

Octal buffer/line driver (3-State)

54ABT244

FEATURES

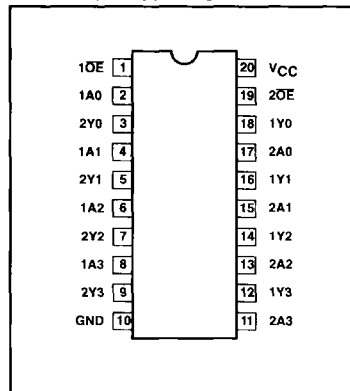
- Octal bus interface
- 3-State buffers
- Output capability: 48mA/-24mA
- Latch-up protection exceeds 500mA per JEDEC JC40.2 Std 17
- ESD protection exceeds 2000V per MIL STD 883C Method 3015.6

DESCRIPTION

The 54ABT244 high-performance BiCMOS device combines low static and dynamic power dissipation with high speed and high output drive.

The 54ABT244 device is an octal buffer that is ideal for driving bus lines. The device features two Output Enables (1OE, 2OE), each controlling four of the 3-State outputs.

PIN CONFIGURATION



ORDERING INFORMATION

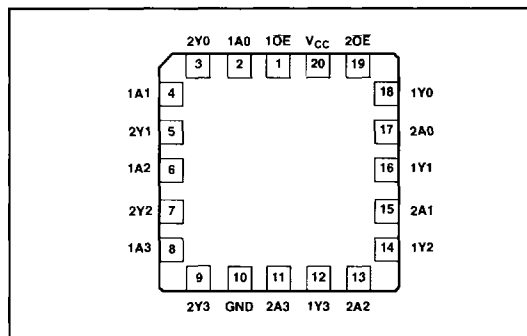
DESCRIPTION	ORDER CODE	PACKAGE DESIGNATOR*
20-Pin Ceramic DIP	54ABT244/BRA	GDIP1-T20
20-Pin Ceramic LLCC	54ABT244/B2A	CQCC2-N20

* MIL-STD 1835 or Appendix A of 1995 Military Data Handbook

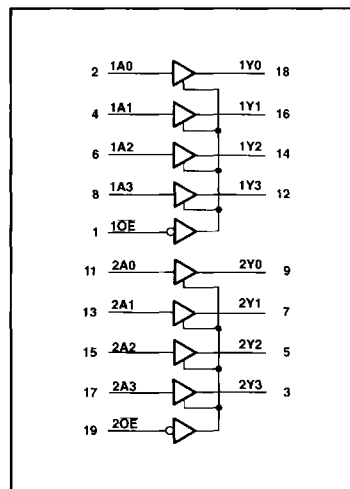
FUNCTION TABLE

INPUTS				OUTPUTS	
1OE	1An	2OE	2An	1Yn	2Yn
L	L	L	L	L	L
L	H	L	H	H	H
H	X	H	X	Z	Z

LLCC LEAD CONFIGURATION



LOGIC SYMBOL



PIN DESCRIPTION

PIN NUMBER	SYMBOL	NAME AND FUNCTION
2, 4, 6, 8	1A0 - 1A3	Data inputs
11, 13, 15, 17	2A0 - 2A3	Data inputs
18, 16, 14, 12	1Y0 - 1Y3	Data outputs
9, 7, 5, 3	2Y0 - 2Y3	Data outputs
1, 19	1OE, 2OE	Output enables
10	GND	Ground (0V)
20	VCC	Positive supply voltage

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ABSOLUTE MAXIMUM RATINGS^{1, 2}

SYMBOL	PARAMETER	CONDITIONS	RATING	UNIT
V_{CC}	DC supply voltage		-0.5 to +7.0	V
I_{IK}	DC input diode current	$V_I < 0$	-18	mA
V_I	DC input voltage ³		-1.2 to +7.0	V
I_{OK}	DC output diode current	$V_O < 0$	-50	mA
V_{OUT}	DC output voltage ³	output in Off or High state	-0.5 to +5.5	V
I_{OUT}	DC output current	output in Low state	96	mA
T_{stg}	Storage temperature range		-65 to 150	°C

RECOMMENDED OPERATING CONDITIONS

SYMBOL	PARAMETER	LIMITS		UNIT
		MIN	MAX	
V_{CC}	DC supply voltage	4.5	5.5	V
V_I	Input voltage	0	V_{CC}	V
V_{IH}	High level input voltage	2.0		V
V_{IL}	Input voltage		0.8	V
I_{OH}	High level output current		-24	mA
I_{OL}	Low level output current		48	mA
$\Delta t/\Delta v$	Input transition rise or fall rate	0	5	ns/V
T_{amb}	Operating free-air temperature range	-55	+125	°C

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DC ELECTRICAL CHARACTERISTICS

Unless otherwise noted: $V_{CC} = \text{MAX}$, $V_I = V_{IL}$ or V_{IH} , $T_{\text{amb}} = -55$ to $+125^\circ\text{C}$

SYMBOL	PARAMETER	TEST CONDITIONS	LIMITS			UNIT	
			MIN	TYP	MAX		
V_{IK}	Input clamp voltage	$V_{CC} = \text{MIN}$, $I = I_{IK}$			-1.2	V	
V_{OH}	High-level output voltage	$V_{CC} = \text{MIN}$	$I_{OH1} = -3\text{mA}$	2.5		V	
			$I_{OH2} = -24\text{mA}$	2.0		V	
		$V_{CC} = 5.0\text{V}$	$I_{OH} = -3\text{mA}$	3.0		V	
V_{OL}	Low-level output voltage	$V_{CC} = \text{MIN}$		0.42	0.55	V	
I_I	Input leakage current	$V_I = \text{GND}$ or 5.5V		± 0.01	± 1.0	μA	
I_{OZH}	3-State output High current	$V_O = 2.7\text{V}$, $V_I = V_{IL}$ or 3.0V^6		5.0	10	μA	
I_{OZL}	3-State output Low current	$V_O = 0.5\text{V}$, $V_I = V_{IL}$ or 3.0V^6		-5.0	-10	μA	
I_{OFF}	Power off leakage current	$V_{CC} = 0\text{V}$, V_I or $V_O \leq 5.5\text{V}$		-150	1.0	150	μA
			$T_{\text{amb}} = 25^\circ\text{C}$	-100		100	
I_{CEX}	Output high leakage current	$V_{CC} = 5.5\text{V}$, $V_O = 5.5\text{V}$			50	μA	
I_O	Output current ⁴	$V_O = 2.5\text{V}$, $V_I = \text{GND}$ or V_{CC}	-50	-100	-180	mA	
I_{CCH}	Quiescent supply current	Outputs High, $V_I = \text{GND}$ or V_{CC}		50	250	μA	
I_{CCL}		Outputs Low, $V_I = \text{GND}$ or V_{CC}		24	30	mA	
I_{CCZ}		Outputs 3-State, $V_I = \text{GND}$ or V_{CC}		50	250	μA	
ΔI_{CC}	Additional supply current per input pin ⁵	Outputs enabled, one input at 3.4V , other inputs at V_{CC} or GND		0.5	1.5	mA	
		Outputs 3-state, one data input at 3.4V , other inputs at V_{CC} or GND		0.5	50	μA	
		Outputs 3-state, one enable input at 3.4V , other inputs at V_{CC} or GND		0.5	1.5	mA	
C_{IN}^7	Input capacitance	$T_{\text{amb}} = 25^\circ\text{C}$; $f = 10\text{MHz}$; $V_{\text{BIAS}} = 3.0\text{V}$			4	pF	
C_{OUT}^7	Output capacitance				7		

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AC ELECTRICAL CHARACTERISTICS

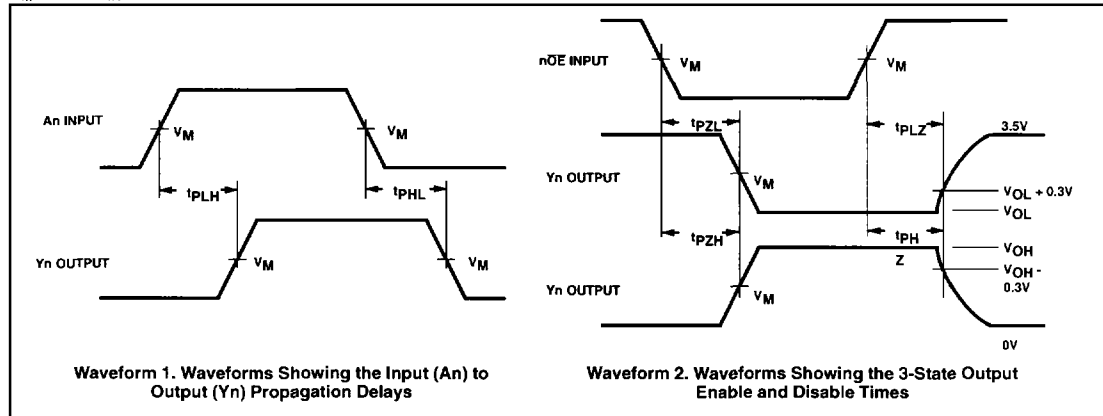
SYMBOL	PARAMETER	WAVEFORM	LIMITS					UNIT
			T _{amb} = +25°C V _{CC} = +5.0V C _L = 50pF, R _L = 500Ω			T _{amb} = -55°C to +125°C V _{CC} = +5.0V ± 0.5V C _L = 50pF, R _L = 500Ω		
			MIN	TYP	MAX	MIN	MAX	
t _{PLH} t _{PHL}	Propagation delay An to Yn	1	1.0 1.0	2.6 2.9	4.1 4.2	1.0 1.0	5.3 5.0	ns
t _{PZH} t _{PZL}	Output enable time to High and Low level	2	1.1 2.1	3.1 4.1	4.6 5.6	0.8 1.2	5.7 7.9	ns
t _{PHZ} t _{PLZ}	Output disable time from High and Low level	2	2.1 1.5	4.1 3.7	5.6 5.6	1.2 1.0	7.6 7.9	ns

NOTES:

- Stresses beyond those listed may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions beyond those indicated under "recommended operating conditions" is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.
- The performance capability of a high-performance integrated circuit in conjunction with its thermal environment can create junction temperatures which are detrimental to reliability. The maximum junction temperature of this integrated circuit should not exceed 150°C.
- The input and output voltage ratings may be exceeded if the input and output current ratings are observed.
- Not more than one output should be tested at a time, and the duration of the test should not exceed one second.
- This is the increase in supply current for each input at 3.4V.
- To accommodate tester limitations, I_{OZ} tests are tested with V_{IH} = 3.0V, but 2.0V V_{IH} is guaranteed.
- C_{IN} and C_{OUT} are measured only for initial qualification or after any design or process changes which may affect capacitance.

AC WAVEFORMS

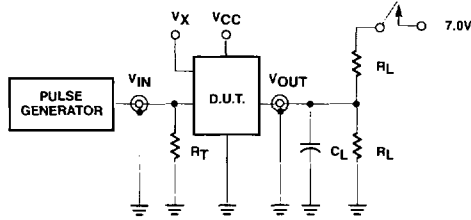
V_M = 1.5V, V_{IN} = GND to 3.0V



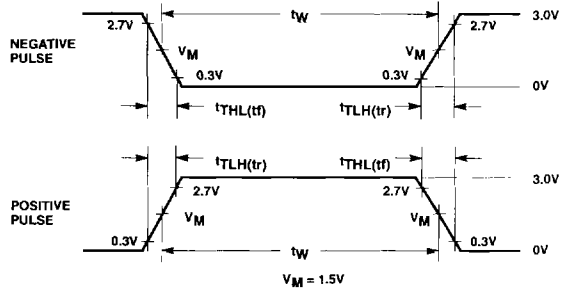
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TEST CIRCUIT AND WAVEFORMS



Test Circuit for 3-State Outputs



Input Pulse Definitions

SWITCH POSITION

TEST	SWITCH
t_{PLZ}	closed
t_{pZL}	closed
All other	open

INPUT PULSE CHARACTERISTICS

Family	Rep. Rate	Pulse Width	t_{TLH}	t_{THL}
54ABT	1MHz	500ns	$\leq 2.5ns$	$\leq 2.5ns$

DEFINITIONS:

- R_L = Load Resistor; see AC Characteristics for value.
- C_L = Load capacitance includes jig and probe capacitance; see AC Characteristics for value.
- R_T = Termination resistance should be equal to Z_{OUT} of pulse generators.
- V_X = Unlocked pins must be held at: $\leq 0.8V$; $\geq 2.7V$ or open per Function Table.