54ABT244 Octal Buffer/Line Driver with TRI-STATE® Outputs

Check for Samples: 54ABT244

FEATURES

- **Non-inverting buffers**
- **Output sink capability of 48 mA, source capability of 24 mA**
- **Output switching specified for both 50 pF and 250 pF loads**
- **Guaranteed simultaneous switching, noise level and dynamic threshold performance**
- **Guaranteed latchup protection**
- **High impedance glitch free bus loading during entire power up and power down cycle**
- **Nondestructive hot insertion capability**
- **Disable time less than enable time to avoid bus contention**
- **Standard Microcircuit Drawing (SMD) 5962-9214701**

DESCRIPTION

The 'ABT244 is an octal buffer and line driver with TRI-STATE outputs designed to be employed as a memory and address driver, clock driver, or bus-oriented transmitter/receiver.

Connection Diagrams

Figure 1. Pin Assignment for DIP and Flatpak

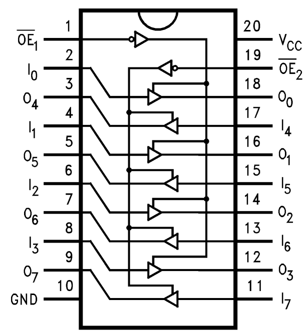
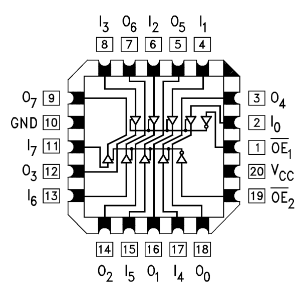


Figure 2. Pin Assignment for LCC



Pin Names	Description
$\overline{OE}_1$, $\overline{OE}_2$	Output Enable Input (Active Low)
I_0–I_7	Inputs
O_0–O_7	Outputs

Truth Table [(1)]

$\overline{OE}_1$	I_{0-3}	O_{0-3}	$\overline{OE}_2$	I_{4-7}	O_{4-7}
H	X	Z	H	X	Z
L	H	H	L	H	H
L	L	L	L	L	L

(1) H = HIGH Voltage Level
L = LOW Voltage Level
X = Immaterial
Z = High Impedance

These devices have limited built-in ESD protection. The leads should be shorted together or the device placed in conductive foam during storage or handling to prevent electrostatic damage to the MOS gates.

Absolute Maximum Ratings [(1)]

Storage Temperature	−65°C to +150°C
Ambient Temperature under Bias	−55°C to +125°C
Junction Temperature under Bias	
Ceramic	−55°C to +175°C
V_{CC} Pin Potential to Ground Pin	−0.5V to +7.0V
Input Voltage [(2)]	−0.5V to +7.0V
Input Current [(2)]	−30 mA to +5.0 mA
Voltage Applied to Any Output	
in the Disabled or	
Power-Off State	−0.5V to 5.5V
in the HIGH State	−0.5V to V_{CC}
Current Applied to Output	
in LOW State (Max)	twice the rated I_{OL} (mA)
DC Latchup Source Current	−500 mA
Over Voltage Latchup (I/O)	10V

(1) Absolute maximum ratings are values beyond which the device may be damaged or have its useful life impaired. Functional operation under these conditions is not implied.
(2) Either voltage limit or current limit is sufficient to protect inputs.

Recommended OperatingConditions

Free Air Ambient Temperature	
Military	−55°C to +125°C
Supply Voltage	
Military	+4.5V to +5.5V
Minimum Input Edge Rate	(ΔV/Δt)
Data Input	50 mV/ns
Enable Input	20 mV/ns

DC Electrical Characteristics

Symbol	Parameter		ABT244 Min	ABT244 Typ	ABT244 Max	Units	V_{CC}	Conditions
V_{IH}	Input HIGH Voltage		2.0			V		Recognized HIGH Signal
V_{IL}	Input LOW Voltage				0.8	V		Recognized LOW Signal
V_{CD}	Input Clamp Diode Voltage				−1.2	V	Min	I_{IN} = −18 mA
V_{OH}	Output HIGH Voltage	54ABT	2.5			V	Min	I_{OH} = −3 mA
		54ABT	2.0			V	Min	I_{OH} = −24 mA
V_{OL}	Output LOW Voltage	54ABT			0.55	V	Min	I_{OL} = 48 mA
I_{IH}	Input HIGH Current				5	μA	Max	V_{IN} = 2.7V (1)
					5			$V_{IN} = V_{CC}$
I_{BVI}	Input HIGH Current Breakdown Test				7	μA	Max	V_{IN} = 7.0V
I_{IL}	Input LOW Current				−5	μA	Max	V_{IN} = 0.5V (1)
					−5			V_{IN} = 0.0V
V_{ID}	Input Leakage Test		4.75			V	0.0	I_{ID} = 1.9 μA
								All Other Pins Grounded
I_{OZH}	Output Leakage Current				50	μA	0 − 5.5V	V_{OUT} = 2.7V; $\overline{OE}_n$ = 2.0V
I_{OZL}	Output Leakage Current				−50	μA	0 − 5.5V	V_{OUT} = 0.5V; $\overline{OE}_n$ = 2.0V
I_{OS}	Output Short-Circuit Current		−100		−275	mA	Max	V_{OUT} = 0.0V
I_{CEX}	Output High Leakage Current				50	μA	Max	$V_{OUT} = V_{CC}$
I_{ZZ}	Bus Drainage Test				100	μA	0.0	V_{OUT} = 5.5V; All Others GND
I_{CCH}	Power Supply Current				50	μA	Max	All Outputs HIGH
I_{CCL}	Power Supply Current				30	mA	Max	All Outputs LOW
I_{CCZ}	Power Supply Current				50	μA	Max	$\overline{OE}_n = V_{CC}$;
								All Others at V_{CC} or Ground
I_{CCT}	Additional I_{CC}/Input	Outputs Enabled			2.5	mA	Max	$V_I = V_{CC}$ − 2.1V
		Outputs TRI-STATE			2.5	mA		Enable Input $V_I = V_{CC}$ − 2.1V
		Outputs TRI-STATE			50	μA		Data Input $V_I = V_{CC}$ − 2.1V
								All Others at V_{CC} or Ground
I_{CCD}	Dynamic I_{CC} (1)	No Load			0.1	mA/ MHz	Max	Outputs Open
								$\overline{OE}_n$ = GND, (2)
								One Bit Toggling, 50% Duty Cycle

(1) Guaranteed, but not tested.
(2) For 8 bits toggling, I_{CCD} < 0.8 mA/MHz.

AC Electrical Characteristics

Symbol	Parameter	54ABT		Units	Fig. No.
		T_A = −55°C to +125°C			
		V_{CC} = 4.5V–5.5V			
		C_L = 50 pF			
		Min	Max		
t_{PLH}	Propagation Delay	1.0	5.3	ns	Figure 23
t_{PHL}	Data to Outputs	1.0	5.0		
t_{PZH}	Output Enable	0.8	6.5	ns	Figure 22
t_{PZL}	Time	1.2	7.9		
t_{PHZ}	Output Disable	1.2	7.6	ns	Figure 22
t_{PLZ}	Time	1.0	7.9		

Capacitance

Symbol	Parameter	Typ	Units	Conditions
				T_A = 25°C
C_{IN}	Input Capacitance	5.0	pF	V_{CC} = 0V
C_{OUT} [(1)]	Output Capacitance	9.0	pF	V_{CC} = 5.0V

(1) C_{OUT} is measured at frequency f = 1 MHz, per MIL-STD-883B, Method 3012.

Typical Performance Curves

Dashed lines represent design characteristics; for specified guarantees refer to AC Characteristics Table.

Figure 3. t_{PLH} vs Temperature (T_A)
C_L = 50 pF, 1 Output Switching

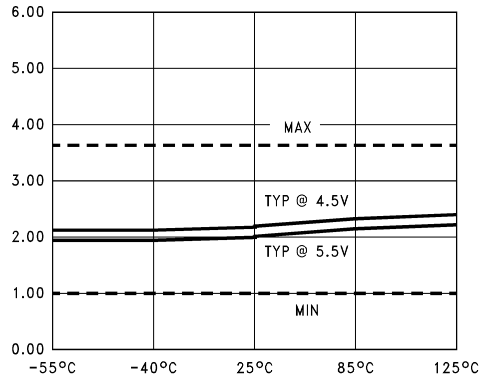


Figure 4. t_{PHL} vs Temperature (T_A)
C_L = 50 pF, 1 Output Switching

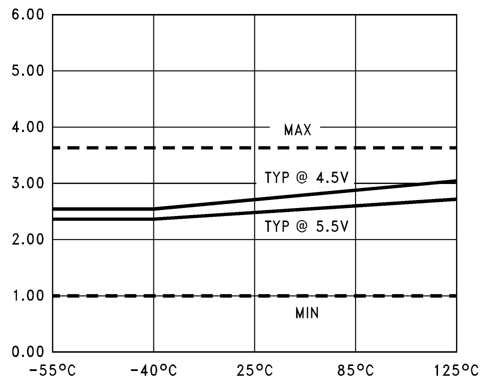


Figure 5. t_{PLH} vs Load Capacitance
1 Output Switching, T_A = 25°C

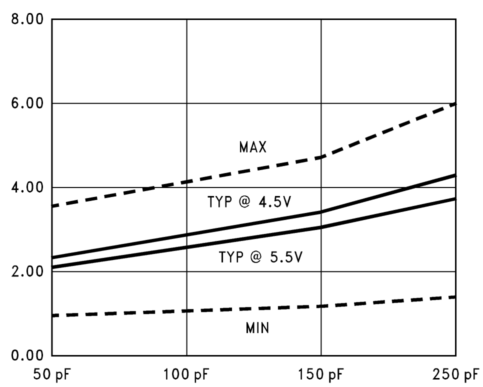


Figure 6. t_{PHL} vs Load Capacitance 1 Output Switching, T_A = 25°C

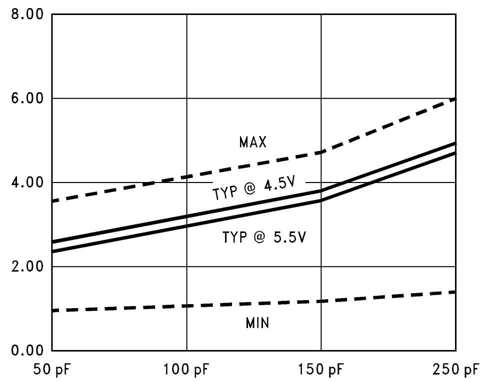


Figure 7. t_{PLH} vs Load Capacitance 8 Outputs Switching, T_A = 25°C

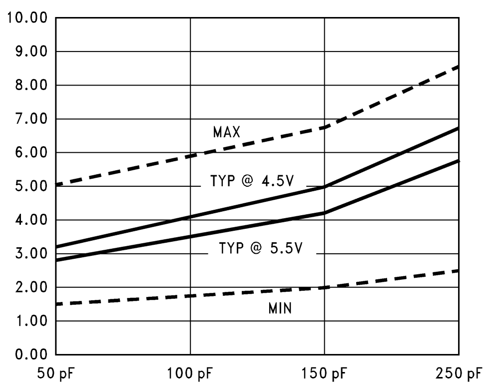


Figure 8. t_{PHL} vs Load Capacitance 8 Outputs Switching, T_A = 25°C

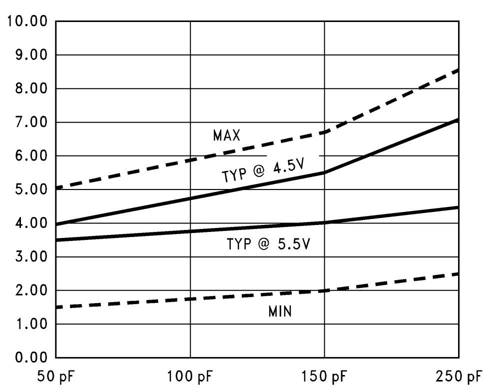


Figure 9. t_{PZL} vs Temperature (T_A) C_L = 50 pF, 1 Output Switching

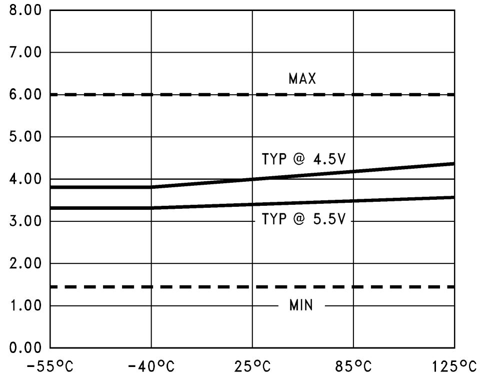


Figure 10. t_{PLZ} vs Temperature (T_A) C_L = 50 pF, 1 Output Switching

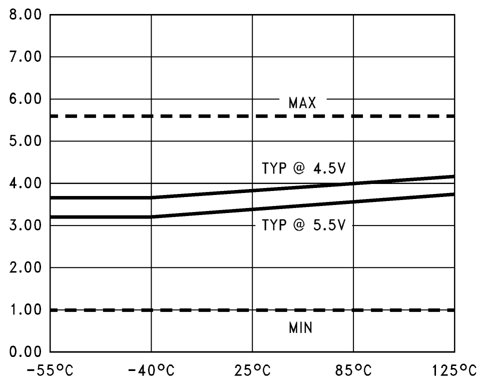


Figure 11. t_{PZH} vs Temperature (T_A) C_L = 50 pF, 1 Output Switching

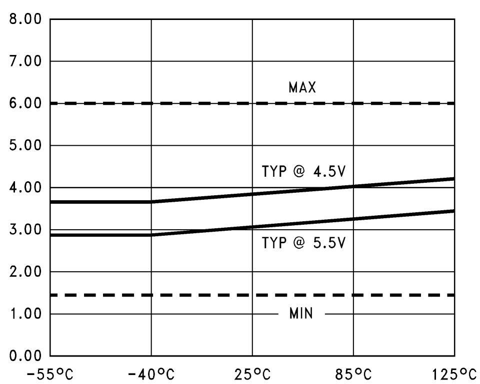


Figure 12. t_{PHZ} vs Temperature (T_A)
C_L = 50 pF, 1 Output Switching

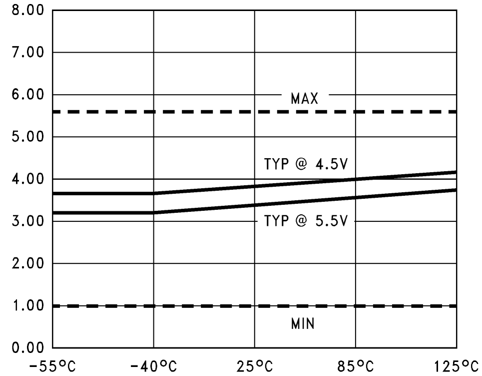


Figure 13. t_{PZH} vs Temperature (T_A)
C_L = 50 pF, 8 Outputs Switching

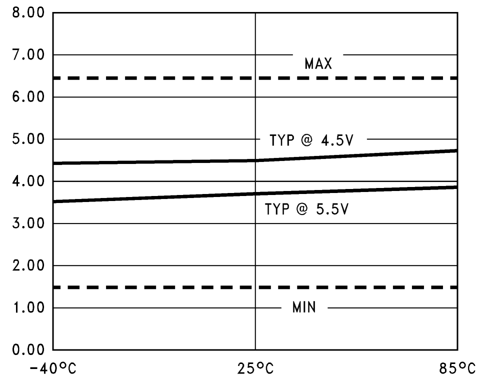


Figure 14. t_{PHZ} vs Temperature (T_A)
C_L = 50 pF, 8 Outputs Switching

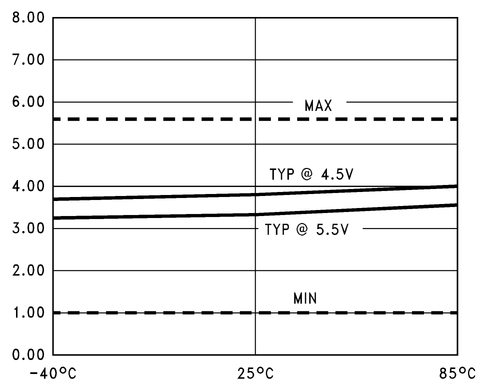


Figure 15. t_{PZL} vs Temperature (T_A)
C_L = 50 pF, 8 Outputs Switching

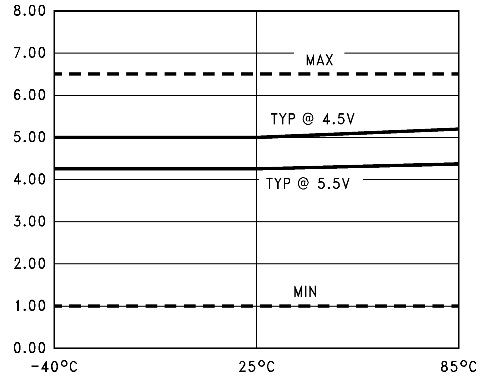


Figure 16. t_{PLZ} vs Temperature (T_A)
C_L = 50 pF, 8 Outputs Switching

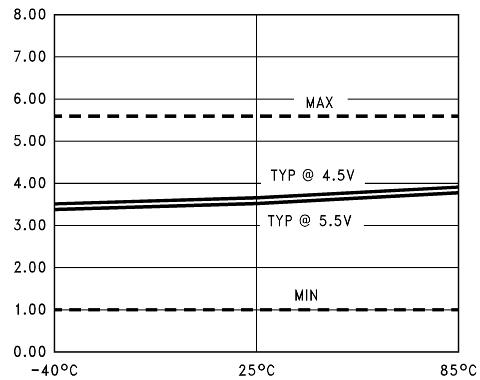


Figure 17. t_{PZL} vs Load Capacitance
8 Outputs Switching
T_A = 25°C

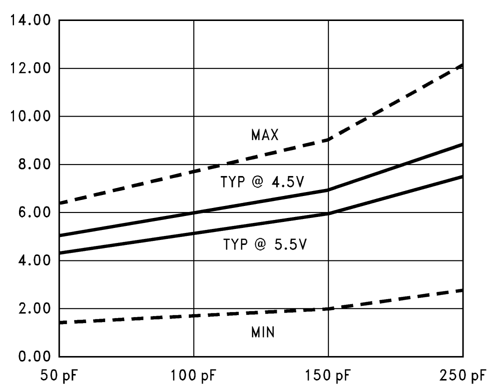


Figure 18. t_{PZH} vs Load Capacitance 8 Outputs Switching T_A = 25°C

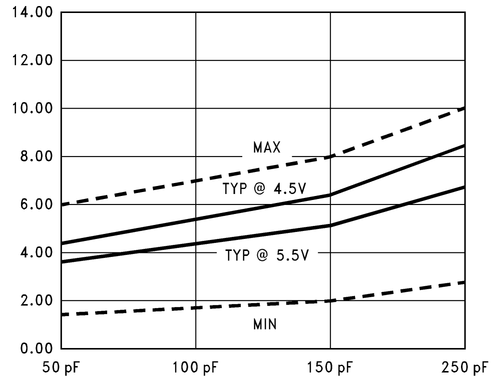


Figure 19. t_{PLH} and t_{PHL} vs Number Outputs Switching V_{CC} = 5.0V, T_A = 25°C, C_L = 50 pF

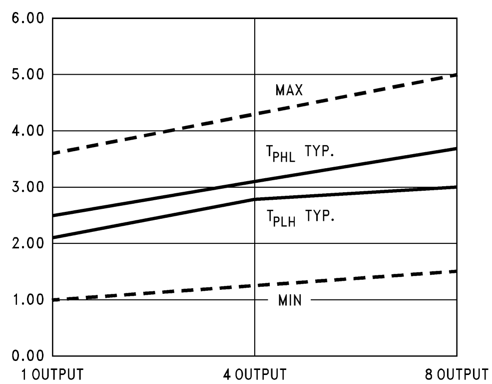
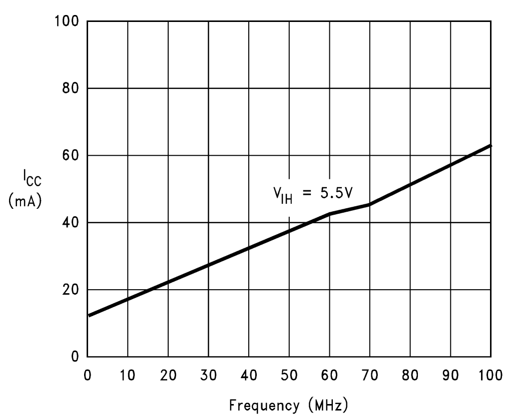
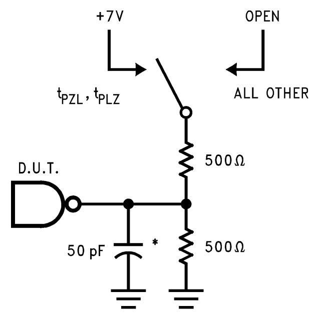


Figure 20. I_{CC} vs Frequency, Average, T_A = 25°C, All Outputs Unloaded/Unterminated



AC Loading



*Includes jig and probe capacitance

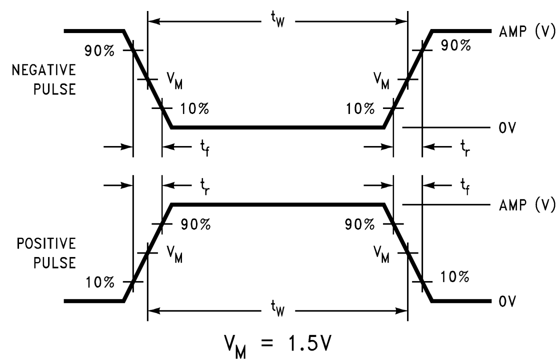


Figure 21. Test Input Signal Levels

Test Input Signal Requirements

Amplitude	Rep. Rate	t_W	t_r	t_f
3.0V	1 MHz	500 ns	2.5 ns	2.5 ns

AC Waveforms

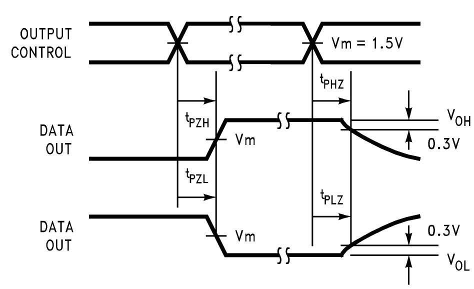


Figure 22. TRI-STATE Output HIGH and LOW Enable and Disable Times

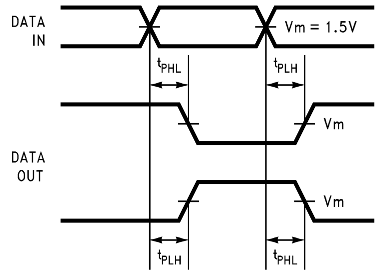


Figure 23. Propagation Delay Waveforms for Inverting and Non-Inverting Functions

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