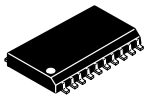
Octal Buffer/Line Driver with 3-State Outputs

74AC540



SOIC−20W
CASE 751BJ

General Description

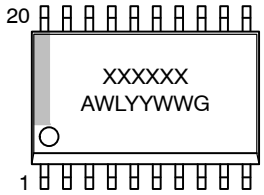
The AC540 is an octal buffer/line drivers designed to be employed as memory and address drivers, clock drivers and bus oriented transmitter/receivers.

These devices are similar in function to the AC240 while providing flow−through architecture (inputs on opposite side from outputs). This pinout arrangement makes these devices especially useful as output ports for microprocessors, allowing ease of layout and greater PC board density.

Features

- I_{CC} and I_{OZ} Reduced by 50%
- 3−State Inverting Outputs
- Inputs and Outputs Opposite Side of Package, Allowing Easier Interface to Microprocessors
- Outputs Source/Sink 24 mA
- These are Pb−Free Devices

MARKING DIAGRAM



XXX	= Specific Device Code
A	= Assembly Location
WL	= Wafer Lot
YY	= Year
WW	= Work Week
G	= Pb−Free Package

ORDERING INFORMATION

See detailed ordering and shipping information on page 4 of this data sheet.

TRUTH TABLE

Inputs			Outputs
$\overline{OE}_1$	$\overline{OE}_2$	D	
L	L	H	L
H	X	X	Z
X	H	X	Z
L	L	L	H

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

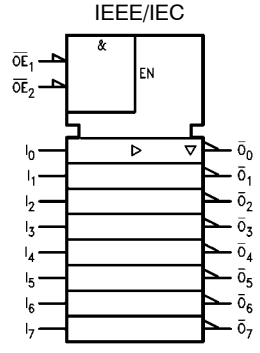


Figure 1. Logic Symbol

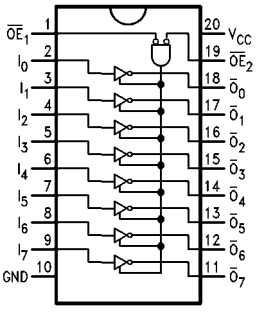


Figure 2. Connection Diagram

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ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
Supply Voltage	V_{CC}	−0.5 to 6.5	V
DC Input Diode Current V_I = −0.5 V V_I = V_{CC} + 0.5 V	I_{IK}	 −20 +20	mA
DC Input Voltage	V_I	−0.5 to V_{CC} + 0.5	V
DC Output Diode Current V_O = −0.5 V V_O = V_{CC} + 0.5 V	I_{OK}	 −20 +20	mA
DC Output Voltage	V_O	−0.5 to V_{CC} + 0.5	V
DC Output Source or Sink Current	I_O	±50	mA
DC V_{CC} or Ground Current per Output Pin	I_{CC} or I_{GND}	±50	mA
Storage Temperature	T_{STG}	−65 to +150	°C

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter	Min	Max	Unit
V_{CC}	Supply Voltage	2.0	6.0	V
V_I	Input Voltage	0	V_{CC}	V
V_O	Output Voltage	0	V_{CC}	V
T_A	Operating Temperature	−40	85	°C
$\Delta V/\Delta t$	Minimum Input Edge Rate V_{IN} from 30% to 70% V_{CC} V_{CC} @ 3.3 V, 4.5 V, 5.5 V	125		mV/ns

Functional operation above the stresses listed in the Recommended Operating Ranges is not implied. Extended exposure to stresses beyond the Recommended Operating Ranges limits may affect device reliability.

DC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	V_{CC} (V)	T_A = +25°C	T_A = −40°C to +85°C		Unit	Conditions
			Typ	Guaranteed Limits			
V_{IH}	Minimum High Level Input Voltage	3.0	1.5	2.1	2.1	V	V_{OUT} = 0.1 V or V_{CC} − 0.1 V
		4.5	2.25	3.15	3.15		
		5.5	2.75	3.85	3.85		
V_{IL}	Maximum Low Level Input Voltage	3.0	1.5	0.9	0.9	V	V_{OUT} = 0.1 V or V_{CC} − 0.1 V
		4.5	2.25	1.35	1.35		
		5.5	2.75	1.65	1.65		
V_{OH}	Minimum High Level Output Voltage	3.0	2.99	2.9	2.9	V	I_{OUT} = −50 μA
		4.5	4.49	4.4	4.4		
		5.5	5.49	5.4	5.4		
						V	V_{IN} = V_{IL} or V_{IH}
		3.0	–	2.56	2.46		I_{OH} = −12 mA
		4.5	–	3.86	3.76		I_{OH} = −24 mA
		5.5	–	4.86	4.76		I_{OH} = −24 mA (Note 1)
V_{OL}	Maximum Low Level Output Voltage	3.0	0.002	0.1	0.1	V	I_{OUT} = 50 μA
		4.5	0.001	0.1	0.1		
		5.5	0.001	0.1	0.1		
						V	V_{IN} = V_{IL} or V_{IH}
		3.0	–	0.36	0.44		I_{OL} = 12 mA
		4.5	–	0.36	0.44		I_{OL} = 24 mA
		5.5	–	0.36	0.44		I_{OL} = 24 mA (Note 1)
I_{IN} (Note 3)	Maximum Input Leakage Current	5.5	–	±0.1	±1.0	μA	V_I = V_{CC}, GND
I_{OZ}	Maximum 3-State Current	5.5	–	±0.25	±2.5	μA	V_I (OE) = V_{IL}, V_{IH} V_I = V_{CC}, GND V_O = V_{CC}, GND
I_{OLD}	Minimum Dynamic Output Current (Note 2)	5.5	–	–	75	mA	V_{OLD} = 1.65 V Max
I_{OHD}		5.5	–	–	−75	mA	V_{OHD} = 3.85 V Min
I_{CC} (Note 3)	Maximum Quiescent Supply Current	5.5	–	8.0	80	μA	V_{IN} = V_{CC} or GND

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

1. All outputs loaded; thresholds on input associated with output under test.
2. Maximum test duration 2.0 ms, one output loaded at a time.
3. I_{IN} and I_{CC} @ 3.0 V are guaranteed to be less than or equal to the respective limit @ 5.5 V V_{CC}.

AC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	V_{CC}* (V)	T_A = +25°C, C_L = 50 pF			T_A = −40°C to +85°C, C_L = 50 pF		Unit
			Min	Typ	Max	Min	Max	
t_{PLH}	Propagation Delay Data to Output	3.3	1.5	5.5	7.5	1.0	8.0	ns
		5.0	1.5	4.0	6.0	1.0	6.5	
t_{PHL}	Propagation Delay Data to Output	3.3	1.5	5.0	7.0	1.0	7.5	ns
		5.0	1.5	4.0	5.5	1.0	6.0	
t_{PZH}	Output Enable Time	3.3	3.0	8.5	11.0	2.5	12.0	ns
		5.0	2.0	6.5	8.5	2.0	9.5	
t_{PZL}	Output Enable Time	3.3	2.5	7.5	10.0	2.0	11.0	ns
		5.0	2.0	6.0	7.5	1.5	8.5	
t_{PHZ}	Output Disable Time	3.3	2.5	8.5	13.0	1.5	14.0	ns
		5.0	1.5	7.5	10.5	1.0	11.0	
t_{PLZ}	Output Disable Time	3.3	2.5	7.0	10.0	2.0	11.0	ns
		5.0	1.5	6.0	8.0	1.5	9.0	

*Voltage Range 3.3 V is 3.3 V ±0.3 V.
Voltage Range 5.0 V is 5.0 V ±0.5 V.

CAPACITANCE

Symbol	Parameter	Typ	Unit	Conditions
C_{IN}	Input Capacitance	4.5	pF	V_{CC} = OPEN
C_{PD}	Power Dissipation Capacitance	30	pF	V_{CC} = 5.0 V

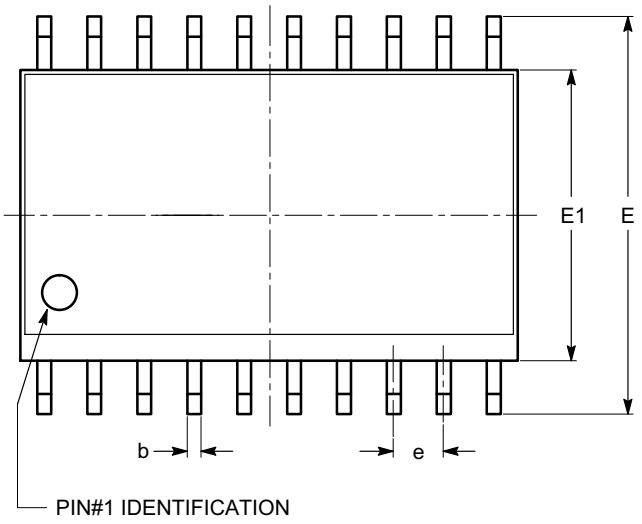
ORDERING INFORMATION

Device	Device Marking	Package	Shipping†
74AC540SCX	AC540	SOIC−20W, case 751BJ (Pb−Free)	1000 / Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

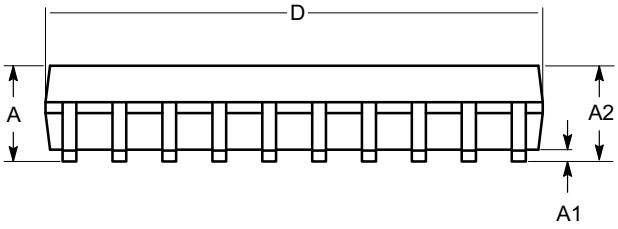
SOIC−20, 300 mils
CASE 751BJ
ISSUE O

DATE 19 DEC 2008

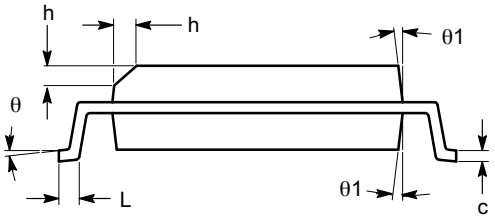


TOP VIEW

SYMBOL	MIN	NOM	MAX
A	2.36	2.49	2.64
A1	0.10		0.30
A2	2.05		2.55
b	0.31	0.41	0.51
c	0.20	0.27	0.33
D	12.60	12.80	13.00
E	10.01	10.30	10.64
E1	7.40	7.50	7.60
e	1.27 BSC		
h	0.25		0.75
L	0.40	0.81	1.27
θ	0°		8°
θ1	5°		15°



SIDE VIEW



END VIEW

Notes:
(1) All dimensions are in millimeters. Angles in degrees.
(2) Complies with JEDEC MS-013.

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