200	—	mV
I_{CCH} I_{CCZ} I_{CCL}	Quiescent Power Supply Current	V_{CC} = Max. V_{IN} = GND or V_{CC}		—	0.2	1.5	mA

2641 tbl 05

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_{CC} = 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.
4. This condition is guaranteed but not tested.

POWER SUPPLY CHARACTERISTICS

Symbol	Parameter	Test Conditions[1]		Min.	Typ.[2]	Max.	Unit
ΔI_{CC}	Quiescent Power Supply Current (Inputs TTL HIGH)	V_{CC} = Max. V_{IN} = 3.4V[3]		—	0.5	2.0	mA
I_{CCD}	Dynamic Power Supply Current[4]	V_{CC} = Max., Outputs Open $\overline{OE}_A = \overline{OE}_B$ = GND One Input Toggling 50% Duty Cycle	$V_{IN} = V_{CC}$ V_{IN} = GND	—	0.3	0.40	mA/ MHz
I_C	Total Power Supply Current[6]	V_{CC} = Max., Outputs Open f_i = 10MHz, 50% Duty Cycle	$V_{IN} = V_{CC}$ V_{IN} = GND	—	3.2	5.5	mA
		$\overline{OE}_A = \overline{OE}_B$ = GND One Bit Toggling	V_{IN} = 3.4V V_{IN} = GND	—	3.5	6.5	
		V_{CC} = Max., Outputs Open f_i = 2.5MHz, 50% Duty Cycle	$V_{IN} = V_{CC}$ V_{IN} = GND	—	6.2	9.5[5]	
		$\overline{OE}_A = \overline{OE}_B$ = GND Eight Bits Toggling	V_{IN} = 3.4V V_{IN} = GND	—	8.2	17.5[5]	

2641 tbl 06

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_{CC} = 5.0V, +25°C ambient.
3. Per TTL driven input (V_{IN} = 3.4V); all other inputs at V_{CC} or GND.
4. This parameter is not directly testable, but is derived for use in Total Power Supply calculations.
5. Values for these conditions are examples of the I_{CC} formula. These limits are guaranteed but not tested.
6. $I_C = I_{QUIESCENT} + I_{INPUTS} + I_{DYNAMIC}$
   $I_C = I_{CC} + \Delta I_{CC} D_H N_T + I_{CCD} (f_{CP}/2 + f_i N_i)$
   I_{CC} = Quiescent Current
   ΔI_{CC} = Power Supply Current for a TTL High Input (V_{IN} = 3.4V)
   D_H = Duty Cycle for TTL Inputs High
   N_T = Number of TTL inputs at D_H
   I_{CCD} = Dynamic Current Caused by an Input Transition Pair (HLH or LHL)
   f_{CP} = Clock Frequency for Register Devices (Zero for Non-Register Devices)
   f_i = Input Frequency
   N_i = Number of Inputs at f_i
   All currents are in milliamps and all frequencies are in megahertz.

SWITCHING CHARACTERISTICS OVER OPERATING RANGE

Symbol	Parameter	Condition[1]	IDT54/74FBT2244				IDT54/74FBT2244A				Unit
			Com'l.		Mil.		Com'l.		Mil.		
			Min.[2]	Max.	Min.[2]	Max.	Min.[2]	Max.	Min.[2]	Max.	
tPLH tPHL	Propagation Delay Dxx to Oxx	C_L = 50pF R_L = 500Ω	1.5	6.5	1.5	7.0	1.5	4.8	1.5	5.1	ns
tPZH tPZL	Output Enable Time		1.5	8.0	1.5	8.5	1.5	6.2	1.5	6.5	ns
tPHZ tPLZ	Output Disable Time		1.5	7.0	1.5	7.5	1.5	5.6	1.5	5.9	ns

2641 tbl 07

NOTES:
1. See test circuit and waveforms.
2. Minimum limits are guaranteed but not tested on Propagation Delays.

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